

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

TERMINAL BLOCKS



Terminal blocks

LOW
VOLTAGE EQUIPMENT Up to 600 Volts


INDIVIDUAL CATALOG
from D\&C CATALOG 20th Edition

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Fuji Electric FA Components \& Systems Co.,Ltd.

## minico 016 <br> Command Switches <br> 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.

- 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.



## 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 35.9 mm .


## 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.


## Brighter illuminated surface

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

## Dedicated LED Iamp

## Highly reliable

contact mechanism
Gold-plated contacts and a snapaction mechanism enables IC-level applications (with a switching current of 1 mA at 5 V ).

## Degrees of protection IP65

The operator has IP65 protection for smooth operation without adverse effects from oil, water, or dusts. Applicable to a wide variety of equipment, from machine tools to OA equipment.

## 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 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 $45^{\circ}$ 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.

(Standard)


## 022 (025) <br> AR22 and DR22 <br> Command Switches

The use of a release arm enables easy mounting.


## 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.


## 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 can be mounted on the panel along with a previously installed button and knob.


## 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.


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 $(5 \mathrm{~V}, 5 \mathrm{~mA})$.

## 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.


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).


Contact section


## Depth of the short body

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

(1) The Short-body Pilot light is 21.5 mm long.

## 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

Contacts Transformer unit

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

Features $30 \times 50 \mathrm{~mm}$ tight mounting


## High brightness LED <br> illuminated model, "PIKARI-KUN"

1. Standard models feature
(1) higher equipment grade,
(2) enhanced safety that enables easy identification of the status, and (3) adoption of pure green illumination color through a major improvement in visibility (Luminance) through the adoption of four elements LED.
2. Along with a significant improvement in Luminance, energy is saved through a reduction in power consumption.
3. The maintenance cost is also reduced 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.

## Panel cutout dimensions of 22.3 mm and $\mathbf{2 5 . 5} \mathbf{~ m m}$ 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.


Units can be mounted on a $25.5-\mathrm{mm}$ diameter hole simply by turning over the tightening nut.

## Safety equipment <br> 16 to 30 mm diameter

Command Switch Emergency Stop (IIluminated) Pushbutton Switches
These pushbutton switches comply with various international standards, so they can be reliably used as emergency stop devices.

Ø16 (AH165, AR16)
minico

AR16V0R

## Gompliance 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. $\Theta$

| Button section | Not pushed | Being pushed Locked |  |
| :--- | :--- | :--- | :--- |
| Contact operation <br> transitions |  |  |  |
| NC contacts | Closed | Closed | Open |

Operation characteristics and contact operation for NC contacts

## 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.

AR16V0R


AR16VOL



AR22VGF


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

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


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

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 model

## SEMI-compliant guard rings are also available

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

- 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.

## Emergency stop pushbutton switches

 with IP2X -compliant terminals are also availableEmergency 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.

| Series | Type | Features <br> Command Series <br> - Standard models feature illumination with high brightness LEDs. <br> - No adjusting of panel thickness is necessary. <br> - The button and lens can be mounted on a panel while the operator is engaged. <br> - Easy replacing contact block and transformer. <br> - Wiring from two directions is possible. <br> - The shortest among industrial pushbuttons. The transformer now occupies far less <br> space. <br> - A terminal cover are provided, assuring safety and security. <br> - The emergency stop pushbuttons employ FUJI's original Trigger Action mechanism. <br> They are suitable for emergency stop and safety. <br> - Mountable even on panel cutout 25 mm diameter. <br> - AR22 and DR22 series of the ø22 Command Switches are approved by UL/CSA <br> CCC and TÜV (EN standard). <br> - Bearing CE markings. |
| :--- | :--- | :--- |



## Command Series

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



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## MINIMUM ORDERS

Orders amounting to less than $\mathbf{¥ 1 0 , 0 0 0}$ 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

Pushbuttons/Selectors/Pilot Lights/Buzzers

## 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 22.3 mm and 25.5 mm 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 25.5 mm in diameter.



## Miniaturization

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


Panel cutting


## Pushbuttons



AF94-357
AR22EOM


Emergency stop pushbuttons

AR22VOL


AR22VGE


Pilot lights


DR22DOL- $\square 8, \square 9$

## Easy replacing contact block and transformer <br> - 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.
- FUJl'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

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head <br> See page 04/17, 04/40 <br> (11L) © $\triangle C \in \mathbb{C}$ | AR22F0L, F5L <br> AF94-318 | Extended with full guard (24mm dia. with openings) <br> See page 04/17, 04/40 <br> (11) (1) $\triangle C \in \mathbb{C C}$ | AR22G2L, G7L | Flush round head with square bezel <br> See page 04/18, 04/40 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22F0P, F5P <br> AF94-315 |
| Extended round head <br> See page 04/17, 04/40 <br> (11) (N) $\triangle C \in$ | AR22E0L, E5L <br> AF94-317 | Extended with full guard (24mm dia.) <br> See page 04/18, 04/40 <br> (11) (1) $\triangle C \in$ | AR22G1L, G6L <br> AF02-70 | Extended round head with square bezel <br> See page 04/18, 04/40 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22E0P, E5P <br> AF94-314 |
| Mushroom head (40mm dia.) <br> See page 04/17, 04/40 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22M0L, M5L <br> AF94-367 | Push-lock, turn-reset (40mm dia. with white arrow) <br> See page 04/18, 04/40 <br> (14) (1) $\triangle C \in$ | AR22V5L <br> KKD06-335 | Mushroom head with square bezel (29mm dia.) <br> See page 04/19, 04/40 <br> (11) ) (1) $\triangle C \in \mathbb{C l}$ | AR22M4P <br> AF94-440 |
| Mushroom head (29mm dia.) <br> See page 04/17, 04/40 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22M4L, M9L <br> AF94-369 | Flush square head <br> See page 04/18, 04/40 <br> (11) ( (1) $\triangle C \in \mathbb{C}$ | AR22F0M, F5M |  |  |
| Extended with transparent full guard (24mm dia.) <br> See page 04/17, 04/40 <br> (1L) © $\triangle C \in \mathbb{C C}$ | AR22G4L, G9L <br> AF94-294 | Extended square head <br> See page 04/18, 04/40 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22E0M, E5M <br> AF94-357 |  |  |

■ Pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head <br> See page 04/20, 04/41 <br> (11) ( (1) $\triangle C \in \mathbb{C l}$ | AR22F0R, F5R <br> AF94-320 | Flush round head Symbol mark type <br> See page 04/20, 04/41 | AR22FAR, FBR <br> AF98-193 | Mushroom head (40mm dia.) <br> See page 04/20, 04/41 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22M0R, M5R <br> AF94-293 |
| Extended round head See page 04/20, 04/41 (11) ©- $\triangle$ C © | AR22E0R, E5R <br> AF94-319 | Extended round head Symbol mark type <br> See page 04/20, 04/41 | AR22EAR, EBR <br> AF98-192 | Mushroom head (29mm dia.) <br> See page 04/20, 04/41 <br> (1L) (1) $\triangle C \in \mathbb{C C}$ | AR22M4R, M9R <br> AF94-321 |

Note ©C. See page 04/289

Pushbuttons/Selectors/Pilot Lights/Buzzers
AR22 and DR22
Quick reference guide

Pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Extended with full guard (24mm dia.) <br> See page 04/20, 04/41 <br> (11) (1) $\triangle C \in @$ | AR22G3R, G8R <br> AF94-292 | Pushbutton with selector ring (2-position) <br> See page 04/22, 04/41 <br> (11) (4) $\triangle C \in$ © | AR22S1R, S2R, S3R, S6R <br> AF97-507 | Flush round head with square bezel <br> See page 04/20, 04/41 <br> (11) (1) $\triangle C \in \mathbb{C C}$ | AR22FOY, F5Y <br> AF94-295 |
| Flush with full guard (24mm dia.) <br> See page 04/20, $04 / 41$ <br> (14) ⑴ $\triangle C \in$ @ | AR22G2R, G7R <br> AF02-68 | Push-lock, turn-reset ( 40 mm dia. with white arrow) <br> See page 04/20, $04 / 41$ <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22V5R <br> KKD08-042 | Extended round head with square bezel <br> See page 04/21, 04/41 <br> (11) © $\triangle C \in \mathbb{C l}$ | AR22EOY, E5Y <br> AF94-297 |
| Extended with half guard <br> See page 04/20, $04 / 41$ <br> (11) (5) $\triangle C \in \mathbb{C}$ | AR22G0R, G5R | Flush square head <br> See page 04/20, 04/41 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22FOS, F5S | Mushroom head with square bezel (29mm dia.) <br> See page 04/21, 04/41 <br> (11) © $\triangle C \in \mathbb{C l}$ | AR22M4Y <br> AF94-298 |
| Mushroom head with full guard (40mm dia.) See page 04/20, 04/41 (11) © ${ }^{\text {(1) }}$ ( $¢$ ©cc) | AR22M3R, M8R <br> AF94-372 | Extended square head <br> See page 04/20, 04/41 <br> (11) © $\triangle C \in \mathbb{C l}$ | AR22EOS, E5S <br> AF94-296 |  |  |

Note: AR22M8R: Not approved standard
■ Emergency stop pushbutton switches (conform to EN418)

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow) <br> See page 04/23, 04/42 <br> (1L) © $\triangle(\in$ © | AR22VOR <br> KKD08-042 | Push-lock, turn-reset (29mm dia.) <br> See page 04/23, 04/42 <br> (11) © $\triangle C \in \mathbb{C}$ | AR22V4R <br> KKD06-339 | Unibody push-lock, turn-reset (Soft-touch 40mm dia. with white arrow) <br> See page 04/23, 04/42 $\mathrm{c} \mathbb{N}_{\mathrm{us}} \triangleq \mathrm{C} \in \mathbb{C c}$ | AR22VGE <br> KKD05-023b |
| Push-lock, turn-reset (40mm dia.) <br> See page 04/23, 04/42 <br> (1L) ) (6) $\triangle C \in$ | AR22V2R <br> KKD05-020b | Key release push-lock, turn-reset (40mm dia.) <br> See page 04/23, 04/42 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22V7R <br> KKD09-020 | Push-lock, turn-reset ( 40 mm dia. with "EMO" charactor) <br> See page 04/120 <br> (11) © $\triangle C \in$ | AR22V3R-■ RRZ286 <br> KKD05-261 |
| Push-lock, turn-reset (Soft-touch 29mm dia. with white arrow) <br> See page 04/23, 04/42 <br> (1L) $\mathbb{C} \triangle C \in$ | AR22VSR <br> KKD06-346 | Push-lock, pull-reset (35mm dia.) <br> See page 04/23, 04/42 <br> (IL) © $\triangle C \in \mathbb{C C}$ | AR22Q2R <br> KKD06-334 |  |  |

■ Emergency stop illuminated pushbutton switches (conform to EN418)

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow) <br> See page 04/24, 04/43 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22VOL <br> KKD06-335 | Push-lock, turn-reset (Soft-touch 40mm dia. transparent in all colors with white arrow) <br> See page 04/24, 04/43 <br> (1L) (6) $\triangle C \in \mathbb{C l}$ | AR22VDL <br> KKD06-342 | Push-lock, turn-reset (Soft touch 29mm dia. with white arrow) <br> See page 04/24, 04/43 <br> (11) (1) $\triangle C \in$ | AR22VSL |
| Push-lock, turn-reset (40mm dia.) See page 04/24, 04/43 (11) © $\triangle$ C ¢@ | AR22V2L <br> KKD06-337 | Push-lock, turn-reset (40mm dia. transparent in all colors) <br> See page 04/24, 04/43 <br> (11) ( (1) $\triangle C \in \mathbb{C K}$ | AR22VAL <br> KKD06-340 | Unibody push-lock, turn-reset (Soft-touch 40mm dia. with white arrow) <br> See page 04/24, 04/43 ${ }_{c} \mathrm{~N}_{u s} \triangleq \mathrm{C} \in \mathbb{C}$ | AR22VGF |

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

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Knob <br> See page 04/25, 04/44 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22PR, PCR <br> AF94-310 | Key <br> See page 04/25, 04/44 <br> (1L) (1) $\triangle C \in \mathbb{C}$ | AR22JR, JCR | Lever with square bezel <br> See page 04/25, 04/44 <br> (1L) (1) $\triangle C \in \mathbb{C l}$ | AR22WY, WCY |
| Lever <br> See page 04/25, 04/44 <br> (11) $\mathbb{C} \triangleq C \in \mathbb{C l}$ | AR22WR, WCR | Key (Long durability) <br> See page 04/25, 04/44 <br> (11) (1) $\triangle C \in$ | AR22JAR | Cylindrical knob with square bezel <br> See page 04/25, 04/44 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22RY, RCY <br> AF94-362 |
| Cylindrical knob <br> See page 04/25, 04/44 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22RR, RCR <br> AF94-308 | Knob with square bezel <br> See page 04/25, 04/44 <br> (11) (1) $\triangle C \in$ | AR22PY, PCY <br> AF94-309 | Key with square bezel <br> See page 04/25, 04/44 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR22JY, JCY <br> KKD09-019 |

■ Illuminated selector switches

| Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: |
| Knob | AR22PL | Knob with square bezel | AR22P |
| See page 04/32, 04/45 |  | See page 04/32, 04/45 |  |
| (112) (1) $\triangle C \in$ © |  | (11) (6) $\triangle C \in$ © |  |

Note @C: See page 04/289

Pushbuttons/Selectors/Pilot Lights/Buzzers
AR22 and DR22
Quick reference guide

## ■ Pilot lights

| Lens | Type | Lens | Type | Lens | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Dome <br> See page 04/34, 04/45 <br> (11) © $\triangle(\in \mathbb{C l}$ | DR22D0L <br> AF94-333 | Flush square <br> See page 04/34, 04/47 <br> (11) (6) $\triangle C \in \mathbb{C l}$ | DR22F3M <br> AF94-330 | Extended square <br> See page 04/34, 04/46 <br> (11) (1) $\triangle C \in$ © | DR22E3M |
| Extended round <br> See page 04/34, 04/46 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | DR22E3L <br> AF94-332 | Flush square (Transparent lens) <br> See page 04/34, 04/47 <br> (11) © $\triangle C \in \mathbb{C l}$ | DR22F4M <br> AF94-443 | Flush rectangular <br> See page 04/34, 04/48 <br> (11) © $\triangle C \in \mathbb{C l}$ | DR22E3N |
| Faceted <br> See page 04/34, 04/46 <br> (11) © $\triangle C \in \mathbb{C C}$ | DR22K0L <br> AF96-189 | Flush square (12mm high frame) <br> See page 04/34, 04/47 <br> (11) © $\triangle C \in \mathbb{C l}$ | DR22F5M <br> AF95-658 | Extended round with square bezel <br> See page 04/34, 04/46 <br> (11) ( ) $\triangle C \in \mathbb{C}$ | DR22E3P |

Note: With resistor unit type: Not approved standard
■ Joy stick selector switches


■ Buzzers

| Sound | Type | Sound | Type | Sound | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Electronic sound | DR22B5 * | Magnetic sound | DR22B3 | Electronic sound (IP54) | DR22B8 * |
| See page 04/39, 04/49 |  | See page 04/39, 04/49 |  | See page 04/39, 04/49 |  |
| (11) (1) |  |  |  | (11) © $\triangle C \in$ |  |

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

# Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AR22 and DR22 <br> Type number nomenclature 

## Illuminated pushbuttons

## AR22 E0L-10 E3 R

Product category
AR22: 22mm-dia. illuminated pushbutton
22 mm -dia. emergency stop illuminated pushbutton

## (2) Operator

- Illuminated pushbutton

FOL: Flush round head
F5L: Flush round head (Alternate)
EOL: Extended round head
E5L: Extended round head (Alternate)
MOL: Mushroom head (40mm dia.)
M5L: Mushroom head ( 40 mm dia. alternate)
M4L: Mushroom head (29mm dia.)
M9L: Mushroom head (29mm dia. alternate)
G4L: Extended with transparent full guard ( 24 mm dia.)
G9L: Extended with transparent full guard ( 24 mm dia. alternate)
G2L: Extended with full guard ( 24 mm dia. with openings)
G7L: Extended with full guard ( 24 mm dia. with openings, alternate)
G1L: Extended with full guard ( 24 mm dia.)
G6L: Extended with full guard ( 24 mm dia. alternate)
V5L: Push-lock, turn-reset ( 40 mm dia. with white arrow) *
F0M: Flush square head
F5M: Flush square head (Alternate)
E0M: Extended square head
E5M: Extended square head (Alternate)
FOP: 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

V0L: Push-lock, turn-reset (Soft-touch 40 mm dia. with white arrow)
V2L: Push-lock, turn-reset ( 40 mm dia.)
VDL: Push-lock, turn-reset (Soft-touch 40 mm dia. transparent in all colors with white arrow
VAL: Push-lock, turn-reset ( 40 mm 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: 1 NO | $30: 3 \mathrm{NO}$ |
| $01: 1 \mathrm{NC}$ | $03: 3 \mathrm{NC}$ |
| 11: $1 \mathrm{NO}+1 \mathrm{NC}$ | $40: 4 \mathrm{NO}$ |
| $20: 2 \mathrm{NO}$ | $04: 4 \mathrm{NC}$ |
| $02: 2 \mathrm{NC}$ | $50: 5 \mathrm{NO}$ |
| $22: 2 \mathrm{NO}+2 \mathrm{NC}$ | $05: 5 \mathrm{NC}$ |

(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: $230-254 \mathrm{~V}$ 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

Color of lens

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

- Neon lamp (For AR22VGF)

H1: 110V AC, without transformer
K1: 120V AC, without transformer
M1: 220V AC, without transformer P1: 240V AC, without transformer

## Special product

Z9: Resisting water-soluble cutting oils and heat
With a contact protection cover
Resisting sulfuration gas
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

Pushbuttons/Selectors/Pilot Lights/Buzzers AR22 and DR22
Type number nomenclature

## Pushbuttons

## AR22 EOR - 10 R $\square \square$

## (1) Product category

AR22: 22 mm -dia. pushbutton
22 mm -dia. emergency stop pushbutton
(2) Operator

- Pushbutton switch

FOR: Flush round head
F5R: Flush round head (Alternate)
EOR: 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)
MOR: Mushroom head ( 40 mm dia.)
M5R: Mushroom head (40mm dia. Alternate)
M4R: Mushroom head (29mm dia.)
M9R: Mushroom head (29mm dia. Alternate)
G3R: Extended with full guard ( 24 mm dia.)
G8R: Extended with full guard ( 24 mm dia. Alternate)
G2R:Flush with full guard (24mm dia.)
G7R: Flush with full guard ( 24 mm dia. Alternate)
GOR: Extended with half guard
G5R: Extended with half guard (Alternate)
M3R:Mushroom head with full guard (40mm dia.)
M8R:Mushroom head with full guard ( 40 mm 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 ( 40 mm dia. with white arrow) *1
FOS: Flush square head
F5S: Flush square head (Alternate)
EOS: Extended square head
E5S: Extended square head (Alternate)
FOY: Flush round head with square bezel
F5Y: Flush round head with square bezel (Alternate)
EOY: Extended round head with square bezel
E5Y: Extended round head with square bezel (Alternate)
M4Y:Mushroom head with square bezel ( 29 mm dia.)

- Emergency stop pushbutton switch

VOR: Push-lock, turn-reset (Soft-touch 40 mm dia. with white arrow)
V2R: Push-lock, turn-reset ( 40 mm dia.)
VSR: Push-lock, turn-reset (Soft-touch 29 mm dia. with white arrow)
V4R: Push-lock, turn-reset ( 29 mm dia.)
V7R: Key-release push-lock, turn-reset ( 40 mm dia.)
Q2R: Push-lock, pull-reset ( 35 mm dia.)
VGE:Unibody push-lock, turn-reset (Soft-touch 40 mm dia. with white arrow)
(3) Contact arrangement

| 10: 1 NO | 30: 3 NO |
| :--- | :--- |
| 01: 1 NC | $03: 3 \mathrm{NC}$ |
| 11: $1 \mathrm{NO}+1 \mathrm{NC}$ | 33: $3 \mathrm{NO}+3 \mathrm{NC}$ |
| 20: 2 NO | 40: 4 NO |
| 02: 2 NC | $04: 4 \mathrm{NC}$ |
| 22: $2 \mathrm{NO}+2 \mathrm{NC}$ | 50: 5 NO |
|  | $05: 5 \mathrm{NC}$ |

(4) Color of button

| G: Green | Y: Yellow |
| :--- | :--- |
| R: Red"2 | A: Orange |
| B: Black | S: Blue |
| W: White | C: Clear |
| T: Green, Red, Black (For AR22F0R) | (For AR22FAR, FBR, |
|  |  |
|  | EAR, EBR) |

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

| Symbol mark | $\bigcirc$ |  | I |  | ( ${ }^{\text {a }}$ |  | $\bigcirc$ |  | ( ${ }^{\text {a }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |

