

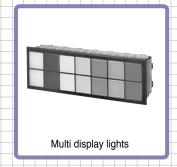








- PUSHBUTTON SWITCHES
- SELECTOR SWITCHES
- EMERGENCY STOP PUSHBUTTON SWITCHES
- PILOT LIGHTS
- MULTI DISPLAY LIGHTS
- TERMINAL BLOCKS





VOLTAGE
EQUIPMENT
Up to 600 Volts





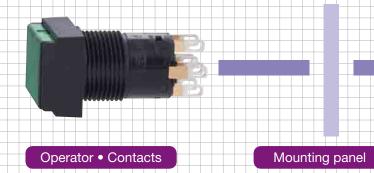


INDIVIDUAL CATALOG 04
from D&C CATALOG 20th Edition

01 02 03 **04** 05 06 07 08 09 10 11 12

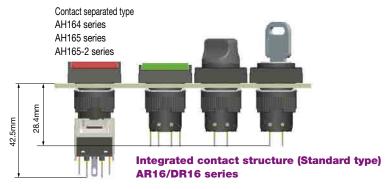
## minico ø16 **Command Switches** AR16 DR16, AF16 DF16

- An integrated structure with built-in contacts that can reduce control panel depth.
- A wide variety of sockets are available to simplify wiring.



### Supporting smaller and thinner operator's panels

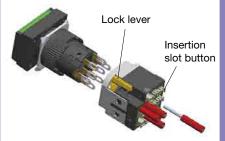
A structure that integrates operator and contacts to reduce panel-mounting depth. Terminals extending to the rear of the switch ensure easy wiring work.



#### A wide variety of sockets reduce wiring work

Switches combine with a variety of sockets to simplify wiring.

#### **Fast-connection socket**



- Applicable as a fast-connection terminal switch by combining the socket with a switch.
- Easily wired by simply removing the wire sheath and inserting the wires while pressing the insertion slot button (no soldering required).
- Incorporates a branch terminal for easy branching.

#### **Connector socket**



- Applicable as a connector by combining the socket with receptacles.
- The socket holds the receptacles, making it easy to connect the receptacle to the switch with a single operation.

#### Socket for PC board



- Applicable as a switch for PC board by combining the socket with a switch.
- Pattern wiring reduces the number of wiring man-hour and helps prevent faulty wiring.

**DF16** 



Fast-Connection socket





Connector socket

Washer

Tightening nut



Socket for PC board

## **Contributes to attractive** panel designs

In addition to the standard type, a thin type with a panel protrusion of only 2 mm is available, allowing high-density mounting for attractive panel designs.

**Integrated contact structure(Thin type)** AF16/DF16 series





- · Keep in mind that the panel cutout size for the thin type depends on the operator shape. See page 04/167 for details.
- The panel depth is unified to 35.9mm.

### **Brighter illuminated** surface

Less power consumption helps to save energy. A longer service life helps to reduce maintenance costs.

**Dedicated LED lamp** 

#### **Degrees of** protection IP65

The operator has IP65 protection for effects from oil, water, or dusts. Applicable to a wide variety of equipment, from machine tools to

### **Highly reliable** contact mechanism

action mechanism enables IC-level applications (with a switching current of 1 mA at 5 V).

### **Meets EU RoHS** requirements

Standard models meet RoHS requirements (EU Directive 2002/95/C).

#### Standard models meet international standards

Standard models meet UL/CSA requirements, China Compulsory Certification (CCC) standards, and TÜV EN standards, making them ideal for equipment for export.

Note: Command switches shipped as single articles to China must conform to the Product Quality Law. Check with your Fuji Electric representative

### The insertion/extraction life of the key is greatly extended

The key selector switch incorporates a pin tumbler type key (reversible type) to improve the insertion/ extraction performance of the key.



- Six key types are available.
- The pin tumbler construction improves security.

## The operating angle position of the selector switch can be easily changed.

The bezel is separate from the knob (key), so the operating angle position can be easily changed in 45° increments (with the AR16 series rectangular or square type only). The following figure shows a knob type example. Same applies to the key type.

Two-position model example.







## Ø22 (Ø25) AR22 and DR22 Command Switches

The use of a release arm enables easy mounting.



Operator • Contacts

Mounting panel

## Easy attachment and detachment with a release arm

The separate structure with a unique wedge mechanism enables one-step attachment and detachment of the operating section and contact section, without the use of any tool.

#### **One-step lock!**



## Panel thickness need not be adjusted

Because the back surface of the operating section is mounted with a tightening nut, there is absolutely no need to adjust the panel thickness. Also, the operator

Also, the operator can be mounted on the panel along with a previously installed button and knob.

Easy





### Contact block and transformer unit can also be added or replaced in a single step

All contact block and transformer unit are designed with snap-on mounting, so no tools are required.

One Touch



Detachment



## Superior contact reliability

All the contacts are double break type and feature self-cleaning action. Every time the switch is operated, the contact surfaces are wiped with a sliding movement, thus ensuring high contact reliability even at low voltage and small current levels (5V, 5mA).

## Improved work efficiency through bi-directional wiring

Terminals can be wired from two directions. This is ideal for wiring crossovers or wiring in narrow spaces. Square washers are used to enable wiring with solid wires.

Utility

Wiring from two directions





1NO

1NC

Transformer Uni







Color coding of contact blocks, lamp terminal and transformer unit makes wiring and checking easy.

## Buzzers are also available

Electronic or electromagnetic buzzers provide audible feedback on the status of the equipment. Splash-proof



buzzers that conform to EN 60204-1 (degrees of protection) are also available (enclosure used in general industry: IP54).

Release arm





Tightening nut

Contact section

#### Depth of the short body

A short design enables full use of the available depth of the equipment.

Illuminated Puchbutton Switch (1NO+1NC with transformer) 41mm Selector Switch (1NO+1NC)

Pilot light (models for full voltages)

Short

1 The Short-body Pilot light is 21.5mm

### **Terminal cover for** charged parts provided as a standard accessory

A terminal cover that covers the terminals is provided as a standard accessory to help prevent electric shock by reducing exposure to charged parts. Note: Not provided on all models.

## Standard models meet international standards

Standard models meet UL/CSA requirements and TÜV EN standards, making them ideal for equipment for export.

Chinese CCC-compliant models are also available. Note: For details, refer to List of Models See page 04/3 to 04/6

Global Standardization

### **Switches with IP2X** -compliant terminals are also available

Switches with IP2X-compliant terminals with a finger protection structure conforming to EN 60204-1 (Protection against electric shock) are available. (A test finger that simulates a human finger does not come into contact with live parts.)

Safety







for pilot light

Contacts

Transformer unit

Note: For details, refer to AR22 and DR22-series Special Products.

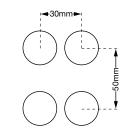
### **High brightness LED** illuminated model, "PIKARI-KUN"

- (1) higher equipment grade, identification of the status, and
  (3) adoption of pure green illumination color through a major improvement in visibility (Luminance) through the
- Along with a significant improvement in Luminance, energy is saved through a reduction in power consumption.
- by increasing the service life.

### Lamp base shape facilitates easy replacement

The same lamp base shape of BA9s/13 for both high brightness LED lamps and incandescent lamps facilitates application.

### Features 30 × 50 mm tight mounting

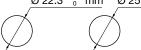


Note: Not applicable to all models.

### **Panel cutout dimensions** of 22.3 mm and 25.5 mm diameter

By providing a projection on the tightening nut, one switch can be mounted on two different panel cutout dimensions. Therefore, switches do not need to be purchased to match the panel cutout dimensions

Ø 22.3 <sup>+ 0.4</sup> mm Ø 25.5 + 0.5 mm



Units can be mounted on a 25.5-mm diameter hole simply by turning over the tightening nut.

## Safety equipment

## 16 to 30 mm diameter

Command Switch Emergency Stop (Illuminated) Pushbutton Switches

These pushbutton switches comply with various international standards, so they can be reliably used as emergency stop devices.



AR16V0R

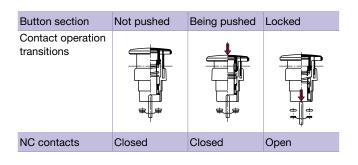
#### **Compliance with International Standards**

The emergency stop pushbuttons employ FUJI's original Trigger Action mechanism.

They are suitable for emergency stop and safety.

This mechanism prevents the contacts from moving until the button is pushed and locked.

- Provided with a Trigger Action mechanism conforming to EN 480.
- Provided with direct opening action (approved by TÜV) conforming to EN60947-5-1 and EN60947-5-5.



Operation characteristics and contact operation for NC contacts

Locked

Not pushed Being pushed Lock position

Operation force NC contacts open (OFF)

NC contact ON OFF

## **Emergency stop pushbutton switches available with an integrated contact structure**

Emergency stop pushbutton switches are available with an integrated contact structure in which the operating section and contact section are combined into one unit (AH165-V, AR16V, and AR22VG). By arranging the contacts in an integrated structure, the reliability of the safety protection function is increased.

- The AR16V types feature a panel depth dimension of 28 mm for nonilluminated models and can have up to four sets of contacts.
- The AR22VGF types are equipped with a lamp circuit interlocking structure in which a lamp lights when the switch is locked.







AR22VGF

#### Ø22 (AR22, AM22)

AR22V0L





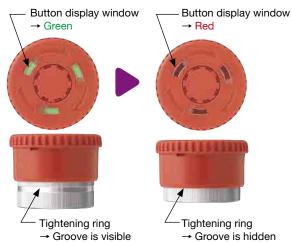
Ø30 (AR30)

AM22VME

## A mechanical indicator mechanism by which the operating status can be seen at a single glance is available.

In AM22VME types, the operating status is indicated mechanically in the form of green and red colors in three button display windows

Reset status Locked status (no operation being performed): Green (during operation): Red



 Ideal for mechanical control panels in which display power supply is difficult to ensure.

## **SEMI-compliant guard rings are also available**

AR30V1R

This guard ring can be combined with our emergency stop switches to comply with the SEMI standards required for semiconductor manufacturing devices.





Combination of an AR9R008 guard ring with an AR22V2R switch Combination of an AR9R008 guard ring with an AR22V3R Z286 switch

- Emergency stop switches with the "EMO" mark are available (AR22V3R Z286).
- EMERGENCY OFF labels are available.



Note: For details, refer to SEMI-compliant guard rings.

AR22V3R Z286

## **Standard models meet international standards**

Standard models meet UL/CSA requirements and TÜV, EN Standard are available and exhibit CE marking.

Chinese CCC-compliant models are also available.



Note: For details, refer to the list of models

## Emergency stop pushbutton switches with IP2X -compliant terminals are also available

Emergency stop pushbutton switches with IP2X-compliant terminals with a finger protection structure conforming to EN 60204-1 (protection against electric shock) are available. (A test finger that simulates a human finger does not come in contact with live parts.)

Note: The AR16V types is IP2X compliant when used with a terminal cover for charged parts (AR9Y262, sold separately). Switches from the AH165-V types are not IP2types compliant. For details on the AR22, 30V, Q, and AM22V types, refer to Special Products. The standard AR22VG types are IP2X compliant.

## General information Command Series

Series	Type	Features
Series  Command Series	AR22 and DR22  AR30 and DR30	<ul> <li>Features</li> <li>Standard models feature illumination with high brightness LEDs.</li> <li>No adjusting of panel thickness is necessary.</li> <li>The button and lens can be mounted on a panel while the operator is engaged.</li> <li>Easy replacing contact block and transformer.</li> <li>Wiring from two directions is possible.</li> <li>The shortest among industrial pushbuttons. The transformer now occupies far less space.</li> <li>A terminal cover are provided, assuring safety and security.</li> <li>The emergency stop pushbuttons employ FUJI's original Trigger Action mechanism. They are suitable for emergency stop and safety.</li> <li>Mountable even on panel cutout 25mm diameter.</li> <li>AR22 and DR22 series of the ø22 Command Switches are approved by UL/CSA CCC and TÜV (EN standard).</li> <li>Bearing CE markings.</li> <li>Standard models feature illumination with high brightness LEDs.</li> <li>Easy replacing contact block and transformer.</li> </ul>
		<ul> <li>The shortest among industrial pushbuttons. The transformer now occupies far less space.</li> <li>A terminal cover are provided, assuring safety and security.</li> <li>The emergency stop pushbuttons employ FUJI's original Trigger Action mechanism. They are suitable for emergency stop and safety.</li> <li>AR30 and DR30 series of the ø30 Command Switches are approved by UL/CSA, CCC and TÜV (EN standard).</li> <li>Bearing CE markings.</li> </ul>
	AR16 and AF16	<ul> <li>An integrated operator component and contact mechanism that reduces control panel's depth. A unified depth of 28.4mm for the Standard type and 35.9mm for the Thin type.</li> <li>Thin type and Standard types available for your control panel design. Select an optimum one to match your control panel design.</li> <li>A wide variety of sockets help to reduce wiring.</li> <li>Incorporating a gold-flashed SPDT or 2PDT contact mechanism with a snap-action structure that makes and breaks 1mA at 5V.</li> <li>A key selector switch with a pin tumbler key and reversible type mechanism provides improved key insertion and removal (extraction) performance.</li> <li>Complies with RoHS (EU Directive 2002/95/EC).</li> <li>The standard AR16 and DR16, AF16 and DF16 series of the Ø16 Command Switches are approved by UL/CSA, CCC and TÜV (EN standard).</li> <li>Bearing CE markings.</li> </ul>
	AH164 and AH165 AH165-2	<ul> <li>Standard models feature illumination with high brightness LEDs.</li> <li>Unified depth dimension of 24 mm for type with indicator and 42.5 mm for other types.</li> <li>Application possible at 1 mA, 5 V due to gold-plated contacts and sliding structure.</li> <li>Incandescent, neon and LED lamps are available.</li> <li>Easy replacing contact block.</li> <li>AH165-2 series are about twice as large as the AH165 series.</li> <li>AH164 and AH165, AH165-2 series of the ø16 Command Switches are approved by UL/CSA, CCC and TÜV (EN standard).</li> <li>Bearing CE markings.</li> </ul>
	AM22 and DM22	<ul> <li>Standard models feature illumination with high brightness LEDs.</li> <li>Easy addition or replacement of text plates with front tightening nut mounting system.</li> <li>Easy replacing contact block and transformer.</li> <li>The shortest among industrial pushbuttons. The transformer now occupies far less space.</li> <li>A terminal cover are provided, assuring safety and security.</li> <li>The emergency stop pushbuttons employ FUJI's original Trigger Action mechanism. They are suitable for emergency stop and safety.</li> <li>AM22 and DM22 series of the ø22 Command Switches are approved by UL/CSA, CCC and TÜV (EN standard).</li> <li>Bearing CE markings.</li> </ul>

					Page
Туре	AR22		DR22		04/2
Degree of protection	IP65		DRZZ		_
Illuminated pushbutton switches	IP65 ●				_
Pushbutton switches	•		_		_
Emergency stop pushbutton switches	•				_
	- <del>-</del>				_
Emergency stop illuminated pushbutton switches Selector switches	•		<del>-</del>		_
Illuminated selector switches					_
			_		_
Joy stick selector switches  Buzzer				00, IP54)	_
Pilot lights	- <del>-</del>		O (IF	00, 1654)	_
Thot lights					_
Туре	AR30		DR30		04/55
Degree of protection	IP65				_
Illuminated pushbutton switches	•		<u> </u>		_
Pushbutton switches	•		1_		_
Emergency stop pushbutton switches	•		1_		_
Emergency stop illuminated pushbutton switches	•				_
Selector switches	•		<u> </u>		<del>-</del>
Illuminated selector switches					_
Joy stick selector switches			+		_
Buzzer			A (IP	'00, IP54)	_
Pilot lights	1_		• (11	00, 11 04)	_
			`		04/129
					04/129
Туре	AR16	DR16	AF16	DF16	_
Degree of protection	IP65	J.(.,0	711.10	120	_
Illuminated pushbutton switches	11 03	<b>—</b>		1_	_
Pushbutton switches		1_		<del>-  -</del>	_
Emergency stop pushbutton switches	•	1=		<del>-  -</del>	_
		- <del>-</del>		<del> </del>	_
Emergency stop illuminated pushbutton switches Selector switches	•				_
Pilot lights		_	_		_
T not lights					_
					<del>-</del> 04/186
	AH164	AH1	65	AH165-2	_
Туре					
Degree of protection	IP40	IP65		IP65	
Degree of protection Illuminated pushbutton switches				IP65 ●	_
Degree of protection Illuminated pushbutton switches Pushbutton switches	IP40	IP65		+-	_
Degree of protection Illuminated pushbutton switches Pushbutton switches Emergency stop pushbutton switches	IP40	IP65 ●		+-	_
Degree of protection Illuminated pushbutton switches Pushbutton switches	IP40	IP65 ●		+-	_
Degree of protection Illuminated pushbutton switches Pushbutton switches Emergency stop pushbutton switches	IP40	IP65		•	
Degree of protection Illuminated pushbutton switches Pushbutton switches Emergency stop pushbutton switches Selector switches	IP40 ● -	IP65		• • -	
Degree of protection Illuminated pushbutton switches Pushbutton switches Emergency stop pushbutton switches Selector switches Pilot lights	IP40 ●	IP65	5	• • •	
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## **General information Command Series**

Series	Туре	Features
Command Series	AH25	<ul> <li>Standard models feature illumination with high brightness LEDs.</li> <li>Easy replacing contact block and transformer.</li> <li>A terminal cover are provided, assuring safety and security.</li> <li>The standard AH25 series of the ø25 Command Switches are approved by UL/CSA.</li> </ul>
	AG22 and AG23	<ul> <li>Application possible at 1 mA, 5 V due to gold-plated contacts and sliding structure.</li> <li>Easy replacing contact block.</li> <li>Compact design with a short depth.</li> <li>Solder/tab terminals.</li> <li>The standard AG22 and AG23 series are approved by UL/CSA.</li> </ul>
Multi Display	AP30F and AP40F	<ul> <li>High brightness for more vivid colors</li> <li>Newly added blue and pure white LEDs improve visibility.</li> <li>Transformer-free design for lighter structure and shorter depth (for 100-V and 200-V models)</li> <li>Easy color and voltage changes.</li> <li>Wide window size selection. A wide selection, including half-size windows.</li> <li>UL/CSA-compliant models also available.</li> </ul>
Rotary Switches	AB09, AB16 and AB32	Rotary switches with code output. Three types of code output are available. Select either soldered or connector connections.
Cam Type	RC310	A wide range of models available for control, instrumentation, and motor starting and with bifurcated contacts, keys, and indicators.
Panel Switches	NS387	Ideal for switching all types of electric circuits.
Terminal Blocks		FUJI can supply a variety of terminal blocks for switchboard or switchgear use.

								Page
Туре			AH25	<del></del>				04CD/3/1
<u> </u>	of protection		IP40			IP65		
	ated pushbutton switches	1	● (Sc	quare ty	ype)	•		
	itton switches			quare ty		•		
Selecto	r switches			quare ty		•		
Pilot lig	ihts			quare ty		•	<del></del>	
Mechan	Mechanical interlocked pushbutton switches		_			•		
Mountir	ng hole dimensions		23.5×	22.5		23.5×30.5		04CD/1/
Туре			AG22	2		AG23		
Degree	of protection		IP40			IP40		
	ated pushbutton switches	i		quare ty		•		
Pilot lig				quare ty		•		
	ated lever switches ated rocker switches			quare ty quare ty		•		
		T			·			04/005
Туре	Illuminated face	Face size	Туре			ated face	Face size	04/235
AP30F	Half size (H)	15×30	AP4		Half siz	\ /	20×40	
	Square (S)	30×30		<b>⊢</b>	Square		40×40	
	Rectangular horizontal long (T)	30×60			Rectan long (T	gular horizontally	40×80	
	Rectangular vertical	60×20				gular vertical	90×40	
	long (V)	60×30			long (V	7)	80×40	
	Mixtture of S, T, V (X)	_			Mixttur	e of S, T, V (X)		
								04/256
Туре	Type of code							
.,,,,	Real binary code	Complex	nentary	nentary binary code Real gray code				
4000		Complet	nontan y	Dilla y	Jours			
Δ1:11 <b>9</b>						•		
AC16	●	•				•		
AC16 AC32	_	•				•		
AC16						•		
AC16		<u> </u>				•		0.1/0.00
AC16		•				•		04/263
AC16	Mounting	Rated insulation	1	I therm		Remarks		04/263
AC16 AC32 Type	Mounting	voltage	curre	I therm	nal I	Remarks	so available.	04/263
AC16 AC32	Mounting  1 40 x 40, mounted with	voltage	1	I therm	nal I	Remarks The following are als		04/263
AC16 AC32 Type	Mounting	voltage	curre	I therm	nal I	Remarks	ırcated	04/263
AC16 AC32 Type	Mounting  1 40 x 40, mounted with	voltage	curre	I therm	nal I	Remarks The following are als Keys, indicators, bifu	ırcated	04/263
AC16 AC32 Type	Mounting  1 40 x 40, mounted with	voltage	curre	I therm	nal I	Remarks The following are als Keys, indicators, bifu	ırcated	
AC16 AC32 Type	Mounting  1 40 x 40, mounted with	voltage	curre	I therm	nal I	Remarks The following are als Keys, indicators, bifu	ırcated	04/263
AC16 AC32 Type	Mounting  1 40 x 40, mounted with	voltage 600V	10A	I therm	nal I	Remarks The following are als Keys, indicators, bifu	ırcated	
AC16 AC32 Type RC310-	Mounting  1 40 x 40, mounted with 4 screws	voltage 600V  Applicat Voltmeter	ion r change	I therm nt	vitches	Remarks The following are als Keys, indicators, bifu	ırcated	
AC16 AC32 Type RC310-	Mounting  1 40 x 40, mounted with 4 screws	voltage 600V Applicat	ion r change	I therm nt	vitches	Remarks The following are als Keys, indicators, bifu	ırcated	
AC16 AC32 Type RC310-	Mounting  1 40 x 40, mounted with 4 screws	voltage 600V  Applicat Voltmeter	ion r change	I therm nt eover sy	vitches	Remarks The following are als Keys, indicators, bifu	ırcated	
AC16 AC32 Type RC310-	Mounting  1 40 x 40, mounted with 4 screws	voltage 600V  Applicat Voltmeter Ammeter	ion r change	I therm nt eover sy	vitches	Remarks The following are als Keys, indicators, bifu	ırcated	
Type RC310-	Mounting  1 40 x 40, mounted with 4 screws  Rated thermal current	voltage 600V  Applicat Voltmeter Ammeter Industrial	ion r change change control	i therm nt eover sw eover sw switche	witches vitches	Remarks The following are als Keys, indicators, bifu	ırcated	04/272
Type RC310- Type NS387	Mounting  1 40 x 40, mounted with 4 screws  Rated thermal current 15A	voltage 600V  Applicat Voltmeter Ammeter Industrial	ion r change change control	i therm nt eover sweever sweever sweeten	witches vitches es	Remarks  The following are als  Keys, indicators, bifucontacts, case cover	ırcated	
Type RC310- Type NS387  Type AYBN	Mounting  1 40 x 40, mounted with 4 screws  Rated thermal current 15A  Rated insulation voltage 600V	Applicat Voltmeter Ammeter Industrial  Rated thermal controls 15 to 600A	ion r change change control	eover sweeten switche	witches vitches es	Remarks  The following are als Keys, indicators, bifucontacts, case cover	ırcated	04/272
Type RC310- Type NS387  Type AYBN AYBS	Mounting  1 40 x 40, mounted with 4 screws  Rated thermal current 15A  Rated insulation voltage 600V 600V	Applicat Voltmeter Ammeter Industrial  Rated thermal c 15 to 600A 49 to 115A	ion r change change control	eover swover switche  Applic General	witches vitches es cation ral purp quality to	Remarks  The following are als Keys, indicators, bifucontacts, case cover  ose terminal blocks erminal blocks	rs, etc.	04/272
Type RC310- Type NS387  Type AYBN AYBS LT4D	Mounting  1 40 x 40, mounted with 4 screws  Rated thermal current 15A  Rated insulation voltage 600V 600V 660V	Rated thermal control of the following states and the states are states as a second state of the states are states are states as a second state of the states are states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state	ion r change change control	eover sweeteners witches  Application Generers High quality Rail m	witches vitches es	Remarks  The following are also development of the following are also	rs, etc.	04/272
Type RC310- Type NS387  Type AYBN AYBS	Mounting  1 40 x 40, mounted with 4 screws  Rated thermal current 15A  Rated insulation voltage 600V 600V	Applicat Voltmeter Ammeter Industrial  Rated thermal c 15 to 600A 49 to 115A	ion r change change control	eover swover switche  Applic Gener High q Rail m Termin	witches vitches es  cation ral purp quality to	Remarks  The following are also developed the following are also d	n isolating switch	04/272
Type RC310- Type NS387  Type AYBN AYBS LT4D SKT	Mounting  1 40 x 40, mounted with 4 screws  Rated thermal current 15A  Rated insulation voltage 600V 600V 660V	Rated thermal control of the following states and the states are states as a second state of the states are states are states as a second state of the states are states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state of the states are states as a second state	ion r change change control	eover swover switche  Applic Gener High q Rail m Termin on one	witches vitches es  cation ral purp quality to nounted hal blockes side an	Remarks  The following are also development of the following are also	n isolating switch	04/272



# Pushbuttons, Selector Switches Pilot Lights, Control Selector Switches Panel Switches, Terminal Blocks



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erminal Blocks		General information	04/27
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			Page
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		Mass	
	Command box	AHX9	

#### **MINIMUM ORDERS**

Orders amounting to **less than ¥10,000** net per order will be charged as ¥10,000 net per order plus freight and other charges.

#### **WEIGHTS AND DIMENSIONS**

Weights and dimensions appearing in this catalog are the best information available at the time of going to press. FUJI ELECTRIC FA has a policy of continuous product improvement, and design changes may make this information out of date.

Please confirm such details before planning actual construction.

INFORMATION IN THIS CATALOG IS SUBJECT TO CHANGE WITHOUT NOTICE.

#### **■** Command series

#### AR22/DR22



- 22mm diameter hole
- Mountable even on panel cutout 25mm in diameter.
- Provided with newly developed release arm
- Provided with terminal cover for safety and security
- •UL, CSA, TÜV and CCC approved



AF98-88

#### AH164, 165



- •16mm diameter hole, finger-sized button
- Incandescent, neon and LED lamps are available.
- Block type contact
- AH165 series is oil-tightUL, CSA, TÜV and CCC approved



#### AR30/DR30



- 30mm diameter hole
- Provided with terminal cover for safety and security
- UL, CSA, TÜV and CCC approved







#### AH165-2



- 16mm diameter hole
- AH165-2 series are about twice as large as the AH165 series
- Incandescent, neon and LED lamps are available.
- Block type contact
- AH165-2 series is oil-tight UL, CSA, TÜV and CCC approved



#### AR16/DR16, AF16/DF16



- 16mm diameter hole, finger-sized button
- Integrated contact structure
- AR16 series is standard type.
- AF16 series is thin type.
- UL, CSA, TÜV and CCC approved





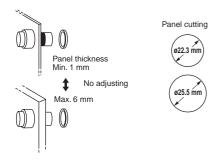
## AR22 and DR22 General information

The AR22 now uses a release arm with a wedge mechanism developed by Fuji Electric FA. This enables you to mount or remove the operator and contact block without using any tools. When fitting the switch to a panel, you can ignore the panel thickness.

You have only to secure the operator with a locking nut from behind the panel without any need for adjustment. The improved locking nut is capable of mounting the operator in both 22.3mm and 25.5mm dia. panel cutout holes.

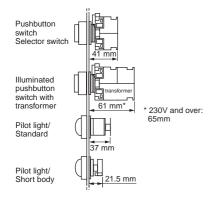
## ■ Features Facilitated mounting

- No adjusting of panel thickness is necessary.
- The button and lens can be mounted on a panel while the operator is engaged.
- Mountable even on a panel cutout 25.5mm in diameter.



#### Miniaturization

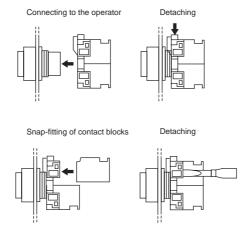
- Pushbuttons and selector switches with 1NO+1NC: 41mm deep Pilot lights: 37mm deep
- The transformer now occupies far less space.





## Easy replacing contact block and transformer

- Because of a snap-on mounting, replacement or addition of the contact block and transformer unit is very simple.
- The contact block is common to all the pushbuttons of this series.
- Contact block is easily replaced even when the pushbuttons are mounted closely together.
- Replacement of the contact block can be done with a screwdriver, without the need for any special tool.



#### Wiring

- Wiring from two directions is possible.
- Wiring in both vertical and lateral directions facilitates wiring in narrow spaces.
- Color coding of contact blocks makes wiring easy.
   1NO: Blue, 1NC: Red Lamp terminal and transformer unit: Black

#### Safety

- A terminal cover is provided, assuring safety and security.
- FUJI's original Trigger Action mechanism is used in the emergency stop pushbuttons. They are suitable for emergency stop and safety. This mechanism prevents the contacts from moving until the button is pushed and locked.
- Reliability of safety functions increased by integrated operator and contact block construction. (AR22VG)

#### **Protection**

- Excellent oil-tight construction (IP65) of the operator.
- Closure of the contact block has been improved.

#### ■ Approvals



For further information related to approved type, see page 04/3 to 04/06.

#### ■ Illuminated pushbutton switches

Illuminated pushb	utton switches				
Operator	Туре	Operator	Туре	Operator	Туре
Flush round head	AR22F0L, F5L	Extended with full guard (24mm dia. with openings)	AR22G2L, G7L	Flush round head with square bezel	AR22F0P, F5P
See page 04/17, 04/40		See page 04/17, 04/40		See page 04/18, 04/40	
	AF94-318	<b>(4) (1)</b>	AF99-319	<b>(4) (1)</b> ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴ ∴	AF94-315
Extended round head	AR22E0L, E5L	Extended with full guard (24mm dia.)	AR22G1L, G6L	Extended round head with square bezel	AR22E0P, E5P
See page 04/17, 04/40		See page 04/18, 04/40		See page 04/18, 04/40	
<b>( ( ( ( ( ( ( ( ( (</b>	AF94-317	<b>() ( ( ( ( ( ( ( ( ( (</b>	AF02-70	<b>④ ⑤</b> △ ( <b>€ ⑥</b>	AF94-314
Mushroom head (40mm dia.)	AR22M0L, M5L	Push-lock, turn-reset (40mm dia. with white arrow)	AR22V5L	Mushroom head with square bezel (29mm dia.)	AR22M4P
See page 04/17, 04/40		See page 04/18, 04/40		See page 04/19, 04/40	
<b>(h) (f)</b>	AF94-367	<b>ⓑ ❹</b> ♠(€	KKD06-335	<b>(h) (f)</b>	AF94-440
Mushroom head (29mm dia.)	AR22M4L, M9L	Flush square head	AR22F0M, F5M		
See page 04/17, 04/40		See page 04/18, 04/40			
( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	AF94-369	<b>♠ ♠ (€ (((()</b>	AF97-68		
Extended with transparent full guard (24mm dia.)  See page 04/17, 04/40	AR22G4L, G9L	Extended square head  See page 04/18, 04/40	AR22EOM, E5M		
<b>⊕ ⊕</b> △ ( € (((()	AF94-294	<b>⊕ ⊕</b> .≙.(€	AF94-357		

#### ■ Pushbutton switches

Operator	Туре	Operator	Туре	Operator	Туре
Flush round head	AR22F0R, F5R	Flush round head Symbol mark type	AR22FAR, FBR	Mushroom head (40mm dia.)	AR22M0R, M5R
See page 04/20, 04/41		See page 04/20, 04/41		See page 04/20, 04/41	
<b>(h) (f)</b>	AF94-320	<b>((()</b>	AF98-193	<b>(</b> ) <b>( ( ( ( ( ( ( ( ( (</b>	AF94-293
Extended round head	AR22E0R, E5R	Extended round head Symbol mark type	AR22EAR, EBR	Mushroom head (29mm dia.)	AR22M4R, M9R
See page 04/20, 04/41		See page 04/20, 04/41		See page 04/20, 04/41	
<b>(h) (f)</b> ∴ ∴ (f (((((((((((((((((((((((((((((((	AF94-319	<b>@</b>	AF98-192	<b>ⓑ ⓑ</b>	AF94-321

Note (((:): See page 04/289

## AR22 and DR22

## **Quick reference guide**

#### ■ Pushbutton switches

Operator	Туре	Operator	Туре	Operator	Туре
Extended with full guard (24mm dia.)	AR22G3R, G8R	Pushbutton with selector ring (2-position)	AR22S1R, S2R, S3R, S6R	Flush round head with square bezel	AR22F0Y, F5Y
See page 04/20, 04/41		See page 04/22, 04/41		See page 04/20, 04/41	
<b>() ( ( ( ( ( ( ( ( ( (</b>	AF94-292	<b>(€</b> (€ (€ (€ (€ (€ (€ (€ (€ (€ (€ (€ (€ (€	AF97-507	<b>(4) (4) (4) (4) (4)</b>	AF94-295
Flush with full guard	AR22G2R, G7R	Push-lock, turn-reset	AR22V5R	Extended round	AR22E0Y, E5Y
(24mm dia.)	·Den	(40mm dia. with white arrow)		head with square bezel	The same of the sa
	Marin 1	ŕ			
See page 04/20, 04/41		See page 04/20, 04/41		See page 04/21, 04/41	
<b>(h) (f)</b> (€(((iii)))	AF02-68	<b>⊕ ⊕ ∈ ©</b>	KKD08-042	<b>♠ ♠</b> ( <b>€</b> @	AF94-297
Extended with	AR22G0R, G5R	Flush square head	AR22F0S, F5S	Mushroom head with	AR22M4Y
half guard	1000		-100	square bezel (29mm dia.)	- Dim
				,	
See page 04/20, 04/41		See page 04/20, 04/41		See page 04/21, 04/41	
<b>④ ⑤</b> △( € (((((((((((((((((((((((((((((((((	AF96-236	<b>⊕ ⊕</b> (€ ((((((((((((((((((((((((((((((((((	AF94-316	<b>④ ⑤</b> ♠ ( € @ )	AF94-298
Mushroom head with full guard (40mm dia.)	AR22M3R, M8R	Extended square head	AR22E0S, E5S		
See page 04/20, 04/41		See page 04/20, 04/41			
<b>♠ ♠</b> (€@	AF94-372	<b>④ ● △</b> (€ <b>◎</b>	AF94-296		

Note: AR22M8R: Not approved standard

**■ Emergency stop pushbutton switches** (conform to EN418)

Operator	Туре	Operator	Туре	Operator	Туре
Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	AR22V0R	Push-lock, turn-reset (29mm dia.)	AR22V4R	Unibody push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	AR22VGE
See page 04/23, 04/42		See page 04/23, 04/42		See page 04/23, 04/42	
<b>④ ♠</b> (€ ((((((((((((((((((((((((((((((((((	KKD08-042	<b>④ ⑤</b> <u>△</u> ( € <b>◎</b>	KKD06-339	<b>₽%</b> us <b>≜</b> (€@	KKD05-023b
Push-lock, turn-reset (40mm dia.)	AR22V2R	Key release push-lock, turn-reset (40mm dia.)	AR22V7R	Push-lock, turn-reset (40mm dia. with "EMO" charactor)	AR22V3R-■■RZ286
See page 04/23, 04/42		See page 04/23, 04/42		See page 04/120	EMO
<b>⊕ ⊕</b> (€ ((((((((((((((((((((((((((((((((((	KKD05-020b	<b>ⓑ</b> ♣(€@	KKD09-020	<b>ⓑ ૹ</b> .≙(€	KKD05-261
Push-lock, turn-reset (Soft-touch 29mm dia. with white arrow)	AR22VSR	Push-lock, pull-reset (35mm dia.)	AR22Q2R		
See page 04/23, 04/42		See page 04/23, 04/42			
<b>④ €</b> (€ (((((((((((((((((((((((((((((((	KKD06-346	<b>♠ ♠</b> (€ ((((((((((((((((((((((((((((((((((	KKD06-334		

Notes: Provided with the  $\bigcirc$  (Direct opening action)

(C): See page 04/289

#### ■ Emergency stop illuminated pushbutton switches (conform to EN418)

Operator	Туре	Operator	Туре	Operator	Туре
Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)  See page 04/24, 04/43	AR22V0L	Push-lock, turn-reset (Soft-touch 40mm dia. transparent in all colors with white arrow) See page 04/24, 04/43	AR22VDL	Push-lock, turn-reset (Soft touch 29mm dia. with white arrow)  See page 04/24, 04/43	AR22VSL
<b>ⓑ ⑥ ⑥ ⑥</b>	KKD06-335	<b>ⓑ ⓒ ⓒ</b>	KKD06-342	<b>ⓑ ∯</b> ≜(€@	KKD06-344
Push-lock, turn-reset (40mm dia.)	AR22V2L	Push-lock, turn-reset (40mm dia. transparent in all colors)	AR22VAL	Unibody push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	AR22VGF
See page 04/24, 04/43	( ) II	See page 04/24, 04/43		See page 04/24, 04/43	
<b>() () (</b> (((((((((((((((((((((((((((	KKD06-337	<b>() (</b> ((((((((((((((((((((((((((((((((	KKD06-340	( <b>P1</b> °US ≜ (€ (((((((((((((((((((((((((((((((((	KKD05-150

Note: Provided with the  $\bigcirc$  (Direct opening action)

#### ■ Selector switches

Operator	Туре	Operator	Туре	Operator	Туре
Knob	AR22PR, PCR	Key	AR22JR, JCR	Lever with square bezel	AR22WY, WCY
See page 04/25, 04/44		See page 04/25, 04/44		See page 04/25, 04/44	
<b>⊕ ⊕</b> (€ ((((((((((((((((((((((((((((((((((	AF94-310	<b>♠</b> ♣(€@	KKD09-018	<b>ⓑ ∰</b> ♠(€@	AF94-323
Lever	AR22WR, WCR	Key (Long durability)	AR22JAR	Cylindrical knob with square bezel	AR22RY, RCY
See page 04/25, 04/44		See page 04/25, 04/44		See page 04/25, 04/44	
<b>(1) (1) (1) (1) (1) (1) (1) (1)</b>	AF94-324	<b>④ ④</b> △( € @)	KKD09-015	<b>ⓑ ∰</b> ♠(€@	AF94-362
Cylindrical knob	AR22RR, RCR	Knob with square bezel	AR22PY, PCY	Key with square bezel	AR22JY, JCY
See page 04/25, 04/44		See page 04/25, 04/44		See page 04/25, 04/44	
<b>(4) (4) (4) (4) (4) (4) (4) (4)</b>	AF94-308	<b>(4) (1)</b>	AF94-309	<b>(4) (4)</b>	KKD09-019

#### ■ Illuminated selector switches

Operator	Туре	Operator	Type
Knob	AR22PL	Knob with square bezel	AR22PP
See page 04/32, 04/45		See page 04/32, 04/45	
<b>④ ④</b> △(€@	AF94-306	<b>(h) (f)</b>	AF94-318

## AR22 and DR22

## **Quick reference guide**

■ Pilot lights

Lens	Туре	Lens	Туре	Lens	Туре
Dome	DR22D0L	Flush square	DR22F3M	Extended square	DR22E3M
See page 04/34, 04/45	3	See page 04/34, 04/47		See page 04/34, 04/46	
<b>(4) (4) (4) (4) (4)</b>	AF94-333	<b>( ( ( ( ( ( ( ( ( (</b>	AF94-330	<b>(4) (1)</b>	AF94-380
Extended round	DR22E3L	Flush square (Transparent lens)	DR22F4M	Flush rectangular	DR22E3N
See page 04/34, 04/46	03	See page 04/34, 04/47		See page 04/34, 04/48	
<b>() (</b> ((((((((((((((((((((((((((((((((	AF94-332	<b>④ ⑤</b> ≜(€@	AF94-443	<b>④                                    </b>	AF96-237
Faceted	DR22K0L	Flush square (12mm high frame)	DR22F5M	Extended round with square bezel	DR22E3P
See page 04/34, 04/46		See page 04/34, 04/47		See page 04/34, 04/46	
<b>④ ⑤</b> △ ( € ((((((((((((((((((((((((((((((((	AF96-189	<b>④                                    </b>	AF95-658	<b>④                                    </b>	AF94-331

Note: With resistor unit type: Not approved standard

■ Joy stick selector switches

Handle	Туре	Handle	Туре	Handle	Туре
Ball type	AR22A0, A5	Ball type with lock	AR22A1, A6	Rubber cap type	AR22A2, A7
See page 04/38, 04/48		See page 04/38, 04/48		See page 04/38, 04/49	
<b>71°⊕</b> ≜(€	AF97-49	<b>71'⊕</b> <u>△</u> (€	AF97-45	<b>71'®</b> ≜(€	AF97-56

#### **■** Buzzers

Sound	Туре	Sound	Туре	Sound	Туре
Electronic sound	DR22B5 *	Magnetic sound	DR22B3	Electronic sound (IP54)	DR22B8 *
See page 04/39, 04/49		See page 04/39, 04/49	1. 1.	See page 04/39, 04/49	
<b>(</b> 1) <b>(1</b> ) •	KKD08-053		AF96-376	<b>(4) (6) (4)</b>	AF96-2

Note: \* 6V AC, 110V DC types: Not approved standard

## AR22 and DR22 Type number nomenclature

• Neon lamp (For AR22VGF) H1: 110V AC, without transformer K1: 120V AC, without transformer M1: 220V AC, without transformer

P1: 240V AC, without transformer

#### Illuminated pushbuttons

#### AR22 E0L − 10 E3 R □ 3 4 5 6 1 2

#### ① Product category

AR22: 22mm-dia. illuminated pushbutton

22mm-dia. emergency stop illuminated pushbutton

#### 2 Operator

• Illuminated pushbutton

F0L: Flush round head

F5L: Flush round head (Alternate)

E0L: Extended round head

E5L: Extended round head (Alternate)

M0L: Mushroom head (40mm dia.)

M5L: Mushroom head (40mm dia. alternate)

M4L: Mushroom head (29mm dia.)

M9L: Mushroom head (29mm dia. alternate)

G4L: Extended with transparent full guard (24mm dia.)

G9L: Extended with transparent full guard (24mm dia. alternate)

G2L: Extended with full guard (24mm dia. with openings)

G7L: Extended with full guard (24mm dia. with openings, alternate)

G1L: Extended with full guard (24mm dia.)

G6L: Extended with full guard (24mm dia. alternate)

V5L: Push-lock, turn-reset (40mm dia. with white arrow) \*1

F0M: Flush square head

F5M: Flush square head (Alternate)

E0M: Extended square head

E5M: Extended square head (Alternate)

F0P: Flush round head with square bezel

F5P: Flush round head with square bezel (Alternate)

E0P: Extended round head with square bezel

E5P: Extended round head with square bezel (Alternate)

M4P: Mushroom head with square bezel (29mm dia.)

• Emergency stop illuminated pushbutton

VOL: Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)

V2L: Push-lock, turn-reset (40mm dia.)

VDL: Push-lock, turn-reset (Soft-touch 40mm dia. transparent in all colors with white arrow)

VAL: Push-lock, turn-reset (40mm dia. transparent in all colors)

VSL: Push-lock, turn-reset (Soft-touch 29mm dia. with white arrow)

VGF: Unibody push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)

#### ③ Contact arrangement

10:	1NO	30:	3NO
01:	1NC	03:	3NC
11:	1NO+1NC	40:	4NO
20:	2NO	04:	4NC
02:	2NC	50:	5NO
22:	2NO+2NC	05:	5NC

#### 4 Lamp voltage

Incandescent lamp

54: 5.5V AC/DC, without transformerC4: 15V AC/DC, without transformerD4: 20V AC/DC, without transformer

E4: 24V AC/DC, without transformer

H4: 100-110V AC, with transformer L4: 115-127V AC, with transformer M4: 200-220V AC, with transformer

Q4: 230-254V AC, with transformer

S4: 350-380V AC, with transformer T4: 400-440V AC, with transformer

V4: 480V AC, with transformer

W4: 500-550V AC, with transformer

LED lamp

A3: 6V AC, without transformer 63: 6V DC, without transformer

B3: 12V AC/DC, without transformer

C3: 15V AC/DC, without transformer E3: 24V AC/DC, without transformer

H3: 100-110V AC, with transformer L3: 115-127V AC, with transformer M3: 200-220V AC, with transformer Q3: 230-254V AC, with transformer

S3: 350-380V AC, with transformer

T3: 400-440V AC, with transformer

V3: 480V AC, with transformer W3: 500-550V AC, with transformer

#### ⑤ Color of lens

G: Green Y: Yellow R: Red \*2 A: Orange W: White S: Blue

#### 6 Special product

Z9: Resisting water-soluble cutting oils and heat

Z8: With a contact protection cover

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

Notes: \*1 Products with no trigger action mechanism. These products cannot be used as emergency stop switches that comply with EN standards.

\*2 Button color of emergency stop illuminated switches are Red only. · The manufacturing range varies depending on the model. For details,

refer to the contents of this catalog.

#### AR22 and DR22

### Type number nomenclature

#### **Pushbuttons**

**AR22 E0R** − **10 R** □ □ 2 3 4 5 6

#### ① Product category

AR22: 22mm-dia. pushbutton

22mm-dia. emergency stop pushbutton

#### ② Operator

Pushbutton switch

F0R: Flush round head

F5R: Flush round head (Alternate)

E0R: Extended round head

E5R: Extended round head (Alternate)

FAR: Flush round head (Symbol mark type)

FBR: Flush round head (Symbol mark type, alternate)

EAR: Extended round head (Symbol mark type)

EBR: Extended round head (Symbol mark type, alternate)

M0R: Mushroom head (40mm dia.)

M5R: Mushroom head (40mm dia. Alternate)

M4R: Mushroom head (29mm dia.)

M9R: Mushroom head (29mm dia. Alternate)

G3R: Extended with full guard (24mm dia.)

G8R: Extended with full guard (24mm dia. Alternate)

G2R: Flush with full guard (24mm dia.)

G7R: Flush with full guard (24mm dia. Alternate)

G0R: Extended with half guard

G5R: Extended with half guard (Alternate)

M3R: Mushroom head with full guard (40mm dia.)

M8R: Mushroom head with full guard (40mm dia. Alternate)

S1R: Push-button with selector ring (2-position)

S2R: Push-button with selector ring (2-position)

S3R: Push-button with selector ring (2-position)

S6R: Push-button with selector ring (2-position)

V5R: Push-lock, turn-reset (40mm dia. with white arrow) \*1

F0S: Flush square head

F5S: Flush square head (Alternate)

E0S: Extended square head

E5S: Extended square head (Alternate)

F0Y: Flush round head with square bezel

F5Y: Flush round head with square bezel (Alternate)

E0Y: Extended round head with square bezel

E5Y: Extended round head with square bezel (Alternate)

M4Y: Mushroom head with square bezel (29mm dia.)

Emergency stop pushbutton switch

VOR: Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)

V2R: Push-lock, turn-reset (40mm dia.)

VSR: Push-lock, turn-reset (Soft-touch 29mm dia. with white arrow)

V4R: Push-lock, turn-reset (29mm dia.)

V7R: Key-release push-lock, turn-reset (40mm dia.)

Q2R: Push-lock, pull-reset (35mm dia.)

VGE: Unibody push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)

#### **3 Contact arrangement**

10: 1NO 30: 3NO 01: 1NC 03: 3NC 33: 3NO+3NC 11: 1NO+1NC 40: 4NO 20: 2NO 02: 2NC 04: 4NC 22: 2NO+2NC 50: 5NO 05: 5NC

#### 4 Color of button

G: Green Y: Yellow R: Red\*2 Orange B: Black S: Blue W: White Clear Green, Red, Black (For AR22F0R)

(For AR22FAR, FBR, EAR, EBR)

#### ⑤ Symbol mark (For AR22FAR, FBR, EAR, EBR)

Symbol mark	0		I		T		0		T
Color of button	White	Black	White	Black	White	Black	Clear		
Color of mark	Red		Green		Green		Black		
Code	01	02	03	04	11	12	02B	04B	12B

#### 6 Special product

Z9: Resisting water-soluble cutting oils and heat

Z8: With a contact protection cover

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

Notes: \*1 Products with no trigger action mechanism. These products cannot be used as emergency stop switches that comply with EN standards.

\*2 Button color of emergency stop switches are Red only.
• The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

## AR22 and DR22 Type number nomenclature

#### Selector and illuminated selector switches

#### Product category

AR22: 22mm dia. selector switch and illuminated selector switch

#### ② Operator

Selector switch

PR: Knob

PCR: Knob operated control type

WR: Lever

WCR: Lever operated control type

Cylindrical knob RR:

RCR: Cylindrical knob operated control type

Key

JCR: Key operated control type JAR: Key (Long durability) PY. Knob with square bezel

PCY: Knob operated control type with square bezel

Lever with square bezel

WCY: Lever operated control type with square bezel

Cylindrical knob with square bezel

RCY: Cylindrical knob operated control type with square bezel

Key with square bezel

JCY: Key operated control type with square bezel

Illuminated selector switch

PL: Knob

Knob with square bezel PP:

#### ③ Operation

- 2-position, maintained 2:
- 2-position, spring return U.
- 3: 3-position, maintained
- 3-position, spring/manual return (Left to center)
- 7: 3-position, spring/manual return (Right to center)
- 3-position, spring return 1:
- 4-position, maintained (For AR22PCR, WCR, RCR) 4.
- 5-position, maintained (For AR22PCR, WCR, RCR)

#### Key removable position

- A: Left
- B: Left and right
- C: Left, right and center
- D: Right
- E: Center
- F: Right and center
- G: Left and center

#### **⑤** Contact arrangement

10: 1NO 30: 3NO 03: 3NC 01: 1NC 33: 3NO+3NC 11: 1NO+1NC 20: 2NO 40: 4NO 02: 2NC 04: 4NC 22: 2NO+2NC 50: 5NO 05: 5NC

Note: Control type: See page 04/29 to 04/31

#### 6 Lamp voltage

Incandescent lamp

54: 5.5V AC/DC, without transformer C4: 15V AC/DC, without transformer D4: 20V AC/DC, without transformer E4: 24V AC/DC, without transformer H4: 100-110V AC, with transformer
L4: 115-127V AC, with transformer M4: 200-220V AC, with transformer Q4: 230-254V AC, with transformer

S4: 350-380V AC, with transformer T4: 400-440V AC, with transformer V4: 480V AC, with transformer W4: 500-550V AC, with transformer

LED lamp

A3: 6V AC, without transformer 63: 6V DC, without transformer B3: 12V AC/DC, without transformer C3: 15V AC/DC, without transformer E3: 24V AC/DC, without transformer H3: 100-110V AC, with transformer L3: 115-127V AC, with transformer M3: 200-220V AC, with transformer

Q3: 230-254V AC, with transformer S3: 350-380V AC, with transformer T3: 400-440V AC, with transformer

V3: 480V AC, with transformer W3: 500-550V AC, with transformer

- Black (Not available for illuminated selector switch)
- G: Green

⑦ Color of knob

- R٠ Red
- W. White (Not available for selector switch)
- Yellow (Not available for selector switch)
- Orange (Not available for selector switch)
- Blue (Not available for selector switch)

8 Key type No.
A, B, C, D, E or F ("A" is standard)

#### 9 Special product

- Z9: Resisting water-soluble cutting oils and heat
- Z8: With a contact protection cover
- Z4: Resisting sulfuration gas
- ZB: Meeting IP2X finger-protection standards

Note: • The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

## AR22 and DR22

### Type number nomenclature

#### **Pilot lights**

 $\begin{array}{c|c} \underline{\mathsf{DR22}} & \underline{\mathsf{D0L}} - \underline{\mathsf{E3}} \ \underline{\mathsf{W}} & \square \\ \hline \textcircled{1} & \textcircled{2} & \textcircled{3} & \textcircled{4} & \textcircled{5} \end{array}$ 

#### ① Product category

DR22: 22mm dia. pilot light

#### 2 Lens

D0L: Dome

E3L: Extended round K0L: Faceted F3M: Flush square

F4M: Flush square (Transparent lens) F5M: Flush square (12mm high frame)

E3M: Extended square E3N: Flush rectangular

E3P: Extended round with square bezel

#### 3 Lamp voltage

Incandescent lamp

54: 5.5V AC/DC, without transformer C4: 15V AC/DC, without transformer D4: 20V AC/DC, without transformer E4: 24V AC/DC, without transformer H4: 100-110V AC, with transformer L4: 115-127V AC, with transformer C4: 230-254V AC, with transformer C4: 230-254V AC, with transformer C5: 350-380V AC, with transformer C7: 400-440V AC, with transformer C7: 480V AC, with tra

LED lamp

A3: 6V AC, without transformer
63: 6V DC, without transformer
B3: 12V AC/DC, without transformer
C3: 15V AC/DC, without transformer
E3: 24V AC/DC, without transformer
H3: 100-110V AC, with transformer
L3: 115-127V AC, with transformer
M3: 200-220V AC, with transformer
Q3: 230-254V AC, with transformer
C3: 350-380V AC, with transformer
C3: 400-440V AC, with transformer
C3: 480V AC, with transformer
C4: 480V AC, with transformer
C5: 500-550V AC, with transformer

4 Color of lens

G: Green Y: Yellow R: Red A: Orange W: White S: Blue

H7: 110V DC, with resistor unit

#### Special product

Z9: Resisting water-soluble cutting oils and heat

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

Note: • The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

58: 5.5V AC/DC, short-body without transformer
C8: 15V AC/DC, short-body without transformer
D8: 20V AC/DC, short-body without transformer
E8: 24V AC/DC, short-body without transformer
H8: 100-110V AC, short-body with transformer
L8: 115-127V AC, short-body with transformer
M8: 200-220V AC, short-body with transformer

A9: 6V AC, short-body without transformer
69: 6V DC, short-body without transformer
B9: 12V AC/DC, short-body without transformer
C9: 15V AC/DC, short-body without transformer
E9: 24V AC/DC, short-body without transformer
H9: 100-110V AC, short-body with transformer
L9: 115-127V AC, short-body with transformer
M9: 200-220V AC, short-body with transformer

#### Joy stick selector switches

#### <u>AR22A 0 N - A0A0 B</u>

0 23 4 5

#### Product category

AR22A: 22mm-dia. Joy stick selector switch

#### 2 Handle

- 0: Ball type (without lock, manual return)
- 1: Ball type with lock (manual return)
- 2: Rubber cap type (without lock, manual return)
- 5: Ball type (without lock, spring return)
- 6: Ball type with lock (spring return)
- 7: Rubber cap type (without lock, spring return)

#### **3 Terminal**

N: Screw

H: Solder/tab

#### **4** Contact arrangement

Contac	ct arrangement	Blank	1NO	1NC	1NO+1NC	2NO	2NC	2NO+2NC
Code	Screw	0	Α	В	1	D	E	-
	Solder/tab	0	-	-	1	-	-	2

#### Operating direction code of contacts



#### ⑤ Handle color

B: Black

#### ■ Ordering information

Specify the following:

1. Type number

For the CCC approved product, add the suffix (CCC) to the type number

Example: Pushbutton switch AR22F0R-11B(CCC)

#### **Buzzers**

#### DR22B 5 - E B

1 2 34

#### ① Product category

DR22B: 22mm-dia. buzzer

- ② Sound
- 5: Electronic sound
- 3: Magnetic sound
- 8: Electronic sound (IP54)

#### ③ Operating voltage

A: 6V AC (Type "5", "8")

6: 6V DC (Type "5", "8")

E: 12-24V AC/DC (Type "3": 24V AC/DC)

F: 35-48V AC/DC (Type "5", "8")

H: 100-110V AC

M: 200-220V AC

1: 100-110V DC (Type "5", "8")

#### 4 Color of head

B: Black

## AR22 and DR22 **Ratings and specifications**

#### ■ Standards approved

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479
	cUL File No. E44592 (For AR22VG)
TÜV: EN60947-5-1	Pushbutton, Illuminated pushbutton: R9551062,
	Selector, Illuminated selector: R9551060
	Pilot lights: R9551061
	Joy stick selector switch: R2050803
	(Lever switch)
	Buzzer: J9950091
TÜV: EN60947-5-1	Emergency stop pushbutton
EN60947-5-5	Emergency stop illuminated pushbutton
	: R50028146, R50028137 (For AR22VG)

#### ■ Specifications (Indoor use)

Description	Pushbutton switch Illuminated pushbutton switch Emergency stop pushbutton switch Emergency stop illuminated pushbutton	Joy stick selector (Lever switch)	Pilot light
	switch Selector switch Illuminated selector switch		
Rated insulation voltage	600V AC/DC *1	250V AC/DC	250V AC/DC *2
Mechanical durability	See page 04/13	250,000 operations	_
Electrical durability	500,000 operations at 220V AC 6A	100,000 operations	_
	1 million operations at 220V AC 3A	at 220V AC 1A	
	(AR22VG type: 100,000 operations)	(Res. load)	
Operating frequency	1200 operations/hour (On-load factor: 40	_	
	AR22VG type: 1800 operations/hour (On		
Dielectric strength	2500V AC, 1 minute *3		
Insulation resistance	100MΩ or more (500V DC megger)		
Rated impulse dielectric strength	6kV (AR22VG type: 4kV)	-	6kV
Conditional short-circuit current	1000A	1000A	_
Short-circuit protective device	Fuse 15A	Fuse 1A	_
Pollution degree	3		
Vibration	Resonance: 10 to 55Hz, double amplitude	le 0.1mm *5	
	Constant: 16.7Hz, double amplitude 3mr	n	
Shock	Malfunction durability: 100m/s <sup>2</sup> *6		Mechanical durability
	Mechanical durability: 500m/s <sup>2</sup>		: 500m/s <sup>2</sup>
Ambient temperature	-20 to +70°C *7	-5 to +70°C	-20 to +50°C
(No condensation or no icing)			
Storage temperature	-40 to +80°C		
Humidity	45 to 85% RH (within -5 to +40°C)		
Degree of protection	IP65		

Notes: \*1 Illuminated type without transformer and AR22VG type: 250V AC/DC

<sup>\*2</sup> Pilot light with transformer: 600V AC

 <sup>\*2</sup> Pilot light with transformer: 600V AC
 \*3 Illuminated type without transformer: 2000V AC, 1 minute (except AR22VGF type)
 \*4 Pilot light with transformer: 2500V AC, 1 minute
 \*5 Emergency stop type: 10 to 500Hz, double amplitude 0.7mm (acceleration 50m/s²), according to the test condition of EN60947-5-5 (1997)
 \*6 Emergency stop type: 150m/s²
 \*7 AR22VGE type: -20 to +60°C, illuminated type: -20 to +50°C

#### • Mechanical durability

Description		Operations
Pushbutton switch Illuminated pushbutton switch Emergency stop pushbutton switch Emergency stop illuminated pushbutton	Momentary action Alternate action With selector ring Push-lock, turn-reset Push-lock, pull-reset	5 million 1 million 100,000 100,000 30,000
Selector switch	Maintained 1, 2, 3, 4-contact Maintained 5, 6-contact Control type, spring return, spring/manual return	1 million 500,000 200,000
Illuminated selector switch	Maintained Without transformer 1, 2, 3-contact 4-contact With transformer 1, 2-contact 3-contact	1 million 500,000 1 million 500,000
	Spring return, spring/manual return	200,000

Note: Key insertion/removal durability for selector switch key types
• Key type 10,000
• Key (Long durability) type 20,000

#### Buzzers

Item	DR22B5	DR22B3	DR22B8			
Rated insulation voltage	Without transformer: 60V	AC/DC With transformer: 2	50V AC			
Sound level	90dB (0.1m) 70dB (1m)	80 to 90dB (0.1m) 60 to 70dB (1m)	80dB (0.1m) 60dB (1.0m)			
Durability	1000h	200h	1000h			
Frequency	2.4 to 3.3kHz					
Intermittent cycle	Approx. 170-cycle/min					
Current consumption	See the table below	See the table below				
Dielectric strength	Without transformer: 1000V AC 1 minute With transformer: 2000V AC 1 minute					
Insulation resistance	100MΩ or more (500V DC	100MΩ or more (500V DC megger)				
Pollution degree	3	3				
Vibration	,	Resonance: 10 to 55Hz, double amplitude 0.1mm Constant: 16.7Hz, double amplitude 3.0mm				
Shock	Mechanical durability: 500n	n/s²				
Ambient temperature	`	-20 to +60°C (No condensation or no icing) (with resistor unit: -20 to +40°C)				
Storage temperature	-30 to +70°C					
Humidity	45 to 85%RH (within -5 to	45 to 85%RH (within –5 to 40°C)				
Degree of protection	IP00	IP00 IP54				

#### • Current consumption

Operational voltage	Current consumption		
	DR22B5, DR22B8	DR22B3	
6V AC	70mA AC	_	
6V DC	35mA DC	_	
24V AC/DC	40mA AC, 25mA DC	30mA AC, 20mA DC	
48V AC/DC	65mA AC, 20mA DC	_	
110V AC	30mA AC	30mA AC	
110V DC	30mA DC	_	
220V AC	15mA AC	15mA AC	

## AR22 and DR22

## **Ratings and specifications**

#### ■ Contact ratings

### UL/CSA standards

**AC** (COS Ø=0.35)

Contact rated code	120V		240V		480V		600V	
	Making current	Breaking current						
A600	60A	6.0A	30A	3.0A	15A	1.5A	12A	1.2A
B300 (AR22VG)	30A	3.0A	15A	1.5A	_	_	_	_

#### **DC** T<sub>0.95</sub>= 6P (Max. 300ms)

Description	Contact rated	Making curre	Making current · Breaking current			
	code	125V	250V	301V-600V		
Illuminated pushbutton switch Pushbutton (Ring type selector switch: AR22S2R only) Emergency stop pushbutton switch	P600	1.1A	0.55A	0.2A		
Emergency stop illuminated pushbutton switch (Except the overlap contact types)	Q300 (AR22VG)	0.55A	0.27A	-		
Overlap contact types of products shown above Pushbutton (Ring type selector switch: AR22S1R, S6R only) Selector switch (2-position only, except the overlap contact types) Illuminated selector switch (2-position only, except the overlap contact types)	Q600	0.55A	0.27A	0.1A		
Pushbutton (Ring type selector switch: AR22S3R only) Selector switch (2-pos./overlap contact type, 3-, 4-, 5-pos. type) Illuminated selector switch (2-pos./overlap contact type, 3-pos. type)	R300	0.22A	0.11A	-		

Note: Joy stick selector switches (Lever switches): 250V AC, 5A (Res. load) 125V DC, 0.2A 24V DC, 1A (Res. load)

#### ● EN standard/TÜV approved

Description	Rated operation	al current	_		
	Rated thermal	Rated operational	AC15 (Ind. load)	DC13 (Ind. load) Rated operational current	
	current	voltage	Rated operational current		
Illuminated pushbutton switch	10A	24V	6.0A	4.0A (AR22VG: 1.5A)	
Pushbutton (Except the selector ring type)		120V	6.0A (AR22VG: 3A)	_	
Emergency stop pushbutton switch		125V	-	1.3A (AR22VG: 0.3A)	
Emergency stop illuminated pushbutton switch		240V	6.0A (AR22VG: 3A)	_	
Selector switch (2-position)		250V	-	0.45A(AR22VG: 0.15A)	
Illuminated selector switch (2-position)		480V	2.5A (AR22VG: -)		
		600V	2.0A (AR22VG: -)		
Selector switch (3, 4, 5-position)	10A	24V	6.0A	2.0A	
Illuminated selector switch (3-position)		120V	6.0A	_	
Pushbutton with selector ring		125V	_	0.65A	
		240V	6.0A	_	
		250V	-	0.23A	
		480V	2.5A	_	
		600V	2.0A	_	
Joy stick selector switch (Lever switch)	5A	24V	-	0.7A	
		120V	0.3A	_	
		125V	_	0.15A	
		240V	0.3A	_	

#### Lamp rated voltage UL/CSA standards, TÜV approved

	LED lamp	Incandescent lamp	Neon lamp
Full-voltage (without transformer)	Max. 24V AC/DC	Max. 30V AC/DC	Max. 240V AC
With transformer	Max. 550V AC (Short-body type: Max. 220V AC	_	

#### ■ Operating characteristic (1NO+1NC)

Description	Pushbutton	Emergency stop pushbutto	n	Selector *2			
	Illuminated pushbutton	Emergency stop illuminate	d pushbutton	Illuminated se	lector		
		Push-lock type	Push-pull type	Maintained	Spring/manual return	Spring return	
Ave. required operating force	9N (Push-lock type: 20N)	30N (AR22VG: 22N)*1	45N	0.15N•m	0.13N•m	0.1N•m	
Operating travel	Approx. 6mm	Approx. 9mm	Approx. 9mm	2-position: Approx. 90°	3-position: Approx. 45°	2-position: Approx. 60°	
	(Push-lock type: Approx. 9mm, operation	(AR22VG: Approx. 10mm, operation		3-position: Approx. 45°		3-position: Approx. 45°	
	angle: Approx. 45°)	angle: Approx. 45°)		4-position: Approx. 40°			
				5-position: Approx. 30°			
Required return	_	0.6N•m	30N (pull)	0.15N•m	0.13N•m	_	
force	(Push-lock type: 0.6N•m)	(AR22VG: 0.2N•m)					

Notes: \*1 AR22V2R, V4R, V7R, VAL types: 45N \*2 4-position, 5-position: 2NO+2NC

#### ■ Lamp ratings

#### • Illuminated pushbuttons, illuminated selectors, pilot lights

Transformer	Lamp voltage	LED			Incandes	cent	
		Туре	Rated voltage	Consumption	Туре	Rated voltage	Consumption
Without	5.5V AC/DC	_	_	_	AHX135	6.3V AC/DC	0.9W
transformer	6V AC	APX510-6□	6V AC	Green, red, orange, amber, blue: 7mA AC	_	_	_
				Yellow: 50mA AC			
	6V DC	APX510-D6□	6V DC	Green, red, orange, amber, blue: 11mA DC	_	_	_
				Yellow: 33mA DC			
	12V AC/DC	APX510-12□	12V AC/DC	Green, red, orange, amber, blue: 14mA AC,11mA DC	_	_	_
				Yellow: 28mA AC, 22mA DC			
	15V AC/DC	APX510-15□	15V AC/DC	Green, red, orange, amber, blue: 13mA AC,11mA DC	AHX279	18V AC/DC	0.8W
				Yellow: 26mA AC, 22mA DC			
	20V AC/DC	_	_	_	AHX144	24V AC/DC	0.9W
	24V AC/DC	APX510-24□	24V AC/DC	12mA AC, 11mA DC	AHX129	30V AC/DC	0.8W
With transformer	110V AC	APX510-6□	6V AC	1.5VA	AHX135	6.3V AC/DC	2VA
(Standard type:	127V AC						2VA
AR9T511)	220V AC						2VA
	254V AC	APX510-6□	6V AC	2.5VA	AHX135	6.3V AC/DC	2.5VA
	380V AC						2.5VA
	440V AC						2.5VA
	480V AC						2.5VA
	550V AC						2.5VA
With resistor unit	110V DC	APX510-24□	24V AC/DC	1.2W	_	_	_
(AR9T519-H)							

Notes: • Short body pilot lights: 110V AC, 127V AC, 220V AC only

Replace the 

mark by the lamp luminous color code, see page 04/16
 Except AR22VGF type

#### • Emergency stop illuminated pushbuttons (AR22VGF type)

Transformer	Lamp	Voltage	Туре	Rated voltage	Consumption
Without transformer	LED	24V AC/DC	AR9L002-ER	24V AC/DC	12mA AC
					11mA DC
	Neon	110V AC	AR9N001-HA	110V AC	0.19VA
		120V AC	AR9N001-KA	120V AC	0.21VA
		220V AC	AR9N001-MA	220V AC	0.30VA
		240V AC	AR9N001-PA	240V AC	0.30VA

Notes: Lamp base: BA9S/13

## AR22 and DR22

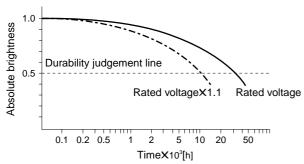
## Ratings and specifications

#### **■** Lamp durability

Lamp	Durability (reference)	Judgement criterion
LED	Approx. 30000h	When brightness is less than 50% of initial value
Incandescent	Approx. 5000h (AC)	When the bulb burns out
Neon	Approx. 5000h	When a remarkable blackening appears in the glass bulb and the using becomes improper

Notes: • The operating voltage for incandescent lamps is set at 80 to 90% of the lamp's rated voltage.
• The durability of LED lamp is a mean value in all colors.

#### Estimated durability for LED lamps



Notes: • Durability at Ta=25°C

• Durability is affected by temperature, humidity, and voltage fluctuation.

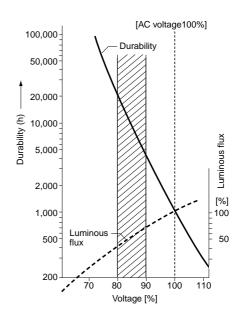
#### ■ Combination of lens color and LED or neon lamp luminous color

Lens		LED or neon lamp	
Color	Code	Luminous color	Туре
Green	G	Green	APX510- <b>■</b> G
Red	R	Red	APX510- <b>■</b> R
White	W	Orange	APX510- <b>■</b> O
Yellow	Υ	Yellow	APX510- <b>■</b> Y
Orange *	Α	Amber	APX510- <b>■</b> A
Blue	S	Blue	APX510- <b>■</b> S
Red (AR22VGF)	R	Red	AR9L002-ER
		Orange (Neon lamp)	AR9N001- <b>■</b> A

Notes: \* DR22F4M: LED lamp color is orange. (APX510-■O)

• Replace the ■ mark by the lamp voltage code

#### Incandescent lamp voltage characteristics



#### ■ Illuminated pushbutton switches

■ Illuminated pushbutte	on switche	S				
Operator	Trans- former	Contact	LED lamp Momentary action Type	Alternate action Type	Incandescent lamp Momentary action Type	Alternate action Type
Flush round head	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22F0L-10■3□ AR22F0L-01■3□ AR22F0L-11■3□ AR22F0L-22■3□	AR22F5L-10■3□ AR22F5L-01■3□ AR22F5L-11■3□ —	AR22F0L-10■4 AR22F0L-01■4 AR22F0L-11■4 AR22F0L-22■4	AR22F5L-10■4□ AR22F5L-01■4□ AR22F5L-11■4□ —
AF94-318	With	1NO 1NC 1NO+1NC	AR22F0L-10■3□ AR22F0L-01■3□ AR22F0L-11■3□	AR22F5L-10■3□ AR22F5L-01■3□ AR22F5L-11■3□	AR22F0L-10■4□ AR22F0L-01■4□ AR22F0L-11■4□	AR22F5L-10■4□ AR22F5L-01■4□ AR22F5L-11■4□
Extended round head	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22E0L-10■3  AR22E0L-01■3  AR22E0L-11■3  AR22E0L-22■3	AR22E5L-10■3  AR22E5L-01■3  AR22E5L-11■3	AR22E0L-10■4 AR22E0L-01■4 AR22E0L-11■4 AR22E0L-22■4	AR22E5L-10■4□ AR22E5L-01■4□ AR22E5L-11■4□
AF94-317	With	1NO 1NC 1NO+1NC	AR22E0L-10■3□ AR22E0L-01■3□ AR22E0L-11■3□	AR22E5L-10■3□ AR22E5L-01■3□ AR22E5L-11■3□	AR22E0L-10■4□ AR22E0L-01■4□ AR22E0L-11■4□	AR22E5L-10■4□ AR22E5L-01■4□ AR22E5L-11■4□
Mushroom head (40mm dia.)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22M0L-10■3  AR22M0L-01■3  AR22M0L-11■3  AR22M0L-22■3	AR22M5L-10■3□ AR22M5L-01■3□ AR22M5L-11■3□ —	AR22M0L-10■4□ AR22M0L-01■4□ AR22M0L-11■4□ AR22M0L-22■4□	AR22M5L-10■4□ AR22M5L-01■4□ AR22M5L-11■4□
AF94-367	With	1NO 1NC 1NO+1NC	AR22M0L-10■3  AR22M0L-01■3  AR22M0L-11■3	AR22M5L-10■3□ AR22M5L-01■3□ AR22M5L-11■3□	AR22M0L-10■4□ AR22M0L-01■4□ AR22M0L-11■4□	AR22M5L-10■4□ AR22M5L-01■4□ AR22M5L-11■4□
Mushroom head (29mm dia.)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22M4L-10■3  AR22M4L-01■3  AR22M4L-11■3  AR22M4L-22■3	AR22M9L-10■3□ AR22M9L-01■3□ AR22M9L-11■3□ —	AR22M4L-10■4□ AR22M4L-01■4□ AR22M4L-11■4□ AR22M4L-22■4□	AR22M9L-10■4□ AR22M9L-01■4□ AR22M9L-11■4□
AF94-369	With	1NO 1NC 1NO+1NC	AR22M4L-10■3□ AR22M4L-01■3□ AR22M4L-11■3□	AR22M9L-10■3□ AR22M9L-01■3□ AR22M9L-11■3□	AR22M4L-10■4□ AR22M4L-01■4□ AR22M4L-11■4□	AR22M9L-10■4□ AR22M9L-01■4□ AR22M9L-11■4□
Extended with transparent full guard (24mm dia.)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22G4L-10m3 AR22G4L-01m3 AR22G4L-11m3 AR22G4L-22m3	AR22G9L-10■3□ AR22G9L-01■3□ AR22G9L-11■3□ —	AR22G4L-10■4□ AR22G4L-01■4□ AR22G4L-11■4□ AR22G4L-22■4□	AR22G9L-10■4□ AR22G9L-01■4□ AR22G9L-11■4□ —
AF94-294	With	1NO 1NC 1NO+1NC	AR22G4L-10■3□ AR22G4L-01■3□ AR22G4L-11■3□	AR22G9L-10■3□ AR22G9L-01■3□ AR22G9L-11■3□	AR22G4L-10■4□ AR22G4L-01■4□ AR22G4L-11■4□	AR22G9L-10■4□ AR22G9L-01■4□ AR22G9L-11■4□
Extended with full guard (24mm dia. with openings)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22G2L-10 <b>m</b> 3	AR22G7L-10■3 □ AR22G7L-01■3 □ AR22G7L-11■3 □ —	AR22G2L-10■4	AR22G7L-10■4 □ AR22G7L-01■4 □ AR22G7L-11■4 □
AF99-319	With	1NO 1NC 1NO+1NC	AR22G2L-10■3 ☐ AR22G2L-01■3 ☐ AR22G2L-11■3 ☐	AR22G7L-10■3 ☐ AR22G7L-01■3 ☐ AR22G7L-11■3 ☐	AR22G2L-10■4□ AR22G2L-01■4□ AR22G2L-11■4□	AR22G7L-10■4 ☐ AR22G7L-01■4 ☐ AR22G7L-11■4 ☐

Note: ■ □ See page 04/19

Operator	Trans- former	Contact	LED lamp Momentary action Type	Alternate action Type	Incandescent lamp Momentary action Type	Alternate action Type
Extended with full guard (24mm dia.)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22G1L-10■3□ AR22G1L-01■3□ AR22G1L-11■3□ AR22G1L-22■3□	AR22G6L-10■3□ AR22G6L-01■3□ AR22G6L-11■3□ —	AR22G1L-10m4  AR22G1L-01m4  AR22G1L-11m4  AR22G1L-22m4	AR22G6L-10■4□ AR22G6L-01■4□ AR22G6L-11■4□
КК02-127А	With	1NO 1NC 1NO+1NC	AR22G1L-10■3□ AR22G1L-01■3□ AR22G1L-11■3□	AR22G6L-10■3□ AR22G6L-01■3□ AR22G6L-11■3□	AR22G1L-10■4□ AR22G1L-01■4□ AR22G1L-11■4□	AR22G6L-10■4□ AR22G6L-01■4□ AR22G6L-11■4□
Push-lock, turn-reset (40mm dia. with white arrow)	Without	1NO 1NC 1NO+1NC 3NC	_ _ _ _	AR22V5L-10■3□ AR22V5L-01■3□ AR22V5L-11■3□ AR22V5L-03■3□	_ _ _ _	AR22V5L-10■4
KKD06-335	With	1NO 1NC 1NO+1NC		AR22V5L-10■3□ AR22V5L-01■3□ AR22V5L-11■3□		AR22V5L-10■4□ AR22V5L-01■4□ AR22V5L-11■4□
Flush square head	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22F0M-10■3□ AR22F0M-01■3□ AR22F0M-11■3□ AR22F0M-22■3□	AR22F5M-10■3□ AR22F5M-01■3□ AR22F5M-11■3□ —	AR22F0M-10m4  AR22F0M-01m4  AR22F0M-11m4  AR22F0M-22m4	AR22F5M-10■4□ AR22F5M-01■4□ AR22F5M-11■4□
AF97-68	With	1NO 1NC 1NO+1NC	AR22F0M-10 <b>=</b> 3  AR22F0M-01 <b>=</b> 3  AR22F0M-11 <b>=</b> 3	AR22F5M-10■3□ AR22F5M-01■3□ AR22F5M-11■3□	AR22F0M-10■4□ AR22F0M-01■4□ AR22F0M-11■4□	AR22F5M-10■4□ AR22F5M-01■4□ AR22F5M-11■4□
Extended square head	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22E0M-10■3□ AR22E0M-01■3□ AR22E0M-11■3□ AR22E0M-22■3□	AR22E5M-10■3□ AR22E5M-01■3□ AR22E5M-11■3□ —	AR22E0M-10m4 AR22E0M-01m4 AR22E0M-11m4 AR22E0M-22m4	AR22E5M-10■4□ AR22E5M-01■4□ AR22E5M-11■4□
AF94-357	With	1NO 1NC 1NO+1NC	AR22E0M-10■3□ AR22E0M-01■3□ AR22E0M-11■3□	AR22E5M-10■3□ AR22E5M-01■3□ AR22E5M-11■3□	AR22E0M-10■4□ AR22E0M-01■4□ AR22E0M-11■4□	AR22E5M-10■4□ AR22E5M-01■4□ AR22E5M-11■4□
Flush round head vith square bezel	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22F0P-10 <b>3</b> AR22F0P-01 <b>3</b> AR22F0P-11 <b>3</b> AR22F0P-11 <b>3</b> AR22F0P-22 <b>3</b>	AR22F5P-10■3□ AR22F5P-01■3□ AR22F5P-11■3□ —	AR22F0P-10■4□ AR22F0P-01■4□ AR22F0P-11■4□ AR22F0P-22■4□	AR22F5P-10■4□ AR22F5P-01■4□ AR22F5P-11■4□
AF94-315	With	1NO 1NC 1NO+1NC	AR22F0P-10■3□ AR22F0P-01■3□ AR22F0P-11■3□	AR22F5P-10■3□ AR22F5P-01■3□ AR22F5P-11■3□	AR22F0P-10■4□ AR22F0P-01■4□ AR22F0P-11■4□	AR22F5P-10■4□ AR22F5P-01■4□ AR22F5P-11■4□
Extended round head with square bezel	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22E0P-10■3□ AR22E0P-01■3□ AR22E0P-11■3□ AR22E0P-22■3□	AR22E5P-10■3□ AR22E5P-01■3□ AR22E5P-11■3□ —	AR22E0P-10■4□ AR22E0P-01■4□ AR22E0P-11■4□ AR22E0P-22■4□	AR22E5P-10■4□ AR22E5P-01■4□ AR22E5P-11■4□
AF94-314	With	1NO 1NC 1NO+1NC	AR22E0P-10■3□ AR22E0P-01■3□ AR22E0P-11■3□	AR22E5P-10■3□ AR22E5P-01■3□ AR22E5P-11■3□	AR22E0P-10■4□ AR22E0P-01■4□ AR22E0P-11■4□	AR22E5P-10■4□ AR22E5P-01■4□ AR22E5P-11■4□

Note: ■ ☐ See page 04/19

Operator	Trans- former	Contact	LED lamp Momentary action Type	Alternate action Type	Incandescent lamp Momentary action Type	Alternate action Type
Mushroom head with square bezel (29mm dia.)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR22M4P-10■3  AR22M4P-01■3  AR22M4P-11■3  AR22M4P-22■3		AR22M4P-10■4□ AR22M4P-01■4□ AR22M4P-11■4□ AR22M4P-22■4□	
AF94-440	With	1NO 1NC 1NO+1NC	AR22M4P-10■3□ AR22M4P-01■3□ AR22M4P-11■3□	_ _ _	AR22M4P-10■4□ AR22M4P-01■4□ AR22M4P-11■4□	

#### • Lens color

Replace the  $\hfill\Box$  mark by the lens color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	А

Note: AR22V5L type: Red, yellow only

#### • Contact arrangements

Contact arrangements other than above are available

Contact arrangement	1NO	1NC	1N0	O+1NC	2NO	2NC	3NO
Code	10	01	11		20	02	30
Contact arrangement	3NC	2NO+2	2NC	4NO	4NC	5NO	5NC
Code	03	22		40	04	50	05

#### Available numbers of contact blocks

Operation	Without transformer	With transformer
Momentary action	5-contact block	3-contact block
Alternate action Push-lock, turn-reset	3-contact block	2-contact block

#### Voltage

Replace the ■ mark by the lamp voltage code

	1 0		
Transformer		Code LED	Incandescent
Without transformer	6V DC 6V AC 5.5V AC/DC 12V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC	6 A   B C   E	
With transformer	100-110V AC 115-127V AC 200-220V AC 230-254V AC 350-380V AC 400-440V AC 480V AC 500-550V AC	H L M Q S T > W	H L M Q S T V W

## Pushbuttons **AR22**

#### ■ Pushbutton switches

Operator	Contact	Momentary action Type	Alternate action Type	Operator	Contact	Momentary action Type	Alternate action Type
Flush round head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22F0R-10  AR22F0R-01  AR22F0R-11  AR22F0R-20  AR22F0R-02  AR22F0R-22	AR22F5R-10  AR22F5R-01  AR22F5R-11  AR22F5R-20  AR22F5R-02  AR22F5R-22	Flush with full guard (24mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22G2R-10 AR22G2R-01 AR22G2R-11 AR22G2R-20 AR22G2R-02 AR22G2R-22	AR22G7R-10 AR22G7R-01 AR22G7R-11 AR22G7R-20 AR22G7R-02 AR22G7R-22
Extended round head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22E0R-10  AR22E0R-01  AR22E0R-11  AR22E0R-20  AR22E0R-02  AR22E0R-22	AR22E5R-10 AR22E5R-01 AR22E5R-11 AR22E5R-20 AR22E5R-02 AR22E5R-22	Mushroom head with full guard (40mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22M3R-10 AR22M3R-01 AR22M3R-11 AR22M3R-20 AR22M3R-02 AR22M3R-22	AR22M8R-10 AR22M8R-01 AR22M8R-11 AR22M8R-20 AR22M8R-02 AR22M8R-22
Flush round head symbol mark type	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22FAR-01C AR22FAR-11C AR22FAR-20C AR22FAR-02C	AR22FBR-10C  AR22FBR-01C  AR22FBR-11C  AR22FBR-20C  AR22FBR-02C  AR22FBR-22C	Extended with half guard	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22G0R-10 AR22G0R-01 AR22G0R-11 AR22G0R-20 AR22G0R-02 AR22G0R-22	AR22G5R-10 AR22G5R-01 AR22G5R-11 AR22G5R-20 AR22G5R-02 AR22G5R-22
Extended round head symbol mark type	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22EAR-01C AR22EAR-11C AR22EAR-20C AR22EAR-02C	AR22EBR-10C  AR22EBR-01C  AR22EBR-11C  AR22EBR-20C  AR22EBR-02C  AR22EBR-22C	Push-lock, turn-reset (40mm dia. with white arrow)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	   	AR22V5R-10  AR22V5R-01  AR22V5R-11  AR22V5R-20  AR22V5R-02  AR22V5R-22
Mushroom head (40mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22M0R-01	AR22M5R-10 AR22M5R-01 AR22M5R-11 AR22M5R-20 AR22M5R-02 AR22M5R-22 AR22M5R-22	Flush square head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22F0S-10  AR22F0S-01  AR22F0S-11  AR22F0S-20  AR22F0S-02  AR22F0S-22	AR22F5S-10  AR22F5S-01  AR22F5S-11  AR22F5S-20  AR22F5S-02  AR22F5S-22
Mushroom head (29mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22M4R-02□	AR22M9R-10 AR22M9R-01 AR22M9R-11 AR22M9R-20 AR22M9R-02 AR22M9R-22	Extended square head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22E0S-10 AR22E0S-01 AR22E0S-11 AR22E0S-20 AR22E0S-02 AR22E0S-22	AR22E5S-10  AR22E5S-01  AR22E5S-11  AR22E5S-20  AR22E5S-02  AR22E5S-22
Extended with full guard (24mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR22G3R-01□	AR22G8R-10 ☐ AR22G8R-01 ☐ AR22G8R-11 ☐ AR22G8R-20 ☐ AR22G8R-02 ☐ AR22G8R-22 ☐	Flush round head with square bezel	1NO 1NC 1NO+1NC 2NO 2NC 2NC+2NC	AR22F0Y-10   AR22F0Y-01   AR22F0Y-11   AR22F0Y-20   AR22F0Y-02   AR22F0Y-22	AR22F5Y-10  AR22F5Y-01  AR22F5Y-11  AR22F5Y-20  AR22F5Y-02  AR22F5Y-22

Note: ■ ☐ See page 04/21

Operator	Contact	Momentary action Type	Alternate action Type
Extended round head with square bezel	2NO 2NC	AR22E0Y-10  AR22E0Y-01  AR22E0Y-11  AR22E0Y-20  AR22E0Y-02  AR22E0Y-22	AR22E5Y-10 AR22E5Y-01 AR22E5Y-11 AR22E5Y-20 AR22E5Y-02 AR22E5Y-22

Operator	Contact	Momentary action Type	Alternate action Type
Mushroom head with square bezel (29mm dia.)	2NO 2NC	AR22M4Y-10 AR22M4Y-01 AR22M4Y-11 AR22M4Y-20 AR22M4Y-02 AR22M4Y-02 AR22M4Y-22	_

#### • Button color

Replace the  $\square$  mark by the button color code

Color	Green	Red	White	Blue	Yellow	Orange	Black
Code	G	R	W	S	Υ	Α	В

Note: AR22V5R type: Red, yellow, black only

#### • Contact arrangements

Contact arrangements other than above are available

Contact arrangement	1NO	1NC	1NO+1NC	2NO	2NC	3NO	3NC
Code	10	01	11	20	02	30	03

Contact arrangement	2NO+2NC	4NO	4NC	5NO	5NC	3NO+3NC
Code	22	40	04	50	05	33

#### • Available numbers of contact blocks

Momentary action	Alternate action Push-lock, turn-reset
6-contact block	4-contact block

## • Symbol mark (For AR22FAR, FBR, EAR, EBR) Replace the ■ mark by the symbol mark code

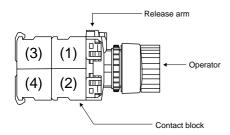
Symbol mark	О		I	(T)			0	1	1
Color of button	White	Black	White	Black	White	Black	Clear		
Color of mark	Red		Green		Green		Black		
Code	01	02	03	04	11	12	02B	04B	12B

Operator	Contact (The following contact is only available.)	Button	Туре	Contact operation					
				Contact block		Left		Right	
				Mounting position	Туре	Free	Depressed	Free	Depressed
Pushbutton with selector ring (2-position)  AF94-355	2NO+2NC	Green Red Black White Yellow Orange Blue	AR22S1R-22G AR22S1R-22R AR22S1R-22B AR22S1R-22W AR22S1R-22Y AR22S1R-22A AR22S1R-22S	(1)	NC	_	_	•	_
				(2)	NC	_	_	•	_
				(3)	NO	_	•	_	•
				(4)	NO	_	•	_	•
	2NO	Green Red Black White Yellow Orange Blue	AR22S2R-20G AR22S2R-20R AR22S2R-20B AR22S2R-20W AR22S2R-20Y AR22S2R-20A AR22S2R-20S	(1)	NO	_	•	_	_
				(2)	NO	_	_	_	•
	2NO+2NC	Green Red Black White Yellow Orange Blue	AR22S2R-22G AR22S2R-22R AR22S2R-22B AR22S2R-22W AR22S2R-22Y AR22S2R-22A AR22S2R-22S	(1)	NC	•	_		
				(2)	NC			•	_
				(3)	NO	_	•	_	_
				(4)	NO	_	_	_	•
	2NO+2NC	Green Red Black White Yellow Orange Blue	AR22S3R-22G AR22S3R-22R AR22S3R-22B AR22S3R-22W AR22S3R-22Y AR22S3R-22A AR22S3R-22A	(1)	NC	_	_		
				(2)	NC			_	_
				(3)	NO	_	•	_	_
				(4)	NO	_	_	_	•
	2NO+2NC	Green Red Black White Yellow Orange Blue	AR22S6R-22G AR22S6R-22R AR22S6R-22B AR22S6R-22W AR22S6R-22Y AR22S6R-22A AR22S6R-22S	(1)	NC	•	_	_	Locked
				(2)	NC	•	_	_	
				(3)	NO	_	•	•	
				(4)	NO	_	•	•	

Note: (1) to (4): Contact block mounting position

Contact closedContact open

#### • Position of contact block



#### **■** Emergency stop pushbutton switches

 $\ominus$  (Direct opening action), conform to EN418

Operator	Contact	Туре
Push-lock, turn-reset (Soft-touch 40mm dia. With white arrow)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AR22V0R-01R AR22V0R-11R AR22V0R-02R AR22V0R-03R AR22V0R-22R AR22V0R-04R
Push-lock, turn-reset (40mm dia.)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AR22V2R-01R AR22V2R-11R AR22V2R-02R AR22V2R-03R AR22V2R-22R AR22V2R-04R
Push-lock, turn-reset (Soft-touch 29mm dia. with white arrow)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AR22VSR-01R AR22VSR-11R AR22VSR-02R AR22VSR-03R AR22VSR-22R AR22VSR-24R
Push-lock, turn-reset (29mm dia.)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AR22V4R-01R AR22V4R-11R AR22V4R-02R AR22V4R-03R AR22V4R-22R AR22V4R-04R

Operator	Contact	Туре
Key release push-lock, turn-reset (40mm dia.)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AR22V7R-01R AR22V7R-11R AR22V7R-02R AR22V7R-03R AR22V7R-22R AR22V7R-04R
Push-lock, pull-reset (35mm dia.)	1NC 1NO+1NC 2NC	AR22Q2R-01R AR22Q2R-11R AR22Q2R-02R
Unibody push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	1NC 1NO+1NC 2NC	AR22VGE-01R AR22VGE-11R AR22VGE-02R

Notes: • Button color : Red only

• Contact arrangements indicated in the table can be supplied.

## Emergency Stop Illuminated Pushbuttons **AR22**

#### **■** Emergency stop illuminated pushbutton switches

⊕ (Direct opening action), conform to EN418

Operator	Transformer	Contact	LED lamp Type	Incandescent lamp Type	Neon lamp Type
Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	Without	1NC 1NO+1NC 2NC 3NC	AR22V0L-01■3R AR22V0L-11■3R AR22V0L-02■3R AR22V0L-03■3R	AR22V0L-01■4R AR22V0L-11■4R AR22V0L-02■4R AR22V0L-03■4R	_ _ _ _
KKD06-335	With	1NC 1NO+1NC 2NC	AR22V0L-01■3R AR22V0L-11■3R AR22V0L-02■3R	AR22V0L-01■4R AR22V0L-11■4R AR22V0L-02■4R	
Push-lock, turn-reset (40mm dia.)	Without	1NC 1NO+1NC 2NC 3NC	AR22V2L-01■3R AR22V2L-11■3R AR22V2L-02■3R AR22V2L-03■3R	AR22V2L-01■4R AR22V2L-11■4R AR22V2L-02■4R AR22V2L-03■4R	_ _ _
KKD06-337	With	1NC 1NO+1NC 2NC	AR22V2L-01■3R AR22V2L-11■3R AR22V2L-02■3R	AR22V2L-01■4R AR22V2L-11■4R AR22V2L-02■4R	_ _ _
Push-lock, turn-reset (Soft-touch 40mm dia. transparent in all colors with white arrow)	Without	1NC 1NO+1NC 2NC 3NC	AR22VDL-01■3R AR22VDL-11■3R AR22VDL-02■3R AR22VDL-03■3R	AR22VDL-01■4R AR22VDL-11■4R AR22VDL-02■4R AR22VDL-03■4R	_ _ _ _
	With	1NC 1NO+1NC 2NC	AR22VDL-01■3R AR22VDL-11■3R AR22VDL-02■3R	AR22VDL-01■4R AR22VDL-11■4R AR22VDL-02■4R	_ _ _
Push-lock, turn-reset (40mm dia. transparent in all colors)	Without	1NC 1NO+1NC 2NC 3NC	AR22VAL-01■3R AR22VAL-11■3R AR22VAL-02■3R AR22VAL-03■3R	AR22VAL-01■4R AR22VAL-11■4R AR22VAL-02■4R AR22VAL-03■4R	_ _ _
KKD06-340	With	1NC 1NO+1NC 2NC	AR22VAL-01■3R AR22VAL-11■3R AR22VAL-02■3R	AR22VAL-01■4R AR22VAL-11■4R AR22VAL-02■4R	
Push-lock, turn-reset (Soft-touch 29mm dia. with white arrow)	Without	1NC 1NO+1NC 2NC 3NC	AR22VSL-01■3R AR22VSL-11■3R AR22VSL-02■3R AR22VSL-03■3R	AR22VSL-01■4R AR22VSL-11■4R AR22VSL-02■4R AR22VSL-03■4R	_ _ _
KKD06-344	With	1NC 1NO+1NC 2NC	AR22VSL-01■3R AR22VSL-11■3R AR22VSL-02■3R	AR22VSL-01■4R AR22VSL-11■4R AR22VSL-02■4R	
Unibody push-lock, turn-reset	Without	1NC	AR22VGF-01E3R	_	AR22VGF-01∎1R
(Soft-touch 40mm dia. with white arrow)		1NO+1NC	AR22VGF-11E3R	_	AR22VGF-11■1R
KKD05-150		2NC	AR22VGF-02E3R	_	AR22VGF-02■1R

Notes: • Button color: Red only • AR22VGF type: Lamp circuit contacts are provided, see page 04/43. • Contact arrangements indicated in the table can be supplied.

#### Voltage

Replace the ■ mark by the lamp voltage code

replace the	replace the = mant by the lamp vertage code						
Transformer		Code LED	Incandescent	Neon			
Without	6V DC 6V AC 5V AC/DC 12V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC 110V AC 120V AC 220V AC	6 A   B C   E	5 CDE	  -  -			

Transformer	ſ	Code LED	Incandescent
With	100-110V AC 115-127V AC 200-220V AC 230-254V AC 350-380V AC 400-440V AC 480V AC 500-550V AC	H L M Q S T V	H L M Q S T V W

Notes: AR22VGF: LED 24V AC/DC and neon only

### ■ Selector switches

2-position							
Operator	Operation Operation		Contact Type Switch with Swi		Switch with	Contact operation (Example)	
	key removable Switch with Switch with position round bezel square bezel		Contact arrangement	Operator position			
						anangement	Left Right
							◊ ∅
Knob	Maintained	Color code:	1NO	AR22PR-210B	AR22PY-210B	1NO (1)	Upper contact
<b>*</b>		B: Black (Standard) Color other than above are	1NC 1NO+1NC 2NO 2NC	AR22PR-201B AR22PR-211B AR22PR-220B AR22PR-202B	AR22PY-201B AR22PY-211B AR22PY-220B AR22PY-202B		3 + 4
	each 90°	available /G: Green	2NO+2NC	AR22PR-222B	AR22PY-222B	1NC (1)	Upper contact
01	Spring return	(R: Red	1NO 1NC	AR22PR-010B AR22PR-001B	AR22PY-010B AR22PY-001B	(1)	1 - 2
•	Ō		1NO+1NC 2NO	AR22PR-011B AR22PR-020B	AR22PY-011B AR22PY-020B		
AF94-310	60°		2NC 2NO+2NC	AR22PR-002B AR22PR-022B	AR22PY-002B AR22PY-022B	1NO+1NC	Upper contact
Lever	Maintained		1NO	AR22WR-210B	AR22WY-210B	(1)	3 + 4
			1NC 1NO+1NC	AR22WR-201B AR22WR-211B	AR22WY-201B AR22WY-211B	(2)	
	b 000		2NO 2NC	AR22WR-220B AR22WR-202B	AR22WY-220B AR22WY-202B	(2)	Lower contact
	each 90°		2NO+2NC	AR22WR-222B	AR22WY-222B		1 + 2
	Spring return		1NO 1NC	AR22WR-010B AR22WR-001B	AR22WY-010B AR22WY-001B	2NO+2NC	Upper contact
	Ō		1NO+1NC 2NO	AR22WR-011B AR22WR-020B	AR22WY-011B AR22WY-020B	(1)	3 + 4
AF94-324	60°		2NC 2NO+2NC	AR22WR-002B AR22WR-022B	AR22WY-002B AR22WY-022B	(3)	
Cylindrical knob	Maintained		1NO 1NC	AR22RR-210B AR22RR-201B	AR22RY-210B	(3)	
			1NO+1NC	AR22RR-211B	AR22RY-201B AR22RY-211B		Lower contact
-Dista	b 000		2NO 2NC	AR22RR-220B AR22RR-202B	AR22RY-220B AR22RY-202B	(2)	1 + 2
Part	each 90° Spring return	_	2NO+2NC 1NO	AR22RR-222B AR22RR-010B	AR22RY-222B AR22RY-010B	(4)	1 - 2
	Spring return		1NC 1NC 1NO+1NC	AR22RR-001B AR22RR-011B	AR22RY-001B AR22RY-011B	( - /	
	5		2NO 2NC	AR22RR-020B	AR22RY-020B		
AF94-308	60°		2NO+2NC	AR22RR-002B AR22RR-022B	AR22RY-002B AR22RY-022B	Upper con	tact
Key	Maintained	■: Key removable	1NO 1NC	,	) AR22JY-2■10() ) AR22JY-2■01()		Release arm
_		position ( ): Key type	1NO+1NC 2NO	AR22J□R-2■11(	) AR22JY-2■11() ) AR22JY-2■20()	(3) (1)	
	each 90°	See page 04/27	2NC 2NC+2NC	AR22J□R-2 <b>■</b> 02(	) AR22JY-2m22() ) AR22JY-2m22()	(4) (2)	Operator
	Spring return		1NO		) AR22JY-0A10()	\/ `	Contact block
			1NC 1NO+1NC	AR22J□R-0A11(	) AR22JY-0A01() ) AR22JY-0A11()	Lower cor	ntact
	<b>\bar{\bar{\bar{\bar{\bar{\bar{\bar{</b>		2NO 2NC	AR22J□R-0A02(	) AR22JY-0A20() ) AR22JY-0A02()		
KKD09-018	60°		2NO+2NC	AR22J⊟R-0A22(	) AR22JY-0A22()		

Notes: • (1) to (4): Contact block mounting position

• ① – ②, ③ – ④: Contact block terminal No.

Contact closed

#### Operator

Replace the  $\square$  mark by the cylinder key type code Standard type: Blank Long durability type: A

<sup>•</sup> Contact arrangements: See page 04/27

2	po:	_:4:	
<b>3</b> -	nn	SITI	nn

Operator	Operation	Knob color	Contact	Type Switch with	Switch with	Contact of	peration (Exam	ple)
				Switch with round bezel	Switch with square bezel	Contact	Operation posi	tion
						arrange- ment	L C R	L C R
Knob	Maintained each 45°	Color code: B: Black (Standard) Color other than	1NO+1NC 2NO 2NC 2NC+2NC	AR22PR-311B AR22PR-320B AR22PR-302B AR22PR-322B	AR22PY-311B AR22PY-320B AR22PY-302B AR22PY-322B	1NO+1NC (1) (2)	Upper contact	Lower contact
	Spring/manual return each 45°	above are available (G: Green R: Red	1NO+1NC 2NO 2NC 2NC+2NC	AR22PR-611B AR22PR-620B AR22PR-602B AR22PR-622B	AR22PY-611B AR22PY-620B AR22PY-602B AR22PY-622B			
	Spring/manual return each 45°		1NO+1NC 2NO 2NC 2NC+2NC	AR22PR-711B AR22PR-720B AR22PR-702B AR22PR-722B	AR22PY-711B AR22PY-720B AR22PY-702B AR22PY-722B	1NO+1NC (1) (2)	Upper contact  (3) (4)	Lower contact
AF94-310	Spring return		2NO+2NC	AR22PR-122B	AR22PY-122B	2NO+2NC (1) (2)	Upper contact  (1) (2)	Lower contact
	each 45°					(3) (4)	3 + + +	3 4 4
Lever	Maintained each 45°		1NO+1NC 2NO 2NC 2NC+2NC	AR22WR-311B AR22WR-320B AR22WR-302B AR22WR-322B	AR22WY-311B AR22WY-320B AR22WY-302B AR22WY-322B	1NO+1NC (1) (2)	Upper contact  (3)  (4)	Lower contact
	Spring/manual return  accepted by the control of th		1NO+1NC 2NO 2NC 2NO+2NC	AR22WR-611B AR22WR-620B AR22WR-602B AR22WR-622B	AR22WY-611B AR22WY-620B AR22WY-602B AR22WY-622B			
S.	Spring/manual return  each 45°		1NO+1NC 2NO 2NC 2NC+2NC	AR22WR-711B AR22WR-720B AR22WR-702B AR22WR-722B	AR22WY-711B AR22WY-720B AR22WY-702B AR22WY-722B	1NO+1NC (1) (2)	Upper contact  (3)  (4)	Lower contact
AF94-324	Spring return		2NO+2NC	AR22WR-122B	AR22WY-122B	2NO+2NC (1) (2)	Upper contact	Lower contact
	each 45°					(3) (4)	3 + + + 4	3 4
Cylindrical knob	Maintained each 45°		1NO+1NC 2NO 2NC 2NO+2NC	AR22RR-311B AR22RR-320B AR22RR-302B AR22RR-322B	AR22RY-311B AR22RY-320B AR22RY-302B AR22RY-322B	1NO+1NC (1) (2)	Upper contact  (3)  (4)	Lower contact
	Spring/manual return each 45°		1NO+1NC 2NO 2NC 2NC+2NC	AR22RR-611B AR22RR-620B AR22RR-602B AR22RR-622B	AR22RY-611B AR22RY-620B AR22RY-602B AR22RY-622B			
	Spring/manual return each 45°		1NO+1NC 2NO 2NC 2NO+2NC	AR22RR-711B AR22RR-720B AR22RR-702B AR22RR-722B	AR22RY-711B AR22RY-720B AR22RY-702B AR22RY-722B	1NO+1NC (1) (2)	Upper contact  (3)  (4)	Lower contact
AF94-308	Spring return		2NO+2NC	AR22RR-122B	AR22RY-122B	2NO+2NC (1) (2)	Upper contact	Lower contact
	each 45°					(3) (4)	3 + + +	3 + + + (4)

Contact closed

Operation Operation	Key removable position	Contact	Type Switch with	Switch with	Contact of	Contact operation (Example)			
		position		round bezel	square bezel	Contact	Operator positi	ion	
						arrange- ment	L C R	L C R	
							$\bigcirc$ $\bigcirc$ $\bigcirc$	$\bigcirc \bigcirc \bigcirc$	
Key	Maintained each 45°	■: Key removable position (): Key type	1NO+1NC 2NO 2NC 2NO+2NC	AR22J□R-3■11() AR22J□R-3■20() AR22J□R-3■02() AR22J□R-3■22()	AR22JY-3■11() AR22JY-3■20() AR22JY-3■02() AR22JY-3■22()	1NO+1NC (1) (2)	Upper contact  (3)  (4)	Lower contact	
2	Spring/manual return each 45°		1NO+1NC 2NO 2NC 2NO+2NC	AR22J□R-6■11() AR22J□R-6■20() AR22J□R-6■02() AR22J□R-6■22()	AR22JY-6■11() AR22JY-6■20() AR22JY-6■02() AR22JY-6■22()				
	Spring/manual return each 45°		1NO+1NC 2NO 2NC 2NO+2NC	AR22J□R-7■11() AR22J□R-7■20() AR22J□R-7■02() AR22J□R-7■22()	AR22JY-7■11() AR22JY-7■20() AR22JY-7■02() AR22JY-7■22()		Upper contact  (3)  (4)	Lower contact ①	
KKD09-018	Spring return		2NO+2NC	AR22J□R-1E22()	AR22JY-1E22()	2NO+2NC (1) (2)	Upper contact  (1) (2)	Lower contact ①	
	each 45°					(3) (4)	3 + + + 4	3 4	

Notes: • Operator position L:Left, C:Center, R:Right

- (1) to (4): Contact block mounting position
- ① ②, ③ ④: Contact block terminal No.

#### • Contact arrangements

Contact arrangements other than above are available

Contact arrangement	1NO	1NC	1NO+1NC	2NO	2NC	3NO	3NC
Code	10	01	11	20	02	30	03

Contact arrangement	2NO+2NC	4NO	4NC	5NO	5NC	3NO+3NC
Code	22	40	04	50	05	33

#### • Available numbers of contact blocks

Mainted	Spring return Spring/manual return
6-contact block	4-contact block

#### • Key removable positions

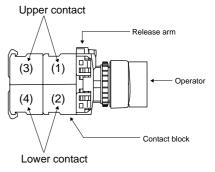
Code	А	В	С	D	Е	F	G
Removable position	A5° +85°	A5°, 45°,	45, 45,	A5, 45.	45° 45°	A5° - 45°	15° 45°
AR22J□R-2	•	•	_	•	_	_	_
AR22J□R-0	•	_	_	_	_	_	_
AR22J□R-3	•	•	•	•	•	•	•
AR22J□R-6	_	_	_	•	•	•	_
AR22J□R-7	•	_	_	_	•	_	•
AR22J□R-1	_	_	_	_	•	_	_

●: Available —: Not available

#### • Key code No.

Replace the ( ) mark with one of the following key code. A, B, C, D, E and F Standard key code is A.

## Position of contact block



#### Operator

Replace the  $\square$  mark by the cylinder key type code Standard type: Blank Long durability type: A

## Selector Switches **AR22**

## ■ Selector switches (control type) 3-position

Operator	Operation	Knob color or key removable position	Contact arrangement	Type Switch with round bezel	Switch with square bezel
Knob	Maintained each 45°	Color code: B: Black (Standard)	Replace the ■ mark by the contact arrangement code	AR22PCR-3■B	AR22PCY-3■B
	Spring/manual return teach 45°	Color other than above are available	(shown on next page).	AR22PCR-6■B	AR22PCY-6■B
	Spring/manual return the each 45°	(G: Green R: Red		AR22PCR-7■B	AR22PCY-7■B
AF94-435	Spring return  (†) each 45°			AR22PCR-1■B	AR22PCY-1■B
Lever	Maintained each 45°		Replace the ■ mark by the contact	AR22WCR-3■B	AR22WCY-3■B
return	Spring/manual return teach 45°		arrangement code (shown on next page).	AR22WCR-6■B	AR22WCY-6■B
	Spring/manual return			AR22WCR-7■B	AR22WCY-7■B
AF94-436	Spring return  † each 45°			AR22WCR-1■B	AR22WCY-1■B
Cylindrical knob	Maintained each 45°		Replace the ■ mark by the contact arrangement code	AR22RCR-3■B	AR22RCY-3■B
	Spring/manual return teach 45°		(shown on next page).	AR22RCR-6■B	AR22RCY-6■B
	Spring/manual return (†) each 45°			AR22RCR-7■B	AR22RCY-7■B
AF94-433	Spring return  the each 45°			AR22RCR-1■B	AR22RCY-1 <b>■</b> B
Key	Maintained Replace the ☐ mark by the		Replace the ■ mark by the contact arrangement code	AR22JCR-3□■()	AR22JCY-3 <b>■</b> □()
Spri	Spring/manual return teach 45°	key removable position code: A, B, C, D, E	(shown on next page).	AR22JCR-6□■()	AR22JCY-6 <b>■</b> □( )
	Spring/manual return (†) each 45°	FOIG		AR22JCR-7□■()	AR22JCY-7 <b>■</b> □()
KKD09-016	Spring return			AR22JCR-1E <b>■</b> ()	AR22JCY-1E <b>■</b> ( )

#### • Key removable positions

Code	А	В	С	D	Е	F	G
Removable position	45, 45,	45, 485,	45, 48,	\$5° - \$5°	45, 45,	15, 45,	\$5° - \$5°
AR22JCR-3 AR22JCR-6 AR22JCR-7 AR22JCR-1	• - • -	- - -	• - - -	• • - -	•	• • - -	• - • -

●: Available —: Not available

#### • Key code No.

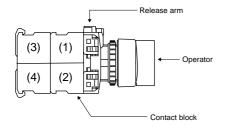
Replace the ( ) mark with one of the following key code. A, B, C, D, E and F Standard key code is A.

#### • Contact arrangement code (Typical example)

Contact arrange-	Contact arrange-	Contact op	eration			
ment	ment code	Contact blo	ock	Operator	position	
	code	Mounting position	Туре	Left	Center	Right
2NC	01F	(1)	NC			
		(2)	NC			
		_	_	_	_	_
		_	_	_	_	_
2NO+2NC	014	(1)	NC			
		(2)	NC			
		(3)	NO			•
		(4)	NO	•		
4NC	01J	(1)	NC			
		(2)	NC			
		(3)	NC			
		(4)	NC			
2NO+2NC	024	(1)	NC			
		(2)	NC		•	
		(3)	NO			•
		(4)	NO	•		•
2NO+2NC	03C*	(1)	NC			
	(Maintained only)	(2)	NC			•
		(3)	NO			•
		(4)	NO	•		
2NO+2NC	044*	(1)	NC			
		(2)	NC		•	
		(3)	NO			•
		(4)	NO	•		
2NO+2NC	054	(1)	NC			
		(2)	NC		•	
		(3)	NO			•
		(4)	NO			•

Contact	Contact	Contact op	eration			
arrange- ment	arrange- ment	Contact blo	ock	Operator	position	
	code	Mounting position	Туре	Left	Center	Right
2NO+2NC	064	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO	•		•
1NO+1NC	07F	(1)	NC			
		(2)	NO			•
		_	_	_	_	_
		_	_	_	_	_
2NO+2NC	07C* (Maintained only)	(1)	NC			
		(2)	NC			•
		(3)	NO	•		
		(4)	NO	•		
2NO+2NC	084	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO	•		
2NO+2NC	094*	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO			•
2NO+2NC	104	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		•
		(4)	NO	•		•
2NO+2NC	11C*	(1)	NC	1	•	
	(Maintained only)	(2)	NC			•
		(3)	NO	•		•
		(4)	NO	•		

#### • Position of contact block



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Notes: ●: Contact closed Blank: Contact open

\* There may be some overlap in the contact when switching between notches.

#### • Contact arrangement code (Typical example)

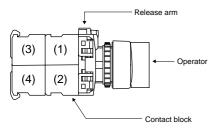
Contact arrange-	Contact	Contact op	eration			
ment	arrange- ment	Contact blo	ock	Operator	position	
	code	Mounting position	Туре	Left	Center	Right
2NO+2NC	124*	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		•
		(4)	NO	•		
2NO+2NC	134*	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		•
		(4)	NO			•
3NO+1NC	14D*	(1)	NO	•		
	(Maintained only)	(2)	NC		•	
		(3)	NO	•		
		(4)	NO			•
3NO+1NC	15A*	(1)	NO			•
		(2)	NC		•	
		(3)	NO			•
		(4)	NO	•		
2NO+2NC	164	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO	•		
2NO+2NC	174*	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO			•
2NO+2NC	184	(1)	NC		•	
		(2)	NC		•	
		(3)	NO			•
		(4)	NO			•

Contact	Contact	Contact op	eration			
arrange- ment	arrange- ment	Contact blo	ck	Operator	position	
СО	code	Mounting position	Туре	Left	Center	Right
2NO+2NC	194	(1)	NC			
		(2)	NC			
		(3)	NO	•		
		(4)	NO			•
4NO	20B	(1)	NO			•
		(2)	NO	•		
		(3)	NO			•
		(4)	NO	•		

Notes: ●: Contact closed Blank: Contact open

\* There may be some overlap in the contact when switching between notches.

#### • Position of contact block



#### 4, 5-position

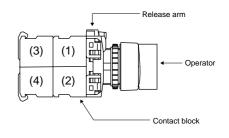
Operator	Contact (The following contact is only available.)	Operation	Knob color	Contact arrangement	Type Switch with round bezel	Switch with square bezel
Knob	nob 2NO+2NC	4-position maintained	Color code: B: Black (Standard) Color other than	Replace the ■ mark by the contact arrangement code	AR22PCR-4■B	AR22PCY-4 <b>■</b> B
AF94-	435	above are available	available /G: Green	(shown below)  AR22PCR-5■B	AR22PCR-5■B	AR22PCY-5 <b>■</b> B
191	4-position maintained			AR22WCR-4■B	AR22WCY-4 <b>■</b> B	
AF94-	5-position maintained	·		AR22WCR-5■B	AR22WCR-5■B	AR22WCY-5 <b>■</b> B
Cylindrical knob	2NO+2NC	4-position maintained			AR22RCR-4■B	AR22RCY-4 <b>■</b> B
AF94-	433	5-position maintained			AR22RCR-5■B	AR22RCY-5■B

#### Contact arrangement code

Position	Contact	Contact	Contact operation						
	arrange- ment	arrange- ment	Contact blo	ck	Operator position				
		code	Mounting position	Туре	1 2 3 4 5				
4-position 2NO+2	2NO+2NC	NO+2NC 41C* (Maintained only)	(1)	NC	+++				
			(2)	NC	<b>+ -</b>				
			(3)	NO	<b>+</b>				
			(4)	NO	<del>                                      </del>				
5-position	2NO+2NC	51C* (Main-	(1)	NC					
		tained only)	(2)	NC	<del>  •      </del>				
			(3)	NO	<b>→</b>				
			(4)	NO					

#### Notes: ●: Contact closed

#### Position of contact block



#### Operator position 4-position 5-position





<sup>\*</sup> There may be some overlap in the contact when switching between notches.

### Illuminated Selector Switches AR22

#### ■ Illuminated selector switches 2-position

Operator	Operation	Contact	LED lamp		Incandescent la	amp
			Transformer	Туре	Transformer	Туре
Knob	Maintained	1NO 1NC 1NO+1NC 2NO+2NC	Without	AR22PL-210■3 ☐ AR22PL-201■3 ☐ AR22PL-211■3 ☐ AR22PL-222■3 ☐	Without	AR22PL-210■4□ AR22PL-201■4□ AR22PL-211■4□ AR22PL-222■4□
	each 90°	1NO 1NC 1NO+1NC 2NO	With	AR22PL-210■3 ☐ AR22PL-201■3 ☐ AR22PL-211■3 ☐ AR22PL-220■3 ☐	With	AR22PL-210■4  AR22PL-201■4  AR22PL-211■4  AR22PL-220■4
	Spring return	1NO 1NC 1NO+1NC 2NO	Without	AR22PL-010■3  AR22PL-001■3  AR22PL-011■3  AR22PL-020■3	Without	AR22PL-010 <b>■</b> 4 AR22PL-001 <b>■</b> 4 AR22PL-011 <b>■</b> 4 AR22PL-020 <b>■</b> 4
	60°	1NO 1NC 1NO+1NC 2NO	With	AR22PL-010m3	With	AR22PL-010 <b>■</b> 4 AR22PL-001 <b>■</b> 4 AR22PL-011 <b>■</b> 4 AR22PL-020 <b>■</b> 4
nob with square ezel	Maintained	1NO 1NC 1NO+1NC 2NO+2NC	Without	AR22PP-210 <b>m</b> 3	Without	AR22PP-210 <b>■</b> 4  AR22PP-201 <b>■</b> 4  AR22PP-211 <b>■</b> 4  AR22PP-222 <b>■</b> 4
	each 90°	1NO 1NC 1NO+1NC 2NO	With	AR22PP-210m3 AR22PP-201m3 AR22PP-211m3 AR22PP-220m3	With	AR22PP-210 <b>■</b> 4  AR22PP-201 <b>■</b> 4  AR22PP-211 <b>■</b> 4  AR22PP-220 <b>■</b> 4
AF94-360	Spring return	1NO 1NC 1NO+1NC 2NO	Without	AR22PP-010 <b>m</b> 3	Without	AR22PP-010 <b>■</b> 4 AR22PP-001 <b>■</b> 4 AR22PP-011 <b>■</b> 4 AR22PP-020 <b>■</b> 4
	© 60°	1NO 1NC 1NO+1NC 2NO	With	AR22PP-010m3 AR22PP-001m3 AR22PP-011m3 AR22PP-020m3	With	AR22PP-010■4  AR22PP-001■4  AR22PP-011■4  AR22PP-020■4

Operator	Operation		Contact	LED lamp		Incandescent la	amp
				Transformer	Туре	Transformer	Туре
Knob	Maintained		1NO+1NC 2NO+2NC	Without	AR22PL-311■3□ AR22PL-322■3□	Without	AR22PL-311■4□ AR22PL-322■4□
	each 45°		1NO+1NC	With	AR22PL-311 <b>≡</b> 3□		AR22PL-311 <b>■</b> 4□
	Spring/manual return	1	1NO+1NC 1NO+1NC	Without With	AR22PL-611■3□ AR22PL-611■3□	Without With	AR22PL-611■4□ AR22PL-611■4□
AF94-306	each 45°	Ť	1NO+1NC 1NO+1NC	Without With	AR22PL-711■3□ AR22PL-711■3□	Without With	AR22PL-711■4□ AR22PL-711■4□
Knob with square bezel	Maintained		1NO+1NC 2NO+2NC	Without	AR22PP-311■3□ AR22PP-322■3□	Without	AR22PP-311■4□ AR22PP-322■4□
	each 45°		1NO+1NC	With	AR22PP-311 <b>≡</b> 3□		AR22PP-311 <b>■</b> 4□
	Spring/manual return	Û	1NO+1NC 1NO+1NC	Without With	AR22PP-611■3□ AR22PP-611■3□	Without With	AR22PP-611■4□ AR22PP-611■4□
AF94-360	each 45°	1	1NO+1NC 1NO+1NC	Without With	AR22PP-711■3□ AR22PP-711■3□	Without With	AR22PP-711■4□ AR22PP-711■4□

Note: □, ■ See page 04/33

#### • Replace the ■ mark by the following lamp voltage code

		3 -	1 3
Transformer	Voltage	Code	_
		LED	Incandescent
Without	5V AC/DC	_	5
	6V DC	6	_
	6V AC	Α	_
	12V AC/DC	В	_
	15V AC/DC	С	С
	20V AC/DC	-	D
	24V AC/DC	E	E
With	100-110V AC	Н	Н
	115-127V AC	L	L
	200-220V AC	M	M
	230-254V AC	Q	Q
	350-380V AC	S	S
	400-440V AC	T	Т
	480V AC	V	V
	500-550V AC	W	W

#### Replace the mark by the following knob color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	Α

## Up to 4-contact of contact arrangement can be made. Available numbers of contacts are as follow.

/ Wallabic	Available Hambers of contacts are as follow.						
No. of position	Operation	Without transformer	With transformer				
2-position	Maintained	4-contact	3-contact				
	Spring return	3-contact	2-contact				
3-position	Maintained	4-contact	3-contact				
	Spring/manual return	3-contact	2-contact				

### Contact arrangement and operator position

#### 2-position

Transformer		Contact blo	ock	Operator	position
	arrangement	Mounting position	Туре	Left	Right
With/without	1NO	(1)	NO	_	•
With/without	1NC	(1)	NC	•	-
Without	1NO+1NC	(1)	NO	-	•
		(2)	NC	•	_
With	1NO+1NC	(1)	NC	•	_
		(2)	NO	_	•
With/without	2NO	(1)	NO	-	•
		(2)	NO	_	•
Without	2NO+2NC	(1)	NO	-	•
	*1	(2)	NC	•	_
		(3)	NO	_	•
		(4)	NC	•	_

Notes: \*1: AR22PL-2, AR22PP-2

●: Contact closed, -: Contact open

#### 3-position

Transformer	Contact	Contact bl	Contact block		tor position	on
	arrangement	Mounting position	Туре	Left	Center	Right
		position		$\bigcirc$	1	$\oslash$
Without	1NO+1NC	(1)	NO	•	-	_
	*1	(2)	NC	_	-	•
	1NO+1NC	(1)	NO	_	_	•
	*2	(2)	NC	•	_	-
	2NO+2NC	(1)	NO	•	_	-
	*3	(2)	NC	_	_	•
		(3)	NO	•	_	-
		(4)	NC	_	_	•
With	1NO+1NC	(1)	NC	_	_	•
	*1	(2)	NO	•	_	_
	1NO+1NC	(1)	NC	•	_	_
	*2	(2)	NO	_	_	•

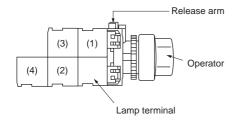
Notes: \*1: AR22PL-3, 6 AR22PP-3, 6

\*3: AR22PL-3 AR22PP-3

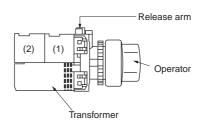
\*2: AR22PL-7, AR22PP-7
•: Contact closed, -: Contact open

#### • Position of contact block

#### Without transformer



#### With transformer



# Pilot Lights **DR22**

#### ■ Pilot lights/standard

Lens	Transformer	LED lamp Lamp voltage	Туре	Incandescent lam Lamp voltage	р Туре
Dome	Without	6V AC 6V DC	DR22D0L-A3□ DR22D0L-63□	5.5V AC/DC	DR22D0L-54□ —
		12V AC/DC 24V AC/DC	DR22D0L-B3□ DR22D0L-E3□	15V AC/DC 24V AC/DC	DR22D0L-C4□ DR22D0L-E4□
AF94-333	With	100–110V AC 200–220V AC	DR22D0L-H3□ DR22D0L-M3□	100-110V AC 200-220V AC	DR22D0L-H4□ DR22D0L-M4□
Extended round	Without	6V AC 6V DC	DR22E3L-A3□ DR22E3L-63□	5.5V AC/DC	DR22E3L-54□ —
		12V AC/DC 24V AC/DC	DR22E3L-B3□ DR22E3L-E3□	15V AC/DC 24V AC/DC	DR22E3L-C4□ DR22E3L-E4□
AF94-332	With	100–110V AC 200–220V AC	DR22E3L-H3□ DR22E3L-M3□	100–110V AC 200–220V AC	DR22E3L-H4□ DR22E3L-M4□
aceted	Without	6V AC 6V DC	DR22K0L-A3□ DR22K0L-63□	5.5V AC/DC	DR22K0L-54□ —
		12V AC/DC 24V AC/DC	DR22K0L-B3□ DR22K0L-E3□	15V AC/DC 24V AC/DC	DR22K0L-C4□ DR22K0L-E4□
AF96-189	With	100–110V AC 200–220V AC	DR22K0L-H3□ DR22K0L-M3□	100–110V AC 200–220V AC	DR22K0L-H4□ DR22K0L-M4□
lush square	Without	6V AC 6V DC	DR22F3M-A3□ DR22F3M-63□	5.5V AC/DC	DR22F3M-54□ —
TO S		12V AC/DC 24V AC/DC	DR22F3M-B3□ DR22F3M-E3□	15V AC/DC 24V AC/DC	DR22F3M-C4□ DR22F3M-E4□
AF94-330	With	100–110V AC 200–220V AC	DR22F3M-H3□ DR22F3M-M3□	100–110V AC 200–220V AC	DR22F3M-H4□ DR22F3M-M4□
Flush square Transparent	Without	6V AC 6V DC	DR22F4M-A3□ DR22F4M-63□	5.5V AC/DC	DR22F4M-54□ —
ens)		12V AC/DC 24V AC/DC	DR22F4M-B3□ DR22F4M-E3□	15V AC/DC 24V AC/DC	DR22F4M-C4□ DR22F4M-E4□
AF94-443	With	100–110V AC 200–220V AC	DR22F4M-H3□ DR22F4M-M3□	100–110V AC 200–220V AC	DR22F4M-H4□ DR22F4M-M4□
Flush square 12mm high	Without	6V AC 6V DC	DR22F5M-A3□ DR22F5M-63□	5.5V AC/DC	DR22F5M-54□ —
rame)		12V AC/DC 24V AC/DC	DR22F5M-B3□ DR22F5M-E3□	15V AC/DC 24V AC/DC	DR22F5M-C4□ DR22F5M-E4□
	With	100–110V AC 200–220V AC	DR22F5M-H3□ DR22F5M-E3□	100–110V AC 200–220V AC	DR22F5M-H4□ DR22F5M-M4□
Extended square AF95-685	Without	6V AC 6V DC	DR22E3M-A3□ DR22E3M-63□	5.5V AC/DC	DR22E3M-54□ —
		12V AC/DC 24V AC/DC	DR22E3M-B3□ DR22E3M-E3□	15V AC/DC 24V AC/DC	DR22E3M-C4□ DR22E3M-E4□
AF94-380	With	100–110V AC 200–220V AC	DR22E3M-H3□ DR22E3M-M3□	100-110V AC 200-220V AC	DR22E3M-H4□ DR22E3M-M4□
Flush rectangular	Without	6V AC 6V DC	DR22E3N-A3□ DR22E3N-63□	5.5V AC/DC	DR22E3N-54□ —
		12V AC/DC 24V AC/DC	DR22E3N-B3□ DR22E3N-E3□	15V AC/DC 24V AC/DC	DR22E3N-C4□ DR22E3N-E4□
AF96-237	With	100–110V AC 200–220V AC	DR22E3N-H3□ DR22E3N-M3□	100–110V AC 200–220V AC	DR22E3N-H4□ DR22E3N-M4□
Extended round with square bezel	Without	6V AC 6V DC	DR22E3P-A3□ DR22E3P-63□	5.5V AC/DC	DR22E3P-54□ —
		12V AC/DC 24V AC/DC	DR22E3P-B3□ DR22E3P-E3□	15V AC/DC 24V AC/DC	DR22E3P-C4□ DR22E3P-E4□
AF94-331	With	100–110V AC 200–220V AC	DR22E3P-H3□ DR22E3P-M3□	100-110V AC 200-220V AC	DR22E3P-H4□ DR22E3P-M4□

Note: ☐ See page 04/37

#### ■ Pilot lights/short-body without transformer

Lens	LED lamp		Incandescent	lamp
	Lamp voltage	Туре	Lamp voltage	Туре
Dome	5.5V AC/DC	_	5.5V AC/DC	DR22D0L-58□
	6V AC 6V DC 12V AC/DC	DR22D0L-A9□ DR22D0L-69□ DR22D0L-B9□	6V AC 6V DC 15V AC/DC	— — DR22D0L-C8□
AF00	24V AC/DC	DR22D0L-E9□	24V AC/DC	DR22D0L-E8□
AF98-1	5.5V AC/DC		5.5V AC/DC	DR22E3L-58
	6V AC 6V DC 12V AC/DC	DR22E3L-A9□ DR22E3L-69□ DR22E3L-B9□	6V AC 6V DC 15V AC/DC	— — DR22E3L-C8□
AF98-	24V AC/DC	DR22E3L-E9□	24V AC/DC	DR22E3L-E8□
aceted	5.5V AC/DC	_	5.5V AC/DC	DR22K0L-58□
	6V AC 6V DC 12V AC/DC	DR22K0L-A9□ DR22K0L-69□ DR22K0L-B9□	6V AC 6V DC 15V AC/DC	  DR22K0L-C8□
AF98-1	24V AC/DC	DR22K0L-E9□	24V AC/DC	DR22K0L-E8□
Flush square	5.5V AC/DC		5.5V AC/DC	DR22F3M-58□
	6V AC 6V DC 12V AC/DC	DR22F3M-A9□ DR22F3M-69□ DR22F3M-B9□	6V AC 6V DC 15V AC/DC	  DR22F3M-C8□
AF98-	24V AC/DC	DR22F3M-E9□	24V AC/DC	DR22F3M-E8□
Flush square	5.5V AC/DC	_	5.5V AC/DC	DR22F4M-58□
(Transparent lens)	6V AC 6V DC 12V AC/DC	DR22F4M-A9□ DR22F4M-69□ DR22F4M-B9□	6V AC 6V DC 15V AC/DC	  DR22F4M-C8□
AF98-	24V AC/DC	DR22F4M-E9□	24V AC/DC	DR22F4M-E8□
Flush square	5.5V AC/DC		5.5V AC/DC	DR22F5M-58
12mm nigh rame)	6V AC 6V DC 12V AC/DC	DR22F5M-A9□ DR22F5M-69□ DR22F5M-B9□	6V AC 6V DC 15V AC/DC	
	24V AC/DC	DR22F5M-E9□	24V AC/DC	DR22F5M-E8
Extended square	5.5V AC/DC		5.5V AC/DC	DR22E3M-58□
-Alcindou square	6V AC 6V DC	DR22E3M-A9□ DR22E3M-69□	6V AC 6V DC	_
	12V AC/DC	DR22E3M-B9	15V AC/DC	DR22E3M-C8
AF98-	24V AC/DC	DR22E3M-E9□	24V AC/DC	DR22E3M-E8
Flush rectangular	5.5V AC/DC		5.5V AC/DC	DR22E3N-58□
A. W.	6V AC 6V DC	DR22E3N-A9□ DR22E3N-69□	6V AC 6V DC	— — —
	12V AC/DC 24V AC/DC	DR22E3N-B9□ DR22E3N-E9□	15V AC/DC 24V AC/DC	DR22E3N-C8□ DR22E3N-E8□
Extended round with	5.5V AC/DC	_	5.5V AC/DC	DR22E3P-58□
square	6V AC	DR22E3P-A9□	6V AC	_
bezel	6V DC 12V AC/DC	DR22E3P-69□ DR22E3P-B9□	6V DC 15V AC/DC	DR22E3P-C8
AF98-	24V AC/DC	DR22E3P-E9□	24V AC/DC	DR22E3P-E8□

Note: ☐ See page 04/37

# Pilot Lights **DR22**

#### ■ Pilot lights/short-body with transformer

■ Pilot lights/short-boo	dy with transformer	1
Lens	LED lamp Lamp voltage Type	Incandescent lamp Lamp voltage Type
Dome	100–110V AC DR22D0L-H9 200–220V AC DR22D0L-M9	100–110V AC DR22D0L-H8 200–220V AC DR22D0L-M8
Extended round  AF97-138	100-110V AC <b>DR22E3L-H9</b> □ 200-220V AC <b>DR22E3L-M9</b> □	100–110V AC DR22E3L-H8□ 200–220V AC DR22E3L-M8□
Faceted  KK02-130A	100–110V AC <b>DR22K0L-H9</b> □ 200–220V AC <b>DR22K0L-M9</b> □	100–110V AC <b>DR22K0L-H8</b> □ 200–220V AC <b>DR22K0L-M8</b> □
Flush square	100–110V AC <b>DR22F3M-H9</b> □ 200–220V AC <b>DR22F3M-M9</b> □	100–110V AC DR22F3M-H8□ 200–220V AC DR22F3M-M8□
Flush square (Transparent lens)	100–110V AC <b>DR22F4M-H9</b> □ 200–220V AC <b>DR22F4M-M9</b> □	100–110V AC DR22F4M-H8□ 200–220V AC DR22F4M-M8□
Flush square (12mm high frame)	100–110V AC <b>DR22F5M-H9</b> □ 200–220V AC <b>DR22F5M-M9</b> □	100–110V AC DR22F5M-H8□ 200–220V AC DR22F5M-M8□
Extended square  KK02-134A	100–110V AC <b>DR22E3M-H9</b> □ 200–220V AC <b>DR22E3M-M9</b> □	100–110V AC <b>DR22E3M-H8</b> □ 200–220V AC <b>DR22E3M-M8</b> □
Flush rectangular  KK02-235B	100–110V AC <b>DR22E3N-H9</b> □ 200–220V AC <b>DR22E3N-M9</b> □	100–110V AC DR22E3N-H8□ 200–220V AC DR22E3N-M8□
Extended round with square bezel	100–110V AC <b>DR22E3P-H9</b> □ 200–220V AC <b>DR22E3P-M9</b> □	100–110V AC DR22E3P-H8□ 200–220V AC DR22E3P-M8□
Note: ☐ See page 04/37		

Note: ☐ See page 04/37

#### • Lens color

Replace the  $\square$  mark by the following lens color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	Α

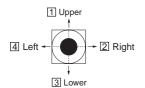
• Lamp voltage
Available lamp voltage are as follow.