## 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.


## Selector and illuminated selector switches

```
AR22 }\frac{PL}{(1)}-\frac{2}{(3)
    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
RR: Cylindrical knob
RCR: Cylindrical knob operated control type
JR: Key
JCR: Key operated control type
JAR: Key (Long durability)
PY: Knob with square bezel
PCY: Knob operated control type with square bezel
WY: Lever with square bezel
WCY: Lever operated control type with square bezel
RY: Cylindrical knob with square bezel
RCY: Cylindrical knob operated control type with square bezel
JY: Key with square bezel
JCY: Key operated control type with square bezel

- Illuminated selector switch

PL: Knob
PP: Knob with square bezel

## (3) Operation

2-position, maintained
2-position, spring return
3-position, maintained
3-position, spring/manual return (Left to center)
3-position, spring/manual return (Right to center)
3-position, spring return
4-position, maintained (For AR22PCR, WCR, RCR)
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: 1 NO | 30: 3 NO |
| :--- | :--- |
| 01: 1 NC | $03: 3 \mathrm{NC}$ |
| 11: $1 \mathrm{NO}+1 \mathrm{NC}$ | 33: $3 \mathrm{NO}+3 \mathrm{NC}$ |
| 20: 2 NO | $40: 4 \mathrm{NO}$ |
| 02: 2 NC | $04: 4 \mathrm{NC}$ |
| 22: $2 \mathrm{NO}+2 \mathrm{NC}$ | $50: 5 \mathrm{NO}$ |
|  | $05: 5 \mathrm{NC}$ |

[^0](6) Lamp voltage

- Incandescent lamp

54: 5.5V AC/DC, without transformer
C4: 15V AC/DC, without transformer
D4: 20 V 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: 24 V 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: $400-440 \mathrm{~V}$ 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)
(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.

## Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AR22 and DR22

Type number nomenclature

## Pilot lights



## (1) Product category

DR22: 22mm dia. pilot light

## (2) Lens

DOL: Dome
E3L: Extended round
KOL: Faceted
F3M: Flush square
F4M: Flush square (Transparent lens)
F5M: Flush square ( 12 mm high frame)
E3M: Extended square
E3N: Flush rectangular
E3P: Extended round with square bezel
(3) Lamp voltage

- Incandescent lamp

54: 5.5 V AC/DC, without transformer
C4: 15V AC/DC, without transformer
D4: 20 V AC/DC, without transformer
E4: 24 V AC/DC, without transformer
H4: 100-110V AC, with transformer
L4: $115-127 \mathrm{~V}$ AC, with transformer
M4: 200-220V AC, with transformer
Q4: $230-254 \mathrm{~V} \mathrm{AC}$, with transformer
S4: $350-380 \mathrm{~V}$ AC, with transformer
T4: $400-440 \mathrm{~V} \mathrm{AC}$, with transformer
V4: 480 V 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: 24 V AC/DC, without transformer
H3: 100-110V AC, with transformer
L3: $115-127 \mathrm{~V}$ AC, with transformer
M3: $200-220 \mathrm{~V}$ AC, with transformer
Q3: $230-254 \mathrm{~V}$ AC, with transformer
S3: $350-380 \mathrm{~V} \mathrm{AC}$, with transformer
T3: $400-440 \mathrm{~V} \mathrm{AC}$, with transformer
V3: 480 V AC , with transformer
W3: 500-550V AC, with transformer
H7: 110 V DC, with resistor unit
(4) Color of lens

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

58: 5.5V AC/DC, short-body without transformer C8: 15V AC/DC, short-body without transformer
D8: 20 V 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

## 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.

## Joy stick selector switches

$\frac{\text { AR22A }}{\text { (1) }} \underset{(2)}{\mathbf{O}} \mathbf{N}-\underset{(4)}{\text { AOAO }}$
(1) 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

| Contact arrangement |  | Blank | 1NO | 1NC | 1NO+1NC | 2NO | 2NC | 2NO+2NC |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | Screw | 0 | A | B | 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 AR22FOR-11B(CCC)


## Buzzers

DR22B 5 - E
(1) (2) (3) (4)
(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" : 24 V 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

## Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AR22 and DR22 <br> Ratings and specifications

## ■ Standards approved

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

Specifications (Indoor use)

| Description | Pushbutton switch <br> Illuminated pushbutton switch <br> Emergency stop pushbutton switch <br> Emergency stop illuminated pushbutton <br> switch <br> Selector switch <br> 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 04/13 | 250,000 operations | - |
| Electrical durability | 500,000 operations at 220 V AC 6A 1 million operations at 220 V AC 3 A (AR22VG type: 100,000 operations) | 100,000 operations at 220 V AC 1A <br> (Res. load) | - |
| Operating frequency | 1200 operations/hour (On-load factor: 40 AR22VG type: 1800 operations/hour (On | \%) <br> -load factor: 40\%) | - |
| Dielectric strength | 2500V AC, 1 minute *3 | 2000V AC, 1 minute *4 |  |
| Insulation resistance | $100 \mathrm{M} \Omega$ 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 55 Hz , double amplitude $0.1 \mathrm{~mm} * 5$ Constant: 16.7 Hz , double amplitude 3 mm |  |  |
| Shock | Malfunction durability: $100 \mathrm{~m} / \mathrm{s}^{2}$ * 6 Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |  | Mechanical durability : $500 \mathrm{~m} / \mathrm{s}^{2}$ |
| Ambient temperature <br> (No condensation or no icing) | -20 to $+70^{\circ} \mathrm{C}$ *7 | -5 to $+70^{\circ} \mathrm{C}$ | -20 to $+50^{\circ} \mathrm{C}$ |
| Storage temperature | -40 to $+80^{\circ} \mathrm{C}$ |  |  |
| Humidity | 45 to $85 \%$ RH (within -5 to $+40^{\circ} \mathrm{C}$ ) |  |  |
| Degree of protection | IP65 |  |  |

Notes: *1 Illuminated type without transformer and AR22VG type: 250V AC/DC
*2 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 500 Hz , double amplitude 0.7 mm (acceleration $50 \mathrm{~m} / \mathrm{s}^{2}$ ), according to the test condition of EN60947-5-5 (1997)
*6 Emergency stop type: $150 \mathrm{~m} / \mathrm{s}^{2}$
${ }^{* 7}$ AR22VGE type: -20 to $+60^{\circ} \mathrm{C}$, illuminated type: -20 to $+50^{\circ} \mathrm{C}$

- Mechanical durability

| Description |  | Operations |
| :---: | :---: | :---: |
| Pushbutton switch <br> 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 | $\begin{array}{r} 5 \text { million } \\ 1 \text { million } \\ 100,000 \\ 100,000 \\ 30,000 \end{array}$ |
| Selector switch | Maintained 1, 2, 3, 4-contact <br> Maintained 5, 6-contact <br> Control type, spring return, spring/manual return | $\begin{aligned} & 1 \text { million } \\ & 500,000 \\ & 200,000 \\ & \hline \end{aligned}$ |
| Illuminated selector switch | Maintained  <br> Without transformer 1,2,3-contact <br> With transformer 4-contact <br>  <br>  <br>  <br>  <br> 3-2-contact <br> Spring return, spring/manual return | $\begin{aligned} & 1 \text { million } \\ & 500,000 \\ & 1 \text { million } \\ & 500,000 \\ & 200,000 \end{aligned}$ |

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: 250 V AC |  |  |
| Sound level | $\begin{array}{\|l} \hline 90 \mathrm{~dB}(0.1 \mathrm{~m}) \\ 70 \mathrm{~dB}(1 \mathrm{~m}) \\ \hline \end{array}$ | 80 to $90 \mathrm{~dB}(0.1 \mathrm{~m})$ 60 to 70 dB (1m) | $\begin{array}{\|l} \hline 80 \mathrm{~dB}(0.1 \mathrm{~m}) \\ 60 \mathrm{~dB}(1.0 \mathrm{~m}) \\ \hline \end{array}$ |
| Durability | 1000h | 200h | 1000h |
| Frequency | 2.4 to 3.3 kHz |  |  |
| Intermittent cycle | Approx. 170-cycle/min |  |  |
| Current consumption | See the table below |  |  |
| Dielectric strength | Without transformer: 1000V AC 1 minute With transformer: 2000V AC 1 minute |  |  |
| Insulation resistance | $100 \mathrm{M} \Omega$ or more (500V DC megger) |  |  |
| Pollution degree | 3 |  |  |
| Vibration | Resonance: 10 to 55 Hz , double amplitude 0.1 mm Constant: 16.7 Hz , double amplitude 3.0 mm |  |  |
| Shock | Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |  |  |
| Ambient temperature | -20 to $+60^{\circ} \mathrm{C}$ (No condensation or no icing) (with resistor unit: -20 to $+40^{\circ} \mathrm{C}$ ) |  |  |
| Storage temperature | -30 to $+70^{\circ} \mathrm{C}$ |  |  |
| Humidity | 45 to $85 \%$ RH (within -5 to $40^{\circ} \mathrm{C}$ ) |  |  |
| Degree of protection | IP00 |  | IP54 |

## - Current consumption

| Operational voltage | Current consumption <br> DR22B5, DR22B8 | DR22B3 |
| :--- | :--- | :--- |
| 6 V AC | 70 mA AC | - |
| 6 V DC | 35 mA DC | - |
| $24 \mathrm{~V} \mathrm{AC/DC}$ | $40 \mathrm{~mA} \mathrm{AC}, 25 \mathrm{~mA} \mathrm{DC}$ | $30 \mathrm{~mA} \mathrm{AC}, 20 \mathrm{~mA} \mathrm{DC}$ |
| $48 \mathrm{~V} \mathrm{AC/DC}$ | $65 \mathrm{~mA} \mathrm{AC}, 20 \mathrm{~mA} \mathrm{DC}$ | - |
| 110 V AC | 30 mA AC | 30 mA AC |
| 110 V DC | 30 mA DC | - |
| 220 V AC | 15 mA AC | 15 mA AC |

Pushbuttons/Selectors/Pilot Lights/Buzzers
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 | Making current | Breaking current | Making current | Breaking current | 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 $\mathrm{T}_{0.95}=6 \mathrm{P}$ (Max. 300ms)

| Description | Contact rated code | Making current - Breaking current |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | 125V | 250V | $301 \mathrm{~V}-600 \mathrm{~V}$ |
| 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) | $\begin{aligned} & \text { Q300 } \\ & \text { (AR22VG) } \end{aligned}$ | 0.55A | 0.27A | - |
| Overlap contact types of products shown above Pushbutton <br> (Ring type selector switch: AR22S1R, S6R only) <br> Selector switch (2-position only, except the overlap contact types) Illuminated selector switch <br> (2-position only, except the overlap contact types) | Q600 | 0.55A | 0.27A | 0.1A |
| Pushbutton <br> (Ring type selector switch: AR22S3R only) <br> Selector switch (2-pos./overlap contact type, 3-, 4-, 5-pos. type) <br> Illuminated selector switch (2-pos./overlap contact type, 3-pos. type) | R300 | 0.22A | 0.11 A | - |

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 current | Rated operational voltage | AC15 (Ind. load) | DC13 (Ind. load) |
|  |  |  | Rated operational current | Rated operational current |
| Illuminated pushbutton switch <br> Pushbutton (Except the selector ring type) <br> Emergency stop pushbutton switch <br> Emergency stop illuminated pushbutton switch <br> Selector switch (2-position) <br> Illuminated selector switch (2-position) | 10A | 24 V | 6.0A | 4.0A (AR22VG: 1.5A) |
|  |  | 120 V | 6.0A (AR22VG: 3A) | - |
|  |  | 125 V | - | 1.3A (AR22VG: 0.3A) |
|  |  | 240 V | 6.0A (AR22VG: 3A) | - |
|  |  | 250 V | - | 0.45A(AR22VG: 0.15A) |
|  |  | 480 V | 2.5A (AR22VG: -) | - |
|  |  | 600 V | 2.0A (AR22VG: -) | - |
| Selector switch (3, 4, 5-position) <br> Illuminated selector switch (3-position) <br> Pushbutton with selector ring | 10A | 24 V | 6.0A | 2.0A |
|  |  | 120 V | 6.0A | - |
|  |  | 125 V | - | 0.65A |
|  |  | 240 V | 6.0A | - |
|  |  | 250 V | - | 0.23A |
|  |  | 480 V | 2.5A | - |
|  |  | 600 V | 2.0A | - |
| Joy stick selector switch (Lever switch) | 5A | 24 V | - | 0.7A |
|  |  | 120 V | 0.3A | - |
|  |  | 125 V | - | 0.15A |
|  |  | 240 V | 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 ( $1 \mathrm{NO}+1 \mathrm{NC}$ )

| Description | Pushbutton Illuminated pushbutton | Emergency stop pushbutton <br> Emergency stop illuminated pushbutton |  | Selector *2 <br> Illuminated selector |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 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 | $0.15 \mathrm{~N} \cdot \mathrm{~m}$ | $0.13 \mathrm{~N} \cdot \mathrm{~m}$ | $0.1 \mathrm{~N} \cdot \mathrm{~m}$ |
| Operating travel | Approx. 6mm <br> (Push-lock type: Approx. 9mm, operation angle: Approx. $45^{\circ}$ ) | Approx. 9mm <br> (AR22VG: <br> Approx. 10mm, operation angle: Approx. $45^{\circ}$ ) | Approx. 9mm | 2-position: Approx. $90^{\circ}$ <br> 3-position: Approx. $45^{\circ}$ <br> 4-position: <br> Approx. $40^{\circ}$ <br> 5-position: Approx. $30^{\circ}$ | 3-position: Approx. $45^{\circ}$ | 2-position: <br> Approx. $60^{\circ}$ <br> 3-position: <br> Approx. $45^{\circ}$ |
| Required return force | (Push-lock type: $0.6 \mathrm{~N} \cdot \mathrm{~m}$ ) | $\begin{aligned} & 0.6 \mathrm{~N} \cdot \mathrm{~m} \\ & \text { (AR22VG: } 0.2 \mathrm{~N} \cdot \mathrm{~m} \text { ) } \end{aligned}$ | 30 N (pull) | $0.15 \mathrm{~N} \cdot \mathrm{~m}$ | $0.13 \mathrm{~N} \cdot \mathrm{~m}$ | - |

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 |  |  | Incandescent |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Type | Rated voltage | Consumption | Type | Rated voltage | Consumption |
| Without transformer | 5.5V AC/DC | - | - | - | AHX135 | 6.3V AC/DC | 0.9W |
|  | 6 V AC | APX510-6 $\square$ | 6V AC | Green, red, orange, amber, blue: 7 mA AC | - | - | - |
|  | $6 \mathrm{~V} \text { DC }$ | $\text { APX510-D6 } \square$ | $6 \mathrm{~V} \text { DC }$ | Yellow: $50 \mathrm{~mA} A C$ <br> Green, red, orange, amber, blue: 11 mA DC | - | - | - |
|  | 12V AC/DC | APX510-12 | $12 \mathrm{~V} \text { AC/DC }$ | Yellow: 33mA DC <br> Green, red, orange, amber, blue: 14 mA AC, 11 mA DC | - | - | - |
|  |  |  |  | Yellow: 28mA AC, 22 mA DC |  |  |  |
|  | $15 \mathrm{~V} \text { AC/DC }$ | APX510-15 $\square$ | 15V AC/DC | Green, red, orange, amber, blue: $13 \mathrm{~mA} \mathrm{AC,11mA} \mathrm{DC}$ | AHX279 | 18V AC/DC | 0.8W |
|  |  |  |  | Yellow: $26 \mathrm{~mA} \mathrm{AC}$, |  |  |  |
|  | 20V AC/DC | - | - |  | AHX144 | 24V AC/DC | 0.9W |
|  | 24 V AC/DC | APX510-24 $\square$ | 24V AC/DC | $12 \mathrm{~mA} \mathrm{AC}$, | AHX129 | 30V AC/DC | $0.8 \mathrm{~W}$ |
| With transformer (Standard type: AR9T511) | 110 V AC | APX510-6 $\square$ | 6V AC | 1.5VA | AHX135 | 6.3V AC/DC | 2VA |
|  | $127 \mathrm{~V} \text { AC }$ |  |  |  |  |  | $2 \mathrm{VA}$ |
|  | 220 V AC |  |  |  |  |  | 2VA |
|  | 254V AC | APX510-6 $\square$ | 6V AC | 2.5VA | AHX135 | 6.3V AC/DC | 2.5 VA |
|  | 380 V AC |  |  |  |  |  | 2.5 VA |
|  | 440 V AC |  |  |  |  |  | 2.5 VA |
|  | 480 V AC |  |  |  |  |  | $2.5 \mathrm{VA}$ |
|  | 550 V AC |  |  |  |  |  | 2.5 VA |
| With resistor unit (AR9T519-H) | 110V DC | APX510-24■ | 24V AC/DC | 1.2W | - | - | - |

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

- Replace the $\square$ mark by the lamp luminous color code, see page 04/16
- Except AR22VGF type
- Emergency stop illuminated pushbuttons (AR22VGF type)

| Transformer | Lamp | Voltage | Type | Rated voltage | Consumption |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Without transformer | LED | $24 \mathrm{~V} \mathrm{AC/DC}$ | AR9L002-ER | $24 \mathrm{~V} \mathrm{AC/DC}$ | 12 mA AC |
|  |  |  |  |  | 11 mA DC |
|  | Neon | 110 V AC | AR9N001-HA | 110 V AC | 0.19 VA |
|  |  | 120 V AC | AR9N001-KA | 120 V AC | 0.21 VA |
|  |  | 220 V AC | AR9N001-MA | 220 V AC | 0.30 VA |
|  |  | 240 V AC | AR9N001-PA | 240 V AC | 0.30 VA |

Notes: Lamp base: BA9S/13

Pushbuttons/Selectors/Pilot Lights/Buzzers

## AR22 and DR22

Ratings and specifications

## ■ Lamp durability

$\left.\begin{array}{l|l|l}\hline \text { Lamp } & \text { Durability (reference) } & \text { Judgement criterion } \\ \hline \text { LED } & \text { Approx. 30000h } & \begin{array}{l}\text { When brightness is less than } \\ 50 \% \text { of initial value }\end{array} \\ \begin{array}{ll}\text { Incandescent } & \text { Approx. 5000h (AC) }\end{array} & \begin{array}{l}\text { When the bulb burns out } \\ \text { Neon }\end{array} & \text { Approx. 5000h }\end{array} \begin{array}{l}\text { When a remarkable blackening } \\ \text { appears in the glass bulb and } \\ \text { the using becomes improper }\end{array}\right]$.

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 $\mathrm{Ta}=25^{\circ} \mathrm{C}$

- 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 | Type |
| Green | G | Green | APX510-■G |
| Red | R | Red | APX510-■R |
| White | W | Orange | APX510-■O |
| Yellow | Y | Yellow | APX510-■Y |
| Orange * | A | Amber | APX510-■A |
| Blue | S | Blue | APX510-■S |
| Red (AR22VGF) | R | Red | AR9L002-ER |
|  |  | Orange (Neon lamp) | AR9N001-■A |

Notes: * DR22F4M: LED lamp color is orange. (APX510-mO)

- Replace the mark by the lamp voltage code


## Incandescent lamp voltage characteristics



■ Illuminated pushbutton switches

| Operator | Transformer | Contact | LED lamp Momentary action Type | Alternate action Type | Incandescent lamp Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22F0L-10■3 <br> AR22F0L-01■3 <br> AR22FOL-11■3 <br> AR22F0L-22■3 | AR22F5L-10■3 <br> AR22F5L-01■3 <br> AR22F5L-11■3 <br> - | AR22F0L-10■4 <br> AR22F0L-01■4 <br> AR22F0L-11■4 <br>  | AR22F5L-10■4 <br> AR22F5L-01■4 <br> AR22F5L-11■4 |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR22F0L-10■3 <br> AR22F0L-01■3 <br> AR22F0L-11■3 | AR22F5L-10■3 <br> AR22F5L-01■3 <br> 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 | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22E0L-10■3 <br> AR22E0L-01■3 <br> AR22E0L-11■3 <br> AR22E0L-22■3 | AR22E5L-10■3 <br> AR22E5L-01■3 <br> AR22E5L-11■3 <br> - | AR22E0L-10■4 <br> AR22E0L-01■4 <br> AR22E0L-11■4 <br> AR22E0L-22■4 | AR22E5L-10■4 <br> AR22E5L-01■4 <br> AR22E5L-11■4 |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR22EOL-10■3 AR22E0L-01■3 AR22E0L-11■3 | AR22E5L-10■3 AR22E5L-01■3 AR22E5L-11■3 | AR22E0L-10■4 <br> AR22E0L-01■4 <br> AR22E0L-11■4 | AR22E5L-10■4 $\square$ AR22E5L-01■4 AR22E5L-11苗 |
| Mushroom head (40mm dia.) | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22MOL-10■3 <br> AR22MOL-01■3 <br> AR22MOL-11■3 <br> AR22MOL-22■3 | AR22M5L-10■3 <br> AR22M5L-01■3 <br> AR22M5L-11■3 $\square$ <br> - | AR22MOL-10■4 $\square$ <br> AR22MOL-01■4 <br> AR22MOL-11■4 <br> AR22MOL-22■4 | AR22M5L-10■4 <br> AR22M5L-01■4 <br> AR22M5L-11■4 |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | $\begin{array}{\|l} \text { AR22MOL-10■3 } \\ \text { AR22MOL-01■3 } \\ \text { AR22MOL-11■3 } \end{array}$ | $\begin{aligned} & \text { AR22M5L-10■3 } \\ & \text { AR22M5L-01■3 } \\ & \text { AR22M5L-11■3 } \end{aligned}$ | $\begin{aligned} & \text { AR22MOL-10■4 } \\ & \text { AR22MOL-01■4 } \\ & \text { AR22MOL-11■4 } \end{aligned}$ | AR22M5L-10 $\square 4 \square$ AR22M5L-01■4 $\square$ AR22M5L-11■4 $\square$ |
| Mushroom head (29mm dia.) | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22M4L-10■3 <br> AR22M4L-01■3 <br> AR22M4L-11■3 <br> AR22M4L-22■3 | AR22M9L-10■3 <br> AR22M9L-01■3 <br> AR22M9L-11■3 $\square$ | AR22M4L-10■4 $\square$ <br> AR22M4L-01■4 <br> AR22M4L-11■4 <br> AR22M4L-22■4 | $\begin{aligned} & \text { AR22M9L-10■4 } \\ & \text { AR22M9L-01■4 } \\ & \text { AR22M9L-11■4 } \end{aligned}$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR22M4L-10■3 $\square$ AR22M4L-01■3 $\square$ AR22M4L-11■3 $\square$ | $\begin{aligned} & \text { AR22M9L-10■3 } \\ & \text { AR22M9L-01■3 } \\ & \text { AR22M9L-11■3 } \end{aligned}$ | AR22M4L-10■4 AR22M4L-01■4 AR22M4L-1114 | AR22M9L-10■4 AR22M9L-01■4 AR22M9L-11■4 |
| Extended with transparent full guard ( 24 mm dia.) | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AR22G4L-10■3} \\ & \text { AR22G4L-01■3 } \\ & \text { AR22G4L-11■3 } \\ & \text { AR22G4L-22■3 } \end{aligned}$ | $\begin{aligned} & \text { AR22G9L-10■3} \\ & \text { AR22G9L-01■3 } \square \\ & \text { AR22G9L-11■3 } \\ & - \end{aligned}$ | AR22G4L-10■4 <br> AR22G4L-01■4 <br> AR22G4L-11■4 <br> AR22G4L-22■4 | $\begin{aligned} & \text { AR22G9L-10■4 } \\ & \text { AR22G9L-01■4 } \\ & \text { AR22G9L-11■4 } \end{aligned}$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AR22G4L-10■3 } \square \\ & \text { AR22G4L-01■3 } \square \\ & \text { AR22G4L-11■3 } \end{aligned}$ | $\begin{aligned} & \text { AR22G9L-10■3} \\ & \text { AR22G9L-01■3 } \\ & \text { AR22G9L-11■3 } \end{aligned}$ | $\begin{aligned} & \text { AR22G4L-10■4 } \\ & \text { AR22G4L-01■4 } \\ & \text { AR22G4L-11■4 } \end{aligned}$ | $\begin{aligned} & \text { AR22G9L-10■4 } \\ & \text { AR22G9L-01■4 } \\ & \text { AR22G9L-11■4 } \end{aligned}$ |
| Extended with full guard (24mm dia. with openings) | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22G2L-10■3 <br> AR22G2L-01■3 <br> AR22G2L-11■3 <br> AR22G2L-22■3 | AR22G7L-10■3 <br> AR22G7L-01■3 <br> AR22G7L-11■3 | AR22G2L-10■4 <br> AR22G2L-01■4 $\square$ <br> AR22G2L-11■4 $\square$ <br> AR22G2L-22■4 | AR22G7L-10■4 $\square$ <br> AR22G7L-01■4 $\square$ <br> AR22G7L-11■4 $\square$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AR22G2L-10■3 } \\ & \text { AR22G2L-01■3 } \\ & \text { AR22G2L-11■3 } \end{aligned}$ | AR22G7L-10■3 <br> AR22G7L-01■3 <br> AR22G7L-11■3 | $\begin{aligned} & \text { AR22G2L-10■4 } \\ & \text { AR22G2L-01■4 } \\ & \text { AR22G2L-11■4 } \end{aligned}$ | AR22G7L-10■4 $\square$ <br> AR22G7L-01■4 $\square$ <br> AR22G7L-11■4 |

[^1]Illuminated Pushbuttons
AR22

| Operator | Trans－ former | Contact | LED lamp <br> Momentary action Type | Alternate action Type | Incandescent lamp Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Extended with full guard （24mm dia．） | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22G1L－103 <br> AR22G1L－01■3 $\square$ <br>  <br> AR22G1L－22■3 $\square$ | $\begin{aligned} & \text { AR22G6L-10■3} \\ & \text { AR22G6L-01■3 } \\ & \text { AR22G6L-11■3 } \end{aligned}$ | AR22G1L－10■4 <br> AR22G1L－01■4 <br> AR22G1L－11■4 <br> AR22G1L－22■4 | $\begin{aligned} & \text { AR22G6L-10■4 } \\ & \text { AR22G6L-01■4 } \\ & \text { AR22G6L-11■4 } \end{aligned}$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR22G1L－10■3 AR22G1L－01■3 AR22G1L－11■3 | AR22G6L－10■3 AR22G6L－01m3 AR22G6L－11■3 | AR22G1L－10■4 AR22G1L－01■4 AR22G1L－11苗 | AR22G6L－10■4 <br> AR22G6L－01■4 <br> AR22G6L－11苗4 |
| Push－lock，turn－reset （40mm dia．with white arrow） | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 3 \mathrm{NC} \end{aligned}$ | - | AR22V5L－10■3 <br> AR22V5L－01■3 <br> AR22V5L－11■3 <br> AR22V5L－03■3 $\square$ | - | AR22V5L－10■4 $\square$ <br> AR22V5L－01■4 $\square$ <br> AR22V5L－11■4 $\square$ <br> AR22V5L－03■4 $\square$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | — | AR22V5L－10■3 AR22V5L－01■3 $\square$ AR22V5L－11■3 | — | AR22V5L－10■4 <br> AR22V5L－01■4 <br> AR22V5L－11■4 |
| Flush square head | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22FOM－10■3 <br> AR22F0M－01■3 <br> AR22F0M－11■3 $\square$ <br> AR22F0M－22■3 | AR22F5M－10■3 AR22F5M－01■3 AR22F5M－11■3 | AR22F0M－10■4 AR22F0M－01■4 AR22F0M－11■4 AR22F0M－22■4 | AR22F5M－10■4 AR22F5M－01■4 AR22F5M－11■4 |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR22F0M－10■3 $\square$ AR22F0M－01■3 $\square$ AR22F0M－11■3 $\square$ | $\begin{aligned} & \text { AR22F5M-10 } \boxed{3} \square \\ & \text { AR22F5M-01■3} \\ & \text { AR22F5M-11■3 } \end{aligned}$ | AR22F0M－10■4 AR22F0M－01■4 AR22F0M－11■4 | $\begin{aligned} & \text { AR22F5M-10 } \square 4 \\ & \text { AR22F5M-01■4 } \\ & \text { AR22F5M-11■4 } \end{aligned}$ |
| Extended square head | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22EOM－10■3 $\square$ <br> AR22E0M－01■3 $\square$ <br> AR22E0M－11■3 $\square$ <br> AR22EOM－22■3 $\square$ | AR22E5M－10■3 AR22E5M－01■3 $\square$ AR22E5M－11■3 $\qquad$ | AR22E0M－104 AR22E0M－01■4 AR22E0M－11■4 AR22E0M－22■4 | AR22E5M－10■4 <br> AR22E5M－01■4 <br> AR22E5M－11■4 $\square$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR22E0M－10■3 AR22E0M－01■3 AR22EOM－11■3 | AR22E5M－10■3 AR22E5M－01■3 AR22E5M－11■3 | AR22E0M－10■4 AR22E0M－01■4 AR22E0M－11苗 | AR22E5M－10■4 AR22E5M－01■4 AR22E5M－11■4 |
| Flush round head with square bezel | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22FOP－10■3 <br> AR22F0P－01■3 <br> AR22F0P－11■3 <br> AR22FOP－22■3 $\square$ | AR22F5P－10■3 <br> AR22F5P－01■3 <br> AR22F5P－11■3 $\square$ | AR22FOP－10■4 <br> AR22F0P－01■4 <br> AR22F0P－11■4 <br> AR22F0P－22■4 | AR22F5P－10■4 <br> AR22F5P－01■4 <br> AR22F5P－11■4 |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR22F0P－10■3 <br> AR22FOP－01■3 <br> AR22F0P－11■3 | AR22F5P－10■3 $\square$ AR22F5P－01■3 $\square$ AR22F5P－11■3■ | AR22F0P－10■4 <br> AR22F0P－01■4 <br> AR22F0P－11苗 | AR22F5P－10■4 <br> AR22F5P－01■4 <br> AR22F5P－11■4 |
| Extended round head with square bezel <br> AF94－314 | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22E0P－10■3 <br> AR22EOP－01■3 <br> AR22EOP－11■3 <br> AR22EOP－22■3 | AR22E5P－10■3 <br> AR22E5P－01■3 $\square$ <br> AR22E5P－11■3 | AR22E0P－10■4 <br> AR22EOP－01■4 <br> AR22E0P－11■4 <br> AR22EOP－22■4 | AR22E5P－10■4 <br> AR22E5P－01■4 <br> AR22E5P－11■4 $\square$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR22E0P－10■3 AR22E0P－01■3 AR22E0P－11■3 | AR22E5P－10■3 $\square$ <br> AR22E5P－01■3 <br> AR22E5P－11醇 | AR22E0P－10■4 AR22E0P－01■4 AR22E0P－11苗 | AR22E5P－10■4 <br> AR22E5P－01■4 <br> AR22E5P－11■4 |

Note：$\square \square$ See page 04／19

| Operator | Transformer | Contact | LED lamp <br> Momentary action Type | Alternate action Type | Incandescent lamp Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Mushroom head with square bezel (29mm dia.) | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22M4P-10■3 $\square$ <br> AR22M4P-01■3 $\square$ <br> AR22M4P-11■3 $\square$ <br> AR22M4P-22■3 | $\begin{aligned} & - \\ & - \\ & - \end{aligned}$ | AR22M4P-10■4 <br> AR22M4P-01■4 <br> AR22M4P-11■4 <br> AR22M4P-22■4 | - - - |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AR22M4P-10 } \ddagger \text { 3 } \\ & \text { AR22M4P-01■3 } \square \\ & \text { AR22M4P-11■3 } \end{aligned}$ | — | AR22M4P-10■4 AR22M4P-01■4 AR22M4P-11■4 | — |

## - Lens color

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

| Color | Green | Red | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | A |

Note: AR22V5L type: Red, yellow only

## - Contact arrangements

Contact arrangements other than above are available

| Contact <br> arrangement | 1 NO | 1 NC | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2 NO | 2 NC | 3 NO |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | 10 | 01 | 11 | 20 | 02 | 30 |
| Contact <br> arrangement | 3 NC | $2 \mathrm{NO}+2 \mathrm{NC}$ | 4 NO | 4 NC | 5 NO | 5 NC |
| 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 <br> Push-lock, turn-reset | 3-contact block | 2-contact block |

- Voltage

Replace the $\square$ mark by the lamp voltage code
04

| Transformer |  | Code LED | Incandescent |
| :---: | :---: | :---: | :---: |
| Without transformer | 6V DC 6 V AC 5.5V AC/DC 12 V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC | $\begin{array}{\|l\|} \hline 6 \\ \mathrm{~A} \\ \hline \mathrm{~B} \\ \hline \mathrm{C} \\ \hline \mathrm{E} \\ \hline \end{array}$ | $\begin{aligned} & \frac{-}{\overline{5}} \\ & \frac{1}{C} \\ & \mathrm{D} \\ & \mathrm{E} \end{aligned}$ |
| With transformer | 100-110V AC <br> 115-127V AC 200-220V AC 230-254V AC 350-380V AC 400-440V AC 480 V AC $500-550 \mathrm{~V}$ AC | $\begin{aligned} & \hline \mathrm{H} \\ & \mathrm{~L} \\ & \mathrm{M} \\ & \mathrm{Q} \\ & \mathrm{~S} \\ & \mathrm{~T} \\ & \mathrm{~V} \end{aligned}$ | $\begin{aligned} & \hline H \\ & L \\ & M \\ & \text { Q } \\ & \text { S } \\ & T \\ & V \\ & W \end{aligned}$ |

Pushbuttons
AR22

■ Pushbutton switches

| Operator | Contact | Momentary <br> action <br> Type | Alternate <br> action |
| :--- | :--- | :--- | :--- |

[^2]| Operator | Contact | Momentary <br> action <br> Type | Alternate <br> action |
| :--- | :--- | :--- | :--- |
|  |  | Type |  |


| Operator | Contact | Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: |
| Extended round head with square bezel | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AR22EOY-10 } \\ & \text { AR22EOY-01 } \\ & \text { AR22EOY-11 } \\ & \text { AR22EOY-20 } \\ & \text { AR22EOY-02 } \\ & \text { AR22EOY-22 } \end{aligned}$ | AR22E5Y-10 $\square$ AR22E5Y-01 AR22E5Y-11 AR22E5Y-20 AR22E5Y-02 AR22E5Y-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 | Y | A | B |

Note: AR22V5R type: Red, yellow, black only

## - Contact arrangements

Contact arrangements other than above are available

| Contact <br> arrangement | 1NO | 1NC | 1NO+1NC | 2NO | 2NC | 3NO | 3NC |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :---: |
| Code | 10 | 01 | 11 | 20 | 02 | 30 | 03 |  |  |
|  |  |  |  |  |  |  |  |  |  |
| Contact <br> arrangement | 2NO+2NC | 4NO | 4NC | $5 N O$ | $5 N C$ | $3 N O+3 N C$ |  |  |  |
| Code | 22 | 40 | 04 | 50 | 05 | 33 |  |  |  |


| Operator | Contact | Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: |
| Mushroom head with square bezel (29mm dia.) | $\begin{array}{\|l} \hline 1 \mathrm{NO} \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \\ 2 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \end{array}$ | AR22M4Y-10 <br> AR22M4Y-01 <br> AR22M4Y-11 <br> AR22M4Y-20 <br> AR22M4Y-02 <br> AR22M4Y-22 | $\begin{aligned} & - \\ & - \\ & - \\ & - \\ & - \end{aligned}$ |

- Available numbers of contact blocks

| Momentary action | Alternate action <br> Push-lock, turn-reset |
| :--- | :--- |
| 6-contact block | 4-contact block |

- Symbol mark (For AR22FAR, FBR, EAR, EBR)

Replace the $\quad$ mark by the symbol mark code

| Symbol mark | $\bigcirc$ |  | , |  | ( ${ }^{\text {a }}$ |  | O |  | ) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |

Pushbuttons
AR22

| Operator | Contact (The following contact is only available.) | Button color | Type | Contact operation |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Contact block |  | Left |  | Right |  |
|  |  |  |  | Mounting position | Type | Free | Depressed | Free | Depressed |
| Pushbutton with selector ring (2-position) <br> AF94-355 | 2NO+2NC | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR22S1R-22G AR22S1R-22R AR22S1R-22B AR22S1R-22W AR22S1R-22Y AR22S1R-22A AR22S1R-22S | (1) | NC | - | - | - | - |
|  |  |  |  | (2) | NC | - | - | - | - |
|  |  |  |  | (3) | NO | - | $\bullet$ | - | $\bullet$ |
|  |  |  |  | (4) | NO | - | - | - | - |
|  | 2NO | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR22S2R-20G <br> AR22S2R-20R <br> AR22S2R-20B <br> AR22S2R-20W <br> AR22S2R-20Y <br> AR22S2R-20A <br> AR22S2R-20S | (1) | NO | - | $\bullet$ | - | - |
|  |  |  |  | (2) | NO | - | - | - | - |
|  |  |  |  |  |  |  |  |  |  |
|  | $2 \mathrm{NO}+2 \mathrm{NC}$ | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR22S2R-22G AR22S2R-22R AR22S2R-22B AR22S2R-22W AR22S2R-22Y AR22S2R-22A AR22S2R-22S | (1) | NC | - | - |  | D |
|  |  |  |  | (2) | NC |  | D | - | - |
|  |  |  |  | (3) | NO | - | - | - | - |
|  |  |  |  | (4) | NO | - | - | - | $\bullet$ |
|  | 2NO+2NC | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR22S3R-22G AR22S3R-22R AR22S3R-22B AR22S3R-22W AR22S3R-22Y AR22S3R-22A AR22S3R-22S | (1) | NC | - | - |  | - |
|  |  |  |  | (2) | NC |  | - | - | - |
|  |  |  |  | (3) | NO | - | - | - | - |
|  |  |  |  | (4) | NO | - | - | - | - |
|  | 2NO+2NC | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR22S6R-22G <br> AR22S6R-22R <br> AR22S6R-22B <br> AR22S6R-22W <br> AR22S6R-22Y <br> AR22S6R-22A <br> AR22S6R-22S | (1) | NC | - | - | - |  |
|  |  |  |  | (2) | NC | - | - | - |  |
|  |  |  |  | (3) | NO | - | - | $\bullet$ |  |
|  |  |  |  | (4) | NO | - | $\bullet$ | $\bullet$ |  |
| Note: (1) to (4): Contact block mounting position |  |  |  |  |  | $\begin{aligned} & \text { - Cont } \\ & -\quad \text { Cont } \end{aligned}$ | closed open |  |  |

- Position of contact block



## ■ Emergency stop pushbutton switches

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

| Operator | Contact | Type |
| :---: | :---: | :---: |
| Push-lock, turn-reset (Soft-touch 40 mm dia. With white arrow) | $\begin{aligned} & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NC} \\ & \text { 3NC } \\ & \text { 2NO+2NC } \\ & 4 \mathrm{NC} \end{aligned}$ | AR22VOR-01R AR22VOR-11R AR22VOR-02R AR22VOR-03R AR22VOR-22R AR22VOR-04R |
| Push-lock, turn-reset (40mm dia.) <br> KKD05-020b | $\begin{aligned} & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NC} \\ & 3 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 4 \mathrm{NC} \end{aligned}$ | AR22V2R-01R AR22V2R-11R AR22V2R-02R AR22V2R-03R AR22V2R-22R AR22V2R-04R |
| Push-lock, turn-reset (Soft-touch 29 mm dia. with white arrow) | $\begin{aligned} & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NC } \\ & \text { 3NC } \\ & \text { 2NO+2NC } \\ & \text { 4NC } \end{aligned}$ | AR22VSR-01R AR22VSR-11R AR22VSR-02R AR22VSR-03R AR22VSR-22R AR22VSR-04R |
| Push-lock, turn-reset (29mm dia.) <br> KKD06-339 | $\begin{aligned} & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & \text { 2NC } \\ & \text { 3NC } \\ & \text { 2NO+2NC } \\ & 4 \mathrm{NC} \end{aligned}$ | AR22V4R-01R AR22V4R-11R AR22V4R-02R AR22V4R-03R AR22V4R-22R AR22V4R-04R |

[^3]- Contact arrangements indicated in the table can be supplied.

| Operator | Contact | Type |
| :--- | :--- | :--- | :--- |
| Key release push-lock, <br> turn-reset <br> (40mm dia.) | 1NC <br> 1NO+1NC <br> 2NC <br> 3NC <br> 2NO+2NC <br> 4NC | AR22V7R-01R <br> AR22V7R-11R <br> AR22V7R-02R <br> AR22V7R-03R <br> AR22V7R-22R <br> AR22V7R-04R |

Emergency Stop Illuminated Pushbuttons
AR22

■ Emergency stop illuminated pushbutton switches
$\Theta$ (Direct opening action), conform to EN418

| Operator | Transformer | Contact | LED lamp | Type | Incandescent lamp |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Type |  |  |  |  |  |

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

| Transformer |  | Code LED | Incandescent | Neon |
| :---: | :---: | :---: | :---: | :---: |
| Without | 6V DC | 6 | - | - |
|  | 6V AC | A | - | - |
|  | 5 V AC/DC | - | 5 | - |
|  | 12V AC/DC | B | - | - |
|  | 15 V AC/DC | C | C | - |
|  | 20V AC/DC | - | D | - |
|  | 24 V AC/DC | E | E | H |
|  | 110 V AC | - | - | H |
|  | 120 V AC | - | - | K |
|  | 220 V AC | - | - | M |
|  | 240V AC | - | - | P |


| Transformer |  | Code <br> LED | Incandescent |
| :--- | :--- | :--- | :--- |
| With | $100-110 \mathrm{~V}$ AC | H | H |
|  | $115-127 \mathrm{~V}$ AC | L | L |
|  | $200-220 \mathrm{~V}$ AC | M | M |
|  | $230-254 \mathrm{~V}$ AC | Q | Q |
|  | $350-380 \mathrm{~V} A C$ | S | S |
|  | $400-440 \mathrm{~V}$ AC | T | T |
|  | 480 V AC | V | V |
|  | $500-550 \mathrm{~V} \mathrm{AC}$ | W | W |

[^4]
## ■ Selector switches

## 2-position



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

- (1) - (2), (3) - (4): Contact block terminal No.
- Contact arrangements: See page 04/27


## - Operator

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

Selector Switches AR22

3-position

| Operator | Operation | Knob color | Contact | Type Switch with round bezel | Switch with square bezel | Contact operation (Example) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | Contact arrangement | Operation position |  |
|  |  |  |  |  |  |  | $\begin{array}{lll} \hline L & C & R \\ \bigcirc & \oplus & \bigcirc \end{array}$ | $\begin{array}{lll} \hline L & C & R \\ 0 & \uparrow & \ddots \end{array}$ |
| Knob | Maintained each $45^{\circ}$ | Color code: <br> B: Black <br> (Standard) <br> Color other than above are available $\binom{$ G: Green }{ R: Red } | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR22PR-311B <br> AR22PR-320B <br> AR22PR-302B <br> AR22PR-322B | AR22PY-311B <br> AR22PY-320B <br> AR22PY-302B <br> AR22PY-322B | $\begin{array}{\|c\|} \hline 1 \mathrm{NO}+\mathrm{NC} \\ (1) \\ \hline \end{array}$ | Upper contact <br> (3) | Lower contact <br> (1) |
|  | Spring/manual return |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & \text { 2NO}+2 \mathrm{NC} \end{aligned}$ | AR22PR-611B AR22PR-620B AR22PR-602B AR22PR-622B | AR22PY-611B AR22PY-620B AR22PY-602B AR22PY-622B |  |  |  |
|  | Spring/manual return each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR22PR-711B <br> AR22PR-720B <br> AR22PR-702B <br> AR22PR-722B | AR22PY-711B <br> AR22PY-720B <br> AR22PY-702B <br> AR22PY-722B | $\left\|\begin{array}{ll} 1 \mathrm{NO}+1 \mathrm{NC} \\ (1) & (2) \end{array}\right\|$ | Upper contact | Lower contact |
|  | Spring return each $45^{\circ}$ |  | 2NO+2NC | AR22PR-122B | AR22PY-122B | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) <br> (3) (4) | Upper contact | Lower contact |
| Lever | Maintained each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & 2 N O \\ & 2 N C \\ & 2 N O+2 N C \end{aligned}$ | AR22WR-311B <br> AR22WR-320B <br> AR22WR-302B <br> AR22WR-322B | AR22WY-311B <br> AR22WY-320B <br> AR22WY-302B <br> AR22WY-322B | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) |  | Lower contact <br> (1) |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22WR-611B <br> AR22WR-620B <br> AR22WR-602B <br> AR22WR-622B | AR22WY-611B <br> AR22WY-620B <br> AR22WY-602B <br> AR22WY-622B |  |  |  |
|  | Spring/manual return |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22WR-711B <br> AR22WR-720B <br> AR22WR-702B <br> AR22WR-722B | AR22WY-711B <br> AR22WY-720B <br> AR22WY-702B <br> AR22WY-722B | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) | Upper contact <br> (3) | Lower contact |
|  | Spring return <br> (1) each $45^{\circ}$ |  | 2NO+2NC | AR22WR-122B | AR22WY-122B | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) <br> (3) (4) |  | Lower contact |
| Cylindrica | Maintained each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & 2 N O \\ & 2 N C \\ & 2 N O+2 N C \end{aligned}$ | AR22RR-311B <br> AR22RR-320B <br> AR22RR-302B <br> AR22RR-322B | AR22RY-311B AR22RY-320B AR22RY-302B AR22RY-322B | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & (1) \quad(2) \end{aligned}$ | Upper contact <br> (3) | Lower contact <br> (1) |
|  | Spring/manual return <br> each $45^{\circ}$ |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR22RR-611B <br> AR22RR-620B <br> AR22RR-602B <br> AR22RR-622B | AR22RY-611B <br> AR22RY-620B <br> AR22RY-602B <br> AR22RY-622B |  |  |  |
|  | Spring/manual return (1) each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & 2 N O \\ & 2 N \mathrm{CO} \\ & \text { 2NO+2NC } \end{aligned}$ | AR22RR-711B <br> AR22RR-720B <br> AR22RR-702B <br> AR22RR-722B | AR22RY-711B <br> AR22RY-720B <br> AR22RY-702B <br> AR22RY-722B | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) | Upper contact | Lower contact |
|  | Spring return each $45^{\circ}$ |  | 2NO+2NC | AR22RR-122B | AR22RY-122B | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) <br> (3) (4) | Upper contact | Lower contact |


| Operator | Operation | Key removable position | Contact | Type Switch with round bezel | Switch with square bezel | Contact operation (Example) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | Contact arrangement | Operator position |  |
|  |  |  |  |  |  |  | $\begin{array}{lll} \hline \text { L } & \mathrm{C} & \mathrm{R} \\ \odot & (1) & \oslash \end{array}$ | $\begin{array}{lll} \hline \text { L } & \mathrm{C} & \mathrm{R} \\ (\mathrm{O} & (1) & \oslash \end{array}$ |
| Key | Maintained each $45^{\circ}$ | Key removable position <br> ( ): Key type | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR22J $\square R-3 \square 11$ () <br> AR22JDR-320() <br> AR22J $\square R-3 \square 02()$ <br> AR22J $\square R-3 \square 22()$ | AR22JY-3■11() <br> AR22JY-3■20() <br> AR22JY-3■02() <br> AR22JY-3■22() | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) | Upper contact <br> (3) | Lower contact <br> (1) |
|  | Spring/manual return |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR22J $\square R-6$-11() <br> AR22J $\square R-6$ 20( ) <br> AR22J $\square R-6$ 02() <br> AR22J $\square R-6$ 22() | AR22JY-6■11() <br> AR22JY-6世20() <br> AR22JY-6■02() <br> AR22JY-6■22() |  |  |  |
|  | Spring/manual return each $45^{\circ}$ |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR22J $\square$ R-7■11() <br> AR22J $\square R-7$ 120() <br> AR22J $\square R-7$ 02( ) <br> AR22J $\square R-7$ ²2() | AR22JY-7■11() <br> AR22JY-7■20() <br> AR22JY-7■02() <br> AR22JY-7■22() | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) | Upper contact | Lower contact |
|  | Spring return <br> (1) each $45^{\circ}$ |  | 2NO+2NC | AR22J $\square$ R-1E22( ) | AR22JY-1E22() | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) <br> (3) (4) | Upper contact | Lower contact |
| Notes: • Operator position L:Left, C:Center, R:Right <br> - (1) to (4): Contact block mounting position <br> - (1) - (2), (3) - (4): Contact block terminal No. |  |  |  |  |  |  |  |  |

## - Contact arrangements

Contact arrangements other than above are available

| Contact arrangement | 1NO | 1NC | $1 \mathrm{NO}+1 \mathrm{NC}$ |  | 2NO |  | 2NC |  | 3NO | 3NC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Code | 10 | 01 | 11 |  | 20 |  | 02 |  | 30 | 03 |
| Contact arrangement | $2 \mathrm{NO}+2 \mathrm{NC}$ |  | 4NO | 4NC | 5NO |  | 5NC |  | $3 \mathrm{NO}+3 \mathrm{NC}$ |  |
| Code | 22 |  | 40 | 04 | 50 |  | 05 |  | 33 |  |

- Available numbers of contact blocks

| Mainted | Spring return <br> Spring/manual return |
| :--- | :--- |
| 6-contact block | 4-contact block |

- Key removable positions

- Position of contact block

- 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.

## - 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 | Switch with square bezel |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Knob | Maintained each $45^{\circ}$ | Color code： <br> B：Black <br> （Standard） <br> Color other than above are available $\binom{\text { G: Green }}{\text { R: Red }}$ | Replace the mark by the contact arrangement code （shown on next page）． | AR22PCR－3曂 | AR22PCY－3曂 |
|  | Spring／manual return each $45^{\circ}$ |  |  | AR22PCR－6■B | AR22PCY－6■B |
|  | Spring／manual return <br> （1）each $45^{\circ}$ |  |  |  | AR22PCY－7■B |
|  | Spring return <br> （1）each $45^{\circ}$ |  |  |  | AR22PCY－1陑 |
| Lever | Maintained each $45^{\circ}$ |  | Replace the mark by the contact arrangement code （shown on next page）． | AR22WCR－3■B | AR22WCY－3■B |
|  | Spring／manual return <br> （1）each $45^{\circ}$ |  |  | AR22WCR－6■B | AR22WCY－6■B |
|  | Spring／manual return <br> （1）each $45^{\circ}$ |  |  | AR22WCR－7■B | AR22WCY－7■B |
|  | Spring return <br> （ 1 ）each $45^{\circ}$ |  |  |  |  |
| Cylindrical knob | Maintained each $45^{\circ}$ |  | Replace the mark by the contact arrangement code （shown on next page）． | AR22RCR－3■B | AR22RCY－3■B |
|  | Spring／manual return <br> （1）each $45^{\circ}$ |  |  | AR22RCR－6．${ }^{\text {a }}$ | AR22RCY－6阳 |
|  | Spring／manual return each $45^{\circ}$ |  |  | AR22RCR－7 ${ }^{\text {a }}$ | AR22RCY－7 ${ }^{\text {a }}$ |
|  | Spring return <br> （1）each $45^{\circ}$ |  |  |  |  |
| Key | Maintained each $45^{\circ}$ | Replace the mark by the key removable position code： A，B，C，D，E F or G | Replace the mark by the contact arrangement code （shown on next page）． | AR22JCR－3■（） | AR22JCY－3■ $\square$（ ） |
|  | Spring／manual return <br> （1）each $45^{\circ}$ |  |  | AR22JCR－6 $\square$（ ） | AR22JCY－6■ $\square$（ ） |
|  | Spring／manual return each $45^{\circ}$ |  |  | AR22JCR－7 $\square$（ ） | AR22JCY－7■ $\square$（ ） |
|  | Spring return <br> each $45^{\circ}$ |  |  | AR22JCR－1E■（ ） | AR22JCY－1E■（） |

## －Key removable positions

| Code | A | B | C | D | E | F | G |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Removable position | $\underbrace{45^{2}+85_{0}}$ | $\frac{45^{\circ}+\frac{85}{8}}{(23)}$ | $\left(\frac{45}{40}\right.$ | $\underbrace{45^{5}+\frac{85}{0}}$ | $4^{45^{5}+50}$ | $\left(\frac{45^{\circ}+85^{2}}{42}\right.$ | $\frac{45^{\circ}+\frac{85}{0}}{4}$ |
| AR22JCR－3 | O | － | － |  |  |  | $\bigcirc$ |
| AR22JCR－6 | － | － | － | － | － | － | － |
| AR22JCR－7 | － | － | － | － |  | － | － |
| AR22JCR－1 | － | － | － | － |  | － | － |

－Available $\quad$－：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 arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type | 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 |  | D |  |
|  |  | (4) | NC |  |  | - |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 024 | (1) | NC |  | D |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO |  |  | - |
|  |  | (4) | NO | - |  | - |
| 2NO+2NC | 03C* <br> (Maintained only) | (1) | NC |  |  |  |
|  |  | (2) | NC |  |  | - |
|  |  | (3) | NO |  |  | - |
|  |  | (4) | NO | - |  |  |
| 2NO+2NC | 044* | (1) | NC |  | D |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO |  |  | - |
|  |  | (4) | NO | - |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 054 | (1) | NC |  | , |  |
|  |  | (2) | NC |  | - |  |
|  |  | (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



| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type | Left | Center | Right |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 064 | (1) | NC |  | $\square$ |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO | - |  | - |
| $1 \mathrm{NO}+1 \mathrm{NC}$ | 07F | (1) | NC |  | $\square$ |  |
|  |  | (2) | NO |  |  | - |
|  |  | - | - | - | - | - |
|  |  | - | - | - | - | - |
| 2NO+2NC | $\begin{aligned} & \text { 07C* } \\ & \text { (Maintained } \\ & \text { onlv) } \end{aligned}$ | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC |  |  | - |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO | - |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 084 | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO | - |  |  |
| 2NO+2NC | 094* | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | - |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 104 | (1) | NC |  | $\bullet$ |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO | $\bullet$ |  | - |
| 2NO+2NC | $\begin{aligned} & 11 \mathrm{C}^{*} \\ & \text { (Maintained } \\ & \text { only) } \end{aligned}$ | (1) | NC |  | - |  |
|  |  | (2) | NC |  |  | - |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO | $\bigcirc$ |  |  |

Selector Switches
AR22

- Contact arrangement code (Typical example)

| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type | Left | Center | Right |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 124* | (1) | NC |  | $\bullet$ |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | $\bullet$ |  | - |
|  |  | (4) | NO | - |  |  |
| 2NO+2NC | 134* | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO |  |  | - |
| $3 \mathrm{NO}+1 \mathrm{NC}$ | $\begin{aligned} & 14 \mathrm{D}^{*} \\ & \text { (Maintained } \\ & \text { only) } \end{aligned}$ | (1) | NO | $\bullet$ |  |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | - |
| $3 \mathrm{NO}+1 \mathrm{NC}$ | 15A* | (1) | NO |  |  | - |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO |  |  | $\bullet$ |
|  |  | (4) | NO | $\bullet$ |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 164 | (1) | NC |  | - |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO | $\bullet$ |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 174* | (1) | NC |  | $\bullet$ |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | $\bullet$ |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 184 | (1) | NC |  | $\bullet$ |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO |  |  | - |
|  |  | (4) | NO |  |  | $\bullet$ |

Notes: ©: Contact closed Blank: Contact open

* There may be some overlap in the contact when switching between notches.
- Position of contact block


| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type | Left | Center <br> (1) |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 194 | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC | $\longrightarrow$ |  |  |
|  |  | (3) | NO | $\bullet$ |  |  |
|  |  | (4) | NO |  |  | $\bullet$ |
| 4NO | 20B | (1) | NO |  |  | $\bullet$ |
|  |  | (2) | NO | - |  |  |
|  |  | (3) | NO |  |  | $\bullet$ |
|  |  | (4) | NO | $\bullet$ |  |  |

4，5－position

| Operator | Contact <br> （The following <br> contact is only <br> anail <br> available．） | Operation | Knob color | Contact arrangement | Type Switch with round bezel | Switch with square bezel |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Knob | 2NO＋2NC | 4－position maintained | Color code： <br> B：Black <br> （Standard） <br> Color other than above are available <br> $\binom{$ G：Green }{ R：Red } | Replace the mark by the contact arrangement code （shown below） | AR22PCR－4■B | AR22PCY－4■B |
|  |  | 5－position maintained |  |  | AR22PCR－5回 | AR22PCY－5回 |
|  | 2NO＋2NC | 4－position maintained |  |  | AR22WCR－4■B | AR22WCY－4 ${ }^{\text {B }}$ |
|  |  | 5－position maintained |  |  | AR22WCR－5酔 | AR22WCY－5mb |
| Cylindrical | 2NO＋2NC | 4－position maintained |  |  |  | AR22RCY－4min |
|  |  | 5－position maintained |  |  | AR22RCR－5嗗 |  |

－Contact arrangement code

| Position | Contact arrange－ ment | Contact arrange－ ment code | Contact operation |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Contact block |  | Operator position |  |  |  |  |
|  |  |  | Mounting position | Type | 1 | $23$ |  | 4 | 5 |
| 4－position | 2NO＋2NC | 41C＊ <br> （Main－ tained only） | （1） <br> （2） <br> （3） <br> （4） | NC <br> NC <br> NO <br> NO |  |  |  |  |  |
| 5－position | 2NO＋2NC | 51C＊ <br> （Main－ tained only） | （1） <br> （2） <br> （3） <br> （4） | NC <br> NC <br> NO <br> NO |  |  |  |  |  |

Notes：©：Contact closed
＊There may be some overlap in the contact when switching between notches．
－Position of contact block


Operator position
4－position $\quad$－position



Illuminated Selector Switches
AR22

■ Illuminated selector switches
2-position

| Operator | Operation | Contact | LED lamp |  | Incandescent lamp |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Transformer | Type | Transformer | Type |
| Knob | Maintained | $\begin{array}{\|l} 1 \mathrm{NO} \\ \text { 1NC } \\ \text { 1NO+1NC } \\ \text { 2NO+2NC } \end{array}$ | Without | $\begin{aligned} & \text { AR22PL-210■3} \\ & \text { AR22PL-201■3} \\ & \text { AR22PL-211■3 } \\ & \text { AR22PL-222■3 } \end{aligned}$ | Without | $\begin{aligned} & \text { AR22PL-210■4} \\ & \text { AR22PL-201■4 } \\ & \text { AR22PL-211■4 } \\ & \text { AR22PL-222■4 } \end{aligned}$ |
|  | each $90^{\circ}$ | $\begin{aligned} & \text { 1NO } \\ & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NO } \end{aligned}$ | With | $\begin{aligned} & \text { AR22PL-210■3} \\ & \text { AR22PL-201■3 } \\ & \text { AR22PL-211■3 } \\ & \text { AR22PL-220■3 } \end{aligned}$ | With | $\begin{aligned} & \text { AR22PL-210 } 4 \\ & \text { AR22PL-201■4} \\ & \text { AR22PL-211■4 } \\ & \text { AR22PL-220 } \end{aligned}$ |
|  | Spring return | $\begin{array}{\|l} 1 \mathrm{NO} \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \end{array}$ | Without | $\begin{aligned} & \text { AR22PL-010■3} \\ & \text { AR22PL-001■3} \\ & \text { AR22PL-011■3 } \\ & \text { AR22PL-020■3 } \end{aligned}$ | Without | $\begin{aligned} & \text { AR22PL-010■4} \\ & \text { AR22PL-001■4} \\ & \text { AR22PL-011■4 } \\ & \text { AR22PL-020■4 } \end{aligned}$ |
|  |  | $\begin{aligned} & \text { 1NO } \\ & \text { 1NC } \\ & \text { 1NO }+1 \mathrm{NC} \\ & \text { 2NO } \end{aligned}$ | With | AR22PL-010 $\square \square$ AR22PL-001 $\square \square$ AR22PL-011 $\square \square$ AR22PL-020 $\square \square$ | With | $\begin{aligned} & \text { AR22PL-010■4} \\ & \text { AR22PL-001■4 } \\ & \text { AR22PL-011■4 } \\ & \text { AR22PL-020■4 } \end{aligned}$ |
| Knob with square bezel | Maintained <br> each $90^{\circ}$ | $\begin{aligned} & 1 \mathrm{NO} \\ & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NO+2NC } \end{aligned}$ | Without | AR22PP-210■3 <br> AR22PP-201■3 <br> AR22PP-211■3 <br> AR22PP-222■3 | Without | AR22PP-210■4 AR22PP-201■4 AR22PP-211■4 AR22PP-222■4 |
|  |  | $\begin{array}{\|l} 1 \mathrm{NO} \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \end{array}$ | With | $\begin{aligned} & \text { AR22PP-210 } \\ & \text { AR22PP-201■3} \\ & \text { AR22PP-211■3} \\ & \text { AR22PP-220 } \end{aligned}$ | With | AR22PP-210■4 <br> AR22PP-201■4 <br> AR22PP-211■4 <br> AR22PP-220■4 |
|  | Spring return | $\begin{array}{\|l} 1 \mathrm{NO} \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \end{array}$ | Without | $\begin{aligned} & \text { AR22PP-010 } \\ & \text { AR22PP-001 } \\ & \text { AR22PP-011 } \\ & \text { AR22PP-020 } \end{aligned}$ | Without | $\begin{aligned} & \text { AR22PP-010 } 4 \\ & \text { AR22PP-001■4} \\ & \text { AR22PP-011■4 } \\ & \text { AR22PP-020 } \end{aligned}$ |
|  |  | $\begin{aligned} & \text { 1NO } \\ & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NO } \end{aligned}$ | With | AR22PP-010 $\square$ 3 $\square$ AR22PP-001 $\square \square$ AR22PP-011 $\square \square$ AR22PP-020 $\square \square$ | With | $\begin{aligned} & \text { AR22PP-010 } 4 \\ & \text { AR22PP-001■4} \\ & \text { AR22PP-011■4 } \\ & \text { AR22PP-020 } \end{aligned}$ |

3-position

| Operator | Operation |  | Contact | LED lamp |  | Incandescent lamp |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Transformer | Type | Transformer | Type |
| Knob | Maintained each $45^{\circ}$ |  |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without <br> With | AR22PL-311■3 <br> AR22PL-322■3 <br> AR22PL-311■3 | Without | AR22PL-311■4 AR22PL-322■4 <br> AR22PL-311■4 |
|  | Spring/manual return | 宁 | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without With | $\begin{aligned} & \text { AR22PL-611■3 } \square \\ & \text { AR22PL-611■3 } \end{aligned}$ | Without With | $\begin{aligned} & \text { AR22PL-611■4 } \square \\ & \text { AR22PL-611■4 } \square \end{aligned}$ |
|  | each $45^{\circ}$ | (1) | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without With | AR22PL-711■3 $\square$ AR22PL-711■3 $\square$ | Without With | AR22PL-711■4 $\square$ AR22PL-711■4 $\square$ |
| Knob with square bezel | Maintained each $45^{\circ}$ |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without <br> With | AR22PP-311■3 <br> AR22PP-322■3 <br> AR22PP-311■3 | Without | AR22PP-311■4 AR22PP-322■4 <br> AR22PP-311■4 |
|  | Spring/manual return | 宁 | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without With | $\begin{aligned} & \text { AR22PP-611■3 } \square \\ & \text { AR22PP-611■3 } \square \end{aligned}$ | Without With | AR22PP-611■4 $\square$ AR22PP-611■4 |
|  | each $45^{\circ}$ | (1) | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without With | AR22PP-711■3 $\square$ AR22PP-711■3 $\square$ | Without With | AR22PP-711■4 AR22PP-711■4 |

Note: $\square$, ■ See page 04/33

- Replace the $\square$ mark by the following lamp voltage code

| Transformer | Voltage | Code LED | Incandescent |
| :---: | :---: | :---: | :---: |
| Without | 5 V AC/DC | - | 5 |
|  | 6V DC | 6 | - |
|  | 6V AC | A | - |
|  | 12V AC/DC | B | - |
|  | 15V AC/DC | C | C |
|  | 20V AC/DC | - | D |
|  | 24V AC/DC | E | E |
| With | 100-110V AC | H | H |
|  | 115-127V AC | L | L |
|  | 200-220V AC | M | M |
|  | 230-254V AC | Q | Q |
|  | 350-380V AC | S | S |
|  | 400-440V AC | T | T |
|  | 480 V AC | V | V |
|  | 500-550V AC | W | W |

## - Contact arrangement and operator position

| Transformer | Contact arrangement | Contact block |  | Operator position |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mounting position | Type | Left $\bigcirc$ | Right <br> $\bigcirc$ |
| With/without | 1 NO | (1) | NO | - | $\bullet$ |
| With/without | 1NC | (1) | NC | - | - |
| Without | 1NO+1NC | $\begin{aligned} & \hline(1) \\ & (2) \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathrm{NO} \\ \mathrm{NC} \end{array}$ | $-$ |  |
| With | 1NO+1NC | $\begin{array}{\|l} \hline(1) \\ (2) \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathrm{NC} \\ \mathrm{NO} \\ \hline \end{array}$ |  | - |
| With/without | 2 NO | $\begin{array}{\|l} \hline(1) \\ (2) \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathrm{NO} \\ \mathrm{NO} \\ \hline \end{array}$ | - |  |
| Without | ${\underset{* 1}{ }}_{2 N O+2 N C}$ | $\begin{aligned} & \hline(1) \\ & (2) \\ & (3) \\ & (4) \end{aligned}$ | $\begin{array}{\|l} \hline \mathrm{NO} \\ \mathrm{NC} \\ \mathrm{NO} \\ \mathrm{NC} \end{array}$ |  |  |

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

- : Contact closed, - : Contact open


## - Position of contact block

Without transformer


- Replace the $\square$ mark by the following knob color code

| Color | Green | Red | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | A |

- Up to 4-contact of contact arrangement can be made.

Available numbers of contacts are as follow.

| No. of <br> position | Operation | Without <br> transformer | With <br> 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 |


| Transformer | Contact arrangement | Contact block |  | Operator position |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mounting position | Type | Left 0 | Center | Right |
| Without | ${\underset{\star 1}{ } 1 \mathrm{NO}+1 \mathrm{NC}}^{2}$ | $\begin{aligned} & \hline(1) \\ & (2) \end{aligned}$ | $\begin{aligned} & \hline \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ |  |  | $-$ |
|  | ${\underset{\star}{ }{ }_{\star 2} \mathrm{NO}+1 \mathrm{NC}}^{2}$ | $\begin{aligned} & \hline(1) \\ & (2) \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathrm{NO} \\ \mathrm{NC} \end{array}$ | $-$ | $\begin{aligned} & - \\ & - \end{aligned}$ |  |
|  |  | (1) <br> (2) <br> (3) <br> (4) | $\begin{array}{\|l} \hline \mathrm{NO} \\ \mathrm{NC} \\ \mathrm{NO} \\ \mathrm{NC} \end{array}$ |  | $\begin{aligned} & - \\ & - \\ & - \\ & - \end{aligned}$ |  |
| With | ${\underset{\star 1}{ } 1 \mathrm{NO}+1 \mathrm{NC}}^{2}$ | (1) <br> (2) | $\begin{array}{\|l\|} \hline \mathrm{NC} \\ \mathrm{NO} \end{array}$ | $-$ | - |  |
|  | ${\underset{\star 2}{ }}^{1 N O}+1 \mathrm{NC}$ | $\begin{aligned} & \hline(1) \\ & (2) \end{aligned}$ | $\begin{aligned} & \hline \mathrm{NC} \\ & \mathrm{NO} \end{aligned}$ |  | $-$ | $-$ |
| ```Notes: *1: AR22PL-3, 6 AR22PP-3, \(6 \quad{ }^{* 3}\) : AR22PL-3 AR22PP-3 *2: AR22PL-7, AR22PP-7 - : Contact closed, - : Contact open``` |  |  |  |  |  |  |

With transformer


Pilot Lights
DR22
$\square$ Pilot lights/standard

| Lens | Transformer | LED lamp |  | Incandescent lamp |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  | Lamp voltage | Type |  |

[^5]■ Pilot lights/short-body without transformer

| Lens | LED lamp Lamp voltage | Type | Incandescent lamp |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | Lamp voltage | Type |
| Dome | 5.5V AC/DC | - | 5.5V AC/DC | DR22D0L-58 $\square$ |
|  | $\begin{aligned} & \hline 6 \mathrm{~V} \mathrm{AC} \\ & 6 \mathrm{~V} \mathrm{DC} \\ & 12 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | $\begin{aligned} & \text { DR22D0L-A9 } \\ & \text { DR22D0L-69 } \\ & \text { DR22D0L-B9 } \end{aligned}$ | $\begin{aligned} & \hline 6 \mathrm{VAC} \\ & 6 \mathrm{~V} \mathrm{DC} \\ & \text { 15V AC/DC } \\ & \hline \end{aligned}$ | $\overline{\bar{D}} \quad .$ |
|  | 24V AC/DC | DR22D0L-E9 | 24V AC/DC | DR22D0L-E8 $\square$ |
| AF98-88 | 5.5V AC/DC | - | 5.5V AC/DC | DR22E3L-58 $\square$ |
| AF98-90 | $\begin{aligned} & \hline 6 \mathrm{~V} \mathrm{AC} \\ & 6 \mathrm{~V} \mathrm{DC} \\ & 12 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | $\begin{aligned} & \text { DR22E3L-A9 } \\ & \text { DR22E3L-69 } \\ & \text { DR22E3L-B9 } \end{aligned}$ | $\begin{aligned} & \text { 6V AC } \\ & 6 \mathrm{~V} \mathrm{DC} \\ & 15 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | DR22E3L-C8 |
|  | 24V AC/DC | DR22E3L-E9 $\square$ | 24V AC/DC | DR22E3L-E8 $\square$ |
| Faceted | 5.5V AC/DC | - | 5.5V AC/DC | DR22K0L-58 $\square$ |
|  | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \mathrm{DC} \\ 12 \mathrm{~V} \mathrm{AC} / D C \\ \hline \end{array}$ | $\begin{aligned} & \text { DR22K0L-A9 } \\ & \text { DR22K0L-69 } \\ & \text { DR22K0L-B9 } \end{aligned}$ | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ \text { 6V DC } \\ 15 \mathrm{~V} \mathrm{AC} / D C \\ \hline \end{array}$ | $\begin{aligned} & \overline{-} \\ & \text { DR22K0L-C8 } \square \end{aligned}$ |
|  | 24V AC/DC | DR22K0L-E9 $\square$ | 24V AC/DC | DR22K0L-E8 $\square$ |
| Flush squar | 5.5V AC/DC | - | 5.5V AC/DC | DR22F3M-58 $\square$ |
|  | $\begin{aligned} & \hline 6 \mathrm{~V} \mathrm{AC} \\ & 6 \mathrm{~V} \text { DC } \\ & 12 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | $\begin{aligned} & \text { DR22F3M-A9 } \\ & \text { DR22F3M-69 } \\ & \text { DR22F3M-B9 } \end{aligned}$ | $\begin{aligned} & \hline 6 \mathrm{VAC} \\ & 6 \mathrm{~V} \mathrm{DC} \\ & 15 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | $\begin{aligned} & \overline{\text { DR22F3M-C8 }} \\ & \end{aligned}$ |
|  | 24V AC/DC | DR22F3M-E9 $\square$ | 24V AC/DC | DR22F3M-E8 $\square$ |
| Flush square <br> (Transparent lens) | 5.5V AC/DC | - | 5.5V AC/DC | DR22F4M-58 $\square$ |
|  | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \mathrm{DC} \\ 12 \mathrm{~V} \mathrm{AC/DC} \\ \hline \end{array}$ | $\begin{aligned} & \text { DR22F4M-A9 } \\ & \text { DR22F4M-69 } \\ & \text { DR22F4M-B9 } \end{aligned}$ | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \mathrm{DC} \\ 15 \mathrm{~V} \mathrm{AC/DC} \end{array}$ | $\begin{aligned} & \overline{\text { DR22F4M-C8 }} \square \end{aligned}$ |
|  | 24V AC/DC | DR22F4M-E9 $\square$ | 24V AC/DC | DR22F4M-E8 $\square$ |
| Flush square (12mm high frame) | 5.5V AC/DC | - | 5.5V AC/DC | DR22F5M-58 $\square$ |
|  | $\begin{aligned} & \hline 6 \mathrm{~V} \mathrm{AC} \\ & 6 \mathrm{~V} \mathrm{DC} \\ & 12 \mathrm{~V} \mathrm{AC/DC} \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { DR22F5M-A9 } \\ & \text { DR22F5M-69 } \\ & \text { DR22F5M-B9 } \end{aligned}$ | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \mathrm{DC} \\ 15 \mathrm{~V} \mathrm{AC/DC} \end{array}$ | $\overline{\overline{D R} 22 F 5 M-C 8} \square$ |
|  | 24V AC/DC | DR22F5M-E9 $\square$ | 24V AC/DC | DR22F5M-E8 $\square$ |
| Extended square <br> AF98-93 | 5.5V AC/DC | - | 5.5V AC/DC | DR22E3M-58 $\square$ |
|  | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \mathrm{DC} \\ 12 \mathrm{~V} \mathrm{AC/DC} \\ \hline \end{array}$ | $\begin{aligned} & \text { DR22E3M-A9 } \square \\ & \text { DR22E3M-69 } \square \\ & \text { DR22E3M-B9 } \end{aligned}$ | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \mathrm{DC} \\ 15 \mathrm{~V} \mathrm{AC/DC} \end{array}$ | $\overline{\overline{D R} 22 E 3 M-C 8} \square$ |
|  | 24V AC/DC | DR22E3M-E9 $\square$ | 24V AC/DC | DR22E3M-E8 $\square$ |
| Flush rectangular | 5.5V AC/DC | - | 5.5V AC/DC | DR22E3N-58 $\square$ |
|  | $\begin{aligned} & \hline 6 \mathrm{~V} \mathrm{AC} \\ & 6 \mathrm{~V} \mathrm{DC} \\ & 12 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | $\begin{aligned} & \hline \text { DR22E3N-A9 } \\ & \text { DR22E3N-69 } \\ & \text { DR22E3N-B9 } \end{aligned}$ | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \mathrm{DC} \\ 15 \mathrm{~V} \mathrm{AC} / D C \end{array}$ | $\begin{aligned} & \overline{\bar{D}} 22 \mathrm{E} 3 \mathrm{~N}-\mathrm{C} 8 \\ & \square \end{aligned}$ |
|  | 24V AC/DC | DR22E3N-E9 $\square$ | 24V AC/DC | DR22E3N-E8 $\square$ |
| Extended round with square bezel | 5.5V AC/DC | - | 5.5V AC/DC | DR22E3P-58 $\square$ |
|  | $\begin{aligned} & \hline 6 \mathrm{~V} \mathrm{AC} \\ & 6 \mathrm{~V} \mathrm{DC} \\ & 12 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | $\begin{aligned} & \text { DR22E3P-A9 } \\ & \text { DR22E3P-69 } \\ & \text { DR22E3P-B9 } \end{aligned}$ | $\begin{array}{\|l} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \mathrm{DC} \\ 15 \mathrm{~V} \mathrm{AC/DC} \end{array}$ | $\begin{aligned} & \overline{\text { DR22E3P-C8 }} \square \end{aligned}$ |
|  | 24V AC/DC | DR22E3P-E9 $\square$ | 24V AC/DC | DR22E3P-E8 $\square$ |

Note: $\square$ See page 04/37

Pilot Lights
DR22

■ Pilot lights/short-body with transformer

| Lens | LED lamp Lamp voltage Type | Incandescent lamp <br> Lamp voltage Type |
| :---: | :---: | :---: |
|  | 100-110V AC DR22DOL-H9 $\square$ 200-220V AC DR22DOL-M9■ | 100-110V AC DR22DOL-H8 200-220V AC DR22DOL-M8 $\square$ |
| Extended round | 100-110V AC DR22E3L-H9 200-220V AC DR22E3L-M9 | 100-110V AC DR22E3L-H8 200-220V AC DR22E3L-M8 |
|  | 100-110V AC DR22KOL-H9 $\square$ 200-220V AC DR22KOL-M9■ | 100-110V AC DR22KOL-H8 200-220V AC DR22KOL-M8 |
| Flush square | 100-110V AC DR22F3M-H9 $\square$ 200-220V AC DR22F3M-M9 | 100-110V AC DR22F3M-H8 200-220V AC DR22F3M-M8 $\square$ |
| Flush square (Transparent lens) | 100-110V AC DR22F4M-H9 200-220V AC DR22F4M-M9 | 100-110V AC DR22F4M-H8 200-220V AC DR22F4M-M8 |
| Flush square (12mm high frame) | 100-110V AC DR22F5M-H9■ 200-220V AC DR22F5M-M9 | 100-110V AC DR22F5M-H8 200-220V AC DR22F5M-M8 |
| Extended square | 100-110V AC DR22E3M-H9 200-220V AC DR22E3M-M9 | 100-110V AC DR22E3M-H8 200-220V AC DR22E3M-M8 $\square$ |
| Flush rectangular | 100-110V AC DR22E3N-H9 $\square$ 200-220V AC DR22E3N-M9 | 100-110V AC DR22E3N-H8 200-220V AC DR22E3N-M8 $\square$ |
| Extended round with square bezel | 100-110V AC DR22E3P-H9 $\square$ <br> 200-220V AC DR22E3P-M9 | 100-110V AC DR22E3P-H8 200-220V AC DR22E3P-M8 |

$\overline{\text { Note: } \square \text { See page 04/37 }}$

## - Lens color

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

| Color | Green | Red | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | A |

- Lamp voltage

Available lamp voltage are as follow.

| Description | Voltage | Code <br> Standard type <br> LED | Incandescent | Short-body type 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

## AR22

■ Joy stick selector switches

| Handle | Terminal | Operating directions | Contact <br> arrangement | Type | Manual return |
| :--- | :--- | :--- | :--- | :--- | :--- |

- Operating direction
- Directions other than those shown in the table above can be provided.
- For types AR22A $\square \mathrm{N}$ - 1 2 34 B, designate the contact arrangement codes for the necessary operating directions (1): Upper, 2) : Right, 3): Lower, 4: Left). Designate "0" for unnecessary directions.
- Contact arrangement

| Contact arrangement | - | 1NO | 1NC | 1NO+1NC | 2NO | 2NC | 2NO+2NC |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Manual return | Screw | 0 | A | B | 1 | D | E | - |
| Spring return | Solder/Tab | 0 | - | - | 1 | - | - | 2 |

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



## - Buzzers

| Sound | Description | Transformer | Operating voltage | Type |
| :---: | :---: | :---: | :---: | :---: |
| Electronic sound | - LED operation indicator (Red) <br> - Intermittent/continuous sound selection <br> - Sound level: 90dB (0.1m) 70dB (1m) | Without | 6V AC <br> 6V DC <br> 12 to 24 V AC/DC <br> 35 to 48 V AC/DC | DR22B5-AB DR22B5-6B DR22B5-EB DR22B5-FB |
|  |  | With | 100 to 110 V AC <br> 200 to 220 V AC | $\begin{array}{l\|} \hline \text { DR22B5-HB } \\ \text { DR22B5-MB } \end{array}$ |
| кк008.053 |  | With resistor unit | 100 to 110V DC | DR22B5-1B |
|  | - Sound volume adjustment <br> - Sound level: 80 to 90 dB ( 0.1 m ) 60 to 70 dB (1m) | Without | 24 V AC/DC | DR22B3-EB |
|  |  | With | 100 to 110 V AC <br> 200 to 220 V AC | DR22B3-HB DR22B3-MB |
| Electronic sound (IP54) <br> AF96-244 | - Intermittent/continuous sound selection <br> - Sound level: 80dB (0.1m) $60 \mathrm{~dB}(1 \mathrm{~m})$ | Without | 6V AC <br> 6V DC <br> 12 to 24 V AC/DC <br> 35 to 48 V AC/DC | DR22B8-AB DR22B8-6B DR22B8-EB DR22B8-FB |
|  |  | With | 100 to 110 V AC <br> 200 to 220 V AC | DR22B8-HB <br> DR22B8-MB |
|  |  | 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 $\rightarrow$ Intermittent sound

- Short-circuit terminal not mounted $\rightarrow$ 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 $\rightarrow$ Increase sound pressure
- Counterclockwise $\rightarrow$ Decrease sound pressure


## Pushbuttons/Selectors/Pilot Lights/Buzzers

AR22 and DR22
Dimensions

## - Dimensions, mm

- Illuminated pushbutton switches


## Flush/Extended

With transformer


Without transformer


Mushroom (29mm dia.)


Extended with full guard


AR22G4L, G9L AR22G1L, G6L



AR22V5L



AR22F0P, F5P AR22E0P, E5P


AR22MOL, M5L


AR22M4L, M9L
AR22M4P



Extended with full guard (with openings)


## ■ Dimensions, mm

- Pushbutton switches

AR22FOR, F5R
AR22EOR, E5R
AR2FAR, FBR


Flush/Extended with full guard


Mushroom (29mm dia.)


AR22M4R, M9R


AR22G0R, G5R


AR22S1R, S2R AR22S3R, S6R


Extended with half guard


Pushbutton with selector ring


AR22M0R, M5R



AR22M4Y


Mushroom with full guard (40mm dia.)


Push-lock, turn-reset


## Pushbuttons/Selectors/Pilot Lights/Buzzers

## AR22 and DR22

## Dimensions

## - Dimensions, mm

- Emergency stop pushbutton switches

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


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


AR22VSR, V4R


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


AR22Q2R


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


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

## ■ Dimensions, mm

- Emergency stop illuminated pushbutton switches

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

With transformer


AR22V0L, V2L AR22VDL, VAL


Without transformer


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

Without transformer


Unibody push-lock, turn-reset (40mm dia.)
Without transformer


NC
2NC
$1 \mathrm{NO}+1 \mathrm{NC}$


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

Pushbuttons/Selectors/Pilot Lights/Buzzers
AR22 and DR22

## Dimensions

## ■ Dimensions, mm

- Selector switches


## Knob



AR22PY, PCY


Lever


AR22WY, WCY


## Cylindrical knob



AR22RR, RCR


AR22JR, JCR
AR22JAR


■ Dimensions, mm

- Illuminated selector switches

With transformer


Note: * 230V and over


Without transformer


## - Pilot lights

## Dome



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

## Pushbuttons/Selectors/Pilot Lights/Buzzers

## AR22 and DR22

## Dimensions

## ■ Dimensions, mm <br> - Pilot lights

## Extended

With transformer, with resistor unit


Short body/with transformer


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

With transformer, with resistor unit


Short body/with transformer



DR22K0L


Without transformer


Short body/without transformer


DR22K0L


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

■ Dimensions, mm

- Pilot lights


## Flush

With transformer, with resistor unit


Short body/with transformer
DR22F3M, F4M


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