Description	Voltage	Code			
		Standard type		Short-body type	
		LED	Incandescent	LED	Incandescent
Without transformer	5.5V AC/DC	_	54	-	58
	6V AC	A3	_	A9	_
	6V DC	63	_	69	_
	12V AC/DC	B3	_	B9	_
	15V AC/DC	C3	C4	C9	C8
	20V AC/DC	_	D4	_	D8
	24V AC/DC	E3	E4	E9	E8
With transformer	100-110V AC	H3	H4	H9	H8
	115-127V AC	L3	L4	L9	L8
	200-220V AC	M3	M4	M9	M8
	230-254V AC	Q3	Q4	_	_
	350-380V AC	S3	S4	_	_
	400-440V AC	T3	T4	_	_
	480V AC	V3	V4	_	_
	500-550V AC	W3	W4	_	_
With resistor unit	110V DC	H7	_	_	_

#### ■ Joy stick selector switches

Handle	Terminal	Operating directions	Contact	Туре	
			arrangement	Manual return	Spring return
Ball type without lock	Screw	<b>1</b>	1NO X 2	AR22A0N-A0A0B	AR22A5N-A0A0B
			1NO + 1NC X 2	AR22A0N-1010B	AR22A5N-1010B
		<b></b>	1NO X 4	AR22A0N-AAAAB	AR22A5N-AAAAB
		$\longleftrightarrow$	1NO + 1NC X 4	AR22A0N-1111B	AR22A5N-1111B
M.	Solder/tab	<b>1</b>	1NO + 1NC X 2	AR22A0H-1010B	AR22A5H-1010B
		\ \ V	2NO + 2NC X 2	AR22A0H-2020B	AR22A5H-2020B
		<b>1</b>	1NO + 1NC X 4	AR22A0H-1111B	AR22A5H-1111B
AF97-49		$\longleftrightarrow$	2NO + 2NC X 4	AR22A0H-2222B	AR22A5H-2222B
Ball type with lock	Screw	<b>1</b>	1NO X 2	AR22A1N-A0A0B	AR22A6N-A0A0B
			1NO + 1NC X 2	AR22A1N-1010B	AR22A6N-1010B
		<b>^</b>	1NO X 4	AR22A1N-AAAAB	AR22A6N-AAAAB
		$\longleftrightarrow$	1NO + 1NC X 4	AR22A1N-1111B	AR22A6N-1111B
	Solder/tab	<b>1</b>	1NO + 1NC X 2	AR22A1H-1010B	AR22A6H-1010B
0			2NO + 2NC X 2	AR22A1H-2020B	AR22A6H-2020B
		<b>1</b>	1NO + 1NC X 4	AR22A1H-1111B	AR22A6H-1111B
AF97-45		$\longleftrightarrow$	2NO + 2NC X 4	AR22A1H-2222B	AR22A6H-2222B
Rubber cap type	Screw	<b>1</b>	1NO X 2	AR22A2N-A0A0B	AR22A7N-A0A0B
without lock		V	1NO + 1NC X 2	AR22A2N-1010B	AR22A7N-1010B
		<b>^</b>	1NO X 4	AR22A2N-AAAAB	AR22A7N-AAAAB
		<b>←</b>	1NO + 1NC X 4	AR22A2N-1111B	AR22A7N-1111B
	Solder/tab	<b>1</b>	1NO + 1NC X 2	AR22A2H-1010B	AR22A7H-1010B
450			2NO + 2NC X 2	AR22A2H-2020B	AR22A7H-2020B
		<b>1</b>	1NO + 1NC X 4	AR22A2H-1111B	AR22A7H-1111B
AF97-5 <i>6</i>		<b>←</b>	2NO + 2NC X 4	AR22A2H-2222B	AR22A7H-2222B

- Operating direction
   Directions other than those shown in the table above can be provided.
   For types AR22A□N-①②③④B, designate the
- contact arrangement codes for the necessary operating directions (①: Upper,②: Right, ③: Left). Designate "0" for unnecessary directions.



#### **Contact arrangement**

4110 0110 0110	
+1NC 2NO 2NC	2NO+2NC
D E	_
-  -	2
-	D E

• Spring/manual return are also available, contact FUJI.

#### **■** Buzzers

Sound	Description	Transformer	Operating voltage	Туре
Electronic sound	LED operation indicator (Red)	Without	6V AC	DR22B5-AB
	Intermittent/continuous sound		6V DC	DR22B5-6B
Gr. 100 F	• Sound level: 90dB (0.1m)		12 to 24V AC/DC	DR22B5-EB
	70dB (1m)		35 to 48V AC/DC	DR22B5-FB
20 111	(,	With	100 to 110V AC	DR22B5-HB
10.00			200 to 220V AC	DR22B5-MB
KKD08-053		With resistor unit	100 to 110V DC	DR22B5-1B
Magnetic sound	Sound volume adjustment     Sound level: 80 to 90dB (0.1m)     60 to 70dB (1m)	Without	24V AC/DC	DR22B3-EB
. W.		With	100 to 110V AC	DR22B3-HB
AF96-376			200 to 220V AC	DR22B3-MB
Electronic sound (IP54)	Intermittent/continuous sound	Without	6V AC	DR22B8-AB
	selection		6V DC	DR22B8-6B
	• Sound level: 80dB (0.1m) 60dB (1m)		12 to 24V AC/DC	DR22B8-EB
	OOGB (TIII)		35 to 48V AC/DC	DR22B8-FB
		With	100 to 110V AC	DR22B8-HB
			200 to 220V AC	DR22B8-MB
AF96-244		With resistor unit	100 to 110V DC	DR22B8-1B

Notes: • Intermittent/continuous sound selection (DR22B5, B8) See the "Short-circuit terminal" in the dimensions diagram on the 04/49 page, and select as follows:

• Short-circuit terminal mounted → Intermittent sound

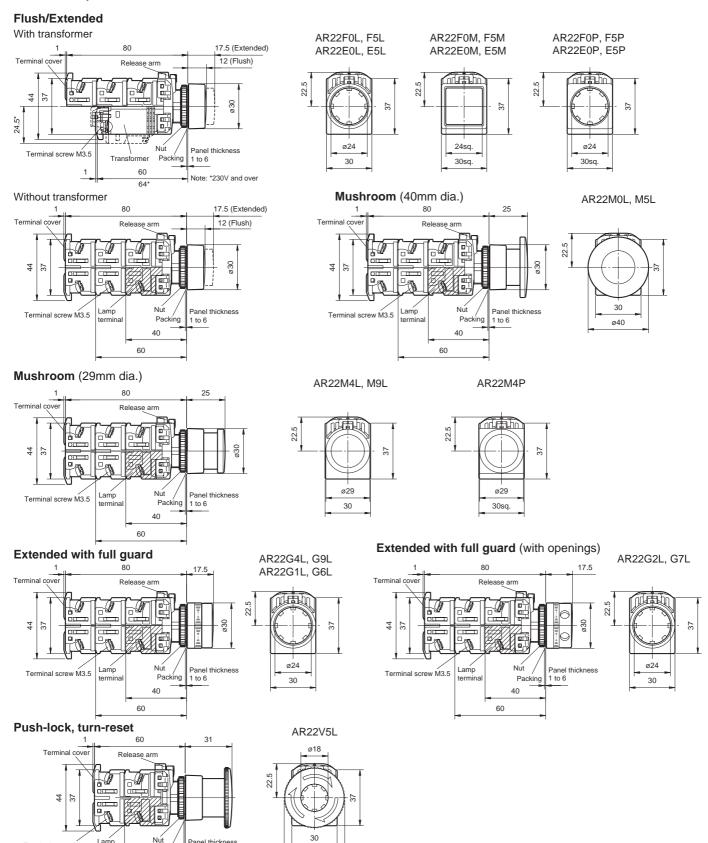
• Short-circuit terminal not mounted → Continuous sound

- Sound volume adjustment (DR22B3) Use a flat-bladed screwdriver with a narrow tip to gently turn "Control knob" shown in the dimensions diagram on the 04/49 page, as follows.
- Clockwise → Increase sound pressure
   Counterclockwise → Decrease sound pressure

## AR22 and DR22 Dimensions

#### **■** Dimensions, mm

#### • Illuminated pushbutton switches



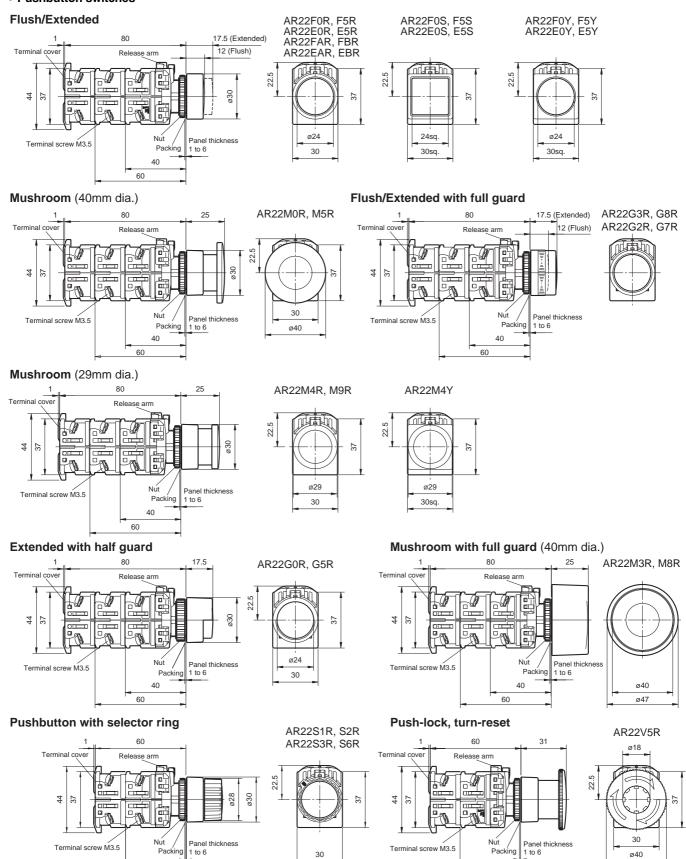
Terminal screw M3.5

Nut / Panel thickness Packing 1 to 6

ø40

#### ■ Dimensions, mm

#### • Pushbutton switches

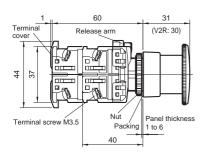


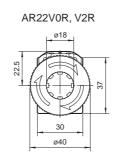
Fuji Electric FA Components & Systems Co., Ltd./D & C Catalog Information subject to change without notice

## AR22 and DR22 Dimensions

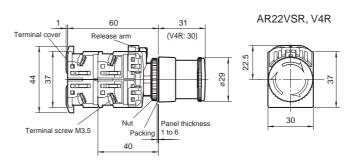
- Dimensions, mm
- Emergency stop pushbutton switches

#### Push-lock, turn-reset (40mm dia.)

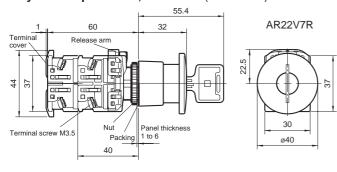




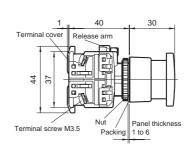
#### Push-lock, turn-reset (29mm dia.)



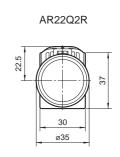
#### Key release push-lock, turn-reset (40mm dia.)



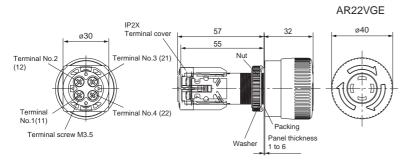
#### Push-lock, pull-reset (35mm dia.)

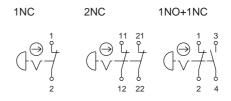


Wiring diagrams



#### Unibody push-lock, turn-reset (40mm dia.)





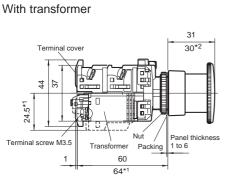
Note: Terminal No. shown in ( ) are for contact arrangement 2NC.

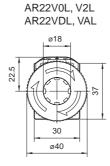
**Dimensions** 

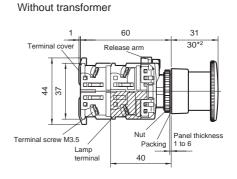
### ■ Dimensions, mm

#### • Emergency stop illuminated pushbutton switches

#### Push-lock, turn-reset (40mm dia.)

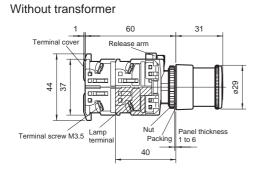


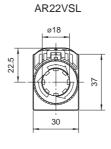




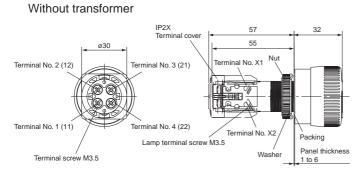
Note: \*1 230V and over \*2 AR22V2L and VAL types only

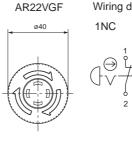
#### Push-lock, turn-reset (29mm dia.)

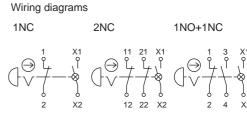




#### Unibody push-lock, turn-reset (40mm dia.)





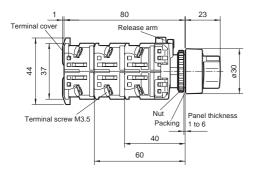


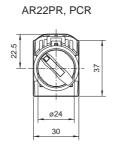
Note: Terminal No. shown in ( ) are for contact arrangement 2NC.

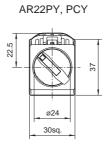
## AR22 and DR22 Dimensions

- **■** Dimensions, mm
- Selector switches

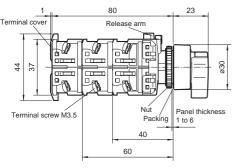
#### Knob



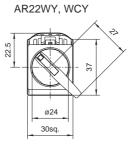




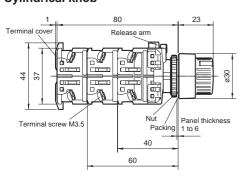
#### Lever

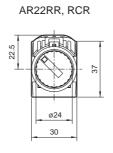


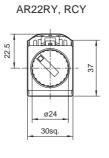




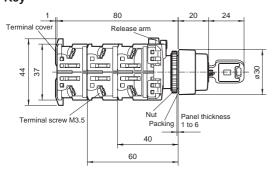
#### Cylindrical knob

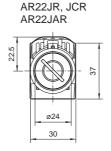


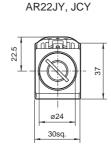




#### Key



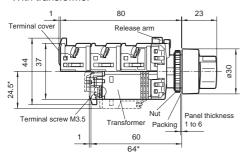




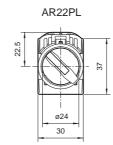
#### **■** Dimensions, mm

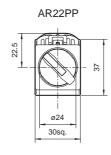
#### • Illuminated selector switches

#### With transformer

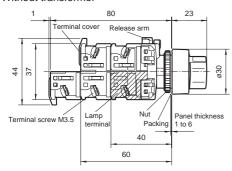


Note: \* 230V and over



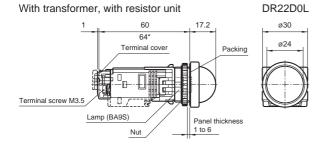


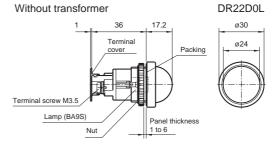
#### Without transformer

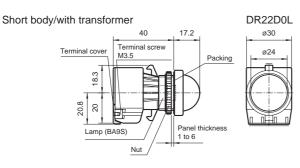


### • Pilot lights

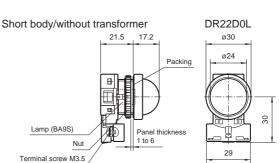
#### Dome







Note: \* Except for the types 110V AC, 127V AC and 220V AC.



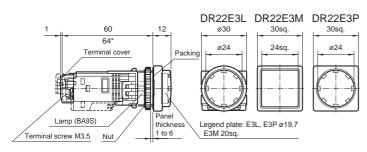
### AR22 and DR22 **Dimensions**

#### **■** Dimensions, mm

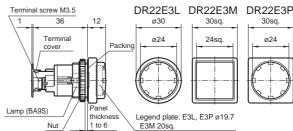
#### • Pilot lights

#### **Extended**

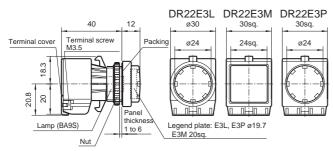
With transformer, with resistor unit



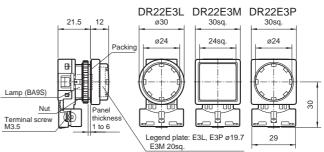
#### Without transformer



#### Short body/with transformer

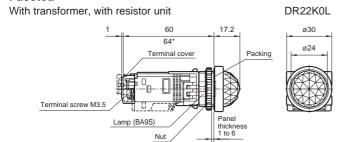


Short body/without transformer

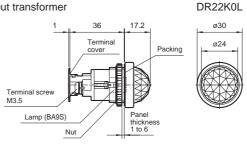


Note: \* Except for the types 110V AC, 127V AC and 220V AC.

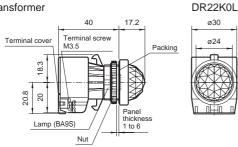
#### **Faceted**



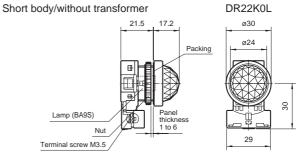
#### Without transformer



#### Short body/with transformer



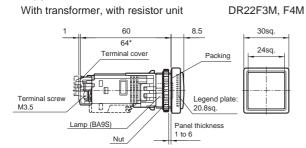
Note: \* Except for the types 110V AC, 127V AC and 220V AC.

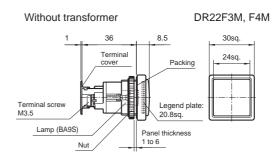


#### **■** Dimensions, mm

#### • Pilot lights

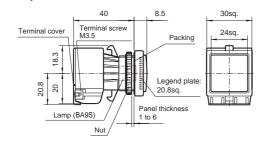
#### Flush





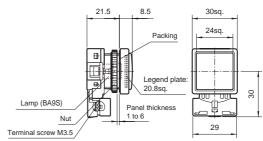
Short body/with transformer

DR22F3M, F4M



Note: \* Except for the types 110V AC, 127V AC and 220V AC.

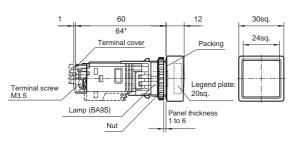
#### Short body/without transformer DR22F3M, F4M

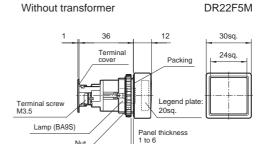


#### Flush (12mm high frame)

With transformer, with resistor unit

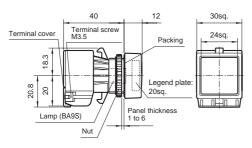






#### Short body/with transformer

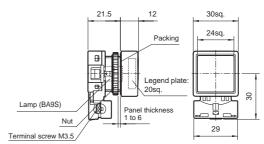
DR22F5M



Note: \* Except for the types 110V AC, 127V AC and 220V AC.

### Short body/without transformer

Nut



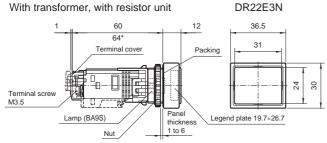
DR22F5M

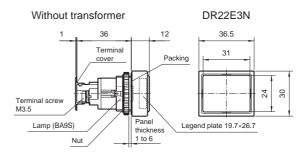
## AR22 and DR22 Dimensions

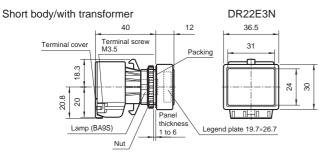
#### **■** Dimensions, mm

#### • Pilot lights

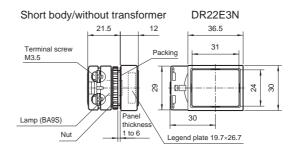
#### Flush rectangular







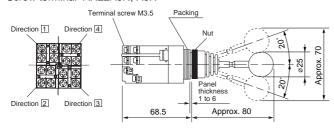
Note: \* Except for the types 110V AC, 127V AC and 220V AC.

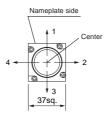


#### • Joy stick selector switches

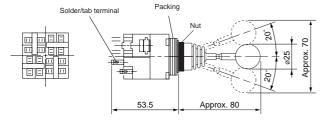
#### Ball type without lock

Screw terminal AR22A0N, A5N





#### Solder/tab terminal AR22A0H, A5H

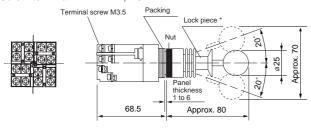


Notes \* The contact arrangement is operable in the designated direction by pulling the lock piece in the central position with the fingers. The lock piece will return automatically and locks when the lock piece is released in the central position.

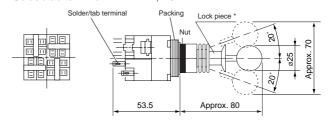
The lock piece locks in the central position only.

#### Ball type with lock

Screw terminal AR22A1N, A6N



#### Solder/tab terminal AR22A1H, A6H

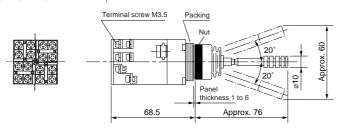


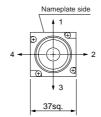
### AR22 and DR22 **Dimensions**

- **■** Dimensions, mm
- Joy stick selector switches

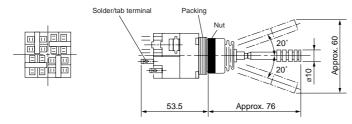
#### Rubber cap type without lock

Screw terminal AR22A2N, A7N



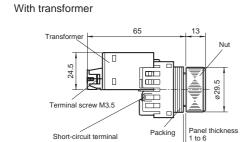


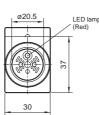
#### Solder/tab terminal AR22A2H, A7H



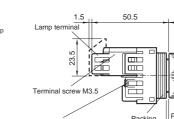
#### Buzzers

#### **Electronic sound**

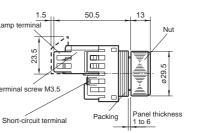


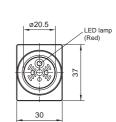


DR22B5



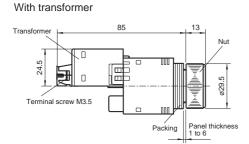
Without transformer

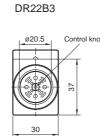




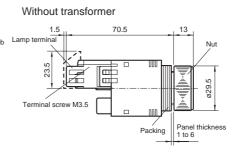
DR22B5

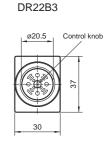
#### **Magnetic sound**



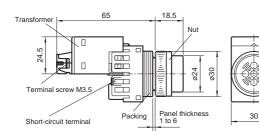


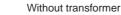
DR22B8

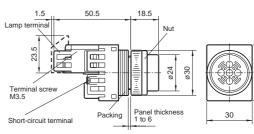




#### Electronic sound (IP54) With transformer







DR22B8

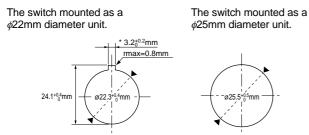
### AR22 and DR22 Notes on use

#### Notes on use

#### ■ Fit two sizes of panel cutout holes

\* The unique nut with a step allows switch to be mounted in either 22.3mm- or 25.5mm-dia. holes as shown in Fig. 1 without any extra adapter.

Fig. 1 Panel cutout

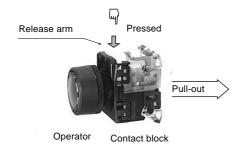


Note: \* If key-washer or legend plate are not used, 3.2mm-wide location holes need not be cutout.

#### ■ Detaching contact block from the operator

While keeping the white release arm pressed with one finger, pull-out the contact block in the direction by the arrow.

Fig. 2 Detaching contact block from the operator



#### ■ Mounting operator to panel

① In a 22.3mm-dia. panel cutout hole

Insert the operator into the cutout hole from the panel front as shown in the Fig. 3.

Then, fit section "A" of the AR9A004 wrench from behind the panel and secure the operator with nut. (See page 04/108 for the wrench)

Fig. 3 Mounting an operator in a 22.3mm-dia. hole

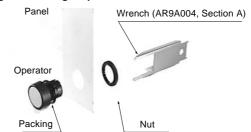


Note: Recommended tightening torque is from 1 to 1.5N•m

② In a 25.5mm-dia. panel cutout hole

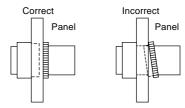
As shown in Fig. 4, with the nut step-out side oriented to the panel, use the wrench to tighten the nut and secure the operator.

Fig. 4 Mounting a operator in a 25.5mm-dia. hole



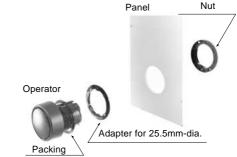
Note: 1. Recommended tightening torque is from 1 to 1.5N•m

Ensure that the step-out portion of the nut is correctly fitted in the cutout hole.



For easier mounting in the 25.5mm-dia. hole, the AR9Y718 adapter is also available separately.

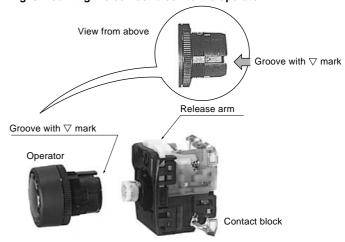
Fig. 5 Mounting with an adapter and locking nut



#### ■ Mounting contact block to the operator

As shown in Fig. 6, align the protruding part of the contact block release arm with the operator groove at the  $\nabla$  mark. Then, insert the contact block into the operator until it clicks.

Fig. 6 Mounting the contact block to the operator



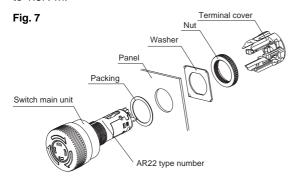
Fuji Electric FA Components & Systems Co., Ltd./D & C Catalog

Information subject to change without notice

## AR22 and DR22 Notes on use

#### ■ VG type panel mounting

As shown in the illustration, remove the live section cover, nut, and washer, and insert the main unit into a panel which has been cut from the front side of the panel. Place the type number AR22 facing upward, and secure the main unit with the nut using a wrench AHX701. The appropriate tightening torque is 1 to 1.5N•m.

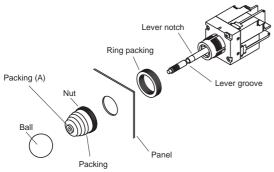


#### ■ Joy stick selector switch mounting on panel

- (1) Twist and remove the ball from the operator.
- (2) Loosen the nut and remove the switch if the switch is provided with a lock.
- (3) If no locking nut is provided, loosen the nut and remove the switch after the packing part (A) shown in the illustration is stretched to the lever groove.
- (4) Mount the switch in the order opposite to removal. Set the packing to the notch on the lever as a reference. Do not separate the nut from the packing.
- (5) Use a torque wrench AR9A006 to tighten the nut from the front of the panel.

Note: Recommended tightening a torque is 1 to 1.5N•m.

Fig. 8



#### ■ Buzzer mounting on panel

- (1) Remove the nut, and insert the main unit into the mounting hole from the back of the panel.
- (2) Tighten the buzzer using a wrench AR9A006 from the front side of the panel.

Note:

- Recommended tightening torque is 1 to 1.5N•m.
- Electronic sound (IP54) type has a all-in-one unit with nut and cap.

#### ■ Applicable panel thickness

The AR22/DR22 series switches are mountable to panels with thickness as given in Table below.

Mounting condition			Applicable panel thickness (mm)	
Without accessories			1 to 6	
With accesories	Protective cover, water-proof cap, legend plate		1 to 4	
	Key washer	without hole	1 to 4	
		with hole	1 to 5	
	Adapter for a 25.5mm-dia. hole		1 to 5.5	

• When using a joy stick selector switch and buzzer The applicable panel thickness is 1 to 6mm. Five 1.3mm packings (single-piece type) are included as standard equipment. Insert as many as required depending on the panel thickness, using the following table as a guide. When using a key washer, legend plate, or adapter, their thickness will have to be added to the values in the guide.

Panel thickness (mm)	Number of packings
(plus key washer, legend plate)	(reference)
1.0 to 1.6	5
1.6 to 2.8	4
2.8 to 3.8	3
3.8 to 4.8	2
4.8 to 6.0	1

## AR22 and DR22 Notes on use

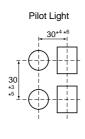
#### ■ Minimum mounting space, mm

(1) Minimum mounting space

Fig. 9
Illuminated pushbuttons,
Pushbutton Selectors

30\*2 42\*1 42\*1 \*8

50\*7



Notes: \*1 AR22M0□, M5□, V5□, V0□, V2□, V7R, VG□: 42mm AR22M3R, M8R: 49mm

AR22Q2R, WR, W0R, WY, WCY: 40mm

- \*2 When mounting contact blocks at 30mm pitch, use it circuit of 380V or less.
- \*3 Short body with transformer types: 50mm.
- \*4 Rectangular types: 36.5mm (except for short body without transformer types).
- \*5 Short body without transformer types: 60mm.
- \*6 Rectangular short body without transformer types: 60mm.
- \*7 This dimension applies when transformer units or contact blocks face each other.
- This dimension applies when transformer unit or contact block is mounted on only one side.

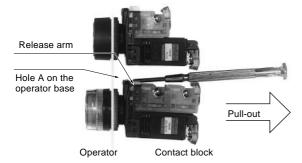
When mounting operators on a panel, orient all  $\nabla$  marks on the operator upwards.

(The operator release arms are oriented upwards.) This aligns the terminals of all contact blocks, thus making wiring easy.

(2) Detaching contact blocks from operators

As shown in Fig. 10, insert a flat-head screw driver into the groove of the white release arm on the contact block. Then, while inserting the driver in hole A of the operator base, lower the driver grip and take out the contact block.

Fig. 10



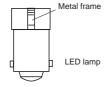
Note: Use a flat head screwdriver as shown at the right.



#### ■ Products with blue and green LEDs

The LED devices on products with high-brightness (blue and green) LEDs are very sensitive to static electricity. When replacing LED lamps do not allow static electricity to come into direct contact with the metal frame on the upper side of the LED lamp. The LED device may be damaged if this part is subjected to static electricity. When installing or removing an LED lamp, it is recommended that you use the lamp changer (AHX790).

Fig. 11



#### ■ Wiring

(1) The terminal screws are M3.5 pan head screws. Solid wires, stranded wires, or crimp terminals can be connected.

Fig. 12



(2) Two crimp terminals can be used by putting one of them on top of the other. If fork-type crimp terminals are used in the horizontal direction, however, use ones as shown in the figure below. (i.e., Toei Tanshi's F2-3.5S or an equivalent).

Fig. 13



- (3) The terminal washers are a self-lifting type.
- (4) Tighten the terminal screws to a tightening torque of 0.8 to 1N•m.
- (5) Keep the terminals free of external force while wiring or after wiring, or operational failures may result.
- (6) Do not use screws other than the provided terminal screws. Notes:
  - If solid wires are connected to the lamp terminals in the horizontal direction (on the side), be sure to insert the solid wires into the square washers.
  - Terminal layout., see page 04/54
  - See page 04/53 for the wiring of the joy stick selector switch and VG type.

#### **■ LED Indicator**

(1) LED Lamp Malfunctioning

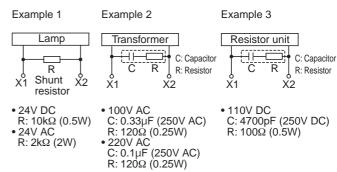
The LED lamp is lit by a very small level of current.

Therefore, it may be erroneously lit by a leaking current from the surge absorption circuit or semiconductor circuit or due to stray capacitance between cables. In that case, provide a countermeasure (e.g., connect a resistor in parallel with the LED lamp)

Countermeasure for Malfunctioning

The LED lamp malfunctions can be prevented by connecting a shunt resistor (R) or CR elements (a capacitor and resistor) in parallel with the LED lamp terminal. The resistance and CR values vary depending on the model and the operating conditions.

Fig. 14



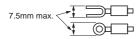
#### (2) Incoming surge

High luminance LED products use an element sensitive to static electricity. They may not be lit by an abnormal voltage like surge. Please note it.

#### ■ Joy stick selector switch

- Screw terminal wiring
- (1) The terminals use M3.5 pan head screws. Use crimp terminals to wire the terminals.

Fig. 15



- (2) The terminal washers are a self-lifting type.
- (3) Tighten the terminal screws to a tightening torque of 0.8 to 1.0N•m. Keep the terminals free of external force during and after wiring, or operational failures may result.
- · Solder (tab terminal) wiring
- Pay attention to the following items when soldering the terminals.

Use a soldering iron with a power consumption of 30W. Use resin-core solder.

If a 30W soldering iron is used, finish soldering the terminals within five seconds. If a 20W soldering iron is used, finish soldering the terminals within 10 seconds. Make sure that the soldering iron tip length is at least 20mm long. Do not apply external force to the terminals. Because lead-free solder's melting point is slightly high, soldering work may be difficult. Use a soldering iron whose tip is rather large or whose calorie is rather high.

- (2) When using adjacent terminals, use insulation tubes to prevent the terminals from short-circuiting. Utmost attention must be paid to the solder terminals if especially thick wires are used or if a large quantity of solder is used.
- (3) Connectable wires

Solid wire: 2 wires, 0.8mm dia. max. Stranded wire: 1 wire, 0.75mm² max.

- (4) Use the 110 (2.8mm) series receptacle for the tab terminals.
- (5) Wire the tab terminals with the contact unit connected to the main unit.

#### Operation

Operation shall be made after the joy stick operation lever is surely returned to the center position. Do not apply excessive force to the operation lever. The maximum permissible force is 100N

Use of contact blocks

If NO and NC contacts are used in the same contact block, check that there is no difference in potential. Do not connect different type of power source different in type.

#### **■** Buzzer

#### Noise

If the application circuit is likely to generate excessively strong noise, connect a surge absorber (e.g., FUJI's ENC390D, provided that the switch is a 24V type) in parallel with the buzzer.

Place of Use

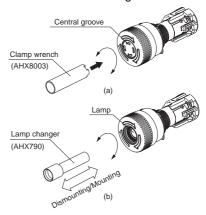
The buzzer does not have a drip-proof construction. Do not use the buzzer in places where oil or water is sprayed or where dust accumulates. If the buzzer is a splash-proof type, it will resist sprays of water.

- Do not use the buzzer in places that are subject to an excessive amount of corrosive gas.
- Note that the buzzer is likely to sound erroneously due to leakage current or the like.

#### ■ AR22VG type

 As shown in Fig. 16 (a), engage the tip of the wrench (AHX8003) with the groove in the center to mount or remove the locking unit. The recommended tightening torque is 0.6 to 1N•m.  As shown in Fig. 16 (b), insert the lamp changer (AHX790) and press the lamp changer to mount or remove the lamp. Turn the lamp changer clockwise when mounting the lamp and counterclockwise when removing it.

Fig. 16



Note: The lamp and neon lamp are special models for the AR22VGF. Use only these special lamps for replacement.

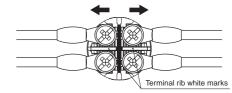
#### Wiring

The terminals use M3.5 pan head screws. Use crimp terminals for wiring and cover the crimp terminals with insulation tubes.

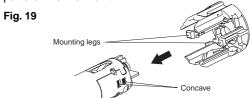
Fig. 17
7.5mm max. Fork-type crimp terminal
Round-type crimp terminal

- The terminal washers are a self-lifting type.
- Tighten the terminal screws to a torque of 0.8 to 1N•m. Keep the terminals free of external force during and after wiring, or operational failures may result.
- Wiring precautions
- (1) Use of round-type crimp terminal
- Remove the live section cover, and half-tighten to the point parallel with the terminal rib white marks in the direction of the arrows as shown in the illustration below.
- Mount the live section cover and tighten the terminals securely.

Fig. 18



As shown in the illustration below, mount the live section cover so that the mounting legs of the cover engage with the concave parts of the main unit.



(2) If fork-type crimp terminals are used, wiring will be possible without removing the live section cover.

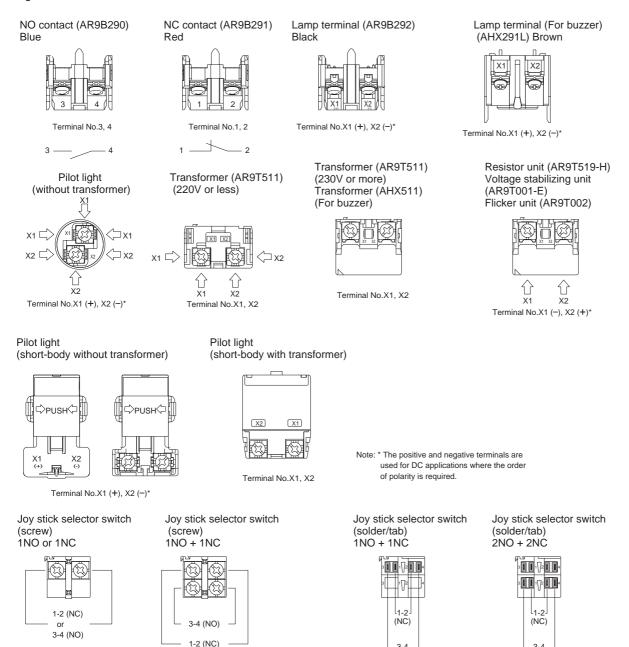
## AR22 and DR22 Notes on use

#### ■ Operation

- Do not use a hitting or bouncing action to operate the button, or the switch may break. Always operate the switch by hand.
   Do not pull mushroom head pushbuttons or alternate buttons other than the Q2.
- Do not rotate the selector ring type while the button is pressed, or the mechanism may break.
- The control type incorporates make-before-break contacts.
   Prepare a protection circuit for the application.
- The dial of the selector switch rotates with a light force. Do not apply force in excess of 1N•m. Please do not pull out or insert the key forcibly.
- To release the lock of the push-lock type, rotate the button clockwise as shown by the arrow. Do not pull the button, or the latch may break and the lock may fail to work.
- Do not lock the emergency stop pushbutton switch and emergency stop illuminated pushbutton switch in use. Push and lock the switch in case of an emergency only.

#### ■ Terminal layout

Fig. 20



Terminal No. 1-2, 3-4

Terminal No. 1-2, 3-4

Terminal No. 1-2 or 3-4

Terminal No. 1-2, 3-4

# AR30 and DR30 General information

The full range of the contact blocks and transformer units suitable for the AR22 and DR22 series may also be fitted to the AR30 and DR30 series.

#### **■** Features

## Quick-replacement contact blocks and transformer units

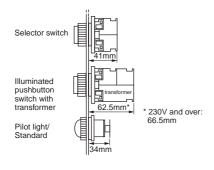
The snap-on construction makes replacement and addition of contact blocks and transformer units very simple and straightforward.

## Oil-and dust-proof operator module construction

The protection level of the AR30/DR30 operator modules conforms to IEC Standard IP65. The special seals protect the operator modules and switch mechanisms against oil, dust, and grime, thus ensuring high performance in dusty and moist environments.

#### Miniaturization

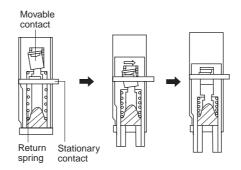
- Selector switches with 1NO+1NC: 41mm deep
   Pilot lights: 34mm deep
- The transformer now occupies far less space.





#### Self-cleaning contacts

All the contacts are double break type and feature self-cleaning action. Every time the switch is operated, the contact surfaces are wiped with a sliding movement, thus ensuring high contact reliability even at low voltage and small current levels (5V, 5mA).



## **Metal nut**Safer model with metal nut is also

available



#### Wiring

- Wiring from two directions is possible.
- Wiring in both vertical and lateral directions facilitates wiring in narrow spaces.
- Color coding of contact blocks makes wiring easy.
   1NO: Blue, 1NC: Red Lamp terminal and transformer unit: Black

#### Safety

- A terminal cover is provided, assuring safety and security.
- FUJI's original Trigger Action
  mechanism is used in the emergency
  stop pushbuttons. They are suitable
  for emergency stop and safety. This
  mechanism prevents the contacts from
  moving until the button is pushed and
  locked.

#### **Protection**

- Excellent oil-tight construction (IP65) of the operator.
- Closure of the contact block has been improved.
- Approvals



For further information related to approved type, see page 04/56 to 04/59.

# Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30

## Quick reference guide

<ul><li>Illuminated p</li></ul>	ushbutton s	switches
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Operator	Туре	Operator	Туре	Operator	Туре
Extended round head	AR30E0L, E5L	Extended with full guard (24mm dia. with openings)	AR30G2L, G7L	Push-lock, turn-reset (40mm dia. with white arrow)	AR30V5L
See page 04/71, 04/94		See page 04/71, 04/94		See page 04/71, 04/95	
<b>⊕ ⊕ △</b> (€ <b> ( ( ( ( ( ( ( ( ( </b>	AF95-4	<b>(4) (6) (4) (4) (4)</b>	AF99-328	<b>④ ⑤</b> ≜(€@	KKD06-348
Extended with transparent full guard	AR30G4L, G9L	Extended with full guard (24mm dia.)	AR30G3L, G8L	Push-pull	AR30Q7L
(24mm dia.)					
See page 04/71, 04/94		See page 04/71, 04/94		See page 04/71, 04/95	
<b>④ ⑤</b> △ ( € ((((((((((((((((((((((((((((((((	KKD05-164	<b>( ( ( ( ( ( ( ( ( (</b>	AF95-6	<b>(</b> ) <b>(</b>	AF96-185

#### ■ Pushbutton switches

Operator	Туре	Operator	Туре	Operator	Туре
Flush round head	AR30F0R, F5R	Mushroom head (29mm dia.)	AR30M4R	Mushroom head with full guard (35mm dia. metal nut)	AR30GSR
See page 04/73, 04/96		See page 04/73, 04/96		See page 04/73, 04/96	0
<b>(4) (1)</b>	AF95-11	<b>(h) (f)</b> ∴ ∴ (f) ((iii)	AF95-8	<b>ⓑ ⓒ ⓒ</b>	AF96-239
Extended round head	AR30E0R, E5R	Extended with full guard (24mm dia.)	AR30G1R, G6R	Giant head	AR30B0R
See page 04/73, 04/96		See page 04/73, 04/96		See page 04/73, 04/97	
( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	AF95-10	<b>( ( ( ( ( ( ( ( ( (</b>	AF95-16	<b>(h) (f)</b>	AF95-579
Flush round head Symbol mark type	AR30FAR, FBR	Extended with half guard	AR30G0R, G5R	Giant head with guard	AR30B1R
See page 04/73, 04/96		See page 04/73, 04/96		See page 04/73, 04/97	
<b>(11)</b>	AF98-195	<b>( ( ( ( ( ( ( ( ( (</b>	AF95-9	<b>ⓑ</b> ♣(€@	AF95-582
Extended round head Symbol mark type	AR30EAR, EBR	Pin lock	AR30GPR	Giant head with full guard	AR30B2R
See page 04/73, 04/96		See page 04/73, 04/96		See page 04/73, 04/97	
<b>(11)</b>	AF98-194	<b>ⓑ ⓒ</b> ≜(€	AF96-240	<b>④ ⑤</b> ≜(€@	AF95-580
Mushroom head (40mm dia.)	AR30M0R, M5R	Mushroom head with full guard (40mm dia.)	AR30M3R, M8R	Giant head with full guard	AR30B3R
See page 04/73, 04/96		See page 04/73, 04/96		See page 04/74, 04/97	
<b>♠ ♠</b> (€ <b>®</b>	AF95-12	<b>ⓑ ❹</b> ♠(€@	AF95-17	<b>₽ £</b> (€@	AF95-581

Note: AR30M8R: Not approved standard

(C): See page 04/289

#### ■ Pushbutton switches

Operator	Туре	Operator	Туре	Operator	Туре
Pushbutton with selector ring (2-position)	AR30S1R, S2R, S3R, S6R	Push-lock, turn-reset (40mm dia. with white	AR30V5R	Pushbutton with emergency operating	AR30FVR
See page 04/75, 04/97		arrow) See page 04/74, 04/97		See page 04/74, 04/97	
<b>ⓑ ⑤</b> ♠ ( € ((((((((((((((((((((((((((((((((	AF97-506	<b>ⓑ ⓒ ⓒ</b>	KKD08-051	<b>(4) (6) (6)</b>	AF96-187
Push, turn-lock	AR30N0R				
See page 04/74, 04/97					
<b>ⓑ ⓒ</b> ♠(€	AF95-583				

■ Emergency stop pushbutton switches (conform to EN418

Operator	Туре	Operator	Туре	Operator	Туре
Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	AR30V0R	Push-lock, turn-reset (65mm dia.with white arrow)	AR30V1R	Push-lock, pull-reset (35mm dia.)	AR30Q2R
See page 04/76, 04/98		See page 04/76, 04/98	370	See page 04/76, 04/98	
<b>(4) (1) (1) (1) (1) (1) (1) (1)</b>	KKD08-051	<b>ⓑ ⓒ</b> ♠(€@	KKD06-352	<b>( ( ( ( ( ( ( ( ( (</b>	KKD06-347
Push-lock, turn-reset (40mm dia.)	AR30V2R				
See page 04/76, 04/98					
<b>() (</b> € ( € ( € ( € ( € ( € ( € ( € ( € ( €	KKD06-353				

Notes: Provided with the (Direct opening action)

■ Emergency stop illuminated pushbutton switches (conform to EN418)

Operator	Туре	Operator	Туре
Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	AR30V0L	Push-lock, turn-reset (40mm dia.)	AR30V2L
See page 04/77, 04/98		See page 04/77, 04/98	
<b>( ( ( ( ( ( ( ( ( (</b>	KKD06-348	<b>♠ ♠</b> ∴ ( € (((()	KKD06-350

Note: Provided with the  $\bigcirc$  (Direct opening action)

@ : See page 04/289

## AR30 and DR30

## **Quick reference guide**

#### ■ Selector switches

Operator	Туре	Operator	Туре	Operator	Туре
Knob	AR30PR, PCR	Key	AR30JR, JCR	Key (Long durability)	AR30JAR
See page 04/78, 04/99		See page 04/78, 04/99		See page 04/78, 04/99	
<b>④ ⑤</b> △(€@	AF95-13	<b>ⓑ</b> ♠ € € € €	KKD09-023	<b>ⓑ ⓒ</b> ♣(€@	KKD09-021
Lever	AR30WR, WCR				
See page 04/78, 04/99					
<b>④ ⑤</b> ♠(€(((()	AF95-14				

#### ■ Illuminated selector switches

Operator	Туре
Knob	AR30PL
See page 04/87, 04/99	
<b>(h) (f)</b> ∴ ∴ ( € ((((((((((((((((((((((((((((((	AF95-5

#### ■ Lever type selector switches

= = - · · · · · · · · · · · · · · · · ·	
Operator	Туре
Lever (metal type)	AR30HR
See page 04/85, 04/099	9
<b>♠ ♠</b> △ <b>( €</b>	KKD05-115

#### ■ Pilot lights

Lens	Туре	Lens	Туре	Lens	Туре
Dome See page 04/89, 04/100	DR30D0L	Dome with dimmer control  See page 04/89, 04/101	DR30D1L	Flush square (40mm sq. transparent lens)  See page 04/91, 04/102	DR30M4M *
<b>ⓑ ⓒ</b> ♠ ( € @ )	AF95-18	<b>ⓑ</b> ♠(€	AF02-63	<b>ⓑ ∰</b> ♠(€@	AF97-63
Extended round  See page 04/89, 04/100   ©	DR30E3L  AF95-20	Flush square (34mm sq. transparent lens)  See page 04/91, 04/102	DR30F4M *		
Faceted	DR30K0L	Flush rectangular (Transparent lens)	DR30F4N *		
See page 04/90, 04/101 <b>① ⑤</b> ♠ <b>○ ○ ○ ○</b>	AF95-19	See page 04/91, 04/102 <b>⑤ ⑥ △ ( ⑥ ( ⑥ ( ⑥ ( ⑥ ( ⑥ ( ( ⑥ ( ( ⑥ ( ( ( ( ( ( ( ( ( (</b>	AF97-64		

Note: With resistor unit and resistor types: Not approved standard \* LED 12V AC type: Not approved standard

(C): See page 04/289

#### ■ Joy stick selector switches

Handle	Туре	Handle	Туре	Handle	Туре
Ball type	AR30A0, A5	Ball type with lock	AR30A1, A6	Rubber cap type	AR30A2, A7
See page 04/92, 04/103		See page 04/92, 04/103		See page 04/92, 04/103	
<b>9</b> 1	AF97-48	<b>71 1 1 1 1 1 1 1 1 1</b>	AF97-44	<b>% (</b> €	AF97-57

#### ■ Buzzers

Sound	Туре	Sound	Туре	Sound	Туре
Electronic sound	DR30B5*	Magnetic sound	DR30B0	Electronic sound (IP54)	DR30B8 *
See page 04/93, 04/104		See page 04/93, 04/104		See page 04/93, 04/104	W. W.
<b>⊕ ⑤</b>	KKD08-058		AF96-378	<b>(h) (f)</b>	AF96-245
Electronic sound (economy)	DR30B6				
See page 04/93, 04/104	(i': 2,1)				
<b>⊕ ⑤</b>	KK02-17				

Note: \* 6V AC, 110V DC types: Not approved standard

#### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AR30 and DR30

#### Type number nomenclature

#### Illuminated pushbuttons

AR30 E0L − 10 E3 R □ 3 4 5 6 (1) (2)

#### ① Product category

AR30: 30mm-dia. illuminated pushbutton

30mm-dia. emergency stop illuminated pushbutton

#### ② Operator

• Illuminated pushbutton

E0L: Extended round head

E5L: Extended round head (Alternate)

G4L: Extended with transparent full guard (24mm dia.)

G9L: Extended with transparent full guard (24mm dia. alternate)

G2L: Extended with full guard (24mm dia. with openings)

G7L: Extended with full guard (24mm dia. with openings, alternate)

G3L: Extended with full guard (24mm dia.)

G8L: Extended with full guard (24mm dia. alternate)

V5L: Push-lock, turn-reset (40mm dia. with white arrow) \*1

Q7L: Push-pull

· Emergency stop illuminated pushbutton

VOL: Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)

V2L: Push-lock, turn-reset (40mm dia.)

#### 3 Contact arrangement

10: 1NO 30: 3NO 03: 3NC 01: 1NC 33: 3NO+3NC 11: 1NO+1NC 20: 2NO 40: 4NO 02: 2NC 04: 4NC 50: 5NO 22: 2NO+2NC 05: 5NC

#### 4 Lamp voltage

Incandescent lamp

54: 5.5V AC/DC, without transformer C4: 15V AC/DC, without transformer D4: 20V AC/DC, without transformer

E4: 24V AC/DC, without transformer

H4: 100-110V AC, with transformer

L4: 115-127V AC, with transformer

M4: 200-220V AC, with transformer

Q4: 230-254V AC, with transformer

S4: 350-380V AC, with transformer

T4: 400-440V AC, with transformer

V4: 480V AC, with transformer

W4: 500-550V AC, with transformer

LED lamp

A3: 6V AC, without transformer 63: 6V DC, without transformer

B3: 12V AC/DC, without transformer

C3: 15V AC/DC, without transformer E3: 24V AC/DC, without transformer

H3: 100-110V AC, with transformer

L3: 115-127V AC, with transformer M3: 200-220V AC, with transformer

Q3: 230-254V AC, with transformer

S3: 350-380V AC, with transformer

T3: 400-440V AC, with transformer V3: 480V AC, with transformer

W3: 500-550V AC, with transformer

#### ⑤ Color of lens

G: Green Y: Yellow A: Orange R: Red \*2 W: White S: Blue

#### 6 Special product

Z9: Resisting water-soluble cutting oils and heat

Z8: With a contact protection cover

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

ZM: Metal nut

Notes: \*1 Products with no trigger action mechanism. These products cannot be used as emergency stop switches that comply with EN standards.

\*2 Button color of emergency stop illuminated switches are Red only.
• The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

#### Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30 Type number nomenclature

#### **Pushbuttons**

**AR30 E0R** − **10 R** □ □ 2 3 4 5 6

① Product category

AR30: 30mm-dia. pushbutton

30mm-dia. emergency stop pushbutton

② Operator

Pushbutton switch

F0R: Flush round head

F5R: Flush round head (Alternate)

E0R: Extended round head

E5R: Extended round head (Alternate)

FAR: Flush round head (Symbol mark type)

FBR: Flush round head (Symbol mark type, alternate)

EAR: Extended round head (Symbol mark type)

EBR: Extended round head (Symbol mark type, alternate)

M0R: Mushroom head (40mm dia.)

M5R: Mushroom head (40mm dia. Alternate)

M4R: Mushroom head (29mm dia.)

G1R: Extended with full guard (24mm dia.)

G6R: Extended with full guard (24mm dia. Alternate)

GPR:Pin lock

G0R: Extended with half guard

G5R: Extended with half guard (Alternate)

M3R: Mushroom head with full guard (40mm dia.)

M8R: Mushroom head with full guard (40mm dia. Alternate)

GSR:Mushroom head with full guard (35mm dia. metal nut)

B0R: Giant head

B1R: Giant head with guard

B2R: Giant head with full guard

B3R: Giant head with full guard

S1R: Pushbutton with selector ring (2-position)

S2R: Pushbutton with selector ring (2-position)

S3R: Pushbutton with selector ring (2-position) S6R: Pushbutton with selector ring (2-position)

N0R: Push, turn-lock

V5R: Push-lock, turn-reset (40mm dia. with white arrow) \*1

FVR: Pushbutton with emergency operating cap

· Emergency stop pushbutton switch

VOR: Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)

V2R: Push-lock, turn-reset (40mm dia.)

V1R: Push-lock, turn-reset (Soft-touch 65mm dia. with white arrow)

Q2R: Push-lock, pull-reset (35mm dia.)

3 Contact arrangement

10: 1NO 30: 3NO 01: 1NC 03: 3NC 11: 1NO+1NC 33: 3NO+3NC 20: 2NO 40: 4NO 02: 2NC 04: 4NC 22: 2NO+2NC 44: 4NO+4NC 50: 5NO 05: 5NC

4 Color of button

G: Green Y: Yellow Red\*2 R: A: Orange B: Black S: Blue W: White Clear

Green, Red, Black (For AR30F0R)

(For AR30FAR, FBR, EAR. EBR)

#### ⑤ Symbol mark (For AR30FAR, FBR, EAR, EBR)

Symbol mark	0		I		T		0	I	T
Color of button	White	Black	White	Black	White	Black	Clear		
Color of mark	Red		Green		Green		Black		
Code	01	02	03	04	11	12	02B	04B	12B

#### 6 Special product

Z9: Resisting water-soluble cutting oils and heat

Z8: With a contact protection cover

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

ZM: Metal nut

Notes: \*1 Products with no trigger action mechanism. These products cannot be used as emergency stop switches that comply with EN standards.

<sup>\*2</sup>Button color of emergency stop switches are Red only.
• The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

#### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AR30 and DR30

#### Type number nomenclature

#### Selector and illuminated selector switches

<u>AR30</u> <u>PL −2</u> □ <u>10</u> <u>E3</u> <u>G</u> □ □ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

#### ① Product category

AR30: 30mm dia. selector switch and illuminated selector switch

#### 2 Operator

Selector switch

PR: Knob

PCR: Knob operated control type

WR: Lever

WCR: Lever operated control type

JR: Key

JCR: Key operated control type JAR: Key (Long durability) HR: Lever (Metal type)

· Illuminated selector switch

PL: Knob

#### 3 Operation

- 2: 2-position, maintained
- 0: 2-position, spring return
- 3: 3-position, maintained
- 6: 3-position, spring/manual return (Left to center)
- 3-position, spring/manual return (Right to center)
- 1: 3-position, spring return
- 4: 4-position, maintained (For AR30PCR, WCR)
- 5: 5-position, maintained (For AR30PCR, WCR)

#### 4 Key removable position

A: Left

- B: Left and right
- C: Left, right and center
- D: Right
- E: Center
- F: Right and center
- G: Left and center

#### **⑤** Contact arrangement

10: 1NO 30: 3NO
01: 1NC 03: 3NC
11: 1NO+1NC 33: 3NO+3NC
20: 2NO 40: 4NO
02: 2NC 04: 4NC
22: 2NO+2NC 44: 4NO+4NC
50: 5NO

50: 5NO 05: 5NC

Note: Control type: See page 04/82 to 04/84

#### 6 Lamp voltage

Incandescent lamp

54: 5.5V AC/DC, without transformer
C4: 15V AC/DC, without transformer
D4: 20V AC/DC, without transformer
E4: 24V AC/DC, without transformer
H4: 100-110V AC, with transformer
L4: 115-127V AC, with transformer
M4: 200-220V AC, with transformer

Q4: 230-254V AC, with transformer S4: 350-380V AC, with transformer T4: 400-440V AC, with transformer

V4: 480V AC, with transformer W4: 500-550V AC, with transformer

LED lamp

A3: 6V AC, without transformer
63: 6V DC, without transformer
B3: 12V AC/DC, without transformer
C3: 15V AC/DC, without transformer
E3: 24V AC/DC, without transformer
H3: 100-110V AC, with transformer
L3: 115-127V AC, with transformer
M3: 200-220V AC, with transformer

Q3: 230-254V AC, with transformer S3: 350-380V AC, with transformer T3: 400-440V AC, with transformer

V3: 480V AC, with transformer W3: 500-550V AC, with transformer

#### ⑦ Color of knob

B: Black (Not available for illuminated selector switch)

G: Green

R: Red

W: White (Not available for selector switch)

Y: Yellow (Not available for selector switch)

A: Orange (Not available for selector switch)S: Blue (Not available for selector switch)

#### C. Bido (Not available for delector of

® Key type No.
A, B, C, D, E or F
("A" is standard)

#### 9 Special product

Z9: Resisting water-soluble cutting oils and heat

Z8: With a contact protection cover

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

ZM: Metal nut

Note: • The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

#### Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30

### Type number nomenclature

#### **Pilot lights**

<u>DR30</u> <u>D0L</u> − <u>E3</u> <u>W</u> □ 3 4 5 1 2

Product category

DR30: 30mm dia. pilot light

2 Lens

D0L: Dome

E3L: Extended round

K0L: Faceted

D1L: Dome with dimmer control

F4M: Flush square (34mm sq. transparent lens) F4N: Flush rectangular (Transparent lens) M4M: Flush square (40mm sq. transparent lens) ④ Color of lens or color plate

G: Green R: Red A: Orange W: White S: Blue

⑤ Special product

Z9: Resisting water-soluble cutting oils and heat

Z4: Resisting sulfuration gas
ZB: Meeting IP2X finger-protection standards

ZM: Metal nut

Note: • The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

#### 3 Lamp voltage

Incandescent lamp

H8: 100-110V AC, short-body with transformer 54: 5.5V AC/DC, without transformer C4: 15V AC/DC, without transformer D4: 20V AC/DC, without transformer E4: 24V AC/DC, without transformer L8: 115-127V AC, short-body with transformer M8: 200-220V AC, short-body with transformer H4: 100-110V AC, with transformer

M4: 200-220V AC, with transformer Q4: 230-254V AC, with transformer S4: 350-380V AC, with transformer T4: 400-440V AC, with transformer V4: 480V AC, with transformer W4: 500-550V AC, with transformer

L4: 115-127V AC, with transformer

FQ: 50V DC, with resistor

HQ: 110V DC, with resistor\* MQ: 220V DC, with resistor\*

LED lamp

A3: 6V AC, without transformer
63: 6V DC, without transformer
B3: 12V AC/DC, without transformer C3: 15V AC/DC, without transformer E3: 24V AC/DC, without transformer

H3: 100-110V AC, with transformer L3: 115-127V AC, with transformer M3: 200-220V AC, with transformer Q3: 230-254V AC, with transformer S3: 350-380V AC, with transformer T3: 400-440V AC, with transformer

V3: 480V AC, with transformer W3: 500-550V AC, with transformer

H7: 110V DC, with resistor unit FR: 50V DC, with resistor\*

HR: 110V DC, with resistor\* MR: 220V DC, with resistor\*

 LED unit (For DR30F4M, F4N, M4M type) 65: 6V DC, without transformer 25: 12V AC, without transformer B5: 12V AC/DC, without transformer E5: 24V AC/DC, without transformer H5: 100-110V AC, with transformer L5: 115-127V AC, with transformer M5: 200-220V AC, with transformer Q5: 230-254V AC, with transformer S5: 350-380V AC, with transformer

T5: 400-440V AC, with transformer V5: 480V AC, with transformer W5: 500-550V AC, with transformer HE: 110V DC, with resistor unit

Note: \* DR30D0L, K0L type only

H9: 100-110V AC, short-body with transformer L9: 115-127V AC, short-body with transformer M9: 200-220V AC, short-body with transformer

#### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AR30 and DR30

#### Type number nomenclature

#### Joy stick selector switches

#### <u>AR30A</u> <u>0</u> <u>N</u> - <u>A0A0</u> <u>B</u>

1 23 (4)(5)

#### Product category

AR30A: 30mm-dia. Joy stick selector switch

#### 2 Handle

- 0: Ball type (without lock, manual return)
- 1: Ball type with lock (manual return)
- Rubber cap type (without lock, manual return)
- Ball type (without lock, spring return)
- Ball type with lock (spring return) 6:
- 7: Rubber cap type (without lock, spring return)

#### **3 Terminal**

- N: Screw
- Solder/tab

#### **4** Contact arrangement

Contac	ct arrangement	Blank	1NO	1NC	1NO+1NC	2NO	2NC	2NO+2NC
Code	Screw	0	Α	В	1	D	E	_
	Solder/tab	0	-	-	1	-	-	2

#### Operating direction code of contacts



- ⑤ Handle color
- B: Black

#### **■** Ordering information

Specify the following:

1. Type number

For the CCC approved product, add the suffix (CCC) to the type number

Example: Pushbutton switch AR30F0R-11B(CCC)

#### **Buzzers**

#### <u>DR30B</u> <u>5</u> – <u>E</u> <u>B</u>

1 2 34

#### Product category

DR30B: 30mm-dia. buzzer

- ② Sound
- 5: Electronic sound
- 6: Electronic sound (economy)
- 0: Magnetic sound
- 8: Electronic sound (IP54)

#### 3 Operating voltage

- A: 6V AC (Type "5", "8") 6: 6V DC (Type "5", "8")
- E: 12-24V AC/DC (Type "6": 24V DC)
- F: 35-48V AC/DC (Type "5", "8")
- G: 24V AC (Type "6")
- H: 100-110V AC
- M: 200-220V AC
- 1: 100-110V DC (Type "5", "8")
- 4 Color of head
- B: Black

#### ■ Standards approved

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479
TÜV: EN60947-5-1	Pushbutton, Illuminated pushbutton: R9551062
	Selector, Illuminated selector: R9551060
	Pilot lights: R9551061
	Joy stick selector switch: R2050803
	(Lever switch)
	Buzzer: J9950091
TÜV: EN60947-5-1	Emergency stop pushbutton
EN60947-5-5	Emergency stop illuminated pushbutton
	: R50028146

#### ■ Specifications (Indoor use)

Description	Pushbutton switch Illuminated pushbutton switch Emergency stop pushbutton switch Emergency stop illuminated pushbutton switch Selector switch Illuminated selector switch	Joy stick selector (Lever switch)	Pilot light		
Rated insulation voltage	600V AC/DC *1	250V AC/DC	250V AC/DC *2		
Mechanical durability	See page 04/66	250,000 operations	_		
Electrical durability	500,000 operations at 220V AC 6A	100,000 operations	_		
	1 million operations at 220V AC 3A	at 220V AC 1A			
		(Res. load)			
Operating frequency	1200 operations/hour (On-load factor: 40	0%)	_		
Dielectric strength	2500V AC, 1 minute *3 2000V AC, 1 minute		*4		
Insulation resistance	100MΩ or more (500V DC megger)	100M $\Omega$ or more (500V	DC megger)		
Rated impulse dielectric strength	6kV	-	6kV		
Conditional short-circuit current	1000A	1000A	-		
Short-circuit protective device	Fuse 15A	Fuse 1A	_		
Pollution degree	3		·		
Vibration	Resonance: 10 to 55Hz, double amplitude	de 0.1mm *5			
	Constant: 16.7Hz, double amplitude 3mr	m			
Shock	Malfunction durability: 100m/s <sup>2</sup> *6		Mechanical durability:		
	Mechanical durability: 500m/s <sup>2</sup>		500m/s <sup>2</sup>		
Ambient temperature	-20 to +70°C	-5 to +70°C	-20 to +50°C		
(No condensation or no icing)					
Storage temperature	-40 to +80°C				
Humidity	45 to 85% RH (within -5 to +40°C)				
Degree of protection	IP65 * <sup>7</sup>				

Notes: \*1 Illuminated type without transformer: 250V AC/DC \*2 Pilot light with transformer: 600V AC

- \*2 Pilot light with transformer: 600V AC
  \*3 Illuminated type without transformer: 2000V AC, 1 minute
  \*4 Pilot light with transformer: 2500V AC, 1 minute
  \*5 Emergency stop type: 10 to 500Hz, double amplitude 0.7mm (acceleration 50m/s²), according to the test condition of EN60947-5-5 (1998)
  \*6 Emergency stop type: 150m/s²
  \*7 AR30Q7L and DR30D1L type: IP40

#### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AR30 and DR30

#### **Ratings and specifications**

#### • Mechanical durability

Description		Operations
Pushbutton switch Illuminated pushbutton switch Emergency stop pusubutton switch Emergency stop illuminated pusubutton	Momentary action Alternate action With selector ring Push-lock, turn-reset Push-lock, pull-reset	5 million 1 million 100,000 100,000 30,000
Selector switch	Maintained 1, 2, 3, 4-contact Maintained 5, 6, 7, 8-contact Control type, spring return, spring/manual return	1 million 500,000 200,000
Illuminated selector switch	Maintained Without transformer Uith transformer  With transformer  1, 2, 3-contact 4-contact 1, 2-contact 3-contact	1 million 500,000 1 million 500,000
	Spring return, spring/manual return	200,000

Note: Key insertion/removal durability for selector switch key types

#### Buzzers

Item	DR30B5	DR30B6	DR30B0	DR30B8			
Rated insulation voltage	Without transformer: 60V AC/DC With transformer: 250V AC *1						
Sound level	90dB (0.1m) 70dB (1m)			80dB (0.1m) 60dB (1.0m)			
Durability	1000h		80h	1000h			
Frequency	2.4 to 3.3kHz	1.9 to 2.5kHz	•	2.4 to 3.3kHz			
Intermittent cycle	Approx. 170-cycle/min	-	_	Approx. 170-cycle/min			
Current consumption	See the table below	•	•	•			
Dielectric strength	Without transformer: 1000	V AC 1 minute With transfe	ormer: 2000V AC 1 minute *	2			
Insulation resistance	100MΩ or more (500V DC I	megger)					
Pollution degree	3						
Vibration	Resonance: 10 to 55Hz, do Constant: 16.7Hz, double a						
Shock	Mechanical durability: 500m	n/s²					
Ambient temperature		-20 to +60°C (No condensation or no icing) (with resistor unit: -20 to +40°C)					
Storage temperature	−30 to +70°C	-30 to +70°C					
Humidity	45 to 85%RH (within –5 to 40°C)						
Degree of protection	IP00 IP54						

Note: \*1 DR30B0 (without transformer): 250V AC \*2 DR30B0 (without transformer): 2000V AC 1 minute

#### • Current consumption

Operational voltage	Current consumption		
	DR30B5, DR30B8	DR30B6	DR30B0
6V AC	70mA AC	-	_
6V DC	35mA DC	25mA AC	_
24V AC	_	45mA AC	_
24V DC	_	30mA DC	_
24V AC/DC	40mA AC, 25mA DC	30mA AC, 20mA DC	-
48V AC/DC	65mA AC, 20mA DC	-	-
110V AC	30mA AC	30mA AC	30mA AC
110V DC	30mA DC	_	-
220V AC	15mA AC	15mA AC	20mA AC

<sup>Key type 10,000
Key (Long durability) type 20,000</sup> 

## ■ Contact ratings • UL/CSA standards

**AC** (COS Ø=0.35)

Contact rated code	120V		240V		480V		600V	
	Making current	Breaking current						
A600	60A	6.0A	30A	3.0A	15A	1.5A	12A	1.2A

#### **DC** T<sub>0.95</sub>= 6P (Max. 300ms)

Description	Contact rated	Making current · Breaking current			
	code	125V	250V	301V-600V	
Illuminated pushbutton switch Pushbutton (Ring type selector switch: AR30S2R only) Emergency stop pushbutton switch Emergency stop illuminated pushbutton switch (Except the overlap contact types)	P600	1.1A	0.55A	0.2A	
Overlap contact types of products shown above Pushbutton (Ring type selector switch: AR30S1R, S6R only) Selector switch (2-position only, except the overlap contact types) Illuminated selector switch (2-position only, except the overlap contact types)	Q600	0.55A	0.27A	0.1A	
Pushbutton (Ring type selector switch: AR30S3R only) Selector switch (2-pos./overlap contact type, 3-, 4-, 5-pos. type) Illuminated selector switch (2-pos./overlap contact type, 3-pos. type)	R300	0.22A	0.11A	_	

Note: Joy stick selector switches (Lever switches): 250V AC, 5A (Res. load) 125V DC, 0.2A 24V DC, 1A (Res. load)

#### • EN standard/TÜV approved

Description	Rated operational current					
	Rated thermal	Rated operational	AC15 (Ind. load)	DC13 (Ind. load)		
	current	voltage	Rated operational current	Rated operational current		
Illuminated pushbutton switch	10A	24V	6.0A	4.0A		
Pushbutton (Except the selector ring type)		120V	6.0A			
Emergency stop pushbutton switch		125V	-	1.3A		
Emergency stop illuminated pushbutton switch		240V	6.0A			
Selector switch (2-position)		250V		0.45A		
Illuminated selector switch (2-position)		480V	2.5A			
		600V	2.0A	_		
Selector switch (3, 4, 5-position)	10A	24V	6.0A	2.0A		
Illuminated selector switch (3-position)		120V	6.0A	_		
Pushbutton with selector ring		125V	_	0.65A		
		240V	6.0A	_		
		250V		0.23A		
		480V	2.5A	_		
		600V	2.0A	_		
Joy stick selector switch (Lever switch)	5A	24V	_	0.7A		
		120V	0.3A	_		
		125V	_	0.15A		
		240V	0.3A	_		

#### Lamp rated voltage UL/CSA standards, TÜV approved

	LED lamp	Incandescent lamp		
Full-voltage (without transformer)	Max. 24V AC/DC	Max. 30V AC/DC		
With transformer	Max. 550V AC (Short-body type: Max. 220V AC)			

#### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AR30 and DR30

#### **Ratings and specifications**

#### **■ Operating characteristic** (1NO+1NC)

Description	Pushbutton	Emergency stop pushbutto	n	Selector *2	Selector *2			
	Illuminated pushbutton	Emergency stop illuminate	d pushbutton	Illuminated sel	Illuminated selector			
		Push-lock type	Push-pull type	Maintained	Spring/manual return	Spring return		
Ave. required operating force	9N (Push-lock type: 20N)	30N *1	45N	0.15N•m	0.13N•m	0.1N•m		
Operating travel	Approx. 6mm	Approx. 9mm	Approx. 9mm	2-position: Approx. 90°	3-position: Approx. 45°	2-position: Approx. 60°		
	(Push-lock type: Approx. 9mm, operation	(Operation angle: Approx. 45°)		3-position: Approx. 45°		3-position: Approx. 45°		
	angle: Approx. 45°)			4-position: Approx. 40°				
				5-position: Approx. 30°				
Required return	_	0.6N•m	30N (pull)	0.15N•m	0.13N•m	_		
force	(Push-lock type: 0.6N•m)							

#### ■ Lamp ratings

#### • Illuminated pushbuttons, illuminated selectors, pilot lights (round type)

Transformer	Lamp voltage	LED (lamp bas	se: BA9S/13)		Incandes	cent (lamp bas	se: BA9S/13)
		Туре	Rated voltage	Consumption	Type	Rated voltage	Consumption
Without	5.5V AC/DC	_	_	_	AHX135	6.3V AC/DC	0.9W
transformer	6V AC	APX510-6□	6V AC	Green, red, orange, amber, blue: 7mA AC	_	_	_
				Yellow: 50mA AC			
	6V DC	APX510-D6□	6V DC	Green, red, orange, amber, blue: 11mA DC	_	_	_
				Yellow: 33mA DC			
	12V AC/DC	APX510-12□	12V AC/DC	Green, red, orange, amber, blue: 14mA AC, 11mA DC	_	_	_
				Yellow: 28mA AC, 22mA DC			
	15V AC/DC	APX510-15□	15V AC/DC	Green, red, orange, amber, blue: 13mA AC, 11mA DC	AHX279	18V AC/DC	0.8W
				Yellow: 26mA AC, 22mA DC			
	20V AC/DC	_	_	_	AHX144	24V AC/DC	0.9W
	24V AC/DC	APX510-24□	24V AC/DC	12mA AC, 11mA DC	AHX129	30V AC/DC	0.8W
With transformer	110V AC	APX510-6□	6V AC	1.5VA	AHX135	6.3V AC/DC	2VA
(Standard type:	127V AC						2VA
AR9T511)	220V AC						2VA
	254V AC	APX510-6□	6V AC	2.5VA	AHX135	6.3V AC/DC	2.5VA
	380V AC						2.5VA
	440V AC						2.5VA
	480V AC						2.5VA
	550V AC						2.5VA
With resistor unit	110V DC	APX510-24□	24V AC/DC	1.2W	_	_	_
(AR9T519-H)							

#### • Pilot lights with resistor

Lamp Voltage	LED (lamp base: E12/15)			Incandescent (lamp base: E12/15)		
	Туре	Rated voltage	Consumption	Туре	Rated voltage	Consumption
50V DC	APX507-24□ *	24V AC/DC	0.8W	AHX130	18V AC/DC	5W
110V DC			1.7W			10W
220V DC			3.3W			20W

Notes: \* White: APX509-24O

Notes: \*1 AR30V2R type: 45N \*2 4-position, 5-position: 2NO+2NC

Notes: • Short body pilot lights: 110V AC, 127V AC, 220V AC only
• Replace the □ mark by the lamp luminous color code, see page 04/70

ullet Replace the  $\square$  mark by the lamp luminous color code, see page 04/70

# Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30 Ratings and specifications

#### • Pilot lights (DR30F4M, F4N, M4M types)

Transformer	Lamp voltage	LED (lamp base	e: BA9S/13)		Incandes	cent (lamp base:	BA9S/13)
		Туре	Rated voltage	Consumption	Туре	Rated voltage	Consumption
Without	5.5V AC/DC	_	_	-	AHX135	6.3V AC/DC	0.9W
transformer	6V DC	DR9Q005-6□	6V DC	Green, red, amber: 20mA DC	_	_	_
				White: 33mA DC			
				Yellow: 48mA DC			
	12V AC	DR9Q005-2□	12V AC	Red, amber: 18mA AC	_	_	_
				Green: 10mA AC			
				White: 30mA AC			
				Yellow: 50mA AC			
	12V AC/DC	DR9Q005-B□	12V AC/DC	Red, amber: 22mA AC, 20mA DC	_	_	_
				Green: 13mA AC, 10mA DC			
				White: 36mA AC, 30mA DC			
				Yellow: 54mA AC, 48mA DC			
	15V AC/DC	_	_	-	AHX279	20V AC/DC	0.8W
	20V AC/DC	_	_	_	AHX144	24V AC/DC	0.9W
	24V AC/DC	DR9Q005-E□	24V AC/DC	Green, red, amber: 11mA AC, 10mA DC	AHX129	30V AC/DC	0.8W
				White: 12mA AC, 11mA DC			
				Yellow: 16mA AC, 12mA DC			
With	110V AC	DR9Q005-2□	12V AC	3VA	AHX135	6.3V AC/DC	2VA
transformer	127V AC						2VA
unit	220V AC						2VA
(LED:	254V AC						2.5VA
AR9T557)	380V AC						2.5VA
(Incandes-	440V AC						2.5VA
cent:	480V AC						2.5VA
AR9T511)	550V AC						2.5VA
With resistor	110V DC	DR9Q005-E□	24V AC/DC	1.4W	_	_	_
unit							
(AR9T519-H)							

Notes: • Replace the  $\square$  mark by the lamp luminous color code, see page 04/70

#### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AR30 and DR30

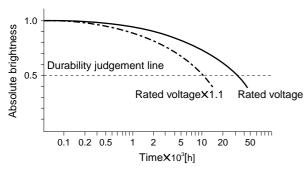
#### Ratings and specifications

#### **■** Lamp durability

Lamp	Durability (reference)	Judgement criterion
LED	''	When brightness is less than 50% of initial value
Incandescent	Approx. 5000h (AC)	When the bulb burns out

Notes: •The operating voltage for incandescent lamps is set at 80 to 90% of the lamp's rated voltage.
•The durability of LED lamp is a mean value in all colors.

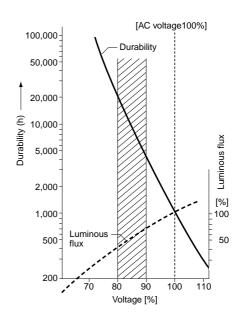
#### **Estimated durability for LED lamps**



Notes: • Durability at Ta=25°C

 Durability is affected by temperature, humidity, and voltage fluctuation.

#### Incandescent lamp voltage characteristics



#### ■ Combination of lens color and LED luminous color

Button col	or	LED lamp		LED lamp		
(lens or co	olor plate)	(high-brightness)		(high-brightness)		
Color	Code	Luminous color	Туре	Type *1	Luminous color	Type *2
Green	G	Green	APX510- <b>■</b> G	APX507-24G	Green	DR9Q005- <b>■</b> G
Red	R	Red	APX510- <b>■</b> R	APX507-24R	Red	DR9Q005- <b>■</b> R
White	W	Orange	APX510- <b>■</b> O	APX509-24O	White	DR9Q005- <b>■</b> W
Yellow	Υ	Yellow	APX510- <b>■</b> Y	APX507-24Y	Yellow	DR9Q005- <b>■</b> Y
Orange	Α	Amber	APX510- <b>■</b> A	APX507-24A	Amber	DR9Q005- <b>■</b> A
Blue	S	Blue	APX510- <b>■</b> S	APX507-24S	_	-

Notes: \*1 For pilot light with resistor
\*2 For DR30 F4M, F4N, M4M type
• Replace the ■ mark by the lamp voltage code, see page 04/68, 04/69

#### ■ Illuminated pushbutton switches

	on switche		. == .		Ī	
Operator	Trans- former	Contact	LED lamp Momentary action Type	Alternate action Type	Incandescent lamp Momentary action Type	Alternate action Type
Extended round head	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR30E0L-10■3  AR30E0L-01■3  AR30E0L-11■3  AR30E0L-22■3	AR30E5L-10■3□ AR30E5L-01■3□ AR30E5L-11■3□	AR30E0L-10■4 ☐ AR30E0L-01■4 ☐ AR30E0L-11■4 ☐ AR30E0L-22■4 ☐	AR30E5L-10■4□ AR30E5L-01■4□ AR30E5L-11■4□
AF95-4	With	1NO 1NC 1NO+1NC	AR30E0L-10■3□ AR30E0L-01■3□ AR30E0L-11■3□	AR30E5L-10■3□ AR30E5L-01■3□ AR30E5L-11■3□	AR30E0L-10■4 □ AR30E0L-01■4 □ AR30E0L-11■4 □	AR30E5L-10■4□ AR30E5L-01■4□ AR30E5L-11■4□
Extended with transparent full guard (24mm dia.)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR30G4L-10 <b>m</b> 3 AR30G4L-01 <b>m</b> 3 AR30G4L-11 <b>m</b> 3 AR30G4L-22 <b>m</b> 3	AR30G9L-10■3□ AR30G9L-01■3□ AR30G9L-11■3□ —	AR30G4L-10■4□ AR30G4L-01■4□ AR30G4L-11■4□ AR30G4L-22■4□	AR30G9L-10■4□ AR30G9L-01■4□ AR30G9L-11■4□ —
KKD05-164	With	1NO 1NC 1NO+1NC	AR30G4L-10■3□ AR30G4L-01■3□ AR30G4L-11■3□	AR30G9L-10■3□ AR30G9L-01■3□ AR30G9L-11■3□	AR30G4L-10■4 ☐ AR30G4L-01■4 ☐ AR30G4L-11■4 ☐	AR30G9L-10■4□ AR30G9L-01■4□ AR30G9L-11■4□
Extended with full guard (24mm dia. with openings)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR30G2L-10■3 ☐ AR30G2L-01■3 ☐ AR30G2L-11■3 ☐ AR30G2L-22■3 ☐	AR30G7L-10■3□ AR30G7L-01■3□ AR30G7L-11■3□ —	AR30G2L-10■4□ AR30G2L-01■4□ AR30G2L-11■4□ AR30G2L-22■4□	AR30G7L-10■4□ AR30G7L-01■4□ AR30G7L-11■4□ —
AF99-328	With	1NO 1NC 1NO+1NC	AR30G2L-10■3 ☐ AR30G2L-01■3 ☐ AR30G2L-11■3 ☐	AR30G7L-10■3□ AR30G7L-01■3□ AR30G7L-11■3□	AR30G2L-10■4□ AR30G2L-01■4□ AR30G2L-11■4□	AR30G7L-10∎4□ AR30G7L-01∎4□ AR30G7L-11∎4□
Extended with full guard (24mm dia.)	Without	1NO 1NC 1NO+1NC 2NO+2NC	AR30G3L-10m3	AR30G8L-10■3□ AR30G8L-01■3□ AR30G8L-11■3□ —	AR30G3L-10■4□ AR30G3L-01■4□ AR30G3L-11■4□ AR30G3L-22■4□	AR30G8L-10■4□ AR30G8L-01■4□ AR30G8L-11■4□ —
AF95-6	With	1NO 1NC 1NO+1NC	AR30G3L-10■3 ☐ AR30G3L-01■3 ☐ AR30G3L-11■3 ☐	AR30G8L-10■3□ AR30G8L-01■3□ AR30G8L-11■3□	AR30G3L-10■4□ AR30G3L-01■4□ AR30G3L-11■4□	AR30G8L-10■4□ AR30G8L-01■4□ AR30G8L-11■4□
Push-lock, turn-reset (40mm dia. with white arrow)	Without	1NO 1NC 1NO+1NC 3NC	_ _ _	AR30V5L-10■3 ☐ AR30V5L-01■3 ☐ AR30V5L-11■3 ☐ AR30V5L-03■3 ☐	_ _ _	AR30V5L-10■4□ AR30V5L-01■4□ AR30V5L-11■4□ AR30V5L-03■4□
KKD06-348	With	1NO 1NC 1NO+1NC	_ _ _	AR30V5L-10 <b>■</b> 3 □ AR30V5L-01 <b>■</b> 3 □ AR30V5L-11 <b>■</b> 3 □	_ _ _	AR30V5L-10■4□ AR30V5L-01■4□ AR30V5L-11■4□
Push-pull (35mm dia.)	Without	1NO+1NC	AR30Q7L-11 <b>≡</b> 3 □	-	AR30Q7L-11 <b>■</b> 4□	-
AF96-185	With	1NO+1NC	AR30Q7L-11 <b>■</b> 3□	_	AR30Q7L-11 <b>■</b> 4□	_

Note: ■ ☐ See page 04/72

#### Illuminated Pushbuttons **AR30**

#### • Lens color

Replace the  $\square$  mark by the lens color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	А

Note: AR30V5L type: Red, yellow only

• Contact arrangements Contact arrangements other than above are available

Contact arrangement	1NO	1NC	1N0	D+1NC	2NO	2NC	3NO
Code	10	01	11		20	02	30
Contact arrangement	3NC	2NO+2	NC	4NO	4NC	5NO	5NC
Code	03	22		40	04	50	05

Note: AR30Q7L type: 1NO + 1NC only

#### Available numbers of contact blocks

Operation	Without transformer	With transformer
Momentary action	6-contact block	4-contact block
Alternate action Push-lock, turn-reset	3-contact block	2-contact block

#### Voltage

Replace the ■ mark by the lamp voltage code

Transformer	Code LED	Incandescent	
Without transformer	6V DC 6V AC 5.5V AC/DC 12V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC	6 A B C E	
With transformer	100-110V AC 115-127V AC 200-220V AC 230-254V AC 350-380V AC 400-440V AC 480V AC 500-550V AC	H L M Q S T > W	H L M Q S T V

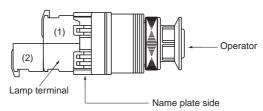
#### • Contact operation (AR30Q7L)

Conta	Contact block		Button position			
No.	Type	Pull	Free	Push		
(1)	NC	•				
(2)	NC					

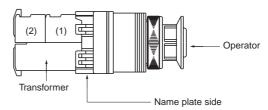
Contact closed

#### Position of contact block

AR30Q7L (without transformer)



#### AR30Q7L (with transformer)



#### ■ Pushbutton switches

Operator	Contact	Momentary action Type	Alternate action Type
Flush round head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30F0R-10 AR30F0R-01 AR30F0R-11 AR30F0R-20 AR30F0R-02 AR30F0R-22	AR30F5R-10   AR30F5R-01   AR30F5R-11   AR30F5R-20   AR30F5R-02   AR30F5R-22
Extended round head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30E0R-10  AR30E0R-01  AR30E0R-11  AR30E0R-20  AR30E0R-02  AR30E0R-22	AR30E5R-10 AR30E5R-01 AR30E5R-11 AR30E5R-20 AR30E5R-22 AR30E5R-22
Flush round head symbol mark type	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30FAR-01C■ AR30FAR-11C■ AR30FAR-20C■ AR30FAR-02C■	AR30FBR-10C  AR30FBR-01C  AR30FBR-11C  AR30FBR-20C  AR30FBR-02C  AR30FBR-22C
Extended round head symbol mark type	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30EAR-01C■ AR30EAR-11C■ AR30EAR-20C■ AR30EAR-02C■	AR30EBR-10CM AR30EBR-01CM AR30EBR-11CM AR30EBR-20CM AR30EBR-02CM AR30EBR-22CM
Mushroom head (40mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30M0R-01 AR30M0R-11	AR30M5R-10 AR30M5R-01 AR30M5R-11 AR30M5R-20 AR30M5R-02 AR30M5R-22
Mushroom head (29mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30M4R-10	
Extended with full guard (24mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30G1R-10 AR30G1R-01 AR30G1R-11 AR30G1R-20 AR30G1R-02 AR30G1R-22	AR30G6R-10 ☐ AR30G6R-01 ☐ AR30G6R-11 ☐ AR30G6R-20 ☐ AR30G6R-02 ☐ AR30G6R-02 ☐

Operator	Contact	Momentary action Type	Alternate action Type
Extended with half guard	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30G0R-10 AR30G0R-01 AR30G0R-11 AR30G0R-20 AR30G0R-02 AR30G0R-22	AR30G5R-01□ AR30G5R-11□ AR30G5R-20□ AR30G5R-02□
Pin lock  AF96-240	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30GPR-10 AR30GPR-01 AR30GPR-11 AR30GPR-20 AR30GPR-02 AR30GPR-22	_ _ _ _
Mushroom head with full guard (40mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30M3R-10□ AR30M3R-01□ AR30M3R-11□ AR30M3R-20□ AR30M3R-02□ AR30M3R-22□	AR30M8R-11□
Mushroom head with full guard (35mm dia. metal nut)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30GSR-10 AR30GSR-01 AR30GSR-11 AR30GSR-20 AR30GSR-02 AR30GSR-22	
Giant head  AF95-579	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30B0R-10  AR30B0R-01  AR30B0R-11  AR30B0R-20  AR30B0R-02  AR30B0R-22	
Giant head with guard	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30B1R-10 AR30B1R-01 AR30B1R-11 AR30B1R-20 AR30B1R-02 AR30B1R-22	_ _ _ _ _
Giant head with full guard  AF95-580	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30B2R-10 AR30B2R-01 AR30B2R-11 AR30B2R-20 AR30B2R-02 AR30B2R-22	

Note: ■ ☐ See page 04/74

## Pushbuttons **AR30**

Operator	Contact	Momentary action Type	Alternate action Type
Giant head with full guard	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30B3R-10	
Push, turn-lock	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30N0R-10	

Operator	Contact	Momentary action Type	Alternate action Type
Push-lock, turn-reset (40mm dia. with white arrow)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	_ _ _ _ _	AR30V5R-10 AR30V5R-01 AR30V5R-11 AR30V5R-20 AR30V5R-02 AR30V5R-02
Pushbutton with emergency operating cap	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30FVR-10  AR30FVR-01  AR30FVR-11  AR30FVR-20  AR30FVR-02  AR30FVR-02  AR30FVR-22	

#### • Button color

Replace the  $\square$  mark by the button color code

Color	Green	Red	White	Blue	Yellow	Orange	Black
Code	G	R	W	s	Υ	Α	В

Note: AR30V5R type: Red, yellow, black only

#### • Contact arrangements

Contact arrangements other than above are available

Contact arrangement	1NO	1NC	1NO+1NC	2NO	2NC	3NO	3NC
Code	10	01	11	20	02	30	03

Contact arrangement	2NO+2NC	4NO	4NC	5NO	5NC	3NO+3NC	4NO+4NC
Code	22	40	04	50	05	33	44

#### • Available numbers of contact blocks

Momentary action	Alternate action Push-lock, turn-reset
8-contact block	4-contact block

#### • Symbol mark (For AR30FAR, FBR, EAR, EBR)

Replace the ■ mark by the symbol mark code

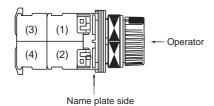
Symbol mark	0		I		T		0		1
Color of button	White	Black	White	Black	White	Black	Clear		
Color of mark	Red		Green		Green		Black		
Code	01	02	03	04	11	12	02B	04B	12B

Operator	Contact (The following	Button color	Туре	Contact operation						
contact is or available.)				Contact block		Left		Right		
				Mounting position	Туре	Free	Depressed	Free	Depressed	
Pushbutton with	2NO+2NC	Green Red	AR30S1R-22G	(1)	NC	_	_	•	_	
selector ring (2-position)		Black	AR30S1R-22R AR30S1R-22B	(2)	NC	_	_	•	_	
		White Yellow	AR30S1R-22W AR30S1R-22Y	(3)	NO	_	•	_	•	
		Orange Blue	AR30S1R-22A AR30S1R-22S	(4)	NO	_	•	_	•	
	2NO	Green Red	AR30S2R-20G	(1)	NO	_	•	_	_	
AF97-506		Black	AR30S2R-20R AR30S2R-20B	(2)	NO	_	_	_	•	
		White Yellow Orange Blue	AR30S2R-20W AR30S2R-20Y AR30S2R-20A AR30S2R-20S							
	2NO+2NC	Green	AR30S2R-22G	(1)	NC	•	_			
		Red Black	AR30S2R-22R AR30S2R-22B	(2)	NC			•	_	
		White Yellow	AR30S2R-22W AR30S2R-22Y	(3)	NO	_	•	_	_	
		Orange Blue	AR30S2R-22A AR30S2R-22S	(4)	NO	_	_	_	•	
	2NO+2NC	Green Red	AR30S3R-22G AR30S3R-22R	(1)	NC	_	_			
		Black White	AR30S3R-22B AR30S3R-22W	(2)	NC			_	_	
		Yellow	AR30S3R-22Y AR30S3R-22Y AR30S3R-22A	(3)	NO	_	•	_	_	
		Orange Blue	AR30S3R-22S	(4)	NO	_	_	_	•	
	2NO+2NC	Green Red	AR30S6R-22G AR30S6R-22R	(1)	NC	•	_	_		
		Black White	AR30S6R-22B AR30S6R-22B AR30S6R-22W	(2)	NC	•	_	_	l ooks d	
		Yellow Orange	AR30S6R-22Y AR30S6R-22A	(3)	NO		•	•	Locked	
		Blue	AR30S6R-22S	(4)	NO	_	•	•		

Note: (1) to (4): Contact block mounting position

Contact closed
Contact open

#### • Position of contact block



## Emergency Stop Pushbuttons **AR30**

#### **■** Emergency stop pushbutton switches

igoplus (Direct opening action), conform to EN418

Operator	Contact	Туре
Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AR30V0R-01R AR30V0R-11R AR30V0R-02R AR30V0R-03R AR30V0R-22R AR30V0R-04R
Push-lock, turn-reset (40mm dia.)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AR30V2R-01R AR30V2R-11R AR30V2R-02R AR30V2R-03R AR30V2R-22R AR30V2R-04R
Push-lock, turn-reset (Soft-touch 65mm dia. with white arrow)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AR30V1R-01R AR30V1R-11R AR30V1R-02R AR30V1R-03R AR30V1R-22R AR30V1R-04R
Push-lock, pull-reset (35mm dia.)	1NC 1NO+1NC 2NC	AR30Q2R-01R AR30Q2R-11R AR30Q2R-02R

Notes: • Button color: Red only

<sup>•</sup> Contact arrangements indicated in the table can be supplied.

#### ■ Emergency stop illuminated pushbutton switches

(Direct opening action), conform to EN418

Operator	Transformer	Contact	LED lamp Type	Incandescent lamp Type
Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow)	Without	1NC 1NO+1NC 2NC 3NC	AR30V0L-01■3R AR30V0L-11■3R AR30V0L-02■3R AR30V0L-03■3R	AR30V0L-01■4R AR30V0L-11■4R AR30V0L-02■4R AR30V0L-03■4R
	With	1NC 1NO+1NC 2NC	AR30V0L-01■3R AR30V0L-11■3R AR30V0L-02■3R	AR30V0L-01■4R AR30V0L-11■4R AR30V0L-02■4R
Push-lock, turn-reset (40mm dia.)	Without	1NC 1NO+1NC 2NC 3NC	AR30V2L-01■3R AR30V2L-11■3R AR30V2L-02■3R AR30V2L-03■3R	AR30V2L-01■4R AR30V2L-11■4R AR30V2L-02■4R AR30V2L-03■4R
KKD06-	With	1NC 1NO+1NC 2NC	AR30V2L-01■3R AR30V2L-11■3R AR30V2L-02■3R	AR30V2L-01■4R AR30V2L-11■4R AR30V2L-02■4R

• Voltage
Replace the ■ mark by the lamp voltage code

Transformer		Code LED	Incandescent
Without	6V DC 6V AC 5V AC/DC 12V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC	6 A B C E	

Transformer		Code LED	Incandescent
With	100-110V AC 115-127V AC 200-220V AC 230-254V AC 350-380V AC 400-440V AC 480V AC 500-550V AC	H L M Q S T V W	H L M Q S T V W

Notes: • Button color: Red only
• Contact arrangements indicated in the table can be supplied.

#### ■ Selector switches

#### 2-position

Operator	Operation	Knob color or key removable	Contact	Type Switch with	Contact opera	ation (Example)
		position		round bezel	Contact arrangement	Operator position
					anangement	Left Right
Knob	Maintained each 90°	Color code: B: Black (Standard) Color other than above are available	1NO 1NC 1NO+1NC 2NO 2NC 2NC	AR30PR-210B AR30PR-201B AR30PR-211B AR30PR-220B AR30PR-202B AR30PR-202B	1NO (1)	Upper contact  ③   ④ ④
AF95-13	Spring return  Spring return	G: Green R: Red	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30PR-010B AR30PR-001B AR30PR-011B AR30PR-020B AR30PR-020B AR30PR-002B AR30PR-002B	1NC (1) 1NO+1NC	Upper contact  ①
Lever	Maintained each 90°		1NO 1NC 1NO+1NC 2NO 2NC 2NC+2NC	AR30WR-210B AR30WR-201B AR30WR-211B AR30WR-220B AR30WR-202B AR30WR-202B	(1)	3 + 4 4 Lower contact 1 + 2
AF95-14	Spring return  Solution		1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AR30WR-010B AR30WR-001B AR30WR-011B AR30WR-020B AR30WR-002B AR30WR-002B	2NO+2NC (1)	Upper contact  ③
Key	Maintained each 90°	■: Key removable position ( ): Key type  See page 04/80	1NO 1NC 1NO+1NC 2NO 2NC 2NC+2NC	AR30J□R-2■10() AR30J□R-2■01() AR30J□R-2■11() AR30J□R-2■20() AR30J□R-2■02() AR30J□R-2■22()	(2)	3 + 4 4 Lower contact 1 + 2
KKD09-023	Spring return  (5) 60°		1NO 1NC 1NO+1NC 2NO 2NC 2NC 2NO+2NC	AR30J□R-0A10() AR30J□R-0A01() AR30J□R-0A11() AR30J□R-0A20() AR30J□R-0A02() AR30J□R-0A22()	(4) Upper col (3) (1) (4) (2) Lower contact	- Operator

Notes: • (1) to (4): Contact block mounting position

• ① – ②, ③ – ④: Contact block terminal No.

• Contact arrangements: See page 04/80

Contact closed

#### Operator

Replace the  $\square$  mark by the cylinder key type code

Standard type: Blank Long durability type: A

3-position							
Operator	Operation	Knob color	Contact	Type Switch with	Contact of	peration (Exam	iple)
				round bezel	Contact	Operation posi	tion
					arrange- ment	L C R	L C R
					mont	$\bigcirc$ $\bigcirc$ $\bigcirc$	$\bigcirc$ $\bigcirc$ $\bigcirc$
Knob	Maintained each 45°	Color code: B: Black (Standard) Color other than	1NO+1NC 2NO 2NC 2NC+2NC	AR30PR-311B AR30PR-320B AR30PR-302B AR30PR-322B	1NO+1NC (1) (2)	Upper contact  (3)  (4)	Lower contact
	Spring/manual return  the cach 45°	above are available (G: Green R: Red	1NO+1NC 2NO 2NC 2NC+2NC	AR30PR-611B AR30PR-620B AR30PR-602B AR30PR-622B			
	Spring/manual return  each 45°		1NO+1NC 2NO 2NC 2NO+2NC	AR30PR-711B AR30PR-720B AR30PR-702B AR30PR-722B	1NO+1NC (1) (2)	Upper contact  3  4  4	Lower contact
	Spring return		2NO+2NC	AR30PR-122B	2NO+2NC	_Upper contact	Lower contact
AF95-13	₼				(1) (2)		
	each 45°				(3) (4)	3 + + + 4	3 4 4
Lever	Maintained		1NO+1NC	AR30WR-311B	1NO+1NC	(a) !!	Lower contact
	each 45°		2NO 2NC 2NO+2NC	AR30WR-320B AR30WR-302B AR30WR-322B	(1) (2)	(3)	
	Spring/manual return  ach 45°		1NO+1NC 2NO 2NC 2NO+2NC	AR30WR-611B AR30WR-620B AR30WR-602B AR30WR-622B			
do.	Spring/manual return  each 45°		1NO+1NC 2NO 2NC 2NO+2NC	AR30WR-711B AR30WR-720B AR30WR-702B AR30WR-722B	1NO+1NC (1) (2)	Upper contact  (3)  (4)	Lower contact  1 2
	Spring return		2NO+2NC	AR30WR-122B	2NO+2NC	Upper contact	Lower contact
AF95-14	(ñ)				(1) (2)	2	
	each 45°				(3) (4)	3 + + + 4	3 4 4

Note: • Contact arrangements: See page 04/80

Contact closed

#### Selector Switches

#### AR30

Operator	Operation	Key removable	Contact	Type	Contact of	peration (Exam	nple)
		position		Switch with round bezel	Contact	Operator posit	ion
					arrange- ment	L C R	L C R
						$\bigcirc \bigcirc \bigcirc$	<b>O O O</b>
Key	Maintained each 45°	■: Key removable position (): Key type	1NO+1NC 2NO 2NC 2NC+2NC	AR30J□R-3■11() AR30J□R-3■20() AR30J□R-3■02() AR30J□R-3■22()	1NO+1NC (1) (2)	Upper contact  (3) (4)	Lower contact
	Spring/manual return (1) each 45°	(). Ney type	1NO+1NC 2NO 2NC 2NO+2NC	AR30J□R-6■11() AR30J□R-6■20() AR30J□R-6■02() AR30J□R-6■22()			
9	Spring/manual return  the each 45°		1NO+1NC 2NO 2NC 2NO+2NC	AR30J□R-7■11() AR30J□R-7■20() AR30J□R-7■02() AR30J□R-7■22()	1NO+1NC (1) (2)	Upper contact  (3)  (4)	Lower contact ①
KKD09-023	Spring return		2NO+2NC	AR30J□R-1E22()	2NO+2NC (1) (2)	Upper contact  1 2	Lower contact
	each 45°				(3) (4)	3 + + 4	3 4

Notes: • Operator position L: Left, C: Center, R: Right

- (1) to (4): Contact block mounting position
- ① ②, ③ ④: Contact block terminal No.

#### • Contact arrangements

Contact arrangements other than above are available

Contact arrangement	1NO	1NC	1NO+1NC	2NO	2NC	3NO	3NC
Code	10	01	11	20	02	30	03

#### • Available numbers of contact blocks

Mainted	Spring return Spring/manual return
8-contact block	4-contact block

Contact arrangement	2NO+2NC	4NO	4NC	5NO	5NC	3NO+3NC	4NO+4NC
Code	22	40	04	50	05	33	44

#### • Key removable positions

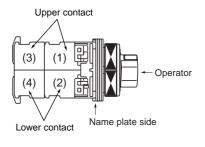
Code	А	В	С	D	E	F	G
Removable position	45°	A5° - 45°	\$5° - \$5°	\$5°. 45°.	15° - 45°	15° - 45°	45° 45°
AR30J□R-2	•	•	_	•	_	_	_
AR30J□R-0	•	_	_	_	_	_	_
AR30J□R-3	•	•	•	•	•	•	•
AR30J□R-6	_	_	_	•	•	•	_
AR30J□R-7	•	_	_	_	•	_	•
AR30J□R-1	_	_	_	_	•	_	_

●: Available —: Not available

#### • Key code No.

Replace the ( ) mark with one of the following key code. A, B, C, D, E and F Standard key code is A.

#### • Position of contact block



Contact closed

#### Operator

Replace the  $\square$  mark by the cylinder key type code Standard type: Blank

Long durability type: A

#### ■ Selector switches (control type) 3-position

Operator	Operation	Knob color or key removable position	Contact arrangement	Type Switch with round bezel
Knob	Maintained each 45°	Color code: B: Black (Standard)	Replace the ■ mark by the contact arrangement code	AR30PCR-3■B
	Spring/manual return ① each 45° Color other than above are available (shown on next page).	AR30PCR-6■B		
	Spring/manual return each 45°	(G: Green R: Red		AR30PCR-7■B
AF95-475	Spring return  (f) each 45°			AR30PCR-1■B
Lever	Maintained each 45°		Replace the ■ mark by the contact	AR30WCR-3■B
	Spring/manual return ① each 45°	arrangement code (shown on next page).		AR30WCR-6■B
	Spring/manual return			AR30WCR-7■B
KK02-140A	Spring return  (†) each 45°			AR30WCR-1■B
(ey	Maintained each 45°	Replace the □ mark by the key removable	Replace the ■ mark by the contact arrangement code	AR30JCR-3□■()
Spring/r return	Spring/manual return ① each 45°	position code: A, B, C, D, E F or G	(shown on next page).	AR30JCR-6□■()
9	Spring/manual return (1) each 45°	T OI G		AR30JCR-7□ <b>■</b> ()
KKD09-022	Spring return  The each 45°			AR30JCR-1E■()

#### • Key removable positions

Code	А	В	С	D	E	F	G
Removable position	45, 45,	45,45	45, 45,	45, 45,	45, 45,	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	45.
AR30JCR-3 AR30JCR-6 AR30JCR-7 AR30JCR-1	• - • -	- - -	- - -	• • - -	•	• • - -	• - • -

●: Available -: Not available

Key code No.
 Replace the ( ) mark with one of the following key code.
 A, B, C, D, E and F
 Standard key code is A.

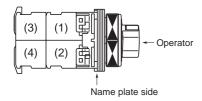
#### • Contact arrangement code (Typical example)

Contact	Contact	Contact operation						
arrange- ment	arrange- ment	Contact blo	ock	Operator	position			
	code	Mounting position	Туре	Left	Center	Right		
2NC	01F	(1)	NC					
		(2)	NC					
		_	_	_	_	_		
		_	_	_	_	_		
2NO+2NC	014	(1)	NC					
		(2)	NC					
		(3)	NO			•		
		(4)	NO	•				
4NC	01J	(1)	NC					
		(2)	NC					
		(3)	NC					
		(4)	NC					
2NO+2NC	024	(1)	NC					
		(2)	NC		•			
		(3)	NO			•		
		(4)	NO	•		•		
2NO+2NC	03C*	(1)	NC					
	(Maintained only)	(2)	NC			•		
		(3)	NO			•		
		(4)	NO	•				
2NO+2NC	044*	(1)	NC					
		(2)	NC		•			
		(3)	NO			•		
		(4)	NO	•				
2NO+2NC	054	(1)	NC					
		(2)	NC		•			
		(3)	NO			•		
		(4)	NO			•		

Contact Contact arrange-		Contact op	eration			
ment	ment	Contact block		Operator position		
	code	Mounting position	Туре	Left	Center	Right
2NO+2NC	064	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO	•		•
1NO+1NC	07F	(1)	NC			
		(2)	NO			•
		_	_	_	_	_
		_	_	_	_	_
2NO+2NC	07C*	(1)	NC			
	(Maintained only)	(2)	NC			•
		(3)	NO	•		
		(4)	NO	•		
2NO+2NC	084	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO	•		
2NO+2NC	094*	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO			•
2NO+2NC	104	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		•
		(4)	NO	•		•
2NO+2NC	11C*	(1)	NC		•	
	(Maintained only)	(2)	NC			•
		(3)	NO	•		•
		(4)	NO	•		

Notes: ●: Contact closed Blank: Contact open

#### • Position of contact block



 $<sup>\</sup>ensuremath{^\star}$  There may be some overlap in the contact when switching between notches.

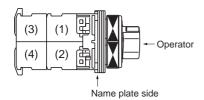
#### • Contact arrangement code (Typical example)

Contact arrangement Contact arrangement Contact operation  Contact operation  Contact plock Operator position  Contact block Operator position  Mounting position Type Left Center Right Contact block Contact block Operator position  2NO+2NC 124* (1) NC • (2) NC	nt
ment ment code Contact block Operator position  Mounting position Type Left Center Right  2NO+2NC 124* (1) NC	nt 
Mounting position Type Left Center Right 2NO+2NC 124* (1) NC	nt _
2NO+2NC 124* (1) NC •	<u></u>
	•
(2) NC -	<b>D</b>
(=)	
(3) NO •	
(4) NO ●	
2NO+2NC   134* (1) NC	
(2) NC •	
(3) NO •	D
(4) NO	D
3NO+1NC 14D* (1) NO ●	
(Maintained only) (2) NC	
(3) NO •	
(4) NO	Þ
3NO+1NC   15A* (1) NO	•
(2) NC •	
(3) NO	•
(4) NO •	
2NO+2NC 164 (1) NC •	
(2) NC •	
(3) NO •	
(4) NO •	
2NO+2NC   174* (1) NC •	
(2) NC •	
(3) NO •	
(4) NO	•
2NO+2NC 184 (1) NC •	
(2) NC •	
(3) NO	
(4) NO	

Contact Contac		Contact operation						
arrange- ment		Contact block		Operator	position			
		Mounting position	Туре	Left	Center	Right		
2NO+2NC 19	194	(1)	NC					
		(2)	NC					
		(3)	NO	•				
		(4)	NO			•		
4NO	20B	(1)	NO			•		
		(2)	NO	•				
		(3)	NO			•		
		(4)	NO	•				

Notes: ●: Contact closed Blank: Contact open

#### • Position of contact block



<sup>\*</sup> There may be some overlap in the contact when switching between notches.

## Selector Switches **AR30**

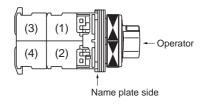
#### 4, 5-position

Operator	Contact (The following contact is only available.)	Operation	Knob color	Contact arrangement	Type Switch with round bezel
Knob	2NO+2NC 4-position maintained Color code: B: Black (Standard) Color other than Replace the ■ mark by the contact arrangement code	mark by the contact arrangement code	AR30PCR-4■B		
AF95-475		5-position maintained		(shown below)	AR30PCR-5■B
Lever	2NO+2NC	4-position maintained			AR30WCR-4■B
KK02-140A		5-position maintained			AR30WCR-5■B

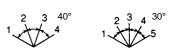
#### • Contact arrangement code

Position	Contact			Contact operation					
	arrange- ment	arrange- ment code	Contact blo	ck	Operator position				
		code	Mounting position	Туре	1 2 3 4 5				
4-position	2NO+2NC	41C* (Main-	(1)	NC	+++				
		tained only)	(2)	NC	<b>+ - - -</b>				
			(3)	NO	<b>+</b>				
			(4)	NO	<b> </b>				
5-position	2NO+2NC	51C* (Main-	(1)	NC	++++				
		tained only)	(2)	NC	-   -   -				
			(3)	NO	<b>+</b>				
			(4)	NO					

#### • Position of contact block



#### Operator position 4-position 5-position



Notes: ●: Contact closed

<sup>\*</sup> There may be some overlap in the contact when switching between notches.

#### ■ Lever type selector switches

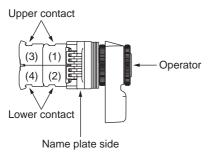
#### 2-position

<b>2-position</b> Operator	Operation	Operation Contact Type		Contact operation			
5,5014101	Ороганоп	Conduct	Typo	Contact operation  Contact arrangement	Operator position  Left Right		
	Mainte	4110	ADOULD 040	400 (0)	<b>○</b>		
ever (metal type)	Maintained	1NO	AR30HR-210	1NO (1)	Upper contact  ③		
each 90°	each 90°	1NC	AR30HR-201	1NC (1)	Upper contact ① -		
		1NO+1NC	AR30HR-211	1NO (1)	Upper contact  ③		
				1NC (2)	Lower contact ① + ②		
		2NO	AR30HR-220	1NO (1)	Upper contact  ③   ④ ④		
0				1NO (2)	Lower contact  ③		
KKD05-11	5	2NC	AR30HR-202	1NC (1)	Upper contact  ① + 2		
				1NC (2)	Lower contact ① - ②		
		2NO+2NC	AR30HR-222	1NO (1)	Upper contact  ③   ④		
				1NO (3)	3 <del> </del> •		
				1NC (2)	Lower contact  ①    ②		
				1NC (4)	① + 2		

Notes: • Contact arrangements in the table can be supplied.

Contact closed

#### • Position of contact block



## Illuminated Selector Switches **AR30**

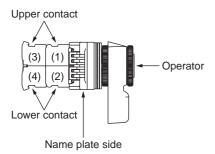
#### 3-position

		Contact operation				
	Contact	Operator position				
		anangement	Left Center Right			
ined 1NO+1NC	AR30HR-311	1NO (1)	Upper contact			
			3 <del> </del> 4			
5°		1NC (2)	Lower contact			
			① + 2			
2NO+2NC <b>AR30HR-322</b>	1NO (1)	Upper contact				
			3 <del> </del> 4			
		1NO (3)				
			3 + 4			
		1NC (2)	Lower contact			
			① + 2			
		1NC (4)	① + + ②			
			' ' '			
2NO+2NC	AR30HR-122	1NC (1)	Upper contact			
			1) ———— 2)			
0°		1NO (3)				
			3 + + • •			
		1NC (2)	Lower contact			
			1) - 2			
		1NO (4)	3 + 4			
	2NO+2NC	2NO+2NC AR30HR-322  2NO+2NC AR30HR-122	1NC (2)  2NO+2NC AR30HR-322 1NO (1)  1NO (3)  1NC (2)  1NC (4)  2NO+2NC AR30HR-122 1NC (1)  1NO (3)  1NO (3)  1NO (3)			

Notes: • Contact arrangements in the table can be supplied.

Contact closed

#### • Position of contact block



<sup>•</sup> Contact arrangements. The NO contacts at (1) and (2) use special parts. Do not interchange these parts.

#### ■ Illuminated selector switches

#### 2-position

Operator	Operation	Contact	LED lamp		Incandescent la	amp
			Transformer	Туре	Transformer	Туре
Knob	Maintained	1NO 1NC 1NO+1NC 2NO+2NC	Without	AR30PL-210  AR30PL-201  AR30PL-211  AR30PL-222  AR30PL-222	Without	AR30PL-210 <b>E</b> 4 AR30PL-201 <b>E</b> 4 AR30PL-211 <b>E</b> 4 AR30PL-222 <b>E</b> 4
	each 90°	1NO 1NC 1NO+1NC 2NO	With	AR30PL-210■3 ☐ AR30PL-201■3 ☐ AR30PL-211■3 ☐ AR30PL-220■3 ☐	With	AR30PL-210 <b>■</b> 4□ AR30PL-201 <b>■</b> 4□ AR30PL-211 <b>■</b> 4□ AR30PL-220 <b>■</b> 4□
AF95-5	Spring return	1NO 1NC 1NO+1NC 2NO	Without	AR30PL-010m3	Without	AR30PL-010■4□ AR30PL-001■4□ AR30PL-011■4□ AR30PL-020■4□
	60°	1NO 1NC 1NO+1NC 2NO	With	AR30PL-010m3	With	AR30PL-010 <b>m</b> 4  AR30PL-001 <b>m</b> 4  AR30PL-011 <b>m</b> 4  AR30PL-020 <b>m</b> 4

#### 3-position

Operator	Operation Contact		Contact	LED lamp		Incandescent la	ımp
				Transformer	Туре	Transformer	Туре
Sp	Maintained		1NO+1NC 2NO+2NC	Without	AR30PL-311■3□ AR30PL-322■3□	Without	AR30PL-311■4□ AR30PL-322■4□
	each 45°		1NO+1NC	With	AR30PL-311 <b>≡</b> 3□	With	AR30PL-311 <b>≡</b> 4□
	Spring/manual return	₾	1NO+1NC 1NO+1NC	Without With	AR30PL-611■3□ AR30PL-611■3□	Without With	AR30PL-611■4□ AR30PL-611■4□
AF95-5	each 45°	1	1NO+1NC 1NO+1NC	Without With	AR30PL-711■3□ AR30PL-711■3□	Without With	AR30PL-711■4□ AR30PL-711■4□

Note: □, ■ See page 04/88

#### **AR30**

#### • Replace the ■ mark by the following lamp voltage code

Transformer	Voltage	Code LED	Incandescent
Without	5V AC/DC	_	5
	6V DC	6	_
	6V AC	Α	_
	12V AC/DC	В	_
	15V AC/DC	С	С
	20V AC/DC	-	D
	24V AC/DC	E	E
With	100-110V AC	Н	Н
	115-127V AC	L	L
	200-220V AC	M	M
	230-254V AC	Q	Q
	350-380V AC	S	S
	400-440V AC	T	Т
	480V AC	V	V
	500-550V AC	W	W

#### • Replace the mark by the following knob color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	А

#### • Up to 4-contact of contact arrangement can be made. Available numbers of contacts are as follow.

Attailable Hallibere of contacte are as follow.								
No. of position	Operation	Without transformer	With transformer					
2-position	Maintained	6-contact	4-contact					
	Spring return	3-contact	2-contact					
3-position	Maintained	6-contact	4-contact					
	Spring/manual return	3-contact	2-contact					

#### Contact arrangement and operator position

#### 2-position

Transformer	Contact	Contact blo	ck	Operator p	osition
	arrangement	Mounting position	Туре	Left	Right
				$\bigcirc$	$\oslash$
With/without	1NO	(1)	NO	-	•
With/without	1NC	(1)	NC	•	_
Without	1NO+1NC	(1)	NO	-	•
		(2)	NC	•	_
With	1NO+1NC	(1)	NC	•	
		(2)	NO	_	•
With/without	2NO	(1)	NO	-	•
		(2)	NO	_	•
Without	2NO+2NC	(1)	NO	-	•
	*1	(2)	NC	•	_
		(3)	NO	_	•
		(4)	NC	•	_
With	2NO+2NC	(1)	NC	•	_
	*1	(2)	NC	•	_
		(3)	NO	_	•
		(4)	NO	_	•

Notes: \*1: AR30PL-2

●: Contact closed, -: Contact open

#### 3-position

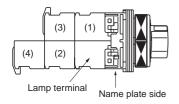
Transformer	Contact	Contact bl	ock	Opera	Operator position		
	arrangement	Mounting position	Туре	Left	Center	Right	
		pooluon		$\bigcirc$	①	$\oslash$	
Without	1NO+1NC	(1)	NO	•	-	_	
	*1	(2)	NC	-	_	•	
	1NO+1NC	(1)	NO	-	_	•	
	*2	(2)	NC	•	_	_	
	2NO+2NC	(1)	NO	•	_	_	
	*3	(2)	NC	-	_	•	
		(3)	NO	•	_	_	
		(4)	NC	_	_	•	
With	1NO+1NC	(1)	NC	-	-	•	
	*1	(2)	NO	•	_	_	
	1NO+1NC	(1)	NC	•	-	-	
	*2	(2)	NO	-	_	•	
	2NO+2NC	(1)	NC	_	-	•	
	*3	(2)	NC	-	_	•	
		(3)	NO	•	_	_	
		(4)	NO	•	_	_	

Notes: \*1: AR30PL-3, 6 \*3: AR30PL-3 \*2: AR30PL-7

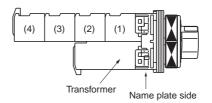
●: Contact closed, -: Contact open

#### Position of contact block

#### Without transformer



#### With transformer



#### ■ Pilot lights/standard

Lens	Transformer	LED lamp Lamp voltage	Type	Incandescent lamp Lamp voltage	Туре
Dome	Without	6V AC 6V DC 12V AC/DC 24V AC/DC	DR30D0L-A3□ DR30D0L-63□ DR30D0L-B3□ DR30D0L-E3□	5.5V AC/DC 	DR30D0L-54□ DR30D0L-C4□ DR30D0L-E4□
AF95-18	With	100–110V AC 200–220V AC	DR30D0L-H3□ DR30D0L-M3□	100–110V AC 200–220V AC	DR30D0L-H4□ DR30D0L-M4□
Dome  AF97-674	With resistor	50V DC 110V DC 220V DC	DR30D0L-FR□ DR30D0L-HR□ DR30D0L-MR□	50V DC	DR30D0L-FQ□ — —
Dome AF97-672	With resistor	Ξ	Ξ	110V DC 220V DC	DR30D0L-HQ□ DR30D0L-MQ□
Extended round	Without	6V AC 6V DC 12V AC/DC 24V AC/DC	DR30E3L-A3□ DR30E3L-63□ DR30E3L-B3□ DR30E3L-E3□	5.5V AC/DC — 15V AC/DC 24V AC/DC	DR30E3L-54□ — DR30E3L-C4□ DR30E3L-E4□
AF95-20	With	100–110V AC 200–220V AC	DR30E3L-H3□ DR30E3L-M3□	100–110V AC 200–220V AC	DR30E3L-H4□ DR30E3L-M4□
Faceted	Without	6V AC 6V DC 12V AC/DC 24V AC/DC	DR30K0L-A3  DR30K0L-63  DR30K0L-B3  DR30K0L-E3  DR30K0L-H3	5.5V AC/DC 15V AC/DC 24V AC/DC 100–110V AC	DR30K0L-54  DR30K0L-C4  DR30K0L-E4  DR30K0L-H4
Faceted  AF97-673	With resistor	50V DC 110V DC 220V DC	DR30K0L-M3□  DR30K0L-FR□ DR30K0L-HR□ DR30K0L-MR□	50V DC	DR30K0L-M4□  DR30K0L-FQ□  —
Faceted  AF97-671	With resistor	=	Ξ	110V DC 220V DC	DR30K0L-HQ□ DR30K0L-MQ□
Dome with dimmer control	Without	6V AC 6V DC 12V AC/DC 15V AC/DC 24V AC/DC	DR30D1L-A3□ DR30D1L-63□ DR30D1L-B3□ DR30D1L-C3□ DR30D1L-E3□	5.5V AC/DC — — 15V AC/DC 24V AC/DC	DR30D1L-54□ — DR30D1L-C4□ DR30D1L-E4□
KK02-144A	With	100V–110V AC 200V–220V AC	DR30D1L-H3□ DR30D1L-M3□	100V–110V AC 200V–220V AC	DR30D1L-H4□ DR30D1L-M4□

Note: ☐ See page 04/90

#### Pilot Lights **DR30**

#### ■ Pilot lights/short-body with transformer

Lens	LED lamp Lamp voltage	Туре	Incandescent la	mp Type
Dome KK02-141A	100–110V AC	DR30D0L-H9□	100–110V AC	DR30D0L-H8□
	200–220V AC	DR30D0L-M9□	200–220V AC	DR30D0L-M8□
Extended round  KK02-142A	100–110V AC	DR30E3L-H9□	100–110V AC	DR30E3L-H8□
	200–220V AC	DR30E3L-M9□	200–220V AC	DR30E3L-M8□
Faceted  KK02-143A	100–110V AC	DR30K0L-H9□	100–110V AC	DR30K0L-H8□
	200–220V AC	DR30K0L-M9□	200–220V AC	DR30K0L-M8□

#### • Lens color

Replace the  $\hfill\square$  mark by the following lens color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	Α

• Lamp voltage
Available lamp voltage are as follow.