## Flush (12mm high frame)

With transformer, with resistor unit
DR22F5M


Short body/with transformer
DR22F5M


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

## Without transformer

DR22F3M, F4M


Short body/without transformer
DR22F3M, F4M


Without transformer
DR22F5M


Short body/without transformer
DR22F5M


## Pushbuttons/Selectors/Pilot Lights/Buzzers

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


## Ball type with lock

Screw terminal AR22A1N, A6N


Solder/tab terminal AR22A1H, A6H


■ Dimensions, mm

- Joy stick selector switches


## Rubber cap type without lock

Screw terminal AR22A2N, A7N


Solder/tab terminal AR22A2H, A7H


## - Buzzers

Electronic sound
With transformer


Without transformer
DR22B5

Magnetic sound
With transformer


DR22B3



Electronic sound (IP54)
With transformer


DR22B8


Without transformer
DR22B8

Pushbuttons/Selectors/Pilot Lights/Buzzers

## 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 22.3 mm - or 25.5 mm -dia. holes as shown in Fig. 1 without any extra adapter.

Fig. 1 Panel cutout
The switch mounted as a $\phi 22 \mathrm{~mm}$ diameter unit.


The switch mounted as a $\phi 25 \mathrm{~mm}$ diameter unit.


Note: * If key-washer or legend plate are not used, 3.2 mm -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 22.3 mm -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 $\mathbf{2 2} \mathbf{3} \mathbf{3 m m}$-dia. hole


[^6](2) In a 25.5 mm -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 25.5 mm -dia. hole


Note: 1. Recommended tightening torque is from 1 to $1.5 \mathrm{~N} \cdot \mathrm{~m}$
2. Ensure that the step-out portion of the nut is correctly fitted in the cutout hole.


For easier mounting in the 25.5 mm -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

## - 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 $1.5 \mathrm{~N} \cdot \mathrm{~m}$.


■ 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 $1.5 \mathrm{~N} \cdot \mathrm{~m}$.

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 $1.5 \mathrm{~N} \cdot \mathrm{~m}$.
- 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 | 5.5 mm -dia. hole | 1 to 5.5 |

- When using a joy stick selector switch and buzzer The applicable panel thickness is 1 to 6 mm . Five 1.3 mm 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) <br> (plus key washer, legend plate) | Number of packings <br> (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

## - Minimum mounting space, mm

(1) Minimum mounting space

## Fig. 9

Illuminated pushbuttons,
Pushbutton Selectors


[^7]AR22Q2R, WR, W0R, WY, WCY: 40 mm
*2 When mounting contact blocks at 30 mm pitch, use it circuit of 380V or less.
*3 Short body with transformer types: 50 mm
*4 Rectangular types: 36.5 mm (except for short body without transformer types).
*5 Short body without transformer types: 60 mm .
*6 Rectangular short body without transformer types: 60 mm .
*7 This dimension applies when transformer units or contact blocks face each other.
*8 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


6 mm or less
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 $1 \mathrm{~N} \cdot \mathrm{~m}$.
(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

Example 1


- 24V DC

R: 10k $\Omega$ (0.5W)

- 24V AC

R: $2 \mathrm{k} \Omega$ (2W)

Example 2

-100V AC
C: $0.33 \mu \mathrm{~F}$ (250V AC)
R: $120 \Omega$ ( 0.25 W )

- 220 V AC

C: $0.1 \mu \mathrm{~F}(250 \mathrm{~V}$ AC)
R: $120 \Omega$ (0.25W)
(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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$. Keep the terminals free of external force during and after wiring, or operational failures may result.
- Solder (tab terminal) wiring
(1) 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 30 W soldering iron is used, finish soldering the terminals within five seconds. If a 20 W soldering iron is used, finish soldering the terminals within 10 seconds. Make sure that the soldering iron tip length is at least 20 mm 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, 0.8 mm dia. max.
Stranded wire: 1 wire, $0.75 \mathrm{~mm}^{2}$ max.
(4) Use the $110(2.8 \mathrm{~mm})$ 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 24 V 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 $1 \mathrm{~N} \cdot \mathrm{~m}$.
- 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

$$
7.5 \mathrm{~mm} \max \cdot \text { Rork-type crimp terminal }
$$

- The terminal washers are a self-lifting type.
- Tighten the terminal screws to a torque of 0.8 to $1 \mathrm{~N} \cdot \mathrm{~m}$. 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.
Fig. 19

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

## Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AR22 and DR22 <br> 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 $1 \mathrm{~N} \cdot \mathrm{~m}$. 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


Pilot light
(short-body without transformer)


Pilot light (short-body with transformer)


Terminal No.X1, X2

Note: * The positive and negative terminals are used for DC applications where the order of polarity is required.

Terminal No.X1 (+), X2 (-)*

Joy stick selector switch
(screw)
1NO or 1NC


Terminal No. 1-2 or 3-4

Joy stick selector switch
(screw)
$1 \mathrm{NO}+1 \mathrm{NC}$


Terminal No. 1-2, 3-4

Joy stick selector switch (solder/tab)
$1 \mathrm{NO}+1 \mathrm{NC}$


Terminal No. 1-2, 3-4

Joy stick selector switch (solder/tab)
$2 \mathrm{NO}+2 \mathrm{NC}$

(NO)
Terminal No. 1-2, 3-4

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 $1 \mathrm{NO}+1 \mathrm{NC}$ : 41 mm deep
Pilot lights: 34 mm deep
- The transformer now occupies far less space.



04

## 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 ( $5 \mathrm{~V}, 5 \mathrm{~mA}$ ).


## 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

## (14) © $\triangle C \in \mathbb{M}$ ©

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

## ■ Illuminated pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Extended round head <br> See page 04/71, 04/94 <br> (11) © (1) $\triangle \in \mathbb{C l}$ | AR30EOL, E5L <br> AF95-4 | Extended with full guard (24mm dia. with openings) <br> See page 04/71, 04/94 <br> (1L) © (6) $\triangle \in \mathbb{C l}$ | AR30G2L, G7L <br> AF99-328 | Push-lock, turn-reset (40mm dia. with white arrow) <br> See page 04/71, 04/95 <br> (1L) © $\triangle C \in \mathbb{C l}$ | AR30V5L |
| Extended with transparent full guard (24mm dia.) <br> See page 04/71, 04/94 <br> (41) (ㄴ) $\triangle C \in(巛)$ | AR30G4L, G9L <br> KKD05-164 | Extended with full guard (24mm dia.) <br> See page 04/71, 04/94 <br> (14) © $\triangle(\mathbb{C}$ | AR30G3L, G8L <br> AF95-6 | Push-pull <br> See page 04/71, 04/95 <br> (14) © $\triangle C \in$ | AR30Q7L |

■ Pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head <br> See page 04/73, 04/96 <br> (11) © $\triangle C \in \mathbb{C l}$ | AR30FOR, F5R <br> AF95-11 | Mushroom head (29mm dia.) <br> See page 04/73, 04/96 <br> (i1) © $\triangle C \in \mathbb{C l}$ | AR30M4R <br> AF95-8 | Mushroom head with full guard (35mm dia. metal nut) <br> See page 04/73, 04/96 <br> (11) © $\triangle C \in \mathbb{C}$ | AR30GSR | AF96-239 |
| Extended round head <br> See page 04/73, 04/96 <br> (1L) (1) $\triangle C \in \mathbb{C l}$ | AR30EOR, E5R <br> AF95-10 | Extended with full guard (24mm dia.) <br> See page 04/73, 04/96 <br> (41) © $\triangle C \in \mathbb{C l}$ | AR30G1R, G6R <br> AF95-16 | Giant head <br> See page 04/73, 04/97 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR30B0R |  |
| Flush round head Symbol mark type <br> See page 04/73, 04/96 | AR30FAR, FBR <br> AF98-195 | Extended with half guard <br> See page 04/73, 04/96 <br> (4l) © $\triangle(\mathbb{C}$ | AR30GOR, G5R <br> AF95-9 | Giant head with guard <br> See page 04/73, 04/97 <br> (11) ( ) $\triangle C \in \mathbb{C K}$ | AR30B1R | AF95-582 |
| Extended round head Symbol mark type <br> See page 04/73, 04/96 | AR30EAR, EBR <br> AF98-194 | Pin lock <br> See page 04/73, 04/96 <br> (11) © $\triangle C \in$ | AR30GPR | Giant head with full guard <br> See page 04/73, 04/97 <br> (11) $\triangle C \in @$ | AR30B2R | AF95-580 |
| Mushroom head (40mm dia.) <br> See page 04/73, 04/96 <br> (11) © $\triangle C \in$ | AR30MOR, M5R <br> AF95-12 | Mushroom head with full guard ( 40 mm dia.) <br> See page 04/73, 04/96 <br> (1L) © $\triangle C \in \mathbb{C l}$ | AR30M3R, M8R <br> AF95-17 | Giant head with full guard <br> See page 04/74, 04/97 <br> (1L) © $\triangle C \in \mathbb{C C}$ | AR30B3 | AF95-581 |

Note: AR30M8R: Not approved standard © : See page 04/289

■ Pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Pushbutton with selector ring (2-position) <br> See page 04/75, 04/97 <br> (11) © $\triangle(\in \mathbb{C l}$ | AR30S1R, S2R, S3R, S6R | Push-lock, turn-reset (40mm dia. with white arrow) <br> See page 04/74, 04/97 <br> (11) © $\triangle C \in$ | AR30V5R <br> KKD08-051 | Pushbutton with emergency operating cap <br> See page 04/74, 04/97 <br> (4) © $\mathbb{A} C \epsilon$ | AR30FVR <br> AF96-187 |
| Push, turn-lock <br> See page 04/74, 04/97 <br> (11) © $\triangle C \in$ | AR30NOR <br> AF95-583 |  |  |  |  |

- Emergency stop pushbutton switches (conform to EN418)

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Push-lock, turn-reset (Soft-touch 40mm dia. with white arrow) <br> See page 04/76, 04/98 <br> (41) (1) $\triangle C \in(\mathbb{C}$ | AR30V0R <br> KKD08-051 | Push-lock, turn-reset (65mm dia.with white arrow) <br> See page 04/76, 04/98 <br> (11) © $\triangle C \in$ | AR30V1R | Push-lock, pull-reset (35mm dia.) <br> See page 04/76, 04/98 <br> (1L) (1) $\triangle \boldsymbol{C}$ @ | AR30Q2R <br> KKD06-347 |
| Push-lock, turn-reset (40mm dia.) <br> See page 04/76, 04/98 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AR30V2R <br> KKD06-353 |  |  |  |  |

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

■ Emergency stop illuminated pushbutton switches (conform to EN418)


Note: Provided with the $\Theta$ (Direct opening action)
(c) : See page 04/289

Pushbuttons/Selectors/Pilot Lights/Buzzers
AR30 and DR30
Quick reference guide

■ Selector switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Knob <br> See page 04/78, 04/99 <br> (14) (1) $\triangle C \in \mathbb{C C}$ | AR30PR, PCR <br> AF95-13 | Key <br> See page 04/78, 04/99 <br> (11) © $\triangle C \in \mathbb{C l}$ | AR30JR, JCR <br> KKD09-023 | Key (Long durability) <br> See page 04/78, 04/99 <br> (Ll) © $\triangle C \in \mathbb{C l}$ | AR30JAR <br> KKD09-021 |
| Lever <br> See page 04/78, 04/99 <br> (41) © $\triangle C \in \mathbb{C}$ | AR30WR, WCR <br> AF95-14 |  |  |  |  |

■ Illuminated selector switches

| Operator | Type |
| :--- | :--- |
| Knob | AR30PL |
| See page 04/87, 04/99 |  |
| (LL) © $\triangle$ C (Cl |  |

■ Lever type selector switches

| Operator | Type |
| :--- | :--- |
| Lever | AR30HR |
| (metal type) |  |
| See page 04/85, 04/099 |  |
| (1L) © $\triangle C \in$ |  |

## ■ Pilot lights

| Lens | Type | Lens | Type | Lens | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Dome <br> See page 04/89, 04/100 <br> (14) © $\triangle C \in \mathbb{C l}$ | DR30DOL <br> AF95-18 | Dome with dimmer control <br> See page 04/89, 04/101 <br> (11) © $\triangle C \in$ | DR30D1L <br> AF02-63 | Flush square (40mm sq. transparent lens) <br> See page 04/91, 04/102 <br> (IL) © $\triangle C \in \mathbb{C}$ | DR30M4M * <br> AF97-63 |
| Extended round <br> See page 04/89, 04/100 <br> (11) (ङ) $\triangle C \in @$ | DR30E3L <br> AF95-20 | Flush square (34mm sq. transparent lens) <br> See page 04/91, 04/102 <br> (11) ( © $\triangle C \in \mathbb{C l}$ | DR30F4M * <br> AF97-65 |  |  |
| Faceted <br> See page 04/90, 04/101 <br> (11) (1) $\triangle C \in \mathbb{C}$ | DR30KOL <br> AF95-19 | Flush rectangular (Transparent lens) <br> See page 04/91, 04/102 <br> (IL) © $\triangle C \in \mathbb{C C}$ | DR30F4N * <br> AF97-64 |  |  |

Note: With resistor unit and resistor types: Not approved standard
*LED 12V AC type: Not approved standard
(cC) : See page 04/289

■ Joy stick selector switches

| Handle | Type | Handle | Type | Handle | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |  |
| TN® $\triangle$ C | AF97-48 | T® | AF97-44 |  | AF97-57 |

■ Buzzers

| Sound | Type | Sound | Type | Sound | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Electronic sound <br> See page 04/93, 04/104 <br> (41) (1) | DR30B5* <br> KKD08-058 | Magnetic sound <br> See page 04/93, 04/104 | DR30B0 <br> AF96-378 | Electronic sound (IP54) <br> See page 04/93, 04/104 <br> (11) © $\triangle C \epsilon$ | DR30B8 * <br> AF96-245 |
| Electronic sound (economy) <br> See page 04/93, 04/104 <br> (11) (1) | DR30B6 |  |  |  |  |

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

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

## Illuminated pushbuttons

## AR30 EOL - 10 E3 R

## (1) Product category

AR30: 30mm-dia. illuminated pushbutton
30 mm -dia. emergency stop illuminated pushbutton
(2) Operator

- Illuminated pushbutton

EOL: Extended round head
E5L: Extended round head (Alternate)
G4L: Extended with transparent full guard ( 24 mm dia.)
G9L: Extended with transparent full guard ( 24 mm dia. alternate)
G2L: Extended with full guard (24mm dia. with openings)
G7L: Extended with full guard ( 24 mm dia. with openings, alternate)
G3L: Extended with full guard ( 24 mm dia.)
G8L: Extended with full guard ( 24 mm dia. alternate)
V5L: Push-lock, turn-reset ( 40 mm dia. with white arrow) *
Q7L: Push-pull

- Emergency stop illuminated pushbutton

V0L: Push-lock, turn-reset (Soft-touch 40 mm dia. with white arrow)
V2L: Push-lock, turn-reset ( 40 mm dia.)
(3) Contact arrangement

| 10: 1 NO | $30: 3 \mathrm{NO}$ |
| :--- | :--- |
| $01: 1 \mathrm{NC}$ | $03: 3 \mathrm{NC}$ |
| 11: $1 \mathrm{NO}+1 \mathrm{NC}$ | $33: 3 \mathrm{NO}+3 \mathrm{NC}$ |
| 20: 2 NO | $40: 4 \mathrm{NO}$ |
| $02: 2 \mathrm{NC}$ | $04: 4 \mathrm{NC}$ |
| $22: 2 \mathrm{NO}+2 \mathrm{NC}$ | $50: 5 \mathrm{NO}$ |
|  | $05: 5 \mathrm{NC}$ |

(4) Lamp voltage

- Incandescent lamp

54: 5.5V AC/DC, without transformer
C4: 15 V AC/DC, without transformer
D4: 20V AC/DC, without transformer
E4: 24 V 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: 24 V 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: $400-440 \mathrm{~V}$ 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 |

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

## AR30 EOR - 10 R $\square \square$

## (1) Product category

AR30: 30 mm -dia. pushbutton
30 mm -dia. emergency stop pushbutton
(2) Operator

- Pushbutton switch

FOR: Flush round head
F5R: Flush round head (Alternate)
EOR: 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)
MOR: Mushroom head ( 40 mm dia.)
M5R: Mushroom head (40mm dia. Alternate)
M4R: Mushroom head (29mm dia.)
G1R: Extended with full guard ( 24 mm dia.)
G6R: Extended with full guard ( 24 mm dia. Alternate)
GPR:Pin lock
GOR: Extended with half guard
G5R: Extended with half guard (Alternate)
M3R:Mushroom head with full guard ( 40 mm dia.)
M8R:Mushroom head with full guard (40mm dia. Alternate)
GSR:Mushroom head with full guard ( 35 mm dia. metal nut)
BOR: 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)
NOR: Push, turn-lock
V5R: Push-lock, turn-reset ( 40 mm dia. with white arrow) *1
FVR: Pushbutton with emergency operating cap

- Emergency stop pushbutton switch

VOR: Push-lock, turn-reset (Soft-touch 40 mm dia. with white arrow)
V2R: Push-lock, turn-reset ( 40 mm dia.)
V1R: Push-lock, turn-reset (Soft-touch 65 mm dia. with white arrow)
Q2R:Push-lock, pull-reset ( 35 mm dia.)

| (3) Contact arrangement |  |  |  |
| :---: | :---: | :---: | :---: |
| 10: | 1NO | 30: 3NO |  |
| 01: | 1NC | 03: 3NC |  |
| 11: | $1 \mathrm{NO}+1 \mathrm{NC}$ | 33: $3 \mathrm{NO}+3 \mathrm{NC}$ |  |
| 20: | 2NO | 40: 4NO |  |
|  | 2NC | 04: 4NC |  |
| 22: | $2 \mathrm{NO}+2 \mathrm{NC}$ | 44: $4 \mathrm{NO}+4 \mathrm{NC}$ |  |
|  |  | 50: 5NO |  |
|  |  | 05: 5NC |  |
| (4) Color of button |  |  |  |
| G : | Green |  | Y: Yellow |
| R: | Red" ${ }^{2}$ |  | A: Orange |
| B: | Black |  | S: Blue |
| W: | White |  | C: Clear |
| T: | Green, Red, Black (For AR30F0R) |  | (For AR30FAR, FBR, EAR, EBR) |

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

| Symbol mark | $\bigcirc$ |  | 1 |  | ( ${ }^{\text {a }}$ |  | $\bigcirc$ | I | ( ${ }^{\text {a }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |

## 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.
*2Button 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


(1) Product category

AR30: 30 mm 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

## Operation

2-position, maintained
2-position, spring return
3 -position, maintained
3-position, spring/manual return (Left to center)
3 -position, spring/manual return (Right to center)
3 -position, spring return
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: 1 NO | 30: 3 NO |
| :--- | :--- |
| 01: 1 NC | 03: 3 NC |
| 11: $1 \mathrm{NO}+1 \mathrm{NC}$ | 33: $3 \mathrm{NO}+3 \mathrm{NC}$ |
| 20: 2 NO | 40: 4 NO |
| 02: 2NC | 04: 4 NC |
| 22: $2 \mathrm{NO}+2 \mathrm{NC}$ | 44: $4 \mathrm{NO}+4 \mathrm{NC}$ |
|  | $50: 5 \mathrm{NO}$ |
|  |  |
|  | $05: 5 \mathrm{NC}$ |

Note: Control type: See page 04/82 to 04/84
© Lamp voltage

- Incandescent lamp

54: 5.5 V AC/DC, without transformer
C4: 15 V AC/DC, without transformer
D4: 20 V AC/DC, without transformer
E4: 24 V 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: $350-380 \mathrm{~V}$ AC, with transformer
T4: $400-440 \mathrm{~V} \mathrm{AC}$, with transformer
V4: 480 V AC , with transformer
W4: 500-550V AC, with transformer

- LED lamp

A3: 6 V AC, without transformer
63: 6V DC, without transformer
B3: 12 V AC/DC, without transformer
C3: 15 V AC/DC, without transformer
E3: 24 V AC/DC, without transformer
H3: 100-110V AC, with transformer
L3: $115-127 \mathrm{~V}$ AC, with transformer
M3: $200-220 \mathrm{~V}$ AC, with transformer
Q3: 230-254V AC, with transformer
S3: $350-380 \mathrm{~V}$ AC, with transformer
T3: $400-440 \mathrm{~V}$ 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)

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

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 

## Pilot lights

$\frac{\text { DR30 }}{(1)} \underset{(2)}{\text { DOL }}-\underset{(3)}{\text { E3 }} \underset{(4)}{\mathbf{W}} \underset{(5)}{\square}$
(1) Product category

DR30: 30mm dia. pilot light

## 2) Lens

DOL: Dome
E3L: Extended round
KOL: 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 | Y: Yellow |
| :--- | :--- |
| R: Red | A: Orange |
| W: White | S: Blue |

R: Red
A: Orange
S: Blue

## (5) Special product

Z9: Resisting water-soluble cutting oils and heat
: 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

54: $5.5 \mathrm{~V} \mathrm{AC} / \mathrm{DC}$, without transformer
C4: 15V AC/DC, without transformer
D4: 20V AC/DC, without transformer
E4: 24 V 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
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: 24 V AC/DC, without transformer
H3: 100-110V AC, with transformer L3: $115-127 \mathrm{~V}$ AC, with transformer
M3: 200-220V AC, with transformer
Q3: $230-254 \mathrm{~V}$ 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: 24 V 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, KOL type only

H8: 100-110V AC, short-body with transformer
L8: 115-127V AC, short-body with transformer
M8: 200-220V AC, short-body with 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

| $\text { AR30A } \underline{O N}-\mathbf{A O}$ |  |
| :---: | :---: |
|  |  |

(1) 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)
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

| Contact arrangement |  | Blank | 1NO | 1NC | 1NO+1NC | 2NO | 2NC | 2NO+2NC |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | Screw | 0 | A | B | 1 | D | E | - |
|  | Solder/tab | 0 | - | - | 1 | - | - | 2 |

## Operating direction code of contacts

## Ordering information

Specify the following:

1. Type number

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

Example: Pushbutton switch AR30FOR-11B(CCC)

| 1 | d positio |  |
| :---: | :---: | :---: |
| $\checkmark$ | 1: Upper | 2: Right |
| 4 | 3: Lower | 4: Left |
| $\checkmark$ |  |  |

Ex. AR30A0N- $\underline{A} \underline{0} \frac{A}{2} \underline{0} B$
$\frac{1}{2} \frac{A}{3} \frac{0}{4}$
(5) Handle color
B: Black

## Buzzers

## DR30B 5 - E B <br> (1) (2) (3) 4)

(1) 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: $35-48 \mathrm{~V}$ AC/DC (Type " 5 ", " 8 ")
G: 24V AC (Type "6")
H: $100-110 \mathrm{~V}$ 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 <br>  <br>  <br>  <br> (Lever switch) <br> Buzzer: J9950091 <br> TÜV: EN60947-5-1 <br> EN60947-5-5 <br>  <br>  |

## - Specifications (Indoor use)

| Description | Pushbutton switch Illuminated pushbutton switch Emergency stop pushbutton switch Emergency stop illuminated pushbutton switch <br> 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 220 V AC 6A 1 million operations at 220 V AC 3 A | 100,000 operations <br> at 220 V AC 1A <br> (Res. load) | - |
| Operating frequency | 1200 operations/hour (On-load factor: 40\%) |  | - |
| Dielectric strength | 2500V AC, 1 minute *3 | 2000 V AC, 1 minute *4 |  |
| Insulation resistance | $100 \mathrm{M} \Omega$ or more (500V DC megger) | $100 \mathrm{M} \Omega$ 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 55 Hz , double amplitude $0.1 \mathrm{~mm} * 5$ Constant: 16.7 Hz , double amplitude 3 mm |  |  |
| Shock | Malfunction durability: $100 \mathrm{~m} / \mathrm{s}^{2}$ * <br> Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |  | Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |
| Ambient temperature (No condensation or no icing) | -20 to $+70^{\circ} \mathrm{C}$ | -5 to $+70^{\circ} \mathrm{C}$ | -20 to $+50^{\circ} \mathrm{C}$ |
| Storage temperature | -40 to $+80^{\circ} \mathrm{C}$ |  |  |
| Humidity | 45 to $85 \%$ RH (within -5 to $+40^{\circ} \mathrm{C}$ ) |  |  |
| Degree of protection | IP65 *7 |  |  |

Notes: *1 Illuminated type without transformer: 250 V AC/DC
${ }^{*}$ 2 Pilot light with transformer: 600V AC
*3 Illuminated type without transformer: 2000V AC, 1 minute
*4 Pilot light with transformer: 2500 V AC, 1 minute
${ }^{* 5}$ Emergency stop type: 10 to 500 Hz , double amplitude 0.7 mm (acceleration $50 \mathrm{~m} / \mathrm{s}^{2}$ ), according to the test condition of EN60947-5-5 (1998)
*6 Emergency stop type: $150 \mathrm{~m} / \mathrm{s}^{2}$
*7 AR30Q7L and DR30D1L type: IP40

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

- Mechanical durability

| Description |  | Operations |
| :---: | :---: | :---: |
| Pushbutton switch <br> 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 | $\begin{array}{r} 5 \text { million } \\ 1 \text { million } \\ 100,000 \\ 100,000 \\ 30,000 \end{array}$ |
| Selector switch | Maintained 1, 2, 3, 4-contact <br> Maintained 5, 6, 7, 8-contact <br> Control type, spring return, spring/manual return | $\begin{aligned} & 1 \text { million } \\ & 500,000 \\ & 200,000 \end{aligned}$ |
| Illuminated selector switch | Maintained  <br> Without transformer 1,2,3-contact <br>  4-contact <br> With transformer 1,2-contact <br>  3-contact <br> Spring return, spring/manual return | $\begin{aligned} & 1 \text { million } \\ & 500,000 \\ & 1 \text { million } \\ & 500,000 \\ & 200,000 \end{aligned}$ |

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

- Key type 10,000
- Key (Long durability) type 20,000


## Buzzers

| Item | DR30B5 | DR30B6 | DR30B0 | DR30B8 |
| :---: | :---: | :---: | :---: | :---: |
| Rated insulation voltage | Without transformer: 60V AC/DC With transformer: 250V AC *1 |  |  |  |
| Sound level | $\begin{aligned} & 90 \mathrm{~dB}(0.1 \mathrm{~m}) \\ & 70 \mathrm{~dB}(1 \mathrm{~m}) \end{aligned}$ |  |  | $\begin{aligned} & 80 \mathrm{~dB}(0.1 \mathrm{~m}) \\ & 60 \mathrm{~dB}(1.0 \mathrm{~m}) \end{aligned}$ |
| Durability | 1000h |  | 80h | 1000h |
| Frequency | 2.4 to 3.3 kHz | 1.9 to 2.5 kHz |  | 2.4 to 3.3 kHz |
| Intermittent cycle | Approx. 170-cycle/min | - | - | Approx. 170-cycle/min |
| Current consumption | See the table below |  |  |  |
| Dielectric strength | Without transformer: 1000V AC 1 minute With transformer: 2000V AC 1 minute *2 |  |  |  |
| Insulation resistance | 100 M S or more (500V DC megger) |  |  |  |
| Pollution degree | 3 |  |  |  |
| Vibration | Resonance: 10 to 55 Hz , double amplitude 0.1 mm Constant: 16.7 Hz , double amplitude 3.0 mm |  |  |  |
| Shock | Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |  |  |  |
| Ambient temperature | -20 to $+60^{\circ} \mathrm{C}$ (No condensation or no icing) (with resistor unit: -20 to $+40^{\circ} \mathrm{C}$ ) |  |  |  |
| Storage temperature | -30 to $+70^{\circ} \mathrm{C}$ |  |  |  |
| Humidity | 45 to $85 \%$ RH (within -5 to $40^{\circ} \mathrm{C}$ ) |  |  |  |
| 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 <br> DR30B5, DR30B8 | DR30B6 |  |
| :--- | :--- | :--- | :--- |
| 6 V AC | 70 mA AC | - | DR30B0 |
| 6 V DC | 35 mA DC | 25 mA AC | - |
| 24 V AC | - | 45 mA AC | - |
| 24 V DC | - | 30 mA DC | - |
| $24 \mathrm{~V} \mathrm{AC} / \mathrm{DC}$ | $40 \mathrm{~mA} \mathrm{AC}, 25 \mathrm{~mA} \mathrm{DC}$ | $30 \mathrm{~mA} \mathrm{AC}, 20 \mathrm{~mA} \mathrm{DC}$ | - |
| $48 \mathrm{~V} \mathrm{AC} / \mathrm{DC}$ | $65 \mathrm{~mA} \mathrm{AC}, 20 \mathrm{~mA} \mathrm{DC}$ | - | - |
| 110 V AC | 30 mA AC | 30 mA AC | 30 mA AC |
| 110 V DC | 30 mA DC | - | - |
| 220 V AC | 15 mA AC | 15 mA AC | 20 mA AC |

## ■ Contact ratings

- UL/CSA standards

AC (COS $\varnothing=0.35$ )

| Contact rated code | 120 V | 240 V | 480V | 600V |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | Making <br> current | Breaking <br> current | Making <br> current | Breaking <br> current | Making <br> current | Breaking <br> current | Making <br> current |
|  | 60 A | 6.0 A | 30 A | 3.0 A | 15 A | 1.5 A | 12 A |

DC $\mathrm{T}_{0.95}=6 \mathrm{P}$ (Max. 300ms)

| Description | Contact rated <br> code |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  | Making current • Breaking current |  |  |
| Illuminated pushbutton switch <br> Pushbutton <br> (Ring type selector switch: AR30S2R only) <br> Emergency stop pushbutton switch <br> Emergency stop illuminated pushbutton switch <br> (Except the overlap contact types) | P600 | 125 V | 250 V |  |
| Overlap contact types of products shown above <br> Pushbutton <br> (Ring type selector switch: AR30S1R, S6R only) <br> Selector switch (2-position only, except the overlap contact types) <br> Illuminated selector switch <br> (2-position only, except the overlap contact types) |  | 0.55 A |  |  |
| Pushbutton <br> (Ring type selector switch: AR30S3R only) <br> Selector switch (2-pos./overlap contact type, 3-, 4-, 5-pos. type) <br> Illuminated selector switch (2-pos./overlap contact type, 3-pos. type) |  | 0.5 A |  |  |

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

## - EN standard/TÜV approved

| Description | Rated operational current |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Rated thermal current | Rated operational voltage | AC15 (Ind. load) | DC13 (Ind. load) |
|  |  |  | Rated operational current | Rated operational current |
| Illuminated pushbutton switch <br> Pushbutton (Except the selector ring type) <br> Emergency stop pushbutton switch <br> Emergency stop illuminated pushbutton switch <br> Selector switch (2-position) <br> Illuminated selector switch (2-position) | 10A | 24V | 6.0A | 4.0A |
|  |  | 120 V | 6.0A | - |
|  |  | 125 V | - | 1.3A |
|  |  | 240 V | 6.0A | - |
|  |  | 250 V | - | 0.45A |
|  |  | 480 V | 2.5A | - |
|  |  | 600 V | 2.0A | - |
| Selector switch (3, 4, 5-position) <br> Illuminated selector switch (3-position) <br> Pushbutton with selector ring | 10A | 24 V | 6.0A | 2.0A |
|  |  | 120 V | 6.0A | - |
|  |  | 125 V | - | 0.65A |
|  |  | 240V | 6.0A | - |
|  |  | 250 V | - | 0.23A |
|  |  | 480 V | 2.5A | - |
|  |  | 600 V | 2.0A | - |
| Joy stick selector switch (Lever switch) | 5A | 24 V | - | 0.7A |
|  |  | 120 V | 0.3A | - |
|  |  | 125 V | - | 0.15A |
|  |  | 240 V | 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 Illuminated pushbutton | Emergency stop pushbutton <br> Emergency stop illuminated pushbutton |  | Selector *2 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 | $0.15 \mathrm{~N} \cdot \mathrm{~m}$ | $0.13 \mathrm{~N} \cdot \mathrm{~m}$ | $0.1 \mathrm{~N} \cdot \mathrm{~m}$ |
| Operating travel | Approx. 6 mm <br> (Push-lock type: Approx. 9mm, operation angle: Approx. $45^{\circ}$ ) | Approx. 9mm <br> (Operation angle: <br> Approx. $45^{\circ}$ ) | Approx. 9mm | 2-position: Approx. $90^{\circ}$ <br> 3-position: Approx. $45^{\circ}$ <br> 4-position: <br> Approx. $40^{\circ}$ <br> 5-position: Approx. $30^{\circ}$ | 3-position: Approx. $45^{\circ}$ | 2-position: <br> Approx. $60^{\circ}$ <br> 3-position: <br> Approx. $45^{\circ}$ |
| Required return force | (Push-lock type: $0.6 \mathrm{~N} \cdot \mathrm{~m}$ ) | $0.6 \mathrm{~N} \cdot \mathrm{~m}$ | 30N (pull) | $0.15 \mathrm{~N} \cdot \mathrm{~m}$ | $0.13 \mathrm{~N} \cdot \mathrm{~m}$ | - |

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

## ■ Lamp ratings

- Illuminated pushbuttons, illuminated selectors, pilot lights (round type)

| Transformer | Lamp voltage | LED (lamp base: BA9S/13) |  |  | Incandescent (lamp base: BA9S/13) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Type | Rated voltage | Consumption | Type | Rated voltage | Consumption |
| Without transformer | 5.5V AC/DC | - | - | - | AHX135 | 6.3V AC/DC | 0.9W |
|  | $6 \mathrm{~V} \mathrm{AC}$ | APX510-6 $\square$ | 6V AC | Green, red, orange, amber, blue: 7mA AC Yellow: 50mA AC |  |  | - |
|  | 6V DC | APX510-D6 $\square$ | 6V DC | Green, red, orange, amber, blue: 11 mA DC Yellow: 33mA DC | - | - | - |
|  |  |  |  |  |  |  |  |
|  | 12V AC/DC | APX510-12 $\square$ | 12V AC/DC | Green, red, orange, amber, blue: $14 \mathrm{~mA} \mathrm{AC}, 11 \mathrm{~mA} \mathrm{DC}$ Yellow: 28mA AC, 22mA DC | - | - | - |
|  |  |  |  |  |  |  |  |
|  | 15V AC/DC | APX510-15 $\square$ | 15V AC/DC | Green, red, orange, amber, blue: $13 \mathrm{~mA} \mathrm{AC}$,11 mA DC Yellow: 26mA AC, 22mA DC | AHX279 | 18 V AC/DC | 0.8W |
|  |  |  |  |  |  |  |  |
|  | 20V AC/DC | - | - | - | $\begin{aligned} & \text { AHX144 } \\ & \text { AHX129 } \end{aligned}$ | $\begin{aligned} & 24 \mathrm{~V} \text { AC/DC } \\ & 30 \mathrm{~V} \text { AC/DC } \end{aligned}$ | $\begin{aligned} & \text { 0.9W } \\ & 0.8 \mathrm{~W} \end{aligned}$ |
|  | 24V AC/DC | APX510-24 $\square$ | 24V AC/DC | $12 \mathrm{~mA} \mathrm{AC}$, |  |  |  |
| With transformer (Standard type: AR9T511) | 110V AC | APX510-6 $\square$ | 6V AC | 1.5VA | AHX135 | 6.3V AC/DC | 2VA |
|  | 127V AC |  |  |  |  |  | 2VA |
|  | 220V AC |  |  |  |  |  | 2VA |
|  | 254 V AC | APX510-6 $\square$ | 6V AC | 2.5VA | AHX135 | 6.3V AC/DC | 2.5 VA |
|  | 380 V AC |  |  |  |  |  | 2.5 VA |
|  | 440 V AC |  |  |  |  |  | 2.5 VA |
|  | 480 V AC |  |  |  |  |  | 2.5 VA |
|  | 550 V AC |  |  |  |  |  | 2.5 VA |
| With resistor unit (AR9T519-H) | 110V DC | APX510-24 $\square$ | 24V AC/DC | 1.2W | - | - | - |

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

- Replace the $\square$ mark by the lamp luminous color code, see page 04/70
- Pilot lights with resistor

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

[^8]- Pilot lights (DR30F4M, F4N, M4M types)


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 | Approx. 30000h | 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 $\mathrm{Ta}=25^{\circ} \mathrm{C}$

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


## Incandescent lamp voltage characteristics

## - Combination of lens color and LED luminous color

| Button color (lens or color plate) |  | LED lamp (high-brightness) |  |  | LED lamp (high-brightness) |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Color | Code | Luminous color | Type | Type *1 | Luminous color | Type *2 |
| Green | G | Green | APX510-■G | APX507-24G | Green | DR9Q005-■G |
| Red | R | Red | APX510-- R | APX507-24R | Red | DR9Q005-- R |
| White | W | Orange | APX510--0 | APX509-24O | White | DR9Q005-■W |
| Yellow | Y | Yellow | APX510-■Y | APX507-24Y | Yellow | DR9Q005-■Y |
| Orange | A | Amber | APX510-■A | APX507-24A | Amber | DR9Q005-■A |
| Blue | S | Blue | APX510-- | APX507-24S | - | - |

Notes: *1 For pilot light with resistor
*2 For DR30 F4M, F4N, M4M type

- Replace the $\square$ mark by the lamp voltage code, see page 04/68, 04/69

■ Illuminated pushbutton switches

| Operator | Trans－ former | Contact | LED lamp <br> Momentary action Type | Alternate action Type | Incandescent lamp Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Extended round head | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30EOL－10■3 <br> AR30EOL－01■3 $\square$ <br> AR30EOL－11■3 <br> AR30EOL－22■3 $\square$ | AR30E5L－10■3 AR30E5L－01■3 $\square$ AR30E5L－11■3 $\square$ | AR30E0L－10■4 AR30EOL－01■4 $\square$ <br> AR30EOL－11■4 $\square$ <br> AR30EOL－22■4 $\qquad$ | AR30E5L－10■4 <br> AR30E5L－01■4 $\square$ <br> AR30E5L－11■4 $\square$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR30EOL－10■3 $\square$ AR30EOL－01■3 $\square$ AR30EOL－11汇 | AR30E5L－10■3 AR30E5L－01■3 AR30E5L－11■3 | AR30EOL－10■4 $\square$ <br> AR30EOL－01■4 <br> AR30EOL－11■4 | AR30E5L－10■4 AR30E5L－01■4 AR30E5L－11■4 |
| Extended with transparent full guard（ 24 mm dia．） <br> KKD05－164 | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30G4L－10■3 <br> AR30G4L－01■3 <br> AR30G4L－11■3 $\square$ <br> AR30G4L－22■3 | AR30G9L－10■3 <br> AR30G9L－01■3 <br> AR30G9L－11■3 $\square$ | AR30G4L－10■4 <br> AR30G4L－01■4 $\square$ <br> AR30G4L－11■4 $\square$ <br> AR30G4L－22■4 $\square$ | AR30G9L－10■4 AR30G9L－01■4 AR30G9L－11■4 $\square$ $\qquad$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR30G4L－10■3 $\square$ AR30G4L－01■3 AR30G4L－11■3 $\square$ | $\begin{aligned} & \text { AR30G9L-10■3} \square \\ & \text { AR30G9L-01■3 } \square \\ & \text { AR30G9L-11■3 } \square \end{aligned}$ | AR30G4L－10■4 $\square$ AR30G4L－01■4 AR30G4L－11苗 | AR30G9L－10■4 $\square$ <br> AR30G9L－01■4 <br> AR30G9L－11■4 |
| Extended with full guard （24mm dia．with openings） | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30G2L－10■3 $\square$ <br> AR30G2L－01■3 <br> AR30G2L－11■3 <br> AR30G2L－22■3 | AR30G7L－10m3 <br> AR30G7L－01■3 <br> AR30G7L－11■3 <br> － | AR30G2L－10■4 $\square$ <br> AR30G2L－01■4 <br> AR30G2L－11■4 <br> AR30G2L－22■4 | AR30G7L－10■4 $\square$ <br> AR30G7L－01■4 $\square$ <br> AR30G7L－11■4 $\square$ <br> － |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR30G2L－10■3 $\square$ <br> AR30G2L－01■3 <br> AR30G2L－11■3 | AR30G7L－10■3 <br> AR30G7L－01■3 <br> AR30G7L－11■3 | AR30G2L－10■4 <br> AR30G2L－01■4 <br> AR30G2L－11■4 | AR30G7L－10■4 <br> AR30G7L－01■4 <br> AR30G7L－11■4 |
| Extended with full guard （24mm dia．） <br> AF95－6 | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30G3L－10■3 <br> AR30G3L－01■3 $\square$ <br> AR30G3L－11■3 $\square$ <br> AR30G3L－22■3 | AR30G8L－10■3 <br> AR30G8L－01■3 <br> AR30G8L－11■3 $\square$ | AR30G3L－10■4 $\square$ <br> AR30G3L－01■4 <br> AR30G3L－11■4 <br> AR30G3L－22■4 | AR30G8L－10■4 AR30G8L－01■4 AR30G8L－11■4 $\square$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AR30G3L－10п3 $\square$ AR30G3L－01■3 $\square$ AR30G3L－11汇 | AR30G8L－10■3 $\square$ <br> AR30G8L－01■3 $\square$ <br> AR30G8L－11■3 $\square$ | AR30G3L－10■4 AR30G3L－01■4 AR30G3L－11■4 | AR30G8L－10■4 $\square$ AR30G8L－01■4 AR30G8L－11■4 |
| Push－lock，turn－reset （40mm dia．with white arrow） | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 3 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & - \\ & - \\ & - \end{aligned}$ | AR30V5L－10■3 <br> AR30V5L－01■3 <br> AR30V5L－11■3 <br> AR30V5L－03■3 $\square$ | — | AR30V5L－10■4 <br> AR30V5L－01■4 $\square$ <br> AR30V5L－11■4 $\square$ <br> AR30V5L－03■4 $\square$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | — | $\begin{aligned} & \text { AR30V5L-10■3} \\ & \text { AR30V5L-01■3 } \\ & \text { AR30V5L-11■3 } \end{aligned}$ | — | AR30V5L－10■4 AR30V5L－01■4 AR30V5L－11■4 |
| Push－pull （35mm dia．） | Without | 1NO＋1NC | AR30Q7L－11■3 $\square$ | － | AR30Q7L－11苼口 | － |
|  | With | 1NO＋1NC | AR30Q7L－11■3 $\square$ | － | AR30Q7L－11■4■ | － |

[^9]
## AR30

## - Lens color

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

| Color | Green | Red | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | A |

Note: AR30V5L type: Red, yellow only

## - Contact arrangements

Contact arrangements other than above are available

| Contact <br> arrangement | 1 NO | 1 NC | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2 NO | 2 NC | 3 NO |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | 10 | 01 | 11 | 20 | 02 | 30 |
| Contact <br> arrangement | 3 NC | $2 \mathrm{NO}+2 \mathrm{NC}$ | 4 NO | 4 NC | 5 NO | 5 NC |
| 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 <br> Push-lock, turn-reset | 3-contact block | 2-contact block |

## - Contact operation (AR30Q7L)

| Contact block |  |  | Button position |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| No. | Type | Pull | Free | Push |  |
| $(1)$ | NC | - |  |  |  |
| $(2)$ | NC |  |  |  |  |

- Contact closed
- Voltage

Replace the $\square$ mark by the lamp voltage code

| Transformer |  | $\begin{aligned} & \text { Code } \\ & \text { LED } \end{aligned}$ | Incandescent |
| :---: | :---: | :---: | :---: |
| Without transformer | 6V DC 6 V AC 5.5 V AC/DC 12 V AC/DC 15V AC/DC 20V AC/DC 24 V AC/DC | $\begin{aligned} & 6 \\ & \mathrm{~A} \\ & \hline \mathrm{~B} \\ & \mathrm{C} \\ & \hline \mathrm{E} \\ & \hline \end{aligned}$ | - <br>  <br>  <br>  <br>  <br> D <br> E |
| With transformer | 100-110V AC 115-127V AC 200-220V AC 230-254V AC $350-380 \mathrm{~V}$ AC 400-440V AC 480V AC $500-550 \mathrm{~V}$ AC | $\begin{aligned} & \mathrm{H} \\ & \mathrm{~L} \\ & \mathrm{M} \\ & \mathrm{Q} \\ & \mathrm{~S} \\ & \mathrm{~T} \\ & \mathrm{~V} \end{aligned}$ | $\begin{aligned} & \mathrm{H} \\ & \mathrm{~L} \\ & \mathrm{M} \\ & \mathrm{Q} \\ & \mathrm{~S} \\ & \mathrm{~T} \\ & \mathrm{~V} \\ & \mathrm{~W} \end{aligned}$ |

Position of contact block AR30Q7L (without transformer)


AR30Q7L (with transformer)


■ Pushbutton switches

| Operator | Contact | Momentary <br> action <br> Type | Alternate <br> action |
| :--- | :--- | :--- | :--- |

[^10]| Operator | Contact | Momentary <br> action <br> Type | Alternate <br> action |
| :--- | :--- | :--- | :--- |

Pushbuttons
AR30

| Operator | Contact | Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: |
| Giant head with full guard | $\begin{aligned} & \text { 1NO } \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30B3R-10 <br> AR30B3R-01 <br> AR30B3R-11 <br> AR30B3R-20 $\square$ <br> AR30B3R-02 <br> AR30B3R-22 | $\begin{aligned} & - \\ & - \\ & - \\ & - \end{aligned}$ |
| Push, turn-lock | $\begin{array}{\|l\|} \hline 1 \mathrm{NO} \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \\ \text { 2NC } \\ \text { 2NO+2NC } \end{array}$ | AR30NOR-10 $\square$ <br> AR30NOR-01 $\square$ <br> AR30NOR-11 <br> AR30NOR-20 <br> AR3ONOR-02 <br> AR30N0R-22 | - - - |


| Operator | Contact | Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: |
| Push-lock, turn-reset (40mm dia. with white arrow) | $\begin{array}{\|l} \text { 1NO } \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \\ 2 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \end{array}$ | $\begin{aligned} & \text { - } \\ & - \\ & - \\ & - \end{aligned}$ | AR30V5R-10 <br> AR30V5R-01 <br> AR30V5R-11 <br> AR30V5R-20 <br> AR30V5R-02 <br> AR30V5R-22 |
| Pushbutton with emergency operating cap | $\begin{array}{\|l} \text { 1NO } \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \\ 2 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \end{array}$ | AR30FVR-10 <br> AR30FVR-01 <br> AR30FVR-11 $\square$ <br> AR30FVR-20 $\qquad$ <br> AR30FVR-02 <br> AR30FVR-22 | - - - |

- Available numbers of contact blocks

| Momentary action | Alternate action <br> Push-lock, turn-reset |
| :--- | :--- |
| 8 -contact block | 4-contact block |

- Symbol mark (For AR30FAR, FBR, EAR, EBR)

Replace the $\quad$ mark by the symbol mark code

| Symbol mark | $\bigcirc$ |  | 1 |  | ( ${ }^{\text {a }}$ |  | $\bigcirc$ |  | (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 |


| Operator | Contact (The following contact is only available.) | Button color | Type | Contact operation |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Contact block |  | Left |  | Right |  |
|  |  |  |  | Mounting position | Type | Free | Depressed | Free | Depressed |
| Pushbutton with selector ring (2-position) <br> AF97-506 | 2NO+2NC | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR30S1R-22G AR30S1R-22R AR30S1R-22B AR30S1R-22W AR30S1R-22Y AR30S1R-22A AR30S1R-22S | (1) | NC | - | - | - | - |
|  |  |  |  | (2) | NC | - | - | $\bullet$ | - |
|  |  |  |  | (3) | NO | - | $\bigcirc$ | - | $\bigcirc$ |
|  |  |  |  | (4) | NO | - | - | - | - |
|  | 2NO | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR30S2R-20GAR30S2R-20RAR30S2R-20BAR30S2R-20WAR30S2R-20YAR30S2R-20AAR30S2R-20S | (1) | NO | - | - | - | - |
|  |  |  |  | (2) | NO | - | - | - | $\bullet$ |
|  |  |  |  |  |  |  |  |  |  |
|  | 2NO+2NC | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR30S2R-22GAR30S2R-22RAR30S2R-22BAR30S2R-22WAR30S2R-22YAR30S2R-22AAR30S2R-22S | (1) | NC | - | - |  | D |
|  |  |  |  | (2) | NC |  | - | - | - |
|  |  |  |  | (3) | NO | - | - | - | - |
|  |  |  |  | (4) | NO | - | - | - | - |
|  | 2NO+2NC | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR30S3R-22G AR30S3R-22R AR30S3R-22B AR30S3R-22W AR30S3R-22Y AR30S3R-22A AR30S3R-22S | (1) | NC | - | - |  | , |
|  |  |  |  | (2) | NC |  | D | - | - |
|  |  |  |  | (3) | NO | - | - | - | - |
|  |  |  |  | (4) | NO | - | - | - | - |
|  | 2NO+2NC | Green <br> Red <br> Black <br> White <br> Yellow <br> Orange <br> Blue | AR30S6R-22G <br> AR30S6R-22R <br> AR30S6R-22B <br> AR30S6R-22W <br> AR30S6R-22Y <br> AR30S6R-22A <br> AR30S6R-22S | (1) | NC | - | - | - |  |
|  |  |  |  | (2) | NC | - | - | - |  |
|  |  |  |  | (3) | NO | - | - | - |  |
|  |  |  |  | (4) | NO | - | $\bigcirc$ | $\bigcirc$ |  |
| Note: (1) to (4): Contact block mounting position |  |  |  |  |  | $\begin{array}{r} \text { - Con } \\ -\quad \text { Con } \end{array}$ | losed pen |  |  |

## - Position of contact block



## Emergency Stop Pushbuttons

AR30

■ Emergency stop pushbutton switches
$\Theta$ (Direct opening action), conform to EN418

| Operator | Contact | Type |
| :---: | :---: | :---: |
| Push-lock, turn-reset (Soft-touch 40 mm dia. with white arrow) | $\begin{array}{\|l} \text { 1NC } \\ \text { 1NO }+1 N C \\ 2 N \mathrm{NC} \\ \text { 3NC } \\ \text { 2NO+2NC } \\ \text { 4NC } \end{array}$ | AR30V0R-01R AR30V0R-11R AR30V0R-02R AR30VOR-03R AR30VOR-22R AR30VOR-04R |
| Push-lock, turn-reset (40mm dia.) | $\begin{aligned} & \text { 1NC } \\ & \text { 1NO }+1 \mathrm{NC} \\ & \text { 2NC } \\ & \text { 3NC } \\ & \text { 2NO+2NC } \\ & \text { 4NC } \end{aligned}$ | AR30V2R-01R AR30V2R-11R AR30V2R-02R AR30V2R-03R AR30V2R-22R AR30V2R-04R |
| Push-lock, turn-reset (Soft-touch 65 mm dia. with white arrow) | $\begin{array}{\|l} \text { 1NC } \\ \text { 1NO }+1 N C \\ 2 N \mathrm{NC} \\ \text { 3NC } \\ \text { 2NO+2NC } \\ \text { 4NC } \end{array}$ | AR30V1R-01R AR30V1R-11R AR30V1R-02R AR30V1R-03R AR30V1R-22R AR30V1R-04R |
| Push-lock, pull-reset (35mm dia.) | $\begin{array}{\|l\|} \hline \text { 1NC } \\ \text { 1NO+1NC } \\ \text { 2NC } \end{array}$ | AR30Q2R-01R AR30Q2R-11R AR30Q2R-02R |

[^11]- 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 40 mm dia. with white arrow) | Without | $\begin{aligned} & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NC} \\ & 3 \mathrm{NC} \end{aligned}$ | AR30VOL-01■3R <br> AR30V0L-11m3R <br> AR30V0L-02■3R <br> AR30V0L-03■3R | AR30VOL-01■4R <br> AR30VOL-11苗4R <br> AR30VOL-02■4R <br> AR30VOL-03 4 4R |
|  | With | $\begin{aligned} & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NC} \end{aligned}$ | AR30V0L-01m3R <br> AR30VOL-11■3R <br> AR30VOL-02■3R | AR30V0L-01■4R <br> AR30VOL-11■4R <br> AR30VOL-02 4 4R |
| Push-lock, turn-reset (40mm dia.) | Without | $\begin{aligned} & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NC } \\ & \text { 3NC } \end{aligned}$ | AR30V2L-01■3R <br> AR30V2L-11■3R <br> AR30V2L-02■3R <br> AR30V2L-03■3R | AR30V2L-01■4R <br> AR30V2L-11年4R <br> AR30V2L-02■4R <br> AR30V2L-03 4 4R |
|  | With | $\begin{aligned} & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NC} \end{aligned}$ | AR30V2L-01■3R <br> AR30V2L-11■3R <br> AR30V2L-02■3R | $\begin{aligned} & \text { AR30V2L-01■4R } \\ & \text { AR30V2L-11■4R } \\ & \text { AR30V2L-02■4R } \end{aligned}$ |

Notes: • Button color: Red only

- Contact arrangements indicated in the table can be supplied.
- Voltage

Replace the $\square$ mark by the lamp voltage code


| Transformer |  | Code <br> LED | Incandescent |
| :--- | :--- | :--- | :--- |
| With | $100-110 \mathrm{~V}$ AC | H | H |
|  | $115-127 \mathrm{~V}$ AC | L | L |
|  | $200-220 \mathrm{~V}$ AC | M | M |
|  | $230-254 \mathrm{~V}$ AC | Q | Q |
|  | $350-380 \mathrm{~V} A C$ | S | S |
|  | $400-440 \mathrm{~V}$ AC | T | T |
|  | 480 V AC | V | V |
|  | $500-550 \mathrm{~V} \mathrm{AC}$ | W | W |

## $■$ Selector switches

2-position


[^12]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 round bezel | Contact operation (Example) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Contact arrangement | Operation position |  |
|  |  |  |  |  |  | $\begin{array}{lll} \mathrm{L} & \mathrm{C} & \mathrm{R} \\ \bigcirc & (1) & \bigcirc \end{array}$ | $\begin{array}{lll} \mathrm{L} & \mathrm{C} & \mathrm{R} \\ \bigcirc & (1) & \bigcirc \end{array}$ |
| Knob | Maintained each $45^{\circ}$ | Color code: <br> B: Black <br> (Standard) <br> Color other than above are available <br> $\binom{$ G: Green }{ R: Red } | $\begin{aligned} & \hline \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30PR-311B AR30PR-320B AR30PR-302B AR30PR-322B | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) |  |  |
|  | Spring/manual return |  | $\begin{aligned} & \hline \text { 1NO }+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30PR-611B <br> AR30PR-620B <br> AR30PR-602B <br> AR30PR-622B |  |  |  |
|  | Spring/manual return each $45^{\circ}$ |  | $\begin{aligned} & \hline \text { 1NO+1NC } \\ & \text { 2NO } \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30PR-711B <br> AR30PR-720B <br> AR30PR-702B <br> AR30PR-722B | 1NO+1NC <br> (1) (2) |  |  |
|  | Spring return <br> 官 each $45^{\circ}$ |  | 2NO+2NC | AR30PR-122B | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) <br> (3) (4) |  |  |
| Lever | Maintained each $45^{\circ}$ |  | $\begin{aligned} & \hline \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR30WR-311B AR30WR-320B AR30WR-302B AR30WR-322B | 1NO+1NC <br> (1) (2) |  |  |
|  | Spring/manual return each $45^{\circ}$ |  | $\begin{aligned} & \hline \text { 1NO }+1 \mathrm{NC} \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR30WR-611B <br> AR30WR-620B <br> AR30WR-602B <br> AR30WR-622B |  |  |  |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AR30WR-711B <br> AR30WR-720B <br> AR30WR-702B <br> AR30WR-722B | 1NO+1NC <br> (1) (2) |  |  |
|  | Spring return <br> (1) each $45^{\circ}$ |  | 2NO+2NC | AR30WR-122B | 2NO+2NC <br> (1) (2) <br> (3) (4) |  |  |


| Operator | Operation | Key removable position | Contact | Type Switch with round bezel | Contact operation (Example) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Contact arrangement | Operator position |  |
|  |  |  |  |  |  | $\begin{array}{lll} \hline L & C & R \\ 0 & (1 & \ddots \end{array}$ | $\begin{array}{lll} \mathrm{L} & \mathrm{C} & \mathrm{R} \\ 0 & \uparrow & \oslash \end{array}$ |
| Key | Maintained each $45^{\circ}$ | Key removable position <br> ( ): Key type | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR30J $\square$ R-3■11() <br> AR30J $\square$ R-3표 20 () <br> AR30J $\square$ R-3■02() <br> AR30J $\square$ R-3■22() | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) | Upper contact <br> (3) | Lower contact |
|  | Spring/manual return <br> 官 each $45^{\circ}$ |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & \text { 2NC } \\ & \text { 2NO }+2 \mathrm{NC} \end{aligned}$ | AR30J $\square$ R-6■11() <br> AR30J $\square$ R-620() <br> AR30J $\square$ R-6.02( ) <br> AR30J $\square$ R-6■22() |  |  |  |
|  | Spring/manual return |  | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AR30J $\square$ R-7■11() <br>  <br> AR30J $\square$ R-7■02() <br> AR30J $\square$ R-7■22() | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & \text { (1) } \end{aligned}$ | Upper contact | Lower contact |
|  | Spring return each $45^{\circ}$ |  | 2NO+2NC | AR30J $\square$ R-1E22() | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) <br> (3) (4) | Upper contact | Lower contact |

- (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 <br> arrangement | 1 NO | 1 NC | $1 N O+1 N C$ | $2 N O$ | $2 N C$ | $3 N O$ | $3 N C$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | 10 | 01 | 11 | 20 | 02 | 30 | 03 |


| Contact <br> arrangement | $2 N \mathrm{NO}+2 \mathrm{NC}$ | 4 NO | 4 NC | 5 NO | 5 NC | $3 \mathrm{NO}+3 \mathrm{NC}$ | $4 \mathrm{NO}+4 \mathrm{NC}$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | 22 | 40 | 04 | 50 | 05 | 33 | 44 |

- Key removable positions

| Code | A | B | C | D | E | F | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Removable <br> position |  | $-65^{\circ}$ |  |  |  |  |  |
| AR30J $\square R-2$ |  |  |  |  |  |  |  |

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



## ■ Selector switches (control type)

3-position

| Operator | Operation | Knob color or key removable position | Contact arrangement | Type Switch with round bezel |
| :---: | :---: | :---: | :---: | :---: |
| Knob | Maintained each $45^{\circ}$ | Color code: <br> B: Black (Standard) Color other than above are available $\binom{$ G: Green }{ R: Red } | Replace the mark by the contact arrangement code (shown on next page). | AR30PCR-3回 |
|  | Spring/manual return <br> © each $45^{\circ}$ |  |  | AR30PCR-6■B |
|  | Spring/manual return each $45^{\circ}$ |  |  | AR30PCR-7■B |
|  | Spring return <br> (1) each $45^{\circ}$ |  |  | AR30PCR-1嗗 |
| Lever | Maintained each $45^{\circ}$ |  | Replace the mark by the contact arrangement code (shown on next page). | AR30WCR-3■ |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  |  | AR30WCR-6■B |
|  | Spring/manual return each $45^{\circ}$ |  |  | AR30WCR-7■ |
|  | Spring return <br> each $45^{\circ}$ |  |  |  |
| Key | Maintained each $45^{\circ}$ | Replace the mark by the key removable position code: A, B, C, D, E F or G | Replace the mark by the contact arrangement code (shown on next page). | AR30JCR-3 $\square$ ( ) |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  |  | AR30JCR-6 $\square$ ( ) |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  |  | AR30JCR-7 $\square$ ( ) |
|  | Spring return <br> each $45^{\circ}$ |  |  | AR30JCR-1Eп() |

## - Key removable positions

| Code | A | B | C | D | E | F | G |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Removable position | $8$ | (25) | (23) | $8$ | $4$ |  | (45) |
| AR30JCR-3 | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
| AR30JCR-6 | - | _ | - | $\bigcirc$ | - | $\bigcirc$ | - |
| AR30JCR-7 | - | - | - | - | - | - | $\bigcirc$ |
| 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.

Selector Switches
AR30

- Contact arrangement code (Typical example)

| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type |  |  |  |
| 2NC | 01F | (1) | NC |  |  |  |
|  |  | (2) | NC |  |  |  |
|  |  | - | - | - | - | - |
|  |  | - | - | - | - | - |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 014 | (1) | NC |  |  |  |
|  |  | (2) | NC |  |  |  |
|  |  | (3) | NO |  |  | $\bullet$ |
|  |  | (4) | NO | $\bullet$ |  |  |
| 4NC | 01J | (1) | NC |  |  |  |
|  |  | (2) | NC |  |  |  |
|  |  | (3) | NC |  |  |  |
|  |  | (4) | NC |  |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 024 | (1) | NC |  |  |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO |  |  | $\bullet$ |
|  |  | (4) | NO | $\bullet$ |  | $\bullet$ |
| 2NO+2NC | $\begin{aligned} & \text { 03C* } \\ & \text { (Maintained } \\ & \text { only) } \end{aligned}$ | (1) | NC |  |  |  |
|  |  | (2) | NC |  |  | $\bullet$ |
|  |  | (3) | NO |  |  | $\bullet$ |
|  |  | (4) | NO | $\bullet$ |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 044* | (1) | NC |  |  |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO |  |  | - |
|  |  | (4) | NO | $\bullet$ |  |  |
| 2NO+2NC | 054 | (1) | NC |  |  |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO |  |  | $\bullet$ |
|  |  | (4) | NO |  |  | $\bullet$ |

Notes: ©: Contact closed Blank: Contact open

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


## - Position of contact block



| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type |  | Center |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 064 | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | $\bullet$ |  |  |
|  |  | (4) | No | - |  | $\bullet$ |
| $1 \mathrm{NO}+1 \mathrm{NC}$ | 07F | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NO |  |  | $\bullet$ |
|  |  | - | - | - | - | - |
|  |  | - | - | - | - | - |
| 2NO+2NC | $\begin{array}{\|l} \begin{array}{l} 07 C^{*} \\ \text { (Maintained } \\ \text { only) } \end{array} \end{array}$ | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC |  |  | $\bullet$ |
|  |  | (3) | NO | $\bullet$ |  |  |
|  |  | (4) | NO | - |  |  |
| 2NO+2NC | 084 | (1) | NC |  |  |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO | $\bullet$ |  |  |
| $\overline{2 N O+2 N C}$ | 094* | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | $\bullet$ |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 104 | (1) | NC |  | $\bullet$ |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO | - |  | $\bullet$ |
| 2NO+2NC | $\begin{aligned} & 11 \mathrm{C}^{*} \\ & \text { (Maintained } \\ & \text { only) } \end{aligned}$ | (1) | NC |  | $\bullet$ |  |
|  |  | (2) | NC |  |  | $\bullet$ |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO | $\bullet$ |  |  |

- Contact arrangement code (Typical example)

| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type | Left | Center | Right |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 124* | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO | - |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 134* | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO |  |  | - |
| $3 \mathrm{NO}+1 \mathrm{NC}$ | $\begin{aligned} & 14 D^{*} \\ & \text { (Maintained } \\ & \text { only) } \end{aligned}$ | (1) | NO | - |  |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | - |
| $3 \mathrm{NO}+1 \mathrm{NC}$ | 15A* | (1) | NO |  |  | - |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO |  |  | - |
|  |  | (4) | NO | - |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 164 | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO | - |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 174* | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | - |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 184 | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (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



| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type |  | Center <br> (1) |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 194 | (1) | NC |  |  |  |
|  |  | (2) | NC |  |  |  |
|  |  | (3) | NO | $\bullet$ |  |  |
|  |  | (4) | NO |  |  | $\bullet$ |
| 4NO | 20B | (1) | NO |  |  | $\bullet$ |
|  |  | (2) | NO | $\bullet$ |  |  |
|  |  | (3) | NO |  |  | $\bullet$ |
|  |  | (4) | NO | $\bullet$ |  |  |

## 4, 5-position

| Operator | Contact <br> (The following <br> contact is only <br> available.) | Operation | Knob color | Contact <br> arrangement | Type <br> Switch with <br> round bezel |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Knob | 2NO+2NC | 4-position <br> maintained | $\left.\begin{array}{l}\text { Color code: } \\ \text { B: Black } \\ \text { (Standard) } \\ \text { Color other than } \\ \text { above are } \\ \text { available } \\ \text { G: Green } \\ \text { R: Red }\end{array}\right)$ |  |  | | Replace the ■ |
| :--- |
| mark by the contact |
| arrangement code |
| (shown below) |$\quad$| AR30PCR-4■B |
| :--- |

## - Contact arrangement code

| Position | Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Contact block |  | Operator position |  |  |  |
|  |  |  | Mounting position | Type | 12 | 3 | 4 | 5 |
| 4-position | 2NO+2NC | 41C* (Maintained only) | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ |  |  |  |  |
| 5-position | $2 \mathrm{NO}+2 \mathrm{NC}$ | 51C* <br> (Maintained only) | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ |  |  |  |  |

[^13]* There may be some overlap in the contact when switching between notches


## - Position of contact block



Operator position
4-position
5-position



## ■ Lever type selector switches

2-position

| Operator | Operation | Contact | Type | Contact operation |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Contact arrangement | Operator position |
|  |  |  |  |  | $\begin{array}{cc} \text { Left } & \text { Right } \\ < & \nearrow \end{array}$ |
| Lever (metal type) | Maintained <br> each $90^{\circ}$ | 1NO | AR30HR-210 | 1NO (1) | Upper contact <br> (3) (4) |
|  |  | 1NC | AR30HR-201 | 1NC (1) | Upper contact <br> (1) (2) |
|  |  | 1NO+1NC | AR30HR-211 | $\begin{aligned} & \text { 1NO (1) } \\ & 1 \mathrm{NC} \end{aligned}$ | Upper contact <br> (3) <br> Lower contact <br> (1) (2) |
| KKD05-115 |  | 2NO | AR30HR-220 | $\begin{aligned} & \text { 1NO (1) } \\ & \text { 1NO (2) } \end{aligned}$ | Upper contact <br> (3) (4) <br> Lower contact <br> (3) (4) |
|  |  | 2NC | AR30HR-202 | $\begin{aligned} & \text { 1NC (1) } \\ & \text { 1NC (2) } \end{aligned}$ | Upper contact <br> (1) (2) <br> Lower contact <br> (1) (2) |
|  |  | 2NO+2NC | AR30HR-222 | 1NO (1) <br> 1NO (3) <br> 1NC (2) <br> 1NC (4) | Upper contact <br> (3) (4) <br> (3) <br> Lower contact <br> (1) <br> (1) |

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

- Position of contact block



## AR30

3-position

| Operator | Operation | Contact | Type | Contact operation |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Contact arrangement | Operator position |
|  |  |  |  |  | Left Center Right |
| Lever (metal type) <br> KKD05-114 | Maintained <br> each $45^{\circ}$ | 1NO+1NC | AR30HR-311 | $1 \mathrm{NO}$ <br> (1) 1NC (2) | Upper contact <br> (3) <br> Lower contact <br> (1) |
|  |  | 2NO+2NC | AR30HR-322 | 1NO <br> (1) <br> 1NO <br> (3) <br> 1NC (2) <br> 1NC (4) | Upper contact <br> (3) <br> (3) <br> Lower contact <br> (1) <br> (1) |
|  | Spring return <br> each $60^{\circ}$ | 2NO+2NC | AR30HR-122 | 1NC <br> (1) <br> 1NO <br> (3) <br> 1NC (2) <br> 1NO (4) | Upper contact <br> (1) <br> (3) <br> Lower contact <br> (1) <br> (3) |

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

- Contact closed
- Contact arrangements. The NO contacts at (1) and (2) use special parts. Do not interchange these parts.
- Position of contact block


■ Illuminated selector switches
2-position

| Operator | Operation | Contact | LED lamp |  | Incandescent lamp |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Transformer | Type | Transformer | Type |
| Knob | Maintained | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | Without | AR30PL-210■3 <br> AR30PL-201■3 <br> AR30PL-211■3 <br> AR30PL-222■3 | Without | AR30PL-210■4 <br> AR30PL-201■4 <br> AR30PL-211■4 <br> AR30PL-222■4 |
|  | each $90^{\circ}$ | $\begin{aligned} & 1 \mathrm{NO} \\ & \text { 1NC } \\ & \text { 1NO }+1 \mathrm{NC} \\ & \text { 2NO } \end{aligned}$ | With | AR30PL-210■3 <br> AR30PL-201■3 <br> AR30PL-211■3 <br> AR30PL-220■3 | With | AR30PL-210■4 <br> AR30PL-201■4 <br> AR30PL-211■4 <br> AR30PL-2204 |
|  | Spring return | $\begin{aligned} & \text { 1NO } \\ & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NO } \end{aligned}$ | Without | AR30PL-010■3 AR30PL-001■3 AR30PL-011■3 AR30PL-020■3 | Without | AR30PL-010■4 $\square$ AR30PL-001■4 $\square$ AR30PL-011■4 AR30PL-020■4 |
|  | $60^{\circ}$ | $\begin{aligned} & 1 \mathrm{NO} \\ & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NO } \end{aligned}$ | With | AR30PL-010■3 AR30PL-001■3 AR30PL-011■3 AR30PL-020п3 | With | AR30PL-010■4 $\square$ AR30PL-001■4 AR30PL-011■4 AR30PL-020■4 |

3-position

| Operator | Operation |  | Contact | LED lamp |  | Incandescent lamp |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Transformer | Type | Transformer | Type |
| Knob | Maintained each $45^{\circ}$ |  |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without <br> With | AR30PL-311■3 AR30PL-322■3 <br> AR30PL-311■3 | Without <br> With | AR30PL-311■4 <br> AR30PL-322■4 <br> AR30PL-311■4 |
|  | Spring/manual return each $45^{\circ}$ | ( ${ }^{\text {( }}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without With | $\begin{aligned} & \text { AR30PL-611■3 } \\ & \text { AR30PL-611■3} \square \end{aligned}$ | Without With | $\begin{aligned} & \text { AR30PL-611■4} \\ & \text { AR30PL-611■4 } \end{aligned}$ |
|  |  | (1) | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without With | $\begin{aligned} & \text { AR30PL-711■3 } \square \\ & \text { AR30PL-711■3 } \square \end{aligned}$ | Without With | AR30PL-711■4 $\square$ AR30PL-711■4 |

Note: $\square$, ■ See page 04/88

- Replace the ■ mark by the following lamp voltage code

| Transformer | Voltage | Code LED | Incandescent |
| :---: | :---: | :---: | :---: |
| Without | 5V AC/DC | - | 5 |
|  | 6V DC | 6 | - |
|  | 6V AC | A | - |
|  | 12V AC/DC | B | - |
|  | 15V AC/DC | C | C |
|  | 20V AC/DC | - | D |
|  | 24V AC/DC | E | E |
| With | 100-110V AC | H | H |
|  | 115-127V AC | L | L |
|  | 200-220V AC | M | M |
|  | 230-254V AC | Q | Q |
|  | 350-380V AC | S | S |
|  | 400-440V AC | T | T |
|  | 480 V AC | V | V |
|  | 500-550V AC | W | W |

## - Contact arrangement and operator position

2-position

| Transformer | Contact arrangement | Contact block |  | Operator position |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mounting position | Type | Left <br> $\bigcirc$ | Right <br> © |
| With/without | 1NO | (1) | NO | - | $\bullet$ |
| With/without | 1NC | (1) | NC | $\bullet$ | - |
| Without | 1NO+1NC | (1) <br> (2) | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | - |  |
| With | 1NO+1NC | (1) <br> (2) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NO} \end{aligned}$ | $\stackrel{\rightharpoonup}{\bullet}$ | - |
| With/without | 2NO | (1) <br> (2) | $\begin{aligned} & \text { NO } \\ & \text { NO } \end{aligned}$ |  |  |
| Without | ${\underset{\star}{*}}_{2 \mathrm{NO}+2 \mathrm{NC}}$ | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \hline \mathrm{NO} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | - |  |
| With | ${\underset{\star 1}{2 N O}+2 \mathrm{NC}}^{2 \mathrm{~N}}$ | (1) <br> (2) <br> (3) (4) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ | $\bullet \bullet$ |  |

Notes: *1 : AR30PL-2

- : Contact closed, - : Contact open
- Replace the $\square$ mark by the following knob color code

| Color | Green | Red | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | A |

- Up to 4-contact of contact arrangement can be made.

Available numbers of contacts are as follow.

| No. of <br> position | Operation | Without <br> transformer | With <br> 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 |

3-position

| Transformer | Contact arrangement | Contact block |  | Operator position |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mounting position | Type | Left <br> $\bigcirc$ | Center <br> (1) | Right $\bigcirc$ |
| Without | ${ }_{\star 1}^{1 N O}+1 N C$ | $\begin{aligned} & (1) \\ & (2) \end{aligned}$ | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | $\bullet$ | $\begin{aligned} & \text { - } \\ & \text { - } \end{aligned}$ | - |
|  | ${\underset{* 2}{ } 1 \mathrm{NO}+1 \mathrm{NC}}^{2}$ | $\begin{aligned} & (1) \\ & (2) \end{aligned}$ | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | $-$ |  | $\bullet$ |
|  | $2 \mathrm{NO}+2 \mathrm{NC}$ | $\begin{aligned} & (1) \\ & (2) \\ & (3) \\ & (4) \end{aligned}$ | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ |  |  | - |
| With | ${\underset{* 1}{ } \mathrm{NO}+1 \mathrm{NC}}^{2}$ | $\begin{aligned} & \hline(1) \\ & (2) \end{aligned}$ | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NO} \end{aligned}$ | $-$ | - | $\bullet$ |
|  | ${ }_{\star 2} \text { NO+1NC }$ | $\begin{aligned} & (1) \\ & (2) \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { NC } \\ & \text { NO } \end{aligned}$ |  | - | - |
|  | $\begin{array}{\|l} 2 \mathrm{NO}+2 \mathrm{NC} \\ * 3 \end{array}$ | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \hline \mathrm{NC} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ |  | - | $\stackrel{-}{\bullet}$ |

Notes: ${ }^{{ }^{*}}$ : AR30PL-3, 6 *3 : AR30PL-3
*2: AR30PL-7

- : Contact closed, - : Contact open

With transformer


## ■ Pilot lights/standard

|  | Transformer | LED lamp <br> Lamp voltage | Type | Incandescent lamp <br> Lamp voltage | Type |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |

[^14]Pilot Lights
DR30

■ Pilot lights/short-body with transformer

| Lens | LED lamp Lamp voltage | Type | Incandescent lamp |  |
| :---: | :---: | :---: | :---: | :---: |
| Dome | $\begin{aligned} & 100-110 \mathrm{~V} \text { AC } \\ & 200-220 \mathrm{~V} \text { AC } \end{aligned}$ | DR30DOL-H9 $\square$ DR30D0L-M9 $\square$ | $\begin{aligned} & 100-110 \mathrm{~V} \text { AC } \\ & 200-220 \mathrm{VAC} \end{aligned}$ | DR30DOL-H8 $\square$ DR30D0L-M8 $\square$ |
| Extended round | $\begin{aligned} & 100-110 \mathrm{~V} \text { AC } \\ & 200-220 \mathrm{~V} \text { AC } \end{aligned}$ | DR30E3L-H9 $\square$ DR30E3L-M9 $\square$ | $\begin{aligned} & 100-110 \mathrm{~V} \text { AC } \\ & 200-220 \mathrm{~V} \text { AC } \end{aligned}$ | $\begin{aligned} & \text { DR30E3L-H8 } \square \\ & \text { DR30E3L-M8 } \square \end{aligned}$ |
|  | $\begin{aligned} & 100-110 \mathrm{~V} \text { AC } \\ & 200-220 \mathrm{~V} \text { AC } \end{aligned}$ | DR30KOL-H9 $\square$ DR30K0L-M9 $\square$ | $\begin{aligned} & 100-110 \mathrm{~V} \text { AC } \\ & 200-220 \mathrm{~V} \text { AC } \end{aligned}$ | DR30KOL-H8 $\square$ DR30K0L-M8 $\square$ |

## - Lens color

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

| Color | Green | Red | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | A |

- Lamp voltage

Available lamp voltage are as follow.

| Description | Voltage | Code <br> Standard type <br> LED | Incandescent | Sode <br> LED |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Without transformer | LED |  |  |  |  |

## ■ Pilot lights/standard

| Lens |
| :--- |

## - Color plate

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

| Color | Green | Red | White | Blue* $^{*}$ | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | A |

Note: * Incandescent lamp only

- Lamp voltage

Available lamp voltage are as follow.

| Description | Voltage | Code <br> Standard type LED | Incandescent |
| :---: | :---: | :---: | :---: |
| Without transformer | 5.5V AC/DC | - | 54 |
|  | 6 V AC | A5 | - |
|  | 6V DC | 65 | - |
|  | 12 V 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 |
|  | 480 V AC | V5 | V4 |
|  | 500-550V AC | W5 | W4 |
| With resistor unit | 110V DC | HE | - |

Joy Stick Selector Switches

## AR30

■ Joy stick selector switches

| Handle | Terminal | Operating directions | Contact arrangement | Type |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Manual return | Spring return |
| Ball type without lock | Screw |  | $\begin{aligned} & 1 \mathrm{NO} \times 2 \\ & 1 \mathrm{NO}+1 \mathrm{NC} \times 2 \end{aligned}$ | AR30AON-AOAOB <br> AR30A0N-1010B | AR30A5N-A0A0B <br> AR30A5N-1010B |
|  |  |  | $\begin{aligned} & 1 \mathrm{NO} \times 4 \\ & 1 \mathrm{NO}+1 \mathrm{NC} \times 4 \end{aligned}$ | AR30AON-AAAAB AR30A0N-1111B | AR30A5N-AAAAB AR30A5N-1111B |
|  | Solder/tab | $\uparrow$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \times 2 \\ & 2 \mathrm{NO}+2 \mathrm{NC} \times 2 \end{aligned}$ | AR30AOH-1010B <br> AR30AOH-2020B | AR30A5H-1010B <br> AR30A5H-2020B |
|  |  |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \times 4 \\ & 2 \mathrm{NO}+2 \mathrm{NC} \times 4 \end{aligned}$ | AR30A0H-1111B AR30AOH-2222B | AR30A5H-1111B AR30A5H-2222B |
| Ball type with lock | Screw |  | $\begin{aligned} & 1 \mathrm{NO} \times 2 \\ & 1 \mathrm{NO}+1 \mathrm{NC} \times 2 \end{aligned}$ | AR30A1N-A0A0B AR30A1N-1010B | AR30A6N-A0A0B AR30A6N-1010B |
|  |  |  | $\begin{aligned} & 1 \mathrm{NO} \times 4 \\ & 1 \mathrm{NO}+1 \mathrm{NC} \times 4 \end{aligned}$ | AR30A1N-AAAAB AR30A1N-1111B | AR30A6N-AAAAB AR30A6N-1111B |
|  | Solder/tab | $\uparrow$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \times 2 \\ & 2 \mathrm{NO}+2 \mathrm{NC} \times 2 \end{aligned}$ | AR30A1H-1010B AR30A1H-2020B | AR30A6H-1010B <br> AR30A6H-2020B |
|  |  |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \times 4 \\ & 2 \mathrm{NO}+2 \mathrm{NC} \times 4 \end{aligned}$ | AR30A1H-1111B AR30A1H-2222B | AR30A6H-1111B AR30A6H-2222B |
| Rubber cap type without lock | Screw | $\downarrow$ | $\begin{aligned} & 1 \mathrm{NO} \times 2 \\ & 1 \mathrm{NO}+1 \mathrm{NC} \times 2 \end{aligned}$ | AR30A2N-AOAOB AR30A2N-1010B | AR30A7N-A0A0B AR30A7N-1010B |
|  |  |  | $\begin{aligned} & 1 \mathrm{NO} \times 4 \\ & 1 \mathrm{NO}+1 \mathrm{NC} \times 4 \end{aligned}$ | AR30A2N-AAAAB AR30A2N-1111B | AR30A7N-AAAAB AR30A7N-1111B |
|  | Solder/tab | $\uparrow$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \times 2 \\ & 2 \mathrm{NO}+2 \mathrm{NC} \times 2 \end{aligned}$ | AR30A2H-1010B <br> AR30A2H-2020B | AR30A7H-1010B AR30A7H-2020B |
|  |  |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \times 4 \\ & 2 \mathrm{NO}+2 \mathrm{NC} \times 4 \end{aligned}$ | AR30A2H-1111B AR30A2H-2222B | AR30A7H-1111B AR30A7H-2222B |

- Operating direction
- Directions other than those shown in the table above can be provided.
- For types AR30A $\square$ N- 1 2 3 B, designate the contact arrangement codes for the necessary operating directions (1): Upper, 2) : Right, 3): Lower, 4: Left). Designate "0" for unnecessary directions.


## - Contact arrangement

| Contact arrangement | - | 1NO | 1NC | 1NO+1NC | 2NO | 2NC | 2NO+2NC |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Manual return | Screw | 0 | A | B | 1 | D | E | - |
| Spring return | Solder/Tab | 0 | - | - | 1 | - | - | 2 |

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



## ■ Buzzers

| Sound | Description | Transformer | Operating voltage | Type |
| :---: | :---: | :---: | :---: | :---: |
| Electronic sound <br> KKD08-058 | - LED operation indicator (Red) <br> - Intermittent/continuous sound selection <br> - Sound level: $90 \mathrm{~dB}(0.1 \mathrm{~m})$ 70 dB (1m) | Without | $\begin{array}{\|l\|} \hline 6 \mathrm{~V} \mathrm{AC} \\ 6 \mathrm{~V} \text { DC } \\ 12 \text { to } 24 \mathrm{~V} \mathrm{AC/DC} \\ 35 \text { to } 48 \mathrm{~V} \mathrm{AC/DC} \\ \hline \end{array}$ | DR30B5-AB <br> DR30B5-6B <br> DR30B5-EB <br> DR30B5-FB |
|  |  | With | 100 to 110 V AC 200 to 220 V AC | DR30B5-HB DR30B5-MB |
|  |  | With resistor unit | 100 to 110V DC | DR30B5-1B |
| Electronic sound (economy) | - Sound level: 90dB (0.1m) 70 dB (1m) | Without | $\begin{aligned} & \hline 6 \mathrm{~V} \text { DC } \\ & 24 \mathrm{~V} \mathrm{AC} \\ & 24 \mathrm{~V} D C \end{aligned}$ | DR30B6-6B <br> DR30B6-GB <br> DR30B6-EB |
|  |  | With | 100 to 110 V AC 200 to 220 V AC | DR30B6-HB DR30B6-MB |
|  | - Sound level: $90 \mathrm{~dB}(0.1 \mathrm{~m})$ $70 \mathrm{~dB}(1 \mathrm{~m})$ | Without | 100 to 110 V AC 200 to 220 V AC | DR30B0-HB DR30B0-MB |
| Electronic sound (IP54) <br> AF96-245 | - Intermittent/continuous sound selection <br> - Sound level: $80 \mathrm{~dB}(0.1 \mathrm{~m})$ $60 \mathrm{~dB}(1 \mathrm{~m})$ | Without | $\begin{aligned} & 6 \mathrm{~V} \mathrm{AC} \\ & 6 \mathrm{~V} \text { DC } \\ & 12 \text { to } 24 \mathrm{~V} \mathrm{AC/DC} \\ & 35 \text { to } 48 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | DR30B8-AB <br> DR30B8-6B <br> DR30B8-EB <br> DR30B8-FB |
|  |  | With | 100 to 110 V AC 200 to 220 V AC | DR30B8-HB DR30B8-MB |
|  |  | 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 $\rightarrow$ Intermittent sound
-Short-circuit terminal not mounted $\rightarrow$ Continuous sound

## Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AR30 and DR30 <br> Dimensions

## $\square$ Dimensions, mm

## - Illuminated pushbuttons

## Extended

With transformer


Extended with transparent full guard ( 24 mm dia.)


Without transformer


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


Extended with full guard ( 24 mm dia.)


[^15]
## ■ Dimensions, mm

## - Illuminated pushbuttons

Push-lock, turn-reset (40mm dia. with white arrow)
With transformer
Without transformer


Push-pull
With transformer


Without transformer


Note: ${ }^{* 1}$ Except for the types 110V AC, 127V AC and 220V AC.

## ■ Dimensions, mm

## - Pushbuttons

Flush/Extended

## Mushroom (40mm dia.)

AR30F0R, F5R, FAR,


Mushroom (29mm dia.)


Extended with full guard (24mm dia.)


Extended with half guard


AR30G0R, G5R


Mushroom with full guard ( 40 mm dia.)


AR30M3R, M8R


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


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

■ Dimensions, mm

## - Pushbuttons

Giant


## Giant with guard

AR30B1R


04

## Giant with full guard

AR30B2R


Pushbutton with selector ring (2-position)
AR30S1R, S2R, S3R, S6R


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


## Giant with full guard



## Push, turn-lock



Note:
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.

## Emergency operating cap



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

## Dimensions

## $\square$ Dimensions, mm

- Emergency stop pushbuttons

Push-lock, turn-reset (40mm dia.)
Push-lock, turn-reset ( 65 mm dia. with white allow)


AR30V1R


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


AR30Q2R


## - Emergency stop illuminated pushbuttons

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

With transformer


AR30VOL, V2L


Without transformer


AR30VOL, V2L


Notes: $\quad{ }^{* 1}$ Except for the types 110 V AC, 127V AC and 220 V AC. ${ }^{* 2}$ AR30V2L type

## ■ Dimensions, mm

## - Selector switches



AR30JR, JCR, JAR


- Lever type selector switches


AR30HR-2


AR30HR-3


AR30HR-1


## - Illuminated selector switches

Knob
With transformer


Without transformer


Notes: ${ }^{* 1}$ Except for the types 110 V AC, 127 V AC and 220 V AC.

## Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AR30 and DR30 <br> Dimensions

## $\square$ Dimensions, mm

## - Pilot lights

## Dome

With transformer, with resistor unit


With resistor LED, incandecent (50V DC)


Short-body / with transformer


## Extended

With transformer, with resistor unit


Short-body / with transformer


Notes: $\quad{ }^{* 1}$ Except for the types 110V AC, 127V AC and 220 V AC. ${ }^{* 2}$ Incandecent (50V DC) type only

## ■ Dimensions, mm

- Pilot lights


## Faceted

With transformer, with resistor unit


With resistor LED, incandescent (50V DC)


Without transformer


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


DR30K0L


Short-body / with transformer


DR30KOL


## Dome with dimmer control



DR30D1L


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 <br> AR30 and DR30 <br> Dimensions

## $\square$ Dimensions, mm

## - Pilot lights

Flush square ( 34 mm sq. transparent lens)

With transformer, with resistor unit


Without transformer


DR30F4M


Flush rectangular (Transparent lens)
With transformer, with resistor unit


Without transformer


DR30F4N


Flush square ( 40 mm sq. transparent lens)

With transformer, with resistor unit


Without transformer


DR30M4M


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: AR30ADH


Solder/tab terminal


## Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AR30 and DR30 <br> Dimensions

## $\square$ Dimensions, mm

## - Buzzers

Electronic sound
With transformer
DR30B5, B6
Without transformer
DR30B5, B6


## Magnetic sound



## Electronic sound (IP54)

With transformer


DR30B8


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, 4.8 mm -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 $2 \mathrm{~N} \cdot \mathrm{~m}$.
2. AR30V0R, VOL, 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


The center button can be attached or removed using the C portion of the AR9A004 tightening wrench as well.

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.

Fig. 5
Small flathead screwdriver
(I-shaped, 4mm wide)

4. AR30MOR, 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 $0.5 \mathrm{~N} \cdot \mathrm{~m}$ )


## 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 $0.5 \mathrm{~N} \cdot \mathrm{~m}$ )
(4) Screw in the button by hand, making sure that it is screwed in all the way.
(Recommended tightening torque: 0.3 to $0.5 \mathrm{~N} \cdot \mathrm{~m}$ )
(5) Loosen and remove the guard ring by hand. (Recommended tightening torque: 1.5 to $2.5 \mathrm{~N} \cdot \mathrm{~m}$ )

Fig. 7


## Notes on use

## 6. AR30N0R, V1R, Q2R

(1) 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: N0R, V1R 0.5 to $1.0 \mathrm{~N} \cdot \mathrm{~m}$ Q2R 0.3 to $0.5 \mathrm{~N} \cdot \mathrm{~m}$
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 $\mathrm{N} \cdot \mathrm{m}$ )
(4) Attach and secure the button with the AR9A001 wrench. (Recommended tightening torque: 0.3 to $0.5 \mathrm{~N} \cdot \mathrm{~m}$ )

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 $1.5 \mathrm{~N} \cdot \mathrm{~m}$
(2) For pilot lights with transformers and resistance units, remove the transformer or resistance unit in advance. (Fig.10)

Fig. 10

9. Mounting a 22 mm -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 30 mm -dia. command switch using an adapter
As shown in Fig. 11, mount an adapter and packing onto a 22 mm -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 $1.5 \mathrm{~N} \cdot \mathrm{~m}$.

- Panel thickness: 2.5 to 5 mm

This adapter can be used with the following 22 mm -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.

Fig. 13

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 $2.5 \mathrm{~N} \cdot \mathrm{~m}$ )
(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 $5-\mathrm{mm}$ 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 $2.5 \mathrm{~N} \cdot \mathrm{~m}$.

Fig. 15


## Degree of protection

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

## - Applicable panel thickness

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

| Switch mounting condition |  |
| :--- | :---: |
| Without accessories | 1 to 6 mm |
| With accessories | AR9Y003 adapter |

## $■$ 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 <br> including lock-ring and <br> legend plate thicknesses | Number of packings |
| 1.0 mm to less than 2.0 mm |  |
| 2.0 mm to less than 3.6 mm |  |
| 3.6 mm to less than 5.0 mm |  |
| 5.0 mm to less than 6.0 mm |  |

## - 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: 55 mm
${ }^{* 2}$ AR30B $\square R$, GPR, V1R: 80 mm

| Type | $* 3$ | $* 4$ |
| :--- | :--- | :--- |
| F4M | 34 | 34 |
| F4N (Vertical lengthwise mounting) | 40 | 34 |
| $\quad$ (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

| Description | Type |
| :---: | :---: |
| Wrench | AR9A004 <br> Dimensions, mm: $30 \times 100 \times 6.5$ <br> Remarks <br> Section "A" <br> Use this section to tighten the nut for mounting the operator on a panel. <br> Section "B" <br> Use this section to tighten or remove the lens. <br> Applicable type: <br> AR22F0L, F5L, E0L, E5L, F0P, F5P, E0P, E5P <br> AR22G1L, G2L, G4L, G6L, G7L, G9L <br> DR22E3L, E3P <br> AR30E0L, E5L, G2L, G3L, G4L, G7L, G8L, G9L DR30E3L <br> Section "C" <br> Fit the tabs on the section " $C$ " in the center button, and turn the wrench to tighten or remove the button. <br> Applicable type: <br> AR22V (except V4R, VG type) <br> AR30V (except V1R type) |
| Wrench for AR22, DR22 | AR9A701 <br> Dimensions, mm: $ø 28 \times 70$ <br> Application: <br> AR22, DR22 nut tightening |
| Wrench | AHX536 <br> Dimensions, mm: $\varnothing 32 \times 76$ <br> Application: <br> DR30F4M, F4N, M4M, N1, N2 nut tightening |
| Wrench <br> KK02-098A | AR9A001 <br> Dimensions, mm: $\varnothing 22 \times 35$ <br> Application: <br> 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 <br> Dimensions, mm: $\varnothing 18 \times 60$ <br> Application: <br> AR22V center button tightening (except V4R, VG type) AR30V center button tightening (except V1R type) |
| Wrench | AHX701 <br> Dimensions, mm: ø $25 \times 72.5$ <br> Application: <br> DR22N, AR22VG nut tightening |


| Description | Type <br> Wrench <br> (for center button) |
| :--- | :--- |
| AHX8003 <br> Dimensions, mm: $\varnothing 14 \times 50$ |  |
| Attaching and removing the center button of |  |
| the AR22VGF type. |  |

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| Description | Type |
| :--- | :--- |
| Key washer <br> for AR22, DR22 | AR9Y715 <br> Use this metal washer when securing a <br> operator in a 22.3mm dia. panel cutout hole. <br> Dimensions, mm: |

- When the periphery of the panel cutout 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 selector types).

| AF95-25 | selector types). |
| :---: | :---: |
| Key washer for ø30 | AHX082 <br> Use this metal washer when securing an operator in a 30.5 mm dia. panel cutout hole. <br> Dimension, mm: |
| Operator base cover <br> AF95-26 | AR9Y002 <br> Attach this cover to the operator base of a pushbutton switch with only one contact block (1NO or 1NC) to protect against dust. |
| Adapter for AR22, DR22 | AR9Y718 <br> Use this resin adapter to mount the AR22/ DR22 (switch/pilot light) in a 25.5 mm dia. cutout hole on a panel. <br> Dimensions, mm: |

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

| Description | Type |
| :--- | :--- |
| Adapter for | AR9Y008 |
| AR22 and DR22 | Use this resin adapter to mount the AR22/ |
|  | DR22 (switch/pilot light) in a 25.5mm dia. |
| cutout hole on a panel. |  |

Mounting, mm:

AF98-198
Adapter for
AR30 and DR30

AF95-416

## AR9Y003

Mount this adapter onto a 22 mm dia. command switch with a square button and a square bezel to obtain a 30mm dia. command switch with a square/round button and a square bezel.
A resin ring-packing and a nut are accessories of the adapter.
Dimensions, mm:


| Description | Type |
| :---: | :---: |
| Round-frame adapter for 30mm dia. types | AR9Y004 <br> By using this adapter in combination with the round type 22 mm dia. command switch, the 22 mm dia. command switch can be used as a 30 mm dia. command switch/ round frame type. <br> Used with: AR22, DR22 round types (except for M3R, M8R,VG $\square$, Joy stick selectors, buzzers) <br> Dimensions, mm <br> Note: Panel thickness: 2.5 to 5 mm |
| Round-frame adapter for 30mm dia. type VG | AHX958 <br> Using this adapter in combination with model AR22VG (22mm dia.) allows mounting to a 30.5 mm panel cutout hole. <br> The attachment method is as follows. <br> - The washer and nut ( 22.3 mm dia.) originally attached to the operator will not be used, so remove them. <br> - Attach the 22 mm dia. packing (included), the 30 mm dia. adapter and the 30 mm dia. packing to the operator in that order, and insert the operator into the cutout hole. <br> - From the back of the panel cutout hole, fasten the 30mm-dia. nut using the AHX701 wrench. The correct tightening torque is 1 to $1.5 \mathrm{~N} \cdot \mathrm{~m}$. <br> ${ }^{* 1}$ Adapter for 30 mm dia. (AHX958) |

Panel cutout, mm:


Dimensions, mm



Packing for
30 mm dia


| Description | Type |  |
| :---: | :---: | :---: |
| Legend plate for AR22 | AR9P711-(1)(2)(3) <br> (1) Color <br> B: Black <br> A: Aluminum | This aluminum legend plate is for a 22.3 mm dia. panel cutout hole. (Packing provided) |
|  | Legend Code  <br>  (2)  <br> (3)   |  |
|  | Blank 0 0 <br> ON 0 A <br> OFF 0 B <br> START 0 C <br> STOP 0 D <br> OFF-ON 2 A |  |
|  | Dimensions, mm: |  |
|  | AR9P711-B | AR9P711-A |
|  |  |  |
| Legend plate for AR22 | AR9P712-(1)(2)(3) <br> (1) Color <br> B: Black <br> A: Partially black | This aluminum legend plate is for a 22.3 mm dia. panel cutout hole. (Packing |
|  | Legend ${ }^{\text {Code }}$ <br>  (2) |  |
| $\square$ | Blank 0 0 <br> ON 0 A <br> OFF 0 B <br> START 0 C <br> STOP 0 D <br> OFF-ON 2 A |  |
|  | Dimensions, mm: |  |
| S1-1032 | AR9P712-B | AR9P712-A <br> Thickness: 0.8 mm |



Dimensions, mm:
AR9P719


Thickness: 0.8 mm

Pushbuttons/Selectors/Pilot Lights
AR22/DR22 and AR30/DR30
Accessories
Description
Legend plate for AR22
(width: 34mm)
Legend plate with name plate for AR22

AR9P007


\begin{tabular}{|c|c|}
\hline Description \& Type \\
\hline \multirow[t]{4}{*}{Legend plate for AR30} \& \begin{tabular}{ll} 
AHX177-(1)(2)(4) \& \begin{tabular}{l} 
This legend plate is \\
(1) Material and \\
color
\end{tabular} \\
\& panel cutout dole.
\end{tabular} \\
\hline \& Code Material Color \\
\hline \& \begin{tabular}{lll} 
S \& Brass \& Silver \\
B \& Aluminum \& Black \\
A \& \& Aluminum
\end{tabular} \\
\hline \& \begin{tabular}{l}
(2) Size \\
H: Standard \\
S: Short size
\end{tabular} \\
\hline \multirow{2}{*}{Y-1545} \& \begin{tabular}{lll} 
Legend \& Code \\
\& (3) \\
\hline
\end{tabular} \\
\hline \& \begin{tabular}{lll} 
\& \\
Blank \& 0 \& 0 \\
ON \& 0 \& A \\
OFF \& 0 \& B \\
START \& 0 \& C \\
STOP \& 0 \& D \\
OFF-ON \& 2 \& A
\end{tabular} \\
\hline AF89-466

AF87-49 \& | Dimensions, mm: AHX177 |
| :--- |
| Thickness: 0.6 mm | <br>

\hline \multirow[t]{5}{*}{Legend plate for AR30 emergency stop} \& | AHX720-(1)(2) | This aluminum legend <br> Plate is for a 30.5mm dia. <br> Plate |
| :--- | :--- |
| Yellow | panel cutout hole. | <br>


\hline \& | Legend | Code <br>  <br>  (1) | (2) | Letter |
| :--- | :--- | :--- | :--- |
|  | hight |  |  | <br>

\hline \& Blank 0 0 - <br>

\hline \& | EMERGENCY | 5 | A | 7 mm |
| :--- | :--- | :--- | :--- |
| STOP |  |  |  | <br>

\hline \& Dimensions, mm: <br>
\hline SK-598 \& Note: Engraving for making letters is not available. <br>
\hline
\end{tabular}

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| Description | Type |
| :---: | :---: |
| Panel plug for AR22 and DR22 | Round: <br> AHX725-B Black <br> AHX725-H Gray <br> Square: <br> AHX726-B Black <br> AHX726-H Gray <br> Dimensions, mm: ø29.5 x 17 (AHX725) <br> 29.5 sq. x 17 (AHX726) <br> Use this plug to cover up unused panel cutout holes. <br> For oil proof usage, use together with packing (AR9Y730) and a nut (AR9R744). |
| Panel plug for AR30 and DR30 | AHX004 <br> Color: Silver (metal) <br> This plug is used to cover up unused panel cutout hole. <br> Dimensions, mm: |



Pushbuttons/Selectors/Pilot Lights

## AR22/DR22 and AR30/DR30

Accessories





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


Do not use the LED lamp for other types.


Replace the $\square$ mark by the luminous color

| Code <br> Luminous <br> color |  |  | Yellow |
| :--- | :--- | :--- | :--- | Red $\quad$ Green $\quad$| Code | Y | R | G |
| :--- | :--- | :--- | :--- |
| Lens color | Y | R | G |


| Luminous <br> color | Amber | Orange |
| :--- | :--- | :--- |
| Code | Y | W |
| Lens color | Y | W |

Dimensions, mm:


Lamp base: BA9s/13
Do not use the LED lamp for other types.

| Description | Type |
| :---: | :---: |
| Incandescent lamp | Type Lamp <br> voltage Rated voltage, <br> consumption |
|  | AHX135 $5.5 \mathrm{~V} \mathrm{AC/DC}$ $6.3 \mathrm{~V} \mathrm{AC/DC}$, <br>    <br>  1 W  |
|  | $\begin{array}{lll}\text { AHX279 } & \\ & 15 \mathrm{~V} \text { AC/DC } & 18 \mathrm{~V} \text { AC/DC, } \\ & \\ 1 \mathrm{~W}\end{array}$ |
|  | $\begin{array}{lll}\text { AHX144 } 20 \mathrm{~V} \text { AC/DC } & 24 \mathrm{~V} \text { AC/DC, } \\ & & 1 \mathrm{~W}\end{array}$ |
|  | $\text { AHX129 } 24 \mathrm{~V} \text { AC/DC } \begin{aligned} & 30 \mathrm{~V} \text { AC/DC, } \\ & 1 \mathrm{~W} \end{aligned}$ |
|  | Dimensions, mm: <br> Lamp base: BA9s/13 |
| Incandescent lamp (for DR30 with resistor) | Type Lamp <br> voltage Rated voltage, <br> consumption |
|  | $\begin{array}{lll} \hline \text { AHX130 } & 15 \mathrm{~V} \mathrm{AC/DC} & \begin{array}{l} 18 \mathrm{~V} \text { AC/DC, } \\ 2 W \end{array} \end{array}$ |
|  | Dimensions, mm: <br> Lamp base: E12/15 |
| Contact block (1NO) | AR9B290 <br> Standard <br> AR9B290-S Overlap <br> Color: Blue <br> Dimensions, mm: $19.3 \times 29 \times 27$ <br> Note: Terminal cover is not supplied with this. |
| Contact block (1NC) | AR9B291 <br> Standard <br> AR9B291-S Overlap <br> Color: Red <br> Dimensions, mm: $19.3 \times 29 \times 27$ <br> Note: Terminal cover is not supplied with this. |
| Lamp terminal | AR9B292 <br> Color: Black <br> Dimensions, mm: $19.3 \times 29 \times 27$ <br> Note: Terminal cover is not supplied with this. |



AR9D002-1


AR9D002-2


| Transformer unit | Type | Primary voltage | Used with |
| :---: | :---: | :---: | :---: |
|  | AR9T511-H | 100-110V AC | Standard type (except buzzers) |
|  | AR9T511-L | 115-127V AC |  |
|  | AR9T511-M | 200-220V AC |  |
|  | AR9T511-Q | $230-254 \mathrm{~V}$ AC |  |
|  | AR9T511-S | $350-380 \mathrm{~V}$ AC |  |
|  | AR9T511-T | 400-440V AC |  |
|  | AR9T511-V | 480 V AC |  |
|  | AR9T511-W | 500-550V AC |  |
|  | AR9T557-H | 100-110V AC | $\begin{aligned} & \text { DR30F4N, F4M, } \\ & \text { M4M } \end{aligned}$ |
|  | AR9T557-L | 115-127V AC |  |
|  | AR9T557-M | 200-220V AC |  |
| AF94-457 | AR9T557-Q | $230-254 \mathrm{~V}$ AC |  |
|  | AR9T557-S | $350-380 \mathrm{~V}$ AC |  |
|  | AR9T557-T | 400-440V AC |  |
|  | AR9T557-V | 480 V AC |  |
|  | AR9T557-W | 500-550V AC |  |
|  | Dimensions, mm: |  |  |
|  | Up to $220 \mathrm{~V} 22.4 \times 30 \times 45$ |  |  |
|  | Over 220 V $25.3 \times 29 \times 48$ |  |  |
|  | Note: With terminal cover |  |  |

## Pushbuttons/Selectors/Pilot Lights

AR22/DR22 and AR30/DR30
Accessories


| Description | Type |
| :---: | :---: |
| Nut for 30mm dia. types (Resin types are black, metallic types are silver.) <br> KK2-120A <br> KK2-121A <br> KK2-122A <br> KK2-123A | AR9R001:Resin types are black (standard) <br> AHX088: Metallic types are silver <br> Used with: <br> AR30F0R, F5R, FAR, FBR, E0R, E5R, EAR, <br> EBR, E0L, E5L, Q7L <br> DR30D0L, E3L, KOL <br> AR9R002: Resin types are black (standard) <br> AHX093: Metallic types are silver <br> Used with: <br> AR30M0R, M5R, M4R, G0R, G5R, N0R, $S \square R, V \square R, ~ Q 2 R, V \square L, ~ P R, ~ P C R, W R, W C R$, JR, JCR, JAR, PL, A $\square \mathrm{N}, ~ A \square H$ |
| Water-tight cap for 22 mm dia. types | AR9D797-[ <br> This rubber cap protects the operator and switch mechanism against dust and water. Use this cap in a dusty or moist environment. <br> Used with: <br> AR22E0L,E5L <br> AR22E0R, E5R <br> Replace the $\square$ mark by the luminous color code. <br> Dimensions, mm: |
| Water-tight cap for 30 mm dia. types | AHX052 <br> 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. <br> Used with: <br> AR30E $\square R$, $\mathrm{E} \square \mathrm{L}$ <br> Dimensions, mm: $ø 36 \times 22.5$ |

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## 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 | Type | Color |  |
| :--- | :--- | :--- | :--- |
| Guardring | AR9R008 |  | Yellow |
| Legend plate for AR9R008 |  |  |  |
| emergency off |  |  |  |

Emergency stop pushbutton switches

| Operator | Contact | Type | Color |
| :---: | :---: | :---: | :---: |
| Push-lock, turn-reset ( 40 mm dia, with "EMO" charactor) | 1NC | AR22V3R-01RZ286 | Red <br> (White legend) |
|  | 1NO+1NC | AR22V3R-11RZ286 |  |
|  | 2NC | AR22V3R-02RZ286 |  |
|  | 1NO+2NC | AR22V3R-12RZ286 |  |
|  | 3NC | AR22V3R-03RZ286 |  |
|  | 1NO+3NC | AR22V3R-13RZ286 |  |
|  | $2 \mathrm{NO}+2 \mathrm{NC}$ | AR22V3R-22RZ286 |  |
| (KKD05-261) | 4NC | AR22V3R-04RZ286 |  |

[^16]
# Pushbuttons/Selectors/Pilot Lights/Buzzers AR22 Special products 

## ■ Dimensions, mm

- Guardring (AR9R008)

- Installation


Legend plate for emergency off (AR9P721-5C)


Note : • Engraving for marking letters is not available.

- Letter hight : 13 mm

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.

| Type | Panel <br> thickness | A (Reference) |  |
| :--- | :--- | :--- | :--- |
| AR22V2R | $1 \sim 2.5$ | 2mm | With AR9P721-5C |
| AR22V4R | $1 \sim 2.5$ | 2 mm | With AR9P721-5C |
| AR22V2L | $1 \sim 2.5$ | 2 mm | With AR9P721-5C |
| AR22VAL | $1 \sim 2.5$ | 2 mm | With AR9P721-5C |
| AR22V3R <br> $($ Z286 $)$ | $1 \sim 3.6$ | 3 mm |  |

- Panel cutout hole dimensions, mm


Emegency stop pushbutton switches (AR22V3R- $\square \square$ RZ286)


* Without accessories


## $\square$ 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 $\square$ Z8
AR30 $\square$ 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

| Type | Contact arrangement | Remarks |
| :---: | :---: | :---: |
| - Pushbuttons* ${ }^{*}$ <br> - Emergency stop pushbuttons *2 | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC}, \\ & 2 \mathrm{NO}^{* 5}, 2 \mathrm{NC} \end{aligned}$ | For use with a 1-step contact |
| - Selectors *3 | $\begin{aligned} & 1 \mathrm{NO}+3 \mathrm{NC}, 2 \mathrm{NO}+2 \mathrm{NC}, \\ & 3 \mathrm{NO}+1 \mathrm{NC}, 4 \mathrm{NO}+5.4 \mathrm{NC} \end{aligned}$ | For use with a 2-step contact |
| - Illuminated pushbuttons *4 (without transformer) | ${ }^{1 \mathrm{NO}^{* 6}, 1 \mathrm{NC}}$ | For use with a 1-step contact |
| - Emergency stop illuminated pushbuttons ${ }^{* 2}$ (without transformer) <br> - llluminated selectors (without transformer) | $\begin{aligned} & 1 \mathrm{NO}+2 \mathrm{NC}, 2 \mathrm{NO}+1 \mathrm{NC}, \\ & 3 \mathrm{NO}^{*}, 3 \mathrm{NC} \end{aligned}$ | For use with a 2-step contact |

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.

## $\square$ Type

AR22 $\square$ Z9, DR22 $\square$ Z9
AR30 $\square$ Z9, DR30 $\square$ 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 $\square$ ZB, DR22 $\square$ ZB
AR30 $\square$ ZB, DR30 $\square$ 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 shortbody 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)

■ Dimensions, mm


DR22/Without transformer


DR22/With transformer


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

## $\square$ Type

AR30 $\square$ ZM
DR30 $\square$ 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 ${ }^{\star 1}$, BOR ${ }^{\star 1}$, and HR ${ }^{* 1}$ types)
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 resins (plastics).

## $\square$ Type

AR22 $\square \mathrm{Z4}$, DR22 $\square \mathrm{Z4}$
AR30 $\square$ Z4, DR30 $\square$ Z4
Specify "Z4" at the end of the type number of the standard type.

## $\square$ 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 $37^{\circ} \mathrm{C}$
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

| Type | Without transformer |  |  | With transformer * |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{array}{\|l\|} \hline 1 \mathrm{NO} \\ (1 \mathrm{NC}) \end{array}$ |  | 2NO+2NC | $\begin{aligned} & \text { 1NO } \\ & \text { (1NC) } \end{aligned}$ | $\begin{aligned} & 2 \mathrm{NO} \\ & (2 \mathrm{NC}) \\ & (1 \mathrm{NO}+1 \mathrm{NC}) \end{aligned}$ |
| AR22F0L | 39 | 48 | 67 | 85 | 94 |
| F5L | 39 | 48 | - | 85 | 94 |
| F0M, FOP | 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: * 230 V and over : +17grams

## - Pushbuttons

| Type | 1 NO <br> $(1 \mathrm{NC})$ | $2 N O$ <br> $(2 N C)$ <br> $(1 N O+1 N C)$ | $2 N O+2 N C$ |
| :--- | :---: | :---: | :---: |
| AR22F0R, FAR, F5R, FBR | 27 | 36 | 55 |
| E0R, EAR, F0S, F0Y, G0R | 28 | 37 | 56 |
| E5R, EBR, F5S, F5Y, G5R | 29 | 38 | 57 |
| E0S, E0Y, M4R, G2R | 29 | 40 | 59 |
| E5S, E5Y, M9R, G7R | - | 43 | 62 |
| M0R, M5R | 44 | 53 | 72 |
| S1R, S2R, S3R, S6R | 49 | 58 | 77 |
| M3R, M8R |  |  |  |
| V5R |  |  |  |

- Emergency stop pushbuttons

| Type | 1 NC | 2 NC <br> $(1 \mathrm{NO}+1 \mathrm{NC})$ | 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 | $\begin{array}{l}\text { Without transformer } \\ \text { 1NC }\end{array}$ |  | $\begin{array}{c}\text { With transformer * } \\ \text { 2NC } \\ (1 N O+1 N C)\end{array}$ |  |
| :---: | :---: | :---: | :---: | :---: | \(\left.\begin{array}{cccc}2 N C <br>

(1 N O+1 N C)\end{array}\right]\)

Note: * 230 V and over : +17grams

Pushbuttons/Selectors/Pilot Lights/Buzzers
AR22 and DR22

## Mass

- Mass, gram
- Pilot lights

| Type | Without transformer |  |  | With transformer |  |
| :--- | :---: | :---: | :---: | :---: | :--- |
| 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: * 230 V and over : +17grams

## - Selector switches

| Type | 1 NO <br> $(1 N C)$ | $2 N O$ <br> $(2 N C)$ <br> $(1 N O+1 N C)$ | 2NO+2NC |
| :--- | :---: | :---: | :---: |
| AR22PR | 30 | 39 | 58 |
| PCR | - | 39 | 58 |
| WR | - | 40 | 59 |
| WCR | - | 40 | 59 |
| RR, PY, WY | - | 41 | 60 |
| RCR, PCY, WCY | 33 | 41 | 60 |
| RY | - | 42 | 61 |
| RCY | 56 | 42 | 61 |
| JR, JAR | - | 65 | 83 |
| JCR | 57 | 65 | 83 |
| JY | - | 66 | 84 |
| JCY |  | 66 | 84 |

- Illuminated selector switches

| Type | Without transformer |  |  | With transformer * |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & 1 \mathrm{NO} \\ & (1 \mathrm{NC}) \end{aligned}$ | $\begin{aligned} & \text { 2NO } \\ & \text { (2NC) } \\ & \text { (1NO } \end{aligned}$ | $2 \mathrm{NO}+2 \mathrm{NC}$ | $\begin{aligned} & 1 \mathrm{NO} \\ & (1 \mathrm{NC}) \end{aligned}$ | $\begin{aligned} & 2 \mathrm{NO} \\ & (2 \mathrm{NC}) \\ & (1 \mathrm{NO}+1 \mathrm{NC}) \end{aligned}$ |
| AR22PL | 42 | 51 | 70 | 88 | 97 |
| PP | 43 | 52 | 71 | 89 | 98 |

Note: * 230 V and over : +17grams

- Joy stick selector switches
- Screw terminal types

| Type | 1NO $\times 2$ | $(1 N O+1 N C) \times 2$ | 1 NO $\times 4$ | $(1 N O+1 N C) \times 4$ |
| :--- | :---: | :---: | :--- | :--- |
| AR22A2N, A7N | 89 | 99 | 116 | 136 |
| AON, A5N | 99 | 109 | 126 | 146 |
| A1N, A6N | 112 | 122 | 139 | 159 |

- Solder/tab terminal types

| Type | $(1 \mathrm{NO}+1 \mathrm{NC}) \times 2$ | $(2 \mathrm{NO}+2 \mathrm{NC}) \times 2$ | $(1 \mathrm{NO}+1 \mathrm{NC}) \times 4$ | $(2 \mathrm{NO}+2 \mathrm{NC}) \times 4$ |
| :--- | :---: | :---: | :---: | :---: |
| AR22A2H, A7H | 72 | 75 | 82 | 88 |
| AOH, A5H | 82 | 85 | 92 | 98 |
| A1H, A6H | 95 | 98 | 105 | 111 |

## - Buzzers

| Type | Without transformer | With transformer | With resistor unit |
| :--- | :---: | :--- | :---: |
| DR22B5 | 50 | 105 | 52 |
| B8 | 53 | 108 | 55 |
| B3 | 66 | 121 | - |

■ Mass, gram

- Illuminated pushbuttons

| Type | Without transformer |  |  | With transformer * |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \text { 1NO } \\ & (1 \mathrm{NC}) \end{aligned}$ | $\begin{aligned} & 2 \mathrm{NO} \\ & \text { (2NC) } \\ & \text { (1NO+ } \end{aligned}$ | 2NO+2NC | $\begin{gathered} 1 \mathrm{NO} \\ (1 \mathrm{NC}) \end{gathered}$ | 2NO <br> (2NC) <br> ( $1 \mathrm{NO}+1 \mathrm{NC}$ ) |
| 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: * 230 V and over : +17grams

- Pushbuttons

| Type | 1 NO <br> $(1 N C)$ | $2 N O$ <br> $(2 N C)$ <br> $(1 N O+1 N C)$ | 2NO+2NC |
| :--- | :---: | :---: | :---: |
| 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

| Type | 1 NC | 2 NC <br> $(1 \mathrm{NO}+1 \mathrm{NC})$ | $2 \mathrm{NO}+2 \mathrm{NC}$ |
| :--- | :---: | :---: | :---: |
| AR30V0R | 43 | 52 | 71 |
| Q2R | 45 | 54 | - |
| V2R | 46 | 55 | 74 |
| V1R | 60 | 69 | 88 |

- Emergency stop illuminated pushbuttons

| Type | Without transformer |  | With transformer * |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 1NC | $\begin{aligned} & 2 \mathrm{NC} \\ & (1 \mathrm{NO}+1 \mathrm{NC}) \end{aligned}$ | 1NC | $\begin{aligned} & 2 \mathrm{NC} \\ & (1 \mathrm{NO}+1 \mathrm{NC}) \end{aligned}$ |
| AR30V0L | 57 | 66 | 103 | 112 |
| V2L | 59 | 68 | 105 | 114 |

Note: * 230 V 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

| Type | Without transformer <br> Standard | With transformer <br> Standard | With <br> Short-body |
| :--- | :--- | :--- | :--- | :--- |
| resistor unit |  |  |  |

Notes: *1 230V and over : + 17 grams
*2 ( ): Incandescent lamp

| - With resistor type |  |  |
| :--- | :--- | :--- |
| Type | 50 V DC | 110 V DC |
|  |  | 220 V DC |
| DR30D0L, K0L (LED) | 103 | 103 |
| DOL, K0L (incandescent) | 107 | 179 |

## - Selector switches

| Type | 1 NO <br> (1NC) | 2NO <br> (2NC) <br> (1NO+1NC) | 2NO+2NC |
| :--- | :---: | :---: | :---: |
| AR30PR, WR | 41 | 50 | 69 |
| PCR, WCR | - | 50 | 69 |
| JR, JAR | 67 | 76 | 94 |
| JCR | - | 76 | 94 |
| HR | 125 | 135 | $153(166)$ |
|  |  |  |  |

- Illuminated selector switches

| Type | Without transformer |  |  | With transformer * |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{gathered} 1 \mathrm{NO} \\ (1 \mathrm{NC}) \end{gathered}$ | $\begin{aligned} & 2 \mathrm{NO} \\ & (2 \mathrm{NC} \\ & \hline \end{aligned}$ | 2NO+2NC | $\begin{aligned} & \text { 1NO } \\ & (1 \mathrm{NC}) \end{aligned}$ | 2NO <br> (2NC) <br> (1NO+1NC) |
| AR30PL | 52 | 61 | 80 | 98 | 107 |

Note: * 230 V and over : +17grams

## - Joy stick selector switches

- Screw terminal type

| Type | 1NO $\times 2$ | $(1 N O+1 N C) \times 2$ | 1 NO $\times 4$ | $(1 N O+1 N C) \times 4$ |
| :--- | :--- | :--- | :--- | :--- |
| AR30A2N, A7N | 100 | 110 | 127 | 147 |
| AON, A5N | 110 | 120 | 137 | 157 |
| A1N, A6N | 124 | 134 | 151 | 171 |

- Solder/tab terminal type

| Type | (1NO+1NC) x2 | $(2 \mathrm{NO}+2 \mathrm{NC}) \times 2$ | $(1 \mathrm{NO}+1 \mathrm{NC}) \times 4$ | $(2 \mathrm{NO}+2 \mathrm{NC}) \times 4$ |
| :--- | :---: | :---: | :---: | :---: |
| AR30A2H, A7H | 83 | 86 | 93 | 99 |
| AOH, 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 | - | - |

- 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 $: 28.4 \mathrm{~mm}$ deep
- Thin type $: 35.9 \mathrm{~mm}$ deep
- Emergency stop : 28mm deep





## A wide variety of sockets reduce wiring work

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.


## 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)
- 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.

Command Switches
AR16, DR16 and AF16, DF16 Quick reference guide

## ■ Illuminated pushbutton switches

| Operator |  |  | Flush rectangular |  | Flush rectangular with guard |  | Flush square |  | Extended round |  | Flush round |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Operator action |  |  | Momentary | Alternate | Momentary | Alternate | Momentary | Alternate | Momentary | Alternate | Momentary | Alternate |
| Standard type | Type |  | AR16F0N | AR16F5N | AR16G0N | AR16G5N | AR16F0M | AR16F5M | AR16E0L | AR16E5L | - | - |
|  | Appearance |  |  | $C \in \circlearrowleft$ |  | C $\in @$ |  | C $\in @$ | ${ }_{c} \mathrm{FB}_{\text {us }}$ | C $\in @$ |  |  |
|  | See page |  | 04/143 |  | 04/143 |  | 04/143 |  | 04/143 |  |  |  |
|  | Bezel (mm) |  | $\begin{aligned} & 1.24 \\ & \hline \\ & \hline \end{aligned}$ | $\rightarrow+\underset{\sim}{\rightarrow+1}$ |  | $\rightarrow \mid$ |  |  |  |  |  |  |
|  | Panel cutting (mm) |  |  | $\phi 16.2_{0}^{+0.2}$ |  |  |  |  |  |  |  |  |
| Thin type | Type |  | AF16F0N | AF16F5N | - | - | AF16F0M | AF16F5M |  |  | AF16F0L | AF16F5L |
|  | Appearance |  |  | C $\in$ @ |  |  |  | $\pm(\in \circlearrowleft$ |  |  |  | $C \in @$ |
|  | See page |  | 04/155 |  |  |  | 04/155 |  |  |  | 04/155 |  |
|  | Bezel (mm) |  |  | $\longrightarrow \underset{\sim}{n}$ |  |  |  |  |  |  |  |  |
|  | Panel cutting (mm) |  | $r^{24.2^{+}}$ |  |  |  |  | $\underbrace{19.2_{-0.1}^{+0.2} \mathrm{sq} .}$ |  |  |  | $\underbrace{\phi 19.2_{-0.1}^{+0.2}}$ |
| Legend plate (mm) |  |  | $19.6 \times 13.6$ |  | $19.6 \times 13.6$ |  | 13.6sq. |  | ¢13.6 |  | \$13.6 |  |
| Bezel color |  |  | Black |  |  |  |  |  |  |  |  |  |
| Button color (transparent) |  |  | Green, Red, White *1, Yellow, Orange, Blue |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { LED } \\ & \text { lamp } \end{aligned}$ | Color |  | Green, Red, Orange, Yellow, Amber, Blue |  |  |  |  |  |  |  |  |  |
|  | Lamp voltage |  | 6V AC/DC, 12V AC/DC, 24V AC/DC |  |  |  |  |  |  |  |  |  |
| Contact arrangement |  |  | SPDT, 2PDT |  |  |  |  |  |  |  |  |  |
| Contact rating |  |  | 120 V AC 1A (AC-13), 24V DC 0.7 A (DC-13, $\mathrm{T}_{0.95}=21 \mathrm{~ms}$ ) 240 V AC $0.7 \mathrm{~A}(\mathrm{AC}-13), 125 \mathrm{~V}$ DC 0.15 A (DC-13, $\left.\mathrm{T}_{0.95}=21 \mathrm{~ms}\right)$ |  |  |  |  |  |  |  |  |  |
| Mechanical durability |  |  | Momentary action: 1 million operations Alternate action: 250,000 operations |  |  |  |  |  |  |  |  |  |
| Electrical durability |  |  | 100,000 operations (220V AC 0.7A) |  |  |  |  |  |  |  |  |  |
| Degree of protection (Operator) |  |  | IP65 |  |  |  |  |  |  |  |  |  |
| Type of terminal |  |  | Tab (\#110) / solder dual-use terminal |  |  |  |  |  |  |  |  |  |
| Accessories | Protective cover ${ }^{2}$ |  |  | $)^{3}$ |  | 迷 |  | ${ }^{3}$ |  |  |  | - |
|  | Dust-proof cover |  |  | $0^{4}$ |  | - |  | ${ }^{4} 4$ |  |  |  |  |
|  | Terminal cover |  |  | $\bigcirc$ |  | ) |  | ) | O |  |  | ) |
|  | Socket | Quick connection |  | $\bigcirc$ |  |  |  |  |  |  |  |  |
|  |  | Connector use |  | O |  |  |  | ) |  |  |  |  |
|  |  | PC board use |  | $\bigcirc$ |  |  |  |  |  |  |  |  |
|  | Panel plug |  |  | O |  |  |  |  |  |  |  |  |

[^17]
## ■ Pushbutton switches

| Operator <br> Operator action |  |  | Flush rectangular |  | Flush rectangular with guard |  | Flush square |  | Extended round |  | Flush round |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Momentary | Alternate | Momentary | Alternate | Momentary | Alternate | Momentary | Alternate | Momentary | Alternate |
| Standard type | Type <br> Appearance |  | AR16F0T | AR16F5T | AR16GOT | AR16G5T | AR16F0S | AR16F5S | AR16E0R | AR16E5R | - | - |
|  |  |  |  | $\geqslant C \in \circlearrowleft$ |  | C © @ |  | $C \in \circlearrowleft$ |  | $C \in @$ |  |  |
|  | See page |  | 04/145 |  | 04/145 |  | 04/145 |  | 04/145 |  |  |  |
|  | Bezel (mm) |  |  |  | $\stackrel{24}{ }$ |  |  |  |  |  |  |  |
|  | Panel cutting (mm) |  |  | $\phi 16.2_{0}^{+0.2}$ |  |  |  |  |  |  |  |  |
| Thin type | Type |  | AF16F0T | AF16F5T | - | - | AF16F0S | AF16F5S |  |  | AF16F0R | AF16F5R |
|  | Appearance |  |  | $C \in \circlearrowleft$ |  |  |  | $C \in \circlearrowleft$ |  | - |  | $C \in \circlearrowleft$ |
|  | See page |  | 04/157 |  |  |  | 04/157 |  |  |  | 04/157 |  |
|  | Bezel (mm) |  | $\begin{array}{\|l}  \\ \hline \end{array}$ |  |  |  |  |  |  | - |  |  |
|  | Panel cutting (mm) |  |  |  |  |  |  |  |  | - |  | $\underbrace{\phi 19.2_{-0.1}^{+0.2}}$ |
| Legend plate (mm) |  |  | $19.6 \times 13.6$ |  | $19.6 \times 13.6$ |  | 13.6sq |  | ¢13.6 |  | ¢13.6 |  |
| Button color (transparent) |  |  | Black |  |  |  |  |  |  |  |  |  |
| Button color |  |  | Green, Red, Black *1, White ${ }^{\text {² }}$, Yellow, Orange, Blue |  |  |  |  |  |  |  |  |  |
| Contact arrangement |  |  | SPDT, 2PDT |  |  |  |  |  |  |  |  |  |
| Contact rating |  |  | 120 V AC 1A (AC-13), 24V DC 0.7A (DC-13, $\left.\mathrm{T}_{0.95}=21 \mathrm{~ms}\right)$ 240 V AC 0.7A (AC-13), 125V DC 0.15A (DC-13, $\mathrm{T}_{0.95}=21 \mathrm{~ms}$ ) |  |  |  |  |  |  |  |  |  |
| Mechanical durability |  |  | Momentary action: 1 million operations Alternate action: 250,000 operations |  |  |  |  |  |  |  |  |  |
| Electrical durability |  |  | 100,000 operations (220V AC 0.7A) |  |  |  |  |  |  |  |  |  |
| Degree of protection (Operator) |  |  | IP65 |  |  |  |  |  |  |  |  |  |
| Type of terminal |  |  | Tab (\#110) / solder dual-use terminal |  |  |  |  |  |  |  |  |  |
| Accessories | Protective cover ${ }^{3}$ |  |  | *4 |  | - |  | *4 | $\bigcirc$ |  | - |  |
|  | Dust-proof cover |  |  | ${ }^{*}$ |  | - |  | ${ }^{* 5}$ | $\bigcirc$ | O |  |  |
|  | Terminal cover |  |  | $\bigcirc$ |  |  |  |  | $\bigcirc$ |  |  |  |
|  | Socket | Quick connection |  |  |  |  |  |  | $\bigcirc$ |  |  |  |
|  |  | Connector use |  |  |  |  |  |  | $\bigcirc$ |  |  |  |
|  |  | PC board use |  |  |  |  |  |  |  |  |  |  |
|  | Panel plug |  |  | O |  |  |  |  | , |  |  |  |
| Notes: ${ }^{*}{ }^{+1}$ A combination of the translucent button and the black legend plate comes to black button.${ }^{4}$ A combination of the translucent button and the white legend plate comes to white button.${ }^{4}$ The protective cover of the thin type is available for momentary <br> action only. |  |  |  |  |  |  |  |  |  |  |  |  |

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Command Switches
AR16, DR16 and AF16, DF16
Quick reference guide

## ■ Pilot lights



[^18]■ Selector switches (Knob type)

| Operator |  |  | Knob with rectangular bezel | Knob with square bezel | Knob with round bezel |
| :---: | :---: | :---: | :---: | :---: | :---: |
| No. of position |  |  | 2-position, 3-position | 2-position, 3-position | 2-position, 3-position |
| Operator action |  |  | Maintained, Spring/manual return, Spring return | Maintained, Spring/manual return, Spring return | Maintained, Spring/manual return, Spring return |
| Standard type | Type |  | AR16PT | AR16PS | AR16PR |
|  | Appearance |  |  | ${ }^{T} \mathbb{N}_{\mathrm{uS}} \triangleq C \in \circlearrowleft$ |  $\mathrm{MN}_{\mathrm{us}} \triangleq(\in \mathbb{C}$ |
|  | See page |  | 04/149 | 04/149 | 04/149 |
|  | Bezel (mm) |  |  | $\begin{array}{\|c\|} \left.\right\|^{18 \mathrm{sq}} \\ \hline \\ \hline \end{array}$ |  |
|  | Panel cutting (mm) |  |  |  |  |
| Thin type | Type |  | AF16PT | AF16PS | AF16PR |
|  | Appearance |  | ${ }_{c} \mathbf{M D}_{\mathrm{us}} \triangleq(\in \mathbb{C}$ | $\mathcal{M N}_{\mathrm{us}} \triangleq C \in \circlearrowleft$ | $c \mathbb{M}_{u s} \triangleq C \in \lll c$ |
|  | See page |  | 04/161 | 04/161 | 04/161 |
|  | Bezel (mm) |  |  |  |  |
|  | Panel cutting (mm) |  |  |  |  |
| Bezel color |  |  | Black |  |  |
| Color of knob |  |  | Black |  |  |
| Contact arrangement |  |  | SPDT, 2PDT |  |  |
| Contact rating |  |  | 120 V AC 1A (AC-13), 24V DC 0.7 A (DC-13, $\mathrm{T}_{0.95}=21 \mathrm{~ms}$ ) 240 V AC 0.7 A (AC-13), 125V DC 0.15 A (DC-13, $\mathrm{T}_{0.95}=21 \mathrm{~ms}$ ) |  |  |
| Mechanical durability |  |  | 250,000 operations |  |  |
| Electrical durability |  |  | 100,000 operations (220V AC 0.7A) |  |  |
| Degree of protection (Operator) |  |  | IP65 |  |  |
| Type of terminal |  |  | Tab (\#110) / solder dual-use terminal |  |  |
| Accessories | Terminal cover |  | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  | Socket | Quick connection | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  |  | Connector use | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  |  | $\begin{aligned} & \text { PC board } \\ & \text { use } \\ & \hline \end{aligned}$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  | Panel plug |  | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |

## Command Switches <br> AR16, DR16 and AF16, DF16 <br> Quick reference guide

## ■ 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 action |  |  | Maintained, Spring/manual return, Spring return | Maintained, Spring/manual return, Spring return | Maintained, Spring/manual return, Spring return |
| Standard type | Type |  | AR16JT | AR16JS | AR16JR |
|  | Appearance |  | $\mathrm{ND}_{\mathrm{us}} \triangleq C \in @$ | $\mathrm{AD}_{\mathrm{us}} \triangleq(\in 巛$ | $\mathrm{AD}_{\mathrm{us}} \triangleq(\in 巛$ |
|  | See page |  | 04/152 | 04/152 | 04/152 |
|  | Bezel (mm) |  |  |  |  |
|  | Panel cutting (mm) |  |  |  |  |
| Thin type | Type |  | AF16JT | AF16JS | AF16JR |
|  | Appearance |  | $\mathrm{ND}_{\mathrm{us}} \triangleq(\in \circlearrowleft$ | $\mathrm{AD}_{\mathrm{us}} \triangleq C \in \Subset$ | $\mathcal{M N}_{\mathrm{us}} \triangleq C \in \Subset$ |
|  | See page |  | 04/164 | 04/164 | 04/164 |
|  | Bezel (mm) |  |  |  |  |
|  | Panel cutting (mm) |  |  |  |  |
| Bezel color |  |  | Black |  |  |
| Key removable position |  |  | Left (A), Left/Right (B), Left/Center/Right (C), Right (D), Center (E), Center/Right (F), Left/Center (G) |  |  |
| No. of key types |  |  | 6 (A, B, C, D, E, F) |  |  |
| Contact arrangement |  |  | SPDT, 2PDT |  |  |
| Contact rating |  |  | 120 V AC 1A (AC-13), 24V DC 0.7 A (DC-13, $\mathrm{T}_{0.95}=21 \mathrm{~ms}$ ) 240 V AC $0.7 \mathrm{~A}(\mathrm{AC}-13), 125 \mathrm{~V}$ DC $0.15 \mathrm{~A}\left(\mathrm{DC}-13, \mathrm{~T}_{0.95}=21 \mathrm{~ms}\right)$ |  |  |
| Mechanical durability |  |  | 250,000 operations |  |  |
| Electrical durability |  |  | 100,000 operations (220V AC 0.7A) |  |  |
| Degree of protection (Operator) |  |  | IP65 |  |  |
| Type of terminal |  |  | Tab (\#110) / solder dual-use terminal |  |  |
| Accessories | Terminal cover |  | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  | Socket | Quick connection | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  |  | Connector use | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  |  | PC board use | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  | Panel plug |  | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |

## ■ Emergency stop pushbutton switches

| Operator |  | $\begin{array}{l}\text { Illuminated push-lock } \\ \text { (32mm dia) }\end{array}$ | Illuminated push-lock (40mm dia) | Push-lock (32mm dia) | Push-lock (40mm dia) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Operator action |  | Turn reset or pull-reset |  | Turn reset or pull-reset |  |
| Type |  | AR16V0L | AR16V1L | AR16V0R | AR16V1R |
| Appearance |  | ${ }^{-1} \mathbb{D}_{u s} \triangleq C \in \circlearrowleft$ |  |  |  |
| See page |  | 04/182 | 04/182 | 04/182 | 04/182 |
| Button size (mm) |  |  |  |  |  |
| Panel cutting (mm) |  |  |  |  |  |
| Button color |  | Red |  |  |  |
| LED lamp | Color | Red |  | - |  |
|  | Lamp voltage | 6V AC/DC, 12V AC/DC, 24V AC/DC |  | - |  |
| Contact arrangement |  | 1NC, 1NO+1NC, 2NC, 1NO+2NC, 3NC, 1NO+3NC, 4NC |  |  |  |
| Contact ratings |  | $\begin{array}{\|lll\|} \hline 120 \mathrm{~V} \text { AC } & 0.3 \mathrm{~A}(\mathrm{AC}-15), 24 \mathrm{~V} \text { DC } & 0.7 \mathrm{~A}(\mathrm{DC}-13), \\ 240 \mathrm{~V} \text { AC } & 0.3 \mathrm{~A}(\mathrm{AC}-15), 125 \mathrm{~V} \text { DC } & 0.15 \mathrm{~A}(\mathrm{DC}-13) \\ \hline \end{array}$ |  |  |  |
| Mechanical durability |  | 100,000 operations |  |  |  |
| Electrical durability |  | 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 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
|  | Name plate (Emergency stop) | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |

# Command Switches <br> AR16 and DR16, AF16 and DF16 <br> Ratings and Specifications 

## ■ Contact ratings

- UL/CSA
- AC (COSø = 0.35)

| Contact rating code | 120 V | 240 V |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | Making current | Breaking current | Making current | Breaking current |
| D300 | 3.6 A | 0.6 A | 1.8 A | 0.3 A |

-TÜV (EN60947-5-1), CCC (GB14048.5), JIS C 8201-5-1

| Type of switches | Conventional free air thermal current Ith | Rated operational current Ie |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Rated operational voltage Ue | AC |  | DC |  |
|  |  |  | AC-13 (Inductive load) | AC-12 <br> (Resistive load) | DC-13 (Inductive load) | $\begin{aligned} & \text { DC-12 } \\ & \text { (Resistive load) } \end{aligned}$ |
| Illuminated pushbutton switch Pushbutton switch Selector switch | 5A | 24V | - | - | $0.7 \mathrm{~A}^{* 1}$ | 1A |
|  |  | 120V | 1A | 1.5A | - | - |
|  |  | 125 V | - | - | $0.15 \mathrm{~A}^{* 1}$ | 0.2A |
|  |  | 240V | 0.7A | 1A | - | - |

## ■ Specifications (indoor use)

| Item |  | - Illuminated pushbutton switch, pushbutton switch | - Selector switch | - Pilot lights |
| :---: | :---: | :---: | :---: | :---: |
| Rated insulation voltage Ui |  | 250V AC/DC |  |  |
| 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 | V AC 0.7A) | - |
| Operating frequency |  | 1200 operations/hour (On-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 |  | $100 \mathrm{M} \Omega$ or more (500V DC megger) |  |  |
| Rated impulse withstand voltage Uimp |  | 2.5 kV |  |  |
| Conditional short-circuit current |  | 1000A |  |  |
| Short-circuit protective device |  | gG 2A (IEC60269 Fuse) |  |  |
| Pollution degree |  | 3 |  |  |
| Vibration |  | Resonance: frequency 10 to 55 Hz , double amplitude 1.0 mm Constant: frequency 16.7 Hz , double amplitude 3 mm |  |  |
| Shock |  | Malfunction durability; $100 \mathrm{~m} / \mathrm{s}^{2}$ <br> Mechanical durability; $500 \mathrm{~m} / \mathrm{s}^{2}$ |  |  |
| Operational ambient temperature |  | -10 to $+55^{\circ} \mathrm{C}$ (no icing or no condensation) |  |  |
| Storage temperature |  | -40 to $+70^{\circ} \mathrm{C}$ |  |  |
| Relative humidity (inside control panel) |  | 45 to $85 \% \mathrm{RH}\left(-5\right.$ to $+40^{\circ} \mathrm{C}$ ) (no icing or no condensation) |  |  |
| Degree of protection of operating (displaying) section |  | IP65 (dust-proof, water jet proof): IEC 60529 |  |  |
| Degree of protection of terminal section |  | IP2X (Fast-connection socket: AR6S690, Connector socket: AR6S691-C or Terminal cover: AR2Y261, At the connection) |  |  |

■ Specifications (Socket)

| Item | Fast-connection socket | Connector socket | Socket for PC board |
| :--- | :--- | :--- | :--- |
| Rated insulation voltage Ui | $250 \mathrm{~V} \mathrm{AC/DC}$ | $60 \mathrm{~V} \mathrm{AC/DC}$ |  |
| Conventional free air thermal current Ith | 3 A | 5 A | 3 A |
| Rated impulse withstand voltage Uimp | 2.5 kV | 0.5 kV |  |
| Withstand voltage (Between live section and grounding) | $2000 \mathrm{~V} \mathrm{AC}, 1$ minute | $1000 \mathrm{~V} \mathrm{AC}, 1 \mathrm{minute}$ |  |
| Insulation resistance | 100 MS or more (500V DC megger) |  |  |
| Operational ambient temperature | -10 to $+55^{\circ} \mathrm{C}$ (no icing or no condensation) |  |  |
| Storage temperature | -40 to $+70^{\circ} \mathrm{C}$ |  |  |
| Relative humidity | 45 to $85 \% \mathrm{RH}\left(-5\right.$ to $\left.+40^{\circ} \mathrm{C}\right)$ (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)

$$
\text { IP- } 65
$$

| Class | Degree of protection against human contact or penetration by a foreign object |  | Degree of protection against ingress of water |  |
| :---: | :---: | :---: | :---: | :---: |
| 5 |  | - Normal operation secured even if the dust that can pass through screen of $75 \mu \mathrm{~m}$ mesh invades. | Protection against water jets | - Protected against water jet from all directions. <br> - Water projected by nozzle (6.3mm-inner dia.) from all directions at 29.4 kPa for 3 min at a distance of 3 m . |
| 6 |  | - The dust which can pass through screen of $75 \mu \mathrm{~m}$ mesh shall not invade. | Protection against powerful water | - Protected against powerful water jet from all directions. <br> - Water projected by nozzle (12.5mm-inner dia.) from all directions at 98 kPa for 3 min at a distance of 3 m . |

## ■ Contact reliability

FUJI has confirmed that the product can be used in 1 mA circuit conditions at 5 V AC or DC . The operable range, however, may vary depending on the operational ambient conditions and type of load.

## Command Switches <br> AR16 and DR16, AF16 and DF16 <br> Specifications

Lamp ratings and current consumption

- Illuminated pushbutton switch, Pilot lights

| Applied method | Lamp operational voltage | High-brightness LED lamp |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Type | Lamp rated voltage | Current consumption |
| without transformer | 6V AC/DC | DR6L695-A $\square$ | 6V AC/DC | Green, Blue: $11 \mathrm{~mA} \mathrm{AC}, 7.5 \mathrm{~mA}$ DC Red, Amber: 9mA AC, 7.5mA DC Orange: $10 \mathrm{~mA} \mathrm{AC}, 8.5 \mathrm{~mA}$ DC Yellow: $30 \mathrm{~mA} A C, 26 \mathrm{~mA}$ DC |
|  | 12V AC/DC | DR6L695-B $\square$ | 12V AC/DC | Green, Red, Amber, Blue: 7.5mA AC, 7.5mA DC Orange: 9mA AC, 8.5 mA DC Yellow: 11mA AC, 8.5mA DC |
|  | 24V AC/DC | DR6L695-E $\square$ | 24V AC/DC | Green, Red, Amber, Blue: 7.5mA AC, 7.5 mA 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

| Illuminated pushbutton / pilot light color (lens color) |  | Luminous color of high-brightness LED lamp |  |
| :---: | :---: | :---: | :---: |
|  | Type |  | Type |
| Green | G | Green | DR6L695-[G |
| Red | R | Red | DR6L695-[R |
| White | W | Orange | DR6L695-■W |
| Yellow | Y | Yellow | DR6L695-■Y |
| Orange | A | Amber | DR6L695-■A |
| Blue | S | Blue | DR6L695-[S |

Note: ${ }^{41} \mathrm{~A}$ box $\boldsymbol{\square}$ 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 <br> Selector: R50116759 <br> Pilot lights: R50116762 |
| CCC: GB14048.5 | Switches (except pilot ligths): 2003010305071068 <br> 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.

## - Illuminated pushbutton switches



## - Pushbutton switches

Product category
AR16 FOT-C2 R

| Category | Code |
| :--- | :--- |
| Standard type | AR16 |
| Thin type | AF16 |

Operator shape and action

| Operator shape | Code |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | Standard type |  |  |  |
|  | Thin type |  |  |  |
|  | Momentary | Alternate | Momentary | Alternate |
| Flush rectangular | FOT | F5T | FOT | F5T |
| Flush rectangular with guard | GOT | G5T | - | - |
| Flush square | FOS | F5S | F0S | F5S |
| Extended round | EOR | E5R | - | - |
| Flush round | - | - | F0R | F5R |

Contact arrangement and terminal

| Contact <br> arrangement | Code | Type of terminal |
| :--- | :--- | :--- |
| SPDT | C1 | Tab (\#110) and <br> solder dual-use terminal |
| 2PDT | C2 | sol |

## Command Switches

## AR16 and DR16, AF16 and DF16

Type number nomenclature

- Pilot lights


Note: • The lens is transparent in color.
${ }^{1}$ : A combination of the transparent lens and the white legend plate comes to white (except for dome type)
Lamp operational voltage and light source

| Applied method | Voltage | Code |
| :--- | :--- | :--- |
|  |  | LED |
| Without |  |  |
|  | $6 \mathrm{~V} \mathrm{AC} / \mathrm{DC}$ | $\mathrm{A3}$ |
|  | $12 \mathrm{~V} \mathrm{AC} / \mathrm{DC}$ | $\mathrm{B3}$ |
|  | $24 \mathrm{~V} \mathrm{AC} / \mathrm{DC}$ | $\mathrm{E3}$ |

Note: The terminal used is a tab (\#110) and solder dual-use terminal.

## - Selector switches (Knob type)

|  |  |
| :--- | :--- |
| Product category |  |
| Category | Code |
| Standard type | AR16 |
| Thin type | AF16 |

Operator shape

| Operator shape | Code |
| :--- | :--- |
| Knob with rectangular bezel | PT |
| Knob with square bezel | PS |
| Knob with round bezel | PR |

AR16 PT-2 C1 B

Product category


Color of knob

| Color | Code |
| :--- | :--- |
| Black | B |

Contact arrangement and terminal

| Contact <br> arrangement | Code | Type of terminal |
| :--- | :--- | :--- |
| SPDT $^{\star 1}$ | C1 | Tab (\#110) and <br> solder dual-use terminal |
| 2PDT | C2 |  |



- Key position and contact operation

2-position


3-position

| Operator action (View form the front) |  |  |  | Contact arrangement | Contact unit |  | Operator position ${ }^{2}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3 | 6 | 7 | 1 |  |  |  | 1 | 2 | 3 |
| ${ }^{1} \quad{ }^{2}$ | $\underbrace{2}$ | $)^{2}$ |  | 2PDT | Left |  |  |  |  |
| Maintained/each $45^{\circ}$ | Spring/manual return/each $45^{\circ}$ | Spring/manual return/each $45^{\circ}$ | Spring return/ each $45^{\circ}$ |  | Right |  |  |  |  |

[^19]
## Command Switches <br> AR16 and DR16, AF16 and DF16 <br> Type number nomenclature

## - Selector switches (Key type)

| No. of <br> positions | Operator action | Code |
| :--- | :--- | :--- |
| 2-position $\left(90^{\circ}\right)$ | Maintained | $\mathbf{2}$ |
|  | Spring return <br> (Right to left) | $\mathbf{0}$ |
| 3-position (45 $)$ | Maintained | $\mathbf{3}$ |
|  | Spring/manual return <br> (Left to center) (© | $\mathbf{6}$ |
|  | Spring/manual return <br> (Right to center) (1) $)$ | $\mathbf{7}$ |
|  | Spring return <br> (Left or right to center) (©) $)$ | $\mathbf{1}$ |

-Key removable position

| Key removable position | Applicable operator action |  |  |  |  |  | Code |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 2 | 0 | 3 | 6 | 7 | 1 |  |
| Left ${ }^{(1)}$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - | A |
| Left and right* | $\bigcirc$ | - | $\bigcirc$ | - | - | - | B |
| Left, center and right $*$ | - | - | $\bigcirc$ | - | - | - | C |
| Right (1) | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | - | D |
| Center (1) | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | E |
| Center and right $\not \subset$ | - | - | $\bigcirc$ | $\bigcirc$ | - | - | F |
| Left and center ( ${ }^{(1)}$ | - | - | $\bigcirc$ | - | $\bigcirc$ | - | G |

## - Key position and contact operation

2-position

| Operator action (View form the front) |  | Contact arrangement | Contact unit |  | Operator position ${ }^{\text {³ }}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 | 0 |  |  |  | 1 | 2 |
|  |  | SPDT | Left |  | - |  |
|  |  | 2PDT | Left | $\mathrm{COM}<\mathrm{NC}$ | - |  |
| Maintained/ $90^{\circ}$ | Spring return $/ 90^{\circ}$ |  |  | NC | - |  |
|  |  |  | Right | $\bigcirc \mathrm{NO}$ |  |  |

Terminal arrangement View from the terminal side (the back)


3-position

| Operator action (View form the front) |  |  |  | Contact arrangement | Contact unit |  | Operator position ${ }^{\text {*3 }}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3 | 6 | 7 | 1 |  |  |  | 1 | 2 | 3 |
| ${ }^{1} \quad 3$ |  | + |  | 2PDT | Left |  |  |  |  |
| Maintained/each $45^{\circ}$ | Spring/manual return/each $45^{\circ}$ | Spring/manual return/each $45^{\circ}$ | Spring return/ each $45^{\circ}$ |  | Right |  |  |  |  |

[^20]1. Standard type, AR16 and DR16

Illuminated pushbutton switches (LED illuminated)

- Type number system

- Type

| Operator | Appearance <br> (Standard type) | Lamp operational voltage | Conntact arrangement | Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Flush rectangular | AR16F0N, F5N | 6V AC/DC | SPDT | AR16F0N-C1A3 $\square$ | AR16F5N-C1A3 $\square$ |
|  |  |  | 2PDT | AR16FON-C2A3 $\square$ | AR16F5N-C2A3 $\square$ |
|  |  | 12V AC/DC | SPDT | AR16FON-C1B3 $\square$ | AR16F5N-C1B3 $\square$ |
|  |  |  | 2PDT | AR16FON-C2B3 $\square$ | AR16F5N-C2B3 $\square$ |
|  |  | 24 V AC/DC | SPDT | AR16FON-C1E3 $\square$ | AR16F5N-C1E3 $\square$ |
|  |  |  | 2PDT | AR16FON-C2E3 $\square$ | AR16F5N-C2E3 $\square$ |
| Flush rectangular with guard | AR16G0N, G5N | 6V AC/DC | SPDT | AR16GON-C1A3 $\square$ | AR16G5N-C1A3 $\square$ |
|  |  |  | 2PDT | AR16GON-C2A3 $\square$ | AR16G5N-C2A3 $\square$ |
|  |  | 12 V AC/DC | SPDT | AR16GON-C1B3 $\square$ | AR16G5N-C1B3 $\square$ |
|  |  |  | 2PDT | AR16GON-C2B3 $\square$ | AR16G5N-C2B3 $\square$ |
|  |  | 24V AC/DC | SPDT | AR16GON-C1E3 $\square$ | AR16G5N-C1E3 $\square$ |
|  |  |  | 2PDT | AR16GON-C2E3 $\square$ | AR16G5N-C2E3 $\square$ |
| Flush square | AR16F0M, F5M | 6V AC/DC | SPDT | AR16F0M-C1A3 $\square$ | AR16F5M-C1A3 $\square$ |
|  |  |  | 2PDT | AR16F0M-C2A3 $\square$ | AR16F5M-C2A3 $\square$ |
|  |  | 12V AC/DC | SPDT | AR16F0M-C1B3 $\square$ | AR16F5M-C1B3 $\square$ |
|  |  |  | 2PDT | AR16F0M-C2B3 $\square$ | AR16F5M-C2B3 $\square$ |
|  |  | 24V AC/DC | SPDT | AR16F0M-C1E3 $\square$ | AR16F5M-C1E3 $\square$ |
|  |  |  | 2PDT | AR16FOM-C2E3 $\square$ | AR16F5M-C2E3 $\square$ |
| Extended round | AF16E0L, E5L | 6V AC/DC | SPDT | AR16E0L-C1A3 $\square$ | AR16E5L-C1A3 $\square$ |
|  |  |  | 2PDT | AR16E0L-C2A3 $\square$ | AR16E5L-C2A3 $\square$ |
|  |  | 12V AC/DC | SPDT | AR16E0L-C1B3 $\square$ | AR16E5L-C1B3 $\square$ |
|  |  |  | 2PDT | AR16E0L-C2B3 $\square$ | AR16E5L-C2B3 $\square$ |
|  |  | 24V AC/DC | SPDT | AR16E0L-C1E3 $\square$ | AR16E5L-C1E3 $\square$ |
|  |  |  | 2PDT | AR16E0L-C2E3 $\square$ | AR16E5L-C2E3 $\square$ |

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 $^{* 1}$ | Y | A | S |

[^21]Command Switches

## AR16 and DR16

Type numbers and dimensions

- Dimensions, mm


## Flush rectangular

 AR16F0N, F5N

Flush rectangular with guard AR16GON, G5N


## Flush square

AR16F0M, F5M


## Extended round

AR16E0L, E5L


## Pushbutton switches

- Type number system


| Type |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| Operator | Appearance <br> (Standard type) | Conntact <br> arrangement | Momentary action <br> Type | Alternate action <br> Type |
| Flush rectangular | AR16F0T, F5T | AR16FOT-C1 $\square$ | AR16F5T-C1 $\square$ |  |

Note: • 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 | $\mathrm{B}^{* 1}$ | $\mathrm{~W}^{*^{2}}$ | Y | A | S |

Notes: *1 A combination of the transparent button and the black legend plate comes to black.
${ }^{* 2} \mathrm{~A}$ combination of the transparent button and the white legend plate comes to white.

Command Switches

## 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


## Pilot lights (LED illuminated)

- Type number system

| DR16 DOL - E3 W |  |
| :--- | :--- | :--- |
| Product category: Standard type |  |
| Lens shape |  |
|  | Color of lens |
| Lamp operational voltage and |  |
| liaht source |  |


| Type |  |  |  |
| :--- | :--- | :--- | :--- |
| Lens | Appearance <br> (Standard type) | LED lamp operational <br> voltage | Type |
| Flush rectangular | DR16FON | DV AC/DC | DR16F0N-A3 $\square$ |
|  |  |  |  |

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 | $W^{* 1}$ | Y | A | S |

[^22]Command Switches

## AR16 and DR16

Type numbers and dimensions

- Dimensions, mm

Flush rectangular DR16F0N


## Flush square

DR16F0M


## Extended round

DR16E0L


## Dome

DR16D0L


## Selector switches (Knob type)

- Type number system

- Type

2-position


Note: *1 Terminal arrangement of contact (View from the terminal side (the back)).

${ }^{* 2} \bullet$ : 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 | Type |  | Contac | ct opera |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| appearance (Standard type) | positions | arrangement |  | $\begin{array}{ll} 2 & 3 \end{array}$ | Conta | ct unit ${ }^{\text {¹ }}$ | Opera positio | $\begin{aligned} & \text { ator } \\ & \text { on }^{2} \end{aligned}$ |
|  |  |  | Maintained/each $45^{\circ}$ | Spring return/each $45^{\circ}$ |  |  | 12 | 3 |
| Knob with rectangular | 3-position | 2PDT | AR16PT-3C2B | AR16PT-1C2B |  |  |  |  |
|  |  |  | AR16PS-3C2B | AR16PS-1C2B |  |  |  |  |
| Knob with square |  |  | AR16PR-3C2B | AR16PR-1C2B | Right |  |  |  |
|  |  |  | $\begin{array}{ll} \hline & 2 \\ \end{array}$ | $2$ | Conta | ct unit ${ }^{\text {¹ }}$ | Opera positio | $\begin{aligned} & \text { ator } \\ & \text { on }^{22} \end{aligned}$ |
|  |  |  | , |  |  |  |  |  |
| Knob with round |  |  | AR16PT-6C2B | AR16PT-7C2B |  |  |  |  |
|  |  |  | AR16PS-6C2B | AR16PS-7C2B |  |  |  |  |
|  |  |  | AR16PR-6C2B | AR16PR-7C2B |  |  |  |  |
|  |  |  |  |  |  |  | - |  |

Notes: ${ }^{~}{ }^{11}$ Terminal arrangement of contact (View from the terminal side (the back)).

${ }^{2} \bullet$ : means the contact closed (ON).

- See page 04/151 for the outline 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

- Type

2-position


Notes: *1 Terminal arrangement of contact (View from the terminal side (the back)).

*2 • Means the contact closed (ON).

- See page 04/154 for the outline dimensions.


## - Key removable position

Specify the key removal position in the square ■ mark.

| Key removable <br> position | Applied operator action |  | Code |
| :--- | :--- | :--- | :--- |
|  | 2 | 0 |  |
| Left $\Theta$ |  | $O$ | A |
| Left•Right $\otimes$ |  | - | B |
| Left $\oslash$ |  | - | D |

O: Available -: Not available

- Type of key

| Type ${ }^{* 1}$ | A | B | C | D | E | F |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | A | B | C | D | E | F |
| $*^{*}$ "A" is standard |  |  |  |  |  |  |

*1 " A " is standard.

3-position


Notes: *1 Terminal arrangement of contact (View form the terminal side (the back)).


Left contact
Right contact
${ }^{* 2} \bullet$ Means the contact closed (ON).

- See page 04/154 for the outline dimensions.


## - Key removal position

Specify the key removal position in the square $\square$ mark.

| Key removable position | Applied operator action |  |  |  | Code |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 3 | 6 | 7 | 1 |  |
| Left ( ) | $\bigcirc$ | - | $\bigcirc$ | - | A |
| Left•Right * | $\bigcirc$ | - | - | - | B |
| Left•Center• Right | $\bigcirc$ | - | - | - | C |
| Right © | $\bigcirc$ | $\bigcirc$ | - | - | D |
| Center (1) | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | E |
| Center•Right $\overbrace{}$ | $\bigcirc$ | $\bigcirc$ | - | - | F |
| Left•Center * | $\bigcirc$ | - | $\bigcirc$ | - | G |

[^23]- Type of key

| Type ${ }^{* 1}$ | A | B | C | D | E | F |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | A | B | C | D | E | F |
| "A" is standard. |  |  |  |  |  |  |

Command Switches

## AF16 and DF16

Type numbers and dimensions

## - Dimensions, mm

## Key with rectangular bezel

 AR16JT

Key with square bezel AR16JS


## Key with round bezel

 AR16JR

## Illuminated pushbutton switches (LED lamp)

- Type number system


| - Type |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Operator | Appearance (Thin type) | LED Iamp operational voltage | Conntact arrangement | Momentary action Type | Alternate action Type |
| Flush rectangular | AF16F0N, F5N | 6V AC/DC | SPDT | AF16F0N-C1A3 $\square$ | AF16F5N-C1A3 $\square$ |
|  |  |  | 2PDT | AF16F0N-C2A3 $\square$ | AF16F5N-C2A3 $\square$ |
|  |  | 12V AC/DC | SPDT | AF16F0N-C1B3 $\square$ | AF16F5N-C1B3 $\square$ |
|  |  |  | 2PDT | AF16F0N-C2B3 $\square$ | AF16F5N-C2B3 $\square$ |
|  |  | 24V AC/DC | SPDT | AF16F0N-C1E3 $\square$ | AF16F5N-C1E3 $\square$ |
|  |  |  | 2PDT | AF16F0N-C2E3 $\square$ | AF16F5N-C2E3 $\square$ |
| Flush square | AF16F0M, F5M | 6V AC/DC | SPDT | AF16F0M-C1A3 $\square$ | AF16F5M-C1A3 $\square$ |
|  |  |  | 2PDT | AF16F0M-C2A3 $\square$ | AF16F5M-C2A3 $\square$ |
|  |  | 12V AC/DC | SPDT | AF16F0M-C1B3 $\square$ | AF16F5M-C1B3 $\square$ |
|  |  |  | 2PDT | AF16F0M-C2B3 $\square$ | AF16F5M-C2B3 $\square$ |
|  |  | 24 V AC/DC | SPDT | AF16F0M-C1E3 $\square$ | AF16F5M-C1E3 $\square$ |
|  |  |  | 2PDT | AF16F0M-C2E3 $\square$ | AF16F5M-C2E3 $\square$ |
| Flush round | AF16F0L, F5L | 6V AC/DC | SPDT | AF16F0L-C1A3 $\square$ | AF16F5L-C1A3 $\square$ |
|  |  |  | 2PDT | AF16F0L-C2A3 $\square$ | AF16F5L-C2A3 $\square$ |
|  |  | 12V AC/DC | SPDT | AF16F0L-C1B3 $\square$ | AF16F5L-C1B3 $\square$ |
|  |  |  | 2PDT | AF16F0L-C2B3■ | AF16F5L-C2B3 $\square$ |
|  |  | 24V AC/DC | SPDT | AF16F0L-C1E3 $\square$ | AF16F5L-C1E3 $\square$ |
|  |  |  | 2PDT | AF16F0L-C2E3 $\square$ | AF16F5L-C2E3 $\square$ |

Note: • The panel cutting dimensions differ depending on the operator shape of thin type model. See page 04/167.

- For the dimensions, see page 04/156.


## -Button color

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

| Color | Green | Red | White | Yellow | Orange | Blue |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W *1 | Y | A | S |

[^24]Command Switches
AF16 and DF16
Type numbers and dimensions

- Dimensions, mm


## Flush rectangular

 AF16F0N, F5N

## Flush square

AF16F0M, F5M


## Flush round

AF16F0L, F5L


## Pushbutton switches

- Type number system

- Type

| Operator | Appearance (Thin type) | Contact arrangement | Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: | :---: |
| Flush rectangular | AF16F0T, F5T | SPDT | AF16F0T-C1■ | AF16F5T-C1■ |
|  |  | 2PDT | AF16F0T-C2 $\square$ | AF16F5T-C2 $\square$ |
| Flush square | AF16F0S, F5S | SPDT | AF16F0S-C1 $\square$ | AF16F5S-C1■ |
|  |  | 2PDT | AF16F0S-C2 $\square$ | AF16F5S-C2 $\square$ |
| Flush round | AF16F0R, F5R | SPDT | AF16F0R-C1 $\square$ | AF16F5R-C1 $\square$ |
|  |  | 2PDT | AF16F0R-C2 $\square$ | AF16F5R-C2 $\square$ |

Note: • The panel cutting dimensions differ depending on the operator shape of thin type model. See page 04/167.

- For the dimensions, see page 04/158.


## - Button color

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

| Color | Green | Black | Red | White | Yellow | Orange | Blue |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | $\mathrm{B}^{* 1}$ | R | $\mathrm{W}^{* 2}$ | Y | A | S |

Notes: *1 A combination of the translucent button and the black legend plate comes to black
$*^{2}$ A combination of the translucent button and the white legend plate comes to white.

Command Switches

## AF16 and DF16

Type numbers and dimensions

- Dimensions, mm

Flush rectangular AF16F0T, F5T


Flush square
AF16F0S, F5S


Flush round
AF16F0R, F5R


Pilot lights (LED lamp)

- Type number system


| - Type |  |  |  |
| :---: | :---: | :---: | :---: |
| Lens | Appearance (Thin type) | LED lamp operational voltage | Type |
| Flush rectangular | DF16FON | 6V AC/DC | DF16F0N-A3 $\square$ |
|  |  | 12V AC/DC | DF16F0N-B3 $\square$ |
|  |  | 24 V AC/DC | DF16F0N-E3 $\square$ |
| Flush square | DF16F0M | 6V AC/DC | DF16F0M-A3 $\square$ |
|  |  | 12V AC/DC | DF16F0M-B3 $\square$ |
|  |  | 24V AC/DC | DF16F0M-E3 $\square$ |
| Flush round | DF16F0L | 6V AC/DC | DF16F0L-A3 $\square$ |
|  |  | 12V AC/DC | DF16F0L-B3 $\square$ |
|  |  | 24 V AC/DC | DF16F0L-E3 $\square$ |

Note: • The panel cutting dimensions differ depending on the lens shape of thin type model. See page 04/167.

- For the dimensions, see page 04/160.


## - Lens color

Replace the $\square$ mark by the color code

| Color | Green | Red | White | Yellow | Orange | Blue |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W *1 | Y | A | S |

[^25]Command Switches

## AF16 and DF16

Type numbers and dimensions

- Dimensions, mm

Flush rectangular DF16F0N


Flush square
DF16F0M


## Flush round

DF16F0L


## Selector switches (Knob type)

- Type number system

- Type

2-position


Notes: *1 Terminal arrangement of contact (view from terminal side).


Left contact
Right contact
*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.

Command Switches
AF16 and DF16
Type numbers and dimensions

3-position


Notes: * ${ }^{* 1}$ Terminal arrangement of contact (view from terminal side).

${ }^{* 2} \bullet$ 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.


## - Dimensions, mm

## Knob with rectangular bezel

 AF16PT

## Knob with square bezel

 AF16PS

## Knob

AF16PR


## Command Switches <br> AF16 and DF16 <br> Type numbers and dimensions

## ■ Selector switches (Key type)

- Type number system

- Type

2-position


Notes: *1 Terminal arrangement of contact (view from terminal side).

*2 $^{2}$ : 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 $\square$ mark by the removable positiom code.

| Removable <br> position | Applied operatior position |  |  |
| :--- | :--- | :--- | :--- |
| n | 2 | 0 | Code |
| Left $\Theta$ |  | $O$ | A |
| Left•Right $\otimes$ | $O$ | - | B |
| Left $\oslash$ | $O$ | - | C |

O: Available -: Not available

| - Type of key |
| :--- |
| Type ${ }^{* 1}$ A B C D E F <br> Code A B C D E F |

${ }^{* 1}$ " A " is standard.

3-position


Notes: *1 Terminal arrangement of contact (view from terminal side).

$*^{2} \bullet$ 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

| Removable position | Applied operatior position |  |  |  | Code |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 3 | 6 | 7 | 1 |  |
| Left ( ) | $\bigcirc$ | - | $\bigcirc$ | - | A |
| Left•Right * | $\bigcirc$ | - | - | - | B |