Description	Voltage	Code		Code		
		Standard type		Short-body type		
		LED	Incandescent	LED	Incandescent	
Without transformer	5.5V AC/DC	_	54	_	_	
	6V AC	A3	_	-	_	
	6V DC	63	_	_	_	
	12V AC/DC	B3	_	_	_	
	15V AC/DC	C3	C4	_	_	
	20V AC/DC	_	D4	_	_	
	24V AC/DC	E3	E4	_	_	
With transformer	100-110V AC	H3	H4	H9	H8	
	115-127V AC	L3	L4	L9	L8	
	200-220V AC	M3	M4	M9	M8	
	230-254V AC	Q3	Q4	_	_	
	350-380V AC	S3	S4	_	_	
	400-440V AC	T3	T4	_	_	
	480V AC	V3	V4	_	_	
	500-550V AC	W3	W4	_	_	
With resistor unit	110V DC	H7	_	-	_	
With resistor	50V DC	FR	FQ	_	_	
	110V DC	HR	HQ	_	_	
	220V DC	MR	MQ	_	_	

#### ■ Pilot lights/standard

Lens	Transformer	LED unit Lamp voltage	Туре	Incandescent lamp Lamp voltage	Туре
Flush square (34mm sq. transparent lens)	Without	6V DC 15V AC/DC 24V AC/DC	DR30F4M-65□ DR30F4M-C5□ DR30F4M-E5□	5.5V AC/DC 15V AC/DC 24V AC/DC	DR30F4M-54□ DR30F4M-C4□ DR30F4M-E4□
AF97-65	With	100–110V AC 200–220V AC	DR30F4M-H5□ DR30F4M-M5□	100–110V AC 200–220V AC	DR30F4M-H4□ DR30F4M-M4□
Flush rectangular (Transparent lens)	Without	6V DC 15V AC/DC 24V AC/DC	DR30F4N-65□ DR30F4N-C5□ DR30F4N-E5□	5.5V AC/DC 15V AC/DC 24V AC/DC	DR30F4N-54□ DR30F4N-C4□ DR30F4N-E4□
AF97-61	With	100–110V AC 200–220V AC	DR30F4N-H5□ DR30F4N-M5□	100–110V AC 200–220V AC	DR30F4N-H4□ DR30F4N-M4□
Flush square (40mm sq. transparent lens)	Without	6V DC 15V AC/DC 24V AC/DC	DR30M4M-65□ DR30M4M-C5□ DR30M4M-E5□	5.5V AC/DC 15V AC/DC 24V AC/DC	DR30M4M-54□ DR30M4M-C4□ DR30M4M-E4□
AF97-63	With	100–110V AC 200–220V AC	DR30M4M-H5□ DR30M4M-M5□	100–110V AC 200–220V AC	DR30M4M-H4□ DR30M4M-M4□

#### • Color plate

Replace the  $\hfill\square$  mark by the following color plate color code

Color	Green	Red	White	Blue*	Yellow	Orange
Code	G	R	W	S	Υ	Α

Note: \* Incandescent lamp only

#### • Lamp voltage

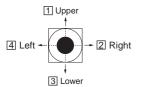
Available lamp voltage are as follow.

Description	Voltage	Code		
		Standard type		
		LED	Incandescent	
Without transformer	5.5V AC/DC	_	54	
	6V AC	A5	_	
	6V DC	65	_	
	12V AC	25	_	
	12V AC/DC	B5	_	
	15V AC/DC	C5	C4	
	20V AC/DC	_	D4	
	24V AC/DC	E5	E4	
With transformer	100-110V AC	H5	H4	
	115-127V AC	L5	L4	
	200-220V AC	M5	M4	
	230-254V AC	Q5	Q4	
	350-380V AC	S5	S4	
	400-440V AC	T5	T4	
	480V AC	V5	V4	
	500-550V AC	W5	W4	
With resistor unit	110V DC	HE	_	

#### ■ Joy stick selector switches

Handle	Terminal	Operating directions	Contact	Туре			
			arrangement	Manual return	Spring return		
Ball type without lock	Screw	<u> </u>	1NO X 2	AR30A0N-A0A0B	AR30A5N-A0A0B		
			1NO + 1NC X 2	AR30A0N-1010B	AR30A5N-1010B		
		$\uparrow$	1NO X 4	AR30A0N-AAAAB	AR30A5N-AAAAB		
		<b>←</b>	1NO + 1NC X 4	AR30A0N-1111B	AR30A5N-1111B		
	Solder/tab	<u> </u>	1NO + 1NC X 2	AR30A0H-1010B	AR30A5H-1010B		
			2NO + 2NC X 2	AR30A0H-2020B	AR30A5H-2020B		
		<b>1</b>	1NO + 1NC X 4	AR30A0H-1111B	AR30A5H-1111B		
AF97-48		$\longleftrightarrow \bigvee$	2NO + 2NC X 4	AR30A0H-2222B	AR30A5H-2222B		
Ball type with lock	Screw	<b>1</b>	1NO X 2	AR30A1N-A0A0B	AR30A6N-A0A0B		
		V	1NO + 1NC X 2	AR30A1N-1010B	AR30A6N-1010B		
		<b>1</b>	1NO X 4	AR30A1N-AAAAB	AR30A6N-AAAAB		
		$\longleftrightarrow \bigvee$	1NO + 1NC X 4	AR30A1N-1111B	AR30A6N-1111B		
	Solder/tab	1	1NO + 1NC X 2	AR30A1H-1010B	AR30A6H-1010B		
0			2NO + 2NC X 2	AR30A1H-2020B	AR30A6H-2020B		
		<b>1</b>	1NO + 1NC X 4	AR30A1H-1111B	AR30A6H-1111B		
AF97-44		<	2NO + 2NC X 4	AR30A1H-2222B	AR30A6H-2222B		
Rubber cap type	Screw	<b>1</b>	1NO X 2	AR30A2N-A0A0B	AR30A7N-A0A0B		
without lock		V	1NO + 1NC X 2	AR30A2N-1010B	AR30A7N-1010B		
		<b>1</b>	1NO X 4	AR30A2N-AAAAB	AR30A7N-AAAAB		
		$\longleftrightarrow$	1NO + 1NC X 4	AR30A2N-1111B	AR30A7N-1111B		
	Solder/tab	1	1NO + 1NC X 2	AR30A2H-1010B	AR30A7H-1010B		
			2NO + 2NC X 2	AR30A2H-2020B	AR30A7H-2020B		
		<b>1</b>	1NO + 1NC X 4	AR30A2H-1111B	AR30A7H-1111B		
AF97-57		<b>←</b>	2NO + 2NC X 4	AR30A2H-2222B	AR30A7H-2222B		

- Operating direction
   Directions other than those shown in the table above can be provided.
   For types AR30A□N-①②③④B, designate the
- contact arrangement codes for the necessary operating directions (①: Upper,②: Right, ③: Left). Designate "0" for unnecessary directions.



#### **Contact arrangement**

<u>~</u>								
Contact arrangement		-	1NO	1NC	1NO+1NC	2NO	2NC	2NO+2NC
Manual return Spring return	Screw	0	Α	В	1	D	E	_
	Solder/Tab	0	_	-	1	_	_	2

• Spring/manual return are also available, contact FUJI .

#### **■** Buzzers

Sound	Description	Transformer	Operating voltage	Туре
Electronic sound  KKD08-058	LED operation indicator (Red)     Intermittent/continuous sound selection     Sound level: 90dB (0.1m)     70dB (1m)	Without	6V AC	DR30B5-AB
			6V DC	DR30B5-6B
			12 to 24V AC/DC	DR30B5-EB
			35 to 48V AC/DC	DR30B5-FB
		With	100 to 110V AC	DR30B5-HB
			200 to 220V AC	DR30B5-MB
		With resistor unit	100 to 110V DC	DR30B5-1B
Electronic sound (economy)	• Sound level: 90dB (0.1m) 70dB (1m)	Without	6V DC	DR30B6-6B
			24V AC	DR30B6-GB
			24V DC	DR30B6-EB
		With	100 to 110V AC	DR30B6-HB
			200 to 220V AC	DR30B6-MB
KK02-145A				
Magnetic sound	Sound level: 90dB (0.1m)	Without	100 to 110V AC	DR30B0-HB
AF96-378	70dB (1m)		200 to 220V AC	DR30B0-MB
Electronic sound (IP54)	Intermittent/continuous sound selection     Sound level: 80dB (0.1m)     60dB (1m)	Without	6V AC	DR30B8-AB
			6V DC	DR30B8-6B
			12 to 24V AC/DC	DR30B8-EB
			35 to 48V AC/DC	DR30B8-FB
		With	100 to 110V AC	DR30B8-HB
			200 to 220V AC	DR30B8-MB
AF96-245		With resistor unit	100 to 110V DC	DR30B8-1B

Notes: • Intermittent/continuous sound selection (DR30B5, B8)
See the "Short-circuit terminal" in the dimensions diagram on the 04/104.
page, and select as follows:
• Short-circuit terminal mounted → Intermittent sound
• Short-circuit terminal not mounted → Continuous sound

## Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30 Dimensions

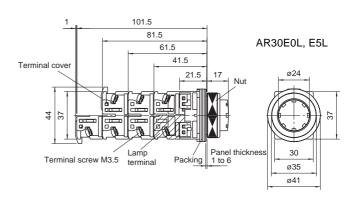
- **■** Dimensions, mm
- Illuminated pushbuttons

#### Extended

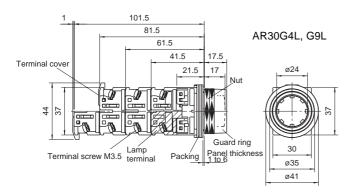
With transformer

# Terminal screw M3.5 Terminal screw M3.5 1 101.5 81.5 61.5 17 Nut 924 Panel thickness 1 to 6 935 941

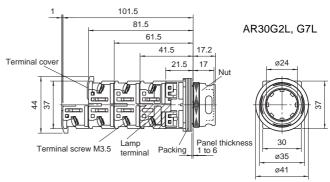
#### Without transformer



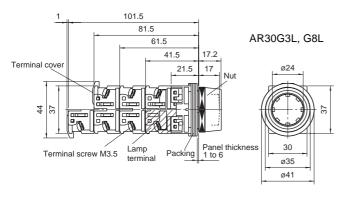
#### Extended with transparent full guard (24mm dia.)



#### Extended with full guard (24mm dia. with openings)



#### Extended with full guard (24mm dia.)



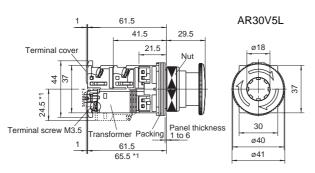
Note: \*1 Except for the types 110V AC, 127V AC and 220V AC.

# **■** Dimensions, mm

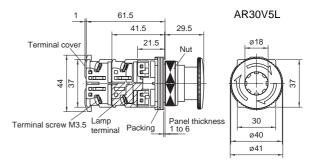
# • Illuminated pushbuttons

Push-lock, turn-reset (40mm dia. with white arrow)

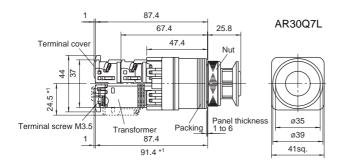
With transformer



# Without transformer

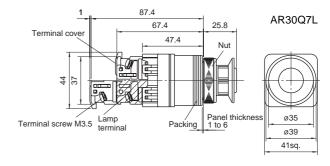


# **Push-pull**With transformer



# Note: \*1 Except for the types 110V AC, 127V AC and 220V AC.

# Without transformer



# Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30

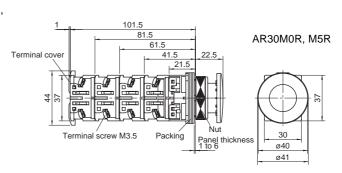
# Dimensions

- **■** Dimensions, mm
- Pushbuttons

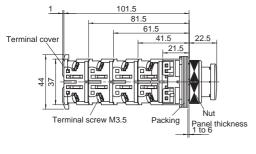
# Flush/Extended

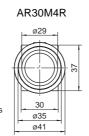
# AR30F0R, F5R, FAR, FBR, E0R, E5R, EAR, EBR Terminal cover 41.5 17(Extended) 11.5(Flush) 024 Terminal screw M3.5 Packing Panel thickness 1 to 6

# Mushroom (40mm dia.)

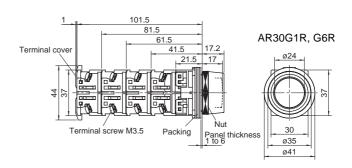


# Mushroom (29mm dia.)

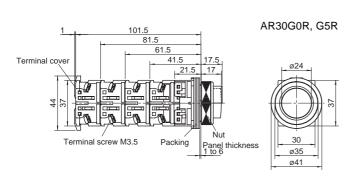




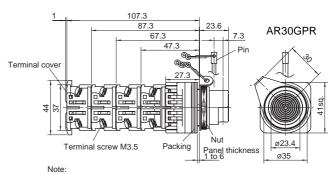
# Extended with full guard (24mm dia.)



# Extended with half guard

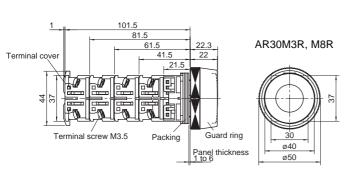


# Pin lock

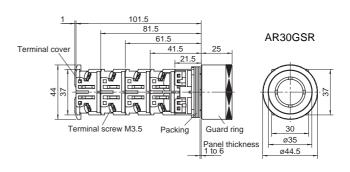


# The enclosed pin can be inserted to lock the pushbutton in a pushed or not pushed state.

# Mushroom with full guard (40mm dia.)



# Mushroom with full guard (35mm dia. metal nut)

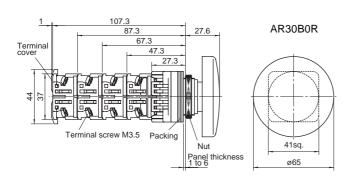


Fuji Electric FA Components & Systems Co., Ltd./D & C Catalog Information subject to change without notice

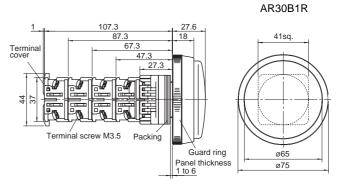
# **■** Dimensions, mm

# Pushbuttons

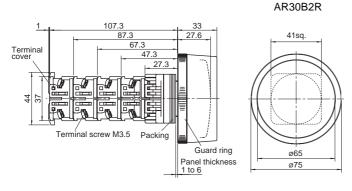
# Giant



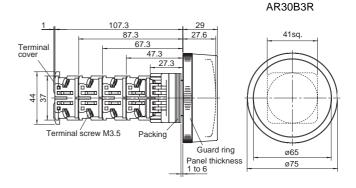
# Giant with guard



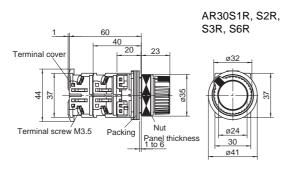
# Giant with full guard



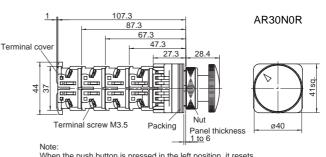
# Giant with full guard



# Pushbutton with selector ring (2-position)



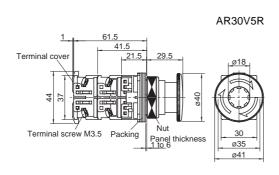
# Push, turn-lock



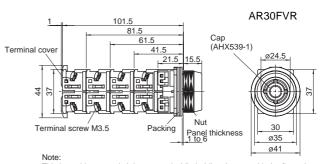
When the push button is pressed in the left position, it resets automatically (momentary operation).

When pressed and turned to the right it locks, and to the left it resets.

# Push-lock, turn-reset (40mm dia. with white arrow)



# **Emergency operating cap**



This is pushbutton switch is operated while holding the cap with the fingertips. The cap (AHX539) can be exchanged.

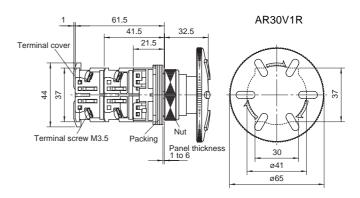
# Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30 Dimensions

- **■** Dimensions, mm
- Emergency stop pushbuttons

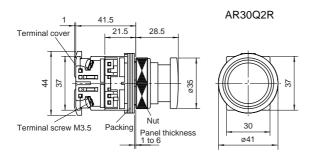
Push-lock, turn-reset (40mm dia.)

# Terminal cover Terminal screw M3.5 Packing Panel thickness 1 to 6 Note: \* AR30V2R type

# Push-lock, turn-reset (65mm dia. with white allow)



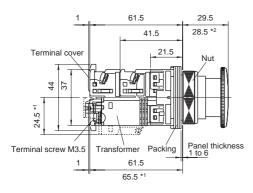
# Push-lock, pull-reset (35mm dia.)

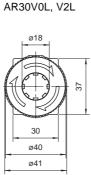


# • Emergency stop illuminated pushbuttons

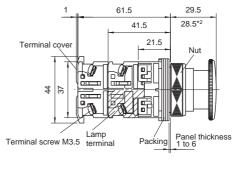
# Push-lock, turn-reset (40mm dia.)

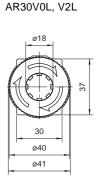
With transformer





# Without transformer



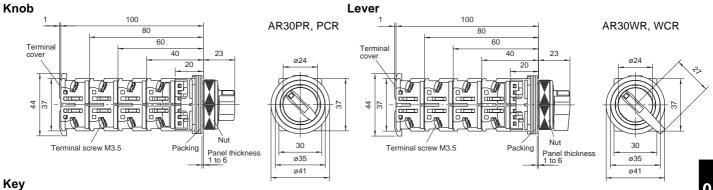


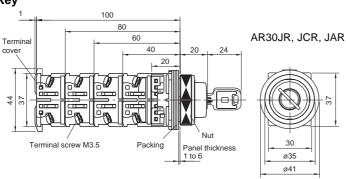
Notes: \*1 Except for the types 110V AC, 127V AC and 220V AC.

\*2 AR30V2L type

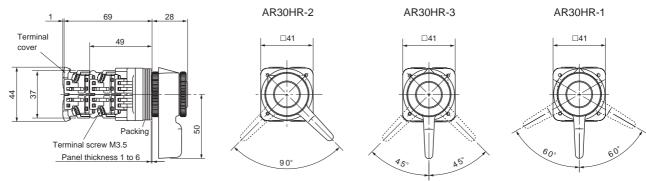
# **■** Dimensions, mm

# Selector switches





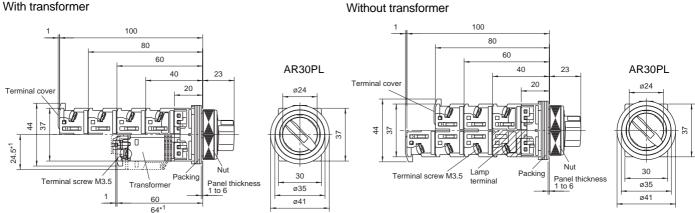
# • Lever type selector switches



# • Illuminated selector switches

# With transformer

Knob



Notes: \*1 Except for the types 110V AC, 127V AC and 220V AC.

# Pushbuttons/Selectors/Pilot Lights/Buzzers

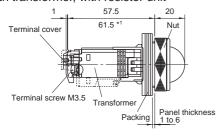
# AR30 and DR30 **Dimensions**

# **■** Dimensions, mm

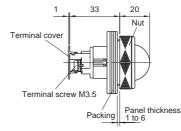
# Pilot lights

# Dome

With transformer, with resistor unit

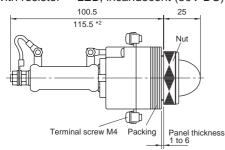


Without transformer

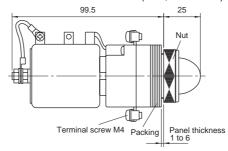


DR30D0L ø24

LED, incandecent (50V DC) With resistor

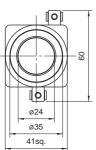


With resistor Incandescent (110, 220V DC)

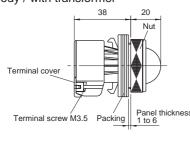




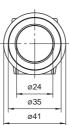
ø35 ø41



Short-body / with transformer

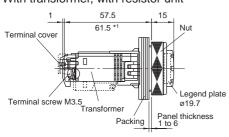


DR30D0L

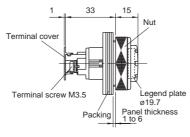


# **Extended**

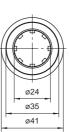
With transformer, with resistor unit



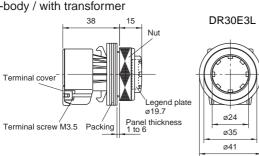
Without transformer



DR30E3L



# Short-body / with transformer



\*1 Except for the types 110V AC, 127V AC and 220V AC. Notes:

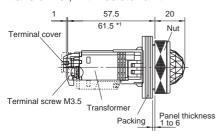
\*2 Incandecent (50V DC) type only

# **■** Dimensions, mm

# Pilot lights

# Faceted

With transformer, with resistor unit



Without transformer

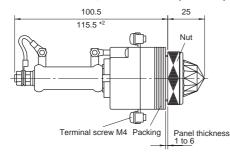
Terminal cover

Terminal screw M3.5

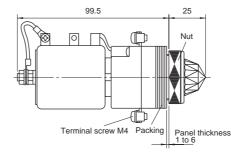
Packing Panel thickness 1 to 6

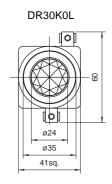


With resistor LED, incandescent (50V DC)

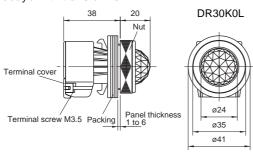


With resistor LED, incandescent (110, 220V DC)

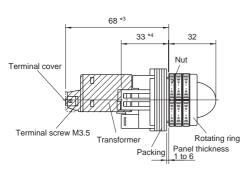


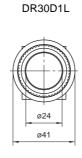


# Short-body / with transformer



# Dome with dimmer control





- Notes: \*1 Except for the types 110V AC, 127V AC and 220V AC.
  - \*2 Incandecent (50V DC) type only
  - \*3 With transformer, with resistor unit type only
  - \*4 For without transformer types, add 1 mm when mounting the terminal cover.

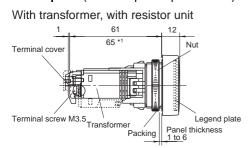
# Pushbuttons/Selectors/Pilot Lights/Buzzers

# AR30 and DR30 Dimensions

# **■** Dimensions, mm

# Pilot lights

# Flush square (34mm sq. transparent lens)



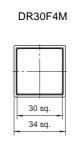
Without transformer

Terminal cover

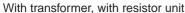
Terminal screw M3.5

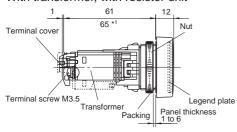
Packing

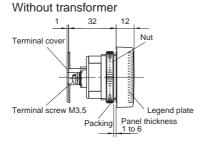
Panel thickness
1 to 6

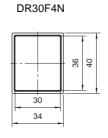


# Flush rectangular (Transparent lens)



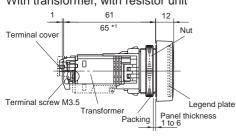


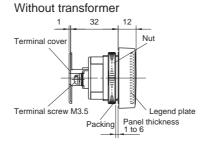


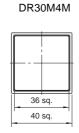


# Flush square (40mm sq. transparent lens)

With transformer, with resistor unit







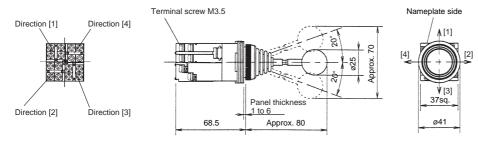
Note: \*1 Except for the types 110V AC, 127V AC and 220V AC.

# **■** Dimensions, mm

# • Joy stick selector switches

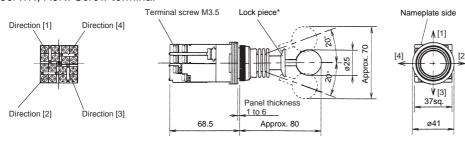
# Ball type (without lock)

AR30A0N, A5N: Screw terminal



# Ball type with lock

AR30A1N, A6N: Screw terminal

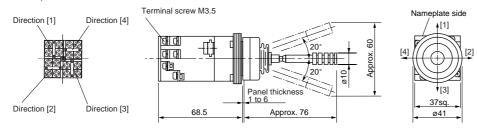


Notes \* The contact arrangement is operable in the designated direction by pulling the lock piece in the central position with the fingers. The lock piece will return automatically and locks when the lock piece is released in the central position.

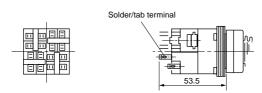
The lock piece locks in the central position only.

# Rubber cap type (without lock)

AR30A2N, A7N: Screw terminal



# Solder/tab terminal: AR30A □ H



# Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30

# Dimensions

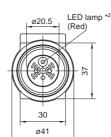
# **■** Dimensions, mm

#### Buzzers

# Electronic sound With transformer

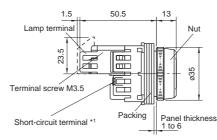
Transformer 65 13 Nut

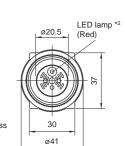
Terminal screw M3.5 Packing Panel thickness



DR30B5, B6

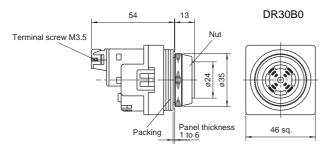
# Without transformer





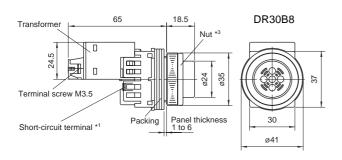
DR30B5, B6

# Magnetic sound

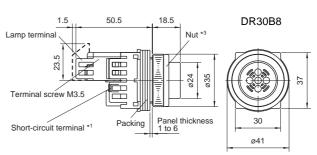


# **Electronic sound (IP54)**

# With transformer



# Without transformer



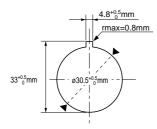
Notes: \*1 There are no short-circuit terminals with DR30B6. (Continuous sound only)

- \*2 There are no LED lamps with DR30B6.
- \*3 The nut and cap are united with DR30B8.

# Notes on use

#### ■ Panel cutout hole

Fig. 1 Panel cutout hole dimensions, mm

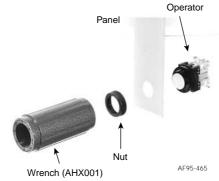


Note: If key-washer or legend plate are not used, 4.8mm-wide. location holes shown in Fig. 1 need not be cutout.

#### ■ Mounting operator to panel

1. Pushbutton with a round bezel (ordinary mounting) Insert the operator into the cutout hole from the back of the panel, and tighten the nut with the AHX001 wrench from the front of the panel to secure the operator as shown in Fig.2.

Fig. 2 Pushbutton with a round bezel

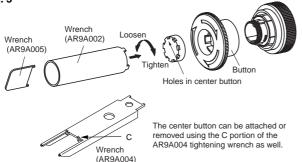


Note: Recommended tightening torque is from 1.5 to 2N-m.

# 2. AR30V0R, V0L, V2R, V2L, V5R, V5L

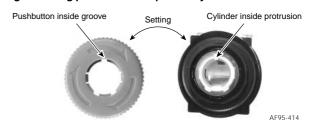
- (1) The button is removed after loosening the center button by inserting the end of the AR9A002 tightening wrench or the AR9A005 wrench (enclosed with pushbutton) into the holes in the center button and turning counterclockwise, as shown in Fig.3.
- (2) Attach the operator in the same manner as described in step 1.

Fig. 3



Insert the operator into the cutout hole from the back of the panel, and as shown in Fig.4, insert the pushbutton into the operator cylinder while aligning the grooves inside the pushbutton with the protrusions on the operator.

Fig. 4 Setting pushbutton to operator cylinder



# 3. AR30WR, WCR

- (1) As shown in the following figure, insert the tip of a flathead screwdriver into the selector tip groove. Rotate the screwdriver in the direction indicated by the arrow until the selector tip rises, and draw out the knob.
- (2) Attach the operator in the same manner as described in step 1.
- (3) Insert the knob, with the selector tip in the floated state, into the original position of the rotation tube, and push the selector tip into place.



# 4. AR30M0R, M4R, M5R, B0R, Q7L

- (1) Loosen the button by hand.
- (2) Attach the operator in the same manner as described in step 1.
- (3) Screw in the button by hand, making sure that the button is screwed in all the way. (Recommended tightening torque: 0.3 to 0.5 N•m)

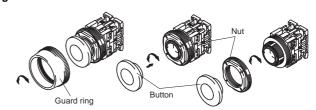


# 5. AR30M3R, M8R, B1R, B2R and B3R

The outer circumference of the nut is threaded, so be careful not to cut your hand on it.

- (1) Loosen and remove the guard ring by hand.
- (2) Loosen and remove the button and nut by hand.
- (3) Insert the operator into the cutout hole from the back of the panel, and tighten the nut to secure it in place.
  (Recommended tightening torque: 0.3 to 0.5 N•m)
- (4) Screw in the button by hand, making sure that it is screwed in all the way.
- (Recommended tightening torque: 0.3 to 0.5 N•m)
- (5) Loosen and remove the guard ring by hand. (Recommended tightening torque: 1.5 to 2.5 N•m)

Fig. 7

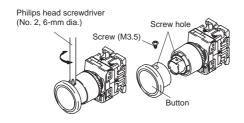


# AR30 and DR30 Notes on use

# 6. AR30N0R, V1R, Q2R

- Loosen and remove the screw on the side of the button, taking care not to loosen the screw.
- (2) Attach the operator in the same manner as described in step 1.
- (3) Attach and secure the button in place with the screw, making sure that the head of the screw does not protrude from the side.
- (4) Recommended tightening torque: NOR, V1R 0.5 to 1.0N•m Q2R 0.3 to 0.5N•m

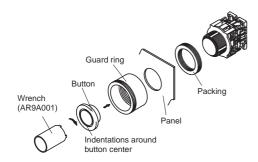
Fig. 8



#### **7. AR30GSR**

- (1) Insert the tips of the AR9A001 wrench into the indentations around the button center, and turn the wrench to loosen and remove the button.
- (2) Loosen and remove the guard ring by hand.
- (3) Insert the switch operator into the cutout hole from the back of the panel, and secure it with the guard ring from the front of the panel. (Recommended tightening torque: 1.5 to 2.5 N•m)
- (4) Attach and secure the button with the AR9A001 wrench. (Recommended tightening torque: 0.3 to 0.5 N•m)

Fig. 9

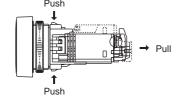


# 8. DR30F4M, F4N, M4M

Insert the pilot lights from the front of the panel and fix it with the AHX536 tightening wrench from the back of the panel.

- (1) Recommended tightening torque: 1 to 1.5N•m
- (2) For pilot lights with transformers and resistance units, remove the transformer or resistance unit in advance. (Fig.10)

Fig. 10

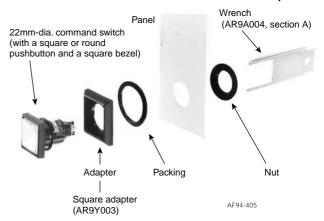


# Mounting a 22mm-dia. command switch with a square button and a square bezel, or with a round button and a square bezel, to a panel cutout hole for a 30mm-dia. command switch using an adapter

As shown in Fig. 11, mount an adapter and packing onto a 22mm-dia. command switch (AR22, DR22 series) with a square button and a square bezel or one with a round button and a square bezel. Then, insert the switch operator into the panel cutout hole from the front of the panel. Use AR9A004 wrench section A to tighten the locking nut from behind the panel to secure the switch.

Use the adapter accessory nut for this purpose. Do not use the command switch accessory nut.

Fig. 11 Command switch with a square button and a square bezel, and command switch with a round button and a square bezel



Note: • Recommended tightening torque is from 1 to 1.5N•m.

Panel thickness: 2.5 to 5mm

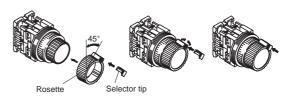
This adapter can be used with the following 22mm-dia. Command switches:

- AR22F0M, F5M, E0M, E5M, F0P, F5P, E0P, E5P, M4P
- AR22F0S, F5S, E0S, E5S, F0Y, F5Y, E0Y, E5Y, M4Y
- AR22PY, PCY, WY, WCY, RY, RCY, JY, JCY, PP
- DR22F3M, F4M, F5M, E3M, E3P

# 10. AR30S1R, S2R, S3R, S6R

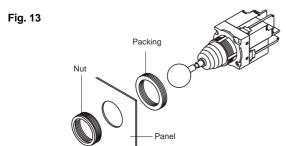
- (1) Attach the operator in the same manner as described in step 1.
- (2) Attach the rosette assembly to the operator.
- (3) Pressing the rosette from the directions indicated by the arrows, insert the selector tip in the groove.
- (4) Make sure that the selector tip is inserted completely.
- (5) To remove the rosette, use a small flathead screwdriver to remove the selector tip as described in step 3, and then remove the rosette.

Fig. 12



# 11. AR30A (joy stick selector)

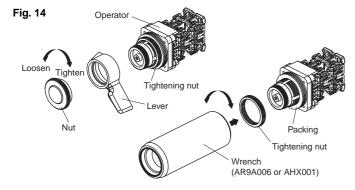
- (1) Remove the clamp ring as shown in the following figure.
- (2) Attach the operator in the same manner as described in step 1. Note: Even if a lock type is used, remove the clamp ring in the same manner.



# 12. AR30HR

- (1) The lever is removed after loosening the nut by hand.
- (2) Loosen and remove the tightening nut by hand.
- (3) Insert the operator into the cutout hole from the back of the panel, and tighten the tightening nut with the AHX001 wrench or AR9A006 wrench from the front of panel to secure the operator as shown in Fig. 14.

  (Recommended tightening torque: 1.5 to 2.5N m)
- (4) Attach the lever assembly to the operator.
- (5) Screw in the nut by hand, making sure that it is screwed in all the way.



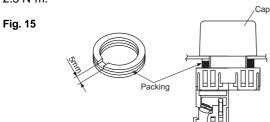
### ■ Water-proof and dust-proof cap

Applicable type: Water-proof cap AHX052

Dust-proof cap AHX032, 033, 034, 113, 157

When attached to the panel in combination with a water-proof or dust-proof cap, the water-proof cap or dust-proof cap may sink downward and prevent the depressed button from returning to its original position.

As shown in the following figure, cut an approximately 5-mm air outlet in the portion of the ring packing touching the panel surface. Also, reduce the number of packing rings by one below the standard number. The clamp ring tightening torque is 1.5 to 2.5 N•m.



# Degree of protection

The water-proof cap or dust-proof cap seals the panel surface to provide IP65 protection.

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# ■ Applicable panel thickness

The AR30/DR30 series switches are mountable to panels with the thickness given in the table below.

Switch mounting condition		Applicable panel thickness
Without accessories		1 to 6mm
With accessories AR9Y003 adapter		2.5 to 5mm

# ■ Using accessory ring-packings

Use the required number of ring-packings (1.6mm-thick, 4 pieces, resin mold).

Table below is a guideline for using the packings. If a locking nut or legend plate is used, the thickness must be counted as an additional panel thickness.

# Panel thickness vs. number of packings (reference data)

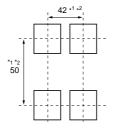
Effective panel thickness including lock-ring and legend plate thicknesses	Number of packings
1.0mm to less than 2.0mm	
2.0mm to less than 3.6mm	
3.6mm to less than 5.0mm	
5.0mm to less than 6.0mm	

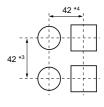
# ■ Minimum mounting space, mm

The minimum mounting spaces required for AR30/DR30 command switches are given below. (Fig. 16)

# Fig. 16

- Illuminated pushbutton and pushbutton
- Pilot light
- Emergency stop illuminated pushbutton and emergency stop pushbutton
- Illuminated and non-illuminated selectors





Notes: \*1 AR30M3R, M8R, GSR: 55mm \*2 AR30B□R, GPR, V1R: 80mm

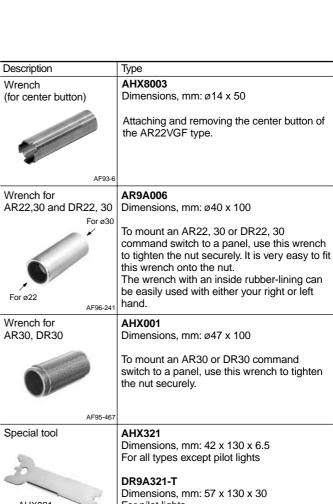
Туре	*3	*4
F4M	34	34
F4N (Vertical lengthwise mounting)	40	34
(Horizontal lengthwise mounting)	34	40
M4M	40	40
Pilot lights short-body with transformer	50	42
Pilot lights with resistor	80	42

Other items are the same as for the AR22 and DR22 series, see page 04/50 to 04/54.

# Pushbuttons/Selectors/Pilot Lights

# AR22/DR22 and AR30/DR30 **Accessories**

■ Accessories	Typo
Description	Туре
Wrench	AR9A004 Dimensions, mm: 30 x 100 x 6.5
	A <b>C</b>
	Remarks Section "A" Use this section to tighten the nut for mounting the operator on a panel.
	Section "B" Use this section to tighten or remove the lens. Applicable type: AR22F0L, F5L, E0L, E5L, F0P, F5P, E0P, E5P AR22G1L, G2L, G4L, G6L, G7L, G9L DR22E3L, E3P AR30E0L, E5L, G2L, G3L, G4L, G7L, G8L, G9L DR30E3L
KK02-261	Section "C" Fit the tabs on the section "C" in the center button, and turn the wrench to tighten or remove the button. Applicable type: AR22V (except V4R, VG type)
Wrench for AR22, DR22	AR9A701 Dimensions, mm: ø28 x 70
ANZZ, DNZZ	Application: AR22, DR22 nut tightening
Wrench	AHX536 Dimensions, mm: ø32 x 76
	Application: DR30F4M, F4N, M4M, N1, N2 nut tightening
KK02-097A	AD0.4004
Wrench	AR9A001 Dimensions, mm: Ø22 x 35
KK02-098A	Application: AR22, DR22 round-type lens tightening AR22E0M, E5M oil-proof cap tightening AR30, DR30 round-type lens tightening AR30GSR button tightening
Wrench (for center button)	AR9A002 Dimensions, mm: Ø18 x 60
	Application: AR22V center button tightening (except V4R, VG type) AR30V center button tightening (except V1R type)
Wrench	AHX701 Dimensions, mm: ø25 x 72.5
	Application: DR22N, AR22VG nut tightening







For pilot lights



• This tool is used to remove contact blocks and transformer units.



• The AHX321 can remove round color lens of switches.



Wrench/Lamp changer

**AHX702** Dimensions, mm: ø36 x 55

illuminated pushbuttons

Use this wrench to tighten or remove the lens and lamp.



Lens of DR22D0L, K0L and DR30D0L, K0L Incandescent lamp of pilot lights and

SI-1030

Lamp changer **AHX790** Dimensions, mm: ø14 x 55



For E12/15 lamp

For BA9S/13 lamp

- Use this rubber wrench for mounting or removing lamps from pilot lights and illuminated pushbutton switches.
- This wrench can be used for both LED and incandescent lamps. • One end is for the BA9S/13 lamp, and the
- other is for the E12/15 lamp (for use with 30mm dia. pilot lights with resistor). • For 30mm dia. pilot lights with resistor, this

AF95-22

tool can also be used to attach or remove incandescent lamps.

AF03-5

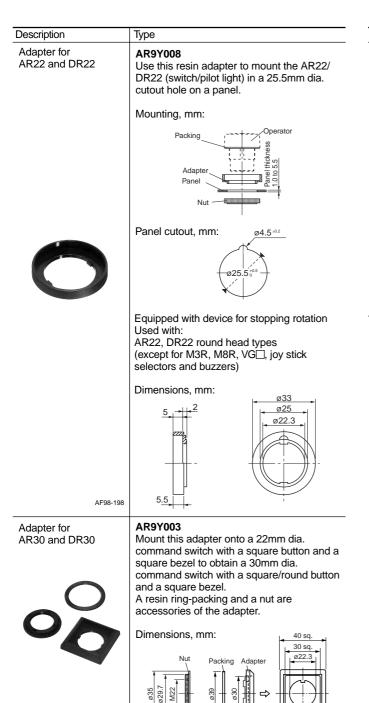
# **Accessories**

Description Type		Description Type		
Protection cover	AR9E760	Key washer	AR9Y715	
	This cover protects against accidental operation.	for AR22, DR22	Use this metal washer when securing a operator in a 22.3mm dia. panel cutout hole.	
	The cover lid is returned home with a spring		Dimensions, mm:	
	force. (Packing is provided)		2.9	
	Used with: AR22F0L, F5L, E0L, E5L, F0M, F5M, E0M, E5M, F0P, F5P, E0P, E5P AR22F0R, F5R, E0R, E5R, F0S, F5S, E0S, E5S,		Q Z Z A A B	
	E0Y, E5Y, F0Y, F5Y, FAR, FBR, EAR, EBR		ø22.1 30 sq.	
	Dimensions, mm:		When the periphery of the panel cutout	
AF95-29	20.8		has a hole to stop rotation, use with side A contacting the panel (except for Joy stick selector types).  • Even when the periphery of the panel cutout does not have a hole to stop rotation, if used with side B contacting the panel it can serve as a washer for	
			eliminating play (except for Joy stick	
Cover for preventing operating errors with	AR9E538 Inadvertent operation can be prevented by	AF95-25	selector types).	
30mm dia. types	fitting a transparent cover with chain in the clamp ring.	Key washer for ø30	Use this metal washer when securing an operator in a 30.5mm dia. panel cutout hole.	
	Used with: AR30F0R, F5R, E0R, E5R, E0L, E5L		Dimension, mm:	
	Dimensions, mm:		In .	
	Ring: ø10  Cover  Length: Approx. 45mm		ø30.2 ø37	
		SC-1016		
		Operator base cover	AR9Y002	
	Clamp ring mounting portion		Attach this cover to the operator base of a pushbutton switch with only one contact	
			block (1NO or 1NC) to protect against dust.	
AF91-671	Thickness: 1mm	Sec. A.		
Cover for preventing operating errors with	AHX408 This is a metallic cover for preventing	AF95-26		
30mm dia. types	inadvertent operation.	Adapter for	AR9Y718	
	Used with: AR30F0R, F5R Dimensions, mm:	AR22, DR22	Use this resin adapter to mount the AR22/ DR22 (switch/pilot light) in a 25.5mm dia. cutout hole on a panel.	
	50.5		Dimensions, mm:	
	When attaching the cover to a vertical panel, if you attach it so that the portion indicated by an "A" is at the upper right, the stopper causes the cover to stop above the push button to		0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	
	halt further rotation.	.AF95-28	- <del>-    4</del> 1.3	
	I to the second of the second	00 20	1	

The material is steel (zinc plated).

# Pushbuttons/Selectors/Pilot Lights

# AR22/DR22 and AR30/DR30 **Accessories**



Note: Panel thickness: 2.5 to 5mm

Description

Round-frame adapter for 30mm dia. types

AR9Y004

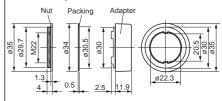
Type

By using this adapter in combination with the round type 22mm dia. command switch, the 22mm dia. command switch can be used as a 30mm dia. command switch/ round frame type.

Used with:

AR22, DR22 round types (except for M3R, M8R, VG□, Joy stick selectors, buzzers)

Dimensions, mm



Note: Panel thickness: 2.5 to 5mm KK02-100A

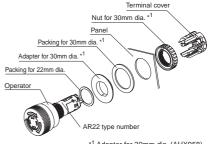
Round-frame adapter for 30mm dia. type VG

**AHX958** 

Using this adapter in combination with model AR22VG (22mm dia.) allows mounting to a 30.5mm panel cutout hole.

The attachment method is as follows.

- The washer and nut (22.3mm dia.) originally attached to the operator will not be used, so remove them.
- Attach the 22mm dia. packing (included), the 30mm dia. adapter and the 30mm dia. packing to the operator in that order, and insert the operator into the cutout hole.
- From the back of the panel cutout hole, fasten the 30mm-dia. nut using the AHX701 wrench. The correct tightening torque is 1 to 1.5 N·m.

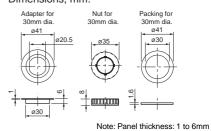


\*1 Adapter for 30mm dia. (AHX958)

# Panel cutout, mm:

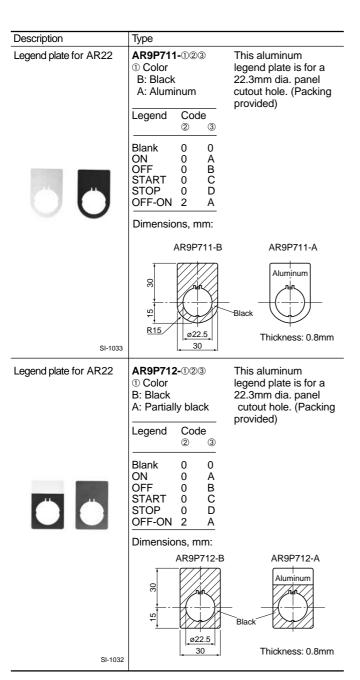


# Dimensions, mm:



AF93-4

AF95-416



Description	Туре			
Legend plate for AR22	AR9P713-①②③ ① Color B: Black A: Partially black			This aluminum legend plate is for a 22.3mm dia. panel cutout hole. (Packing provided)
	Legend	Coc ②	le ③	providedy
	Blank ON OFF START STOP OFF-ON		0 A B C D A	
	Dimension	ons, n	nm:	
	Ai	R9P7	13-B	AR9P713-A
AF95-114	15 30	ø22.:	5	Aluminum  Black  Thickness: 0.8mm
74.00 111				



KK02-265A

Legend plate for AR22

emergency stop

AR9P719-112 This aluminum legend Plate color: Yellow Letter color: Black

plate is for a 22.3mm dia. panel cutout hole. (Packing provided)

Legena	Code	Letter	
	1	2	hight
Blank	0	0	_
EMERGENCY	5	Α	7mm
STOP	5	В	13mm
EMERGENCY OFF	5	С	13mm

Dimensions, mm:

AR9P719

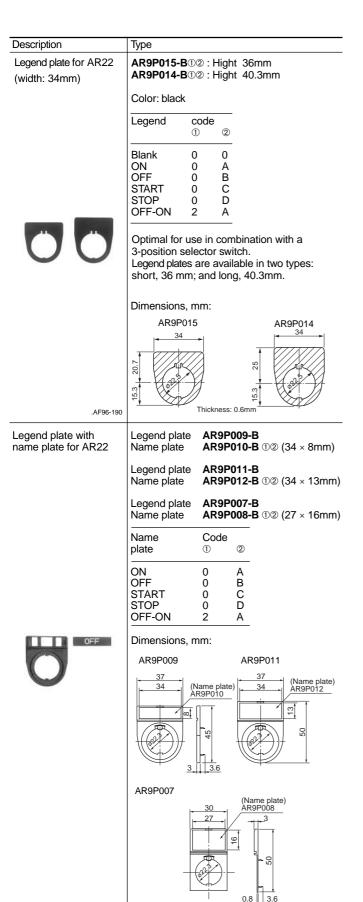


Thickness: 0.8mm

Note: Engraving for making letters is not available.

# Pushbuttons/Selectors/Pilot Lights

# AR22/DR22 and AR30/DR30 Accessories



Description	Type		
egend plate for AR30	AHX177-①②③④ ① Material and color		This legend plate for a 30.5mm dia. panel cutout hole
	Code	Material	Color
	S	Brass	Silver



② SizeH: StandardS: Short size

В

Legend	Code ③	4
Blank ON OFF START STOP OFF-ON	0 0 0 0 0 2	0 A B C D

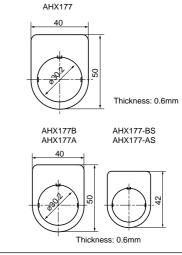
Aluminum

Black

Aluminum

GFE ON AF89-466

Dimensions, mm:



AF87-49

Legend plate for AR30 emergency stop

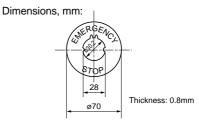
AHX720-①②
Plate color: Yellow

Letter color: Black

This aluminum legend plate is for a 30.5mm dia. panel cutout hole.



Legend	Code		Letter
	1	2	hight
Blank	0	0	-
EMERGENCY STOP	5	Α	7mm

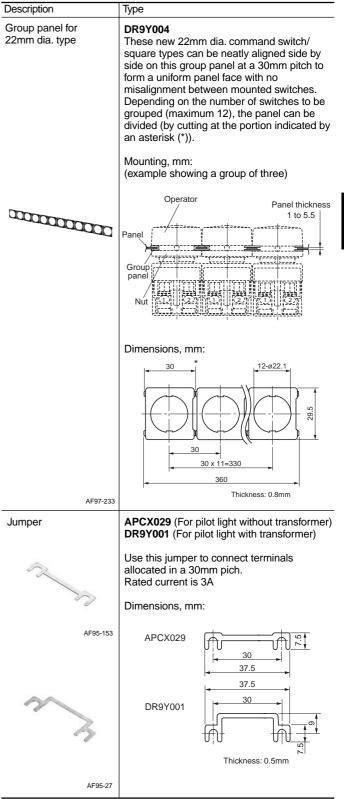


Note: Engraving for making letters is not available.

.AF96-190

# Pushbuttons/Selectors/Pilot Lights AR22/DR22 and AR30/DR30 **Accessories**

Description	Туре		
Panel plug for AR22 and DR22	Round: AHX725-B Black AHX725-H Gray		
	Square: AHX726-B Black AHX726-H Gray		
	Dimensions, mm: Ø29.5 x 17 (AHX725) 29.5 sq. x 17 (AHX726) Use this plug to cover up unused panel		
SI-1027	cutout holes. For oil proof usage, use together with packing (AR9Y730) and a nut (AR9R744).		
Panel plug for AR30 and DR30	AHX004		
	Color: Silver (metal) This plug is used to cover up unused panel cutout hole.		
	Dimensions, mm:		
	Panel plug Packing M5  Packing M5  1.6  20		
T-1993			



# Pushbuttons/Selectors/Pilot Lights AR22/DR22 and AR30/DR30

# **Accessories**

Description	Туре	Description	Туре
Lens for illuminated	Type Used with	Center button	Type Used with
pushbutton switch and	AR9C011-□*1 AR22F0L, F5L, F0P, F5P	(For V type)	Type Used with  AR9C020-R AR22V0R, V2R, VSR
pilot lights	<b>AR9C012-</b> □*¹ AR22E0L, E5L, E0P, E5P		AR30V0R, V2R
	AR22G1L, G2L, G4L, G6L, G7L, G9L		AR9C020-□ AR22V5R, AR30V5R
	DR22E3L, E3P		AR9C018-R AR22V0L, V2L, VDL, VAL, VSL
	AR30E0L, E5L, G2L, G3L, G4L, G7L, G8L, G9L		AR30V0L, V2L
	DR30E3L	San mile	AR9C018-□ AR22V5L*, AR30V5L*
	<b>AR9C013-</b> □*1 AR22F0M, F5M		
	<b>AR9C014-</b> □*¹ AR22E0M, E5M		
	DR22E3M, F5M		Replace the mark by the button color code
	<b>AR9C015-</b> □ AR22M4L, M4P		Color Red Black Yellow
	AR9C016-□ AR22M0L, M5L		Code R B Y
	DR9C001-□ DR22D0L		Note: * V5L: Red and yellow only
	DR30D0L*2		Note. VSL. Ned and yellow only
	DR9C002-□ DR22K0L DR30K0L*²	.=	
	DR9C120-C DR30M4M	AF95-32	
	DR9C121-C DR30F4N	Push-lock, turn-reset	Type Used with
	DR9C122-C DR30F4M	button	AR9C008-R AR22V4R
	DR9C126-□*1 DR22F3M	(V and Q types)	AR9C010-R AR22Q2R, AR30Q2R
	DR9C126-C DR22F4M	(2)	AR9C017-R AR22V2R, V2L, AR30V2R, V2L
	<b>DR9C127-</b> □*¹ DR22E3N		AR9C019-R AR22VAL
•			AR9C021-R AR22V0R, V0L, AR30V0R, V0L
	Replace the mark by the lens color code		<b>AR9C021-</b> □ AR22V5R, V5L*, AR30V5R, V5L*
	Color Green Red Clear Yellow		AR9C026-R AR22VDL
	Code G R C Y		AR9C029-R AR30V1R
	Color Orange Blue White	Control of the Contro	AR9C040-R AR22VSR, VSL
	Code A S W		Replace the mark by the button color code
	Notes: *1 When the main unit code is "W" (white),	AF95-31	Color Red Black Yellow
	use a lens of clear color.	5-7	Code R B Y
AF94-458	*2 Except for pilot lights with resistor	3	
Button for pushbutton	Type Used with		Note: * V5L: Red and yellow only
switch	<b>AR9C001-</b> □ AR22F0R, F5R, F0Y, F5Y, G2R, G7R	KK02-104A	
	AR30F0R, F5R, FVR	Knob	
	AR22S1R, S2R, S3R, S6R	KHOD	Type Used with
	AR30S1R, S2R, S3R, S6R	4	AR9M006-□ AR22PR, PCR, PY, PCY
	AR22E0R, E5R, G0R, G3R, G5R, G8R AR22E0Y, E5Y		AR30PR, PCR
	AR30E0R, E5R, G0R, G1R, G5R, G6R		
	AR9C004-□ AR22F0S, F5S		Replace the mark by the knob color code
1000	AR9C005-□ AR22E0S, E5S		Color Black Green Red
	AR9C006-□ AR22M4R, M9R, M4Y	AF95-43	Code B G R
	AR30M4R		
	AR9C007-□ AR22M0R, M5R	Lever	Type Used with
	AR30M0R, M3R, M5R, M8R		AR9M007-□ AR22WR, WCR, WY, WCY
AF94-461	<b>AR9C024-</b> □ AR30B0R, B1R, B2R, B3R		AR30WR, WCR
	AR9C027-C AR22FAR, FBR, AR30FAR, FBR AR9C028-C AR22EAR, EBR, AR30EAR, EBR		
	AR9C041-R AR30N0R		Replace the mark by the lever color code
	AHX539 Cap for AR30FVR		Color Black Green Red
KK02-101A			Code B G R
		AF95-42	
	Replace the ☐ mark by the button color code	Cylindrical knob	Type Used with
244	Color Green Red Black White		AR9M008-□ AR22RR, RCR, RY, RCY
	Code G R B W		ANZZINI, NON, NI, NOI
KK02-102A	Color   Yellow Orange Blue	100	
	Code Y A S	(if (M) II.	Replace the mark by the knob color code
			Color Black Green Red
KK02-103A		AF95-44	Code B G R
NNU2-103A			

# Pushbuttons/Selectors/Pilot Lights AR22/DR22 and AR30/DR30 Accessories

Description	Туре	
Knob (for illuminated selector switch)	Type Used with  AR9M005-  AR22PL, PP  AR30PL	
AF94-465	Replace the mark by the knob color code  Color Green Red White  Code G R W  Color Yellow Orange Blue  Code Y A S	
Key	Type Used with  AR9C022- AR22JR, JCR, AR30JR, JCR,  AR9C025- AR22JAR, AR30JAR  Replace the mark by the key type code.  Code: A, B, C, D, E or F, 6 types.	
Legend plate (for F type with round bezel)	AR9P001-W  This part is made of acrylic resin. Use paint or thinner compatible with resin.  Dimensions, mm: Ø17.8 x 0.9	
Legend plate (for E type with round bezel)	AR9P002-W  This part is made of acrylic resin. Use paint or thinner compatible with resin.  Dimensions, mm: ø19.7 x 4.2	
AF94-459 Symbol mark plate	_	
Symbol mark plate	Type	
AF98-197	W: White, B: black	

Description	Туре	
Legend plate and	Legend plate	
color plate	Type Used with	
(for F type with square	<b>DR9P241-W</b> AR22F0M, F5M	
bezel)	DR22F3M, F4M	
	DR9P242-WP DR30M4M	
	<b>DR9P242-W</b> DR30M4M, LED(W)	
	<b>DR9P243-WP</b> DR30F4N	
AF94-460	<b>DR9P243-W</b> DR30F4N, LED(W)	
	<b>DR9P244-WP</b> DR30F4M	
	<b>DR9P244-W</b> DR30F4M, LED(W)	
	Types DR9P242, 243 and 244-W are LED illuminated, and used exclusively with operators having a "W" in the type number.	
	color plate	
KK02-105A	Type Used with	
	<b>DR9P241-</b> □ DR22F3M, F4M	
	<b>DR9P242-</b> □ DR30M4M	
	<b>DR9P243-</b> □ DR30F4N	
	<b>DR9P244-</b> □ DR30F4M	
KK02-106A	Replace the mark by the color code	
	Replace the mark by the color code Color Green Red White	
	Code G R W	
	Color Yellow Orange Blue	
	Code Y A S	
KK02-107A	This part is made of acrylic resin. Use paint or thinner compatible with resin.	
	Dimensions, mm: DR9P241: 20.8 sq. x 0.8 DR9P242: 33.4 sq. x 1 DR9P243: 33.4 x 27.4 x 1 DR9P244: 27.4 sq. x 1	
Legend plate	Type Used with	
(for E type with square	AR9P003-W AR22E0M, E5M	
bezel)	DR22F5M, E3M	
	<b>DR9P001-W</b> DR22E3N	
AF94-460	This part is made of acrylic resin. Use paint or thinner compatible with resin.	
	Dimensions, mm: AR9P003-W: 20 sq. x 4.8 DR9P001-W: 19.7 x 26.7 x 4.5	
AF94-460	21.61.601 11.1611 X 2611 X 116	
egend sheet	AHX727	
	Affix this seal to the DR9P241-□/AR9P003 legend plate for marking or labeling.	
	Dimensions, mm: 20 sq. x 0.025	
AF95-34		

# Pushbuttons/Selectors/Pilot Lights

# AR22/DR22 and AR30/DR30 **Accessories**

Туре			
Туре	Lam	Lamp voltage	
APX510-D6 APX510-12 [ APX510-15 [ APX510-24 [	6V E 12V 15V 24V	AC/DC AC/DC AC/DC AC/DC	-
Replace the code	☐ mark by	the lumin	ous color
Luminous	Yellow	Red	Green
Code	Υ	R	G
Lens color	Υ	R	G
Luminous color	Amber	Orange	Blue
Code	Α	0	S
Lens color	Α	W, A*	S
* Orange is available only for the DR22F4M pilot light.			
Dimensions, mm:			
Lamp base: BA9s/13			
Type	Lamp	voltage	
	Type  APX510-6  APX510-D6 APX510-12  APX510-15  APX510-24  Replace the code Luminous color Code Lens color  Luminous color Code Lens color  * Orange is av pilot light. Dimensions	Type Lam  APX510-6  6V APX510-D6 6V APX510-D6 50V APX510-12 12V APX510-15 15V APX510-24 24V  Replace the mark by code Luminous Yellow color Code Y Lens color Y  Luminous Amber color Code A Lens color A  * Orange is available only pilot light.  Dimensions, mm:	Type Lamp voltage  APX510-6  6V AC APX510-D6 6V DC APX510-12 12V AC/DC APX510-15 15V AC/DC APX510-24 24V AC/DC  Replace the mark by the lumin code Luminous Yellow Red color Code Y R Lens color Y R  Luminous Amber Orange color Code A O Lens color A W, A*  * Orange is available only for the DR2 pilot light.  Dimensions, mm:

APX507-24 □ 24V AC/DC APX509-240

Lamp base: E12/15



Note:

The symbol in the box indicates the color of light emitted. (See note APX510.) When the code is "W" (white), use an LED lamp ((APX.509-24O)

Dimensions, mm:



LED lamp

(for AR22VGF type)

APX509

KK02-111A

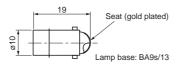
KK02-110A

Lamp voltage

AR9L002-ER 24V AC/DC

Luminous color: Red

Dimensions, mm:



Do not use the LED lamp for other types.

Description Neon lamp (for AR22VGF type)

Type Lamp voltage	
AR9N001-HA 110V AC AR9N001-KA 120V AC AR9N001-MA 220V AC AR9N001-PA 240V AC	



Luminous color: Orange

Dimensions, mm:

Type

KK03-038 Do not use the LED lamp for other types.

KKD06-208

LED lamp for DR30 (square type)

Туре	Lamp voltage	
DN6Q005-6 ☐ DN6Q005-2 ☐ DN6Q005-B ☐ DN6Q005-E ☐	6V DC 12V AC 12V AC/DC 24V AC/DC	

Replace the  $\square$  mark by the luminous color

Luminous	Yellow	Red	Green
color			
Code	Υ	R	G
Lens color	Υ	R	G

Luminous	Amber	Orange
color		
Code	Υ	W
Lens color	Υ	W

Dimensions, mm:



Do not use the LED lamp for other types.

Lamp base: BA9s/13

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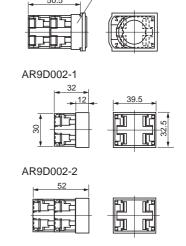
Description	Туре		
Incandescent lamp	Туре	Lamp voltage	Rated voltage, consumption
	AHX135	5.5V AC/DC	6.3V AC/DC, 1W
	AHX279	15V AC/DC	18V AC/DC, 1W
	AHX144	20V AC/DC	24V AC/DC, 1W
	AHX129	24V AC/DC	30V AC/DC, 1W
	Dimensions, ı	mm:	
		20	_
AF89-427		Lamp base: BA	9s/13
Incandescent lamp (for DR30 with	Туре	Lamp voltage	Rated voltage, consumption
resistor)	AHX130	15V AC/DC	18V AC/DC, 2W
	Dimensions, mm:		
		7 34	
		Lamp base: E1	<del></del>
KK02-115A			
Contact block (1NO)	AR9B290 AR9B290-S	Standard Overlap	
	Color: Blue Dimensions,	mm: 19.3 x 29	x 27
AF94-455	Note: Terminal cover is not supplied with this.		
Contact block (1NC)	AR9B291 AR9B291-S	Standard Overlap	
	Color: Red Dimensions, mm: 19.3 x 29 x 27		
AF94-455	Note: Terminal cover is not supplied with this.		
Lamp terminal	AR9B292		
after at the	Color: Black Dimensions,	mm: 19.3 x 29	x 27
AF94-456	Note: Terminal	cover is not supp	lied with this.

Description	Туре	
Contact protection cover	Type Used with *	
	AR9D001-1 AR9D001-2 AR9D002-1 AR9D002-2	AR22, 1-step contact AR22, 2-step contact AR30, 1-step contact AR30, 2-step contact
	rubber cove such as dus • Section A of	is covered with a silicon r to keep out foreign matter t, etc. the AR9D001 is separate. /122, "AR22 □ Z8, AR30 □ Z8"
	Dimensions, r	nm:
	AR9D0	01-1
KK02-117A	33	30.5 4.7 42.6

AR9D001-2



KK02-118A



4
3 W/ S
The sales

Transformer unit

AF94-45	,

Туре	Primary voltage	Used with
AR9T511-H	100-110V AC	Standard type
AR9T511-L	115-127V AC	(except buzzers)
AR9T511-M	200-220V AC	, ,
AR9T511-Q	230-254V AC	
AR9T511-S	350-380V AC	
AR9T511-T	400-440V AC	
AR9T511-V	480V AC	
AR9T511-W	500-550V AC	
AR9T557-H	100-110V AC	DR30F4N, F4M,
AR9T557-L	115-127V AC	M4M
AR9T557-M	200-220V AC	
AR9T557-Q	230-254V AC	
AR9T557-S	350-380V AC	
AR9T557-T	400-440V AC	
AR9T557-V	480V AC	
AR9T557-W	500-550V AC	

Dimensions, mm: Up to 220 V 22.4 x 30 x 45 Over 220 V 25.3 x 29 x 48

Note: With terminal cover

AF95-33

# Pushbuttons/Selectors/Pilot Lights

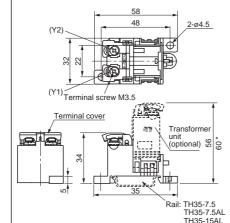
# AR22/DR22 and AR30/DR30 **Accessories**

# Description Base unit for transformer separate mounting

# Type AR9T003

Use this base in combination with a transformer unit. This base unit can be mounted using screws or rails.

Dimensions, mm



KK02-118A \* Except for the types 110V AC, 127V AC and 220V AC

> Resistor: AR9T519-H (110V DC) Fit this resistor when using LED of 24V DC

Voltage stabilizer rating with 110V DC power. Device for LED lamp

> Voltage stabilizer: AR9T001-E This unit allows an LED lamp of 24V DC rating to be used in a circuit with voltage

from 27V to 35V (AC or DC).

Flickering device: 6V AC:

AR9T002-A 6V DC: AR9T002-6 12 to 24V AC: AR9T002-G 12 to 24V DC: AR9T002-E \*

Used in combination with 12V, 15V, or 24V rated

Note: With terminal cover AF95-33

Nut

Resistor

flickering



Type Used with Dimensions, mm AR9R744 AR22, DR22\* ø29.7 x 4 DR9R001 DR30F4M ø33.8 x 5 DR30F4N DR30M4M \* Except AR22VG , Joy stick selectors, buzzers

and numerical indicators

#### Description

Nut for 30mm dia. types (Resin types are black, metallic types are silver.)



KK2-120A







#### Type

AR9R001: Resin types are black (standard) AHX088: Metallic types are silver

Used with:

AR30F0R, F5R, FAR, FBR, E0R, E5R, EAR, EBR, E0L, E5L, Q7L DR30D0L, E3L, K0L

AR9R002: Resin types are black (standard) AHX093: Metallic types are silver

AR30M0R, M5R, M4R, G0R, G5R, N0R, S□R, V□R, Q2R, V□L, PR, PCR, WR, WCR, JR, JCR, JAR, PL, A□N, A□H



22mm dia. types

#### AR9D797-□

This rubber cap protects the operator and switch mechanism against dust and water. Use this cap in a dusty or moist environment.

Used with: AR22E0L.E5L AR22E0R, E5R

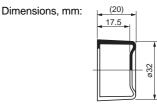
Replace the  $\square$  mark by the luminous color



Code	Color
G	Green
R	Red
В	Black
Υ	Yellow
Rlank	Clear (standard)

Clear (standard)





KK2-124A

# Water-tight cap for 30mm dia. types

# AHX052

This rubber cap protects the operator and switch mechanism against dust and water. Use this cap in a dusty or moist environment. The only color available is transparent.



Used with: AR30E□R, E□L

Dimensions, mm: ø36 x 22.5

Y-1559

# Pushbuttons/Selectors/Pilot Lights AR22/DR22 and AR30/DR30

# **Accessories**

Description	Туре			
Dust-proof cap for 30mm dia. types	Туре	Color	Used with	Spec.
oomin did. typoo	AHX032 AHX033 AHX034	Red Green Black	AR30E0R	Oil-proof
	AHX041 AHX042 AHX043	Red Green Black	AR30F0R	Oil-proof
	AHX157-R AHX157-G AHX157-B	Red Green Black	AR30B2R, B3R	Oil-proof
	AHX113-R AHX113-G AHX113-B	Red Green Black	AR30E0R	Weather resistance
SC-993	AHX111-R AHX111-G AHX111-B	Red Green Black	AR30F0R	Weather resistance
	Dimensions, r AHX032 to 0 AHX111, 11	34, 041	to 043	
	AHX157		M30 P1.5 040	
AF89-772		31 35.5	M70 P1.5	
	Used for seal debris such a water (weathe where the uni elements.	s dust, d er resista	il (oil-proof), ance) in envii	and onments
Packing	<b>AR9Y730:</b> AR22 and DR	22 (Rub	ber)	
	Note: Except for joystick selector switches, buzzers			
	AHX282: AR30 and DR	30 (Res	in-standerd)	
AF94-462	Note: Except for indicators	DR30F4	M, F4N, M4M,	numerical
	AHX149: AR30 and DR	30 (Rub	ber)	
KK2-125A	Note: Except for indicators	DR30F4	M, F4N, M4M,	numerical

Description		Туре		
Terminal cover		Туре	Used with	Dimensions, mm
		AR9Y305	Contact unit	18.4 x 29 x 8.4
			Lamp terminal	
			Transformer unit *1	
Q 6	DR9Y320	Pilot lights *2	ø22 x 5.8	
	7		(without transformer)	
		DR9Y321	DR30F4M, F4N, M4M	34 sq. x 8.7
AF	94-466		(without transformer)	
KK	2-126A	*2 DR22D0L DR30D0L The termin with the ap (Except for numerical	e up to 220V, E3L, K0L, F□M, E3N ., E3L, K0L  all cover is provided oplicable types listed r joy stick selector s indicators, pilot light contact block alone a one)	as standard I above. witches, s with
Terminal cover		Туре	Used with	Dimensions, mm
		AHX305	Buzzers	23.5 x 27.5 x 16



AHX426 AF92-339

Type	Used with	Dimensions, mm
AHX305	Buzzers	23.5 x 27.5 x 16
	(without transformer)	
AHX426	DR30D1L	27.5 x 31 x 8
	(without transformer)	
AHX376	DR30D1L	13 x 29 x 6.5
	(with transformer)	
	Buzzers (B0 type)	
	With transformer *	
	With short-body transformer	
	With resistor unit	
* 230V and	d over	

The terminal cover is provided as standard with the applicable types listed above.



# Pushbuttons/Selectors/Pilot Lights/Buzzers

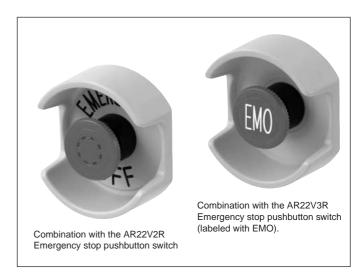
# **AR22 Special products**

# Semi standard compliant guardring

# **■** Features

- Combine a guard ring with a Fuji electric emergency stop pushbutton switches to comply with SEMI (SEMI-S2, SEMATECH Application Guide for SEMI S2-93).

  • EMERGENCY OFF legend plates are available.
- Emergency stop pushbutton switches labeled with "EMO" are available.



# **■** Accessories

Description	Туре	Color
Guardring	AR9R008	Yellow
Legend plate for AR9R008 emergency off  OFF  (K	AR9P721-5C	Yellow (Black legend)

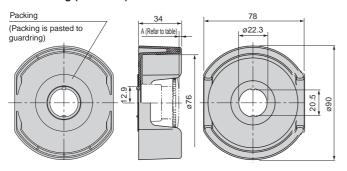
# **■** Emergency stop pushbutton switches

Operator	Contact	Туре	Color
Push-lock, turn-reset	1NC	AR22V3R-01RZ286	Red
(40mm dia, with "EMO" charactor)	1NO+1NC	AR22V3R-11RZ286	(White legend)
	2NC	AR22V3R-02RZ286	
	1NO+2NC	AR22V3R-12RZ286	
THO	3NC	AR22V3R-03RZ286	
EMO	1NO+3NC	AR22V3R-13RZ286	
	2NO+2NC	AR22V3R-22RZ286	
(KKD05-261)	4NC	AR22V3R-04RZ286	

Note: Contact arrangements indicated in the table can be supplied.

# **■** Dimensions, mm

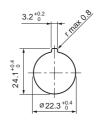
# Guardring (AR9R008)



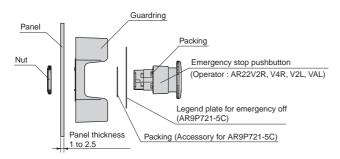
\* Dimension A (the height difference between the switch and guardring) depends on the emergency stop (Illuminated) pushbutton switch that is being used. Refer to the following table.

Туре	Panel thickness	A (Reference)		
AR22V2R	1~2.5	2mm	With AR9P721-5C	
AR22V4R	1~2.5	2mm	With AR9P721-5C	
AR22V2L	1~2.5	2mm	With AR9P721-5C	
AR22VAL	1~2.5	2mm	With AR9P721-5C	
AR22V3R (Z286)	1~3.6	3mm		

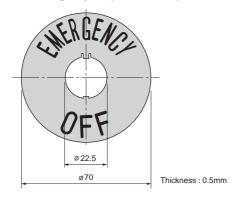
• Panel cutout hole dimensions, mm



#### Installation



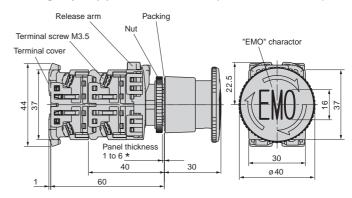
# Legend plate for emergency off (AR9P721-5C)



Note: • Engraving for marking letters is not available.

• Letter hight : 13mm

# ■ Emegency stop pushbutton switches (AR22V3R-□□RZ286)



\* Without accessories

#### ■ Notes on use

This guardring conform to SEMI sandard. Please do not use it for the emergency stops other than Semiconductor manufacturing Equipment.

#### ■ Applicable types

AR22V2R, V4R, V2L, VAL and V3R Z286

# Pushbuttons/Selectors/Pilot Lights/Buzzers

# AR22/DR22 and AR30/DR30 Special products

# Products equipped with contact protection cover

#### ■ Features

A silicon rubber cover is provided for the contact block to keep out foreign matter such as dust, etc.

Other ratings and specifications are the same as those of the standard type.

#### ■ Type AR22 □ Z8

**AR30** □ **Z8** 

Specify "Z8" at the end of the type number of the standard type.

# **■** Dimensions

The only thing different from the standard product is the addition of a 1-mm thick silicon rubber cover around the contact block.

# ■ Applicable types

Туре	Contact arrangement	Remarks
Pushbuttons *1	1NO+1NC,	For use with a
• Emergency stop pushbuttons *2	2NO*5, 2NC	1-step contact
• Selectors *3	1NO+3NC, 2NO+2NC,	For use with a
	3NO+1NC, 4NO*5, 4NC	2-step contact
Illuminated pushbuttons *4	1NO*6, 1NC	For use with a
(without transformer)		1-step contact
<ul> <li>Emergency stop illuminated</li> </ul>	1NO+2NC, 2NO+1NC,	For use with a
pushbuttons*2 (without transformer)	3NO*6, 3NC	2-step contact
Illuminated selectors		
(without transformer)		

Notes: \*1 Except for AR30B0R, B1R, B2R, B3R, N0R, and GPR.

- \*2 Except for unibody (VG types)
- \*3 Except for AR30HR
- \*4 Except for AR30Q7L
- \*5 Except for emergency stop pushbutton switch
- \*6 Except for emergency stop illuminated pushbutton switch

# Resisting water-soluble cutting oils and heat

#### **■** Features

Safer operation in environments exposed to water-miscible cutting fluids, machining oils, lubricating oils, cleaning oils and high humidity (up to 95%) is made possible by using materials that protect against rust and corrosion of components. Other ratings and specifications are the same as those of the standard type.

<b>■</b> Type	
AR22 □ Z9, DR22 □ Z9	
AR30 □ Z9, DR30 □ Z9	

Specify "Z9" at the end of the type number of the standard type.

#### **■** Dimensions

Same as those of the standard type

# ■ Applicable types

AR22, DR22 series

AR 22 (Except for joy stick selectors, FAR, FBR, EAR, EBR types and VG types)

DR22 (Except for pilot lights with resistor unit and buzzers)

• AR30, DR30 series

AR30 (Except for Q7L, FAR, FBR, EAR, EBR, HR types and joy stick selectors)

DR30 (Except for D1L, F4M, F4N, M4M types, pilot lights with resistor/resistor unit and buzzers)

# Meeting IP2X finger protection standards

#### ■ Features

Conforms to EN standard EN60204-1 (protecting against electric shock). The terminal has IEC60529 degree of protection; IP2X finger protection secured (a mock human finger used in testing did not come into contact with charged parts). The contact block and lamp terminal can be easily mounted or removed with the terminal cover mounted.

■ Type

AR22 □ ZB, DR22 □ ZB

AR30 □ ZB, DR30 □ ZB

Specify "ZB" at the end of the type number of the standard type.

#### ■ Accessories

· Contact block (plus terminal cover)

NO contact: AR9B290-D NC contact: AR9B291-D

•Transformer unit (plus terminal cover)

AR9T511-□ D

# ■ Ratings and specifications

- Protection degree: IP2X
- Terminal screw: M3.5

Wiring can be done with a solid wire or fork shaped crimp terminal.

Note: Ring-type crimp terminals cannot be used.

 Other ratings and specifications are the same as those of the standard type.

# ■ Applicable types

• AR22, DR22 series

AR22 (except for joy stick selectors)

DR22: Without transformer, with transformer (except for short-body types, buzzers and numerical indicators)

• AR30, DR30 series

AR30 (except for HR and joy stick selectors)

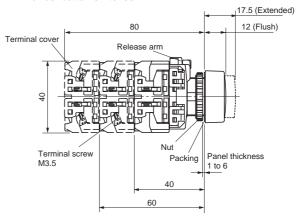
DR30: Without transformer, with transformer (except for D1L,

F4M, F4N, M4M types and buzzers)

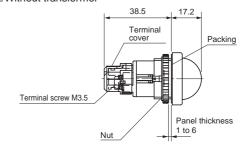
Note: The terminal of the standard type VG has IP2X protection.

# **■** Dimensions, mm

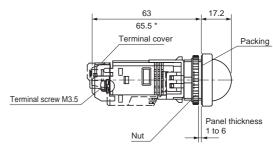
AR22/Pushbutton switches



#### DR22/Without transformer



#### DR22/With transformer



Note: \* Except for the types 110V AC, 127V AC and 220V AC.

# Pushbuttons/Selectors/Pilot Lights/Buzzers

# AR22/DR22 and AR30/DR30 **Special products**

# Metal nut (chrome plated) types

#### **■** Features

The nut is a metallic ring (chrome plated).

Other ratings and specifications are the same as those of the standard model.

# ■ Type

AR30 □ ZM

DR30 □ ZM

Specify "ZM" at the end of the type number of the standard type.

#### **■** Dimensions, mm

Same as those of the standard types.

#### ■ Applicable types

AR30, DR30 series

AR30 (except for G4L, G9L, GSR\*1, GPR\*1, BOR\*1, and HR\*1

DR30 with round bezel (except for IP54 buzzer type B8)\*2

Notes: \*1 Standard type is a metallic ring (chrome plated).
\*2 The nut of types DR30B0, B5 and B6 buzzers are resin (chrome plated).



# Resisting sulfuration gas

#### **■** Features

These products can be used in environments having a concentration of hydrogen sulfide gas of 0.5 ppm or less. The metallic parts have been subjected to an anti-corrosion treatment (see note).

The contacts of the AR series are gold plated.

Note: The body is made of resin and cannot be used with gases that affect

# ■ Type

AR22 □ Z4, DR22 □ Z4

AR30 □ Z4, DR30 □ Z4

Specify "Z4" at the end of the type number of the standard type.

#### ■ Notes on use

- This product is resistant to light corrosive gas exposure.
- Other measures, such as covering the entire switch with a box, and the degree of protection of the panel should be taken into consideration.

### ■ Ratings and specifications

Hydrogen sulfide gas concentration of 0.5 ppm max.

Ambient storage temperature: 8 to 37°C

Humidity: 62 to 81%

Other ratings and specifications are the same as those of the standard type.

# **■** Dimensions, mm

Same as those of the standard types.

# ■ Applicable types

• AR22, DR22 series

AR22 (except for Joy stick selectors and VG type) DR22 (except for pilot lights with resistor unit and buzzers)

• AR30, DR30 series

AR30 (except for HR and Joy stick selectors) DR30 (except for F4M, F4N, M4M types, pilot lights with resistor/resistor unit and buzzers)

# ■ Mass, gram

# • Illuminated pushbuttons

Туре	Without	transformer		With tra	nsformer *
	1NO (1NC)	2NO (2NC) (1NO+1NC)	2NO+2NC	1NO (1NC)	2NO (2NC) (1NO+1NC)
AR22F0L	39	48	67	85	94
F5L	39	48	-	85	94
F0M, F0P	40	49	68	86	95
F5M, F5P	40	49	-	86	95
E0L	41	50	69	87	96
E5L	41	50	_	87	96
E0M, E0P, M4L, G1L, G2L, G4L	42	51	70	88	97
E5M, E5P, M9L, G6L, G7L, G9L	42	51	-	88	97
M4P	43	52	71	89	98
MOL	44	53	72	90	99
M5L	44	53	-	90	99
V5L	48	57	-	94	103

Note: \* 230V and over : +17grams

# Pushbuttons

Туре	1NO (1NC)	2NO (2NC) (1NO+1NC)	2NO+2NC	
AR22F0R, FAR, F5R, FBR	27	36	55	
E0R, EAR, F0S, F0Y, G0R E5R, EBR, F5S, F5Y, G5R	28	37	56	
E0S, E0Y, M4R, G2R E5S, E5Y, M9R, G7R	29	38	57	
MOR, M5R	31	40	59	
S1R, S2R, S3R, S6R	_	43	62	
M3R, M8R	44	53	72	
V5R	49	58	77	

# • Emergency stop pushbuttons

Туре	1NC	2NC (1NO+1NC)	2NO+2NC
AR22VSR	34	43	62
V0R, V4R	36	45	64
Q2R	36	45	_
V2R	38	47	66
V7R	59	68	87
VGE	61	65	_

# • Emergency stop illuminated pushbuttons

Type	Without tr	Without transformer		With transformer *		
	1NC	2NC (1NO+1NC)	1NC	2NC (1NO+1NC)		
AR22VSL, VDL	48	57	94	103		
V0L	49	58	95	104		
VAL	50	59	96	105		
V2L	51	60	97	106		
VGF	66	70	_	-		

Note: \* 230V and over : +17grams

# Pushbuttons/Selectors/Pilot Lights/Buzzers

# AR22 and DR22

# Mass

# ■ Mass, gram

# Pilot lights

Type	Without transformer		With transformer		With
	Standard	Short-body	Standard *	Short-body	resistor unit
DR22D0L, K0L	18	23	70	68	32
E3L, E3P, F3M, F4M	19	24	71	69	33
F5M	20	25	72	70	34
E3M	21	26	73	71	35
E3N	23	28	75	73	37

Note: \* 230V and over : +17grams

# Selector switches

Туре	1NO (1NC)	2NO (2NC) (1NO+1NC)	2NO+2NC
AR22PR	30	39	58
PCR	_	39	58
WR	31	40	59
WCR	_	40	59
RR, PY, WY	32	41	60
RCR, PCY, WCY	_	41	60
RY	33	42	61
RCY	_	42	61
JR, JAR	56	65	83
JCR	_	65	83
JY	57	66	84
JCY	_	66	84

# • Illuminated selector switches

Туре	Without transformer			With transformer *	
	1NO (1NC)	2NO (2NC) (1NO+1NC	2NO+2NC	1NO (1NC)	2NO (2NC) (1NO+1NC)
AR22PL	42	51	70	88	97
PP	43	52	71	89	98

Note: \* 230V and over: +17grams

# Joy stick selector switches

# Screw terminal types

Type	1NO x2	(1NO+1NC) x2	1NO x4	(1NO+1NC) x4
AR22A2N, A7N	89	99	116	136
A0N, A5N	99	109	126	146
A1N, A6N	112	122	139	159

# • Solder/tab terminal types

Туре	(1NO+1NC) x2	(2NO+2NC) x2	(1NO+1NC) x4	(2NO+2NC) x4
AR22A2H, A7H	72	75	82	88
A0H, A5H	82	85	92	98
A1H, A6H	95	98	105	111

# Buzzers

Туре	Without transformer	With transformer	With resistor unit
DR22B5	50	105	52
B8	53	108	55
B3	66	121	_

# ■ Mass, gram

# Illuminated pushbuttons

Туре	Without t	ransformer		With trai	With transformer *	
	1NO (1NC)	2NO (2NC) (1NO+1NC)	2NO+2NC	1NO (1NC)	2NO (2NC) (1NO+1NC)	
AR30E0L	49	58	77	95	104	
E5L	49	58	_	95	104	
G4L	50	59	78	96	105	
G9L	50	59	_	96	105	
V5L	56	65	_	102	111	
G2L	66	75	94	112	121	
G7L	66	75	_	112	121	
G3L	72	81	100	118	127	
G8L	72	81	_	118	127	
Q7L	_	159	_	_	205	

Note: \* 230V and over: +17grams

# Pushbuttons

Туре	1NO (1NC)	2NO (2NC)	2NO+2NC
	, ,	(1NO+1NC)	
AR30F0R, FAR, F5R, FBR	36	45	64
E0R, EAR, G0R, E5R, EBR, G5R	37	46	65
M4R	38	47	66
M0R, M5R	40	49	68
V5R	42	51	70
S1R, S2R, S3R, S6R	_	53	72
FVR	54	63	82
G1R, G6R	59	68	87
N0R	96	105	124
GPR	116	125	144
GSR, B0R	123	132	151
M3R, M8R	126	135	154
B1R	241	250	269
B3R	279	288	307
B2R	291	300	319

# • Emergency stop pushbuttons

Туре	1NC	2NC (1NO+1NC)	2NO+2NC
AR30V0R	43	52	71
Q2R	45	54	_
V2R	46	55	74
V1R	60	69	88

# • Emergency stop illuminated pushbuttons

Type	Without transformer		With trans	With transformer *	
•	1NC	2NC (1NO+1NC)	1NC	2NC (1NO+1NC)	
AR30V0L	57	66	103	112	
V2L	59	68	105	114	

Note: \* 230V and over : +17grams

# Pushbuttons/Selectors/Pilot Lights/Buzzers AR30 and DR30

# Mass

# ■ Mass, gram

# Pilot lights

• Without transformer type, With transformer type, With resistor unit type

Туре	Without transformer	With transfo	rmer	With
	Standard	Standard *1	Short-body	resistor unit
DR30D0L, K0L	28	80	78	42
E3L	29	81	79	43
F4M *2	32 (30)	84 (82)	_	46
F4N *2	34 (30)	86 (82)	_	48
M4M *2	37 (32)	88 (84)	_	50
D1L	94	164	_	111

Notes: \*1 230V and over : +17grams
\*2 ( ): Incandescent lamp

• With resistor type

Туре		110V DC 220V DC
DR30D0L, K0L (LED)	103	103
D0L, K0L (incandescent)	107	179

# Selector switches

Туре	1NO (1NC)	2NO (2NC) (1NO+1N0	2NO+2NC C)
AR30PR, WR	41	50	69
PCR, WCR	_	50	69
JR, JAR	67	76	94
JCR	_	76	94
HR	125	135	153(166)

Note: ( ): AR30HR-122

# • Illuminated selector switches

Туре	Without tra	nsformer	With transformer *			
	1NO (1NC)	2NO (2NC) (1NO+1NC)	2NO+2NC	1NO (1NC)	2NO (2NC) (1NO+1NC)	
AR30PL	52	61	80	98	107	

Note: \* 230V and over: +17grams

# Joy stick selector switches

Screw terminal type

Туре	1NO x2	(1NO+1NC) x2	1NO x4	(1NO+1NC) x4
AR30A2N, A7N	100	110	127	147
A0N, A5N	110	120	137	157
A1N, A6N	124	134	151	171

# • Solder/tab terminal type

Туре	(1NO+1NC) x2	(2NO+2NC) x2	(1NO+1NC) x4	(2NO+2NC) x4
AR30A2H, A7H	83	86	93	99
A0H, A5H	93	96	103	109
A1H, A6H	107	110	117	123

# Buzzers

Type	Without transformer	With transformer	With resistor unit
DR30B5, B6	47	102	49 (Except B6)
B8	48	103	50
B0	86	_	

# Command Switches AR16, DR16 and AF16, DF16 General information

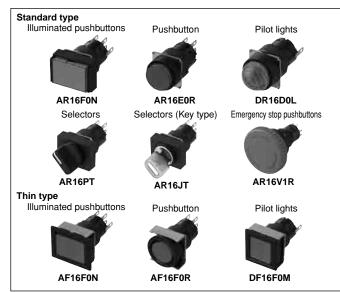
- An integrated structure with built-in contacts that can reduce control panel depth.
- A wide variety of sockets are available to simplify wiring.
- Thin type and Standard types available for your control panel design. Select an optimum one to match your control panel design.

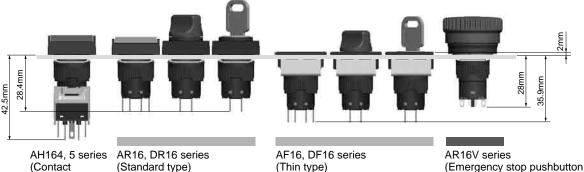
#### **■** Features

# Supporting smaller and thinner operator's panels

A structure that integrates operator and contacts to reduce panel-mounting depth. Terminals extending to the rear of the switch ensure easy wiring work.

Standard type : 28.4mm deep
Thin type : 35.9mm deep
Emergency stop : 28mm deep

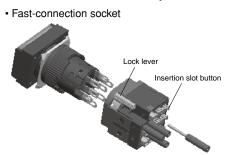




# A wide variety of sockets reduce wiring work

separated type)

Switches combine with a variety of sockets to simplify wiring.



- Applicable as a fast-connection terminal switch by combining the socket with a switch.
- Easily wired by simply removing the wire sheath and inserting the wires while pressing the insertion slot button (no soldering required).
- Incorporates a branch terminal for easy branching.

· Connector socket

- Applicable as a connector by combining the socket with receptacles.
- The socket holds the receptacles, making it easy to connect the receptacle to the switch with a single operation.

Socket for PC board

switches)



- Applicable as a switch for PC board by combining the socket with a switch.
- Pattern wiring reduces the number of wiring man-hour and helps prevent faulty wiring.

#### Safety

 FUJI's original Trigger Action mechanism is used in the emergency stop pushbuttons. They are suitable for emergency stop and safety. This mechanism prevents the contacts from moving untill the button in pushed and locked. (See page 04/180)

# Degree of protection

The operator has IP65 protection for smooth operation without advere effects from oil, water, or dusts.

# Approvals

Receptacle



For further information related to approved type, see page 04/130 to 04/135

Note: commanded switches shipped as aeticiles to China must conform to the Product Quality Law. Check with your Fuji Electric representative.

# **Command Switches** AR16, DR16 and AF16, DF16 Quick reference guide

# ■ Illuminated pushbutton switches

Operator Operator action		Flush rectangular Flush rectangular with guard			Flush square		Extended round		Flush round				
		Momentary Alternate		Momentary			Alternate	Momentary Alternate		Momentary	Alternate		
Standard	Туре		AR16F0N	AR16F5N	AR16G0N	AR16G5N	Momentary AR16F0M	AR16F5M	AR16E0L	AR16E5L	_		
type	Appearance				ANTOGON ANTOGON		ACTOR ACTOR SIN		ANTOESE		_		
	See pag		04/143	£((@	<b>c¶</b> °us <b>△</b> (€ <b>◎</b> 04/143		c <b>¶</b> °us <b>△</b> ( € ( € ( € ( € ( € ( € ( € ( € ( € (		<b>c¶°</b> us ♣ ( € ((((((((((((((((((((((((((((((((				
				-		-	04/143						
	Bezel (r	,	24	24		24		18sq.		φ18 +		-	
	Panel c	utting (mm)		φ16.2 <sup>+02</sup> <sub>0</sub>									
Thin type	Туре		AF16F0N	AF16F5N	_	-	AF16F0M	AF16F5M		_	AF16F0L	AF16F5L	
,,	Appeara	ance		1				0.				4	
	, ppoulario		<b>3)</b> ≜ 2u <b>/R</b> 3		-		<b>② 3 2 2 2 1 R 3</b>		-		<b>② 3 3 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3</b>		
	See nad	70	04/155				04/155				04/155		
	See page Bezel (mm)  Panel cutting (mm)		04/133					04/155					
			- 20	22	-		* LLUY.		-		φ22		
			24.2	20+02 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1	-		19.2 <sup>+0.2</sup> <sub>-0.1</sub> sq.		-			φ19.2 <sup>+0.2</sup>	
Legend pla	ate (mm)		19.6×13.6		19.6×13.6		13.6sq.		φ13.6		φ13.6		
Bezel colo			Black				1		7.0.0		7		
Button col		parent)	Green, Red, White "1, Yellow, Orange, Blue										
LED	Color	,	Green, Red, Orange, Yellow, Amber, Blue										
lamp	Lamp v	oltage		6V AC/DC, 12V AC/DC, 24V AC/DC									
Contact ar			SPDT, 2PDT										
Contact ra			120V AC 1A (AC-13), 24V DC 0.7A (DC-13, T <sub>0.95</sub> = 21ms) 240V AC 0.7A (AC-13), 125V DC 0.15A (DC-13, T <sub>0.95</sub> = 21ms)										
Mechanica	al durabil	ity	Momentary action: 1 million operations Alternate action: 250,000 operations										
Electrical	durability			perations (2									
Degree of protection (Operator)		IP65											
Type of terminal		Tab (#110) / solder dual-use terminal											
Accessories Protective cov		ve cover *2		) *3	-		O ,3		0			_	
	Dust-proof cover		(	) *4			O *4		Ö			_	
	Termina			5	(	$\supset$				<u> </u>	0		
	Socket	_	(	)		0		0		0		)	
		Connector	(	)	(	)	(	)	(	)	(	)	
		PC board use	(	)	(	)	(	)	(	)	(	)	
	Panel p		(	)	(	$\overline{}$	0		0		(		
*1 •		of the translu								<u> </u>			

Notes: <sup>1</sup> A combination of the translucent button and the white legend plate comes to white.

<sup>2</sup> The protective cover and button of the thin type are made of an integral structure.

<sup>3</sup> The protective cover of the thin type is available for momentary action only.

<sup>4</sup> Available for standard type only.

# **Command Switches** AR16, DR16 and AF16, DF16 Quick reference guide

#### ■ Pushbutton switches

Operator				Flush square		Extended	Extended round		nd			
Operator	Operator action		Momentary	Alternate	with guard Momentary	Alternate	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate
Standard			AR16F0T	AR16F5T	AR16G0T	AR16G5T	AR16F0S	AR16F5S	AR16E0R	AR16E5R	womentary	Allemale
type	Appeara	ance	AKTOPOT	AKTOFST		•		•	AKTOLOK	AKIOLSK		-
			c <b>91</b> °us 🚣	<b>()</b>	c <b>₹1</b> °us ∠	£(((@)	c <b>91</b> °us 🚣	₹ <b>(</b> €@	c <b>₹1</b> 3°us ∠	<b>◎)</b> ) <u>£</u>		
	See pag	ge	04/145		04/145		04/145		04/145			
	Bezel (r	mm)	24	8	24	18	18	Bsq.		18	-	_
	Panel c	utting (mm)		φ16.2 <sup>+0.2</sup>								
Thin type	Туре		AF16F0T	AF16F5T	-	_	AF16F0S	AF16F5S	-	_	AF16F0R	AF16F5R
	Appeara	ance	ر المالات		-	-	c SN'us d		-	_	ک وین الج	<b>*</b>
	See page		04/157		04/157				04/157			
	Bezel (r	nm)	28	22	-	_	1	2sq	-	_		22
	Panerc	utting (mm)	24.2	19.2-01	-	_	-	19.2 <sup>+0.2</sup> <sub>-0.1</sub> sq.	-	_		φ 19.2 <sup>+0.2</sup> <sub>-0.1</sub>
Legend pla	ate (mm)		19.6×13.6		19.6×13.6		13.6sq		φ13.6		φ13.6	
Button col			Black									
Button col				ed, Black *1,	White *2, Ye	low, Orang	e, Blue					
Contact ar		ent	SPDT, 2P									
Contact ra	iting		120V AC 1A (AC-13), 24V DC 0.7A (DC-13, T <sub>0.95</sub> = 21ms) 240V AC 0.7A (AC-13), 125V DC 0.15A (DC-13, T <sub>0.95</sub> = 21ms)									
Mechanica	al durabil	ity	Momentar	y action: 1 i	million oper	ations	,-13, 1 <sub>0.95</sub> =	211115)				
Electrical	durability			perations (2								
		n (Operator)		(-								
Type of ter				) / solder du	al-use term	inal						
		ve cover *3	<u> </u>	·4		_		○ <b>*</b> 4	(	$\overline{)}$		_
	Dust-pr	oof cover	(	·5		_	(	→ *5	(	$\supset$		_
	Termina	al cover	(	$\supset$	(	)	(	C	(	$\supset$	(	$\overline{\mathcal{C}}$
	Socket	Quick connection	(	)	(	)	(	)	(	)	(	)
		Connector use	(	)		)		)		)		)
		PC board use	(	)	(	)	(	)	(	)	(	)
Notes: *1 A or	Panel p	lug	(	)	(			The protect	(	)	(	)

Notes: 1 A combination of the translucent button and the black legend plate comes to black button. 2 A combination of the translucent button and the white legend plate comes to white button.

<sup>&</sup>lt;sup>3</sup> The protective cover and button of the thin type are made of an integral structure.

<sup>&</sup>lt;sup>14</sup> The protective cover of the thin type is available for momentary action only.

<sup>\*5</sup> Available for standard type only.

# Command Switches AR16, DR16 and AF16, DF16 Quick reference guide

#### ■ Pilot lights

Lens shap	e	Flush rectangular	Flush square	Extended round	Flush round	Dome
Standard	Туре	DR16F0N	DR16F0M	DR16E0L	_	DR16D0L
rype	Appearance				-	
		<b>₩)</b> ) <u>\</u> 2u° <b>\</b>	( ) ) <u>\</u> ≥ 2 u° <b>\ \</b> 2 u° <b>\</b> \ 2 v° \ \ 2	<b>₽</b> 1°us ≜.(€ ((((((((((((((((((((((((((((((((((		<b>₽</b> \$°US ≜ ( € @)
	See page	04/147	04/147	04/147		04/147
	Bezel (mm)	24	18sq.	φ18 +	-	φ18 +
	Panel cutting (mm)	φ16.2 <sup>+02</sup> <sub>0</sub>				
Thin type	Туре	DF16F0N	DF16F0M	_	DF16F0L	_
	Appearance	£ <b>71</b> us <b>≜</b> (€ <b>©</b>		-	<b>②</b> (€ ( <b>©</b> ( <b>©</b> ( <b>©</b> ( <b>)</b>	-
	See page	04/159	04/159		04/159	
	Bezel (mm)	28	22sq.	-	φ22	-
	Panel cutting (mm)	24.2 <sup>+0.2</sup>	19.2 <sup>+0.2</sup> / <sub>0.1</sub> sq.	_	φ 19.2 <sup>+0.2</sup> -0.1	-
Legend pla	ate (mm)	19.6×13.6	13.6sq	φ13.6	φ13.6	_
Bezel colo		Black				
	or (transparent)		, Yellow, Orange, Blue			
LED	Color	Green, Red, Orange,				
lamp	Lamp voltage	6V AC/DC, 12V AC/D	DC, 24V AC/DC			
	protection (Lens)	IP65				
Type of ter		Tab (#110) / solder d				
Accessories	Terminal cover Socket Quick connection	0	0	0	0	0
	Connector	0	0	0	0	0
	PC board	0	0	0	0	0
	use	0	0		0	0

Note: "A combination of the translucent lens and the white legend plate comes to white lens (except for dome type).

#### ■ Selector switches (Knob type)

				T			
Operator			Knob with rectangular bezel	Knob with square bezel	Knob with round bezel		
No. of pos	No. of position		2-position, 3-position	2-position, 3-position	2-position, 3-position		
Operator a	action		Maintained,	Maintained,	Maintained,		
			Spring/manual return,	Spring/manual return,	Spring/manual return,		
			Spring return	Spring return	Spring return		
Standard	Туре		AR16PT	AR16PS	AR16PR		
туре	type Appearance						
			<b>₽</b> \$\us_\alpha(€@)	c <b>¶</b> °us ≜ ( € @	<b>₽</b> \$\us_\( \in \omega \)		
	See pag		04/149	04/149	04/149		
	Bezel (r	nm)	24	18sq.	φ 18		
	Panel co	utting (mm)	φ16.2 <sup>+02</sup>				
Thin type	Туре		AF16PT	AF16PS	AF16PR		
	Appearance						
			£ <b>\</b>	(	£ \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
	See pag		04/161	04/161	04/161		
	Bezel (r	nm)	28	2280.	φ22		
	Panel ci	utting (mm)	24.2+0.2	19.2 <sup>+0.2</sup> sq.	\$\delta 19.2^{\dagger^{\alpha}^{\alpha}}}}}}}}}}}}}}}}}}}}}}}}} \endetright) \tage \tag		
Bezel colo	r		Black	J			
Color of ki			Black	,	,		
Contact a		ent	SPDT, 2PDT				
Contact ra			120V AC 1A (AC-13), 24V DC 0.7A (DC-13, T <sub>0.95</sub> = 21ms) 240V AC 0.7A (AC-13), 125V DC 0.15A (DC-13, T <sub>0.95</sub> = 21ms)				
Mechanica		ity	250,000 operations				
Electrical durability			100,000 operations (2	220V AC 0.7A)			
Degree of protection (Operator)		IP65					
	Type of terminal		Tab (#110) / solder du	_			
Accessories			0	0	0		
	Socket	Quick connection	0	0	0		
		Connector use	0	0	0		
	1	PC board					
		use	0	0	0		
	Panel p	use	0	0	0		

#### ■ Selector switches (Key type)

Operator					
			Key with rectangular bezel	Key with square bezel	Key with round bezel
No. of position			2-position, 3-position	2-position, 3-position	2-position, 3-position
Operator a			Maintained,	Maintained,	Maintained,
•			Spring/manual return,	Spring/manual return,	Spring/manual return,
			Spring return	Spring return	Spring return
Standard	Type		AR16JT	AR16JS	AR16JR
type	Appearance				
	0		c <b>F1</b> °us ♠ ( € @)	c <b>\$1</b> °us ♠ ( € @)	c <b>¶</b> °us ♠ ( € @
	See pag		04/152	04/152	04/152
	Bezel (r	nm)	24	<u>18sq.</u>	φ18 H
	Panel co	utting (mm)	φ16.2 <sup>+02</sup>		
Thin type	Type		AF16JT	AF16JS	AF16JR
		5	5	3	
	See nad	10	<b>c¶°</b> us <b>△</b> (€ (((((((((((((((((((((((((((((((((((	c <b>R</b> °us △(€ ((((((((((((((((((((((((((((((((((	<b>c¶3°</b> us <b>△</b> (€ (((((((((((((((((((((((((((((((((((
	See pag		04/164	04/164	04/164
	See pag Bezel (n		04/164		
	Bezel (n		04/164	04/164	04/164
Bezel cold	Bezel (r	nm)	04/164	04/164	04/164
Key remov	Panel co	nm) utting (mm)	04/164  28  24.2*****  Black  Left (A), Left/Right (B)  Center/Right (F), Left/	04/164	04/164
Key remov	Panel convable pos	nm) utting (mm) ition	Black Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F)	04/164	04/164
No. of key Contact a	Panel convable pos	nm) utting (mm) ition	Black Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F) SPDT, 2PDT	04/164	04/164
No. of key Contact an	Panel control or types trangementating	utting (mm) ition	04/164  28  24.2****  Black  Left (A), Left/Right (B)  Center/Right (F), Left/ 6 (A, B, C, D, E, F)  SPDT, 2PDT  120V AC 1A (AC-13), 240V AC 0.7A (AC-13)	04/164	04/164  ### ### ### #### ###################
No. of key Contact a Contact ra	Panel control or types trangementating	utting (mm) ition ent	04/164  28  24.2*****  Black  Left (A), Left/Right (B)  Center/Right (F), Left/ 6 (A, B, C, D, E, F)  SPDT, 2PDT  120V AC 1A (AC-13), 240V AC 0.7A (AC-13  250,000 operations	04/164    19.2 <sup>+0.2</sup> / <sub>-0.1</sub> sq.   19.2 <sup>+0.2</sup> / <sub>-0.1</sub> sq.   19.2 <sup>+0.2</sup> / <sub>-0.1</sub> sq.   24V DC 0.7A (DC-13, B), 125V DC 0.15A (DC-13)	04/164  ### ### ### #### ###################
No. of key Contact a Contact ra Mechanica Electrical	Panel control or types trangementating all durability	utting (mm) ition ent	04/164  28  24.2*****  Black  Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F) SPDT, 2PDT  120V AC 1A (AC-13), 240V AC 0.7A (AC-13 250,000 operations 100,000 operations (2	04/164    19.2 <sup>+0.2</sup> / <sub>-0.1</sub> sq.   19.2 <sup>+0.2</sup> / <sub>-0.1</sub> sq.   19.2 <sup>+0.2</sup> / <sub>-0.1</sub> sq.   24V DC 0.7A (DC-13, B), 125V DC 0.15A (DC-13)	04/164  ### ### ### ### #### ###############
No. of key Contact at Contact ra Mechanica Electrical of Degree of	Panel control or vable post types rrangementating all durability protection	utting (mm) ition ent	04/164  28  24.2 <sup>+0.2</sup> Black  Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F) SPDT, 2PDT 120V AC 1A (AC-13), 240V AC 0.7A (AC-13) 250,000 operations 100,000 operations (2) IP65	04/164	04/164  ### ### ### #### ###################
No. of key Contact at Contact ra Mechanica Electrical Degree of Type of tel	Panel control or vable post types rrangementating all durability protection rminal	utting (mm) ition ent ity n (Operator)	04/164  28  28  24.2**0.2*  Black  Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F) SPDT, 2PDT 120V AC 1A (AC-13), 240V AC 0.7A (AC-13) 250,000 operations 100,000 operations (2 IP65 Tab (#110) / solder du	04/164	04/164  ### ### ### ### #### ###############
No. of key Contact at Contact ra Mechanica Electrical of Degree of	Panel control or vable post types rrangementating all durability protection rminal Terminal	utting (mm) ition ent ity n (Operator)	04/164  28  24.2 <sup>+0.2</sup> Black  Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F) SPDT, 2PDT 120V AC 1A (AC-13), 240V AC 0.7A (AC-13) 250,000 operations 100,000 operations (2) IP65	04/164	04/164  ### ### ### #### ###################
No. of key Contact at Contact ra Mechanica Electrical Degree of Type of tel	Panel control or vable post types rrangementating all durability protection rminal	utting (mm)  ition  ent  ity  n (Operator)  cl cover	04/164  28  28  24.2**0.2*  Black  Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F) SPDT, 2PDT 120V AC 1A (AC-13), 240V AC 0.7A (AC-13) 250,000 operations 100,000 operations (2 IP65 Tab (#110) / solder du	04/164	04/164  ### ### ### ### #### ###############
No. of key Contact an Contact ra Mechanica Electrical Degree of Type of tel	Panel control or vable post types rrangementating all durability protection rminal Terminal	utting (mm)  ition  int  ity  n (Operator)  cover  Quick connection Connector	04/164  28  24.2****  Black  Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F) SPDT, 2PDT  120V AC 1A (AC-13), 240V AC 0.7A (AC-13) 250,000 operations 100,000 operations 100,000 operations (2) IP65  Tab (#110) / solder du	04/164    19.2 <sup>+0.2</sup> / <sub>-0.1</sub> sq.   24V DC 0.7A (DC-13, B), 125V DC 0.15A (DC-13, B), 12	04/164  ### ### ### #### ###################
No. of key Contact an Contact ra Mechanica Electrical Degree of Type of tel	Panel control or vable post types rrangementating all durability protection rminal Terminal	utting (mm)  ition  int  ity  n (Operator)  cl cover  Quick connection	04/164    28	04/164    19.2 <sup>+02</sup> / <sub>01</sub> sq.   19.2 <sup>+02</sup> / <sub>01</sub> sq.   19.2 <sup>+02</sup> / <sub>01</sub> sq.   24V DC 0.7A (DC-13, B), 125V DC 0.15A (DC-13, B), 125V DC 0.15A (DC-13, B), 125V DC 0.15A (DC-13, B), 125V DC 0.7A)	04/164  Property of the proper
No. of key Contact an Contact ra Mechanica Electrical Degree of Type of tel	Panel control or vable post types rrangementating all durability protection rminal Terminal	utting (mm)  ition  itiy  n (Operator)  cover  Quick connection Connector use  PC board use	Black Left (A), Left/Right (B) Center/Right (F), Left/ 6 (A, B, C, D, E, F) SPDT, 2PDT 120V AC 1A (AC-13), 240V AC 0.7A (AC-13) 250,000 operations 100,000 operations (2 IP65 Tab (#110) / solder du	04/164    19.2+0.2	04/164  ### ### ### ### #### ###############

#### **■** Emergency stop pushbutton switches

Operator		Illuminated push-lock	Illuminated push-lock	Push-lock	Push-lock				
		(32mm dia)	(40mm dia)	(32mm dia)	(40mm dia)				
Operator actio	n	Turn reset or pull-reset		Turn reset or pull-reset					
Туре		AR16V0L	AR16V1L	AR16V0R	AR16V1R				
Appearance									
		<b>192</b> °us <u>≜</u> (€@	c <b>¶</b> °us <u>≜</u> (€ @	<b>₽</b> 1°us <u></u>	<b>? ? ! ! ! ! ! ! ! ! ! !</b>				
See page		04/182	04/182	04/182	04/182				
Button size (m	m)	**************************************	φ40 •	φ32	φ40 • • • • • • • • • • • • • • • • • • •				
Panel cutting (	)	17.9 <sup>+0.2</sup> mm							
Button color		Red							
LED lamp	Color	Red		_					
	Lamp voltage	6V AC/DC, 12V AC/DC, 24V AC/DC —							
Contact arrang	jement	1NC, 1NO+1NC, 2NC, 1NO+2NC, 3NC, 1NO+3NC, 4NC							
Contact ratings			120V AC 0.3A (AC-15), 24V DC 0.7A (DC-13), 240V AC 0.3A (AC-15), 125V DC 0.15A (DC-13)						
Mechanical durability		100,000 operations							
Electrical durability		100,000 operations (AC	100,000 operations (AC-15, AC-13, AC-12, DC-13, DC-12)						
Degree of protection (Operator)		IP65							
Type of terminal		Solder use terminal							
Accessories	Terminal cover	0	0	0	0				
	Name plate (Emergency stop)	O	0	0	0				

# Command Switches AR16 and DR16, AF16 and DF16

# **Ratings and Specifications**

#### ■ Contact ratings

#### • UL/CSA

• AC (COS $\emptyset$  = 0.35)

Contact rating code	120V		240V		
	Making current	Breaking current	Making current	Breaking current	
D300	3.6A	0.6A	1.8A	0.3A	

#### • TÜV (EN60947-5-1), CCC (GB14048.5), JIS C 8201-5-1

Type of switches		ntional free Rated operational current le					
	air thermal current Ith	Rated operational	AC		DC		
		voltage Ue	AC-13	AC-12	DC-13	DC-12	
			(Inductive load)	(Resistive load)	(Inductive load)	(Resistive load)	
Illuminated pushbutton switch	h 5A	24V	_	_	0.7A *1	1A	
Pushbutton switch		120V	1A	1.5A	_	_	
Selector switch		125V	-	_	0.15A *1	0.2A	
		240V	0.7A	1A	_	_	

Note: \*1 T<sub>0.95</sub>=21ms

#### ■ Specifications (indoor use)

Item		Illuminated pushbutton switch,	Selector switch	Pilot lights		
Data dia salahara sal	Le ve	pushbutton switch				
Rated insulation vol		250V AC/DC	Tarana and a			
Durability	Mechanical	Momentary action: 1 million operations Alternate action: 250,000 operations	Maintained: 250,000 operations Spring/manual return: 250,000 operations Spring return: 250,000 operations	-		
	Electrical	100,000 operations (at 22		_		
Operating frequency	1	1200 operations/hour (Or	n-load factor: 40%)	_		
Withstand voltage	Between live section and grounding	2000V AC, 1 minute				
	Between opposite polarity live sections	2000V AC, 1 minute		_		
Insulation resistance	9	100M $\Omega$ or more (500V DC megger)				
Rated impulse withs	tand voltage Uimp	2.5kV				
Conditional short-cir	cuit current	1000A				
Short-circuit protect	ive device	gG 2A (IEC60269 Fuse)				
Pollution degree		3				
Vibration		Resonance: frequency 10 to 55Hz, double amplitude 1.0mm Constant: frequency 16.7Hz, double amplitude 3mm				
Shock		Malfunction durability; 100m/s <sup>2</sup> Mechanical durability; 500m/s <sup>2</sup>				
Operational ambien	t temperature	-10 to +55°C (no icing or no condensation)				
Storage temperature	9	-40 to +70°C				
Relative humidity (ir	side control panel)	45 to 85%RH (-5 to + 40°C) (no icing or no condensation)				
Degree of protection	of operating (displaying) section	IP65 (dust-proof, water jet proof): IEC 60529				
Degree of protection	n of terminal section	IP2X (Fast-connection socket: AR6S690, Connector socket: AR6S691-C or Terminal cover: AR2Y261, At the connection)				

# Command Switches AR16 and DR16, AF16 and DF16 Specifications

#### ■ Specifications (Socket)

Item	Fast-connection socket	Connector socket	Socket for PC board
Rated insulation voltage Ui	250V AC/DC		60V AC/DC
Conventional free air thermal current Ith	3A	5A	3A
Rated impulse withstand voltage Uimp	2.5kV		0.5kV
Withstand voltage (Between live section and grounding)	2000V AC, 1 minute		1000V AC, 1 minute
Insulation resistance	100M $\Omega$ or more (500V DC m	egger)	
Operational ambient temperature	-10 to +55°C (no icing or no	condensation)	
Storage temperature	-40 to +70°C		
Relative humidity	45 to 85%RH (-5 to +40°C) (no icing or no condensation)		
Pollution degree	3		

#### ■ Degree of protection

• The table below shows the degree of protection stipulated by IEC (International Electrotechnical Commission) standard (IEC 60529).

IP- 6 5

Class	Degree of protection ag foreign object	ainst human contact or penetration by a	Degree of protection ag	gainst ingress of water
5		Normal operation secured even if the dust that can pass through screen of 75µm mesh invades.	Protection against water jets	Protected against water jet from all directions. Water projected by nozzle (6.3mm-inner dia.) from all directions at 29.4kPa for 3min at a distance of 3m.
6		The dust which can pass through screen of 75µm mesh shall not invade.	Protection against powerful water	Protected against powerful water jet from all directions. Water projected by nozzle (12.5mm-inner dia.) from all directions at 98kPa for 3min at a distance of 3m.

#### **■** Contact reliability

FUJI has confirmed that the product can be used in 1mA circuit conditions at 5V AC or DC. The operable range, however, may vary depending on the operational ambient conditions and type of load.

# Command Switches AR16 and DR16, AF16 and DF16 Specifications

#### ■ Lamp ratings and current consumption

#### · Illuminated pushbutton switch, Pilot lights

Applied method	Lamp operational voltage	High-brightness LED lamp				
		Туре	Lamp rated voltage	Current consumption		
without transformer	6V AC/DC	DR6L695-A□	6V AC/DC	Green, Blue: 11mA AC, 7.5mA DC Red, Amber: 9mA AC, 7.5mA DC Orange: 10mA AC, 8.5mA DC Yellow: 30mA AC, 26mA DC		
	12V AC/DC	DR6L695-B□	12V AC/DC	Green, Red, Amber, Blue: 7.5mA AC, 7.5mA DC Orange: 9mA AC, 8.5mA DC Yellow: 11mA AC, 8.5mA DC		
	24V AC/DC	DR6L695-E□	24V AC/DC	Green, Red, Amber, Blue: 7.5mA AC, 7.5mA DC Orange, Yellow: 9mA AC, 8.5mA DC		

Note: A box  $\square$  indicates the luminous color. For details, see the "Combination of Illuminated pushbutton / pilot light color and LED lamp luminous color".

#### ■ Combination of Illuminated pushbutton / pilot light color and LED lamp luminous color

		1, :	
Illuminated push	button / pilot light col	or Luminous color	of high-brightness
	(I	ens color) LED lamp	
	Type		Туре
Green	G	Green	DR6L695- <b>■</b> G
Red	R	Red	DR6L695- <b>■</b> R
White	W	Orange	DR6L695- <b>■</b> W
Yellow	Υ	Yellow	DR6L695- <b>■</b> Y
Orange	Α	Amber	DR6L695- <b>■</b> A
Blue	S	Blue	DR6L695- <b>■</b> S

Note: <sup>1</sup> A box ■ indicates the lamp operational voltage. For details, see the "Lamp ratings and current consumption".

#### ■ LED durability

Type of lamp	Durability (reference)	Judgment criterion
LED lamp	Approx. 30000h	When the brightness is less than 50% of initial value.

Note: The durability of LED lamp is a mean value in all colors.

#### ■ Standard approved

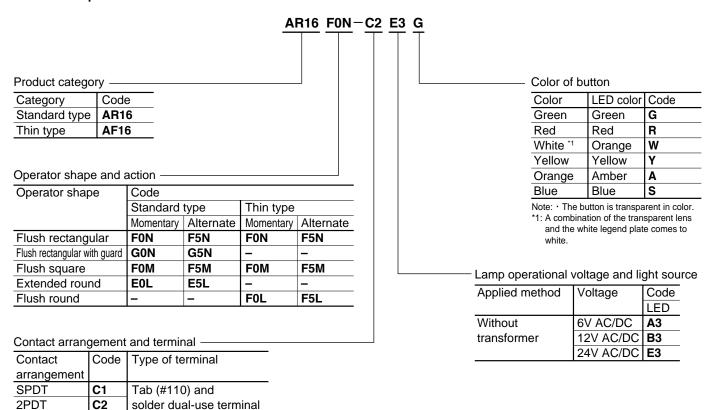
UL508	cUL File No.E44592
CSA C22.2 No.14	
TÜV: EN60947-5-1	Pushbutton, Illuminated pushbutton: R50116757 Selector: R50116759 Pilot lights: R50116762
CCC: GB14048.5	Switches (except pilot ligths): 2003010305071068 Pilot lights: 2003010305071044

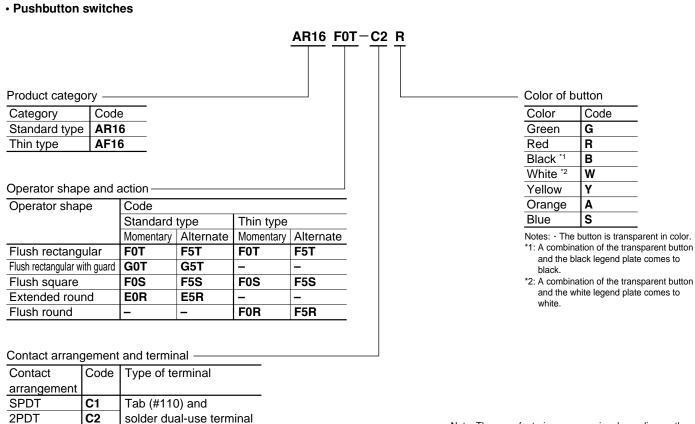
#### ■ Standard models approved by international standards

The standard models of AR16 and DR16, AF16 and DF16 series of the  $\phi$ 16 Command Switches meet UL / CSA requirements, China Compulsory Certification (CCC) standards, and TÜV EN standards, thus ensuring easier direct or indirect export to North America and European countries with no safety standard concerns.

## Command Switches AR16 and DR16, AF16 and DF16 Type number nomenclature

#### · Illuminated pushbutton switches

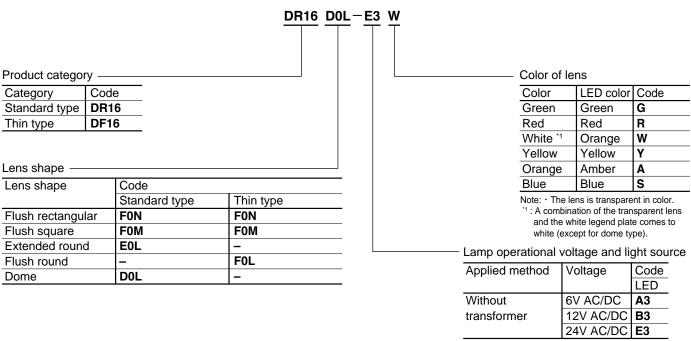




Note: The manufacturing range varies depending on the model. For details, see "Types and dimensions" of this catalog.

# Command Switches AR16 and DR16, AF16 and DF16 Type number nomenclature

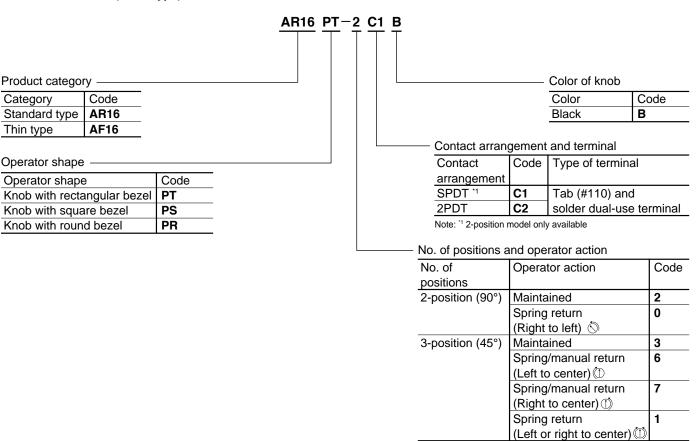
#### · Pilot lights



Note: The terminal used is a tab (#110) and solder

# Command Switches AR16 and DR16, AF16 and DF16 Type number nomenclature

#### · Selector switches (Knob type)

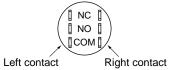


#### · Key position and contact operation

2-position

Operator action (V	Contact	Contact unit		Operator position *2		
2	0	arrangement			1	2
		SPDT	Left	COM < NC	•	1
1 2	1 2		Leit	NO		•
		2PDT	l of	NC NC	•	
			Left	COM <		•
Maintained/90°	Spring return/90°		Diaht	COM NC	•	!
			Right	COM NO	T	•

Terminal arrangement
View from the terminal side (the back)



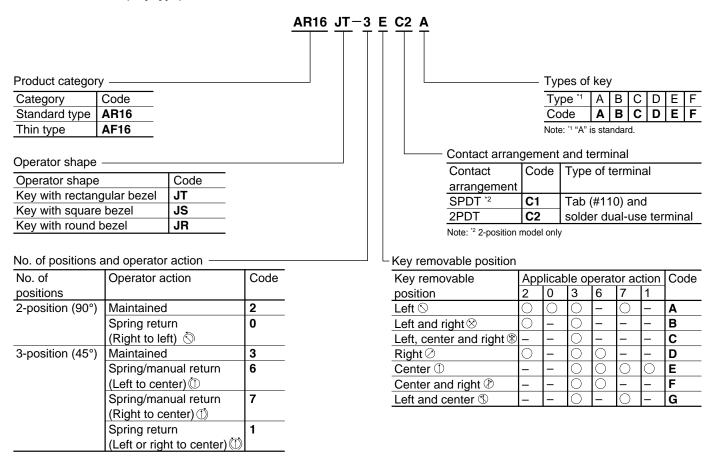
#### 3-position

Operator action (View form the front)				Contact	Conta	ct unit	Operator position *2		
3	6	7	1	arrangement			1	2	3
2	2	2	2	2PDT		NC			
			Left		COM < ·		! !	•	
Maintained/each	Spring/manual	Spring/manual	Spring return/		Right	NC			
45°	return/each 45°	return/each 45°	each 45°		Rigili	NO	•	!	

Note:  $^{\cdot_2} \bullet$ , means the contact closed (ON).

# AR16 and DR16, AF16 and DF16 Type number nomenclature

#### · Selector switches (Key type)

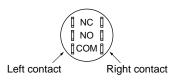


#### · Key position and contact operation

2-position

Operator action (V	riew form the front)	Contact	Contact unit		Operator position *3	
2	0	arrangement			1	2
		SPDT	Left	NC	•	
1 2	1 2 Spring return/90°		Left COM			•
		2PDT	Left COM		•	
			Len	COM <		•
Maintained/90°			D:l. (	NC	•	
			Right	NO		•

Terminal arrangement View from the terminal side (the back)



#### 3-position

Operator action (V	Operator action (View form the front)				Contact unit		Operator position *3		
3	6	7	1	arrangement			1	2	3
2	3 1 2 3 2F		2PDT	1 -44	NC				
			Left (		COM < ····			•	
Maintained/each	Spring/manual	Spring/manual	Spring return/		D:l. (	NC NC			
45°	return/each 45°	return/each 45°	each 45°		Right	COM < ····	•		

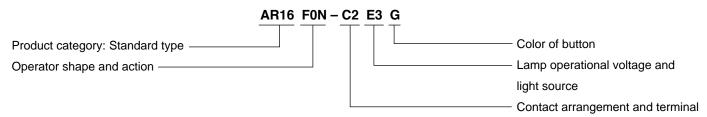
Note: \*3 •, • means the contact closed (ON).

# Command Switches AR16 and DR16, AF16 and DF16 Type numbers and dimensions

#### 1. Standard type, AR16 and DR16

#### ■ Illuminated pushbutton switches (LED illuminated)

#### • Type number system



#### Type

Operator	Appearance (Standard type)	Lamp operational voltage	Conntact arrangement	Momentary action Type	Alternate action Type
Flush rectangular	AR16F0N, F5N	6V AC/DC	SPDT	AR16F0N-C1A3□	AR16F5N-C1A3□
	41		2PDT	AR16F0N-C2A3□	AR16F5N-C2A3□
		12V AC/DC	SPDT	AR16F0N-C1B3□	AR16F5N-C1B3□
			2PDT	AR16F0N-C2B3□	AR16F5N-C2B3□
		24V AC/DC	SPDT	AR16F0N-C1E3□	AR16F5N-C1E3□
			2PDT	AR16F0N-C2E3□	AR16F5N-C2E3□
	AR16G0N, G5N	6V AC/DC	SPDT	AR16G0N-C1A3□	AR16G5N-C1A3□
with guard			2PDT	AR16G0N-C2A3□	AR16G5N-C2A3□
		12V AC/DC	SPDT	AR16G0N-C1B3□	AR16G5N-C1B3□
			2PDT	AR16G0N-C2B3□	AR16G5N-C2B3□
		24V AC/DC	SPDT	AR16G0N-C1E3□	AR16G5N-C1E3□
			2PDT	AR16G0N-C2E3□	AR16G5N-C2E3□
Flush square	AR16F0M, F5M	6V AC/DC	SPDT	AR16F0M-C1A3□	AR16F5M-C1A3□
	A 1	0.	2PDT	AR16F0M-C2A3□	AR16F5M-C2A3□
		12V AC/DC	SPDT	AR16F0M-C1B3□	AR16F5M-C1B3□
			2PDT	AR16F0M-C2B3□	AR16F5M-C2B3□
		24V AC/DC	SPDT	AR16F0M-C1E3□	AR16F5M-C1E3□
			2PDT	AR16F0M-C2E3□	AR16F5M-C2E3□
xtended round	AF16E0L, E5L	6V AC/DC	SPDT	AR16E0L-C1A3□	AR16E5L-C1A3□
			2PDT	AR16E0L-C2A3□	AR16E5L-C2A3□
		12V AC/DC	SPDT	AR16E0L-C1B3□	AR16E5L-C1B3□
			2PDT	AR16E0L-C2B3□	AR16E5L-C2B3□
		24V AC/DC	SPDT	AR16E0L-C1E3□	AR16E5L-C1E3□
			2PDT	AR16E0L-C2E3□	AR16E5L-C2E3□

Note: • See page 04/144 for the outline dimensions.

#### • Button color

Replace the  $\square$  mark by the color code

Color	Green	Red	White	Yellow	Orange	Blue
Code	G	R	W *1	Υ	Α	S

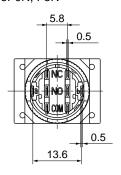
Note:  $^{\star 1}$  A combination of the transparent button and the white legend plate comes to white.