| Left-Center• Right | $\bigcirc$ | - | - |  | C |
| Right © | $\bigcirc$ | $\bigcirc$ | - | - | D |
| Center (1) | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | E |
| Center•Right $(7)$ | $\bigcirc$ | $\bigcirc$ | - | - | F |
| Left•Center (1) | $\bigcirc$ | - | $\bigcirc$ | - | G |

[^26]- Type of key

| Type ${ }^{* 1}$ | A | B | C | D | E | F |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :---: |
| Code | A | B | C | D | E | F |  |
| " A " is standard. |  |  |  |  |  |  |  |

Command Switches

## 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:

| $\triangle$ Warning | : If operation is incorrect, a dangerous situation |
| :--- | :--- |
| may occur, resulting in death or serious injuries. |  |

An item described under CAUTION may result in a serious accident, depending on the situation.

| 亿 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. |

## $\triangle$ 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.

## ■ 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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$.


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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$.


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)

| Mounting condition | Applicable panel <br> thickness, mm |  |
| :--- | :--- | :--- |
| Without accessories | 1 to 6 |  |
| With | Pccessories | Protective cover |
|  | Dust-tight cover | 1 to 4 |
|  | Various sockets | 1 to 4 |
|  | Terminal cover | 1 to 3.2 |
|  | Protective cover + various sockets | 1 to 3.2 |
|  | 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 <br> AR16, DR16 and AF16, DF16 <br> Panel cutout and mounting

Table 2 Thin type (AF16/DF16 series)

| Mounting condition | Applicable panel <br> thickness, mm |  |
| :--- | :--- | :--- |
| Without accessories | 1 to 6 |  |
| With | Protective cover | 1 to 4 |
|  | 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
(1)Rectangular
(2)Square
(3)Round, dome


$\xrightarrow{18}$

Note: Determine the mounting pitch by taking the operatbility and wiring work into consideration.

- Thin type (AF16/DF16 series)

Illuminated pushbuttons, pushbuttons, selectors, and pilot lights
(1)Rectangular
(2)Square
(3)Round, dome


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)

- Dust-tight cover AHX668 (Standard type)

- Dust-tight cover AHX822 (Standard type)

- Minimum mounting spaces (pitch) with sockets, such as FastConnection 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.

## 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.

| $\bigwedge$ 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. |


| $\bigwedge$ 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 <br> AR16, DR16 and AF16, DF16 <br> 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

| Shape | Size, mm |
| :---: | :---: |
| Rectangular |  |
| Square |  |
| Round | Textured surface (back side) |

Notes: ${ }^{11} \mathrm{~A}$ 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 $45^{\circ}$ increments (the AR16 series rectangular or square type only).
The following figures show a knob type example. The key type is the same.


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

## 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 $A C$ or $D C$.

- 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

- Wiring to tab terminal Use 110 ( 2.8 mm ) 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 terminal.
- 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 $0.75 \mathrm{~mm}^{2}$ (solder) Flat-type connection terminal
(2.8 -1.25-5) 0.5 to $1.25 \mathrm{~mm}^{2}$
(2.8 $\square-0.5-5$ ) 0.2 to $0.5 \mathrm{~mm}^{2}$

- 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

| Model | Circuit diagram (example) | Terminal arrangement (view from the terminal (back) side) |
| :---: | :---: | :---: |
| Illuminated pushbuttons (2PDT) |  |  |
| Pushbuttons and selector switches (2PDT) |  |  |
| Pilot lights |  | [TOP] ( $\boldsymbol{\nabla}$ ) Display side |

Note: Only the left-side contact is applicable to the SPDT mechanism.

# Command Switches <br> AR16, DR16 and AF16, DF16 <br> 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.

(b)
In the case of 24 V DC
R: $10 \mathrm{k} \Omega(0.5 \mathrm{~W})$
In the case of 24V AC
R: $2 \mathrm{k} \Omega(2 \mathrm{~W})$

- The permissible fluctuation range for the operating voltage of the 6 V model is $\pm 5 \%$ and that for the 12 V or 24 V model is $\pm 10 \%$. 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 24 V red LED to a 48 V circuit
External resistance $[\Omega]=\frac{\text { Circuit voltage }[\mathrm{V}] \text { - Rated voltage }[\mathrm{V}]}{\text { Rated current }[\mathrm{A}]}$

$$
=\frac{48-24}{7.5 \times 10^{-3}}=3200[\Omega]
$$

$\rightarrow$ Therefore, use an external resistor of $3.3 \mathrm{k} \Omega 1 \mathrm{~W}$.
(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 $1 \mathrm{~N} \cdot \mathrm{~m}$.

## - 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.


- 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 $0.1 \mathrm{~N} \cdot \mathrm{~m}$.
- 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 $0.75 \mathrm{~mm}^{2}$ (AWG22 to AWG18)
- Single wire : 0.5 to 1 mm dia.
- Recommended ferrule : Phoenix Contact, part number AIO, 34-8TQ

Wire size : $0.34 \mathrm{~mm}^{2}$ (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 extemal 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)


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## Connector sockets

- Connectable wires Stranded wire: 0.5 to $0.75 \mathrm{~mm}^{2}$ (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 $\boldsymbol{\Delta}$ mark of the socket and the TOP ( $\boldsymbol{\nabla}$ ) mark of the switch, and put the socket and switch together.

- 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.

- Mount the switch to the panel. Make sure that the switch is free of any bends.
- 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 mounting side)

- Insert the socket so that the lever will be located in the 5 mm diameter 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 <br> AR16, DR16 and AF16, DF16 <br> Notes on use

- Pay attention to the following points when soldering.
- Type of solder: Use resin-core solder.
- Finish soldering at $350^{\circ} \mathrm{C}$ 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 | $A(\mathrm{~mm})$ |
| :--- | :--- |
| AR16/DR16 | $30.2 \pm 0.2$ |
| AF16/DF16 | $37.7 \pm 0.2$ |

- 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: 24 V
- 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.


Command Switches
AR16, DR16 and AF16, DF16
Accessories


| Description | Type |  | Dimensions, mm |
| :---: | :---: | :---: | :---: |
| Wrench | Type <br> AHX601 <br> When installing a <br> secure and firm tig | Used with AR16 and DR16 series AF16 and DF16 series Command Switch on a panel, this tool enables ghtening. |  |
| Remover (for Standard type) <br> KKD07-258 | Type <br> AHX618 <br> This tool is used | Used with <br> Illuminated pushbutton switch, pushbutton switch, pilot light <br> for removing color lens, buttons or screens. |  |
|  | Type <br> AHX672 <br> This tool is used for Use the part A to | Used with <br> Illuminated pushbutton switch, pilot light for installing or removing lamps. remove LED lamps. | $\hat{*}$ |
| Panel plug (for Standard type) <br> KKD07-260 <br> KKD07-261 <br> KKD07-262 <br> KKD07-267 | Type U <br> AXH645- $\square$ R <br>   <br> AXH644- $\square$ Squ <br> AXH622- $\square$ R <br> AXH850-B "  <br> Packing and nut  <br> Note: $\cdot$ Enter the c <br> Type <br> Code  | Used with <br> Rectangular type <br> Degree of protection: IP40 <br> Square type <br> Degree of protection: IP40 <br> Round type <br> Degree of protection: IP40 <br> Rectangular type <br> Degree of protection: IP65 <br> tare provided. The color is black only. color code in the square box ㅁ. |  |
| Panel plug (for Thin type) <br> KKD07-264 <br> KKD07-266 <br> KKD07-265 <br> KKD07-263 <br> KKD07-268 <br> KKD07-269 |  | Used with <br> Rectangular type <br> Degree of protection: IP40 <br> Square type <br> Degree of protection: IP40 <br> Round type <br> Degree of protection: IP40 <br> Rectangular type <br> Degree of protection: IP65 <br> Square type <br> Degree of protection: IP65 <br> Round type <br> Degree of protection: IP65 <br> retainer, and nut are provided. is black only. |  |



| - Standard type <AR16, DR16 series> <br> 1. Illuminated push button switches |  |  | (g) |
| :---: | :---: | :---: | :---: |
| Type | Without transformer |  |  |
|  | SPDT | 2PDT |  |
| AR16F0N | 9.3 | 9.9 |  |
| AR16F5N | 9.3 | 9.9 |  |
| AR16GON | 9.4 | 10 |  |
| AR16G5N | 9.4 | 10 |  |
| AR16F0M | 8.7 | 9.3 |  |
| AR16F5M | 8.7 | 9.3 |  |
| AR16E0L | 8.1 | 8.7 |  |
| AR16E5L | 8.1 | 8.7 |  |

2. Pushbutton switches
(g)

| Type | SPDT | 2PDT |
| :--- | :--- | :--- |
| AR16FOT | 8.5 | 9.1 |
| AR16F5T | 8.5 | 9.1 |
| AR16GOT | 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 |

3. Pilot lights
(g)

| Type | Without transformer |
| :--- | :--- |
| DR16FON | 8.7 |
| DR16FOM | 8.1 |
| DR16EOL | 7.5 |
| DR16DOL | 7.5 |

4. Selector switches (knob type)
(g)

| Type | SPDT | 2PDT |
| :--- | :--- | :--- |
| AR16PT | 9.6 | 10.2 |
| AR16PS | 8.6 | 9.2 |
| AR16PR | 8.3 | 8.9 |

5. Selector switches (key type)
(g)

| Type | 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>

1. Illuminated push button switches

| Type | Without transformer |  |
| :--- | :--- | :--- |
|  | SPDT | 2PDT |
| AF16F0N | 13.5 | 14.1 |
| AF16F5N | 13.5 | 14.1 |
| AF16FOM | 12.8 | 13.4 |
| AF16F5M | 12.8 | 13.4 |
| AF16FOL | 12 | 12.6 |
| AF16F5L | 12 | 12.6 |

2. Pushbutton switches
(g)

| Type | 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 |

3. Pilot lights
(g)

| Type | Without transformer |
| :--- | :--- |
| DF16FON | 12.8 |
| DF16FOM | 12.1 |
| DF16FOL | 11.4 |

4. Selector switches (knob type)
(g)

| Type | SPDT | 2PDT |
| :--- | :--- | :--- |
| AF16PT | 14.2 | 14.8 |
| AF16PS | 13.7 | 14.3 |
| AF16PR | 13.1 | 13.7 |

5. Selector switches (key type)
(g)

| Type | 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.

# Command Switches <br> AR16, DR16 and AF16, DF16 <br> 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
Illuminated type


- 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. $\theta$
- 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.


## ■ Specifications (indoor use)

| Item |  | AR16V |
| :---: | :---: | :---: |
| Rated insulation voltage Ui |  | 250V AC/DC |
| Durability | Mechanical | 100,000 operations |
|  | Electrical | 100,000 operations (AC-15, AC-13, AC-12, DC-13, DC-12) |
| Operating frequency |  | 1200 operations / hour (On-load factor : 40\%) |
| Withstand voltage | Between live section and grounding | 2000V AC, 1 minute |
|  | Between opposite polarity live sections | 2000 V AC, 1 minute |
| Insulation resistance |  | $100 \mathrm{M} \Omega$ or more (500V DC megger) |
| Rated impulse withstand voltage Uimp |  | 2.5 kV |
| Conditional short-circuit current |  | 1000A |
| Short-circuit protective device |  | gG 6A (IEC60269 Fuse) |
| Pollution degree |  | 3 |
| Vibration |  | Operating extremes : frequency 10 to 500 Hz , double amplitude 0.7 mm <br> acceleration $50 \mathrm{~m} / \mathrm{s}^{2}$ <br> Damage limits : frequency 10 to 500 Hz , double amplitude 0.7 mm <br> acceleration $50 \mathrm{~m} / \mathrm{s}^{2}$ |
| Shock |  | Malfunction durability : $100 \mathrm{~m} / \mathrm{s}^{2}$ Mchanical durability : $500 \mathrm{~m} / \mathrm{s}^{2}$ |
| Operational ambient temperature |  | -10 to $+55^{\circ} \mathrm{C}$ (no icing or no condensation) |
| Storage temperature |  | -40 to $+70^{\circ} \mathrm{C}$ |
| Relative humidity (inside control panel) |  | 45 to $85 \% \mathrm{RH}\left(-5\right.$ to $40^{\circ} \mathrm{C}$ ) (no icing or no condensation) |
| Degree of protection of operating (displaying) section |  | IP65 (dust-ploof, water jet proof): IEC 60529 |
| Degree of protection of control section |  | IP2X (Terminal cover : AR6Y262, At the connection) |
| Terminal style |  | Solder terminal |
| Connectable wire |  | $0.75 \mathrm{~mm}^{2}$ maximun (18AWG maximun) |

■ Contact ratings
-TÜV (EN60947-5-1), JIS C 8201-5-1 (1999)

| Conventional free air thermal current I th | Rated operational current |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Rated operational voltage Ue | AC |  |  | DC |  |
|  |  | AC-12 <br> (Resistive load) | AC-13 (Inductive load) | AC-15 (Inductive load) | DC-12 (Resistive load) | DC-13 (Inductive load) |
| 5A | 24 V | - | - | - | 1.0A | 0.7A |
|  | 120V | 1.5A | 1.0A | 0.3A | - | - |
|  | 125 V | - | - | - | 0.2A | 0.15A |
|  | 240 V | 1.0A | 0.7A | 0.3A | - | - |

- UL/CSA
- AC (COSø=0.35)

| Contact rating code | 120 V | 240 V |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | Making current | Braeking current | Making current | Braeking current |
| C300 | 15 A | 1.5 A | 7.5 A | 0.75 A |

- DC ( $\left.\mathrm{T}_{0.95}=6 \mathrm{P}\right)$

| Contact rating code | 年年ing current $\cdot$ Braeking current |  |
| :--- | :--- | :--- |
|  | 125 V | 250 V |
| R300 | 0.22 A | 0.11 A |

## ■ Contact reliability

- FUJI has confirmed that the product can be used in 1 mA circuit conditions at 5V AC or DC. The operable range, however, may vary deperding on the operational ambient conditions and type of load.

■ Operating characteristic

| Operation | Push-lock, turn-reset or pull-reset |
| :--- | :--- |
| Ave. required operating force | 25 N |
| Operating travel | Approx. 5.4mm |
| Operation angle | Approx. $45^{\circ}$ |
| Required return force (pull-reset) | 20 N |
| Required return force (tarn-reset) | $0.3 \mathrm{~N} \cdot \mathrm{~m}$ |

$\square$ Mass

| Type | 1NC | 2NC(1NO+1NC) | 4NC(2NO+2NC) |
| :--- | :--- | :--- | :--- |
| AR16V0R | 19.0 | 19.4 | 20.0 |
| AR16V1R | 21.1 | 21.5 | 22.1 |
| AR16VOL | 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 | 6 V AC/DC | $9 \mathrm{~mA} \mathrm{AC}, \mathrm{7.5mA} \mathrm{DC}$ |
|  |  |  | 12 V AC/DC | $7.5 \mathrm{~mA} \mathrm{AC,7.5mA} \mathrm{DC}$ |
|  |  | 24 V AC/DC | $7.5 \mathrm{~mA} \mathrm{AC,7.5mA} \mathrm{DC}$ |  |

## Command Switches <br> AR16，DR16 and AF16，DF16 <br> Type numbers／AR16V

## ■ Type

－Emergency stop pushbutton switches

| Operator |  | Contact | Type |
| :---: | :---: | :---: | :---: |
| Unibody push－lock，pull or turn－reset（32mm dia．） | （KKD08－090） | 1NC | AR16V0R－01R |
|  |  | 1NO＋1NC | AR16V0R－11R |
|  |  | 2NC | AR16V0R－02R |
|  |  | 1NO＋2NC | AR16V0R－12R |
|  |  | 3NC | AR16V0R－03R |
|  |  | 1NO＋3NC | AR16V0R－13R |
|  |  | 4NC | AR16V0R－04R |
| Unibody push－lock，pull or turn－reset（40mm dia．） | （KKD08－092） | 1NC | AR16V1R－01R |
|  |  | 1NO＋1NC | AR16V1R－11R |
|  |  | 2NC | AR16V1R－02R |
|  |  | 1 $\mathrm{NO}+2 \mathrm{NC}$ | AR16V1R－12R |
|  |  | 3NC | AR16V1R－03R |
|  |  | 1NO＋3NC | AR16V1R－13R |
|  |  | 4NC | AR16V1R－04R |

－Emergency stop illuminated pushbutton switches

| Operator |  | Contact | LED Lamp Type |
| :---: | :---: | :---: | :---: |
| Unibody push－lock，pull or turn－reset（32mm dia．） | （KKD08－087） | 1NC | AR16V0L－01號 |
|  |  | 1NO＋1NC | AR16V0L－11员 |
|  |  | 2NC | AR16V0L－02四 |
|  |  | 1NO＋2NC | AR16V0L－12■R |
|  |  | 3NC | AR16V0L－03號 |
|  |  | 1NO＋3NC | AR16V0L－13國 |
|  |  | 4NC | AR16V0L－04园 |
| Unibody push－lock，pull or turn－reset（40mm dia．） |  | 1NC | AR16V1L－01號 |
|  |  | 1NO＋1NC | AR16V1L－11员 |
|  |  | 2NC | AR16V1L－02■R |
|  |  | 1NO＋2NC | AR16V1L－12回 |
|  |  | 3NC | AR16V1L－03的 |
|  |  | 1NO＋3NC | AR16V1L－13园 |
|  | （KKDO8－091） | 4NC | AR16V1L－04號 |

－Voltage Replace the ■mark by the lamp voltage code

| Lamp voltage | Code |
| :--- | :--- |
| $6 \mathrm{~V} \mathrm{AC/DC}$ | A3 |
| $12 \mathrm{~V} \mathrm{AC/DC}$ | B3 |
| $24 \mathrm{~V} \mathrm{AC/DC}$ | E 3 |

## Dimensions, mm

- Emergency stop pushbutton switches
- AR16V0R

-AR16V1R

- Emergency stop illuminated pushbutton switches

-AR16V1L

- Accessories

| Description | Type | Dimensions, mm |
| :---: | :---: | :---: |
| Wrench | AHX601 (AH9A601) <br> When installing a command switch on a panel, this tool is useful for tightening the switch firmly and efficiently. |  |
| Terminal cover | AR6Y262 <br> Protective cover for insulation between terminals and live parts. Note : Dimensions when connected with a switch (unit : mm) <br> - Wiring work should be made first , and attach the cover to the switch. |  |
| Legend plate for AR16V emergency stop | AR6P719-*1,2 <br> - Plate color : Yellow <br> - Letter color : Black |  |

## ■ 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.
$\uparrow$ WARNING
Indicates a potentially hazardous situation, which, if not avoided, could resuit in death or serious injury.

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.

## $\triangle$ 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.


## $\triangle$ 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.


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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$.

*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.

## $\square$ 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 60 W $\left(350^{\circ} \mathrm{C}\right)$ 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 1.0 mm
One standed wire with a maximum area of $0.75 \mathrm{~mm}^{2}$

- 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 <br> (view from the terminal (back) side) |
| :--- | :--- | :--- |
| Emergency stop pushbutton <br> switches |  | Top (marked with inverted triangular) |
| Emergency stop illuminated |  |  |

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 $45^{\circ}$ 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.

Terminals $1-2: b$ (NC) contact terminals
Terminals 3-4: a (NO) contact terminals
Terminals a-b : Lamp terminals

# Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AH164, AH165 and AH165-2 <br> General information 

## ■ Features

## Design basis

The 16 mm 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.


## Emergency stop pushbuttons

KKD07-222
AH165-V6


AH165-2ML


AH164-Z Selectors


AH165-2P

## 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


## 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 1 mA at 5 V AC/DC is assured. Contact blocks are available in $1 \mathrm{NO}+1 \mathrm{NC}$ to $3 \mathrm{NO}+3 \mathrm{NC}$ 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 | Type | Operator | Type | Type |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Extended round head | AH164-L, L5 <br> AH165-L, L5 | Flush square head | AH164-SL, SL5 <br> AH165-SL, SL5 | Flush rectangular head | AH164-TL, TL5 |
| AH165-TL, TL5 |  |  |  |  |  |

Note: Spot LED and red/green LED types: Not approved standard
■ Pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Extended round head <br> See page 04/199 <br> T®ㅔ $\triangleq C \in$ | AH164-E, E5 AH165-E, E5 | Mushroom head <br> See page 04/199 <br> T에․ $\triangle C$ <br> (CC) | AH164-M, M5 AH165-M, M5 <br> KKD07-210 | Flush square head <br> See page 04/199 <br> TI © $\triangle$ C $\mathbb{C C}$ | AH164-SF, SF5 AH165-SF, SF5 |
| Flush rectangular head <br> See page 04/199 <br> T『 (1) $\triangleq C(\mathbb{C l}$ | AH164-TF, TF5 AH165-TF, TF5 <br> KKD07-206 | Flush rectangular head with guard <br> See page 04/199 <br> TIN © $\triangle C$ | AH164-TGF, TGF5 AH165-TGF, TGF5 <br> KKD05-176 | Flush square head with guard <br> See page 04/199 $\triangleq C \in \mathbb{C}$ | AH164-SGF, SGF5 AH165-SGF, SGF5 |
| Convex square head <br> See page 04/199 <br>  | AH164-SM, SM5 AH165-SM, SM5 | Convex rectangular head <br> See page 04/199 <br> 데 싸 $\triangle C$ | AH164-TM, TM5 AH165-TM, TM5 <br> KKD05-082b | Push-lock, turn-reset (32mm dia.) <br> $\Theta$ (Direct opening action) <br> See page 04/200 <br>  | AH165-VR <br> AF91-584 |
| Push-lock, turn-reset ( 40 mm dia.) <br> $\Theta$ (Direct opening action) <br> See page 04/200 <br>  | AH165-V1R <br> AF91-583 |  |  |  |  |

■ Emergency stop pushbutton switches $\Theta$ (Direct opening action), conform to EN418

| Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: |
| Push-lock, turn-reset (32mm dia.) | AH165-V5R | Push-lock, turn-reset (40mm dia.) | AH165-V6R |
| See page 04/200 |  | See page 04/200 |  |
| -N® $\mathbb{N}$ |  | TN® (el C © |  |

Note: © (CC): See page 04/292
Fuji Electric FA Components \& Systems Co., Ltd./D \& C Catalog Information subject to change without notice

Pushbuttons/Selectors/Pilot Lights/Buzzers
AH164, AH165 and AH165-2
Quick reference guide

## ■ Selector switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Knob with rectangular bezel <br> See page 04/201 <br>  | AH164-P AH165-P <br> KKD07-213 | Knob with square bezel <br> See page 04/201 <br> 께․ $\triangle C$ <br> (c) | AH164-SP AH165-SP <br> KKD07-215 | Key with rectangular bezel <br> See page 04/201 <br>  | AH164-J AH165-J |
| Key with square bezel <br> See page 04/201, 04/204 <br>  | AH164-SJ <br> AH165-SJ <br> KKD09-001R | Key with rectangular bezel <br> $\Theta$ (Direct opening action) <br> See page 04/202 <br>  | AH165-JM <br> KKD09-006 | Key <br> $\Theta$ (Direct opening action) <br> See page 04/202 <br>  | AH165-RJM <br> KKD09-007 |

$\square$ Pilot lights


■ Buzzers


[^27]
## AH165-2 (oil-tight)

■ Illuminated pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head <br> See page 04/213 <br> 께쑈 $\triangle C$ © | AH165-2FL, 2FL5 <br> AF87-211 | Extended round head <br> See page 04/213 <br>  | AH165-2EL, 2EL5 <br> AF87-210 | Mushroom head <br> See page 04/213 <br>  | AH165-2ML |
| Mushroom head with square bezel <br> See page 04/213 <br>  | AH165-2YML <br> AF87-220 | Flush square head <br> See page 04/214 <br> Tハ (1) $\triangle C \in$ | AH165-2SFL, 2SFL5 <br> AF87-201 | Extended square head <br> See page 04/214 <br> TN N. $\triangle$ C © | AH165-2SEL, 2SEL5 |
| Concave square head See page 04/214 Fiem $\triangle$ C © <cc) | AH165-2SCL, 2SCL5 | Push-lock, turn-reset <br> See page 04/215 <br>  | AH165-2VL | Push-lock, turn-reset with square bezel <br> See page 04/215 <br> 께 스 | AH165-2YVL |

Note: ©CC: See page 04/292

■ Pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head <br> See page 04/216 <br>  | AH165-2F, 2F5 <br> AF87-211 | Extended round head <br> See page 04/216 <br> 제잔 $\triangle C$ <br> (CC) | AH165-2E, 2E5 <br> AF87-210 | Mushroom head <br> See page 04/216 <br> 제 ब $\triangle C \in$ <br> (cc) | AH165-2M <br> AF87-215 |
| Mushroom head with square bezel <br> See page 04/216 <br>  | AH165-2YM <br> AF87-214 | Flush square head <br> See page 04/216 <br>  | AH165-2SF, 2SF5 <br> AF87-201 | Concave square head <br> See page 04/216 <br>  | AH165-2SCE, 2SCE5 <br> AF87-199 |
| Extended square head <br> See page 04/216 <br>  | AH165-2SE, 2SE5 <br> AF87-200 | With selector ring <br> See page 04/217 <br>  | AH165-2S2 | With selector ring with square bezell <br> See page 04/217 <br> 제․․․ $C$ | AH165-2YS2 |
| Push-lock, turn-reset <br> See page 04/217 <br>  | AH165-2V <br> AF87-217 | Push-lock, turn-reset with square bezel <br> See page 04/217 <br> 제 (6) $\triangle$ C © | AH165-2YV <br> AF87-216 |  |  |

Pushbuttons/Selectors/Pilot Lights/Buzzers
AH164, AH165 and AH165-2
Quick reference guide

## ■ Selector switches



■ Illuminated selector switches

| Operator | Type |
| :---: | :---: |
| Knob | AH165-2PL |
| See page 04/221 |  |
| TN® (1) C |  |

## ■ Pilot lights



Note: ©CC: See page 04/292

# Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AH164 and AH165 <br> Type number nomenclature 

## - Type number nomenclature

## Pushbuttons, illuminated pushbuttons and pilot lights

AH165 - $\frac{L}{2} \frac{R}{3} \frac{11}{4} \frac{E}{5} \frac{3}{6}-\frac{W}{7}$
(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)
TL: Flush rectangular head
TL5: Flush rectangular head (Alternate)
L: 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)
E: Extended round head
E5: Extended round head (Alternate)
TGF: Flush rectangular head with guard
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)
TM: Convex rectangular head
TM5: Convex rectangular head (Alternate)
V: Push-lock, turn-reset (32mm dia.) *1 *2
V1: Push-lock, turn-reset (40mm dia.) *1*2

- Operator for emergency stop pushbuttons

V5: Push-lock, turn-reset (32mm dia.)*2
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

Color of button or lens

| Code | color | Button | LED | Incandescent | Neon |
| :--- | :--- | :--- | :--- | :--- | :--- |
| G | Green | $O$ | $O$ | $O$ | $O$ |
| R | Red | $O$ | $O$ | $O$ | $O$ (Orange) |
| B | Black* | $O$ | - | - | - |
| Y | Yellow | $O$ | $O$ | $O$ | $O$ (Orange) |
| W | White | $O$ | $O$ (Orange) | $O$ | $O$ (Orange) |
| S | Blue | $O$ | $O$ | $O$ | $O$ (Green) |
| O | Orange | $O$ | $O$ (Amber) | $O$ | $O$ |
| RG | Red/Green | - | $O$ | - | - |

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: $2 \mathrm{NC}^{* 1}$
33: $3 \mathrm{NO}+3 \mathrm{NC}^{\star 2}$
11: $1 \mathrm{NO}+1 \mathrm{NC}$
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 | - | - |
| A | $6 \mathrm{~V} \mathrm{DC}^{* 2}$ | 5V AC/DC | - |
| B | 12V DC | 12V AC/DC | - |
| E | 24 V DC | 24V AC/DC | - |
| H | 100-110V AC*1 *2 | 100-110V AC*1 | 110 V AC |
| K | - | - | 120 V AC |
| M | 200-220V AC*1*2 | 200-220V AC*1 | 220 V AC |
| P | - | - | 240V AC |
| Notes: * ${ }^{* 1}$ With transformer (LED: 24V, Incandescent: 28V) <br> *2 Not available AH165-ZM <br> - ZM type: LED lamp only (12, 24V DC) |  |  |  |

(6) Type of lamp

Blank: Incandescent
Neon

Terminal
Blank: Solder/tab
W: Wire-wrap
S: $\quad$ Soder (AH165-V, V1, V5, V6 types only)
Note: ZM types: wire-wrap terminal only (Code is blank)

2: Spot LED, LED (ZM types)
3: Flat LED
$\begin{array}{ll}\text { 2: } & \text { Spot LED, LED (ZM types) } \\ \text { 3: } & \text { Flat LED }\end{array}$

## Pushbuttons/Selectors/Pilot Lights/Buzzers

## AH164 and AH165

## Type number nomenclature

## - Type number nomenclature

## Selector switches

$\frac{\mathrm{AH} 165}{(1)}-\frac{\mathrm{J}}{(2)} \frac{2}{(3)} \frac{\mathrm{B}}{4} \frac{\mathbf{1 1}}{(5)} \frac{\mathrm{A}}{(6)}-\frac{\mathrm{W}}{7}$
(1) Product category

AH164: Standard (IP40)
AH165: Oil-tight (IP65)
(2) Operator

- 2-position, 3-position (operating angle $90^{\circ}$ )

SP: Knob with square bezel
P: Knob with rectangular bezel
SJ: Key with square bezel
$\mathrm{J}: \quad$ 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 $45^{\circ}$ )
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 $90^{\circ}$ ) |  |  |  | 3-position <br> (operating angle $45^{\circ}$ ) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 2 | 0 | 1 | 3 | 6 | 7 | 1 | 3 | 6 | 7 |
| A | Q | Q | - | $\ominus$ | - | $\Theta$ | - | Q | - | Q |
| B | * | - | - | $\Theta$ | - | - | - | * | - | - |
| C | - | - | - | ( + | - | - | - | * | - | - |
| D | (2) | - | - | $\Theta$ |  | - | - | (8) |  | - |
| E | - | - | (1) |  |  |  | (1) |  |  |  |
| F | - | - | - | - | - | - | - | (4) |  | - |
| G | - | - | - | - | - | - | - | (*) | - | (1) |

(5) Contact arrangement

11: $1 \mathrm{NO}+1 \mathrm{NC}$
22: $2 \mathrm{NO}+2 \mathrm{NC}$
33: 3NO $+3 N C^{*}$
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

$\frac{\mathrm{AH} 164}{(1)}-\frac{T}{(2)} \frac{B}{(3)} \frac{E}{(4)}$

## (1) Product category

AH164: Standard (IP00)
AH165: Splash-proof (IP54)

## (2) Sound

TX: $\quad$ Standard (AH164)
TX1: Loud sound (AH164)
TX2: Loud sound with volume control (AH164)
X: $\quad$ Standard sound with volume control (AH165)
(3) Color of head

B: Black
4) Operating voltage

AAC: $6 \mathrm{~V} \mathrm{AC}^{* 2}$
ADC: $6 \mathrm{~V} \mathrm{DC}^{* 2}$
A: $\quad 6 \mathrm{~V} \mathrm{AC} / \mathrm{DC}^{* 1}$
E: $\quad 12$ to 24 V AC/DC
F: $\quad 35$ to 48 V AC/DC
Notes: *1 Except for TX and TX1 types
*2 Except for TX2 and X types

# Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AH164 and AH165 <br> Ratings and specifications 

## Standards approved

| UL508 | File No. E44592 |
| :--- | :--- |
| CSA C22.2 No.14 | File No. LR20479 (except for AH165-ZM) <br> File No. LR84365 (for AH165-ZM) |
| TÜV: EN60947-5-1 | Pushbutton (excet for AH165-V, V1), <br> llluminated pushbutton: R9250087 <br>  <br>  <br> Pushbutton (for AH165-V, V1): J9551059 <br> Selector (except for AH165-JM, RJM): R9250088 <br> Selector (for AH165-JM, RJM): J9551059 <br> Pilot lights: R9250089 <br> 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

| Item | AH164 | AH165 |
| :---: | :---: | :---: |
| Rated insulation voltage | 250V AC/DC |  |
| Ambient temperature (no condensation or no icing) | -20 to $+70^{\circ} \mathrm{C}$ *1 | -10 to $+70^{\circ} \mathrm{C}$ *2 |
| Humidity | 45 to $85 \% R H$ (at -5 to $+40^{\circ} \mathrm{C}$ ), no condensation or no icing |  |
| Durability <br> Mechanical (operations) <br> Electrical | Pushbutton switch <br> Momentary action: 1 million <br> Alternate action: 250,000 <br> Push-lock, turn-reset: 100,000 <br> Selector switch: 250,000 *3 <br> 100,000 (220V AC 0.7A) |  |
| Dielectric strength | 2000V AC, 1 minute <br> (Between lamp and contact terminals: <br> 1500 V AC, 1 minute) |  |
| Conditional short-circuit current | 1000A |  |
| Short-circuit protective device | Fuse 1A *4 |  |
| Pollution degree | 3 |  |
| Vibration | Resonance: 10 to 55 Hz , double amplitude 0.1 mm *5 <br> Constant: 16.7 Hz , double amplitude 3mm |  |
| Shock | Malfunction durability: $100 \mathrm{~m} / \mathrm{s}^{2}$ *6 Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |  |
| Operating frequency | 1200 operation/hour (on-load factor: 40\%) |  |
| Insulation resistance | $100 \mathrm{M} \Omega$ or more (500V DC megger) |  |
| Degree of protection | IP40 | IP65 |
| Notes: *1 For illuminated pushbutton switch and pilot light: -20 to $+55^{\circ} \mathrm{C}$ <br> *2 For illuminated pushbutton switch and pilot light: -10 to $+55^{\circ} \mathrm{C}$ <br> *3 Key insertion/removal durability for selector switch key types: 10,000 <br> *4 AH165-V, V1, JM, RJM, V5, V6 types: Fuse 5A <br> *5 Emergency stop type: 10 to 500 Hz , double amplitude 0.7 mm (acceleration $50 \mathrm{~m} / \mathrm{s}^{2}$ ), according to the test condition of EN60947-5-5 (1998) <br> *6 Emergency stop type: $150 \mathrm{~m} / \mathrm{s}^{2}$ |  |  |

- Buzzers

| Item | AH164-TX | AH164-TX1 |
| :---: | :---: | :---: |
| Rated insulation voltage | 60V AC/DC |  |
| Operating voltage | 6 V AC, 6 V DC, 12 to 24 V AC/DC 35 to 48 V AC/DC |  |
| Sound level | $\begin{array}{\|l} \hline 80 \mathrm{~dB}(0.1 \mathrm{~m}) \\ 60 \mathrm{~dB}(1 \mathrm{~m}) \end{array}$ | $\begin{aligned} & 90 \mathrm{~dB}(0.1 \mathrm{~m}) \\ & 70 \mathrm{~dB}(1 \mathrm{~m}) \end{aligned}$ |
| Durability | 1000h |  |
| Frequency | $2 \pm 0.5 \mathrm{kHz}$ | 2.4 to 3.3 kHz |
| Intermittent cycle | Approx. 170 cycle/minute |  |
| Current consumption | $7 \mathrm{~mA}(24,48 \mathrm{~V}$ DC) 15mA(6V DC) $20 \mathrm{~mA}(6,24 \mathrm{~V}$ AC) 30 mA (48V AC) | $\begin{aligned} & 15 \mathrm{~mA}(24,48 \mathrm{~V} D) \\ & 25 \mathrm{~mA}(6 \mathrm{~V}) \mathrm{DC}) \\ & 30 \mathrm{~mA}(24 \mathrm{VAC}) \\ & 40 \mathrm{~mA}(48 \mathrm{VAC}) \\ & 50 \mathrm{~mA}(6 \mathrm{VAC}) \end{aligned}$ |
| Dielectric strength | 1000 V AC, 1 minute |  |
| Insulation resistance | $100 \mathrm{M} \Omega$ or more ( 500 V DC megger) |  |
| Ambient temperature | -20 to $+60^{\circ} \mathrm{C}$ (no condensation or no icing) |  |
| Humidity | 45 to $85 \%$ RH (at -5 to $+40^{\circ} \mathrm{C}$ ) |  |
| Operator protection | IP00 |  |
| Item | AH164-TX2 | AH165-X |
| Rated insulation voltage | 60V AC/DC |  |
| Operating voltage | $6 \mathrm{~V} \mathrm{AC} / D C, 12$ to 24 V AC/DC 35 to 48 V AC/DC |  |
| Sound level | 70 dB to $90 \mathrm{~dB}(0.1 \mathrm{~m})$ 50 dB to 70 dB (1m) | 60 dB to $80 \mathrm{~dB}(0.1 \mathrm{~m})$ 40dB to 60dB (1m) |
| Durability | 1000h |  |
| Frequency | $2 \pm 0.5 \mathrm{kHz}$ | 2.4 to 3.3 kHz |
| Intermittent cycle | Approx. 170 cycle/minute |  |
| Current consumption | 30 mA (6V DC) $20 \mathrm{~mA}(24,48 \mathrm{~V}$ DC) $40 \mathrm{~mA}(6,24,48 \mathrm{~V} \mathrm{AC})$ |  |
| Dielectric strength | 1000 V AC, 1 minute |  |
| Insulation resistance | $100 \mathrm{M} \Omega$ or more ( 500 V DC megger) |  |
| Ambient temperature | -20 to $+60^{\circ} \mathrm{C}$ (no condensation or no icing) |  |
| Humidity | 45 to $85 \%$ RH (at -5 to $+40^{\circ} \mathrm{C}$ ) |  |
| Degree of protection | IP00 | IP54 |

Pushbuttons/Selectors/Pilot Lights/Buzzers
AH164 and AH165
Ratings and specifications

## $\square$ Contact ratings

- UL/CSA standards

| Rated thermal current | Rated operational voltage | Maximum current |  |
| :---: | :---: | :---: | :---: |
|  |  | AC <br> (Res. load) | DC <br> (Res. load) |
| 5A | 24V | - | 1.0A |
|  | 125 V | - | 0.2A |
|  | 250V | 5.0A | - |

- EN standards (TÜV approved)

| Rated thermal current | Rated operational voltage | Rated operational current |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | AC 15 (Ind. load) | AC 13 (Ind. load) | AC 12 <br> (Res. load) | DC 13 <br> (Ind. load) | DC 12 <br> (Res. load) |
| 5A | $\begin{aligned} & 24 \mathrm{~V} \\ & 100 \text { to } 120 \mathrm{~V} \\ & 100 \text { to } 125 \mathrm{~V} \\ & 200 \text { to } 240 \mathrm{~V} \end{aligned}$ | $\begin{gathered} - \\ 0.3 \mathrm{~A} \\ - \\ 0.3 \mathrm{~A} \end{gathered}$ | $\begin{aligned} & 1 . \overline{\mathrm{OA}} \\ & - \\ & 0.7 \mathrm{~A} \end{aligned}$ | $\begin{gathered} -\overline{5} \mathrm{~A} \\ - \\ 1.0 \mathrm{~A} \end{gathered}$ | $\begin{gathered} \hline 0.7 \mathrm{~A} \\ - \\ 0.15 \mathrm{~A} \end{gathered}$ | $\begin{aligned} & 1.0 \mathrm{~A} \\ & - \\ & 0.2 \mathrm{~A} \end{aligned}$ |

## ■ Lamp ratings

| Rated operational <br> voltage | Consumption |  |  |  | LED <br> DC | Incandescent <br> AC/DC | Neon <br> AC |
| :--- | :--- | :--- | :--- | :---: | :---: | :---: | :---: |
| 5 V | 7 mA (Yellow: 28 mA$)$ | $0.45 \mathrm{~W}(6 \mathrm{~V})$ | - |  |  |  |  |
| 6 V | 7 mA (Yellow: 28 mA$)$ | - | - |  |  |  |  |
| 12 V | 7 mA | $0.55 \mathrm{~W}(14 \mathrm{~V})$ | - |  |  |  |  |
| 24 V | 7 mA | $0.55 \mathrm{~W}(28 \mathrm{~V})$ | - |  |  |  |  |
| 110 V | - | - | 0.19 VA |  |  |  |  |
| 120 V | - | - | 0.21 VA |  |  |  |  |
| 220 V | - | - | 0.38 VA |  |  |  |  |
| 240 V | - | 0.42 VA |  |  |  |  |  |

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 1 mA 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 headKKD07-205 | Flat LED | 24V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-L $\square 11 E 3$ AH164-L $\square 22 E 3$ AH164-L $\square 33 E 3$ | AH165-L $\square 11 E 3$ AH165-L $\square 22 E 3$ AH165-L $\square 33 E 3$ | AH164-L5 $\square 11 E 3$ <br> AH164-L5 $\square 22 E 3$ <br> AH164-L5 $\square 33 E 3$ | AH165-L5 $\square 11 E 3$ <br> AH165-L5 $\square 22 E 3$ <br> AH165-L5 $\square 33 E 3$ |
|  | Spot LED | 24V DC | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO+2NC } \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-L $\square 11 E 2$ AH164-L $\square 22 E 2$ AH164-L $\square 33 E 2$ | AH165-L $\square 11 E 2$ AH165-L $\square 22 \mathrm{E} 2$ AH165-L $\square 33 \mathrm{E} 2$ | AH164-L5 $\square 11 E 2$ <br> AH164-L5 $\square 22 E 2$ <br> AH164-L5 $\square 33 E 2$ | AH165-L5 $\square 11 E 2$ <br> AH165-L5 $\square 22 E 2$ <br> AH165-L5 $\square 33 E 2$ |
|  | Incandescent | $\begin{aligned} & 24 \mathrm{~V} \\ & \mathrm{AC} / \mathrm{DC} \end{aligned}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-L $\square 11 E$ AH164-L $\square 22 \mathrm{E}$ AH164-L $\square 33 \mathrm{E}$ | AH165-L $\square 11 E$ AH165-L $\square 22 E$ AH165-L $\square 33 E$ | AH164-L5 $\square 11 E$ AH164-L5 $\square 22 E$ AH164-L5 $\square 33 E$ | AH165-L5 $\square 11 E$ <br> AH165-L5 $\square 22 \mathrm{E}$ <br> AH165-L5 $\square 33 \mathrm{E}$ |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH164-L } \square 11 \mathrm{H} 1 \\ & \text { AH164-L } \square 22 \mathrm{H} 1 \\ & \text { AH164-L } \square 33 \mathrm{H} 1 \end{aligned}$ | $\begin{aligned} & \text { AH165-L } \square 11 \mathrm{H} 1 \\ & \text { AH165-L } \square 22 \mathrm{H} 1 \\ & \text { AH165-L } \square 33 \mathrm{H} 1 \end{aligned}$ | $\begin{aligned} & \text { AH164-L5 } \square 11 \mathrm{H} 1 \\ & \text { AH164-L5 } \square 22 \mathrm{H} 1 \\ & \text { AH164-L5 } \square 33 \mathrm{H} 1 \end{aligned}$ | $\begin{aligned} & \text { AH165-L5 } \square 11 \mathrm{H} 1 \\ & \text { AH165-L5 } \square 22 \mathrm{H} 1 \\ & \text { AH165-L5 } \square 33 \mathrm{H} 1 \end{aligned}$ |
|  |  | 220 V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-L $\square 11$ M1 AH164-L $\square 22 \mathrm{M} 1$ AH164-L $\square 33 \mathrm{M} 1$ | AH165-L $\square 11$ M1 AH165-L $\square 22 M 1$ AH165-L $\square 33 M 1$ | AH164-L5 $\square 11$ M1 <br> AH164-L5 $\square 22 \mathrm{M} 1$ <br> AH164-L5 $\square 33 \mathrm{M} 1$ | AH165-L5 $\square 11$ M1 <br> AH165-L5 $\square 22 \mathrm{M} 1$ <br> AH165-L5 $\square 33 \mathrm{M} 1$ |
| Flush square head | Flat LED | 24 V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SL $\square 11 E 3$ AH164-SL $\square 22 \mathrm{E} 3$ AH164-SL $\square 33 E 3$ | AH165-SL $\square 11 E 3$ <br> AH165-SL $\square 22 \mathrm{E} 3$ <br> AH165-SL $\square 33 E 3$ | AH164-SL5 $\square 11 E 3$ AH164-SL5 $\square 22 \mathrm{E} 3$ AH164-SL5 $\square 33 E 3$ | AH165-SL5 $\square 11 E 3$ AH165-SL5 $\square 22 \mathrm{E} 3$ AH165-SL5 $\square 33 E 3$ |
|  | Spot LED | 24 V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SL $\square 11 E 2$ <br> AH164-SL $\square 22 E 2$ <br> AH164-SL $\square 33 E 2$ | AH165-SL $\square 11 E 2$ <br> AH165-SL $\square 22 E 2$ <br> AH165-SL $\square 33 E 2$ | $\begin{aligned} & \text { AH164-SL5 } \square 11 E 2 \\ & \text { AH164-SL5 } \square 22 \mathrm{E} 2 \\ & \text { AH164-SL5 } \square 33 \mathrm{E} 2 \end{aligned}$ | $\begin{aligned} & \text { AH165-SL5 } \square 11 E 2 \\ & \text { AH165-SL5 } \square 22 \mathrm{E} 2 \\ & \text { AH165-SL5 } \square 33 \mathrm{E} 2 \end{aligned}$ |
|  | Incandescent | $\begin{aligned} & 24 \mathrm{~V} \\ & \mathrm{AC} / \mathrm{DC} \end{aligned}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SL $\square 11 E$ <br> AH164-SL $\square 22 E$ <br> AH164-SL $\square 33 E$ | AH165-SL $\square 11 E$ <br> AH165-SL $\square 22 E$ <br> AH165-SL $\square 33 E$ | AH164-SL5 $\square 11 \mathrm{E}$ AH164-SL5 $\square 22 E$ AH164-SL5 $\square 33 E$ | AH165-SL5 $\square 11 E$ <br> AH165-SL5 $\square 22 \mathrm{E}$ <br> AH165-SL5 $\square 33 E$ |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SL $\square 11 \mathrm{H} 1$ <br> AH164-SL $\square 22 \mathrm{H} 1$ <br> AH164-SL $\square 33 \mathrm{H} 1$ | AH165-SL $\square 11 \mathrm{H} 1$ AH165-SL $\square 22 \mathrm{H} 1$ AH165-SL $\square 33 \mathrm{H} 1$ | AH164-SL5 $\square 11 \mathrm{H} 1$ <br> AH164-SL5 $\square 22 \mathrm{H} 1$ <br> AH164-SL5 $\square 33 \mathrm{H} 1$ | $\begin{aligned} & \text { AH165-SL5 } \square 11 \mathrm{H} 1 \\ & \text { AH165-SL5 } \square 22 \mathrm{H} 1 \\ & \text { AH165-SL5 } \square 33 \mathrm{H} 1 \end{aligned}$ |
|  |  | 220 V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SL $\square 11 \mathrm{M} 1$ <br> AH164-SL $\square 22 M 1$ <br> AH164-SL $\square 33 \mathrm{M} 1$ | AH165-SL $\square 11$ M1 AH165-SL $\square 22 \mathrm{M} 1$ AH165-SL $\square 33 \mathrm{M} 1$ | AH164-SL5 $\square 11$ M1 AH164-SL5 $\square 22 \mathrm{M} 1$ AH164-SL5 $\square 33 \mathrm{M} 1$ | AH165-SL5 $\square 11$ M1 AH165-SL5 $\square 22 \mathrm{M} 1$ AH165-SL5 $\square 33 \mathrm{M} 1$ |
| Flush rectangular head | Flat LED | 24V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TL $\square 11 E 3$ <br> AH164-TL $\square 22 E 3$ <br> AH164-TL $\square 33 E 3$ | AH165-TL $\square 11 E 3$ AH165-TL $\square 22 \mathrm{E} 3$ AH165-TL $\square 33 E 3$ | AH164-TL5 $\square 11 E 3$ <br> AH164-TL5 $\square 22 \mathrm{E} 3$ <br> AH164-TL5 $\square 33 E 3$ | AH165-TL5 $\square 11 \mathrm{E} 3$ <br> AH165-TL5 $\square 22 \mathrm{E} 3$ <br> AH165-TL5 $\square 33 E 3$ |
|  | Spot LED | 24V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TL $\square 11 E 2$ AH164-TL $\square 22 E 2$ AH164-TL $\square 33 E 2$ | AH165-TL $\square 11 E 2$ <br> AH165-TL $\square 22 \mathrm{E} 2$ <br> AH165-TL $\square 33 E 2$ | AH164-TL5 $\square 11 E 2$ AH164-TL5 $\square 22 E 2$ AH164-TL5 $\square 33 E 2$ | AH165-TL5 $\square 11 \mathrm{E} 2$ AH165-TL5 $\square 22 \mathrm{E} 2$ AH165-TL5 $\square 33 \mathrm{E} 2$ |
|  | Incandescent | $\begin{aligned} & 24 \mathrm{~V} \\ & \mathrm{AC} / \mathrm{DC} \end{aligned}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TL $\square 11 E$ <br> AH164-TL $\square$ 22E <br> AH164-TL $\square 33 E$ | AH165-TL $\square 11 E$ <br> AH165-TL $\square 22 E$ <br> AH165-TL $\square 33 E$ | AH164-TL5 $\square 11 \mathrm{E}$ <br> AH164-TL5 $\square 22 \mathrm{E}$ <br> AH164-TL5 $\square 33 E$ | AH165-TL5 $\square 11 \mathrm{E}$ <br> AH165-TL5 $\square 22 \mathrm{E}$ <br> AH165-TL5 $\square 33 E$ |
|  | Neon | 110 V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TL $\square 11 \mathrm{H} 1$ <br> AH164-TL $\square 22 \mathrm{H} 1$ <br> AH164-TL $\square 33 \mathrm{H} 1$ | AH165-TL $\square 11 \mathrm{H} 1$ AH165-TL $\square 22 \mathrm{H} 1$ AH165-TL $\square 33 \mathrm{H} 1$ | $\begin{aligned} & \text { AH164-TL5 } \square 11 \mathrm{H} 1 \\ & \text { AH164-TL5 } \square 22 \mathrm{H} 1 \\ & \text { AH164-TL5 } \square 33 \mathrm{H} 1 \end{aligned}$ | $\begin{aligned} & \text { AH165-TL5 } \square 11 \mathrm{H} 1 \\ & \text { AH165-TL5 } \square 22 \mathrm{H} 1 \\ & \text { AH165-TL5 } \square 33 \mathrm{H} 1 \end{aligned}$ |
|  |  | 220 V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TL $\square 11$ M1 <br> AH164-TL $\square 22 \mathrm{M} 1$ <br> AH164-TL $\square 33 \mathrm{M} 1$ | AH165-TL $\square 11$ M1 <br> AH165-TL $\square 22 \mathrm{M} 1$ <br> AH165-TL $\square 33 M 1$ | $\begin{aligned} & \text { AH164-TL5 } \square 11 \mathrm{M} 1 \\ & \text { AH164-TL5 } \square 22 \mathrm{M} 1 \\ & \text { AH164-TL5 } \square 33 \mathrm{M} 1 \end{aligned}$ | $\begin{aligned} & \text { AH165-TL5 } \square 11 \mathrm{M} 1 \\ & \text { AH165-TL5 } \square 22 \mathrm{M} 1 \\ & \text { AH165-TL5 } \square 33 \mathrm{M} 1 \end{aligned}$ |

[^28]Illuminated Pushbuttons

## 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 | 24 V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TGL $\square 11$ E3 AH164-TGL $\square 22 \mathrm{E} 3$ AH164-TGL $\square 33 E 3$ | AH165-TGL $\square 11 \mathrm{E} 3$ AH165-TGL $\square 22 \mathrm{E} 3$ AH165-TGL $\square 33 \mathrm{E} 3$ | AH164-TGL5 $\square 11 E 3$ <br> AH164-TGL5 $\square 22 E 3$ <br> AH164-TGL5 $\square 33 E 3$ | AH165-TGL5 $\square 11 E 3$ <br> AH165-TGL5 $\square 22 \mathrm{E} 3$ <br> AH165-TGL5 $\square 33 E 3$ |
|  | Incandescent | $\begin{array}{\|l\|} 24 \mathrm{~V} \\ \mathrm{AC} / \mathrm{DC} \end{array}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TGL $\square 11 E$ AH164-TGL $\square 22 \mathrm{E}$ <br> AH164-TGL $\square 33 E$ | AH165-TGL $\square 11 \mathrm{E}$ AH165-TGL $\square 22 \mathrm{E}$ AH165-TGL $\square 33 \mathrm{E}$ | AH164-TGL5 $\square 11 E$ <br> AH164-TGL5 $\square 22 E$ <br> AH164-TGL5 $\square 33 E$ | AH165-TGL5 $\square 11 \mathrm{E}$ <br> AH165-TGL5 $\square 22 \mathrm{E}$ <br> AH165-TGL5 $\square 33 \mathrm{E}$ |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TGL $\square 11 \mathrm{H} 1$ <br> AH164-TGL $\square 22 \mathrm{H} 1$ <br> AH164-TGL $\square 33 \mathrm{H} 1$ | AH165-TGL $\square 11 \mathrm{H} 1$ <br> AH165-TGL $\square 22 \mathrm{H} 1$ <br> AH165-TGL $\square 33 \mathrm{H} 1$ | AH164-TGL5 $\square 11 \mathrm{H} 1$ <br> AH164-TGL5 $\square 22 \mathrm{H} 1$ <br> AH164-TGL5 $\square 33 \mathrm{H} 1$ | $\begin{aligned} & \text { AH165-TGL5 } \square 11 \mathrm{H} 1 \\ & \text { AH165-TGL5 } \square 22 \mathrm{H} 1 \\ & \text { AH165-TGL5 } \square 33 \mathrm{H} 1 \end{aligned}$ |
|  |  | 220 V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TGL $\square 11$ M1 <br> AH164-TGL $\square 22 \mathrm{M} 1$ <br> AH164-TGL $\square 33 \mathrm{M} 1$ | AH165-TGL $\square 11 \mathrm{M} 1$ AH165-TGL $\square 22 \mathrm{M} 1$ AH165-TGL $\square 33 M 1$ | AH164-TGL5 $\square 11 \mathrm{M} 1$ AH164-TGL5 $\square 22 \mathrm{M} 1$ AH164-TGL5 $\square 33 \mathrm{M} 1$ | AH165-TGL5 $\square 11$ M1 AH165-TGL5 $\square 22 \mathrm{M} 1$ AH165-TGL5 $\square 33 M 1$ |
| Flush square head with guard | Flat LED | 24V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline \end{aligned}$ | AH164-SGL $\square 11 E 3$ <br> AH164-SGL $\square 22 E 3$ <br> AH164-SGL $\square 33 E 3$ | AH165-SGL $\square 11 E 3$ AH165-SGL $\square 22 \mathrm{E} 3$ AH165-SGL $\square 33 E 3$ | AH164-SGL5 $\square 11 E 3$ AH164-SGL5 $\square 22 E 3$ AH164-SGL5 $\square 33 E 3$ | AH165-SGL5 $\square 11 E 3$ AH165-SGL5 $\square 22 \mathrm{E} 3$ AH165-SGL5 $\square 33 \mathrm{E} 3$ |
|  | Incandescent | $\begin{array}{\|l} 24 \mathrm{~V} \\ \mathrm{AC} / \mathrm{DC} \end{array}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SGL $\square 11 E$ AH164-SGL $\square 22 E$ AH164-SGL $\square 33 E$ | AH165-SGL $\square 11 \mathrm{E}$ <br> AH165-SGL $\square 22 E$ <br> AH165-SGL $\square$ 33E | AH164-SGL5 $\square 11 E$ <br> AH164-SGL5 $\square 22 E$ <br> AH164-SGL5 $\square 33 E$ | AH165-SGL5 $\square 11 E$ <br> AH165-SGL5 $\square 22 E$ <br> AH165-SGL5 $\square 33 E$ |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SGL $\square 11 \mathrm{H} 1$ <br> AH164-SGL $\square 22 \mathrm{H} 1$ <br> AH164-SGL $\square 33 \mathrm{H} 1$ | AH165-SGL $\square 11 \mathrm{H} 1$ <br> AH165-SGL $\square 22 \mathrm{H} 1$ <br> AH165-SGL $\square 33 \mathrm{H} 1$ | $\begin{aligned} & \text { AH164-SGL5 } \square 11 \mathrm{H} 1 \\ & \text { AH164-SGL5 } \square 22 \mathrm{H} 1 \\ & \text { AH164-SGL5 } \square 33 \mathrm{H} 1 \end{aligned}$ | AH165-SGL5 $\square 11 \mathrm{H} 1$ <br> AH165-SGL5 $\square 22 \mathrm{H} 1$ <br> AH165-SGL5 $\square 33 \mathrm{H} 1$ |
|  |  | 220 V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SGL $\square 11$ M1 AH164-SGL $\square 22 M 1$ AH164-SGL $\square 33 M 1$ | AH165-SGL $\square 11$ M1 AH165-SGL $\square 22 M 1$ AH165-SGL $\square 33 \mathrm{M} 1$ | AH164-SGL5 $\square 11$ M1 AH164-SGL5 $\square 22 \mathrm{M} 1$ AH164-SGL5 $\square 33 \mathrm{M} 1$ | AH165-SGL5 $\square 11 \mathrm{M} 1$ AH165-SGL5 $\square 22 M 1$ AH165-SGL5 $\square 33 M 1$ |

- Dimensions, mm



## - Button color

| Color | Green | Red | White | Yellow | Blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | Y | S | O |

- 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 47 mm .


TGL, TGL5
SGL, SGL5


- Lamp voltage

Voltages other than above are available

| Code | LED | Incandescent | Neon |
| :--- | :--- | :--- | :--- |
| AA | 5 V DC | - | - |
| A | 6 V DC | 5 V AC/DC | - |
| B | 12 V DC | 12 V AC/DC | - |
| K | - | - | $120 V$ AC |
| P | - | - | $240 V ~ A C$ |

■ 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 <br> code <br> $\mathrm{H}:$ <br> $100-110 \mathrm{~V}$ <br> AC <br> $\mathrm{M}:$ <br> $200-220 \mathrm{~V}$ <br> AC | 1NO+1NC | AH164-L $\square 11$ ■ | AH165-L $\square 11$ ■ | AH164-L5 $\square 11$ ³ | AH165-L5 $\square 11$ - 3 |
|  |  |  | 2NO+2NC | AH164-L $\square 22$ ■ 3 | AH165-L $\square 22 \square 3$ | AH164-L5 $\square 22 \square 3$ | AH165-L5 $\square 22$ - 3 |
|  | Incandescent |  | 1NO+1NC | AH164-L $\square 11 \square$ | AH165-L $\square 11$ ■ | AH164-L5 $\square 11$ ■ | AH165-L5 $\square 11$ ■ |
|  |  |  | $2 \mathrm{NO}+2 \mathrm{NC}$ | AH164-L $\square \mathbf{2 2}$ | AH165-L $\square 22 \square$ | AH164-L5 $\square 22 \square$ | AH165-L5 $\square 22 \square$ |
| Flush square head | Flat LED | Voltage <br> code <br> $\mathrm{H}:$ <br> $100-110 \mathrm{~V}$ <br> AC <br> $\mathrm{M}:$ <br> $200-220 \mathrm{~V}$ <br> AC | $1 \mathrm{NO}+1 \mathrm{NC}$ | AH164-SL $\square 11$ ■ | AH165-SL $\square 11$ ■ | AH164-SL5 $\square 11$ ■ | AH165-SL5 $\square 11$ ■ |
|  |  |  | 2NO+2NC | AH164-SL $\square 22 \square 3$ | AH165-SL $\square 22 \square 3$ | AH164-SL5 $\square 22 \square 3$ | AH165-SL5 $\square 22 \square 3$ |
|  | Incandescent |  | 1NO+1NC | AH164-SL $\square 11$ ■ | AH165-SL $\square 11 \square$ | AH164-SL5 $\square 11$ ■ | AH165-SL5 $\square 11$ ■ |
|  |  |  | 2NO+2NC | AH164-SL $\square 22 \square$ | AH165-SL $\square 22 \square$ | AH164-SL5 $\square 22 \square$ | AH165-SL5 $\square 22 \square$ |
| Flush rectangular head | Flat LED | ■ Voltage <br> code <br> $\mathrm{H}:$ <br> $100-110 \mathrm{~V}$ <br> AC <br> $\mathrm{M}:$ <br> $200-220 \mathrm{~V}$ <br> AC | 1NO+1NC | AH164-TL $\square 11$ [ ${ }^{\text {a }}$ | AH165-TL $\square 11 \square 3$ | AH164-TL5 $\square 11$ ■ | AH165-TL5 $\square 11 \square 3$ |
|  |  |  | 2NO+2NC | AH164-TL $\square 22$ ■ | AH165-TL $\square 22$ ■ | AH164-TL5 $\square 22 \square 3$ | AH165-TL5 $\square 22$ ■ |
|  | Incandescent |  | 1NO+1NC | AH164-TL $\square 11$ ■ | AH165-TL $\square 11$ ■ | AH164-TL5 $\square 11$ ■ | AH165-TL5 $\square 11$ ■ |
|  |  |  | 2NO+2NC | AH164-TL $\square 22 \square$ | AH165-TL $\square 22 \square$ | AH164-TL5 $\square 22 \square$ | AH165-TL5 $\square 22$ ■ |
| Flush rectangular head with guard <br> AF90-941 | Flat LED | Voltage <br> code <br> $\mathrm{H}:$ <br> $100-110 \mathrm{~V}$ <br> AC <br> $\mathrm{M}:$ <br> $200-220 \mathrm{~V}$ <br> AC | $1 \mathrm{NO}+1 \mathrm{NC}$ | AH164-TGL $\square 11$ ■ | AH165-TGL $\square 11 \square 3$ | AH164-TGL5 $\square 11 \square 3$ | AH165-TGL5 $\square 11 \square 3$ |
|  |  |  | $2 \mathrm{NO}+2 \mathrm{NC}$ | AH164-TGL $\square 22$ ■ | AH165-TGL $\square 22$ ■ | AH164-TGL5 $\square 22$ ³ | AH165-TGL5 $\square 22$ - 3 |
|  | Incandescent |  | 1NO+1NC | AH164-TGL $\square 11 \square$ | AH165-TGL $\square 11$ ■ | AH164-TGL5 $\square 11$ ■ | AH165-TGL5 $\square 11 \square$ |
|  |  |  | $2 \mathrm{NO}+2 \mathrm{NC}$ | AH164-TGL $\square 22 \square$ | AH165-TGL $\square 22 \square$ | AH164-TGL5 $\square 22 \square$ | AH165-TGL5 $\square 22 \square$ |
| Flush square head with guard <br> AF90-948 | Flat LED | Voltage <br> code <br> H: <br> $100-110 \mathrm{~V}$ <br> AC <br> M: <br> $200-220 \mathrm{~V}$ <br> AC | 1NO+1NC | AH164-SGL $\square 11$ ■ | AH165-SGL $\square 11 \square 3$ | AH164-SGL5 $\square 11$ ■ | AH165-SGL5 $\square 11 \square 3$ |
|  |  |  | $2 \mathrm{NO}+2 \mathrm{NC}$ | AH164-SGL $\square 22$ ■ | AH165-SGL $\square 22 \square 3$ | AH164-SGL5 $\square 22$ ■ | AH165-SGL5 $\square 22$ ■ |
|  | Incandescent |  | 1NO+1NC | AH164-SGL $\square 11$ ■ | AH165-SGL $\square 11 \square$ | AH164-SGL5 $\square 11$ ■ | AH165-SGL5 $\square 11$ ■ |
|  |  |  | 2NO+2NC | AH164-SGL $\square 22 \square$ | AH165-SGL $\square 22 \square$ | AH164-SGL5 $\square 22 \square$ | AH165-SGL5 $\square 22 \square$ |

[^29]
## AH164 and AH165

■ Dimensions, mm


## - Button color

| Color | Green | Red | White | Yellow | Blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | Y | S | O |

- The color lens is made of a tinted transparent material.


## ■ Pushbutton switches

| Operator | Contact | Momentary action |  | Alternate action |  | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | AH164 type A | AH165 (oil-tight) type | AH164 type AH | 65 (oil-tight) type |  |
| Extended round head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-E $\square 11$ <br> AH164-E $\square 22$ <br> AH164-E $\square 33$ | AH165-E $\square 11$ <br> AH165-E $\square 22$ <br> AH165-E $\square 33$ | AH164-E5 $\square 11$ <br> AH164-E5 $\square 22$ <br> AH164-E5 $\square 33$ | AH165-E5 $\square 11$ <br> AH165-E5 $\square 22$ <br> AH165-E5 $\square 33$ |  |
| Flush square head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SF $\square 11$ <br> AH164-SF $\square 22$ <br> AH164-SF $\square 33$ | AH165-SF $\square 11$ <br> AH165-SF $\square 22$ <br> AH165-SF $\square 33$ | AH164-SF5 $\square 11$ AH164-SF5 $\square 22$ AH164-SF5 $\square 33$ | AH165-SF5 $\square 11$ <br> AH165-SF5 $\square 22$ <br> AH165-SF5 $\square 33$ |  |
| Flush rectangular head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TF $\square 11$ <br> AH164-TF $\square 22$ <br> AH164-TF $\square 33$ | AH165-TF $\square 11$ <br> AH165-TF $\square 22$ <br> AH165-TF $\square 33$ | AH164-TF5 $\square 11$ <br> AH164-TF5 $\square 22$ <br> AH164-TF5 $\square 33$ | AH165-TF5 $\square 11$ <br> AH165-TF5 $\square 22$ <br> AH165-TF5 $\square 33$ |  |
| Flush rectangular head with guard | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TGF $\square 11$ <br> AH164-TGF $\square 22$ <br> AH164-TGF $\square 33$ | 1 AH165-TGF $\square 11$ <br> 2 AH165-TGF $\square 22$ <br> 3 AH165-TGF $\square 33$ | AH164-TGF5 $\square 11$ <br> AH164-TGF5 $\square 22$ <br> AH164-TGF5 $\square 33$ | AH165-TGF5 $\square 11$ <br> AH165-TGF5 $\square 22$ <br> AH165-TGF5 $\square 33$ |  |
| Flush square head with guard | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SGF $\square 11$ <br> AH164-SGF $\square 22$ <br> AH164-SGF $\square 33$ | 1 AH165-SGF $\square 11$ <br> 2 AH165-SGF $\square 22$ <br> 3 AH165-SGF $\square 33$ | AH164-SGF5 $\square 11$ <br> AH164-SGF5 $\square 22$ <br> AH164-SGF5 $\square 33$ | AH165-SGF5 $\square 11$ <br> AH165-SGF5 $\square 22$ <br> AH165-SGF5 $\square 33$ |  |
| Mushroom head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-M $\square 11$ <br> AH164-M $\square 22$ <br> AH164-M $\square 33$ | AH165-M $\square 11$ <br> AH165-M $\square 22$ <br> AH165-M $\square 33$ | AH164-M5 $\square 11$ <br> AH164-M5 $\square 22$ <br> AH164-M5 $\square 33$ | AH165-M5 $\square 11$ <br> AH165-M5 $\square 22$ <br> AH165-M5 $\square 33$ |  |
| Convex square head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SM $\square 11$ <br> AH164-SM $\square 22$ <br> AH164-SM $\square 33$ | AH165-SM $\square 11$ <br> AH165-SM $\square 22$ <br> AH165-SM $\square 33$ | AH164-SM5 $\square 11$ AH164-SM5 $\square 22$ AH164-SM5 $\square 33$ | AH165-SM5 $\square 11$ <br> AH165-SM5 $\square 22$ <br> AH165-SM5 $\square 33$ |  |
| Convex rectangular head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-TM $\square 11$ <br> AH164-TM $\square 22$ <br> AH164-TM $\square 33$ | AH165-TM $\square 11$ <br> AH165-TM $\square 22$ <br> AH165-TM $\square 33$ | AH164-TM5 $\square 11$ AH164-TM5 $\square 22$ AH164-TM5 $\square 33$ | AH165-TM5 $\square 11$ <br> AH165-TM5 $\square 22$ <br> AH165-TM5 $\square 33$ |  |

- Button color

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

| Color | Green | Red | Black | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | B | W | S | Y | O |

- 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)
- With wire-wrap pin terminals have a depth of 47 mm .

Pushbuttons
AH165

## ■ Pushbutton switches

$\Theta$ (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 <br> (AH165-VR01-S) |  |
| AF91-584 |  | 2NC |  | AH165-VR02 <br> (AH165-VR02-S) |  |
| Push-lock, turn-reset (40mm dia.) |  | 1NC |  | AH165-V1R01 <br> (AH165-V1R01-S) |  |
| AF91-583 |  | 2NC |  | AH165-V1R02 <br> (AH165-V1R02-S) |  |

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

| Operator | Button color | Contact | Terminal | AH165 (oil-tight) type | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Push-lock, turn-reset (32mm dia.) <br> KKD07-221 | Red | 1NC | Solder/Tab Solder | AH165-V5R01 <br> (AH165-V5R01-S) <br> AH165-V5R02 <br> (AH165-V5R02-S) |  |
| Push-lock, turn-reset (40mm dia.) <br> KKD07-222 |  | 1NC |  | AH165-V6R01 <br> (AH165-V6R01-S) <br> AH165-V6R02 <br> (AH165-V6R02-S) |  |

Notes: * ( ) For switch with solder terminal.

- Contact arrangements indicated in the table can be supplied.
$■$ Selector switches/2-position (90-degree)

| Operator | Operation | Key removable position | Contact | AH164 type | AH165 (oil-tight) type | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Knob with rectangular bezel | Maintained <br> Spring return | - - | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-P2B11 <br> AH164-P2B22 <br> AH164-P2B33 <br> AH164-P0B11 <br> AH164-POB22 <br> AH164-POB33 | AH165-P2B11 <br> AH165-P2B22 <br> AH165-P2B33 <br> AH165-P0B11 <br> AH165-P0B22 <br> AH165-P0B33 |  |
| Knob with square bezel | Maintained <br> Spring return | - - | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SP2B11 <br> AH164-SP2B22 <br> AH164-SP2B33 <br> AH164-SP0B11 <br> AH164-SPOB22 <br> AH164-SPOB33 | AH165-SP2B11 <br> AH165-SP2B22 <br> AH165-SP2B33 <br> AH165-SPOB11 <br> AH165-SPOB22 <br> AH165-SPOB33 |  |
| Key with rectangular bezel <br> KKD09-001L | Maintained <br> Spring return | $\bigcirc$ A $\otimes$ B B D D A | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-J2A11A <br> AH164-J2A22A <br> AH164-J2A33A <br> AH164-J2B11A <br> AH164-J2B22A <br> AH164-J2B33A <br> AH164-J2D11A <br> AH164-J2D22A <br> AH164-J2D33A <br> AH164-J0A11A <br> AH164-J0A22A <br> AH164-J0A33A | AH165-J2A11A <br> AH165-J2A22A <br> AH165-J2A33A <br> AH165-J2B11A <br> AH165-J2B22A <br> AH165-J2B33A <br> AH165-J2D11A <br> AH165-J2D22A <br> AH165-J2D33A <br> AH165-J0A11A <br> AH165-J0A22A <br> AH165-J0A33A |  |
| Key with square bezel <br> KKD09-001R | Maintained <br> Spring <br> return | © A ® B - D D A | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH164-SJ2A11A <br> AH164-SJ2A22A <br> AH164-SJ2A33A <br> AH164-SJ2B11A <br> AH164-SJ2B22A <br> AH164-SJ2B33A <br> AH164-SJ2D11A <br> AH164-SJ2D22A <br> AH164-SJ2D33A <br> AH164-SJ0A11A <br> AH164-SJ0A22A <br> AH164-SJ0A33A | AH165-SJ2A11A <br> AH165-SJ2A22A <br> AH165-SJ2A33A <br> AH165-SJ2B11A <br> AH165-SJ2B22A <br> AH165-SJ2B33A <br> AH165-SJ2D11A <br> AH165-SJ2D22A <br> AH165-SJ2D33A <br> AH165-SJ0A11A <br> AH165-SJ0A22A <br> AH165-SJ0A33A |  |

- The operating angle range can be changed as shown below by setting the attached flange shifted by $45^{\circ}$ in combination with the contact block.
In this case, the minimum mounting pitch is 26 mm because the contact block is shifted by $45^{\circ}$ from the flange.

- Contact block position

View from back


- 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 47 mm .
- Contact arrangement and operator position: 2-position selector switch

| Contact arrange- <br> ment | $1 \mathrm{NO}+1 \mathrm{NC}$ | $2 \mathrm{NO}+2 \mathrm{NC}$ | $3 \mathrm{NO}+3 \mathrm{NC}$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Operator <br> position | Left |  |  |


| Contact arrangement |  | 2NO+2NC | $3 \mathrm{NO}+3 \mathrm{NC}$ |
| :---: | :---: | :---: | :---: |
| Operator position | Left $\Theta$ | $\begin{array}{\|c} \hline U \\ 1010210 \\ 30 \\ 30 \\ \hline 0 \end{array}$ |  |
|  | Center (1) | $\begin{array}{lllllll} \hline 10 & 102 & 10102 \\ 30 & 0430 & 04 \end{array}$ | $1 \mathrm{OLQ} 21 \mathrm{O}\|\mathrm{O} 21 \mathrm{O}\| \mathrm{O} 2$ $30 \quad 0430 \quad 0430 \quad 04$ |
|  | Right |  |  |

## AH165

## $■$ Selector switches/2-position (90-degree)

$\Theta$ (Direct opening action)

| Operator | Operation | Key removable position | Contact | AH165 (oil-tight) type | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Key with rectangular bezel | Maintained | A ( ) <br> B * <br> D 8 | 1NO+1NC | AH165-JM2A11A <br> AH165-JM2B11A <br> AH165-JM2D11A |  |
|  |  | A $\bigcirc$ <br> B $\otimes$ <br> D © | 2NO+2NC | AH165-JM2A22A <br> AH165-JM2B22A <br> AH165-JM2D22A |  |
| Key with round bezel | Maintained | A $\bigcirc$ <br> B * <br> D $®$ | 1NO+1NC | AH165-RJM2A11A <br> AH165-RJM2B11A <br> AH165-RJM2D11A |  |
|  |  | A $\bigcirc$ <br> B © <br> D © | 2NO+2NC | AH165-RJM2A22A <br> AH165-RJM2B22A <br> AH165-RJM2D22A |  |

- 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 <br> arrangement | $1 \mathrm{NO}+1 \mathrm{NC}$ |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Operator <br> position | Left |  |  |  |  |



## - Terminal number

$$
1 \mathrm{NO}+1 \mathrm{NC} \quad 2 \mathrm{NO}+2 \mathrm{NC}
$$



■ Selector switches/3-position (90-degree)


- There are 6 available key types; A, B, C, D, E and F Standard key code is A
-     * Available key removable position: Code B $\Theta$
- With wire-wrap pin terminals have a depth of 47 mm .

Contact arrangement and operator position: See page 04/201.

- Spring return, spring/manual return (spring return):

Operation angle 70-degree

## Selector Switches

AH164 and AH165

■ Selector switches/3-position (45-degree)


[^30]- Key removable positions (JK, SJK)

| Remvable position | $Q$ | $\otimes$ | \% | $\square$ | 0 | D | 0 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Code | A | B | C | D | E | F | G |
| Operation code |  |  | Key removable position |  |  |  |  |
| 3 |  |  | A, B, C, D, E, F, G |  |  |  |  |
|  |  |  | D, E, F |  |  |  |  |
| 6 |  | 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

- Contact arrangement and operator position:

3-position selector switch

| Contact arrangement |  | 2NO+2NC | 3NO+3NC |
| :---: | :---: | :---: | :---: |
| Operator position | Left (2) |  |  |
|  | Center (1) | $\begin{array}{llllll} 10 & 10210 & 10 & 0 \\ 30 & 0430 & 0 \end{array}$ |  |
|  | Right ( $)$ |  |  |

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 $\square$ E3 | AH165-Z $\square$ E3 |  |
|  | Spot LED | 24 V DC | AH164-Z $\square$ E2 | AH165-Z $\square \mathrm{E} 2$ |  |
|  | Incandescent | 24V AC/DC | AH164-Z $\square$ E | AH165-Z $\square \mathrm{E}$ |  |
|  | Neon | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \text { AC } \end{aligned}$ | AH164-Z $\square$ H1 AH164-Z $\square$ M1 | AH165-Z $\square$ H1 <br> AH165-Z $\square$ M1 |  |
| Flush sauare | Flat LED | 24 V DC | AH164-ZS $\square$ E3 | AH165-ZS $\square$ E3 |  |
|  | Spot LED | 24V DC | AH164-ZS $\square$ E2 | AH165-ZS $\square$ E2 |  |
|  | Incandescent | 24V AC/DC | AH164-ZS $\square$ E | AH165-ZS $\square \mathrm{E}$ |  |
|  | Neon | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \mathrm{AC} \end{aligned}$ | AH164-ZS $\square$ H1 AH164-ZS $\square$ M1 | AH165-ZS $\square$ H1 AH165-ZS $\square$ M1 |  |
| Flush rectangular | Flat LED | 24 V DC | AH164-ZT $\square$ E3 | AH165-ZT $\square$ E3 |  |
|  | Spot LED | 24 V DC | AH164-ZT $\square$ E2 | AH165-ZT $\square$ E2 |  |
|  | Incandescent | 24V AC/DC | AH164-ZT $\square \mathrm{E}$ | AH165-ZT $\square \mathrm{E}$ |  |
|  | Neon | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \text { AC } \end{aligned}$ | AH164-ZT $\square$ H1 AH164-ZT $\square$ M1 | AH165-ZT $\square$ H1 AH165-ZT $\square$ M1 |  |
| Dome <br> AF87-45 | LED | 12 V DC |  | AH165-ZM $\square$ B2 <br> AH165-ZM $\square E 2$ |  |

- Lens color

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

| Color | Green | Red | White | Yellow | Blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | Y | S | O |

- 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 | 5 V DC | - | - |
| A | 6 V DC | 5V AC/DC | - |
| B | 12 V DC | 12 V AC/DC | - |
| K | - | - | $120 V$ AC |
| P | - | - | $240 V$ AC |

Note: Except for ZM types and red/green LED types

## ■ Pilot lights/with transformer

\begin{tabular}{|c|c|c|c|c|c|}
\hline Lens \& Lamp \& Voltage \& AH164 type \& AH165 (oil-tight) type \& Dimensions, mm \\
\hline \begin{tabular}{l}
Extended square \\
AF90-944
\end{tabular} \& \begin{tabular}{l} 
Flat LED \\
\hline \\
Incandescent
\end{tabular} \& ■ Voltage
\(\mathrm{H}:\)
\(100-110 \mathrm{~V}\)
AC
\(\mathrm{M}:\)
\(200-220 \mathrm{~V}\)
AC \& AH164-Z \(\square \square 3\)

AH164-Z $\square \square$ \& AH165-Z $\square \square 3$
AH165-Z $\square \square$ \&  <br>

\hline | Flush square |
| :--- |
| AF90-943 | \& | Flat LED |
| :--- |
|  |
| Incandescent | \& ■ Voltage

$\mathrm{H}:$
$100-110 \mathrm{~V}$
AC
$\mathrm{M}:$
$200-220 \mathrm{~V}$
AC \& AH164-ZS $\square \square 3$

AH164-ZS $\square \square$ \& AH165-ZS $\square$ ■3

AH165-ZS $\square \square$ \&  <br>

\hline | Flush rectangular |
| :--- |
| AF90-942 | \& | Flat LED |
| :--- |
|  |
| Incandescent | \& Voltage

$\mathrm{H}:$
$100-110 \mathrm{~V}$
AC
$\mathrm{M}:$
$200-220 \mathrm{~V}$
AC \& AH164-ZT $\square \square 3$

AH164-ZT $\square \square$ \& AH165-ZT $\square \square 3$
AH165-ZT $\square \square$ \&  <br>
\hline
\end{tabular}

## - Lens color

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

| Color | Green | Red | White | Yellow | Blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | Y | S | O |

- The color lens is made of a tinted transparent material.
- A white pilot lights is fitted with a transparent color lens.
- Buzzers

| Sound | Operating voltage | Type | Dimensions, mm |
| :---: | :---: | :---: | :---: |
| Standard <br> AF87-317 | 6V AC <br> 6V DC <br> 12 to 24 V AC/DC <br> 35 to 48 V AC/DC | AH164-TXBAAC <br> AH164-TXBADC <br> AH164-TXBE <br> AH164-TXBF |  |
| Loud sound <br> AF87-44 | 6V AC <br> 6V DC <br> 12 to 24 V AC/DC <br> 35 to 48 V AC/DC | AH164-TX1BAAC <br> AH164-TX1BADC <br> AH164-TX1BE <br> AH164-TX1BF | Short-circuit terminal <br> Connected: Intermittent sound <br> Not connected: Continuous sound |
| Loud sound with volume control <br> KKD07-223 | 6V AC/DC <br> 12 to 24 V AC/DC <br> 35 to 48 V AC/DC | AH164-TX2BA <br> AH164-TX2BE <br> AH164-TX2BF |  |
| Standard sound with volume control (IP54) <br> KKD05-096b | 6V AC/DC <br> 12 to 24 V AC/DC <br> 35 to 48 V AC/DC | AH165-XBA <br> AH165-XBE <br> AH165-XBF | Volume |

■ Mounting space, mm

- Pushbuttons and pilot lights

Extended round head or lens


Mushroom head


## Flush square head or lens



Convex square head


- When mounting the selector switches near each other

- 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

## . AH165-JM, RJM



## ■ Terminal number

- AH164, 165

| Type | Wiring | Terminal position |
| :---: | :---: | :---: |
| Illuminated pushbuttons |  | Type number display side |
| Pushbuttons Selector switches (except for JM, RJM types) | (1) 0 (3) (3) |  |
| Pilot lights (without transformer) |  | Type number display side |

Pushbuttons/Selectors/Pilot Lights

## AH165-2

## Type number nomenclature

## - Type number nomenclature

## Pushbuttons, illuminated pushbuttons and pilot lights



Color of button or lens

| Code | Color | Button | LED | Incandescent | Neon |
| :--- | :--- | :--- | :--- | :--- | :--- |
| G | Green | $O$ | $O$ | $O$ | $O$ |
| R | Red | $O$ | $O$ | $O$ | $O$ (Orange) |
| B | Black $^{*}$ | $O$ | - | - | - |
| Y | Yellow | $O$ | $O$ | $O$ | $O$ (Orange) |
| W | White | $O$ | $O$ (Orange) | 0 | $O$ (Orange) |
| S | Blue | $O$ | $O$ | $O$ | $O$ (Green) |
| O | Orange | $O$ | $O$ (Amber) | $O$ | $O$ |

Notes: - ( ): indicates luminous color
Not available for illuminated types
(4) Contact arrangement (except pilot lights)

NC
33. $3 \mathrm{NO}+3 \mathrm{NC}$
(5) Lamp voltage

| Code | LED | Incandescent | Neon |
| :--- | :--- | :--- | :--- |
| AA | 5 V DC | - | - |
| A | 6 V DC | 5 V AC/DC | - |
| B | $12 V$ DC | $12 V$ AC/DC | - |
| E | 24 V DC | $24 V$ AC/DC | - |
| H | - | - | 110 V AC |
| K | - | - | 120 V AC |
| M | - | - | 220 V AC |
| P | - | - | 240 V AC |

© Type of lamp
Blank: Incandescent
1: Neon
: Flat LED
(7) Terminal

Blank: Solder/tab
W: Wire-wrap

## ■ Type number nomenclature

## Selector switches

$\frac{\mathrm{AH} 165-2}{(1)} \frac{\mathrm{J}}{2} \frac{2}{(3)} \frac{B}{(4)} \frac{11}{(5)} \frac{\mathrm{A}}{6}-\frac{W}{(7)}$
(1) Product category

AH165-2: Oil-tight (Large operator)

## (2) Operator

- Knob and key type

2-position (operating angle $90^{\circ}$ )
P: Knob
YP: Knob with square bezel
J: Key
YJ: Key with square bezel
3-position (operating angle $45^{\circ}$ )
P: Knob
YP: Knob with square bezel
J: Key
YJ: Key with square bezel

- Lever type

2-position (operating angle $45^{\circ}$ )
H: Lever
SH: Lever with square bezel
Note: The operation angle is $45^{\circ}$ 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 |
| A | $\bigcirc$ | O | - | (2) | - | (2) |
| B | * | - | - | * | - | - |
| C | - | - | - | * | - | - |
| D | (2) | - | - | ( $)$ |  | - |
| E | - | - | (1) |  |  |  |
| F | - | - | - | (*) |  | - |
| G | - | - | - | (1) | - | (1) |

## (5) Contact arrangement

11: $1 \mathrm{NO}+1 \mathrm{NC} \mathrm{*}^{*}$
22: $2 \mathrm{NO}+2 \mathrm{NC}$
33: 3NO+3NC
Note: * Except for 3-position
(6) Key type No.

A (standard), B, C, D, E, F

## (7) Terminal

Blank: Solder/tab
W: Wire-wrap

## Illuminated selector switches



Operation
2-position, maintained
3: 3-position, maintained
(4) Color of knob
(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) <br> File No. LR84365 (for AH165-2Z, 2ZE, 2SZ, 2SZE) |
| TÜV: EN60947-5-1 | Pushbutton, illuminated pushbutton: R9250087 <br> Selector (except for AH165-2H, SH), illuminated selector: R9250088 <br> Selector (for AH165-2H, SH): R9250087 <br> Pilot lights: R9250089 |

## - Specifications (Indoor use)

| Item | AH165-2 |
| :---: | :---: |
| Rated insulation voltage | 250V AC/DC |
| Ambient temperature (no condensation or no icing) | -10 to $+70^{\circ} \mathrm{C}$ *1 |
| Humidity | 45 to $85 \%$ RH (at -5 to $+40^{\circ} \mathrm{C}$ ), no condensation or no icing |
| Durability <br> Mechanical (operations) | Pushbutton and illuminated pushubutton switch <br> Momentary action: 1 million <br> Alternate action: 250,000 <br> Push-lock, turn-reset: 100,000 <br> With selector ring: 250,000 <br> Selector and illuminated selector switch: 250,000*2 $100,000(220 \mathrm{~V} \text { AC } 0.7 \mathrm{~A})$ |
| Dielectric strength | 2000V AC, 1 minute <br> (Between lamp and contact terminals: 1500V AC, 1 minute) |
| Conditional short-circuit current | 1000A |
| Short-circuit protective device | Fuse 1A |
| Pollution degree | 3 |
| Vibration | Resonance: 10 to 55 Hz , double amplitude 0.1 mm Constant: 16.7 Hz , double amplitude 3mm |
| Shock | Malfunction durability: $100 \mathrm{~m} / \mathrm{s}^{2}$ Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |
| Operating frequency | 1200 operation/hour (on-load factor: 40\%) |
| Insulation resistance | $100 \mathrm{M} \Omega$ or more (500V DC megger) |
| Operator protection | IP65 |

Notes: *1 For illuminated pushbutton, illuminated selector switch and pilot light: -10 to $+55^{\circ} \mathrm{C}$