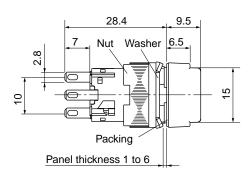
#### AR16 and DR16

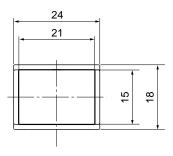
# Type numbers and dimensions

#### · Dimensions, mm

#### Flush rectangular AR16F0N, F5N

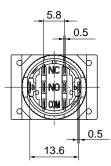


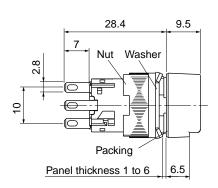


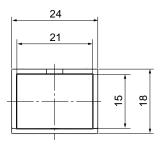


# Flush rectangular with guard

AR16G0N, G5N

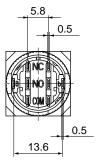


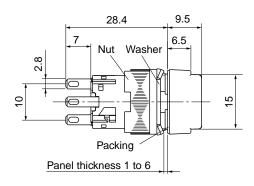


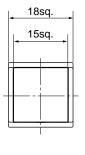


# Flush square

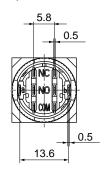
AR16F0M, F5M

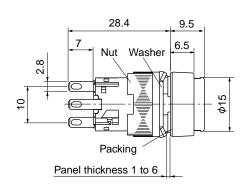


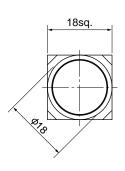




#### **Extended round** AR16E0L, E5L



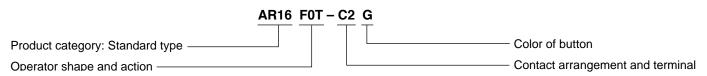




# **Command Switches** AR16 and DR16 Type numbers and dimensions

#### **■** Pushbutton switches

#### • Type number system



#### • Type

Operator	Appearance	Conntact	Momentary action	Alternate action
	(Standard type)	arrangement	Type	Туре
Flush rectangular	AR16F0T, F5T	SPDT	AR16F0T-C1□	AR16F5T-C1□
		2PDT	AR16F0T-C2□	AR16F5T-C2□
Flush rectangular with guard	AR16G0T, G5T	SPDT	AR16G0T-C1□	AR16G5T-C1□
		2PDT	AR16G0T-C2□	AR16G5T-C2□
Flush square	AR16F0S, F5S	SPDT	AR16F0S-C1□	AR16F5S-C1□
		2PDT	AR16F0S-C2□	AR16F5S-C2□
Extended round	AR16E0R, E5R	SPDT	AR16E0R-C1□	AR16E5R-C1□
		2PDT	AR16E0R-C2□	AR16E5R-C2□

Note:  $\bullet$  See page 04/146 for the outline dimensions.

#### Button color

Replace the  $\square$  mark by the color code

Color	Green	Red	Black	White	Yellow	Orange	Blue
Code	G	R	B *1	W *2	Υ	Α	S

Notes:  $^{\star 1}$  A combination of the transparent button and the black legend plate

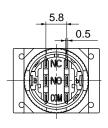
comes to black.  $^{\star 2}\,\mathrm{A}$  combination of the transparent button and the white legend plate comes to white.

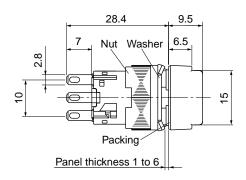
#### AR16 and DR16

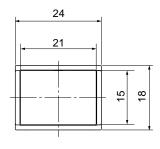
# Type numbers and dimensions

#### · Dimensions, mm

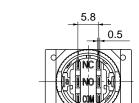
#### Flush rectangular AR16F0T, F5T

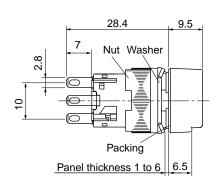


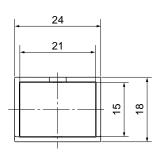




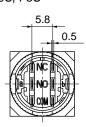
# Flush rectangular with guard AR16G0T, G5T

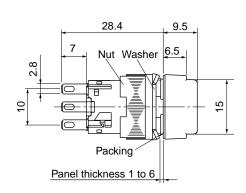


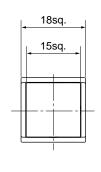




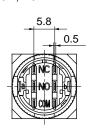
#### Flush square AR16F0S, F5S

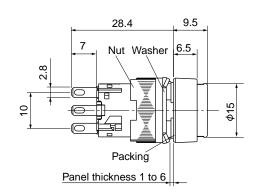


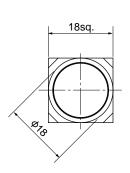




#### Extended round AR16E0R, E5R



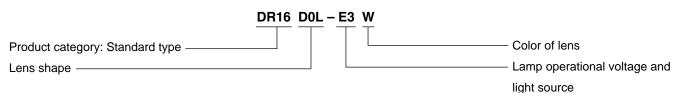




# Command Switches AR16 and DR16 Type numbers and dimensions

## ■ Pilot lights (LED illuminated)

#### • Type number system



#### Type

Lens	Appearance (Standard type)	LED lamp operational voltage	Туре	
Flush rectangular	DR16F0N	6V AC/DC	DR16F0N-A3□	
		12V AC/DC	DR16F0N-B3□	
		24V AC/DC	DR16F0N-E3□	
Flush square	DR16F0M	6V AC/DC	DR16F0M-A3□	
		12V AC/DC	DR16F0M-B3□	
		24V AC/DC	DR16F0M-E3□	
Extended round	DR16E0L	6V AC/DC	DR16E0L-A3□	
		12V AC/DC	DR16E0L-B3□	
		24V AC/DC	DR16E0L-E3□	
Dome	DR16D0L	6V AC/DC	DR16D0L-A3□	
		12V AC/DC	DR16D0L-B3□	
		24V AC/DC	DR16D0L-E3□	

Note: • See page 04/148 for the outline dimensions.

#### · Lens color

Replace the  $\square$  mark by the color code

Color	Green	Red	White	Yellow	Orange	Blue
Code	G	R	W *1	Υ	Α	S

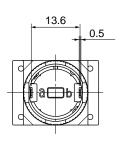
Note: \*1 A combination of the transparent lens and the white legend plate comes to white (except for dome type).

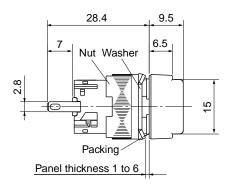
## AR16 and DR16

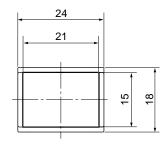
# Type numbers and dimensions

#### · Dimensions, mm

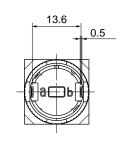
# Flush rectangular DR16F0N

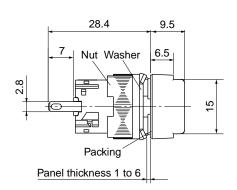


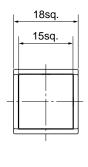




#### Flush square DR16F0M

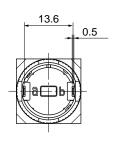


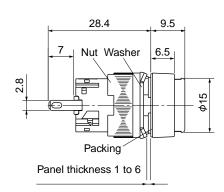


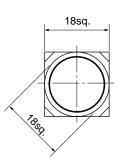


## **Extended round**

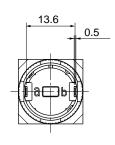
DR16E0L

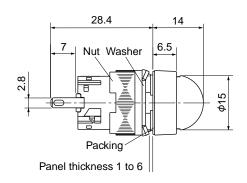


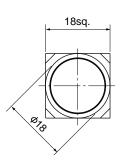




#### Dome DR16D0L







# **Command Switches** AR16 and DR16 Type numbers and dimensions

#### ■ Selector switches (Knob type)

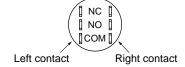
#### • Type number system

AR16 PT -	-2 C2 B
Product category: Standard type	Color of knob: Black
Operator shape	Contact arrangement and terminal
	No. of positions and operator action

#### Type 2-position

Operator and	No. of	Contact	Туре		Conta	act operation		
appearance (Standard type)	positions	arrangement	1 2	1 2	Contact unit *1		Ope posi	rator tion *2
			Maintained/90°	Spring return/90°			1	2
Knob with rectangular bezel/ <b>AR16PT</b>	2-position	SPDT	AR16PT-2C1B	AR16PT-0C1B		/NC		
			AR16PS-2C1B	AR16PS-0C1B	Left	COM		ļ 
			AR16PR-2C1B	AR16PR-0C1B		NO		•
Knob with square bezel/ <b>AR16PS</b>		2PDT	AR16PT-2C2B	AR16PT-0C2B		, NC		
					Left	сом		
			AR16PS-2C2B	AR16PS-0C2B		NO		•
Knob with round bezel/ <b>AR16PR</b>						NC	•	; ; ; ; ; ;
			AR16PR-2C2B	AR16PR-0C2B	Right	сом (		<u>+</u>
						NO		•

Note: \*1 Terminal arrangement of contact (View from the terminal side (the back)).



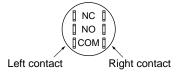
<sup>\*2 •:</sup> Means the contact closed (ON).
• See page 04/151 for the outline dimensions.

# **Command Switches** AR16 and DR16 Type numbers and dimensions

## 3-position

Operator and	No. of	Contact	Туре			act operation	n			
appearance (Standard type)	positions	arrangement			Conta	act unit *1		Ope	itio	n *² ;
			Maintained/each 45°	Spring return/each 45°				1	2	3
Knob with rectangular bezel/AR16PT	3-position	2PDT	AR16PT-3C2B	AR16PT-1C2B			NC			
			AR16PS-3C2B	AR16PS-1C2B	Left	СОМ	NO			•
Knob with square bezel/AR16PS			AR16PR-3C2B	AR16PR-1C2B	Right COM <		NC		•	
							NO			
			1 3	1 3	Conta	act unit *1		Ope	itio	n *2
			Spring/manual return/each 45°	Spring/manual return/each 45°				1	2	3
Knob with round bezel/ <b>AR16PR</b>			AR16PT-6C2B	AR16PT-7C2B			NC			
			AR16PS-6C2B	AR16PS-7C2B	Left	COM	NO			•
			AR16PR-6C2B	AR16PR-7C2B	Pight	сом	NC			
					rxigiit	NO		•		

Notes: <sup>1</sup> Terminal arrangement of contact (View from the terminal side (the back)).



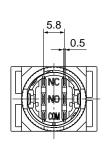
<sup>•</sup> See page 04/151 for the outline dimensions.

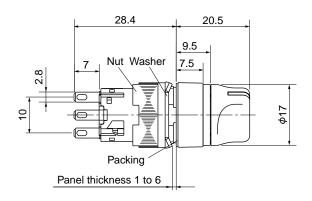
04

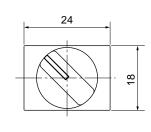
# Command Switches AR16 and DR16 Type numbers and dimensions

#### • Dimensions, mm

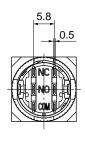
# Knob with rectangular bezel AR16PT

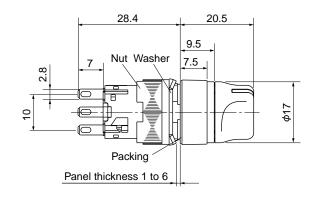


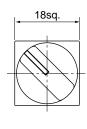




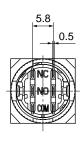
# **Knob with square bezel** AF16PS

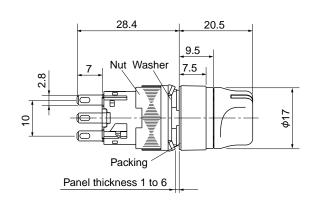


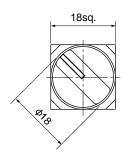




# Knob with round bezel AF16PR







# **Command Switches** AR16 and DR16

# Type numbers and dimensions

#### ■ Selector switches (Key type)

#### • Type number system

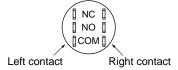
AR16 JT - 2	2 B C2 A
Product category: Standard type	Type of key
Operator shape	Contact arrangement and terminal
No. of positions and operator action —	Key removable position

# Type

2-position

Operator and	No. of	Contact	Туре		Conta	act operation		
appearance (Standard type)	urd type)		1 2	Conta	act unit <sup>*1</sup>	Ope posit	rator tion *2	
			Maintained/90°	Spring return/90°			'	-
Key with rectangular bezel/ <b>AR16JT</b>	2-position	SPDT	AR16JT-2■C1A	AR16JT-0AC1A		/NC		
			AR16JS-2■C1A	AR16JS-0AC1A	Left	сом		
			AR16JR-2■C1A	AR16JR-0AC1A	R16JR-0AC1A	NC		•
Key with square bezel	/	2PDT	AR16JT-2■C2A	AR16JT-0AC2A		, NC		
			AR16JS-2■C2A	AR16JS-0AC2A	Left	COM		•
Key with round bezel/ AR16JR			AR16JR-2■C2A	AR16JR-0AC2A	Pight	NC COM ····	•	 
					Rigit	NC		•

Notes: \*1 Terminal arrangement of contact (View from the terminal side (the back)).



#### · Key removable position

Specify the key removal position in the square ■ mark.

Key removable	Applied operator	Code	
position	2	0	
Left ⊗	0	0	Α
Left•Right ⊗	0	_	В
Left ⊘	0	_	D

<sup>○:</sup> Available -: Not available

#### · Type of key

Type *1	Α	В	С	D	Е	F
Code	Α	В	С	D	Ε	F

<sup>\*1 &</sup>quot;A" is standard.

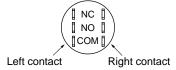
<sup>\*</sup>² •: Means the contact closed (ON).
• See page 04/154 for the outline dimensions.

# Command Switches AR16 and DR16 Type numbers and dimensions

#### 3-position

Operator and	No. of	Contact	Туре		Conta	act operation			
appearance (Standard type)	positions	arrangement	1 3	1 2 3	Conta	act unit *1	po	i	on *2
			Maintained/each 45°	Spring return/each 45°			1	2	3
Key with rectangular bezel/AR16JT	3-position	2PDT	AR16JT-3≣C2A	AR16JT-1EC2A		NC			
			AR16JS-3■C2A	AR16JS-1EC2A	Left	COM	)	÷	•
Key with square bezel/			AR16JR-3■C2A	AR16JR-1EC2A	Right	COM			
			2 3 Spring/manual return/each 45°	2 3 Spring/manual return/each 45°	Conta	act unit 1	Or	i	tor on <sup>2</sup>
Key with round bezel/			AR16JT-6■C2A	AR16JT-7■C2A			+	<del>!</del>	<del></del>
AR16JR			AR16JS-6∎C2A	AR16JS-7■C2A	Left	COM			•
			AR16JR-6∎C2A	AR16JR-7■C2A	Right	COM			

Notes: \*1 Terminal arrangement of contact (View form the terminal side (the back)).



 $<sup>^{\</sup>star 2}$  •,  $\blacksquare$ : Means the contact closed (ON).

#### Key removal position

Specify the key removal position in the square ■ mark.

Key removable	Applied	operator	Code		
position	3	6	7	1	
Left <b></b>	0	-	0	-	Α
Left•Right ⊗	0	-	-	-	В
Left•Center•					С
Right	$\subseteq$				C
Right Ø	0	0	_	_	D
Center ①	0	0	0	0	E
Center•Right ③	0	0	-	-	F
Left•Center \mathscr{m}	0	_	0	_	G

<sup>○:</sup> Available -: Not available

## Type of key

Type *1	Α	В	С	D	Е	F
Code	Α	В	С	D	Е	F

<sup>\*1 &</sup>quot;A" is standard.

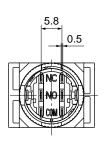
<sup>•</sup> See page 04/154 for the outline dimensions.

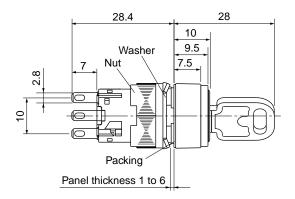
## AF16 and DF16

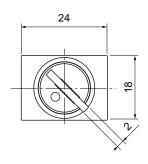
# Type numbers and dimensions

#### · Dimensions, mm

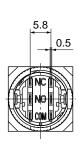
# **Key with rectangular bezel** AR16JT

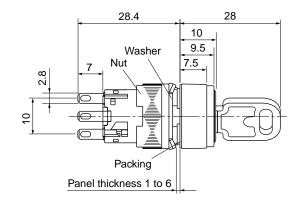


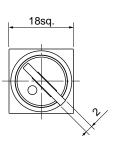




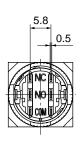
# **Key with square bezel** AR16JS

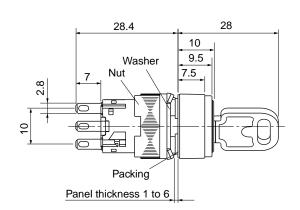


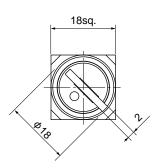




# **Key with round bezel** AR16JR



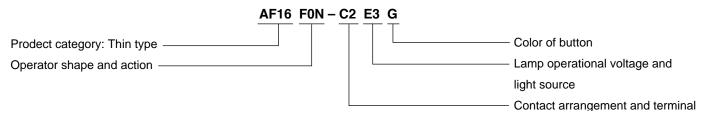




# Command Switches AF16 and DF16 Type numbers and dimensions

#### ■ Illuminated pushbutton switches (LED lamp)

#### • Type number system



#### Type

Operator	Appearance	LED lamp	Conntact	Momentary action	Alternate action
	(Thin type)	operational voltage	arrangement	Type	Туре
Flush rectangular	AF16F0N, F5N	6V AC/DC	SPDT	AF16F0N-C1A3□	AF16F5N-C1A3□
	A 2		2PDT	AF16F0N-C2A3□	AF16F5N-C2A3□
		12V AC/DC	SPDT	AF16F0N-C1B3□	AF16F5N-C1B3□
			2PDT	AF16F0N-C2B3□	AF16F5N-C2B3□
		24V AC/DC	SPDT	AF16F0N-C1E3□	AF16F5N-C1E3□
			2PDT	AF16F0N-C2E3□	AF16F5N-C2E3□
Flush square	AF16F0M, F5M	6V AC/DC	SPDT	AF16F0M-C1A3□	AF16F5M-C1A3□
	A 1		2PDT	AF16F0M-C2A3□	AF16F5M-C2A3□
		12V AC/DC	SPDT	AF16F0M-C1B3□	AF16F5M-C1B3□
			2PDT	AF16F0M-C2B3□	AF16F5M-C2B3□
		24V AC/DC	SPDT	AF16F0M-C1E3□	AF16F5M-C1E3□
			2PDT	AF16F0M-C2E3□	AF16F5M-C2E3□
Flush round	AF16F0L, F5L	6V AC/DC	SPDT	AF16F0L-C1A3□	AF16F5L-C1A3□
			2PDT	AF16F0L-C2A3□	AF16F5L-C2A3□
		12V AC/DC	SPDT	AF16F0L-C1B3□	AF16F5L-C1B3□
			2PDT	AF16F0L-C2B3□	AF16F5L-C2B3□
		24V AC/DC	SPDT	AF16F0L-C1E3□	AF16F5L-C1E3□
			2PDT	AF16F0L-C2E3□	AF16F5L-C2E3□

Note: • The panel cutting dimensions differ depending on the operator shape of thin type model. See page 04/167.

#### ·Button color

Replace the  $\square$  mark by the color code.

Color	Green	Red	White	Yellow	Orange	Blue
Code	G	R	W *1	Υ	Α	S

Note:  $^{\star 1}$  A combination of the translucent button and the white legend plate comes to white lens.

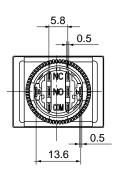
<sup>•</sup> For the dimensions, see page 04/156.

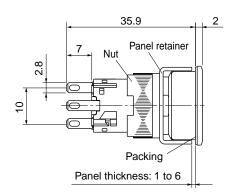
## AF16 and DF16

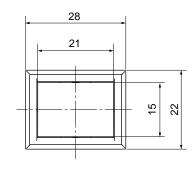
# Type numbers and dimensions

#### · Dimensions, mm

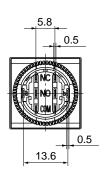
#### Flush rectangular AF16F0N, F5N

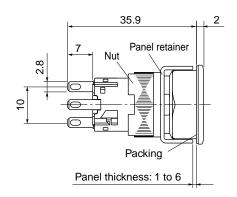


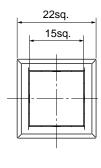




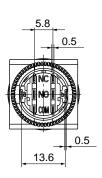
#### Flush square AF16F0M, F5M

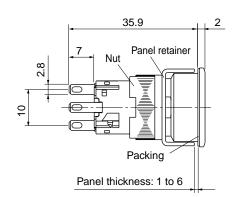


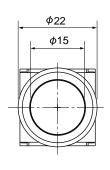




#### Flush round AF16F0L, F5L







# **Command Switches** AF16 and DF16 Type numbers and dimensions

#### **■** Pushbutton switches

#### • Type number system

AF16	FOT – C2 G
Prodect category: Thin type	Color of button
Operator shape and action ————————————————————————————————————	Contact arrangement and terminal

#### • Type

Thin type)	arrangement	1_	
E40E0T FET	1 3	Туре	Туре
AF16F0T, F5T	SPDT	AF16F0T-C1□	AF16F5T-C1□
	2PDT	AF16F0T-C2□	AF16F5T-C2□
AF16F0S, F5S	SPDT	AF16F0S-C1□	AF16F5S-C1□
	2PDT	AF16F0S-C2□	AF16F5S-C2□
AF16F0R, F5R	SPDT	AF16F0R-C1□	AF16F5R-C1□
	2PDT	AF16F0R-C2□	AF16F5R-C2□
		F16F0S, F5S  SPDT  2PDT  SPDT  SPDT	SPDT AF16F0S-C1  2PDT AF16F0S-C2  SPDT AF16F0S-C2  SPDT AF16F0R-C1

Note: • The panel cutting dimensions differ depending on the operator shape of thin type model. See page 04/167.

#### • Button color

Replace the  $\square$  mark by the color code.

Color	Green	Black	Red	White	Yellow	Orange	Blue
Code	G	B *1	R	W * <sup>2</sup>	Υ	Α	S

Notes: \*1 A combination of the translucent button and the black legend plate

<sup>•</sup> For the dimensions, see page 04/158.

comes to black.

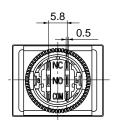
\*2 A combination of the translucent button and the white legend plate comes to white.

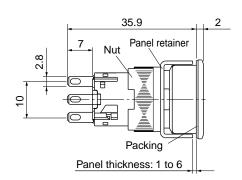
## AF16 and DF16

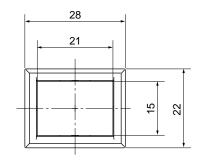
# Type numbers and dimensions

#### · Dimensions, mm

#### Flush rectangular AF16F0T, F5T

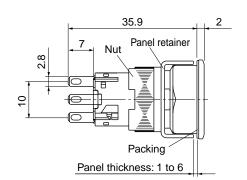


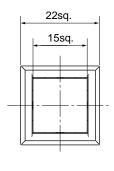




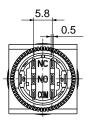
#### Flush square AF16F0S, F5S

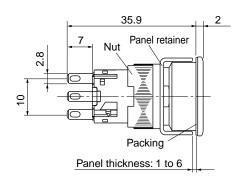


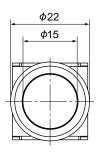




#### Flush round AF16F0R, F5R







# Command Switches AF16 and DF16 Type numbers and dimensions

## ■ Pilot lights (LED lamp)

#### • Type number system

DF16 F0N	I – E3 W
Product category: Thin type	Color of lens
Lens shape	Lamp operational voltage and light source

#### Type

Lens	Appearance (Thin type)	LED lamp operational voltage	Туре
Flush rectangular	DF16F0N	6V AC/DC	DF16F0N-A3□
		12V AC/DC	DF16F0N-B3□
		24V AC/DC	DF16F0N-E3□
Flush square	DF16F0M	6V AC/DC	DF16F0M-A3□
		12V AC/DC	DF16F0M-B3□
		24V AC/DC	DF16F0M-E3□
Flush round	DF16F0L	6V AC/DC	DF16F0L-A3□
		12V AC/DC	DF16F0L-B3□
		24V AC/DC	DF16F0L-E3□

Note: • The panel cutting dimensions differ depending on the lens shape of thin type model. See page 04/167.

#### · Lens color

Replace the  $\square$  mark by the color code

Color	Green	Red	White	Yellow	Orange	Blue
Code	G	R	W *1	Υ	Α	S

Note:  $^{\star 1}$  A combination of the transparent lens and the white legend plate comes to white.

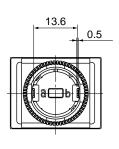
<sup>•</sup> For the dimensions, see page 04/160.

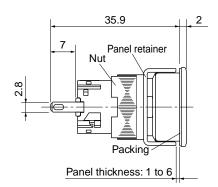
## AF16 and DF16

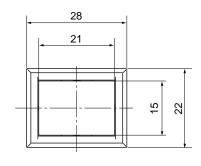
# Type numbers and dimensions

#### • Dimensions, mm

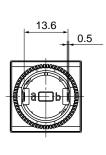
# Flush rectangular DF16F0N

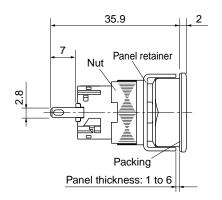


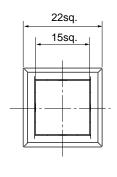




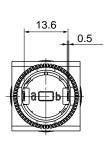
#### Flush square DF16F0M

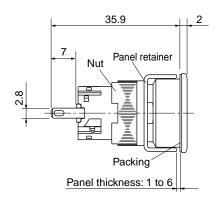


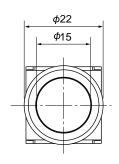




#### Flush round DF16F0L







# **Command Switches** AF16 and DF16 Type numbers and dimensions

#### ■ Selector switches (Knob type)

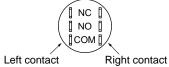
#### • Type number system

AF16 PT - 2 C2 B	
Product category: Thin type	Color of knob: Black Contact arrangement and terminal No. of positions and operator action

#### Type 2-position

Operator	Conntact	Туре			Contact operation			
(Thin type)	arrangement	1 2 1 2		Contact unit *1		Oper	rator tion *2	
		Maintained/90°	Spring return/90°			1	2	
Knob with rectangular bezel/ <b>AF16PT</b>	SPDT	AF16PT-2C1B	AF16PT-0C1B		/ NC	•		
		AF16PS-2C1B	AF16PS-0C1B	Left	сом		<u>.</u>	
		AF16PR-2C1B	AF16PR-0C1B	No	NO		•	
Knob with square bezel/ <b>AF16PS</b>	2PDT	AF16PT-2C2B	AF16PT-0C2B		, NC			
				Left	сом		<u></u>	
		AF16PS-2C2B	AF16PS-0C2B		NO		•	
Knob with round bezel/ <b>AF16PR</b>					/ NC		<del></del>	
		AF16PR-2C2B	AF16PR-0C2B	Right	COM ·		<u>.</u>	
					NO		•	

Notes: \*1 Terminal arrangement of contact (view from terminal side).



<sup>\*</sup>² •: Contact closed.
• The panel cutting dimensions differ depending on the operator shape of thin type model. See page 04/167.
• For the dimensions, see page 04/163.

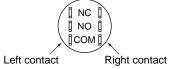
# AF16 and DF16

# Type numbers and dimensions

#### 3-position

Operator	Contact	Type		Conta	act operation			
(Thin type)	arrangement	1 3	1 3	Contact unit *1		Operator position *2		tor on *2
		Maintained/each 45°	Spring return/each 45°			1	2	3
Knob with flush square/ <b>AF16PT</b>	2PDT	AF16PT-3C2B	AF16PT-1C2B		/ NO			
		AF16PS-3C2B	AF16PS-1C2B	Left	COM		+	•
Knob with square bezel/ <b>AF16PS</b>		AF16PR-3C2B	AF16PR-1C2B	Right	COM ····			
		2 1 3 Spring/manual return/each 45°	2 3 Spring/manual return/each 45°	Conta	act unit "	Op po	;	on 2
Knob with round bezel/ <b>AF16PR</b>		AF16PT-6C2B	AF16PT-7C2B		NO	•		
		AF16PS-6C2B	AF16PS-7C2B	Left	COM ·	)		•
- Annah		AF16PR-6C2B	AF16PR-7C2B	Right	NO COM ·	;		
				Trigiti	NO			

Notes: \*1 Terminal arrangement of contact (view from terminal side).



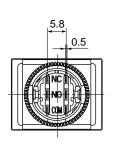
<sup>• \* •</sup> Contact closed.
• The panel cutting dimensions differ depending on the operator shape of thin type model. See page 04/167.
• For the dimensions, see page 04/163.

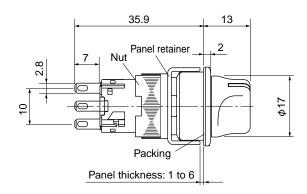
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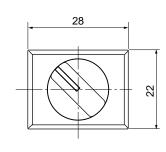
# Command Switches AF16 and DF16 Type numbers and dimensions

#### • Dimensions, mm

# **Knob with rectangular bezel** AF16PT

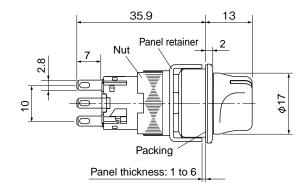


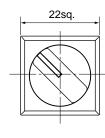




# **Knob with square bezel** AF16PS

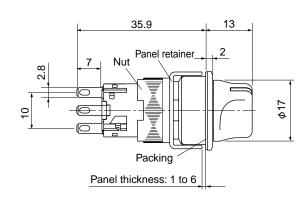


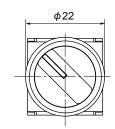




**Knob** AF16PR





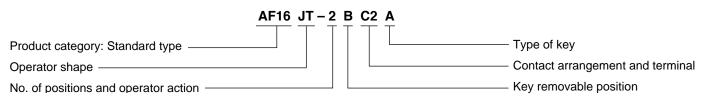


#### AF16 and DF16

## Type numbers and dimensions

#### ■ Selector switches (Key type)

#### • Type number system

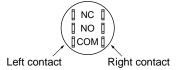


#### Type

2-position

Operator	Contact	Туре			Contact operation			
(Thin type)	arrangement	1 2	1 2	Contact unit <sup>™</sup>		Ope	rator tion *2	
		Maintained/90°	Spring return/90°			1	2	
Key with rectangular bezel/ <b>AF16JT</b>	SPDT	AF16JT-2■C1A	AF16JT-0AC1A		/NC	•	1	
		AF16JS-2■C1A	AF16JS-0AC1A	Left	сом	ļ	ļ	
		AF16JR-2∎C1A	AF16JR-0AC1A		NO		•	
Key with square bezel. AF16JS	2PDT	AF16JT-2■C2A	AF16JT-0AC2A		/ NC	•	 	
		AF16JS-2■C2A	AF16JS-0AC2A	Left	COM		•	
Key with round bezel/ AF16JR		AF16JR-2≣C2A	AF16JR-0AC2A	Pight	NC COM ·	•		
<b>D</b>				Rigiti	NO		•	

Notes: \*1 Terminal arrangement of contact (view from terminal side).



<sup>\*2 •:</sup> Contact closed.

Contact loses.
 The panel cutting dimensions differ depending on the operator shape of thin type model. See page 04/167.
 For the dimensions, see page 04/166.

#### · Key removable position

Replace the ■ mark by the removable positiom code.

Removable	Applied operation	Code	
position	2	0	
Left 🛇	0	0	Α
Left•Right ⊗	0	-	В
Left ⊘	0	_	С

<sup>○:</sup> Available -: Not available

#### Type of key

Type *1	Α	В	С	D	Е	F
Code	Α	В	С	D	Ε	F

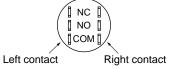
<sup>\*1 &</sup>quot;A" is standard.

# Command Switches AF16 and DF16 Type numbers and dimensions

#### 3-position

Operator	Contact	Туре			Contact operation				
(Thin type)	arrangement	1 3	1 2 3	Conta	act unit <sup>*1</sup>	pos	ï	n <sup>*2</sup> ;	
		Maintained/each 45°	Spring return/each 45°			1	2	3	
Key with Flush square	/ 2PDT	AF16JT-3■C2A	AF16JT-1EC2A		/ NC	•			
		AF16JS-3■C2A	AF16JS-1EC2A	Left	COM ·	 		•	
Key with square beze AF16JS	1/	AF16JR-3■C2A	AF16JR-1EC2A	Right	COM				
		2 3 Spring/manual return/each 45°	1 2 3 Spring/manual return/each 45°	Contact unit 1		Operator position 1 2 3		n *2	
Key with round bezel/ AF16JR	,	AF16JT-6■C2A	AF16JT-7■C2A		NC	-			
		AF16JS-6■C2A	AF16JS-7■C2A AF16JR-7■C2A	Left	COM NO			•	
		AF16JR-6∎C2A		Right	COM				
						•			

Notes: \*1 Terminal arrangement of contact (view from terminal side).



- \*2 •, Contact closed.
- The panel cutting dimensions differ depending on the operator shape of thin type model. See page 04/167.
- For the dimensions, see page 04/166.

#### Key removable position

Replace the  $\blacksquare$  mark by the removable positiom code.

Removable	Applied operatior position				Code
position	3	6	7	1	
Left ⊗	0	-	0	_	Α
Left•Right ⊗	0	-	_	_	В
Left•Center• ®	0	_	_	_	С
Right Ø	0	0	_	_	D
Center ①	0	0	0	0	E
Center•Right ②	0	0	-	-	F
Left•Center 🐒	0	-	0	_	G

<sup>○:</sup> Available -: Not available

## Type of key

Type <sup>*1</sup>	Α	В	С	D	Е	F
Code	Α	В	С	D	Е	F

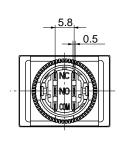
<sup>\*1 &</sup>quot;A" is standard.

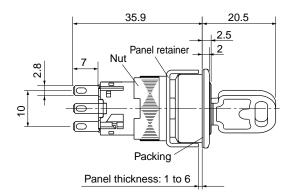
## AF16 and DF16

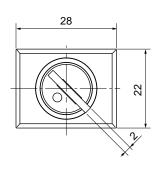
# Type numbers and dimensions

#### · Dimensions, mm

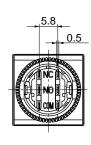
# **Key with recrangular bezel** AF16JT

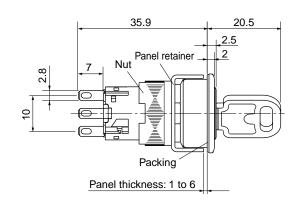


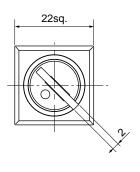




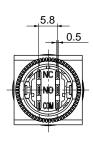
# **Key with square bezel** AF16JS

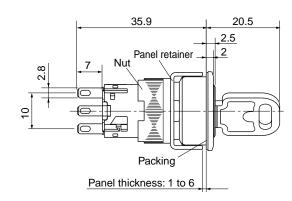


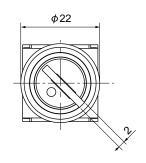




# **Key with round bezel** AF16JR







#### Safety Precautions

Read the Operating Instructions carefully before mounting, wiring, operating, servicing, or inspecting the command switch. Make sure that the Operating Instructions is delivered to the final user of the command switch.

 The safety precautions are classified into two levels, Warning and Caution, with meanings described as follows:

: If operation is incorrect, a dangerous situation may occur, resulting in death or serious injuries.

: If operation is incorrect, a dangerous situation may occur, resulting in minor to medium injuries or physical damage to equipment.

An item described under CAUTION may result in a serious accident, depending on the situation.

### 

- Do not touch or approach any live part while power is supplied. An electric shock or burning may result.
- Be sure to turn off the power before mounting, dismounting, wiring, or inspecting the product. An electric shock, burning from shortcircuiting or equipment malfunction may result.

#### ♠ Caution

- Wire the product according to the wiring instructions in the Operating Instructions. Make sure that the size of the wires is suitable for the voltage and applied current. The wrong wiring may result in fire, accidents or malfunctions.
- Treat the product as industrial waste when it is to be discarded.

#### ■ Panel cutout, mm

Standard type (common)



When requiring rotation prevention or positional stabilization



Note: When changing the operating angle position of the selector switch, the panel cutout also requires an angle change.

- Thin type (The panel cutout dimension varies depending on the operator or lens shape.)
- · Rectangular type



• Square type



Round type

When requiring rotation prevention or positional stabilization





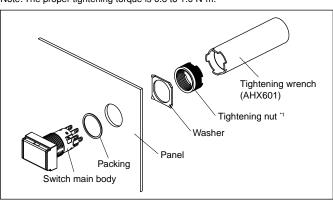
Note: When changing the operating angle position of the selector switch, the panel cutout also requires an angle change.

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#### ■ Installation on panel

 As shown in the figure below, insert the switch main unit into the mounting hole from the front of the panel, attach the washer and tightening nut from the back of the panel, and securely tighten the nut with the wrench (AHX601).

Note: The proper tightening torque is 0.6 to 1.0 N·m.

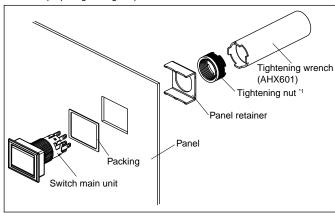


Note: \*1 Do not use pliers or other improper tools to tighten the nut, or tighten it excessively, Otherwise, the nut may be damaged or the switch may malfunction

#### Thin type

As shown in the figure below, insert the switch main unit into the mounting hole from the front of the panel, attach the panel retainer from the back of the panel, and securely tighten the nut with the wrench (AHX601).

Note: The proper tightening torque is 0.6 to 1.0 N•m.



Note: \*1 Do not use pliers or other improper tools to tighten the nut, or tighten it excessively, Otherwise, the nut may be damaged or the switch may malfunction.

#### ■ Applicable panel thickness

Tables 1 and 2 show applicable panel thickness.

Table 1 Standard type (AR16/DR16 series)

		Applicable panel thickness, mm
Without acce	essories	1 to 6
With	Protective cover	1 to 4
accessories	Dust-tight cover	1 to 4
	Various sockets	1 to 3.2
	Terminal cover	1 to 3.2
	Protective cover + various sockets	1 to 1.6
	Protective cover + Terminal cover	1 to 1.6
	Dust-tight cover + various sockets	Cannot be used.
	Dust-tight cover + Terminal cover	Cannot be used.

# Command Switches

# AR16, DR16 and AF16, DF16 Panel cutout and mounting

#### Table 2 Thin type (AF16/DF16 series)

		Applicable panel thickness, mm
Without accessories		1 to 6
With	Protective cover	1 to 4
accessories Various sockets		1 to 3.2
	Terminal cover	1 to 3.2
	Protective cover + various sockets	1 to 3.2
	Protective cover + Terminal cover	1 to 3.2

#### ■ High-density mounting

#### Minimum mounting space (pitch) without accessories, mm

• Standard type (AR16/DR16 series)

Illuminated pushbuttons, pushbuttons, selectors, and pilot lights

①Rectangular
②Square
③Round, dome

Note: Determine the mounting pitch by taking the operatbility and wiring work into consideration.

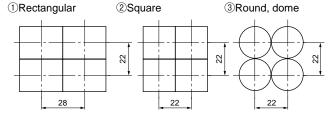
18

18

#### • Thin type (AF16/DF16 series)

24

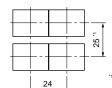
Illuminated pushbuttons, pushbuttons, selectors, and pilot lights



Note: Determine the mounting pitch by taking the operatbility and wiring work into consideration.

#### Minimum mounting space (pitch) with accessories, mm

 Protective cover AHX669 and AHX826 (Standard type)



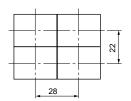
1 43: with the cover fully opened

 Protective cover AHX671 (Standard type)

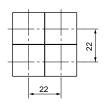


1 43: with the cover fully opened

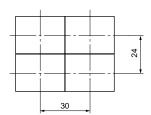
 Protective cover AF6D826 (Thin type)



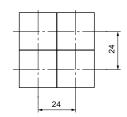
• Protective cover AF6D827 (Thin type)



 Dust-tight cover AHX668 (Standard type)



 Dust-tight cover AHX822 (Standard type)



 Minimum mounting spaces (pitch) with sockets, such as Fast-Connection socket (AR6S690), connector socket (AR6S691) and PC board-use socket (AR6S692) are the same as those without accessories.

Note: Determine the mounting pitch by taking the operability and wiring workability into consideration.

# Command Switches AR16, DR16 and AF16, DF16 Notes on use

# Safety Precautions

Read the Operating Instructions carefully before mounting, wiring, operating, servicing, or inspecting the command switch. Make sure that the Operating Instructions is delivered to the final user of the command switch.

 The safety precautions are classified into two levels, Warning and Caution, with meanings described as follows:

**⚠** Warning

: If operation is incorrect, a dangerous situation may occur, resulting in death or serious injuries.

⚠ Caution

: If operation is incorrect, a dangerous situation may occur, resulting in minor to medium injuries or physical damage to equipment.

An item described under CAUTION may result in a serious accident, depending on the situation.

#### 

- Do not touch or approach any live part while power is supplied. An electric shock or burning may result.
- Be sure to turn off the power before mounting, dismounting, wiring, or inspecting the product. An electric shock, burning from shortcircuiting, or equipment malfunction may result.

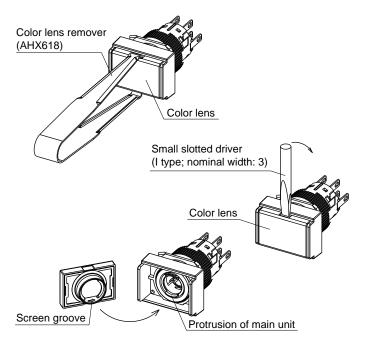
### **⚠** Caution

- Wire the product according to the wiring instructions in the Operating Instructions. Make sure that the size of the wires is suitable for the voltage and applied current. The wrong wiring may result in fire, accidents, or malfunctions.
- Treat the product as industrial waste when it is to be discarded.

# ■ Method of replacing color lens, legend plate, and screen Replacing color lens (screen)

• Standard type (AR16/DR16 series)

To remove the color lens, fit the color lens remover (AHX618) to the grooves in the color lens and pull out the lens, or pry the lens lightly with a small slotted screwdriver.

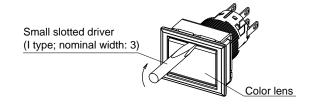


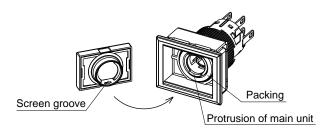
#### • Thin type (AF16/DF16 Series)

To remove the color lens, pry the lens lightly with a small slotted screwdriver.

If one side of the color lens is separated from the screen, further insert the screwdriver and remove the color lens together with the screen. Do not pry the packing when doing this.

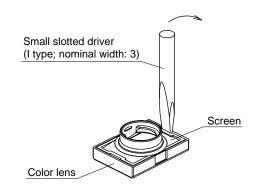
To fit the color lens, align the protrusion of switch main body with the groove of the screen, and press-fit them.





#### Removing screen

Insert the tip of a small slotted screwdriver into the groove and press down the screwdriver in the direction of the arrow.



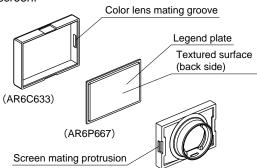
#### Command Switches

# AR16, DR16 and AF16, DF16 Notes on use

#### Fitting color lens to screen

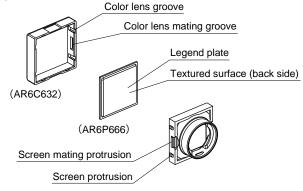
#### Rectangular type

Set the textured surface side of the legend plate with the screen side, then press-fit the color lens. When press-fitting, make sure that your fingers do not touch the reflective surface inside the screen.



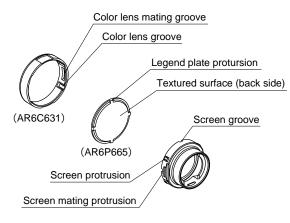
# Square type

Set the textured surface side of the legend plate with the screen side, align the screen protrusion with the color lens groove, and press-fit together. When press-fitting, make sure that your fingers do not touch the reflective surface inside the screen.



### · Round type

Align the protrusion of the legend plate with the groove of the screen, also align the screen protrusion and color lens groove, and press-fit together. When press-fitting, make sure that your fingers do not touch the reflective surface inside the screen.



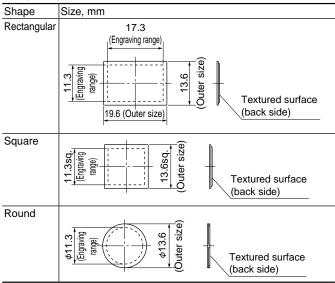
 For alternate action type of illuminated pushbutton switches and pushbutton switches, do not remove the color lenses (screens) in locked (depressed) state. The internal mechanisms may be damaged.

#### **■** Engraving legend plate

Engrave the surface of the legend plate.

- · Material: Acrylic resin
- Engraving depth: 0.5 mm max.
- Paint: Use a paint that has alcohol as its main ingredient, such as melamine paint, phthalic acid paint, or acrylic paint.

#### Legend plate size

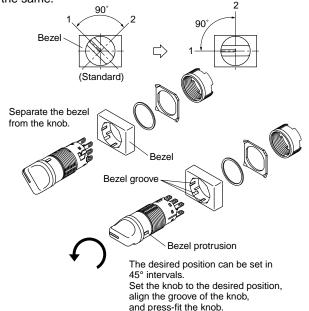


Notes: 1 A legend sheet may be used, provided that the external dimensions do not exceed the corresponding outer size specified in the above table and that the thickness is 0.1 mm or below. (No legend sheets are provided with the product. Please prepare on customer side.)
2 Do not engrave any part other than the legend plate.

# ■ Changing the operating angle position of selector switch

The bezel is separated from the knob (key), which makes it easy to change the operating angle position in 45° increments (the AR16 series rectangular or square type only).

The following figures show a knob type example. The key type is the same.



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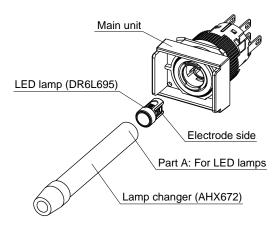
# Command Switches AR16, DR16 and AF16, DF16 Notes on use

#### ■ Method of replacing lamp

• To remove the LED lamp, insert the lamp changer (AHX672) in the LED lamp and pull out the LED lamp.

To mount the LED lamp, align the lamp terminal side of the main unit with the electrode side of the LED lamp, lightly hold the lamp by hand or with the head of the lamp changer (AHX672), and insert the lamp.

The LED lamp has no polarity, so it can be powered by either AC or DC.



#### · Handling of LEDs

LED whose luminous color is green or blue is sensitive to static electricity. Be careful when handling the LED. Take thorough measures against static electricity and surges when handling the product. The following anti-electrostatic measure is recommended.

Use a wristband or anti-electrostatic glove when replacing LED lamps.

#### ■ Wiring

terminal.

- · Wiring to tab terminal
- Use 110 (2.8mm) series receptacles for tab terminals.
- Pay attention to the following points when soldering.
   Type of solder: Use resin-core solder.
   Use a soldering iron with a maximum power consumption of 60W (350(C) within five seconds. Make sure that the terminal is free of tension during soldering. Also, do not deform the
- The melting point of lead-free solder is slightly high, which may make soldering difficult. Use a soldering iron that has a large soldering tip or high heat generation.
- Connectable wires

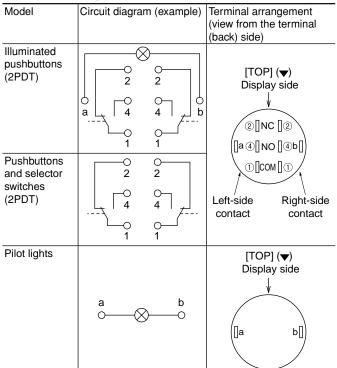
Two solid wires with a maximum diameter of 0.8 mm (solder) One stranded wire with a maximum area of 0.75 mm<sup>2</sup> (solder) Flat-type connection terminal

 $(2.8 \Box -1.25-5) \ 0.5 \text{ to } 1.25 \text{mm}^2$ 

 $(2.8 \square -0.5-5) \ 0.2 \ \text{to} \ 0.5 \text{mm}^2$ 

- · Use of contact blocks
  - When using NO and NC contacts in the same contact block, avoid connection that involves opposite polarity or wiring from different types of power supply.
- For wiring to adjacent terminals, use the terminal cover (AR6Y261) to prevent short-circuit, or an insulation tube to assure isolation. For solder terminals, caution is required if thick wires, in particular, are connected or a large quantity of solder is used.

# Terminal arrangement



Note: Only the left-side contact is applicable to the SPDT mechanism.

#### **Command Switches**

# AR16, DR16 and AF16, DF16 Notes on use

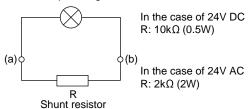
#### **■ LED Lamps**

 LED lamp malfunctioning (incorrect lighting)
 The LED lamp incorporates a circuit to prevent malfunctioning. Compared with conventional models, this LED lamp is less likely to malfunction, but it incorporates no absolute countermeasures.

A minute current (approximately 0.25 mA) turns on the LED lamp. A leakage current from the surge absorption circuit or noncontact circuit, or stray capacitance between cables, may also turn on the LED lamp.

In this case, a countermeasure (e.g., attaching a resistor in parallel with the LED lamp) is required.

Countermeasure against malfunctioning
 Malfunctioning can be prevented by connecting a shunt
 resistor (R) in parallel. The resistance in that case varies with
 the model and operating conditions.



- The permissible fluctuation range for the operating voltage
  of the 6V model is ±5% and that for the 12V or 24V model is
  ±10%. If the operating voltage is always 5% or 10% higher,
  select a resistor that will make the operating current the
  same as or lower than the rated current, and connect the
  resistor in series to the LED lamp.
- Calculation of external resistance Example: Connecting a 24V red LED to a 48V circuit External resistance  $[\Omega] = \frac{\text{Circuit voltage [V]} \text{Rated voltage [V]}}{\text{Rated current [A]}} = \frac{48-24}{7.5\times10^3} = 3200 \ [\Omega]$ 
  - Therefore, use an external resistor of 3.3kΩ 1W. (Select a resistor with sufficient wattage.)
- Surges

High-brightness LED products use elements that are sensitive to static electricity. Keep in mind that an unusual voltage, such as a surge voltage, may cause the product to malfunction.

#### **■** Selector Switches

# Knob type

The knob can be operated by turning it lightly. Be careful to operate the knob with a torque not exceeding 1N•m.

#### Key type

Types of keys

Five types (B, C, D, E, and F) are available in addition to the standard type (type A).

Make sure that the symbol on the key coincides with the symbol on the switch.





Symbol on key

Symbol on main body

- Fully insert the key into the switch and turn the key. Do not pull on the key while turning it.
- Operate the key with a torque not exceeding 0.1N•m.
- · Do not forcibly insert or extract the key.
- Do not attempt to operate the switch with the key insufficiently inserted or insert the wrong key. Otherwise, a malfunction may result.

#### ■ Fast-connection socket

#### Connectable wires

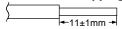
- Standed wire: 0.3 to 0.75 mm<sup>2</sup> (AWG22 to AWG18)
- Single wire: 0.5 to 1 mm dia.
- Recommended ferrule : Phoenix Contact, part number AI0, 34-8TQ

Wire size: 0.34 mm<sup>2</sup> (22 AWG) Crimping tool: CRIMPFOX UD6-6

Note: Use a crimping tool with a hexagonal or round cross section.

Sheath external diameter: 2.8 mm dia. Max.

#### · Wire sheath stripping length



Note: If ferrules are used, securely insert the wire sheath inside a resin shell. Cut the end of the wire the same length as the ferrule or cut it at a position approximately 0.5 mm longer.

Check the length using the strip gauge on the surface of the socket displayed on the model nameplate. If standed wire is used, twist the wire so that there are no loose strands after stripping.

#### · Connection method

- (1) Insert the wire while pressing the button on the insertion slot with a small flat-head screwdriver (tip width of 2 mm max.). Release the button when the wire is all the way seated in the switch.
- (2) When disconnecting the wire, pull out the wire while pressing the button on the insertion slot with a small flathead screwdriver. Cut the bare part of the wire if it was previously used, and then newly remove the sheath to reuse the wire.
- (3) Insert a single wire for each insertion slot.
- (4) Do not pull on the wires with excessive force (15 N or more) when you perform wiring. Make sure that not external force is exerted on the wires after wiring has been completed. The next time that a wire is inserted, the parts that support the wire may change shape and result in conduction failure.

#### Terminal arrangement (Rear-side View)

(1) Socket Terminal Arrangement for AR6S690-L2

Top mark on nameplate

Top of switch Terminal Arrangement for Illuminated 2PDT Contacts

Top of switch (▼mark)

Top of switch (▼mark)

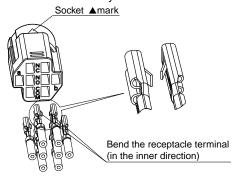
Top of switch (▼mark)

Fuji Electric FA Components & Systems Co., Ltd./D & C Catalog Information subject to change without notice

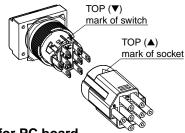
# Command Switches AR16, DR16 and AF16, DF16 Notes on use

#### **■** Connector sockets

- · Connectable wires
  - Stranded wire: 0.5 to 0.75 mm<sup>2</sup> (20AWG to 18AWG)
- Arrange for a receptacle terminal separately.
   Nichifu Co., Ltd.: CMC62895F
- Check the insertion position and insert the receptacle terminal into the socket after connecting the wires to the receptacle terminal. (The wires once connected cannot be disconnected.) Lightly pull the wires and check that the receptacle terminal is securely connected to the socket.

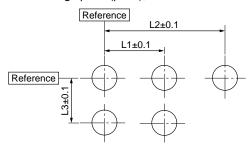


 Align the ▲ mark of the socket and the TOP (▼) mark of the switch, and put the socket and switch together.



#### ■ Socket for PC board

• Minimum mounting space (pitch), mm

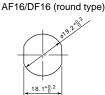


Obtain the mounting pitch based on a reference line to minimize the cumulative error.

Make sure that the centering difference between the switch and the PCB socket does not exceed 0.25 mm.

 Apply the following panel cutout dimensions (in mm) to stabilize the operator position of the switch when combined with the socket.

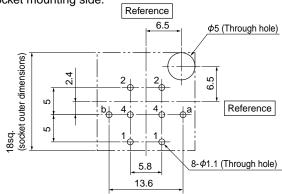
AR16/DR16 (common)



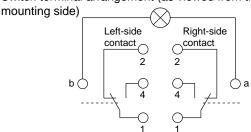
 Mount the switch to the panel. Make sure that the switch is free of any bends.

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 PC board processing dimensions (in mm) as viewed from the socket mounting side.

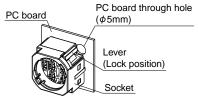


- The reference is the center of the socket (switch).
- Switch terminal arrangement (as viewed from the socket

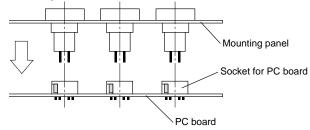


Note: The right-side contact is connected in the case of an SPDT contact.

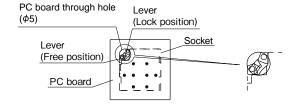
 Insert the socket so that the lever will be located in the 5mmdiameter through hole of the PC board. Set the lever to the lock position as viewed from the socket mounting side.



 Combine the switch-mounted panel with the socket on the PC board, and solder the socket terminal.



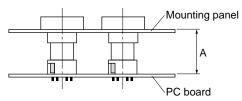
- Combine the PCB socket and the panel while making sure that the socket terminal does not fall off, and turn over the socket to do the soldering. Do not leave any space between the PC board and socket.
- After combining them, check that the lever as viewed from the soldering side is in the lock position, and solder the terminal.



#### Command Switches

# AR16, DR16 and AF16, DF16 Notes on use

- · Pay attention to the following points when soldering.
  - Type of solder: Use resin-core solder.
  - Finish soldering at 350°C within 5 seconds.
  - Do not wash the socket.
  - · Solder the socket so that no flux adheres to it.
- The melting point of lead-free solder is slightly higher than lead solder, which may make soldering difficult. Use a soldering iron with a large tip or that provides a high heat generation.
- Using a spacer between the panel and the PC board Make sure that the distance shown in the figure below is maintained between the panel and the PC board. The spacer dimensions vary with the thickness of the mounting panel.



Series	A (mm)
AR16/DR16	30.2±0.2
AF16/DF16	37.7±0.2

- · Mounting and removing PC board sockets
- Removing

Push down the socket levers all the way viewed from the soldering side in the direction of the free position and remove the PC board sockets. After removal, the socket levers will return to the lock position automatically.

Mounting

Check that the socket lever as viewed from the soldering side is in the lock position, lightly insert the terminal and socket so their position is aligned with the switch on the panel, press the socket-mounting portion of the PC board, and securely insert the entire socket until the socket lever snaps. (Check that the lever as viewed from the soldering side is in the lock position.)

- Use the switch within the following rated voltage range when the PCB socket is used.
- Rated insulation voltage: 60V
- Rated operational voltage: 24V
- · Conventional free air thermal current: 3A
- Use a 1.6-mm-thick double-sided through-hole printed circuit board made of copper-plated laminated epoxy resin on a woven glass fabric base.
- In case of standard type (AR16 and DR16 series), beware that the adopted models are not allowed to attach the protective cover to some models and that the adopted models cannot be mounted to some models afterward.

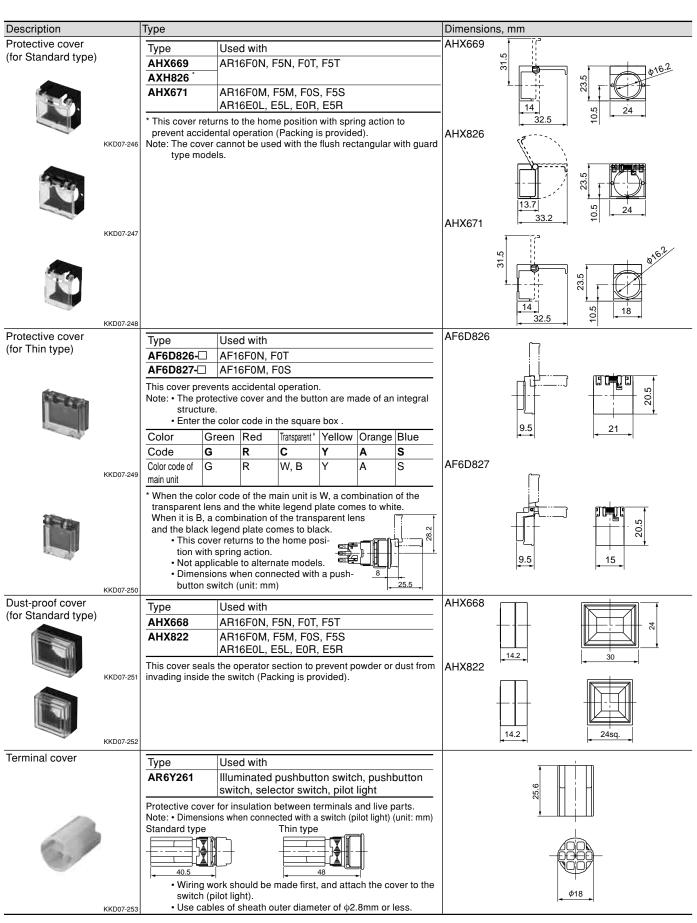
#### ■ Others

Operation

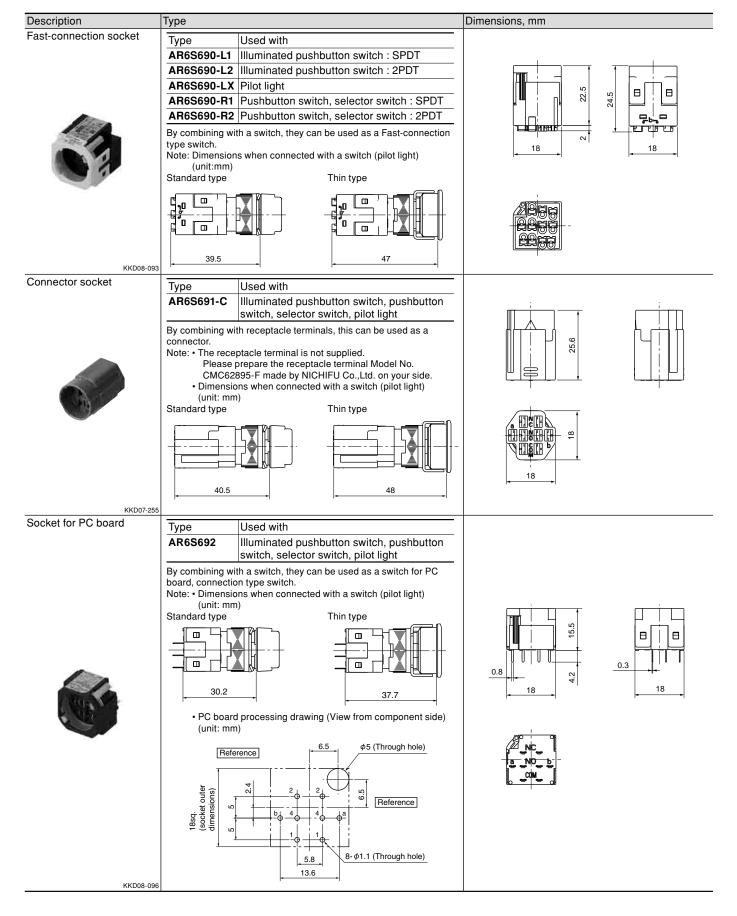
Do not hit or flip the button, or the button may be damaged. Be sure to operate the button by hand.

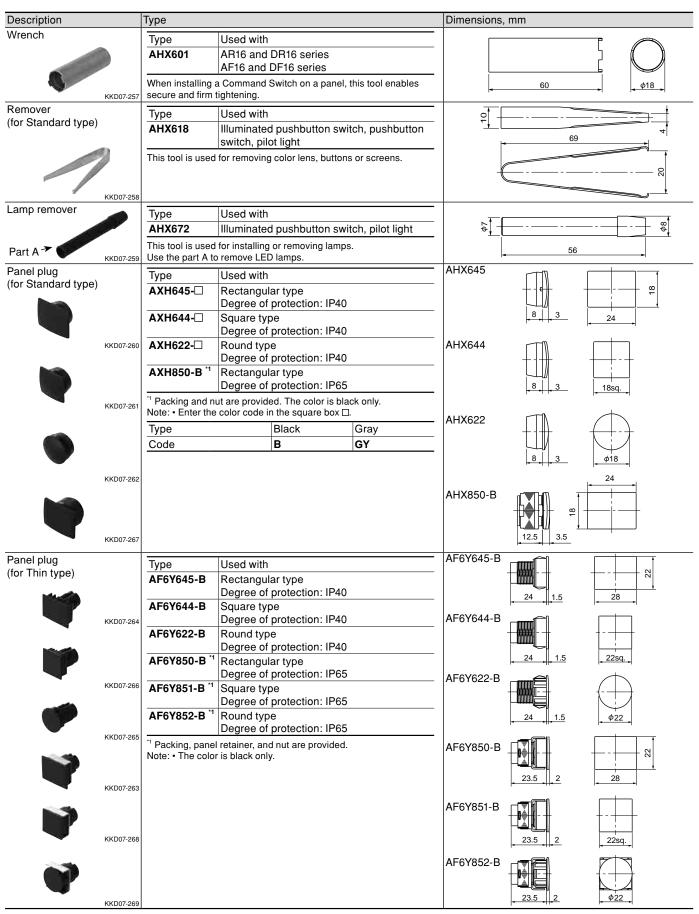
Do not pull the button if the switch is an alternate action type.

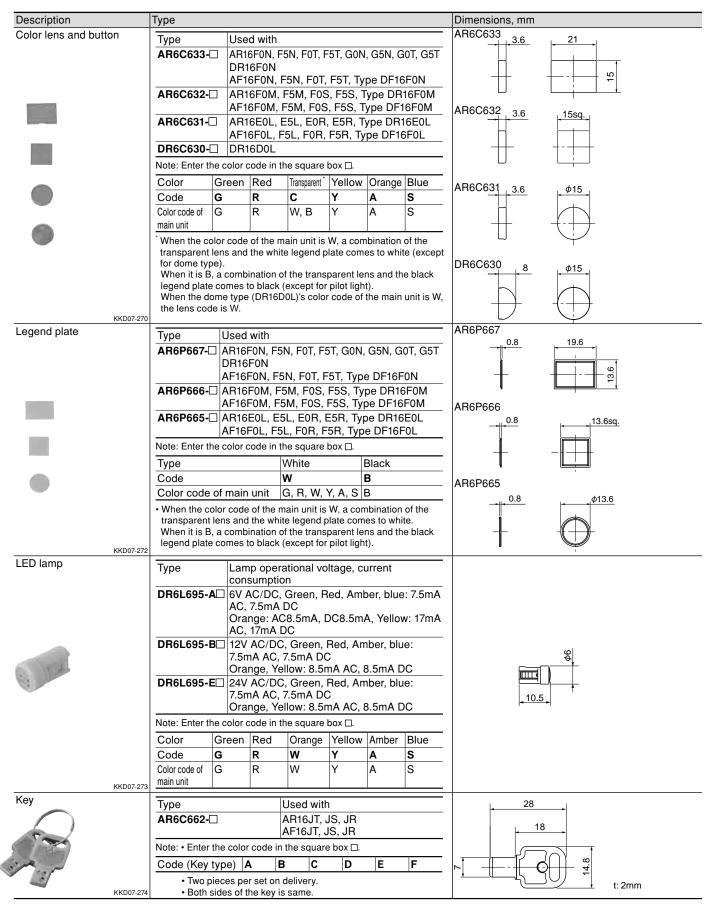
- High-density mounting of illuminated type
   When continuously lighting pilot lights or pressing illuminated
   pushbuttons, keep in mind that the ambient temperature may
   exceed the rated value due to the heat radiated by the lamp.
   Be sure to ventilate the lamp /switch if the mounting panel
   is not made of metal or if the mounting panel is an enclosed
   type.
- Usage locations
  - Be sure to use and store the product within the rated ambient temperature and humidity ranges.
- Although the product resists ordinary cutting oils and coolant oils, do not use the unit in places where special oils may be sprayed onto the product.
- If dusts or filings accumulate in the gap between the button and the frame, the switch may fail to operate normally. Take appropriate measures, such as using a dust-proof protective cover, if the switch is to be used in places that are subject to dusts or filings.
- The AR16/DR16 series and AF16/DF16 series are for indoor use. Make sure that the product is not exposed to direct sunlight.
- Do not use the product in the places that are subject to the adverse effects of ozone or corrosive gases.



# AR16, DR16 and AF16, DF16 **Accessories**







# · Standard type <AR16, DR16 series>

8.1

8.1

AR16E0L

AR16E5L

Illuminated push button switches			(g)
Туре	Without transformer		
	SPDT	2PDT	
AR16F0N	9.3	9.9	
AR16F5N	9.3	9.9	
AR16G0N	9.4	10	
AR16G5N	9.4	10	
AR16F0M	8.7	9.3	
AR16F5M	8.7	9.3	

8.7

8.7

2. Pushbutton switches			(g)
Туре	SPDT	2PDT	
AR16F0T	8.5	9.1	
AR16F5T	8.5	9.1	
AR16G0T	8.7	9.3	
AR16G5T	8.7	9.3	
AR16F0S	8	8.6	
AR16F5S	8	8.6	
AR16E0R	7.4	8	
AR16E5R	7.4	8	

<ol><li>Pilot lights</li></ol>		(g)
Туре	Without transformer	
DR16F0N	8.7	
DR16F0M	8.1	
DR16E0L	7.5	
DR16D0L	7.5	

4. Selector switches (knob type)			(g)
Туре	SPDT	2PDT	_
AR16PT	9.6	10.2	
AR16PS	8.6	9.2	
AR16PR	8.3	8.9	

5. Selector switches (key type)			(g)
Туре	SPDT	2PDT	
AR16JT	23.2	23.8	
AR16JS	22.3	22.9	
AR16JR	21.9	22.5	

Note: The value when two keys are attached.

# • Thin type <AF16, DF16 series>

Illuminated push button switches			(g)
Туре	Without transformer		
	SPDT	2PDT	
AF16F0N	13.5	14.1	
AF16F5N	13.5	14.1	
AF16F0M	12.8	13.4	
AF16F5M	12.8	13.4	
AF16F0L	12	12.6	
AF16F5L	12	12.6	

Pushbutton switches		(g)
Туре	SPDT	2PDT
AF16F0T	12.7	13.3
AF16F5T	12.7	13.3
AF16F0S	12	12.6
AF16F5S	12	12.6
AF16F0R	11.3	11.9
AF16F5R	11.3	11.9

<ol><li>Pilot lights</li></ol>		(g)
Туре	Without transformer	
DF16F0N	12.8	
DF16F0M	12.1	
DF16F0L	11.4	

4. Selector switches (knob type)			(g)
Туре	SPDT	2PDT	
AF16PT	14.2	14.8	
AF16PS	13.7	14.3	
AF16PR	13.1	13.7	

5. Selector switches (key type)			(g)
Туре	SPDT	2PDT	
AF16JT	27.8	28.4	
AF16JS	27.3	27.9	
AF16JR	26.8	27.4	

Note: The value when two keys are attached.

# Rating and specifications/AR16V

# Integrated Contacts Structure Emergency stop pushbutton switches AR16V

#### **■** Features

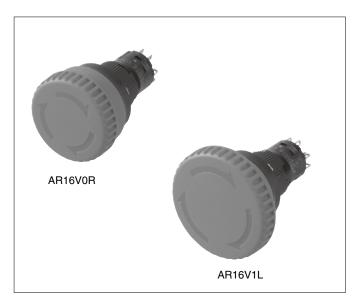
 Up to four sets of contacts in a one-piece structure with a panel depth dimension of 28 mm (non-illuminated type).

Non illuminated type

28mm

31.5mm

- Both pull or turn reset methods are supported.
- Two button diameters are available: 32 mm (AR16V0) and 40 mm (AR16V1).
- Safety trigger-action mechanism that prevents the contacts from operating until the switch is locked, even if people or objects accidentally come into contact with the switch.
- Direct opening mechanism for NC contacts to ensure that the contacts can be opened even in the unlikely event that they become fused.
- IP65 protection for operating section.



- RoHS compliance (EU Directive 2002/95/EC) is a standard feature.
- Compliance with UL/CSA standards, China Compulsory Certification (CCC) standards, and TÜV (EN standards).
- CE marking. CRI us & CE

#### ■ Specifications (indoor use)

	AR16V		
e Ui	250V AC/DC		
Mechanical	100,000 operations		
Electrical	100,000 operations (AC-15, AC-13, AC-12, DC-13, DC-12)		
	1200 operations / hour (On-load factor : 40%)		
Between live section and grounding	2000V AC, 1 minute		
Between opposite polarity live sections	2000V AC, 1 minute		
	100MΩ or more (500V DC megger)		
d voltage Uimp	2.5kV		
current	1000A		
device	gG 6A (IEC60269 Fuse)		
	3		
	Operating extremes: frequency 10 to 500 Hz, double amplitude 0.7mm acceleration 50m/s <sup>2</sup>		
	Damage limits : frequency 10 to 500 Hz, double amplitude 0.7mm acceleration 50m/s <sup>2</sup>		
	Malfunction durability: 100m/s <sup>2</sup>		
	Mchanical durability: 500m/s <sup>2</sup>		
nperature	-10 to +55°C (no icing or no condensation)		
	-40 to +70°C		
e control panel)	45 to 85%RH (-5 to 40°C) (no icing or no condensation)		
operating (displaying) section	IP65 (dust-ploof, water jet proof): IEC 60529		
control section	IP2X (Terminal cover : AR6Y262, At the connection)		
	Solder terminal		
	0.75mm <sup>2</sup> maximun (18AWG maximun)		
	Mechanical Electrical Between live section and grounding Between opposite polarity live sections d voltage Uimp current device  preparature e control panel) operating (displaying) section		

# Command Switches AR16, DR16 and AF16, DF16 Rating and specifications/AR16V

#### **■** Contact ratings

# • TÜV (EN60947-5-1), JIS C 8201-5-1 (1999)

Conventional free	Rated operational current						
air thermal current	Rated operational	AC			DC		
I th	voltage Ue	AC-12 (Resistive load)	AC-13 (Inductive load)	AC-15 (Inductive load)	DC-12 (Resistive load)	DC-13 (Inductive load)	
5A	24V	<del> -</del>	_	_	1.0A	0.7A	
	120V	1.5A	1.0A	0.3A	<del>-</del>	<u> </u>	
	125V	<del>-</del>	_	_	0.2A	0.15A	
	240V	1.0A	0.7A	0.3A	1_		

#### • UL/CSA

# • AC (COSø=0.35)

Contact rating code	120V		240V	
	Making current	Braeking current	Making current	Braeking current
C300	15A	1.5A	7.5A	0.75A

# • DC (T<sub>0.95</sub>=6P)

Contact rating code	Making current · Braeking current		
	125V	250V	
R300	0.22A	0.11A	

#### ■ Contact reliability

 FUJI has confirmed that the product can be used in 1mA circuit conditions at 5V AC or DC. The operable range, however, may vary depending on the operational ambient conditions and type of load.

#### ■ Operating characteristic

Operation	Push-lock, turn-reset or pull-reset
Ave. required operating force	25N
Operating travel	Approx. 5.4mm
Operation angle	Approx. 45°
Required return force (pull-reset)	20N
Required return force (tarn-reset)	0.3N · m

#### ■ Mass

. .

Туре	1NC	2NC(1N0+1NC)	4NC(2NO+2NC)
AR16V0R	19.0	19.4	20.0
AR16V1R	21.1	21.5	22.1
AR16V0L	19.7	20.1	20.7
AR16V1L	21.8	22.2	22.8

# ■ Standards approved

UL508	cUL File No. E44592
CSA C22.2 No.14	
TÜV: EN60947-5-1, EN60947-5-5	R50136611

#### ■ Lamp rating and current consumption

Applied method	Type of lamp	Luminous color	Lamp rated voltage	Current consumption
Without transformer	LED lamp	Red	6V AC/DC	9mA AC, 7.5mA DC
			12V AC/DC	7.5mA AC, 7.5mA DC
			24V AC/DC	7.5mA AC, 7.5mA DC

# Command Switches AR16, DR16 and AF16, DF16 Type numbers/AR16V

# **■** Type

# • Emergency stop pushbutton switches

Operator		Contact	Туре
Unibody push-lock, pull or turn-reset (32mm dia.)		1NC	AR16V0R-01R
		1NO+1NC	AR16V0R-11R
		2NC	AR16V0R-02R
		1NO+2NC	AR16V0R-12R
		3NC	AR16V0R-03R
		1NO+3NC	AR16V0R-13R
	(KKD08-090)	4NC	AR16V0R-04R
Unibody push-lock, pull or turn-reset (40mm dia.)		1NC	AR16V1R-01R
<b></b>		1NO+1NC	AR16V1R-11R
		2NC	AR16V1R-02R
		1NO+2NC	AR16V1R-12R
		3NC	AR16V1R-03R
		1NO+3NC	AR16V1R-13R
	(KKD08-092)	4NC	AR16V1R-04R

# • Emergency stop illuminated pushbutton switches

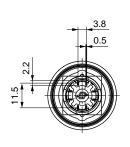
Operator		Contact	LED Lamp Type
Unibody push-lock, pull or turn-reset (32mm dia.)		1NC	AR16V0L-01 <b>■</b> R
		1NO+1NC	AR16V0L-11 <b>■</b> R
All the second		2NC	AR16V0L-02 <b>■</b> R
- 3		1NO+2NC	AR16V0L-12 <b>■</b> R
		3NC	AR16V0L-03 <b>■</b> R
		1NO+3NC	AR16V0L-13 <b>■</b> R
	(KKD08-087)	4NC	AR16V0L-04 <b>■</b> R
Unibody push-lock, pull or turn-reset (40mm dia.)		1NC	AR16V1L-01 <b>■</b> R
		1NO+1NC	AR16V1L-11 <b>■</b> R
		2NC	AR16V1L-02 <b>■</b> R
		1NO+2NC	AR16V1L-12 <b>■</b> R
		3NC	AR16V1L-03 <b>■</b> R
		1NO+3NC	AR16V1L-13 <b>■</b> R
	(KKD08-091)	4NC	AR16V1L-04 <b>■</b> R

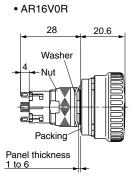
#### • Voltage Replace the ■mark by the lamp voltage code

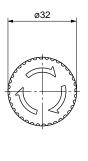
Lamp voltage	Code
6V AC/DC	A3
12V AC/DC	B3
24V AC/DC	E3

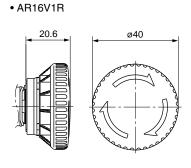
#### **■** Dimensions, mm

• Emergency stop pushbutton switches





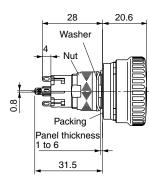




• Emergency stop illuminated pushbutton switches



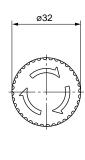
3.8 0.5

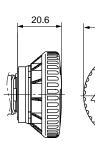


EMERGENCY STOP

Plate color : YellowLetter color : Black

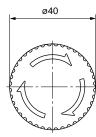
5A





Thickness: 0.35mm

• AR16V1L



# ■ Accessories

■ Accessories								
Description	Туре			Dimensions, mm				
Wrench (KKD07-257)	AHX601 (AH9A601) When installing a comm for tightening the switch		60 018					
Terminal cover	AR6Y262 Protective cover for insulation Note: Dimensions when  • Wiring work should be switch.	n connected with a	switch (unit : mm)	20.4				
Legend plate for AR16V	AR6P719-*1,2							
emergency stop	Legend	code (*1, 2)	Letter hight					
EMERGENCL	Black	00	_					

7mm

#### Command Switches

# AR16, DR16 and AF16, DF16 Notes on use/AR16V

#### ■ Notes on use

#### **Safety Precautions**

Read the Operating Instructions carefully before mounting, wiring, operating, servicing, or inspecting the command switch. Make sure that the Operating Instructions is delivered to the final user of the command switch.

• The safety precautions are classified into two levels, "WARNING and CAUTION", with meanings described follows.

MARNING: Indicates a potentially hazardous situation, which, if not avoided, could resuit in death or serious injury.

**⚠** CAUTION

Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and/or damage to the equipment.

An item described under "CAUTION" may resuit in a serious accident, depending on the situation.

# **⚠ WARNING**

- Do not touch or approach any live part while power is supplied. An electric shock or burning may result.
- Be sure to turn off the power before mounting, dismounting, wiring, or inspecting, the product.

An electric shock, burning from short-circuiting, or equipment malfunction may result.

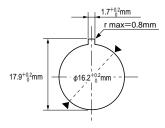
# **⚠** CAUTION

Wire the product according to the wiring instructions in the Operating Instructions. Make sure that the size of the wires is suitable for the voltage and applied current.

The wrong wiring may result in fire, accidents, or malfunctions.

Treat the product as industrial waste when it is to be discarded.

#### ■ Panel cutout (mm)

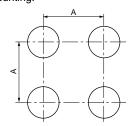


#### ■ Applicable panel thickness

The applicable panel thickness is 1 to 6 mm. When the terminal cover (AR6Y262) is used, however, the applicable panel thickness will be 1 to 3.2 mm.

# ■ High-density mounting

The following minimum mounting pitch applies to high-density mounting.



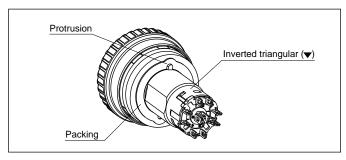
Туре	Dimension A
AR16V0□	41mm min.
AR16V1	45mm min.
With AR6P719	65mm min.

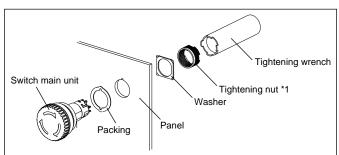
Note: Detemine the mounting pitch by taking the operability and wiring workability into consideration.

#### Installation on panel

As shown in the figure below, insert the switch main unit into the panel cutout from the front of the panel with the top of the switch main unit (marked with an inverted triangular) facing upward. Then, use a tightening wrench (AHX601) and secure the unit with a washer and tightening nut from the rear of the panel.

Note: The proper tightening torque is 0.6 to 1.0 N·m.





\*1 : Do not use pliers or other improper tools tighten the nut, and do not tighten it excessively, or the nut may be damaged or switch may malfunction.

#### ■ Wiring

- •The wiring to this switch must be soldered. Keep the following items in mind when soldering.
- Type of solder : Use resin-core solder.
- Use a soldering iron with a maximum power consumption of 60W (350°C) within five seconds. Make sure that the terminals is free of tension during soldering. Also, do not deform the terminal.
- •Lead-free solder has a high melting point, but the specific melting point depends on the type of lead-free solder. This may cause difficulty in soldering. Be careful not to overheat the solder if a soldering iron with a large soldering tip or a large heating capacity is used. Keep in mind that overheating the solder may resuit in product malfunctioning.
- Connectable wires
- One Solid wires with a maximum diameter of 1.0mm One standed wire with a maximum area of 0.75 mm<sup>2</sup>
- •For wiring to adjacent terminals, use the terminal cover (AR6Y262) to prevent short-circuit, or an insulation tube to assure isolation. Care is necessary when two wires are connected together or a large quantily of solder is applied. In addition, keep in mind that overheating the tube may result in product malfunctioning if a heat-shrinking tube is used.

#### · Terminal arrangement

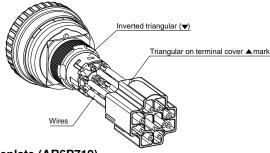
Model	Circuit diagram (example)	Terminal arrangement (view from the terminal (back) side)
Emergency stop pushbutton switches	1 2	Top (marked with inverted triangular)
Emergency stop illuminated pushbutton switches		Terminals 1-2 : b (NC) contact terminals Terminals 3-4 : a (NO) contact terminals Terminals a-b : Lamp terminals

Note: If NO contacts are uesd in the contact configuration, they will be on the top of the unit (marked with the inverted triangular) and on the opposite side, regardless of the number of contacts.

#### ■ Terminal caver (AR6Y262)

#### Combination

The terminal cover must be attached in the correct direction. Make sure that the triangular on the terminal cover is aligned with the inverted triangular on the top of the unit. Also, when wiring the switch, check the alignment of these triangles and insert the wires correctly through the corresponding holes in the terminal cover.



### ■ Nameplate (AR6P719)

#### Precautions

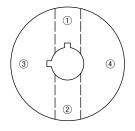
The nameplate must be attached. Attach the nameplate to an appropriate part, such as the panel, after removing the paper from the back of the nameplate.

Before attaching the nameplate, claen the surface to which the nameplate will be attached with alcohol.

The nameplate may come off if the surface is dirty or oily.

Attachment Procedure (Example)

Remove portions ① and ② from the center of the nameplate, aligh the nameplate with the panel cutout, and lightly press on the front surface of the nameplate to attach it to the panel. Then remove portions ③ and ④ , and press on the entire front surface of the nameplate to complate attaching it to the panel.



#### **■** Others

#### Operation

- Do not hit or flip the button, or the button may be damaged. Be sure to operate the button by hand.
- To unlock the switch, turn the button approximately 45° clockwise (in the direction of the arrow) or pull out the button. Do not operate or handle the button with excessive force.
- Do not lock the emergency stop pushbutton switch during normal use. Push and lock the switch only in an emergency.

# Storage and Usage Locations

- Be sure to use and store the product within the rated ambient temperature and humidity ranges.
- Although the product resists ordinary cutting oils and coolant oils, do not use the unit in places where special oils may be sprayed onto the product.
- If dusts or filings accumulate in the gap between the button and the frame, the switch may fail to operate normally.
- This switch are for indoor use. Make sure that the product is not exposed to direct sunlight.
- Do not use the product in the places thet are subject to the adverse effects of ozone or corrosive gases.

# Pushbuttons/Selectors/Pilot Lights/Buzzers

# AH164, AH165 and AH165-2 General information

#### ■ Features Design basis

The 16mm dia. series of compact size pushbuttons are 'finger-size', and consequently take up little panel space. AH165-2 series operators are about twice as large as the AH164 and AH165 series operators for easier operation. With many types of operator available, the most suitable switch can be identified by color, shape and legend, and have a smooth, quality "snap-action". In spite of their small size they have a highly reliable mechanism, and are eminently suited for solid state and other electronic circuits. AH164, AH165 and AH165-2 series contact block holders can easily be removed manually. Moreover, the contact block can be easily attached or detached without using any special tools, thus facilitating addition or replacement of contact.

#### Selector switches

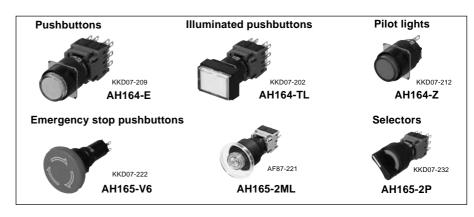
Selector switches can also be supplied in either knob-handle operated or key operated types.

#### Strong construction

The operator and contact blocks are molded from an excellent thermal resistance resin and can withstand the heat at the time of soldering. Since these pushbuttons are manufactured to industrial standards they can withstand vibration or shock thus eliminating lamp failure due to such causes as loose bases. With regard to the degree of protection, standard types which met the requirements of IP40 of IEC 60529, and oil tight types which meet the requirements of IP65 of the said, are available. This permits the application to various fields, from machine tools to OA (Office Automation) facilities.

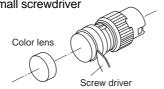
#### **Quality feel tough**

Both the operator and contact block are precisely engineered. There is no fear of the switch malfunction even after long use and it continues to operate smoothly for its service life of about 1,000,000 operations.



#### Easy color change

Color lenses fit over the inner button. The lens can easily be removed using a small screwdriver



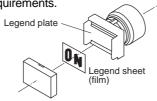
Note: The luminous color of LEDs and neon illumination types varies with the body color of the product.

#### Visible inscription

Button legends are printed on legend sheet, which is stuck to the legend plate on the inner button.

The lettering is back lit by the switch lamp and the inscription is highly visible through the color lens.

Contact FUJI for your lettering requirements.

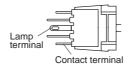


#### **Excellent switch reliability**

The switch uses a snap-action mechanism. The pushbuttons are available with either momentary or alternative actions. The snap-action switch has a double break movement which operates independently of the speed of switching. The contacts are made from gold-flashed silver. High contact reliability of 1mA at 5V AC/DC is assured. Contact blocks are available in 1NO+1NC to 3NO+3NC arrangement.

# Large terminals

Solder/tab terminal is provided as standard. Wire-wrap terminal is available on reguest.



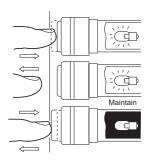
#### Safety

FUJI's original Trigger Action mechanism is used in the emergency stop pushbuttons. They are suitable for emergency stop and safety. This mechanism prevents the contacts from moving until the button is pushed and locked.

- Provided with a trigger action mechanism conforming to EN418.
- Provided with direct opening action (approved by TÜV) conforming to EN60947-5-1 and EN60947-5-5.

#### Alternate action

In the case of alternate action when the button is depressed the contacts are maintained and remain so even if the finger is removed. The button will not return to its free position. In order to remove the lock, the button must be given a second pressure before the button will return to its free position. This makes it most suitable as the switch for a power source.



#### Pushbutton with finger guards

Finger guards are provided for square or rectangular type pushbuttons (SF, TF, SL and TL types) in order to prevent operational error of adjacent buttons.

#### **Approvals**



For further information related to approved type, see page 04/187 to 04/190 .

# AH164 (standard) / AH165 (oil-tight)

# ■ Illuminated pushbutton switches

Operator	Туре	Operator	Туре	Operator	Туре
Extended round head	AH164-L, L5 AH165-L, L5	Flush square head	AH164-SL, SL5 AH165-SL, SL5	Flush rectangular head	AH164-TL, TL5 AH165-TL, TL5
See page 04/195 <b>₹1</b> ° <b>②</b> <u>△</u> <b>( € 《</b>	KKD07-205	See page 04/195 <b>91°                                    </b>	KKD07-204	See page 04/195 <b>R G L L L L L L L</b>	KKD07-202
Flush rectangular head with guard	AH164-TGL, TGL5 AH165-TGL, TGL5	Flush square head with guard	AH164-SGL, SGL5 AH165-SGL, SGL5		
See page 04/196 <b>₹1 ( ( ( ( ( ( ( ( ( (</b>	KKD07-203	See page 04/196 <u>▲</u> ( € (((()))	KKD05-075b		

Note: Spot LED and red/green LED types: Not approved standard

# ■ Pushbutton switches

Operator	Туре	Operator	Туре	Operator	Туре
Extended round head	AH164-E, E5 AH165-E, E5	Mushroom head	AH164-M, M5 AH165-M, M5	Flush square head	AH164-SF, SF5 AH165-SF, SF5
See page 04/199		See page 04/199		See page 04/199	
<b>71</b> ° <b>6</b> ° <u>A</u> ( <b>6</b> ((()	KKD07-209	<b>71 1 2 1 1</b>	KKD07-210	<b>71</b> ° <b>@</b> 🚣 ( <b>(</b> ((()	KKD07-208
Flush rectangular head	AH164-TF, TF5 AH165-TF, TF5	Flush rectangular head with guard	AH164-TGF, TGF5 AH165-TGF, TGF5	Flush square head with guard	AH164-SGF, SGF5 AH165-SGF, SGF5
	30				200
See page 04/199		See page 04/199		See page 04/199	
<b>91</b> ° <b>6</b> ° 🚣 ( <b>6</b> ((((	KKD07-206	<b>71 6</b> <u>4</u> ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	KKD05-176	<u></u>	KKD05-075b
Convex square head	AH164-SM, SM5 AH165-SM, SM5	Convex rectangular head	AH164-TM, TM5 AH165-TM, TM5	Push-lock, turn-reset (32mm dia.)	AH165-VR
				⊕ (Direct opening action)	
See page 04/199		See page 04/199		See page 04/200	
<b>71° 6°</b> <u>A</u> ( <b>6</b> <u>((()</u>	KKD05-081b	<b>71 @</b> <u>A</u> ( <b>6</b> ( ( ( ( )	KKD05-082b	<b>71</b> ° <b>6</b> ° <u>A</u> ( <b>6</b> ((())	AF91-584
Push-lock, turn-reset (40mm dia.)	AH165-V1R				
⊕ (Direct opening action)					
See page 04/200					
<b>71</b> ° <b>6</b> ° <u>4</u> ( <b>6</b> ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	AF91-583				

### ■ Emergency stop pushbutton switches ⊕ (Direct opening action), conform to EN418

= = mor goney orop p	donbatton owner	© (Bridge opening denotity, content to Eit 116			
Operator	Туре	Operator	Туре		
Push-lock, turn-reset (32mm dia.)	AH165-V5R	Push-lock, turn-reset (40mm dia.)	AH165-V6R		
See page 04/200		See page 04/200			
<b>9 4 6 4</b>	KKD07-221	<b>71 @</b> <u>A</u> ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	KKD07-222		

Note: ((C): See page 04/292

# Pushbuttons/Selectors/Pilot Lights/Buzzers AH164, AH165 and AH165-2 Quick reference guide

# ■ Selector switches

Operator	Туре	Operator	Туре	Operator	Туре
Knob with rectangular bezel	AH164-P AH165-P	Knob with square bezel	AH164-SP AH165-SP	Key with rectangular bezel	AH164-J AH165-J
See page 04/201 <b>91°                                    </b>	KKD07-213	See page 04/201 <b>91°                                    </b>	KKD07-215	See page 04/201 <b>91°                                    </b>	KKD09-001L
Key with square bezel	AH164-SJ AH165-SJ	Key with rectangular bezel	AH165-JM	Key	AH165-RJM
	A11103-33	⊕ (Direct opening action)		⊕ (Direct opening action)	
See page 04/201, 04/204		See page 04/202	5	See page 04/202	100
<b>71° 6</b> ° <u>A</u> ( <b>6 ((()</b>	KKD09-001R	<b>71 1 2 1</b>	KKD09-006	<b>71</b> ° <b>(</b> ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	KKD09-007

#### ■ Pilot lights

Friot lights							
Lens	Type	Lens	Type	Lens	Туре		
Extended round	AH164-Z AH165-Z	Flush square	AH164-ZS AH165-ZS	Flush rectangular	AH164-ZT AH165-ZT		
See page 04/206		See page 04/206		See page 04/206			
<b>71</b> ° <b>@</b> 🚣 ( <b>€ (((</b> )	KKD07-212	<b>91</b> ° <b>6</b> ° 🚣 ( € ((()	KKD05-094b	<b>71</b> ° <b>@</b> <u>A</u> ( <b>E</b> ((()	KKD07-211		
Dome	AH165-ZM						
See page 04/206	M.						
<b>91</b> ° <b>©</b> 🚣 ( €	AF87-45						

#### **■** Buzzers

Sound	Туре	Sound	Туре	Sound	Туре
Standard	AH164-TX	Loud sound	AH164-TX1	Loud sound with volume control	AH164-TX2B
See page 04/208	8 4 4	See page 04/208	10: A1:	See page 04/208 <b>73°                                    </b>	is it
	AF87-317		AF87-44	74 W 101 Marian C C	KKD07-223
Standard sound with volume control (IP54)	AH165-X				
See page 04/208	4.1				
<b>71</b> ° <b>6</b> ° 🚣 ( <b>6</b>	KKD05-096b				

Note: (((): See page 04/292

# AH165-2 (oil-tight)

#### ■ Illuminated pushbutton switches

Operator	Туре	Operator	Туре	Operator	Type
Flush round head	AH165-2FL, 2FL5	Extended round head	AH165-2EL, 2EL5	Mushroom head	AH165-2ML
See page 04/213		See page 04/213		See page 04/213	
<b>91</b> ° <b>6</b> ° 🚣 ( <b>6 (((()</b>	AF87-211	<b>9 6 6 6</b>	AF87-210	<b>71</b> ° <b>6</b> ° <u>A</u> ( <b>6</b> ( <b>6</b> )	AF87-22
Mushroom head with square bezel	AH165-2YML	Flush square head	AH165-2SFL, 2SFL5	Extended square head	AH165-2SEL, 2SEL5
See page 04/213		See page 04/214		See page 04/214	
<b>71</b> ° <b>6</b> ° 🔬 ( <b>6</b> ((())	AF87-220	<b>71 @</b> <u>A</u> ( <b>6 ((()</b>	AF87-201	<b>71 (</b> ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	AF87-20
Concave square head	AH165-2SCL, 2SCL5	Push-lock, turn-reset	AH165-2VL	Push-lock, turn-reset with square bezel	AH165-2YVL
See page 04/214	5	See page 04/215		See page 04/215	
, 0		_		_	
<b>71</b> ° <b>(</b> ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	AF87-199	<b>N 6 4</b> ( <b>6 ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (</b>	AF87-219	<b>71 @</b> <u>&amp;</u> ( <b>6</b> ( <b>®</b> )	AF87-2

Note: ((C): See page 04/292

# ■ Pushbutton switches

Operator	Туре	Operator	Туре	Operator	Туре
Flush round head	AH165-2F, 2F5	Extended round head	AH165-2E, 2E5	Mushroom head	AH165-2M
	~				
See page 04/216		See page 04/216		See page 04/216	(C)
<b>71</b> °	AF87-211	<b>71° ⊕</b> ≜ ( € ((())	AF87-210	<b>71</b> ° <b>@</b> 🚣 ( <b>6</b> · · · ·	AF87-215
Mushroom head with square bezel	AH165-2YM	Flush square head	AH165-2SF, 2SF5	Concave square head	AH165-2SCE, 2SCE5
·	~				
See page 04/216		See page 04/216		See page 04/216	
<b>71</b> ° <b>6</b> ° 🚣 ( <b>6</b> 📖	AF87-214	<b>71 6 4</b> ( <b>6 (()</b>	AF87-201	<b>91 6 4</b> ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	AF87-199
Extended square head	AH165-2SE, 2SE5	With selector ring	AH165-2S2	With selector ring with square bezell	AH165-2YS2
See page 04/216		See page 04/217		See page 04/217	O
<b>71. 6</b> ≜ ( € @)	AF87-200	<b>71.6</b> <u>&amp;</u> (€ <u>@</u>	AF87-207	<b>71</b> ° <b>6</b>	AF87-206
Push-lock, turn-reset	AH165-2V	Push-lock, turn-reset with square bezel	AH165-2YV		
	1				
See page 04/217		See page 04/217			
<b>71° ⊕</b> <u>&amp;</u> ( € (((()	AF87-217	<b>71 6 (6 (10</b> )	AF87-216		

# Pushbuttons/Selectors/Pilot Lights/Buzzers AH164, AH165 and AH165-2 Quick reference guide

# ■ Selector switches

Operator	Туре	Operator	Туре	Operator	Туре
Knob	AH165-2P	Knob with square bezel	AH165-2YP	Key	AH165-2J
See page 04/218 <b>₹1 6</b> ♠ <b>( € (((()))</b>	KKD07-232	See page 04/218 <b>91</b>	KKD07-234	See page 04/218 <b>Su 6</b> ♠ <b>( 6 (((</b> )	KKD09-003L
Key with square bezel	AH165-2YJ	Lever	AH165-2H	Lever with square bezel	AH165-2SH
See page 04/218 <b>**** ** ** * * * * * *</b>	KKD09-003R	See page 04/219	AF87-209	See page 04/219 <b>Su ⊕</b> △ ( €	AF87-203

#### ■ Illuminated selector switches

Operator	Туре
Knob	AH165-2PL
See page 04/221	
<b>71</b> ° <b>6</b> ° 🔬 ( <b>6 (((()</b>	KKD07-240

# ■ Pilot lights

Lens	Туре	Lens	Туре	Lens	Туре
Flush round	AH165-2Z	Extended round	AH165-2ZE	Flush square	AH165-2SZ
See page 04/222 <b>₹3° 6° △ ( € ○</b>	AF87-213	See page 04/222  \$\mathbb{A}^{\circ} \mathbb{A}_{\circ} ( € (((())))	AF87-212	See page 04/222 <b>N° ⊕</b> △ ( € ⋘	AF87-205
Extended square	AH165-2SZE		71.07.212		71 07 203
See page 04/222 <b>₹3°                                    </b>	AF87-204				

Note: ((C): See page 04/292

# ■ Type number nomenclature

#### Pushbuttons, illuminated pushbuttons and pilot lights

 $\frac{\textbf{AH165}}{\textcircled{1}} \cdot \frac{\textbf{L}}{\textcircled{2}} \ \frac{\textbf{R}}{\textcircled{3}} \ \frac{\textbf{11}}{\textcircled{4}} \ \frac{\textbf{E}}{\textcircled{5}} \ \frac{\textbf{3}}{\textcircled{6}} - \frac{\textbf{W}}{\textcircled{7}}$ 

#### ① Product category

AH164: Standard (IP40) AH165: Oil-tight (IP65)

#### 2 Operator or lens

· Operator for illuminated pushbutton

SL: Flush square head

SL5: Flush square head (Alternate) TI: Flush rectangular head

Flush rectangular head (Alternate) TL5:

1: Extended round head

L5: Extended round head (Alternate) TGL: Flush rectangular head with guard

TGL5: Flush rectangular head with guard (Alternate)

SGL: Flush square head with guard

SGL5: Flush square head with guard (Alternate)

#### Operator for pushbuttons

SF: Flush square head

SF5: Flush square head (Alternate) TF:

Flush rectangular head

TF5: Flush rectangular head (Alternate)

F: Extended round head

Extended round head (Alternate) E5: Flush rectangular head with guard TGF:

TGF5: Flush rectangular head with guard (Alternate)

SGF: Flush square head with guard

SGF5: Flush square head with guard (Alternate)

M: Mushroom head

M5: Mushroom head (Alternate) SM: Convex square head

SM5: Convex square head (Alternate)

Convex rectangular head TM:

Convex rectangular head (Alternate) TM5: V: Push-lock, turn-reset (32mm dia.)\*1 \*2 Push-lock, turn-reset (40mm dia.)\*1 \*2 V1:

#### • Operator for emergency stop pushbuttons

Push-lock, turn-reset (32mm dia.)\*2 V5: V6: Push-lock, turn-reset (40mm dia.)\*2

#### · Lens for pilot lights

Z: Extended round ZS: Flush square

ZT: Flush rectangular

ZM: Dome

Note: \*1 Product with no trigger action mechanism

\*2 AH165 type only, direct opening action

#### 3 Color of button or lens

Code	color	Button	LED	Incandescent	Neon
G	Green	0	0	0	0
R	Red	0	0	0	O (Orange)
В	Black*	0	_	_	_
Υ	Yellow	0	0	0	O (Orange)
W	White	0	O (Orange)	0	O (Orange)
S	Blue	0	0	0	○ (Green)
0	Orange	0	O (Amber)	0	0
RG	Red/Green	_	0	_	_

Pushbuttons/Selectors/Pilot Lights/Buzzers

Notes: • ( ): indicates luminous color

- AH165-V, V1, V5, V6: Red only
- \* Not available for illuminated types

#### ④ Contact arrangement

01: 1NC\*1 22: 2NO+2NC 02: 2NC\*1 33: 3NO+3NC\*2

11: 1NO+1NC

Notes: \*1 Available for AH165-V, V1, V5, V6

\*2 Not available for with transformer types

#### ⑤ Lamp voltage

Code	LED	Incandescent*2	Neon*2
AA	5V DC*2	_	_
Α	6V DC*2	5V AC/DC	_
В	12V DC	12V AC/DC	_
Е	24V DC	24V AC/DC	_
Н	100-110V AC*1 *2	100-110V AC*1	110V AC
K	-	_	120V AC
M	200-220V AC*1 *2	200-220V AC*1	220V AC
Р	_	_	240V AC

Notes: \*1 With transformer (LED: 24V, Incandescent: 28V)

\*2 Not available AH165-ZM

• ZM type: LED lamp only (12, 24V DC)

# 6 Type of lamp

Blank: Incandescent

1: Neon

2: Spot LED, LED (ZM types)

3. Flat LED

#### 7 Terminal

Blank: Solder/tab W٠ Wire-wrap

Soder (AH165-V, V1, V5, V6 types only)

Note: ZM types: wire-wrap terminal only (Code is blank)

# Pushbuttons/Selectors/Pilot Lights/Buzzers

# **AH164 and AH165**

# Type number nomenclature

### **■** Type number nomenclature

#### Selector switches

 $\frac{\textbf{AH165}}{\textcircled{1}} - \frac{\textbf{J}}{\textcircled{2}} \ \frac{\textbf{2}}{\textcircled{3}} \ \frac{\textbf{B}}{\textcircled{4}} \ \frac{\textbf{11}}{\textcircled{5}} \ \frac{\textbf{A}}{\textcircled{6}} - \frac{\textbf{W}}{\textcircled{7}}$ 

#### ① Product category

AH164: Standard (IP40) AH165: Oil-tight (IP65)

#### ② Operator

• 2-position, 3-position (operating angle 90°)

SP: Knob with square bezelP: Knob with rectangular bezelSJ: Key with square bezelJ: Key with rectangular bezel

JM: Key with rectangular bezel (Direct opening action) \*

RJM: Key (Direct opening action) \*
Note: \* AH165 types (2-position) only

3-position (operating angle 45°)
 SPK: Knob with square bezel
 PK: Knob with rectangular bezel
 SJK: Key with square bezel
 JK: Key with rectangular bezel

#### **3** Operation

2: 2-position, maintained

0: 2-position, spring return\*

3: 3-position, maintained

6: 3-position, spring/manual return (Left to center)

7: 3-position, spring/manual return (Right to center)

1: 3-position, spring return

Note: \* Except for JM and RJM types

#### 4 Color of knob or key removable position

Color of knob

B: Black

#### Key removable position

Code	2-position			3-position (operating angle 90°)			3-pos (oper	sition ating a	ingle 4	 15°)
	2	0	1	3	6	7	1	3	6	7
Α	ᢐ	0	_	$\Theta$	_	$\Theta$	_	0	_	0
В	⊗	_	_	$\Theta$	_	_	_	⊗	_	_
С	_	_	_	<b>⊕</b>	_	_	_	\\$	_	_
D	Ø	_	_	$\Theta$		_	_	Ø		_
Е	_	_	1				1			
F	_	_	_	_	_	_	_	<b>②</b>		_
G	_	_	_	_	_	_	_	•	_	◆

#### **5** Contact arrangement

11: 1NO+1NC 22: 2NO+2NC

33: 3NO+3NC\*

Note: \* Except for JM and RJM types.

# 6 Key type No.

A (standard), B, C, D, E, F

#### 7 Terminal

Blank: Solder/tab W: Wire-warp

Note: JM, RJM types: Solder/tab terminal only

#### **Buzzers**

AH164 - T X B E 4

#### ① Product category

AH164: Standard (IP00) AH165: Splash-proof (IP54)

#### ② Sound

TX: Standard (AH164)
TX1: Loud sound (AH164)

TX2: Loud sound with volume control (AH164)
X: Standard sound with volume control (AH165)

#### 3 Color of head

B: Black

#### ④ Operating voltage

AAC: 6V AC\*<sup>2</sup>
ADC: 6V DC\*<sup>2</sup>
A: 6V AC/DC\*<sup>1</sup>
E: 12 to 24V AC/DC
F: 35 to 48V AC/DC

Notes: \*1 Except for TX and TX1 types

\*2 Except for TX2 and X types

# Pushbuttons/Selectors/Pilot Lights/Buzzers **AH164** and **AH165 Ratings and specifications**

#### ■ Standards approved

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479 (except for AH165-ZM)
	File No. LR84365 (for AH165-ZM)
TÜV: EN60947-5-1	Pushbutton (except for AH165-V, V1), Illuminated pushbutton: R9250087
	Pushbutton (for AH165-V, V1): J9551059
	Selector (except for AH165-JM, RJM): R9250088
	Selector (for AH165-JM, RJM): J9551059
	Pilot lights: R9250089
	Buzzer: J9950092 (for AH164-TX2, AH165-X)
TÜV: EN60947-5-1	Emergency stop pushbutton: R9950093
EN60947-5-5	

# ■ Specifications (Indoor use)

• Pushbutton switches, illuminated pushbutton switches selector switches, pilot lights

· · ·	O			
Item	AH164	AH165		
Rated insulation voltage	250V AC/DC			
Ambient temperature (no condensation or no icing)	-20 to +70°C *1	-10 to +70°C *2		
Humidity	45 to 85%RH (at –5 condensation or no i			
Durability (operations) Mechanical Electrical	Pushbutton switch Momentary action: 1 million Alternate action: 250,000 Push-lock, turn-reset: 100,000 Selector switch: 250,000 *3 100,000 (220V AC 0.7A)			
Dielectric strength	2000V AC, 1 minute (Between lamp and contact terminals: 1500V AC, 1 minute)			
Conditional short-circuit current	1000A			
Short-circuit protective device	Fuse 1A *4			
Pollution degree	3			
Vibration	Resonance: 10 to 55Hz, double amplitude 0.1mm *5 Constant: 16.7Hz, double amplitude 3mm			
Shock	Malfunction durability: 100m/s² *6 Mechanical durability: 500m/s²			
Operating frequency	1200 operation/hour (on-load factor: 40%)			
Insulation resistance	100MΩ or more (500V DC megger)			
Degree of protection	IP40	IP65		

# Notes: \*1 For illuminated pushbutton switch and pilot light: -20 to +55°C \*2 For illuminated pushbutton switch and pilot light: -10 to +55°C

- \*3 Key insertion/removal durability for selector switch key types: 10,000
- \*4 AH165-V, V1, JM, RJM, V5, V6 types: Fuse 5A
- $^{\star 5}\,$  Emergency stop type: 10 to 500Hz, double amplitude 0.7mm (acceleration 50m/s²), according to the test condition of EN60947-5-5 (1998)
- \*6 Emergency stop type:150m/s²

#### Buzzers

Buzzers					
Item	AH164-TX	AH164-TX1			
Rated insulation voltage	60V AC/DC				
Operating voltage	6V AC, 6V DC,12 to 35 to 48V AC/DC	24V AC/DC			
Sound level	80dB (0.1m) 60dB(1m)	90dB (0.1m) 70dB(1m)			
Durability	1000h				
Frequency	2 ±0.5kHz	2.4 to 3.3kHz			
Intermittent cycle	Approx. 170 cycle/n	ninute			
Current consumption	7mA(24, 48V DC) 15mA(6V DC) 20mA (6, 24V AC) 30mA (48V AC)	15mA (24, 48V DC) 25mA (6V DC) 30mA (24V AC) 40mA (48V AC) 50mA (6V AC)			
Dielectric strength	1000V AC, 1 minute				
Insulation resistance	100M $\Omega$ or more (500V DC megger)				
Ambient temperature	-20 to +60°C (no cor	ndensation or no icing)			
Humidity	45 to 85%RH (at -	5 to +40°C)			
Operator protection	IP00				
Item	AH164-TX2	AH165-X			
Rated insulation voltage	60V AC/DC				
Operating voltage	6V AC/DC, 12 to 24 35 to 48V AC/DC	V AC/DC			
Sound level	70dB to 90dB (0.1m) 50dB to 70dB (1m)	60dB to 80dB (0.1m) 40dB to 60dB (1m)			
Durability	1000h	•			
Frequency	2 ±0.5kHz	2.4 to 3.3kHz			
Intermittent cycle	Approx. 170 cycle/n	ninute			
Current consumption	30mA (6V DC) 20mA (24, 48V DC) 40mA (6, 24, 48V AC)				
Dielectric strength	1000V AC, 1 minute	)			
Insulation resistance	100M $\Omega$ or more (50	0V DC megger)			
Ambient temperature	-20 to +60°C (no cor	-20 to +60°C (no condensation or no icing)			
Humidity	45 to 85%RH (at -				
Degree of protection	IP00	IP54			
<u> </u>	1	1			

# Pushbuttons/Selectors/Pilot Lights/Buzzers

# AH164 and AH165 Ratings and specifications

# **■** Contact ratings

# UL/CSA standards

Rated thermal	Rated	Maximum current		
current	operational voltage	AC (Res. load)	DC (Res. load)	
5A	24V	_	1.0A	
	125V	_	0.2A	
	250V	5.0A	_	

# • EN standards (TÜV approved)

Rated thermal		Rated operational current				
current	voltage	AC 15 (Ind. load)	AC 13 (Ind. load)	AC 12 (Res. load)	DC 13 (Ind. load)	DC 12 (Res. load)
5A	24V	_	_		0.7A	1.0A
	100 to 120V 100 to 125V	0.3A _	1.0A _	1.5A _	0.15A	0.2A
	200 to 240V	0.3A	0.7A	1.0A	_	

# ■ Lamp ratings

Rated operational	Consumption				
voltage	LED DC	Incandescent AC/DC	Neon AC		
5V	7mA (Yellow: 28mA)	0.45W (6V)	_		
6V	7mA (Yellow: 28mA)	_	_		
12V	7mA	0.55W (14V)	_		
24V	7mA	0.55W (28V)	-		
110V	_	_ ` ` `	0.19VA		
120V	_	_	0.21VA		
220V	-	_	0.38VA		
240V	_	_	0.42VA		

Notes: • With transformer (LED): 2.6VA/110, 220V

- With transformer (Incandescent): 2VA/110, 220V
- For the incandescent lamps, the values in parentheses indicate the rated voltage of the lamps.

#### ■ Contact reliability

FUJI has confirmed that the unit can be used in 1mA circuit conditions at 5V AC or DC. The operable range may vary depending on the ambient conditions and type of load.

# ■ Illuminated pushbutton switches/without transformer

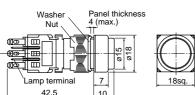
Operator	Lamp	Voltage	Contact	Momentary action		Alternate action	
				AH164 type	AH165 (Oil-tight) type	AH164 type	AH165 (Oil-tight) type
Extended round head	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11E3 AH164-L□22E3 AH164-L□33E3	AH165-L□11E3 AH165-L□22E3 AH165-L□33E3	AH164-L5□11E3 AH164-L5□22E3 AH164-L5□33E3	AH165-L5□11E3 AH165-L5□22E3 AH165-L5□33E3
	Spot LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11E2 AH164-L□22E2 AH164-L□33E2	AH165-L□11E2 AH165-L□22E2 AH165-L□33E2	AH164-L5□11E2 AH164-L5□22E2 AH164-L5□33E2	AH165-L5□11E2 AH165-L5□22E2 AH165-L5□33E2
	Incandes- cent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11E AH164-L□22E AH164-L□33E	AH165-L□11E AH165-L□22E AH165-L□33E	AH164-L5□11E AH164-L5□22E AH164-L5□33E	AH165-L5□11E AH165-L5□22E AH165-L5□33E
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11H1 AH164-L□22H1 AH164-L□33H1	AH165-L□11H1 AH165-L□22H1 AH165-L□33H1	AH164-L5□11H1 AH164-L5□22H1 AH164-L5□33H1	AH165-L5□11H1 AH165-L5□22H1 AH165-L5□33H1
KKD07-205		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11M1 AH164-L□22M1 AH164-L□33M1	AH165-L□11M1 AH165-L□22M1 AH165-L□33M1	AH164-L5□11M1 AH164-L5□22M1 AH164-L5□33M1	AH165-L5□11M1 AH165-L5□22M1 AH165-L5□33M1
Flush square head	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□22E3	AH165-SL□11E3 AH165-SL□22E3 AH165-SL□33E3		AH165-SL5□11E3 AH165-SL5□22E3 AH165-SL5□33E3
	Spot LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□22E2	AH165-SL□11E2 AH165-SL□22E2 AH165-SL□33E2	AH164-SL5□11E2 AH164-SL5□22E2 AH164-SL5□33E2	
	Incandes- cent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□11E AH164-SL□22E AH164-SL□33E	AH165-SL□11E AH165-SL□22E AH165-SL□33E	AH164-SL5□11E AH164-SL5□22E AH164-SL5□33E	AH165-SL5□11E AH165-SL5□22E AH165-SL5□33E
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□22H1	AH165-SL□11H1 AH165-SL□22H1 AH165-SL□33H1	AH164-SL5□11H1 AH164-SL5□22H1 AH164-SL5□33H1	AH165-SL5□22H1
KKD07-204		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□22M1	AH165-SL□11M1 AH165-SL□22M1 AH165-SL□33M1	AH164-SL5□22M1	AH165-SL5□11M1 AH165-SL5□22M1 AH165-SL5□33M1
Flush rectangular head	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□22E3	AH165-TL□11E3 AH165-TL□22E3 AH165-TL□33E3	AH164-TL5□11E3 AH164-TL5□22E3 AH164-TL5□33E3	AH165-TL5□22E3
	Spot LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□22E2	AH165-TL□11E2 AH165-TL□22E2 AH165-TL□33E2	AH164-TL5□11E2 AH164-TL5□22E2 AH164-TL5□33E2	AH165-TL5□22E2
	Incandes- cent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□11E AH164-TL□22E AH164-TL□33E	AH165-TL□11E AH165-TL□22E AH165-TL□33E	AH164-TL5□11E AH164-TL5□22E AH164-TL5□33E	AH165-TL5□11E AH165-TL5□22E AH165-TL5□33E
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□22H1	AH165-TL□11H1 AH165-TL□22H1 AH165-TL□33H1		AH165-TL5□11H1 AH165-TL5□22H1 AH165-TL5□33H1
KKD07-202		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□22M1	AH165-TL□11M1 AH165-TL□22M1 AH165-TL□33M1	AH164-TL5□22M1	AH165-TL5□11M1 AH165-TL5□22M1 AH165-TL5□33M1

Note: Replace the ☐ mark by the button color code, see page 04/196.

# **AH164 and AH165**

Operator	Lamp	Voltage	Contact	Momentary action		Alternate action	
				AH164 type	AH165 (oil-tight) type	AH164 type	AH165 (oil-tight) type
Flush rectangular head with guard	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TGL□11E3 AH164-TGL□22E3 AH164-TGL□33E3	AH165-TGL□11E3 AH165-TGL□22E3 AH165-TGL□33E3	AH164-TGL5□11E3 AH164-TGL5□22E3 AH164-TGL5□33E3	AH165-TGL5□11E3 AH165-TGL5□22E3 AH165-TGL5□33E3
	Incandes- cent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TGL□11E AH164-TGL□22E AH164-TGL□33E	AH165-TGL□11E AH165-TGL□22E AH165-TGL□33E	AH164-TGL5□11E AH164-TGL5□22E AH164-TGL5□33E	AH165-TGL5□11E AH165-TGL5□22E AH165-TGL5□33E
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TGL□11H1 AH164-TGL□22H1 AH164-TGL□33H1	AH165-TGL□11H1 AH165-TGL□22H1 AH165-TGL□33H1	AH164-TGL5□11H1 AH164-TGL5□22H1 AH164-TGL5□33H1	AH165-TGL5□11H1 AH165-TGL5□22H1 AH165-TGL5□33H1
KKD07-203	3	220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TGL□11M1 AH164-TGL□22M1 AH164-TGL□33M1	AH165-TGL□11M1 AH165-TGL□22M1 AH165-TGL□33M1	AH164-TGL5□11M1 AH164-TGL5□22M1 AH164-TGL5□33M1	AH165-TGL5□11M1 AH165-TGL5□22M1 AH165-TGL5□33M1
Flush square head with guard	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SGL□11E3 AH164-SGL□22E3 AH164-SGL□33E3	AH165-SGL□11E3 AH165-SGL□22E3 AH165-SGL□33E3	AH164-SGL5□11E3 AH164-SGL5□22E3 AH164-SGL5□33E3	AH165-SGL5□11E3 AH165-SGL5□22E3 AH165-SGL5□33E3
	Incandes- cent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SGL□11E AH164-SGL□22E AH164-SGL□33E	AH165-SGL□11E AH165-SGL□22E AH165-SGL□33E	AH164-SGL5□11E AH164-SGL5□22E AH164-SGL5□33E	AH165-SGL5□11E AH165-SGL5□22E AH165-SGL5□33E
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SGL□11H1 AH164-SGL□22H1 AH164-SGL□33H1	AH165-SGL□11H1 AH165-SGL□22H1 AH165-SGL□33H1	AH164-SGL5□11H1 AH164-SGL5□22H1 AH164-SGL5□33H1	AH165-SGL5□11H1 AH165-SGL5□22H1 AH165-SGL5□33H1
KKD05-075b		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SGL□11M1 AH164-SGL□22M1 AH164-SGL□33M1	AH165-SGL□11M1 AH165-SGL□22M1 AH165-SGL□33M1	AH164-SGL5□11M1 AH164-SGL5□22M1 AH164-SGL5□33M1	AH165-SGL5□11M1 AH165-SGL5□22M1 AH165-SGL5□33M1

# **■** Dimensions, mm



L, L5

TL, TL5





SL, SL5

15sq.

18sq.

24

18sq.

Panel thickness 4 (max.)

10

Washer

Lamp terminal

42.5

42.5

		Panel thicknes (max.)	ss
_		- 4	25 6
	Lamp terminal 42.5	7	21

# • Button color

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Υ	s	0

- The color lens is made of a tinted transparent material.
- A white illuminated pushbutton is fitted with a transparent color lens.(Except the neon lamp)
- With wire-wrap pin terminals have a depth of 47mm.

#### • Lamp voltage

Voltages other than above are available

Code	LED	Incandescent	Neon
AA A B K P	5V DC 6V DC 12V DC - -	 5V AC/DC 12V AC/DC 	- - - 120V AC 240V AC

# ■ Illuminated pushbutton switches/with transformer

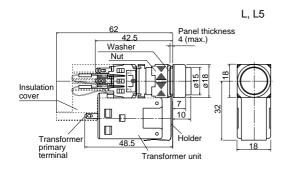
Operator	Lamp	Voltage	Contact	Momentary action		Alternate action	
				AH164 type	AH165 (oil-tight) type	AH164 type	AH165 (oil-tight) type
Extended round head	Flat LED	■ Voltage code	1NO+1NC	AH164-L□11 <b>■</b> 3	AH165-L□11 <b>■</b> 3	AH164-L5□11 <b>■</b> 3	AH165-L5□11 <b>■</b> 3
AF90-945		H: 100-110V	2NO+2NC	AH164-L□22 <b>■</b> 3	AH165-L□22 <b>■</b> 3	AH164-L5□22 <b>■</b> 3	AH165-L5□22 <b>■</b> 3
	Incandes- cent	AC M: 200-220V	1NO+1NC	AH164-L□11■	AH165-L□11 <b>■</b>	AH164-L5□11 <b>■</b>	AH165-L5□11 <b>■</b>
		AC	2NO+2NC	AH164-L□22 <b>■</b>	AH165-L□22 <b>■</b>	AH164-L5□22 <b>■</b>	AH165-L5□22 <b>■</b>
Flush square head	Flat LED	■ Voltage code	1NO+1NC	AH164-SL⊡11 <b>■</b> 3	AH165-SL□11 <b>■</b> 3	AH164-SL5⊡11 <b>■</b> 3	AH165-SL5□11 <b>■</b> 3
AF90-946		H: 100-110V	2NO+2NC	AH164-SL□22 <b>■</b> 3	AH165-SL□22 <b>■</b> 3	AH164-SL5□22 <b>■</b> 3	AH165-SL5□22 <b>■</b> 3
	Incandes- cent	AC M:	1NO+1NC	AH164-SL⊡11 <b>■</b>	AH165-SL□11■	AH164-SL5⊡11 <b>■</b>	AH165-SL5□11■
		200-220V AC	2NO+2NC	AH164-SL□22 <b>■</b>	AH165-SL□22 <b>■</b>	AH164-SL5□22 <b>■</b>	AH165-SL5□22■
Flush rectangular head	Flat LED	■ Voltage code	1NO+1NC	AH164-TL□11 <b>■</b> 3	AH165-TL□11 <b>■</b> 3	AH164-TL5□11 <b>■</b> 3	AH165-TL5□11 <b>■</b> 3
		H: 100-110V	2NO+2NC	AH164-TL□22 <b>■</b> 3	AH165-TL□22 <b>■</b> 3	AH164-TL5□22 <b>■</b> 3	AH165-TL5□22 <b>■</b> 3
	Incandes- cent	M:	1NO+1NC	AH164-TL□11■	AH165-TL□11■	AH164-TL5□11 <b>■</b>	AH165-TL5□11■
AF90-947		200-220V AC	2NO+2NC	AH164-TL□22■	AH165-TL□22■	AH164-TL5□22 <b>■</b>	AH165-TL5□22 <b>■</b>
Flush rectangular head with guard	Flat LED	■ Voltage code	1NO+1NC	AH164-TGL□11 <b>■</b> 3	AH165-TGL□11 <b>■</b> 3	AH164-TGL5□11 <b>■</b> 3	AH165-TGL5□11 <b>■</b> 3
		H: 100-110V	2NO+2NC	AH164-TGL□22 <b>■</b> 3	AH165-TGL□22 <b>■</b> 3	AH164-TGL5□22 <b>■</b> 3	AH165-TGL5□22 <b>■</b> 3
	Incandes- cent	AC M:	1NO+1NC	AH164-TGL□11■	AH165-TGL□11■	AH164-TGL5□11 <b>■</b>	AH165-TGL5□11■
AF90-941		200-220V AC	2NO+2NC	AH164-TGL□22■	AH165-TGL□22■	AH164-TGL5□22 <b>■</b>	AH165-TGL5□22 <b>■</b>
Flush square head with guard	Flat LED	■ Voltage code	1NO+1NC	AH164-SGL□11 <b>■</b> 3	AH165-SGL□11 <b>■</b> 3	AH164-SGL5□11 <b>■</b> 3	AH165-SGL5□11 <b>■</b> 3
		H: 100-110V	2NO+2NC	AH164-SGL□22 <b>■</b> 3	AH165-SGL□22 <b>■</b> 3	AH164-SGL5□22 <b>■</b> 3	AH165-SGL5□22 <b>■</b> 3
100	Incandes- cent	AC M:	1NO+1NC	AH164-SGL□11 <b>■</b>	AH165-SGL□11 <b>■</b>	AH164-SGL5□11 <b>■</b>	AH165-SGL5□11■
AF90-948		200-220V AC	2NO+2NC	AH164-SGL□22 <b>■</b>	AH165-SGL□22 <b>■</b>	AH164-SGL5□22 <b>■</b>	AH165-SGL5□22■

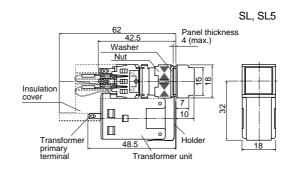
Note: Replace the  $\square$  mark by the button color code, see page 04/198.

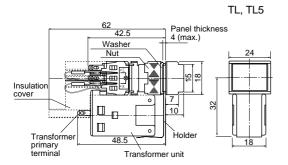
# Illuminated Pushbuttons

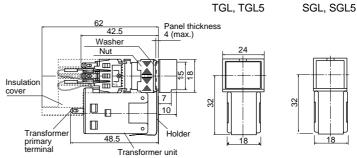
# **AH164 and AH165**

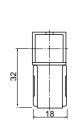
# **■** Dimensions, mm











#### Button color

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Υ	S	0

• The color lens is made of a tinted transparent material.

#### ■ Pushbutton switches

■ Pushbutton switche	_	T		T		
Operator	Contact	Momentary action		Alternate action		Dimensions, mm
		AH164 type A	MH165 (oil-tight) type	AH164 type AH	165 (oil-tight) type	
Extended round head	1NO+1NC	AH164-E□11	AH165-E□11	AH164-E5□11	AH165-E5□11	Washer Panel thickness Nut \ 4 (max.)
	2NO+2NC	AH164-E□22	AH165-E□22	AH164-E5□22	AH165-E5□22	7 18sq.
KKD07-209	3NO+3NC	AH164-E□33	AH165-E□33	AH164-E5□33	AH165-E5□33	42.5 10
Flush square head	1NO+1NC	AH164-SF□11	AH165-SF⊡11	AH164-SF5□11	AH165-SF5□11	Washer Panel thickness Nut 4 (max.)
	2NO+2NC	AH164-SF□22	AH165-SF□22	AH164-SF5□22	AH165-SF5□22	
KKD07-208	3NO+3NC	AH164-SF□33	AH165-SF□33	AH164-SF5□33	AH165-SF5□33	42.5 10 15sq. 18sq.
Flush rectangular head	1NO+1NC	AH164-TF□11	AH165-TF□11	AH164-TF5□11	AH165-TF5□11	Washer Panel thickness Nut, \ 4 (max.)
	2NO+2NC	AH164-TF□22	AH165-TF□22	AH164-TF5□22	AH165-TF5□22	
KKD07-206	3NO+3NC	AH164-TF□33	AH165-TF□33	AH164-TF5□33	AH165-TF5□33	42.5 10 21 21 24
Flush rectangular head with guard	1NO+1NC	AH164-TGF□11	AH165-TGF□11	AH164-TGF5□11	AH165-TGF5□11	Washer Panel thickness Nut 4 (max.)
ST	2NO+2NC	AH164-TGF□22	AH165-TGF□22	AH164-TGF5□22	AH165-TGF5□22	
KKD05-176	3NO+3NC	AH164-TGF□33	AH165-TGF□33	AH164-TGF5□33	AH165-TGF5□33	42.5 10 21 24
Flush square head with guard	1NO+1NC	AH164-SGF⊡11	AH165-SGF⊡11	AH164-SGF5□11	AH165-SGF5□11	Washer Panel thickness Nut 1 (max.)
	2NO+2NC	AH164-SGF□22	AH165-SGF□22	AH164-SGF5□22	AH165-SGF5□22	
KKD05-075b	3NO+3NC	AH164-SGF⊟33	AH165-SGF□33	AH164-SGF5□33	AH165-SGF5□33	42.5 10 15sq. 18sq.
Mushroom head	1NO+1NC	AH164-M□11	AH165-M□11	AH164-M5□11	AH165-M5□11	Washer Panel thickness Nut 4 (max.)
	2NO+2NC	AH164-M□22	AH165-M□22	AH164-M5□22	AH165-M5□22	33.5
KKD07-210	3NO+3NC	AH164-M□33	AH165-M□33	AH164-M5□33	AH165-M5□33	42.5 16.5
Convex square head	1NO+1NC	AH164-SM□11	AH165-SM□11	AH164-SM5□11	AH165-SM5⊡11	Washer Panel thickness Nut 4 (max.)
	2NO+2NC	AH164-SM□22	AH165-SM□22	AH164-SM5□22	AH165-SM5□22	33 23 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
KKD05-081b	3NO+3NC	AH164-SM□33	AH165-SM□33	AH164-SM5□33	AH165-SM5⊟33	42.5 16.5
Convex rectangular head	1NO+1NC	AH164-TM□11	AH165-TM□11	AH164-TM5□11	AH165-TM5□11	Washer Panel thickness Nut 4 (max.)
	2NO+2NC	AH164-TM□22	AH165-TM□22	AH164-TM5□22	AH165-TM5□22	
KKD05-082b	3NO+3NC	AH164-TM□33	AH165-TM□33	AH164-TM5□33	AH165-TM5□33	42.5 16.5 23.5

#### Button color

Replace the  $\square$  mark by the following color code

Color	Green	Red	Black	White	Blue	Yellow	Orange
Code	G	R	В	W	S	Υ	0

- The color lens is made of a tinted transparent material. (Except the M, SM, TM types)
- A white pushbutton is fitted with a transparent color lens.(Except the M, SM, TM types) A black pushbutton consists of a transparent color lens and an attached black legend plate. (Except M, SM, TM types)

  Output

  Description:
- With wire-wrap pin terminals have a depth of 47mm.