*2 Key insertion/removal durability for selector switch key types: 10,000

## ■ Contact ratings

See page 04/194

## ■ Lamp ratings

| Rated operational <br> voltage | Consumption |  |  |
| :--- | :--- | :--- | :--- |
|  | LED | Incandescent <br> AC/DC | Neon <br> AC |
| 5 DC | 7 mA (Yellow: 28mA) | $0.45 \mathrm{~W}(6 \mathrm{~V})$ | - |
| 6 V | 7 mA (Yellow: 28mA) | - | - |
| 12 V | 7 mA | $0.55 \mathrm{~W}(14 \mathrm{~V})$ | - |
| 24 V | 7 mA | $0.55 \mathrm{~W}(28 \mathrm{~V})$ | - |
| 110 V | - | - | 0.19 VA |
| 120 V | - | - | 0.21 VA |
| 220 V | - | - | 0.38 VA |
| 240 V | - | 0.42 VA |  |

Notes: For the incandescent lamps, the values in parentheses indicate the rated voltage of the lamps.

## $\square$ Contact reliability

FUJI has confirmed that the unit can be used in 1 mA circuit conditions at 5V AC or DC. The operable range may vary depending on the ambient conditions and type of load.

## ■ Illuminated pushbutton switches

| Operator | Lamp | Voltage | Contact | Momentary action | Alternate action | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Type | Type |  |
| Flush round head | Flat LED | 24V DC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | $\begin{aligned} & \text { AH165-2FL } \square 11 \mathrm{E} 3 \\ & \text { AH165-2FL } \square 22 \mathrm{E} 3 \\ & \text { AH165-2FL } \square 33 \mathrm{E} 3 \end{aligned}$ | AH165-2FL5 $\square 11 E 3$ AH165-2FL5 $\square 22 E 3$ AH165-2FL5 $\square 33 E 3$ |  |
|  | Incandescent | 24V AC/DC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { AH165-2FL } \square 11 E \\ & \text { AH165-2FL } \square 22 E \\ & \text { AH165-2FL } \square 33 E \end{aligned}$ | AH165-2FL5 $\square 11 E$ AH165-2FL5 $\square 22 E$ AH165-2FL5 $\square 33 E$ |  |
|  | Neon | 110V AC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH165-2FL } \square 11 \mathrm{H} 1 \\ & \text { AH165-2FL } \square 22 \mathrm{H} 1 \\ & \text { AH165-2FL } \square 33 \mathrm{H} 1 \end{aligned}$ | AH165-2FL5 $\square 11 \mathrm{H} 1$ AH165-2FL5 $\square 22 \mathrm{H} 1$ AH165-2FL5 $\square 33 \mathrm{H} 1$ |  |
|  |  | 220 V AC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2FL $\square 11 \mathrm{M} 1$ AH165-2FL $\square 22 \mathrm{M} 1$ AH165-2FL $\square 33 \mathrm{M} 1$ | AH165-2FL5 $\square 11 \mathrm{M} 1$ AH165-2FL5 $\square 22 \mathrm{M} 1$ AH165-2FL5 $\square$ 33M1 |  |
| Extended round head | Flat LED | 24V DC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2EL $\square 11 E 3$ AH165-2EL $\square 22 E 3$ AH165-2EL $\square 33 E 3$ | AH165-2EL5 $\square 11 E 3$ AH165-2EL5 $\square 22 E 3$ AH165-2EL5 $\square 33 E 3$ |  |
| AF87-210 | Incandescent | 24V AC/DC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2EL $\square 11 E$ AH165-2EL $\square 22 E$ AH165-2EL $\square 33 E$ | AH165-2EL5 $\square 11 \mathrm{E}$ <br> AH165-2EL5 $\square 22 \mathrm{E}$ <br> AH165-2EL5 $\square 33 \mathrm{E}$ |  |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2EL $\square 11 \mathrm{H} 1$ AH165-2EL $\square 22 \mathrm{H} 1$ AH165-2EL $\square$ 33H1 | AH165-2EL5 $\square 11 \mathrm{H} 1$ AH165-2EL5 $\square 22 \mathrm{H} 1$ AH165-2EL5 $\square 33 \mathrm{H} 1$ |  |
|  |  | 220 V AC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2EL $\square 11 \mathrm{M} 1$ AH165-2EL $\square 22 \mathrm{M} 1$ AH165-2EL $\square 33 \mathrm{M} 1$ | AH165-2EL5 $\square 11 \mathrm{M} 1$ AH165-2EL5 $\square 22 \mathrm{M} 1$ AH165-2EL5 $\square 33 \mathrm{M} 1$ |  |
| Mushroom head | Flat LED | 24V DC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2ML $\square 11 E 3$ AH165-2ML $\square 22 \mathrm{E} 3$ AH165-2ML $\square 33 \mathrm{E} 3$ | - |  |
| AF87-221 | Incandescent | 24V AC/DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2ML $\square 11 E$ AH165-2ML $\square 22 E$ AH165-2ML $\square 33 E$ | - |  |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2ML $\square 11 \mathrm{H} 1$ AH165-2ML $\square 22 \mathrm{H} 1$ AH165-2ML $\square 33 \mathrm{H} 1$ | - |  |
|  |  | 220 V AC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2ML $\square 11$ M1 AH165-2ML $\square 22 M 1$ AH165-2ML $\square 33 M 1$ | - |  |
| Mushroom head with square bezel | Flat LED | 24V DC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2YML $\square 11 E 3$ AH165-2YML $\square 22 E 3$ AH165-2YML $\square 33 E 3$ | - |  |
|  | Incandescent | 24V AC/DC | $\begin{array}{\|l\|} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2YML $\square 11 E$ AH165-2YML $\square 22 E$ AH165-2YML $\square 33 E$ |  |  |
|  | Neon | 110V AC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH165-2YML } \square 11 \mathrm{H} 1 \\ & \text { AH165-2YML } \square 22 \mathrm{H} 1 \\ & \text { AH165-2YML } \square 33 \mathrm{H} 1 \end{aligned}$ | $\left\lvert\, \begin{aligned} & - \\ & - \\ & - \end{aligned}\right.$ |  |
| AF87-220 |  | 220 V AC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline \end{aligned}$ | AH165-2YML $\square 11 \mathrm{M} 1$ AH165-2YML $\square 22 \mathrm{M} 1$ AH165-2YML $\square 33 \mathrm{M} 1$ | $\begin{aligned} & - \\ & - \\ & - \end{aligned}$ |  |

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 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Type | Type |  |  |
| Flush square head | Flat LED | 24V DC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2SFL $\square 11 E 3$ AH165-2SFL $\square 22 \mathrm{E} 3$ AH165-2SFL $\square 33 \mathrm{E} 3$ | AH165-2SFL5 $\square 11 E 3$ <br> AH165-2SFL5 $\square 22 E 3$ <br> AH165-2SFL5 $\square 33 E 3$ |  |  |
|  | Incandescent | 24V AC/DC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2SFL $\square 11 E$ <br> AH165-2SFL $\square 22 E$ <br> AH165-2SFL $\square 33 E$ | AH165-2SFL5 $\square 11 \mathrm{E}$ <br> AH165-2SFL5 $\square 22 E$ <br> AH165-2SFL5 $\square 33 E$ |  |  |
|  | Neon | 110V AC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH165-2SFL } \square 11 \mathrm{H} 1 \\ & \text { AH165-2SFL } \square 22 \mathrm{H} 1 \\ & \text { AH165-2SFL } \square 33 \mathrm{H} 1 \end{aligned}$ | AH165-2SFL5 $\square 11 \mathrm{H} 1$ <br> AH165-2SFL5 $\square 22 \mathrm{H} 1$ <br> AH165-2SFL5 $\square 33 \mathrm{H} 1$ |  |  |
|  |  | 220V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2SFL $\square 11 \mathrm{M} 1$ <br> AH165-2SFL $\square 22 M 1$ <br> AH165-2SFL $\square 33 M 1$ | AH165-2SFL5 $\square 11 \mathrm{M} 1$ <br> AH165-2SFL5 $\square 22 \mathrm{M} 1$ <br> AH165-2SFL5 $\square 33 M 1$ |  |  |
| Extended square head | Flat LED | 24 V DC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2SEL $\square 11 E 3$ AH165-2SEL $\square 22 E 3$ AH165-2SEL $\square 33 E 3$ | AH165-2SEL5 $\square 11 E 3$ <br> AH165-2SEL5 $\square 22 E 3$ <br> AH165-2SEL5 $\square 33 E 3$ |  |  |
|  | Incandescent | 24V AC/DC | $\begin{array}{\|l\|} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2SEL $\square 11 E$ <br> AH165-2SEL $\square 22 E$ <br> AH165-2SEL $\square 33 E$ | AH165-2SEL5 $\square 11 E$ <br> AH165-2SEL5 $\square 22 E$ <br> AH165-2SEL5 $\square 33 E$ |  |  |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2SEL $\square 11 \mathrm{H} 1$ AH165-2SEL $\square 22 \mathrm{H} 1$ AH165-2SEL $\square 33 \mathrm{H} 1$ | AH165-2SEL5 $\square 11 \mathrm{H} 1$ <br> AH165-2SEL5 $\square 22 \mathrm{H} 1$ <br> AH165-2SEL5 $\square 33 \mathrm{H} 1$ |  |  |
| 87-200 |  | 220 V AC | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2SEL $\square 11 \mathrm{M} 1$ AH165-2SEL $\square 22 \mathrm{M} 1$ AH165-2SEL $\square 33 \mathrm{M} 1$ | AH165-2SEL5 $\square 11 \mathrm{M} 1$ <br> AH165-2SEL5 $\square 22 \mathrm{M} 1$ <br> AH165-2SEL5 $\square 33 M 1$ |  |  |
| Concave square head | Flat LED | 24V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2SCL $\square 11 E 3$ AH165-2SCL $\square 22 E 3$ AH165-2SCL $\square 33 E 3$ | AH165-2SCL5 $\square 11 \mathrm{E} 3$ <br> AH165-2SCL5 $\square 22 \mathrm{E} 3$ <br> AH165-2SCL5 $\square$ 33E3 |  |  |
|  | Incandescent | 24V AC/DC | $\begin{array}{\|l\|} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2SCL $\square 11 E$ AH165-2SCL $\square 22 E$ AH165-2SCL $\square$ 33E | AH165-2SCL5 $\square 11 E$ <br> AH165-2SCL5 $\square 22 E$ <br> AH165-2SCL5 $\square 33 E$ |  | $\xrightarrow{\underline{205 s q}}$ |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH165-2SCL } \square 11 \mathrm{H} 1 \\ & \text { AH165-2SCL } \square 22 \mathrm{H} 1 \\ & \text { AH165-2SCL } \square 33 \mathrm{H} 1 \end{aligned}$ | AH165-2SCL5 $\square 11 \mathrm{H} 1$ <br> AH165-2SCL5 $\square 22 \mathrm{H} 1$ <br> AH165-2SCL5 $\square 33 \mathrm{H} 1$ |  |  |
|  |  | 220 V AC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline \end{aligned}$ | AH165-2SCL $\square 11 \mathrm{M} 1$ AH165-2SCL $\square 22 \mathrm{M} 1$ AH165-2SCL $\square 33 \mathrm{M} 1$ | AH165-2SCL5 $\square 11 \mathrm{M} 1$ AH165-2SCL5 $\square 22 \mathrm{M} 1$ AH165-2SCL5 $\square 33 \mathrm{M} 1$ |  |  |

[^31]■ Illuminated pushbutton switches

| Operator | Lamp | Voltage | Contact | Type | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Push-lock, turn-reset | Flat LED | 24V DC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2VL $\square 11 E 3$ <br> AH165-2VL $\square 22 \mathrm{E} 3$ <br> AH165-2VL $\square 33 E 3$ |  |
|  | Incandescent | 24V AC/DC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2VL $\square 11 E$ <br> AH165-2VL $\square$ 22E <br> AH165-2VL $\square 33 \mathrm{E}$ |  |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH165-2VL } \square 11 \mathrm{H} 1 \\ & \text { AH165-2VL } \square 22 \mathrm{H} 1 \\ & \text { AH165-2VL } \square 33 \mathrm{H} 1 \end{aligned}$ |  |
| AF87-219 |  | 220V AC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2VL $\square 11 \mathrm{M} 1$ <br> AH165-2VL $\square 22 \mathrm{M} 1$ <br> AH165-2VL $\square 33 \mathrm{M} 1$ |  |
| Push-lock, turn-reset with square bezel | Flat LED | 24V DC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2YVL $\square 11 E 3$ AH165-2YVL $\square 22 E 3$ AH165-2YVL $\square$ 33E3 |  |
|  | Incandescent | 24V AC/DC | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2YVL $\square 11 E$ <br> AH165-2YVL $\square 22 E$ <br> AH165-2YVL $\square 33 E$ |  |
|  | Neon | 110V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2YVL $\square 11 \mathrm{H} 1$ <br> AH165-2YVL $\square 22 \mathrm{H} 1$ <br> AH165-2YVL $\square 33 \mathrm{H} 1$ |  |
| AF87-218 |  | 220V AC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2YVL $\square 11 \mathrm{M} 1$ <br> AH165-2YVL $\square 22 \mathrm{M} 1$ <br> AH165-2YVL $\square 33 \mathrm{M} 1$ |  |

- Button color

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

| Color | Green | Red | White | Yellow | Blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | Y | S | O |

- With wire-wrap pin terminals have a depth of 47 mm .
- 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 | 5 V DC | - | - |
| A | 6 V DC | 5 V AC/DC | - |
| B | $12 V$ DC | 12 V AC/DC | - |
| K | - | - | $120 V$ AC |
| P | - | - | $240 V ~ A C$ |

Pushbutton Switches

## AH165-2

## ■ Pushbutton switches

| Operator | Contact | Momentary action | Alternate action | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Type | Type |  |
| Flush round head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2F $\square 11$ <br> AH165-2F $\square 22$ <br> AH165-2F $\square 33$ | AH165-2F5 $\square 11$ AH165-2F5 $\square 22$ AH165-2F5 $\square 33$ |  |
| Flush square head <br> AF87-201 | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2SF $\square 11$ <br> AH165-2SF $\square 22$ <br> AH165-2SF $\square 33$ | AH165-2SF5 $\square 11$ <br> AH165-2SF5 $\square 22$ <br> AH165-2SF5 $\square 33$ |  |
| Extended round head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2E $\square 11$ <br> AH165-2E $\square 22$ <br> AH165-2E $\square 33$ | AH165-2E5 $\square 11$ AH165-2E5 $\square 22$ AH165-2E5 $\square 33$ |  |
| Extended square head <br> AF87-200 | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2SE $\square 11$ <br> AH165-2SE $\square 22$ <br> AH165-2SE $\square 33$ | AH165-2SE5 $\square 11$ <br> AH165-2SE5 $\square 22$ <br> AH165-2SE5 $\square 33$ |  |
| Concave square head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2SCE $\square 11$ <br> AH165-2SCE $\square 22$ <br> AH165-2SCE $\square 33$ | AH165-2SCE5 $\square 11$ <br> AH165-2SCE5 $\square 22$ <br> AH165-2SCE5 $\square 33$ |  |
| Mushroom head | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2M $\square 11$ <br> AH165-2M $\square 22$ <br> AH165-2M $\square 33$ |  |  |
| Mushroom head with square bezel | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2YM $\square 11$ AH165-2YM $\square 22$ AH165-2YM $\square 33$ |  |  |

[^32]
## ■ Pushbutton switches

| Operator | Contact | Type | Dimensions, mm |
| :---: | :---: | :---: | :---: |
| With selector ring | 2NO+2NC | AH165-2S2 $\square 22$ |  |
| With selector ring with square bezel | 2NO+2NC | AH165-2YS2 $\square 22$ |  |
| Push-lock, turn-reset <br> AF87-210 | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2V $\square 11$ <br> AH165-2V $\square 22$ <br> AH165-2V $\square 33$ |  |
| Push-lock, turn-reset with square bezel | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2YV $\square 11$ <br> AH165-2YV $\square 22$ <br> AH165-2YV $\square 33$ |  |

## - Button color

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

| Color | Green | Red | Black | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | B | W | S | Y | O |

- Contact arrangement and operator position

AH165-2S, 2YS


[^33]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 47 mm .


## - Terminal number and contact block position




## AH165-2

$■$ Selector switches/2-position (90-degree)

| Operator | Operation | Key removable position | Contact | Type | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Knob | Maintained <br> Spring return | - | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2P2B11 <br> AH165-2P2B22 <br> AH165-2P2B33 <br> AH165-2P0B11 <br> AH165-2P0B22 <br> AH165-2P0B33 |  |
| Knob <br> KKD07-234 | Maintained <br> Spring return | - | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \end{array}$ | AH165-2YP2B11 <br> AH165-2YP2B22 <br> AH165-2YP2B33 <br> AH165-2YP0B11 <br> AH165-2YP0B22 <br> AH165-2YP0B33 |  |
| Key | Maintained | $\bigcirc \mathrm{A}$ | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \text { AH165-2J2A11A } \\ \text { AH165-2J2A22A } \\ \text { AH165-2J2A33A } \\ \hline \end{array}$ |  |
| KKD09-003L |  | Х B | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2J2B11A <br> AH165-2J2B22A <br> AH165-2J2B33A |  |
|  |  | (7) D | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | $\begin{array}{\|l\|} \hline \text { AH165-2J2D11A } \\ \text { AH165-2J2D22A } \\ \text { AH165-2J2D33A } \end{array}$ |  |
|  | Spring return | $\bigcirc \mathrm{A}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH165-2JOA11A } \\ & \text { AH165-2J0A22A } \\ & \text { AH165-2JOA33A } \end{aligned}$ |  |
| Key with square bezel | Maintained | $\bigcirc \mathrm{A}$ | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2YJ2A11A <br> AH165-2YJ2A22A <br> AH165-2YJ2A33A |  |
|  |  | * B | $\begin{array}{\|l} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ 3 \mathrm{NO}+3 \mathrm{NC} \\ \hline \end{array}$ | AH165-2YJ2B11A <br> AH165-2YJ2B22A <br> AH165-2YJ2B33A |  |
|  |  | (1) D | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \\ & \hline \end{aligned}$ | AH165-2YJ2D11A <br> AH165-2YJ2D22A <br> AH165-2YJ2D33A |  |
|  | Spring return | $\bigcirc \mathrm{A}$ | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2YJOA11A <br> AH165-2YJ0A22A <br> AH165-2YJ0A33A |  |

- The key can be removed only at the following positions:
A: $\bigcirc$
B: $>$
D: (7)
- For spring-return selector switches, the key can be removed at position A.
- 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 47 mm .
- Terminal number and contact block position


Contact arrangement (terminal No.: common)
1NO+1NC: Middle
2NO+2NC: Upper, lower
$3 N O+3 N C$ : Upper, middle, lower

- Contact arrangement and operator positions:

2-position

| Contact arrangement |  | 1NO+1NC | 2NO+2NC | $3 \mathrm{NO}+3 \mathrm{NC}$ |
| :---: | :---: | :---: | :---: | :---: |
| Operator position | Left 0 | $\begin{array}{lcc}  & \mathrm{M} & \\ 10 & 1 & O 2 \\ 30 & & O 4 \end{array}$ |  U  <br> $1 O$ O2  <br> $3 O$  $O 4$ <br> $1 O$ 1 $O 2$ <br> $3 O$ L $O 4$ | $1 O$ $O 2$ <br> $3 O$ $O 4$ <br> $1 O$ $O 2$ <br> $3 O$ $O 4$ <br> $1 O$ $O 2$ <br> $3 O$ $O 4$ |
|  | Right (7) | $\begin{array}{lll}  & \mathrm{M} & \mathrm{O} \\ 1 O & 1 & O 2 \\ 30 & \mathrm{O} \end{array}$ | 10 $U$ $O 2$ <br> 30 1 $O 4$ <br> 10  $O 2$ <br> 30 L $O 4$ | $1 O$ $O 2$ <br> 30 $O 4$ <br> 10 $O 2$ <br> 30 $O 4$ <br> 10 $O 2$ <br> 30 $O 4$ |

U: Upper contact block
M: Middle contact block
L: Lower contact block

## ■ Selector switches/2-position

| Operator | Lever color | Operation | Contact | Type | Dimensions, mm |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Lever <br> AF87-209 | Black | Maintained | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2H2B11 <br> AH165-2H2B22 <br> AH165-2H2B33 |  |
| Lever with square bezel <br> AF87-203 | Black | Maintained | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 3 \mathrm{NO}+3 \mathrm{NC} \end{aligned}$ | AH165-2SH2B11 <br> AH165-2SH2B22 <br> AH165-2SH2B33 |  |

- Contact arrangement and operator position

AH165-2H, 2SH


U: Upper contact block
M: Middle contact block
L: Lower contact block

- With wire-wrap pin terminals have a depth of 47 mm .
- Terminal number and contact block position


Contact arrangement (terminal No.: common)
$1 \mathrm{NO}+1 \mathrm{NC}$ : Middle
2NO+2NC: Upper, lower
3NO +3 NC: Upper, middle, lower

## AH165-2

$■$ Selector switches/3-position (45-degree)


- The Key can be removed at the following positions:
A: ©
B: *
C: ${ }^{*}$
$\mathrm{D}:$ ©
$\mathrm{E}: ~(1) \quad \mathrm{F}:($
G:(\$)

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 $\mathrm{D}, \mathrm{E}$ and F for type J 6 , and position $\mathrm{A}, \mathrm{E}$ and G for type J 7 .

- 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 47 mm
- Contact arrangement and operator positions:

| Contact arrangement |  | 2NO+2NC | 3NO+3NC |
| :---: | :---: | :---: | :---: |
| Operator position | Left | $\begin{aligned} & 10 \mathrm{U} \\ & 10210^{\mathrm{L}} \mathrm{O} 2 \\ & 30 \end{aligned} \mathrm{O} 430^{2} \mathrm{O} 4$ |  |
|  | Center | $\begin{array}{llll} 10-102 & 10-10 & O_{2} \\ 30 & O 4 & 30 & O \end{array}$ | 10 , O2 10 , $\mathrm{O}_{2} 1 \mathrm{O}$, $\mathrm{O}_{2}$ <br> $\begin{array}{llllll}30 & 04 & 30 & 04 & 30 & 04\end{array}$ |
|  | Right | $\begin{array}{llll} 10 & 02 & 10-102 \\ 30 & 04 & 30 & 04 \\ \hline \end{array}$ | $\begin{array}{lllllll} 10 & \mathrm{O} 2 & 10 & \mathrm{O} & 1 \mathrm{O} & \mathrm{O} \\ 30 & \mathrm{O} \\ 30 & \mathrm{O} & 30 & \mathrm{O} & 3 & 3 \mathrm{O} & \mathrm{O} \end{array}$ |

■ Illuminated selector switches

| Operator | Operation | Lamp voltage | No. of positions | Contact | Type | Dimensions, mm |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Knob | Maintained | Flat LED 24V DC | 2 | $\begin{array}{\|l\|} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \\ \hline \end{array}$ | AH165-2PL2 $\square 11 E 3$ <br> AH165-2PL2 $\square 22 E 3$ |  |  |
|  |  |  | 3 | 2NO+2NC | AH165-2PL3 $\square 22 \mathrm{E} 3$ |  |  |
|  |  | Incandescent 24V AC/DC | 2 | $\begin{aligned} & \hline \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH165-2PL2 $\square 11 \mathrm{E}$ AH165-2PL2 $\square 22 E$ |  |  |
|  |  |  | 3 | $2 \mathrm{NO}+2 \mathrm{NC}$ | AH165-2PL3 $\square 22 \mathrm{E}$ |  |  |
|  |  | $\begin{aligned} & \text { Neon } \\ & 110 \mathrm{~V} \text { AC } \end{aligned}$ | 2 | $\begin{aligned} & \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH165-2PL2 } \square 11 \mathrm{H} 1 \\ & \text { AH165-2PL2 } \square 22 \mathrm{H} 1 \end{aligned}$ |  |  |
|  |  |  | 3 | 2NO+2NC | AH165-2PL3 $\square 22 \mathrm{H} 1$ |  |  |
|  |  | $\begin{aligned} & \text { Neon } \\ & 220 \mathrm{~V} \text { AC } \end{aligned}$ | 2 | $\begin{aligned} & 1 \mathrm{NO}+2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{array}{\|l} \hline \text { AH165-2PL2 } \square 11 \mathrm{M} 1 \\ \text { AH165-2PL2 } \square 22 \mathrm{M} 1 \end{array}$ |  |  |
|  |  |  | 3 | 2NO+2NC | AH165-2PL3 $\square 22 \mathrm{M} 1$ |  |  |

- Knob color (arrow)

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

| Color | Green | Red | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | O |



## - Lamp voltage

Voltages other than above are available

| Code | LED | Incandescent | Neon |
| :--- | :--- | :--- | :--- |
| AA | $5 V$ DC | - | - |
| A | 6 V DC | 5 V AC/DC | - |
| B | $12 V$ DC | $12 V$ AC/DC | - |
| K | - | - | $120 V ~ A C$ |
| $P$ | - | - | 240 V AC |

## - Terminal number and contact block position



- Contact arrangement and operator positions:

2-position

| Contact arrangement |  | 1NO+1NC | 2NO+2NC |
| :---: | :---: | :---: | :---: |
| Operator position | Left $\bigcirc$ | $\begin{array}{ll} M_{3 O}^{1 O} \quad O 2 \\ \hline \end{array}$ |  |
|  | Right (7) | $\begin{array}{c\|} M_{3 O}^{1 O} \\ \hline \end{array}$ | $\begin{array}{c\|c} \mathrm{U}^{1 O} & \mathrm{O} 2 \\ 30 & O 4 \\ 10 & O 2 \\ \mathrm{~L}^{1 O} & 04 \end{array}$ |


| Contact arrangement |  | 2NO+2NC |
| :---: | :---: | :---: |
| Operator position | Left $\bigcirc$ | $\begin{array}{cc} \hline 1 \mathrm{O} & O^{2} \\ 30 & O 4 \\ \mathrm{~L} \\ \hline 1 O & O_{2} \\ 30 & 04 \end{array}$ |
|  | Center $\uparrow$ | $\begin{aligned} & \mathrm{U} \begin{array}{ll} 1 \mathrm{O} & \mathrm{O} 2 \\ 3 \mathrm{O} & \mathrm{O} 4 \\ \mathrm{O} & \mathrm{O} \\ \mathrm{~L} \\ 3 \mathrm{O} & \mathrm{O} \end{array} \end{aligned}$ |
|  | Right (7) | $\begin{array}{cc} \hline & \begin{array}{cc} 10 & O 2 \\ 30 & O 4 \\ & \\ 1 O & O 2 \\ 30 & O 4 \end{array} \end{array}$ |

U: Upper contact block
M: Middle contact block
L: Lower contact block

Pilot Lights
AH165-2

■ Pilot lights

| Lens |  | Lamp | Voltage | Type | Dimensions, mm |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round | AF87-213 | Flat LED | 24V DC | AH165-2Z $\square$ E3 |  |  |
|  |  | Incandescent | 24V AC/DC | AH165-2Z $\square \mathrm{E}$ |  |  |
|  |  | Neon | 110V AC | AH165-2Z $\square \mathrm{H} 1$ |  |  |
|  |  |  | 220V AC | AH165-2Z $\square$ M1 |  |  |
| Flush square |  | Flat LED | 24V DC | AH165-2SZ $\square$ E3 |  |  |
|  |  | Incandescent | 24V AC/DC | AH165-2SZ $\square \mathrm{E}$ |  | $\square$ |
|  |  | Neon | 110V AC | AH165-2SZ $\square$ H1 |  | $1)^{\infty}$ |
|  | AF87-205 |  | 220V AC | AH165-2SZ $\square$ M1 |  | $25 s \mathrm{~s}$. |
| Extended round |  | Flat LED | 24 V DC | AH165-2ZE $\square$ E3 |  |  |
|  |  | Incandescent | 24V AC/DC | AH165-2ZE $\square \mathrm{E}$ |  |  |
|  |  | Neon | 110V AC | AH165-2ZE $\square \mathrm{H} 1$ |  |  |
|  | AF87-212 |  | 220 V AC | AH165-2ZE $\square$ M1 |  |  |
| Extended square |  | Flat LED | 24 V DC | AH165-2SZE $\square$ E3 |  |  |
|  |  | Incandescent | 24V AC/DC | AH165-2SZE $\square \mathrm{E}$ |  | -i |
|  |  | Neon | 110V AC | AH165-2SZE $\square$ H1 |  |  |
|  | AF87-204 |  | 220V AC | AH165-2SZE $\square$ M1 |  | $\xrightarrow{25 \mathrm{sq} .}$ |

- Lens color

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

| Color | Green | Red | White | Yellow | Blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | Y | S | O |

- Lamp voltage

Voltage other than above is available

| Code | LED | Incandescent | Neon |
| :--- | :--- | :--- | :--- |
| AA | 5 V DC | - | - |
| A | 6 V DC | 5V AC/DC | - |
| B | 12 V DC | $12 \mathrm{~V} \mathrm{AC/DC}$ | - |
| K | - | - | 120 V AC |
| P | - | - | 240 V 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 29 mm .

■ 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

| Type | Wiring | Terminal position |
| :---: | :---: | :---: |
| Illuminated pushbuttons, Illuminated selector switches |  | Type number display side |
| Pilot lights (without transformer) |  | Type number display side |

# Pushbuttons/Selectors/Pilot Lights/Buzzers AH164, AH165 and AH165-2 <br> Notes on use 

## Notes on use

## - Installation on panel

- For installation, use dedicated wrench AHX601. The appropriate tightening torque is 0.6 to $1 \mathrm{~N} \cdot \mathrm{~cm}$.
- 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 while pressing the catch arms inward.



## ■ Mounting steps of switch with transformer

(1)Pass the switch operator through the panel hole and secure with a nut by way of the retainer metal from the front of the panel. (2)Align 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. (3Insert and secure the transformer unit while assembling the contact block holder with the retainer metal. (4)Connect the receptacle 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: -) (5)Push 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, guard-

 ringBe careful that the panel thickness does not exceed the following:
Panel thickness
Protection cover: 2.6 mm max.
Dust-tight cover: 2.0 mm max.
Guard ring: 2.5 mm max.

■ Operating voltage and rated voltage of incandescent lamps

| Rated voltage | Operating voltage |
| :--- | :--- |
| 6 V | 4 to 5 V |
| 14 V | 10 to 12 V |
| 28 V (Standard) | 20 to 24 V |

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 $30^{\circ} \mathrm{C}$ 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 of removing.
- 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.

# Pushbuttons/Selectors/Pilot Lights/Buzzers <br> AH164, AH165 and AH165-2 <br> Notes on use 

## $\square$ 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 $25 \mu \mathrm{~m}$ thick. If preparing custom description sheets, make sure that the thickness is 0.1 mm 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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$ to operate the selectors switch (Type "P"). Required operating force of switches is less than $0.1 \mathrm{~N} \cdot \mathrm{~m}$.
- 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 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 $0.1 \mathrm{~N} \cdot \mathrm{~m}$.
- 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 20 mm .
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 0.8 mm (solder) One stranded wire with a maximum area of $0.75 \mathrm{~mm}^{2}$ (solder) Flat connection terminal
(2.8■-1.25-5) 0.5 to $1.25 \mathrm{~mm}^{2}$
(2.8 $\square-0.5-5) 0.2$ to $0.5 \mathrm{~mm}^{2}$

- 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 |
| :--- | :--- | :--- | :--- |
| 0.4 mm dia. | $3-\mathrm{A}$ | $1-\mathrm{B}$ | About 8 |
| 0.5 mm dia. | $1-\mathrm{A}$ | $1-\mathrm{B}$ | About 6 |
| $(0.65 \mathrm{~mm}$ dia. $)$ | $(2-\mathrm{A})$ | $(2-\mathrm{B})$ | (About 6$)$ |

Use ordinary wrapping for connection.
Wires of 0.65 mm dia. must not be used on adjacent terminals.
However, 0.65 mm dia. wire can be mixed with 0.4 and 0.5 mm 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 <br> Notes on use

## ■ LEDs

- LED Lamp Malfunctioning

The LED lamp is lit by a very small level of current (approximately 0.01 mA ). 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.

Example 1


- 24 V DC

R: $10 \mathrm{k} \Omega$ (1W)

Example 2


110V AC
C: $0.33 \mu \mathrm{~F}(250 \mathrm{~V}$ AC
R. $120 \Omega$ ( 0.25 W )

- 220 V AC

C: $0.33 \mu \mathrm{~F}(250 \mathrm{~V}$ AC
R: $120 \Omega(0.25 \mathrm{~W})$

- 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 24 V 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) 110 V AC: 100 k ( 0.25 W ) 220V AC: 50k (2W)

If an external surge of 3 kV 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.

## $\square$ 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 24 V 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



Pushbuttons/Selectors/Pilot Lights/Buzzers
AH164 and AH165
Accessories



Pushbuttons/Selectors/Pilot Lights/Buzzers AH165-2
Accessories


■ Accessories for AH164, AH165 and AH165-2


| Description | Type |
| :---: | :---: |
| Wrench | Type: AHX601 <br> When installing a command switch on a panel, this tool is useful for tightening the switch firmly and efficiently. |
|  <br> AF87-637 | Type: AHX2602 <br> 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 <br> KKD06-305, KKD06-304 | Terminal Type <br> Solder/Tab AGX001 <br> Wire-wrap AGX001-W |
| Dummy unit <br> SK-1141 | Type: AGX002 <br> A dummy unit is used to fill the space where no contact blocks are installed. For example, two dummy units are used if $1 \mathrm{NO}+1 \mathrm{NC}$ contact block is installed, and one dummy unit is used if $2 \mathrm{NO}+2 \mathrm{NC}$ contact blocks are installed. |
|  | Type: AGX012 <br> This tool is used for replacing the contact blocks or dummy units. |

Pushbuttons/Selectors/Pilot Lights/Buzzers AH164, AH165 and AH165-2
Accessories

| Description | Type |
| :---: | :---: |
| Sockets <br> SM-1097 | Terminal Type Used with <br>    <br> Solder/Tab AHX697-S Pushbuttons <br> Wire-wrap AHX697-W  <br> PC board AHX697-P  <br> Solder/Tab AHX697-SL Illuminated <br> Wire-wrap AHX697-WL pushbuttons <br> PC board AHX697-PL  <br> Contact arrangement is 2NO+2NC only.   <br> Except for AH165-2PL types   |
| Sockets for LED <br> SM-1098 | $\begin{array}{ll}\text { Terminal } & \text { Type } \\ \text { Solder/Tab } & \text { AHX697-SH3 } \\ \text { Wire-wrap } & \text { AHX697-WH3 }\end{array}$ <br> - Contact arrangement is $2 \mathrm{NO}+2 \mathrm{NC}$ only. <br> - These sockets are used only when LED lamps rated for 24V DC are used under 110 V AC/DC. <br> - Except for AH164, 165 and 165-2 series pilot lights or AH165-2PL type. <br> - When side-by-side mounting and continuous lighting, note that a socket has higher temperature over the ambient temperature. |

Dimensions, mm


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 |
| :--- | :--- | :--- | :--- |
| 0.4 mm dia. | $3-\mathrm{A}$ | $1-\mathrm{B}$ | About 8 |
| 0.5 mm dia. | $1-\mathrm{A}$ | $1-\mathrm{B}$ | About 6 |
| $(0.65 \mathrm{~mm}$ dia.) | (2-A) | $(2-\mathrm{B})$ | (About 6) |

Use ordinary wrapping for connection. Wires of 0.65 mm dia. must not be used on adjacent terminals. However, 0.65 mm dia. wire can be mixed with 0.4 mm and 0.5 mm dia. wires.

- Mass, gram AH164 series

| Type | $\begin{gathered} 1 \mathrm{NO} \\ + \\ 1 \mathrm{NC} \end{gathered}$ | $\begin{gathered} 2 \mathrm{NO} \\ + \\ 2 \mathrm{NC} \end{gathered}$ | $\begin{gathered} 3 \mathrm{NO} \\ + \\ \mathbf{3 N C} \end{gathered}$ |
| :---: | :---: | :---: | :---: |
| AH164-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 | - |
| 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 | 13.4 | 14.4 | 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 |
|  |  |  |  |
| 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

| Type | $\begin{gathered} 1 \mathrm{NO} \\ + \\ 1 \mathrm{NC} \end{gathered}$ | $\begin{gathered} 2 \mathrm{NO} \\ + \\ 2 \mathrm{NC} \end{gathered}$ | $\begin{gathered} \text { 3NO } \\ + \\ \text { 3NC } \end{gathered}$ |
| :---: | :---: | :---: | :---: |
| 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 | $13.4 *$ * | 14 *2 | - |
| V1R | 14.4 *1 | 15 *2 | - |
| AH165-V5R | 18.1 *1 | 18.7 *2 | - |
| 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 (Without transformer) | 8.2 |  |  |
| ZT (With transformer) | 52.2 |  |  |
| ZM (Without transformer) | 5.4 |  |  |
| AH165-X | 13.7 |  |  |

[^34]Pushbuttons/Selectors/Pilot Lights/Buzzers AH164, AH165 and AH165-2
Mass

## - Mass, gram

AH165-2 series

| Type | $\begin{gathered} \hline 1 \mathrm{NO} \\ + \\ 1 \mathrm{NC} \end{gathered}$ | $\begin{gathered} \hline 2 \mathrm{NO} \\ + \\ + \\ 2 \mathrm{NC} \end{gathered}$ | $\begin{gathered} \hline 3 \mathrm{NO} \\ + \\ + \\ 3 \mathrm{NC} \end{gathered}$ |
| :---: | :---: | :---: | :---: |
| AH165-2FL,FL5 | 15.3 | 16.3 | 17.3 |
| 2EL,EL5 | 15.8 | 16.8 | 17.8 |
| 2ML | 18.7 | 19.7 | 20.7 |
| 2YML | 20.2 | 21.2 | 22.2 |
| 2SFL,SFL5 | 16.6 | 17.6 | 18.6 |
| 2SEL,SEL5 | 17.4 | 18.4 | 19.4 |
| 2SCL,SCL5 | 17.6 | 18.6 | 19.6 |
| 2VL | 20.7 | 21.7 | 22.7 |
| 2YVL | 21.4 | 22.4 | 23.4 |
| AH165-2F,F5 | 13.4 | 14.4 | 15.4 |
| 2E,E5 | 13.9 | 14.9 | 15.9 |
| 2 M | 17.8 | 18.8 | 19.8 |
| 2YM | 18.2 | 19.2 | 20.2 |
| 2SF,SF5 | 14.6 | 15.6 | 16.6 |
| 2SE,SE5 | 15.4 | 16.4 | 17.4 |
| 2SCE,SCE5 | 15.6 | 16.6 | 17.6 |
| 2 S 2 | - | 19 | - |
| 2YS2 | - | 20.6 | - |
| 2 V | 18 | 19 | 20 |
| 2 YV | 19.4 | 20.4 | 21.4 |
| AH165-2P2,P0 | 16.6 | 17.6 | 18.6 |
| 2P3,P6,P7,P1 | - | 17.6 | 18.6 |
| 2YP2,YP0 | 18.3 | 19.3 | 20.3 |
| 2YP3,YP6,YP7,YP1 | - | 19.3 | 20.3 |
| 2J2,J0 | 40.9 | 41.9 | 42.9 |
| 2J3,J6,J7, 11 | - | 41.9 | 42.9 |
| 2 YJ 2 | 42.6 | 43.6 | 44.6 |
| 2YJ3,YJ6,YJ7,YJ1 | - | 43.6 | 44.6 |
| 2 H | 14.3 | 15.3 | 16.3 |
| 2SH | 16.1 | 17.1 | 18.1 |
| AH165-2PL2 | 17.4 | 18.4 | - |
| 2PL3 | - | 18.4 | - |


| AH165-2Z | 9.7 |
| :---: | :--- |
| $2 Z E$ | 10.2 |
| $2 S Z$ | 11 |
| 2 SZE | 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: $30 \times 30 \mathrm{~mm}, 30 \times 60 \mathrm{~mm}, 15 \times 30 \mathrm{~mm}$
AP40F: $40 \times 40 \mathrm{~mm}, 40 \times 80 \mathrm{~mm}, 20 \times 40 \mathrm{~mm}$

## 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.


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.

## Conventional



New


## Charged-section cover

A cover for the charged section is provided as a standard accessory.


| LED luminous color | Color-insert | lllumination |
| :--- | :--- | :--- |
| 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)


Frame, Black

| Voltage units | LED | Incandescent |
| :--- | :--- | :--- |
| Type | $\bigcirc$ |  |
| Full-voltage type | $\bigcirc$ | - |
| R voltage dividing | $\bigcirc$ | - |
| CR voltage dividing | $\bigcirc$ |  |
| Transformer unit | - | $\bigcirc$ |
| Resistor unit | $\bigcirc$ | - |
| Flicker unit | $\bigcirc$ | - |
| Voltage stabilizer unit | $\bigcirc$ | - |

$\bigcirc$ : Available

- : Not available


## Multi Display Lights <br> AP30F and AP40F <br> Type number nomenclature

## ■ Type number nomenclature

| AP30F- $0405 \square$ E3-S 4 - SR (20) Z1 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| (1) (2) (3) (4) (5) (6) (7) (8) |  |  |  |  |
| (1) Basic type <br> AP30F: $30 \times 30,30 \times 60,60 \times 30,15 \times 30 \mathrm{~mm}$ (Window size) <br> AP40F: $40 \times 40,40 \times 80,80 \times 40,20 \times 40 \mathrm{~mm}$ <br> (2) Number of windows <br> (=Row $\times$ Column) |  |  |  |  |
|  | Row |  |  |  |
| AP30F | $\begin{aligned} & \hline 01,02,03,04 \\ & 11,12,13,14 \end{aligned}$ | $\begin{aligned} & 04,05,06,07,08,09,10 \\ & 14,15,16,17,18,19,20 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 01,02,03,04,05,06,07,08,09,10 \\ 11,12,13,14,15,16,17,18,19,20 \\ \hline \end{array}$ | $\begin{aligned} & \text { Max. } \\ & 400 \end{aligned}$ |
| AP40F | 01,02,03,04 | ,04,05,06,07 | $\begin{aligned} & \text { 01,02,03,04,05,06,07,08,09,10, } \\ & 11,12,13,14,15 \end{aligned}$ | $\begin{aligned} & \hline \text { Max. } \\ & 105 \\ & \hline \end{aligned}$ |

- 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: 5.5 V AC/DC C: 15.5 V AC/DC <br> D: 20 V AC/DC E: 24 V AC/DC | A3: 6 V DC B3: 12 V ACDC <br> C3: $15 \mathrm{~V} \mathrm{AC/DC}$ E3: 24V AC/DC <br> ES: 24 V AC/DC F3: 48 V AC/DC <br> H3: $100-110 \mathrm{VAC} / D C$ L3: $115-127 \mathrm{~V}$ AC/DC <br> M3: $200-220 \mathrm{~V}$ AC  |
| Transformer unit |   <br> H: $100-110 \mathrm{~V}$ AC L:115-127V AC <br> M: $200-220 \mathrm{~V}$ AC Q:230-254V AC <br> S: $350-380 \mathrm{~V}$ AC T: $400-440 \mathrm{~V}$ AC <br> V: 480 V AC  | Q3: 230-254V AC S3: 350-380V AC <br> T3: $400-440 \mathrm{~V}$ AC V3: 480 VAC |
| 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

|  | Incandescent | LED unit |
| :---: | :---: | :---: |
| Full-voltage type | C: 15.5V AC/DC D: 20V AC/DC E: 24 V AC/DC | A3: 6 V DC B3: 12 V AC/DC <br> C3: 15 V AC/DC E3: 24 V AC/DC <br> ES: 24 V AC/DC F3: 48 V AC/DC <br> H3: $100-110 \mathrm{~V}$ AC/DC L3: $115-127 \mathrm{~V}$ AC/DC <br> M3: $200-220 \mathrm{~V}$ AC  |
| Transformer unit | $\begin{array}{\|ll\|} \hline \text { H: } 100-110 \mathrm{~V} \text { AC } & \text { L: } 115-127 \mathrm{~V} \mathrm{AC} \\ \text { M: } 200-220 \mathrm{~V} & \mathrm{Q}: 230-254 \mathrm{VAC} \\ \text { S: } 350-380 \mathrm{VAC} & \text { T: } 400-440 \mathrm{~V} \mathrm{AC} \\ \text { V: } 480 \mathrm{~V} \text { AC } & \\ \hline \end{array}$ | $\begin{array}{ll} \text { Q3: } 230-254 \mathrm{VAC} & \text { S3: } 350-380 \mathrm{VAC} \\ \mathrm{~T} 3: 400-440 \mathrm{VAC} & \mathrm{~V}: 480 \mathrm{~V} \text { AC } \end{array}$ |
| 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 |


| Notes: <br> 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 24 V AC/DC type.
- The flicker unit is available in square design only (S-type).


## 5) Shape of illuminated face

AP30F series
S: Square $(30 \times 30)$
T: Rectangular, horizontally long $(30 \times 60)$
V: Rectangular, vertically long $(60 \times 30)$
H: Half-size $(15 \times 30) \times 2$
X: Mixture of $\mathrm{S}, \mathrm{T}$, and V

## AP40F series

S: Square $(40 \times 40)$
T: Rectangular, horizontally long $(40 \times 80)$
V: Rectangular, vertically long $(80 \times 40)$
H: Half-size $(20 \times 40) \times 2$
X : Mixture of $\mathrm{S}, \mathrm{T}$, 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 | CR: Red | SR: Red |
| G: Green | CG: Green | SG: Green |
| Y: Yellow | CY: Yellow | SY: Yellow |
| O: Orange | CO: Orange | SO: Orange |
| W: White | CS: Blue | SW: White |
| S: Blue | RG: Red/green | SS: Blue |
| P: Pure-white* |  |  |

- 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
(8) 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 (4) 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

## ■ Specifications

| Type |  | AP30F |  | AP40F |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Light source |  | Incandescent | LED | Incandescent | LED |
| Size of illuminated face |  |  |  |  |  |
| Illuminated color (types of color-insert) | Red Green Yellow Orange White Blue Pure-white |  |  |  |  |
| Input voltage | Full voltage | $\begin{aligned} & 5.5,15.5,20 \\ & 24 \mathrm{~V} \text { AC/DC } \end{aligned}$ | 6V DC <br> 12, 15, 24, 48, 110, 127V AC/DC 220V AC | $\begin{aligned} & 15.5,20 \\ & 24 \mathrm{VAC} / D C \end{aligned}$ | $\begin{aligned} & \text { 6V DC } \\ & 12,15,24,48,110,127 \mathrm{~V} \text { AC/DC } 220 \mathrm{~V} \text { AC } \end{aligned}$ |
|  | With transformer unit | 110, 127, 220, 254, $380,440,480 \mathrm{~V}$ AC $50 / 60 \mathrm{~Hz}$ | 254, 380, 440, 480V AC 50/60Hz | $\begin{aligned} & 110,127,220,254, \\ & 380,440,480 \mathrm{~V} \text { AC } 50 / 60 \mathrm{~Hz} \end{aligned}$ | 254, 380, 440, 480V AC 50/60Hz |
|  | With resistor unit | $\begin{aligned} & 110 \mathrm{~V} \text { DC } \\ & 125 \mathrm{DCC} \end{aligned}$ | - | $\begin{aligned} & 110 \mathrm{~V} \text { DC } \\ & \text { 125V DC } \end{aligned}$ | - |
|  | With flicker unit | - | $\begin{aligned} & 24 \mathrm{~V} \text { DC } \\ & 24 \mathrm{~V} \text { AC } \end{aligned}$ | - | $\begin{aligned} & 24 \mathrm{~V} \text { DC } \\ & 24 \mathrm{~V} \text { AC } \end{aligned}$ |
|  | 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 $105{ }^{* 1}$ |  |
|  |  | 1 to 80 *2 |  | 1 to 80 *2 |  |
| Panel thickness |  | 1 to 6 mm |  |  |  |
| ■ Performan |  |  |  | - Available <br> *1 : Without <br> *2 : With tran | -: Not available <br> transformer unit sformer unit |


| Rated insulation voltage | 250V AC/DC: <br> Full voltage type, with resistor unit, with voltage stabilizer unit, <br> R/CR dividing, with flicker unit, <br> with transformer unit (AP30F incandescent 100 to 200V) <br>  <br>  <br>  <br> 600V AC/DC: <br> With transformer unit (AP30F 230 to 480V) |
| :--- | :--- |
| Dielectric strength <br> (between unit and ground) | 2000V AC 1-minute: <br> Full voltage type, with resistor unit, with voltage stabilizer unit, <br> R/CR dividing, with flicker unit, <br> with transformer unit (AP30F incandescent 100 to 200V) |
|  | 2500 V AC 1-minute: <br> With transformer unit (AP30F 230 to 480V) |
| Operating ambient temperature | $-20^{\circ} \mathrm{C}$ to 40 $0^{\circ} \mathrm{C}$ |
| Humidity | 45 to $85 \%$ RH |
| Insulation resistance | $100 \mathrm{M} \Omega$ or more (500V DC megger) |

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 | P | R, G, Y, O, W, S, P |
| LED | Full voltage | 6V DC | 0.26W | 0.33W | 0.40W | 0.53W | - |
|  |  | 12 V AC/DC | 0.53W 0.56VA | 0.66W 0.70VA | 0.79W 0.82VA | 1.06W 1.30VA | 0.14W 0.16VA |
|  |  | 15 V AC/DC | 0.66 W 0.69 VA | 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 |
|  |  | 48 V AC/DC | 0.53W 0.67VA | 0.53W 0.67VA |  |  | - |
|  | $R$ voltage | 100-110V AC/DC | 1.21W 1.54VA | 1.21 W 1.54 VA1.40 W 1.78 VA |  |  |  |
|  | dividing type | 115-127V AC/DC | 1.40W 1.78VA |  |  |  |  |
|  | CR voltage dividing type | 200-220V AC | 3.3VA | 3.3VA |  |  |  |
|  | With transformer | 230-254V AC | 2.4VA | 2.4VA |  |  |  |
|  |  | $350-380 \mathrm{~V}$ AC |  |  |  |  |  |
|  |  | 400-440V AC |  |  |  |  |  |
|  |  | $480 \mathrm{~V} \mathrm{AC}$ |  |  |  |  |  |
|  | With flicker unit | 24V AC | 1.0VA | $\begin{aligned} & \hline 1.0 \mathrm{VA} \\ & 0.48 \mathrm{~W} \end{aligned}$ |  |  |  |
|  |  | 24V DC | 0.48W |  |  |  |  |
| Incandescent | Full voltage | 5.5V AC/DC | 1.0W | - |  |  |  |
|  |  | 15.5V AC/DC | 1.0W | 2.0W |  |  |  |
|  |  | 20 V AC/DC |  |  |  |  |  |
|  |  | 24 V AC/DC |  |  |  |  |  |
|  | With transformer unit | 100-110V AC | 3.0VA | 3.0VA |  |  |  |
|  |  | 115-127V AC |  |  |  |  |  |
|  |  | 200-220V AC |  |  |  |  |  |
|  |  | 230-254V AC |  |  |  |  |  |
|  |  | $350-380 \mathrm{~V}$ AC |  |  |  |  |  |
|  |  | 400-440V AC |  |  |  |  |  |
|  |  | 480 V AC |  |  |  |  |  |
|  | With resistor unit | 110 V DC | 2.0W | 3.0W |  |  |  |

[^35]- Maximum power consumption for rectangular type is twice value indicated in the table.

AP30F

## - 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


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- With transformer (Incandescent, 100V to 220V)


With resistor unit, with flicker unit, with voltage stabilizer unit



## - V-type



- H-type



# Multi Display Lights <br> AP30F <br> Dimensions 

## AP30F <br> ■ 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 | A | 35 | 65 | 95 | 125 | 155 | 185 | 215 | 245 | 275 | 305 | 336 | 366 | 396 | 426 | 456 | 486 | 516 | 546 | 576 | 606 |
|  | B | 35 | 65 | 95 | 125 | 155 | 185 | 215 | 245 | 275 | 305 | 335 | 365 | 395 | 425 | 455 | 485 | 515 | 545 | 575 | 605 |
| Overall | C | 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 win |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Panel cutout | A | 35 | 65 | 95 | 125 | 155 | 366 | 426 | 486 | 546 | 606 | 336 | 366 | 396 | 426 | 456 | 486 | 516 | 546 | 576 | 606 |
|  | B * | 65 | 125 | 185 | 145 | 305 | 365 | 425 | 485 | 545 | 605 | - | - | - | - | - | - | - | - | - | - |
| Overall | C | 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 | - | - | - | - | - | - | - | - | - | - |
|  | B | 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


$\square$

## AP40F

## ■ Dimensions, mm

## Front view

- S-type

- T-type

- V-type

- With transformer unit, with resistor unit, with flicker unit, with voltage stabilizer unit


$$
\begin{aligned}
& \text { (Slotted and Philliss } \\
& \text { head, self-lifting) }
\end{aligned}
$$

Back view

- Full-voltage type (LED)
- Full-voltage type (LED, short body type)


Half size (Illuminated face)
With check terminal

- Full-voltage type


- Full-voltage type (Incandescent)


Multi Display Lights

## AP40F

Dimensions

## AP40F

- 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 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Panel cutout | A | 45 | 85 | 125 | 165 | 205 | 245 | 285 | - | - | - | - | - | - | - | - |
|  | B | 45 | 85 | 125 | 165 | 205 | 245 | 285 | 325 | 365 | 405 | 445 | 485 | 525 | 565 | 605 |
| Overall | C | 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 windows | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Panel cutout | A | 45 | 85 | 125 | 165 | 205 | 245 | 285 |
|  | $\mathrm{~B}^{*}$ | 85 | 165 | 245 | 325 | 405 | 485 | 565 |
| Overall | C | 56 | 96 | 136 | 176 | 216 | 256 | 296 |
|  | $\mathrm{D}^{*}$ | 96 | 176 | 256 | 336 | 416 | 496 | 576 |



S-type


T-type


- V-type

| Number of windows |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Panel cutout | A * | 85 | 165 | 245 | - | - | - | - | - | - | - | - | - | - | - | - |
|  | B | 45 | 85 | 125 | 165 | 205 | 245 | 285 | 325 | 365 | 405 | 445 | 485 | 525 | 565 | 605 |
| Overall | C * | 96 | 176 | 256 | - | - | - | - | - | - | - | - | - | - | - | - |
|  | 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

| Stype |  |  | Number of windows (Column) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | 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 | - |  |  |  |  |  |  |  |
| Number of windows (Row) | $\begin{aligned} & 1 \\ & 2 \\ & 3 \end{aligned}$ | $\begin{aligned} & 1 \\ & 2 \\ & 3 \end{aligned}$ | $\begin{aligned} & 1 \\ & 2 \\ & 3 \end{aligned}$ | 2 4 6 | 3 6 9 | $\begin{array}{r} 4 \\ 8 \\ 12 \end{array}$ | $\begin{array}{r} 5 \\ 10 \\ 15 \end{array}$ | $\begin{array}{r} 6 \\ 12 \\ 18 \end{array}$ | $\begin{array}{r} 7 \\ 14 \\ 21 \end{array}$ | $\begin{array}{r} 8 \\ 16 \\ 24 \end{array}$ | $\begin{array}{r} 9 \\ 18 \\ 27 \end{array}$ | $\begin{aligned} & 10 \\ & 20 \\ & 30 \end{aligned}$ | $\begin{aligned} & 11 \\ & 22 \\ & 33 \end{aligned}$ | $\begin{aligned} & 12 \\ & 24 \\ & 36 \end{aligned}$ | 13 26 39 | $\begin{aligned} & 14 \\ & 28 \\ & 42 \\ & \hline \end{aligned}$ | 15 30 45 |
|  | 4 5 6 7 | - | $\begin{aligned} & 4 \\ & 5 \\ & 6 \\ & 7 \\ & \hline \end{aligned}$ | 8 10 12 14 | 12 15 18 21 | $\begin{aligned} & 16 \\ & 20 \\ & 24 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 25 \\ & 30 \\ & 35 \end{aligned}$ | $\begin{aligned} & 24 \\ & 30 \\ & 36 \\ & 42 \end{aligned}$ | $\begin{aligned} & 28 \\ & 35 \\ & 42 \\ & 49 \end{aligned}$ | $\begin{aligned} & 32 \\ & 40 \\ & 48 \\ & 56 \end{aligned}$ | $\begin{aligned} & 36 \\ & 45 \\ & 54 \\ & 63 \end{aligned}$ | 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) $\quad \mathrm{S}$ type (Square type)
$\square$

## ■ Installation <br> Mounting panel

- Panel thickness: 1 to 6 mm
- 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 $0.6 \mathrm{~N} \cdot \mathrm{~m}$ )



## ■ 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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$ ). 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
$\square$ Mass ( g )
Mass of multi display light $=$ Voltage unit $\times$ (rows $\times$ columns) + Side plate $\times$ (rows + columns $)$

## AP30F

| Description |  |  | Mass (g) |
| :---: | :---: | :---: | :---: |
| Voltage unit | Incandescent | Full-voltage type | 29 |
|  |  | 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 plate |  |  | 27 |

The number of brackets required depends on the type as follows
Full-voltage type and transformer type with 1 to 20 lamps

| Column Row | mn AP30F | 01~02 | 03~08 | 09~15 | 16~20 |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Row AP40F | 01~02 | 03~06 | 07~11 | 12~15 |
| AP30F | AP40F | $\square$ | $\square$ | - - - | - ! - |
| 01~02 | 01~02 | $\square$ | $\square$ | $\square$ | - ! ! |
| 03~06 | 03~04 |  |  |  |  |
| 07~10 | 05~07 |  |  |  |  |
| 11~15 | - |  |  |  |  |
| 16~20 | - |  |  |  |  |

## Transformer type with 21 to 50 lamps

| Rows or <br> columns | $1-2$ | $3-4$ | 5 | $6-8$ | 9 | $10-12$ | 13 | $14-16$ | 17 | $18-20$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Brackets <br> 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.

# Multi Display Lights <br> AP30F and AP40F <br> 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 4.5 mm or less wide and 0.6 mm 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.


## - 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.


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.


## ■ LED unit color display

The operating voltage and lamp color are printed on the LED unit lamp using codes.


| Color <br> code <br> Rated <br> voltage <br> code | R | A | W | Y | G | S | P | F |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| M | 220 R | 220 A | 220 W | 220 Y | 220 G | 220 S | 220 P |  |
| L | 127 R | 127 A | 127 W | 127 Y | 127 G | 127 S | 127 P |  |
| H | 110 R | 110 A | 110 W | 110 Y | 110 G | 110 S | 110 P |  |
| F | 48 R | 48 A | 48 W | 48 Y | 48 G | 48 S | 48 P |  |
| E | 24 R | 24 A | 24 W | 24 Y | 24 G | 24 S | 24 P | 24 F |
| C | 15 R | 15 A | 15 W | 15 Y | 15 G | 15 S | 15 P |  |
| B | 12 R | 12 A | 12 W | 12 Y | 12 G | 12 S | 12 P |  |
| 6 | 6 R | 6 A | 6 W | 6 Y | 6 G | 6 S | 6 P |  |
| E <br> (With check <br> terminal) | $24-\mathrm{RC}$ | $24-\mathrm{AC}$ | $24-\mathrm{WC}$ | $24-\mathrm{YC}$ | $24-\mathrm{GC}$ | $24-\mathrm{SC}$ | $24-\mathrm{PC}$ |  |

## $■$ 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. X 1 is the positive terminal.


## ■ Connecting color lamps and half-size lamp windows

| Terminals | Light color from <br> two-color lamp | Half-size lamp <br> window |
| :--- | :--- | :--- |
| X1 to X3 | Green | Top |
| X1 to X2 | Red | Bottom |



## Multi Display Lights <br> AP30F and AP40F <br> 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 <br> (V AC) | Standard operating voltage <br> (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.
7. 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



Legend plate

| Used with |  | Type |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  | Square (S) | Rectangular (T, V) | Half size (H) |
| AP30F | Clear | APCX012-LW | APCX014-LW | DN7P002-W |
|  | Smoked | APCX012-LWS | APCX014-LWS | DN7P002-WS |
| AP40F | Clear | APCX013-LW | APCX015-LW | DN8P002-W |
|  | Smoked | APCX013-LWS | APCX015-LWS | DN8P002-WS |

$$
\text { AP30F Square } \quad \text { AP30F Rectangular }
$$

AP30F Split rectangular AP30F Half size (Color-insert)


Multi Display Lights
AP30F and AP40F

## Accessories



| Description | Type and dimensions, mm |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LED unit | Used with | Emitted color | Color-insert specification | Type |  |  |  |
|  |  |  |  | Square(S) | Horizontal rectangular (T) | Vertical rectangular (V) | Half size(H) |
|  | AP30F <br> Single color <br> All surface illumination <br> Full voltage | Red | Color-insert (color when light turned OFF) | DN7Q001-S1 $\square$ R | DN7Q001-T1 $\square$ R | DN7Q001-V1 $\square$ R | DN7Q001-H1 $\square$ R |
|  |  | Orange |  | DN7Q001-S1 $\square$ A | DN7Q001-T1 $\square$ A | DN7Q001-V1 $\square$ A | DN7Q001-H1 $\square$ A |
|  |  | White |  | DN7Q001-S1 $\square$ W | DN7Q001-T1 $\square$ W | DN7Q001-V1 $\square$ W | DN7Q001-H1 $\square \mathrm{W}$ |
|  |  | Green |  | DN7Q001-S1 $\square$ G | DN7Q001-T1 $\square$ G | DN7Q001-V1 $\square$ G | DN7Q001-H1 $\square$ G |
|  |  | Yellow |  | DN7Q001-S1 $\square \mathrm{Y}$ | DN7Q001-T1 $\square \mathbf{Y}$ | DN7Q001-V1 $\square \mathrm{Y}$ | DN7Q001-H1 $\square \mathrm{Y}$ |
|  |  | Blue |  | DN7Q001-S1 $\square$ S | DN7Q001-T1 $\square$ S | DN7Q001-V1 $\square$ S | DN7Q001-H1 $\square$ S |
|  |  | Pure-white |  | DN7Q001-S1 $\square$ P | DN7Q001-T1 $\square$ P | DN7Q001-V1 $\square$ P | DN7Q001-H1 $\square$ P |
|  |  | Red | Color (transparent) -insert (white when light turned OFF) | DN7Q001-S3 $\square$ R | DN7Q001-T3 $\square$ R | DN7Q001-V3 $\square$ R | DN7Q001-H3 $\square$ R |
|  |  | Orange |  | DN7Q001-S3 $\square$ A | DN7Q001-T3 $\square$ A | DN7Q001-V3 $\square$ A | DN7Q001-H3 $\square$ A |
|  |  | Green |  | DN7Q001-S3 $\square \mathrm{G}$ | DN7Q001-T3 $\square \mathrm{G}$ | DN7Q001-V3 $\square \mathrm{G}$ | DN7Q001-H3 $\square \mathrm{G}$ |
|  |  | Yellow |  | DN7Q001-S3 $\square \mathrm{Y}$ | DN7Q001-T3 $\square \mathbf{Y}$ | DN7Q001-V3 $\square \mathrm{Y}$ | DN7Q001-H3 $\square \mathrm{Y}$ |
|  |  | Blue |  | DN7Q001-S3 $\square$ S | DN7Q001-T3 $\square$ S | DN7Q001-V3 $\square$ S | DN7Q001-H3 $\square$ S |
|  | AP40F <br> Single color <br> All surface <br> illumination <br> Full voltage | Red | Color-insert (color when light turned OFF) | DN8Q001-S1 $\square$ R | DN8Q001-T1 $\square$ R | DN8Q001-V1 $\square$ R | DN8Q001-H1 $\square$ R |
|  |  | Orange |  | DN8Q001-S1 $\square$ A | DN8Q001-T1 $\square$ A | DN8Q001-V1 $\square$ A | DN8Q001-H1 $\square$ A |
|  |  | White |  | DN8Q001-S1 $\square$ W | DN8Q001-T1 $\square$ W | DN8Q001-V1 $\square$ W | DN8Q001-H1 $\square$ W |
|  |  | Green |  | DN8Q001-S1 $\square$ G | DN8Q001-T1 $\square$ G | DN8Q001-V1 $\square$ G | DN8Q001-H1 $\square$ G |
|  |  | Yellow |  | DN8Q001-S1 $\square \mathbf{Y}$ | DN8Q001-T1 $\square \mathrm{Y}$ | DN8Q001-V1 $\square \mathrm{Y}$ | DN8Q001-H1 $\square \mathrm{Y}$ |
|  |  | Blue |  | DN8Q001-S1 $\square$ S | DN8Q001-T1 $\square$ S | DN8Q001-V1 $\square$ S | DN8Q001-H1 $\square$ S |
|  |  | Pure-white |  | DN8Q001-S1 $\square$ P | DN8Q001-T1 $\square$ P | DN8Q001-V1 $\square$ P | DN8Q001-H1 $\square$ P |
| AF00-373 |  | Red | Color (transparent) -insert (white when light turned OFF) | DN8Q001-S3 $\square$ R | DN8Q001-T3 $\square$ R | DN8Q001-V3 $\square$ R | DN8Q001-H3 $\square$ R |
|  |  | Orange |  | DN8Q001-S3 $\square$ A | DN8Q001-T3 $\square$ A | DN8Q001-V3 $\square$ A | DN8Q001-H3 $\square$ A |
|  |  | Green |  | DN8Q001-S3 $\square$ G | DN8Q001-T3 $\square \mathrm{G}$ | DN8Q001-V3 $\square \mathrm{G}$ | DN8Q001-H3 $\square \mathrm{G}$ |
|  |  | Yellow |  | DN8Q001-S3 $\square \mathrm{Y}$ | DN8Q001-T3 $\square \mathrm{Y}$ | DN8Q001-V3 $\square \mathrm{Y}$ | DN8Q001-H3 $\square \mathrm{Y}$ |
|  |  | Blue |  | DN8Q001-S3 $\square$ S | DN8Q001-T3 $\square$ S | DN8Q001-V3 $\square$ S | DN8Q001-H3 $\square$ S |

Notes: The LED unit is provided with a lens case and a color-insert.

Replace the $\square$ in the type number with one of the following voltage code.


Multi Display Lights
AP30F and AP40F
Accessories




Multi Display Lights
AP30F and AP40F
Accessories

| Description | Type and dimensions, mm |
| :--- | :--- |
| Mounting bracket | Type |
| APX111 |  |

■ Separate mounted transformer application table

| Used with | LED specification |  |  |  | Incandescent specification |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Applicable light type | Built-in unit | Transformer unit | Separate base | Applicable light type | Built-in light bulb | Transformer unit | Separate base |
| AP30F | $\begin{aligned} & \text { AP30F- }-E 3-\bullet \\ & \text { AP3OF- } \end{aligned}$ | $\begin{aligned} & \text { DN7Q001-■ロED } \\ & \text { DN7Q004-ПロE } \end{aligned}$ | AHX544- $\square \times$ No. of windows | AHX326 $\times$ No. of windows | AP30F- $>$ - A- | AHX135 (6.3 V 1W bulb) | AHX511- $\square \times$ No. of windows | AHX326× No. of windows |
| AP40F | $\begin{aligned} & \text { AP40F- } \diamond \text { E3- }- \\ & \text { AP40F- } \diamond E S-\bullet \end{aligned}$ | $\begin{aligned} & \text { DN8Q001-■ } \\ & \text { DN8Q004- } \square \mathrm{ED} \end{aligned}$ |  |  | AP40F- $\diamond$ C- | AHX141 (18 V 2 W bulb) | $\begin{aligned} & \text { AHX503- } \square \times \\ & \text { No. of windows } \end{aligned}$ |  |

Notes: 1. Replace $\diamond$ mark by the number of basic windows. $\diamond>=$ vertical x horizontal
2. Replace mark by the code indicating the shape of illuminated face ( $\mathrm{S}, \mathrm{T}$, or V , do not specify H ).
3. The following depths are available. AP30F- $\checkmark$ E3: 60.5 mm AP30F- $\checkmark$ ES: $52 \mathrm{~mm} \quad$ AP30F- $\checkmark$ A: 54 mm AP40F $\checkmark \quad$ E3: $60.5 \mathrm{~mm} \quad$ AP $40 \mathrm{~F}-\triangle \quad \mathrm{ES}: 52 \mathrm{~mm} \quad$ AP $40 \mathrm{~F}-\checkmark$ C: 54 mm
4. Refer to pages 04/249 and 04/250 for built-in unit types with LED specifications.
Terminal cover

## - 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


## Specification example



## ■ 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) <br> (resistive load) |
| :--- | :--- |
| 50 V AC | 0.05 |
| 5 V AC | 0.5 |
| 25 V DC | 0.05 |
| 5 V 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 $360^{\circ} / 26\left(13.85^{\circ}\right)$. 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 voltage <br> Operating temperature <br> Humidity | 50 V |  |
| :--- | :--- | :--- |
| Service life | Mechanical | 45 to $+70^{\circ} \mathrm{C}$ |
|  | Electrical | $55 \% \mathrm{RH}$ (non condensation) |
| Dielectric | Between terminals | 50,000 operations |
| strength | Between terminals and ground | 250 V AC, 1 minute |
| Insulation | Between terminals |  |
| resistance | Between terminals and ground | $500 \mathrm{VAC}, 1$ minute |
| Degree of protection (operator section) | $5,000 \mathrm{M} \Omega$ or more |  |

Type number nomenclature


- M9 nut mounting

| Angle of step | Connector | Lock ring | Type*1 *2 *3 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Real binary code | Complementary binary code | Real gray code |
| $30^{\circ}$ | Without connector | Without lock ring With lock ring With adhesive lock ring | $\begin{aligned} & \text { AC09-RX } \square / \square() \square \\ & \mathrm{AC09-RX} \square / \square() \square / 0007 \\ & \mathrm{AC09-RX} \square / \square \text { ( ) } \square / 0009 \end{aligned}$ | $\begin{aligned} & \text { AC09-CX } \square / \square() \square \\ & \text { AC09-CX } \square / \square() \square / 0007 \\ & \text { AC09-CX } \square \square \square() \square / 0009 \end{aligned}$ | $\begin{aligned} & \text { AC09-GX } \square / \square() \square \\ & \text { AC09-GX } \square \square \square(\square / 0007 \\ & \text { AC09-GX } \square / \square() \square / 0009 \end{aligned}$ |
|  | With right angle connector | Without lock ring With lock ring With adhesive lock ring | AC09-RX $\square / \square() \square 01$ AC09-RX $\square / \square() \square 01 / 0007$ AC09-RX $\square / \square() \square 01 / 0009$ |  | $\begin{aligned} & \text { AC09-GX } \square / \square() \square 01 \\ & \text { AC09-GX } \square / \square() \square 01 / 0007 \\ & \text { AC09-GX } \square / \square() \square 01 / 0009 \end{aligned}$ |
|  | With straight connector | Without lock ring With lock ring With adhesive lock ring | $\begin{aligned} & \text { AC09-RX } \square / \square() \square 02 \\ & \text { AC09-RX } \square / \square() \square 02 / 0007 \\ & \text { AC09-RX } \square / \square() \square 02 / 0009 \end{aligned}$ |  | $\begin{aligned} & \text { AC09-GX } \square / \square() \square 02 \\ & \text { AC09-GX } \square / \square() \square 02 / 0007 \\ & \text { AC09-GX } \square / \square() \square 02 / 0009 \end{aligned}$ |
| $\begin{aligned} & 360^{\circ} / 13 \\ & \left(27.69^{\circ}\right) \end{aligned}$ | Without connector | Without lock ring With lock ring With adhesive lock ring | $\begin{aligned} & \text { AC09-RW } \square / \square() \square \\ & \text { AC09-RW } \square / \square() \square / 0007 \\ & \text { AC09-RW } \square / \square() \square / 0009 \end{aligned}$ |  |  |
|  | With right angle connector | Without lock ring With lock ring With adhesive lock ring | AC09-RW $\square / \square$ ( ) $\square 01$ AC09-RW $\square / \square$ ( $\square 01 / 0007$ AC09-RW $\square / \square$ ( ) $\square 01 / 0009$ | AC09-CW $\square / \square() \square 01$ AC09-CW $\square / \square() \square 01 / 0007$ AC09-CW $\square \square \square() \square 01 / 0009$ |  |
|  | With straight connector | Without lock ring With lock ring With adhesive lock ring | AC09-RW $\square / \square$ ( ) $\square 02$ AC09-RW $\square / \square$ ( ) $\square 02 / 0007$ AC09-RW $\square / \square$ ( ) $\square 02 / 0009$ | AC09-CW $\square / \square$ ( ) $\square 02$ AC09-CW $\square / \square$ ( ) $\square 02 / 0007$ AC09-CW $\square / \square$ ( ) $\square 02 / 0009$ |  |
| $15^{\circ}$ | Without connector | Without lock ring With lock ring With adhesive lock ring | $\begin{aligned} & \text { AC09-RY } \square \square() \square \\ & \text { AC09-RY } \square / \square() \square / 0007 \\ & \text { AC09-RY } \square / \square() \square / 0009 \end{aligned}$ | $\begin{aligned} & \text { AC09-CY } \square \square() \square \\ & \text { AC09-CY } \square \square(\square / \square / 0007 \\ & \text { AC09-CY } \square \square() \square / 0009 \end{aligned}$ | $\begin{aligned} & \text { AC09-GY } \square / \square() \square \\ & \text { AC09-GY } \square / \square \text { () } \square / 0007 \\ & \text { AC09-GY } \square / \square() \square / 0009 \end{aligned}$ |
|  | With right angle connector | Without lock ring With lock ring With adhesive lock ring | AC09-RY $\square / \square() \square 01$ AC09-RY $\square / \square() \square 01 / 0007$ AC09-RY $\square / \square() \square 01 / 0009$ |  |  |
|  | With straight connector | Without lock ring <br> With lock ring With adhesive lock ring | AC09-RY $\square / \square() \square 02$ AC09-RY $\square / \square() \square 02 / 0007$ AC09-RY $\square / \square() \square 02 / 0009$ | AC09-CY $\square / \square$ ( ) $\square 02$ AC09-CY $\square / \square() \square 02 / 0007$ AC09-CY $\square / \square() \square 02 / 0009$ | AC09-GY $\square / \square() \square 02$ AC09-GY $\square / \square$ ( ) $\square 02 / 0007$ AC09-GY $\square / \square() \square 02 / 0009$ |
| $\begin{aligned} & 360^{\circ} / 26 \\ & \left(13.85^{\circ}\right) \end{aligned}$ | Without connector | Without lock ring With lock ring With adhesive lock ring | AC09-RZ $\square / \square() \square$ AC09-RZ $\square / \square(\square / 0007$ AC09-RZ $\square / \square() \square / 0009$ | $\begin{aligned} & \text { AC09-CZ } \square / \square() \square \\ & \text { AC09-CZ } \square / \square(\square / 0007 \\ & \text { AC09-CZ } \square / \square() \square / 0009 \end{aligned}$ | $\begin{aligned} & \text { AC09-GZ } \square / \square() \square \\ & \text { AC09-GZ } \square / \square() \square / 0007 \\ & \text { AC09-GZ } \square / \square() \square / 0009 \end{aligned}$ |
|  | With right angle connector | Without lock ring <br> With lock ring With adhesive lock ring | AC09-RZ $\square / \square() \square 01$ AC09-RZ $\square / \square() \square 01 / 0007$ AC09-RZ $\square / \square() \square 01 / 0009$ | $\begin{aligned} & \text { AC09-CZ } \square / \square() \square 01 \\ & \text { AC09-CZ } \square / \square() \square 01 / 0007 \\ & \text { AC09-CZ } \square / \square() \square 01 / 0009 \end{aligned}$ |  |
|  | With straight connector | Without lock ring With lock ring With adhesive lock ring | AC09-RZ $\square / \square() \square 02$ AC09-RZ $\square / \square() \square 02 / 0007$ AC09-RZ $\square / \square() \square 02 / 0009$ |  | AC09-GZ $\square \square() \square 02$ AC09-GZ $\square \square() \square 02 / 0007$ AC09-GZ $\square \square() \square 02 / 0009$ |

Notes:
${ }^{* 1}$ Replace the $\square \square$ marks by the Start and End positions

| Step angle | $30^{\circ}$ | $360^{\circ} / 13$ | $15^{\circ}$ | $360^{\circ} / 26$ |
| :--- | :--- | :--- | :--- | :--- |
| Start and End positions | 0 to 11 | 0 to 12 | 0 to 23 | 0 to 25 |

*2 Replace the () mark by the shaft length code
L1: $16 \mathrm{~mm} \quad$ L2: $18 \mathrm{~mm} \quad$ L3: $20 \mathrm{~mm} \quad$ L4: 22 mm
${ }^{* 3}$ Replace the $\begin{aligned} & \text { mark by the connector }\end{aligned}$
Blank: 8-terminal, without connector
A01: 8 -terminal, with right angle connector
A02: $\quad 8$-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 step | Connector | Type＊1＊2 |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Real binary code | Complementary binary code | Real gray code |
| $30^{\circ}$ | Without connector With right angle connector With straight connector | AC16－RX $\square / \square \mathrm{L} 4 \square$ AC16－RX $\square / \square \mathrm{L} 4 \mathrm{\square} 01$ AC16－RX $\square \square$ L4■02 | AC16－CX $\square / \square L 4 \square$ AC16－CX $\square / \square$ L4■01 AC16－CX $\square / \square$ L4■02 | AC16－GX $\square / \square \mathrm{L} 4 \square$ AC16－GX $\square / \square$ L4■01 AC16－GX $\square / \square$ L4 ${ }^{-1} 02$ |
| $\begin{aligned} & 360^{\circ} / 13 \\ & \left(27.69^{\circ}\right) \end{aligned}$ | Without connector With right angle connector With straight connector | AC16－RW $\square / \square$ L4 AC16－RW $\square \square \square 4 \square 01$ AC16－RW $\square / \square$ L4■02 | AC16－CW $\square / \square$ L4 AC16－CW $\square \square$ L4■01 AC16－CW $\square \square \square 4 \square 02$ |  |
| $15^{\circ}$ | Without connector With right angle connector With straight connector | AC16－RY $\square / \square$ L4 AC16－RY $\square / \square$ L4■01 AC16－RY $\square / \square$ L4■02 | AC16－CY $\square / \square$ L4 AC16－CY $\square / \square$ L4 ${ }^{(01}$ AC16－CY $\square / \square$ L4 ${ }^{(02}$ | AC16－GY $\square / \square \mathrm{L} 4 \square$ AC16－GY $\square / \square$ L4 ${ }^{(101}$ <br> AC16－GY $\square / \square$ L4 ${ }^{(02}$ |
| $\begin{aligned} & 360^{\circ} / 26 \\ & \left(13.85^{\circ}\right) \end{aligned}$ | Without connector With right angle connector With straight connector | AC16－RZ $\square \square$ L4 AC16－RZ $\square \square$ L4 01 AC16－RZ $\square / \square$ L4■02 | AC16－CZ $\square / \square$ L4 AC16－CZ $\square / \square$ L4 01 AC16－CZ $\square / \square$ L4■02 | AC16－GZ $\square / \square$ L4■ AC16－GZ $\square / \square$ L4 01 AC16－GZ $\square / \square$ L4■02 |

Notes：
${ }^{* 1}$ Replace the $\square \square$ marks by the Start and End positions

| Step angle | $30^{\circ}$ | $360^{\circ} / 13$ | $15^{\circ}$ | $360^{\circ} / 26$ |
| :--- | :--- | :--- | :--- | :--- |
| Start and End positions | 0 to 11 | 0 to 12 | 0 to 23 | 0 to 25 |

＊2 Replace the $\square$ 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：

Blank：8－terminal without connector
A01： 8 －terminal，with right angle connector
A02：$\quad 8$－terminal，with straight connector
B01：7－terminal，with right angle connector
B02：7－terminal，with straight connector
－Adaptor mounting（ 32 mm mounting pitch）

| Angle of step | Connector | Type＊1＊2＊3 |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Real binary code | Complementary binary code | Real gray code |
| $30^{\circ}$ | Without connector With right angle connector With straight connector | AC32－RX $\square / \square() \square$ AC32－RX $\square \square() \square 01$ AC32－RX $\square \square() \square 02$ | AC32－CX $\square / \square() \square$ AC32－CX $\square \square() \square 01$ AC32－CX $\square \square() \square 02$ | $\begin{aligned} & \text { AC32-GX } \square / \square() \square \\ & \text { AC32-GX } \square / \square() \square 01 \\ & \text { AC32-GX } \square \square() \square 02 \end{aligned}$ |
| $\begin{aligned} & 360^{\circ} / 13 \\ & \left(27.69^{\circ}\right) \end{aligned}$ | Without connector With right angle connector With straight connector | $\begin{aligned} & \text { AC32-RW } \square \square() \square \\ & \text { AC32-RW } \square / \square() \square 01 \\ & \text { AC32-RW } \square \square() \square 02 \end{aligned}$ | $\begin{aligned} & \text { AC32-CW } \square \square() \square \\ & \text { AC32-CW } \square / \square() \square 01 \\ & \text { AC32-CW } \square \square() \square 02 \end{aligned}$ |  |
| $15^{\circ}$ | Without connector With right angle connector With straight connector | $\begin{aligned} & \text { AC32-RY } \square / \square() \square \\ & \text { AC32-RY } \square \square() \square 01 \\ & \text { AC32-RY } \square \square() \square 02 \end{aligned}$ | $\begin{aligned} & \text { AC32-CY } \square / \square() \square \\ & \text { AC32-CY } \square / \square() \square 01 \\ & \text { AC32-CY } \square \square() \square 02 \end{aligned}$ | $\begin{aligned} & \text { AC32-GY } \square / \square() \square \\ & \text { AC32-GY } \\ & \text { AC32-GY } \square(\square() \square 01 \end{aligned}$ |
| $\begin{aligned} & 360^{\circ} / 26 \\ & \left(13.85^{\circ}\right) \end{aligned}$ | Without connector With right angle connector With straight connector | $\begin{aligned} & \text { AC32-RZ } / \square() \square \\ & \text { AC32-RZ/ロ()■01 } \\ & \text { AC32-RZ } \square \square() \square 02 \end{aligned}$ | $\begin{aligned} & \text { AC32-CZ } \square / \square() \square \\ & \text { AC32-CZDロ()■01 } \\ & \text { AC32-CZロロ()■02 } \end{aligned}$ | $\begin{array}{\|l} \text { AC32-GZ } \square / \square() \square \\ \text { AC32-GZ } \\ \text { AC32-GZ } \square(\square) \square 01 \end{array}$ |

Notes：
＊1 Replace the $\square \square$ marks by the Start and End positions

| Step angle | $30^{\circ}$ | $360^{\circ} / 13$ | $15^{\circ}$ | $360^{\circ} / 26$ |
| :--- | :--- | :--- | :--- | :--- |
| Start and End positions | 0 to 11 | 0 to 12 | 0 to 23 | 0 to 25 |

＊2 Replace the（）mark by the shaft length
L1： $14.5 \mathrm{~mm} \quad$ L2： $16.5 \mathrm{~mm} \quad$ L3： $18.5 \mathrm{~mm} \quad$ L4： 20.5 mm
${ }^{* 3}$ 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

## - 24-position

## R: Real binary code



C: Complementary binary code

| Terminal No. | $\begin{aligned} & \hline \text { Bit } \\ & \text { No. } \end{aligned}$ | Setting position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 23 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  | 011 | 112 | 213 | 14 | 415 | 16 | 17 | 18 | 19 | 202 | 2122 |  |
| A | 1 | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | - |  | $\bullet$ |  | - |  | - |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |
| F | 2 | - | - |  |  | - | $\bullet$ |  |  | - | - |  |  | - | - |  |  | - | - |  |  | - - | - |  |
| B | 4 | $\bullet$ | - | - | - |  |  |  |  | $\bullet$ | - | - | - |  |  |  |  | - | - | $\bullet$ | - |  |  |  |
| E | 8 | $\bullet$ | - | - | $\bullet$ | $\bullet$ | $\bullet$ | - | $\bullet$ |  |  |  |  |  |  |  |  | - | - | - | - | - - | $\bullet \bullet$ | $\bullet \bullet$ |
| C | 16 | $\bullet$ | - | - | $\bullet$ | $\bullet$ | $\bullet$ | - | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ |  |  |  |  |  |  |  |