# **Pushbuttons AH165**

# ■ Pushbutton switches

⊕ (Direct opening action)

Operator	Button color	Contact	Terminal	AH165 (oil-tight) type	Dimensions, mm
Push-lock, turn-reset (32mm dia.)	Red	1NC	Solder/Tab Solder	AH165-VR01 (AH165-VR01-S)	Panel thickness  Washer  Nut  Nut  Nat  Nat  Nat  Nat  Nat  Nat
AF91-584		2NC		AH165-VR02 (AH165-VR02-S)	15.5 15 24.5 (20)
Push-lock, turn-reset (40mm dia.)		1NC		AH165-V1R01 (AH165-V1R01-S)	Panel thickness 4 (max.)
AF91-583		2NC		AH165-V1R02 (AH165-V1R02-S)	15.5 15 15 15 12 15 15 15 15 15 15 15 15 15 15 15 15 15

- Notes: \* ( ) For switch with solder terminal.

   Contact arrangements indicated in the table can be supplied.
  - Product with no trigger action mechanism.

# **■** Emergency stop pushbutton switches

⊕ (Direct opening action), conform to EN418

Operator	Button color	Contact	Terminal	AH165 (oil-tight) type	Dimensions, mm
Push-lock, turn-reset (32mm dia.)	Red	1NC	Solder/Tab Solder	AH165-V5R01 (AH165-V5R01-S)	Washer Panel thickness 6 (max.)
KKD07-221		2NC		AH165-V5R02 (AH165-V5R02-S)	33 42 (37.5)
Push-lock, turn-reset (40mm dia.)		1NC		AH165-V6R01 (AH165-V6R01-S)	Washer Panel thickness 6 (max.)
KKD07-222		2NC		AH165-V6R02 (AH165-V6R02-S)	33 42 24.5

Notes: \* ( ) For switch with solder terminal.

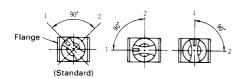
• Contact arrangements indicated in the table can be supplied.

#### ■ Selector switches/2-position (90-degree)

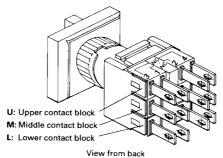
■ Selector switches	s/2-position (	90-degree)				
Operator	Operation	Key removable position	Contact	AH164 type	AH165 (oil-tight) type	Dimensions, mm
Knob with	Maintained		1NO+1NC	AH164-P2B11	AH165-P2B11	Washer Panel thickness #18
rectangular bezel		_	2NO+2NC	AH164-P2B22	AH165-P2B22	Washer 4 (max.) $\phi$ 18
			3NO+3NC	AH164-P2B33	AH165-P2B33	
	Spring		1NO+1NC	AH164-P0B11	AH165-P0B11	
	return 🖔	_	2NO+2NC	AH164-P0B22	AH165-P0B22	42.5 18.5 24
KKD07-213			3NO+3NC	AH164-P0B33	AH165-P0B33	42.5 18.5
Knob with square	Maintained		1NO+1NC	AH164-SP2B11	AH165-SP2B11	Panel thickness
bezel		_	2NO+2NC	AH164-SP2B22	AH165-SP2B22	Washer 4 (max.)
- TO 18			3NO+3NC	AH164-SP2B33	AH165-SP2B33	
	Spring		1NO+1NC	AH164-SP0B11	AH165-SP0B11	
	return 🖔	_	2NO+2NC	AH164-SP0B22	AH165-SP0B22	42.5 18.5 18sq.
KKD07-215			3NO+3NC	AH164-SP0B33	AH165-SP0B33	42.5 18.5 18sq.
Key with	Maintained		1NO+1NC	AH164-J2A11A	AH165-J2A11A	
rectangular bezel		$\bigcirc$	2NO+2NC	AH164-J2A22A	AH165-J2A22A	
		Α	3NO+3NC	AH164-J2A33A	AH165-J2A33A	
-00-00		_	1NO+1NC	AH164-J2B11A	AH165-J2B11A	Washer Panel thickness
		$\otimes$	2NO+2NC	AH164-J2B22A	AH165-J2B22A	Washer Panel trickness Nut 4 (max.)
		В	3NO+3NC	AH164-J2B33A	AH165-J2B33A	
2		_	1NO+1NC	AH164-J2D11A	AH165-J2D11A	
		$\bigcirc$	2NO+2NC	AH164-J2D22A	AH165-J2D22A	42.5
		D	3NO+3NC	AH164-J2D33A	AH165-J2D33A	10.5
	Spring		1NO+1NC	AH164-J0A11A	AH165-J0A11A	
	return 🖔		2NO+2NC	AH164-J0A22A	AH165-J0A22A	
KKD09-001L	-	Α	3NO+3NC	AH164-J0A33A	AH165-J0A33A	
Key with square	Maintained		1NO+1NC		AH165-SJ2A11A	
bezel		$\bigcirc$	2NO+2NC		AH165-SJ2A22A	
		Α	3NO+3NC	AH164-SJ2A33A	AH165-SJ2A33A	
			1NO+1NC	AH164-SJ2B11A	AH165-SJ2B11A	Washer Panel thickness
2000		$\otimes$	2NO+2NC	AH164-SJ2B22A	AH165-SJ2B22A	Washer Hanel mickness Nut, 4 (max.)
		В	3NO+3NC	AH164-SJ2B33A	AH165-SJ2B33A	
			1NO+1NC	AH164-SJ2D11A	AH165-SJ2D11A	
		$\bigcirc$	2NO+2NC	AH164-SJ2D22A	AH165-SJ2D22A	42.5 8.5 18
		D	3NO+3NC	AH164-SJ2D33A	AH165-SJ2D33A	10.5
	Spring		1NO+1NC	AH164-SJ0A11A	AH165-SJ0A11A	
	return 🕤		2NO+2NC	AH164-SJ0A22A	AH165-SJ0A22A	
KKD09-001R		Α	3NO+3NC	AH164-SJ0A33A	AH165-SJ0A33A	

• The operating angle range can be changed as shown below by setting the attached flange shifted by 45° in combination with the contact block.

In this case, the minimum mounting pitch is 26mm because the contact block is shifted by 45° from the flange.



#### · Contact block position



• Contact arrangement and operator position: 2-position selector switch

Contact arrange- ment		1NO+1NC	2NO+2NC	3NO+3NC
Operator position	Left	M 1 Q L Q 2 3 O O 4	U 1 Q L Q 2 3 O O 4 1 Q L Q 2 3 O O 4 L	1 Q 1 Q 2 3 O O 4 1 Q 1 Q 2 3 O O 4 1 Q 1 Q 2 3 O O 4
	Right 🗷	M 1 O O 2 3 O O 4	U 1 0 0 2 3 0 0 4 1 0 0 2 3 0 0 4	1 0 0 2 U 3 0 0 4 U 1 0 0 2 M 3 0 0 4 1 0 0 2 L 3 0 0 4

3-nc	eition	selector	ewitch
3-pc	วธเนษก	Selector	SWILCH

Contact arrange- ment		2NO+2NC	3NO+3NC	
Operator position	Left ⊕	U L 101021002 30 0430 04	U M L 1010210021002 30 0430 0430 04	
•	Center	1 <u>0   0</u> 2 1 <u>0   0</u> 2 30 04 30 04	101021010210102 30 0430 0430 04	
	Right	10 02 1 <u>0 1 02</u> 30 04 30 04	10 02 10 02 10 102 30 04 30 04 30 04	

- There are 6 available key types; A, B, C, D, E and F.
  Standard key code is A.
- With wire-wrap pin terminals have a depth of 47mm.

# Selector Switches **AH165**

# ■ Selector switches/2-position (90-degree)

⊕ (Direct opening action)

(bilect opening action)					
Operator	Operation	Key removable position	Contact	AH165 (oil-tight) type	Dimensions, mm
Key with rectangular bezel	Maintained	A 🚫	1NO+1NC	AH165-JM2A11A	Washer Panel thickness 24 (max.)
KKD09-005L		B ⊗ D ⊘		AH165-JM2B11A AH165-JM2D11A	32.5 8.8 41.5 10.8 18
KKD09-003E		A 🕥	2NO+2NC	AH165-JM2A22A	Washer Panel thickness Nut 4 (max.)
		В ⊗		AH165-JM2B22A	37.5 0.5
KKD09-005R		D Ø		AH165-JM2D22A	46.5 10.5 18
Key with round bezel	Maintained	A 🚫	1NO+1NC	AH165-RJM2A11A	Washer Panel thickness Nut 4(max.)
		В ⊗		AH165-RJM2B11A	32.5 9.8
KKD09-005L		D 🕢		AH165-RJM2D11A	41.5 10.8 18
		A 🚫	2NO+2NC	AH165-RJM2A22A	Washer Panel thickness Nut 4(max.)
		В 🕅		AH165-RJM2B22A	37.5 9.8
KKD09-007R		D 🕢		AH165-RJM2D22A	37.5 9.8 46.5 10.8 18

<sup>•</sup> There are 6 available key types; A, B, C, D, E and F. Standard key code is A.

# • Contact arrangement and operator positions:

2-position selector switch

Contact arrangem	ent	1NO+1NC
Operator position	Left	O   O O O O O O O O O O O O O O O O O O
	Right	
	0	O O O O 11 12 21 22

Contact arrangem	ent	2NO+2NC	
Operator position	Left 🛇	U O O O O O O O O O O O O O O O O O O O	L O
	Right	O O O O O O O O O O O O O O O O O O O	O O O O O O O O O O O O O O O O O O O

#### • Terminal number

#### ■ Selector switches/3-position (90-degree)

Operator	Operation	Key	Contact	AH164 type	AH165	Dimensions, mm
		removable position			(oil-tight) type	
Knob with	Maintained		2NO+2NC	AH164-P3B22	AH165-P3B22	
rectangular bezel		_	3NO+3NC	AH164-P3B33	AH165-P3B33	D 1411
20.00	Spring/ (†)		2NO+2NC	AH164-P6B22	AH165-P6B22	Washer Panel thickness 4 (max.)
	manual return	_	3NO+3NC	AH164-P6B33	AH165-P6B33	Nut
	Spring/		2NO+2NC	AH164-P7B22	AH165-P7B22	
	manual return		3NO+3NC	AH164-P7B33	AH165-P7B33	
	Spring return		2NO+2NC	AH164-P1B22	AH165-P1B22	42.5   8.5   24   24
KKD07-214		_	3NO+3NC	AH164-P1B33	AH165-P1B33	1 1000
Knob with square	Maintained		2NO+2NC	AH164-SP3B22	AH165-SP3B22	
bezel		_	3NO+3NC	AH164-SP3B33	AH165-SP3B33	Panel thickness
200	Spring/ (†)		2NO+2NC	AH164-SP6B22	AH165-SP6B22	Washer 4 (max.)
	manual return		3NO+3NC	AH164-SP6B33	AH165-SP6B33	
	Spring/ 🕥		2NO+2NC	AH164-SP7B22	AH165-SP7B22	
	manual return	_	3NO+3NC	AH164-SP7B33	AH165-SP7B33	
	Spring return		2NO+2NC	AH164-SP1B22	AH165-SP1B22	42.5 18.5 18sq.
KKD07-216		_	3NO+3NC	AH164-SP1B33	AH165-SP1B33	
Key with	Maintained*		2NO+2NC	AH164-J3A22A	AH165-J3A22A	
rectangular bezel		⊖ A	3NO+3NC	AH164-J3A33A	AH165-J3A33A	
			2NO+2NC	AH164-J3E22A	AH165-J3E22A	1
		① E	3NO+3NC	AH164-J3E33A	AH165-J3E33A	
			2NO+2NC	AH164-J3D22A	AH165-J3D22A	1
		⊖D	3NO+3NC	AH164-J3D33A	AH165-J3D33A	B. Juli
~00 a			2NO+2NC	AH164-J3C22A	AH165-J3C22A	Washer Panel thickness
		⊕ C	3NO+3NC	AH164-J3C33A	AH165-J3C33A	Nut ————————————————————————————————————
	Spring/		2NO+2NC	AH164-J6E22A	AH165-J6E22A	
	manual return	① E	3NO+3NC	AH164-J6E33A	AH165-J6E33A	
			2NO+2NC	AH164-J6D22A	AH165-J6D22A	10.5
	(1)	⊝D	3NO+3NC	AH164-J6D33A	AH165-J6D33A	
	Spring/		2NO+2NC	AH164-J7A22A	AH165-J7A22A	1
	manual return	⊖ A	3NO+3NC	AH164-J7A33A	AH165-J7A33A	
			2NO+2NC	AH164-J7E22A	AH165-J7E22A	1
	Ô	① E	3NO+3NC	AH164-J7E33A	AH165-J7E33A	
	Spring 🚗		2NO+2NC	AH164-J1E22A	AH165-J1E22A	-
KKD09-002L	return	① E	3NO+3NC	AH164-J1E33A	AH165-J1E33A	
Key with square	Maintained*		2NO+2NC	AH164-SJ3A22A	AH165-SJ3A22A	
bezel	Mantanioa	⊖A	3NO+3NC	AH164-SJ3A33A	AH165-SJ3A33A	
50201			2NO+2NC	AH164-SJ3E22A	AH165-SJ3E22A	-
		① E	3NO+3NC	AH164-SJ3E33A		
			2NO+2NC	AH164-SJ3D22A		-
			3NO+3NC		AH165-SJ3D33A	Danel thiskness
4.4			2NO+2NC		AH165-SJ3C22A	Washer Panel thickness 4 (max.)
		⊕ C	3NO+3NC		AH165-SJ3C33A	\\
	Spring/		2NO+2NC	AH164-SJ6E22A		<del>│</del>
	manual return	① E	3NO+3NC		AH165-SJ6E33A	
(Joseph			2NO+2NC		AH165-SJ6D22A	42.5   18   18sq.
	(1)	⊖D	3NO+3NC		AH165-SJ6D33A	
	Spring/		2NO+2NC		AH165-SJ7A22A	1
	manual return	⊖ A	3NO+3NC		AH165-SJ7A33A	
			2NO+2NC	AH164-SJ7E22A		-
	1	① E	3NO+3NC	AH164-SJ7E33A		
	Spring		2NO+2NC	AH164-SJ1E22A		-
KKD09-002R	Spring	① E				
	return	I	3NO+3NC	AH164-SJ1E33A	АП 100-0J TE33A	1

- There are 6 available key types; A, B, C, D, E and F.
- Standard key code is A.

   Contact arrangement and operator position: See page 04/201.
- Spring return, spring/manual return (spring return): Operation angle 70-degree

- ullet \* Available key removable position: Code B ullet
- With wire-wrap pin terminals have a depth of 47mm.

#### Selector Switches **AH164 and AH165**

#### ■ Selector switches/3-position (45-degree)

Selector switch	· · · · · · · · · · · · · · · · · · ·	(+5-uegree	7)	·		
Operator	Operation	Key	Contact	AH164 type	AH165	Dimensions, mm
		removable			(oil-tight) type	
		position				
Knob with	Maintained	_	2NO+2NC	AH164-PK3B22	AH165-PK3B22	
rectangular bezel	2 1 6		3NO+3NC	AH164-PK3B33	AH165-PK3B33	Washer Panel thickness
0000	Spring/ ①	_	2NO+2NC	AH164-PK6B22	AH165-PK6B22	Nut 4 (max.)
1	manual return		3NO+3NC	AH164-PK6B33	AH165-PK6B33	
	Spring/	_	2NO+2NC	AH164-PK7B22	AH165-PK7B22	
	manual return		3NO+3NC	AH164-PK7B33	AH165-PK7B33	
WWDOT OU	Spring return	_	2NO+2NC	AH164-PK1B22	AH165-PK1B22	42.5 18.5 24
KKD07-214	(1)		3NO+3NC	AH164-PK1B33	AH165-PK1B33	
Knob with square	Maintained	_	2NO+2NC	AH164-SPK3B22	AH165-SPK3B22	
bezel			3NO+3NC	AH164-SPK3B33	AH165-SPK3B33	Panel thickness Washer 4 (max.)
	Spring/ 👚		2NO+2NC	AH164-SPK6B22	AH165-SPK6B22	Nut 4 (max.)
	manual return		3NO+3NC	AH164-SPK6B33	AH165-SPK6B33	
	Spring/	_	2NO+2NC	AH164-SPK7B22	AH165-SPK7B22	
	manual return		3NO+3NC	AH164-SPK7B33	AH165-SPK7B33	8.5
	Spring return	_	2NO+2NC	AH164-SPK1B22	AH165-SPK1B22	42.5 18.5 18sq.
KKD07-216	<b>1</b>		3NO+3NC	AH164-SPK1B33	AH165-SPK1B33	
Key with	Maintained	⊗A	2NO+2NC	AH164-JK3A22A	AH165-JK3A22A	
rectangular bezel			3NO+3NC	AH164-JK3A33A	AH165-JK3A33A	_
		① E	2NO+2NC	AH164-JK3E22A	AH165-JK3E22A	
			3NO+3NC	AH164-JK3E33A	AH165-JK3E33A	
		⊘ D	2NO+2NC	AH164-JK3D22A	AH165-JK3D22A	
		<b>○ b</b>	3NO+3NC	AH164-JK3D33A	AH165-JK3D33A	Washer Panel thickness
		® C	2NO+2NC	AH164-JK3C22A	AH165-JK3C22A	Nut \ 4 (max.)
		₩ 0	3NO+3NC	AH164-JK3C33A	AH165-JK3C33A	
	Spring/	① E	2NO+2NC	AH164-JK6E22A	AH165-JK6E22A	
	manual return		3NO+3NC	AH164-JK6E33A	AH165-JK6E33A	42.5
	₾	⊘ D	2NO+2NC	AH164-JK6D22A	AH165-JK6D22A	10.5
		<b>⊘ D</b>	3NO+3NC	AH164-JK6D33A	AH165-JK6D33A	
	Spring/	⊗ A	2NO+2NC	AH164-JK7A22A	AH165-JK7A22A	
	manual return	○ A	3NO+3NC	AH164-JK7A33A	AH165-JK7A33A	
	(1)	① E	2NO+2NC	AH164-JK7E22A	AH165-JK7E22A	
		U E	3NO+3NC	AH164-JK7E33A	AH165-JK7E33A	
	Spring (	① E	2NO+2NC	AH164-JK1E22A	AH165-JK1E22A	
KKD09-002L	return	U E	3NO+3NC	AH164-JK1E33A	AH165-JK1E33A	
Key with square	Maintained		2NO+2NC	AH164-SJK3A22A	AH165-SJK3A22A	
bezel		<b>⊗</b> A	3NO+3NC	AH164-SJK3A33A	AH165-SJK3A33A	
			2NO+2NC	AH164-SJK3E22A	AH165-SJK3E22A	
		① E	3NO+3NC	AH164-SJK3E33A	AH165-SJK3E33A	
		@ <b>D</b>	2NO+2NC	AH164-SJK3D22A	AH165-SJK3D22A	
		⊘ D	3NO+3NC	AH164-SJK3D33A	AH165-SJK3D33A	
		<b>®</b> C	2NO+2NC	AH164-SJK3C22A	AH165-SJK3C22A	
-12-02		<b>®</b> C	3NO+3NC	AH164-SJK3C33A	AH165-SJK3C33A	
	Spring/	<b>∞ Γ</b>	2NO+2NC	AH164-SJK6E22A	AH165-SJK6E22A	
	manual return	① E	3NO+3NC	AH164-SJK6E33A	AH165-SJK6E33A	42.5 8.5 18
	<b>(</b>	- D	2NO+2NC	AH164-SJK6D22A	AH165-SJK6D22A	1 1880
Up-		⊘ D	3NO+3NC	AH164-SJK6D33A	AH165-SJK6D33A	
	Spring/		2NO+2NC	AH164-SJK7A22A	AH165-SJK7A22A	
	manual return	⊗ A	3NO+3NC	AH164-SJK7A33A	AH165-SJK7A33A	
	1		2NO+2NC	AH164-SJK7E22A	AH165-SJK7E22A	]
		① E	3NO+3NC	AH164-SJK7E33A		
	Spring 🚕		2NO+2NC	AH164-SJK1E22A		
KKD09-002R	return	① E	3NO+3NC	AH164-SJK1E33A		
					5025071	t .

<sup>•</sup> There are 6 available key types; A, B, C, D, E and F.

Standard key code is A.

• Contact arrangement and operator position: See page 04/205.

#### • Key removable positions (JK, SJK)

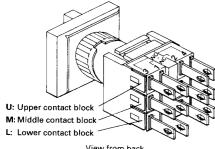
Remvable position	$\varnothing$	$\boxtimes$	<b>X</b>	$\varnothing$	$\bigcirc$	<b>X</b>	\$
Code	Α	В	С	D	E	F	G

Operation code	Key removable position
3	A, B, C, D, E, F, G
6	A, B, C, D, E, F, G D, E, F A, E, G
7	A, E, G
1	E

#### • Key code No.

There are 6 available key types; A, B, C, D, E and F. Standard key code is A.

#### • Contact block position



View from back

#### • Contact arrangement and operator position:

3-position selector switch

Contact arrange- ment		2NO+2NC	3NO+3NC	
Operator position	Left	U L 101021002 30 0430 04	U M L 1010210021002 30 0430 0430 04	
	Center	1 <u>O I O</u> 2 1 <u>O I O</u> 2 3O O4 3O O4	1 <u>O I O2</u> 1 <u>O I O2</u> 1 <u>O I O2</u> 30	
	Right	10 02 10 1 02 30 04 30 04	10 02 10 02 10 02 30 04 30 04 30 04	

#### Pilot Lights **AH164 and AH165**

#### ■ Pilot lights/without transformer

Lens	Lamp	Voltage	AH164 type	AH165 (oil-tight) type	Dimensions, mm
Extended round	Flat LED	24V DC	AH164-Z□E3	AH165-Z□E3	Washer Panel thickness
	Spot LED	24V DC	AH164-Z□E2	AH165-Z□E2	a (+) (-)
	Incandescent	24V AC/DC	AH164-Z□E	AH165-Z□E	
	Neon	110V AC	AH164-Z□H1	AH165-Z□H1	b (-)
SK-1139		220V AC	AH164-Z□M1	AH165-Z□M1	10 18sq.
Flush square	Flat LED	24V DC	AH164-ZS□E3	AH165-ZS□E3	Washer Panel thickness
	Spot LED	24V DC	AH164-ZS□E2	AH165-ZS□E2	a (+) (=
	Incandescent	24V AC/DC	AH164-ZS□E	AH165-ZS□E	
	Neon	110V AC	AH164-ZS□H1	AH165-ZS□H1	b (-) (24 7 15sq. 1
SK-1138		220V AC	AH164-ZS□M1	AH165-ZS□M1	10 18sq.
Flush rectangular	Flat LED	24V DC	AH164-ZT□E3	AH165-ZT□E3	Washer Panel thickness Nut 4 (max.)
	Spot LED	24V DC	AH164-ZT□E2	AH165-ZT□E2	a (+) (C)
	Incandescent	24V AC/DC	AH164-ZT□E	AH165-ZT□E	
	Neon	110V AC	AH164-ZT□H1	AH165-ZT□H1	b (-) (24 7 )   21   21
SK-1137		220V AC	AH164-ZT□M1	AH165-ZT□M1	10 24
Dome	LED	12V DC	_	AH165-ZM□B2	Nut Panel thickness , 16 , ↓ <u></u> <u></u> <u></u> <u></u> <u></u> 5 (max.)
AF87-45		24V DC	_	AH165-ZM□E2	a (+) 1sq.   1sq
AF87-45					<del> </del>

#### • Lens color

Replace the  $\square$  mark by the following lens color code

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Υ	S	0

- The color lens is made of a tinted transparent material.
- A white pilot lights is fitted with a transparent color lens. (Except the
- neon lamp and dome).

   With wire-wrap pin terminals have a depth of 29mm. (Except for ZM type)

#### • Lamp voltage

Voltages other than above are available

Code	LED	Incandescent	Neon
AA	5V DC		-
A	6V DC		-
B	12V DC		-
K	-		120V AC
P	-		240V AC

Note: Except for ZM types and red/green LED types

#### ■ Pilot lights/with transformer

Lens	Lamp	Voltage	AH164 type	AH165 (oil-tight) type	Dimensions, mm
Extended square	Flat LED	■ Voltage H: 100-110V AC	AH164-Z□■3	AH165-Z□ <b>■</b> 3	62 Panel thickness Washer 4 (max.)  Nut  Insulation cover
AF90-944	Incandescent	M: 200-220V AC	AH164-Z□■	AH165-Z□ <b>■</b>	Transformer unit  Transformer unit
Flush square	Flat LED	■ Voltage H: 100-110V AC	AH164-ZS□■3	AH165-ZS□■3	Panel thickness  Washer  Value  18  15  Insulation
AF90-943	Incandescent	M: 200-220V AC	AH164-ZS□■	AH165-ZS□■	Cover 0 7 10 8 Holder primary terminal Transformer unit
Flush rectangular	Flat LED	■ Voltage H: 100-110V AC	AH164-ZT□■3	AH165-ZT□ <b>■</b> 3	Panel thickness  Washer  Value  Value
AF90-942	Incandescent	M: 200-220V AC	AH164-ZT□■	AH165-ZT□■	Transformer primary terminal Transformer unit

#### • Lens color

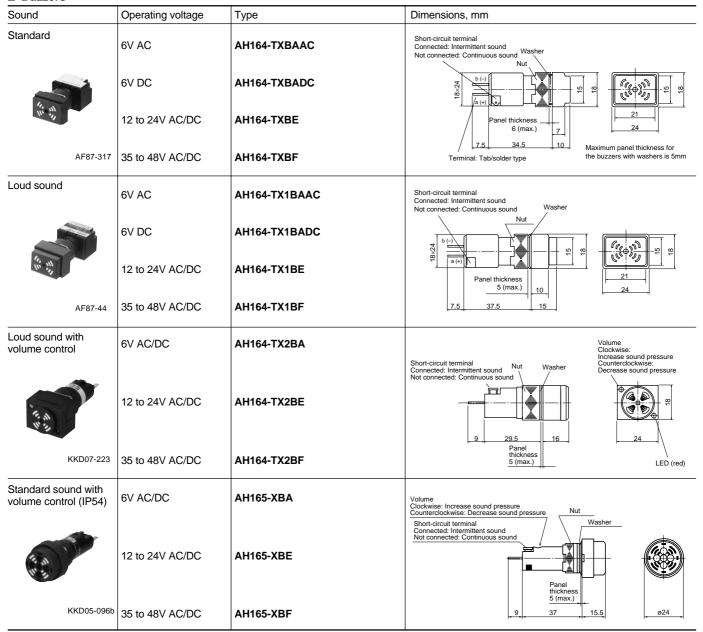
Replace the  $\square$  mark by the following lens color code

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Υ	S	0

- The color lens is made of a tinted transparent material.A white pilot lights is fitted with a transparent color lens.

## Buzzers AH164 and AH165

#### **■** Buzzers

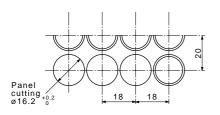


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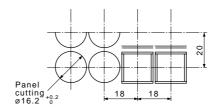
## AH164 and AH165 Mounting space

- Mounting space, mm
- Pushbuttons and pilot lights

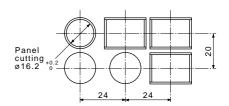
#### Extended round head or lens



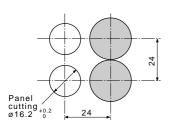
#### Flush square head or lens



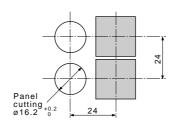
#### Flush rectangular head or lens



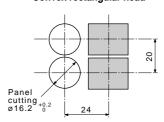
#### Mushroom head



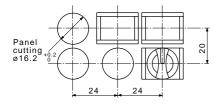
#### Convex square head



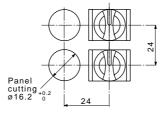
#### Convex rectangular head



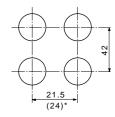
- Selector switches
- •When mounting the selector switches near the pilot light



 When mounting the selector switches near each other

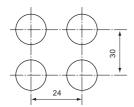


· With transformer

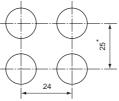


Note: \*( ) For switch with flush rectangular head

 When mounting the JM or RJM selector switches near each other (2NO+2NC only)



 When mounting the JM or RJM selector switches near the other selector switch, pushbutton switch and pilot lights

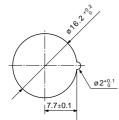


Note: \* Mushroom, convex square, convex rectangular: 27

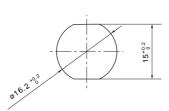
## ■ Terminal number • AH164, 165

Туре	Wiring		Terminal position
Illuminated pushbuttons	a (+) •————————————————————————————————————	b (-) —	Type number display side
	① <u>-</u>	• (4)	30 b 24     (-)         30 - 24
Pushbuttons Selector switches (except for JM, RJM types)	① <u>•</u> ③。	• (4)	(a) (a) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c
Pilot lights (without transformer)	a (+) •————————————————————————————————————	b (-)	Type number display side

• AH165-V, V1, V5, V6



• AH165-JM, RJM



#### Pushbuttons/Selectors/Pilot Lights

#### AH165-2

#### Type number nomenclature

#### ■ Type number nomenclature

#### Pushbuttons, illuminated pushbuttons and pilot lights

#### Product category

AH165-2: Oil-tight (Large operator)

#### 2 Operator or lens

• Operator for illuminated pushbutton

FL: Flush round head

FL5: Flush round head (Alternate)

SFL: Flush square head

SFL5: Flush square head (Alternate)

Extended round head

EL5: Extended round head (Alternate)

SEL: Extended square head

SEL5: Extended square head (Alternate)

SCL: Concave square head

SCL5: Concave square head (Alternate)

ML: Mushroom head

YML: Mushroom head with square bezel

Push-lock, turn-reset VI:

Push-lock, turn-reset with square bezel YVL:

#### • Operator for pushbuttons

Flush round head

F5: Flush round head (Alternate)

SF: Flush square head

SF5: Flush square head (Alternate)

E: Extended round head

E5: Extended round head (Alternate)

SE: Extended square head

SE5: Extended square head (Alternate)

SCF: Concave square head

SCE5: Concave square head (Alternate)

M: Mushroom head

YM: Mushroom head with square bezel

V: Push-lock, turn-reset

YV: Push-lock, turn-reset with square bezel

S2: With selector ring

YS2: With selector ring with square bezel

#### • Lens for pilot lights

Flush round SZ: Flush square Extended round SEZ: Extended square

#### 3 Color of button or lens

Code	Color	Button	LED	Incandescent	Neon
G	Green	0	0	0	0
R	Red	0	0	0	O (Orange)
В	Black*	0	_	_	_
Υ	Yellow	0	0	0	O (Orange)
W	White	0	O (Orange)	0	O (Orange)
S	Blue	0	0	0	○ (Green)
0	Orange	0	O (Amber)	0	0

Notes: • ( ): indicates luminous color

\* Not available for illuminated types

#### ④ Contact arrangement (except pilot lights)

11: 1NO+1NC

22: 2NO+2NC

33: 3NO+3NC

#### ⑤ Lamp voltage

Code	LED	Incandescent	Neon
AA	5V DC	_	_
Α	6V DC	5V AC/DC	_
В	12V DC	12V AC/DC	-
E	24V DC	24V AC/DC	_
Н	_	_	110V AC
K	_	_	120V AC
M	_	_	220V AC
Ρ	_	_	240V AC

#### 6 Type of lamp

Blank: Incandescent

1: Neon

3: Flat LED

#### **7** Terminal

Blank: Solder/tab W: Wire-wrap

## AH165-2

#### Type number nomenclature

#### ■ Type number nomenclature

#### Selector switches

<u>AH165-2</u> <u>J</u> <u>2</u> <u>3</u> <u>B</u> <u>11</u> <u>A</u> - <u>W</u>

#### ① Product category

AH165-2: Oil-tight (Large operator)

#### 2 Operator

· Knob and key type

2-position (operating angle 90°)

P: Knob

YP: Knob with square bezel

J: Key

YJ: Key with square bezel

3-position (operating angle 45°)

P: Knob

YP: Knob with square bezel

J: Key

YJ: Key with square bezel

#### • Lever type

2-position (operating angle 45°)

H: Lever

SH: Lever with square bezel

Note: The operation angle is 45° on the upper and lower side.

#### **3 Operation**

2: 2-position, maintained

0: 2-position, spring return\*

3: 3-position, maintained

6: 3-position, spring/manual return (Left to center)

7: 3-position, spring/manual return (Right to center)

1: 3-position, spring return

Note: \* Except for H and SH types

#### **④** Color of knob, lever or key removable position

• Color of knob or lever

B: Black

#### • Key removable position

Code	2-position		3-position			
	2	0	1	3	6	7
Α	$\bigcirc$	$\odot$	_	$\odot$	_	$\bigcirc$
В	$\otimes$	_	_	$\otimes$	_	_
С	_	_	_	*	_	_
D	$\oslash$	_	_	$\oslash$		_
E	-	_	1			
F	-	_	_	<b>(</b> P)		-
G	_	_	_	1	_	1

#### **⑤** Contact arrangement

11: 1NO+1NC\*

22: 2NO+2NC

33: 3NO+3NC

Note: \* Except for 3-position

#### 6 Key type No.

A (standard), B, C, D, E, F

TerminalBlank: Solder/tabW: Wire-wrap

#### Illuminated selector switches

#### ① Product category

AH165-2: Oil-tight (Large operator)

#### ② Operator

• 2-position (operating angle 90°)

PL: Knob

• 3-position (operating angle 45°)

PL: Knob

#### ③ Operation

2: 2-position, maintained

3: 3-position, maintained

#### 4 Color of knob

Code	Color	LED	Incandescent	Neon
G	Green	0	0	0
R	Red	0	0	O (Orange)
Υ	Yellow	0	0	O (Orange)
W	White	○ (Orange)	0	O (Orange)
S	Blue	0	0	○ (Green)
0	Orange	O (Amber)	0	0

Notes: • ( ): indicates luminous color

The part other than the arrow of the knob is black.

#### ⑤ Contact arrangement

11: 1NO+1NC\*

22: 2NO+2NC

Note: \* Except for 3-position

#### 6 Lamp voltage

Code	LED	Incandescent	Neon
AA	5V DC	_	_
Α	6V DC	5V AC/DC	_
В	12V DC	12V AC/DC	_
E	24V DC	24V AC/DC	_
Н	_	_	110V AC
K	_	_	120V AC
M	_	_	220V AC
Р	_	_	240V AC

#### **7** Type of lamp

Blank: Incandescent

1: Neon

3: Flat LED

Note: Terminal with solder/tab only

### Pushbuttons/Selectors/Pilot Lights

#### AH165-2 **Ratings and specifications**

#### ■ Standards approved

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479 (except for AH165-2Z, 2ZE, 2SZ, 2SZE)
	File No. LR84365 (for AH165-2Z, 2ZE, 2SZ, 2SZE)
TÜV: EN60947-5-1	Pushbutton, illuminated pushbutton: R9250087
	Selector (except for AH165-2H, SH), illuminated selector: R9250088
	Selector (for AH165-2H, SH): R9250087
	Pilot lights: R9250089

#### ■ Specifications (Indoor use)

Item		AH165-2			
Rated insulation volta	age	250V AC/DC			
Ambient temperature (no condensation or n		-10 to +70°C *1			
Humidity		45 to 85%RH (at –5 to +40°C), no condensation or no icing			
Durability (operations)	Mechanical Electrical	Pushbutton and illuminated pushubutton switch Momentary action: 1 million Alternate action: 250,000 Push-lock, turn-reset: 100,000 With selector ring: 250,000 Selector and illuminated selector switch: 250,000*2 100,000 (220V AC 0.7A)			
Dielectric strength		2000V AC, 1 minute (Between lamp and contact terminals: 1500V AC, 1 minute)			
Conditional short-circ	cuit current	1000A			
Short-circuit protective	ve device	Fuse 1A			
Pollution degree		3			
Vibration		Resonance: 10 to 55Hz, double amplitude 0.1mm Constant: 16.7Hz, double amplitude 3mm			
Shock		Malfunction durability: 100m/s <sup>2</sup> Mechanical durability: 500m/s <sup>2</sup>			
Operating frequency		1200 operation/hour (on-load factor: 40%)			
Insulation resistance		100MΩ or more (500V DC megger)			
Operator protection		IP65			

Notes: \*1 For illuminated pushbutton, illuminated selector switch and pilot light: -10 to +55°C 
\*2 Key insertion/removal durability for selector switch key types: 10,000

#### **■** Contact ratings

See page 04/194

#### **■** Lamp ratings

Rated operational	Consumption					
voltage	LED DC	Incandescent AC/DC	Neon AC			
5V	7mA (Yellow: 28mA)	0.45W (6V)	_			
6V 12V	7mA (Yellow: 28mA) 7mA	0.55W (14V)	_			
24V	7mA	0.55W (14V)	_			
110V	_	_ ` ´	0.19VA			
120V	-	_	0.21VA			
220V	-	_	0.38VA			
240V	_	_	0.42VA			

Notes: For the incandescent lamps, the values in parentheses indicate the rated voltage of the lamps.

#### ■ Contact reliability

FUJI has confirmed that the unit can be used in 1mA circuit conditions at 5V AC or DC. The operable range may vary depending on the ambient conditions and type of load.

#### ■ Illuminated pushbutton switches

■ Illuminated push	I.		10	In a contract	LALL 1	B: :
Operator	Lamp	Voltage	Contact	Momentary action	Alternate action	Dimensions, mm
				Туре	Туре	
Flush round head	Flat LED	24V DC	1NO+1NC	AH165-2FL□11E3	AH165-2FL5□11E3	Panel thickness 1 to 5
			2NO+2NC	AH165-2FL□22E3	AH165-2FL5□22E3	
			3NO+3NC	AH165-2FL□33E3	AH165-2FL5□33E3	
	Incandescent	24V AC/DC	1NO+1NC	AH165-2FL□11E	AH165-2FL5□11E	
			2NO+2NC	AH165-2FL□22E	AH165-2FL5□22E	42.5 11.5 020 025
			3NO+3NC	AH165-2FL□33E	AH165-2FL5□33E	,
	Neon	110V AC	1NO+1NC	AH165-2FL□11H1	AH165-2FL5□11H1	
			2NO+2NC	AH165-2FL□22H1	AH165-2FL5□22H1	
			3NO+3NC	AH165-2FL□33H1	AH165-2FL5□33H1	
AF87-211		220V AC	1NO+1NC	AH165-2FL□11M1	AH165-2FL5□11M1	
			2NO+2NC	AH165-2FL□22M1	AH165-2FL5□22M1	
			3NO+3NC	AH165-2FL□33M1	AH165-2FL5□33M1	
Extended round head	Flat LED	24V DC	1NO+1NC	AH165-2EL□11E3	AH165-2EL5□11E3	Panel thickness 1 to 5
			2NO+2NC	AH165-2EL□22E3	AH165-2EL5□22E3	
			3NO+3NC	AH165-2EL□33E3	AH165-2EL5□33E3	
-40 A	Incandescent	24V AC/DC	1NO+1NC	AH165-2EL□11E	AH165-2EL5□11E	
			2NO+2NC	AH165-2EL□22E	AH165-2EL5□22E	11.5 42.5 15 020 025
			3NO+3NC	AH165-2EL□33E	AH165-2EL5□33E	42.5   625
( )	Neon	110V AC	1NO+1NC	AH165-2EL□11H1	AH165-2EL5□11H1	
	110011	1101710	2NO+2NC	AH165-2EL□22H1	AH165-2EL5□22H1	
			3NO+3NC	AH165-2EL□33H1	AH165-2EL5□33H1	
AF87-210		220V AC	1NO+1NC	AH165-2EL□11M1	AH165-2EL5□11M1	
		220V AC	2NO+2NC	AH165-2EL□22M1	AH165-2EL5□22M1	
			3NO+3NC	AH165-2EL□33M1	AH165-2EL5□33M1	
Mushroom head	Flat LED	24V DC	1NO+1NC	AH165-2ML□11E3	AH 163-2EL3□33W1	
Mushiooni nead	FIALLED	24 V DC	2NO+2NC			Panel thickness 1 to 5
			1	AH165-2ML□22E3	_	
	la sa a da sa sa a	04)/ AC/DC	3NO+3NC	AH165-2ML□33E3	-	
	Incandescent	24V AC/DC	1NO+1NC	AH165-2ML□11E	_	11.5
- C 3			2NO+2NC	AH165-2ML□22E	-	42.5 1 22 1
			3NO+3NC	AH165-2ML□33E	-	
	Neon	110V AC	1NO+1NC	AH165-2ML□11H1	-	
			2NO+2NC	AH165-2ML□22H1	-	
A F07 004			3NO+3NC	AH165-2ML□33H1	-	
AF87-221		220V AC	1NO+1NC	AH165-2ML□11M1	-	
			2NO+2NC	AH165-2ML□22M1	-	
			3NO+3NC	AH165-2ML□33M1	-	
Mushroom head	Flat LED	24V DC	1NO+1NC	AH165-2YML□11E3	-	Panel thickness 1 to 5
with square bezel			2NO+2NC	AH165-2YML□22E3	-	
			3NO+3NC	AH165-2YML□33E3	-	
	Incandescent	24V AC/DC	1NO+1NC	AH165-2YML□11E	_	
			2NO+2NC	AH165-2YML□22E	-	42.5 11.3 22 25sq.
			3NO+3NC	AH165-2YML□33E	-	
	Neon	110V AC	1NO+1NC	AH165-2YML□11H1	_	
			2NO+2NC	AH165-2YML□22H1	_	
			3NO+3NC	AH165-2YML□33H1	_	
AF87-220		220V AC	1NO+1NC	AH165-2YML□11M1	_	
AI 07-220		220 V / (O				
Al 07-220		220770	2NO+2NC	AH165-2YML□22M1	_	

Note: Replace the  $\square$  mark by the following color code, see page 04/215.

## Illuminated Pushbutton Switches **AH165-2**

#### ■ Illuminated pushbutton switches

Operator	Lamp	Voltage	Contact	Momentary action	Alternate action	Dimensions, mm
				Туре	Туре	
Flush square head	Flat LED	24V DC	1NO+1NC	AH165-2SFL□11E3	AH165-2SFL5□11E3	
			2NO+2NC	AH165-2SFL□22E3	AH165-2SFL5□22E3	Panel thickness 1 to 5
			3NO+3NC	AH165-2SFL□33E3	AH165-2SFL5□33E3	
	Incandescent	24V AC/DC	1NO+1NC	AH165-2SFL□11E	AH165-2SFL5□11E	
19 70 %			2NO+2NC	AH165-2SFL□22E	AH165-2SFL5□22E	42.5 11.5 25sq.
100			3NO+3NC	AH165-2SFL□33E	AH165-2SFL5□33E	1, 1
	Neon	110V AC	1NO+1NC	AH165-2SFL□11H1	AH165-2SFL5□11H1	
			2NO+2NC	AH165-2SFL□22H1	AH165-2SFL5□22H1	
			3NO+3NC	AH165-2SFL□33H1	AH165-2SFL5□33H1	
AF87-201		220V AC	1NO+1NC	AH165-2SFL□11M1	AH165-2SFL5□11M1	
			2NO+2NC	AH165-2SFL□22M1	AH165-2SFL5□22M1	
			3NO+3NC	AH165-2SFL□33M1	AH165-2SFL5□33M1	
Extended square	Flat LED	24V DC	1NO+1NC	AH165-2SEL□11E3	AH165-2SEL5□11E3	B. aldia a second
head			2NO+2NC	AH165-2SEL□22E3	AH165-2SEL5□22E3	Panel thickness 1 to 5
			3NO+3NC	AH165-2SEL□33E3	AH165-2SEL5□33E3	
	Incandescent	24V AC/DC	1NO+1NC	AH165-2SEL□11E	AH165-2SEL5□11E	
1			2NO+2NC	AH165-2SEL□22E	AH165-2SEL5□22E	42.5 15 25sq.
			3NO+3NC	AH165-2SEL□33E	AH165-2SEL5□33E	- <del> </del>
The state of the s	Neon	110V AC	1NO+1NC	AH165-2SEL□11H1	AH165-2SEL5□11H1	
			2NO+2NC	AH165-2SEL□22H1	AH165-2SEL5□22H1	
			3NO+3NC	AH165-2SEL□33H1	AH165-2SEL5□33H1	
AF87-200		220V AC	1NO+1NC	AH165-2SEL□11M1	AH165-2SEL5□11M1	
			2NO+2NC	AH165-2SEL□22M1	AH165-2SEL5□22M1	
			3NO+3NC	AH165-2SEL□33M1	AH165-2SEL5□33M1	
Concave square	Flat LED	24V DC	1NO+1NC	AH165-2SCL□11E3	AH165-2SCL5□11E3	Panel thickness 1 to 5
head			2NO+2NC	AH165-2SCL□22E3	AH165-2SCL5□22E3	Parlet Unickness 1 to 3
			3NO+3NC	AH165-2SCL□33E3	AH165-2SCL5□33E3	
	Incandescent	24V AC/DC	1NO+1NC	AH165-2SCL□11E	AH165-2SCL5□11E	
			2NO+2NC	AH165-2SCL□22E	AH165-2SCL5□22E	11.5 42.5 16.5 20sq. 25sq.
			3NO+3NC	AH165-2SCL□33E	AH165-2SCL5□33E	
	Neon	110V AC	1NO+1NC	AH165-2SCL□11H1	AH165-2SCL5□11H1	
			2NO+2NC	AH165-2SCL□22H1	AH165-2SCL5□22H1	
			3NO+3NC	AH165-2SCL□33H1	AH165-2SCL5□33H1	
AF87-199		220V AC	1NO+1NC	AH165-2SCL□11M1	AH165-2SCL5□11M1	
			2NO+2NC	AH165-2SCL□22M1	AH165-2SCL5□22M1	
			3NO+3NC	AH165-2SCL□33M1	AH165-2SCL5□33M1	

Note: Replace the  $\square$  mark by the following color code, see page 04/215.

#### ■ Illuminated pushbutton switches

Operator	Lamp	Voltage	Contact	Туре	Dimensions, mm
Push-lock, turn-reset	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2VL□11E3 AH165-2VL□22E3 AH165-2VL□33E3	Panel thickness 1 to 5
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2VL□11E AH165-2VL□22E AH165-2VL□33E	11.5 22
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2VL□11H1 AH165-2VL□22H1 AH165-2VL□33H1	
AF87-219		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2VL□11M1 AH165-2VL□22M1 AH165-2VL□33M1	
Push-lock, turn-reset with square bezel	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YVL□11E3 AH165-2YVL□22E3 AH165-2YVL□33E3	Panel thickness 1 to 5
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YVL□11E AH165-2YVL□22E AH165-2YVL□33E	42.5 11.5 22 25sq.
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YVL□11H1 AH165-2YVL□22H1 AH165-2YVL□33H1	
AF87-218		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YVL□11M1 AH165-2YVL□22M1 AH165-2YVL□33M1	

#### • Button color

Replace the  $\square$  mark by the following button color code

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Υ	S	0

• With wire-wrap pin terminals have a depth of 47mm.

- A white illuminated pushbutton is fitted with a transparent color lens.
- The color lens is made of a tinted transparent material.

#### • Lamp voltage

Voltages other than above are available

Code	LED	Incandescent	Neon
AA	5V DC 6V DC	- 5V AC/DC	_
A B	12V DC	12V AC/DC	_
K	_	_	120V AC
Р	_	_	240V AC

## Pushbutton Switches **AH165-2**

#### ■ Pushbutton switches

Operator	Contact	Momentary action	Alternate action	Dimensions, mm
		Туре	Туре	
Flush round head	1NO+1NC	AH165-2F□11	AH165-2F5□11	Panel thickness 1 to 5
	2NO+2NC	AH165-2F□22	AH165-2F5□22	42.5
AF87-211	3NO+3NC	AH165-2F□33	AH165-2F5□33	- 025 T
Flush square head	1NO+1NC	AH165-2SF□11	AH165-2SF5□11	Panel thickness 1 to 5
	2NO+2NC	AH165-2SF□22	AH165-2SF5□22	42.5 11.5 2559.
AF87-201	3NO+3NC	AH165-2SF□33	AH165-2SF5□33	42.5   11.5    E554- H
Extended round head	1NO+1NC	AH165-2E□11	AH165-2E5□11	Panel thickness 1 to 5
	2NO+2NC	AH165-2E□22	AH165-2E5□22	11.5
AF87-210	3NO+3NC	AH165-2E□33	AH165-2E5□33	11.5 0 020 025 025
Extended square head	1NO+1NC	AH165-2SE□11	AH165-2SE5□11	Panel thickness 1 to 5
	2NO+2NC	AH165-2SE□22	AH165-2SE5□22	
AF87-200	3NO+3NC	AH165-2SE□33	AH165-2SE5□33	42.5 11.5 25sq.
Concave square head	1NO+1NC	AH165-2SCE□11	AH165-2SCE5□11	Panel thickness 1 to 5
	2NO+2NC	AH165-2SCE□22	AH165-2SCE5□22	11.5 20sq.
AF87-199	3NO+3NC	AH165-2SCE□33	AH165-2SCE5□33	42.5 16.5 25sq.
Mushroom head	1NO+1NC	AH165-2M□11	_	Panel thickness 1 to 5
	2NO+2NC	AH165-2M□22	_	
AF87-215	3NO+3NC	AH165-2M□33	-	42.5
Mushroom head with square bezel	1NO+1NC	AH165-2YM□11	-	Panel thickness 1 to 5
	2NO+2NC	AH165-2YM□22	-	
AF87-214	3NO+3NC	AH165-2YM□33	_	42.5 11.5 22 25bq.

Note: Replace the  $\square$  mark by the following color code, see page 04/217.

#### ■ Pushbutton switches

■ Pushbutton switches			
Operator	Contact	Туре	Dimensions, mm
With selector ring	2NO+2NC	AH165-2S2□22	Panel thickness 1 to 5  90'  42.5  11.5. 22
With selector ring with square bezel	2NO+2NC	AH165-2YS2□22	Panel thickness 1 to 5  90'  42.5  11.5  22  25sq.
Push-lock, turn-reset	1NO+1NC 2NO+2NC	AH165-2V□11 AH165-2V□22	Panel thickness 1 to 5
AF87-	3NO+3NC	AH165-2V□33	42.5
Push-lock, turn-reset with square bezel	1NO+1NC	AH165-2YV□11	Panel thickness 1 to 5
	2NO+2NC	AH165-2YV□22	11.5
AF87-	3NO+3NC	AH165-2YV□33	42.5 22 25sq.

#### • Button color

Replace the  $\square$  mark by the following button color code

Color	Green	Red	Black	White	Blue	Yellow	Orange
Code	G	R	В	W	S	Υ	0

#### • Contact arrangement and operator position

AH165-2S, 2YS

Ring	Left		Right	1	
9		_	g		
Button				$\Psi$	
Free	U	L	U		L
	10 02 10	02	10	02 10	
	30 04 30	0 04	30	04 30	O4
Depressed					
	10 02 10	02	10	02 10	02
	30 04 30	0 04	30	04 30	<b>O</b> 4

U: Upper contact block L: Lower contact block

- The color lens is made of a tinted transparent material. (Except for M, YM, V, YV, types)
- A white pushbutton is fitted with a transparent color lens. A black pushbutton consists of a transparent color lens and an attached black legend plate. (Except for M, YM, V, YV, types)
- With wire-wrap pin terminals have a depth of 47mm.

#### • Terminal number and contact block position

Type number display side

#### ■ Selector switches/2-position (90-degree)

Operator	Operation	Key removable position	Contact	Туре	Dimensions, mm
Knob	Maintained	_	1NO+1NC	AH165-2P2B11	Dental Michael A 1 o 5
			2NO+2NC	AH165-2P2B22	Panel thickness 1 to 5
			3NO+3NC	AH165-2P2B33	
	Spring return	_	1NO+1NC	AH165-2P0B11	
			2NO+2NC	AH165-2P0B22	42.5 24 025
KKD07-232	$\bigcirc$		3NO+3NC	AH165-2P0B33	
Knob	Maintained	_	1NO+1NC	AH165-2YP2B11	Developing and the F
			2NO+2NC	AH165-2YP2B22	Panel thickness 1 to 5
			3NO+3NC	AH165-2YP2B33	
	Spring return	_	1NO+1NC	AH165-2YP0B11	
			2NO+2NC	AH165-2YP0B22	11.5 42.5 24 25sq.
KKD07-234			3NO+3NC	AH165-2YP0B33	1 72.0 1 24
Key	Maintained		1NO+1NC	AH165-2J2A11A	
			2NO+2NC	AH165-2J2A22A	
			3NO+3NC	AH165-2J2A33A	Panel thickness 1 to 5
22.00			1NO+1NC	AH165-2J2B11A	
		⊗ B	2NO+2NC	AH165-2J2B22A	
			3NO+3NC	AH165-2J2B33A	
			1NO+1NC	AH165-2J2D11A	11.5
		Ø D	2NO+2NC	AH165-2J2D22A	
KKD09-003L			3NO+3NC	AH165-2J2D33A	
	Spring return		1NO+1NC	AH165-2J0A11A	
	$\bigcirc$		2NO+2NC	AH165-2J0A22A	
	0		3NO+3NC	AH165-2J0A33A	
Key with square bezel	Maintained	_	1NO+1NC	AH165-2YJ2A11A	
			2NO+2NC	AH165-2YJ2A22A	
			3NO+3NC	AH165-2YJ2A33A	
		_	1NO+1NC	AH165-2YJ2B11A	Panel thickness 1 to 5
KKD09-003R		⊗ B	2NO+2NC	AH165-2YJ2B22A	
			3NO+3NC	AH165-2YJ2B33A	
			1NO+1NC	AH165-2YJ2D11A	11.5 13.5 25sq.
		Ø D	2NO+2NC	AH165-2YJ2D22A	42.5 37 25sq.
			3NO+3NC	AH165-2YJ2D33A	
	Spring return		1NO+1NC	AH165-2YJ0A11A	
	5		2NO+2NC	AH165-2YJ0A22A	
			3NO+3NC	AH165-2YJ0A33A	

• The key can be removed only at the following positions:

A: 🚫

B: 🛞

D: 🕢

- For spring-return selector switches, the key can be removed at
- There are 6 available key types; A, B, C, D, E and F. Standard key code is A.
- With wire-wrap pin terminals have a depth of 47mm.

#### • Terminal number and contact block position

Type number display side



Contact arrangement (terminal No.: common) 1NO+1NC: Middle 2NO+2NC: Upper, lower 3NO+3NC: Upper, middle, lower

#### • Contact arrangement and operator positions:

2-position

Contact arrangem	ent	1NO-	+1NC	;	2NO-	+2NC		3NO+	3NC	
Operator position	Left	10_30	М	O2 O4	1Q_ 3O 1Q_ 3O	U L	O2 O4 O2 O4	10 30 10 30 10 30		02 04 04 04 04 04 04 04
	Right	10	M	○2 ○4	10 30 10 30	U	02 04 02 04	10 30 10 30 10 30	1	02 04 04 04 04 04 04 04 04

U: Upper contact block M: Middle contact block L: Lower contact block

#### ■ Selector switches/2-position

Operator	Lever color	Operation	Contact	Туре	Dimensions, mm
Lever	Black	Maintained	1NO+1NC	AH165-2H2B11	Panel thickness 1 to 5
			2NO+2NC	AH165-2H2B22	45.
AF87-209			3NO+3NC	AH165-2H2B33	42.5 11.5 025 025
Lever with square bezel	Black	Maintained	1NO+1NC	AH165-2SH2B11	Panel thickness 1 to 5
			2NO+2NC	AH165-2SH2B22	54
AF87-203			3NO+3NC	AH165-2SH2B33	42.5 11.5 25sq.

#### • Contact arrangement and operator position

AH165-2H, 2SH

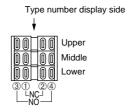
Lever Contact block	Up	Down
1NO+1NC	M 10 02 30 04	M 10_1_02 30_04
2NO+2NC	U L 10 02 10 02 30 04 30 04	U L 10 02 10 02 30 04 30 04
3NO+3NC	U M L 10 02 10 02 10 02 30 04 30 04 30 04	U M L 10 02 10 02 10 02 30 04 30 04 30 04

U: Upper contact block M: Middle contact block

L: Lower contact block

• With wire-wrap pin terminals have a depth of 47mm.

#### • Terminal number and contact block position



Contact arrangement (terminal No.: common) 1NO+1NC: Middle 2NO+2NC: Upper, lower 3NO+3NC: Upper, middle, lower

#### ■ Selector switches/3-position (45-degree)

Operator	Operation	Key removable position	Contact	Туре	Dimensions, mm
Knob	Mainteined	_	2NO+2NC	AH165-2P3B22	
200			3NO+3NC	AH165-2P3B33	Panel thickness 1 to 5
Jan Bo	Spring/	_	2NO+2NC	AH165-2P6B22	
	manual return		3NO+3NC	AH165-2P6B33	
	Spring/	_	2NO+2NC	AH165-2P7B22	
KKD07-233	manual return		3NO+3NC	AH165-2P7B33	11.5 × 025
	Spring return	_	2NO+2NC	AH165-2P1B22	42.5 24
12 1 21	(T)		3NO+3NC	AH165-2P1B33	
Knob with square bezel	Mainteined	_	2NO+2NC	AH165-2YP3B22	Panel thickness 1 to 5
	Consistent to		3NO+3NC	AH165-2YP3B33	
100	Spring/ manual return	_	2NO+2NC	AH165-2YP6B22	
		_	3NO+3NC 2NO+2NC	AH165-2YP6B33 AH165-2YP7B22	
	Spring/  manual return	_	3NO+3NC	AH165-2YP7B33	
	Spring return	_	2NO+2NC	AH165-2YP1B22	42.5 11.5 25sq.
KKD07-235	Spring return	_	3NO+3NC	AH165-2YP1B33	1 11 11
Key	Mainteined		2NO+2NC	AH165-2J3A22A	
Tioy	Wallitolliou		3NO+3NC	AH165-2J3A33A	
			2NO+2NC	AH165-2J3E22A	
		① E	3NO+3NC	AH165-2J3E33A	
-00 0		O 5	2NO+2NC	AH165-2J3D22A	
		⊘ D	3NO+3NC	AH165-2J3D33A	
		<b>**</b> C	2NO+2NC	AH165-2J3C22A	Panel thickness 1 to 5
		<b>(</b> ♥ C	3NO+3NC	AH165-2J3C33A	
(34)	Spring/	① E	2NO+2NC	AH165-2J6E22A	
	manual return		3NO+3NC	AH165-2J6E33A	
KKD09-003R	1	⊘ D	2NO+2NC	AH165-2J6D22A	11.5 13.5 025
		<b>⊘</b> b	3NO+3NC	AH165-2J6D33A	42.5
	Spring/		2NO+2NC	AH165-2J7A22A	
	manual return		3NO+3NC	AH165-2J7A33A	
		① E	2NO+2NC	AH165-2J7E22A	
		<u> </u>	3NO+3NC	AH165-2J7E33A	
	Spring return	① E	2NO+2NC	AH165-2J1E22A	
12 31	(1)		3NO+3NC	AH165-2J1E33A	
Key with square bezel	Mainteined		2NO+2NC	AH165-2YJ3A22A	
		_	3NO+3NC	AH165-2YJ3A33A	
		① E	2NO+2NC 3NO+3NC	AH165-2YJ3E22A AH165-2YJ3E33A	
-00 1			2NO+2NC	AH165-2YJ3D22A	
		Ø D	3NO+3NC	AH165-2YJ3D33A	
			2NO+2NC	AH165-2YJ3C22A	Panel thickness 1 to 5
		★ C	3NO+3NC	AH165-2YJ3C33A	
	Spring/	<u> </u>	2NO+2NC	AH165-2YJ6E22A	
	manual return	① E	3NO+3NC	AH165-2YJ6E33A	
KKD09-003L		<u> </u>	2NO+2NC	AH165-2YJ6D22A	11.5 13.5 42.5 37
KKD09-003L		⊘ D	3NO+3NC	AH165-2YJ6D33A	1
	Spring/	(S) A	2NO+2NC	AH165-2YJ7A22A	
	manual return		3NO+3NC	AH165-2YJ7A33A	
		① F	2NO+2NC	AH165-2YJ7E22A	
		① E	3NO+3NC	AH165-2YJ7E33A	
	Spring return	① E	2NO+2NC	AH165-2YJ1E22A	
			3NO+3NC	AH165-2YJ1E33A	

• The Key can be removed at the following positions:

B: 🛠

C:(\*)

D: (7) E: (1) F: (7) G: (1)

For spring-return selector switches, the key can be removed only at position E. For manual/spring-return selector switches, the key can be removed at positions D, E and F for type J6, and position A, E and G for type J7.

• There are 6 available key types; A, B, C, D, E and F. Standard key code is A.

#### • Contact arrangement and operator positions:

Contact arrangement		2NO+2NC	3NO+3NC	
Operator	Left	10_L02 10 L02	10_L02 10 M 02 10 L 02	
position		30 04 30 04	30 04 30 04 30 04	
	Center	10_102 10_102	10 102 10 102 10 102	
		30 04 30 04	30 04 30 04 30 04	
	Right _	10 02 10 102	10 02 10 02 10 02	
		30 04 30 04	30 04 30 04 30 04	

<sup>•</sup> With wire-wrap pin terminals have a depth of 47mm.

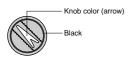
#### ■ Illuminated selector switches

Operator	Operation	Lamp voltage	No. of positions	Contact	Туре	Dimensions, mm
Knob	Maintained	Flat LED 24V DC	2	1NO+1NC 2NO+2NC	AH165-2PL2□11E3 AH165-2PL2□22E3	025
200		Incandescent	2	2NO+2NC 1NO+1NC	AH165-2PL3□22E3 AH165-2PL2□11E	
		24V AC/DC		2NO+2NC	AH165-2PL2□22E	42.5 22
			3	2NO+2NC	AH165-2PL3□22E	
		Neon	2	1NO+1NC	AH165-2PL2□11H1	
KKD07-240		110V AC		2NO+2NC	AH165-2PL2□22H1	
			3	2NO+2NC	AH165-2PL3□22H1	
		Neon	2	1NO+2NC	AH165-2PL2□11M1	
		220V AC		2NO+2NC	AH165-2PL2□22M1	
			3	2NO+2NC	AH165-2PL3□22M1	

#### • Knob color (arrow)

Replace the  $\square$  mark by the following color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	0



#### • Lamp voltage

Voltages other than above are available

Code	LED	Incandescent	Neon
AA A B K P	5V DC 6V DC 12V DC -	- 5V AC/DC 12V AC/DC - -	- - - 120V AC 240V AC

#### • Terminal number and contact block position

Type number display side



Contact arrangement (terminal No.: common) 1NO+1NC: Middle 2NO+2NC: Upper, lower

#### • Contact arrangement and operator positions:

#### 2-position

- Francis					
Contact arrangement		1NO+1NC	2NO+2NC		
Operator position	Left 🚫	M <sup>1</sup> O LO2 30 O4	U 10 102 30 04 L 10 02 30 04		
	Right 🕢	M <sub>30</sub> 02	U 10 02 30 04 10 02 L 30 04		

#### 3-position

٠		
Contact a	rrangement	2NO+2NC
Operator position	Left 🕥	U 30 04
		L 10 02 30 04
	Center ①	U 10_102 30 04
		L 10 102 L 30 04
	Right 🗷	U 10 02 30 04
		L 10_102 30 04

U: Upper contact block M: Middle contact block L: Lower contact block

## Pilot Lights **AH165-2**

#### ■ Pilot lights

Lens		Lamp	Voltage	Туре	Dimensions, mm
Flush round		Flat LED	24V DC	AH165-2Z□E3	Panel thickness 1 to 5
		Incandescent	24V AC/DC	AH165-2Z□E	a (+)
		Neon	110V AC	AH165-2Z□H1	b (-)
	AF87-213		220V AC	AH165-2Z□M1	24 11.5
Flush square		Flat LED	24V DC	AH165-2SZ□E3	Panel thickness 1 to 5
		Incandescent	24V AC/DC	AH165-2SZ□E	a (+) @
		Neon	110V AC	AH165-2SZ□H1	b (-)
	AF87-205		220V AC	AH165-2SZ□M1	24 11.5 25sq.
Extended round		Flat LED	24V DC	AH165-2ZE□E3	Panel thickness 1 to 5
	l l	Incandescent	24V AC/DC	AH165-2ZE□E	a (+) 📴
	,	Neon	110V AC	AH165-2ZE□H1	b (-)
	AF87-212		220V AC	AH165-2ZE□M1	24 11.5 0020 0025
Extended square		Flat LED	24V DC	AH165-2SZE□E3	Panel thickness 1 to 5
		Incandescent	24V AC/DC	AH165-2SZE□E	a (+) @
		Neon	110V AC	AH165-2SZE□H1	b (-)
	AF87-204		220V AC	AH165-2SZE□M1	24 11.5 25sq.

#### • Lens color

Replace the  $\square$  mark by the following lens color code

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Υ	S	0

#### • Lamp voltage

Voltage other than above is available

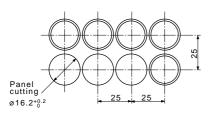
Code	LED	Incandescent	Neon
AA	5V DC	_	-
A	6V DC	5V AC/DC	-
B	12V DC	12V AC/DC	-
K	-	_	120V AC
P	-	_	240V AC

- The color lens is made of a tinted transparent material.
  A white lens is fitted with a transparent color lens.
  With wire-wrap pin terminals have a depth of 29mm.

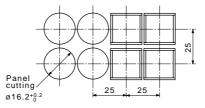
#### ■ Mounting space, mm

• Illuminated pushbuttons, pushbuttons, selector switches, illuminated selector switches and pilot lights

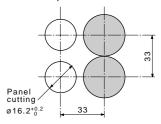
#### Round head



#### Square head



#### Mushroom head Push-lock, turn-reset



#### **■** Terminal number

Туре	Wiring	Terminal position
Illuminated pushbuttons, Illuminated selector switches	a b (+) (-) (-) (-) (-) (-) (-) (-) (-) (-) (-	Type number display side
Pushbuttons Selector swiches	1 <u>°                                    </u>	31 a 24 (+) [ ]
Pilot lights (without transformer)	a b (+) (-)	Type number display side

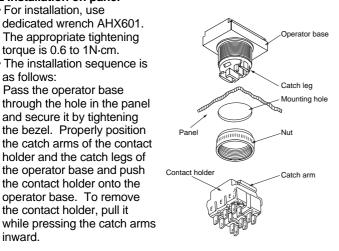
#### AH164. AH165 and AH165-2 Notes on use

#### Notes on use

inward.

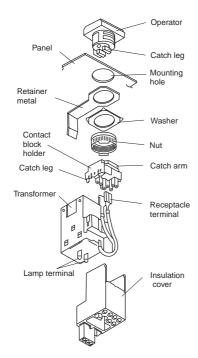
#### ■ Installation on panel

- · For installation, use dedicated wrench AHX601. The appropriate tightening torque is 0.6 to 1N·cm.
- The installation sequence is as follows: Pass the operator base through the hole in the panel and secure it by tightening the bezel. Properly position the catch arms of the contact holder and the catch legs of the operator base and push the contact holder onto the operator base. To remove the contact holder, pull it



#### ■ Mounting steps of switch with transformer

①Pass the switch operator through the panel hole and secure with a nut by way of the retainer metal from the front of the panel. ②Align the position of the catch arm of the contact block holder with that of the catch leg of the switch operator. Engage these two catches by pushing them together. 3 Insert and secure the transformer unit while assembling the contact block holder with the retainer metal. terminal with lead wires extending from the transformer to the lamp terminal of the contact block holder. (Be care on the polarity of the LED. Red: +, Black: -) ⑤Push in and secure the standard accessory



insulation cover by aligning its position with each terminal. To replace the transformer, remove the transformer by widening the catch leg of the contact block holder. Pay attention not to excessively widen the catch leg. Mounting steps are the same as the above steps 3, 4, and 5.

#### ■ Installing the protection cover / dust-tight cover, guardring

Be careful that the panel thickness does not exceed the following: Panel thickness Protection cover: 2.6mm max. Dust-tight cover: 2.0mm max.

Guard ring: 2.5mm max.

#### ■ Operating voltage and rated voltage of incandescent lamps

Operating voltage
4 to 5V
10 to 12V
20 to 24V

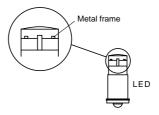
Incandescent lamps should be operated at the operating voltages if a lamp service life of 5,000 to 10,000 hours are needed. The ambient temperature must not exceed 30°C if the lamp is used at the rated voltage continuously.

#### ■ Method of replacing lamp

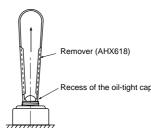
 Incandescent lamps/LED lamps/neon lamps Remove the color lens and inner button with a remover AHX618.

Then draw out the lamp with a lamp changer AHX672. When installing lamps, do it manually and in the reverse order

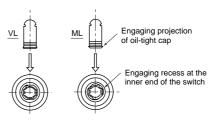
• Products with blue and green LEDs The LED devices on products with high-brightness (blue and green) LEDs are very sensitive to static electricity. When replacing LED lamps do not allow static electricity to come into direct contact with the metal frame on the upper side of the LED lamp. The LED device may be damaged if this part is subjected to static electricity. When installing or removing an LED lamp, it is recommended that you use the lamp changer (AHX672).



• To replace the lamp of a AH165-2 illuminated pushbutton switch (ML,VL), remove the button and draw out the oil-tight cap.



• Then, replace the lamp using a lamp changer (AHX672) and push the oil-tight cap into its original position with its engaging projection properly adjusted (see the figure below).

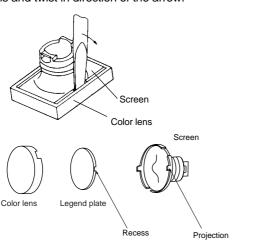


Note: Lamp of AH165-ZM type can not be replaced.

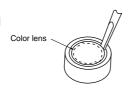
#### AH164, AH165 and AH165-2 Notes on use

#### ■ Method of replacing color lens

 To remove the color lens, insert a small screwdriver into the color lens and twist in direction of the arrow.



 For an AH165-2, use a small standard screwdriver or a similar tool with a flat end. If one side of the color lens is removed from the screen, insert the screwdriver or a similar tool deeper and remove the color lens together with the screen.



#### ■ Replacing pushbuttons

In the case of alternative action type pushbutton switches and illuminated pushbutton switches, be sure not to replace the pushbuttons in their locked state. This could result in internal damage to the mechanism.

#### **■** Description sheet

The Fuji description sheet is 25µm thick. If preparing custom description sheets, make sure that the thickness is 0.1mm or less.

#### **■** Contact block

To replace a contact block, use removing tool AGX012. If excessive force is applied when attempting to open the support legs for the contact block holder, deformation or damage may occur.

#### ■ Handling precautions

- Do not apply torque in excess of 1.0 N•m to operate the selectors switch (Type "P"). Required operating force of switches is less than 0.1 N•m.
- Do not tap on a pushbutton to turn it ON or OFF, such handling may damage it. Be sure to operate the pushbutton by hand.

#### ■ Key type selector switch

• Five key types (Type B to Type F) are available besides Type A, which is the standard key type. Be sure to use a key with





Symbol on the key

Symbol on the main unit

a symbol which is matched with the symbol on the main unit.

- Fully insert the key into the main unit before turning the key.
- The key turning force should not exceed 0.1 N•m.
- Do not pull out or insert the key forcibly.

#### **■** Wiring connections

 Use a soldering iron with a wattage of not more than 30W and a tip length of more than 20mm.

Use a rosin-core solder

With a 30W iron complete soldering within 5 seconds, or 10 seconds with a 20W iron. Do not apply external force to the terminals. Do not deform the terminals.

Because lead-free solder's melting point is slightly high, soldering work may be difficult. Use a soldering iron whose tip is rather large or whose calorie is rather high.

• Wires that can be connected

Two solid wires with a maximum diameter of 0.8mm (solder)
One stranded wire with a maximum area of 0.75mm² (solder)
Flat connection terminal

 $(2.8\square -1.25-5) \ 0.5 \text{ to } 1.25\text{mm}^2$  $(2.8\square -0.5-5) \ 0.2 \text{ to } 0.5\text{mm}^2$ 

Using contact blocks

When using NO and NC contacts in the same contact block, avoid connection that involves opposite polarity or wiring from different types of power supply.

- For wiring to adjacent terminals, use insulated tubing to prevent short-circuit and to assure isolation. For solder terminals, be careful when connecting thick wires. Do not use too much solder.
- Wiring to wire-wrap pin terminals
   Select the appropriate wire sizes and tools from the table below.

Wire size	Bit	Sleeve	Number of effective wraps
0.4mm dia.	3-A	1-B	About 8
0.5mm dia.	1-A	1-B	About 6
(0.65mm dia.)	(2-A)	(2-B)	(About 6)

Use ordinary wrapping for connection.

Wires of 0.65mm dia. must not be used on adjacent terminals. However, 0.65mm dia. wire can be mixed with 0.4 and 0.5mm dia. wires.

• Wiring to tab terminals Use receptacles, No. 110.

#### ■ Installing lamps in close order

When continuously lighting pilot lights or pressing illuminated pushbuttons installed in close order, care must be taken that the ambient temperature does not exceed the rated value.

#### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AH164, AH165 and AH165-2 Notes on use

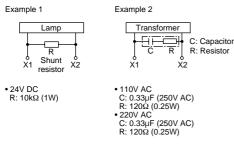
#### **■ LEDs**

#### • LED Lamp Malfunctioning

The LED lamp is lit by a very small level of current (approximately 0.01mA). Therefore, the it may be erroneously lit by a current leaking from the surge absorption circuit or semiconductor circuit or due to stray capacitance between cables. In that case, provide a countermeasure (e.g., connect a resistor in parallel with the LED lamp).

#### Countermeasure for Malfunctioning

Shunt Resistor R or CR elements connected in parallel Lamp malfunctions can be prevented by connecting a shunt resistor (R) or CR elements (a capacitor and resistor) in parallel with the LED lamp terminal. The resistance and CR values vary depending on the model and the operating conditions.



#### Incoming surge

Be careful that since high luminance LED products use an element sensitive to static electricity, they may not be lit by an abnormal voltage like surge.

#### ■ Using a flat LED in 48V DC circuit

When a flat LED lamps having a rated voltage of 24V DC is used with 48V DC circuit, connect an external resistor of  $3,500\Omega$  (1W).

#### ■ Preventing the neon lamp from incorrectly turning ON

The neon lamp may incorrectly turn ON due to current leakage or voltage induction. In such a case, connect a shunt resistor in parallel with the lamp.

Example) 110V AC: 100k (0.25W) 220V AC: 50k (2W)

If an external surge of 3kV or more may occur, connect a surge absorption element in parallel with the lamp.

#### ■ Operation

Do not use a hitting or bouncing action to operate the button, or the switch may break. Always operate the switch by hand.

#### ■ Storage and operation site

- Use the unit within the rated operating ambient temperature and humidity ranges.
- Do not use the enclosed type in places where oil or water is sprayed or where dust accumulates. In places such as these, use the oil-tight type or provide a dust cover.
- The oil-tight type is evaluated with standard cutting oil and cooling oil applied. The oil-tight type cannot be used with some special oils.

#### **■** Buzzer

#### Noise

If the application circuit is likely to generate excessively strong noise, connect a surge absorber (e.,g., FUJI'S ENC390D, provided that the switch is a 24V type) in parallel with the buzzer.

Place of Use

The buzzer does not have a drip-proof construction. Do not use the buzzer in places where oil or water is sprayed or where dust accumulates. If the buzzer is a splash-proof type, it will resist sprays of water.

- Do not use the buzzer in places that are subject to an excessive amount of corronsive gas.
- Be careful that the buzzer is likely to sound erroneously due to leakage current or the like.

#### ■ Accessories for AH164 and AH165

Description		Туре	
Color chips (I	Round)	Color	Туре
	L, L5, E	Green	AHX631-G
	E5, Z	Red	AHX631-R
	, -	White (For Neon)	AHX631-W
		Blue	AHX631-S
		Yellow	AHX631-Y
1		Orange	AHX631-O
		Clear	AHX631-C
SF-682	For LED, Neon	Green	AHX653-G
Color chips (	Square)	Color	Туре
	01 015 001	0	ALIVO22 C
	SL, SL5, SGL,	Green	AHX632-G
	SGL5, SF, SF5,		AHX632-R
	SGF, SGF5, ZS	White (For Neon)	AHX632-W
Sec.		Blue Yellow	AHX632-S
		1	AHX632-Y
		Orange	AHX632-O
		Clear	AHX632-C
SF-681	For LED, Neon	Green	AHX653-SG
Color chips (I	Rectangular)	Color	Туре
	TL, TL5, TGL	Green	AHX633-G
1	TGL5, TF, TF5	Red	AHX633-R
	TGF, TGF5, ZT	White (For Neon)	AHX633-W
	- ,,	Blue	AHX633-S
		Yellow	AHX633-Y
		Orange	AHX633-O
1		Clear	AHX633-C
SF-680	For LED, Neon	Green	AHX653-TG
Mushroom he	ead button	Color	Туре
	M, M5	Green	AHX682-G
	ivi, ivio	Red	AHX682-R
	Dr .	White	AHX682-W
		Blue	AHX682-S
		Yellow	AHX682-S AHX682-Y
		1 _ 1	AHX682-0
SI-40		Orange Black	AHX682-B
	re head button	Color	Туре
	CNA CNA	Cross	AUVE02 C
	SM, SM5	Green	AHX683-G
	-	Red	AHX683-R
	The same of the sa	White	AHX683-W
		Blue	AHX683-S
	1	Yellow	AHX683-Y
01.40		Orange	AHX683-O
SI-43		Black	AHX683-B
Convex recta button		Color	Type
	TM, TM5	Green	AHX684-G
		Red	AHX684-R
0.00	ingl.	White	AHX684-W
		Blue	AHX684-S
		No. II and	A11V004 V
		Yellow	AHX684-Y
	ľ	Orange	AHX684-Y AHX684-O

Description			Туре		
Legend sheet			Round Type: AHX Legend: O	(615-□ N, OFF, UP	, DOWN
DFF OFF OFF	OF ON SIDE CLOSE, AUTO, MAN, RESET, POWER, RE FWD, HIGH, LOW				P, OPEN O, MAN, VER, REV,
OFF OFF OFF OFF	ON ON ON ON ON	\$10P \$10P \$10P \$10P \$10P	Rectangular Type: AHX617-□ Legend: ON, OFF, UP, DOWN START, STOP, AUTO, MAN, FOWARD, REVERSE		
SH-165			in the $\square$ at t	the end of o	desired legend rdering code, ets are also
Legend	•		Туре	Color	Dimensions, mm
(ACIVIII	c resin)	Round	AHX665 AHX665-C AHX665-B		ø12.2 x 0.9
		Square		White Transparent Black	12.2sq. x 0.9
SH-164		Rectangula	AHX667 AHX667-C AHX667-B	White Transparent Black	12.2 x 18.2 x 0.9
Legeno (Acrylic	•	or spot LED	Туре	Dimension	s, mm
SP-113	Comp	Round Square Rectangular	AHX651	ø12.2 x 0.9 12.2sq. x 0 12.2 x 18.2	.9
	(2-position	or selector on)	Type: AHX Legend: O Legend: Bl	N-OFF	
- SH-226A			Dimensions	s, mm: 24sq	. x 0.5
Legend plate for symbol mark			Mark	Туре	
1	0	Square Rectangular	_	АНХ666-Е АНХ667-Е	
1	0	Square Rectangular		AHX666-H AHX667-H	
		Square Rectangular	<b>I</b>	AHX666-T AHX667-T	

### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AH164 and AH165 Accessories

Description	Туре		
Protection cover	For round and square head button Type: AHX671		
	For rectangular head button Type: AHX669 AHX826		
	This cover protect against accidental operation.  Note: Not used for illuminated pushbuttons with guard.  Applicable panel thickness is 2.6mm max.		
KKD07-246	Dimensions, mm		
	AHX671 AHX669		
KKD07-248	18 24		
	AHX826		
KKD07-247	24 24 8		
	33.2		
Dust-tight cover	For round and square head button Type: AHX822 Dimensions, mm: 24sq. x 14.2		
	For rectangular head button Type: AHX668 Dimensions, mm: 24 x 30 x 14.2		
	For mushroom head button Type: AHX649 Dimensions, mm: ø30 x 18		
AF91-123, SI-41	These covers protect against dust. Note: Applicable panel thickness is 2.0mm max.		
Guard ring	Type Color Dimensions, mm		
4	<b>AHX676-B</b> Black Ø21 x 12 <b>AHX676-GY</b> Gray		
GG	This guard ring is used in combination with an extended round head pushbutton (L or E).		
SI-42	Note: Applicable panel thickness is 2.5mm max. Please place an order for a packing (AHX685) separately when you intend to use for AH165 series.		
Transformer	Voltage Type Lamp		
	100 to 110V AC AHX805-H LED 200 to 220V AC AHX805-M		
	100 to 110V AC AHX806-H Incandescent 200 to 220V AC AHX806-M		
AF90-949			

**Accessories** 

#### ■ Accessories for AH165-2

■ Accessories for A	AH165-2			
Description	Туре		Description	Туре
Color lens (Round)	Color Green Red	F, 2F5, 2FL, 2FL5, 2Z)  Type  AHX2604-G  AHX2604-R	Legend plate	For flush head Color Type Used with White AHX2609-W Incandescent lamp, LED lamp, Pushbutton *1 Clear AHX2609-C Neon lamp *2 Black AHX2609-B Pushbutton *3 Dimensions, mm: Ø18 × 0.9
00	Yellow Blue Orange Clear			For extended head Color Type Used with White AHX2610-W Incandescent lamp, LED lamp, Pushbutton *1 Clear AHX2610-C Neon lamp *2 Black AHX2610-B Pushbutton *3
	(Used with 2 Color Green Red Yellow Blue Orange Clear	E, 2E5, 2EL, 2EL5, 2ZE) Type AHX2605-G AHX2605-R AHX2605-Y AHX2605-S AHX2605-O AHX2605-C		Dimensions, mm: Ø18 x 4.4  For flush square Color Type Used with White AHX2611-W Incandescent lamp, LED lamp, Pushbutton *1 Clear AHX2611-C Neon lamp *2 Black AHX2611-B Pushbutton *3  Dimensions, mm: 17sq. x 0.9
AF87-631  Color lens (Square)	For flush hea	and		For extended square, concave square Color Type Used with White AHX2612-W Incandescent lamp,
	(Used with 2 Color Green Red Yellow Blue Orange Clear	SF, 2SF5, 2SFL, 2SFL5, 2SZ) Type AHX2606-G AHX2606-R AHX2606-Y AHX2606-S AHX2606-O AHX2606-C	AF87-631 AF87-630	LED lamp, Pushbutton *1 Clear AHX2612-C Neon lamp *2 Black AHX2612-B Pushbutton *3 Dimensions, mm: 17sq. x 4.4  *1 Illuminated pushbutton switches and pilot lights with incandescent lamps or LED lamps, Pushbutton switches (excluding).  *2 Illuminated pushbutton switches and pilot lights with neon lamps.  *3 Pushbutton switches (black)  *4 Engraved range: 17mm dia.
	For extended (Used with 2 Color Green Red Yellow Blue Orange Clear	head SE, 2SE5, 2SEL, 2SEL5, 2SZE) Type AHX2607-G AHX2607-R AHX2607-Y AHX2607-S AHX2607-O AHX2607-C	Mushroom head button	For illuminated pushbuttons (Used with 2ML, 2YML)  Color Type Green AHX2614-G Red AHX2614-R White AHX2614-W Yellow AHX2614-Y Blue AHX2614-S Orange AHX2614-O
	For concave (Used with 2 Color Green Red Yellow Blue Orange Clear	head SCE, 2SCE5, 2SCL, 2SCL5) Type AHX2608-G AHX2608-R AHX2608-Y AHX2608-S AHX2608-O AHX2608-C	9	For non-illuminated pushbuttons (Used with 2M, 2YM)  Color Type Green AHX2613-G Red AHX2613-R White AHX2613-W Yellow AHX2613-Y Blue AHX2613-S Orange AHX2613-O
AF87-632			AF87-633	Black AHX2613-B

## Pushbuttons/Selectors/Pilot Lights/Buzzers **AH165-2**

## **Accessories**

Description	Туре	
Push-lock, turn-reset button	For illuminated pushbuttons (Used with 2VL, 2YVL)  Color Type Green AHX2616-G Red AHX2616-R White AHX2616-W Yellow AHX2616-Y  For pushbuttons (Used with 2V, 2YV)  Color Type Green AHX2615-G Red AHX2615-R Yellow AHX2615-P Black AHX2615-B	
AF87-634	Slack AllAzoro B	
Dust-tight cover	For flush round (Used with 2F, 2FL, 2F5, 2FL5) Type: AHX2603-2  For flush square (Used with 2SF, 2SFL, 2SF5, 2SFL5) Type: AHX2603-2S These covers protect against dust.	
Key washer	Type: AHX2601  Mounting hole, mm  1.7'9² max.0.8	

#### ■ Accessories for AH164, AH165 and AH165-2

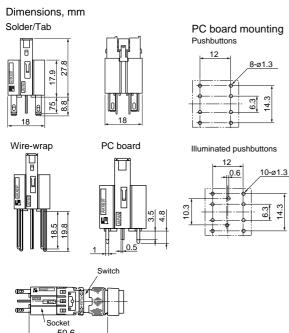
Description		Туре			
Incandescent lam	np	Voltage		Туре	
KKD06-333		6V, 0.6V 14V, 0.7 28V, 0.7	W	AHX641 AHX642 AHX643	
LED lamp		Voltage		Туре	
		5V DC 6V DC 12V DC 24V DC		AHX6 AHX6 AHX6	95-5
KKD06-206		color cod Red (R),	de Gre	□ mark by t een (G), Ora Yellow (Y), E	
Neon lamp		Voltage		Туре	Luminous
		110V AC		AHX655-I AHX654-I	
		120V AC		AHX655-I AHX654-I	
	500	220V AC		AHX655-I AHX654-I	
KKD06-306		240V AC		AHX655-I AHX654-I	
Panel plug		Color	Тур	ре	
(KD07-262	Round	Black Gray		X622-B X622-GY	IP40 IP40
KKD07-261	Square	Black Gray		X644-B X644-GY	IP40 IP40
KKD07-260	Rectangular	Black Gray Black	АН	X645-B X645-GY X850-B	IP40 IP40 IP65
Lamp changer		Туре: А	HX	672	
KKD07-259		this tool	to re	emove the la	n a lamp, use amp. The tool stalling a lamp.
Remover		Type: AHX618			
KKD07-258		This tool is used for replacing the color chips or screens.			
Contact holder re	mover	Type: A	НХ	699	
SUITABLE TO HOVE		This tool	is u		ove a contact re densely

Description	Туре
Wrench	Туре: АНХ601
KKD07-257	When installing a command switch on a panel, this tool is useful for tightening the switch firmly and efficiently.
Terminal cover	Type: <b>AHX2602</b>
AF87-637	This cover is used with AH164 and AH165 and AH165-2 (except pilot lights). Pass the wires through the cover, then mount the cover in position.
Contact block	Terminal Type
A Proposition	Solder/Tab AGX001 Wire-wrap AGX001–W
KKD06-305, KKD06-304	
Dummy unit	Type: AGX002
SK-1141	A dummy unit is used to fill the space where no contact blocks are installed. For example, two dummy units are used if 1NO+1NC contact block is installed, and one dummy unit is used if 2NO+2NC contact blocks are installed.
Removei	Type: AGX012
SM-334	This tool is used for replacing the contact blocks or dummy units.

#### Pushbuttons/Selectors/Pilot Lights/Buzzers

#### AH164, AH165 and AH165-2 Accessories

Description	Туре		
Sockets	Terminal	Туре	Used with
	Solder/Tab Wire-wrap PC board	AHX697-S AHX697-W AHX697-P	Pushbuttons
3	Solder/Tab Wire-wrap PC board	AHX697-SL AHX697-WL AHX697-PL	Illuminated pushbuttons
SM-1097		ngement is 2N 1165-2PL type	•
Sockets for	Terminal	Туре	
	Solder/Tab Wire-wrap	AHX697-SH	-
SM-1098	These sockets lamps rated for 110V AC/DC. Except for AH pilot lights or When side-by continuous lig	gement is 2NO- s are used only or 24V DC are u 1164, 165 and 1 AH165-2PL type -side mounting hting, note that ature over the a	when LED sed under 65-2 series and a socket has



For wiring to wire-wrap pin terminals, select appropriate wire sizes and tool from the table below.

Wire size	Bit	Sleeve	Number of effective wraps
0.4mm dia.	3-A	1-B	About 8
0.5mm dia.	1-A		About 6
(0.65mm dia.)	(2-A)		(About 6)

Use ordinary wrapping for connection. Wires of 0.65mm dia. must not be used on adjacent terminals. However, 0.65mm dia. wire can be mixed with 0.4mm and 0.5mm dia. wires.

#### ■ Mass, gram AH164 series

#### Type 1NO 2NO 3NO 1NC 2NC 3NC AH164-L,L5 (Without transformer) 12.5 13.5 14.5 L,L5 (With transformer) 53.5 54.5 SL,SL5 (Without transformer) 14.1 13.1 15.1 SL,SL5 (With transformer) TL,TL5 (Without transformer) 54.1 55.1 13.9 14.9 15.9 TL,TL5 (With transformer) 54.9 55.9 TGL,TGL5 (Without transformer) 13.9 14.9 15.9 TGL, TGL5 (With transformer) 54.9 55.9 SGL,SGL5 (Without transformer) 13.1 14.1 15.1 SGL,SGL5 (With transformer) 54.1 55.1 AH164-E,E5 10.5 11.5 12.5 M,M5 12.5 13.5 14.5 SF,SF5 11.1 12.1 13.1 TF,TF5 11.9 12.9 13.9 TGF,TGF5 11.9 12.9 13.9 SGF,SGF5 11.1 12.1 13.1 SM,SM5 14.4 13.4 15.4 TM,TM5 13.1 14.1 15.1 AH164-P2,P0 16.1 17.1 18.1 P3,P6,P7,P1 17.1 18.1 PK3,PK6,PK7,PK1 17.1 18.1 SP2,SP0 15.8 16.8 17.8 SP3,SP6,SP7,SP1 16.8 17.8 SPK3,SPK6,SPK7,SPK1 16.8 17.8 J2,J0 30.6 31.6 32.6 J3,J6,J7,J1 31.6 32.6 JK3,JK6,JK7,JK1 31.9 32.9 SJ2,SJ0 30.3 31.3 32.3 SJ3,SJ6,SJ7,SJ1 31.3 32.3 SJK3,SJK6,SJK7,SJK1 31.6 32.6 AH164-Z (Without transformer) 6.9 Z (With transformer) 50.9 ZS (Without transformer) 7.5 ZS (With transformer) 51.5 ZT (Without transformer) 8.2 ZT (With transformer) 52.2 AH164-TX 16 TX1 17.5 TX2B 13

#### AH165 series

AH165 series			
Туре	1NO	2NO	3NO
	+ 1NC	+ 2NC	+ 3NC
AH165-L,L5 (Without transformer)	12.5	13.5	14.5
L,L5 (With transformer)	53.5	54.5	-
SL,SL5 (Without transformer)	13.1	14.1	15.1
SL,SL5 (With transformer)	54.1	55.1	-
TL,TL5 (Without transformer)	13.9	14.9	15.9
TL,TL5 (With transformer)	54.9	55.9	-
TGL,TGL5 (Without transformer)	13.9	14.9	15.9
TGL,TGL5 (With transformer)	54.9	55.9	-
SGL,SGL5 (Without transformer)	13.1	14.1	15.1
SGL,SGL5 (With transformer)	54.1	55.1	-
AH165-E,E5	10.5	11.5	12.5
M,M5	12.5	13.5	14.5
SF,SF5	11.1	12.1	13.1
TF,TF5	11.9	12.9	13.9
TGF,TGF5	11.9	12.9	13.9
SGF,SGF5	11.1	12.1	13.1
SM,SM5	13.4	14.4	15.4
TM,TM5	13.1	14.1	15.1
VR	13.4 *1	14 *²	-
V1R	14.4 *1	15 * <sup>2</sup>	-
AH165-V5R	18.1 *1	18.7 * <sup>2</sup>	-
V6R	18.9 *1	19.5 *2	-
AH165-P2,P0	16.7	17.7	18.7
P3,P6,P7,P1	-	17.7	18.7
PK3,PK6,PK7,PK1	_	17.7	18.7
SP2,SP0	16.1	17.1	18.1
SP3,SP6,SP7,SP1	-	17.1	18.1
SPK3,SPK6,SPK7,SPK1	-	17.1	18.1
J2,J0	31.2	32.2	33.2
J3,J6,J7,J1	-	32.2	33.2
JK3,JK6,JK7,JK1	-	32.5	33.5
SJ2,SJ0	30.6	31.6	32.6
SJ3,SJ6,SJ7,SJ1	-	31.6	32.6
SJK3,SJK6,SJK7,SJK1	-	31.9	32.9
AH165-JM2	30	33.9	-
RJM2	29.6	34	-
AH165-Z (Without transformer)	6.9		
Z (With transformer)	50.9		
ZS (Without transformer)	7.5		
ZS (With transformer)	51.5		
ZT (With transformer)	8.2		
ZT (With transformer)	52.2 5.4		
	5 /1		
ZM (Without transformer)	J. <del>4</del>		

Note: \*1 For 1NC \*2 For 2NC

# Pushbuttons/Selectors/Pilot Lights/Buzzers AH164, AH165 and AH165-2 Mass

#### ■ Mass, gram AH165-2 series

Туре	1NO +	2NO	3NO
	1NC	2NC	3NC
AH165-2FL,FL5 2EL,EL5 2ML 2YML 2SFL,SFL5 2SEL,SEL5 2SCL,SCL5 2VL 2YVL	15.3 15.8 18.7 20.2 16.6 17.4 17.6 20.7 21.4	16.3 16.8 19.7 21.2 17.6 18.4 18.6 21.7 22.4	17.3 17.8 20.7 22.2 18.6 19.4 19.6 22.7 23.4
AH165-2F,F5 2E,E5 2M 2YM 2SF,SF5 2SE,SE5 2SCE,SCE5 2S2 2YS2 2V 2YV	13.4 13.9 17.8 18.2 14.6 15.4 15.6 - 18 19.4	14.4 14.9 18.8 19.2 15.6 16.4 16.6 19 20.6 19 20.4	15.4 15.9 19.8 20.2 16.6 17.4 17.6 - 20 21.4
AH165-2P2,P0 2P3,P6,P7,P1 2YP2,YP0 2YP3,YP6,YP7,YP1 2J2,J0 2J3,J6,J7,J1 2YJ2 2YJ3,YJ6,YJ7,YJ1 2H 2SH	16.6 - 18.3 - 40.9 - 42.6 - 14.3 16.1	17.6 17.6 19.3 19.3 41.9 41.9 43.6 43.6 15.3 17.1	18.6 18.6 20.3 20.3 42.9 42.9 44.6 44.6 16.3 18.1
AH165-2PL2 2PL3	17.4 -	18.4 18.4	-
AH165-2Z 2ZE 2SZ 2SZE	9.7 10.2 11 11.6		

#### Multi display lights F series

#### ■ Description

Provide a bright, colorful display surface. More user-friendly with easy wiring and windows in a wide variety of sizes.

#### ■ Features

#### Lightweight (LED display, 100V or 200V AC)

Only one-third the weight of FUJI conventional models.

#### Wide window size selection

A wide selection, including half-size windows. AP30F: 30 x 30mm, 30 x 60mm, 15 x 30mm AP40F: 40 x 40mm, 40 x 80mm, 20 x 40mm

#### Easy color and voltage changes

LEDs (with voltage-dividing resistors or voltage-dividing capacitors and resistors) are easily replaced from the panel surface.

#### Save energy

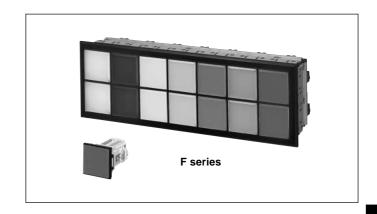
A sharp reduction in power consumption.

#### High brightness for more vivid colors

LEDs with two to eight times the brightness of those on FUJI conventional models. Newly added blue and pure white LEDs improve visibility.

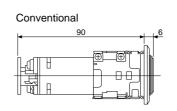
#### **Charged-section cover**

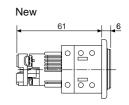
A cover for the charged section is provided as a standard accessory.



#### Reduced depth (AP30 series, 100V or 200V AC)

Two-thirds the depth of FUJI conventional models. And, the AP30F and AF40F feature the same depth.





#### ■ Configuration of AP30F/AP40F

Lens case AP30F AP40F Lens case Standard 0 0

Inclined 0

I FD unit Combination of LED luminous colors and colorinserts

LED luminous color	Color-insert	Illumination
Red	Red	Red
Green	Green	Green
Yellow	Yellow	Yellow
Amber	Orange	Orange
Orange	Clear	White
Red/green	Clear	Red/green
Blue	Blue	Blue
Pure-white	White	Pure-white

Bracket -(Standard accessories)



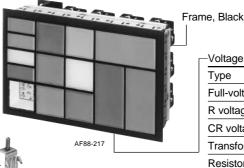
Lens: Clear lens and smoked lens Common to incandescent and LED lamps

Legend plate

Common to incandescent and LED lamps

Color-insert





-voitage units			
Туре	LED	Incandescent	
Full-voltage type	0		
R voltage dividing	0	_	
CR voltage dividing	0	_	
Transformer unit	(	)	
Resistor unit	_	0	
Flicker unit	0	_	
Voltage stabilizer unit	0	_	

○ · Available

- : Not available

#### Multi Display Lights

#### AP30F and AP40F

#### Type number nomenclature

#### ■ Type number nomenclature

AP30F- 04 05 [ E3-S 4 -SR (20) Z1 2 3 4 5 6 7 8

① Basic type

AP30F:  $30 \times 30, \ 30 \times 60, \ 60 \times 30, \ 15 \times 30$ mm (Window size) AP40F:  $40 \times 40, \ 40 \times 80, \ 80 \times 40, \ 20 \times 40$ mm

**Number of windows** (=Row × Column)

	Row	Column —	
AP30F	01,02,03,04,05,06,07,08,09,10 11,12,13,14,15,16,17,18,19,20	01,02,03,04,05,06,07,08,09,10 11,12,13,14,15,16,17,18,19,20	Max. 400
AP40F	01,02,03,04,05,06,07	01,02,03,04,05,06,07,08,09,10, 11,12,13,14,15	Max. 105

- Convert one rectangular window to two square windows.
  The number of windows is limited to 80 when transformer units are mounted.

#### 3 Check terminal

C: with Blank: without

#### 4 Voltage unit and input voltage

#### AP30F series

	Incandescent	LED unit
Full-voltage type	A: 5.5V AC/DC C: 15.5V AC/DC D: 20V AC/DC E: 24V AC/DC	A3: 6V DC B3: 12V ACDC C3: 15V AC/DC E3: 24V AC/DC ES: 24V AC/DC F3: 48V AC/DC H3: 100-110V AC/DC L3: 115-127V AC/DC M3: 200-220V AC
Transformer unit	H: 100-110V AC L:115-127V AC M: 200-220V AC Q:230-254V AC S: 350-380V AC T:400-440V AC V: 480V AC	Q3: 230-254V AC S3: 350-380V AC T3: 400-440V AC V3: 480V AC
Resistor unit	H6:110V DC L6: 125V DC (Electric bulb 48V 1W)	_
Mixed type	X: Combination of the above three	X3: Combination of the above three types plus flicker and voltage stabilizer unit

\* Short body type

#### **AP40F** series

711 101 001100					
	Incandescent	LED unit			
Full-voltage type	C: 15.5V AC/DC D: 20V AC/DC E: 24V AC/DC	A3: 6V DC B3: 12V AC/DC C3: 15V AC/DC E3: 24V AC/DC ES: 24V AC/DC F3: 48V AC/DC H3: 100-110V AC/DC L3: 115-127V AC/DC M3: 200-220V AC			
Transformer unit	H: 100-110V AC L: 115-127V AC M: 200-220V AC Q: 230-254V AC S: 350-380V AC T: 400-440V AC V: 480V AC	Q3: 230-254V AC S3: 350-380V AC T3: 400-440V AC V3: 480V AC			
Resistor unit	H6: 110V DC L6: 127V DC (Electric bulb 48V 2W)	-			
Mixed type	X: Combination of the above three	X3: Combination of the above three types plus flicker and voltage stabilizer unit			

\* Short body type

The combination of LED units and voltage units is limited as follows:

Code	Voltage unit		LED unit
E3FA	Flicker unit	For 24V AC	24V (short body type)
E3FD		For 24V DC	
E3C	Voltage stabilizer unit 27-35V AC/DC		24V (short body type)

- Two-color illumination face is only available for 24V AC/DC type.
- The flicker unit is available in square design only (S-type).

#### 5 Shape of illuminated face

#### **AP30F series**

S: Square (30 × 30)

T: Rectangular, horizontally long (30 × 60)

V: Rectangular, vertically long (60 × 30)

H: Half-size (15 × 30) × 2

X: Mixture of S, T, and V

#### **AP40F** series

S: Square (40 × 40)

T: Rectangular, horizontally long (40 × 80)

V: Rectangular, vertically long (80 × 40)

H: Half-size (20 × 40) × 2

X: Mixture of S, T, and V

#### 6 Illumination method

Blank: Single color, entire surface illumination

4: 2-color, entire surface illumination (for 24V AC/DC LEDs only)

2: 2-way rectangular-split illumination

#### 7 Illuminated color

Using clear lens	Color plate (White)	Using smoked lens
R: Red G: Green Y: Yellow O: Orange W: White S: Blue P: Pure-white*	CR: Red CG: Green CY: Yellow CO: Orange CS: Blue RG: Red/green	SR: Red SG: Green SY: Yellow SO: Orange SW: White SS: Blue

- Specify the number of windows in ( ).
- · If two or more colors are specified using LED unit, the illuminated
- color ⑦ here should be blank. Not available for incandescent lamp

#### **® UL, CSA Approved (Option)**

#### Using window layout sheet

Use the copies of the window layout sheet (See page 04/255) and specify for each of the window when ordering the following types.

- Types with letters on legend plate
- Types with symbol X for @ voltage unit and input voltage
- Types with symbol X for ⑤ shape of illuminated face
- When two or more illuminated colors are specified for LED unit in ⑦.

#### ■ Ordering information

Specify the following:

1. Type number

# Multi Display Lights AP30F and AP40F Specifications and performance

#### **■** Specifications

Туре		AP30F		AP40F			
Light source		Incandescent	LED	Incandescent	LED		
Size of illuminated face		30mm (H) (S) 60mm (V)		20mm (H) 40mm (S) 80mm (V)			
Illuminated color (types of color-insert)	Red Green Yellow Orange White Blue Pure-white	•	•	•	• • • •		
Input voltage	Full voltage	5.5, 15.5, 20 24V AC/DC	6V DC 12, 15, 24, 48, 110, 127V AC/DC 220V AC	15.5, 20 24V AC/DC	6V DC 12, 15, 24, 48, 110, 127V AC/DC 220V AC		
	With transformer unit	110, 127, 220, 254, 380, 440, 480V AC 50/60Hz	254, 380, 440, 480V AC 50/60Hz	110, 127, 220, 254, 380, 440, 480V AC 50/60Hz	254, 380, 440, 480V AC 50/60Hz		
	With resistor unit	110V DC 125V DC	-	110V DC 125V DC	-		
	With flicker unit	-	24V DC 24V AC	_	24V DC 24V AC		
	With voltage stabilizer unit	-	27 to 35V AC/DC	_	27 to 35V AC/DC		
	Mixture	Combination of the above input voltages for different windows.					
Terminal		M3.5 screw with washer (self-lifting)					
No. of windows		1 to 400 *1	1 to 400 *1		1 to 105 *1		
		1 to 80 *2	1 to 80 *2		1 to 80 *2		
Panel thickness		1 to 6mm					

#### ■ Performance

Rated insulation voltage	250V AC/DC: Full voltage type, with resistor unit, with voltage stabilizer unit, R/CR dividing, with flicker unit, with transformer unit (AP30F incandescent 100 to 200V) 600V AC/DC: With transformer unit (AP30F 230 to 480V)		
Dielectric strength (between unit and ground)	2000V AC 1-minute: Full voltage type, with resistor unit, with voltage stabilizer unit, R/CR dividing, with flicker unit, with transformer unit (AP30F incandescent 100 to 200V)  2500V AC 1-minute: With transformer unit (AP30F 230 to 480V)		
Operating ambient temperature	-20°C to 40°C		
Humidity	45 to 85%RH		
Insulation resistance	100MΩ or more (500V DC megger)		

<sup>●:</sup> Available —: Not available

<sup>\*1 :</sup> Without transformer unit \*2 : With transformer unit

#### Multi Display Lights AP30F and AP40F Specifications and performance

#### **■** Power consumption

Light source	Operating voltage		AP30F square	AP40F square			AP30F, AP40F half size
			R, G, Y, O, W, S, P	R, Y, O, W	G, S	Р	R, G, Y, O, W, S, P
LED	Full voltage	6V DC	0.26W	0.33W	0.40W	0.53W	-
		12V AC/DC	0.53W 0.56VA	0.66W 0.70VA	0.79W 0.82VA	1.06W 1.30VA	0.14W 0.16VA
		15V AC/DC	0.66W 0.69VA	0.83W 0.87VA	0.99W 1.02VA	1.32W 1.62VA	0.17W 0.18VA
		24V AC/DC	0.26W 0.34VA	0.53W 0.58VA	0.53W 0.58VA	0.53W 0.65VA	0.26W 0.29VA
		48V AC/DC	0.53W 0.67VA	0.53W 0.67VA	•		_
	R voltage	100-110V AC/DC	1.21W 1.54VA	1.21W 1.54VA			
	dividing type	115-127V AC/DC	1.40W 1.78VA	1.40W 1.78VA			
	CR voltage	200-220V AC	3.3VA	3.3VA			-
	dividing type						
	With transformer	230-254V AC	2.4VA	2.4VA			
	unit	350-380V AC					
		400-440V AC					
		480V AC					
	With flicker unit	24V AC	1.0VA	1.0VA			
		24V DC	0.48W	0.48W			
Incandescent	Full voltage	5.5V AC/DC	1.0W	_			
		15.5V AC/DC	1.0W	2.0W			]
		20V AC/DC					
		24V AC/DC					
	With transformer	100-110V AC	3.0VA	3.0VA			
	unit	115-127V AC					
		200-220V AC					
		230-254V AC					
		350-380V AC					
		400-440V AC					
		480V AC					
	With resistor unit	110V DC	2.0W	3.0W			

Notes: • Maximum power consumption per one square window, except for half-size window.

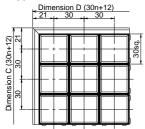
• Maximum power consumption for rectangular type is twice value indicated in the table.

#### AP30F

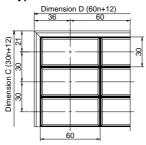
**■** Dimensions, mm

#### Front view

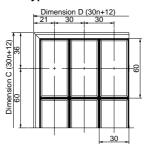
S-type



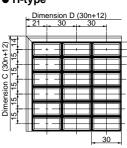
T-type



V-type

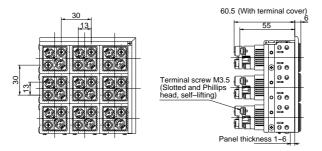


H-type

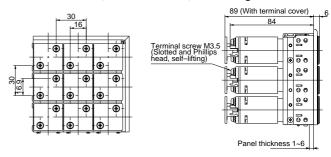


#### **Back view**

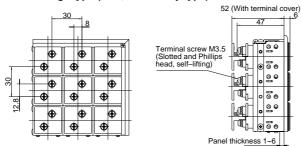
● Full-voltage type (LED)



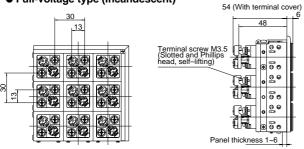
With transformer unit (230V to 480V LED and incandescent)
 With resistor unit, with flicker unit, with voltage stabilizer unit



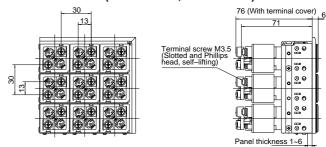
• Full-voltage type (LED, short body type)



• Full-voltage type (Incandescent)

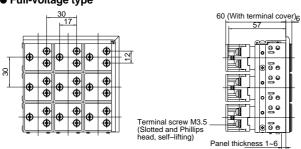


• With transformer (Incandescent, 100V to 220V)



## Half size (Illuminated face) With check terminal

● Full-voltage type

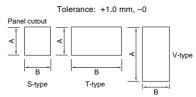


Fuji Electric FA Components & Systems Co., Ltd./D & C Catalog Information subject to change without notice

# Multi Display Lights **AP30F Dimensions**

#### AP30F

#### ■ Panel cutout and overall dimensions



#### ● S, H-type

Number of windows		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Panel cutout	Α	35	65	95	125	155	185	215	245	275	305	336	366	396	426	456	486	516	546	576	606
	В	35	65	95	125	155	185	215	245	275	305	335	365	395	425	455	485	515	545	575	605
Overall	С	42	72	102	132	162	192	222	252	282	312	342	372	402	432	462	492	522	552	582	612
	D	42	72	102	132	162	192	222	252	282	312	342	372	402	432	462	492	522	552	582	612

#### T-type

Number of windows		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Panel cutout	Α	35	65	95	125	155	366	426	486	546	606	336	366	396	426	456	486	516	546	576	606
	В*	65	125	185	145	305	365	425	485	545	605	_	_	_	_	_	_	_	_	_	_
Overall	С	42	72	102	132	162	192	222	252	282	312	342	372	402	432	462	492	522	552	582	612
	D *	72	132	192	252	312	372	432	492	552	612	_	_	_	_	_	_	_	_	_	_

#### V-type

Number of windows		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Panel cutout	A *	65	125	185	245	305	366	426	486	546	606	_	-	-	-	ı	_	ı	ı	_	
	В	35	65	95	125	155	185	215	245	275	305	335	365	395	425	455	485	515	545	575	605
Overall	C *	72	132	192	252	312	372	432	492	552	612	_	_	_	_	_	_	-	-	_	
	D	42	72	102	132	166	192	222	252	282	312	342	372	402	432	462	492	522	552	582	612

Note: \* Indicates dimensions for rectangular windows.

#### ■ Total numbers of windows

	T ty	уре	Num	ber of	windo	ows (C	Colum	n)														
V type S.V	√ type		1	2	3	4	5	6	7	8	9	10	_	_	_	_	_	-	-	_	_	-
S.T type			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Number of windows (Row)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38	3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57	4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76	5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 90 95	66 12 18 24 30 36 42 48 54 60 66 72 78 84 90 90 102 108 114	7 14 21 28 35 42 49 56 63 70 77 84 91 98 105 112 119 126 133	8 16 24 40 48 56 64 72 80 88 89 61 112 120 128 136 134 152	9 18 27 36 45 54 63 72 81 90 99 108 117 126 135 144 153 162 171	10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190	11 22 33 44 55 66 77 88 99 110 121 132 143 154 165 176 187 198 209	12 24 36 60 72 84 96 90 108 120 132 144 156 168 180 192 204 216 228	13 26 39 52 65 78 91 104 117 130 143 156 169 182 208 221 234 247	14 28 42 56 70 84 98 112 112 112 140 154 168 182 196 210 224 224 252 266	15 30 45 60 75 90 105 120 135 150 165 210 225 240 225 2270 285	16 32 48 64 80 96 112 128 144 160 176 179 2208 224 240 256 272 288 304	177 34 51 68 85 102 119 136 153 170 187 204 221 238 255 272 272 2289 306 323	18 36 54 72 90 108 126 144 162 180 198 2216 234 252 270 288 306 324 342	19 38 57 76 95 114 133 152 171 190 209 228 247 266 285 304 323 342 361	20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380
	20	_	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

Note: For H type, count two windows as one S type window.

S type (Square type)

Examples: 1. S-type Row: 6 2. T-type Row: 8 3. V-type Row: 5 Column: 14 Total: 84 Total: 64 Total: 90



H type (Half size)

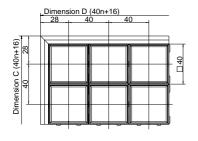


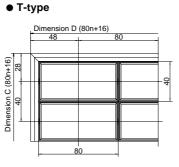
#### AP40F

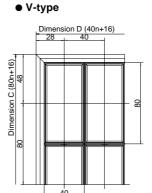
**■** Dimensions, mm

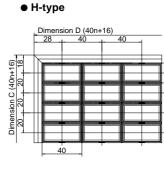
#### Front view

S-type





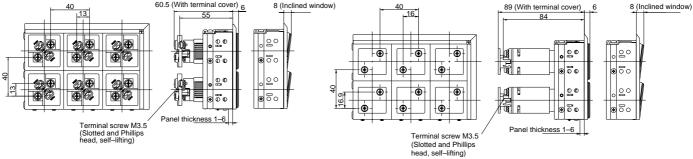




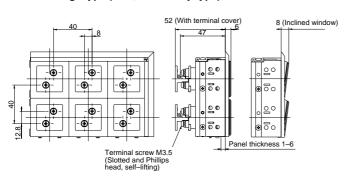
#### **Back view**

● Full-voltage type (LED)

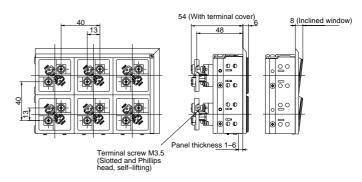




#### • Full-voltage type (LED, short body type)

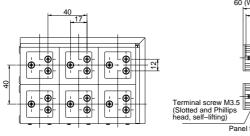


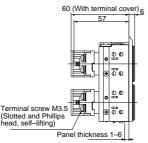
#### • Full-voltage type (Incandescent)

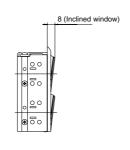


#### Half size (Illuminated face) With check terminal

#### ● Full-voltage type







# Multi Display Lights **AP40F**

## Dimensions

#### AP40F

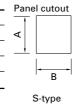
#### ■ Panel cutout and overall dimensions

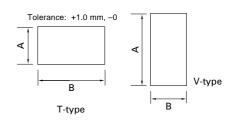
#### • S, H-type

Number of window	vs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Panel cutout	Α	45	85	125	165	205	245	285	_	_	_	_	_	_	_	_
	В	45	85	125	165	205	245	285	325	365	405	445	485	525	565	605
Overall	С	56	96	136	176	216	256	296	_	_	_	_	_	_	_	_
	D	56	96	136	176	216	256	296	336	376	416	456	496	536	576	616

#### T-type

Number of window	vs	1	2	3	4	5	6	7
Panel cutout	Α	45	85	125	165	205	245	285
	В*	85	165	245	325	405	485	565
Overall	С	56	96	136	176	216	256	296
	D *	96	176	256	336	416	496	576





#### V-type

Number of window	vs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Panel cutout	A *	85	165	245	_	_	_	_	_	_	_	_	_	-	-	_
	В	45	85	125	165	205	245	285	325	365	405	445	485	525	565	605
Overall	C *	96	176	256	_	_	_	_	_	_	_	_	_	1	-	_
	D	56	96	136	176	216	256	296	336	376	416	456	496	536	576	616

Note: \* Indicates dimensions for rectangular windows.

#### ■ Total numbers of windows

	S,	V type	Numl	per of wi	ndows (	Column)											
V type	1	type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S, T type			1	2	3	4	5	6	7	ı							
Number of windows	1 2 3	1 2 3	1 2 3	2 4 6	3 6 9	4 8 12	5 10 15	6 12 18	7 14 21	8 16 24	9 18 27	10 20 30	11 22 33	12 24 36	13 26 39	14 28 42	15 30 45
(Row)	4 5 6 7	_	4 5 6 7	8 10 12 14	12 15 18 21	16 20 24 28	20 25 30 35	24 30 36 42	28 35 42 49	32 40 48 56	36 45 54 63	40 50 60 70	44 55 66 77	48 60 72 84	52 65 78 91	56 70 84 98	60 75 90 105

Note: For H Type, count two-windows as one S-type window.

H type (Half size)

S type (Square type)





#### ■ Installation

#### **Mounting panel**

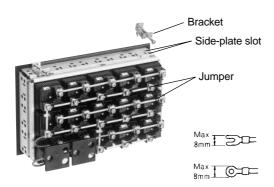
- Panel thickness: 1 to 6mm
- The panel thickness must be able to support the weight of the products and wiring cables. Take particular care in deciding the panel thickness when the products are heavy.

#### Panel cutout

Cut the mounting panel according to the numbers of rows and columns of windows. (See the dimensions on page 04/240 and 242.)

#### How to install

- Insert the product into the panel cutout from the front of the mounting panel. Make sure the product top and bottom are correctly oriented. The product nameplate is stuck to the top of the product.
- Fix the brackets into the side-plate slots at the back of the panel, as shown in the figure below, and clamp the product with the bracket screws. (Tightening torque: 0.4 to 0.6N•m)



#### ■ Wiring

#### Terminal size

The M3.5 terminal screw is suitable for both phillips and slotted screwdrivers. The terminal washers are the self-lifting type. Use crimp terminals. (Tightening torque: 0.8 to 1.0N•m). Double crimp terminals can be connected.

#### Staggered terminals

Because the terminals are staggered, jumper connection is simple. Jumpers are supplied with products as standard. Rated current of jumper: 3A

#### ■ Mass (g)

Mass of multi display light = Voltage unit × (rows × columns) + Side plate × (rows + columns)

#### AP30F

Descripti	on		Mass (g)
Voltage	Incandescent	Full-voltage type	29
unit		With transformer (short)	79
		With transformer	107
		With resistor unit	52
	LED	Full-voltage type	29
		With transformer	109
		Short body type	33
		With R/CR voltage dividing type	32
		2-color all surface illumination with check terminal half size	38
		With flicker unit	54
		With voltage stabilizer unit	54
Side plat	e	1	27

The number of brackets required depends on the type as follows

#### Full-voltage type and transformer type with 1 to 20 lamps

	ago typo	and the		typo mini	to zo idinpo
Colu	ımn AP30F	01~02	03~08	09~15	16~20
Row	AP40F	01~02	03~06	07~11	12~15
AP30F	AP40F				
01~02	01~02				
03~06	03~04				
07~10	05~07		$\Box$		
11~15	_				
16~20	-				

#### Transformer type with 21 to 50 lamps

Rows or columns	1–2	3–4	5	6–8	9	10–12	13	14–16	17	18–20
Brackets required	1	2	3	4	5	6	7	8	9	10

The transformer type with over 20 lamps is very heavy and extra brackets are required. Fit brackets at equal intervals.

#### Transformer type with 51 to 80 lamps

Fit brackets in all slots.

#### A DANE

Descripti	on		Mass (g)
Voltage	Incandescent	Full-voltage type	32
unit		With transformer	110
		With resistor unit	64
	LED	Full-voltage type	38
		With transformer	121
		Short body type	33
		With R/CR voltage dividing type	32
		2-color all surface illumination with check terminal half size	38
		With flicker unit	67
		With voltage stabilizer unit	67
ide plat	e	•	28

# Multi Display Lights AP30F and AP40F Notes on use

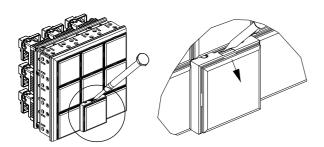
#### ■ Replacing parts Detaching lens case

To remove a lamp, place the tip of a flat-blade screwdriver in the grove at the edge of the lens case and press it in the direction of the arrow. The tip of the screwdriver should be 4.5mm or less wide and 0.6mm or less thick.

To remove both the LED unit and lens case, place the tip of flatblade screwdriver in one of the indents on the edges of the lens case and press it in the direction of the arrow.

When installing an LED unit, press it into the frame so that the LED unit side with the arrow faces the top side of the frame (i.e., the side with the unit type nameplate). The LED unit must be in the correct orientation when installing it.

After installing the lens case and lens, use your finger to press the lens part firmly until it stops in place. To prevent defective lighting or other problems caused by static electricity, do not press directly on the LED chip surface with your finger.



Using the specially-designed suction cup removal tool DN7Y020, replace a color insert and legend plate by applying the suction cup as shown in the diagram below.



Do not touch the chip when the color insert is removed from the LED unit and the LED chip is exposed. Defective lighting or other problems may be caused by static electricity. Install a color insert and legend plate by inserting their rough surfaces so that they face the lamp.

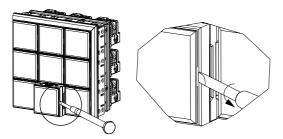
#### Replacing incandescent lamps

Insert and remove lamps using the hollow end of the lamp changer type AHX029.



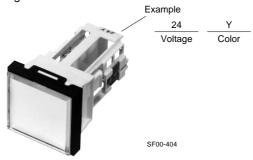
#### ■ Replacing color inserts and legend plates

To replace a color insert and legend plate, insert a flat-blade screwdriver and press it to remove the lens.



#### ■ LED unit color display

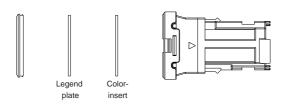
The operating voltage and lamp color are printed on the LED unit lamp using codes.



Color code Rated voltage code	R	Α	W	Y	G	S	Р	F
M	220R	220A	220W	220Y	220G	220S	220P	
L	127R	127A	127W	127Y	127G	127S	127P	
Н	110R	110A	110W	110Y	110G	110S	110P	
F	48R	48A	48W	48Y	48G	48S	48P	
E	24R	24A	24W	24Y	24G	24S	24P	24F
С	15R	15A	15W	15Y	15G	15S	15P	
В	12R	12A	12W	12Y	12G	12S	12P	
6	6R	6A	6W	6Y	6G	6S	6P	
E (With check terminal)	24-RC	24-AC	24-WC	24-YC	24-GC	24-SC	24-PC	

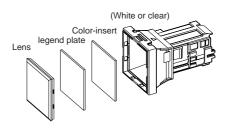
#### ■ Installing color inserts and legend plate

Inserting a color insert and legend plate

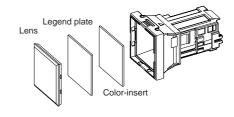


- For a color display when the lamp is OFF, insert first a color insert and then an opaque white legend plate into the lens case.
- For an opaque white display when the lamp is OFF, insert first a transparent color insert and then an opaque white legend plate into the lens case (only with LEDs).
- For smoked lenses, insert first a color insert and then an opaque white legend plate into the lens case.
- The legend plate and color inserts can be engraved.
- Do not touch the chip when the color insert is removed from the LED unit and the LED chip is exposed. Defective lighting or other problems may be caused by static electricity.

#### Opaque white display with the lamp off

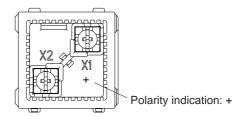


#### Color display with the lamp off



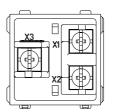
#### **■ LED polarity**

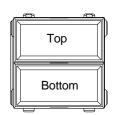
The terminals of all 6V DC voltage products and DC flicker units have polarity, so care is needed when installing them. X1 is the positive terminal.



#### ■ Connecting color lamps and half-size lamp windows

Terminals	Light color from two-color lamp	Half-size lamp window
X1 to X3	Green	Top
X1 to X2	Red	Bottom





### Multi Display Lights AP30F and AP40F Notes on use

#### Assembling lens and lens case

Assemble the lens with lens case by mating lens projections with lens case indents.

#### **■** Other precautions

- 1. Transformer units
- A maximum of 80 windows can function for a unit with transformers when the windows are square.
- Transformers are designed for a load of one incandescent lamp and one LED unit. It is not possible to connect additional loads.
- 2. Operating voltage and the rated voltage of incandescent lamp
- Incandescent lamps can be used within the lamp's rated voltage.
   If you need 5,000 to 10,000 hours of service life for incandescent lamp (at AC circuit), use the lamp within the standard operating voltage. Using incandescent lamps in DC circuit greatly reduces the lamp service life due to notching phenomenon. Use LED units in DC circuit instead.

Lamp rated voltage	Standard operating voltage
(V AC)	(V AC)
6.3	4 to 5.5
18	12 to 15
24	16 to 20
30	20 to 24

#### 3. Flicker units

- When two or more flicker units are used in a Multi Display Light, they may not illuminate simultaneously because of variations in flicker unit circuits.
- Flicker units can be used only with square Multi Display Lights.
   They cannot be used with rectangular lights.
- 4. Continuous lighting
- For continuous light, the duty cycle should be 50% or less. If densely packed LEDs are lit continuously with a high duty cycle, LED life will be reduced.
- With 2-color lighting on the entire surface, do not use continuous lighting when lighting 2 colors simultaneously.
- 5. Store and operate these units within the temperature and humidity specifications on *page 04/237*.
- 6. Do not use these units at outdoor.
- Do not use these units in places where dust or cuttings will accumulate. The lights may not turn ON if dust or cuttings penetrate into the units.

#### **■** Accessory

- Accessory										
Description	Type and	d dimen	sions,	mm						
Lens	Used wit	th		Туре						
	0000			Squar	re(S)	Rec	ctangular(T,V)	Half size(H)		
	AP30F Cle		ar				7C001-TC	DN7C001-H	iC .	
			oked				7C001-TS	DN7C001-H		
	AP40F	Clea					8C001-TC	DN8C001-H		
		Smo		1			8C001-TS	DN8C001-H		
					DN8C			N8C001-T □		
	DN7C001-8			DN7C001-	Т		7sq. 1.5 1.5	77		
	28sq. 1.5 1.5 58									
		'			<b>─────────────────────────────</b>	_	₩.		Y U	
	DN7C001-F	-l □ 8sq.,			DN8C	001-F	H 🗌			
	<u> </u>	. 1					2′-			
AF00-379	⊨	<del>ॗ</del> ⊒₽ॄ ┪	F			$\pm$	+ +=			
		<u> </u>					т			
Color-insert and	Color-in:	1			<u> </u>					
legend plate	Used	Code			Color		Туре		ı	1
	with	LED		ndescent			Square (S)		2-way split rectangular	
	AP30F	R	R		Red		APCX016-SR	APCX016-TR	APCX058-R	DN7P002-R
		0	0		Orange		APCX016-SO	APCX016-TO	APCX058-O	DN7P002-A
		Р	W		White		APCX012-LW	APCX014-LW	APCX058-W	DN7P002-W
		G	-		Green (LED)		APCX016-SLG	APCX016-TLG		DN7P002-G
		-	G		Green (incandescent	t)	DN7P004-G	DN7P005-G	DN7P006-G	-
		Υ	Υ		Yellow		APCX016-SLY			DN7P002-Y
		S	S		Blue		APCX016-SS	APCX016-TS	APCX058-S	DN7P002-S
		W, RG, 0	2  -		Clear		APCX012-C	APCX014-C	APCX058-C	-
		W, C			Clear		_	_	_	DN7P002-C
	-	R	R		Red		DN8P004-R	DN8P005-R	DN8P006-R	DN8P002-R
		0	0		Orange		DN8P004-A	DN8P005-A	DN8P006-A	DN8P002-A
		W, RG, 0	CW		White		APCX013-LW	APCX015-LW	APCX059-W	DN8P002-W
		G	-		Green (LED)		APCX077-SG	APCX077-TG	APCX079-G	DN8P002-G
		-	G		Green (incandescent	t)	DN8P004-G	DN8P005-G	DN8P006-G	<del>-</del>
		Υ	Υ		Yellow		DN8P004-Y	DN8P005-Y	DN8P006-Y	DN8P002-Y
		S	S		Blue		APCX017-SS	APCX017-TS	APCX059-S	DN8P002-S
		Р	-		White (LED)		APCX077-SW	APCX077-TW	APCX079-W	-
		Р	-		White		-	_	_	DN8P002-W
		W, C			Clear		_	_	_	DN8P002-C
	Legend			T=						
	Used w	itn		Туре		T <sub>D</sub>	t (T \/)	11516 5:	/LI)	
	4 D20F	Cla			re (S)	_	ectangular (T, V) PCX014-LW			
	AP30F	Cle	ar oked		X012-LW X012-LWS		PCX014-LWS	DN7P002		
	AP40F	Cle			X012-LWS X013-LW	_	PCX014-LWS	DN7P002 DN8P002		
	AP40F		oked		X013-LWS		PCX015-LWS	DN8P002		
		OIII	iokeu	AI C	X013-L443		I CAUTS-LVVS	DIVOI 002	-110	
	AP30F Sq	luare		AP30F	Rectangular	AP	30F Split rectangula	ar AP30F Half s	ize	
		700			J		color-insert)			
		/sq.	<del>  1</del>	-	57		28.5	<del>-27</del> -  <sup>≈</sup>		
	F	<del>-</del> -	1	1	<del></del>		+ + + + +	+ + +	+	
	L	+-	I	L			L+1:* 1	•		
	AP30F Sq	luare		AP30F	Rectangular		30F Split rectangula	ar AP30F Half s	ize	
	'	.8sq.	. 1		75.8		Color-insert)		m I	
			T	_			37.9	35.8	7.5.	
		<u> </u>	+				35.8		‡ +	
		$\vdash$	I					<del></del>	<b>†</b>	

AF00-379

Description	Type an	d dimensio	ons, mm						
Jumper	Used w	ith Type							
		2 pol	1	3 poles	4 po	les	5 pole	es	6 poles
	AP30F		X029	DN7Y001-03		Y001-04		<b>/001-05</b>	DN7Y001-06
	AP40F		X030	DN8Y001-03		Y001-04		<b>/001-05</b>	DN8Y001-06
	Jumper	dimension	ns				I		
	Used w		Dimension A	Dimension B					
	1			2 poles	3 poles	s 4	poles	5 poles	6 poles
,, ,, ,, ,, ,,	AP30F		30	37.6	67.6		7.6	127.6	157.6
	AP40F	series	40	47.6	87.6	12	27.6	167.6	207.6
					oles	es)	sion A		
	F00-379					-			
ncandescent lamp	Used w	ith Sock	et type	Voltage/c	apacity	Туре		Remarks	
	AP30F	BA9s	s/13 bayonet typ	pe 6.3V 1W		AHX135		Lamp with	built-in transformer
				18V 1W		AHX279		_	
				24V 1W		AHX144		_	
				30V 1W		AHX129		-	
<i>P</i> .	AB405			48V 1W		AHX407			built-in resistor unit
	AP40F			18V 2W		AHX141		-	built-in transformer
				24V 2W 30V 2W		AHX142 AHX143		_	
				48V 2W		DN7H001		Lamp with	built-in resistor unit
	F00-383	For AP30F (except 48V 1W)  For AP40F, AP30F (48V 1W)							
Lamp changer	Used w AP30F, For inc		Type AHX0		916	35	7 P	012.5	Cross section A-A
Color-insert and leger changer	Type		DN7\	7020			Ø22	<u> </u>	
M:							90	ø <u>5</u>	
A	F00-380							ヷ 	

escription	Type and d	imensions,	mm				
ED unit	Used with	Emitted	Color-insert	Туре			
		color	specification	Square(S)	Horizontal rectangular (T	Vertical rectangular (V)	Half size(H)
and the same	AP30F	Red	Color-insert	DN7Q001-S1□R	DN7Q001-T1	□R DN7Q001-V1□R	DN7Q001-H1□F
3	Single color	Orange	(color when light	DN7Q001-S1□A	DN7Q001-T1	□A DN7Q001-V1□A	DN7Q001-H1□
		White	turned OFF)	DN7Q001-S1□W	DN7Q001-T1	W DN7Q001-V1_W	/ DN7Q001-H1□\
	All surface illumination	Green		DN7Q001-S1□G	DN7Q001-T1	G DN7Q001-V1□G	DN7Q001-H1
	illumination	Yellow		DN7Q001-S1□Y	DN7Q001-T1	Y DN7Q001-V1□Y	DN7Q001-H1
	Full voltage	Blue		DN7Q001-S1□S	DN7Q001-T1		+
		Pure-white		DN7Q001-S1□P	DN7Q001-T1	P DN7Q001-V1□P	DN7Q001-H1□
AF00-37	74	Red	Color (transparent)	DN7Q001-S3□R	DN7Q001-T3	R DN7Q001-V3□R	DN7Q001-H3□
		Orange	-insert (white when	DN7Q001-S3□A	DN7Q001-T3		
		Green	light turned OFF)	DN7Q001-S3□G	DN7Q001-T3		_
		Yellow		DN7Q001-S3_Y	DN7Q001-T3		
		Blue		DN7Q001-S3□S	DN7Q001-T3		
	AP40F	Red	Color-insert	DN8Q001-S1□R	DN8Q001-T1		
14	Single color	Orange	(color when light	DN8Q001-S1□A	DN8Q001-T1		
	Gilligio delle	White	turned OFF)	DN8Q001-S1_W			
	All surface	Green		DN8Q001-S1_G	DN8Q001-T1		
12/2	illumination	Yellow		DN8Q001-S1_Y	DN8Q001-T1		
	Full voltage	Blue		DN8Q001-S1_S	DN8Q001-T1		
1		Pure-white		DN8Q001-S1□P	DN8Q001-T1		
AF00-37	73	Red	Color (transparent)	DN8Q001-S3_R	DN8Q001-T3		
		Orange	-insert (white when	DN8Q001-S3_A	DN8Q001-T3		
		Green	light turned OFF)	DN8Q001-S3 G	DN8Q001-T3		
		Yellow		DN8Q001-S3_Y	DN8Q001-T3		DN8Q001-H3
		Blue		DN8Q001-S3_S	DN8Q001-T3		
	Notes: The I		l ovided with a lens cas		D140Q001-13	_O   D140Q001-43_O	DNOQ001-113
	Replace the [	in the type	number with one of th	Square,	horizontal/	Half size	_
					ectangular		_
	6V DC		6	0			_
	12V AC/DC		В	0		0	_
	15V AC/DC		С	0		0	_
	24V AC/DC		E	0		0	_
	48V AC/DC		F	0			_
	110V AC/D		H	0		-	_
	127V AC/D	С	L	0		-	_
	220V AC		M	0		_	_
	: Available	– :Not avai	lable				
	AP30F Square	AP30F Rectangu	AP30F lar Half size	AP40F Square	AP40F Rectangular	AP40F Half size	
	30sq.		30	<u>st</u>	80	9 40	
	## 84 84		\$ P	88	84		
	DN7Q001-S	DN7Q00	)1-T,V DN7Q001	I-H DN8Q001-	S DN8Q001	-T,V DN8Q001-H	

Description	Type and d	imensions,	mm							
ED unit	Used with	Emitted color		or-insert cification	Туре					
					Square(	S)	Horizor rectang	ntal gular (T)	Vertical rectangular (V)	
	AP30F	Red	Col	or-insert	DN7Q0	04-S1ER	DN7Q0	04-T1ER	DN7Q004-V1ER	
	LED	Orange	(col	or when light	DN7Q0	04-S1EA	DN7Q0	04-T1EA	DN7Q004-V1EA	
	transformer	White		ned OFF)			DN7Q0	004-T1EW	DN7Q004-V1EW	
	units	Green	1		DN7Q004-S1EG		DN7Q0	04-T1EG	DN7Q004-V1EG	
-00	LED short	Yellow	1		DN7Q0	04-S1EY	DN7Q004-T1EY		DN7Q004-V1EY	
	body type	Blue	1		DN7Q004-S1ES		DN7Q0	04-T1ES	DN7Q004-V1ES	
		Pure-white	1		DN7Q0	04-S1EP	DN7Q004-T1EP		DN7Q004-V1EP	
		Red		or (transparent)	DN7Q0	04-S3ER	DN7Q0	04-T3ER	DN7Q004-V3ER	
AF0	0-376	Orange		ert (white when	DN7Q004-S3EA		DN7Q004-T3EA		DN7Q004-V3EA	
		Green	light	t turned OFF)	DN7Q0	04-S3EG	DN7Q0	004-T3EG	DN7Q004-V3EG	
		Yellow	1		DN7Q0	04-S3EY	DN7Q0	004-T3EY	DN7Q004-V3EY	
		Blue				04-S3ES	DN7Q004-T3ES		DN7Q004-V3ES	
	AP40F	Red	Col	or-insert	DN8Q0	04-S1ER	DN8Q0	04-T1ER	DN8Q004-V1ER	
	LED	Orange	(col	or when light	DN8Q004-S1EA			004-T1EA	DN8Q004-V1EA	
	transformer	White	turr	ned OFF)	DN8Q0	04-S1EW	DN8Q0	04-T1EW	DN8Q004-V1EW	
	units	Green	1		DN8Q004-S1EG		DN8Q0	04-T1EG	DN8Q004-V1EG	
	LED short	Yellow	1		DN8Q0	04-S1EY	DN8Q0	04-T1EY	DN8Q004-V1EY	
	body type	Blue			DN8Q0	04-S1ES	DN8Q0	04-T1ES	DN8Q004-V1ES	
		Pure-white			DN8Q0	04-S1EP		04-T1EP	DN8Q004-V1EP	
		Red	Cold	or (transparent)		04-S3ER	DN8Q0	04-T3ER	DN8Q004-V3ER	
AE0	00-375	Orange	-ins	ert (white when	DN8Q0	04-S3EA	DN8Q0	004-T3EA	DN8Q004-V3EA	
AFU	10-375	Green	light	t turned OFF)	DN8Q0	04-S3EG	DN8Q0	004-T3EG	DN8Q004-V3EG	
		Yellow	1		DN8Q0	04-S3EY	DN8Q0	04-T3EY	DN8Q004-V3EY	
		Blue	1		DN8Q0	04-S3ES	DN8Q0	004-T3ES	DN8Q004-V3ES	
	Note: The LE	D unit is prov	/ided	with a lens case	and a colo	r-insert.				
	Used with			Horizontal re	ctangular	Vertical rectan	gular	Remarks		
	AP30F			DN7Q001-T		DN7Q001-V□		Full-voltage typ	e (R/CR voltage dividing)	
	2-way split	illumination		DN7Q004-T	EAB	DN7Q004-V□I	EAB		e for transformer unit	
	AP40F			DN8Q001-T			e (R/CR voltage dividing)			
	2-way split	illumination		DN8Q004-T	EAB	DN7Q008-V□I	EAB	Short body type for transformer unit		
	☐: Color-inse	ert specification e voltage cod	les. S	des: Colored = 2 see page <i>04/249</i> . split illumination.		nt or white: 4			nensions, See page 04/24	
	Horizontal re 2-way split i		T)	Vertical recta 2-way split illi	ectangular (V) Specify the colors by replacing "A" and "B" with the					
				В			1-T2ER ay split il	lumination with	zontal rectangular typ n red on the left and	
		AP30F So	quare	e AP30F Re	ectangular	ctangular AP40F Square AP40F Rectangular			ngular	
		30s0	q.	60		9			0 4	
				3			8		88	

DN7Q004-S

DN7Q004-T,V

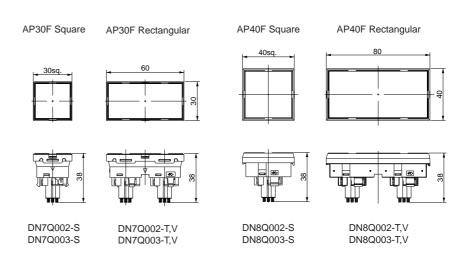
DN8Q004-T,V

DN8Q004-S

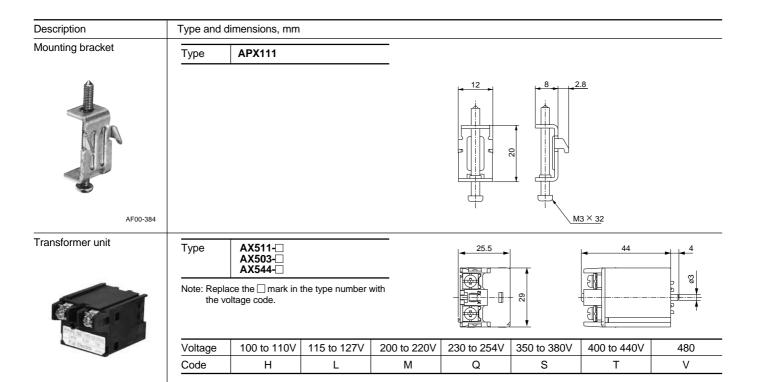
Description	Type and d	imensions,	mm				
LED unit	Used with	Emitted color	Color-insert specification	Туре			
				Square(S)	Horizontal rectangular (T)	Vertical rectangular (V)	Half size(H)
	AP30F	Red	Color-insert	DN7Q003-S1ER	DN7Q003-T1ER	DN7Q003-V1ER	_
	Single color	Orange	(color when light	DN7Q003-S1EA	DN7Q003-T1EA	DN7Q003-V1EA	_
	All surface	White	turned OFF)	DN7Q003-S1EW	DN7Q003-T1EW	DN7Q003-V1EW	_
	illumination	Green		DN7Q003-S1EG	DN7Q003-T1EG	DN7Q003-V1EG	_
	with a	Yellow		DN7Q003-S1EY	DN7Q003-T1EY	DN7Q003-V1EY	_
	check terminal	Blue		DN7Q003-S1ES	DN7Q003-T1ES	DN7Q003-V1ES	_
	(full voltage	Pure-white		DN7Q003-S1EP	DN7Q003-T1EP	DN7Q003-V1EP	_
	only 24V	Red	Color (transparent)-	DN7Q003-S3ER	DN7Q003-T3ER	DN7Q003-V3ER	_
AF00-376	type)	Orange	insert (white when light turned OFF)	DN7Q003-S3EA	DN7Q003-T3EA	DN7Q003-V3EA	_
		Green	ingrictumed STT)	DN7Q003-S3EG	DN7Q003-T3EG	DN7Q003-V3EG	_
		Yellow		DN7Q003-S3EY	DN7Q003-T3EY	DN7Q003-V3EY	_
		Blue		DN7Q003-S3ES	DN7Q003-T3ES	DN7Q003-V3ES	_
	AP40F	Red	Color-insert	DN8Q003-S1ER	DN8Q003-T1ER	DN8Q003-V1ER	_
	Single color	Orange	(color when light turned OFF)	DN8Q003-S1EA	DN8Q003-T1EA	DN8Q003-V1EA	_
	All surface illumination	White		DN8Q004-S1EW	DN8Q003-T1EW	DN8Q003-V1EW	_
		Green		DN8Q003-S1EG	DN8Q003-T1EG	DN8Q003-V1EG	_
	with a check	Yellow		DN8Q003-S1EY	DN8Q003-T1EY	DN8Q003-V1EY	_
	terminal	Blue		DN8Q003-S1ES	DN8Q003-T1ES	DN8Q003-V1ES	_
	(full voltage	Pure-white		DN8Q003-S1EP	DN8Q003-T1EP	DN8Q003-V1EP	_
	only 24V type)	Red	Color (transparent)-	DN8Q003-S3ER	DN8Q003-T3ER	DN8Q003-V3ER	_
AF00-375	1,900)	Orange	insert (white when light turned OFF)	DN8Q003-S3EA	DN8Q003-T3EA	DN8Q003-V3EA	_
		Green	ingric tarriod Or r )	DN8Q003-S3EG	DN8Q003-T3EG	DN8Q003-V3EG	_
		Yellow		DN8Q003-S3EY	DN8Q003-T3EY	DN8Q003-V3EY	-
		Blue		DN8Q003-S3ES	DN8Q003-T3ES	DN8Q003-V3ES	_

Note: The LED unit is provided with a lens case and a color-insert.

Used with	Emitted color	Туре		
		Square(S)	Horizontal rectangular (T)	Vertical rectangular (V)
AP30F 2-color illumination	Red and green	DN7Q002-S3EF	DN7Q002-T3EF	DN7Q003-V3EF
AP40F 2-color illumination	Red and green	DN8Q002-S3EF	DN8Q002-T3EF	DN8Q003-V3EF



# Multi Display Lights **AP30F and AP40F Accessories**



Base unit for separate mounting transformer

SF-1111

AF89-824

Type   AHX326		Туре	AHX326
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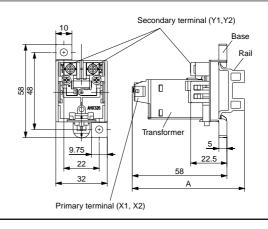
#### Remarks

 If the power supply voltage is 100V AC or over (or more than 220V for R or CR voltage-dividing types) and the panel has limited depth or there are weight limitations, a full-voltage type can be used with a separate mounted transformer, as shown in the following table below.

 A base unit is required when combining with a transformer unit.

Mounting is possible using screws or rail.

Rail type	A (mm)
TH35-15AL	69
TH35-7.5, AH35-7.5AL	61.5



■ Separate mounted transformer application table

Used with	LED specification	1			Incandescent specification					
	Applicable light type	Built-in unit	Transformer unit	Separate base	Applicable light type	Built-in light bulb	Transformer unit	Separate base		
AP30F		DN7Q001-□ □E□ DN7Q004-□ □E□		AHX326 × No. of windows	AP30F-◇◆A-●		AHX511-□ × No. of windows	AHX326 × No. of windows		
AP40F		DN8Q001-□ □E□ DN8Q004-□ □E□			AP40F- <b>◇</b> ◆C-●		AHX503-□ × No. of windows			

Notes: 1. Replace  $\diamondsuit \spadesuit$  mark by the number of basic windows.  $\diamondsuit \spadesuit$  = vertical x horizontal

- 2. Replace mark by the code indicating the shape of illuminated face (S, T, or V, do not specify H).
- 3. The following depths are available. AP30F-♦€E3: 60.5mm AP40F-♦€E3: 52mm AP40F-♦©E3: 52mm AP40F-♦©E3: 52mm AP40F-♦©E3: 52mm AP40F-♦©E3: 52mm AP40F-♦©E3: 52mm AP40F-♦©E3: 52mm AP40F-P\$
- 4. Refer to pages 04/249 and 04/250 for built-in unit types with LED specifications.

Description	Type and	dimensions, mm						
Terminal cover	Series	Description		DN7Y002	APCX054	APX131	DN8Y002	APCX055
AF00-389	AP30F	LED single-color, full-surface illumination	Full-voltage type R, CR voltage dividing type	0				
			Transformer type					
		Half-size, 2-color illumination	Full-voltage type			0		
0.00		LED short body type	Full-voltage type		0			
		Incandescent lamp	Full-voltage type	0				
AF00-388			Transformer type 110V, 220V	0				
			Transformer type over than 220V					0
	AP40F	LED single-color, full-surface illumination	dividing type				0	
6			Transformer type					
1		Half-size, 2-color illumination	Full-voltage type			0		
AF00-387		LED short body type	Full-voltage type		0			
		Incandescent lamp	Full-voltage type				0	
			Transformer type					0
66	DN7Y	(002	DN8Y002		APCX055		I	
	_ 22.8		32.8sq.	15.7	29 16	2 <u>-  </u>	11.1	
AF00-386	ø6.5		26.5		Ø7.	277	3.2	
	APX1	31 77sq. 17			APCX054  27sq. 12.8	2	11.5	
AF00-385		Ø7 3			<u>ø</u> 7		3.2	

# Multi Display Lights AP30F and AP40F Window layout sheet

#### ■ Window layout ordering sheet

When ordering Multi Display Lights, fill in the necessary items in this ordering sheet on Page 04/255. (It is also recommended that you make copies of the sheet for future use.)

#### Cases in which you should order with the ordering sheet

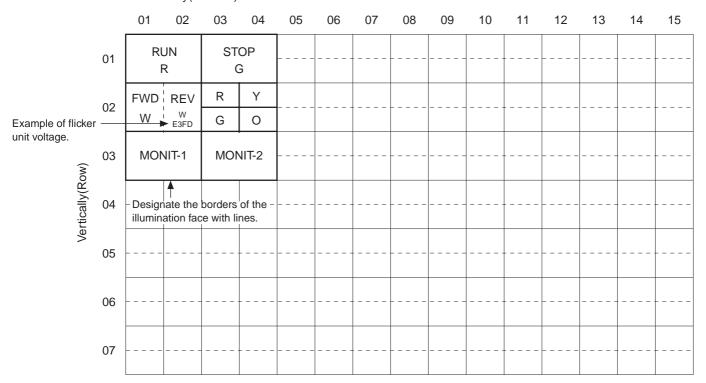
- · When ordering a mixture of LED luminous colors
- When ordering a mixture of window sizes in the illumination face
- · When ordering a mixture of two-color illumination faces
- · When ordering a mixture of input voltages
- When requesting embossed characters

#### Filling in the ordering sheet

- 1. Use lines to designate the borders of the illumination face.
- Write the color code (G, R, W, Y, O, S) for each window into the bottom row of the window. For T and V types, write the code in only one place.
- 3. If you are requesting embossed characters, write the characters into the table.
- For windows requiring more than 7 (vertical) or 15 (horizontal) spaces, continue writing on a separate ordering sheet.
- 5. Write in two places for a two-split illumination type.
- 6. When using a flicker unit or a voltage stabilizer unit, write the unit code into the bottom row of the window.

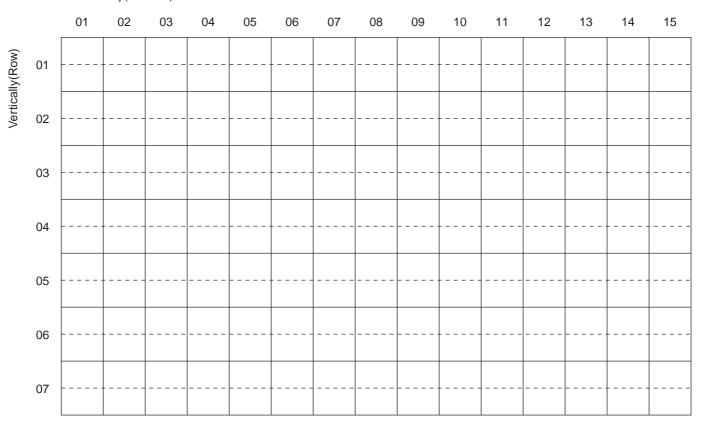
#### Specification example

Horizontally(Column)



#### ■ Window layout ordering sheet

Horizontally(Column)



#### Digital code output type

#### **■** Description

FUJI AC series rotary switches offer a wide choice of output codes. They feature sliding Au-flashed contacts for high contact reliability. Inhibitor and parity check circuits guard against switch malfunctions caused by error signals. With only seven connections to make, these switches are an economical solution to multiposition switching needs.

#### **■** Features

- Au-flashed contacts for high contact reliability.
- Ratings

Volts	Operational current (A) (resistive load)
50V AC	0.05
5V AC	0.5
25V DC	0.05
5V DC	0.25

- The protection of operator section meets the IP65 (IEC), so these switches can be used in oil-splash environments, such as on machine tool control panels. (Except for AC32)
- A wide choice of output codes fits a broad range of applications.
   Available step angles are 15, 30, and 360°/26 (13.85°). Real binary code, complementary binary code, and real gray code are available.
- Switches are available with connectors or with lock rings for easy handling.
- Stopper screw positions are user selectable.



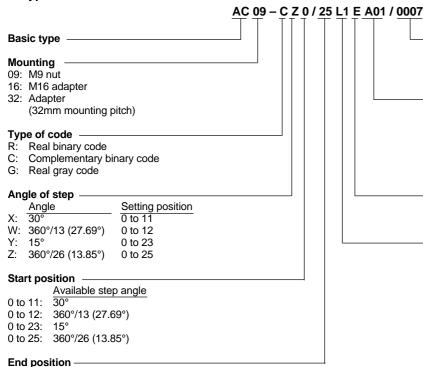
#### ■ Performance

Rated insulation vo		50V -20 to +70°C					
Humidity		45 to 85%RH (non condensation)					
Service life	Mechanical Electrical	50,000 operations 50,000 operations					
Dielectric strength	Between terminals Between terminals and ground	250V AC, 1 minute 1500V AC, 1 minute					
Insulation resistance	Between terminals Between terminals and ground	$500$ M $\Omega$ or more $5,000$ M $\Omega$ or more					
Degree of protection	on (operator section)	AC09, AC16 : IP65 (IEC60529) AC32 : IP40 (IEC60529)					

#### ■ Type number nomenclature

Available step angle

360°/13 (27.69°)



With or without lock ring Blank: Without lock ring 0007: With lock ring 0009: With adhesive lock ring With or without connector Blank: 8-terminal, without connector 8-terminal, with right-angle connector A02: 8-termianl, with straight connector B00: 7-terminal, without connector B01: 7-terminal, with right-angle connector B02: 7-terminal, with straight connector With or without stopper screw Blank: With stopper screw Without stopper screw Length of shaft (mm)

AC09	AC16	AC32
16	_	14.5
18	_	16.5
20	_	18.5
22	19.5	20.5
	16 18 20	16 — 18 — 20 —

te: When shorter action than the maximum range of switch action is used, stopper screws are used. However, stopper screws are not used if the maximum action range is used when either 15° (symbol Y) or 360°/26 (symbol Z) is specified.

0 to 11:

0 to 12:

0 to 23:

309

0 to 25: 360°/26 (13.85°)

#### • M9 nut mounting

Angle of	Connector	Lock ring	Type*1 *2 *3		
step			Real binary code	Complementary binary code	Real gray code
30°	Without connector	Without lock ring With lock ring With adhesive lock ring	AC09-RX□/□()■ AC09-RX□/□()■/0007 AC09-RX□/□()■/0009	AC09-CX□/□( )■ AC09-CX□/□( )■/0007 AC09-CX□/□( )■/0009	AC09-GX□/□( )■ AC09-GX□/□( )■/0007 AC09-GX□/□( )■/0009
	With right angle connector	Without lock ring With lock ring With adhesive lock ring	AC09-RX□/□( )■01 AC09-RX□/□( )■01/0007 AC09-RX□/□( )■01/0009	AC09-CX□/□( )■01 AC09-CX□/□( )■01/0007 AC09-CX□/□( )■01/0009	AC09-GX□/□( )■01 AC09-GX□/□( )■01/0007 AC09-GX□/□( )■01/0009
	With straight connector	Without lock ring With lock ring With adhesive lock ring	AC09-RX□/□( )■02 AC09-RX□/□( )■02/0007 AC09-RX□/□( )■02/0009	AC09-CX□/□( )■02 AC09-CX□/□( )■02/0007 AC09-CX□/□( )■02/0009	AC09-GX□/□( )■02 AC09-GX□/□( )■02/0007 AC09-GX□/□( )■02/0009
360°/13 (27.69°)	Without connector	Without lock ring With lock ring With adhesive lock ring	AC09-RW□/□( )■ AC09-RW□/□( )■/0007 AC09-RW□/□( )■/0009	AC09-CW□/□( )■ AC09-CW□/□( )■/0007 AC09-CW□/□( )■/0009	
	With right angle connector	Without lock ring With lock ring With adhesive lock ring	AC09-RW□/□()■01 AC09-RW□/□()■01/0007 AC09-RW□/□()■01/0009	AC09-CW□/□( )■01 AC09-CW□/□( )■01/0007 AC09-CW□/□( )■01/0009	
	With straight connector	Without lock ring With lock ring With adhesive lock ring	AC09-RW□/□()■02 AC09-RW□/□()■02/0007 AC09-RW□/□()■02/0009	AC09-CW□/□( )■02 AC09-CW□/□( )■02/0007 AC09-CW□/□( )■02/0009	
15°	Without connector	Without lock ring With lock ring With adhesive lock ring	AC09-RY□/□()■ AC09-RY□/□()■/0007 AC09-RY□/□()■/0009	AC09-CY□/□()■ AC09-CY□/□()■/0007 AC09-CY□/□()■/0009	AC09-GY□/□( )■ AC09-GY□/□( )■/0007 AC09-GY□/□( )■/0009
	With right angle connector	Without lock ring With lock ring With adhesive lock ring	AC09-RY□/□( )■01 AC09-RY□/□( )■01/0007 AC09-RY□/□( )■01/0009	AC09-CY□/□( )■01 AC09-CY□/□( )■01/0007 AC09-CY□/□( )■01/0009	AC09-GY□/□( )■01 AC09-GY□/□( )■01/0007 AC09-GY□/□( )■01/0009
	With straight connector	Without lock ring With lock ring With adhesive lock ring	AC09-RY□/□()■02 AC09-RY□/□()■02/0007 AC09-RY□/□()■02/0009	AC09-CY□/□()■02 AC09-CY□/□()■02/0007 AC09-CY□/□()■02/0009	AC09-GY□/□( )■02 AC09-GY□/□( )■02/0007 AC09-GY□/□( )■02/0009
360°/26 (13.85°)	Without connector	Without lock ring With lock ring With adhesive lock ring	AC09-RZ□/□()■ AC09-RZ□/□()■/0007 AC09-RZ□/□()■/0009	AC09-CZ□/□( )■ AC09-CZ□/□( )■/0007 AC09-CZ□/□( )■/0009	AC09-GZ□/□( )■ AC09-GZ□/□( )■/0007 AC09-GZ□/□( )■/0009
	With right angle connector	Without lock ring With lock ring With adhesive lock ring	AC09-RZ□/□( )■01 AC09-RZ□/□( )■01/0007 AC09-RZ□/□( )■01/0009	AC09-CZ□/□( )■01 AC09-CZ□/□( )■01/0007 AC09-CZ□/□( )■01/0009	AC09-GZ□/□( )■01 AC09-GZ□/□( )■01/0007 AC09-GZ□/□( )■01/0009
	With straight connector	Without lock ring With lock ring With adhesive lock ring	AC09-RZ□/□( )■02 AC09-RZ□/□( )■02/0007 AC09-RZ□/□( )■02/0009	AC09-CZ□/□( )■02 AC09-CZ□/□( )■02/0007 AC09-CZ□/□( )■02/0009	AC09-GZ□/□( )■02 AC09-GZ□/□( )■02/0007 AC09-GZ□/□( )■02/0009

Notes:
\*¹ Replace the □□ marks by the Start and End positions

Step angle	30°	360°/13	15°	360°/26
Start and End positions	0 to 11	0 to 12	0 to 23	0 to 25

<sup>\*3</sup> Replace the ■ mark by the connector Blank: 8-terminal, without connector A01: 8-terminal, with right angle connector A02: 8-terminal, with straight connector B00: 7-terminal, without connector B01: 7-terminal, with right angle connector B02: 7-terminal, with straight connector

#### • M16 adapter mounting

Angle of	Connector	Type*1 *2	Type*1 *2										
step		Real binary code	Complementary binary code	Real gray code									
30°	Without connector With right angle connector With straight connector	AC16-RX□/□L4■ AC16-RX□/□L4■01 AC16-RX□/□L4■02	AC16-CX□/□L4■ AC16-CX□/□L4■01 AC16-CX□/□L4■02	AC16-GX□/□L4■ AC16-GX□/□L4■01 AC16-GX□/□L4■02									
360°/13 (27.69°)	Without connector With right angle connector With straight connector	AC16-RW□/□L4■ AC16-RW□/□L4■01 AC16-RW□/□L4■02	AC16-CW□/□L4■ AC16-CW□/□L4■01 AC16-CW□/□L4■02										
15°	Without connector With right angle connector With straight connector	AC16-RY□/□L4■ AC16-RY□/□L4■01 AC16-RY□/□L4■02	AC16-CY□/□L4■ AC16-CY□/□L4■01 AC16-CY□/□L4■02	AC16-GY□/□L4■ AC16-GY□/□L4■01 AC16-GY□/□L4■02									
360°/26 (13.85°)	Without connector With right angle connector With straight connector	AC16-RZ□/□L4■ AC16-RZ□/□L4■01 AC16-RZ□/□L4■02	AC16-CZ□/□L4■ AC16-CZ□/□L4■01 AC16-CZ□/□L4■02	AC16-GZ□/□L4■ AC16-GZ□/□L4■01 AC16-GZ□/□L4■02									

#### Notes:

,						
Step angle	30°	360°/13	15°	360°/26		
Start and End positions	0 to 11	0 to 12	0 to 23	0 to 25		

\*2 Replace the ■ mark by the connector Blank: 8-terminal, without connector A01: 8-terminal, with right angle connector A02: 8-terminal, with straight connector 7-terminal, without connector B00:

B01: 7-terminal, with right angle connector B02: 7-terminal, with straight connector

#### • Adaptor mounting (32mm mounting pitch)

Angle of	Connector	Type*1 *2 *3	Type*1 *2 *3										
step		Real binary code	Complementary binary code	Real gray code									
30°	Without connector With right angle connector With straight connector	AC32-RX□/□( )■ AC32-RX□/□( )■01 AC32-RX□/□( )■02	AC32-CX□/□( )■ AC32-CX□/□( )■01 AC32-CX□/□( )■02	AC32-GX□/□( )■ AC32-GX□/□( )■01 AC32-GX□/□( )■02									
360°/13 (27.69°)	Without connector With right angle connector With straight connector	AC32-RW□/□( )■ AC32-RW□/□( )■01 AC32-RW□/□( )■02	AC32-CW□/□( )■ AC32-CW□/□( )■01 AC32-CW□/□( )■02										
15°	Without connector With right angle connector With straight connector	AC32-RY□/□( )■ AC32-RY□/□( )■01 AC32-RY□/□( )■02	AC32-CY□/□( )■ AC32-CY□/□( )■01 AC32-CY□/□( )■02	AC32-GY□/□( )■ AC32-GY□/□( )■01 AC32-GY□/□( )■02									
360°/26 (13.85°)	Without connector With right angle connector With straight connector	AC32-RZ□/□()■ AC32-RZ□/□()■01 AC32-RZ□/□()■02	AC32-CZ□/□()■ AC32-CZ□/□()■01 AC32-CZ□/□()■02	AC32-GZ□/□()■ AC32-GZ□/□()■01 AC32-GZ□/□()■02									

Notes:
\*1 Replace the \( \subseteq \subseteq \text{marks by the Start and End positions} \)

Step angle	30°	360°/13	15°	360°/26		
Start and End positions	0 to 11	0 to 12	0 to 23	0 to 25		

 $<sup>^{\</sup>star 2}$  Replace the ( ) mark by the shaft length

L4: 20.5mm

\*3 Replace the ■ mark by the connector Blank: 8-terminal, without connector 8-terminal, with right angle connector A01: 8-terminal, with straight connector 7-terminal, without connector 7-terminal, with right angle connector 7-terminal, with straight connector A02: B00: B01:

#### ■ 24-position

#### R: Real binary code

		-																							
Terminal	Bit	S	Setting position																						
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
A	1		•		•		•		•		•		•		•		•		•		•		•		•
F	2			•	•			•	•			•	•			•	•			•	•			•	•
В	4					•	•	•	•					•	•	•	•					•	•	•	•
Е	8									•	•	•	•	•	•	•	•								
С	16																	•	•	•	•	•	•	•	•
G	INH	• •		•	•		•	•	•		•	•			•							•			•
<u>D</u>	C																								

C: Complementary binary code

Terminal	Bit	S	etti	ing	pos	itio	n																		_
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
A	1	•		•		•		•		•		•		•		•		•		•		•		•	
F	2	•	•			•	•			•	•			•	•			•	•			•	•		
В	4	•	•	•	•					•	•	•	•					•	•	•	•				
E	8	•	•	•	•	•	•	•	•									•	•	•	•	•	•	•	•
С	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•								
G	INH •												•		•										•
D	С																								

G: Real gray code

Terminal	Bit	5	Sett	ing	pos	sitio	n																		
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Α	а		•	•			•	•			•	•			•	•			•	•			•	•	
F	b			•	•	•	•					•	•	•	•					•	•	•	•		
В	С					•	•	•	•	•	•	•	•									•	•	•	•
E	d									•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
С	е																	•	•	•	•	•	•	•	•
G	Р		•		•		•		•		•		•		•		•		•		•		•		•
D	С																								

# ■ 26-position R: Real binary code

Terminal	Bit	S	etti	ing	pos	sitio	n																				
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Α	1		•		•		•		•		•		•		•		•		•		•		•		•		•
F	2			•	•			•	•			•	•			•	•			•	•			•	•		
В	4					•	•	•	•					•	•	•	•					•	•	•	•		
E	8									•	•	•	•	•	•	•	•									•	•
С	16																	•	•	•	•	•	•	•	•	•	•
G	INH	• (		•			•	•	•		•											•					•
D	С																										_

C: Complementary binary code

<u>0. 00p</u>	<u>,</u>	~.					_																				
Terminal	Bit	S	etti	ing	pos	sitio	n																				
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
А	1	•		•		•		•		•		•		•		•		•		•		•		•		•	
F	2	•	•			•	•			•	•			•	•			•	•			•	•			•	•
В	4	•	•	•	•					•	•	•	•					•	•	•	•					•	•
E	8	•	•	•	•	•	•	•	•									•	•	•	•	•	•	•	•		
С	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•										
G	INH	• •									•		•							•	•				•		•
D	С																										

G: Real gray code

Terminal	Bit	S	etti	ing	pos	sitio	n																				
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Α	а		•	•			•	•			•	•			•	•			•	•			•	•			•
F	b			•	•	•	•					•	•	•	•					•	•	•	•				
В	С					•	•	•	•	•	•	•	•									•	•	•	•	•	•
E	d									•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
С	е																	•	•	•	•	•	•	•	•	•	•
G	Р		•		•		•		•		•		•		•		•		•		•		•		•		•
D	С																										_

#### ■ 12-position

#### R: Real binary code

Terminal	Bit	S	ett	ing	po	osit	ior	1					
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11
A	1		•		•		•		•		•		•
F	2			•	•			•	•			•	•
В	4					•	•	•	•				
E	8									•	•	•	•
С	Р		•	•		•			•	•			•
G	INH •												
D	С												

#### C: Complementary binary code

• • • • • • • • • • • • • • • • • • • •					,			٠,	_				
Terminal	Bit	S	ett	ing	po	osit	ior	1					
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11
A	1	•		•		•		•		•		•	
F	2	•	•			•	•			•	•		
В	4	•	•	•	•					•	•	•	•
E	8	•	•	•	•	•	•	•	•				
С	Р		•	•		•			•	•			•
G	INH •									•			
D	С												

G: Real gray code

O. INCA	ı gıu,	, ,	,,,	uu	•								
Terminal	Bit	S	ett	ing	р	osit	ior	1					
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11
A	а		•	•			•	•			•	•	
F	b			•	•	•	•					•	•
В	С					•	•	•	•	•	•	•	•
E	d									•	•	•	•
С	Р		•		•		•		•		•		•
G													
D	С												

#### ■ 13-position

#### R: Real binary code

		~· ,	, -											
Terminal	Bit	S	ett	ing	po	osit	ior	1						_
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11	12
A	1		•		•		•		•		•		•	
F	2			•	•			•	•			•	•	
В	4					•	•	•	•					•
E	8									•	•	•	•	•
C G	Р		•	•		•			•	•			•	
G	INH •		•											
<u>D</u>	С													_

#### C: Complementary binary code

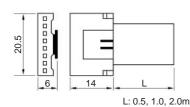
Terminal	Bit	S	ett	ing	po	osit	ior	1						_
No.	No.	0	1	2	3	4	5	6	7	8	9	10	11	12
A	1	•		•		•		•		•		•		•
F	2	•	•			•	•			•	•			•
В	4	•	•	•	•					•	•	•	•	
E	8	•	•	•	•	•	•	•	•					
С	Р		•	•		•			•	•			•	
G	INH •													•
D	С													_

INH: Inhibit terminal Parity check terminal C : Common terminal Turned ON

#### **■** Accessories Lead wire with connector (8-terminal)



Length of lead wire (m)	Туре	Mass (g)
0.5	ACX011-805	11
1.0 (Standard)	ACX011-810	19
2.0	ACX011-820	33

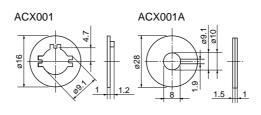


Lock ring

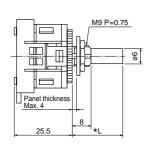


AF91-710

	Туре	Mass (g)
Lock ring (inserted)	ACX001	2
Lock ring (sealed)	ACX001A	5



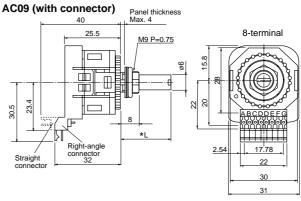
#### **■** Dimensions, mm AC09

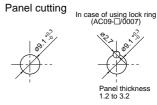


Shaft length	L1	L2	L3	L4
*	16	18	20	22
Mass (g)				
Without connector	41	42	43	44
With connector	42	43	44	45

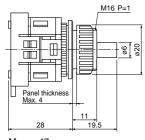
8-terminal

Panel cutting

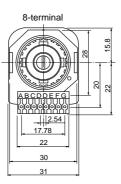






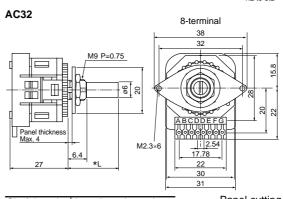




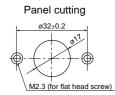


Panel cutting

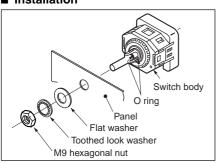




Shaft length	L1	L2	L3	L4
*	14.5	16.5	18.5	20.5
Mass (g)	47	48	49	50



#### ■ Installation

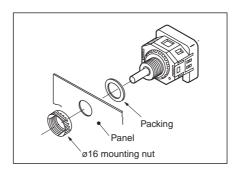


#### AC09

Pass the switch body through the hole from the back of the panel, and secure it by tightening the hexagonal nut with a flat washer and a toothed lock washer.

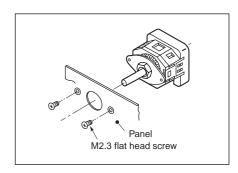
The recommended tightening torque for the hexagonal nut is 1.5 to 2N·m.

Insert the lock ring (ACX001) between the panel and the flat washer, and the adhesive lock ring (ACX001A) between the switch body and the panel.



#### AC16

Pass the switch body with a bezel through the hole from the back of the panel, and secure it with a  $\phi$ 16 mounting nut. The recommended tightening torque for the nut is 0.6 to 1N·m.



#### AC32

Pass the switch body through the hole from the back of the panel, and secure it with two flat head screws from the face of the panel. The recommended tightening torque for the flat head screws is 0.3 to 0.5N·m.

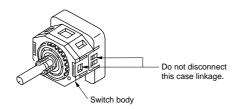
#### ■ Notes on use

#### 1. Connecting wires

Note the following points when soldering:

- The power of the soldering iron must not be over 30W.
- Use solder with resin flux core.
- Complete soldering within 5 seconds if using a 30W soldering iron, or within 10 seconds if using a 20W soldering iron.

#### 2. Note on the case linkage



#### 3. Number of stopper screws shipped

- AC09 and AC32
- Step angle: 30° (symbol X)
   Positions 0/11 (0 to 11): one screw. User-selectable start
   and the positions the server (see for the testing see

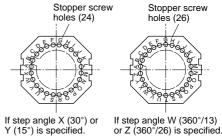
and stop positions: two screws (one for start position, one for end position).

- Step angle: 15° (symbol Y)
  - Positions 0/22 (0 to 22): one screw. User-selectable start and stop positions: two screws (one for start position, one for end position).
- Step angle: 360°/26 (symbol Z)
   Positions 0/24 (0 to 24): one screw. User-selectable start and stop positions: two screws (one for start position, one for end position).
- AC16

Customers can specify the stopper screw positions. The switch is then shipped with stopper screws already in the specified positions.

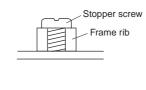
#### 4. Stopper screw positions

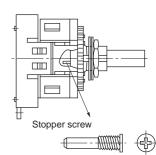
Insert stopper screws into the switch body holes marked with letters, as shown in the insertion example on the right. These tables below show that the start position stopper screw is inserted in the hole on the left of the position setting and the end positions stopper screw is inserted in the hole on the right.



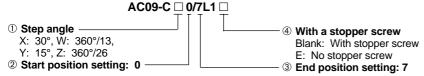
#### 5. Installing a stopper screw

The maximum tightening torque for a stopper screw is 0.1N·m. Screw the stopper screw into position until it hits the body frame rib. Do not overtighten the screw.



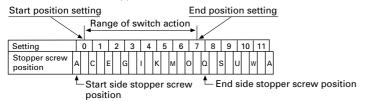


#### Insertion example 1



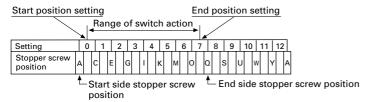
#### • If symbol ① (step angle) is X----type AC09-CX0/7L1:

Insert the start side stopper screw in hole A and the end side screw in hole Q.



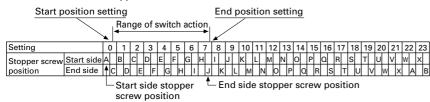
#### • If symbol ① (step angle) is W-----type AC09-CW0/7L1:

Insert the start side stopper screw in hole A and the end side screw in hole Q.



#### • If symbol ① (step angle) is Y----type AC09-CY0/7L1:

Insert the start side stopper screw in hole A and the end side screw in hole J.

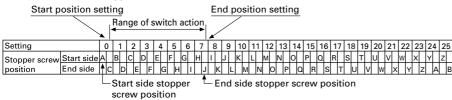


Notes: 1. If the range of action is designated as 0/22 (0 to 22), insert a stopper screw into hole A only.

#### 2. If the range of action is designated as 0/23 (0 to 23), no stopper screws are inserted (symbol ④ is E).

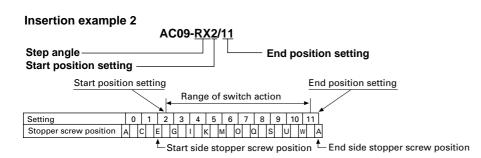
#### • If symbol ① (step angle) is Z----type AC09-CZ0/7L1:

Insert the start side stopper screw in hole A and the end side screw in hole J.



Notes: 1. If the range of action is designated as 0/24 (0 to 24), insert a stopper screw in hole A only.

2. If the range of action is designated as 0/25 (0 to 25), no stopper screws are inserted (symbol ④ is E).



## Cam-type control selector switches

#### **■** Description

FUJI cam-type control switches are recommended for use on switchboards, control panels and switchgear because of their reliability in service. The main type is RC310 with operational current ratings of 10A.

Simplified and economical circuits can be designed around the RC310, since it can handle loads of up to 10A at 220VAC without the need of contactors. Typical examples of complex circuits based on the attractive features of these economical cam-type selector switches are given on pages 04/265 to 04/268. FUJI is prepared to manufacture other versions to suit your particular applications, and switches with up to 12 selector positions can be made to order. RC310 switches are normally supplied with H-type handles. Alternative handle shapes available include the pistol-grip P-type, cane-handle shaped S-type and rosette shaped R-type.

Switches with a 2-12 position maintained type, 3-position center spring-return type and center spring-return type with locking device are also available.

#### ■ Ordering information

Specify the following (See page 04/264):

- 1. Type number
- 2. Mounting method
- 3. Operation
- 4. Selector position and notch angles
- 5. No. of contact blocks
- 6. Contact arrangement
- 7. Handle
- 8. Handle colors

Cam switch,	
rated current 10A	RC310-1
Flush mounting	X
Maintained operation	M
Contact arrangement	3201
(3-position, 2 contact blocks,	
H type handle	H
Black color handle	В
Type number	RC310x-1M3201HB

Note: "C" in the type No. nomenclature must be filled with numbers appearing in the table of "The Contact Arrangement". (page 04/265)
When requiring special arrangements not appearing in the list clearly specify the arrangement required.
Note that "C" in the type nomenclature must not be removed in this case.
RC310x-1MCHB

Туре	Flush mounting x-type	Semi-flush mounting	Enclosed g-type
RC310-1	SG-740	SG-743	AF-191
	RC310x-1	RC310-1	RC310g-1

#### ■ Ratings

Туре	Rated thermal	Breaking capacity (A)					
,,	current (A)	Voltage (V)	AĆ ` Inductive	DC Resistive	DC Inductive		
RC310-1	10	24	10	10	5		
		110	7.5	3	1.3		
		220	7.5	0.8	0.45		
		440	2.5	0.4	0.2		
		550	2	0.3	0.15		

#### ■ Technical data

Insulation resistance: Over 100M $\Omega$  at 500VDC Dielectric strength: 2,500VAC. 1 minute Ambient temperature: -5° to +60°C Operating cycle: 600 cycles/hour

■ Contact arrangement: See page 04/265.

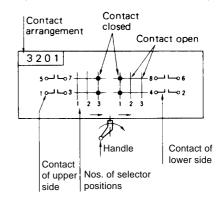


#### ■ Life expectancy (operations)

Туре	Mechanical	Electrical
RC310-1	5 million	250,000 at 220VAC 7.5A 500,000 at 220VAC 3A

#### ■ Contact arrangement (typical)

(Viewed from the direction of the handle)

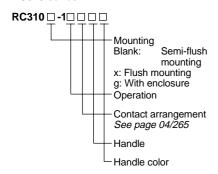


# Cam Type RC310 Control selector switches

#### **■** Type number nomenclature

• Handle color B: Black

#### RC310 series



#### Operation

Model	Description	
М	Maintained	
A	Center spring return	12,3
L	Center spring return with locking device (Pull to turn)	1 2 3

#### • Selector position and notch angle

Available

Operation	Notch angle	Position
	90° 2 position	Ö
M	90° * 3, 4 position	2 2 3
	45° * 3-8 position	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
	30° 9-12 position	4.5 7 5 7 7 12 12 12 12 12 12 12 12 12 12 12 12 12
A	45°	
L	45°	(With locking device)

Note: \* 3 or 4-position type notch angle is normally 45 degrees. Specify when ordering other than this.

Available

#### Handle

Туре	Standard	Versions						
	H type	R type	W type	S type	P type	K type	D type	G type
RC310-1	25 08	25 038	40 50	50 222	9.5	25 830	<u>A</u> <u>w</u>	40 220 8 25

#### Ratings

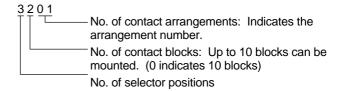
Type	Rated thermal	Voltage	Number of contact	Selector position and	Flush mounting (x-type)	Semi-flush mounting	Enclosed (g-type)
	current (A)	(VAC)	blocks	notch angle	Туре	Туре	Туре
RC310-1	10	550	1	See the table	RC310x-1□■	RC310-1□■	RC310g-1□■
			2	above.	RC310x-1□■	RC310-1□■	RC310g-1□■
			3		RC310x-1□■	RC310-1□■	RC310g-1□■
			4		RC310x-1□■	RC310-1□■	
			5		RC310x-1□■	RC310-1□■	
			6		RC310x-1□■	RC310-1□■	_
			7		RC310x-1□■	RC310-1□■	_
			8		RC310x-1□■	RC310-1□■	-
			9		RC310x-1□■	RC310-1□■	_
			10		RC310x-1□■	RC310-1□■	_

Note: □: Type of operation ■: Contact arrangement – See page 04/265.

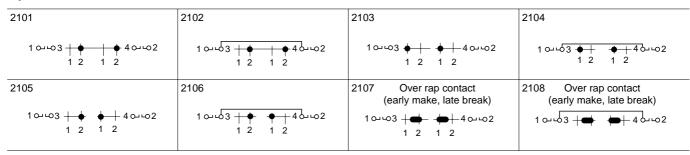
#### ■ Contact arrangement

The following diagrams show the cam-type selector switch contact arrangement. These are only typical examples and other versions can be manufactured to meet your special requirements. Contact FUJI for details.

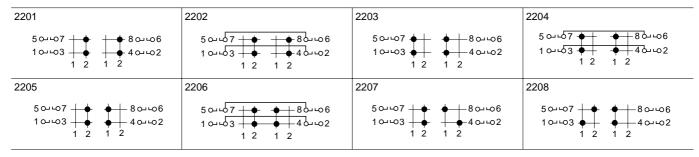
The figures appearing on the right side indicate the contact arrangement. This information must be given when ordering.



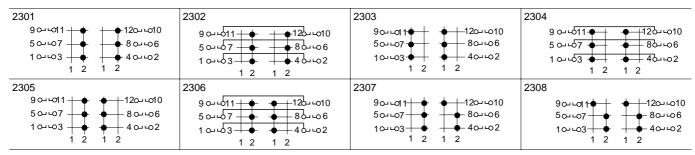
#### 2-position 1-contact block



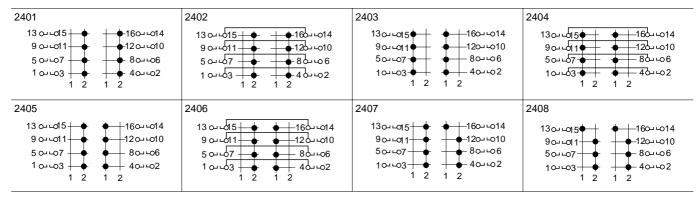
#### 2-position 2-contact block



#### 2-position 3-contact block



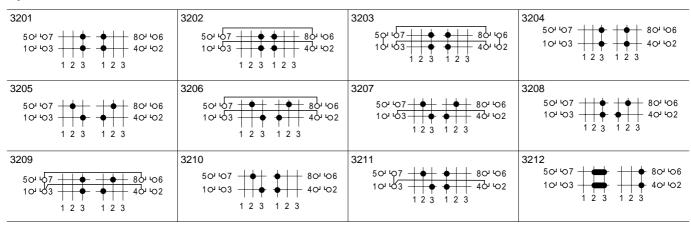
#### 2-position 4-contact block



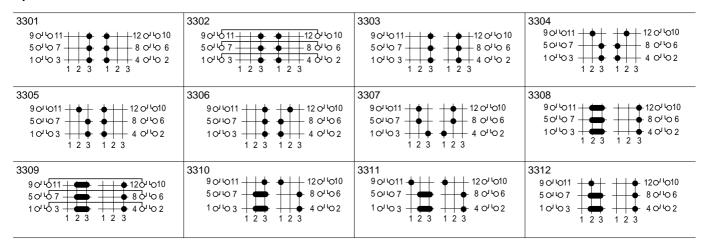
# ■ Contact arrangement 3-position 1-contact block

3101	3102	3103	3104
10' 103	10 03 + + + + 40 02	10' 103 + + + + 40' 102	10' 103 + + + + 40' 102
3105	3106	3107	3108 Notch angle : 90°
10' 103 + + + + 40' 102	10' 103 + + + + 40' 102	10' 03 + + + 40' 02	10' 103 + + + + + 40' 102
3109	3110	3111	3112
10' 103	10' 103 1 2 3 1 2 3	10, 103 + + + + 40, 102	10, 03 + + + 40, 02

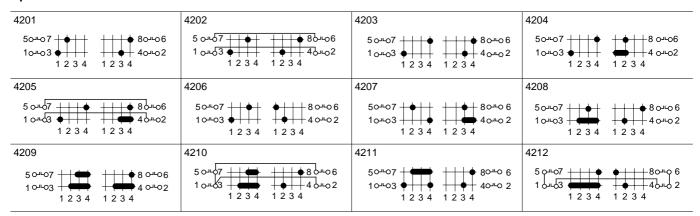
#### 3-position 2-contact block



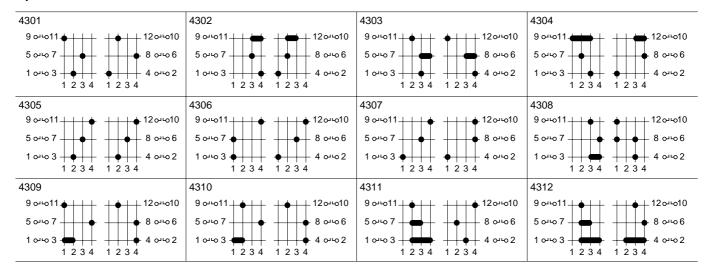
#### 3-position 3-contact block



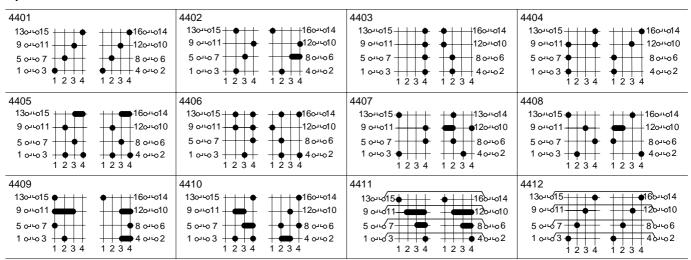
#### ■ Contact arrangement 4-position 2-contact block



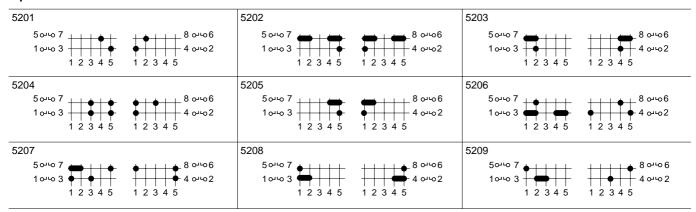
#### 4-position 3-contact block



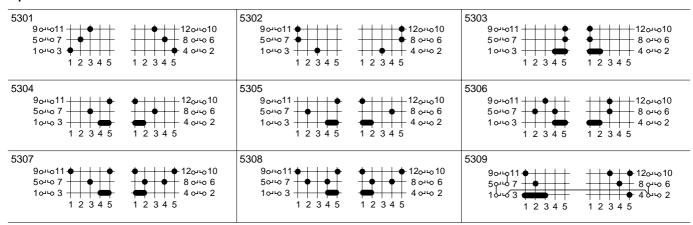
#### 4-position 4-contact block



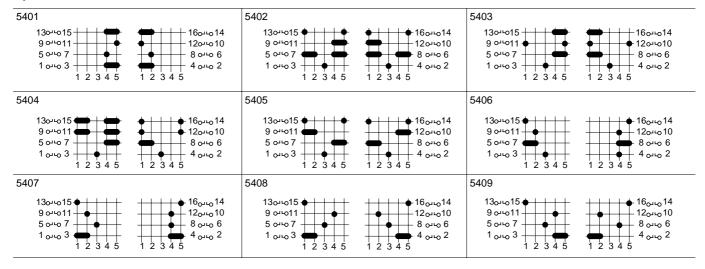
# ■ Contact arrangement 5-position 2-contact block



#### 5-position 3-contact block



#### 5-position 4-contact block

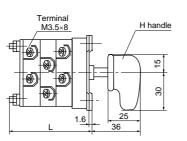


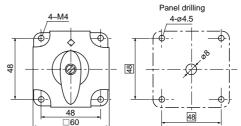
#### **■** Dimensions, mm

### Flush mounting

RC310x-1

No. of contact blocks	1	2	3	4	5	6	7	8	9	10
L	39.5	51.5	63.5	75.5	87.5	99.5	111.5	123.5	135.5	147.5

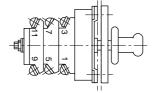


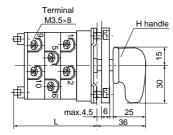


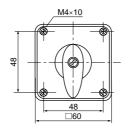
Semi-flush mounting

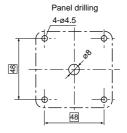
RC310-1

No. of contact blocks	1	2	3	4	5	6	7	8	9	10
L	39.5	51.5	63.5	75.5	87.5	99.5	111.5	123.5	135.5	147.5



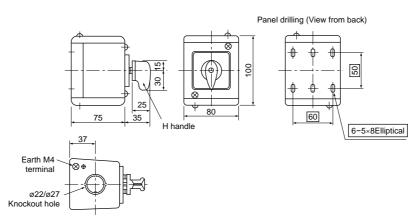






#### Enclosed (Up to 3-contact block)

RC310g-1



# NS387 and RC310 Instrument switches

# Voltmeter/Ammeter Changeover Switches

#### **■** Description

These switches are used with voltmeters or ammeters in secondary PT or CT circuits. Normally, 3-phase line voltage or phase current is measured with 3 meters provided, which requires considerable switchboard or console space. Space can be saved by using NS387 and RC310 instrument switches, since the phase current or line voltage can be read with a single meter and either VS or AS (Voltmeter or Ammeter switch). FUJI AS's are precisely and ruggedly constructed, and open circuits do not occur at the time of switch-over, so eliminating the possibility of abnormal voltage trouble. NS387 is a



blade-type switch and RC310 is a camtype. Both are compact in size and use highly dependable silver contacts. FUJI can also supply DC voltmeter type switches in addition to these for AC use.

### ■ Ordering information

Specify the following:

1. Type number

Series	Application	Туре	Ordering code	No. of contact block	Legend plate *	Handle angle	With or without Off position	Mass (kg)
NS387	AC Voltmeter AC Voltmeter DC Voltmeter	Voltmeter NS387/4V0	AC38V4N AC38V4F AC38V2N	4 4 2	R-S · S-T · T-R OFF · R-S · S-T · T-R I · OFF · II	2 x 45° 3 x 45° 2 x 45°	Without With With	0.5 0.5 0.43
	AC Ammeter AC Ammeter AC Ammeter AC Ammeter	NS387/2M NS387/2M0 NS387/3M NS387/4M	AC38A2N AC38A2F AC38A3N AC38A43F	2 3 3 4	R · S · T OFF · R · S · T R · S · T OFF · R · S · T	2 x 45° 3 x 45° 2 x 45° 3 x 45°	Without With Without With	0.43 0.47 0.47 0.5
RC310	AC Voltmeter AC Voltmeter	RC310-1V RC310-1V0	AK2R1-V32 AK2R1-V42	2 2	R-S · S-T · T-R OFF · R-S · S-T · T-R	2 x 45° 3 x 45°	Without With	0.22 0.22
	AC Ammeter AC Ammeter AC Ammeter AC Ammeter	RC310-1A2 RC310-1A20 RC310-1A3 RC310-1A30	AK2R1-A32 AK2R1-A42 AK2R1-A33 AK2R1-A43	2 2 3 3	$R \cdot S \cdot T$ $OFF \cdot R \cdot S \cdot T$ $R \cdot S \cdot T$ $OFF \cdot R \cdot S \cdot T$	2 x 45° 3 x 45° 2 x 45° 3 x 45°	Without With Without With	0.22 0.22 0.25 0.25

Note: \* For standard type legend plate. Other types can be manufactured by request.

#### ■ Ratings

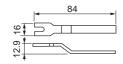
	<b>J</b>						
Series	Rated thermal current (A)	Making a AC (induction Voltage (V)		ing capaci Break (A)	ty DC (indu- Voltage (V)	ctive) Make (A)	Break (A)
NS387	15	110 220 440 550	30 30 20 20	3 3 2 2	24 110 220 440	60 15 5 2.5	60 15 5 2.5
RC310	10	110 220 440 550	37.5 37.5 37.5 37.5	7.5 7.5 2.5 1.5	24 110 220 440	37.5 37.5 37.5 37.5	7.5 1.3 0.45 0.15

#### ■ Handle color (standard)

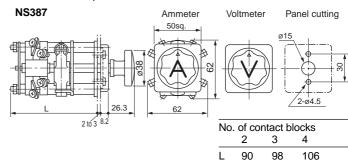
NS387: Black RC310: Black

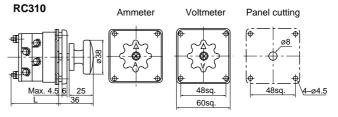
#### ■ Special spanner (for NS387)

Use this spanner for installation or replacement.



#### ■ Dimensions, mm





Note: Do not remove the wires connected.

No. of contact blocks

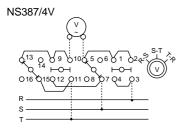
2 3

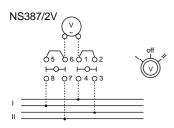
L 51.5 63.5

#### **■** Wiring diagrams

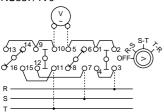
#### Voltmeter changeover switches

#### • NS387 series



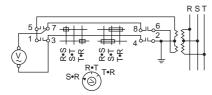


#### NS387/4V0

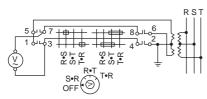


#### • RC310 series

#### RC310-1V

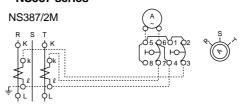


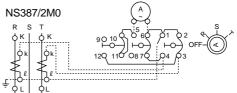
RC310-1V0

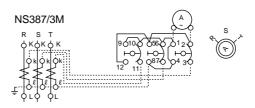


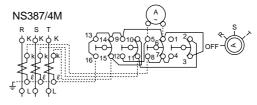
#### Ammeter changeover switches

#### NS387 series

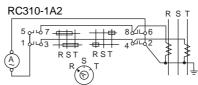


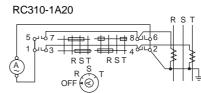




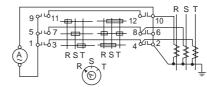


#### • RC310 series

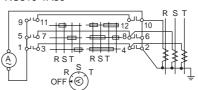




#### RC310-1A3



#### RC310-1A30



#### **Control switches**

# Panel switches for industrial control switchboards

#### **■**Description

NS387 control switches are used on control panels or consoles to operate H.V. circuit breakers or disconnecting switches. These switches are small in size, dependable and take up little switchboard space. Since they have a large current capacity they can be applied to many types of control circuits.

The movable blade has both an excellent contact performance and a long service life. Switches can be supplied in center spring return for momentary action and maintained versions, with 2, 3 and 4 positions. They can be fitted with H, K or R-type standard FUJI handles. The H-type is used as an ON-OFF switch to control circuit breakers or as a disconnecting switch. The K-type is mainly for regulation use and the R-type is used for controlling the power source. In addition to the standard handles key-controlled handles are also available.

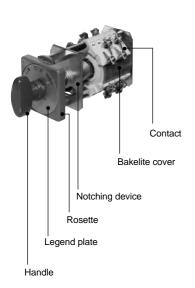
Please refer to page 04/273 of this catalog for typical contact arrangements of these panel switches. We are in a position to supply many other types of switches to meet your particular application needs.

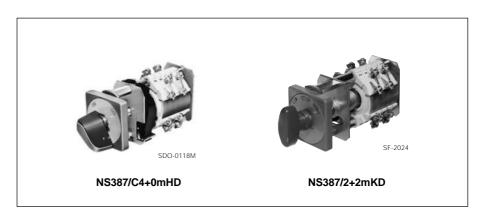
#### ■ Technical data

Insulation resistance: Over 25M $\Omega$  at 500V DC Dielectric strength: 2200V AC rms, 1 minute Durability

Mechanical: 300,000 operations

Electrical: 100,000 operations at 220V AC 5A Allowable ambient temperature: -5° to +40°C





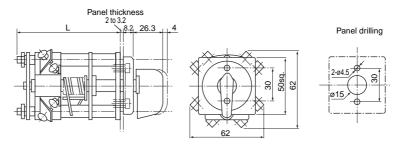
#### ■ Ratings

Contacts	Rated	Making and breaking capac	
	thermal current (A)	DC (inductive) [W] 24V 110V 220V 440V	AC (inductive) [VA] * 110V 220V 440V 550V
Standard contact	15	1440 1650 1100 1100	3300 6600 8800 11000
Residual contact	15	1440 1650 550 220	
Non-break contact	15	720 825 550 132	

Note: \* When the operated equipment is AC electromagnet, breaking capacity is the above-mentioned 10% or less the cacpacity of the stationary state to which the electromagnet is energized.

#### **■** Dimensions, mm

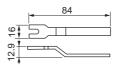
#### With H, I, R, K, KP, KQ, KX, KY type handle



Туре	No. of c	ontact blocks	6			
	1	2	3	4	5	6
NS387/	82	90	98	106	114	123
NS387S/	82	90	98	106	114	123
NS387/C	82	90	98	106	114	139
NS387/A	82	90	98	106	114	123
NS387/D	82	90	98	106	114	123
Mass (kg)	0.4	0.43	0.47	0.5	0.54	0.57

#### Special spanner

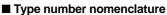
Use this spanner for installation or replacement

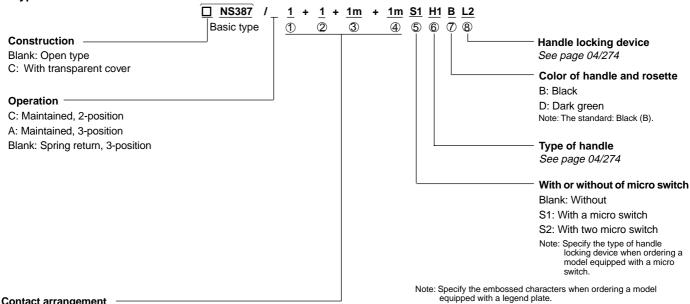


#### **■** Ordering information

Specify the following (See page 04/273)

- 1. Type number
- Letters or symbols to be printed on legend plate
- 3. Color of rosette (if you require other color but black standard color)
- 4. Color of handle
- 5. Options if required





Contact arrange- ment	Code	Contact position	Contact (varies de	epending on	operation)	No. of combinations (varies depending on operation)		
			Blank	С	A	С	А	Blank
1	0–10	Contacts at right angles to the operating handle (in parallel to the operating handle only in the case of the 4-position changeover type)	o o ←]→ o o	م الم	o o ←]→ o o	①+③+④ ≤ 6-block ③+④ ≤ 4-block	①+②+③ +④ ≤ 6-block	①+②+③ +④ ≤ 6-block
2	Blank, 1–10	The above contacts ① shifted clockwise by 45°	000	-	000	. 2 1 2.001	≤ 6-block	≤ 4-block
3	0m- 6m	Non-interrupting contacts at right angles to the operating handle (in parallel to the operating handle only in the case of the 4-position changeover type)  Code "m" is added after the number of blocks.			€			
4	Blank, 1m– 6m	The above contacts ③ shifted clockwise by 45° Code "m" is added after the number of blocks.	%	<b>\$</b>				

Notes: • In each of the above contact forms, the symbol  $\square$  refers to the position of the operating handle.

• If no contacts are required, leave ② and ④ blank and enter "0" for ① and ③.

#### Operation

•				
Operation	No. of positions	Handle position	Operation angle	Code
Maintained	2	1_2	90°	С
	3	123	45°	А
	4	2 3 4		D
Spring return	(3)	A O B		Blank
Spring / manual return	(3)	A O B		F
	(3)	A OBB		E

#### Contact

Standard contact

Non-break contact

For clockwise rotation, terminals 1, 3, and 4 are conductive before the continuity of terminals 1 and 4 is interrupted. After that, only terminals 1 and 3 are conductive.

### **Panel Switches NS387 Control switches**

#### **■** Operating handle

#### • Combination of rosette and handle

Rosette	Handle	Type of handle (refer to 2. Shape of handle, table be	low)
For NS387	For NS387	KP1	Key removable position   K61   K62   K63   K64   K65   K66   K67   K78   K79   K710
	For RC310	Without micro switch: P, S, D, W	With micro switch: H, P, S, K, D, R, W

Notes: • With micro switch equipped, NS387 panel switch are provided with NS387-use rosette as standard, and with the handle for RC310-1 cam switch.

• The large handle (P, S, D, or W) for the RC310-1 is not compatible with any other handle.

#### • Shape of handle

For	H type	I type	K type	R type	KP type	KQ type	KX type	KY type
NS387	4							
	H type	R type	W type	S type	P type	K type	D type	
For RC310	27.5	25 038	40 50	50 22	9.5	25 8 930	50 38	

#### • Types of handle locking

Center spring return type	Maintained type
In the case of the NS387, the handle can be turned after being pulled, and the handle then returns to the center position automatically when it is released. If the handle needs to be turned without being pulled, order a model with "no handle lock".  The RC310 handle can be turned without being locked.	The handle can be turned without being locked.
With a handle for the RC310. The handle can be turned after being pulled, and the handle then returns to the center position automatically when it is released.	The handle can be turned after being pulled, and the handle stops at each notch when it is released.
The handle can be turned without being pulled, and will return to the center position automatically when it is released. The micro switch is activated while the handle is pulled in the center position, and the switch is reset when the handle is released. The handle, however, does not turn left or right when it is pulled.	The handle can be turned after being pulled, and when it is released in any notch position, the handle will stop at that notch position. Moreover, when the handle is pulled in any notch position, the micro switch will be activated, and both the micro switch and handle will be reset when the handle is released. However, the handle cannot be switched to any other notch while it is in the pulled condition.
The handle can be turned without being pulled, and will return to the center position automatically when it is released. When the handle is pulled in the left position, the lock mechanism will activate and no other notch can be selected. In that case, the handle will automatically return to the center position when it is pressed in the shaft direction.	_
The handle can be turned after being pulled. When it is released, the handle will automatically return to the center position in the pulled condition. The handle will return when it is pressed in the shaft direction.	-
The handle can be turned without being pulled, and will return to the center position automatically when it is released. The micro switch will be activated when the handle is pulled in the center position, and the handle will return when the handle is pressed in the shaft direction.	_
	In the case of the NS387, the handle can be turned after being pulled, and the handle then returns to the center position automatically when it is released. If the handle needs to be turned without being pulled, order a model with "no handle lock".  The RC310 handle can be turned without being locked.  With a handle for the RC310. The handle can be turned after being pulled, and the handle then returns to the center position automatically when it is released.  The handle can be turned without being pulled, and will return to the center position automatically when it is released. The micro switch is activated while the handle is pulled in the center position, and the switch is reset when the handle is released. The handle, however, does not turn left or right when it is pulled.  The handle can be turned without being pulled, and will return to the center position automatically when it is released. When the handle is pulled in the left position, the lock mechanism will activate and no other notch can be selected. In that case, the handle will automatically return to the center position when it is pressed in the shaft direction.  The handle can be turned after being pulled. When it is released, the handle will automatically return to the center position in the pulled condition. The handle will return when it is pressed in the shaft direction.  The handle can be turned without being pulled, and will return to the center position automatically when it is released. The micro switch will be activated when the handle is pulled in the center position, and the

Note: If a micro switch is equipped, it will be activated when the handle is pulled.

### ■ Assembled typical switches

Operation	Type(example)	Contact arrangement	Description
Center	NS387/2 + 0mHD		The handle can be turned after being pulled, and will return to the
spring		0 9 9 9	center position automatically when it is released.
return	NS387/2 + 2 + 0mHB	P 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	The handle can be turned after being pulled, and will return to the center position automatically when it is released.
	NS387/1 + 1mHB		The handle can be turned after being pulled, and will return to the center position automatically when it is released.
	NS387/2 + 0mS1B	P 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RC310-1 handle, equipped with a rosette.     Add L1 for the pull-and-turn type.
	NS387/1 + 0mS1HDL2		Provided with a micro switch, RC310-1 handle, and a rosette for the NS387.
			The handle can be turned without being pulled, and will return to the center position automatically when it is released. The micro switch will be activated while the handle is pulled in the center position.
	NS387/5 + 0mSBL3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RC310-1 handle, equipped with the NS387 rosette.  When the handle is pulled in the left position, it will be locked, and the handle will automatically return to the center position when it is pressed in the shaft direction.
	NS387/1 + 0mS1H1BL4		<ul> <li>Equipped with a micro switch, RC310-1 handle, and a rosette for the NS387.</li> <li>The handle can be turned after being pulled, and will return to the center position automatically when it is released, but the handle remains in the pulled condition. The handle will be reset when it is pressed.</li> <li>The micro switch will be activated while the handle is pulled.</li> </ul>
Maintained 2-position	NS387/C3 + 1mKB	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	-
	NS387/C6 + 0mW1D	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RC310-1 cam switch handle, equipped with a rosette.
Maintained 3-position	NS387/A6 + 0mRB	2 0 6 6 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-
	NS387/A2 + 0mH1B		RC310-1 cam switch handle, equipped with a rosette.
	NS387/A3 + 3 + 0mS1KDL2	2 3 6 6 6 6 8 10 3 10 3 20 20 20 20 20 20 20 20 20 20 20 20 20	RC310-1 cam switch handle, equipped with the NS387 rosette.     The handle can be turned left or right without being pulled. The micro switch will be activated while the handle is pulled.

For other than above, contact FUJI.

## **Terminal Blocks**

### **General Information**

#### **■** Description

FUJI can supply a variety of terminal blocks for switchboard or switchgear use. FUJI terminal blocks and end barriers are strongly constructed from a phenol resin and have adequate creepage distance and excellent insulation characteristics. Good connections are assured by convenient screw terminals and solderless box lugs. All terminal blocks are designed to carry their rated amperage without danger of overheating. FUJI terminal blocks are available in a variety of types, some of which are illustrated on this page.

**AYBN type** is simple to assemble and is designed to speed up installation. It is available in up to 12 poles and 600 Amps versions.

AYBS type terminal blocks are made from the highest quality phenol resin and resists tracking. Current ratings are available up to 115 Amps and 12 poles. The customer is required to assemble the channel-mounted type himself. The modular construction allows the number of blocks in a channel to be increased or decreased very easily.

In addition we can also supply the LT4D type which is provided with an isolating switch, and SKT type power terminal blocks, which are used in motor circuits, power source and similar circuits. Testing terminals type LT5 for CT, VT secondary circuits are also available.



#### Type LT2E

Rail mounted type terminal blocks 600 volts 22 to 600 Amps

■ Further information: See page 04/283.





#### Type AYBN

General purpose terminal blocks 600 Volts 15 to 600 Amps

■ Further information: See page 04/277.



#### Type AYBS

High quality terminal blocks 600 Volts 49 to 115 Amps

■ Further information: See page 04/279.

### Type LT4D

Rail mounted terminal blocks with isolating switch 660 Volts 20 Amps

■ Further information: See page 04/280.





#### Type SKT

Terminal block with pressure solderless box lug type connector on one side and screw type connector on the other.

600 Volts 50 to 200 Amps

■ Further information: See page 04/281.



#### Type LT5

Testing terminal and link for VT and CT circuit 250 Volts AC/DC 30 Amps

■ Further information: See page 04/288.

#### ■ Wire gauge and square

The following table shows the relationship between B.W.G., A.W.G. wire gauge and mm<sup>2</sup> cross-sections. In this catalog wire sizes are quoted in mm<sup>2</sup>. Please use this table for reference.

Gauge B.W.G.	A.W.G.	Square mm²	Gauge B.W.G.	A.W.G.	Square mm <sup>2</sup>
4/0	4/0	107.2 104.2	12	9	6.6 6.0
3/0 2/0	3/0	91.6 85.2 73.2	13	10 11	5.3 4.6 4.2
2/0		13.2		11	4.2
0	2/0	67.5 58.6	14	12	3.5 3.3
1	0	53.5 45.6	15 16	13	2.63 2.14
	1	42.4	10	14	2.08
2		40.9 34.0	17	15	1.71 1.65
	2	33.6	40	16	1.32
4	3	28.7 26.7	18	17	1.22 1.03
5	4	24.5 21.2	19	18	0.89 0.81
6	4	20.9		19	0.66
O	5	16.8	20	19	0.62
7	3	16.4	20 21	20	0.52
8	6	13.8 13.3	22	21	0.41 0.40
9	U	11.1	22	22	0.40
3	7	10.5	23		0.32
10	•	9.1		23	0.26
	8	8.3	24	-	0.25
11		7.3		24	0.20

B.W.G. Birminghan Wire Gauge A.W.G. American Wire Gauge

### General purpose terminal blocks 600 Volts

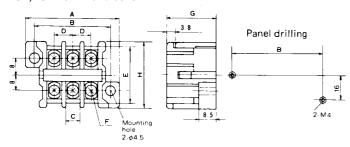
Typical illustration	n and descriptior	n	Amps	No. of	With spring w		With turtle-shaped washer		
				poles	Туре	Ordering code	Туре	Ordering code	
	1000	1	15	3 4 6	AYBN013-5 AYBN014-5 AYBN016-5	LT1N-0203B LT1N-0204B LT1N-0206B	AYBN013-1 AYBN014-1 AYBN016-1	LT1N-0203A LT1N-0204A LT1N-0206A	
B-277	AYBN011-1 With screw marking stri	type connectors,		8 10 12	AYBN018-5 AYBN010-5 AYBN011-5	LT1N-0208B LT1N-0210B LT1N-0212B	AYBN018-1 AYBN010-1 AYBN011-1	LT1N-0208A LT1N-0210A LT1N-0212A	
Vith screw type on narking strip and		Wire size: Max. 5.5mm² Terminal screw: M4	25	3 4 6 8 10 12	AYBN023-5 AYBN024-5 AYBN026-5 AYBN028-5 AYBN020-5 AYBN021-5	LT1N-0503B LT1N-0504B LT1N-0506B LT1N-0508B LT1N-0510B LT1N-0512B	AYBN023-1 AYBN024-1 AYBN026-1 AYBN028-1 AYBN020-1 AYBN021-1	LT1N-0503A LT1N-0504A LT1N-0506A LT1N-0508A LT1N-0510A LT1N-0512A	
3-232		Wire size: Max. 14mm² Terminal screw: M5  Wire size: Max. 22mm² Terminal screw: M6	40 60	3 4 3 4	AYBN043-5 AYBN044-5 AYBN063-5 AYBN064-5	LT1N-1403B LT1N-1404B LT1N-2203B LT1N-2204B	AYBN043-1 AYBN044-1 AYBN063-1 AYBN064-1	LT1N-1403A LT1N-1404A LT1N-2203A LT1N-2204A	
	Ada	Wire size: Max. 60mm² Terminal screw: M8	150	3 4	_ _		AYBN103-5 *1 AYBN104-5 *1	LT1N-6003B LT1N-6004B	
	444	Wire size: Max. 100mm² Terminal screw: M10	200	3 4	_ _		AYBN203-5 *2 AYBN204-5 *2	LT1N-1X03B LT1N-1X04B	
With screw type on arking strip and		Wire size: Max. 200mm² Terminal screw: M12	400	3 4	-		AYBN403-5 *2 AYBN404-5 *2	LT1N-2X03B LT1N-2X04B	
G-292	AYBN601-5	Wire size: Max. 325mm² Terminal screw: M16	600	1	-		AYBN601-5 *2	LT1N-3X01B	

Notes: \*1 Cross recessed pan head screw type. \*2 Hexagonal bolt

## Terminal Blocks

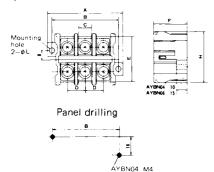
## **Type AYBN**

#### ■ Dimensions, mm 15A, 25A Terminal blocks



Туре	No.	Α	В	С	D	Е	F	G	Н	Mass
	of poles									(g)
AYBN013-1, -5	3	45	37	6.9	9	28	M3.5	23.8	32	20
AYBN014-1, -5	4	54	46	6.9	9	28	M3.5	23.8	32	30
AYBN016-1, -5	6	72	64	6.9	9	28	M3.5	23.8	32	40
AYBN018-1, -5	8	90	82	6.9	9	28	M3.5	23.8	32	50
AYBN010-1, -5	10	108	100	6.9	9	28	M3.5	23.8	32	60
AYBN011-1, -5	12	126	118	6.9	9	28	M3.5	23.8	32	75
AYBN023-1, -5	3	52.5	44.5	9.9	11.5	30	M4	26.8	36	35
AYBN024-1, -5	4	64	56	9.9	11.5	30	M4	26.8	36	40
AYBN026-1, -5	6	87	79	9.9	11.5	30	M4	26.8	36	60
AYBN028-1, -5	8	110	102	9.9	11.5	30	M4	26.8	36	80
AYBN020-1, -5	10	133	125	9.9	11.5	30	M4	26.8	36	95
AYBN021-1, -5	12	156	148	9.9	11.5	30	M4	26.8	36	115

#### 40A, 60A Terminal blocks



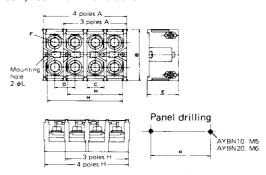
Туре	No. of	Α	В	С	D	Е	F	Н	L	Mass
	poles									(g)
AYBN043-1, -5	3	67	59	12.4	16	40	31.8	45	φ4.5	5 80
AYBN044-1, -5	4	83	75	12.4	16	40	31.8	45	$\phi 4.5$	5 110
AYBN063-1, -5	3	90	78	16.9	20	52	39	60	φ6	160
AYBN064-1, -5	4	113	101	16.9	20	52	39	60	$\phi$ 6	210

#### **■** Ordering information

Specify the following:

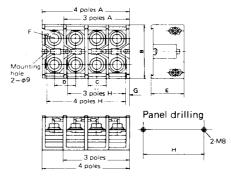
1. Ordering code or type number

### 150A, 200A Terminal blocks



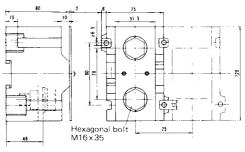
Туре	No. of	Α	В	С	D	Е	F	Н	L	Mass
	pole	S								(g)
AYBN103-5	3	85	79	23	27	51	M8	72	φ6	390
AYBN104-5	4	112	79	23	27	51	M8	99	φ6	510
AYBN203-5	3	110	90	29.7	35	63	M10	96	φ7	740
AYBN204-5	4	145	90	29.7	35	63	M10	131	φ7	970

#### 400A Terminal blocks



Туре	No. of poles	A	В	С	D	Е	F	G	Н	Mass (g)
AYBN403-5 AYBN404-5	3 4	175 230	120 120	45 45	55 55	82 82	M12 M12			1670 2170

## 600A Terminal blocks



Mass: 1040g

#### ■ Technical data

Insulation resistance: Over  $100M\Omega$  at 500V DC Dielectric strength: 2500V AC rms. 1 minute Ambient temperature:  $-20^{\circ}$  to  $+40^{\circ}$ C

### High quality terminal blocks 600 Volts

Typical illustration and	description	Volts	Amps	No. of	With spring w	<i>r</i> asher	With turtle-sh	With turtle-shaped washer		
				poles	Туре	Ordering code	Туре	Ordering code		
Wire size: Max. 5.5mm² Terminal screw: M4			49	6 12	AYBS026-5 AYBS021-5	LT1S-0506B LT1S-0512B	AYBS026-1 AYBS021-1	LT1S-0506A LT1S-0512A		
AYBS021-	1									
No.	Wire size: Max. 14mm <sup>2</sup> Terminal screw: M5	600	88	3 4 12	AYBS043-5 AYBS044-5 AYBS041-5	LT1S-1403B LT1S-1404B LT1S-1412B	AYBS043-1 AYBS044-1 AYBS041-1	LT1S-1403A LT1S-1404A LT1S-1412A		
AYBS044-1	SB-241									
	Wire size: Max. 22mm² Terminal screw: M6	600	115	3 4	AYBS063-5 AYBS064-5	LT1S-2203B LT1S-2204B	AYBS063-1 AYBS064-1	LT1S-2203A LT1S-2204A		
AYBS064-1										

#### **■** Ordering information

Specify the following:

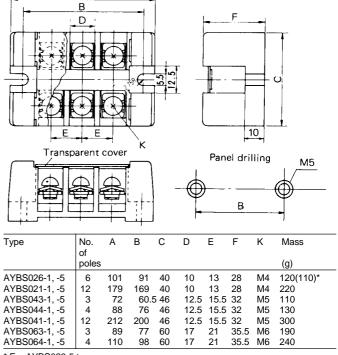
1. Ordering code or type number

#### ■ Technical data

Insulation resistance: Over  $100M\Omega$  at 500V DC Dielectric strength: 2500V AC rms 1 minute Ambient temperature: -20° to +40°C

-20° to +60°C (at 70% ratings)

### ■ Dimensions, mm



<sup>\*</sup> For AYBS026-5 type

## **Type LT4D**

#### Channel mounted type terminal blocks with isolating switch

660 Volts 20 Amps

Wire size: Maximum 5.5mm<sup>2</sup>

Terminal screw: M4

These blocks are provided with isolating switches. When opening the control circuit tentatively for testing or inspection purposes please operate the switch knob. If the leads of an ammeter are connected to both ends of the terminal block and then open the switch the ammeter will then be connected in series and this will allow measurement.

#### Warning

Do not use this switch for secondary CT circuits. Incorrect operation could be dangerous.

Illustration	Description	Туре	Minimum quantity per order
	Terminal block section with isolating switch	LT4D-020Y	100 pcs
	End barrier	LT9D-E1	50 pcs
	End clamp kit	LT9E-T2	50 pcs
	Mounting rail	LT9E-R1	1 pcs (1m)
	Marking strip sheet	LT9D-M1	1 sheets (900mm)

## ■ Ordering information

Specify the following:

1. Type number

2. Quantity: Specify in minimum quantity or multiples of minimum

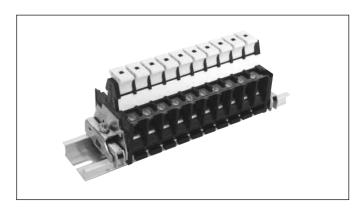
quantity per order.

Examples: minimum quantity per order: 20 pcs.

To order, 20 pcs, 40 pcs, 60 pcs, ..., 100 pcs, etc.
Should be specified.

#### ■ Technical data

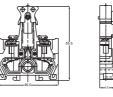
Insulation resistance: Over 100M $\Omega$  at 500V DC Dielectric strength: 2500V AC rms. 1 minute Ambient temperature:  $-20^{\circ}$  to +60°C



#### **■** Dimensions, mm

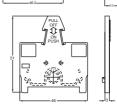
Terminal block section LT4D

mass: 50g



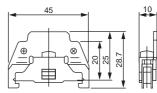
• End barrier LT9D-E1

mass: 5a



• End clamp kit LT9E-T2

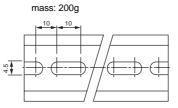
mass: 12g

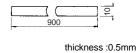


Mounting rail LT9E-R1

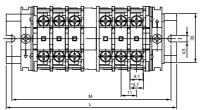
ing rail L19E-

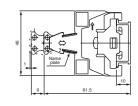
• Marking strip sheet LT9D-M1 mass: 2g





• Assembled LT4D-020Y- □□





M: Mounting hole pitch L: Full length

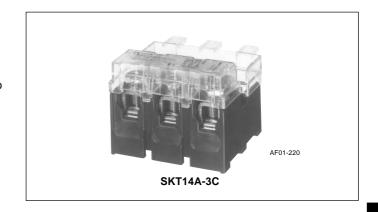
No. of poles	M	L	No. of poles	M	L
8	132	140	22	292	300
10	152	172	24	312	320
12	172	180	30	372	380
			40	492	500
14	192	200			
16	232	240	50	592	600
18	252	260	85	992	1000
	272	280			

Note: 1 to 85 poles can also be assembled except those listed above.

### With transparent cover power terminal blocks

600 Volts 50 to 200 Amps Wire size: 2 to 100 mm<sup>2</sup>

- Transparent terminal cover allows the wiring configuration to be checked externally.
- Slotted hexagon head bolts that can be tightened with screwdrivers or box wrenches are used for the terminals.
- The line side and load side are provided with hinged terminal covers to ensure safety and allow easier maintenance and inspections.
- cUL approved, file No. E45457 SKT14A-3C to SKT100A-3C only.



#### **■** Types and ratings

#### Terminal blocks

Pole	Rated insulation voltage (V AC)	Rated continuous current (A)	Wire size (mm²)	Туре	Mass (g)
3	600	50	2 to 14	SKT14A-3C	300
		100	2 to 38	SKT38A-3C	310
		150	14 to 60	SKT60A-3C	450
		200	30 to 100	SKT100A-3C	730
3 + 1 (Earth terminal)	600	50	2 to 14	SKT14A-3CG	440
		100	2 to 38	SKT38A-3CG	450
		150	14 to 60	SKT60A-3CG	690
		200	30 to 100	SKT100A-3CG	1120

#### Connectors

Rated voltage (V AC)	Rated continuous current (A)	Wire size (mm²)	Туре	Mass (g)
600	50	2 to 14	SKT14-S	52
	100	2 to 38	SKT38-S	55
	150	14 to 60	SKT60-S	80
	200	30 to 100	SKT100-S	135

#### **■** Specifications

Insulation resistance	100MΩ or more (500V DC megger)
Withstand voltage	2500V AC 1minute
Ambient temperature	-20 to +55°C
Humidity	85%RH or less
Flammability	UL94V-2 (Cover), UL94V-0 (Frame)
Temperature rise	45K or less (JIS C 2811)

### ■ Ordering information

Specify the following:

1. Type number

#### **■** Tightening torque

Туре	, , ,		Cable pull-out (UL486A min. force (N)		
	Line side	Load side	Min. cable	Max. cable	
SKT14A-3C	5.1-6.5	11.5–15.5	222	400	
SKT14A-3CG	(M6)	(M8)	(14AWG)	(8AWG)	
SKT38A-3C	5.1-6.5	11.5–15.5	222	445	
SKT38A-3CG	(M6)	(M6) (M8)		(6AWG)	
SKT60A-3C	11.5–15.5	11.5-15.5	311	623	
SKT60A-3CG	(M8)	(M8)	(12AWG)	(4AWG)	
SKT100A-3C	23–31	23–31	311	801	
SKT100A-3CG	(M10)	(M10)	(12AWG)	(2AWG)	

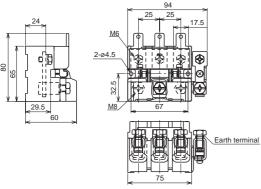
## **Terminal Blocks**

## Type SKT

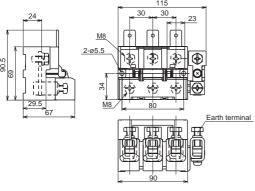
#### **■** Dimensions, mm

#### Terminal block

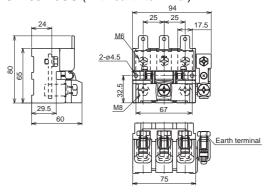
SKT14A-3C (Without earth terminal) SKT14A-3CG (With earth terminal)



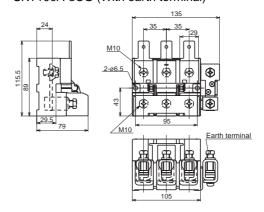
SKT60A-3C (Without earth terminal) SKT60A-3CG (With earth terminal)



### SKT38A-3C (Without earth terminal) SKT38A-3CG (With earth terminal)

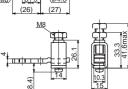


SKT100A-3C (Without earth terminal) SKT100A-3CG (With earth terminal)

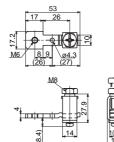


Connector

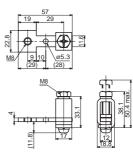




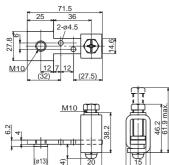
SKT38-S



SKT60-S



SKT100-S



#### **■** Features

- Any number of poles can be assembled on a 35mm DIN rail.
- A lineup of 10 models supporting screw sizes from M3.5 to M16 and a maximum current of 600A is available.
- Our standard models are approved by UL, CSA, and TÜV.
  The molded material conforms to the UL standard for self-
- extinguishing materials (UL94V-0).
  Mounting is performed by simply pressing the block down onto the rail (except for models LT2E-200 to 600).



### **■** Specifications

Rated thermal current (A)	Terminal screw	Applicable wire size and maximum current	Terminal block	End barrier	Cover	Legend plate	End clamp	Rail
22	M3.5	1.25mm <sup>2</sup> -16A 2mm <sup>2</sup> -22A	LT2E-020	LT9E-E1	LT9E-C1	LT9E-M1		LT9E-R1 LT9E-R2
30	M4	1.25mm <sup>2</sup> -16A 2mm <sup>2</sup> -22A 3.5mm <sup>2</sup> -30A	LT2E-030	LT9E-E2	LT9E -C2			
40	M4	3.5mm <sup>2</sup> -30A 5.5mm <sup>2</sup> -40A	LT2E-040	LT9E-E3				
75	M5	5.5mm <sup>2</sup> -40A 8mm <sup>2</sup> -50A 14mm <sup>2</sup> -75A	LT2E-080	LT9E-E4	LT9E-C3			
95	M6	8mm <sup>2</sup> -50A 14mm <sup>2</sup> -75A 22mm <sup>2</sup> -95A	LT2E-090	LT9E-E5	LT9E-C4			
160	M8	22mm²-95A 38mm²-130A 60mm²-160A	LT2E-150	LT9E-E6	LT9E-C5			
200	M10	38mm <sup>2</sup> -130A 60mm <sup>2</sup> -160A 100mm <sup>2</sup> -200A	LT2E-200	LT9E-E7	LT9E-C6 (Standard provided) LT9E-C7	LT9E-M3 (Standard provided)	LT9E-T2	
300	M10	60mm <sup>2</sup> -160A 100mm <sup>2</sup> -240A 150mm <sup>2</sup> -300A	LT2E-300	LT9E-E7	LT9E-C8 (Standard provided) LT9E-C9			
400	M12	100mm²-240A 150mm²-310A 200mm²-400A	LT2E-400	LT9E-E7	LT9E-C10 (Standard provided) LT9E-C11	_		
600	M16	150mm²-310A 200mm²-400A 325mm²-600A	LT2E-600	LT9E-E7	LT9E-C12 (Standard provided) LT9E-C13			

# Terminal Blocks Type LT2E

### **■** Performance

Rated insulation voltage	600V
Ambient operating conditions	Temperature -25 to 60°C (with no icing or condensation) Relative humidity 45% to 85%
Temperature rise	Temperature rise in conducting metal is less than 35K.
Insulation resistance	200MΩ between charged parts, and between charged parts and the metal mounting plate (Measured at 500V DC megger.)
Dielectric strength	2,500V AC (1 min)
Applicable standards	Conforms to JIS C 2811

### ■ Material

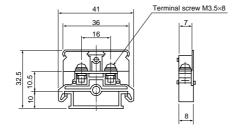
Main body	PPE (modified polyphenylene ether resin) (black) UL94V-0			
Conductive plate	C2680R (Ni-plated)			
Terminal screws	SWRM (Zn-plated)			
Side panel	PPE (modified polyphenylene ether resin) (black) UL94V-0			
Cover	PC (translucent polycarbonate resin) UL94V-0			
Legend plate	PVC (white)			

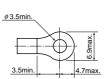
## **■** Dimensions, mm

#### • Terminal blocks

#### LT2E-020



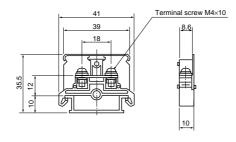


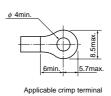


Applicable crimp terminal

LT2E-030

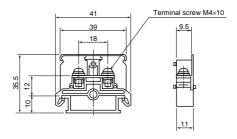


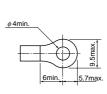




LT2E-040



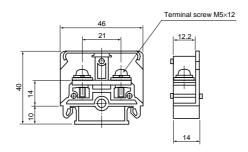


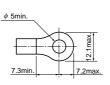


Applicable crimp terminal

#### LT2E-080







Applicable crimp terminal

### ● Terminal blocks LT2E-090



#### LT2E-150



#### LT2E-200



(Cover, supplied with a legend plate)

#### LT2E-300



(Cover, supplied with a legend plate)

#### LT2E-400

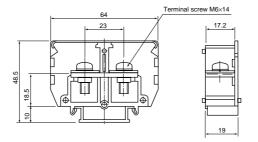


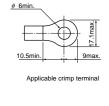
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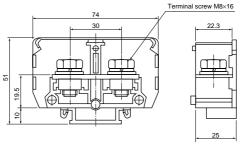
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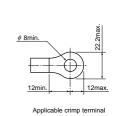


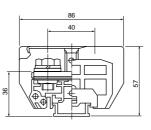
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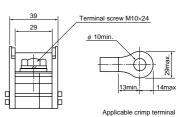


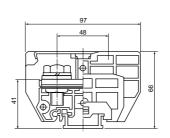


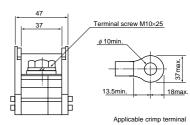


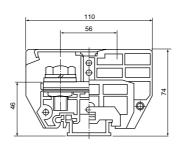


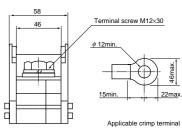


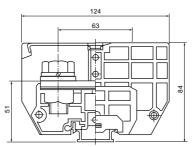


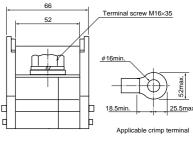




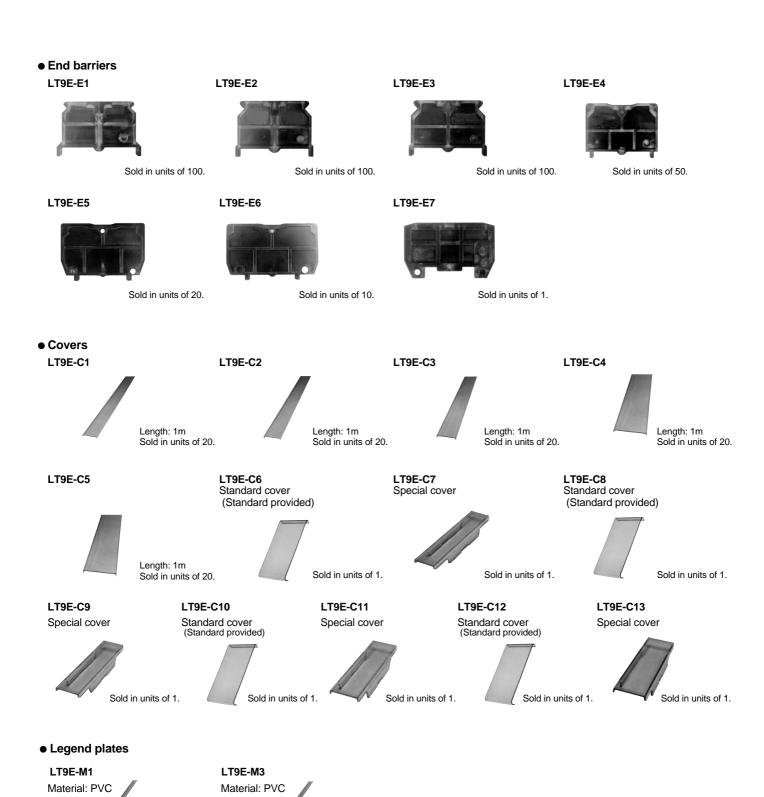




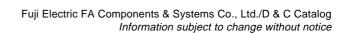




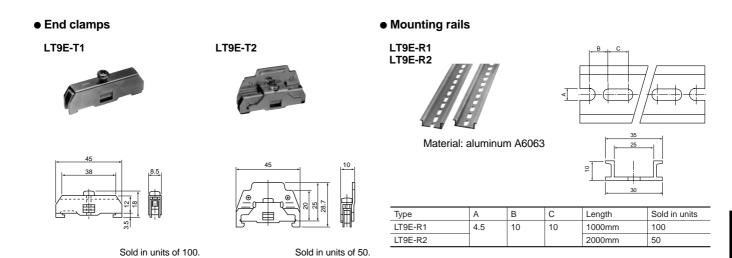
# Terminal Blocks Type LT2E



Dimensions (0.5t×12W×900L) Sold in units of 50



Dimensions (0.5t×10W×1200L) Sold in units of 50



## ■ Application to products satisfying international standards

Dielectric strength: 2,200V AC for 1 min. Operating temperature range: -25 to 60°C

Туре	Standard		Rated insulation voltage (V)	Rated continuous current (A)	Applicable wire size for stranded wires (AWG)	International standards
LT2E-020	UL	E45457	600	20	20–14	UL approved
	CSA	109308-M-001	1	20	20–14	CSA approved
	TÜV	R9551146	1	22	20–14	TÜV approved
LT2E-030	UL	E45457	600	30	18–12	1
	CSA	109308-M-001	1	30	18–12	
	TÜV	R9551147	1	30	18–12	
LT2E-040	UL	E45457	600	40	18–10	
	CSA	109308-M-001	1	40	18–10	
	TÜV	R9551148	1	40	18–10	
LT2E-080	UL	E45457	600	75	10–6	
	CSA	109308-M-001	]	75	10–6	
	TÜV	J9551159	1	75	12–6	
T2E-090	UL	E45457	600	95	8–4	
	CSA	109308-M-001		95	8–4	
	TÜV	J9551160		95	10–4	
T2E-150	UL	E45457	600	150	4–2/0	
	CSA	109308-M-001		150	4–2/0	
	TÜ∨	J9551161		160	6–2/0	
T2E-200	UL	E45457	600	200	2–4/0	
	CSA	109308-M-001		200	2–4/0	
	TÜV	J9551162	660	200	2–250	
T2E-300	UL	E45457	600	300	2/0–300	
	CSA	109308-M-001		300	2/0–300	
	TÜV	J9551163	660	300	1/0–300	
T2E-400	UL	E45457	600	400	4/0–350	
	CSA	109308-M-001		400	4/0–350	
	TÜV	J9551164	660	400	3/0–500	
T2E-600	UL	E45457	600	550	300–600	
	CSA	109308-M-001		550	300–600	
	TÜ∨	J9551165	660	600	250–600	

Note: The values in the above table are for when strandard wires and crimp terminals are used for connection. Use the terminal block together with the crimp terminals and wires approved for the desired standard.

## Testing terminals for VT, CT circuit – For panel mounting

250 Volts AC or DC, 30 Amps Wire size: Maximum 8 mm<sup>2</sup>

These terminals are used in VT and CT secondary circuits.

These are used to test protective relays or meters or for carrying out calibration.

#### ■ Ordering information

Specify the following:

- 1. Ordering code or type number
- 2. Quantity: One pack (10 pcs) is minimum.

#### **■** Technical data

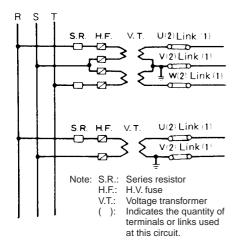
 $\begin{array}{c} \text{Insulation resistance: Over 100M}\Omega \text{ at} \\ 500\text{V DC} \\ \text{Dielectric strength: } 2000\text{V AC rms.} \end{array}$ 

1 minute Ambient temperature: –25° to +50°C

#### ■ Applications

#### **VT** circuit

**CT** circuit



|--|--|--|

Illustration	Description	Etched letters (Standard)	Туре
SDO-0095M	VT circuit Black	U V W O	LT5S-B2 LT5S-B3 LT5S-B4 LT5S-B1 LT5S-B
SB-260	CT circuit Black	R S T O	LT5D-B5 LT5D-B6 LT5D-B7 LT5D-B1 LT5D-B
U 3 0-4	Link, black		LT95S-B1
SDO-00991	Link, black (small	type)	LT95S-B2

#### **■** Dimensions, mm

LT5S - for VT circuits Mass: 30g

R(2) Link (2)
T(2) Link (2)
T(2) Link (2)

S(2) Link (1)

S(2) Link (1)

R(2) Link (2)

S(2) Link (2)

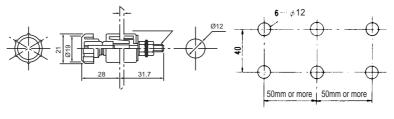
T(2) Link (2)

T(2) Link (2)

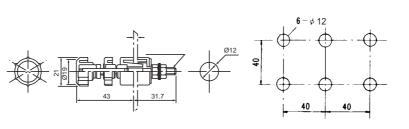
C.T.
O(2) Link (1)

Note: C.T.: Current transformer

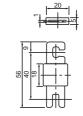
( ): Indicates the quantity of terminals or links used at this circuit.



LT5D - for CT circuits Mass: 50g







LT95S - B2

## **■ CCC** approved

#### ● AR22/DR22 and AD30/DR30 series

#### **Pushbutton switches**

Bezel	Operator	Туре					
		AR22		AR30			
		Momentary action	Alternate action	Momentary action	Alternate action		
			(Turn-reset for V5R)		(Turn-reset for V5R)		
Round bezel	Flush round head	AR22F0R	AR22F5R	AR30F0R	AR30F5R		
	Extended round head	AR22E0R	AR22E5R	AR30E0R	AR30E5R		
	Flush round head (symbol mark type)	AR22FAR	AR22FBR	AR30FAR	AR30FBR		
	Extended round head (symbol mark type)	AR22EAR	AR22EBR	AR30EAR	AR30EBR		
	Extended with half guard	AR22G0R	AR22G5R	AR30G0R	AR30G5R		
	Extended with full guard (24mm dia.)	AR22G3R	AR22G8R	AR30G1R	AR30G6R		
	Flush with full guard (24mm dia.)	AR22G2R	_	_	_		
	Mushroom head with full guard (40mm dia.)	AR22M3R	_	AR30M3R	AR30M8R		
	Mushroom head with full guard (35mm dia. metal nut)	_	_	AR30GSR	_		
	Mushroom head (29mm dia.)	AR22M4R	AR22M9R	AR30M4R	_		
	Mushroom head (40mm dia.)	AR22M0R	AR22M5R	AR30M0R	AR30M5R		
	Giant head	_	_	AR30B0R	_		
	Giant head with guard	_	_	AR30B1R	_		
	Giant head with full guard	_	_	AR30B2R	_		
	Giant head with full guard	-	_	AR30B3R	_		
	Push-lock, turn-reset (40mm dia, with white arrow)	_	AR22V5R	_	AR30V5R		
Square bezel	Flush square head	AR22F0S	AR22F5S	_	_		
	Extended square head	AR22E0S	AR22E5S	_	_		
	Flush round head	AR22F0Y	AR22F5Y	_	_		
	Extended round head	AR22E0Y	AR22E5Y	_	_		
	Mushroom head	AR22M4Y	-	_	_		
Certificate No.	·	2003010305063372	)	2003010305063384			

Note: Certified contact of AR22 type: Momentary action: within 6 contacts
Alternate action: within 4 contacts Certified contact of AR30 type: Momentary action: within 8 contacts Alternate action: within 4 contacts

#### Ring selection type pushbutton switches

Bezel	Operator	Туре		
		AR22	AR30	
Round bezel	With selector ring	AR22S1R	AR30S1R	
		AR22S2R	AR30S2R	
		AR22S3R	AR30S3R	
		AR22S6R	AR30S6R	
Certificate No.		2003010305063372	2003010305063384	

Note: Certified contact: 2NO+2NC (S2R: 2NO is also certified)

## **Emergency stop pushbutton switches**

Bezel	Operator	Туре			
		AR22		AR30	
		With white arrow	No white arrow	With white arrow	No white arrow
		(soft-touch)		(soft-touch)	
Round bezel	Push-lock, turn-reset (29mm dia.)	AR22VSR	AR22V4R	_	_
	Push-lock, turn-reset (40mm dia.)	AR22V0R	AR22V2R	AR30V0R	AR30V2R
	Push-lock, turn-reset (65mm dia.)	_	_	AR30V1R	_
	Key-release push-lock, turn-reset (40mm dia.)	_	AR22V7R	_	_
	Push-look, pull-reset (35mm dia.)	_	AR22Q2R	_	AR30Q2R
	Unibody push-lock, turn-reset (40mm dia.)	AR22VGE	-	_	_
Certificate No.		2003010305063372	(except for AR22VGE)	2003010305063384	
		2005010305156646	(for AR22VGE)		

Notes: • Certified contact: 1NC, 1NO+1NC, 2NC, 3NC, 2NO+2NC, 4NC (except for Q2R, VGE type)
• Certified contact of Q2R, VGE type: 1NC, 1NO+1NC and 2NC only
• Certified button color: red (R) only

## **Command Series CCC** approved

#### Illuminated pushbutton switches

Bezel	Operator	Туре			
		AR22		AR30	
		Momentary	Alternate	Momentary	Alternate
Round bezel	Flush round head	AR22F0L	AR22F5L	_	_
	Extended round head	AR22E0L	AR22E5L	AR30E0L	AR30E5L
	Mushroom head (29mm dia.)	AR22M4L	AR22M9L	_	_
	Mushroom head (40mm dia.)	AR22M0L	AR22M5L	_	_
	Extended with transparent full guard (24mm dia.)	AR22G4L	AR22G9L	AR30G4L	AR30G9L
	Extended with full guard (24mm dia. with openings)	AR22G2L	AR22G7L	AR30G2L	AR30G7L
	Extended with full guard (24mm dia.)	AR22G1L	AR22G6L	AR30G3L	AR30G8L
	Push-lock, turn-reset	_	_	_	AR30V5L
	(40mm dia. with white arrow)				
Square bezel	Flush square head	AR22F0M	AR22F5M	_	_
	Extended square head	AR22E0M	AR22E5M	_	_
	Flush round head	AR22F0P	AR22F5P	_	_
	Extended round head	AR22E0P	AR22E5P	_	_
	Mushroom head	AR22M4P	_	_	_
Certificate No.		20030103050633	72	2003010305063384	
Specifications		Contact     Without transformer     Momentary action: within 5 contacts     Alternate action: within 3 contacts     With transformer     Momentary action: within 3 contacts     Alternate action: within 2 contacts     Alternate action: within 2 contacts  Alternate action: within 2 contacts  Alternate action: within 2 contacts			
		Color of button Green, red, white, yellow, orange, blue Light source LED lamp, incandescent lamp Operating voltage of lamp Without transformer LED: 6V AC, 6V DC, 12V AC/DC Incandescent lamp: 5.5V AC/DC, 20V AC/DC LED, incandescent lamp: 15V AC/DC, 24V AC/DC With transformer LED, incandescent lamp: 100-110V AC, 115-127V AC, 200-22 230-254V AC, 350-380V AC, 400-44 480V AC, 500-550V AC			

### Emergency stop illuminated pushbutton switches

Bezel	Operator	Туре				
		AR22		AR30		
		With white arrow	No white arrow	With white arrow	No white arrow	
		(soft-touch)		(soft-touch)		
Round bezel	Push-lock, turn-reset (29mm dia.)	AR22VSL	_	_	_	
	Push-lock, turn-reset (40mm dia.)	AR22V0L	AR22V2L	AR30V0L	AR30V2L	
	Push-lock, turn-reset (40mm dia. transparent in all colors)	AR22VDL	AR22VAL	_	_	
	Unibody push-lock, turn-reset (40mm dia.)	AR22VGF	_	_	_	
Certificate No.		2003010305063372	(except for AR22VGF)	200301030506338	34	
		2005010305156646	(for AR22VGF)			

Notes: • Certified contact without transformer: 1NC, 1NO+1NC, 2NC, 3NC (except for VGF type)

- Certified contact with transformer: 1NC, 1NO+1NC, 2NC (except for VGF type)
- Certified contact of VGF type: 1NC, 1NO+1NC and 2NC only,
   Certified lamp voltage of VGF type: LED lamp: 24V AC/DC, neon lamp: 110, 120, 220, 240V AC
- Certified button color: red (R) only

#### Selector switches

Bezel	Operator	Туре	Туре				
		AR22		AR30	AR30		
		Standard type	Control type	Standard type	Control type		
Round bezel	Knob	AR22PR	AR22PCR	AR30PR	AR30PCR		
	Lever	AR22WR	AR22WCR	AR30WR	AR30WCR		
	Cylindrical knob	AR22RR	AR22RCR	_	_		
	Key	AR22JR	AR22JCR	AR30JR	AR30JCR		
	Key (long durability)	AR22JAR	_	AR30JAR	_		
Square bezel	Knob	AR22PY	AR22PCY	-	_		
	Lever	AR22WY	AR22WCY	_	_		
	Cylindrical knob	AR22RY	AR22RCY	-	_		
	Key	AR22JY	AR22JCY	-	_		
Certificate No.	Certificate No.		372	20030103050633	384		

Note: Certified contact of AR22 type: Mainted: within 6 conrtacts

Control type, spring return and spring / manurl return: within 4 contacts

Certified contact of AR30 type: Momentary action: within 8 conrtacts

Control type, spring return and spring / manurl return: within 4 contacts

#### Illuminated selector switches

Bezel	Operator	Туре		
		AR22	AR30	
		Standard type	Standard type	
Round bezel	Knob	AR22PL	AR30PL	
Square bezel	Knob	AR22PP	_	
Certificate No.		2003010305063372	2003010305063384	

Notes: • Certified contact of AR22 type :

Without transformer

Maintained: within 4 contacts

Spring return and spring / manual return: within 3 contacts

With transformer

Maintained : within 3 contacts

Spring return and spring / manual return: within 2 contacts

• Certified contact of AR30 type :

Without transformer

Maintained : within 6 contacts

Spring return and spring / manual return: within 3 contacts

With transformer

Maintained: within 4 contacts

Spring return and spring / manual return: within 2 contacts

#### **Pilot lights**

Bezel	Lens	Туре		
		DR22	DR30	
Round bezel	Dome	DR22D0L	DR30D0L	
	Extended round	DR22E3L	DR30E3L	
	Faceted	DR22K0L	DR30K0L	
Square bezel	Flush square	DR22F3M	_	
	Flush square (Transparent lens)	DR22F4M	DR30F4M	
	Flush square (12mm high frame)	DR22F5M	-	
	Extended square	DR22E3M	_	
	Flush rectangular	DR22E3N	_	
	Flush rectangular (Transparent lens)	_	DR30F4N	
	Flush square large type (Transparent lens)	_	DR30M4M	
	Extended round	DR22E3P	-	
Certificate No.		2003010305063383	2003010305063487	

Notes: • Certified lamp: both LED and incandescent lamp

• Certified transformer type: standard and short-body

• Except for with resistor/resistor unit

#### Item with degree of protection IP2X (IP20)

Туре	Certificate No.
AR22 □ZB	2003010305063372
AR30 □ZB	2003010305063384
DR22□ZB	2003010305063383
DR30□ZB	2003010305063487

Notes: • Certified for all types listed on the table in page 04/289 to 04/291 except for unibody push-lock, turn-reset (40mm dia.) types of emergency stop illuminated pushbutton switches and short-body transformer of pilot light

 The terminal section of standard emergency stop illuminated pushbutton switches has degree of protection, IP2X.

## **Command Series CCC** approved

#### • AH164, 165, 165-2 series

#### **Pushbutton switches**

Operator	Туре					
	AH164		AH165		AH165-2	
	Momentary action	Alternate action	Momentary action	Alternate action	Momentary action	Alternate action
				(Turn-reset		(Turn-reset
				for V, V1)		for 2V, 2YV)
Flush round head	_	_	_	_	AH165-2F	AH165-2F5
Extended round head	AH164-E	AH164-E5	AH165-E	AH165-E5	AH165-2E	AH165-2E5
Extended square head	_	_	_	_	AH165-2SE	AH165-2SE5
Extended square concave head	_	_	_	_	AH165-2SCE	AH165-2SCE5
Flush square head	AH164-SF	AH164-SF5	AH165-SF	AH165-SF5	AH165-2SF	AH165-2SF5
Flush rectangular head	AH164-TF	AH164-TF5	AH165-TF	AH165-TF5	_	_
Flush square head with guard	AH164-SGF	AH164-SGF5	AH165-SGF	AH165-SGF5	_	_
Flush rectangular head	AH164-TGF	AH164-TGF5	AH165-TGF	AH165-TGF5	-	_
with guard						
Mushroom head (round bezel)	_	_	_	_	AH165-2M	_
Mushroom head (square bezel)	_	_	_	_	AH165-2YM	_
Mushroom head	AH164-M	AH164-M5	AH165-M	AH165-M5	_	_
Convex square head	AH164-SM	AH164-SM5	AH165-SM	AH165-SM5	_	_
Convex rectangular head	AH164-TM	AH164-TM5	AH165-TM	AH165-TM5	_	_
Push-locked (round bezel)	_	_	_	AH165-V	_	AH165-2V
Push-locked large type	_	_	_	AH165-V1	_	_
Push-locked (square bezel)	_	_	_	_	-	AH165-2YV
Certificate No.	200301030507106	68				

Notes: • Certified contact: 1NO+1NC, 2NO+2NC, 3NO+3NC. AH165-V and -V1: 1NC and 2NC only.

- Certified button color: all in manufactured range of corresponding type. AH165-V and -V1: red (R) only.
   Certified terminal shape: for soldering and tab, and for wrapping. AH165-V and -V1: soldering and tab only.

#### Ring selection type pushbutton switches

9				
Operator	Туре			
	AH165-2			
With selector ring (round bezel)	AH165-2S2			
With selector ring (square bezel)	AH165-2YS2			
Certificate No.	2003010305071068			

Note: Certified contact: 2NO+2NC

#### **Emergency stop pushbutton switches**

Operator	Туре
	AH165
Push-lock, turn-reset (ø32)	AH165-V5
Push-lock, turn-reset (ø40)	AH165-V6
Certificate No.	2003010305071068

Notes: • Certified contact: 1NC and 2NC only

- Certified button color: red (R) only
- Certified terminal shape: soldering and tab only

#### Illuminated pushbutton switches

Operator	Туре						
	AH164		AH165		AH165-2		
	Momentary action	Alternate action	Momentary action	Alternate action	Momentary action	Alternate action	
						(Turn-reset for	
						2VL, 2YVL)	
Flush round head	-	_	_	_	AH165-2FL	AH165-2FL5	
Extended round head	AH164-L	AH164-L5	AH165-L	AH165-L5	AH165-2EL	AH165-2EL5	
Extended square head	-	_	_	_	AH165-2SEL	AH165-2SEL5	
Concave square head	-	_	_	_	AH165-2SCL	AH165-2SCL5	
Flush square head	AH164-SL	AH164-SL5	AH165-SL	AH165-SL5	AH165-2SFL	AH165-2SFL5	
Flush rectangular head	AH164-TL	AH164-TL5	AH165-TL	AH165-TL5	_	_	
Flush square head with guard	AH164-SGL	AH164-SGL5	AH165-SGL	AH165-SGL5	_	_	
Flush rectangular head	AH164-TGL	AH164-TGL5	AH165-TGL	AH165-TGL5	_	_	
with guard							
Mushroom head (round bezel)	-	_	_	_	AH165-2ML	_	
Mushroom head (square bezel)	-	_	_	_	AH165-2YML	_	
Push-locked (round bezel)	_	_	_	_	_	AH165-2VL	
Push-locked (square bezel)	_	_	_	_	_	AH165-2YVL	
Certificate No.	200301030507106		•			•	

Notes: • Certified contact: 1NO+1NC, 2NO+2NC, 3NO+3NC

- Certified terminal shape: for soldering and tab, and for wrapping.
  Certified lamp: LED, incandescent lamp and neon

- Certified operating lamp voltage: 6, 12 and 24V DC (LED)/ 5, 12, 15 and 24V AC/DC (incandescent lamp) / 110, 120, 220 and 240V AC (neon) /110, 220V AC (LED and incandesent lamps with transformer)

  • The spot LED type have not been approved.

#### Selector switches (Standard)

Operator	Type					
	AH164	AH165	AH165-2			
Knob (round bezel)	_	_	AH165-2P			
Knob (rectangular bezel)	AH164-P	AH165-P	_			
Knob (square bezel)	AH164-SP	AH165-SP	AH165-2YP			
Key (round bezel)	_	_	AH165-2J			
Key (rectangular bezel)	AH164-J	AH165-J	_			
Key (square bezel)	AH164-SJ	AH165-SJ	AH165-2YJ			
Key, 45-degree notch	AH164-JK	AH165-JK	_			
(rectangular bezel)						
Certificate No.	2003010305071068		·			

Notes: • Certified contact: 1NO+1NC, 2NO+2NC, 3NO+3NC

• Certified terminal shape: for soldering and tab, and for wrapping

#### Selector switches (Direct opening action)

	y				
Operator	Туре				
Key (rectangular bezel)	AH165-JM2				
Key (round bezel)	AH165-RJM2				
Certificate No	2003010305071068				

Notes: • Certified contact: 1NO+1NC, 2NO+2NC

· Certified position quantity: 2-position only Certified returning method: maintained only.

#### Illuminated selector switches

Operator	Туре
knob (round bezel)	AH165-2PL
Certificate No.	2003010305071068

Notes: • Certified contact: 1NO+1NC, 2NO+2NC

Certified operating lamp voltage: 6, 12 and 24V DC (LED)/ 5, 12, 15 and 24V AC/DC (incandescent lamp)

#### **Pilot lights**

. not ngino						
Lens	Туре					
	AH164	AH165	AH165-2			
Flush round	_	-	AH165-2Z			
Extended round	AH164-Z	AH165-Z	AH165-2ZE			
Extended square	_	-	AH165-2SZE			
Flush square	AH164-ZS	AH165-ZS	AH165-2SZ			
Flush rectangular	AH164-ZT	AH165-ZT	-			
Certificate No.	2003010305071044	•	*			

- Notes: Certified lamp: LED, incandescent lamp and neon
   Certified operating lamp voltage: 6, 12 and 24V DC (LED)/ 5, 12, 15 and 24V AC/DC (incandescent lamp)/
  110, 120, 220 and 240V AC (neon) /110, 220V AC (LED and incandesent lamps with transformer)

  - The spot LED type have not been approved.

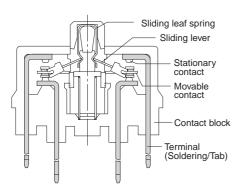
#### **■** Description

AG series Command Switches are designed to be installed in a square or rectangular hole. AG23 series are 25 x 32mm rectangular type while AG22 series are 25mm regular square type. Either of them comprises illuminated pushbutton switch and pilot light. The illuminated pushbutton switches are available either in momentary action or alternative action. Moreover, their light sources are also available in either incandescent lamp or LED lamp. These AG series Command Switches are highly suitable for use with instrumentation panels or control panels. Their contacts use Au-flashed Ag contacts and adopt a sliding mechanism, thus ensuring a high contact reliability. The color inserts for indicators are available up to 4-way split types. Each indicator is provided with 5color inserts and the color you desire can be easily replace.

#### **■** Features

### • Excellent contact reliability

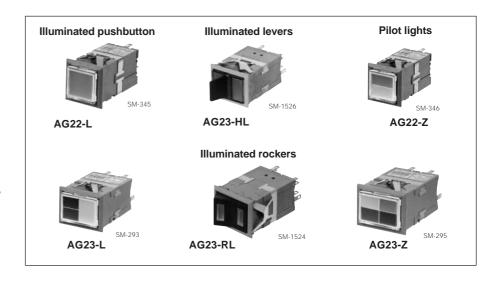
These switches combine Au-flashed Ag contact and sliding mechanism features so as to ensure a high contact reliability even when used with low-voltage, small current circuits of 5V 1mA range. Therefore, they allow direct input to IC's. Moreover, their contacts are a double-break type, thus permitting their application to 240V AC circuits.



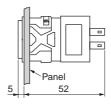
#### Terminals are both use of soldering and tab terminal types

They are subjected to "solder plated" so as to permit accurate soldering.

• Contact can be added or replaced The contact block comprises 1NO and 1NC. In AG23 series the contact arrangement is available up to 4NO+4NC and in AG22 series up to 2NO+2NC.



• Small in depth and compactly built Both AG22 and AG23 series Command Switches are as small as 52mm in depth and their buttons are extruded only 5mm from the panel surface.