| G | INH | - | $\bullet$ | $\bullet$ | - | $\bullet$ | - | - |  | , |  | - | $\bullet$ | $\bullet$ | $\bullet$ | - | - |  |  | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| G: Real | ray |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Terminal | Bit |  | etting | g | pos | ition |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No. | No. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  | 011 | 112 | 213 | 14 | 415 | 16 | 17 | 181 | 19 | 202 | 2122 | 2223 |
| A | a |  |  | - |  |  | $\bullet$ | - |  |  | - | - |  |  | - | - |  |  | - | - |  |  |  | - |
| F | b |  |  | - | - | - | $\bullet$ |  |  |  |  |  | - | - | - |  |  |  |  | - | - | - - |  |  |
| B | c |  |  |  |  | - | $\bullet$ | $\bullet$ | $\bullet$ | - | $\bullet$ |  | $\bullet$ |  |  |  |  |  |  |  |  | - - | - - | - - |
| E | d |  |  |  |  |  |  |  |  | $\bullet$ | $\bullet$ | - | - | - | - | - | $\bullet$ | - | - | - | - | - - | - - | - - |
| C | e |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - | $\bullet$ | - | - | - $\bullet$ | - $\bullet$ | $\bullet \cdot$ |
| G | P |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ | $\bullet$ |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## - 26-position

## R: Real binary code

| Terminal No. | Bit <br> No. | Setting position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 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 |
| A | 1 |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |
| F | 2 |  |  | - | $\bullet$ |  |  | $\bullet$ | $\bullet$ |  |  | $\bullet$ | $\bullet$ |  |  | $\bullet$ | $\bullet$ |  |  | $\bullet$ | $\bullet$ |  |  | $\bullet$ | - |  |  |
| B | 4 |  |  |  |  | $\bullet$ | $\bullet$ | - | $\bullet$ |  |  |  |  | - | $\bullet$ | - | $\bullet$ |  |  |  |  | - | $\bullet$ | - | $\bullet$ |  |  |
| E | 8 |  |  |  |  |  |  |  |  | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | - | - | - | $\bullet$ |  |  |  |  |  |  |  |  | $\bullet$ | - |
| C | 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\bullet$ | - | - | - | - | $\bullet$ | $\bullet$ | - | $\bullet$ | - |
| G | INH |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

C: Complementary binary code

| Terminal No. | $\begin{aligned} & \hline \text { Bit } \\ & \text { No. } \end{aligned}$ | Setting position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 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 |
| A | 1 | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | - |  | $\bullet$ |  | $\bullet$ |  |
| F | 2 | $\bullet$ | - |  |  | $\bullet$ | $\bullet$ |  |  | $\bullet$ | $\bullet$ |  |  | $\bullet$ | $\bullet$ |  |  | $\bullet$ | - |  |  | $\bullet$ | $\bullet$ |  |  | $\bullet$ | $\bullet$ |
| B | 4 | $\bullet$ | - | - | $\bullet$ |  |  |  |  | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ |  |  |  |  | $\bullet$ | - | - | $\bullet$ |  |  |  |  | - | $\bullet$ |
| E | 8 | $\bullet$ | - | - | - | - | - | - | $\bullet$ |  |  |  |  |  |  |  |  | $\bullet$ | - | - | - | - | - | $\bullet$ | $\bullet$ |  |  |
| C | 16 | $\bullet$ | $\bullet$ | - | $\bullet$ | $\bullet$ | - | - | - | $\bullet$ | $\bullet$ | $\bullet$ | - | $\bullet$ | $\bullet$ | - | $\bullet$ |  |  |  |  |  |  |  |  |  |  |
| G | INH |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## G: Real gray code

| Terminal No. | $\begin{aligned} & \hline \text { Bit } \\ & \text { No. } \end{aligned}$ | Setting position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 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 |
| A | a |  | $\bullet$ | $\bullet$ |  |  | - | - |  |  | $\bullet$ | $\bullet$ |  |  | - | - |  |  | - | - |  |  | - | - |  |  | $\bullet$ |
| F | b |  |  | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ |  |  |  |  | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ |  |  |  |  | $\bullet$ | $\bullet$ | - | - |  |  |  |  |
| B | C |  |  |  |  | - | - | $\bullet$ | - | $\bullet$ | $\bullet$ | - | - |  |  |  |  |  |  |  |  | - | - | - | - | - | $\bullet$ |
| E | d |  |  |  |  |  |  |  |  | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | - | - | - | $\bullet$ | - | $\bullet$ | - | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ |  |  |
| C | e |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\bullet$ | - | $\bullet$ | $\bullet$ | - | - | $\bullet$ | $\bullet$ | - | $\bullet$ |
| G | P |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | - |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## - 12-position

R: Real binary code

| Terminal | Bit |  | etting | p po | osit |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| No. | No. | 0 | 12 | 23 | 4 | 5 | 6 | 78 | 89 |  |  |
| A | 1 |  |  | - |  | $\bullet$ |  | $\bullet$ | $\bullet$ |  | $\bullet$ |
| F | 2 |  |  | - |  |  | - | - |  |  | $\bullet$ |
| B | 4 |  |  |  | - | - | - | - |  |  |  |
| E | 8 |  |  |  |  |  |  |  | $\bullet$ | - | $\bullet$ |
| C | P |  |  |  | - |  |  |  |  |  | $\bullet$ |
| G | $\mathrm{INH} \bullet \bullet \bullet \bullet \bullet \bullet \bullet \bullet \bullet \bullet \bullet \bullet$ |  |  |  |  |  |  |  |  |  |  |
| D | C |  |  |  |  |  |  |  |  |  |  |

C: Complementary binary code

| Terminal | Bit |  | etti | ing | po | sit | tion |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| No. | No. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 6 | 7 | 9 |  |  |
| A | 1 | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ | - | - |  | $\bullet$ |  |
| F | 2 | - | - |  |  | - | - |  |  | $\bullet$ | - |  |  |
| B | 4 | $\bullet$ | - | - | - |  |  |  |  | - | - | - | $\bullet$ |
| E | 8 | $\bullet$ | - | $\bullet$ | - | - | - | - | $\bullet$ | - |  |  |  |
| C | P |  | - | $\bullet$ |  | - |  |  |  | - $\bullet$ |  |  | $\bullet$ |
| G | INH - - - - - - - - - - |  |  |  |  |  |  |  |  |  |  |  |  |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |

G: Real gray code

| Terminal No. | $\begin{aligned} & \hline \text { Bit } \\ & \text { No. } \end{aligned}$ | Setting position |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |
| A | a |  | - | - |  |  | $\bullet$ | - |  |  | - | - |  |
| F | b |  |  | - | - | - | - |  |  |  |  | - | - |
| B | c |  |  |  |  | - | - | - | - | - | - | - | $\bullet$ |
| E | d |  |  |  |  |  |  |  |  | - | - | - | $\bullet$ |
| C | P |  |  |  | - |  | - |  | - |  | - |  | $\bullet$ |
| G |  |  |  |  |  |  |  |  |  |  |  |  |  |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |

- 13-position

R: Real binary code

| Terminal No. | $\begin{aligned} & \hline \text { Bit } \\ & \text { No. } \end{aligned}$ | Setting position |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  | 10 | 11 |  |
| A | 1 |  | $\bullet$ |  | - |  | - |  | $\bullet$ |  | - |  | $\bullet$ |  |
| F | 2 |  |  | - | - |  |  | - | - |  |  | - | - |  |
| B | 4 |  |  |  |  | - | - | - | $\bullet$ |  |  |  |  | $\bullet$ |
| E | 8 |  |  |  |  |  |  |  |  | - | - | - | - | $\bullet$ |
| C | P |  | - | - |  | - |  |  |  | - |  |  | - |  |
| G |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |  |

C: Complementary binary code
Terminal $\begin{aligned} & \text { Bit } \\ & \text { Setting position }\end{aligned}$

| No. | No. | 0 | 1 | 2 | 3 | 4 | 5 | 5 | 6 | 7 | 8 | 9 |  | 011 | 112 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A | 1 | $\bullet$ |  | $\bullet$ |  | $\bullet$ |  |  | $\bullet$ |  | $\bullet$ |  | $\bullet$ | - | $\bullet$ |
| F | 2 | $\bullet$ | - |  |  | - | - |  |  |  | - | - |  |  | - |
| B | 4 | $\bullet$ | - | - | - |  |  |  |  |  | $\bullet$ | - | - | - | - |
| E | 8 | $\bullet$ | $\bullet$ | - | - | $\bullet$ | - | - | - | - |  |  |  |  |  |
| C | P |  | - | - |  | - |  |  |  | - | - |  |  | - | - |
| G |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| D | C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

[^36]
## - Accessories

Lead wire with connector (8-terminal)

AF91-675

| Length of lead wire $(\mathrm{m})$ | Type | Mass $(\mathrm{g})$ |
| :--- | :--- | :---: |
| 0.5 | ACX011-805 | 11 |
| $1.0($ Standard $)$ | ACX011-810 | 19 |
| 2.0 | ACX011-820 | 33 |

## Lock ring



|  | Type | Mass (g) |
| :--- | :--- | :---: |
| Lock ring (inserted) | ACX001 | 2 |
| Lock ring (sealed) | ACX001A | 5 |

ACX001 ACX001A


L: 0.5, 1.0, 2.0 m

## ■ Dimensions, mm

## AC09

## AC16


Mass: 47 g


Panel cutting


AC32


| * |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 14.5 | 16.5 | 18.5 | 20.5 |
| Mast $(\mathrm{g})$ | 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 $2 \mathrm{~N} \cdot \mathrm{~m}$.
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 $1 \mathrm{~N} \cdot \mathrm{~m}$.


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 $0.5 \mathrm{~N} \cdot \mathrm{~m}$.

## - 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: $30^{\circ}$ (symbol X)

Positions 0/11 (0 to 11): one screw. User-selectable start and stop positions: two screws (one for start position, one for end position).

- Step angle: $15^{\circ}$ (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: $360^{\circ} / 26$ (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 $0.1 \mathrm{~N} \cdot \mathrm{~m}$. Screw the stopper screw into position until it hits the body frame rib. Do not overtighten the screw.



Stopper 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 $E$ ).

## Insertion example 2



## 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. FUJl 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

## Example

Cam switch,
rated current 10A $\qquad$ RC310-1
Flush mounting .. $\qquad$ ..... X
Maintained operation ......................... M
Contact arrangement ....... 3201
(3-position, 2 contact blocks,
H type handle H
Black color handle............................................... B 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

| Type | Flush mounting <br> x-type | Semi-flush mounting | Enclosed <br> g-type |
| :--- | :--- | :--- | :--- |
| RC310-1 |  |  |  |
|  | RC310x-1 | SG-740 |  |
| RC310-1 | SG-743 |  |  |

■ Ratings

| Type | Rated thermal <br> current | Breaking capacity (A) |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | (A) | Voltage | AC | DC | DC |
|  | (V) | Inductive | Resistive | 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 $100 \mathrm{M} \Omega$ at 500 VDC
Dielectric strength: 2,500VAC. 1 minute
Ambient temperature: $-5^{\circ}$ to $+60^{\circ} \mathrm{C}$
Operating cycle: 600 cycles/hour
■ Contact arrangement: See page 04/265.


Life expectancy (operations)

| Type | 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

## RC310 series

RC310ㅁ-1ㅁㅁㅁㅁ


- Handle color B: Black

| - Operation |  |
| :--- | :--- |
| Model | Description |
| M | Maintained |
| L | Center spring return |
| Center spring return with locking device |  |
| (Pull to turn) |  |

- Selector position and notch angle

| Operation | Notch angle | Position |  |
| :---: | :---: | :---: | :---: |
| M | $\begin{array}{\|l} 90^{\circ} \\ 2 \text { position } \end{array}$ | $y^{1}$ |  |
|  | $\left.\right\|_{90^{\circ}} ^{3,4 \text { position }} \quad \text { * }$ |  |  |
|  | $\begin{array}{\|l} 45^{\circ} \\ 3-8 \text { position } \end{array}$ |  |  |
|  | $\begin{array}{\|l\|} \hline 30^{\circ} \\ 9-12 \text { position } \end{array}$ |  |  |
| A | $45^{\circ}$ |  |  |
| L | $45^{\circ}$ | (With locking device) |  |
| Note: * 3 or 4-position type notch angle is normally 45 degrees. Specify when ordering other than this. |  |  | - Available |

## - Handle

| Type | Standard | Versions |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RC310-1 |  |  |  |  |  |  | D type |  |

- Ratings
$\left.\begin{array}{l|llllll}\hline \text { Type } & \begin{array}{l}\text { Rated } \\ \text { thermal } \\ \text { current (A) }\end{array} & \text { Voltage } & \begin{array}{l}\text { Number of } \\ \text { contact } \\ \text { (VAC) }\end{array} & \begin{array}{l}\text { Selector } \\ \text { position and } \\ \text { notch angle }\end{array} & \begin{array}{l}\text { Flush mounting } \\ \text { (x-type) } \\ \text { Type }\end{array} & \text { Semi-flush mounting }\end{array} \begin{array}{l}\text { Enclosed } \\ \text { (g-type) }\end{array}\right]$

[^37]
## ■ 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.
3201
LNo. of contact arrangements: Indicates the arrangement number.
No. of contact blocks: Up to 10 blocks can be mounted. (0 indicates 10 blocks)
No. of selector positions

## 2-position 1-contact block

| 2101 | 2102 | 2103 | 2104 |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
| $2105$ | $2106$ | 2107 Over rap contact (early make, late break) | 2108 Over rap contact (early make, late break) $1 0 - 0 \longdiv { 3 + 4 0 2 0 2 }$ |

2-position 2-contact block

| 2201 | 2202 | 2203 | 2204 |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
| 2205 | 2206 | 2207 | 2208 |
|  |  |  |  |

## 2-position 3-contact block

| 2301 | 2302 | 2303 | 2304 |
| :---: | :---: | :---: | :---: |
| $90-6011+\quad 120-210$ | $90-1011+\quad-120-10$ |  | $90-511 \cdot{ }^{\text {- }}$ |
| 50-57 - -80-506 | $50-57 \bullet 80-66$ | $50-107$ - 80-56 | $50-57 \bullet$ - - 88- 6 |
|  | $10-53+4 \mathrm{~L}$ | $\begin{array}{r} 10-53-1 \end{array}$ | $10-50 \underset{1}{6}$ |
| 2305 | 2306 | 2307 | 2308 |
|  | $90-511+\bullet$ - $120-210$ |  | 90-art - - 120-2010 |
| 50-207 - 80-206 |  | 50-07 - - 80-206 | $50-67$ - 80-56 |
| 10-53 - - 40-202 | $1 \mathrm{O}-\mathrm{O} 3 \cdots$ - 40-202 | 10-03 - - 40- - 2 | 10-63 - - 40-52 |
| 1212 | 1212 | 1212 | 1212 |

## 2-position 4-contact block

| 2401 | 2402 | 2403 | 2404 |  |
| :---: | :---: | :---: | :---: | :---: |
| 13 O-015 - -160-014 | 130-015-160-614 | 130-915 - - $160-1014$ | 130-950 | - $160-1014$ |
| $90-1011$ - -120-2010 | $90-1011-120-10$ | $90-\operatorname{Ol}$ - - 120-010 | $90-410$ | - - 120-10 |
| $50-107 \longrightarrow 80-26$ | $50-107 \quad$ - 80-206 | 50-07- - 80-⿺𠃊 6 | $50-57$ | - - 88-26 |
| 1 - 0 - - 40-52 | $10-03 \div-40-22$ | 10-53- - 40-LO2 | 10- 03 - - | - - 40-52 |
| 1212 | $1212$ | 1212 |  | 12 |
| 2405 | 2406 | 2407 | 2408 |  |
| 13 - - 015 - - $160-214$ | 13 - 015 ¢ ¢ - 160-014 | 130-ON5 - - $160-214$ | 130-450 | +160-14 |
| 90-011 - 120-L010 | $90-1110 \cdot 120-10$ | 90-0, 1 - -120-2010 | 90 -an 1 | - $120-10$ |
| $50-107$ - 80-206 | $50-109$ - 80-606 | $50-07 \longrightarrow 80-106$ | $50-27$ | - 80-66 |
| $10-103$ - 40-02 | $1 \mathrm{O-O3}$ - - 40-52 | $10-1-40-102$ | 10-03 | - - 40-52 |
| 1212 | 1212 | 1212 | 12 | 12 |

## Control selector switches

## ■ Contact arrangement

3-position 1-contact block

| 3101 | 3102 | 3103 | 3104 |
| :---: | :---: | :---: | :---: |
|  |  |  | $10 \text { كـ }$ |
| $3105$ | $3106$ |  | 3108 Notch angle : $90^{\circ}$ |
| $3109$ | $3110$ | $3111$ | $3112$ |

3-position 2-contact block

| $3201$ | $3202$  | $3203$  |  |
| :---: | :---: | :---: | :---: |
| $3205$  |  | $3207$  | $3208$  |
| 3209 | 3210 | 3211 |  |

## 3-position 3-contact block

| 3301 | 3302 | 3303 | 3304 |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
| 3305 | $3306$  |  |  |
|  | 3310 | 3311 |  |

## ■ Contact arrangement

4-position 2-contact block

|  |  | $4203$ |  |
| :---: | :---: | :---: | :---: |
|  |  | $4207$ |  |
| $4209$ |  |  |  |

## 4-position 3-contact block

| 43 | 4302 | 4303 | 4304 |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
|  |  |  |  |
|  |  | 4311 |  |

## 4-position 4-contact block



Cam Type
RC310

## Control selector switches

## ■ Contact arrangement

5-position 2-contact block

| 5201 | 5202 | 5203 |
| :---: | :---: | :---: |
|  |  |  |
| $5204$ | $5205$ |  |
|  | 5208 |  |

5-position 3-contact block

|  |  |  |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |

5-position 4-contact block

| 5401 |  | 5402 |  | 5403 |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $*$  16014 |  |  |  |  |
| 5404 |  | 5405 |  | 5406 |  |
|  |  |  |  |  |  |
| 5407 |  | 5408 |  | 5409 |  |
|  |  |  |  |  |  |

## ■ 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


# Panel Switches <br> NS387 and RC310 <br> 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 | Type | Ordering code | No. of contact block | Legend plate * | Handle angle | With or without Off position | Mass <br> (kg) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NS387 | AC Voltmeter | NS387/4V | AC38V4N | 4 | R-S. S-T. T-R | $2 \times 45^{\circ}$ | Without | 0.5 |
|  | AC Voltmeter | NS387/4V0 | AC38V4F | 4 | OFF •R-S S-T • T-R | $3 \times 45^{\circ}$ | With | 0.5 |
|  | DC Voltmeter | NS387/2V | AC38V2N | 2 | 1. OFF . II | $2 \times 45^{\circ}$ | With | 0.43 |
|  | AC Ammeter | NS387/2M | AC38A2N | 2 | R.S.T | $2 \times 45^{\circ}$ | Without | 0.43 |
|  | AC Ammeter | NS387/2M0 | AC38A2F | 3 | OFF.R.S.T | $3 \times 45^{\circ}$ | With | 0.47 |
|  | AC Ammeter | NS387/3M | AC38A3N | 3 | R.S.T | $2 \times 45^{\circ}$ | Without | 0.47 |
|  | AC Ammeter | NS387/4M | AC38A43F | 4 | OFF.R.S.T | $3 \times 45^{\circ}$ | With | 0.5 |
| RC310 | AC Voltmeter | RC310-1V | AK2R1-V32 | 2 | R-S.S-T.T-R | $2 \times 45^{\circ}$ | Without | 0.22 |
|  | AC Voltmeter | RC310-1V0 | AK2R1-V42 | 2 | OFF •R-S S-T $\cdot$ T-R | $3 \times 45^{\circ}$ | With | 0.22 |
|  | AC Ammeter | RC310-1A2 | AK2R1-A32 | 2 | R.S.T | $2 \times 45^{\circ}$ | Without | 0.22 |
|  | AC Ammeter | RC310-1A20 | AK2R1-A42 | 2 | OFF.R.S.T | $3 \times 45^{\circ}$ | With | 0.22 |
|  | AC Ammeter | RC310-1A3 | AK2R1-A33 | 3 | R.S.T | $2 \times 45^{\circ}$ | Without | 0.25 |
|  | AC Ammeter | RC310-1A30 | AK2R1-A43 | 3 | OFF.R.S.T | $3 \times 45^{\circ}$ | With | 0.25 |

Note: * For standard type legend plate. Other types can be manufactured by request.

## - Ratings

| Series | Rated thermal current (A) | Making and breaking capacity AC (inductive) |  |  | DC (inductive) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Voltage <br> (V) | Make <br> (A) | Break <br> (A) | Voltage (V) | Make <br> (A) | Break <br> (A) |
| NS387 | 15 | 110 | 30 | 3 | 24 | 60 | 60 |
|  |  | 220 | 30 | 3 | 110 | 15 | 15 |
|  |  | 440 | 20 | 2 | 220 | 5 | 5 |
|  |  | 550 | 20 | 2 | 440 | 2.5 | 2.5 |
| RC310 | 10 | 110 | 37.5 | 7.5 | 24 | 37.5 | 7.5 |
|  |  | 220 | 37.5 | 7.5 | 110 | 37.5 | 1.3 |
|  |  | 440 | 37.5 | 2.5 | 220 | 37.5 | 0.45 |
|  |  | 550 | 37.5 | 1.5 | 440 | 37.5 | 0.15 |

## ■ Handle color (standard) ■ Special spanner (for NS387)



## ■ Dimensions, mm


RC310


| 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


RC310-1A20


RC310-1A3


RC310-1A30


## Panel Switches

NS387
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 $25 \mathrm{M} \Omega$ at 500 V DC Dielectric strength: 2200 V AC rms, 1 minute Durability
Mechanical: 300,000 operations
Electrical: 100,000 operations at 220V AC 5A
Allowable ambient temperature: $-5^{\circ}$ to $+40^{\circ} \mathrm{C}$


$\square$ Ratings

| Contacts | Rated thermal current (A) | Making and breaking capacity |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | DC (inductive) [W] <br> 24 V 110 V 220 V 440 V |  |  |  | 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


| Type | No. of contact blocks |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :---: |
|  | 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
2. 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

## Type number nomenclature



| Contact arrangement | Code | Contact position | Contact (varies depending on operation) |  |  | No. of combinations <br> (varies depending on operation) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Blank | C | A | C | A | 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) | $\stackrel{\circ}{\substack{\in[\square] \\ 0}}$ | $0_{0}^{0}$ | $\stackrel{\circ}{\circ} \stackrel{0}{\circ} \stackrel{0}{\circ}$ | $\begin{aligned} & (1++3+(4)+4 \\ & \leq 6 \text { block } \\ & 3+(4) \\ & \leq 4 \text {-block } \end{aligned}$ | $\begin{aligned} & (1+(2)+(3) \\ & +4) \\ & \leq 6 \text {-block } \\ & \text { (3)+(4) } \\ & \leq 6-\text { block } \end{aligned}$ | $\begin{aligned} & (1++(2)+(3) \\ & + \text { (4) } \\ & \leq 6 \text {-block } \\ & 3+4 \\ & \leq 4 \text {-block } \end{aligned}$ |
| (2) | $\begin{aligned} & \begin{array}{l} \text { Blank, } \\ 1-10 \end{array} \end{aligned}$ | The above contacts (1) shifted clockwise by $45^{\circ}$ | $0_{0}^{0} 0_{0}^{0}$ | - | $)_{8}^{o}$ |  |  |  |
| (3) | $\begin{array}{\|l\|} \hline 0 \mathrm{~m}- \\ 6 \mathrm{~m} \end{array}$ | 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. | $\underset{\circ}{\stackrel{\circ}{\circ}}$ | ${ }_{0}^{\circ}$ | $\stackrel{\circ}{\stackrel{\circ}{\circ}}$ |  |  |  |
| (4) | Blank, <br> 1m- <br> 6 m | The above contacts (3) shifted clockwise by $45^{\circ}$ Code " $m$ " is added after the number of blocks. | $\mathrm{K}_{0}^{0}$ | $\stackrel{\circ}{\delta} \stackrel{0}{0}$ | $\mathbb{B}_{0}^{0}$ |  |  |  |

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 | ${ }^{1} O^{2}$ | $90^{\circ}$ | C |
|  | 3 | $0^{1} 0^{2}$ | $45^{\circ}$ | A |
|  | 4 | $1_{1}^{2} \biguplus^{3}$ |  | D |
| Spring return | (3) | $A^{A=0} O^{0} B$ |  | Blank |
| Spring manua return | (3) | $A^{A}{ }^{0}{ }^{B}$ |  | F |
|  | (3) | ${ }^{A} \circlearrowleft^{0}{ }^{0} B$ |  | E |

## - Contact

Standard contact
$\stackrel{\circ}{\circ} \mathrm{O}$

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.

## Control switches

## Operating handle

- Combination of rosette and handle

| Rosette | Handle | Type of handle (refer to 2. Shape of handle, table below) |  |
| :---: | :---: | :---: | :---: |
| For NS387 | For NS387 | Without micro switch: $\begin{aligned} & \mathrm{H}, \mathrm{I}, \mathrm{~K} \\ & \mathrm{KP} 1-\mathrm{KP} 10 \\ & \mathrm{KQ} 1-\mathrm{KQ} 10 \\ & \mathrm{KX1}-\mathrm{KX10} \\ & \mathrm{KY1}-\mathrm{KY10} \\ & \mathrm{R} \end{aligned}$ |  |
|  | 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 NS387 |  |  |  |  |  | KQ type | $\begin{gathered} \mathrm{KX} \text { type } \\ \text { 48.5 } \end{gathered}$ | KY type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| For RC310 | H type | R type |  |  |  | K type | D type |  |

- Types of handle locking

| Code | Center spring return type | Maintained type |
| :---: | :---: | :---: |
| Blank | 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". <br> The RC310 handle can be turned without being locked. | The handle can be turned without being locked. |
| L1 | With a handle for the RC310. <br> 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. |
| L2 | 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. |
| L3 | 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. | - |
| L4 | 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. | - |
| L5 | 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. | - |

[^38]
## ■ Assembled typical switches

| Operation | Type(example) | Contact arrangement | Description |
| :---: | :---: | :---: | :---: |
| Center spring return | NS387/2 + 0mHD |  | - The handle can be turned after being pulled, and will return to the center position automatically when it is released. |
|  | NS387/2 + 2 + 0mHB |  <br>  | - 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 + OmS1B | $\begin{array}{r} 0 \\ \end{array}$ | - RC310-1 handle, equipped with a rosette. <br> - Add L1 for the pull-and-turn type. |
|  | NS387/1 + OmS1HDL2 |  | - Provided with a micro switch, RC310-1 handle, and a rosette for the NS387. <br> - 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 + OmSBL3 |  | - RC310-1 handle, equipped with the NS387 rosette. <br> - 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 + OmS1H1BL4 |  | - Equipped with a micro switch, RC310-1 handle, and a rosette for the NS387. <br> - 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. <br> - The micro switch will be activated while the handle is pulled. |
| Maintained 2-position | NS387/C3 + 1mKB |  | - |
|  | NS387/C6 + OmW1D |  | - RC310-1 cam switch handle, equipped with a rosette. |
| Maintained 3-position | NS387/A6 + 0mRB |  <br>  | - |
|  | NS387/A2 + 0mH1B |  | - RC310-1 cam switch handle, equipped with a rosette. |
|  | NS387/A3 + 3 + OmS1KDL2 |  | - RC310-1 cam switch handle, equipped with the NS387 rosette. <br> - 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 <br> 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 $\mathrm{mm}^{2}$ cross-sections. In this catalog wire sizes are quoted in $\mathrm{mm}^{2}$. Please use this table for reference.

| Gauge <br> B.W.G. | A.W.G. | Square $\mathrm{mm}^{2}$ | Gauge B.W.G. | A.W.G. | Square $\mathrm{mm}^{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 4/0 | 107.2 | 12 | 9 | 6.6 |
| 4/0 |  | 104.2 |  |  | 6.0 |
| 3/0 |  | 91.6 |  | 10 | 5.3 |
|  | 3/0 | 85.2 | 13 |  | 4.6 |
| 2/0 |  | 73.2 |  | 11 | 4.2 |
| 0 | 2/0 | 67.5 | 14 |  | 3.5 |
|  |  | 58.6 |  | 12 | 3.3 |
|  | 0 | 53.5 | 15 | 13 | 2.63 |
| 1 |  | 45.6 | 16 |  | 2.14 |
|  | 1 | 42.4 |  | 14 | 2.08 |
| 23 |  | 40.9 | 17 |  | 1.71 |
|  |  | 34.0 |  | 15 | 1.65 |
|  | 2 | 33.6 |  | 16 | 1.32 |
| 4 |  | 28.7 | 18 |  | 1.22 |
|  | 3 | 26.7 |  | 17 | 1.03 |
| 5 | 4 | 24.5 | 19 |  | 0.89 |
|  |  | 21.2 |  | 18 | 0.81 |
| 6 |  | 20.9 |  | 19 | 0.66 |
|  | 5 | 16.8 | $\begin{aligned} & 20 \\ & 21 \end{aligned}$ |  | 0.62 |
| 7 |  | 16.4 |  | 20 | 0.52 |
| 8 | 6 | 13.8 | 22 | 21 | 0.41 |
|  |  | 13.3 |  |  | 0.40 |
| 9 |  | 11.1 |  | 22 | 0.32 |
|  | 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 $\mathbf{6 0 0}$ Volts



Notes: $\begin{gathered}* 1 \\ { }^{* 2} \text { Cross recessed pan head screw type. } \\ \end{gathered}$

## ■ Dimensions, mm

15A, 25A Terminal blocks


| Type | No. of poles | A | B | C | D | E | F | G | H | Mass <br> (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


| Type | No. <br> of <br> poles | A | B | C | D | E | F | H | L | Mass |
| :--- | :--- | ---: | ---: | ---: | :--- | :--- | :--- | :--- | :--- | :--- |
| AYBN043-1, -5 | 3 | 67 | 59 | 12.4 | 16 | 40 | 31.8 | 45 | $\phi 4.5$ | 80 |
| AYBN044-1, -5 | 4 | 83 | 75 | 12.4 | 16 | 40 | 31.8 | 45 | $\phi 4.5$ | 110 |
|  |  |  |  |  |  |  |  |  |  |  |
| AYBN063-1, -5 | 3 | 90 | 78 | 16.9 | 20 | 52 | 39 | 60 | $\phi 6$ | 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


| Type | No. <br> of <br> poles | A | B | C | D | E | F | H | L | Mass |
| :--- | :--- | ---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| AYBN103-5 | 3 | 85 | 79 | 23 | 27 | 51 | M8 | 72 | $\phi 6$ | 390 |
| AYBN104-5 | 4 | 112 | 79 | 23 | 27 | 51 | M8 | 99 | $\phi 6$ | 510 |
|  |  |  |  |  |  |  |  |  |  |  |
| AYBN203-5 | 3 | 110 | 90 | 29.7 | 35 | 63 | M10 | 96 | $\phi 7$ | 740 |
| AYBN204-5 | 4 | 145 | 90 | 29.7 | 35 | 63 | M10 | 131 | $\phi 7$ | 970 |

400A Terminal blocks


| Type | No. <br> of <br> poles |  |  |  | B | C | D | E | F | G |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | H | Mass |  |  |  |  |  |  |  |  |
| AYBN403-5 | 3 | 175 | 120 | 45 | 55 | 82 | M12 | 9.5 | 156 | 1670 |
| AYBN404-5 | 4 | 230 | 120 | 45 | 55 | 82 | M12 | 9.5 | 211 | 2170 |

## 600A Terminal blocks



Mass: 1040 g

## ■ Technical data

Insulation resistance: Over $100 \mathrm{M} \Omega$ at 500 V DC
Dielectric strength: 2500V AC rms. 1 minute
Ambient temperature: $-20^{\circ}$ to $+40^{\circ} \mathrm{C}$

High quality terminal blocks 600 Volts

| Typical illustration and description | Volts | Amps | No. of poles | With spring washer |  | With turtle-shaped washer |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Type | Ordering code | Type | Ordering code |
| Wire size: Max. $5.5 \mathrm{~mm}^{2}$ Terminal screw: M4 <br> AYBS021-1 | 600 | 49 | $\begin{aligned} & 6 \\ & 12 \end{aligned}$ | AYBS026-5 <br> AYBS021-5 | LT1S-0506B <br> LT1S-0512B | AYBS026-1 AYBS021-1 | LT1S-0506A <br> LT1S-0512A |
| Wire size: Max. $14 \mathrm{~mm}^{2}$ Terminal screw: M5 <br> AYBS044-1 | 600 | 88 | $\begin{aligned} & 3 \\ & 4 \\ & 12 \end{aligned}$ | AYBS043-5 <br> AYBS044-5 <br> AYBS041-5 | LT1S-1403B <br> LT1S-1404B <br> LT1S-1412B | AYBS043-1 <br> AYBS044-1 <br> AYBS041-1 | LT1S-1403A <br> LT1S-1404A <br> LT1S-1412A |
| Wire size: Max. 22mm² Terminal screw: M6 <br> AYBS064-1 | 600 | 115 | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | AYBS063-5 <br> AYBS064-5 | LT1S-2203B <br> LT1S-2204B | AYBS063-1 <br> AYBS064-1 | LT1S-2203A <br> LT1S-2204A |

## ■ Ordering information

Specify the following:

1. Ordering code or type number

## - Technical data

Insulation resistance: Over $100 \mathrm{M} \Omega$ at 500 V DC
Dielectric strength: 2500V AC rms 1 minute
Ambient temperature: $-20^{\circ}$ to $+40^{\circ} \mathrm{C}$ $-20^{\circ}$ to $+60^{\circ} \mathrm{C}$ (at $70 \%$ ratings)

## ■ Dimensions, mm



| Type | No. of poles | A | B | C | D | E | F | K | Mass <br> (g) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AYBS026-1, -5 | 6 | 101 | 91 | 40 | 10 | 13 | 28 | M4 | 120(110)* |
| AYBS021-1, -5 | 12 | 179 | 169 | 40 | 10 | 13 | 28 | M4 | 220 |
| AYBS043-1, 5 | 3 | 72 | 60.5 | 46 | 12.5 | 15.5 | 32 | M5 | 110 |
| AYBS044-1, -5 | 4 | 88 | 76 | 46 | 12.5 | 15.5 | 32 | M5 | 130 |
| AYBS041-1, -5 | 12 | 212 | 200 | 46 | 12.5 | 15.5 | 32 | M5 | 300 |
| AYBS063-1, -5 | 3 | 89 | 77 | 60 | 17 | 21 | 35.5 | M6 | 190 |
| AYBS064-1, -5 | 4 | 110 | 98 | 60 | 17 | 21 | 35.5 | M6 | 240 |

* For AYBS026-5 type



## Terminal Blocks <br> Type LT4D

## Channel mounted type terminal blocks with isolating switch

660 Volts 20 Amps
Wire size: Maximum $5.5 \mathrm{~mm}^{2}$
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 | Type | Minimum <br> quantity <br> per order |
| :--- | :--- | :--- | :--- |
|  | Terminal block <br> section with <br> isolating switch | LT4D-020Y | 100 pcs |
|  | End barrier | LT9D-E1 | 50 pcs |


| End clamp kit | LT9E-T2 | 50 pcs |
| :--- | :--- | :--- |
|  | Mounting rail | LT9E-R1 |

■ Dimensions, mm

- Terminal block section LT4D
mass: 50 g

- End barrier LT9D-E1
mass: 5 g

- End clamp kit LT9E-T2
mass: 12g

- Mounting rail LT9E-R1
- Marking strip sheet LT9D-M1
mass: 200 g
mass: 2 g



## ■ 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 $100 \mathrm{M} \Omega$ at 500 V DC
Dielectric strength: 2500V AC rms. 1 minute
Ambient temperature: $-20^{\circ}$ to $+60^{\circ} \mathrm{C}$

thickness : 0.5 mm

- Assembled LT4D-020Y- $\square \square$


|  |  |  |  | M: Mounting hole pitch <br> L: Full length |  |  |  |
| ---: | :--- | :--- | :--- | :--- | :--- | :---: | :---: |
| No. of <br> poles | M | L | No. of <br> 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.
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## With transparent cover power terminal blocks

600 Volts 50 to 200 Amps
Wire size: 2 to $100 \mathrm{~mm}^{2}$

- 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 ( $\mathrm{mm}^{2}$ ) | Type | Mass <br> (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 <br> (V AC) | Rated continuous current <br> (A) | Wire size <br> $\left(\mathrm{mm}^{2}\right)$ | Type | Mass <br> $(\mathrm{g})$ |
| :--- | :--- | :--- | :--- | :--- |
| 600 | 50 | 2 to 14 | 52 |  |
|  | 100 | 2 to 38 | SKT14-S | SKT38-S |
|  | 150 | 14 to 60 | SKT60-S | 85 |
|  | 200 | to 100 | SKT100-S | 130 |

## ■ Specifications

| Insulation resistance | $100 \mathrm{M} \Omega$ or more (500V DC megger) |
| :--- | :--- |
| Withstand voltage | 2500 V AC 1 minute |
| Ambient temperature | -20 to $+55^{\circ} \mathrm{C}$ |
| Humidity | $85 \%$ RH or less |
| Flammability | UL94V-2 (Cover), UL94V-0 (Frame) |
| Temperature rise | 45 K or less (JIS C 2811) |

## ■ Ordering information

Specify the following:

1. Type number

- Tightening torque

| Type | Recommended tightening <br> torque (N•m) <br> Line side |  | Cable pull-out (UL486A) <br> min. force (N) |  |
| :--- | :--- | :--- | :--- | :--- |
|  | Load side | Min. cable | Max. cable |  |
| SKT14A-3C | $5.1-6.5$ | $11.5-15.5$ | 222 | 400 |
| SKT14A-3CG | $(\mathrm{M} 6)$ | $(\mathrm{M})$ | $(14 \mathrm{AWG})$ | $(8 \mathrm{AWG})$ |
| SKT38A-3C | $5.1-6.5$ | $11.5-15.5$ | 222 | 445 |
| SKT38A-3CG | $(\mathrm{M} 6)$ | $(\mathrm{M})$ | $(14 \mathrm{AWG})$ | $(6 \mathrm{AWG})$ |
| SKT60A-3C | $11.5-15.5$ | $11.5-15.5$ | 311 | 623 |
| SKT60A-3CG | $(\mathrm{M} 8)$ | $(\mathrm{M} 8)$ | $(12 A W G)$ | $(4 \mathrm{AWG})$ |
| SKT100A-3C | $23-31$ | $23-31$ | 311 | 801 |
| SKT100A-3CG | $(\mathrm{M} 10)$ | $(\mathrm{M} 10)$ | $(12 A W G)$ | $(2 A W G)$ |

## Dimensions, mm

## - Terminal block

SKT14A-3C (Without earth terminal) SKT14A-3CG (With earth terminal)


SKT60A-3C (Without earth terminal) SKT60A-3CG (With earth terminal)


- Connector

SKT14-S


SKT38-S


SKT100-S


SKT38A-3C (Without earth terminal) SKT38A-3CG (With earth terminal)


SKT100A-3C (Without earth terminal) SKT100A-3CG (With earth terminal)



SKT60-S


## ■ Features

- Any number of poles can be assembled on a 35 mm 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 selfextinguishing 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 | $\begin{aligned} & 1.25 m^{2}-16 A \\ & 2{m m^{2}-22 A} \end{aligned}$ | LT2E-020 | LT9E-E1 | LT9E-C1 | LT9E-M1 | LT9E-T1 | LT9E-R1 LT9E-R2 |
| 30 | M4 | $\begin{array}{\|l} \hline 1.25 m^{2}-16 \mathrm{~A} \\ 2 \mathrm{~mm}^{2}-22 \mathrm{~A} \\ 3.5 \mathrm{~mm}^{2}-30 \mathrm{~A} \\ \hline \end{array}$ | LT2E-030 | LT9E-E2 | LT9E -C2 |  |  |  |
| 40 | M4 | $\begin{aligned} & 3.5 \mathrm{~mm}^{2}-30 \mathrm{~A} \\ & 5.5 \mathrm{~mm}^{2}-40 \mathrm{~A} \end{aligned}$ | LT2E-040 | LT9E-E3 |  |  |  |  |
| 75 | M5 | $\begin{aligned} & 5.5 \mathrm{~mm}^{2}-40 \mathrm{~A} \\ & 8 \mathrm{~mm}^{2}-50 \mathrm{~A} \\ & 14 \mathrm{~mm}^{2}-75 \mathrm{~A} \end{aligned}$ | LT2E-080 | LT9E-E4 | LT9E-C3 |  |  |  |
| 95 | M6 | $\begin{aligned} & 8 \mathrm{~mm}^{2}-50 \mathrm{~A} \\ & 14 \mathrm{~mm}^{2}-75 \mathrm{~A} \\ & 22 \mathrm{~mm}^{2}-95 \mathrm{~A} \end{aligned}$ | LT2E-090 | LT9E-E5 | LT9E-C4 |  |  |  |
| 160 | M8 | $\begin{array}{l\|} \hline 22 \mathrm{~mm}^{2}-95 \mathrm{~A} \\ 38 \mathrm{~mm}^{2}-130 \mathrm{~A} \\ 60 \mathrm{~mm}^{2}-160 \mathrm{~A} \end{array}$ | LT2E-150 | LT9E-E6 | LT9E-C5 |  |  |  |
| 200 | M10 | $\begin{array}{\|l\|} \hline 38 \mathrm{~mm}^{2}-130 \mathrm{~A} \\ 60 \mathrm{~mm}^{2}-160 \mathrm{~A} \\ 100 \mathrm{~mm}^{2}-200 \mathrm{~A} \\ \hline \end{array}$ | LT2E-200 | LT9E-E7 | LT9E-C6 (Standard provided) LT9E-C7 | LT9E-M3 (Standard provided) | LT9E-T2 |  |
| 300 | M10 | $60 \mathrm{~mm}^{2}-160 \mathrm{~A}$ $100 \mathrm{~mm}^{2}-240 \mathrm{~A}$ $150 \mathrm{~mm}^{2}-300 \mathrm{~A}$ | LT2E-300 | LT9E-E7 | $\begin{aligned} & \text { LT9E-C8 } \\ & \text { (Standard provided) } \\ & \text { LT9E-C9 } \end{aligned}$ |  |  |  |
| 400 | M12 | $\begin{aligned} & 100 \mathrm{~mm}^{2}-240 \mathrm{~A} \\ & 150 \mathrm{~mm}^{2}-310 \mathrm{~A} \\ & 200 \mathrm{~mm}^{2}-400 \mathrm{~A} \end{aligned}$ | LT2E-400 | LT9E-E7 | LT9E-C10 (Standard provided) LT9E-C11 |  |  |  |
| 600 | M16 | $\begin{aligned} & 150 \mathrm{~mm}^{2}-310 \mathrm{~A} \\ & 200 \mathrm{~mm}^{2}-400 \mathrm{~A} \\ & 325 \mathrm{~mm}^{2}-600 \mathrm{~A} \end{aligned}$ | LT2E-600 | LT9E-E7 | LT9E-C12 (Standard provided) LT9E-C13 |  |  |  |

## - Performance

| Rated insulation voltage | 600 V |
| :--- | :--- |
| Ambient operating conditions | Temperature <br> (with no icing or condensation) <br> Relative humidity $45 \%$ to $85 \%$ |
| Temperature rise | Temperature rise in conducting <br> metal is less than 35K. |
| Insulation resistance | $200 \mathrm{M} \Omega$ between charged parts, and <br> between charged parts and the <br> metal mounting plate <br> (Measured at 500V DC megger.) |
| Dielectric strength | $2,500 \mathrm{~V}$ AC (1 min) |
| Applicable standards | Conforms to JIS C 2811 |

## ■ Material

| Main body | PPE (modified polyphenylene ether resin) <br> (black) UL94V-0 |
| :--- | :--- |
| Conductive plate | C2680R (Ni-plated) |
| Terminal screws | SWRM (Zn-plated) |
| Side panel | PPE (modified polyphenylene ether resin) <br> (black) UL94V-0 |
| Cover | PC (translucent polycarbonate resin) UL94V-0 |
| Legend plate | PVC (white) |

## - Dimensions, mm

- Terminal blocks


## LT2E-020



LT2E-030


LT2E-040


Applicable crimp terminal
LT2E-080


## - Terminal blocks

## LT2E-090



LT2E-150


## LT2E-200


(Cover, supplied with a legend plate)

## LT2E-300


(Cover, supplied with a legend plate)


LT2E-400

(Cover, supplied with a legend plate)


LT2E-600

(Cover, supplied with a legend plate)


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## Type LT2E



## LT9E-E7



Sold in units of 1 .
LT9E-C3



## LT9E-C7

Special cover
LT9E-C4

Length: 1 m Sold in units of 20.
-

LT9E-C5


Length: 1 m
Sold in units of 20 .
LT9E-C6
Standard cover (Standard provided)

LT9E-C9
Special cover

LT9E-C10
Standard cover (Standard provided)


## LT9E-C2




## LT9E-C12

Standard cover (Standard provided)
Sold in units of 1.

LT9E-C11
Special cover


LT9E-C8
Standard cover (Standard provided)

Sold in units of 1.

LT9E-C13
Special cover

## - Legend plates

## LT9E-M1

Material: PVC

## LT9E-M3

Material: PVC

Dimensions
( $0.5 \mathrm{t} \times 10 \mathrm{~W} \times 1200 \mathrm{~L}$ )
Sold in units of 50

Dimensions
( $0.5 \mathrm{t} \times 12 \mathrm{~W} \times 900 \mathrm{~L}$ )
Sold in units of 50

## - End clamps

LT9E-T1


Sold in units of 100.

LT9E-T2


Sold in units of 50 .

## - Mounting rails

LT9E-R1
LT9E-R2


| Type | A | B | C | Length | Sold in units |
| :--- | :--- | :--- | :--- | :--- | :--- |
| LT9E-R1 | 4.5 | 10 | 10 | 1000 mm | 100 |
|  |  |  |  | 2000 mm | 50 |

## ■ Application to products satisfying international standards

Dielectric strength: 2,200V AC for 1 min .
Operating temperature range: -25 to $60^{\circ} \mathrm{C}$

| Type | 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 approved TÜV approved |
|  | CSA | 109308-M-001 |  | 20 | 20-14 |  |
|  | TÜV | R9551146 |  | 22 | 20-14 |  |
| LT2E-030 | UL | E45457 | 600 | 30 | 18-12 |  |
|  | CSA | 109308-M-001 |  | 30 | 18-12 |  |
|  | TÜV | R9551147 |  | 30 | 18-12 |  |
| LT2E-040 | UL | E45457 | 600 | 40 | 18-10 |  |
|  | CSA | 109308-M-001 |  | 40 | 18-10 |  |
|  | TÜV | R9551148 |  | 40 | 18-10 |  |
| LT2E-080 | UL | E45457 | 600 | 75 | 10-6 |  |
|  | CSA | 109308-M-001 |  | 75 | 10-6 |  |
|  | TÜV | J9551159 |  | 75 | 12-6 |  |
| LT2E-090 | UL | E45457 | 600 | 95 | 8-4 |  |
|  | CSA | 109308-M-001 |  | 95 | 8-4 |  |
|  | TÜV | J9551160 |  | 95 | 10-4 |  |
| LT2E-150 | UL | E45457 | 600 | 150 | 4-2/0 |  |
|  | CSA | 109308-M-001 |  | 150 | 4-2/0 |  |
|  | TÜV | J9551161 |  | 160 | 6-2/0 |  |
| LT2E-200 | UL | E45457 | 600 | 200 | 2-4/0 |  |
|  | CSA | 109308-M-001 |  | 200 | 2-4/0 |  |
|  | TÜV | J9551162 | 660 | 200 | 2-250 |  |
| LT2E-300 | UL | E45457 | 600 | 300 | 2/0-300 |  |
|  | CSA | 109308-M-001 |  | 300 | 2/0-300 |  |
|  | TÜV | J9551163 | 660 | 300 | 1/0-300 |  |
| LT2E-400 | UL | E45457 | 600 | 400 | 4/0-350 |  |
|  | CSA | 109308-M-001 |  | 400 | 4/0-350 |  |
|  | TÜV | J9551164 | 660 | 400 | 3/0-500 |  |
| LT2E-600 | UL | E45457 | 600 | 550 | 300-600 |  |
|  | CSA | 109308-M-001 |  | 550 | 300-600 |  |
|  | TÜV | J9551165 | 660 | 600 | 250-600 |  |

[^39]
## Testing Terminals

Type LT5

## Testing terminals for VT, CT circuit For panel mounting

250 Volts AC or DC, 30 Amps Wire size: Maximum $8 \mathrm{~mm}^{2}$

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

Insulation resistance: Over $100 \mathrm{M} \Omega$ at 500V DC
Dielectric strength: 2000V AC rms.
1 minute
Ambient temperature: $-25^{\circ}$ to $+50^{\circ} \mathrm{C}$

## ■ Applications

## VT circuit





## - Dimensions, mm

LT5S - for VT circuits Mass: $30 \mathrm{~g} \quad$ LT95S - Link
Mass: 10 g
LT95S - B1


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 | Type |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | AR22 |  | AR30 |  |
|  |  | Momentary action | Alternate action <br> (Turn-reset for V5R) | Momentary action | Alternate action <br> (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 | Type |  |
| :--- | :--- | :--- | :--- |
|  |  | 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 | Type |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | AR22 |  | AR30 |  |
|  |  | With white arrow (soft-touch) | No white arrow | With white arrow (soft-touch) | No white arrow |
| 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) 2005010305156646 (for AR22VGE) |  | 2003010305063384 |  |

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

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Illuminated pushbutton switches

| Bezel | Operator | Type |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 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 (40mm dia. with white arrow) | - | - | - | AR30V5L |
| 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. |  | 2003010305063372 |  | 2003010305063384 |  |
| Specifications |  | Contact <br> Without transformer <br> Momentary action: within 5 contacts <br> Alternate action: within 3 contacts <br> With transformer <br> Momentary action: within 3 contacts <br> Alternate action: within 2 contacts |  | - Contact <br> Without transformer <br> Momentary action: within 6 contacts Alternate action: within 3 contacts With transformer Momentary action: within 4 contacts Alternate action: within 2 contacts |  |
|  |  |  |  |  |  |

Emergency stop illuminated pushbutton switches

| Bezel | Operator | Type |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | AR22 |  | AR30 |  |
|  |  | With white arrow (soft-touch) | No white arrow | With white arrow (soft-touch) | No white arrow |
| 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) 2005010305156646 (for AR22VGF) |  | 2003010305063384 |  |

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 | Type |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | AR22 |  | 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. |  | 2003010305063372 |  | 2003010305063384 |  |

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 | Type |  |
| :--- | :--- | :--- | :--- |
|  |  | 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 | Type |  |
| :---: | :---: | :---: | :---: |
|  |  | 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)

| Type | Certificate No. |
| :--- | :--- |
| AR22 $\square$ ZB | 2003010305063372 |
| AR30 $\square$ ZB | 2003010305063384 |
| DR22 $\square$ ZB | 2003010305063383 |
| DR30 $\square$ 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 ( 40 mm 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
Fuji Electric FA Components \& Systems Co., Ltd./D \& C Catalog

Command Series

## CCC approved

- AH164, 165, 165-2 series

Pushbutton switches

| Operator | Type |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | AH164 |  | AH165 |  | AH165-2 |  |
|  | Momentary action | Alternate action | Momentary action | Alternate action (Turn-reset for $\mathrm{V}, \mathrm{V} 1$ ) | Momentary action | Alternate action (Turn-reset 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 with guard | AH164-TGF | AH164-TGF5 | AH165-TGF | AH165-TGF5 | - | - |
| 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. | 2003010305071068 |  |  |  |  |  |

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

| Operator | Type |
| :--- | :--- |
|  | 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 | Type |
| :--- | :--- |
|  | AH165 |
| Push-lock, turn-reset $(\varnothing 32)$ | AH165-V5 |
| Push-lock, turn-reset ( $\varnothing 40)$ | 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


## Selector switches (Standard)

| Operator | Type |  |  |
| :--- | :--- | :--- | :--- |
|  | AH164 | AH165 |  |
| Knob (round bezel) | - | - | AH165-2 |
| Knob (rectangular bezel) | AH164-P | AH165-P | AH165-2P |
| Knob (square bezel) | AH164-SP | AH165-SP | - |
| Key (round bezel) | - | - | AH165-2YP |
| Key (rectangular bezel) | AH164-J | AH165-S | AH165-2J |
| Key (square bezel) | AH164-SJ | AH165-JK | - |
| Key, 45-degree notch <br> (rectangular bezel) | AH164-JK |  | AH165-2YJ |
| Certificate No. | 2003010305071068 |  | - |

Notes: • Certified contact: $1 \mathrm{NO}+1 \mathrm{NC}, 2 \mathrm{NO}+2 \mathrm{NC}, 3 \mathrm{NO}+3 \mathrm{NC}$

- Certified terminal shape: for soldering and tab, and for wrapping

Selector switches (Direct opening action)

| Operator | Type |
| :--- | :--- |
| Key (rectangular bezel) | AH165-JM2 |
| Key (round bezel) | AH165-RJM2 |
| Certificate No. | 2003010305071068 |

Notes: • Certified contact: $1 \mathrm{NO}+1 \mathrm{NC}, 2 \mathrm{NO}+2 \mathrm{NC}$

- Certified position quantity: 2-position only.

Certified returning method: maintained only.

## Illuminated selector switches

| Operator | Type |
| :--- | :--- |
| knob (round bezel) | AH165-2PL |
| Certificate No. | 2003010305071068 |

Notes: • Certified contact: $1 \mathrm{NO}+1 \mathrm{NC}, 2 \mathrm{NO}+2 \mathrm{NC}$

- Certified operating lamp voltage: 6,12 and 24 V DC (LED)/ 5, 12, 15 and 24V AC/DC (incandescent lamp)

Pilot lights

| Lens | Type |  |  |
| :--- | :--- | :--- | :--- |
|  | AH164 | AH165 |  |
| Flush round | - | - | AH165-2 |
| Extended round | AH164-Z | AH165-Z | AH165-2Z |
| Extended square | - | - | AH165-2ZE |
| Flush square | AH164-ZS | AH165-ZS | AH165-2SZE |
| Flush rectangular | AH164-ZT | AH165-ZT | - |
| Certificate No. | 2003010305071044 |  |  |

[^40]
## ■ Description

AG series Command Switches are designed to be installed in a square or rectangular hole. AG23 series are 25 x 32 mm rectangular type while AG22 series are 25 mm 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 5 V 1 mA range. Therefore, they allow direct input to IC's. Moreover, their contacts are a doublebreak 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 $4 \mathrm{NO}+4 \mathrm{NC}$ and in AG22 series up to $2 \mathrm{NO}+2 \mathrm{NC}$.
Illuminated pushbutton

## - Small in depth and compactly built

Both AG22 and AG23 series Command Switches are as small as 52 mm in depth and their buttons are extruded only 5 mm 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)


For further information related to approved type, see page 04CD/1/2 to 04CD/1/3.

Illuminated Switches/Pilot Lights
AG22 and AG23
Quick reference guide

AG22 series
■ Illuminated pushbutton switches
Incandescent lamp

| Indicator split | See page 04CD/1/8 |  |
| :--- | :--- | :--- |
| A: $\square$ | B: |  |
| AG22-LAX | AG22-LBX |  |

LED lamp: Indicators


LED lamp: Contact unit

$\square$ Pilot lights
Incandescent lamp

| Indicator split | See page 04CD/1/8 |  |
| :--- | :--- | :--- |
| A: $\square$ | B: $\square$ | AG22-ZBX |
| AG22-ZAX |  |  |

LED lamp: Indicators

| Indicator split |  | See page 04CD/1/9 |
| :--- | :--- | :--- |
| A: $\square$ | B: $\square$ |  |
| AG22-ZA $\square 3$ | AG22-ZB $\square 3$ |  |

LED lamp: Contact socket
AG22-Z6


See page 04CD/1/9
조
©

AG23 series

- Illuminated pushbutton switches

Incandescent lamp

| Indicator split |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| A: $\square$ | B: $\square$ | C: $\square \square$ | D: $\square$ | E: $\square \square$ |  |
| AG23-LAX |  |  |  | AG23-LEX |  |

LED lamp: Indicators

| Indicator split |
| :--- |
| A: $\square$ |
| AG23-LA $\square 3$ |

LED lamp: Contact unit
AG23-L $\square$

## $\square$ Pilot lights <br> Incandescent lamp

| Indicator split |  |  |  |  | See page 04CD/1/8 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| A: $\square$ | B: $\square$ | C: $\square$ | D: $\square$ | E: $\square$ | F: $\square$ |
| AG23-ZAX |  |  |  |  |  |

LED lamp: Indicators


LED lamp: Socket
AG23-Z6 See page 04CD/1/9

$\square$ Illuminated lever switches

| 2-position | 3-position | See page 04CD/1/10 |
| :--- | :--- | :--- |
| Mainteined, <br> Spring return | Spring/manual <br> return |  |
| AG23-HL $\square$ | AG23-HL $\square$ |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

■ Illuminated rocker switches

| 2-position | 3-position | See page 04CD/1/11 |
| :--- | :--- | :--- |
| Mainteined, <br> Spring return | Spring/manual <br> return |  |
| AG23-RL $\square$ | AG23-RL $\square$ |  |
|  |  |  |
|  |  |  |
|  |  |  |

Illuminated Switches/Pilot Lights
AG22 and AG23
Type number nomenclature

## ■ Type number nomenclature

- Illuminated pushbutton switch (Incandescent lamp)

AG 23-L 5 A X 1 E- $\square \square$
Basic type
Mounting hole dimensions
22: $23.5 \times 22.5 \mathrm{~mm}$
23: $23.5 \times 30.5 \mathrm{~mm}$
Operation
L: Illuminated pushbutton/Momentary action
L5: Illuminated pushbutton/Alternate action*
Indicator split

| A: $\square$ | B: $\square$ | C: $\square$ |
| :--- | :--- | :--- |
| D: $\square$ | E: $\square$ | F: $\square$ |
| (C, $\square$ |  |  |

(C, D, E, F: for AG23 only)
Color insert kits (See page 04CD/1/8)
X: Provided
Contact arrangement
1: $1 \mathrm{NO}+1 \mathrm{NC}, 3: 3 \mathrm{NO}+3 \mathrm{NC}$ (AG23 series only)
2: 2NO+2NC, 4: 4NO+4NC (AG23 series only)
Lamp voltage
A: 5 V AC/DC B: $12 \mathrm{~V} \mathrm{AC/DC} \mathrm{C:} 15 \mathrm{~V}$ 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

- Illuminated pushbutton switch (LED lamp)

Indicator

- Pilot light (Incandescent lamp)
Blank: Grey (standard)B: Black
- Pilot light (LED lamp)

Socket


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.
Indicator
1234 $\square \square \square \square$
Basic type
Mounting hole dimensions
22: $23.5 \times 22.5 \mathrm{~mm}$
$23: 23.5 \times 30.5 \mathrm{~mm}$
Pilot light
Indicator split
$\square$

D: $\square$
E: $\square \quad$ 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


L: Illuminated pushbutton/Momentary action
L5: Illuminated pushbutton/Alternate action*

## Contact arrangement

1: $1 \mathrm{NO}+1 \mathrm{NC}, 3: 3 \mathrm{NO}+3 \mathrm{NC}$ (AG23 series only)
2: $2 \mathrm{NO}+2 \mathrm{NC}, 4: 4 \mathrm{NO}+4 \mathrm{NC}$ (AG23 series only)
Mounting (See page 04CD/1/13)
Blank : Horizontal mounting
T: Vertical mounging
Color of flange
Blank : Grey (standard)
B: Black

- Illuminated lever switch and illuminated rocker switch


Illuminated Switches/Pilot Lights

## AG22 and AG23

## Ratings and specifications

## $\square$ 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 $+40^{\circ} \mathrm{C}$ |  |  |
| Humidity | 45 to $85 \%$ RH (at -5 to $+40^{\circ} \mathrm{C}$ ), no condensation or no icing |  |  |
| Durability Mechanical (operations) | $1 \mathrm{NO}+1 \mathrm{NC}, 2 \mathrm{NO}+2 \mathrm{NC}$ <br> Momentary action: 1 million <br> Alternate action: 250,000 $3 N O+3 N C^{*}, 4 N O+4 N C^{*}: 100,000$ | 100,000 | - |
| Electrical | 100,000 (220V AC 0.7A) |  | - |
| Dielectric strength | 2000V AC, 1 minute <br> (Between lamp and contact terminals: 1500 V AC, 1 minute) |  |  |
| Pollution degree | 3 |  |  |
| Vibration | Resonance: 10 to 55 Hz , double amplitude 0.1 mm Constant: 16.7 Hz , double amplitude 3 mm |  |  |
| Shock | Malfunction durability: $100 \mathrm{~m} / \mathrm{s}^{2}$ Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |  | Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |
| Insulation resistance | $100 \mathrm{M} \Omega$ or more (500V DC megger) |  |  |
| Degree of protection | IP40 |  |  |

Notes: * AG23 type only.

- Contact ratings
- UL/CSA standards

| Rated thermal <br> current | Rated <br> operational <br> voltage | Maximum current  | AC <br> (Res. load) |
| :--- | :--- | :--- | :--- |
| 5 A | 24 V | - | (Res. load) |

- NECA C 4521 standards

| Rated thermal current | Rated operational voltage | Rated operational current |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | AC 15 (Ind. load) | AC 13 (Ind. load) | AC 12 <br> (Res. load) | DC 13* <br> (Ind. load) | $\text { DC } 12$ <br> (Res. load) |
| 5A | $\begin{aligned} & 24 \mathrm{~V} \\ & 110 \mathrm{~V} \\ & 220 \mathrm{~V} \end{aligned}$ | $\begin{array}{\|l} -\overline{3} \\ 0.3 A \\ 0.3 A \end{array}$ | $\begin{aligned} & -\overline{0} A \\ & 1.0 \mathrm{~A} \end{aligned}$ | $\begin{aligned} & -\overline{\mathrm{A}} \\ & 1.5 \mathrm{~A} \\ & 1.0 \mathrm{~A} \end{aligned}$ | $\begin{gathered} 0.7 \mathrm{~A} \\ - \\ 0.15 \mathrm{~A} \end{gathered}$ | $\begin{gathered} 1.0 \mathrm{~A} \\ - \\ 0.2 \mathrm{~A} \end{gathered}$ |

Notes: * T $0.95=21 \mathrm{~ms}$

## ■ Contact reliability

FUJI has confirmed that the unit can be used in 1 mA 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

${ }^{* 1}$ Yellow: 0.14w/split
${ }^{* 2}$ Yellow: $0.17 \mathrm{w} /$ split

| Description | Color insert split | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC}{ }_{\star 1 * 2 \star 3} \\ & \text { Type } \end{aligned}$ | $\underset{\substack{* 1 * 2 * 3 \\ \text { Type }}}{2 \mathrm{NO}_{+2}^{+2 \mathrm{NC}}}$ |
| :---: | :---: | :---: | :---: |
|  | A $\square$ <br> B $\square$ | $\begin{aligned} & \text { AG22-LAX1 } \square \text {-( ) } \square \\ & \text { AG22-LBX1 } \square \text {-() } \square \end{aligned}$ | $\begin{aligned} & \text { AG22-LAX2■-() } \square \\ & \text { AG22-LBX2■-() } \square \end{aligned}$ |
|  | A | AG23-LAX1■-() $\square$ | AG23-LAX2■-() $\square$ |
|  | B | AG23-LBX1■-() $\square$ | AG23-LBX2■-() $\square$ |
| AG23-L | C | AG23-LCX1■-() $\square$ | AG23-LCX2■-() $\square$ |
|  | D $\square$ | AG23-LDX1■-() $\square$ | AG23-LDX2■-() $\square$ |
|  | E $\square$ | AG23-LEX1■-() $\square$ | AG23-LEX2■-() $\square$ |
|  | $F \square$ | AG23-LFX1■-() $\square$ | AG23-LFX2■-() $\square$ |

Alternate action

| Description | Color insert split | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC}{ }_{* 1 * 2 * 3} \\ & \text { Type } \end{aligned}$ | $\underset{\substack{* 1 * 2 * 3 \\ \text { Type }}}{2 \mathrm{NO}}+2 \mathrm{NC}$ |
| :---: | :---: | :---: | :---: |
|  | A $\square$ <br> B $\square$ | AG22-L5AX1■-() <br> AG22-L5BX1■-() | $\begin{aligned} & \text { AG22-L5AX2■-() } \square \\ & \text { AG22-L5BX2■-() } \square \end{aligned}$ |
| SM-345 <br> AG22-L5 | A $\square$ <br> B $\square$ <br> C $\square$ <br> D $\square$ E $\square$ $F$ | $\begin{aligned} & \text { AG23-L5AX1■-() } \square \\ & \text { AG23-L5BX1■-() } \square \\ & \text { AG23-L5CX1■-() } \square \\ & \text { AG23-L5DX1■-() } \square \\ & \text { AG23-L5EX1■-() } \square \\ & \text { AG23-L5FX1■-() } \square \end{aligned}$ | $\begin{aligned} & \text { AG23-L5AX2■-() } \square \\ & \text { AG23-L5BX2■-() } \square \\ & \text { AG23-L5CX2■-() } \square \\ & \text { AG23-L5DX2■-() } \square \\ & \text { AG23-L5EX2■-( ) } \square \\ & \text { AG23-L5FX2■-() } \square \end{aligned}$ |

$\square$ Pilot lights (Incandescent lamp)

Notes:
*1
Replace the $\square$ mark by the lamp voltage code
A: 5 V AC/DC
B: 12 V AC/DC
C: $15 \mathrm{~V} \mathrm{AC/DC}$
E: $24 \mathrm{~V} \mathrm{AC/DC}$
*2
Replace the ( ) mark by the mounting angle code
Blank:Horizontal mounting
T: Vertical mounting
*3
Replace the $\square$ mark by the flange color code
Blank: Gray (Standard)
B: Black
For AG23 type illuminated pushbutton switch,
3NO+3NC and $4 \mathrm{NO}+4 \mathrm{NC}$ 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 insert split | Color insert |  |  |  | Light baffle |  |  |  | Legend plate |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Full | Half |  | Quarter | Half |  | Quarter |  |  |
|  | $\square$ | $\square$ | $\square$ | $\square$ | $\square$ | $\square$ | $\square$ | $\square$ | $\square$ |
| A | 5 | - | - | - | - | - | - | - | 1 |
| B $\square$ | - | 5 | - | - | 1 | - | - | - | 1 |
| C $\square$ | - | - | 5 | - | - | 1 | - | - | 1 |
| D $\square$ | - | 5 | - | 5 | 1 | - | - | 1 | 1 |
| E $\quad \square \square$ | - | - | 5 | 5 | - | 1 | 1 | - | 1 |
| F $\square$ | - | - | - | 10 | 1 | - | - | 2 | 1 |

## $\square$ Wiring diagrams

AG22 (2NO+2NC)

- Terminal arrangement

AG23 (4NO+4NC)

- Terminal arrangement

|  |
| :---: |
|  |  |
|  |  |
|  |  |
|  |  |

View from terminal side

■ Dimensions, mm

## AG22



- Barrier Center barrier AGX008-C


AG23

- Body

- Barrier

Long center barrier Long end barrier AGX003-LC


AGX003-LE


Short center barrier AGX003-SC


Short end barrier AGX003-SE



- Contact unit

| Description | Contact | Momentary action <br> Type | Alternate actionn <br> Type |
| :--- | :--- | :--- | :--- |
| AG3*4 |  |  |  |

Pilot lights (LED lamp)

- Indicators

| Description | $\begin{aligned} & \text { Color } \\ & \text { insert } \\ & \text { split } \end{aligned}$ | Type ${ }^{* 1} \times 2$ |
| :---: | :---: | :---: |
|  | $\begin{array}{\|l\|} \hline \text { A } \square \\ \text { B } \square \end{array}$ | $\begin{aligned} & \text { AG22-ZA■- } \triangle \\ & \text { AG22-ZBח- } \triangle \triangle \end{aligned}$ |
|  | A | AG23-ZAп- $\triangle$ |
| AG22-Z ${ }^{\text {SM-349 }}$ | в $\square$ | AG23-zBa- $\triangle \triangle$ |
| 4 | c $\square$ | AG23-ZC■- $\triangle \triangle$ |
|  | D $\square$ | AG23-ZDa-M |
|  | E $\square$ | AG23-ZEm- $\triangle M$ |
| AG23-Z | F $\square$ | AG23-ZF■- $\triangle M \triangle$ |

Notes:
*1 Replace the $\quad$ mark by the lamp voltage code. E3: 24V DC
*2 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)
*3 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 ..........................................L
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

Color of flange Gray .......................................Blank

- Sockets

| Description | Type <br> code*3*4 |
| :--- | :--- |
|  | AG22-Z6-( $\square$ |
| AG22-Z6 SM-347 |  |

$\square$ Wiring diagrams (Lamp circuit)


2-way


View from terminal side


AG23

- Incandescent lamp • LED lamp (24V)

Full face


2-way Horizontal split (-1)



3 - way split (Half at top) (-)L1


3 - way split (Half at left)


4 - way split


Illuminated lever Switches
AG23

■ Illuminated lever switches/Incandescent lamps

| Description | Contact block | No. of lamp | Operation | 2-position Type* | 3-position Type* |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Incandescent lamp | 1NO+1NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ | Maintained | $\begin{aligned} & \text { AG23-HL2 } \triangle 1 \square \text {-1 () } \square \mathbf{V} \\ & \text { AG23-HL2 } \triangle 1 \square-2() \square \Delta \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ |  | $\begin{aligned} & \text { AG23-HL2 } \triangle 2 \square-1() \square \Delta \\ & \text { AG23-HL2 } \triangle 2 \square-2() \square \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL3 } \triangle 2 \Pi-1() \square / \Delta \\ & \text { AG23-HL3 } \triangle 2 \square-2() \square \Delta \end{aligned}$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ |  | $\begin{aligned} & \text { AG23-HL2 } \triangle 3 \square-1() \square \Delta \\ & \text { AG23-HL2 } \triangle 3 \square-2() \square \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL3 } \triangle 3 \square-1() \square \Delta \\ & \text { AG23-HL3 } \triangle 3 \square-2() \square \Delta \end{aligned}$ |
|  | 1NO+1NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ | Spring return | $\begin{aligned} & \text { AG23-HLO } \triangle 1 ■ \text {-1 () } \square \mathbf{V} \\ & \text { AG23-HLO } \triangle 1 \square-2() \square \Delta \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-HLO } \triangle 2 \square-1() \square \Delta \\ & \text { AG23-HLO } \triangle 2 \square-2() \square \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL1 } \triangle 2 \Pi-1() \square \mathbf{A} \\ & \text { AG23-HL1 } \triangle 2 \square-2() \square \mathbf{A} \end{aligned}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | $\begin{aligned} & \text { AG23-HLO } \triangle 3 \square-1() \square \Delta \\ & \text { AG23-HLO } \triangle 3 \square-2() \square \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL1 } \triangle \text { 3■-1( }) \square \mathbf{\Delta} \\ & \text { AG23-HL1 } \triangle 3 \square-2() \square \Delta \end{aligned}$ |
|  | 2NO+2NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | Spring/ manual return | - | $\begin{aligned} & \text { AG23-HL6 } \triangle 2 \Pi-1() \square \Delta \\ & \text { AG23-HL6 } \triangle 2 \square-2() \square \Delta \end{aligned}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | - | $\begin{aligned} & \text { AG23-HL6 } \triangle 3 \square-1() \square \Delta \\ & \text { AG23-HL6 } \triangle \text { 3■-2() } \square \mathbf{I} \end{aligned}$ |

■ Illuminated lever switches/LED lamps

| Description | Contact block | No. of lamp | Operation | 2-position Type* | 3-position Type* |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Spot LED | 1NO+1NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ | Maintained | $\begin{aligned} & \text { AG23-HL2 } \triangle 1 \square 2-1() \square / \Delta \\ & \text { AG23-HL2 } \triangle 1 \square 2-2() \square / \Delta \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | $\begin{aligned} & \hline \text { AG23-HL2 } \triangle 2 \square 2-1() \square / \Delta \\ & \text { AG23-HL2 } \triangle 2 \square 2-2() \square / \Delta \end{aligned}$ | $\begin{aligned} & \hline \text { AG23-HL3 } \triangle 2 \square 2-1() \square / \Delta \\ & \text { AG23-HL3 } \triangle 2 \square 2-2() \square / \Delta \end{aligned}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | $\begin{aligned} & \text { AG23-HL2 } \triangle 3 \square 2 \text {-1 ( ) } \square / \Delta \\ & \text { AG23-HL2 } \triangle 3 \square 2-2() \square / \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL3 } \triangle 3 \text { 3-1 } 2 \text { ( }) \square / \Delta \\ & \text { AG23-HL3 } \triangle 3 \square 2-2() \square / \Delta \end{aligned}$ |
|  | 1NO+1NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | Spring return | $\begin{aligned} & \text { AG23-HLO } \triangle 1 \text { 1-1 } 1() \square / \Delta \\ & \text { AG23-HLO } \triangle 1 \square 2-2() \square / \Delta \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | $\begin{aligned} & \text { AG23-HLO } \triangle 2 \square 2 \text { 2-1 () } \square / \Delta \\ & \text { AG23-HLO } \triangle 2 \square 2-2() \square / \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL1 } \triangle 2 \square 2 \text {-1 ( ) } \square / \mathbf{\Delta} \\ & \text { AG23-HL1 } \triangle 2 \square 2-2() \square / \Delta \\ & \hline \end{aligned}$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-HLO } \triangle \text { 3■2-1( ) } \square / \Delta \\ & \text { AG23-HLO } \triangle 3 \square 2 \text {-2 }) \square / \Delta \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { AG23-HL1 } \triangle \text { 3■2-1() } \square / \mathbf{A} \\ & \text { AG23-HL1 } \triangle 3 \square 2-2() \square / \Delta \end{aligned}$ |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ | Spring/ manual return | - | $\begin{aligned} & \text { AG23-HL6 } \triangle 2 \square 2 \text {-1 () } \square / \Delta \\ & \text { AG23-HL6 } \triangle 2 \square 2-2() \square / \Delta \end{aligned}$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ |  | - | $\begin{aligned} & \text { AG23-HL6 } \triangle 3 \square 2 \text { 2-1 () } \square / \Delta \\ & \text { AG23-HL6 } \triangle 3 \square 2-2() \square / \Delta \end{aligned}$ |
| Flat LED | 1NO+1NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ | Maintained | $\begin{aligned} & \text { AG23-HL2 } \triangle 1 \square 3-1() \square / \mathbf{A} \\ & \text { AG23-HL2 } \triangle 1 \square 3-2() \square / \mathbf{A} \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-HL2 } \triangle 2 \square 3-1() \square / \Delta \\ & \text { AG23-HL2 } \triangle 2 \square 3-2() \square / \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL3 } \triangle 2 \square 3 \text {-1 () } \square / \mathbf{\Delta} \\ & \text { AG23-HL3 } \triangle 2 \square 3-2() \square / \Delta \\ & \hline \end{aligned}$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-HL2 } \triangle 3 \square 3 \text {-1 ( ) } \square / \mathbf{A} \\ & \text { AG23-HL2 } \triangle 3 \square 3-2() \square / \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL3 } \triangle 3 \square 3 \text {-1 ( }) \square / \mathbf{\Delta} \\ & \text { AG23-HL3 } \triangle 3 \square 3 \text {-2() } \square / \mathbf{A} \end{aligned}$ |
|  | 1NO+1NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ | Spring return | $\begin{aligned} & \text { AG23-HLO } \triangle 1 \square 3 \text {-1 ( ) } \square / \mathbf{\Delta} \\ & \text { AG23-HLO } \triangle 1 \square 3-2() \square / \Delta \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ |  | $\begin{aligned} & \text { AG23-HLO } \triangle 2 \varpi 3-1() \square / \Delta \\ & \text { AG23-HLO } \triangle 2 \square 3-2() \square / \Delta \end{aligned}$ | $\begin{aligned} & \text { AG23-HL1 } \triangle 2 \square 3-1() \square / \Delta \\ & \text { AG23-HL1 } \triangle 2 \square 3-2() \square / \Delta \end{aligned}$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-HLO } \triangle 3 \square 3-1() \square / \Delta \\ & \text { AG23-HLO } \triangle 3 \square 3-2() \square / \Delta \end{aligned}$ |  |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ | Spring/ manual return | - | $\begin{aligned} & \text { AG23-HL6 } \triangle 2 \square 3-1() \square / \Delta \\ & \text { AG23-HL6 } \triangle 2 \square 3-2() \square / \Delta \end{aligned}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | - | $\begin{aligned} & \text { AG23-HL6 } \triangle 3 \square 3 \text {-1 () } \square / \mathbf{A} \\ & \text { AG23-HL6 } \triangle 3 \square 3-2() \square / \Delta \end{aligned}$ |

*     - Replace the $\triangle$ mark by the lamp color codes

G: Green R: Red W: White Y: Yellow O: Orange
S: Blue (Incandescent Lamp only)

- Replace the $\begin{aligned} & \text { mark by the lamp voltage codes }\end{aligned}$

Incandescent A: 5 V AC/DC B: 12 V AC/DC C: 15 V AC/DC E: 24 V AC/DC
LED AA:5VDC 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 $\square$ mark by the flange color codes. Blank: Gray (Standard) B: Black
Replace the $\boldsymbol{\Delta}$ mark by the lever color codes. Blank: Black (Standard) H: Gray R: Red

| Description | Contact block | No. of lamp | Operation | 2-position Type* | 3-position Type* |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Incandescent | 1NO+1NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ | Maintained | AG23-RL2 $\triangle 1 ■-1() \square$ AG23-RL2 $\triangle 1 \square-2() \square$ | 一 |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ |  | $\begin{aligned} & \text { AG23-RL2 } \triangle 2 \square-1() \square \\ & \text { AG23-RL2 } \triangle 2 \square-2() \square \end{aligned}$ | AG23-RL3 $\backslash 2 \square-1() \square$ AG23-RL3 $\triangle 2 \square-2() \square$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ |  | $\begin{aligned} & \text { AG23-RL2 } \triangle \text { 3■-1() } \\ & \text { AG23-RL2 } \triangle \text { 3■-2() } \end{aligned}$ | $\begin{aligned} & \text { AG23-RL3 } \triangle 3 \square-1() \square \\ & \text { AG23-RL3 } \triangle 3 \square-2() \square \end{aligned}$ |
|  | 1NO+1NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ | Spring return | $\begin{aligned} & \hline \text { AG23-RLO } \triangle 1 ■-1() \square \\ & \text { AG23-RLO } \triangle 1 \square-2() \square \\ & \hline \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ |  | $\begin{aligned} & \hline \text { AG23-RLO } \triangle 2 \square-1() \square \\ & \text { AG23-RLO } \triangle 2 \square-2() \square \\ & \hline \end{aligned}$ | AG23-RL1 $\triangle 2 \square-1() \square$ AG23-RL1 $\triangle 2 \square-2() \square$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \end{array}$ |  | $\begin{aligned} & \text { AG23-RLO } \triangle \text { 3■-1( }) \square \\ & \text { AG23-RLO } \triangle \text { 3■-2( }) \square \\ & \hline \end{aligned}$ | AG23-RL1 $\triangle$ 3■-1( $) \square$ AG23-RL1 $\triangle$ 3■-2() |
|  | 2NO+2NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | Spring/ manual return | - | $\begin{aligned} & \text { AG23-RL6 } \triangle 2 \square-1() \square \\ & \text { AG23-RL6 } \triangle 2 \square-2() \square \end{aligned}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | - | $\begin{aligned} & \text { AG23-RL6 } \triangle \text { 3■-1( ) } \\ & \text { AG23-RL6 } \triangle \text { 3■-2( }) \end{aligned}$ |

■ Illuminated rocker switches/LED lamps

| Description | Contact block | No. of lamp | Operation | 2-position Type* | 3-position Type* |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Spot LED | 1NO+1NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | Maintained | $\begin{aligned} & \text { AG23-RL2 } \triangle 1 ■ 2-1() \square \\ & \text { AG23-RL2 } \triangle 1 \square 2-2() \square \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | $\begin{aligned} & \text { AG23-RL2 } \triangle 2 \square 2-1() \square \\ & \text { AG23-RL2 } \triangle 2 \square 2-2() \end{aligned}$ | $\begin{array}{\|l} \hline \text { AG23-RL3 } \triangle 2 \square 2-1() \square \\ \text { AG23-RL3 } \triangle 2 \square 2-2() \square \end{array}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | $\begin{aligned} & \text { AG23-RL2 } \triangle \text { 3■2-1() } \square \\ & \text { AG23-RL2 } \triangle 3 \square 2-2() \end{aligned}$ | $\begin{array}{\|l} \hline \text { AG23-RL3 } \triangle \text { 3■2-1( }) \square \\ \text { AG23-RL3 } \triangle \text { 3■2-2( }) \square \\ \hline \end{array}$ |
|  | 1NO+1NC | $\begin{aligned} & \hline 1 \\ & 2 \end{aligned}$ | Spring return | $\begin{aligned} & \text { AG23-RLO } \triangle 1 \square 2-1() \\ & \text { AG23-RLO } \triangle 1 \square 2-2() \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | $\begin{aligned} & \text { AG23-RLO } \triangle 2 \square 2-1() \square \\ & \text { AG23-RLO } \triangle 2 \square 2-2() \square \end{aligned}$ | $\begin{array}{\|l} \hline \text { AG23-RL1 } \triangle \text { 2■2-1( }) \square \\ \text { AG23-RL1 } \triangle 2 \boxed{2-2()} \end{array}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | $\begin{aligned} & \text { AG23-RLO } \triangle \text { 3■2-1( }) \square \\ & \text { AG23-RLO } \triangle 3 \square 2-2() \end{aligned}$ | $\begin{array}{\|l} \hline \text { AG23-RL1 } \triangle \text { 3■2-1( }) \square \\ \text { AG23-RL1 } \triangle \text { 3■2-2( }) \end{array}$ |