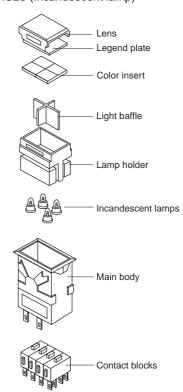
#### The color inserts are available in max. 4-way split

The 4-color inserts can be positioned in any of the four quarters of the total display area. 6 combinations are available.

In these switches with incandescent lamp, their lens colors can be replaced with one from the "colored plate kit" which is provided for illuminated pushbutton switches or pilot lights.

#### **■** Construction

AG23 (Incandescent lamp)



#### ■ Approvals

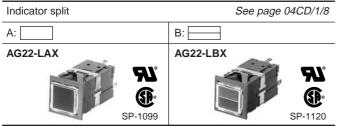
#### **71** @

For further information related to approved type, see page 04CD/1/2 to 04CD/1/3.

## AG22 and AG23 Quick reference guide

#### AG22 series

## ■ Illuminated pushbutton switches Incandescent lamp



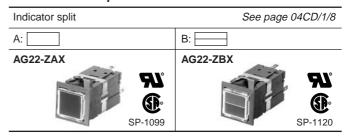
## I FD lamp: Indicators

LLD lamp. mulcators	
Indicator split	See page 04CD/1/9
A:	B:
AG22-LA□3	AG22-LB□3
SP-1101	<b>⊕</b> ° SP-1121

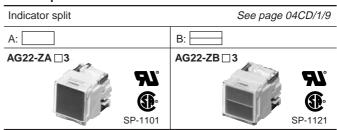
#### **LED lamp: Contact unit**



## ■ Pilot lights Incandescent lamp



#### **LED lamp: Indicators**



#### **LED lamp: Contact socket**





See page 04CD/1/9

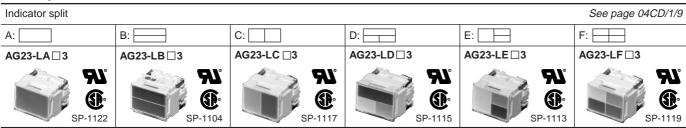


### AG23 series

## ■ Illuminated pushbutton switches Incandescent lamp

Indicator split					See page 04CD/1/8
A:	B:	C:	D:	E:	F:
AG23-LAX	AG23-LBX	AG23-LCX	AG23-LDX	AG23-LEX	AG23-LFX
<b>91°</b> SP-1102	<b>91°</b> SP-1105	<b>91</b> ° SP-1116	<b>9</b> ° (SP-1114	<b>91</b> ° SP-1112	<b>91</b> ° <b>9</b> ° SP-1118

#### **LED lamp: Indicators**



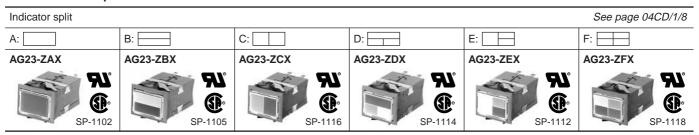
## **LED lamp: Contact unit**

AG23-L□ See page 04CD/1/9

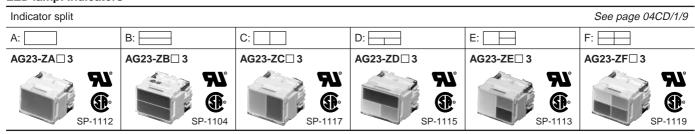




## ■ Pilot lights Incandescent lamp



#### **LED lamp: Indicators**



### **LED lamp: Socket**

**AG23-Z6** See page 04CD/1/9





### ■ Illuminated lever switches

2-position	3-position	See page 04CD/1/10
Mainteined, Spring return	Spring/manual return	
AG23-HL□	AG23-HL□	
SP-1108	SP-1108	

#### ■ Illuminated rocker switches

2-position	3-position	See page 04CD/1/11
Mainteined, Spring return	Spring/manual return	
AG23-RL□	AG23-RL□	
SP-1107	SP-1107	

#### AG22 and AG23

## Type number nomenclature

#### ■ Type number nomenclature

#### Illuminated pushbutton switch (Incandescent lamp) AG 23-L 5 A X 1 Basic type Mounting hole dimensions 22: 23.5 × 22.5mm 23: $23.5 \times 30.5 mm$ Operation Illuminated pushbutton/Momentary action L5: Illuminated pushbutton/Alternate action' Indicator split C: 🗆 A: 🗆 В: ⊟ E: ⊞ (C, D, E, F: for AG23 only) Color insert kits (See page 04CD/1/8) X: Provided Contact arrangement 1: 1NO+1NC, 3: 3NO+3NC (AG23 series only) 2: 2NO+2NC, 4: 4NO+4NC (AG23 series only) Lamp voltage A: 5 V AC/DC B: 12 V AC/DC C: 15 V AC/DC E: 24 V AC/DC Mounting (See page 04CD/1/13)-Blank: Horizontal mounting Vertical mounging Color of flange Blank: Grey (standard) B: Black • Illuminated pushbutton switch (LED lamp) 1 2 3 4 Indicator **AG 23−L AE3−□□□**□ Basic type Mounting hole dimensions 22: 23.5 × 22.5mm 23: 23.5 × 30.5mm Illuminated unit Indicator split A: □ D: □ В: ⊟ C· III E: 🖽 F: ⊞ (C, D, E, F: for AG23 only) Lamp voltage E3: 24 V DC Color insert sequence Replace the $\square$ (1, 2, 3, 4) by color code depending on the type of split patterns. G: Green, R: Red, W: White, O: Orange, Y: Yellow 1 2 4 3 1 2 3 1 2 3 2 D Ε **Contact unit** AG 23-L 5 1-□ Basic type Mounting hole dimensions 22: 23.5 × 22.5mm 23: 23.5 × 30.5mm Operation Illuminated pushbutton/Momentary action L5: Illuminated pushbutton/Alternate action Contact arrangement 1: 1NO+1NC, 3: 3NO+3NC (AG23 series only) 2: 2NO+2NC, 4: 4NO+4NC (AG23 series only) Mounting (See page 04CD/1/13) Blank: Horizontal mounting Vertical mounging Color of flange

#### Pilot light (Incandescent lamp)

	AG 23 - Z A X E-□ □
Basic type —	
Mounting hole dimensions  22: 23.5 × 22.5mm  23: 23.5 × 30.5mm	
Pilot light —	
$ \begin{array}{c cccc} \textbf{Indicator split} & & & \\ A: & & B: & & C: & \\ D: & & E: & & F: & \\ (C, D, E, F: \text{for AG23 only}) & & & \end{array} $	
Color insert kits (See page 04CD/1/8) — X: Provided	
Lamp voltage —	
A: 5 V AC/DC B: 12 V AC/DC C: 15	V AC/DC E: 24 V AC/DC
Mounting (See page 04CD/1/13)  Blank : Horizontal mounting T: Vertical mounging	
Color of flange  Blank : Grey (standard)  B : Black	

Pilot light (LED lamp)
 Indicator

Indicator					1 2	3 4
	AG	23-Z	ΑE	3 -	$_{\perp}$	ШЦ
Basic type —						
Mounting hole dimensions 22: 23.5 × 22.5mm 23: 23.5 × 30.5mm						
Pilot light —						
Indicator split						
Lamp voltage ————————————————————————————————————				J		
Color insert sequence ———————————————————————————————————	deper	nding on t	he tvn	e of sp	lit	

4

AG 23 - Z 6 - □ □

Replace the  $\square$  (1, 2, 3, 4) by color code depending on the type of spl patterns.

1 1 2 1 3 2 1 3 4 3 A B C D E F

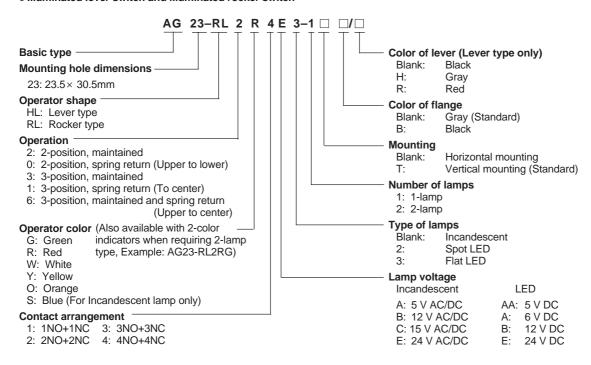
Socket

Basic type —	
Wounting hole dimensions 22: 23.5 × 22.5mm 23: 23.5 × 30.5mm	J
Pilot light ————————————————————————————————————	
Socket ————————————————————————————————————	
Mounting  Blank : Horizontal mounting T : Vertical mounging	
Color of flange Blank : Grey (standard) B : Black	

Notes: \*When the button is depressed the contacts are maintained and remain so even if the finger is removed. The button will not return to its free position. In order to remove the lock, the button must be given a second pressure before the button will return to its free position.

Blank: Grey (standard)
B: Black

#### • Illuminated lever switch and illuminated rocker switch



## Illuminated Switches/Pilot Lights

## AG22 and AG23

## **Ratings and specifications**

#### **■** Standards approved

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479

#### ■ Specifications (Indoor use)

Item		Illuminated pushbutton switch	Illuminated lever switch Illuminated rocker switch	Pilot light		
Rated insulation	voltage	250V AC/DC	•			
Ambient temperature (no condensation or no icing)		-5 to +40°C				
Humidity		45 to 85%RH (at –5 to +40°C), no condensation or no icing				
Durability (operations)	Mechanical	1NO+1NC, 2NO+2NC Momentary action: 1 million Alternate action: 250,000 3NO+3NC*, 4NO+4NC*: 100,000	100,000	_		
	Electrical	100,000 (220V AC 0.7A)		_		
Dielectric streng	th	2000V AC, 1 minute (Between lamp and contact terminals:	1500V AC, 1 minute)			
Pollution degree	)	3				
Vibration		Resonance: 10 to 55Hz, double amplitude 0.1mm Constant: 16.7Hz, double amplitude 3mm				
Shock		Malfunction durability: 100m/s² Mechanical durability: 500m/s²	Mechanical durability: 500m/s²			
Insulation resista	ance	100MΩ or more (500V DC megger)				
Degree of protect	ction	IP40				

Notes: \* AG23 type only.

#### **■** Contact ratings

#### UL/CSA standards

Rated thermal	operational	Maximum current		
current		AC (Res. load)	DC (Res. load)	
5A	24V	_	1.0A	
	125V	_	0.2A	
	250V	5.0A	_	

#### • NECA C 4521 standards

Rated thermal current	Rated operational voltage	Rated operation	Rated operational current				
		AC 15 (Ind. load)	AC 13 (Ind. load)	AC 12 (Res. load)	DC 13* (Ind. load)	DC 12 (Res. load)	
5A	24V 110V 220V	- 0.3A 0.3A	1.0A 0.7A	_ 1.5A 1.0A	0.7A _ 0.15A	1.0A _ 0.2A	

Notes: \* T<sub>0.95</sub> = 21ms

## ■ Contact reliability

FUJI has confirmed that the unit can be used in 1mA circuit conditions at 5V AC or DC. The operable range may vary depending on the ambient conditions and type of load.

## ■ Power consumption • AG22, 23

Operating	LED Lamp [w/spli	t]					Incandescent
Voltage (V)	Illuminated pushb	utton switch, pilot li	ght	Lever switch, rocker switch		lamp [W/1-lamp]	
	0-split	2-split	3-split	4-split	1-lamp	2-lamp	
5	-	-	-	-	0.04*1	0.04*1	0.45
6	-	-	-	-	0.05*2	0.05* <sup>2</sup> 0.05* <sup>2</sup>	_
12	-	-	-	-	0.09	0.09	0.55
24	0.36	0.36 0.36 0.36	0.36       0.36       0.36       0.36       0.36	0.36 0.36 0.36 0.36	0.17	0.17	0.55

<sup>\*1</sup> Yellow: 0.14w/split

<sup>\*2</sup> Yellow: 0.17w/split

#### ■ Illuminated pushbutton switches (Incandescent lamp) Momentary action

Description	Color	1NO+1NC *1 *2 *3	2NO+2NC *1 *2 *3
	split	Type	Туре
	Α 🗌	AG22-LAX1 <b>■</b> -()□	AG22-LAX2 <b>■</b> -()□
	В	AG22-LBX1 <b>■</b> -()□	AG22-LBX2 <b>■</b> -()□
	Α	AG23-LAX1 <b>■-(</b> )□	AG23-LAX2 <b>■</b> -( ) □
AG22-L SM-346	В	AG23-LBX1 <b>■</b> -()□	AG23-LBX2 <b>■</b> -( ) □
200	С	AG23-LCX1 <b>■-(</b> )□	AG23-LCX2 <b>■</b> -( ) □
	D $\square$	AG23-LDX1 <b>■-(</b> )□	AG23-LDX2 <b>■</b> -( ) □
-	E $\square$	AG23-LEX1 <b>■</b> -( ) □	AG23-LEX2 <b>■</b> -( ) □
AG23-L SM-293	F $\blacksquare$	AG23-LFX1 <b>■</b> -( ) □	AG23-LFX2 <b>■</b> -( ) □

#### Alternate action

Description	Color insert split	1NO+1NC *1 *2 *3	2NO+2NC *1 *2 *3 Type
	Split	туре	Туре
	Α 🗌	AG22-L5AX1 <b>■</b> -()□	AG22-L5AX2 <b>■-(</b> )□
1	В	AG22-L5BX1 <b>■</b> -()□	AG22-L5BX2 <b>■-(</b> )□
	Α 🔙	AG23-L5AX1 <b>■</b> -()□	AG23-L5AX2 <b>■-(</b> )□
AG22-L5	В	AG23-L5BX1 <b>■</b> -( ) □	AG23-L5BX2 <b>■</b> -( ) □
and the same of th	С	AG23-L5CX1 <b>■</b> -()□	AG23-L5CX2 <b>■</b> -( ) □
	D $\square$	AG23-L5DX1 <b>■</b> -()□	AG23-L5DX2 <b>■</b> -( ) □
1	Е	AG23-L5EX1 <b>■</b> -( ) □	AG23-L5EX2 <b>■-(</b> ) □
AG23-I 5	F 🖽	AG23-L5FX1 <b>■</b> -( ) □	AG23-L5FX2 <b>■</b> -( ) □

### ■ Pilot lights (Incandescent lamp)

Description	Color insert split	1NO+1NC *1 *2 *3 Type
	Α 🗌	AG22-ZAX <b>■</b> -()□
	В	AG22-ZBX <b>■</b> -()□
	Α 🔲	AG23-ZAX <b>■</b> -()□
AG22-Z	В	AG23-ZBX■-()□
W. F.	С	AG23-ZCX■-()□
	D $\square$	AG23-ZDX■-()□
	E $\square$	AG23-ZEX <b>■</b> -()□
AG23-Z	F $\blacksquare$	AG23-ZFX■-()□

#### Notes:

Replace the ■ mark by the lamp voltage code A: 5V AC/DC

B: 12V AC/DC C: 15V AC/DC E: 24V AC/DC

Replace the ( ) mark by the mounting angle code Blank: Horizontal mounting

Vertical mounting

Replace the  $\square$  mark by the flange color code

Blank: Gray (Standard) B: Black

For AG23 type illuminated pushbutton switch, 3NO+3NC and 4NO+4NC are also available.

#### **■** Color insert kits

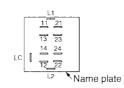
Illuminated pushbutton switches and pilot lights with an incandescent lamp comprise the following number of green, red, white, orange and blue inserts, legend plates and light baffle plates.

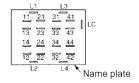
Color		Color insert			Light baffle			Legend		
	sert	Full	На	alf	Quarter	На	alf	Qua	arter	plate
sp	olit									
Α		5	_	_	_	-	_	-	-	1
В		_	5	_	_	1	_	ı	ı	1
С		_	_	5	_	ı	1	١	ı	1
D		_	5	_	5	1	_	ı	1	1
Е		_	_	5	5	ı	1	1	ı	1
F		_	_	_	10	1	_	-	2	1

#### ■ Wiring diagrams AG22 (2NO+2NC)

### • Terminal arrangement

AG23 (4NO+4NC) Terminal arrangement

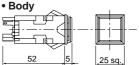




View from terminal side

#### **■** Dimensions, mm



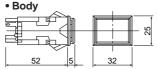


## • Barrier

Center barrier AGX008-C



AG23



#### Barrier

Long center barrier AGX003-LC



Long end barrier



Short center barrier AGX003-SC



Short end barrier AGX003-SE



### ■ Illuminated pushbutton switches (LED lamp)

#### Indicators

Description	Color insert split	Type*1 *2
	Α 🗌	AG22-LA■-△
	В	AG22-LB≣-△△
	Α 🗌	AG23-LA≣-∆
AG22-L SK-1016	В	AG23-LB■-△△
Acres	С	AG23-LC≣-△△
1	D $\square$	AG23-LD■-△△△
	E $\square$	AG23-LE≣-△△△
AG23-L	F $\blacksquare$	AG23-LF≣-△△△△

#### Contact unit

Description	Contact	Momentary action Type*3 *4	Alternate actionn Type*3*4
ART	1NO+1NC	AG22-L1-( )□	AG22-L51-( )□
	2NO+2NC	AG22-L2-( )□	AG22-L52-( )□
<b>AG22-L</b> SM-347	1NO+1NC	AG23-L1-( )□	AG23-L51-( )□
AT	2NO+2NC	AG23-L2-( )□	AG23-L52-( )□
1 1	3NO+3NC	AG23-L3-( )□	AG23-L53-( )□
AG23-L	4NO+4NC	AG23-L4-( )□	AG23-L54-( )□

## ■ Pilot lights (LED lamp)

<ul> <li>Indicators</li> </ul>		
Description	Color insert split	Type*1 *2
A T	Α 🗌	AG22-ZA≣-△
	В	AG22-ZB≣-△△
	Α 🗌	AG23-ZA≣-△
<b>AG22-Z</b> SM-349	В	AG23-ZB≣-△△
	С	AG23-ZC≣-△△
	D 🗔	AG23-ZD≣-△△△
	E 🖽	AG23-ZE≣-△△△
<b>AG23-Z</b> SM-304	F $\blacksquare$	AG23-ZF■-△△△△

#### Notes:

- \*1 Replace the mark by the lamp voltage code. E3: 24V DC
- Replace the  $\triangle$  mark by color code depending on the type of split patterns.
  - G: Green, R: Red, W: White, O: Orange, Y: Yellow (For color insert sequence, see page 04CD/1/4)
- Replace the () mark by the mounting code. Blank: Horizontal mounting T: Vertical mounting
- \*4 Replace the  $\square$  mark by the flange color code. Blank: Gray, B: Blank

## **■** Ordering information

#### Example

#### • Indicator

AG23 series AG23						
Illuminated pushbutton						
4-way split color insert F						
LED lamp 24V DC (Anode common) E3						
Color sequence 1: Green 2: Red						
	4: Orange	3: White				

Type number	AG23-LFE3-GRWO

#### Contact unit

Momentary action	L
Contact block 2NO+2NC	
Horizontal mounting	Blank
Color of flange Gray	Blank
Type number	ΔG23-I 2

#### Sockets

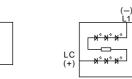
Description	Type code*3 *4
AG22-Z6	AG22-Z6-( )□
	AG23-Z6-( )□
AG23-Z6 SM-298	

## ■ Wiring diagrams (Lamp circuit)

#### AG22

#### Incandescent lamp LED lamp

Full face





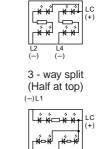




Full face

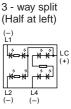


Full face



2 - way

Vertical split



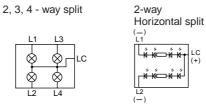
4 - way split



View from terminal side

2-way





• Incandescent lamp 
● LED lamp (24V)

#### ■ Illuminated lever switches/Incandescent lamps

Description	Contact block	No. of lamp	Operation	2-position Type*	3-position Type*
Incandescent lamp	1NO+1NC	1 2	Maintained	AG23-HL2△1■-1( )□/▲ AG23-HL2△1■-2( )□/▲	_
	2NO+2NC	1 2		AG23-HL2△2■-1( )□/▲ AG23-HL2△2■-2( )□/▲	AG23-HL3∆2■-1( )□/▲ AG23-HL3∆2■-2( )□/▲
ani.	3NO+3NC	1 2		AG23-HL2△3■-1( )□/▲ AG23-HL2△3■-2( )□/▲	AG23-HL3∆3■-1( )□/▲ AG23-HL3∆3■-2( )□/▲
SP-1108	1NO+1NC	1 2	Spring return	AG23-HL0△1■-1( )□/▲ AG23-HL0△1■-2( )□/▲	_
	2NO+2NC	1 2		AG23-HL0△2■-1( )□/▲ AG23-HL0△2■-2( )□/▲	AG23-HL1△2■-1( )□/▲ AG23-HL1△2■-2( )□/▲
	3NO+3NC	1 2		AG23-HL0△3■-1( )□/▲ AG23-HL0△3■-2( )□/▲	AG23-HL1∆3■-1( )□/▲ AG23-HL1∆3■-2( )□/▲
	2NO+2NC	1 2	Spring/ manual	_	AG23-HL6∆2■-1( )□/▲ AG23-HL6∆2■-2( )□/▲
	3NO+3NC	1 2	return	_	AG23-HL6△3■-1( )□/▲ AG23-HL6△3■-2( )□/▲

#### ■ Illuminated lever switches/LED lamps

Description	Contact block	No. of lamp	Operation	2-position Type*	<b>3-</b> position Type*
Spot LED	1NO+1NC	1 2	Maintained	AG23-HL2△1■2-1( )□/▲ AG23-HL2△1■2-2( )□/▲	Ξ
	2NO+2NC	1 2		AG23-HL2△2■2-1( )□/▲ AG23-HL2△2■2-2( )□/▲	AG23-HL3∆2■2-1( )□/▲ AG23-HL3∆2■2-2( )□/▲
	3NO+3NC	1 2		AG23-HL2△3■2-1( )□/▲ AG23-HL2△3■2-2( )□/▲	AG23-HL3∆3■2-1( )□/▲ AG23-HL3∆3■2-2( )□/▲
	1NO+1NC	1 2	Spring return	AG23-HL0△1■2-1( )□/▲ AG23-HL0△1■2-2( )□/▲	_
	2NO+2NC	1 2		AG23-HL0∆2■2-1( )□/▲ AG23-HL0∆2■2-2( )□/▲	AG23-HL1∆2■2-1( )□/▲ AG23-HL1∆2■2-2( )□/▲
KK04-047A	3NO+3NC	1 2		AG23-HL0△3■2-1( )□/▲ AG23-HL0△3■2-2( )□/▲	AG23-HL1∆3■2-1( )□/▲ AG23-HL1∆3■2-2( )□/▲
	2NO+2NC	1 2	Spring/ manual	_	AG23-HL6∆2■2-1( )□/▲ AG23-HL6∆2■2-2( )□/▲
	3NO+3NC	1 2	return	_	AG23-HL6∆3■2-1( )□/▲ AG23-HL6∆3■2-2( )□/▲
Flat LED	1NO+1NC	1 2	Maintained	AG23-HL2△1■3-1( )□/▲ AG23-HL2△1■3-2( )□/▲	_
	2NO+2NC	1 2		AG23-HL2∆2■3-1( )□/▲ AG23-HL2∆2■3-2( )□/▲	AG23-HL3∆2■3-1( )□/▲ AG23-HL3∆2■3-2( )□/▲
	3NO+3NC	1 2		AG23-HL2△3■3-1( )□/▲ AG23-HL2△3■3-2( )□/▲	AG23-HL3∆3■3-1( )□/▲ AG23-HL3∆3■3-2( )□/▲
D. P.	1NO+1NC	1 2	Spring return	AG23-HL0△1■3-1( )□/▲ AG23-HL0△1■3-2( )□/▲	Ξ
	2NO+2NC	1 2		AG23-HL0∆2■3-1( )□/▲ AG23-HL0∆2■3-2( )□/▲	AG23-HL1∆2■3-1( )□/▲ AG23-HL1∆2■3-2( )□/▲
SP-1108	3NO+3NC	1 2		AG23-HL0△3■3-1( )□/▲ AG23-HL0△3■3-2( )□/▲	AG23-HL1∆3■3-1( )□/▲ AG23-HL1∆3■3-2( )□/▲
	2NO+2NC	1 2	Spring/ manual	_	AG23-HL6∆2■3-1( )□/▲ AG23-HL6∆2■3-2( )□/▲
	3NO+3NC	1 2	return	_	AG23-HL6∆3■3-1( )□/▲ AG23-HL6∆3■3-2( )□/▲

- \* Replace the △ mark by the lamp color codes.
  G: Green R: Red W: White Y: Yellow O: Orange
  S: Blue (Incandescent Lamp only)
   Replace the mark by the lamp voltage codes
  Incandescent A: 5V AC/DC B: 12V AC/DC C: 15V AC/DC E: 24V AC/DC
  LED AA: 5V DC A: 6V DC B: 12V DC E: 24V DC
- Replace the ( ) mark by the mounting angle code. Blank: Horizontal mounting
  T: Vertical mounting
  Replace the 
  mark by the flange color codes.
- Blank: Gray (Standard) B: Black
- Replace the ▲ mark by the lever color codes. Blank: Black (Standard) H: Gray R: Red

#### ■ Illuminated rocker switches/Incandescent lamps

Description	Contact block	No. of lamp	Operation	2-position Type*	3-position Type*
Incandescent	1NO+1NC	1 2	Maintained	AG23-RL2△1■-1( )□ AG23-RL2△1■-2( )□	_
	2NO+2NC	1 2		AG23-RL2△2■-1( )□ AG23-RL2△2■-2( )□	AG23-RL3∆2 <b>■</b> -1( )□ AG23-RL3∆2 <b>■</b> -2( )□
	3NO+3NC	1 2		AG23-RL2△3■-1( )□ AG23-RL2△3■-2( )□	AG23-RL3△3■-1( )□ AG23-RL3△3■-2( )□
SP-1107	1NO+1NC	1 2	Spring return	AG23-RL0△1■-1( )□ AG23-RL0△1■-2( )□	
	2NO+2NC	1 2		AG23-RL0∆2■-1( )□ AG23-RL0∆2■-2( )□	AG23-RL1∆2 <b>■</b> -1( )□ AG23-RL1∆2 <b>■</b> -2( )□
	3NO+3NC	1 2		AG23-RL0△3■-1( )□ AG23-RL0△3■-2( )□	AG23-RL1△3■-1( )□ AG23-RL1△3■-2( )□
	2NO+2NC	1 2	Spring/ manual	_	AG23-RL6∆2 <b>■</b> -1( )□ AG23-RL6∆2 <b>■</b> -2( )□
	3NO+3NC	1 2	return	_	AG23-RL6△3■-1( )□ AG23-RL6△3■-2( )□

### ■ Illuminated rocker switches/LED lamps

Description	Contact block	No. of lamp	Operation	2-position Type*	3-position Type*
Spot LED	1NO+1NC	1 2	Maintained	AG23-RL2△1■2-1( )□ AG23-RL2△1■2-2( )□	
	2NO+2NC	1 2		AG23-RL2∆2■2-1( )□ AG23-RL2∆2■2-2( )□	AG23-RL3∆2■2-1( )□ AG23-RL3∆2■2-2( )□
	3NO+3NC	1 2		AG23-RL2△3■2-1( )□ AG23-RL2△3■2-2( )□	AG23-RL3△3■2-1( )□ AG23-RL3△3■2-2( )□
	1NO+1NC	1 2	Spring return	AG23-RL0△1■2-1( )□ AG23-RL0△1■2-2( )□	_
	2NO+2NC	1 2		AG23-RL0∆2■2-1( )□ AG23-RL0∆2■2-2( )□	AG23-RL1∆2■2-1( )□ AG23-RL1∆2■2-2( )□
KK04-048A	3NO+3NC 1 2			AG23-RL0△3■2-1( )□ AG23-RL0△3■2-2( )□	AG23-RL1△3■2-1( )□ AG23-RL1△3■2-2( )□
	2NO+2NC	1 2	Spring/ manual return	_	AG23-RL6∆2 <b>■</b> 2-1( )□ AG23-RL6∆2 <b>■</b> 2-2( )□
	3NO+3NC	1 2		_	AG23-RL6△3■2-1( )□ AG23-RL6△3■2-2( )□
Flat LED	1NO+1NC	1 2	Maintained	AG23-RL2△1■3-1( )□ AG23-RL2△1■3-2( )□	_
	2NO+2NC	1 2		AG23-RL2∆2■3-1( )□ AG23-RL2∆2■3-2( )□	AG23-RL3∆2■3-1( )□ AG23-RL3∆2■3-2( )□
23	3NO+3NC	1 2		AG23-RL2△3■3-1( )□ AG23-RL2△3■3-2( )□	AG23-RL3△3■3-1( )□ AG23-RL3△3■3-2( )□
SP-1107	1NO+1NC	1 2	Spring return	AG23-RL0△1■3-1( )□ AG23-RL0△1■3-2( )□	
	2NO+2NC	1 2		AG23-RL0∆2■3-1()□ AG23-RL0∆2■3-2()□	AG23-RL1△2■3-1( )□ AG23-RL1△2■3-2( )□
	3NO+3NC	1 2		AG23-RL0△3■3-1()□ AG23-RL0△3■3-2()□	AG23-RL1△3■3-1( )□ AG23-RL1△3■3-2( )□
	2NO+2NC	1 2	Spring/ manual	_	AG23-RL6∆2■3-1( )□ AG23-RL6∆2■3-2( )□
	3NO+3NC	1 2	return	_	AG23-RL6△3■3-1( )□ AG23-RL6△3■3-2( )□

<sup>Replace the △ mark by the lamp color codes
G: Green R: Red W: White Y: Yellow O: Orange
S: Blue (Incandescent Lamp only)
Replace the ■ mark by the lamp voltage codes
Incandescent A: 5V AC/DC B: 12V AC/DC C: 15V AC/DC E: 24V AC/DC
LED AA: 5V DC A: 6V DC B: 12V DC E: 24V DC</sup> 

<sup>•</sup> Replace the () mark by the mounting angle code

Blank: Horizontal mounting
T: Vertical mounting
Replace the mark by the flange color codes
Blank: Gray (Standard) B: Black

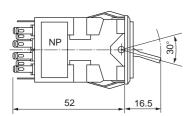
## Illuminated lever Switches/Illuminated rocker Switches

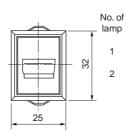
## **AG23**

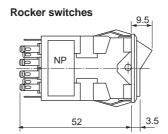
## **Dimensions**

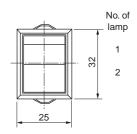
### **■** Dimensions, mm

Lever switches



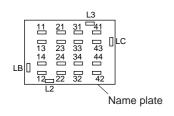






## ■ Wiring diagrams (AG23 4NO+4NC)

#### • Terminal arrangement



## ■ Wiring diagrams (Lamp circuit)

#### Incandescent lamp





## • LED lamp



2 - lamp



#### **■** Contact arrangement

Operator	positon	1NO+1NC	2NO+2NC	3NO+3NC	4NO+4NC
2-position	1 2	1 2	11 1 2 11 1 2 41 1 42 13 14 43 14 44	11 1 2 11 1 2 11 1 2 11 1 2 11 1 2 11 1 2 11 1 2 11 1 1 2 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11 1 2 1 1 2 21 1 2 21 1 2 21 1 2 21 1 32 41 1 2 42 13 1 4 23 1 4 3 3 4 43 4 4
3-position	1 1 2 2 3	_	1 2 3 1 2 3 11 12 41 42 13 14 43 44	1 2 3 1 2 3 1 2 3 11 12 31 32 41 42 13 14 33 34 43 44	1 2 3 1 2 3 1 2 3 11 12 21 22 31 32 41 42 13 14 23 24 33 34 43 44

Note: The operator position shown is where the nameplate-stuck-surface is positioned toward you.

#### Notes on use

## ■ Mounting the Switches (Pilot lights)

Mounting the switches by inserting them into place in the front of the mounting panel. The switches will be held in position by the mounting springs.

#### ■ Panel cutting

#### • AG 22

Description		Mounting design	Panel cutting	Remarks
Flange mounting	Individual mounting (Horizontal)	70 ± 25 ± 0.1	22.5 ± 0.3	Panel cutting space between rows of units
	Manifold mounting (Horizontal)	25n ± 0.5	24.9n-2.4 ± 0.3 (32.5n-10 ± 0.3)	\$ 1
Barrier mounting	Individual mounting (Horizontal)	\$2 \$2 32	27.8 ± 0.3	Panel cutting space between rows of units Dotted line indicates the position of each mounting barrier
	Manifold mounting (Horizontal)	26n+6.5 ± 1	25.9n+1.9 ± 0.3	S S S S S S S S S S S S S S S S S S S

Notes • n: Number of mounted unit Max 10 Panel thickness: 1 to 5 mm (with dust covers: 1 to 4 mm)
• For vertical mounting, contact FUJI
• The dimensions in parentheses are for tandem mounting of switches with dust covers.

#### • AG 23

Description		Mounting design	Panel cutting	Remarks
Flange mounting	Individual mounting (Horizontal)	\(\frac{7}{9}\) \(\frac{1}{9}\) \(\frac{1}9\) \(\frac	₹0 ± 30.5 ± 0.3	
	Manifold mounting (Horizontal)	32n ± 0.5	31.9n-1.5 ± 0.3 (39.5n-9 ± 0.3)	Panel cutting space between rows of units
	Individual mounting (Vertical)	70 + 25 ± 0.1	€ 0 1 9 23.5 ± 0.3	8 1
	Manifold mounting (Vertical)	25n ± 0.5	(32.5n-9 ± 0.3)	
Barrier mounting	Individual mounting (Horizontal)	25 29	% + 36.4 ± 0.3	Panel cutting space between rows of units
	Manifold mounting (Horizontal)	33n+6 ± 1	8 32.8n+3.5 ± 0.3	Dotted line indicates the position of each mounting barrier
	Individual mounting (Vertical)	12 ± 0.3	© 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.3 - Over 6
	Manifold mounting (Vertical)	26n+6 ± 1	© + 1 25.8n+3.5 ± 0.3	11: 71:

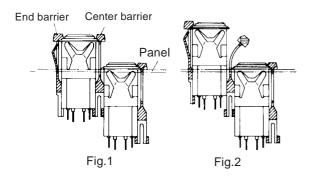
Notes • n: Number of mounted unit Max10 Panel thickness: 1 to 5 mm (with dust covers: 1 to 4 mm)

• The dimensions in parentheses are for tandem mounting of switches with dust covers.

## AG22 and AG23 Notes on use

#### ■ Installing or removing switches

- To install switches in the standard mounting or barrier-isolated single-unit mounting method, insert the switches one at a time from the front of the panel.
- Installing the main bodies of the switches If the mounting panel is vatical, install the switches with their nameplates positioned at the bottom. If the mounting panel is horizontal, install the switches with their nameplates positioned
- If the mounting panel is thin (1 to 2 mm thick), make panel cutouts smaller.



- When the barrier-isolated tandem-mounting method is employed, you can sequentially install switches one by one. For the final one, place a part of the center barrier in the mounting hole beforehand, and then insert the switch into the mounting hole so that the end barrier is in close contact with the main body of the switch (procedure: Fig.2 to Fig.1)
- To remove a switch which has been installed in the standard mounting or barrier-isolated single-uint monting method, push out the switch by pushing it from the back of the panel while holding the panel bay pushing it inward.
- To remove switches which have been installed in the barrierisolated tandem-mounting method, proceed as follows:disengage the rear of the barrier on both sides of the switch to be removed so that the barriers are attached to the switch and, push the switch outward from the back of the panel while holding the front of the mounting panel firm, and take out the switch by opening the barriers by bending them to both sides on the front side of the panel (procedure: Fig.1 to Fig.2)

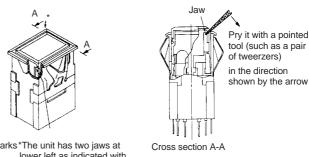
#### ■ Operating voltage and rated voltage of incandescent lamps

Rated voltage	Operating voltage	
6V	4 to 5V	
14V	10 to 12V	
18V	12 to 15V	
28V (Standard)	20 to 24V	

Incandescent lamps should be operated at the operating voltages if a lamp service life of 5,000 to 10,000 hours are needed. The ambient temperature must not exceed 30°C if the lamp is used at the rated voltage continuously.

#### ■ Removing the lighting unit...AG23 (Oblong)

To remove the lighting unit, refer to the illlustraions given in the below. (Especially when removing the unit installed on a panel)



Remarks\*The unit has two jaws at lower left as indicated with the asterisks

(main components only)

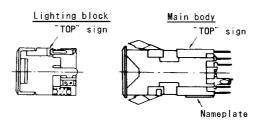
#### ■ Lamp replacement (For illuminated pushbutton and pilot lights)

To replace a lamp, pull out the entire lighting unit and replace the lamp from the back of the lamp holder. Install the lighting unit so that it conforms with the contact end inside the switch main-body. The inserting force must not be

#### ■ Installing the lighting section

greater than 60N.

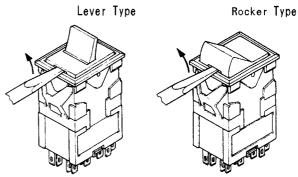
Install the lighting unit aligning the "TOP" display on the lighting uint and switch main-body as shown in the below.



Do not push the internal mechanism of the switch main body while the lamp unit has been removed. Deformation of contact piece for the lamp may result in poor lighting or malfunction.

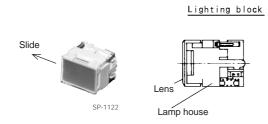
## ■ Replacing the lamp (Lever type or rocker type)

To remove the lamp, remove the lens by using a screwdriver or other pointed tool (see.the illustrations in the below) and then pull out the lamp by using a lamp remover (Type AHX672) .To install the lamp, insert it with your fingers and then put back the



#### ■ Removeing or installing the lens

To remove the lens, slide it horizontally. To install the lens, align it with the lamp house and insert it from the top.



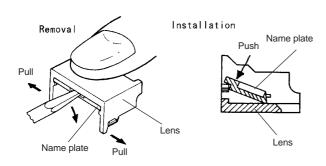
#### ■ Installing the color plate and nameplate

Install the color plate and Nameplate in the lens section with their grained surfaces directed inward.

#### ■ Removeing or installing the nameplate (Lever type)

To remove the nameplate from the lens, press the studs of the lens against a flat plane so that the lens is widened slightly, and insert a screwdriver or other pointed tool into the groove of the nameplate. (See the illustration in the below.)

To install the nameplate into the cover, put the end of thenameplate in the cover and then press the nameplate into the cover by pinching them with your fingers. (See the illustration in the below.)



#### **■** Contact block

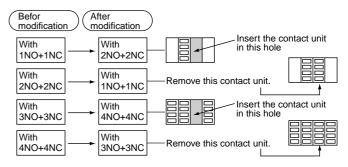
To replace a contact block, use removing tool AGX012. If excessive force is applied when attempting to open the support legs for the contact block holder, deformation or damage may occur.

#### **■** Contacts configuration modifications

Note that there are certain restrictions on contact configureation modifications.

No modifications other than those below are available. Although it is not impossible to modify a switch with 3a3b or 4a4b into that with 2a2b, do not attempt this modification because the layout of the contacts of the former differs from that of the latter.

Caution: never remove any of the contact units or dummy units which are located at both ends. If you do, the main units of the switches may be damaged, may become unable to be installed, or other troubles may result.



#### ■ Wiring connections

• Use a soldering iron with a wattage of not more than 30W and a tip length of more than 20mm.

Use a rosin-core solder

With a 30W iron complete soldering within 5 seconds, or 10 seconds with a 20W iron. Do not apply external force to the terminals. Do not deform the terminals.

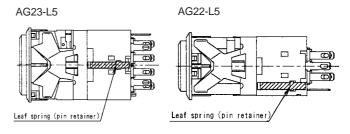
Because lead-free solder's melting point is slightly high, soldering work may be difficult. Use a soldering iron whose tip is rather large or whose calorie is rather high.

- Wires that can be connected
   Two solid wires with a maximum diameter of 0.8mm (solder)
   One stranded wire with a maximum area of 0.75mm² (solder)
- Using contact blocks
   When using NO and NC contacts in the same contact block,
   avoid connection that involves opposite polarity or wiring from
   different types of power supply.
- For wiring to adjacent terminals, use insulated tubing to prevent short-circuit and to assure isolation. For solder terminals, be careful when connecting thick wires. Do not use too much solder.

## ■ Installing lamps in close order

When continuously lighting pilot lights or pressing illuminated pushbuttons installed in close order, care must be taken that the ambient temperature does not exceed the rated value.

#### ■ Alternate types



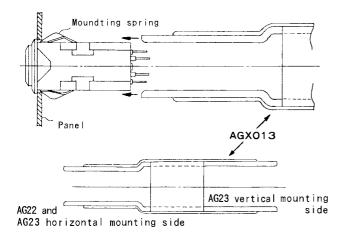
Do not open/close the switch with its leaf spring held pressed.If you do, the alternate mechanism can be damaged.

## Illuminated Switches/Pilot Lights

## AG22 and AG23 Notes on use

#### ■ Dismounting the switch (Main body)

- ① To remove the main body of a rectangular command switch installed on a panel, bend the mounting springs and push them outside of the main body.lf it is densely packed with other devices, use the removeing tool (Type AGX013) for ease of removal.
- ② For how to use the removing tool, see the illustration in the below.Insert the tool from back of the switch (main-body) and then push out the switch.



#### ■ Operation

Do not use a hitting or bouncing action to operate the button, or the switch may break. Always operate the switch by hand.

#### ■ Storage and operating environment

Observe the operating ambient temperature and humidity specifications indicated in the catalog or other related material. Do not use the switches in a location where they are exposed to being splashed with oil or water. The location must not be dusty.

- If it is inevitable that the installed switches will be exposed to dust or metallic particles caused by factory installation work or other tasks, cover the switches with suitable sheets to protect them.
- If using the switches in a dusty atmosphere cannot be avoided protect the switches with dust covers.

#### **■** Accessories

Description	Туре		
Barrier	For AG22	Color	Туре
AM	Center -barrier End-barrier	Black Gray Black Gray	AGX008-CB AGX008-CH AGX008-EB AGX008-EH
SM-337	For AG23 Long center -barrier Long end -barrier Short center -barrier Short end -barrier	Black Gray Black Gray Black Gray Black Gray	AGX003-LCB AGX003-LCH AGX003-LEB AGX003-SCB AGX003-SCH AGX003-SCH AGX003-SEB AGX003-SEH
Bezel  SM-354	For AG22 For AG23	Color Black Gray Black Gray	Type AGX010-2B AGX010-2H AGX010-3B AGX010-3H
Color insert kit	For AG22-L, Z For AG23-L, Z	2-way s	plit AGX019-2B
2		2-way s	plit AGX019-3B AGX019-3C
This kit contains green, red, white, orange and blue color-inserts, legend plates and light baffle plates.  See page 04CD/1/8		3-way s 4-way s	AGX019-3E
Legend plate	For AG22-L, Z	White	Type AGX009-2C AGX009-2W AGX009-3C AGX009-3W
SM-355	*:Standard Dimension (mile 15sq.×1 (AGe) 15×23×1 (AGe)	X009-2)	
Dust-tight cover	Type AGX011-3	Use AG2	d with
SM-1528	AGX011-2	AG2	2-L

Description	Туре
Protection cover	Type
SM-375	For AG22-L For AG23-L AGX007-2 AGX007-3 AGX007-3T  (vertical mounting) The cover portects against accidental operation. The cover lid is returned home with a spring force.  Dimensions (mm)  AGX007-2  AGX007-2  AGX007-3  AGX007-3  AGX007-3  AGX007-3T
	12.5 28.5 19
Panel plug	Color Type For AG22 Black AGX006-2B Gray AGX006-2H For AG23 Black AGX006-3B Gray AGX006-3H
SM-338	
Contact block  KKD06-305	AGX001 Soldering/Tab use
Dummy unit	AGX002
Dummy unit	The dummy unit installs in the part which does not use the contact unit.

## AG22 and AG23 Accessories

Description	Туре					
Lens	Туре					
For AG23-HL	Incandescent, Flat LED	Spot LED	Color	Split		
	AGX034-R	AGX038-R	Red	Two-		
A (	AGX034-G	AGX038-G	Green	way		
~	AGX034-W	AGX038-W	White	split		
A	AGX034-Y	AGX038-Y	Yellow			
,	AGX034-S*1	_	Blue			
	AGX034-O	AGX038-O	Orange			
	AGX034-B <sup>*2</sup>	_	Black			
SP-124	*1 Used with the *2 Used with non illu	incandecent lan minated side of spo	np only ot LED(1-lam	np types)		
Lens	Туре					
For AG23-RL	Incandescent, Flat LED	Spot LED	Color	Split		
•	AGX032-R	_	Red	Full		
	AGX032-G	_	Green	face		
	AGX032-W	_	White			
117 2	AGX032-Y	_	Yellow			
	AGX032-S*1	_	Blue			
	AGX032-O	_	Orange			
	AGX033-R	AGX037-R	Red	Two-		
	AGX033-G	AGX037-G	Green	split		
	AGX033-W	AGX037-W	White			
	AGX033-Y	AGX037-Y	Yellow			
	AGX033-S*1	_	Blue			
	AGX033-O	AGX037-O	Orange			
SP-123	AGX033-B*2	_	Black			
	*1 Used with the incandecent lamp only *2 Used with non illuminated side of spot LED(1-lamp types)					
Legend plate For AG23-HL	AGX036-W					
	Dimension (mm 8.5×16.5×2	)				
SP-115						
Legend plate For AG23-RL	AGX035-W					
SP-116	Dimension (mm 9.5×16×8.5	)				
Remover SM-334, 335	For contact unit AGX012 For body AGX013					
Remover SP-1142	AGX039 This tool is used of illuminated pu			or		

Description	Туре		
Lamp changer For AG23-HL, RL	Type: AHX672		
AF02-117	tool to remove the	tted with a lamp, use this ne lamp. The tool is nen installing a lamp.	
Incandescent lamp	Voltage 6V, 0.6W 14V, 0.7W 18V, 0.7W 28V, 0.7W	Type AHX641 AHX642 AHX612 AHX643	

#### Socket AGX005



AF02-129

Terminal	Туре	Contact arrangement	Used with
Solder/tab	AGX005-S	1a1b	AG22
Wire wrap	AGX005-W	2a2b	
PC board	AGX005-P		
Solder/tab	AGX004-2S	1a1b	AG23
Wire wrap	AGX004-2W	2a2b	
PC board	AGX004-2P		
Solder/tab	AGX004-4S	3a3b	
Wire wrap	AGX004-4W	4a4b	
PC board	AGX004-4P		

For wiring to wire-wrap pin terminals, select appropriate wire sizes and tool from the table below.



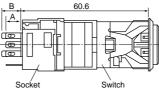
AGX004

Wire size	Bit	Sleeve	Number of effective wraps
0.4mm dia.	3-A	1-B	About 8
0.5mm dia.	1-A	2-B	About 6
(0.65mm dia.)	(2-A)	(2-B)	(About 6)

AF02-130

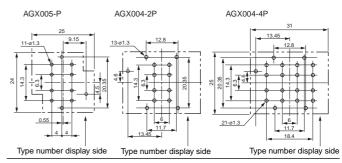
Use ordinary wrapping for connection. Wires of 0.65mm dia. must not be used on adjacent terminals. Howerver, 0.65mm dia. wire can be mixed with 0.4mm and 0.5mm dia. wires.

#### Dimension (mm)



Terminal	Α	В
Solder/tab	7.5	8.8
Wire wrap	18.5	19.8
PC board	3.5	4.8

PC board mounting



#### ■ Mass, gram

Lamp type	Illuminated pushbuttons	1NO + 1NC	2NO + 2NC	3NO + 3NC	4NO + 4NC	Pilot lights		Illuminated rocker and lever switches	1NO + 1NC	2NO + 2NC	3NO + 3NC	4NO + 4NC
Incandescent lamp	AG22-LA, L5A B, L5B	21.5 22.5	22.5 23.5			AG22-ZA B	18.5 19.3	AG23-RL1 AG23-RL2	26 28	27 29	28 30	29 31
	AG23-LA, L5A B, L5B C, L5C D, L5D E, L5E F, L5F	27 29.2 29.2 29.4 29.4 29.5	28 30.2 30.2 30.4 30.4 30.5	29 31.2 31.2 31.4 31.4 31.5	30 32.2 32.2 32.4 32.4 32.5	AG23-ZA B C D E F	23.5 25.7 25.7 25.9 25.9 26	AG23-HL1 AG23-HL2	26 28	27 29	28 30	29 31
LED lamp	*1AG22-LA, L5A B, L5B *2AG23-LA, L5A	21.8 22.2 27.5	22.8 23.2 28.5	_ _ _ 29.5	- - 30.5	*2AG22-ZA B *2AG23-ZA	19 19 24	AG23-RL·2-1 AG23-RL·2-2 AG23-RL·3-1 AG23-RL·3-2	25 27.5 25.5 28	26 28.5 27.2 29	27 29.5 27.5 30	28 30.5 28.5 31
	B, L5B C, L5C D, L5D E, L5E F, L5F	28 28 28.2 28.2 28.3	29 29 29.2 29.2 29.3	30 30 30.2 30.2 30.3	31 31 31.2 31.2 31.3	B C D E F	24.5 24.5 24.7 24.7 24.8	AG23-HL·2-1 AG23-HL·2-2 AG23-HL·3-1 AG23-HL·3-2	25 27.5 25.5 28	26 28.5 26.5 29	27 29.5 27.5 30	28 30.5 28.5 31

L5: Alternate action

\*1 Combined indicators and contact unit.

\*2 Combined indicators and sockets.

The full range of the contact blocks and transformer units suitable for the AR22 and DR22 series may also be fitted to the AM22 and DM22 series.

#### **■** Features

### Quick-replacement contact blocks and transformer units

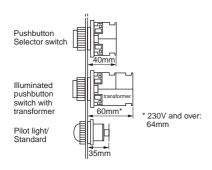
The snap-on construction makes replacement and addition of contact blocks and transformer units very simple and straightforward.

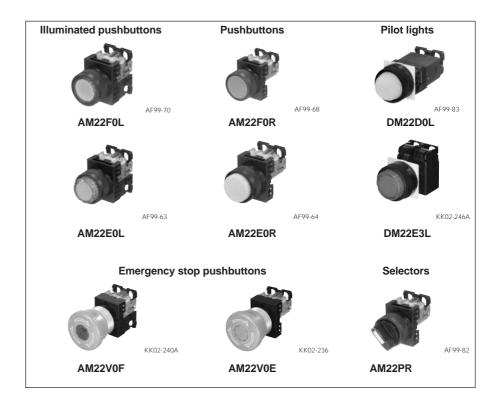
### Oil-and dust-proof operator module construction

The protection level of the AM22/DM22 operator modules conforms to IEC Standard IP65. The special seals protect the operator modules and switch mechanisms against oil, dust, and grime, thus ensuring high performance in dusty and moist environments.

#### Miniaturization

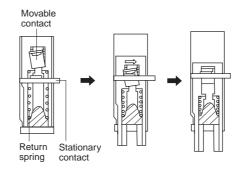
- Pushbutton and selector switches with 1NO+1NC: 40mm deep Pilot lights: 35mm deep
- The transformer now occupies far less space.





#### Self-cleaning contacts

All the contacts are double break type and feature self-cleaning action. Every time the switch is operated, the contact surfaces are wiped with a sliding movement, thus ensuring high contact reliability even at low voltage and small current levels (5V, 5mA).



### Metal nut

Safer model with metal nut is also available



#### Wiring

- Wiring from two directions is possible.
- Wiring in both vertical and lateral directions facilitates wiring in narrow spaces.
- Color coding of contact blocks makes wiring easy.
   1NO: Blue, 1NC: Red Lamp terminal and transformer unit: Black

#### Safety

- A terminal cover is provided, assuring safety and security.
- FUJI's original Trigger Action mechanism is used in the emergency stop pushbuttons. They are suitable for emergency stop and safety. This mechanism prevents the contacts from moving until the button is pushed and locked.

#### **Protection**

- Excellent oil-tight construction (IP65) of the operator.
- Closure of the contact block has been improved.

#### ■ Approvals



For further information related to approved type, see page 04CD/2/2 to 04CD/2/3.

# Pushbuttons/Selectors/Pilot Lights AM22 and DM22 Quick reference guide

#### ■ Illuminated pushbutton switches

Operator	Туре	Operator	Type	Operator	Туре
Flush round head	AM22F0L, F5L	Mushroom head (40mm dia.)	AM22M0L, M5L	Extended with transparent full guard	AM22G4L, G9L
See page 04CD/2/13, 04CD/2/29		See page 04CD/2/13, 04CD/2/29		See page 04CD/2/14, 04CD/2/29	
<b>⊕ ⊕</b> (€ ((((((((((((((((((((((((((((((((((	AF99-70	<b>④ ●</b> <u>△</u> ( € @	AF99-59	<b>④  ⑤</b>	AF99-66
Extended round head	AM22E0L, E5L	Mushroom head	AM22M4L, M9L	Extended with full guard (With openings)	AM22G2L, G7L
See page 04CD/2/13, 04CD/2/29		(29mm dia.)  See page 04CD/2/13, 04CD/2/29		See page 04CD/2/14, 04CD/2/29	
<b>(h) (f)</b>	AF99-63	<b>ⓑ</b> ♠(€@	AF99-61	<b>() () (</b> ((((((((((((((((((((((((((	AF99-69

#### ■ Pushbutton switches

Operator	Туре	Operator	Type	Operator	Type
Flush round head	AM22F0R, F5R	Mushroom head (40mm dia.)	AM22M0R, M5R	Extended with full guard (24mm dia.)	AM22G3R, G8R
See page 04CD/2/15, 04CD/2/30		See page 04CD/2/15, 04CD/2/30		See page 04CD/2/15, 04CD/2/30	
<b>() () (</b> ((((((((((((((((((((((((((	AF99-68	<b>(4) (6) (4) (6) (6) (6) (6) (6) (6) (6) (6) (7)</b>	AF99-58	<b>(€</b> (€ (€ (€ (€ (€ (€ (€ (€ (€ (€ (€ (€ (€	AF99-65
Extended round head	AM22E0R, E5R	Mushroom head (29mm dia.)	AM22M4R	Mushroom head with full guard (40mm dia.)	AM22M3R, M8R
See page 04CD/2/15, 04CD/2/30		See page 04CD/2/15, 04CD/2/30		See page 04CD/2/15, 04CD/2/30	
<b>♠ ♠</b> (€@	AF99-64	<b>(4) (6) (4) (6) (6)</b>	AF99-67	<b>♠ ♠</b> (€ <b>®</b>	AF99-89

#### ■ Emergency stop pushbutton switches (conform to EN418)

Operator	Туре	Operator	Туре	Operator	Type
Push-lock, turn-reset (40mm dia. with white arrow)	AM22V0E	Push-lock, turn-reset (29mm dia. with white arrow)	AM22VSE	Push-lock, turn-reset (40mm dia. with mechanical indicator)	AW22VME
See page 04CD/2/16, 04CD/2/31		See page 04CD/2/16, 04CD/2/31		See page 04CD/2/16, 04CD/2/31	(1) To
<b>ⓑ ⓒ ⓒ ⓒ</b>	KK02-236A	<b>(4) (6) (4) (6) (6) (6) (6) (6) (6) (7)</b>	KK02-237A	<b>ⓑ ₤</b> (€	KKD07-0

Note (C): See page 04CD/2/50

#### ■ Emergency stop illuminated pushbutton switches (conform to EN418)

Operator	Туре	Operator	Туре	Operator	Туре
Push-lock, turn-reset (40mm dia. with white arrow)	AM22V0F	Push-lock, turn-reset (29mm dia. with white arrow)	AM22VSF	Push-lock, turn-reset (40mm dia. transparent in all colors with white arrow)	AM22VDF
See page 04CD/2/17, 04CD/2/32		See page 04CD/2/17, 04CD/2/32		See page 04CD/2/17, 04CD/2/32	
<b>(h) (f)</b>	KK02-339A	<b>( ( ( ( ( ( ( ( ( (</b>	KK02-241A	<b>④ ⊕</b> ≜(€@	KK02-243A

Note: Provided with the (Direct opening action)

#### ■ Selector switches

Operator	Туре	Operator	Туре	Operator	Туре
Knob	AM22PR, PCR	Lever	AM22WR, WCR	Key	AM22JR, JCR
See page 04CD/2/18, 04CD/2/33	AF99-82	See page 04CD/2/18, 04CD/2/33	AF99-76	See page 04CD/2/18, 04CD/2/33 <b>⑤ ⑤ △ C € (®(</b>	KKD09-012

#### ■ Illuminated selector

Operator	Туре
Knob	AM22PL
See page 04CD/2/25, 04CD/2/34	
<b>(h)                                    </b>	AF99-79

■ Pilot lights

Operator	Туре	Operator	Туре	Operator	Туре
Dome	DM22D0L	Extended round	DM22E3L	Faceted	DM22K0L
See page 04CD/2/27, 04CD/2/34 <b>(h) (f) (a) (a) (a)</b>	AF99-88	See page 04CD/2/27, 04CD/2/35 <b>⑤ ⑥ △ C ⓒ ⓒ</b>	AF99-85	See page 04CD/2/27, 04CD/2/35 <b>ⓑ ⓑ △ ( ⓒ ( ⓒ</b>	AF99-87

Notes: With resitor unit type: Not approved standard

(C): See page 04CD/2/50

#### AM22 and DM22

#### Type number nomenclature

#### Illuminated pushbuttons

AM22 E0L − 10 E3 R □ 1 2 3 4 5 6

#### ① Product category

AM22: 22mm-dia. illuminated pushbutton

22mm-dia. emergency stop illuminated pushbutton

#### ② Operator

• Illuminated pushbutton

F0L: Flush round head

F5L: Flush round head (Alternate)

E0L: Extended round head

E5L: Extended round head (Alternate) M0L: Mushroom head (40mm dia.)

M5L: Mushroom head (40mm dia. alternate)

M4L: Mushroom head (29mm dia.)

M9L: Mushroom head (29mm dia. alternate)

G4L: Extended with transparent full guard

G9L: Extended with transparent full guard (Alternate)

G2L: Extended with full guard (With openings)

G7L: Extended with full guard (With openings, alternate)

• Emergency stop illuminated pushbutton

V0F: Push-lock, turn-reset (40mm dia. with white arrow)

VSF: Push-lock, turn-reset (29mm dia. with white arrow)

VDF: Push-lock, turn-reset (40mm dia. transparent in all colors with white arrow)

#### **3 Contact arrangement**

30: 3NO 10: 1NO 03: 3NC 01: 1NC 11: 1NO+1NC 33: 3NO+3NC 20: 2NO 40: 4NO 02: 2NC 04: 4NC 50: 5NO 22: 2NO+2NC 05: 5NC

#### 4 Lamp voltage

Incandescent lamp \*1

54: 5.5V AC/DC, without transformer C4: 15V AC/DC, without transformer D4: 20V AC/DC, without transformer E4: 24V AC/DC, without transformer

H4: 100-110V AC, with transformer L4: 115-127V AC, with transformer

M4: 200-220V AC, with transformer Q4: 230-254V AC, with transformer S4: 350-380V AC, with transformer T4: 400-440V AC, with transformer

V4: 480V AC, with transformer

W4: 500-550V AC, with transformer

• LED lamp

A3: 6V AC, without transformer 63: 6V DC, without transformer \*1

B3: 12V AC/DC, without transformer \*1

C3: 15V AC/DC, without transformer \*1 E3: 24V AC/DC, without transformer

H3: 100-110V AC, with transformer

L3: 115-127V AC, with transformer M3: 200-220V AC, with transformer

Q3: 230-254V AC, with transformer S3: 350-380V AC, with transformer T3: 400-440V AC, with transformer

V3: 480V AC, with transformer W3: 500-550V AC, with transformer

#### ⑤ Color of lens

G: Green Y: Yellow R: Red \*2 A: Orange W: White S: Blue

#### 6 Special product

Z9: Resisting water-soluble cutting oils and heat

Z8: With a contact protection cover

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

ZM: Metal nut

Notes: \*1 Except for emergency stop illuminated pushbutton.

\*2 Button color of emergency stop illuminated switches are Red only.

• The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

#### **Pushbuttons**

 $\begin{array}{c|c} \underline{\mathsf{AM22}} & \underline{\mathsf{E0R}} - \underline{\mathsf{10}} & \underline{\mathsf{R}} & \underline{\square} \\ \hline 0 & 2 & 3 & 4 & 5 \end{array}$ 

#### ① Product category

AM22: 22mm-dia. pushbutton

#### 2 Operator

Pushbutton switch

F0R: Flush round head

F5R: Flush round head (Alternate)

E0R: Extended round head

E5R: Extended round head (Alternate)

M0R: Mushroom head (40mm dia.)

M5R: Mushroom head (40mm dia. alternate)

M4R: Mushroom head (29mm dia.)

G3R: Extended with full guard (24mm dia.)

G8R: Extended with full guard (24mm dia. alternate)

M3R: Mushroom head with full guard (40mm dia.)

M8R: Mushroom head with full guard (40mm dia. alternate)

• Emergency stop pushbutton switch

V0E: Push-lock, turn-reset (40mm dia. with white arrow)

VSE: Push-lock, turn-reset (29mm dia. with white arrow)

VME:Push-lock, turn-reset (40mm dia. with mechanical indicator)

#### **3 Contact arrangement**

10: 1NO 30: 3NO
01: 1NC 03: 3NC
11: 1NO+1NC 33: 3NO+3NC
20: 2NO 40: 4NO
02: 2NC 04: 4NC
22: 2NO+2NC 44: 4NO+4NC
50: 5NO

50: 5NO 05: 5NC

#### **4** Color of button

G: Green Y: Yellow
R: Red\* A: Orange
B: Black S: Blue

W: White

T: Green, Red, Black (For AM22F0R)

#### Special product

- Z9: Resisting water-soluble cutting oils and heat
- Z8: With a contact protection cover
- Z4: Resisting sulfuration gas
- ZB: Meeting IP2X finger-protection standards

ZM: Metal nut

Notes: \* Button color of emergency stop switches are Red only.

 The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

#### AM22 and DM22

#### Type number nomenclature

#### Selector and illuminated selector switches

AM22 PL - 2 □ 10 E3 G □ □ 1 2 3 4 5 6 7 8 9

#### ① Product category

AM22: 22mm dia. selector switch and illuminated selector switch

#### ② Operator

Selector switch

PR: Knob

PCR: Knob operated control type

WR: Lever

WCR: Lever operated control type

JR: Key

JCR: Key operated control type

· Illuminated selector switch

PL: Knob

#### (3) Operation

2-position, maintained

2-position, spring return

3: 3-position, maintained

3-position, spring/manual return (Left to center) 6:

7: 3-position, spring/manual return (Right to center)

3-position, spring return

4-position, maintained (For AM22PCR, WCR)

5-position, maintained (For AM22PCR, WCR)

#### 4 Key removable position

Left

B: Left and right

C: Left, right and center

D: Right

E: Center

Right and center

Left and center

#### **⑤** Contact arrangement

10: 1NO 30: 3NO 01: 1NC 03: 3NC 11: 1NO+1NC 33: 3NO+3NC 40: 4NO 20: 2NO 02: 2NC 04: 4NC 22: 2NO+2NC 44: 4NO+4NC 50: 5NO

Note: Control type: See page 04CD/2/22 to 04CD/2/24

#### 6 Lamp voltage

Incandescent lamp

54: 5.5V AC/DC, without transformer

C4: 15V AC/DC, without transformer D4: 20V AC/DC, without transformer

E4: 24V AC/DC, without transformer

H4: 100-110V AC, with transformer L4: 115-127V AC, with transformer

M4: 200-220V AC, with transformer

Q4: 230-254V AC, with transformer

S4: 350-380V AC, with transformer T4: 400-440V AC, with transformer

V4: 480V AC, with transformer

W4: 500-550V AC, with transformer

LED lamp

A3: 6V AC, without transformer
63: 6V DC, without transformer
B3: 12V AC/DC, without transformer

C3: 15V AC/DC, without transformer E3: 24V AC/DC, without transformer

H3: 100-110V AC, with transformer L3: 115-127V AC, with transformer M3: 200-220V AC, with transformer

Q3: 230-254V AC, with transformer

S3: 350-380V AC, with transformer T3: 400-440V AC, with transformer

V3: 480V AC, with transformer W3: 500-550V AC, with transformer

#### ⑦ Color of knob

B: Black (Not available for illuminated selector switch)

G: Green

R: Red

W: White (Not available for selector switch)

Yellow (Not available for selector switch)

A: Orange (Not available for selector switch)

Blue (Not available for selector switch)

#### 8 Key type No.

A, B, C, D, E or F ("A" is standard)

#### 9 Special product

Z9: Resisting water-soluble cutting oils and heat

Z8: With a contact protection cover

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

ZM: Metal nut

Notes: •The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

#### **Pilot lights**

<u>DM22</u> <u>D0L</u> − <u>E3</u> <u>W</u> <u>□</u> 3 4 5 1 2

① Product category

DM22: 22mm dia. pilot light

2 Lens

D0L: Dome

E3L: Extended round

K0L: Faceted

#### 3 Lamp voltage

Incandescent lamp

54: 5.5V AC/DC, without transformer H8: 100-110V AC/DC, short-body with transformer C4: 15V AC/DC, without transformer D4: 20V AC/DC, without transformer L8: 115-127V AC/DC, short-body with transformer M8: 200-220V AC/DC, short-body with transformer E4: 24V AC/DC, without transformer

H9: 100-110V AC, short-body with transformer L9: 115-127V AC, short-body with transformer M9: 200-220V AC, short-body with transformer

H4: 100-110V AC, with transformer L4: 115-127V AC, with transformer M4: 200-220V AC, with transformer Q4: 230-254V AC, with transformer S4: 350-380V AC, with transformer T4: 400-440V AC, with transformer

V4: 480V AC, with transformer W4: 500-550V AC, with transformer

• LED lamp

A3: 6V AC, without transformer 63: 6V DC, without transformer B3: 12V AC/DC, without transformer C3: 15V AC/DC, without transformer E3: 24V AC/DC, without transformer H3: 100-110V AC, with transformer L3: 115-127V AC, with transformer M3: 200-220V AC, with transformer Q3: 230-254V AC, with transformer S3: 350-380V AC, with transformer T3: 400-440V AC, with transformer V3: 480V AC, with transformer

W3: 500-550V AC, with transformer H7: 110V DC, with resistor unit

#### 4 Color of lens

G: Green Y: Yellow R: Red A: Orange S: Blue W: White

#### ⑤ Special product

Z9: Resisting water-soluble cutting oils and heat

Z4: Resisting sulfuration gas

ZB: Meeting IP2X finger-protection standards

ZM: Metal nut

Notes: • The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

#### AM22 and DM22 **Ratings and specifications**

#### **■** Standards approved

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479
TÜV: EN60947-5-1	Pushbutton, Illuminated pushbutton: R9551062
	Selector, Illuminated selector: R9551060
	Pilot lights: R9551061
TÜV: EN60947-5-1	Emergency stop pushbutton
EN60947-5-5	Emergency stop illuminated pushbutton
	: R50028146

#### ■ Specifications (Indoor use)

Description	Pushbutton switch	Pilot light	
	Illuminated pushbutton switch		
	Emergency stop pushbutton switch		
	Emergency stop illuminated pushbutton switch		
	Selector switch		
	Illuminated selector switch		
Rated insulation voltage	600V AC/DC *1	1	
Mechanical durability	See page 04CD/2/9	_	
Electrical durability	500,000 operations at 220V AC 6A	_	
	1 million operations at 220V AC 3A		
Operating frequency	1200 operations/hour (On-load factor: 40%)	_	
Dielectric strength	2500V AC, 1 minute *2		
Insulation resistance	100MΩ or more (500V DC megger)		
Rated impulse dielectric strength	6kV		
Conditional short-circuit current	1000A	-	
Short-circuit protective device	Fuse 15A	_	
Pollution degree	3		
Vibration	Resonance: 10 to 55Hz, double amplitude 0.1mm *3		
	Constant: 16.7Hz, double amplitude 3mm		
Shock	Malfunction durability: 100m/s <sup>2</sup> * <sup>4</sup>	Mechanical durability:	
	Mechanical durability: 500m/s <sup>2</sup>	500m/s <sup>2</sup>	
Ambient temperature	-10 to +70°C, *5	-10 to +50°C	
(No condensation or no icing)	(Illuminated type: -10 to +50°C *6)		
Storage temperature	-40 to +80°C		
Humidity	45 to 85% RH (within -5 to +40°C)		
Degree of protection	IP65		

Notes: \*1 Illuminated type without transformer: 250V AC/DC

\*2 Illuminated type without transformer: 2000V AC, 1 minute

\*3 Emergency stop type: 10 to 500Hz, double amplitude 0.7mm (acceleration 50m/s²), according to the test condition of EN60947-5-5 (1997)

\*4 Emergency stop type: 150m/s²

\*5 AM22V0E, VSE type: -20 to +60°C

\*6 AM22V0F, VDF, VSF type: -20 to +50°C

#### Mechanical durability

Description		Operations
Pushbutton switch Illuminated pushbutton switch Emergency stop pusubutton switch Emergency stop illuminated pusubutton	Momentary action Alternate action	5 million 1 million 300,000
Selector switch	Maintained 1, 2, 3, 4-contact Maintained 5, 6, 7, 8-contact Control type, spring return, spring/manual return	1 million 500,000 200,000
Illuminated selector switch	Maintained Without transformer 1, 2, 3-contact 4-contact 1, 2-contact 3-contact	1 million 500,000 1 million 500,000
	Spring return, spring/manual return	200,000

Notes: Key insertion/removal durability for selector switch key types 
• Key type 10,000

### AM22 and DM22 Ratings and specifications

### ■ Contact ratings • UL/CSA standards

**AC** (COS Ø=0.35)

Contact rated code	120V		240V		480V		600V	
	Making current	Breaking current						
A600	60A	6.0A	30A	3.0A	15A	1.5A	12A	1.2A

#### **DC** T<sub>0.95</sub>= 6P (Max. 300ms)

Descripton	Contact rated	Making current · Breaking current		
	code	125V	250V	301V-600V
Illuminated pushbutton switch Pushbutton (Except the overlap contact types)	P600	1.1A	0.55A	0.2A
Overlap contact types of products shown above Pushbutton Selector switch (2-position only, except the overlap contact types) Illuminated selector switch (2-position only, except the overlap contact types) Emergency stop pushbutton switch Emergency stop illuminated pushbutton switch	Q600	0.55A	0.27A	0.1A
Selector switch (2-pos./overlap contact type, 3-, 4-, 5-pos. type) Illuminated selector switch (2-pos./overlap contact type, 3-pos. type)	R300	0.22A	0.11A	-

#### • EN standard/TÜV approved

Descripton	Rated operational current				
	Rated thermal	Rated operational	AC15 (Ind. load)	DC13 (Ind. load)	
	current	voltage	Rated operational current	Rated operational current	
Illuminated pushbutton switch	10A	24V	6.0A	4.0A	
Pushbutton		120V	6.0A	-	
Selector switch (2-position)		125V	_	1.3A	
Illuminated selector switch (2-position)		240V	6.0A	-	
		250V	-	0.45A	
		480V	2.5A	_	
		600V	2.0A	_	
Selector switch (3, 4, 5-position)	10A	24V	6.0A	2.0A	
Illuminated selector switch (3-position)		120V	6.0A	_	
Emergency stop pushbutton switch		125V	_	0.65A	
Emergency stop illuminated pushbutton switch		240V	6.0A	_	
		250V	_	0.23A	
		480V	2.5A	-	
		600V	2.0A	-	

#### Lamp rated voltage UL/CSA Standards, TÜV approved

	LED lamp	Incandescent lamp
Full-voltage (without transformer)	Max. 24V AC/DC	Max. 30V AC/DC
With transformer	Max. 550V AC (Short-body type: Max. 220V AC)	

#### ■ Operating characteristic (1NO+1NC)

Description	Pushbutton	Emergency stop pushbutton	Selector *				
	Illuminated pushbutton	Emergency stop illuminated pushbutton	Illuminated se	Illuminated selector			
		Push-lock type	Maintained	Spring/manual return	Spring return		
Ave. required operating force	9N	22N	0.15N•m	0.13N•m	0.1N•m		
Operating travel	Approx. 6mm	Approx. 9mm	2-position: Approx. 90°	3-position: Approx. 45°	2-position: Approx. 60°		
		( Operation angle: Approx. 60°)	3-position: Approx. 45°		3-position: Approx. 45°		
			4-position: Approx. 40°				
			5-position: Approx. 30°				
Required return force	-	0.25N•m	0.15N•m	0.13N•m	_		

Note: \* 4-position, 5-position : 2NO+2NC

### ■ Lamp ratings • Illuminated pushbuttons, illuminated selectors, pilot lights

Transformer	Lamp voltege	LED (lamp bas	se: BA9S/13)		Incandes	cent (lamp base	e: BA9S/13)
		Type	Rated voltage	Consumption	Type	Rated voltage	Consumption
Without	5.5V AC/DC	_	_	-	AHX135	6.3V AC/DC	0.9W
transformer	6V AC	APX510-6□	6V AC	Green, red, orange, amber, blue: 7mA AC	-	_	_
				Yellow: 50mA AC			
	6V DC	APX510-D6□	6V DC	Green, red, orange, amber, blue: 11mA DC	_	_	_
				Yellow: 33mA DC			
	12V AC/DC	APX510-12□	12V AC/DC	Green, red, orange, amber, blue: 14mA AC, 11mA DC	_	_	_
				Yellow: 28mA AC, 22mA DC			
	15V AC/DC	APX510-15□	15V AC/DC	Green, red, orange, amber, blue: 13mA AC, 11mA DC	AHX279	18V AC/DC	0.8W
				Yellow: 26mA AC, 22mA DC			
	20V AC/DC	_	_	_	AHX144	24V AC/DC	0.9W
	24V AC/DC	APX510-24□	24V AC/DC	12mA AC, 11mA DC	AHX129	30V AC/DC	0.8W
With transformer	110V AC	APX510-6□	6V AC	1.5VA	AHX135	6.3V AC/DC	2VA
(Standard type:	127V AC						2VA
AR9T511)	220V AC						2VA
	254V AC	APX510-6□	6V AC	2.5VA	AHX135	6.3V AC/DC	2.5VA
	380V AC						2.5VA
	440V AC						2.5VA
	480V AC						2.5VA
	550V AC						2.5VA
With resistor unit	110V DC	APX510-24□	24V AC/DC	1.2W	_	_	_
(AR9T519-H)							

Notes: • Short body pilot lights: 110V AC, 127V AC, 220V AC only
• Replace the □ mark by the lamp luminous color code, see page 04CD/2/12
• Except AM22V0F, VDF, VSF type

### AM22 and DM22

#### **Ratings and specifications**

#### • Emergency stop illuminated pushbutton swtiches

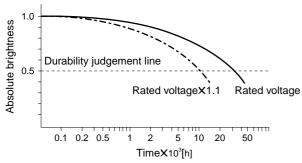
Transformer	Lamp	LED		
	voltage	Туре	Rated	Consumption
			voltage	
Without	6V AC	AR9L001-6R	6V AC	9mA AC
transformer	24V AC/DC	AR9L001-24R	24V AC/DC	15mA AC, 14mA DC
With	110V AC	AR9L001-6R	6V AC	1.5VA
transformer	127V AC			
(Type: AM9T511)	220V AC			
	254V AC			3.0VA
	380V AC			
	440V AC			
	480V AC			
	550V AC			

#### ■ Lamp durability

Lamp	)	Durability (reference)	Judgement criterion
LED			When brightness is less than 50% of initial value
Incar	descent	Approx. 5000h (AC)	When the bulb burns out

Note: • The operating voltage for incandescent lamps is set at 80 to 90% of the lamp's rated voltage.
• The durability of LED lamp is a mean value in all colors.

#### Estimated durability for LED lamps



Notes: • Durability at Ta=25°C

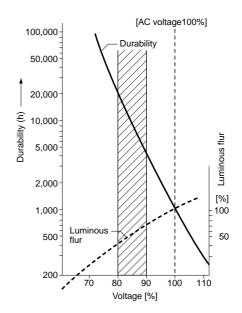
· Durability is affected by temperature, humidity, and voltage fluctuation.

#### ■ Combination of lens color and LED lamp luminous color

Button		LED lamp	
Color	Code	Luminous color	Туре
Green	G	Green	APX510- <b>■</b> G
Red	R	Red	APX510- <b>■</b> R
White	W	Orange	APX510- <b>■</b> O
Yellow	Υ	Yellow	APX510- <b>■</b> Y
Orange	Α	Amber	APX510- ■ A
Blue	S	Blue	APX510-■S
Red	R	Red	AR9L001-■R
(AM22V0F, VDF, VSF)			

Note: Replace the ■ mark by Lamp voltage. See page 04CD/2/11

#### Incandescent lamp voltage characteristics



#### ■ Illuminated pushbutton switches

Operator	Trans- former	Contact	LED lamp Momentary action Type	Alternate action Type	Incandescent lamp Momentary action Type	Alternate action Type
Flush round head	Without	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22F0L-10■3 □ AM22F0L-01■3 □ AM22F0L-11■3 □ AM22F0L-20■3 □ AM22F0L-20■3 □ AM22F0L-22■3 □	AM22F5L-10 ■3 □ AM22F5L-01 ■3 □ AM22F5L-11 ■3 □ AM22F5L-20 ■3 □ AM22F5L-02 ■3 □	AM22F0L-10 ■4 □ AM22F0L-01 ■4 □ AM22F0L-11 ■4 □ AM22F0L-20 ■4 □ AM22F0L-02 ■4 □ AM22F0L-02 ■4 □	AM22F5L-10 ■4□ AM22F5L-01 ■4□ AM22F5L-11 ■4□ AM22F5L-20 ■4□ AM22F5L-02 ■4□
AF99-70	With	1NO 1NC 1NO+1NC 2NO 2NC	AM22F0L-10■3 □ AM22F0L-01■3 □ AM22F0L-11■3 □ AM22F0L-20■3 □ AM22F0L-20■3 □	AM22F5L-10 ■3 □ AM22F5L-01 ■3 □ AM22F5L-11 ■3 □ AM22F5L-20 ■3 □ AM22F5L-02 ■3 □	AM22F0L-10 ■4 □ AM22F0L-01 ■4 □ AM22F0L-11 ■4 □ AM22F0L-20 ■4 □ AM22F0L-20 ■4 □	AM22F5L-10 ■4□ AM22F5L-01 ■4□ AM22F5L-11 ■4□ AM22F5L-20 ■4□ AM22F5L-02 ■4□
Extended round head	Without	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22E0L-10■3 □ AM22E0L-01■3 □ AM22E0L-11■3 □ AM22E0L-20■3 □ AM22E0L-02■3 □ AM22E0L-02■3 □	AM22E5L-10 ■3 □ AM22E5L-01 ■3 □ AM22E5L-11 ■3 □ AM22E5L-20 ■3 □ AM22E5L-02 ■3 □	AM22E0L-10 ■4 □ AM22E0L-01 ■4 □ AM22E0L-11 ■4 □ AM22E0L-20 ■4 □ AM22E0L-02 ■4 □ AM22E0L-22 ■4 □	AM22E5L-10 ■4 □ AM22E5L-01 ■4 □ AM22E5L-11 ■4 □ AM22E5L-20 ■4 □ AM22E5L-02 ■4 □
AF99-63	With	1NO 1NC 1NO+1NC 2NO 2NC	AM22E0L-10■3 □ AM22E0L-01■3 □ AM22E0L-11■3 □ AM22E0L-20■3 □ AM22E0L-20■3 □	AM22E5L-10 ■3 □ AM22E5L-01 ■3 □ AM22E5L-11 ■3 □ AM22E5L-20 ■3 □ AM22E5L-02 ■3 □	AM22E0L-10 ■4 □ AM22E0L-01 ■4 □ AM22E0L-11 ■4 □ AM22E0L-20 ■4 □ AM22E0L-20 ■4 □	AM22E5L-10■4□ AM22E5L-01■4□ AM22E5L-11■4□ AM22E5L-20■4□ AM22E5L-02■4□
Mushroom head (40mm dia.)	Without	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22M0L-10■3 □ AM22M0L-01■3 □ AM22M0L-11■3 □ AM22M0L-20■3 □ AM22M0L-02■3 □ AM22M0L-02■3 □	AM22M5L-10 ■3 □ AM22M5L-01 ■3 □ AM22M5L-11 ■3 □ AM22M5L-20 ■3 □ AM22M5L-02 ■3 □	AM22M0L-10 ■4 □ AM22M0L-01 ■4 □ AM22M0L-11 ■4 □ AM22M0L-20 ■4 □ AM22M0L-02 ■4 □ AM22M0L-22 ■4 □	AM22M5L-10 ■4□ AM22M5L-01 ■4□ AM22M5L-11 ■4□ AM22M5L-20 ■4□ AM22M5L-02 ■4□
AF99-59	With	1NO 1NC 1NO+1NC 2NO 2NC	AM22M0L-10=3	AM22M5L-10 ■3 □ AM22M5L-01 ■3 □ AM22M5L-11 ■3 □ AM22M5L-20 ■3 □ AM22M5L-02 ■3 □	AM22M0L-10 ■4 □ AM22M0L-01 ■4 □ AM22M0L-11 ■4 □ AM22M0L-20 ■4 □ AM22M0L-02 ■4 □	AM22M5L-10 ■4□ AM22M5L-01 ■4□ AM22M5L-11 ■4□ AM22M5L-20 ■4□ AM22M5L-20 ■4□
Mushroom head (29mm dia.)	Without	1NO 1NC 1NO+1NC 2NO 2NC 2NC+2NC	AM22M4L-10=3	AM22M9L-10 ■3 □ AM22M9L-01 ■3 □ AM22M9L-11 ■3 □ AM22M9L-20 ■3 □ AM22M9L-02 ■3 □	AM22M4L-10 ■4 □ AM22M4L-01 ■4 □ AM22M4L-11 ■4 □ AM22M4L-20 ■4 □ AM22M4L-02 ■4 □ AM22M4L-02 ■4 □	AM22M9L-10 ■4 □ AM22M9L-01 ■4 □ AM22M9L-11 ■4 □ AM22M9L-20 ■4 □ AM22M9L-02 ■4 □
AF99-61	With	1NO 1NC 1NO+1NC 2NO 2NC	AM22M4L-10■3 □ AM22M4L-01■3 □ AM22M4L-11■3 □ AM22M4L-20■3 □ AM22M4L-20■3 □	AM22M9L-10 ■3 □ AM22M9L-01 ■3 □ AM22M9L-11 ■3 □ AM22M9L-20 ■3 □ AM22M9L-02 ■3 □	AM22M4L-10 ■4 □ AM22M4L-01 ■4 □ AM22M4L-11 ■4 □ AM22M4L-20 ■4 □ AM22M4L-02 ■4 □	AM22M9L-10 ■4 □ AM22M9L-01 ■4 □ AM22M9L-11 ■4 □ AM22M9L-20 ■4 □ AM22M9L-20 ■4 □

Note: ■ ☐ See page 04CD/2/14

#### ■ Illuminated pushbutton switches

Operator	Trans- former	Contact	LED lamp Momentary action Type	Alternate action Type	Incandescent lamp Momentary action Type	Alternate action Type
Extended with transparent full guard (24mm dia.)	Without	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22G4L-10 3 AM22G4L-01 3 AM22G4L-11 3 AM22G4L-20 3 AM22G4L-02 3 AM22G4L-22 3 AM22G	AM22G9L-10 3 AM22G9L-01 3 AM22G9L-11 3 AM22G9L-20 3 AM22G9L-02 3 AM22G9L-02 3	AM22G4L-10■4 ☐ AM22G4L-01■4 ☐ AM22G4L-11■4 ☐ AM22G4L-20■4 ☐ AM22G4L-02■4 ☐ AM22G4L-22■4 ☐	AM22G9L-10■4 ☐ AM22G9L-01■4 ☐ AM22G9L-11■4 ☐ AM22G9L-20■4 ☐ AM22G9L-02■4 ☐
AF99-66	With	1NO 1NC 1NO+1NC 2NO 2NC	AM22G4L-10 3 AM22G4L-01 3 AM22G4L-11 3 AM22G4L-20 3 AM22G4L-20 3 AM22G4L-02 3	AM22G9L-10 3 AM22G9L-01 3 AM22G9L-11 AM22G9L-20 3 AM22G9L-20 3 AM22G9L-02 3	AM22G4L-10■ 4 ☐ AM22G4L-01■ 4 ☐ AM22G4L-11■ 4 ☐ AM22G4L-20■ 4 ☐ AM22G4L-02■ 4 ☐	AM22G9L-10 4 AM22G9L-01 4 AM22G9L-01 4 AM22G9L-20 4 AM22G9L-02 4 AM22G
Extended with full guard (24mm dia. with openings)	Without	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22G2L-10 3 AM22G2L-10 3 AM22G2L-11 3 AM22G2L-11 3 AM22G2L-20 3 AM22G2L-02 3 AM22G2L-22 3 AM22C2 3	AM22G7L-10■3 ☐ AM22G7L-01■3 ☐ AM22G7L-11■3 ☐ AM22G7L-20■3 ☐ AM22G7L-02■3 ☐	AM22G2L-10■ 4 ☐ AM22G2L-01■ 4 ☐ AM22G2L-11■ 4 ☐ AM22G2L-20■ 4 ☐ AM22G2L-20■ 4 ☐ AM22G2L-22■ 4 ☐	AM22G7L-10 4 AM22G7L-01 4 AM22G7L-11 4 AM22G7L-20 4 AM22G7L-02 4 AM22G
	With	1NO 1NC 1NO+1NC 2NO 2NC	AM22G2L-10 3 AM22G2L-01 3 AM22G2L-11 3 AM22G2L-11 3 AM22G2L-20 3 AM22G2L-02 3 AM22G	AM22G7L-10 3 AM22G7L-01 3 AM22G7L-11 3 AM22G7L-11 3 AM22G7L-20 3 AM22G7L-02	AM22G2L-10■ 4 ☐ AM22G2L-01■ 4 ☐ AM22G2L-11■ 4 ☐ AM22G2L-20■ 4 ☐ AM22G2L-02■ 4 ☐	AM22G7L-10■4 ☐ AM22G7L-01■4 ☐ AM22G7L-11■4 ☐ AM22G7L-20■4 ☐ AM22G7L-02■4 ☐

#### • Lens color

Replace the  $\square$  mark by the lens color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	А

#### • Contact arrangements

Contact arrangements other than above are available

Contact arrangement	1NO	1NC	1NO+	1NC	2NO	2NC		3NO
Code	10	01	11		20	02		30
Contact arrangement	3NC	2NO+2NC	4NO	4NC	5NO	5NC	3N	IO+3NC
Code	03	22	40	04	50	05	33	

#### Available numbers of contact blocks

Operation	Without transformer	With transformer
Momentary action	6-contact block	4-contact block
Alternate action	3-contact block	2-contact block

#### Voltage

Replace the ■ mark by the lamp voltage code

Transformer		Code LED	Incandescent
Without transformer	6V DC 6V AC 5.5V AC/DC 12V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC	6 A B C E	
With transformer	100-110V AC 115-127V AC 200-220V AC 230-254V AC 350-380V AC 400-440V AC 480V AC 500-550V AC	H L M Q S T V	H L M Q S T V

#### ■ Pushbutton switches

Operator	Contact	Momentary action Type	Alternate action Type
Flush round head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22F0R-10   AM22F0R-01   AM22F0R-11   AM22F0R-20   AM22F0R-02   AM22F0R-22	AM22F5R-10 AM22F5R-01 AM22F5R-11 AM22F5R-20 AM22F5R-02 AM22F5R-22
Extended round head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22E0R-10	AM22E5R-10
Mushroom head (40mm dia.)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22M0R-10 AM22M0R-01 AM22M0R-11 AM22M0R-20 AM22M0R-02 AM22M0R-22	AM22M5R-10 AM22M5R-01 AM22M5R-11 AM22M5R-20 AM22M5R-02 AM22M5R-02

	1		
Operator	Contact	Momentary	Alternate
		action	action
		Туре	Type
Mushroom head	1NO	AM22M4R-10□	_
(29mm dia.) _	1NC	AM22M4R-01□	_
200	1NO+1NC	AM22M4R-11□	_
NO P	2NO	AM22M4R-20□	_
	2NC	AM22M4R-02	_
AF99-67	2NO+2NC	AM22M4R-22□	_
Extended with full	1NO	AM22G3R-10□	AM22G8R-10□
guard (24mm dia.)	1NC	AM22G3R-01□	AM22G8R-01□
200	1NO+1NC	AM22G3R-11□	AM22G8R-11□
100	2NO	AM22G3R-20□	AM22G8R-20□
	2NC	AM22G3R-02□	AM22G8R-02□
AF99-65	2NO+2NC	AM22G3R-22□	AM22G8R-22□
Mushroom head with	1NO	AM22M3R-10□	AM22M8R-10□
full guard (40mm dia.)	1NC	AM22M3R-01□	AM22M8R-01□
-Do	1NO+1NC	AM22M3R-11□	AM22M8R-11□
	2NO	AM22M3R-20□	AM22M8R-20□
	2NC	AM22M3R-02□	AM22M8R-02□
AF99-89	2NO+2NC	AM22M3R-22□	AM22M8R-22□

#### • Button color

Replace the  $\square$  mark by the button color code

		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Color	Green	Red	White	Blue	Yellow	Orange	Black
Code	G	R	W	S	Υ	А	В

#### • Available numbers of contact blocks

Momentary action	Alternate action
8-contact block	4-contact block

#### • Contact arrangements

22

Code

Contact arrangements other than above are available

40 04

Contact arrangement		1NC	1NO+1	INC 2	2NO	2NC	3N0	O 3NC	;
Code	10	01	11	2	20	02	30	03	
Contact	2NO+2N	C 4NO	4NC	5NO	5NC	3NO+3	BNC	4NO+4l	NC

50

05 33

44

#### Emergency stop pushbuttons AM22

#### **■** Emergency stop pushbutton switches

 $\bigcirc$  (Direct opening action), conform to EN418

Operator	Contact	Т	у	р	е
Push-lock, turn-reset (40mm dia. with white arrow)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AM AM AM	122V 122V 122V 122V	0E-0 0E-1 0E-0 0E-0 0E-2 0E-0	1R 2R 3R 2R
Push-lock, turn-reset (29mm dia. with white arrow)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AM AM AM	122V 122V 122V 122V	SE-0 SE-1 SE-0 SE-0 SE-2 SE-0	1R 2R 3R 2R
Push-lock, turn-reset (40mm dia. with mechanical indicator)	1NC 1NO+1NC 2NC 3NC 2NO+2NC 4NC	AM AM AM	122V 122V 122V 122V	ME-0 ME-1 ME-0 ME-0 ME-2 ME-0	1R 2R 3R 2R

Notes: • Button color: Red only
• Used with AR9B290-S for NO contact.
• Contact arrangements indicated in the table can be supplied.

#### **■** Emergency stop illuminated pushbutton switches

⊕ (Direct opening action), conform to EN418

Operator	Transformer	Contact	LED lamp Type
Push-lock, turn-reset (40mm dia. with white arrow)	Without	1NC 1NO+1NC 2NC 3NC	AM22V0F-01■3R AM22V0F-11■3R AM22V0F-02■3R AM22V0F-03■3R
KK02-240A	With	1NC 1NO+1NC 2NC	AM22V0F-01■3R AM22V0F-11■3R AM22V0F-02■3R
Push-lock, turn-reset (29mm dia. with white arrow)	Without	1NC 1NO+1NC 2NC 3NC	AM22VSF-01■3R AM22VSF-11■3R AM22VSF-02■3R AM22VSF-03■3R
KK02-241A	With	1NC 1NO+1NC 2NC	AM22VSF-01■3R AM22VSF-11■3R AM22VSF-02■3R
Push-lock, turn-reset (40mm dia. transparent in all colors with white arrow)	Without	1NC 1NO+1NC 2NC 3NC	AM22VDF-01■3R AM22VDF-11■3R AM22VDF-02■3R AM22VDF-03■3R
КК02-243А	With	1NC 1NO+1NC 2NC	AM22VDF-01■3R AM22VDF-11■3R AM22VDF-02■3R

- Notes: Button color: Red only
   Contact arrangements indicated in the table can be supplied.
   Used with AR9B290-S for NO contact.

Replace the ■ mark by the lamp voltage code

Transformer		Code LED
Without	6V AC 24V AC/DC	A E

Transformer		Code LED
With	100-110V AC 115-127V AC 200-220V AC 230-254V AC 350-380V AC 400-440V AC 480V AC 500-550V AC	H L M Q S T V W

## Selector Switches **AM22**

#### ■ Selector switches

#### 2-position

Operator	Operation	Knob color or key removable	Contact	Type Switch with	Contact opera	ation (Example)
		position		round bezel	Contact arrangement	Operator position
					arrangement	Left Right
Knob	Maintained each 90°	B: Black (Standard) Color other than above are available	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AM22PR-210B AM22PR-201B AM22PR-211B AM22PR-020B AM22PR-202B AM22PR-202B	1NO (1)	Upper contact  ③   ④ ④
	Spring return	(G: Green R: Red	1NO	AM22PR-010B	1NC (1)	Upper contact
AF99-82	Ō		1NC 1NO+1NC 2NO 2NC	AM22PR-001B AM22PR-011B AM22PR-020B AM22PR-002B		1 + 2
	60°	_	2NO+2NC	AM22PR-022B	1NO+1NC	Upper contact
Lever	Maintained		1NO 1NC 1NO+1NC 2NO	AM22WR-210B AM22WR-201B AM22WR-211B AM22WR-220B	(1)	3 + 4
	each 90°		2NC 2NO+2NC	AM22WR-202B AM22WR-222B	(2)	Lower contact
Anna .	Spring return		1NO 1NC	AM22WR-010B AM22WR-001B	-	1 + 2
AF99-76	AF99-76 60°		1NO+1NC 2NO 2NC 2NO+2NC	AM22WR-011B AM22WR-020B AM22WR-002B AM22WR-022B	2NO+2NC (1)	Upper contact  ③    ④  ④
Key	Maintained	■: Key removable position ( ): Key type	1NO 1NC 1NO+1NC 2NO	AM22JR-2m10() AM22JR-2m01() AM22JR-2m11() AM22JR-2m20()	(3)	3 + • •
<b>D</b>	each 90°	See page - 04CD/2/20	2NC 2NO+2NC	AM22JR-2■02() AM22JR-2■22()	(2)	Lower contact  ①   ②
Sp	Spring return	0400/2/20	1NO 1NC 1NO+1NC 2NO	AM22JR-0A10() AM22JR-0A01() AM22JR-0A11() AM22JR-0A20()	(4)	1 + 2
	60°		2NC 2NO+2NC	AM22JR-0A02() AM22JR-0A22()	Upper con	tact
KKD09-014					(3) (1) (4) (2) Lower con	Operator  Name plate side

Notes: • (1) to (4): Contact block mounting position

Contact closed

<sup>•</sup> ① – ②, ③ – ④: Contact block terminal No.

<sup>•</sup> Contact arrangements: See page 04CD/2/20

#### 3-position

3-position	T	I	1				
Operator	Operation	Knob color	Contact	Type Switch with	Contact of	peration (Exam	nple)
				round bezel	Contact	Operation posi	ition
					arrange- ment	L C R	L C R
					mem	$\bigcirc \bigcirc \bigcirc \bigcirc$	$\bigcirc \bigcirc \bigcirc \bigcirc$
Knob	Maintained	Color code:	1NO+1NC	AM22PR-311B	1NO+1NC	Upper contact	Lower contact
	each 45°	B: Black (Standard) Color other than	2NO 2NC 2NO+2NC	AM22PR-320B AM22PR-302B AM22PR-322B	(1) (2)	4	
	Spring/manual return  each 45°	above are available (G: Green (R: Red	1NO+1NC 2NO 2NC 2NO+2NC	AM22PR-611B AM22PR-620B AM22PR-602B AM22PR-622B			
	Spring/manual		1NO+1NC	AM22PR-711B	1NO+1NC	Upper contact	Lower contact
3000	return		2NO 2NC	AM22PR-720B AM22PR-702B	(1) (2)	3	
•	each 45°		2NO+2NC	AM22PR-722B	(1) (2)	I I T <sub>4</sub>	
	Spring return		2NO+2NC	AM22PR-122B	2NO+2NC	Upper contact	Lower contact
AF99-82					(1) (2)		
							3, ,
	each 45°				(3) (4)		
Lever	Maintained		1NO+1NC	AM22WR-311B	1NO+1NC	Upper contact	Lower contact
	each 45°		2NO 2NC 2NO+2NC	AM22WR-320B AM22WR-302B AM22WR-322B	(1) (2)	4	
	Spring/manual return		1NO+1NC 2NO	AM22WR-611B AM22WR-620B			
	each 45°		2NC 2NO+2NC	AM22WR-602B AM22WR-622B			
	Spring/manual		1NO+1NC	AM22WR-711B	1NO+1NC	Upper contact	Lower contact
No.	return		2NO 2NC	AM22WR-720B	(4) (0)	3   1	
	each 45°		2NO+2NC	AM22WR-702B AM22WR-722B	(1) (2)	T <sub>4</sub>	
	Spring return		2NO+2NC	AM22WR-122B	2NO+2NC	Upper contact	Lower contact
AF99-76	36				(1) (2)		
	each 45°				(3) (4)	3 + + + 4	

Note: • Contact arrangements: See page 04CD/2/20

Contact closed

Operation Operation		Contact	Type	Contact of	peration (Exam	ıple)	
		position		Switch with round bezel	Contact arrange- ment	Operator positi	ion
						L C R	L C R
Key	Maintained each 45°	■: Key removable position (): Key type	1NO+1NC 2NO 2NC 2NC+2NC	AM22JR-3■11() AM22JR-3■20() AM22JR-3■02() AM22JR-3■22()	1NO+1NC (1) (2)	Upper contact (3)	Lower contact
	Spring/manual return  ach 45°		1NO+1NC 2NO 2NC 2NC+2NC	AM22JR-6■11() AM22JR-6■20() AM22JR-6■02() AM22JR-6■22()			
	Spring/manual return each 45°		1NO+1NC 2NO 2NC 2NO+2NC	AM22JR-7■11() AM22JR-7■20() AM22JR-7■02() AM22JR-7■22()	1NO+1NC (1) (2)	Upper contact (3)	Lower contact ①
KKD09-014	Spring return		2NO+2NC	AM22JR-1E22()	2NO+2NC (1) (2)	Upper contact	Lower contact ①
	each 45°				(3) (4)	3 + + + 4	3 + 1 4

Notes: • Operator position L: Left, C: Center, R: Right

- (1) to (4): Contact block mounting position
- ① ②, ③ ④: Contact block terminal No.

#### Contact arrangements

Contact arrangements other than above are available

Contact arrangement	1NO	1NC	1NO+1NC	2NO	2NC	3NO	3NC
Code	10	01	11	20	02	30	03

#### Available numbers of contact blocks

Mainted	Spring return Spring/manual return
8-contact block	4-contact block

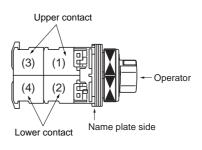
Contact arrangement	2NO+2NC	4NO	4NC	5NO	5NC	3NO+3NC	4NO+4NC
Code	22	40	04	50	05	33	44

#### • Key removable positions

Code	А	В	С	D	E	F	G
Removable position	M5° - 45°	W2, 480,	A5, 45,	A5°   45°	A5, 45.	A5. 45.	A5° - 45°
AM22JR-2	•	•	_	•	_	_	_
AM22JR-0	•	_	_	_	_	_	_
AM22JR-3	•	•	•	•	•	•	•
AM22JR-6	_	_	_	•	•	•	_
AM22JR-7	•	_	_	_	•	_	•
AM22JR-1	_	_	_	_	•	_	_

•: Available —: Not available

#### • Position of contact block



Contact closed

#### • Key code No.

Replace the ( ) mark with one of the following key code. A, B, C, D, E and F Standard key code is A.

#### ■ Selector switches (control type) 3-position

3-position				
Operator	Operation	Knob color or key removable position	Contact arrangement	Type Switch with round bezel
Knob	Maintained each 45°	Color code: B: Black (Standard)	Replace the ■ mark by the contact arrangement code	AM22PCR-3■B
	Spring/manual return teach 45°	Color other than above are available	(shown on next page).	AM22PCR-6■B
	Spring/manual return each 45°	(G: Green R: Red		AM22PCR-7■B
KK02-248A	Spring return  (f) each 45°			AM22PCR-1■B
Lever	Maintained each 45°		Replace the ■ mark by the contact	AM22WCR-3■B
	Spring/manual return ① each 45°		arrangement code (shown on next page).	AM22WCR-6■B
On the	Spring/manual return (†) each 45°			AM22WCR-7■B
KK02-249A	Spring return  (†) each 45°			AM22WCR-1■B
Key	Maintained each 45°	Replace the  mark by the  key removable	Replace the ■ mark by the contact arrangement code	AM22JCR-3□■()
	Spring/manual return (†) each 45°	position code: A, B, C, D, E F or G	(shown on next page).	AM22JCR-6□■()
	Spring/manual return each 45°	l ol G		AM22JCR-7□■()
KKD09-013	Spring return  (†) each 45°			AM22JCR-1E■()

#### • Key removable positions

Code	А	В	С	D	Е	F	G
Removable position	45, 45,	45, 45,	45, 45	45, 45,	45, 45,	A5. 45.	45, 45,
AM22JCR-3 AM22JCR-6 AM22JCR-7 AM22JCR-1	• - • -	- - -	- - -	• • - -	•	• • - -	• - • -

●: Available -: Not available

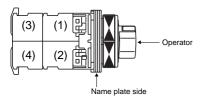
Key code No.
 Replace the ( ) mark with one of the following key code.
 A, B, C, D, E and F
 Standard key code is A.

#### • Contact arrangement code (Typical example)

Contact	Contact	Contact op	eration			
arrange- ment	arrange- ment	Contact blo	ock	Operator	position	
	code	Mounting position	Туре	Left	Center	Right
2NC	01F	(1)	NC			
		(2)	NC			
		_	_	_	_	_
		_	_	_	_	_
2NO+2NC	014	(1)	NC			
		(2)	NC			
		(3)	NO			•
		(4)	NO	•		
4NC	01J	(1)	NC			
		(2)	NC			
		(3)	NC			
		(4)	NC			
2NO+2NC	024	(1)	NC			
		(2)	NC		•	
		(3)	NO			•
		(4)	NO	•		•
2NO+2NC	03C*	(1)	NC			
	(Maintained only)	(2)	NC			•
		(3)	NO			•
		(4)	NO	•		
2NO+2NC	044*	(1)	NC			
		(2)	NC		•	
		(3)	NO			•
		(4)	NO	•		
2NO+2NC	054	(1)	NC			
		(2)	NC		•	
		(3)	NO			•
		(4)	NO			•

Contact arrange-	Contact arrange-	Contact op	eration			
ment	ment	Contact blo	ock	Operator	position	
	code	Mounting position	Туре	Left	Center	Right
2NO+2NC	064	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO	•		•
1NO+1NC	07F	(1)	NC			
		(2)	NO			•
		_	-	_	_	_
		_	-	_	_	_
2NO+2NC	07C* (Maintained only)	(1)	NC			
		(2)	NC			•
		(3)	NO	•		
		(4)	NO	•		
2NO+2NC	084	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO	•		
2NO+2NC	094*	(1)	NC			
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO			•
2NO+2NC	104	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		•
		(4)	NO	•		•
2NO+2NC	11C*	(1)	NC		•	
	(Maintained only)	(2)	NC			•
		(3)	NO	•		•
		(4)	NO	•		

#### • Position of contact block



notches.

#### • Contact arrangement code (Typical example)

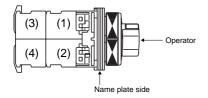
• Contac	t arrange	ment code	(Typic	cal exam	ple)	
Contact arrange-	Contact arrange-	Contact op	eration			
ment	ment	Contact blo	ock	Operator	position	
	oodc	Mounting position	Туре	Left	Center	Right
2NO+2NC	124*	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		•
		(4)	NO	•		
2NO+2NC	134*	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		•
		(4)	NO			•
3NO+1NC	14D* (Maintained only)	(1)	NO	•		
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO			•
3NO+1NC	15A*	(1)	NO			•
		(2)	NC		•	
		(3)	NO			•
		(4)	NO	•		
2NO+2NC	164	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO	•		
2NO+2NC	174*	(1)	NC		•	
		(2)	NC		•	
		(3)	NO	•		
		(4)	NO			•
2NO+2NC	184	(1)	NC		•	
		(2)	NC		•	
		(3)	NO			•
		(4)	NO			•

Contact	Contact	Contact op	eration				
ment m	arrange- ment	Contact blo	ck	Operator	Operator position		
	code	Mounting position	Туре	Left	Center	Right	
2NO+2NC 1	194	(1)	NC				
		(2)	NC				
		(3)	NO	•			
		(4)	NO			•	
4NO	20B	(1)	NO			•	
		(2)	NO	•			
		(3)	NO			•	
		(4)	NO	•			

Notes: ●: Contact closed Blank: Contact open

\* These may be some overlap in the contact when switching between notches.

#### • Position of contact block



### Selector Switches **AM22**

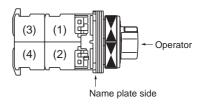
#### 4, 5-position

Operator	Contact (The following contact is only available.)	Operation	Knob color	Contact arrangement	Type Switch with round bezel
Knob	2NO+2NC  4-position maintained  Color code: B: Black (Standard) Color other than above are available (G: Green) R: Red  Replace the ■ mark by the contact arrangement code (shown below)	mark by the contact arrangement code	AM22PCR-4■B		
КК02-248А		(shown below)	AM22PCR-5■B		
Lever	2NO+2NC	4-position maintained			AM22WCR-4■B
KK02-249A		5-position maintained			AM22WCR-5■B

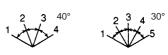
#### • Contact arrangement code

Position	Contact	Contact	Contact ope	eration	
	arrange- ment	arrange- ment code	Contact blo	ck	Operator position
		code	Mounting position	Туре	1 2 3 4 5
4-position 2NO+2NC		41C* (Main-	(1)	NC	+++
		tained only)	(2)	NC	<b>+</b>
			(3)	NO	<b>+</b>
			(4)	NO	
5-position	2NO+2NC	51C* (Main-	(1)	NC	++++
		tained only)	(2)	NC	
			(3)	NO	<b>+</b>
			(4)	NO	

#### • Position of contact block



#### Operator position 4-position 5-position



Notes: ●: Contact closed

<sup>\*</sup> There may be some overlap in the contact when switching between notches.

#### ■ Illuminated selector switches

#### 2-position

Operator	Operation	Contact	LED lamp		Incandescent la	amp
			Transformer	Туре	Transformer	Туре
Knob	Maintained	1NO 1NC 1NO+1NC 2NO 2NO+2NC	Without	AM22PL-210 3 AM22PL-201 3 AM22PL-211 3 AM22PL-020 3 AM22PL-022 3 AM22PL-222 3	Without	AM22PL-210■4
	each 90°	1NO 1NC 1NO+1NC 2NO	With	AM22PL-210m3	With	AM22PL-210■4□ AM22PL-201■4□ AM22PL-211■4□ AM22PL-220■4□
	Spring return	1NO 1NC 1NO+1NC 2NO	Without	AM22PL-010m3	Without	AM22PL-010■4 ☐ AM22PL-001■4 ☐ AM22PL-011■4 ☐ AM22PL-020■4 ☐
AF99-79	60°	1NO 1NC 1NO+1NC 2NO	With	AM22PL-010■3□ AM22PL-001■3□ AM22PL-011■3□ AM22PL-020■3□	With	AM22PL-010 4 AM22PL-001 4 AM22PL-011 4 AM22PL-010 4 AM22PL-020 4 AM22PL-020 4

#### 3-position

Operator	or Operation Contact LED lamp			Incandescent lamp			
				Transformer	Туре	Transformer	Туре
Knob	Maintained		1NO+1NC 2NO+2NC	Without	AM22PL-311■3□ AM22PL-322■3□	Without	AM22PL-311■4□ AM22PL-322■4□
	each 45°		1NO+1NC	With	AM22PL-311■3□	With	AM22PL-311■4□
	Spring/manual return	1	1NO+1NC 1NO+1NC	Without With	AM22PL-611■3□ AM22PL-611■3□	Without With	AM22PL-611■4□ AM22PL-611■4□
AF99-79	each 45°	1	1NO+1NC 1NO+1NC	Without With	AM22PL-711■3□ AM22PL-711■3□	Without With	AM22PL-711■4□ AM22PL-711■4□

Note: ☐ , ■ See page 04CD/2/26

#### • Replace the ■ mark by the following lamp voltage code

	,		1 0
Transformer	Voltage	Code LED	Incondocent
		LED	Incandescent
Without	5V AC/DC	_	5
	6V DC	6	_
	6V AC	Α	_
	12V AC/DC	В	_
	15V AC/DC	С	С
	20V AC/DC	-	D
	24V AC/DC	E	E
With	100-110V AC	Н	Н
	115-127V AC	L	L
	200-220V AC	M	M
	230-254V AC	Q	Q
	350-380V AC	S	S
	400-440V AC	T	Т
	480V AC	V	V
	500-550V AC	W	W

#### • Replace the ☐ mark by the following knob color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	А

### • Up to 4-contact of contact arrangement can be made. Available numbers of contacts are as follow.

7174114610	A trainable frame of our table are as follows.							
No. of position	Operation	Without transformer	With transformer					
2-position	Maintained	6-contact	4-contact					
	Spring return	3-contact	2-contact					
3-position	Maintained	6-contact	4-contact					
	Spring/manual return	3-contact	2-contact					

#### • Contact arrangement and operator position

#### 2-position

Transformer	Contact	Contact blo	ock	Operator position	
	arrangement	Mounting position	Туре	Left	Right
		poomon		$\bigcirc$	$\oslash$
With/without	1NO	(1)	NO	_	•
With/without	1NC	(1)	NC	•	_
Without	1NO+1NC	(1)	NO	_	•
		(2)	NC	•	_
With	1NO+1NC	(1)	NC	•	_
		(2)	NO	_	•
With/without	2NO	(1)	NO	_	•
		(2)	NO	_	•
Without	2NO+2NC	(1)	NO	_	•
	*1	(2)	NC	•	_
		(3)	NO	_	•
		(4)	NC	•	_
With	2NO+2NC	(1)	NC	•	_
	*1	(2)	NC	•	_
		(3)	NO	_	•
		(4)	NO	_	•

Notes: \*1: AM22PL-2

●: Contact closed, -: Contact open

#### 3-position

Transformer	Contact	Contact ble	ock	Operator position		
	arrangement	Mounting position	Туре	Left	Center	Right
		pooliion		$\bigcirc$	①	$\bigcirc$
Without	1NO+1NC	(1)	NO	•	-	-
	*1	(2)	NC	_	_	•
	1NO+1NC	(1)	NO	_	_	•
	*2	(2)	NC	•	_	_
	2NO+2NC	(1)	NO	•	_	_
	*3	(2)	NC	-	_	•
		(3)	NO	•	_	_
		(4)	NC	_	_	•
With	1NO+1NC	(1)	NC	-	_	•
	*1	(2)	NO	•	_	_
	1NO+1NC	(1)	NC	•	_	_
	*2	(2)	NO	-	_	•
	2NO+2NC	(1)	NC	_	_	•
	*3	(2)	NC	_	_	•
		(3)	NO	•	_	_
		(4)	NO	•	_	_

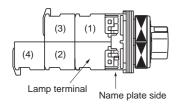
Notes: \*1: AM22PL-3, 6 \*3: AM22PL-3

\*2: AM22PL-7

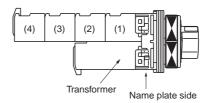
●: Contact closed, -: Contact open

#### Position of contact block

#### Without transformer



#### With transformer



#### ■ Pilot lights/standard

Lens	Transformer	LED lamp Lamp voltage	Туре	Incandescent lam Lamp voltage	p Type
Dome	Without	6V AC 6V DC 12V AC/DC 24V AC/DC	DM22D0L-A3□ DM22D0L-63□ DM22D0L-B3□ DM22D0L-E3□	5.5V AC/DC — 15V AC/DC 24V AC/DC	DM22D0L-54 ☐ — DM22D0L-C4 ☐ DM22D0L-E4 ☐
AF99-88	With	100–110V AC 200–220V AC	DM22D0L-H3□ DM22D0L-M3□	100-110V AC 200-220V AC	DM22D0L-H4 ☐ DM22D0L-M4☐
Extended round	Without	6V AC 6V DC 12V AC/DC 24V AC/DC	DM22E3L-A3□ DM22E3L-63□ DM22E3L-B3□ DM22E3L-E3□	5.5V AC/DC — 15V AC/DC 24V AC/DC	DM22E3L-54 ☐ — DM22E3L-C4 ☐ DM22E3L-E4 ☐
AF99-85	With	100–110V AC 200–220V AC	DM22E3L-H3□ DM22E3L-M3□	100-110V AC 200-220V AC	DM22E3L-H4 ☐ DM22E3L-M4 ☐
Faceted	Without	6V AC 6V DC 12V AC/DC 24V AC/DC	DM22K0L-A3	5.5V AC/DC — 15V AC/DC 24V AC/DC	DM22K0L-54□ — DM22K0L-C4□ DM22K0L-E4□
AF99-87	With	100–110V AC 200–220V AC	DM22K0L-H3□ DM22K0L-M3□	100–110V AC 200–220V AC	DM22K0L-H4□ DM22K0L-M4□

#### ■ Pilot lights/short-body with transformer

Lens	LED lamp Lamp voltage	Туре	Incandescent la Lamp voltage	mp Type
Dome KK02-245A	100–110V AC 200–220V AC	DM22D0L-H9 DM22D0L-M9	100–110V AC 200–220V AC	DM22D0L-H8 DM22D0L-M8
Extended round  KK02-246A	100–110V AC 200–220V AC	DM22E3L-H9 DM22E3L-M9	100–110V AC 200–220V AC	DM22E3L-H8 DM22E3L-M8
Faceted KK02-247A	100–110V AC 200–220V AC	DM22K0L-H9 DM22K0L-M9	100–110V AC 200–220V AC	DM22K0L-H8 DM22K0L-M8

Note: ☐ See page 04CD/2/28

#### Pilot Lights **DM22**

#### • Lens color

Replace the  $\square$  mark by the following lens color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Υ	Α

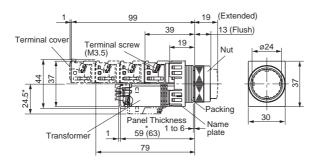
• Lamp voltage
Available lamp voltage are as follow.

Description	Voltage	Code			
		Standard type		Short-body type	
		LED	Incandescent	LED	Incandescent
Without transformer	5.5V AC/DC	_	54	_	_
	6V AC	A3	_	_	_
	6V DC	63	_	_	_
	12V AC/DC	B3	_	_	_
	15V AC/DC	C3	C4	_	_
	20V AC/DC	_	D4	_	_
	24V AC/DC	E3	E4	_	_
With transformer	100-110V AC	H3	H4	H9	H8
	115-127V AC	L3	L4	L9	L8
	200-220V AC	M3	M4	M9	M8
	230-254V AC	Q3	Q4	_	_
	350-380V AC	S3	S4	_	_
	400-440V AC	T3	T4	_	_
	480V AC	V3	V4	_	_
	500-550V AC	W3	W4	_	_
With resistor unit	110V DC	H7	_	-	_

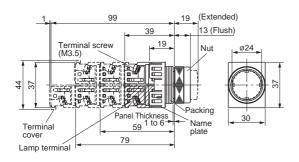
- **■** Dimensions, mm
- Illuminated pushbutton switches

#### Flush/Extended

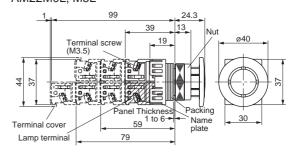
AM22F0L, F5L, E0L, E5L With transformer



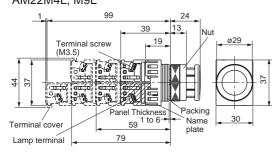
#### Without transformer



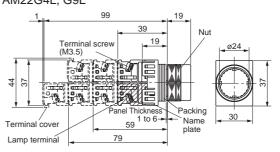
#### **Mushroom** (40mm dia.) AM22M0L, M5L



#### **Mushroom** (29mm dia.) AM22M4L, M9L

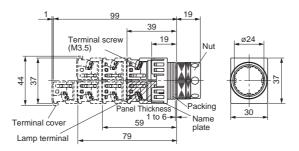


### Extended with transparent full guard AM22G4L, G9L



#### Extended with full guard (with openings)

AM22G2L, G7L



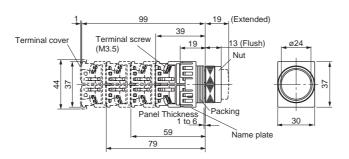
Note: \* Except for the types 110V AC, 127V AC and 220V AC.

## AM22 and DM22 Dimensions

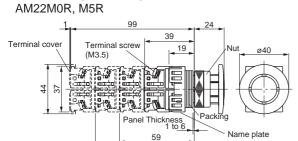
- **■** Dimensions, mm
- Pushbutton switches

#### Flush/Extended

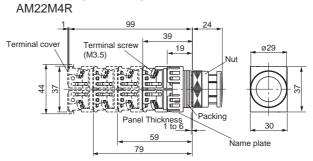
AM22F0R, F5R AM22E0R, E5R



#### Mushroom (40mm dia.)



#### Mushroom (29mm dia.)



### **Extended with full guard** (24mm dia.) AM22G3R, G8R

Terminal cover (M3.5)

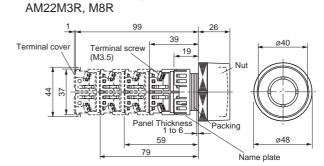
19

Nut

Panel Thickness
10.6

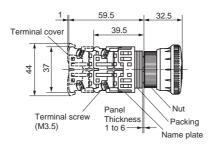
Name plate

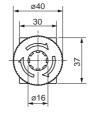
### Mushroom with full guard (40mm dia.)



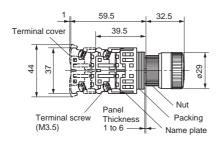
- **■** Dimensions, mm
- Emergency stop pushbutton switches

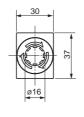
**Push-lock, turn-reset** (40mm dia. with white arrow) AM22V0E



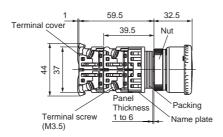


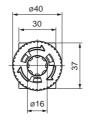
**Push-lock, turn-reset** (29mm dia. with white arrow) AM22VSE





**Push-lock**, **turn-reset** (40mm dia. with mechanical indicator) AM22VME





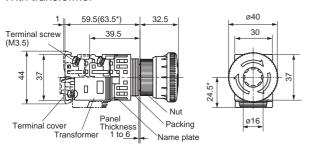
## AM22 and DM22 Dimensions

- **■** Dimensions, mm
- Emergency stop illuminated pushbutton switches

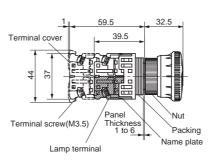
#### Push-lock, turn-reset (40mm dia. with white arrow)

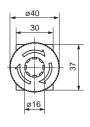
AM22V0F

With transformer



#### Without transformer

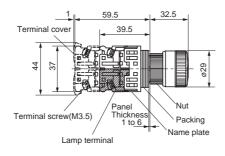


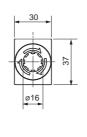


#### Push-lock, turn-reset (29mm dia. with white arrow)

AM22VSF

Without transformer

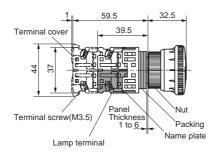


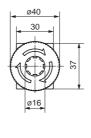


#### Push-lock, turn-reset (40mm dia. transparent in all colors with white arrow)

AM22VDF

Without transformer



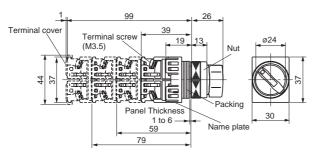


Note: \* Except for the types 110V AC, 127V AC and 220V AC.

- **■** Dimensions, mm
- Selector switches

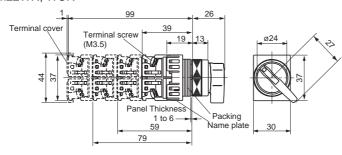
#### Knob

AM22PR, PCR



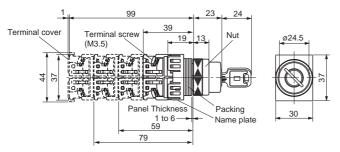
#### Lever

AM22WR, WCR



#### Key

AM22JR, JCR

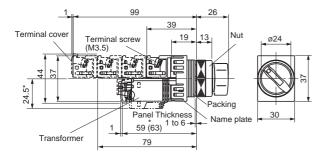


## AM22 and DM22 Dimensions

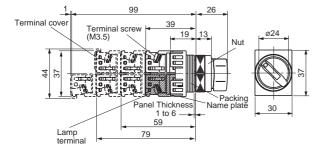
- **■** Dimensions, mm
- Illuminated selector switches

#### Knob AM22PL

With transformer



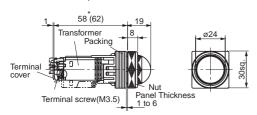
#### Without transformer



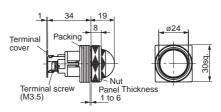
#### • Pilot lights

#### Dome DM22D0L

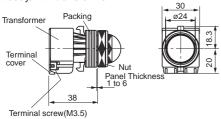
With transformer, with resistor unit



Without transformer



Short body/with transformer

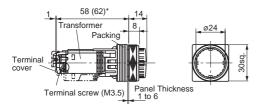


Note: \* Except for the types 110V AC, 127V AC and 220V AC.

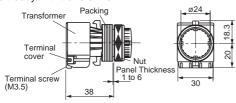
- **■** Dimensions, mm
- Pilot lights

### Extended DM22E3L

With transformer, with resistor unit



### Short body/with transformer



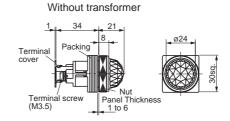
### \_\_\_\_\_

Without transformer

Panel Thickness 1 to 6

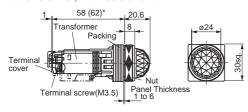
Terminal

Terminal screw (M3.5)

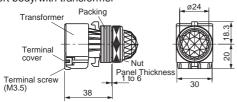


### Faceted DM22K0L

With transformer, with resistor unit



### Short body/with transformer



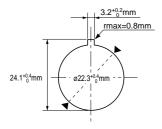
Note: \* Except for the types 110V AC, 127V AC and 220V AC.

# AM22 and DM22 Notes on use

### Notes on use

### ■ Panel cutout hole

Fig. 1 Panel cutout hole dimensions, mm



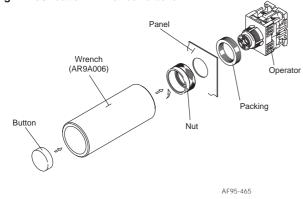
Note: If key-washer or legend plate are not used, 3.2mm-wide. location holes shown in Fig. 1 need not be cutout.

### ■ Mounting operator to panel

1. Pushbutton with a round bezel (ordinary mounting)

Insert the operator into the cutout hole from the back of the panel, and tighten the nut with the AR9A006 wrench from the front of the panel to secure the operator as shown in Fig.2.

Fig. 2 Pushbutton with a round bezel

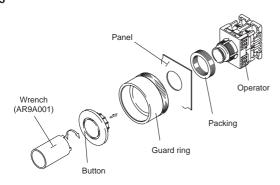


Note: Recommended tightening torque is from 1.0 to 1.5N·m.

### 2. Mounting Procedure for the M3R and M8R

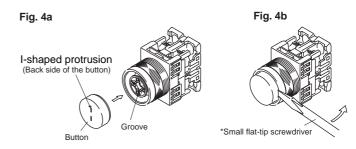
- Insert the operator through the cutout hole from behind the panel and secure it by the guard ring from the front of the panel.
- Note: The correct tightening torque is 1.0 to 1.5 N•m.
- Use the wrench (AR9A001) to mount the button. Note:The correct tightening torque is 0.5 to 1.0 N•m.

Fig. 3

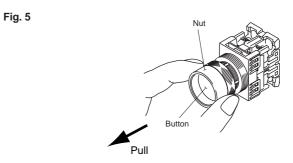


### ■ Method for changing the button, lens, and nameplate

- AM22F0R, F5R, E0R, E5R, G3R, G8R
- To remove the button, insert a small flat-tip screwdriver in the groove around the periphery of the button, and gently pry it off working the screwdriver around the entire periphery.
- To attach the button, align the I-shaped protrusion on the back side of the button with the cross-shaped groove on the plunger and push the button in.



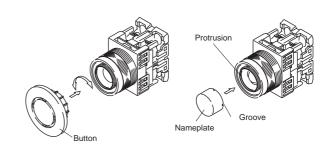
 In case of G3R, G8R: Loosen and pull the nut, and the button will come off.



# • AM22MOR, M5R, M4R, M0L, M4L, M5L, M9L

- The button is threaded. Attach it and remove it by hand. When attaching the button, make sure that it is screwed in completely.
- Note: The correct tightening torque is 0.5 to 1.0 Nem.
- For illuminated pushbutton switches, insert the groove of the nameplate onto the protrusion on the plunger and push in the nameplate.

Fig. 6

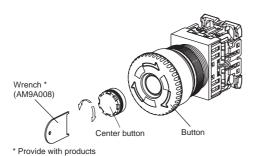


# • AM22V0E, VSE, VME, V0F, VDF, VSF

As shown in Fig.7, engage the tips of the AM9A008 wrench into the indentations around the pushbutton center button, and turn the wrench to loosen and remove the pushbutton center button, then remove the pushbutton.

Note: The correct tightening torque is 0.5 to 1.0N•m.

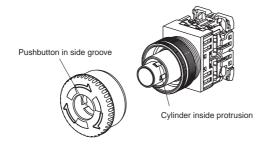
Fig. 7



Insert the operator into the cutout hole from the back of the panel, and as shown in Fig.8, insert the pushbutton into the operator cylinder while aligning the grooves inside the pushbutton with the protrusions on the operator.

Note: The correct tightening torque is 0.5 to 1.0N•m.

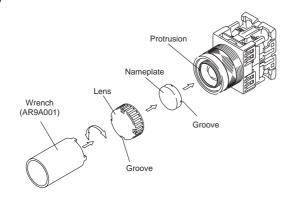
Fig. 8 Setting pushbutton to operator cylinder



### • AM22F0L, F5L, E0L, E5L, G4L, G9L, G2L, DM22E3L

- Engage the protrusions on the front end of the wrench (AR9A001) with the groove on the lens and screw on the lens.
   Note: The correct tightening torque is 0.5 to 1.0 N·m.
- Attaching the nameplate Insert the groove of the nameplate onto the protrusion on the plunger.

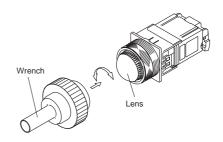
Fig. 9



### DM22D0L, K0L

 Push the end of the wrench (AHX702) onto the lens and turn the wrench to attach or remove the lens.
 Note: The correct tightening torque is 0.5 to 1.0 Nem.

Fig. 10



### • AM22PR, PCR, WR, WCR

- (1) As shown in the following figure, insert the tip of a small flathead screwdriver into the selector tip groove. Rotate the screwdriver in the direction indicated by the arrow until the selector tip rises, and draw out the knob.
- (2) Attach the operator in the same manner as described in step 1.
- (3) Insert the knob, with the selector tip in the floated state, into the original position of the rotation tube, and push the selector tip into place.

Fig. 11a

Fig. 11b

Small flathead screwdriver\*

Selector tip

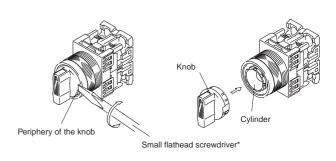
Cylinder

Knob

### AM22PL

 To remove an illuminated switch, insert a small flathead screwdriver or the like into the groove around the periphery of the knob and pry it off.

Fig. 12a Fig. 12b



<sup>\*</sup>Use a small flathead screwdriver with a head that is about 4 mm wide.

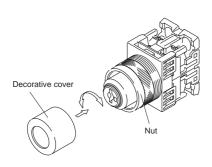
# AM22 and DM22 Notes on use

### • AM22JR, JCR

• For key type switches, the decorative cover and nut are threaded. Removing the decorative cover enables the nut to be removed. Make sure to tighten the decorative cover so that there is no play.

Note: The correct tightening torque is 0.3 to 0.5 Nem.

Fig. 13



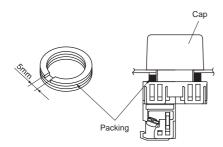
### ■ Water-proof and dust-proof cap

Applicable type: Water-proof cap AHX797 Dust-proof cap AM9D797

When attached to the panel in combination with a water-proof or dust-proof cap, the water-proof cap or dust-proof cap may sink downward and prevent the depressed button from returning to its original position.

As shown in the following figure, cut an approximately 5-mm air outlet in the portion of the ring packing touching the panel surface. Also, reduce the number of packing rings by one below the standard number. The clamp ring tightening torque is 1 to 1.5 Nem.

Fig. 14



### Degree of protection

The water-proof cap or dust-proof cap seals the panel surface to provide IP65 protection.

AM9D797: Air outlet groove packing provided.

### ■ Using accessory ring-packings

Use the required number of ring-packings (1.3mm-thick, 5 pieces, resin mold).

Table below is a guideline for using the packings. If a locking nut or legend plate is used, the thickness must be counted as an additional panel thickness.

### Panel thickness vs. number of packings (reference data)

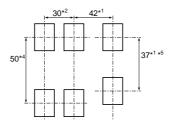
Effective panel thickness including lock-ring and legend plate thicknesses	Number of packings
1.0mm to less than 1.6mm	
1.6mm to less than 2.8mm	
2.8mm to less than 3.8mm	
3.8mm to less than 4.8mm	
4.8mm to less than 6.0mm	

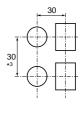
### ■ Minimum mounting space, mm

The minimum mounting spaces required for AM22•DM22 command switches are given below. (Fig. 15)

Fig. 15

- Illuminated pushbutton and pushbutton
- Pilot light
- Emergency stop illuminated pushbutton and emergency stop pushbutton
- · Illuminated and non-illuminated selectors





- Notes: \*1 AM22M0L, M5L, M0R, M5R, V0E, V0F, VDF: 42
  - AM22M3R, M8R: 49
  - AM22WR. WCR: 40
  - \*2 When mounting contact blocks at 30mm pitch, use it circuit of 380V or
  - Short body with transformer types: 50mm.
  - This dimension applies when transformer units or contact blocks face
  - This dimension applies when transformer unit or contact block is mounted on only one side.

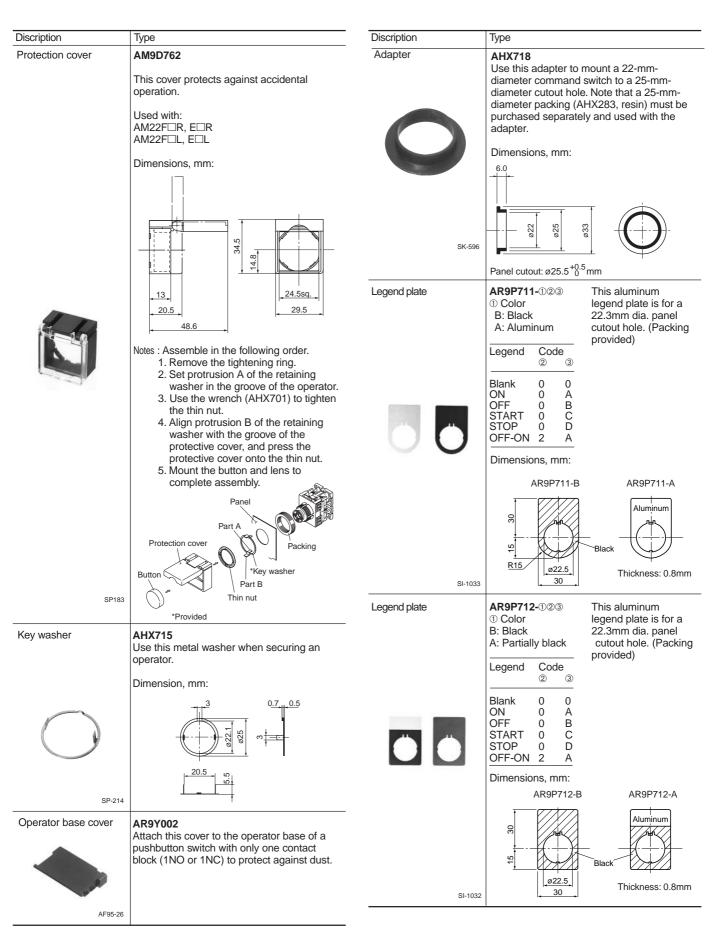
Other items are the same as for the AR22 and DR22 series, see page 04/53 to 04/57

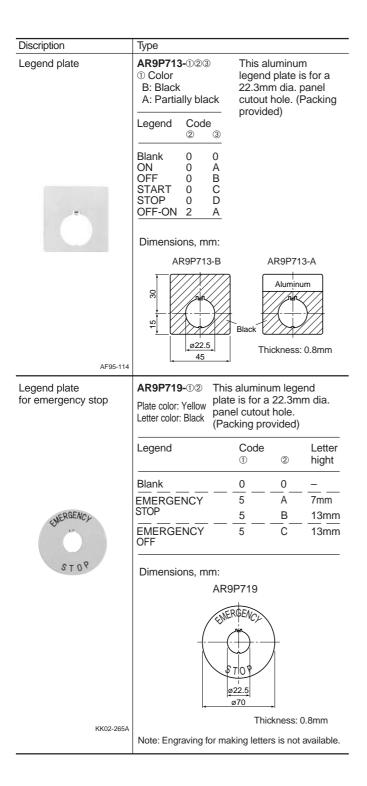
### **■** Accessories

Discription		Туре	Discription	Type
Wrench		<b>AR9A004</b> Dimensions, mm: 30 x 100 x 6.5	Special tool	AHX
		Billiensions, min. 30 x 100 x 0.3	65	Dime For a
			10	DR9
		C		Dime
	4	A-►	AHX321	For p
	107	Section "B"	SG-873	• This
		Use this section to tighten or remove the lens.		and • The
/ /		Applicable type: AM22M3R, M8R, F0L, F5L, E0L, E5L, G4L,		of s
		G9L, G2L, G7L, DM22E3L		
		Remarks	DR9A321-T AF95-21	
		Section "A" : (For AR22 nut tightening)		AHX7
	KK02-261	Section "C" : (For AR22V □□, AR30V □□	Wrench/Lamp changer	Dime
	11102 201	center button tighting)		Use t
Wrench		<b>AM9A008</b> Dimensions, mm: 16 x 23 x 0.8		and la
				Used
1	9	Application: AM22V□□ center button		Lens pilot li
				pilot i
	KKD07-096		SI-1030	
Wrench		AR9A001	Lamp changer	AHX <sup>*</sup> Dime
- 4		Dimensions, mm: ø22 x 35	For BA9S/13 lamp	
		Application: AM22M3R, M8R, F0L, F5L, E0L, E5L, G4L,		• Use
		G9L, G2L, G7L, DM22E3L lens tightening		illur
	KK02-098A			
Wrench for		AR9A006		
ø22, ø30	For ø30	Dimensions, mm: ø40 x 100	(For E12/15 lamp)	
		Application:	AF95-22	
		AM22, DM22 nut tightening	Lamp changer	AM9
For ø22	AF96-241		(for AM22 V□F type)	Dime
Wrench		AHX701		• App
VVICITORI		Dimensions, mm: ø25 x 72.5		AM2
		Application:		
		To mount on Protection cover (AM9D762),	KK02-261	
		use this wrench to tighten the nut.		
	SI-303			

Discription	Туре
Special tool	AHX321 Dimensions, mm: 42 x 130 x 6.5 For all types except pilot lights
AHX321	DR9A321-T Dimensions, mm: 57 x 130 x 30 For pilot lights
SG-873	<ul> <li>This tool is used to remove contact blocks and transformer units.</li> <li>The AHX321 can remove round color lens of switches.</li> </ul>
DR9A321-T AF95-21	
Wrench/Lamp changer	AHX702 Dimensions, mm: ø36 x 55
	Use this wrench to tighten or remove the lens and lamp.  Used with: Lens of DM22D0L, K0L Incandescent lamp of pilot lights and illuminated pushbuttons
SI-1030	
Lamp changer  For BA9S/13 lamp	AHX790 Dimensions, mm: Ø14 x 55  • Use this rubber wrench for mounting or removing LED lamps from pilot lights and illuminated pushbutton switches.
(For E12/15 lamp)	
(For E12/15 lamp)	
` ',	AM9A009 Dimensions, mm: Ø8 x 50
AF95-22	

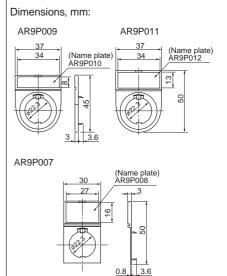
# AM22 and DM22 Accessories





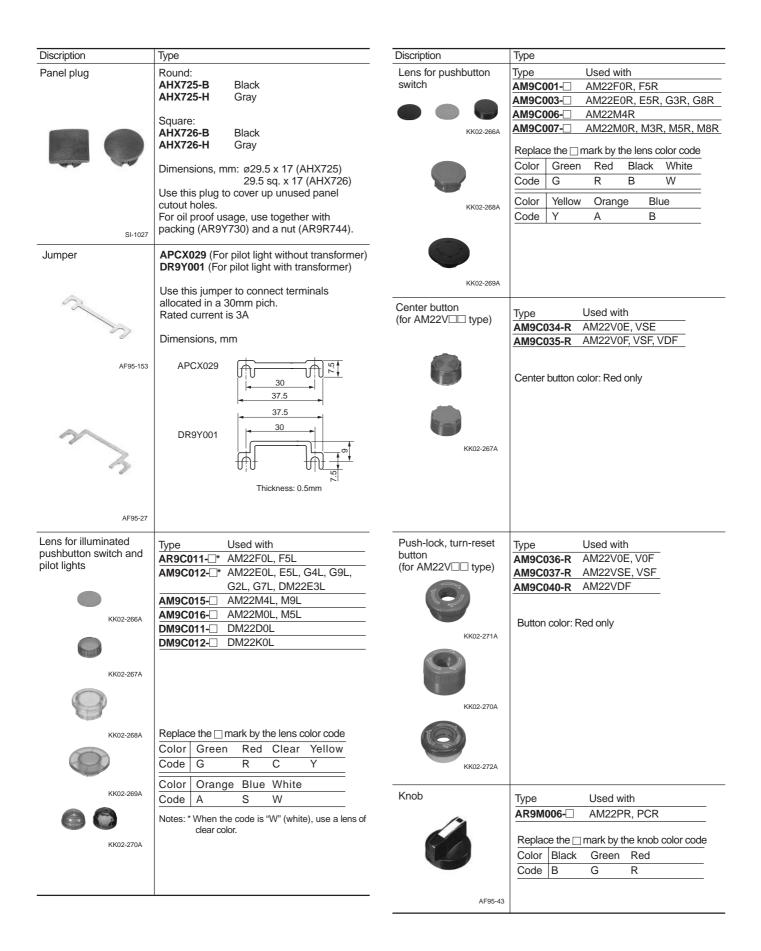
Discription	Туре		
Legend plate (width: 34mm)	AR9P015-B①②: Hight 36mm AR9P014-B①②: Hight 40.3mm		
	Color: black		
		code	
	ON (OFF (START (STOP (	0 0 0 A 0 B 0 C 0 D	
00	Optimal for use in combination with a 3-position selector switch. Legend plates are available in two types: short, 36 mm; and long, 40.3mm.		
	Dimensions, mm:		
	24		AR9P014
.AF96-190	202	Thickness	15.3
Legend plate with name plate	Legend plate Name plate	AR9P AR9P	009-B 010-B ①② (34 × 8mm)
	Legend plate Name plate		<b>011-B</b> <b>012-B</b> ①② (34 × 13mm)
	Legend plate Name plate		007-В 008-В ①② (27 × 16mm)
	Name plate	Code ①	2
	ON OFF START STOP OFF-ON	0 0 0 0 0 2	A B C D A





.AF96-190

# AM22 and DM22 Accessories



Discription	Туре	
Lever	Type Used with AR9M007- AM22WR, WCR	
	Replace the ☐ mark by the lever color code  Color Black Green Red  Code B G R	
AF95-42		
Knob (for illuminated selector switch)	Type Used with  AR9M005- AM22PL	
AF94-465	Replace the _ mark by the knob color code  Color Green Red White  Code G R W  Color Yellow Orange Blue  Code Y A S	
Key	Type Used with AR9C022-□ AM22JR, JCR	
	Replace the $\square$ mark by the key type code. Code: A, B, C, D, E or F, 6 types.	
KKD09-012		
Legend plate	Type Used with  AR9P001-W AM22F0L, F5L	
	This part is made of acrylic resin. Use paint or thinner compatible with resin.  Dimensions, mm: ø17.8 x 0.9	
AF94-459		
Legend plate	Type Used with  AR9P002-W AM22E0L, E5L, G4L, G9L, G2L, G7L	
	This part is made of acrylic resin. Use paint or thinner compatible with resin.	
	Dimensions, mm: ø17.8 x 4.5	
KK02-273A		
KK02-273A  Legeng plate	Type Used with  AM9P024-W AM22M0L, M5L, M4L, M9L	
	31	

Discription	Туре			
LED lamp	Туре	Lam	p voltage	
	APX510-6 ☐ 6V AC APX510-D6 ☐ 6V DC APX510-12 ☐ 12V AC/DC APX510-15 ☐ 15V AC/DC APX510-24 ☐ 24V AC/DC		-	
	Replace the code		the lumir	nous color
	Luminous color	Yellow	Red	Green
	Code	Υ	R	G
	Lens color	Υ	R	G
(6)		1		
	Luminous	Amber	Orange	Blue
	Code	А	0	S
	Lens color	Α	W	S
KKD06-208	Dimensions, mm:			
LED lamp	Type Lamp voltage			
(for AM22V0F, VSF, VDF type)	AR9L001-6R 6V AC AR9L001-24R 24V AC/DC			
<i>//</i>	Luminous color: Red only Dimensions, mm:			
KK02-273A	ø6.9	AC DC 24V (	9	
	Holder (24V: gray) (6V: white)			Lamp base
Incandescent lamp	Туре	Lamp voltage	Rat con	ed voltage, sumption
	AHX135	5.5V AC	/DC 6.3 1W	V AC/DC,
	AHX279	15V AC/	DC 18 1W	V AC/DC,
	AHX144	20V AC/	DC 24 1W	V AC/DC,
	AHX129	24V AC/	DC 30\ 1W	/ AC/DC,
	Dimensions,	mm:		
		9		
		I-	20	

Lamp base: BA9s/13

KKD06-307

# AM22 and DM22 Accessories

Discription	Туре		
Contact block (1NO)	AR9B290 Standard AR9B290-S Overlap		
	Color: Blue Dimensions, mm: 19.3 x 29 x 27		
AF94-455	Note: Terminal cover is not supplied with this.		
Contact block (1NC)	AR9B291 Standard AR9B291-S Overlap		
	Color: Red Dimensions, mm: 19.3 x 29 x 27		
AF94-455	Note: Terminal cover is not supplied with this.		
Lamp terminal	AR9B292		
410	Color: Black Dimensions, mm: 19.3 x 29 x 27		
AF94-456	Note: Terminal cover is not supplied with this.		
Contact protection cover	Type Used with*  AR9D002-1 AM22, 1step contact AR9D002-2 AM22, 2step contact		
	The contact is covered with a silicon rubber cover to keep out foreign matter such as dust, etc.  See page 04CD/2/46(AM22□Z8 types)		
	Dimensions, mm:		
5	AR9D002-1		
KK02-118A	8		
	AR9D002-2		

Discription	Туре		
Transformer unit	Туре	Primary voltage	Used with
	AR9T511-H	100-110V AC	Standard type
	AR9T511-L	115-127V AC	31
	AR9T511-M	200-220V AC	
	AR9T511-Q	230-254V AC	
	AR9T511-S		
, 11 Park	AR9T511-V	.001710	
AF94-457	AR9T511-W		
	AM9T511-H		AM22V0F,
	AM9T511-L		VDF, VSF
	AM9T511-M		
	AM9T511-Q		
	AM9T511-S		
	AM9T511-T		
1 1 1 1 1 1	AM9T511-V		
	AM9T511-W	500-550V AC	
	Dimensions, n	nm·	
AF95-33	Up to 220 V		
		25.3 x 29 x 48	
	Note: With termi	inal cover	
Base unit for transformer	AR9T003		
separate mounting	I lse this hase i	in combination v	with a
soparate mounting		it. This base un	
		screws or rails.	
	Thounted using	J Sciews of Talls.	•
	Dimensions, m	nm	
		58	-I
		48	2-ø4.5
	(Y2)		
	1 7		<u>₩</u> 4
	2 2		<b>1</b> 原



(Y2)

When the state of the types 110V AC, 127V AC and 220V AC.

Resistor Voltage stabilizer Device for LED lamp flickering

Resistor: **AR9T519-H** (110V DC) Fit this resistor when using LED of 24V DC rating with 110V DC power.

Voltage stabilizer: **AR9T001-E** This unit allows an LED lamp of 24V DC rating to be used in a circuit with voltage from 27V to 35V (AC or DC).

Flickering device:

6V AC: AR9T002-A 6V DC: AR9T002-6 12 to 24V AC: AR9T002-G \* 12 to 24V DC: AR9T002-E \*

 $^{\ast}$  Used in combination with 12V, 15V, or 24V rated LED lamp.

AF95-33

KK02-118A

Note: With terminal cover

Discription	Timo
•	Type
Nut	Type Used with
	<b>AM9R744</b> *1 AM22F0R, F5R, E0R, E5R,
	MOR, M5R, M4R, F0L, F5L,
	EOL, E5L, MOL, M5L, M4L,
KK02-274A	M9L, PR, PCR, WR, WCR,
	JR, JCR, PL
	DM9R744*1 DM22D0L, E3L, K0L
	AM9R057*3 AM22V0E, V0F, VDF
	<b>AM9R057*</b> <sup>2</sup> AM22F0R, F5R, E0R, E5R,
KK02-275A	M4R, F0L, F5L, E0L, E5L,
	M4L, M9L, PR, PCR, WR,
	WCR, JR, JCR, PL
	AM9R058*3 AM22VSE, VSF
KK02-276A	DM9R057*2 DM22D0L, E3L, K0L
11102 2707	
	*1 Resin types are black (standard)
	*2 Aluminum types are silver
	*3 Aluminum types are silver (standard)
Guard-ring	Type Used with
	AM9R003*1 AM22G4L, G9L
	AM9R054*2 AM22G3R, G8R
	AM9R056*2 AM22G2L, G7L
AM9R003 AM9R054	AM9R223*2 AM22M3R, M8R
KK02-277A	
	*1 Resin types are transparent
	*2 Resin types are black
AM9R056	
KK02-274A	
AM9R223	
AM9R223 KK02-278A	
KK02-278A	AR9R744
KK02-278A	
KK02-278A	AR9R744 For AHX725*, 726*
KK02-278A	
KK02-278A	For AHX725*, 726*
KK02-278A	For AHX725*, 726*  * When use the panel plug as IP65,
KK02-278A	For AHX725*, 726*  * When use the panel plug as IP65,
Nut	For AHX725*, 726*  * When use the panel plug as IP65,
KK02-278A	For AHX725*, 726*  * When use the panel plug as IP65,
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65,
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)  AHX797  This rubber cap protects the operator and
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)  AHX797  This rubber cap protects the operator and switch mechanism against dust and water.
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)  AHX797  This rubber cap protects the operator and switch mechanism against dust and water. Use this cap in a dusty or moist environment
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)  AHX797  This rubber cap protects the operator and switch mechanism against dust and water.
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)  AHX797  This rubber cap protects the operator and switch mechanism against dust and water. Use this cap in a dusty or moist environment
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)  AHX797  This rubber cap protects the operator and switch mechanism against dust and water. Use this cap in a dusty or moist environment The only color available is transparent.
Nut	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)  AHX797  This rubber cap protects the operator and switch mechanism against dust and water. Use this cap in a dusty or moist environment The only color available is transparent.  Used with:  AM22E0R, E5R, E0L, E5L
Nut  AF94-462	For AHX725*, 726*  * When use the panel plug as IP65, then use with packing(AR9Y730)  AHX797  This rubber cap protects the operator and switch mechanism against dust and water. Use this cap in a dusty or moist environment The only color available is transparent.  Used with:

Discription	Туре
Dust-proof cap	AM9D797-□
KK02-279A	Replace the mark by the cap color code Color Green Red Black Code G R B  Dimensions, mm:  Packing  1.3  Air outlet groove
	Used for sealing the operator from foreign debris such as dust in environments where the unit is in contact with such elements.
Packing	AHX730: For all AM22 and DM22 (Resin) Note: 5 pieces of packing per delivery
AHX730 SI-299	AHX283: For AHX728 (Resin) Note: 4 pieces of packing per delivery AR9Y730: For AHX725*, 726* (Rubber)
	1 0171171120 , 120 (1100001)



When use the panel plug as IP65, then use with nut (AR9R744)



Terminal cover

Terminal cover

Type Used with Dimensions, mm AR9Y305 Contact unit 18.4 x 29 x 8.4 Lamp terminal Transformer unit \* DR9Y320 Pilot lights ø22 x 5.8 (without transformer)

\* Rated up to 220V.

The terminal cover is provided as standard with the applicable types listed above. (Except for contact block alone and lamp terminal alone)



Type	Used with	Dimensions, mm
AHX376	With transformer * With short-body transformer With resistor unit	13 x 29 x 6.5

Use types that exceed the standard 220V rating for products with standard type transformer.

The terminal cover is provided as standard with the applicable types listed above.

# AM22 and DM22 Special products

### Products equipped with contact protection cover

### **■** Features

A silicon rubber cover is provided for the contact block to keep out foreign matter such as dust, etc.

Other ratings and specifications are the same as those of the standard type.

### ■ Type

# AM22 □ Z8

Specify "Z8" at the end of the type number of the standard type.

### **■** Dimensions

The only thing different from the standard product is the addition of a 1-mm thick silicon rubber cover around the contact block.

### ■ Applicable types

Туре	Contact arrangement	Remarks
Pushbuttons	1NO+1NC,	For use with a
<ul> <li>Emergency stop pushbuttons</li> </ul>	2NO*1, 2NC	1-step contact
<ul> <li>Selectors</li> </ul>	1NO+3NC, 2NO+2NC,	For use with a
	3NO+1NC, 4NO*1, 4NC	2-step contact
Illuminated pushbuttons	1NO*2, 1NC	For use with a
(without transformer)		1-step contact
<ul> <li>Emergency stop illuminated</li> </ul>	1NO+2NC, 2NO+1NC,	For use with a
pushbuttons (without transformer)	3NO*2, 3NC	2-step contact
<ul> <li>Illuminated selectors</li> </ul>		
(without transformer)		

Notes: \*1 Except for emergency stop pushbutton switch

### Resisting water-soluble cutting oils and heat

### **■** Features

Safer operation in environments exposed to water-miscible cutting fluids, machining oils, lubricating oils, cleaning oils and high humidity (up to 95%) is made possible by using materials that protect against rust and corrosion of components. Other ratings and specifications are the same as those of the standard type.

### ■ Type

**AM22** □ **Z9**, **DM22** □ **Z9** 

Specify "Z9" at the end of the type number of the standard type.

### **■** Dimensions

Same as those of the standard type

### ■ Applicable types

AM22, DM22 series

AM22 (Except for emergency stop pushbutton switch and emergency stop illuminated pushbutton switch)

DM22 (Except for pilot lights with resistor unit)

<sup>\*2</sup> Except for emergency stop illuminated pushbutton switch

### Meeting IP2X finger protection standards

### **■** Features

Conforms to EN standard EN60204-1 (protecting against electric shock). The terminal has IEC60529 degree of protection; IP2X finger protection secured (a mock human finger used in testing did not come into contact with charged parts). The contact block and lamp terminal can be easily mounted or removed with the terminal cover mounted.

### **■** Type

AM22 □ ZB, DM22 □ ZB

Specify "ZB" at the end of the type number of the standard type.

### **■** Accessories

· Contact block (plus terminal cover)

NO contact: AR9B290-□ D NC contact: AR9B291-□ D

•Transformer unit (plus terminal cover)

AR9T511-□ D

### ■ Ratings and specifications

• Protection degree: IP2X

• Terminal screw: M3.5

Wiring can be done with a solid wire or fork shaped crimp terminal.

Note: Ring-type crimp terminals cannot be used.

 Other ratings and specifications are the same as those of the standard type.

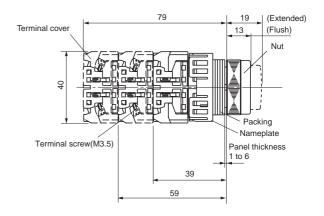
# ■ Applicable types

AM22

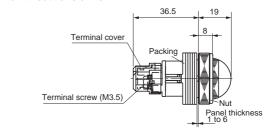
DM22: Without transformer, with transformer (except for short-body types)

### **■** Dimensions, mm

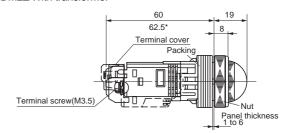
### AM22/Pushbutton switches



### DM22/Without transformer



# DM22/With transformer



Note: \* Except for the types 110V AC, 127V AC and 220V AC.

# AM22 and DM22 Special products

### Metal nut (aluminum) types

### **■** Features

The nut is an aluminum ring.

Other ratings and specifications are the same as those of the standard model.

### ■ Type

AM22 □ ZM

DM22 □ ZM

Specify "ZM" at the end of the type number of the standard type.

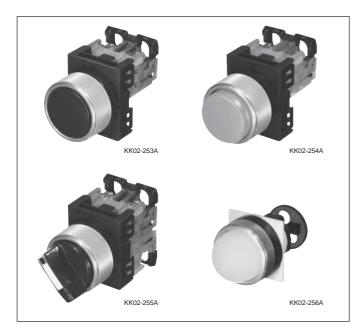
### **■** Dimensions, mm

Same as those of the standard types.

### ■ Applicable types

AM22 (except for G4L, G9L, M3R, M8R, V□E\*, V□F\* types) DM22 with round bezel

Note: \* Standard type is a metallic ring (chrome plated).



### Resisting sulfuration gas

### ■ Features

These products can be used in environments having a concentration of hydrogen sulfide gas of 0.5 ppm or less. The metallic parts have been subjected to an anti-corrosion treatment (see note).

The contacts of the AM series are gold plated.

Note: The body is made of resin and cannot be used with gases that affect resins (plastics)

### ■ Type

**AM22** □ **Z4**, **DM22** □ **Z4** 

Specify "Z4" at the end of the type number of the standard type.

### ■ Notes on use

- This product is resistant to light corrosive gas exposure.
- Other measures, such as covering the entire switch with a box, and the degree of protection of the panel should be taken into consideration.

### ■ Ratings and specifications

Hydrogen sulfide gas concentration of 0.5 ppm max. Ambient storage temperature: 8 to 37°C

Humidity: 62 to 81%

Other ratings and specifications are the same as those of the standard type.

### **■** Dimensions, mm

Same as those of the standard types.

### ■ Applicable types

AM22

DM22 (except for pilot lights with resistor unit)
(except for emergency stop pushbutton switch and emergency stop illumingted pushbutton switch)

# ■ Mass, gram

### • Pushbutton switches

Туре	1-contact	2-contact	4-contact
F0R	28	38	57
F5R			
E0R	29	39	58
E5R			
G3R, M4R	31	41	60
G8R			
M0R	33	43	62
M5R			
M3R	49	59	78
M8R			

### • Illuminated pushbutton switches

Туре	Without trans	Without transformer			With transformer*	
	1-contact	2-contact	4-contact	1-contact	2-contact	
F0L	42	51	70	88	97	
F5L	42	51	_	88	97	
E0L	43	53	72	89	99	
E5L	43	53	_	89	99	
M4L, G4L, G2L	44	54	73	90	100	
M9L, G9L, G7L	44	54	_	90	100	
MOL	45	55	74	91	101	
M5L	45	55	_	91	101	

### • Emergency stop pushbutton switches

Туре	1-contact	2-contact	4-contact
VSE	42	52	71
V0E	51	61	80
VME	53	63	82

# • Emergency stop illuminated pushbutton switches

Туре	Without transformer		With transformer*	
	1-contact	2-contact	1-contact	2-contact
VSF	53	62	99	108
VDF	60	69	106	115
V0F	62	71	108	117

# • Pilot lights

Туре	Without transformer	With transformer		With resistor
	Standard	Standard*	Short body	unit
D0L	22	74	72	36
E3L, K0L	23	75	73	37

# Selector switches

Туре	1-contact	2-contact	4-contact
PR	33	43	62
PCR	_	43	62
WR	34	44	63
WCR	_	44	63
JR	58	68	87
JCR	_	68	87

# • Illuminated selector switches

Туре	Without transformer			With transformer*	
	1-contact 2-contact 4-contact		1-contact	2-contact	
PL	44	54	73	90	100

Note: \*230V and over : +17grams

# Command Series CCC approved

# **■ CCC** approved

### AM22/DM22 series

### **Pushbutton switches**

Bezel	Operator	Type	Туре	
		AM22		
		Momentary action	Alternate action	
			(Turn-reset for V5R)	
Round bezel	Flush round head	AM22F0R	AM22F5R	
	Extended round head	AM22E0R	AM22E5R	
	Extended with full guard (24mm dia.)	AM22G3R	AM22G8R	
	Mushroom head with full guard (40mm dia.)	AM22M3R	AM22M8R	
	Mushroom head (29mm dia.)	AM22M4R	-	
	Mushroom head (40mm dia.)	AM22M0R	AM22M5R	
Certificate No.		2003010305063372		

Note: • Certified contact: Momentary action: within 8 contacts Alternate action: within 4 contacts

### **Emergency stop pushbutton switches**

Bezel	Operator	Туре
		AM22
Round bezel	Push-lock, turn-reset (29mm dia.)	AM22VSE
	Push-lock, turn reset (40mm dia.)	AM22V0E
	Push-lock, turn-reset (40mm dia.)	AM22VME
Certificate No.		2003010305063372

Notes: • Certified contact: 1NC, 1NO+1NC, 2NC, 3NC, 2NO+2NC, 4NC

• Certified button color: red (R) only

### Illuminated pushbutton switches

Bezel	Operator	Туре		
		AM22		
		Momentary	Alternate	
Round bezel	Flush round head	AM22F0L	AM22F5L	
	Extended round head	AM22E0L	AM22E5L	
	Mushroom head (29mm dia.)	AM22M4L	AM22M9L	
	Mushroom head (40mm dia.)	AM22M0L	AM22M5L	
	Extended with transparent full guard (24mm dia.)	AM22G4L	AM22G9L	
	Extended with full guard (24mm dia. with openings)	AM22G2L	AM22G7L	
Certificate No.		2003010305063372		
Specifications		- Contact  Without transformer  Momentary action: within 6 contacts  Alternate action: within 3 contacts  With transformer  Momentary action: within 4 contacts  Alternate action: within 2 contacts  - Color of button  Green, red, white, yellow, orange, blue  - Light source  LED lamp, incandescent lamp  - Operating voltage of lamp  Without transformer  LED: 6V AC, 6V DC, 12V AC/DC  Incandescent lamp: 5.5V AC/DC, 20V AC/DC  LED, incandescent lamp: 15V AC/DC, 24V AC/DC  With transformer  LED, incandescent lamp: 100-110V AC, 115-127V AC, 200-220V AC, 230-254V AC, 350-380V AC, 400-440V AC, 480V AC, 500-550V AC		

### **Emergency stop illuminated pushbutton switches**

Bezel	Operator	Туре
		AM22
Round bezel	Push-lock, turn-reset (29mm dia.)	AM22VSF
	Push-lock, turn reset (40mm dia.)	AM22V0F
	Push-lock, turn-reset (40mm dia. transparent in all colors)	AM22VDF
Certificate No.		2003010305063372

Notes: • Certified contact without transformer: 1NC, 1NO+1NC, 2NC, 3NC

- Certified contact with transformer: 1NC, 1NO+1NC, 2NC
- Certified light source: LED lamp only
- Certified operating lamp voltage: Without transfomer: 6A AC, 24V AC/DC

With transfomer: 100-110V AC, 115-127V AC, 200-220V AC, 230-254V AC, 350-380V AC, 400-440V AC, 480V AC, 500-550V AC

• Certified button color: red (R) only

### Selector switches

Bezel	Operator	Туре		
		AM22		
		Standard type	Control type	
Round bezel	Knob	AM22PR	AM22PCR	
	Lever	AM22WR	AM22WCR	
	Key	AM22JR	AM22JCR	
Certificate No.		2003010305063372		

Note: • Certified contact:

Maintained: within 8 contacts

Control type, spring return and spring/manual return: within 4 contacts

### Illuminated selector switches

Bezel	Operator	Туре
		AM22
		Standard type
Round bezel	Knob	AM22PL
Certificate No.		2003010305063372

Notes: • Certified contact: Without transformer

Maintained: within 6 contacts

Spring return and spring/manual return: within 3

contacts

With transformer

Maintained: within 4 contacts

Spring return and spring/manual return: within 2

contacts

• Certified lamp: both LED and incandescent lamp

## **Pilot lights**

Bezel	Lens	Туре
		DM22
Round bezel	Dome	DM22D0L
	Extended round	DM22E3L
	Faceted	DM22K0L
Certificate No.		2003010305063383

Notes: • Certified lamp: both LED and incandescent lamp

- Certified transformer type: standard and short-body
- Except for with resistor unit

### Item with degree of protection IP2X (IP20)

Туре	Certificate No.
AM22□ZB	2003010305063372
DM22□ ZB	2003010305063383

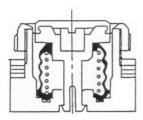
Note: Certified for all types listed in the above items except for short-body transformer of pilot light.

# General information

### **Features**

# ■ Oil and dust-proof construction

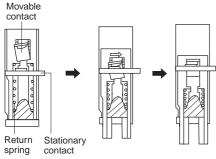
Protection complies with IEC Standard IP65. Special seals keep out oil, water, dust, and chips. This gives FUJI switches superior performance where dampness and dirt are likely to cause trouble .FUJI recommended where reliability is important.



### ■ Slide-action self-cleaning contacts

All contacts are double-break and selfcleaning.

With each operation, the contact surfaces are wiped by sliding that ensures positive engagement and excellent conductivity even in very low level circuits (5V, 5mA) and in corrosive environments.



Scrubbing contact action

### ■ Snap-on contact blocks and transformer

The contact blocks are easily snapped on, without using screws. Light transformers can also be mounted without tools.

### ■ A wide variety of operators

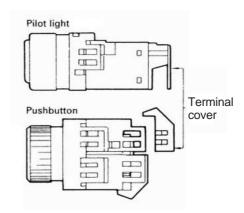
Pushbuttons, illuminated pushbuttons,2- or 3-position selector switches, and key-operated selector switches, etc. Choose the one you need.

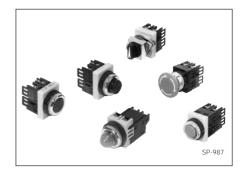
### ■ Contact blocks available up to 4NO+4NC

The AH25 series controls from one to eight control blocks in combination. Each contact block contains a set of 1NO or 1NC contacts.

### **■ Terminal covers**

Terminal covers make mounting safe. These covers can be used to indicate device numbers.





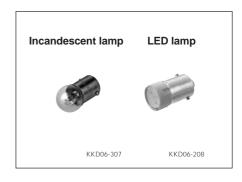
### ■ Easily replaced color tips

Only a screwdriver is needed to replace the buttons. A wide variety of colors available to suit to your needs.



### ■ Bright, long-life lamp

LED lamps that have a longer service life than standard incandescent lamps are available. FUJI LED lamps are bright and can be used with both AC and DC, much the same way as incandescent lamps.

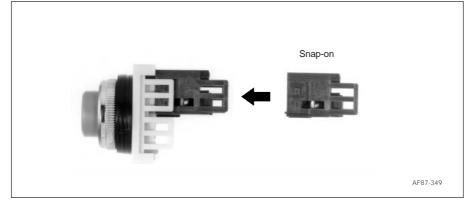


### ■ Approvals

**UL** listed



CSA certified (1)



For further infomation related to approved type, see page 04CD/3/2 to 04CD/3/4

# Quick reference guide

### ■ Pushbutton switches

Туре	Description	Туре	Description
AH25-F Flush round head	The button surface is flush with the locking nut. Momentary type.	AH25-M Mushroom head	Mushroom head button. Momentary type.
AF87-312	See page 04CD/3/10	<b>Q G</b> SG-185	See page 04CD/3/10
AH25-F5 Flush round head /Alternate action	The button surface is flush with the locking nut. Push-ON/push-OFF type.	AH25-M5 Mushroom head /Alternate action	Mushroom head button. Push-ON/push-OFF type.
<b>() ()</b> SG-166	See page 04CD/3/10	<b>(L) (S)</b> SG-183	See page 04CD/3/10
AH25-E Extended round head	The button surface projects 7mm from the locking nut. Momentary type.	AH25-V Push-lock, turn-reset	Locked when the button is pushed. To reset turn the button to the right.
<b>(1) (3)</b> AF87-314	See page 04CD/3/10	AF89-414	See page 04CD/3/11
AH25-E5 Extended round head /Alternate action	The button surface projects 7mm from the locking nut. Push-ON/push-OFF type.	AH25-U Wobble stick	The contact works when the lever is moved in any direction. Spring return action.
<b>Q G</b> SG-175	See page 04CD/3/10	<b>(b) (f)</b> SG-202	See page 04CD/3/11
AH25-G Extended with half guard	The upper half of the button has a guard ring to help prevent operating errors. Momentary type.	AH25-SF Flush square head	The button surface is flush with the guard. Momentary type. Operator protection conforms to IP40.
<b>6 6</b> SG-171	See page 04CD/3/10	<b>(L)</b> SG-208	See page 04CD/3/11
AH25-G5 Extended with half guard /Alternate action	The upper half of the button has a guard ring to help prevent operating errors. Push-ON/push-OFF type.	AH25-SF5 Flush square head /Alternate action	The button surface is flush with the guard. Push-ON/push-OFF type. Operator protection conforms to IP40.
<b>6</b> SG-172	See page 04CD/3/10	<b>6</b> SG-210	See page 04CD/3/11
AH25-G1 Extended with full guard	The button has a guard ring to help prevent operating errors.  Momentary type.	AH25-SE Extended square head	The button surface projects 7mm from the guard. Momentary type.  Operator protection conforms to IP40.
<b>♠</b> ♣ AF87-179	See page 04CD/3/10	<b>♠ ⑤</b> SG-206	See page 04CD/3/11
AH25-G6 Extended with full guard /Alternate action	The button has a guard ring to help prevent operating errors. Push-ON/push-OFF type.	AH25-SE5 Extended square head /Alternate action	The button surface projects 7mm from the guard. Push-ON/push-OFF type. Operator protection conforms to IP40.

# ■ Mechanically interlocked pushbutton switches

Туре	Description	Туре	Description
AH25-S1, S2, S3, S4, S5, S6 Pushbotton with selector ring(2-position)	Turning the ring to the left or right changes over the contact.	AH25-□/□ Mechanically interlocked	Two buttons are interlocked by a lever. When on is ON, the other is OFF.
<b>№</b> SI-55	See page 04CD/3/13	<b>AF89-610</b>	See page 04CD/3/14

# ■ Illuminated pushbutton switches

Туре	Description	Туре	Description
AH25-L Extended round head	The surface of the illuminated button projects about 15mm from the locking nut. Momentary type.	AH25-L4 Extend with transparent full guard	The illuminated button has a guard ring to help prevent operating errors. Momentary action.
<b>9</b> SG-150	See page 04CD/3/15	AF89-605	See page 04CD/3/15
AH25-L5 Extended round head /Alternate action	The surface of the illuminated button projects about 15mm from the locking nut.	AH25-VL Push-lock, turn-reset	Locked when the illuminated button is pushed. To reset, turn the button to the right.
<b>SG-152</b>	See page 04CD/3/15	AF89-413	See page 04CD/3/16
AH25-L2 Extended with full guard (With openings)	The illuminated button has a guard ring to help prevent operating errors. Momentary type.	AH25-SL Extended square head	The illuminated button projects about 8mm from the guard. Momentary type. Operator protection conforms to IP40.
AF90-267	See page 04CD/3/15	<b>O G</b> SG-144	See page 04CD/3/16
AH25-L6 Extended with full guard (With openings) /Alternate action	The illuminated button has a guard ring to help prevent operating errors. Push-ON/push-OFF type.	AH25-SL5 Extended square head / Alternate action	The illuminated button projects about 8mm from the guard. Push-ON/push-OFF type. Operator protection conforms to IP40.
AF90-277	See page 04CD/3/15	<b>S</b> G-149	See page 04CD/3/16
AH25-L3 Extended with full guard	The illuminated button has a guard ring to help prevent operating errors. Momentary action.	AH25-SL1 Flush square head	The illuminated button has a built-in legend plate. Momentary type. Operator protection conforms to IP40.
<b>AF89-604</b>	See page 04CD/3/15	<b>SG-139</b>	See page 04CD/3/16
AH25-L7 Extended with full guard /Alternate action	The illuminated button has a guard ring to help prevent operating errors. Push-ON/push-OFF type.	AH25-SL6 Flush square head/ Alternate action	The illuminated button has a built-in legend plate. Push-ON/push-OFF type. Operator protection conforms to IP40.
(AF90-265	See page 04CD/3/15	<b>© G</b> SG-146	See page 04CD/3/16

# AH25 Quick reference guide

# ■ Selector switches

Туре	Description	Туре	Description
AH25-P Knob	This switch works when the knob is turned. Operating positions: 2 or 3 Operating: Maintained, spring return, and spring/manual return.	AH25-SJ Key with square bezel	This switch works with a key inserted. Operator protection conforms to IP40. Operating positions: 2 or 3 Operating: Maintained.
<b>SG-188</b>	See page 04CD/3/18	<b>♣</b> SG-226	See page 04CD/3/18
AH25-PC Knob operated control type	21 types of operation are available using a cam for performing complex controls.	AH25-PW Lever	The lever extends out 13mm from the knob. Operating positions: 2 or 3 Operating: Maintained, spring return, and spring/manual return.
AF89-596	See page 04CD/3/22	<b>(L) (SP-1007)</b>	See page 04CD/3/18
AH25-J Key	This switch works when the key is inserted. Operating positions: 2 or 3 Operating: Maintained, spring return, and spring/manual return.	AH25-PL Illuminated knob	Illuminated switch with a lamp built into the knob. Operating positions: 2 or 3 Operating: Maintained.
SG-233	See page 04CD/3/18	AF89-622	See page 04CD/3/23
AH25-SP Knob with square bezel	This switch works when the knob is turned. Operator protection conforms to IP40. Operating positions: 2 or 3 Operating: Maintained.		
<b>9 S</b> G-196	See page 04CD/3/18		

# ■ Pilot lights

Transparent colored lens.  Flush square with legend plate legend plate on which charact symbols can be marked. Operator protection conforms  SF-1095  See page 04CD/3/25  Flush square with legend plate legend plate on which charact symbols can be marked. Operator protection conforms  See page 04CD/3/25	Туре	Description	Туре	Description
AH25-ZK* Faceted  This pilot light uses a faceted transparent colored lens.  AH25-ZM□8, □9 Dome (Short-body with transformer)  This pilot light has a short-bod transformer.  See page 04CD/3/25  AH25-ZS  This pilot light uses a square lens.  See page 04CD/3/25  This pilot light uses a square lens.				This pilot light has a built-in square legend plate on which characters and symbols can be marked.  Operator protection conforms to IP40.
Faceted transparent colored lens.  Dome (Short-body with transformer.  See page 04CD/3/25  AH25-ZS  This pilot light uses a square lens.  Dome (Short-body with transformer.  See page 04CD/3/25  —  See page 04CD/3/25  —  —	<b>SF-1095</b>	See page 04CD/3/25	<b>♣</b> SF-1092	See page 04CD/3/25
	Faceted	transparent colored lens.	Dome (Short-body with transformer)	
SF-1093 See page 04CD/3/25	Extended square	Operator protection conforms to IP40.	_	_

Note: \* With resistor unit types: Not approved standard

# Type number nomenclature

### **■** Type number nomenclature Pushbuttons

<u>AH25</u> - <u>E R 11</u> ② ③ ④

### ① Product category

AH25: 25mm-dia. pushbutton

### 2 Operator

Flush round head

F5: Flush round head(Alternate action)

Extended round head

E5: Extended round head(Alternate action)

Extended with half guard

G5: Extended with half guard (Alternate action)

G1: Extended with full guard

G6: Extended with full guard (Alternate action)

Mushroom head

M5: Mushroom head (Alternate action)

Push-lock, turn-reset

Wobble stick

SF: Flush square head

SF5: Flush square head (Alternate action)

SE: Extended square head

SE5: Extended square head (Alternate action)

S1-S6:Pushbutton with selector ring (2-position)

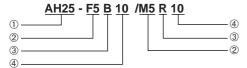
### 3 Color of button

G: D: Dark green Green Y: Yellow R: Red W: B: Black White O: Sky-blue Orange \*AH25-U type: ball color Black only.

### **4** Contact arrangement

30: 3NO 10: 1NO 03: 3NC 01: 1NC 33: 3NO+3NC 11: 1NO+1NC 20: 2NO 40: 4NO 02: 2NC 04: 4NC 22: 2NO+2NC 44: 4NO+4NC

### Mechanically interlocked pushbutton switches



### Product category

AH25: 25mm-dia. interlocked pushbutton

### 2 Combination of operator and operation mode

Latched/Latched

F5/F5: Flush (Push-locked)/Flush (Push-locked) F5/E5: Flush (Push-locked)/Extended (Push-locked) M5/M5: Mushroom (Push-locked)/Mushroom (Push-locked)

Latched/Unlatched

F5/F: Flush (Push-locked)/Flush (Momentary) Extended (Push-locked)/Extended (Momentary) M5/M: Mushroom (Push-locked)/Mushroom (Momentary)

#### 3 Button color Contact arrangement

G: Green 10: 1NO R: Red 01: 1NC B: Black 11: 1NO+1NC Dark green 20: 2NO Yellow 02: 2NC W: White

S: Sky-blue Orange

### Illuminated pushbuttons

AH25 - L5 G 11 H 3 (1) 2 3 4 5 6

### ① Product category

AH25: 25mm-dia. illuminated pushbutton

### 2 Operator

Extended round head

L5: Extended round head (Alternate action)

Extended with full guard (With openings) 12:

Extended with full guard (With openings alternate action)

Extended with full guard

Extended with full guard (Alternate action) L7:

L4: Extended with transparent full guard

VL: Push-lock, turn-reset

SL: Extended square head

SL5: Extended square head (Alternate action)

SL1: Flush square head

SL6: Flush square head (Alternate action)

### 3 Color of lens

Green S: Sky-blue\* Red Y: Yellow White O: Orange \* For LED lamp: Not available

 Contact arrangement 10: 1NO 30: 3NO 01: 1NC 03: 3NC 11: 1NO+1NC 33: 3NO+3NC 20: 2NO 40: 4NO 02: 2NC 04: 4NC 22: 2NO+2NC 44: 4NO+4NC

# ⑤ Lamp voltage

### • Without transformer:

Incandescent Blank 5.5V Α AD 6V DC 12V AC/DC В С 15V AC/DC 15V AC/DC 20V AC/DC D F 24V AC/DC 24V AC/DC

### • With transformer:

Incandescent **LED** 100-110V AC 100-110V AC 115-127V AC 115-127V AC 200-220V AC 200-220V AC Q 230-254V AC 230-254V AC S 350-380V AC 350-380V AC 400-440V AC 400-440V AC 480V AC 480V AC 500-550V AC 500-550V AC

### 6 Type of lamp

Blank: Incandescent lamp LED lamp

Note: • The manufacturing varies depending on the model. For details, refer to the contents of this catalog

# Type number nomenclature

### Selector and illuminated selector switches

<u>AH25 - PL 3 □ G 22 E 3 □</u> 2 3 4 5 6 7 8 9

### ① Product category

AH25: 25mm-dia. selector and illuminated selector switch

### ② Operator

Knob

PC: Knob operated control type

Key

Knob with square bezel

SJ: Key with square bezel

PW: Lever

PL: Illuminated knob

#### (3) Operating

2-position, maintained 2.

2-position, spring return (Right to left) 0:

3-position, maintained

3-position, spring/manual return (Left to center) 6:

3-position, spring/manual return (Right to center) 7:

3-position,center spring return 1.

Blank: 3-position, maintained (Control type only)

#### ⑤ Color of knob ④ Key removable position

G: Green B: Black \*1 A: Left Y: Yellow\*3 R: Red B: Left and right W: White\*3 O: Orange\*3 C: Left,center and right S: Sky-blue\*2\*3 D: Right E: Center Except for illuminated type

F: Center and right G: Center and left

\*2 For LED lamp: Not available \*3 Illuminated type only

### **6** Contact arrangement

30: 3NO 10: 1NO 01: 1NC 03: 3NC 3NO+3NC 1NO+1NC 33: 11: 40: 4NO 20: 2NO 04: 4NC 02: 2NC 22: 2NO+2NC 44: 4NO+4NC Note: Control type: See page 04CD/3/22

### ② Lamp voltage

• Without transformer: Incandescent LED Blank 5.5V AC/DC 6V AC AD 6V DC 12V AC/DC В Ċ 15V AC/DC 15V AC/DC

D 20V AC/DC

Ε 24V AC/DC 24V AC/DC

### • With transformer:

LFD Incandescent 100-110V AC 100-110V AC 115-127V AC 115-127V AC 200-220V AC 200-220V AC Q 230-254V AC 230-254V AC 350-380V AC 350-380V AC 400-440V AC 400-440V AC 480V AC 480V AC W 500-550V AC 500-550V AC

### Type of lamp

Blank: Incandescent lamp

LED lamp

### 9 Key code No.

A, B, C, D, E or F

### **Pilot lights**

AH25 - ZM W Q 3 (1) 2 3 4 5

### ① Product category

AH25: 25mm-dia. pilot light

2 Lens

ZM: Dome

7K: Faceted

ZS: Extended square\*

ZN: Flush square with legend plate\*

\* Incandescent lamp only

### 3 Color of lens

G: Green Sky-blue\* Red Yellow White O: Orange \* For LED lamp: Not available

### 4 Lamp voltage

• Without transformer:

Incandescent Blank 5.5V AC/DC Α 6V AC AD 6V DC 12V AC/DC В 15V AC/DC 15V AC/DC С D 20V AC/DC 24V AC/DC 24V AC/DC Ε

· With transformer:

Incandescent LED 110V DC\* 100-110V AC 100-110V AC 115-127V AC 115-127V AC 200-220V AC 200-220V AC 230-254V AC 230-254V AC Q 350-380V AC 350-380V AC 400-440V AC 400-440V AC 480V AC 480V AC 500-550V AC 500-550V AC

### 5 Type of lamp

Blank: Incandescent lamp

Incandescent lamp/Short-body with transformer 8:

3: LED lamp

LED lamp/With resistor unit 7:

9: LED lamp/Short-body with transformer

Note: • The manufacturing varies depending on the model. For details, refer to the contents of this catalog

<sup>\*</sup> With resistor unit only

### **■** Standards approved

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479

### ■ Specifications (Indoor use)

Description	Pushbutton switch Illuminated pushbutton switch Mechanically interlacked pushbutton switch Selector switch Illuminated selector switch	Pilot light	
Rated insulation voltage	600V AC/DC *1	l	
Mechanical durability	See the table below	-	
Electrical durability	500,000 operations at 220V AC 6A	-	
	1 million operations at 220V AC 3A		
Operating frequency	1800 operations/hour (On-load factor: 40%)	-	
Dielectric strength	2500V AC, 1 minute *2		
Insulation resistance	100MΩ or more (500V DC megger)		
Pollution degree	3		
Vibration	Resonance: 10 to 55Hz, double amplitude 0.1mm		
	Constant: 16.7Hz, double amplitude 3mm		
Shock	Malfunction durability: 100m/s <sup>2</sup>	Mechanical durability: 500m/s <sup>2</sup>	
	Mechanical durability: 500m/s <sup>2</sup>		
Ambient temperature	-20 to +70°C -20 to +50°C		
(No condensation or no icing)	(Illuminated type: -20 to +50°C)		
Storage temperature	-40 to +80°C		
Humidity	45 to 85% RH (within -5 to +40°C)		
Degree of protection	IP65*3		

### Mechanical durability

Description	Operations	
Pushbutton switch Illuminated pushbutton switch	Momentary action Alternate action With selector ring Push-lock, turn-reset	5 million 1 million 200,000 100,000
Mechanically interlocked pushbutton switch	Latched/Latched, Latched/Unlatched	100,000
Selector switch	Maintained, spring return, spring/manual return Control type	1 million 200,000
Illuminated selector switch	Maintained, spring return, spring/manual return	1 million

Note: Key insertion/removal durability for selector switch key types

Notes: \*1 Illuminated type without transformer: 250V AC/DC
\*2 Illuminated type without transformer: 1500V AC, 1 minute
\*3 Square type: IP40

<sup>•</sup> Key type 10,000

# AH25 Ratings and Specifications

# **■** Contact ratings

### UL/CSA standards

Voltage [V]	Application	Application		AC(COS ≠ =0.3	$AC(COS \phi = 0.35 \text{ or less})$	
	UL	CSA	[A]	Make [A]	Break [A]	
110-120	•		10	60	6.0	
120		•				
220-240	•			30	3.0	
240		•				
440-480	•			15	1.5	
480		•				
550-600	•			12	1.2	
600		•				

Voltage [V]	Application		DC
	UL CSA		Make and break currents [A]
115-125	•		1.1
115		•	
230-250	•		0.55

Note: AH25-J3, -J5, -P3, -P1, -S1, -S3, -S4, -S5 types cannot be used in DC circuit.

### NECA standards

Description	Rated	AC	AC		DC		
	thermal current	Voltage	Operational current (A)	Voltage	Operational of	current (A)	
	(A)	(V)	AC15(Ind.)	(V)	DC13(Ind.)	DC12(Res.)	
Pushbutton switch Illuminated pushbutton switch Selector switch (2-position)	10	24 110 220 440 550	6 6 6 2.5 2	24 110 220 -	6 1.3 0.45 -	6 2.5 1 -	
Selector switch (3-position) Pushbutton switch with selector ring Pushbutton switch with selector lever	10	24 110 220 440 550	3 3 3 1.3	24 110 220 - -	3 0.65 0.23 -	3 1.3 0.5 -	

# ■ Contact reliability

The AH25 command switches can be used in low level circuit of 5V AC/DC, 5mA. The operating environment and the types of load, however, may affect the operating range.

### ■ Lamp ratings

# • Illuminated pushbuttons, illuminated selectors, pilot lights

Transformer	Lamp voltage	LED (lamp base: BA9S/13)				Incandescent (lamp base: BA9S/13)		
		Туре		Rated voltage	Consumption	Type	Rated voltage	Consumption
Without	5.5V AC/DC	_	_	_	_	AHX135	6.3V AC/DC	0.9W
transformer	6V AC	APX508-6□	APX510-6□	6V AC	Green, red, orange, amber: 7mA AC	_	-	_
					Yellow: 50mA AC			
	6V DC	APX508-D6□	APX510-D6□	6V DC	Green, red, orange, amber: 11mA DC	-	_	-
					Yellow: 33mA DC			
	12V AC/DC	APX508-12□	APX510-12□	12V AC/DC	Green, red, orange, amber: 14mA AC, 11mA DC	-	_	-
					Yellow: 28mA AC, 22mA DC			
	15V AC/DC	APX508-15□	APX510-15□	15V AC/DC	Green, red, orange, amber: 13mA AC, 11mA DC	AHX279	18V AC/DC	0.8W
					Yellow: 26mA AC, 22mA DC			
	20V AC/DC	-	_	-	_	AHX144	24V AC/DC	0.9W
	24V AC/DC	APX508-24□	APX510-24□	24V AC/DC	12mA AC, 11mA DC	AHX129	30V AC/DC	0.8W
With transformer	110V AC	APX508-6□	APX510-6□	6V AC	1.5VA	AHX135	6.3V AC/DC	2VA
	127V AC							2VA
	220V AC							2VA
	254V AC	APX508-6□	APX510-6□	6V AC	2.5VA	AHX135	6.3V AC/DC	2.5VA
	380V AC							2.5VA
	440V AC							2.5VA
	480V AC							2.5VA
	550V AC							2.5VA
With resistor unit	110V DC	APX508-24□	APX510-24□	24V AC/DC	1.2W	_	_	_

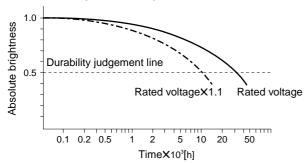
Note: Replace the  $\square$  mark by the lamp luminous color code.

### ■ Lamp durability

Lamp	Durability (reference)	Judgement criterion
LED		When brightness is less than 50% of initial value
Incandescent	Approx. 5000h (AC)	When the bulb burns out

Note: • The operating voltage for incandescent lamps is set at 80 to 90% of the lamp's rated voltage.
• The durability of LED lamp is a mean value in all colors.

### Estimated durability for LED lamps



Notes: • Durability at Ta=25°C
• Durability is affected by temperature, humidity, and voltage fluctuation.

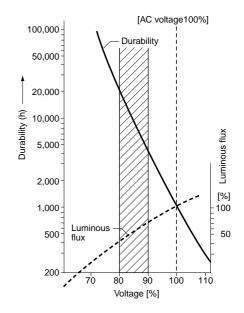
### ■ Combination of lens color and LED luminous color

Lens color		LED lamp					
(lens or color plate)		(high-brightness)					
Color	Code	Luminous color	Type *1				
Green	G	Green	APX510- <b>■</b> G	APX508- <b>■</b> G			
Red	R	Red	APX510- <b>■</b> R	APX508- <b>■</b> R			
White	W	Orange	APX510- <b>■</b> O	APX510- <b>■</b> O			
Yellow	Υ	Yellow	APX510- <b>■</b> Y	APX508- <b>■</b> Y			
Orange	Α	Amber	APX510- <b>■</b> A	APX508- <b>■</b> A			

Notes: \*1 For pilot lights

• Replace the ■ mark by the lamp voltage code

# Incandescent lamp voltage characteristics



# Pushbuttons **AH25**

Operator	Contact	Momentary action Type	Alternate action Type	Operator dimensions,mm
Flush round head  AF87-312	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-F   10 AH25-F   01 AH25-F   11 AH25-F   20 AH25-F   02 AH25-F   22	AH25-F5 □10 AH25-F5 □01 AH25-F5 □11 AH25-F5 □20 AH25-F5 □02 AH25-F5 □22	Panel thickness 0.8 to 6
Extended round head  AF87-314	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-E□10 AH25-E□01 AH25-E□11 AH25-E□20 AH25-E□02 AH25-E□22	AH25-E5 □ 10 AH25-E5 □ 01 AH25-E5 □ 11 AH25-E5 □ 20 AH25-E5 □ 02 AH25-E5 □ 22	Panel thickness 0.8 to 6
Extended with half guard	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-G □ 10 AH25-G □ 01 AH25-G □ 11 AH25-G □ 20 AH25-G □ 02 AH25-G □ 22	AH25-G5 □ 10 AH25-G5 □ 01 AH25-G5 □ 11 AH25-G5 □ 20 AH25-G5 □ 02 AH25-G5 □ 22	Panel thickness 0.8 to 6
Extended with full guard	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-G1 □ 10 AH25-G1 □ 01 AH25-G1 □ 11 AH25-G1 □ 20 AH25-G1 □ 02 AH25-G1 □ 22	AH25-G6 □10 AH25-G6 □01 AH25-G6 □11 AH25-G6 □20 AH25-G6 □02 AH25-G6 □22	Panel thickness  O.8 to 6
Mushroom head SG-185	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-M□10 AH25-M□01 AH25-M□11 AH25-M□20 AH25-M□02 AH25-M□22	AH25-M5 □ 10 AH25-M5 □ 01 AH25-M5 □ 11 AH25-M5 □ 20 AH25-M5 □ 02 AH25-M5 □ 22	Panel thickness  0.8 to 6

Notes: • ☐ See page 04CD/3/11

• Contact block dimensions: See page 04CD/3/12

Operator	Contact	Momentary action Type	Operator dimensions,mm
Push-lock, turn-reset	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-V □10 AH25-V □01 AH25-V □11 AH25-V □20 AH25-V □02 AH25-V □22	Panel thickness 1 to 6
Wobble stick	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-UB10 AH25-UB01 AH25-UB11 AH25-UB20 AH25-UB02 AH25-UB22	Panel thickness 0.8 to 6

Notes: • AH25-U type: ball color Black only.

\*1 Alternate action type.

Operator	Contact	Momentary action Type	Alternate action Type	Operator dimensions,mm
Flush square head	1NO 1NC 1NO+1NC 2NO 2NC 2NC+2NC	AH25-SF □10 AH25-SF □01 AH25-SF □11 AH25-SF □20 AH25-SF □02 AH25-SF □22	AH25-SF5 □10 AH25-SF5 □01 AH25-SF5 □11 AH25-SF5 □20 AH25-SF5 □02 AH25-SF5 □22	Panel thickness 0.8 to 2
Extended square head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-SE □ 10 AH25-SE □ 01 AH25-SE □ 11 AH25-SE □ 20 AH25-SE □ 02 AH25-SE □ 22	AH25-SE5 □10 AH25-SE5 □01 AH25-SE5 □11 AH25-SE5 □20 AH25-SE5 □02 AH25-SE5 □22	Panel thickness 0.8 to 2

# • Button color

Replace the  $\ \square$  mark by the following button color code

Button color	Green	Red	Black	Yellow	White
Code	G	R	В	Υ	W

Button color	Dark green	Sky-blue	Orange
Code	D	S	0

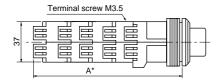
Note: AH25-V type: Red, yellow, black only.

- Up to 8-contact block of the contact arrangement can be made. For alternate action type, up to 4-contact block of the contact arrangement can be made. (Except for AH25-V type)
- AH25-V type: Up to 4-contacts can be made.
- Contact block dimensions: See page 04CD/3/12

# **Pushbuttons**

# **AH25**

# • Contact block dimensions, mm



• Up to 8-contact block of the contact arrangement can be made. For alternate action type, up to 4-contact block of the contact arrangement can be made.

# **AH25**

$\overline{}$	Carata at blash	4NO 4NO	2010 2010	2010 - 2010	4NO - 4NO
	Contact block	TINO, TINO,	SINO, SINO,	3110+3110	4NO+4NC
		2NO, 2NC,	4NO, 4NC,		
	Operator	1NO+1NC	2NO+2NC		
Ā	F,E,M,G,G1	45	67	89	111
*	F5,E5,M5,G5,G6	67	89	_	_
	V	48.5	70.5	ı	1
	U	43.5	65.5	87.5	109.5
	SF,SE	46.5	68.5	90.5	112.5
	SF5,SE5	68.5	90.5	_	-

<sup>\*</sup> When attaching the terminal cover, the dimension of externals increase 1.5mm.

Operator	Туре	Contact ope	Contact operation					
		Contact blo	ck	Left		Right		
		Mounting position	Туре	Free	Depressed	Free	Depressed	
Pushbutton with	AH25-S1 □ 22	(1)	NC	_	_	•	_	
selector ring 2-position		(2)	NC	_	_	•	_	
2NO+2NC		(3)	NO	_	•	_	•	
		(4)	NO	_	•	_	•	
	AH25-S2□22	(1)	NC	•	_			
		(2)	NC			•	_	
		(3)	NO	_	•	_	_	
SI-55		(4)	NO	_	_	_	•	
31 33	AH25-S3□22	(1)	NC	_	_			
		(2)	NC			_	_	
		(3)	NO	_	•	_	_	
		(4)	NO	_	_	_	•	
	AH25-S4□22	(1)	NC	_	_			
		(2)	NC	_	_	•	_	
		(3)	NO	_	•	_	_	
		(4)	NO	_	•	_	•	
	AH25-S5□22	(1)	NC	•	_	_	_	
		(2)	NC	•	_	_	_	
		(3)	NO	_	•	_	•	
		(4)	NO	_	•	_	•	
	AH25-S6 □ 22	(1)	NC	•	_	_		
		(2)	NC	•	_	_	Locked	
		(3)	NO	_	•	•	LOCKEU	
		(4)	NO	_	•	•		

Note: (1) to (4) contact block mounting position

Contact closed Contact open

# • Button color

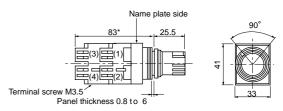
Replace the  $\square$  mark by the following button color code

Button color	Green	Red	Black	Yellow	White
Code	G	R	В	Υ	W

Button color	Dark green	Sky-blue	Orange
Code	D	S	0

- The contact arrangement is 2NO+2NC only.
- The terminals are on the upper and lower positions.
  To turn selector ring of the S3 type right/left, the contacts in the upper and lower contact blocks overlap.

### • Dimensions, mm



\* When attaching the terminal cover, the dimension of externals increase 1.5mm.

# ■ Mechanically interlocked pushbutton switches

Exterior view	Operator	Contact block	Cat. No.
Latched/Latched	Flush/Flush Flush/Extended Flush/Mushroom	1NO/1NO 1NO+1NC/1NO+1NC 1NO/1NO 1NO+1NC/1NO+1NC 1NO/1NO 1NO+1NC/1NO+1NC	AH25-F5 □10/F5 □10 AH25-F5 □11/F5 □11 AH25-F5 □10/E5 □10 AH25-F5 □11/E5 □11 AH25-F5 □10/M5□10 AH25-F5 □11/M5□11
Latched/Unlatched	Flush/Flush Flush/Extended	1NO/1NO 1NO+1NC/1NO+1NC 1NO/1NO 1NO+1NC/1NO+1NC	AH25-F5 □10/F □10 AH25-F5 □11/F □11 AH25-F5 □10/E □10 AH25-F5 □11/E □11
AF89-6	Flush/Mushroom	1NO/1NO 1NO+1NC/1NO+1NC	AH25-F5 □10/M□ 10 AH25-F5 □11/M□ 11

### • Button color

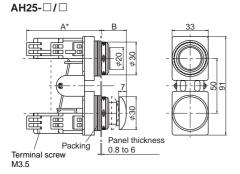
Replace the  $\hfill\square$  mark by the following button color code

Button color	Green	Red	Black	Yellow	White
Code	G	R	В	Υ	W

Button color	Dark green	Sky-blue	Orange
Code	D	S	0

<sup>•</sup> Up to 2-contacts can be made.

# • Dimensions, mm



Contact arrangement	1NO, 1NC	1NO+1NC 2NO, 2NC
A*	46.5	68.5

 $<sup>^{\</sup>star}$  When attaching the terminal cover, the deimension of externals increase 1.5mm.

Button	F, F5	E, E5	M, M5
В	7.5	14	22.5

Operator	Contact	Momentary action Type	Alternate action Type	Operator dimensions, mm
Extended round head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-L □10 ■ AH25-L □01 ■ AH25-L □11 ■ AH25-L □20 ■ AH25-L □22 ■ AH25-L □22 ■	AH25-L5 □ 10 AH25-L5 □ 01 AH25-L5 □ 11 AH25-L5 □ 20 AH25-L5 □ 02 AH25-L5 □ 22	20.5 0.8 to 6
Extended with full guard (With openings)	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-L2 □10 ■ AH25-L2 □01 ■ AH25-L2 □11 ■ AH25-L2 □20 ■ AH25-L2 □02 ■ AH25-L2 □22 ■	AH25-L6	933 94 94 94 94 94 95 95 95 95 95 95 95 95 95 95 95 95 95
Extended with full guard	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-L3 □10 ■ AH25-L3 □11 ■ AH25-L3 □11 ■ AH25-L3 □20 ■ AH25-L3 □02 ■ AH25-L3 □22 ■	AH25-L7 □10 AH25-L7 □01 AH25-L7 □11 AH25-L7 □20 AH25-L7 □02 AH25-L7 □22	
Extended with transparent full guard	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-L4 □10 ■ AH25-L4 □11 ■ AH25-L4 □11 ■ AH25-L4 □20 ■ AH25-L4 □02 ■ AH25-L4 □22 ■	- - - - -	

### • Lens color

Replace the  $\hfill\Box$  mark by the following lens color code

Button color	Green	Red	Yellow	White	Sky-blue	Orange
Code	G	R	Υ	W	S	0

For illuminated pushbutton with LED lamp,sky-blue is not available. Lens are transparent colored plastic.

- Contact block dimensions: See page 04/19.
- Up to 8-contact block of contact arrangement can be made.
   For switches with transformers or alternate action switches,up to 4-contact block can be made.

# • Voltage

Replace the ■ mark by the lamp voltage code

Transformer		Code LED	Incandescent
Without transformer	6V DC 6V AC 5.5V AC/DC 12V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC	AD3 A3 — B3 C3 — E3	Blank C D E
With transformer		Q3 S3 T3 V3	H L M Q S T V

# Illuminated Pushbuttons **AH25**

Operator	Contact	Momentary action Type	Alternate action Type	Operator dimensions, mm
Extended square head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-SL □10 ■ AH25-SL □11 ■ AH25-SL □11 ■ AH25-SL □20 ■ AH25-SL □22 ■ AH25-SL □22 ■	AH25-SL5 □ 10 ■ AH25-SL5 □ 01 ■ AH25-SL5 □ 11 ■ AH25-SL5 □ 20 ■ AH25-SL5 □ 02 ■ AH25-SL5 □ 22 ■	Panel thickness 0.8 to 3
Flush square head	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-SL1 □ 10 ■ AH25-SL1 □ 01 ■ AH25-SL1 □ 11 ■ AH25-SL1 □ 20 ■ AH25-SL1 □ 02 ■ AH25-SL1 □ 22 ■	AH25-SL6 □ 10 ■ AH25-SL6 □ 01 ■ AH25-SL6 □ 11 ■ AH25-SL6 □ 20 ■ AH25-SL6 □ 02 ■ AH25-SL6 □ 22 ■	26.5  Panel thickness 0.8 to 3

Notes: For SL,SL1,SL5 and SL6,switches with incandescent lamp only.

Operator	Contact	Туре	Operator dimensions,mm
Push-lock, turn-reset	1NO 1NC 1NO+1NC 2NO 2NC 2NO+2NC	AH25-VL □10 ■ AH25-VL □01 ■ AH25-VL □11 ■ AH25-VL □20 ■ AH25-VL □02 ■ AH25-VL □22 ■	Panel thickness 1 to 6

### • Lens color

Replace the ☐ mark by the following lens color code

Button color	Green	Red	Yellow	White	Sky-blue	Orange
Code	G	R	Υ	W	S	0

AH25-VL type: Red, yellow only For illuminated pushbutton with LED lamp,sky-blue is not available. Lens are transparent colored plastic.

- Contact block dimensions: See page 04CD/3/19.
- Up to 8-contact block of contact arrangement can be made. For switches with transformers or alternate action switches,up to 4-contact block can be made. (Except AH25-VL type)
- AH25-VL type without transformer: Up to 4-contacts AH25-VL type with transformer: Up to 2-contacts

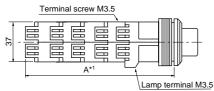
### Voltage

Replace the ■ mark by the lamp voltage code

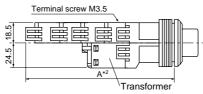
Transformer		Code LED	Incandescent
Without transformer	6V DC 6V AC 5.5V AC/DC 12V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC	AD3 A3 — B3 C3 — E3	Blank C D E
With transformer	100-110V AC 115-127V AC 200-220V AC 230-254V AC 350-380V AC 400-440V AC 480V AC 500-550V AC	L3 M3	H L M Q S T V W

### • Contact block dimensions, mm

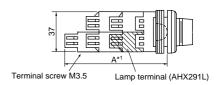
Without transformer (Except VL type)







Without transformer (For VL type)



### Without transformer

_							
	Contact block	1NO, 1NC	2NO, 2NC,	3NO, 3NC	4NO, 4NC,	3NO+3NC	4NO+4NC
			1NO+1NC		2NO+2NC		
	Operator						
Α	L	64.5		86.5		108.5	130.5
*1	L5	86.5		108.5		ı	_
	L2,L3,L4	63.5		85.5		107.5	129.5
	L6,L7	85.5		107.5		1	_
	VL	48.5	70.5	70.5	92.5	ı	_
	SL,SL1	66		88		110	132
	SL5,SL6	88		110		_	-

### With transformer

	Contact block	1NO, 1NC	2NO, 2NC	3NO, 3NC	4NO, 4NC
			1NO+1NC		2NO+2NC
	Operator				
Α	L	81	86.5	108.5	130.5
*2	L5	103	108.5	130.5	152.5
	L2,L3,L4	80	85.5	107.5	129.5
	L6,L7	102	107.5	129.5	151.5
	VL	62	70.5	-	_
	SL,SL1	83	88	110	132
	SL5,SL6	105	110	132	154

Notes: • Up to 8-contact block of contact arrangement can be made.

For switches with transformers or alternate action switches, up to 4-contact block of contact arrangement can be made. (Except AH25-VL)

- Type AH25-VL without transformer: 4 contact Max. with transformer: 2 contact Max.
- \*1 When attaching the terminal cover, the dimension of externals increase 1.5mm.
- \*2 When attaching the terminal cover, the dimension of externals increase 1.5mm. (Except for 1NO and 1NC)

# • 2-position

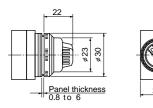
Operator		Operation	Contact	Туре	Contact oper	ration (Example)
					Contact	Operator position
					arrangement	Left Right
						0 0
Knob		Maintained	1NO	AH25-P2 □10	1NO (1)	Upper contact
		Walitalioa	1NC	AH25-P2 □01		
			1NO+1NC	AH25-P2 □11		3 + 4
- Allen			2NO	AH25-P2 □20		
		each 90°	2NO+2NC	AH25-P2 □22	1NC (1)	Upper contact
	1	Spring return	1NO	AH25-P0 □10		① • 2
29/4			1NC	AH25-P0 □01		
		6	1NO+1NC	AH25-P0 □11	1NO+1NC	Unnergenteet
			2NO	AH25-P0 □ 20	(1)	Upper contact
	SG-188	90°	2NO+2NC	AH25-P0 □ 22	(1)	3 -4
Lever		Maintained	1NO	AH25-PW2 □10		Lower contact
			1NC	AH25-PW2 □01	(2)	Lower contact
dla.			1NO+1NC	AH25-PW2 □11		1 - 2
		each 90°	2NO 2NO+2NC	AH25-PW2 □20 AH25-PW2 □22		
			ZIVOTZIVO	A1123-1 W2	2NO+2NC	Upper contact
		Spring return	1NO	AH25-PW0 □10	(1)	3 - 4
			1NC	AH25-PW0 □ 01		
•		Ō	1NO+1NC	AH25-PW0 □11	(3)	3 + 4
			2NO 2NO+2NC	AH25-PW0 □ 20 AH25-PW0 □ 22		
	SP-1007	90°	ZINOTZINO	AH23-FWU 🗆 22		Lower contact
Knob with square be	ezel	Maintained	1NO	AH25-SP2 □10	(2)	1 2
			1NC	AH25-SP2 □ 01		
			1NO+1NC	AH25-SP2 □11	(4)	1 - 2
	r	each 90°	2NO 2NO+2NC	AH25-SP2 □ 20 AH25-SP2 □ 22		
	SG-196	Gdoil 30	214012140	A1123-01 2 1 22		
Key		Maintained	1NO	AH25-J2 ■10()		
			1NC	AH25-J2 ■01()	Upper contact	lame plate side
			1NO+1NC	AH25-J2 ■11()		
AL B	1	each 90°	2NO 2NO+2NC	AH25-J2 ■20() AH25-J2 ■22()		<del>_</del>
	,		211012110	A1120 02 = 22()	4)=	
		Spring return	1NO	AH25-J0 ■10()	Lower contact	
K			1NC	AH25-J0 ■01()		
		\ \bar{\bar{\bar{\bar{\bar{\bar{\bar{\bar	1NO+1NC 2NO	AH25-J0 ■11() AH25-J0 ■20()		
	SG-233	90°	2NO+2NC	AH25-J0 ■22()		
Key with square bez	zel	Maintained	1NO	AH25-SJ2 ■10()		
iii) iiiii square sez	b	Iviaii itali ieu	1NC	AH25-SJ2 ■ 10( ) AH25-SJ2 ■ 01( )		
			1NO+1NC	AH25-SJ2 ■11()		
3 4			2NO	AH25-SJ2 ■20()		
	SG-226	each 90°	2NO+2NC	AH25-SJ2 ■22()		
	55 220		1			

Notes: • (1) to (4): Contact block mounting position

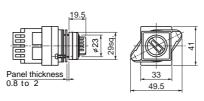
<sup>•</sup>①-②,③-④: Contact block terminal No.
• □ , ■ , ( ) and contact arrangements: See page 04CD/3/19

# • Operator dimensions, mm

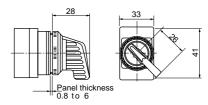
### AH25-P



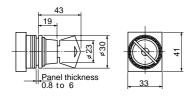
# AH25-SP



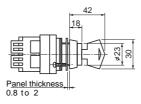
AH25-PW



### AH25-J

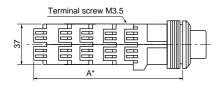


# AH25-SJ





### · Contact block dimensions, mm



		Contact block	1NO, 1NC,	3NO, 3NC,	3NO+3NC	4NO+4NC
			2NO, 2NC,	4NO, 4NC,		
		Operator	1NO+1NC	2NO+2NC		
Α	AH25	P0, P2, PW0, PW2	53.5	75.5	97.5	119.5
*		SP2	55.5	77.5	99.5	121.5
		SJ2	52.5	74.5	96.5	118.5
		J0, J2	51.5	73.5	95.5	117.5

Notes: \* When attaching the terminal cover, the dimension of externals increase 1.5mm.

# • Knob color

Replace the  $\square$  mark by the following knob color code

Knob color	Green	Red	Black
Code	G	R	В

The standard knob color is black.

# • Key code No.

Replace the  $\blacksquare$  with the key code No. A, B, C, D, E or F. Standard key code is A.

### • Key removable positions

Replace the () mark by the following code No.

Code	А	D	В
Removable position	NS. 45°	N2, 42.	
J2 J0 SJ2	•	• - •	• - •

<sup>• :</sup> Available

-: Not available

<sup>•</sup> Up to 8-contact block of the contact arrangement can be made.

#### Selector Switches **AH25**

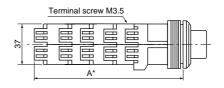
#### • 3-position

Operator		Operation	Contact	AH25 Type
Knob		Maintained	1NO+1NC	AH25-P3 □11
		each 45°	2NO+2NC	AH25-P3 □22
F131 17		Spring/manual return	1NO+1NC	AH25-P5 □11
		(1) each 45°	2NO+2NC	AH25-P5 □22
		Spring/manual return	1NO+1NC	AH25-P6 □11
		each 45°	2NO+2NC	AH25-P6 □22
		Spring return	2NO+2NC	AH25-P1 □ 22
5	SG-193	each 60°		
Lever operated		Maintained	1NO+1NC	AH25-PW3 □11
		each 45°	2NO+2NC	AH25-PW3 □22
MAN		Spring/manual return	1NO+1NC	AH25-PW5 □11
		each 45°	2NO+2NC	AH25-PW5 □22
		Spring/manual return	1NO+1NC	AH25-PW6 □11
		each 45°	2NO+2NC	AH25-PW6 □22
		Spring return	2NO+2NC	AH25-PW1 □ 22
AF	89-602	each 60°		
Knob with square bezel		Maintained	1NO+1NC	AH25-SP3 □11
		220h 45°	2NO+2NC	AH25-SP3 □ 22
		each 45°		
AF	88-599			
Key		Maintained	1NO+1NC	AH25-J3 ■11()
The same of the sa		each 45°	2NO+2NC	AH25-J3 ■ 22( )
		Spring/manual return	1NO+1NC	AH25-J5■11()
		each 45°	2NO+2NC	AH25-J5■ 22( )
		Spring/manual return	1NO+1NC	AH25-J6 ■ 11()
	SG-364	① each 45°	2NO+2NC	AH25-J6 ■ 22()
Key with square bezel		Maintained	1NO+1NC	AH25-SJ3 ■11()
			2NC+2NC	AH25-SJ3 ■22( )
		each 45°		
AF	89-609			

Notes: • □, ■, ( ) and contact arrangements: See page 04CD/3/21
• Operator dimensions: See page 04CD/3/19

#### • Contact block dimensions, mm

		block	2NO. 2NC	3NO, 3NC 4NO, 4NC 2NO+2NC	3NO+3NC	4NO+4NC
Α	AH25	P3, P5, P6, PW3, PW5, PW6	53.5	75.5	97.5	119.5
*		SP3	55.5	77.5	99.5	121.5
		SJ3	52.5	74.5	96.5	118.5
		J3, J5, J6	51.5	73.5	95.5	117.5
		P1, PW1	_	75.5	_	-
		J1	_	73.5	_	_



Notes: \* When attaching the terminal cover, the dimension of externals increase 1.5mm.

#### • Key removable positions

Replace the () mark by the following code No.

Code	А	В	С	D	E	F	G
Removable position	\$5° 45°	\$5°, 48°,	45, 48,	45° 45°	45, 45,	45, 45,	A5° 45°
J3, SJ3 J5 J6	• - •	• - -	• - -	•	•	•	• - •

●: Available —: Not available

#### • Contact operation (Example)

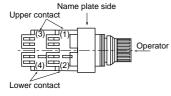
3-position

Туре	Contact	Operator position
	arrange- ment	L         C         R         L         C         R           S         ①         Ø         ①         Ø         ①         Ø
P3, PW3,	1NO+1NC	Upper contact Lower contact
SP3, J3, SJ3, P5, PW5, J5	(1) (2)	
P6, PW6,	1NO+1NC	Upper contact Lower contact
J6	(1) (2)	
P1, PW1	2NO+2NC	Upper contact Lower contact
	(1) (2)	
	(3) (4)	3 4 4

Note: ①-②,③-④ : Contact block terminal No. 

■ Contact closed

#### • Position of contact block



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#### • Key code No.

Replace the  $\blacksquare$  with the key code No. A, B, C, D, E or F. Standard key code is A.

#### • Knob color

Replace the  $\hfill\Box$  mark by the following knob color code

Knob color	Green	Red	Black
Code	G	R	В

The standard knob color is black.

Up to 8-contact block of the contact arrangement can be made.

For spring return switches, up to 4-contact block can be made.

Up to 8-contact block of the contact arrangement can be made.

For P1, PW1 types, up to 4-contact block can be made.

#### ■ Selector switches (control type)

#### 3-position

Operator	Operation	Knob color or key removable position	Contact arrangement (2NO+2NC only)	Туре
Knob  AF89-596	Maintained each 60°	Color code: B: Black (Standard) Color other than above are available (G: Green) R: Red	Replace the ■ mark by type arrangement code (shown on under table).	AH25-PCR  AH25-PCG  AH25-PCG  ■

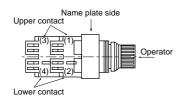
#### Contact operation (2NO+2NC)

Contact operation (2110)					
Code	Operation	Contact operation			
		Upper contact Lower contact			
012	Maintained	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
032		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
052	each 60°	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
072		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
092		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
112		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
132		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
152		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
172		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
192		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
212		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			

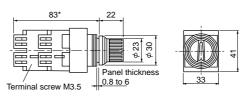
Code	Operation	Contact operation	
		Upper contact	Lower contact
022	Maintained 1 2 3	(1) ① 1 2 3 (3) ③ 4 4	(2) ① <del>•</del> • ② ② (4) ③ • • ④
042		(1) ① ① ① ② 3 (3) ③ ② ② ② ④ ④	(2) ① <del>•</del> 2 3 (4) ③ <del>•</del> 4
062	each 60°	(1) 1 2 3 (3) 3 4 4	(2) ① <del>•</del> • ② ② (4) ③ • • ④
082		(1) 1 2 3 (3) 3 4	(2) ① <del>  •   2</del> ② (4) ③ <del>  •   4</del>
102		(1) ① ① ① ② 3 (3) ③ ② ② ② ②	(2) ① <del>•</del> • 2 (4) ③ <del>•</del> • 4
122		(1) 1 2 3 (3) 3 + 2 2	(2) ① <del>•</del> 2 3 (4) ③ <del>•</del> 4
142		(1) 1 2 3 (3) 3 4 4	(2) ① <del>                                    </del>
162		(1) 1 2 3 (3) 3 4 4 4	(2) ① <del>                                    </del>
182		(1) ① <u> </u>	(2) ①
202		(1) ① 1 2 3 (3) ③ • • • • • • • • • • • • • • • • • •	(2) ① 1 2 3 (4) ③ • • • • •

Contact closed

Notes: • (1) to (4): Contact block mounting position •①-②,③-④: Contact block terminal No.



#### • Dimensions, mm

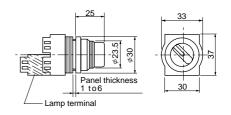


 $<sup>^{\</sup>star}$  When attaching the terminal cover, the dimmension of externals  $\,$  increase1.5mm.

#### • 2-position

Operator	Operation	Contact	Туре
Knob	Maintained each 90°	1NO+1NC 2NO+2NC	AH25-PL2 □11 ■ AH25-PL2 □22 ■
AF89-622	Spring return 5 90°	1NO+1NC 2NO+2NC	AH25-PL0 □11 ■ AH25-PL0 □22 ■

#### • Operator dimensions, mm



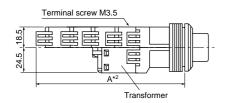
#### • 3-position

- p			
Operator	Operation	Contact	Туре
Knob	Maintained	1NO+1NC	AH25-PL3 □ 11■
, maren	each 45°	2NO+2NC	AH25-PL3 □ 22■
	Manual/ spring return	1NO+1NC	AH25-PL6 □ 11 ■
	each 45°	2NO+2NC	AH25-PL6 □ 22■
	Manual/ spring return	1NO+1NC	AH25-PL7 □ 11 ■
AF89-415	each 45°	2NO+2NC	AH25-PL7 □ 22■

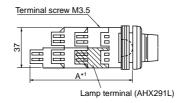
Notes: • □, ■ and contact arrangements: See page 04CD/3/24

#### • Contact block dimensions, mm

Switch: with transformer



Switch: without transformer



	Opera	block		1NO+1NC 2NO, 2NC	3NO, 3NC	2NO+2NC 4NO, 4NC	
		Without transformer	48.5	70.5	70.5	92.5	114.5
*1	-PL	With transformer	62	70.5	92.5	114.5	-

Notes:  $\bullet$  \*1 When attaching the terminal cover, the dimension of external increase 1.5mm.

<sup>• 3-</sup>position, spring return type is not available.

<sup>\*2</sup> When attaching the terminal cover, the dimension of external increase 1.5mm. (Except for 1NO and 1NC)

#### **AH25**

#### • Replace the mark by the following lamp voltage code

	•		
Transformer	Voltage	Code LED	Incandescent
Without	5.5V AC/DC 6V DC	– AD3	Blank
	6V AC	A3	_
	12V AC/DC	B3	_
	15V AC/DC	C3	С
	20V AC/DC	_	D
	24V AC/DC	E3	E
With	100-110V AC	H3	Н
	115-127V AC	L3	L
	200-220V AC	M3	M
	230-254V AC	Q3	Q
	350-380V AC	S3	S
	400-440V AC	T3	T
	480V AC	V3	V
	500-550V AC	W3	W

#### • Replace the ☐ mark by the following knob color code

				-		
Color	Green	Red	White	Sky-blue	Yellow	Orange
Code	G	R	W	S	Υ	0

For illuminated selector switch with LED lamp, sky-blue is not available.

## • Up to 4-contact of contact arrangement can be made. Available numbers of contacts are as follow.

No. of position	Operation	Without transformer	With transformer
2-position	Maintained	6-contact	4-contact
	Spring return	4-contact	4-contact
3-position	Maintained	6-contact	4-contact
	Spring/manual return	6-contact	4-contact

#### Contact arrangement and operator position

#### 2-position

Transformer		Contact blo	ock	Operator position		
	arrangement	Mounting position	Туре	Left	Right	
		poomon		0	$\oslash$	
With/without	1NO	(1)	NO	_	•	
With/without	1NC	(1)	NC	•	_	
Without	1NO+1NC	(1)	NO	-	•	
		(2)	NC	•	_	
With	1NO+1NC	(1)	NC	•	_	
		(2)	NO	_	•	
With/without	2NO	(1)	NO	_	•	
		(2)	NO	_	•	
Without	2NO+2NC	(1)	NO	_	•	
	*1	(2)	NC	•	_	
		(3)	NO	_	•	
		(4)	NC	•	_	
With	2NO+2NC	(1)	NC	•	_	
	*1	(2)	NC	•	_	
		(3)	NO	_	•	
		(4)	NO	_	•	

Notes: \*1: AH25-PL2

●: Contact closed, -: Contact open

#### 3-position

Transformer		Contact bl	ock	Operator position			
	arrangement	Mounting position	Туре	Left	Center	Right	
		p = 0.1		$\bigcirc$	①	$\oslash$	
Without	1NO+1NC	(1)	NO	•	-	_	
	*1	(2)	NC	_	_	•	
	1NO+1NC	(1)	NO	_	_	•	
	*2	(2)	NC	•	_	_	
	2NO+2NC	(1)	NO	•	_	_	
	*3	(2)	NC	-	_	•	
		(3)	NO	•	_	_	
		(4)	NC	_	_	•	
With	1NO+1NC	(1)	NC	-	_	•	
	*1	(2)	NO	•	_	_	
	1NO+1NC	(1)	NC	•	_	_	
	*2	(2)	NO	-	_	•	
	2NO+2NC	(1)	NC	_	_	•	
	*3	(2)	NC	_	_	•	
		(3)	NO	•	_	_	
		(4)	NO	•	_	_	

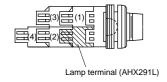
Notes: \*1: AH25-PL3, PL6 \*3: AH25-PL3

\*2: AH25-PL7

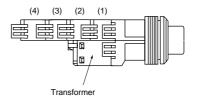
●: Contact closed, -: Contact open

#### Position of contact block

Without transformer



#### With transformer



#### • Incandescent lamp

			1
Lens	Lamp voltag	ge	Туре
Dome	Without	15V D0	AH25-ZM□
	transformer	24V D0	AH25-ZM□E
	With	110V A	C AH25-ZM□H
SF-1095	transformer	220V A	AH25-ZM □ M
Faceted	Without		AH25-ZK □
	transformer	24V D0	AH25-ZK □E
OF THE	With	110V A	AH25-ZK □H
SF-1094	transformer	220V A	AH25-ZK □M
Extended	Without	15V D0	AH25-ZS □
square	transformer	24V D0	AH25-ZS □E
	With transformer	110V A0	AH25-ZS □H
SF-1093		220V A	AH25-ZS □M
Flush square, with	Without	15V D0	C AH25-ZN □
legend plate	transformer	24V D0	AH25-ZN □E
1	With	110V A	AH25-ZN □H
SF-1092	transformer	220V A	AH25-ZN □M
Dome/short-body wi	th	110V A	AH25-ZM□H8
transformer		220V A0	AH25-ZM □ M8
ME.	SH-971		
S1000 TO	0.1011		

#### • LED lamp

Lens	Lamp voltaç	ge	Туре
Dome	Without		AH25-ZM□B3
SF-1095	transformer	24V DC	AH25-ZM□E3
	With		AH25-ZM□H3
	transformer	220V AC	AH25-ZM ☐ M3
Faceted	Without		AH25-ZK □B3
	transformer	24V DC	AH25-ZK □E3
	With		AH25-ZK □H3
SF-1094	transformer	220V AC	AH25-ZK □M3
Dome/	_	110V AC	AH25-ZM□H9
short-body with transformer	100	220V AC	AH25-ZM □ M9
	SH-971		

#### Lens color

Replace the  $\hfill\Box$  mark by the following lens color code

Code G R Y W S O	Button color	Green	Red	Yellow	White	Sky-blue	Orange
	Code	G	R	Υ	W	S	0

Pilot light with LED lamp, sky-blue is not available.

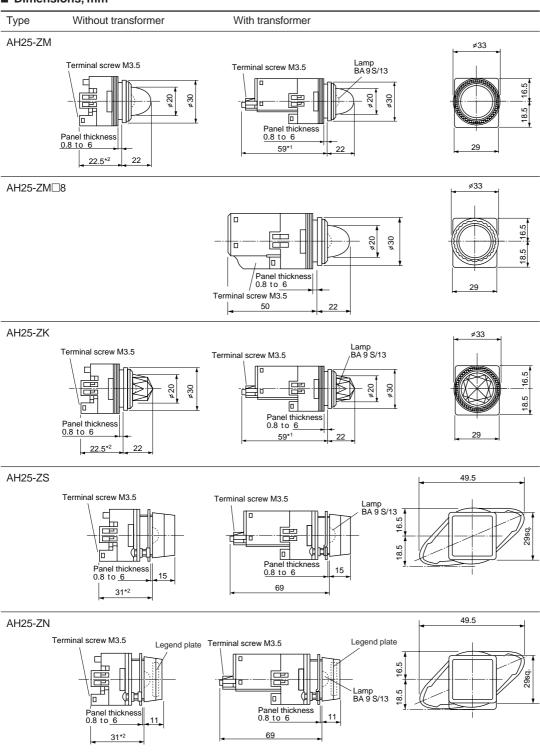
#### Voltage

Available lamp voltage are as follow.

Description	Voltage	Code	
		Standard type	
		LED	Incandescent
Without transformer	5.5V AC/DC	_	Blank
	6V AC	A3	_
	6V DC	AD3	_
	12V AC/DC	B3	_
	15V AC/DC	C3	С
	20V AC/DC	_	D
	24V AC/DC	E3	E
With transformer	100-110V AC	H3	Н
	115-127V AC	L3	L
	200-220V AC	M3	M
	230-254V AC	Q3	Q
	350-380V AC	S3	S
	400-440V AC	T3	Т
	480V AC	V3	V
	500-550V AC	W3	W
With resistor unit	110V DC	H7	

## Pilot Lights AH25

#### ■ Dimensions, mm



Note: \*1 Same as the resistor unit type.

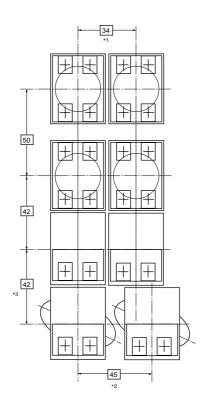
 $<sup>^{\</sup>star 2}$  When attaching the terminal cover, the dimension of externals increase 1.0mm.

#### Notes on use

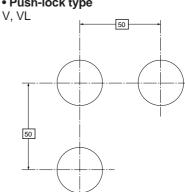
#### ■ Mounting space, mm

#### • Switch

F, F5, E, E5, G, G5, G1, G6, M,M5, U, S1~S6, SF, SF5, SE, SE5, L, L5, L3, L2, L4, SL, SL5, SL1, SL6, P, PW, SP, J, SJ, PC, PL



#### Push-lock type

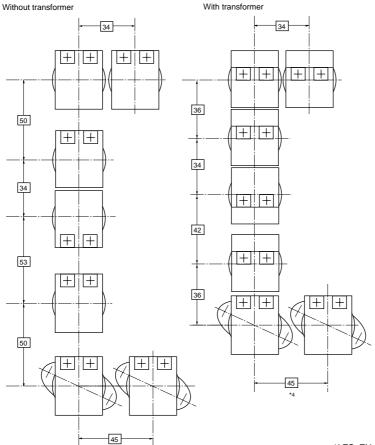


- \*1 G, G5 type: 42
- \*2 This dimension applies SF, SF5, SE, SE5, SL, SL5, SL1, SL6, SP, SJ types.
- $^{\star3}$  L, SL type: 44 (not meet with the live section.)

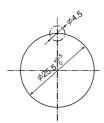
#### • Pilot light ZM, ZK,

ZS, ZN





#### ■ Panel cutout hole



Note: If key-washer or legend plate are not used, 4.5mm dia. location holes sown and the same pilot light type ZS, ZN need not cutout.

\*4 ZS, ZN type: In case of horizontal mounting

#### **AH25**

#### Notes on use

#### ■ Replace buttons

(1) To replace AH25 type F, E and G buttons with a different color, insert a flat-blade screwdriver into the gloove on the button. To install them, align the button projection and the recess on the inner button and press them together firmly.



- (3) For AH25-M, V, VL, remove the button and mount the switch to the panel.
- a) Tighten the button completely. The button stroke is adjusted only when it is completely tightened. If tightening is insufficient, stroke increases and destroys the contact.

#### ■ Replace the contact block

- (1) AH25 contacts can be increased with snap-fitting contact block. To add a contact block, push the additional contact block straight in until it clicks. When adding more than two contact blocks, join the slots on both sides and make sure that the contact blocks facing each other are not open. After addition or replacement, operate the switches a few times to check that they work correctly.
- (2) To remove a contact block, use a screwdriver to slightly open the mounting leg, and remove the contact block from the side of the opening leg. When two contact blocks are mounted release one a little, and then the other, and remove both at the same time. The same thing goes for transformers joined to contact blocks. Be careful not to force the mounting leg. Using a special tool (AHX321), the units can be removed more easily.

#### ■ Exchange of transformer

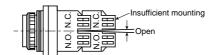
- (1) A transformer can be easily snapfitted to an AH25 pilot light. When a transformer is added to a pilot light without a transformer, attach a cover to the terminal of the pilot light to avoid wiring errors.
- (2) The capacity of the transformer is set for the lamp. No other load can be applied.

(2) To replace the color tip of AH25 type G (with half guard), do not make the trip gloove face the guard.



b) Determine the panel thickness and number of adjustment packings with the table.

Do not adjust the button stroke with a liner under the button.











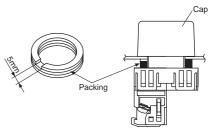
#### ■ Water-proof and dust-proof cap

Applicable type:

Water-proof cap
Dust-proof cap
AHX106, 155
AHX025, 026, 027
AHX046, 047, 048
AHX105, 112, 114

When attached to the panel in combination with a water-proof or dust-proof cap, the water-proof cap or dust-proof cap may sink downward and prevent the depressed button from returning to its original position.

As shown in the following figure, cut an approximately 5-mm air outlet in the portion of the ring packing touching the panel surface. Also, reduce the number of packing rings by one below the standard number. The clamp ring tightening torque is 1.5 to 2.5 N•m.



#### Degree of protection

The water-proof cap or dust-proof cap seals the panel surface to provide IP65 protection.

#### ■ Adjustment packing

Four 1.6mm packings (molded as one) are included. Based on the thickness of the mounting panel, adjust the number as shown in the table. To mount to a panels thinner than 1.6mm, one 1.6mm packing is needed (Purchased separately).

Mounting panel thickness and number of packings (reference)

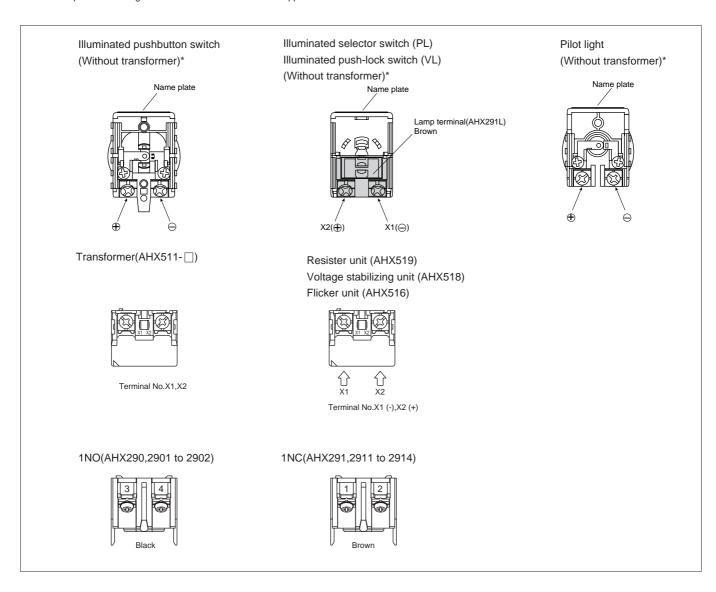
Mounting panel thickness (mm)	Number of packings					
0.8 to 2.0	5					
2.0 to 3.2	4					
3.2 to 4.5	3					
4.5 to 6.0	2					

#### Notes:

- When using a key washer or legend plate, decrement one from the numbers in the above table.
- 2. When more than four packings are needed, these are bought separately.

#### **■** Terminal layout

Notes: \* The positive and negative terminals are used for 6V DC applications.



Other items are the same as for the AR22 and DR22 series, see page 04/53 to 04/57.

#### AH25 Accessories

#### **■** Accessories

Description		Туре
Wrench		AHX001
Part of the same		
	T-1995	
Panel plug		AHX003
		Color: Silver (metal)  Panel plug Packing / Nut
		Dimensions, mm
	•	2   H
		3 1 1
		20
	T-1993	
Dust-tight ca	р	F type Red AHX046 Dimensions, mm
(indoor use)		Green <b>AHX047</b> $\phi$ 34×17.3
		Black AHX048
	0	E type Red AHX025 Dimensions, mm
		Green Anxuzo
	SC993	Black AHX027
		M type Red AHX105-R Dimensions,
6	1	Green AHX105-G mm
		Black AHX105-B
	SC992	Yellow AHX105-Y
Dust-tight ca	.n	White AHX105-W F type Red AHX112-R Dimensions,
(outdoor use		Green AHX112-G mm
(outdoor asc	·) 3	Black <b>AHX112-B</b> \$\phi 34 \times 17.3
	)h	E type Red AHX114-R Dimensions,
	10	Green AHX114-G mm
Annual Harman	SC-993	Black <b>AHX114-B</b> $\phi 34 \times 17.3$
Water-tight of	cap	E type AHX106 Dimensions, mm ≠31×18
		L type AHX155 Dimensions, mm ≠31×25.5
		Note:
	9	The only color available is transparent.
	Y-1559	
Lamp chang	er	AHX029 For Incandescen lamp
		AHX790 For LED lamp
4		
AHX029	Y-1990	
	1	
AHX790	AF95-22	

Description	<b></b>								
Description	Туре								
Button	Standard	,	,	S1-S	,	•	AH		
				G, G	65, C	31,	AH	K06	2-□
		G6	typ	е					
	Engraving					ре	AH		
Y-1541				G, G			AH	K06	4-□
1-1341		G1	, G	3 typ	е				
	Replace the	е г	1 ma	ırk bı	/ the	e foll	owing	oo r	lor
	code.						•	,	
	Button cold	or T	Gre	en	Red	d	Blac	k	
	Code	$\rightarrow$	G		R		В		
Y-1542		_							
	Button cold	or	Dar	k gre	en	_	low	Wh	ite
	Code		D			Υ		W	
	Button cold	or T	Sky	-blue	10	ranç			
	Code	$\rightarrow$	S	-biuc	0		<u> </u>		
	Code	- 1	<u> </u>		10		_		
Mushroom head	M, M5 type	A	ХНХ	065-					
pushbutton	Replace the	e ⊏	⊤ma	ırk bı	/ the	e foll	owing	വ ററ	lor
	code.	_			,			,	
	Button cold	or T	Gre	en	Red	4	Blac	k	
	Code	_	G	-	R	_	В		
	Button cold	or	Dar	k gre	en	_	low	Wh	ite
	Code		D			Υ		W	
	Button cold	or	Skv	-blue	10	ranç	<u></u>		
SC-1094	Code	$\rightarrow$	S	Diac	0				
	0000		<u> </u>				_		
Symbol mark button	Туре		Us	ed w	/ith				
	<b>AHX067-</b> □ E, E5 type								
	Note: Replace the ☐ mark by the following color								
	code.								
	Symbol mar	k			0				
	Symbol mar	k co	olor		Red			Free	n
	Button			Whit	е В	lack	+	е В	
	Code			Е		F	Н		J
	Symbol mar	k	I		1		-		
	Symbol mar		olor	(	Gree	n	_		
	Button	55		Whit	-	lack	_		
00.4040	Code			T		U	_		
SC-1012									
Push-lock, turn-reset	V type	Αŀ	IX7	69-□	]				
pushbutton	VL type AHX755-□								
	Replace the	<u> </u>	mar	k hv	the	follo	wing	col	or
	code.	<b>-</b> □	mal	κυу	uie	IOIIC	, wiiig	COI	O1
	Button cold	r I	Red	RI	ack*	Yel	llow		
	Code	-	R R	В	JUN	Y	11044		
	* Except VL t			10		<u>'</u>			
AF87-522	Except vL1	ype							

Description	Туре			
Illuminated pushbutton	L, L5, L2, L6,	Green	AHX06	8-G, LG*
	L3, L7, L4 type	e Red	AHX06	8-R, LR*
		Clear	AHX06	8-C
		Orange	AHX06	8-O
		Yellow	AHX06	
		Sky-blue		-
		White		8-W, LW*
AF88-613	*For LED lamp		AIIAUC	10-VV, LVV
Pilot light round lens	714 (	Green	AHX12	23-G, LG*
•	ZM type	Red	AHX12	3-R, LR*
		Clear	AHX12	23-C
		Orange	AHX12	3-0
		Yellow	AHX12	23-Y
		Sky-blue		
		White		3-W, LW*
SC-1001	*For LED lamp		AIIAIZ	.J-VV, LVV
Pilot light faceted lens	ZK type	Green	AHX12	4-G, LG*
3		Red		4-R, LR*
		Clear	AHX12	-
		Orange		-
		Yellow	AHX12	
		Sky-blue		
		White		:4-3 :4-W, LW*
SC-1002	*For LED lamp		АПАТ	.4-VV, LVV
Pilot light square lens	ZS type	Green	AHX12	25-G
		Red	AHX12	25-R
The second division is not the second		Clear	AHX12	25-C
		Orange	AHX12	25-O
		Yellow	AHX12	
A STREET, STRE		Sky-blue		
SC-1009		White	AHX12	
Dilat Pakt and	<b></b>			
Pilot light and illuminated	ZN, SL1, SL6	• •	AHX12	-
pushbutton square	Replace the code.	mark by th	ne follow	ing color
lens	Lens color	Green Re	d Clear	Sky-blue
	Code	G R	C	Sky-blue S
ji di	Code	<u> </u>		
	Lens color	Orange \	rellow	White
	Code	0	<b>′</b>	W
SC-1011				
Legend plate	ZN, SL1, SL6		AHX24	1-W
	Dimensions, n		×2	
	I			
SF-1114				

B 1.0	I <del>-</del>			
Description	Туре			
Incandescent lamp	Туре	Lamp voltage		ted voltage, nsumption
	AHX135	5.5V AC	/DC 6.3 1W	V AC/DC,
	AHX279	15V AC	DC 18	SV AC/DC,
_	AHX144	20V AC	DC 24	V AC/DC,
	AHX129	24V AC	DC 30'	V AC/DC,
	Dimensions,	mm:		
		07 - (-	_	
			20	
W/D00 007		Lamp bas	e: BA9s/13	3
LED lamp	Туре	Lamp v	oltane II	sed with
LLD lamp				
	APX508-6□ APX508-D6		Р	ilot Lights*
	APX508-12		:/DC	
	APX508-15			
	APX508-24			
	APX510-6□	6V AC	Ш	 luminated
	APX510-D6			ushbuttons,
	APX510-12	-	•	luminated
	APX510-15	□ 15V AC	C/DC s	ellectors
	APX510-24	□ 24V AC	C/DC	
	* When the pilot lights code is "W" (white), us LED lamp (APX510-■O)		hite), use an	
	Replace the code	□ mark by	the lumir	ous color
	Luminous	Yellow	Red	Green
	Code	Υ	R	G
	Lens color	Υ	R	G
			-	
	Luminous color	Amber	Orange	Blue
	Code	Α	0	S
	Lens color	0	W	S
	Dimensions	, mm:		
	APX508		APX51	0
	. 24		19	
	9.11.6		ø 10	
KKD06-208			Lamp	base: BA9s/13
Contact block	1NO	VHX30U		
Contact block	1NO 1NC	AHX290 AHX291		
4 =				
Note: Some models use dedicated contact so this may not be used. Contact FU				

SG-370

#### AH25 Accessories

Description	
AHX291L VL, PL  Lamp terminal: for without transformer  100 to 110V AC AHX511-H 115 to 127V AC AHX511-L 200 to 220V AC AHX511-L 200 to 220V AC AHX511-Q 350 to 380V AC AHX511-S 400 to 440V AC AHX511-T 480V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 type 100 to 110V AC AHX513-H 115 to 127V AC AHX513-L	
Transformer  100 to 110V AC AHX511-H 115 to 127V AC AHX511-L 200 to 220V AC AHX511-M 230 to 254V AC AHX511-Q 350 to 380V AC AHX511-S 400 to 440V AC AHX511-T 480V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 type  100 to 110V AC AHX513-H 115 to 127V AC AHX513-L	_
Transformer  100 to 110V AC AHX511-H 115 to 127V AC AHX511-L 200 to 220V AC AHX511-M 230 to 254V AC AHX511-Q 350 to 380V AC AHX511-S 400 to 440V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 115 to 127V AC AHX513-L	
Transformer  100 to 110V AC AHX511-H 115 to 127V AC AHX511-L 200 to 220V AC AHX511-M 230 to 254V AC AHX511-Q 350 to 380V AC AHX511-S 400 to 440V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 type  100 to 110V AC AHX513-H 115 to 127V AC AHX513-L	
115 to 127V AC AHX511-L 200 to 220V AC AHX511-M 230 to 254V AC AHX511-Q 350 to 380V AC AHX511-S 400 to 440V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 100 to 110V AC AHX513-H 115 to 127V AC AHX513-L	
200 to 220V AC AHX511-M 230 to 254V AC AHX511-Q 350 to 380V AC AHX511-S 400 to 440V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 115 to 127V AC AHX513-L	
230 to 254V AC AHX511-Q 350 to 380V AC AHX511-S 400 to 440V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 type  100 to 110V AC AHX513-H 115 to 127V AC AHX513-L	
350 to 380V AC AHX511-S 400 to 440V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 type	
400 to 440V AC AHX511-T 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 type  400 to 440V AC AHX511-T 480V AC AHX511-W  AHX513-H 115 to 127V AC AHX513-L	
Sl-8 480V AC AHX511-V 500 to 550V AC AHX511-W  Short-body transformer for ZM□8 and ZM□9 115 to 127V AC AHX513-L	
Short-body transformer for ZM□8 and ZM□9 115 to 127V AC AHX513-L	
Short-body transformer for ZM□8 and ZM□9 115 to 127V AC AHX513-L	
for ZM□8 and ZM□9 115 to 127V AC AHX513-L	
tyng	
200 to 220V AC AHX513-M	
230 to 254V AC AHX513-W	
350 to 380V AC AHX513-S	
400 to 440V AC AHX513-T	
480V AC AHX513-V	
SH-183 500 to 550V AC AHX513-W	
transformer makes a separate mounting type transformer. It can be mounted to the panel with screw or rails.  * Not aproved Secondary side terminal cover need to order.	
Terminal cover Type Used with Dimensions, r	
AHX305 Contact block, 23.5×27.5×16	
lamp terminal unit	
AHX305 Pilot lights 27.5×31×8 (without transformer)	
SG-842 <b>AHX376</b> Transformer 13×29×6.5	
Short-body transformer	
transformer  Resistor unit	
transformer  Resistor unit	 rd
AHX426 AF92-339 The terminal cover is provided as standa	rd

Description	Туре	
Terminal cover	Type Used with	
	AHX306 Illuminated typ	е
	For pilot lights and AH326 (base	unit)
	Dimensions, mm	
SG-842		
3G-042	8.5	
	25.5 Thickne	ess: 0.5mm Black
Key washer	AHX083	
Ney washer	AllX003	
SC-1016		
Packing	Rubber AHX151	
	Resin (Standard) AHX283	
	Use rubber packing for mountin	
SF-1113	panels or panels painted with na paint.	atural dry
Nut (Resin)	For F, E, L, L5 Red	AHX094
rtat (rtoom)	type Black	AHX095
	White	AHX096
	Dark green	AHX097
	* Chrome-plate	
	For ZM, ZK type Chrome-plate For P. J. M. Red	
	For P, J, M, Red S1-S6, G, G5 Black	AHX099 AHX100
Mildi Dinasani di Malaini	White	AHX101
	Dark green	AHX102
	* Chrome-plate	AHX103
SC-1148	Note: Chrome-plated products mark asterisk (*) are made of metal	
Nut (aluminum)	For F, E AHX050	
	For M, P AHX051	
	Note:The locking nut is made of alui	minum
SC-1000		
Full guard ring	For G1, G6 type AHX055	
	For L2, L6 type AHX058	
	For L3, L7 type AHX059 For L4 type AHX060	
SC-998	For L4 type AHX060	
Dust-tight cap for knob	AHX323	
operated selector s	In combination with this cap, the	
witch	operated selector switch can be dust-proof type.	used as a
	uusi-piooi type.	
SH-154	111	4.5
Dust-tight case	Used with AHX3	
All	AH25 F, E, G1, M, U AHX3	,
	S1-S6, SF, SE, (2NO+	-
4	P, PW, J, PC	-,
SG-1050 SG-1051	SJ, SP	
3G-1050 SG-1051		

Description	Type	
Locking attachment	AHX053	
for E type  AF89-613	Locks the button as it is pressed, easily attached and removed with the nut.	
Special tool	AHX321	
2	This is a special tool for removing contact blocks and transformers. It can also remove round color lens.	
SG-873		
Legend plate	AHX351( )	
(Standard)	Pushbutton switch	Selector switch
STOP	ON OFF START STOP	OFF-ON
Y-1545	Note: Put in the ( ) ordering wo Example: In case of STO AHX351(STO	OP
Legend plate (Unprinted)	Unprinted aluminume AHX351-A Unprinted aluminume, short AHX351-A size	
	Black Black, short size	AHX351-B AHX351-BS
AF-87-49		

## ■ Mass, gram AH25 series

Туре	1NO	2NO	2NC	3NC	4NC
71 -	(1NC)	(2NC)	+	+	+
	` ′	(1NO+1NC)	2NO	3NO	4NO
AH25- F	42	56	80	104	128
E	44	58	82	106	130
M	48	62	86	110	134
G	51	65	89	113	137
G1	53	67	91	115	139
SF	80	94	118	142	166
SE	82	96	120	144	168
U	80	94	118	142	166
S1-S6	_	_	133	_	_
V	55	69	93	_	_
AH25- F5	59	73	97	_	_
E5	61	75	99	_	_
M5	65	79	103	_	_
G5	68	82	106	_	_
G6	70	84	108	-	_
SF5	97	111	135	-	_
SE5	99	113	137	_	
AH25- L	61	75	99	123	147
L•T	131	143	167	_	_
L2	74	88	112	136	160
L2 • T	144	156	180	_	_
L3	78	92	116	140	164
L3 • T	148	160	184	_	_
L4	57	71	95	119	143
L4 • T	127	139	163	_	-
SL	99	113	137	161	185
SL • T	169	181	205	_	_
SL1	80	94	118	142	166
SL1 • T	150	162	186	_	_
VL	72	84	108	_	_
VL•T	129	141	_	_	
AH25- L5	81	95	119	_	_
L5 • T	151	163	187	_	_
L6	94	108	132	_	_
L6 • T	164	176	200	_	_
L7	98	112	136	_	_
L7 • T	168	180	204	_	_
SL5	116	130	154	_	_
SL5 • T	186	198	222	_	_
SL6	97	111	135	_	_
SL6 • T	167	179	203	_	_

Туре		1NO	2NO	2NC	3NC	4NC
		(1NC)	(2NC)	+	+	+
			(1NO+1NC)	2NO	3NO	4NO
AH25-	P2, P0	62	76	100	124	148
	P3, P5, P6	_	76	100	124	148
	P1	_	128	152	_	_
	PW2, PW0	67	81	105	129	153
	PW3, PW5, PW6	_	81	105	129	153
	PW1	_	133	157	-	_
	SP2	89	103	127	151	175
	SP3	_	103	127	151	175
	PC	_	-	108	_	_
	J2, J0	88	102	126	150	174
	J3, J5, J6	_	102	126	150	174
	SJ2	115	129	153	177	201
	SJ3	_	129	153	177	201
AH25-	PL2, PL0	71	83	107	131	_
	PL2, PL0 • T	128	140	164	_	_
	PL3, PL6, PL7	_	83	107	131	_
	PL3, PL6, PL7 • T	_	140	164	_	_

AH25- ZM	29	
ZM • T	99	
<b>ZM</b> □8, □9	101	
ZK	29	
ZK•T	99	
ZS	62	
ZS•T	132	
ZN	62	
ZN•T	132	

Note • T: With transformer

Туре	1NO(1NC)/1NO(1NC)	2NO(2NC)/2NO(2NC)
		1NO+1NC/1NO+1NC
AH25- F5/F5	151	175
F5/E5	153	177
F5/M5	157	181

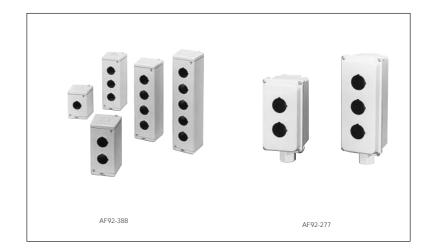
#### **■** Description

Enclosed type

Enclosed type steel boxes finished respectively with one to five holes.Rounded, smooth design. Selectable from the 22mm, 25mm, and 30mm dia. series command switches according to the application.

• Dust protected type, protected against water jets Made of lightweight, strong aluminum die-casting. Rounded, smooth design.

Series of models finished respectively with one to four holes. (Note: Only 22 dia. series models incorporate four holes.)



#### **■** Type number nomenclature

AHX 9 0 1 A

① Product category

AHX: Type

#### 2 Size of mounting hole

- 2: 22mm dia. series
- 1: 25mm dia. series
- 0: 30mm dia. series
- 9: without hole

#### **3 Number of mounting hole**

- •Enclosed type
  - 1: 1 hole\*1
  - 2: 2 holes
  - 3: 3 holes
  - 4: 4 holes
  - 5: 5 holes
- •Dust protected type, protected against water jets
  - 1: 1 hole\*2
  - 2: 2 holes
  - 3: 3 holes
  - 4: 4 hole\*3 9: 1 hole\*1

- Notes: \*1 Dedicated box with one hole
  \*2 Same as the box for two holes in external dimension
  - \*3 Only 22mm dia. series can be manufactured

#### ④ Degree of protection

A: Enclosed type

W: Dust protected type, protected against water jets

Dgree of Protection		Type
Enclosed-type		AHX9□1A
		AHX9□2A
		AHX9□3A
		AHX9□4A
		AHX9□5A
Dust protected type,	Dedicated box with	AHX929W
protected against	one hole.	AHX919W
water jets		AHX909W
		AHX9□1W
		AHX9□2W
		AHX9□3W
		AHX924W

Replace the mark the Size of mounting hole code

## Command boxes **AHX9**

#### ■ Specifications

Description	Enclosed type	Dust protected type, protected against water jets
Degree of Protection	IP40(IEC 60529)	IP65(IEC 60529)
Material	Steel	Aluminum die cast
Ambient temperature	-25 to +50°C	
(No condensation or no icing)		
Humidity	45 to 85% RH(with in -5 to $+40^{\circ}$ C)	
Applicable type *1	22, 25, 30mm dia.Command switch series	See the description in the bellow:
	AK22, RC310-F Cam type	Mountable switches and degree of protection
	selector switch	
	30mm dia. short-body type meter	
Depth	73mm	84mm
Laed hole	Knockout hole (22mm dia. top side	, 27mm dia. bottom side)
Options	Mounting bracket: A mounting	
	bracket is available, with which	
	the command box can be	
	mounted vertical or at an angle	
	of 15 (see page 04CD/4/4)	
	Command boxes incorporating sw	itches are available

Note: \*1 Check the effective depth of the box when selecting mountable switches.

## ■ Mountable switches and degree of protection (Dust protected type, protected against water jets)

The degree of protection of the command box is IP65, which, however, changes according to the device to which the command box is mounted. Check the depth of the command box when selecting the device. Consult your Fuji Electric FA representative when using the command box outdoors (e.g., plating factory yards, seashores, and places exposed to special cutting oil).

Conforms to IEC standard IP65 (Dust protected type, protected against water jets)

- •25mm dia. 30mm dia. series pushbuttons.\*

  Note: \*Except for conform to IEC standard IP40 (Enclosed type)

  Pushbutton switches, illuminated pushbutton switches, selector switches, pilot lights, and joy stick selector switches.
- •22mm dia. series pushbuttons.

Pushbutton switches, illuminated pushbutton switches, selector switches, pilot lights, and joy stick selector switches.

•Cam switch

AK22 series (22mm dia.), RC310F series (30mm dia.).

Conforms to IEC standard IP40 (Enclosed type)

•25mm dia. series pushbuttons.

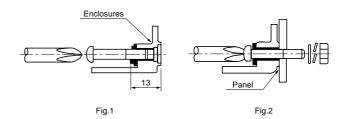
Sqare head pushbutton switch, illuminated sqare head pushbutton switch, sqare head selector switches, sqare head pilot lights, sqare head pilot lights with legend plate.

•30mm dia. series pushbuttons.

Illuminated pushbutton switches(push-pull type), pilot lights with dome with dimmer control.

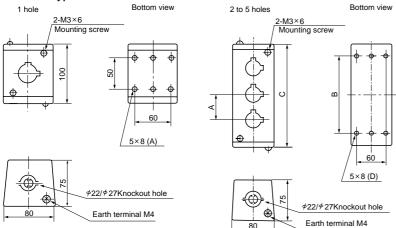
#### Note on use

- Precautions for panel (wall) mounting (Dust protected type, protected against water jets)
- Do not insert M4 screws into the waterproof bushings that are press-fit into the four mounting holes of the casing and hit the screws with a hammer, or otherwise the screws will break through the waterproof bushings (see fig. 1).
- Insert the screws into the panel mounting holes and secure the screws with nuts (see fig. 2). The waterproof performance of the casing remains unchanged when the screws are inserted into the bushings.

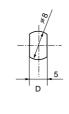


#### ■ Dimensions. mm:

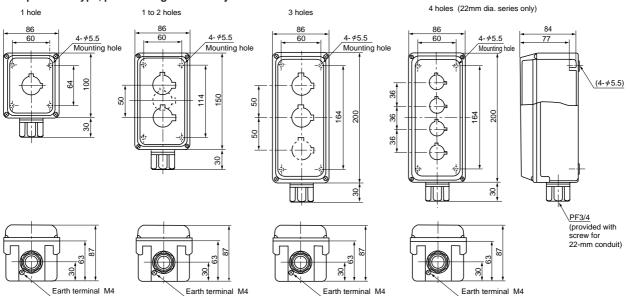
#### Enclosed type



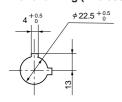
Number of	Dimension	on : mm	
holes	Α	В	С
2	50	100	150
3	50	150	200
4	50	200	250
5	50	250	300

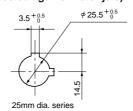


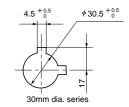
#### •Dust protected type, protected against water jets



#### •Panel drilling (Enclosed type, Dust protected type, protected against water jets)



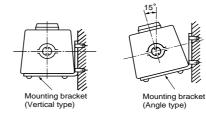




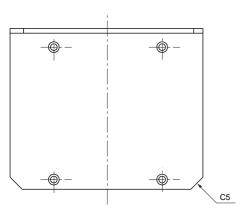
#### Command boxes AHX9

## ■ Accessories (for Enclosed type) • Mounting bracket

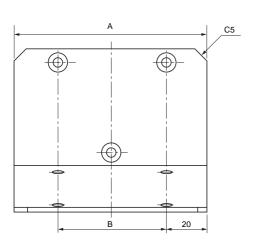
Number of holes	Mounting method	Туре
1	Vertical type	AJ91S
	Angle type	AJ91K
2	Vertical type	AJ92S
	Angle type	AJ92K
3	Vertical type	AJ93S
	Angle type	AJ93K
4	Vertical type	AJ94S
	Angle type	AJ94K
5	Vertical type	AJ95S
	Angle type	AJ95K

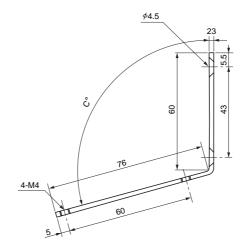


#### Dimensions, mm:



Туре	Dimension:mm		
	Α	В	C°
AJ91S	90	50	90
AJ91K	90	50	105
AJ92S	140	100	90
AJ92K	140	100	105
AJ93S	190	150	90
AJ93K	190	150	105
AJ94S	240	200	90
AJ94K	240	200	105
AJ95S	290	250	90
AJ95K	290	250	105





#### ■ Mass, gram

Туре	Mass	Туре	Mass	Туре	Mass
AHX901A	300	AHX923A	520	AHX924W	610
AHX902A	410	AHX924A	660	AHX992W	490
AHX903A	500	AHX925A	780	AHX993W	620
AHX904A	650	AHX901W	480	AHX909W	390
AHX905A	770	AHX902W	480	AHX919W	390
AHX911A	300	AHX903W	600	AHX929W	390
AHX912A	410	AHX911W	490	AHX999W	400
AHX913A	510	AHX912W	490	AHX991A	310
AHX914A	660	AHX913W	590	AHX992A	420
AHX915A	770	AHX921W	490	AHX993A	520
AHX921A	300	AHX922W	490	AHX994A	670
AHX922A	410	AHX923W	610	AHX995A	790

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- Operate (keep) in the environment specified in the operating instructions and manual. High temperature, high humidity, condensation, dust, corrosive gases, oil, organic solvents, excessive vibration or shock might cause electric shock, fire, erratic operation or failure.
- Follow the regulations of industrial wastes when the product is to be discarded.
- The products covered in this catalogs have not been designed or manufactured for use in equipment or systems which, in the event of failure, can lead to loss of human life.
- If you intend to use the products covered in this catalog for special applications, such as for nuclear energy control, aerospace, medical, or transportation, please consult our Fuji Electric FA agent.
- Be sure to provide protective measures when using the product covered in these catalogs in equipment which, in the event of failure, may lead to loss of human life or other grave results.
- Follow the directions of the operating instructions when mounting the product.

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03	Industrial Relays, Industrial Control Relays Annunciator Relay Unit, Time Delay Relays
04	Pushbuttons, Selector Switches, Pilot Lights Rotary Switches, Cam Type Selector Switches Panel Switches, Terminal Blocks, Testing Terminals
05	Limit Switches, Proximity Switches Photoelectric Switches
06	Molded Case Circuit Breakers Air Circuit Breakers
07	Earth Leakage Circuit Breakers Earth Leakage Protective Relays
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