|  | 2NO+2NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | Spring/ manual return | - | $\begin{array}{\|l} \hline \text { AG23-RL6 } \triangle 2 \square 2-1() \square \\ \text { AG23-RL6 } \triangle 2 \square 2-2() \square \\ \hline \end{array}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | - | $\begin{array}{\|l} \hline \text { AG23-RL6 } \triangle \text { 3■2-1( ) } \square \\ \text { AG23-RL6 } \triangle \text { 3■2-2( }) \square \end{array}$ |
| Flat LED | $1 \mathrm{NO}+1 \mathrm{NC}$ | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ | Maintained | $\begin{aligned} & \text { AG23-RL2 } \triangle 1 \square 3-1() \square \\ & \text { AG23-RL2 } \triangle 1 \square 3-2() \square \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-RL2 } \triangle 2 \square 3-1() \square \\ & \text { AG23-RL2 } \triangle 2 \square 3-2() \square \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline \text { AG23-RL3 } \triangle 2 ■ 3-1() \square \\ \text { AG23-RL3 } \triangle 2 ■ 3 \text {-2 }) \square \\ \hline \end{array}$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-RL2 } \triangle 3 \sqcap 3 \text {-1 () } \\ & \text { AG23-RL2 } \triangle 3 \square 3-2() \end{aligned}$ | $\begin{array}{\|l} \hline \text { AG23-RL3 } \triangle 3 \square 3-1() \square \\ \text { AG23-RL3 } \triangle 3 \square 3 \text {-2 }) \\ \hline \end{array}$ |
|  | 1NO+1NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ | Spring return | $\begin{aligned} & \text { AG23-RLO } \triangle 1 \square 3-1() \square \\ & \text { AG23-RLO } \triangle 1 \square 3-2() \square \end{aligned}$ | - |
|  | 2NO+2NC | $\begin{array}{\|l\|} \hline 1 \\ \hline 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-RLO } \triangle 2 \square 3-1() \square \\ & \text { AG23-RLO } \triangle 2 \square 3-2() \square \end{aligned}$ | $\begin{array}{\|l} \hline \text { AG23-RL1 } \triangle 2 \square 3-1() \square \\ \text { AG23-RL1 } \triangle 2 \square 3 \text {-2() } \\ \hline \end{array}$ |
|  | 3NO+3NC | $\begin{array}{\|l\|} \hline 1 \\ 2 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { AG23-RLO } \triangle \text { 3 } ■ 3 \text {-1 ( }) \square \\ & \text { AG23-RLO } \triangle 3 \square 3 \text {-2 }) \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline \text { AG23-RL1 } \triangle \text { 3■3-1( }) \square \\ \text { AG23-RL1 } \triangle \text { 3■3-2() } \square \\ \hline \end{array}$ |
|  | 2NO+2NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | Spring/ manual return | - | $\begin{array}{\|l} \hline \text { AG23-RL6 } \triangle 2 \square 3-1() \square \\ \text { AG23-RL6 } \triangle 2 \square 3-2() \square \\ \hline \end{array}$ |
|  | 3NO+3NC | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ |  | - | $\begin{array}{\|l} \hline \text { AG23-RL6 } \triangle \text { 3■3-1 () } \square \\ \text { AG23-RL6 } \triangle \text { 3■3-2( }) \square \end{array}$ |

* Replace the $\triangle$ mark by the lamp color codes G: Green R: Red W: White Y: Yellow O: Orange S: Blue (Incandescent Lamp only)
- Replace the $\square$ mark by the lamp voltage codes

Incandescent A: 5 V AC/DC B: 12 V AC/DC C: 15 V AC/DC E: 24 V 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 $\square$ 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

1-lamp


2 - lamp


- LED lamp

1 - lamp


2 - lamp


## ■ Contact arrangement



[^41]
## Notes on use

## $\square$ 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) | $\stackrel{\square}{\square}$ |  | Panel cutting space between rows of units |
|  | Manifold mounting (Horizontal) | $\underbrace{\square}_{25 n \pm 0.5}$ |  |  |
| Barrier mounting | Individual mounting (Horizontal) |  |  | Panel cutting space between rows of units Dotted line indicates the position of each mounting barrier |
|  | Manifold mounting (Horizontal) |  | $\begin{aligned} & \text { m } \\ & \stackrel{m}{+} \\ & \stackrel{+}{m} \\ & \stackrel{m}{\sim} \\ & 25.9 n+1.9 \pm 0.3 \\ & \hline \end{aligned}$ |  |

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) |  |  | Panel cutting space between rows of units <br> $\rightarrow$ - Over 3 |
|  | Manifold mounting (Horizontal) |  |  |  |
|  | Individual mounting (Vertical) |  |  |  |
|  | Manifold mounting (Vertical) |  |  |  |
| Barrier mounting | Individual mounting (Horizontal) |  |  | Panel cutting space between |
|  | Manifold mounting (Horizontal) |  |  | Dotted line indicates the position of each mounting barrier |
|  | Individual mounting (Vertical) |  | $\underbrace{}_{29.4 \pm 0.3}$ |  |
|  | Manifold mounting (Vertical) |  |  |  |

- The dimensions in parentheses are for tandem mounting of switches with dust covers.


## ■ 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 on this side.
- If the mounting panel is thin (1 to 2 mm thick), make panel cutouts smaller.


Fig. 1


Fig. 2

- 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 |
| :--- | :--- |
| 6 V | 4 to 5 V |
| 14 V | 10 to 12 V |
| 18 V | 12 to 15 V |
| 28 V (Standard) | 20 to 24 V |

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 $30^{\circ} \mathrm{C}$ if the lamp is used at the rated voltage continuously.

## Removing the lighting unit...AG23 (Oblong)

To remove the lighting unit, refer to the illustraions 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 greater than 60 N .

## $\square$ Installing the lighting section

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.

## $\square$ 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 lens.


## 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 20 mm .
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 0.8 mm (solder)
One stranded wire with a maximum area of $0.75 \mathrm{~mm}^{2}$ (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

$\square$ 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. If 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.

## $\square$ 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 | Type |  |  |
| :---: | :---: | :---: | :---: |
| Barrier <br> SM-337 <br> SM-313 | For AG22 <br> Center -barrier End-barrier <br> For AG23 <br> Long center -barrier Long end -barrier Short center -barrier Short end -barrier | Color Ty <br> Black AGX <br> Gray AGX <br> Black AGX <br> Gray AGX <br> Black AGX <br> Gray AGX <br> Black AGX <br> Gray AG <br> Black AGX <br> Gray AGX <br> Black AGX <br> Gray AGX | Type <br> AGX008-CB <br> AGX008-CH <br> AGX008-EB <br> AGX008-EH <br> AGX003-LCB <br> AGX003-LCH <br> AGX003-LEB <br> AGX003-LEH <br> AGX003-SCB <br> AGX003-SCH <br> AGX003-SEB <br> AGX003-SEH |
| Bezel | For AG22 <br> For AG23 | Color <br> Black <br> Gray <br> Black <br> Gray | Type AGX010-2B AGX010-2H AGX010-3B AGX010-3H |
| Color insert kit <br> This kit contains green, red, white, orange and blue color-inserts, legend plates and light baffle plates. <br> See page 04CD/1/8 | For AG22-L, Z <br> For AG23-L, Z | Split <br> Full face <br> 2-way split <br> Full face <br> 2-way split <br> 3-way split <br> 4-way split | Type  <br>  AGX019-2A <br> AGX019-2B  <br>   <br>  AGX019-3A <br>  AGX019-3B <br>  AGX019-3C <br> AGX019-3D  <br>  AGX019-3E <br>  AGX019-3F |
| Legend plate |  Color <br> For AG22-L, Z <br> Clear* <br> White  <br> For AG23-L, Z Clear* <br> White <br> *Standard Wimension (mm) <br> D  <br> - 15sq. $\times 1$ (AGX009-2)  <br> $-15 \times 23 \times 1$ (AGX009-3)  |  | Type AGX009-2C <br> AGX009-2W <br> AGX009-3C <br> AGX009-3W |
| Dust-tight cover | Type <br> AGX011-3 <br> AGX011-2 |  Used w <br>  AG23-L <br>  AG22-L |  |

Description

Illuminated Switches/Pilot Lights
AG22 and AG23
Accessories

| Description | Type |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Lens <br> For AG23-HL | Type |  | Color | Split |
|  | Incandescent, Flat LED | Spot LED |  |  |
|  | AGX034-R | AGX038-R | Red | Twoway split |
|  | AGX034-G | AGX038-G | Green |  |
|  | AGX034-W | AGX038-W | White |  |
|  | AGX034-Y | AGX038-Y | Yellow |  |
|  | AGX034-S* ${ }^{\text {1 }}$ | - | Blue |  |
|  | AGX034-O | AGX038-O | Orange |  |
|  | AGX034-B*2 | - | Black |  |
|  | ${ }^{* 1}$ Used with the incandecent lamp only <br> *2 Used with non illuminated side of spot LED(1-lamp types) |  |  |  |
| Lens <br> For AG23-RL | Type |  | Color | Split |
|  | Incandescent, Flat LED | Spot LED |  |  |
|  | AGX032-R | - | Red | Full face |
|  | AGX032-G | - | Green |  |
|  | AGX032-W | - | White |  |
|  | AGX032-Y | - | Yellow |  |
|  | AGX032-S** | - | Blue |  |
|  | AGX032-O | - | Orange |  |
|  | AGX033-R | AGX037-R | Red | Two split <br> mp types) |
|  | AGX033-G | AGX037-G | Green |  |
|  | AGX033-W | AGX037-W | White |  |
|  | AGX033-Y | AGX037-Y | Yellow |  |
|  | AGX033-S ${ }^{* 1}$ | - | Blue |  |
|  | AGX033-O | AGX037-O | Orange |  |
|  | AGX033-B* ${ }^{\text {2 }}$ | - | Black |  |
|  | ${ }^{* 1}$ Used with the incandecent lamp only <br> *2 Used with non illuminated side of spot LED(1-lamp types) |  |  |  |
| Legend plate For AG23-HL <br> SP-115 | AGX036-W <br> Dimension (mm) $8.5 \times 16.5 \times 2$ |  |  |  |
| Legend plate For AG23-RL | AGX035-W$\begin{aligned} & \text { Dimension }(\mathrm{mm}) \\ & 9.5 \times 16 \times 8.5 \end{aligned}$ |  |  |  |
| Remover | For contact unit AGX012 <br> For body AGX013 |  |  |  |
| Remover | AGX039 <br> This tool is used of illuminated pu | to remove ushbutton or | e indicato pilot light. |  |



## ■ Mass, gram

| Lamp type | Illuminated pushbuttons | $\begin{gathered} 1 \mathrm{NO} \\ + \\ 1 \mathrm{NC} \end{gathered}$ | $\begin{gathered} \text { 2NO } \\ + \\ \text { 2NC } \end{gathered}$ | $\begin{gathered} \text { 3NO } \\ + \\ \text { 3NC } \end{gathered}$ | $\begin{gathered} \text { 4NO } \\ + \\ 4 \mathrm{NC} \end{gathered}$ | Pilot lights |  | Illuminated rocker and lever switches | $\begin{gathered} 1 \mathrm{NO} \\ + \\ 1 \mathrm{NC} \end{gathered}$ | $\begin{gathered} \text { 2NO } \\ + \\ \text { 2NC } \end{gathered}$ | $\begin{gathered} \text { 3NO } \\ + \\ \text { 3NC } \end{gathered}$ | $\begin{gathered} 4 \mathrm{NO} \\ + \\ 4 \mathrm{NC} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Incandescent lamp | $\begin{array}{r} \text { AG22-LA, L5A } \\ \text { B, L5B } \end{array}$ | $\begin{aligned} & 21.5 \\ & 22.5 \end{aligned}$ | $\begin{aligned} & 22.5 \\ & 23.5 \end{aligned}$ | $-$ | $-$ | $\begin{array}{\|r} \hline A G 22-Z A \\ B \\ \hline \end{array}$ | $\begin{aligned} & 18.5 \\ & 19.3 \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { AG23-RL--1 } \\ & \text { AG23-RL--2 } \end{aligned}$ | $\begin{aligned} & 26 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 29 \end{aligned}$ | $\begin{aligned} & 28 \\ & 30 \end{aligned}$ | $\begin{aligned} & 29 \\ & 31 \end{aligned}$ |
|  | $\begin{array}{r} \text { AG23-LA, L5A } \\ \text { B, L5B } \\ \text { C, L5C } \\ \text { D, L5D } \\ \text { E, L5E } \\ \text { F, L5F } \end{array}$ | $\begin{array}{\|l} 27 \\ 29.2 \\ 29.2 \\ 29.4 \\ 29.4 \\ 29.5 \end{array}$ | $\begin{aligned} & 28 \\ & 30.2 \\ & 30.2 \\ & 30.4 \\ & 30.4 \\ & 30.5 \end{aligned}$ | $\begin{aligned} & 29 \\ & 31.2 \\ & 31.2 \\ & 31.4 \\ & 31.4 \\ & 31.5 \end{aligned}$ | $\begin{aligned} & 30 \\ & 32.2 \\ & 32.2 \\ & 32.4 \\ & 32.4 \\ & 32.5 \end{aligned}$ |  | $\begin{aligned} & 23.5 \\ & 25.7 \\ & 25.7 \\ & 25.9 \\ & 25.9 \\ & 26 \end{aligned}$ | $\begin{aligned} & \text { AG23-HL--1 } \\ & \text { AG23-HL--2 } \end{aligned}$ | $\begin{aligned} & 26 \\ & 28 \end{aligned}$ | $\begin{aligned} & 27 \\ & 29 \end{aligned}$ | $\begin{aligned} & 28 \\ & 30 \end{aligned}$ | $\begin{aligned} & 29 \\ & 31 \end{aligned}$ |
| LED lamp | ${ }^{* 1}$ AG22-LA, L5A <br> B, L5B | $\begin{aligned} & 21.8 \\ & 22.2 \end{aligned}$ | $\begin{aligned} & 22.8 \\ & 23.2 \end{aligned}$ | - | - | $\begin{array}{r} { }^{* 2} \text { AG22-ZA } \\ \text { B } \end{array}$ | $\begin{array}{\|l} 19 \\ 19 \\ \hline \end{array}$ | AG23-RL•2-1 <br> AG23-RL-2-2 <br> AG23-RL•3-1 <br> AG23-RL•3-2 <br> AG23-HL•2-1 <br> AG23-HL-2-2 <br> AG23-HL-3-1 <br> AG23-HL•3-2 | $\begin{aligned} & 25 \\ & 27.5 \\ & 25.5 \\ & 28 \\ & 25 \\ & 27.5 \\ & 25.5 \\ & 28 \end{aligned}$ | $\begin{aligned} & 26 \\ & 28.5 \\ & 27.2 \\ & 29 \\ & 26 \\ & 28.5 \\ & 26.5 \\ & 29 \end{aligned}$ | $\begin{aligned} & 27 \\ & 29.5 \\ & 27.5 \\ & 30 \\ & 27 \\ & 29.5 \\ & 27.5 \\ & 30 \end{aligned}$ | $\begin{aligned} & 28 \\ & 30.5 \\ & 28.5 \\ & 31 \\ & 28 \\ & 30.5 \\ & 28.5 \\ & 31 \end{aligned}$ |
|  | *2AG23-LA, L5A B, L5B C, L5C D, L5D E, L5E F, L5F | $\begin{aligned} & 27.5 \\ & 28 \\ & 28 \\ & 28.2 \\ & 28.2 \\ & 28.3 \end{aligned}$ | $\begin{aligned} & 28.5 \\ & 29 \\ & 29 \\ & 29.2 \\ & 29.2 \\ & 29.3 \end{aligned}$ | $\begin{aligned} & 29.5 \\ & 30 \\ & 30 \\ & 30.2 \\ & 30.2 \\ & 30.3 \end{aligned}$ | $\begin{aligned} & 30.5 \\ & 31 \\ & 31 \\ & 31.2 \\ & 31.2 \\ & 31.3 \end{aligned}$ | $\begin{array}{r} { }^{* 2} \text { AG23-ZA } \\ \mathrm{B} \\ \mathrm{C} \\ \mathrm{D} \\ \mathrm{E} \\ \mathrm{~F} \end{array}$ | $\begin{aligned} & 24 \\ & 24.5 \\ & 24.5 \\ & 24.7 \\ & 24.7 \\ & 24.8 \end{aligned}$ |  |  |  |  |  |

[^42]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 $1 \mathrm{NO}+1 \mathrm{NC}: 40 \mathrm{~mm}$ deep
Pilot lights: 35 mm deep
- The transformer now occupies far less space.

Illuminated pushbuttons Pilot lights


## 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 ( $5 \mathrm{~V}, 5 \mathrm{~mA}$ ).


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.
- FUJl'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

(14) (1) $\triangle C \in$ ©

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
$\square$ Illuminated pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head <br> See page 04CD/2/13, 04CD/2/29 <br>  | AM22FOL, F5L <br> AF99-70 | Mushroom head (40mm dia.) <br> See page 04CD/2/13, 04CD/2/29 <br> (11) (6) $\triangle C \in$ © | AM22M0L, M5L <br> AF99-59 | Extended with transparent full guard <br> See page 04CD/2/14, 04CD/2/29 <br> (4L) © $\triangle(\mathbb{A}$ © | AM22G4L, G9L <br> AF99-66 |
| Extended round head <br> See page 04CD/2/13, 04CD/2/29 <br> (14) © $\triangle C \in \mathbb{C l}$ | AM22E0L, E5L <br> AF99-63 | Mushroom head (29mm dia.) <br> See page 04CD/2/13, 04CD/2/29 <br> (1L) © $\triangle(\in$ © | AM22M4L, M9L <br> AF99-61 | Extended with full guard (With openings) <br> See page 04CD/2/14, 04CD/2/29 <br> (11) © $\triangle C \in \mathbb{C}$ | AF99-69 |

- Pushbutton switches

| Operator | Type | Operator | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head <br> See page 04CD/2/15, 04CD/2/30 <br> (14) © $\triangle C \in \mathbb{C l}$ | AM22FOR, F5R <br> AF99-68 | Mushroom head (40mm dia.) <br> See page 04CD/2/15, 04CD/2/30 <br> (1L) © $\triangle C \in \mathbb{C C}$ | AM22MOR, M5R <br> AF99-58 | Extended with full guard ( 24 mm dia.) <br> See page 04CD/2/15, 04CD/2/30 <br> (ㄴ) © $\triangle C \in \mathbb{C C}$ | AM22G3R, G8R <br> AF99-65 |
| Extended round head <br> See page 04CD/2/15, 04CD/2/30 <br> (11) © $\triangle C \in \Subset$ | AM22EOR, E5R <br> AF99-64 | Mushroom head (29mm dia.) <br> See page 04CD/2/15, 04CD/2/30 <br> (1L) © $\triangle C \in$ © | AM22M4R <br> AF99-67 | Mushroom head with full guard (40mm dia.) <br> See page 04CD/2/15, 04CD/2/30 <br> (11) © $\triangle C \in \mathbb{C l}$ | AM22M3R, M8R <br> AF99-89 |

■ Emergency stop pushbutton switches (conform to EN418)

| Operator | Type | Operator | Type | Operator | Type |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Push-lock, turn-reset <br> (40mm dia. with white | AM22V0E | Push-lock, turn-reset <br> (29mm dia. with white <br> arrow) | AM22VSE |  | Push-lock, turn-reset <br> (40mm dia. with |
| arrow) | AW22VME |  |  |  |  |
| mechanical indicator) |  |  |  |  |  |

[^43]■ Emergency stop illuminated pushbutton switches (conform to EN418)

| Operator | Type | tor | Type | Operator | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Push-lock, turn-reset (40mm dia. with white arrow) <br> See page 04CD/2/17, 04CD/2/32 <br> (11) (1) $\triangle C \in \mathbb{C l}$ | AM22VOF <br> KK02-339A | Push-lock, turn-reset (29mm dia. with white arrow) <br> See page 04CD/2/17, 04CD/2/32 <br> (11) (1) $\triangle C \in$ | AM22VSF | Push-lock, turn-reset (40mm dia. transparent in all colors with white arrow) <br> See page 04CD/2/17, 04CD/2/32 <br> (11) © $\triangle C \in \mathbb{C l}$ | AM22VDF <br> KK02-243A |

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

■ Selector switches

| Operator | Type | Operator | Type | Operator | Type |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Knob | AM22PR, PCR <br> AF99-82 | Lever <br> See page 04CD/2/18, 04CD/2/33 | AM22WR, WCR | Key <br> See page 04CD/2/18, 04CD/2/33 | AM22JR, JCR <br> KKD09-014 |  |  |
| See page 04CD/2/18, 04CD/2/33 |  |  |  |  |  |  |  |
| (14) (1) $\triangle$ C $¢$ (c) |  |  |  |  |  |  |  |

■ Illuminated selector

| Operator | Type |
| :--- | :--- |
| Knob | AM22PL |
| See page 04CD/2/25, |  |
| $04 C D / 2 / 34$ |  |
| (1L) © $\triangle C \in$ ©C |  |

$\square$ Pilot lights


Notes: With resitor unit type: Not approved standard
(cc) : See page 04CD/2/50

## Pushbuttons/Selectors/Pilot Lights <br> AM22 and DM22 <br> Type number nomenclature

## Illuminated pushbuttons

## AM22 $\frac{\text { EOL }}{(2)}-\frac{10}{(3)} \frac{E 3}{4} \frac{R}{(5)} \frac{\square}{6}$

(1) Product category

AM22: 22mm-dia. illuminated pushbutton
22 mm -dia. emergency stop illuminated pushbutton

## (2) Operator

- Illuminated pushbutton

FOL: Flush round head
F5L: Flush round head (Alternate)
EOL: Extended round head
E5L: Extended round head (Alternate)
MOL: 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

VOF: Push-lock, turn-reset ( 40 mm dia. with white arrow)
VSF: Push-lock, turn-reset ( 29 mm dia. with white arrow)
VDF: Push-lock, turn-reset ( 40 mm dia. transparent in all colors with white arrow)
(3) Contact arrangement

| 10: 1 NO | $30: 3 \mathrm{NO}$ |
| :--- | :--- |
| 01: 1 NC | $03: 3 \mathrm{NC}$ |
| 11: $1 \mathrm{NO}+1 \mathrm{NC}$ | 33: $3 \mathrm{NO}+3 \mathrm{NC}$ |
| 20: 2 NO | 40: 4 NO |
| 02: 2 NC | $04: 4 \mathrm{NC}$ |
| 22: $2 \mathrm{NO}+2 \mathrm{NC}$ | $50: 5 \mathrm{NO}$ |
|  |  |

## (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 *1
B3: 12V AC/DC, without transformer *1
C3: 15V AC/DC, without transformer *
E3: 24 V AC/DC, without transformer
H3: 100-110V AC, with transformer
L3: 115-127V AC, with transformer
M3: 200-220V AC, with transformer
Q3: $230-254 V$ 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
(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.
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

AM22 $\frac{\text { E0R }}{(2)}-\frac{10}{(3)} \frac{R}{(4)} \frac{\square}{(5)}$
(1) Product category

AM22: 22mm-dia. pushbutton

## (2) Operator

- Pushbutton switch

FOR: Flush round head
F5R: Flush round head (Alternate)
E0R: Extended round head
E5R: Extended round head (Alternate)
MOR: Mushroom head (40mm dia.)
M5R: Mushroom head (40mm dia. alternate)
M4R: Mushroom head (29mm dia.)
G3R: Extended with full guard ( 24 mm dia.)
G8R: Extended with full guard ( 24 mm dia. alternate)
M3R:Mushroom head with full guard ( 40 mm dia.)
M8R:Mushroom head with full guard (40mm dia. alternate)

- Emergency stop pushbutton switch

VOE: Push-lock, turn-reset ( 40 mm dia. with white arrow)
VSE: Push-lock, turn-reset (29mm dia. with white arrow)
VME:Push-lock, turn-reset ( 40 mm dia. with mechanical indicator)
(3) Contact arrangement

10: 1NO 30: 3NO
01: 1NC 03: 3NC
11: $1 \mathrm{NO}+1 \mathrm{NC} \quad 33: 3 \mathrm{NO}+3 \mathrm{NC}$
20: 2NO 40: 4NO
02: 2NC 04: 4NC
22: $2 \mathrm{NO}+2 \mathrm{NC} \quad 44: 4 \mathrm{NO}+4 \mathrm{NC}$
50: 5 NO
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)
(5) 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

[^44]
## Pushbuttons/Selectors/Pilot Lights <br> AM22 and DM22 <br> Type number nomenclature

## Selector and illuminated selector switches

## $\frac{\mathrm{AM22}}{(1)} \frac{\mathrm{PL}}{(2)}-\frac{2}{(3)} \frac{\square}{(4)} \frac{10}{(5)} \frac{\mathrm{E} 3}{(6)} \frac{\mathbf{G}}{(7)} \frac{\square}{(8)} \frac{\square}{(9)}$ <br> (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

## Operation

2. 2-position, maintained

2-position, spring return
3-position, maintained
3-position, spring/manual return (Left to center)
3 -position, spring/manual return (Right to center)
3-position, spring return
4-position, maintained (For AM22PCR, WCR)
5 -position, maintained (For AM22PCR, WCR)

## 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: 1 NO | 30: 3 NO |
| 01: 1 NC | 03: 3 NC |
| 11: $1 \mathrm{NO}+1 \mathrm{NC}$ | 33: $3 \mathrm{NO}+3 \mathrm{NC}$ |
| 20: 2 NO | 40: 4 NO |
| 02: 2 NC | 04: 4 NC |
| 22: $2 \mathrm{NO}+2 \mathrm{NC}$ | 44: $4 \mathrm{NO}+4 \mathrm{NC}$ |
|  | 50: 5 NO |
|  | 05: 5 NC |

Note: Control type: See page 04CD/2/22 to 04CD/2/24
© Lamp voltage

- Incandescent lamp

54: 5.5 V AC/DC, without transformer
C4: 15 V AC/DC, without transformer
D4: 20 V AC/DC, without transformer
E4: 24 V 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: $350-380 \mathrm{~V}$ AC, with transformer
T4: $400-440 \mathrm{~V} \mathrm{AC}$, with transformer
V4: 480 V AC, with transformer
W4: 500-550V AC, with transformer

- LED lamp

A3: 6 V AC, without transformer
63: 6V DC, without transformer
B3: 12 V AC/DC, without transformer
C3: 15 V AC/DC, without transformer
E3: 24 V AC/DC, without transformer
H3: 100-110V AC, with transformer
L3: $115-127 \mathrm{~V}$ AC, with transformer
M3: $200-220 \mathrm{~V}$ AC, with transformer
Q3: $230-254 \mathrm{~V}$ AC, with transformer
S3: $350-380 \mathrm{~V}$ AC, with transformer
T3: $400-440 \mathrm{~V} \mathrm{AC}$, 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)
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: $\cdot$ The manufacturing range varies depending on the model. For details, refer to the contents of this catalog.

## Pilot lights

## $\frac{\text { DM22 }}{(1)} \frac{\text { DOL }}{(2)}-\frac{E 3}{(3)} \frac{W}{(4)} \frac{\square}{(5)}$

(1) Product category

DM22: 22mm dia. pilot light

## (2) Lens

DOL: Dome
E3L: Extended round
KOL: Faceted

## (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: 24 V 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: 24 V AC/DC, without transformer
H3: 100-110V AC, with transformer
L3: 115-127V AC, with transformer
M3: 200-220V AC, with transformer
Q3: $230-254 \mathrm{~V}$ 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
W: White
S: Blue

H8: 100-110V AC/DC, short-body with transformer L8: 115-127V AC/DC, short-body with transformer M8: 200-220V AC/DC, short-body with transformer

## (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.

## Pushbuttons/Selectors/Pilot Lights <br> AM22 and DM22 <br> Ratings and specifications

## $\square$ Standards approved

| UL508 | File No. E44592 |
| :--- | :--- |
| CSA C22.2 No.14 | File No. LR20479 |
| TÜV: EN60947-5-1 | Pushbutton, Illuminated pushbutton: R9551062 <br> Selector, Illuminated selector: R9551060 <br>  <br> Pilot lights: R9551061 |
| TÜV: EN60947-5-1 | Emergency stop pushbutton |
| EN60947-5-5 | Emergency stop illuminated pushbutton <br> $:$ |

## Specifications (Indoor use)

| Description | Pushbutton switch <br> Illuminated pushbutton switch <br> Emergency stop pushbutton switch <br> Emergency stop illuminated pushbutton <br> switch <br> Selector switch <br> Illuminated selector switch | Pilot light |
| :---: | :---: | :---: |
| Rated insulation voltage | 600V AC/DC *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 | $100 \mathrm{M} \Omega$ 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 55 Hz , double amplitude $0.1 \mathrm{~mm} * 3$ Constant: 16.7 Hz , double amplitude 3 mm |  |
| Shock | Malfunction durability: $100 \mathrm{~m} / \mathrm{s}^{2}{ }^{* 4}$ Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ | Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |
| Ambient temperature (No condensation or no icing) | $\begin{aligned} & -10 \text { to }+70^{\circ} \mathrm{C},{ }^{* 5} \\ & \text { (Illuminated type: }-10 \text { to }+50^{\circ} \mathrm{C}{ }^{* 6} \text { ) } \end{aligned}$ | -10 to $+50^{\circ} \mathrm{C}$ |
| Storage temperature | -40 to $+80^{\circ} \mathrm{C}$ |  |
| Humidity | 45 to $85 \%$ RH (within -5 to $+40^{\circ} \mathrm{C}$ ) |  |
| 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 500 Hz , double amplitude 0.7 mm (acceleration $50 \mathrm{~m} / \mathrm{s}^{2}$ ), according to the test condition of EN60947-5-5 (1997)
*4 Emergency stop type: $150 \mathrm{~m} / \mathrm{s}^{2}$
${ }^{*} 5$ AM22VOE, VSE type: -20 to $+60^{\circ} \mathrm{C}$
*6 AM22V0F, VDF, VSF type: -20 to $+50^{\circ} \mathrm{C}$

## - Mechanical durability

| Description |  | Operations |
| :---: | :---: | :---: |
| Pushbutton switch <br> 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 | $\begin{aligned} & 1 \text { million } \\ & 500,000 \\ & 200,000 \end{aligned}$ |
| Illuminated selector switch | Maintained  <br> Without transformer 1,2,3-contact <br> With transformer 4-contact <br>  1,2-contact <br>  3-contact <br> Spring return, spring/manual return | $\begin{aligned} & 1 \text { million } \\ & 500,000 \\ & 1 \text { million } \\ & 500,000 \\ & \\ & 200,000 \end{aligned}$ |

Notes: Key insertion/removal durability for selector switch key types - Key type 10,000

# Pushbuttons/Selectors/Pilot Lights <br> AM22 and DM22 <br> Ratings and specifications 

## $\square$ Contact ratings

- UL/CSA standards

AC (COS ø=0.35)

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

DC $\mathrm{T}_{0.95}=6 \mathrm{P}$ (Max. 300ms)

| Descripton | Contact rated <br> code | Making current • Breaking current |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  | 125 V | 250 V | 0.2 V |
| Illuminated pushbutton switch <br> Pushbutton <br> (Except the overlap contact types) | Q600 | 1.1 A | 0.55 A |  |
| Overlap contact types of products shown above <br> Pushbutton <br> Selector switch (2-position only, except the overlap contact types) <br> Illuminated selector switch <br> (2-position only, except the overlap contact types) <br> Emergency stop pushbutton switch <br> Emergency stop illuminated pushbutton switch | 0.55 A | 0.27 A |  |  |
| Selector switch (2-pos./overlap contact type, 3-, 4-, 5-pos. type) <br> Illuminated selector switch (2-pos./overlap contact type, 3-pos. type) | R300 | 0.22 A | 0.1 A |  |

- EN standard/TÜV approved

| Descripton | Rated operational current |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Rated thermal current | Rated operational voltage | AC15 (Ind. load) | DC13 (Ind. load) |
|  |  |  | Rated operational current | Rated operational current |
| Illuminated pushbutton switch <br> Pushbutton <br> Selector switch (2-position) <br> Illuminated selector switch (2-position) | 10A | 24 V | 6.0A | 4.0A |
|  |  | 120 V | 6.0 A | - |
|  |  | 125 V | - | 1.3A |
|  |  | 240 V | 6.0A | - |
|  |  | 250 V | - | 0.45A |
|  |  | 480 V | 2.5A | - |
|  |  | 600 V | 2.0A | - |
| Selector switch (3, 4, 5-position) <br> Illuminated selector switch (3-position) <br> Emergency stop pushbutton switch <br> Emergency stop illuminated pushbutton switch | 10A | 24 V | 6.0A | 2.0A |
|  |  | 120 V | 6.0A | - |
|  |  | 125 V | - | 0.65A |
|  |  | 240 V | 6.0A | - |
|  |  | 250 V | - | 0.23A |
|  |  | 480 V | 2.5A | - |
|  |  | 600 V | 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 Illuminated pushbutton | Emergency stop pushbutton <br> Emergency stop illuminated pushbutton | Selector * <br> Illuminated selector |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Push-lock type | Maintained | Spring/manual return | Spring return |
| Ave. required operating force | 9N | 22N | $0.15 \mathrm{~N} \cdot \mathrm{~m}$ | $0.13 \mathrm{~N} \cdot \mathrm{~m}$ | $0.1 \mathrm{~N} \cdot \mathrm{~m}$ |
| Operating travel | Approx. 6mm | Approx. 9mm <br> ( Operation angle: Approx. $60^{\circ}$ ) | 2-position: Approx. $90^{\circ}$ 3-position: Approx. $45^{\circ}$ <br> 4-position: Approx. $40^{\circ}$ <br> 5-position: Approx. $30^{\circ}$ | 3-position: Approx. $45^{\circ}$ | 2-position: Approx. $60^{\circ}$ 3-position: Approx. $45^{\circ}$ |
| Required return force | - | $0.25 \mathrm{~N} \cdot \mathrm{~m}$ | $0.15 \mathrm{~N} \cdot \mathrm{~m}$ | $0.13 \mathrm{~N} \cdot \mathrm{~m}$ | - |

Note: * 4-position, 5-position : 2NO+2NC

■ Lamp ratings

- Illuminated pushbuttons, illuminated selectors, pilot lights

| Transformer | Lamp voltege | LED (lamp base: BA9S/13) |  |  | Incandescent (lamp base: BA9S/13) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Type | Rated voltage | Consumption | Type | Rated voltage | Consumption |
| Without transformer | 5.5V AC/DC | - | - | - | AHX135 | 6.3V AC/DC | 0.9W |
|  | $6 \mathrm{~V} \mathrm{AC}$ | APX510-6 $\square$ | 6V AC | Green, red, orange, amber, blue: 7mA AC Yellow: 50mA AC | - | - | - |
|  | 6V DC | APX510-D6 $\square$ | 6V DC | Green, red, orange, amber, blue: 11 mA DC | - | - | - |
|  | $12 \mathrm{~V} \text { AC/DC }$ | APX510-12 $\square$ | 12V AC/DC | Yellow: 33mA DC <br> Green, red, orange, amber, blue: $14 \mathrm{~mA} A C, 11 \mathrm{~mA}$ DC | - | - | - |
|  | $15 \mathrm{~V} \mathrm{AC/DC}$ | APX510-15 | $15 \mathrm{~V} \text { AC/DC }$ | Yellow: $28 \mathrm{~mA} A C, 22 \mathrm{~mA}$ DC <br> Green, red, orange, amber, blue: $13 \mathrm{mAAC}, 11 \mathrm{~mA} D C$ Yellow: $26 \mathrm{~mA} A C, 22 \mathrm{~mA}$ DC | AHX279 | 18V AC/DC | 0.8W |
|  | 20V AC/DC | - | - |  | AHX144 | 24V AC/DC | 0.9W |
|  | 24V AC/DC | APX510-24 $\square$ | 24V AC/DC | $12 \mathrm{~mA} \mathrm{AC}$, | AHX129 | 30V AC/DC | 0.8W |
| With transformer (Standard type: AR9T511) | 110 V AC | APX510-6 $\square$ | 6V AC | 1.5VA | AHX135 | 6.3V AC/DC | 2VA |
|  | 127 V AC |  |  |  |  |  | 2VA |
|  | 220 V AC |  |  |  |  |  | 2VA |
|  | 254V AC | APX510-6 $\square$ | 6V AC | 2.5 VA | AHX135 | 6.3V AC/DC | 2.5 VA |
|  | 380V AC |  |  |  |  |  | 2.5 VA |
|  | 440 V AC |  |  |  |  |  | 2.5 VA |
|  | 480 V AC |  |  |  |  |  | 2.5 VA |
|  | 550 V AC |  |  |  |  |  | 2.5 VA |
| With resistor unit (AR9T519-H) | 110V DC | APX510-24 $\square$ | 24V AC/DC | 1.2W | - | - | - |

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

- Replace the $\square$ mark by the lamp luminous color code, see page 04CD/2/12
- Except AM22V0F, VDF, VSF type


## Pushbuttons/Selectors/Pilot Lights <br> AM22 and DM22 <br> Ratings and specifications

- Emergency stop illuminated pushbutton swtiches

| Transformer | Lamp voltage | LED |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Type | Rated voltage | Consumption |
| Without transformer | $\begin{aligned} & 6 \mathrm{~V} \mathrm{AC} \\ & 24 \mathrm{~V} \text { AC/DC } \end{aligned}$ | AR9L001-6R <br> AR9L001-24R | $\begin{aligned} & \hline 6 \mathrm{~V} \mathrm{AC} \\ & 24 \mathrm{~V} \mathrm{AC/DC} \end{aligned}$ | $\begin{aligned} & 9 \mathrm{~mA} \mathrm{AC} \\ & 15 \mathrm{~mA} \mathrm{AC}, 14 \mathrm{~mA} \mathrm{DC} \end{aligned}$ |
| With transformer (Type: AM9T511) | $\begin{aligned} & \hline 110 \mathrm{~V} \text { AC } \\ & 127 \mathrm{~V} \text { AC } \\ & 220 \mathrm{~V} \text { AC } \end{aligned}$ | AR9L001-6R | 6V AC | 1.5VA |
|  | $\begin{aligned} & 254 \mathrm{~V} \mathrm{AC} \\ & 380 \mathrm{~V} \text { AC } \\ & 440 \mathrm{~V} \text { AC } \\ & 480 \mathrm{~V} \text { AC } \\ & 550 \mathrm{~V} \end{aligned}$ |  |  | 3.0VA |

## ■ 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 |

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 $\mathrm{Ta}=25^{\circ} \mathrm{C}$
Durability is affected by temperature, humidity, and voltage fluctuation.
$\square$ Combination of lens color and LED lamp luminous color

| Button |  | LED lamp |  |
| :--- | :--- | :--- | :--- |
| Color | Code | Luminous color | Type |
| Green | G | Green | APX510-■G |
| Red | R | Red | APX510-■R |
| White | W | Orange | APX510-■O |
| Yellow | Y | Yellow | APX510-■Y |
| Orange | A | 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 | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AM22F0L－10■3 $\square$ <br> AM22F0L－01■3 $\square$ <br> AM22FOL－11■3 <br> AM22FOL－20ㅍㅁㅁ <br> AM22F0L－02■3口 <br> AM22F0L－22■3 | AM22F5L－10 ■3 $\square$ AM22F5L－01 ■ ${ }^{-1}$ AM22F5L－11 ■ $\quad$ ■ AM22F5L－20 ■3口 AM22F5L－02 ■ $3 \square$ | AM22FOL－10 ■4■ AM22FOL－01 ■4 $\square$ AM22F0L－11 $14 \square$ AM22FOL－20 $\quad$ 4 $\square$ AM22FOL－02 ${ }^{\text {■ }}$ 4 $\square$ <br>  | AM22F5L－10 ■4ロ AM22F5L－01 $\quad 4 \square$ AM22F5L－11 AM22F5L－20 $\quad 4 \square$ AM22F5L－02 $\quad$ 4 $\square$ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \end{aligned}$ | AM22FOL－10■3■ <br> AM22FOL－01■3口 <br> AM22F0L－11■3口 <br> AM22FOL－20■3口 <br> AM22F0L－02■3口 |  <br>  <br> AM22F5L－11［ 3 <br>  <br> AM22F5L－02 ${ }^{-1}$ 3 | AM22FOL－10 4 4 <br> AM22FOL－01［4ロ <br> AM22FOL－11 ■4 <br> AM22FOL－20［4ロ <br> AM22FOL－02 4 4 | AM22F5L－10 1 4 <br> AM22F5L－01 1 4 $\square$ <br> AM22F5L－11［4］ <br> AM22F5L－20 4 4 <br> AM22F5L－02 |
| Extended round head | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AM22EOL－10■3 $\square$ AM22EOL－01■3 $\square$ AM22EOL－11■3口 AM22EOL－20ㅍㅁ AM22EOL－02■3口 AM22EOL－22■3口 | AM22E5L－10 ■3口 AM22E5L－01 ■3口 AM22E5L－11 ■3口 AM22E5L－20 ■3口 AM22E5L－02 ■3口 － | AM22E0L－10 4 －$\square$ AM22E0L－01 ${ }^{-1}$－ AM22E0L－11 4 －$\square$ AM22EOL－20 ${ }^{-1}$－$\square$ AM22EOL－02 ${ }^{\text {© }}$－$\square$ AM22EOL－22 $\quad$ 4 | AM22E5L－10－ $4 \square$ <br> AM22E5L－01 1 4 $\square$ <br> AM22E5L－11 <br> AM22E5L－20 $-4 \square$ <br> AM22E5L－02 $-4 \square$ <br> － |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \end{aligned}$ | AM22EOL－10■3 $\square$ <br> AM22E0L－01■3口 <br> AM22EOL－11■3口 <br> AM22EOL－203口 <br> AM22EOL－02■3口 | AM22E5L－10 ■ $3 \square$ <br> AM22E5L－01 ■3口 <br> AM22E5L－11 ${ }^{\text {－}}$ 3 $\square$ <br> AM22E5L－20 ■3口 <br> AM22E5L－02 ■ ${ }^{-1}$ | AM22E0L－10 $14 \square$ <br> AM22E0L－01 $14 \square$ <br> AM22E0L－11 $14 \square$ <br> AM22E0L－20 $\quad 4 \square$ <br> AM22E0L－02 ■4 |  AM22E5L－01 1 4 $\square$ AM22E5L－11 1 4 $\square$ AM22E5L－20 $14 \square$ AM22E5L－02■4 |
| Mushroom head （40mm dia．） | Without | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AM22MOL－10 <br> AM22MOL－01■3口 <br> AM22MOL－11■3口 <br> AM22MOL－20■3口 <br> AM22MOL－02■3口 <br> AM22MOL－22■3口 | AM22M5L－10 $\quad$ 3 <br> AM22M5L－01 ■ <br> AM22M5L－11 $\quad$ 3 $\square$ <br> AM22M5L－20 ■3 $\square$ <br> AM22M5L－02 $\quad$－$\square \square$ <br> － | AM22MOL－10 $\quad 4 \square$ <br> AM22MOL－01 4 －$\square$ <br> AM22MOL－11 4 －$\square$ <br> AM22MOL－20 $\quad 4 \square$ <br> AM22MOL－02 $\quad 4 \square$ <br> AM22MOL－22 14 － | AM22M5L－10 4 4 <br> AM22M5L－01 1 4 <br> AM22M5L－11 1 4 <br> AM22M5L－20 ${ }^{-1} 4$ <br> AM22M5L－02 $14 \square$ <br> － |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \end{aligned}$ | AM22MOL－10 3 <br> AM22MOL－01■3口 <br> AM22MOL－11■3口 <br> AM22MOL－20■3 <br> AM22MOL－02■3 | AM22M5L－10 ■3口 <br> AM22M5L－01 ■ ${ }^{-1}$ <br> AM22M5L－11 $\quad$ 3 $\square$ <br> AM22M5L－20 ■3口 <br> AM22M5L－02 $\quad$－ | AM22MOL－10 $14 \square$ <br> AM22MOL－01 4 4 <br> AM22MOL－11 <br> AM22MOL－20 $-4 \square$ <br> AM22MOL－02 14 ［ | AM22M5L－10 <br> AM22M5L－01 4 4 <br> AM22M5L－11 $4 \square$ <br> AM22M5L－20 1 4 <br> AM22M5L－02■4 |
| Mushroom head （29mm dia．） | Without | $\begin{aligned} & \text { 1NO } \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NC}+2 \mathrm{NC} \end{aligned}$ | AM22M4L－10■3口 AM22M4L－01■3口 AM22M4L－11■3口 AM22M4L－203ㅁ AM22M4L－02■3口 AM22M4L－22■3口 | AM22M9L－10 ■3■ <br> AM22M9L－01 1 － <br> AM22M9L－11 $\quad 3 \square$ <br> AM22M9L－20 ■3口 <br> AM22M9L－02 ■3■ | AM22M4L－10 ${ }^{-1}$ 4 $\square$ AM22M4L－01 4 4 AM22M4L－11 ${ }^{-1}$ 4 AM22M4L－20 $-4 \square$ AM22M4L－02 $\quad 4 \square$ AM22M4L－22 $\quad 4 \square$ | AM22M9L－10 4 4 AM22M9L－01 ${ }^{\text {B }} 4$ AM22M9L－11■4■ AM22M9L－20 $-4 \square$ AM22M9L－02■4■ |
|  | With | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \end{aligned}$ | AM22M4L－10■3 <br> AM22M4L－01■3 <br> AM22M4L－11■3口 <br> AM22M4L－20■3口 <br> AM22M4L－02■3口 | AM22M9L－10 ■3口 <br> AM22M9L－01 ■3■ <br> AM22M9L－11 $\quad$ 3 $\square$ <br> AM22M9L－20 ■ $3 \square$ <br> AM22M9L－02－${ }^{-1}$ | AM22M4L－10 $\quad 4 \square$ <br> AM22M4L－01 4 4 <br> AM22M4L－11 4 4 <br> AM22M4L－20 $\quad 4 \square$ <br> AM22M4L－02 $\quad 4 \square$ | AM22M9L－10 4 4 <br> AM22M9L－01 ${ }^{\text {［4 }}$－ <br> AM22M9L－11 4 4 <br> AM22M9L－20 $14 \square$ <br> AM22M9L－02■4■ |

[^45]■ Illuminated pushbutton switches

| Operator | Transformer | Contact | LED lamp Momentary action Type | Alternate action Type | Incandescent lamp Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Extended with transparent full guard ( 24 mm dia.) | Without | $\begin{array}{\|l} \text { 1NO } \\ \text { 1NC } \\ \text { 1NO+1NC } \\ \text { 2NO } \\ \text { 2NC } \\ \text { 2NO+2NC } \end{array}$ | AM22G4L-10■3 AM22G4L-01■ 3 AM22G4L-11■ 3 AM22G4L-20■ 3 AM22G4L-02■ 3 AM22G4L-22■ 3 | AM22G9L-10■3 $\square$ AM22G9L-01■ 3 AM22G9L-11 3 AM22G9L-20■ 3 AM22G9L-02■3■ $\qquad$ | 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臬 4 AM22G9L-20 4 AM22G9L-02■4 $\square$ $\qquad$ |
|  | With | $\begin{array}{\|l} \text { 1NO } \\ \text { 1NC } \\ \text { 1NO+1NC } \\ \text { 2NO } \\ \text { 2NC } \end{array}$ | AM22G4L-10■ $3 \square$ <br> AM22G4L-01■ 3 <br> AM22G4L-11■ 3 <br> AM22G4L-20■3 <br> AM22G4L-02 | AM22G9L-10■3 <br> AM22G9L-01■3 $\square$ <br> AM22G9L-11■3 <br> AM22G9L-20■3 <br> AM22G9L-02■ 3 | AM22G4L-10■4 AM22G4L-01■4 $\square$ AM22G4L-11■4 AM22G4L-20■4 AM22G4L-02■ 4 | AM22G9L-10■4 $\square$ AM22G9L-01■ 4 AM22G9L-11 4 AM22G9L-20■ 4 AM22G9L-02■ 4 |
| Extended with full guard (24mm dia. with openings) | Without | $\begin{array}{\|l} \text { 1NO } \\ \text { 1NC } \\ \text { 1NO+1NC } \\ \text { 2NO } \\ \text { 2NC } \\ \text { 2NO+2NC } \end{array}$ | AM22G2L-10■3 AM22G2L-01■ 3 AM22G2L-11■3 AM22G2L-20■ 3 AM22G2L-02■ 3 AM22G2L-22■ 3 | AM22G7L-10■3 $\square$ AM22G7L-01■3 AM22G7L-11 3 AM22G7L-20■ 3 AM22G7L-02■ ${ }^{\square} \square$ $\qquad$ | AM22G2L-10■4 AM22G2L-01■ 4 AM22G2L-11■ 4 AM22G2L-20■ 4 AM22G2L-02 4 AM22G2L-22■ 4 | AM22G7L-10■4 AM22G7L-01■4 <br> AM22G7L-11 4 <br> AM22G7L-20■4 <br> AM22G7L-02■4 $\square$ <br> - |
|  | With | $\begin{array}{\|l} \text { 1NO } \\ \text { 1NC } \\ \text { 1NO+1NC } \\ \text { 2NO } \\ \text { 2NC } \end{array}$ | AM22G2L-10■ 3 <br> AM22G2L-01■ 3 <br> AM22G2L-11■ 3 <br> AM22G2L-20■ 3 <br> AM22G2L-02■ 3 | AM22G7L-10■ 3 <br> AM22G7L-01■ 3 <br> AM22G7L-11■3 <br> AM22G7L-20■3 <br> AM22G7L-02■3 $\square$ | AM22G2L-10■4 <br> AM22G2L-01■ 4 <br> AM22G2L-11■4 <br> AM22G2L-20■4 <br> AM22G2L-02■4 | AM22G7L-10■4 <br> AM22G7L-01■ 4 <br> AM22G7L-11■ <br> AM22G7L-20■4 <br> 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 | Y | A |

## - Contact arrangements

Contact arrangements other than above are available

| Contact arrangement | 1NO | 1 NC | 1NO+1NC |  | 2NO | 2NC | 3NO |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Code | 10 | 01 | 11 |  | 20 | 02 | 30 |
| Contact arrangement | 3NC | 2NO+2NC | 4NO | 4NC | 5NO | 5NC | $3 \mathrm{NO}+3 \mathrm{NC}$ |
| Code |  | 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 |  | $\begin{aligned} & \hline \begin{array}{l} \text { Code } \\ \text { LED } \end{array} \end{aligned}$ | Incandescent |
| :---: | :---: | :---: | :---: |
| Without transformer | 6 V DC <br> 6 V AC <br> $5.5 \mathrm{VAC} / \mathrm{DC}$ <br> $12 \mathrm{~V} A C / D C$ <br> $15 \mathrm{~V} A C / D C$ <br> $20 \mathrm{~V} A C / D C$ <br> 24 V AC/DC | A | - |
|  |  | A | 5 |
|  |  | B |  |
|  |  | C | C |
|  |  |  | D |
|  |  | E | E |
| With transformer | 100-110V AC <br> 115-127V AC 200-220V AC 230-254V AC $350-380 \mathrm{~V}$ AC 400-440V AC 480 V AC $500-550 \mathrm{~V}$ AC | H | H |
|  |  | L | L |
|  |  | M | M |
|  |  | Q | Q |
|  |  | S | S |
|  |  | V | V |
|  |  | W | W |

■ Pushbutton switches

| Operator | Contact | Momentary action Type | Alternate action Type |
| :---: | :---: | :---: | :---: |
| Flush round head | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AM22FOR-10 <br> AM22FOR-01 <br> AM22F0R-11 <br> AM22FOR-20 <br> AM22FOR-02 <br> AM22F0R-22 | AM22F5R-10 AM22F5R-01 AM22F5R-11 AM22F5R-20 AM22F5R-02 AM22F5R-22 $\square$ |
| Extended round head | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AM22E0R-10 <br> AM22E0R-01 <br> AM22E0R-11 <br> AM22E0R-20 <br> AM22E0R-02 <br> AM22E0R-22 | AM22E5R-10 AM22E5R-01 AM22E5R-11 $\square$ AM22E5R-20 AM22E5R-02 AM22E5R-22 |
| Mushroom head (40mm dia.) | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AM22M0R-10 AM22M0R-01 AM22M0R-11 AM22MOR-20 AM22M0R-02 $\square$ AM22M0R-22 | AM22M5R-10 AM22M5R-01 AM22M5R-11 AM22M5R-20 AM22M5R-02 $\square$ AM22M5R-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 | Y | A | B |

## - Contact arrangements

Contact arrangements other than above are available

| Contact <br> arrangement | 1 NO | 1 NC | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2 NO | 2 NC | 3 NO | 3 NC |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | 10 | 01 | 11 | 20 | 02 | 30 | 03 |
|  |  |  |  |  |  |  |  |
| Contact <br> arrangement | 2NO+2NC | 4 NO | 4 NC | 5 NO | 5 NC | $3 \mathrm{NO}+3 \mathrm{NC}$ | $4 \mathrm{NO}+4 \mathrm{NC}$ |
| Code | 22 | 40 | 04 | 50 | 05 | 33 | 44 |


| Operator | Contact | Momentary <br> action <br> Type | Alternate <br> action <br> Type |
| :--- | :--- | :--- | :--- |

- Available numbers of contact blocks

| Momentary action | Alternate action |
| :--- | :--- |
| 8 -contact block | 4-contact block |

Emergency stop pushbuttons
AM22

## ■ Emergency stop pushbutton switches

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

| Operator | Contact | T y p e |
| :---: | :---: | :---: |
| Push-lock, turn-reset ( 40 mm dia. with white arrow) | $\begin{array}{\|l} \text { 1NC } \\ \text { 1NO }+1 N C \\ \text { 2NC } \\ \text { 3NC } \\ \text { 2NO+2NC } \\ \text { 4NC } \end{array}$ | AM22V0E-01R AM22V0E-11R AM22V0E-02R AM22V0E-03R AM22V0E-22R AM22V0E-04R |
| Push-lock, turn-reset ( 29 mm dia. with white arrow) | $\begin{array}{\|l} \text { 1NC } \\ \text { 1NO }+1 N C \\ \text { 2NC } \\ \text { 3NC } \\ \text { 2NO+2NC } \\ \text { 4NC } \end{array}$ | AM22VSE-01R AM22VSE-11R AM22VSE-02R AM22VSE-03R AM22VSE-22R AM22VSE-04R |
| Push-lock, turn-reset ( 40 mm dia. with mechanical indicator) | $\begin{array}{\|l} \text { 1NC } \\ \text { 1NO }+1 N C \\ \text { 2NC } \\ \text { 3NC } \\ \text { 2NO+2NC } \\ \text { 4NC } \end{array}$ | AM22VME-01R <br> AM22VME-11R <br> AM22VME-02R <br> AM22VME-03R <br> AM22VME-22R <br> AM22VME-04R |

[^46]- 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 | $\begin{aligned} & 1 \mathrm{NC} \\ & \text { 1NO+1NC } \\ & \text { 2NC } \\ & 3 \mathrm{NC} \end{aligned}$ | AM22VOF-01■ 3R <br> AM22V0F-11 3R <br> AM22VOF-02■ 3R <br> AM22V0F-03■ 3R |
|  | With | $\begin{aligned} & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NC} \\ & \hline \end{aligned}$ | AM22VOF-01■ 3R AM22V0F-11 3R AM22V0F-02■ 3R |
| Push-lock, turn-reset (29mm dia. with white arrow) | Without | $\begin{aligned} & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NC } \\ & \text { 3NC } \end{aligned}$ | AM22VSF-01■ 3R <br> AM22VSF-11■3R <br> AM22VSF-02■ 3R <br> AM22VSF-03■ 3R |
|  | With | $\begin{aligned} & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NC} \end{aligned}$ | AM22VSF-01■3R AM22VSF-11■3R AM22VSF-02■ 3R |
| Push-lock, turn-reset (40mm dia. transparent in all colors with white arrow) | Without | $\begin{aligned} & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NC } \\ & \text { 3NC } \end{aligned}$ | AM22VDF-01■3R <br> AM22VDF-11■3R <br> AM22VDF-02■ 3R <br> AM22VDF-03■ 3R |
|  | With | $\begin{aligned} & \text { 1NC } \\ & \text { 1NO+1NC } \\ & \text { 2NC } \end{aligned}$ | 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.
- Voltage

Replace the $\quad$ mark by the lamp voltage code

| Transformer |  | Code <br> LED |
| :--- | :--- | :--- |
| Without | 6 V AC <br> $24 \mathrm{~V} \mathrm{AC/DC}$ | A <br> E |


| Transformer |  | Code <br> LED |
| :--- | :--- | :--- |
| With | $100-110 \mathrm{~V}$ AC | H |
|  | $115-127 \mathrm{~V}$ AC | L |
|  | $200-220 \mathrm{AC}$ | M |
|  | $230-254 \mathrm{~V}$ AC | Q |
|  | $350-380 \mathrm{AC}$ | S |
|  | $400-440 \mathrm{~V}$ AC | T |
|  | 480 V AC | V |
|  | $500-550 \mathrm{~V}$ AC | W |

## AM22

## ■ Selector switches

2-position

\begin{tabular}{|c|c|c|c|c|c|c|}
\hline \multirow[t]{3}{*}{Operator} \& \multirow[t]{3}{*}{Operation} \& \multirow[t]{3}{*}{Knob color or key removable position} \& \multirow[t]{3}{*}{Contact} \& \multirow[t]{3}{*}{Type Switch with round bezel} \& \multicolumn{2}{|l|}{Contact operation (Example)} \\
\hline \& \& \& \& \& \multirow[t]{2}{*}{Contact arrangement} \& Operator position \\
\hline \& \& \& \& \& \& Left Right © \(\bigcirc\) \\
\hline \multirow[t]{2}{*}{Knob} \& \begin{tabular}{l}
Maintained \\
each \(90^{\circ}\)
\end{tabular} \& \multirow[t]{4}{*}{B: Black (Standard) Color other than above are available \(\binom{\) G: Green }{ R: Red }} \& \[
\begin{aligned}
\& \hline 1 \mathrm{NO} \\
\& 1 \mathrm{NC} \\
\& 1 \mathrm{NO}+1 \mathrm{NC} \\
\& 2 \mathrm{NO} \\
\& \text { 2NC } \\
\& \text { 2NO+2NC }
\end{aligned}
\] \& AM22PR-210B AM22PR-201B AM22PR-211B AM22PR-020B AM22PR-202B AM22PR-222B \& 1NO (1) \& \begin{tabular}{l}
Upper contact \\
(3) (4)
\end{tabular} \\
\hline \& Spring return

$$
60^{\circ}
$$ \& \& \[

$$
\begin{aligned}
& 1 \mathrm{NO} \\
& 1 \mathrm{NC} \\
& 1 \mathrm{NO}+1 \mathrm{NC} \\
& 2 \mathrm{NO} \\
& \text { 2NC } \\
& 2 \mathrm{NO}+2 \mathrm{NC}
\end{aligned}
$$

\] \& AM22PR-010B AM22PR-001B AM22PR-011B AM22PR-020B AM22PR-002B AM22PR-022B \& 1NC (1) \& | Upper contact |
| :--- |
| (1) (2) | <br>


\hline \multirow[t]{2}{*}{Lever} \& | Maintained |
| :--- |
| each $90^{\circ}$ | \& \& \[

$$
\begin{aligned}
& 1 \mathrm{NO} \\
& 1 \mathrm{NC} \\
& 1 \mathrm{NO}+1 \mathrm{NC} \\
& 2 \mathrm{NO} \\
& 2 \mathrm{NC} \\
& 2 \mathrm{NO}+2 \mathrm{NC}
\end{aligned}
$$

\] \& AM22WR-210B AM22WR-201B AM22WR-211B AM22WR-220B AM22WR-202B AM22WR-222B \& | $1 \mathrm{NO}+1 \mathrm{NC}$ |
| :--- |
| (1) |
| (2) | \& | Upper contact |
| :--- |
| (3) |
| Lower contact |
| (1) | <br>

\hline \& Spring return

$$
60^{\circ}
$$ \& \& \[

$$
\begin{aligned}
& \text { 1NO } \\
& 1 \mathrm{NC} \\
& 1 \mathrm{NO}+1 \mathrm{NC} \\
& 2 \mathrm{NO} \\
& \text { 2NC } \\
& 2 \mathrm{NO}+2 \mathrm{NC}
\end{aligned}
$$

\] \& AM22WR-010B AM22WR-001B AM22WR-011B AM22WR-020B AM22WR-002B AM22WR-022B \& | $2 \mathrm{NO}+2 \mathrm{NC}$ |
| :--- |
| (1) | \& | Upper contact |
| :--- |
| (3) |
| (4) | <br>


\hline \multirow[t]{3}{*}{Key} \& | Maintained |
| :--- |
| each $90^{\circ}$ | \& \multirow[t]{3}{*}{| Key removable position ( ): Key type |
| :--- |
| See page 04CD/2/20 |} \& \[

$$
\begin{aligned}
& 1 \mathrm{NO} \\
& 1 \mathrm{NC} \\
& 1 \mathrm{NO}+1 \mathrm{NC} \\
& 2 \mathrm{NO} \\
& 2 \mathrm{NC} \\
& 2 \mathrm{NO}+2 \mathrm{NC}
\end{aligned}
$$

\] \& | AM22JR-2■10( ) |
| :--- |
| AM22JR-2■01() |
| AM22JR-2■11() |
| AM22JR-2■20() |
| AM22JR-2■02( ) |
| AM22JR-2■22() | \& (3)

(2) \& | (3) |
| :--- |
| Lower contact |
| (1) | <br>

\hline \& Spring return \& \& \[
$$
\begin{aligned}
& 1 \mathrm{NO} \\
& 1 \mathrm{NC} \\
& 1 \mathrm{NO}+1 \mathrm{NC}
\end{aligned}
$$

\] \& | AM22JR-0A10( ) |
| :--- |
| AM22JR-0A01( ) |
| AM22JR-0A11( ) | \& (4) \& (1) <br>

\hline \& $$
60^{\circ}
$$ \& \& \[

$$
\begin{aligned}
& 2 \mathrm{NC} \\
& 2 \mathrm{NO}+2 \mathrm{NC}
\end{aligned}
$$

\] \& | AM22JR-0A02( ) |
| :--- |
| AM22JR-0A22( ) | \&  \& act <br>


\hline \multicolumn{5}{|l|}{| Notes: • (1) to (4): Contact block mounting position |
| :--- |
| - (1) - (2), (3) - (4): Contact block terminal No. |
| - Contact arrangements: See page 04CD/2/20 |} \& \& - Contact closed <br>

\hline
\end{tabular}

## 3-position

| Operator | Operation | Knob color | Contact | Type Switch with round bezel | Contact operation (Example) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Contact arrangement | Operation position |  |
|  |  |  |  |  |  | $\begin{array}{lll} \mathrm{L} & \mathrm{C} & \mathrm{R} \\ (1) & (1) & \bigcirc \end{array}$ | $\begin{array}{lll} \mathrm{L} & \mathrm{C} & \mathrm{R} \\ \bigcirc & (1) & \cap \end{array}$ |
| Knob | Maintained each $45^{\circ}$ | Color code: B: Black (Standard) Color other than above are available $\binom{$ G: Green }{ R: Red } | $\begin{aligned} & \text { 1NO+1NC } \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AM22PR-311B AM22PR-320B AM22PR-302B AM22PR-322B | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) $(2)$ |  |  |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AM22PR-611B <br> AM22PR-620B <br> AM22PR-602B <br> AM22PR-622B |  |  |  |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  | $\begin{aligned} & \hline \mathrm{NO}+1 \mathrm{NC} \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO }+2 \mathrm{NC} \end{aligned}$ | AM22PR-711B <br> AM22PR-720B <br> AM22PR-702B <br> AM22PR-722B | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) |  |  |
|  | Spring return <br> (1) each $45^{\circ}$ |  | 2NO+2NC | AM22PR-122B | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) (3) (4) |  | (3) |
| Lever | Maintained each $45^{\circ}$ |  | 1NO+1NC 2 NO 2NC 2NO+2NC | AM22WR-311B AM22WR-320B AM22WR-302B AM22WR-322B | 1NO+1NC <br> (1) (2) |  |  |
|  | Spring/manual return |  | $\begin{aligned} & \text { 1NO }+1 \mathrm{NC} \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO }+2 \mathrm{NC} \end{aligned}$ | AM22WR-611B AM22WR-620B AM22WR-602B AM22WR-622B |  |  |  |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AM22WR-711B <br> AM22WR-720B <br> AM22WR-702B <br> AM22WR-722B | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) |  |  |
|  | Spring return <br> $\uparrow$ each $45^{\circ}$ |  | 2NO+2NC | AM22WR-122B | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) <br> (3) (4) |  |  |


| Operator | Operation | Key removable position | Contact | Type Switch with round bezel | Contact operation (Example) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Contact arrangement | Operator position |  |
|  |  |  |  |  |  | $\begin{array}{\|ccc} \hline \mathrm{L} & \mathrm{C} & \mathrm{R} \\ \bigcirc & \oplus & O \end{array}$ | $\begin{array}{lll} \hline \mathrm{L} & \mathrm{C} & \mathrm{R} \\ \bigcirc & \oplus & \bigcirc \end{array}$ |
| Key | Maintained each $45^{\circ}$ | ■: Keyremovableposition():Key type | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { NOO+2NC } \end{aligned}$ | $\begin{aligned} & \hline \text { AM22JR-3■11() } \\ & \text { AM2JR-3120() } \\ & \text { AM22JR-3■02() } \\ & \text { AM22JR-3■22() } \end{aligned}$ | 1NO+1NC <br> (1) (2) |  |  |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | $\begin{aligned} & \text { AM22JR-6■11() } \\ & \text { AM2JRR-6120() } \\ & \text { AM22JR-6■02() } \\ & \text { AM2SR-6■22() } \end{aligned}$ |  |  |  |
|  | Spring/manual return each $45^{\circ}$ |  | $\begin{aligned} & \text { 1NO+1NC } \\ & \text { 2NO } \\ & \text { 2NC } \\ & \text { 2NO+2NC } \end{aligned}$ | AM22JR-7■11() <br> AM22JR-7 ${ }^{(120()}$ <br> AM22JR-702() <br> AM22JR-7■22() | 1NO+1NC <br> (1) (2) |  |  |
|  | Spring return <br> 管 each $45^{\circ}$ |  | 2NO+2NC | AM22JR-1E22() | 2NO+2NC <br> (1) (2) <br> (3) (4) |  |  |
| Notes: - Operator position L: Left, C: Center, R: Right <br> - (1) to (4): Contact block mounting position <br> - (1) - (2), (3) - (4): Contact block terminal No. |  |  |  |  |  |  |  |

## - Contact arrangements



| Contact <br> arrangement | $2 \mathrm{NO}+2 \mathrm{NC}$ | 4 NO | 4 NC | 5 NO | 5 NC | $3 \mathrm{NO}+3 \mathrm{NC}$ | $4 \mathrm{NO}+4 \mathrm{NC}$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | 22 | 40 | 04 | 50 | 05 | 33 | 44 |

- Available numbers of contact blocks

| Mainted | Spring return <br> Spring/manual return |
| :--- | :--- |
| 8-contact block | 4-contact block |

- Key removable positions

| Code | A | B | C | D | E | F | G |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Removable position |  | $\underbrace{(5)}_{\left(\sqrt{4} 5^{\circ}-450\right.}$ | $\frac{45^{\circ}+45}{(53}$ | $\underbrace{45^{\circ}+\frac{850}{0}}$ |  |  |  |
| AM22JR-2 | - | - | - | - | - | - | - |
| AM22JR-0 | - | - | - | - | - | - | - |
| AM22JR-3 | - | - | - | - | - | - | - |
| AM22JR-6 | - | - | - | - | - | - | - |
| AM22JR-7 | - | - | - | - | - | - | - |
| AM22JR-1 | - | - | - | - | - | - | - |

Available
-: Not available

## - Position of contact block



## - 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.

| Operator | Operation | Knob color or key removable position | Contact arrangement | Type Switch with round bezel |
| :---: | :---: | :---: | :---: | :---: |
| Knob | Maintained each $45^{\circ}$ | Color code: <br> B: Black <br> (Standard) <br> Color other than above are available <br> (G: Green $\left.\begin{array}{l}\text { R: Red }\end{array}\right)$ | Replace the mark by the contact arrangement code (shown on next page). | AM22PCR-3■B |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  |  | AM22PCR-6■B |
|  | Spring/manual return (1) each $45^{\circ}$ |  |  | AM22PCR-7пB |
| кк02-248A | Spring return <br> each $45^{\circ}$ |  |  |  |
| Lever | Maintained each $45^{\circ}$ |  | Replace the mark by the contact arrangement code (shown on next page). | AM22WCR-3m |
|  | Spring/manual return © each 45 |  |  | AM22WCR-6mB |
|  | Spring/manual return (1) each $45^{\circ}$ |  |  | AM22WCR-7 ${ }^{\text {a }}$ |
|  | Spring return <br> each $45^{\circ}$ |  |  |  |
| Key | Maintained each $45^{\circ}$ | Replace the mark by the key removable position code: A, B, C, D, E F or G | Replace the mark by the contact arrangement code (shown on next page). | AM22JCR-3■■() |
|  | Spring/manual return <br> (1) each $45^{\circ}$ |  |  | AM22JCR-6■回 ( |
|  | Spring/manual return (1) each $45^{\circ}$ |  |  | AM22JCR-7■() |
|  | Spring return <br> (1) each $45^{\circ}$ |  |  | AM22JCR-1E®() |

- Key removable positions

| Code | A | B | C | D | E | F | G |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Removable position | $8$ | $\stackrel{45}{450}$ | $\frac{4^{5} 0^{23}}{\left(4^{2}\right)}$ | (8) |  | (ais) | (4) |
| AM22JCR-3 | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | $\bigcirc$ |
| AM22JCR-6 | - | - | - | - | - | $\bigcirc$ | - |
| AM22JCR-7 | $\bigcirc$ | - | - | - | - | - | - |
| AM22JCR-1 | - | - | - | - | - | - | - |

: 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.

Selector Switches
AM22

- Contact arrangement code (Typical example)


| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type |  | Center <br> (1) |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 064 | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | $\bullet$ |  |  |
|  |  | (4) | NO | - |  | $\bullet$ |
| $1 \mathrm{NO}+1 \mathrm{NC}$ | 07F | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NO |  |  | $\bullet$ |
|  |  | - | - | - | - | - |
|  |  | - | - | - | - | - |
| 2NO+2NC | $\left\{\begin{array}{l} 07 \mathrm{C}^{*} \\ \text { (Maitaned } \\ \text { only) } \end{array}\right.$ | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC |  |  | $\bullet$ |
|  |  | (3) | NO | $\bullet$ |  |  |
|  |  | (4) | NO | $\bullet$ |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 084 | (1) | NC |  |  |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | $\bullet$ |  |  |
|  |  | (4) | NO | $\bullet$ |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 094* | (1) | NC |  |  |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | $\bullet$ |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 104 | (1) | NC |  | $\bullet$ |  |
|  |  | (2) | NC |  | $\bullet$ |  |
|  |  | (3) | NO | - |  | $\bullet$ |
|  |  | (4) | NO | $\bullet$ |  | $\bullet$ |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | $\begin{aligned} & 11 \mathrm{C}^{*} \\ & \begin{array}{l} \text { (Maintained } \\ \text { only) } \end{array} \end{aligned}$ | (1) | NC |  | $\bullet$ |  |
|  |  | (2) | NC |  |  | $\bullet$ |
|  |  | (3) | NO | $\bullet$ |  | - |
|  |  | (4) | NO | $\bullet$ |  |  |

Notes: ©: Contact closed Blank: Contact open

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


## - Position of contact block



Name plate side

- Contact arrangement code (Typical example)

| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type | Left | Center | Right |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 124* | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO | - |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 134* | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  | - |
|  |  | (4) | NO |  |  | - |
| $3 \mathrm{NO}+1 \mathrm{NC}$ | 14D* <br> (Maintained <br> only) | (1) | NO | - |  |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | - |
| $3 \mathrm{NO}+1 \mathrm{NC}$ | 15A* | (1) | NO |  |  | - |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO |  |  | - |
|  |  | (4) | NO | - |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 164 | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO | - |  |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 174* | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (3) | NO | - |  |  |
|  |  | (4) | NO |  |  | - |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 184 | (1) | NC |  | - |  |
|  |  | (2) | NC |  | - |  |
|  |  | (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



| Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Contact block |  | Operator position |  |  |
|  |  | Mounting position | Type | Left | Center <br> (1) |  |
| $2 \mathrm{NO}+2 \mathrm{NC}$ | 194 | (1) | NC |  | $\longrightarrow$ |  |
|  |  | (2) | NC | $\longrightarrow$ |  |  |
|  |  | (3) | NO | $\bullet$ |  |  |
|  |  | (4) | NO |  |  | $\bullet$ |
| 4NO | 20B | (1) | NO |  |  | - |
|  |  | (2) | NO | $\bullet$ |  |  |
|  |  | (3) | NO |  |  | $\bullet$ |
|  |  | (4) | NO | $\bullet$ |  |  |

## 4, 5-position

| Operator | Contact <br> (The following contact is on available.) | Operation | Knob color | Contact arrangement | Type Switch with round bezel |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Knob | $2 \mathrm{NO}+2 \mathrm{NC}$ | 4-position maintained | Color code: <br> B: Black <br> (Standard) <br> Color other than above are available <br> $\binom{$ G: Green }{ R: Red } | Replace the mark by the contact arrangement code (shown below) | AM22PCR-4■B |
|  |  | 5-position maintained |  |  | AM22PCR-5■B |
| Lever | 2NO+2NC | 4-position maintained |  |  | AM22WCR-4 ${ }^{\text {B }}$ |
|  |  | 5-position maintained |  |  | AM22WCR-5 ${ }^{\text {B }}$ |

## - Contact arrangement code

| Position | Contact arrangement | Contact arrangement code | Contact operation |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Contact block |  | Operator position |  |  |  |  |
|  |  |  | Mounting position | Type | 1 | 2 | 3 | 4 | 5 |
| 4-position | 2NO+2NC | 41C* (Maintained only) | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ | $\square$ |  | $\phi$ |  |  |
| 5-position | 2NO+2NC | 51C* (Maintained only) | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ |  |  |  |  |  |

[^47]* There may be some overlap in the contact when switching between notches.


## - Position of contact block



Operator position 4-position 5-position



■ Illuminated selector switches
2-position

\begin{tabular}{|c|c|c|c|c|c|c|}
\hline \multirow[t]{2}{*}{Operator} \& \multirow[t]{2}{*}{Operation} \& \multirow[t]{2}{*}{Contact} \& \multicolumn{2}{|l|}{LED lamp} \& \multicolumn{2}{|l|}{Incandescent lamp} <br>
\hline \& \& \& Transformer \& Type \& Transformer \& Type <br>
\hline \multirow[t]{4}{*}{Knob} \& \multirow[t]{2}{*}{Maintained

each $90^{\circ}$} \& \[
$$
\begin{aligned}
& 1 \mathrm{NO} \\
& 1 \mathrm{NC} \\
& \text { 1NO+1NC } \\
& \text { 2NO } \\
& \text { 2NO+2NC }
\end{aligned}
$$

\] \& Without \& | AM22PL-210■3 $\square$ |
| :--- |
| AM22PL-201■3 $\square$ |
| AM22PL-211■3 |
| AM22PL-020■ |
| AM22PL-222■3 | \& Without \& | AM22PL-210■4 $\square$ |
| :--- |
| AM22PL-201■4 |
| AM22PL-211■4 $\square$ |
| AM22PL-020■4 |
| AM22PL-222■4 | <br>

\hline \& \& $$
\begin{aligned}
& \text { 1NO } \\
& \text { 1NC } \\
& \text { 1NO+1NC } \\
& \text { 2NO }
\end{aligned}
$$ \& With \& \[

$$
\begin{aligned}
& \text { AM22PL-210■3} \\
& \text { AM22PL-201■ } \\
& \text { AM22PL-211■ } \\
& \text { AM22PL-220■3 }
\end{aligned}
$$

\] \& With \& | AM22PL-210■ 4 |
| :--- |
| AM22PL-201■ 4 $\square$ |
| AM22PL-211■4 |
| AM22PL-220■4 | <br>

\hline \& \multirow[t]{2}{*}{Spring return} \& $$
\begin{aligned}
& 1 \mathrm{NO} \\
& 1 \mathrm{NC} \\
& 1 \mathrm{NO}+1 \mathrm{NC} \\
& 2 \mathrm{NO}
\end{aligned}
$$ \& Without \& \[

$$
\begin{aligned}
& \text { AM22PL-010■3} \\
& \text { AM22PL-001■ } \\
& \text { AM22PL-011■ } \\
& \text { AM22PL-020 }
\end{aligned}
$$

\] \& Without \& | AM22PL-010■4 |
| :--- |
| AM22PL-001■ 4 $\square$ |
| AM22PL-011■ 4 $\square$ |
| AM22PL-020■4 | <br>

\hline \& \& $$
\begin{aligned}
& 1 \mathrm{NO} \\
& 1 \mathrm{NC} \\
& 1 \mathrm{NO}+1 \mathrm{NC} \\
& \text { 2NO }
\end{aligned}
$$ \& With \& \[

$$
\begin{aligned}
& \text { AM22PL-010■3} \\
& \text { AM22PL-001■3} \\
& \text { AM22PL-011■3} \\
& \text { AM22PL-020■3 }
\end{aligned}
$$

\] \& With \& | AM22PL-010■4 |
| :--- |
| AM22PL-001■ 4 $\square$ |
| AM22PL-011■ 4 $\square$ |
| AM22PL-020■4 $\square$ | <br>

\hline
\end{tabular}

3-position

| Operator | Operation |  | Contact | LED lamp |  | Incandescent lamp |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Transformer | Type | Transformer | Type |
| Knob | Maintained each $45^{\circ}$ |  |  | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | Without <br> With | AM22PL-311■3 $\square$ AM22PL-322 $\square \square$ AM22PL-311■3 $\square$ | Without <br> With | AM22PL-311■4 AM22PL-322■4 $\square$ AM22PL-311■4 |
|  | Spring/manual return <br> each $45^{\circ}$ | ( ${ }^{\text {( }}$ | $\begin{array}{\|l\|} \text { 1NO+1NC } \\ 1 \mathrm{NO}+1 \mathrm{NC} \end{array}$ | Without With | $\begin{aligned} & \text { AM22PL-611■3} \\ & \text { AM22PL-611■3 } \end{aligned}$ | Without With | $\begin{aligned} & \text { AM22PL-611■4} \\ & \text { AM22PL-611■4 } \end{aligned}$ |
|  |  | (1) | $\begin{array}{\|l\|} \hline 1 \mathrm{NO}+1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \end{array}$ | Without With | $\begin{aligned} & \text { AM22PL-711■3 } \square \\ & \text { AM22PL-711■3 } \square \end{aligned}$ | Without With | $\begin{aligned} & \text { AM22PL-711■4 } \square \\ & \text { AM22PL-711■4 } \square \end{aligned}$ |

Note: $\square$, ■ See page 04CD/2/26

- Replace the $\quad$ mark by the following lamp voltage code

| Transformer | Voltage | Code LED | Incandescent |
| :---: | :---: | :---: | :---: |
| Without | 5V AC/DC | - | 5 |
|  | 6V DC | 6 | - |
|  | 6V AC | A | - |
|  | 12V AC/DC | B | - |
|  | 15V AC/DC | C | C |
|  | 20V AC/DC | - | D |
|  | 24 V AC/DC | E | E |
| With | 100-110V AC | H | H |
|  | 115-127V AC | L | L |
|  | 200-220V AC | M | M |
|  | 230-254V AC | Q | Q |
|  | $350-380 \mathrm{~V}$ AC | S | S |
|  | 400-440V AC | T | T |
|  | 480 V AC | V | V |
|  | 500-550V AC | W | W |

## - Contact arrangement and operator position

2-position

| Transformer | Contact arrangement | Contact block |  | Operator position |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mounting position | Type | Left <br> $\bigcirc$ | Right <br> $\odot$ |
| With/without | 1NO | (1) | NO | - | $\bullet$ |
| With/without | 1NC | (1) | NC | $\bullet$ | - |
| Without | 1NO+1NC | $\begin{aligned} & \hline(1) \\ & (2) \end{aligned}$ | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | $\bullet$ |  |
| With | 1NO+1NC | $\begin{array}{\|l} \hline(1) \\ (2) \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NO} \end{aligned}$ |  | - |
| With/without | 2 NO | (1) (2) | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ | - |  |
| Without | ${\underset{\star}{* 1}}_{2 N O+2 N C}$ | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \hline \mathrm{NO} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ |  |  |
| With | $2 \mathrm{NO}+2 \mathrm{NC}$ | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ | $\bullet$ |  |

Notes: *1: AM22PL-2

- : Contact closed, - : Contact open
- Replace the $\square$ mark by the following knob color code

| Color | Green | Red | White | Blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | A |

- Up to 4-contact of contact arrangement can be made.

Available numbers of contacts are as follow.

| No. of <br> position | Operation | Without <br> transformer | With <br> 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 |

3-position

| Transformer | Contact arrangement | Contact block |  | Operator position |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mounting position | Type | Left <br> 0 | Center <br> (1) | Right <br> 0 |
| Without | ${ }_{* 1}^{1 N O}+1 N C$ | (1) (2) | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | $\bullet$ - |  | - |
|  | ${ }_{* 2}^{1 N O+1 N C}$ | $\begin{aligned} & (1) \\ & (2) \end{aligned}$ | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | $-$ | - |  |
|  | $\begin{aligned} & \text { 2NO+2NC } \\ & { }_{*} \end{aligned}$ | (1) <br> (2) <br> (3) (4) | $\begin{array}{\|l\|} \hline \mathrm{NO} \\ \mathrm{NC} \\ \mathrm{NO} \\ \mathrm{NC} \end{array}$ |  |  | $\begin{aligned} & - \\ & \bullet \\ & - \\ & - \end{aligned}$ |
| With | ${ }_{\star 1}^{1 N O}+1 \mathrm{NC}$ | (1) (2) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NO} \end{aligned}$ | $-$ | - |  |
|  | ${ }_{\star 2}^{1 N O}+1 \mathrm{NC}$ | $\begin{aligned} & \hline(1) \\ & (2) \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathrm{NC} \\ \mathrm{NO} \end{array}$ |  | - | $-$ |
|  | ${ }_{* 3}^{2 N O}+2 N C$ | (1) <br> (2) <br> (3) (4) | NC <br> NC <br> NO <br> NO |  |  |  |

Notes: *1: AM22PL-3, $6{ }^{* 3}$ : AM22PL-3
*2: AM22PL-7

- : Contact closed, - : Contact open

With transformer


## ■ Pilot lights/standard

| Lens | Transformer | LED lamp Lamp voltage | Type | Incandescent lamp Lamp voltage | Type |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Dome <br> AF99-88 | Without <br> With | $\begin{gathered} \text { 6V AC } \\ 6 \mathrm{~V} \text { DC } \\ 12 \mathrm{~V} \text { AC/DC } \\ 24 \mathrm{~V} \text { AC/DC } \\ \\ 100-110 \mathrm{~V} \text { AC } \\ 200-220 \mathrm{~V} \text { AC } \end{gathered}$ | DM22D0L-A3 $\square$ DM22D0L-63 $\square$ DM22D0L-B3 $\square$ DM22D0L-E3 $\square$ DM22DOL-H3 $\square$ DM22D0L-M3 $\square$ | $\begin{gathered} 5.5 \mathrm{~V} \text { AC/DC } \\ \overline{15 V} \mathrm{AC} / \mathrm{DC} \\ 24 \mathrm{~V} \mathrm{AC/DC} \\ \\ 100-110 \mathrm{~V} \mathrm{AC} \\ 200-220 \mathrm{~V} \mathrm{AC} \end{gathered}$ | $\begin{aligned} & \text { DM22DOL-54 } \square \\ & \overline{\text { DM22DOL-C4 }} \square \\ & \text { DM22DOL-E4 } \square \\ & \text { DM22DOL-H4 } \square \\ & \text { DM22DOL-M4 } \square \end{aligned}$ |
| Extended round <br> AF99-85 | Without <br> With | $\begin{gathered} \text { 6V AC } \\ 6 \mathrm{~V} \text { DC } \\ 12 \mathrm{~V} \text { AC/DC } \\ 24 \mathrm{~V} \text { AC/DC } \\ \\ 100-110 \mathrm{~V} \text { AC } \\ 200-220 \mathrm{~V} \text { AC } \end{gathered}$ | DM22E3L-A3 $\square$ DM22E3L-63 $\square$ DM22E3L-B3 $\square$ DM22E3L-E3 $\square$ DM22E3L-H3 $\square$ DM22E3L-M3 $\square$ | $\begin{gathered} 5.5 \mathrm{~V} \text { AC/DC } \\ 15 \mathrm{~V} \text { AC/DC } \\ 24 \mathrm{~V} \mathrm{AC/DC} \\ 100-110 \mathrm{~V} \mathrm{AC} \\ 200-220 \mathrm{~V} \text { AC } \end{gathered}$ | $\begin{aligned} & \text { DM22E3L-54 } \square \\ & \overline{\text { DM22E3L-C4 }} \square \\ & \text { DM22E3L-E4 } \square \\ & \text { DM22E3L-H4 } \square \\ & \text { DM22E3L-M4 } \square \end{aligned}$ |
| Faceted <br> AF99-87 | Without <br> With | $\begin{gathered} \text { 6V AC } \\ \text { 6V DC } \\ 12 \mathrm{~V} \text { AC/DC } \\ \text { 24V AC/DC } \\ \\ 100-110 \mathrm{~V} \mathrm{AC} \\ 200-220 \mathrm{~V} \text { AC } \end{gathered}$ | DM22KOL-A3 $\square$ DM22K0L-63 $\square$ DM22K0L-B3 $\square$ DM22K0L-E3 $\square$ DM22KOL-H3 $\square$ DM22K0L-M3 $\square$ | $\begin{gathered} 5.5 \mathrm{~V} \text { AC/DC } \\ 15 \mathrm{~V} \text { AC/DC } \\ 24 \mathrm{~V} \mathrm{AC/DC} \\ 100-110 \mathrm{~V} \mathrm{AC} \\ 200-220 \mathrm{~V} \text { AC } \end{gathered}$ | DM22KOL-54 $\square$ DM22KOL-C4 $\square$ DM22KOL-E4 $\square$ DM22KOL-H4 $\square$ DM22KOL-M4 $\square$ |

Pilot lights/short-body with transformer

|  |  | LED lamp |  | Incandescent lamp |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Lens |  |  |  |  |  |
|  | Lamp voltage | Type | Lamp voltage | Type |  |

[^48]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 | Y | A |

## - Lamp voltage

Available lamp voltage are as follow.

| Description | Voltage | Code <br> Standard type LED | Incandescent | Short-body type 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 | - | - |
|  | $350-380 \mathrm{~V}$ AC | S3 | S4 | - | - |
|  | $400-440 \mathrm{~V}$ AC | T3 | T4 | - | - |
|  | 480 V 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 (29mm dia.)
AM22M4L, M9L


Mushroom (40mm dia.)
AM22M0L, M5L


Extended with transparent full guard AM22G4L, G9L


Extended with full guard (with openings)
AM22G2L, G7L


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

Pushbuttons/Selectors/Pilot Lights

## AM22 and DM22

## Dimensions

## ■ Dimensions, mm

- Pushbutton switches


## Flush/Extended

AM22F0R, F5R AM22E0R, E5R



Extended with full guard ( 24 mm dia.)
AM22G3R, G8R


Mushroom (29mm dia.)
AM22M4R


Mushroom with full guard (40mm dia.)
AM22M3R, M8R


## ■ Dimensions, mm

- Emergency stop pushbutton switches

Push-lock, turn-reset ( 40 mm 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


## Pushbuttons/Selectors/Pilot Lights

## 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 ( 40 mm dia. transparent in all colors with white arrow)
AM22VDF
Without transformer


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

## - Dimensions, mm

- Selector switches


## Knob

AM22PR, PCR


Lever
AM22WR, WCR


Key
AM22JR, JCR


## Pushbuttons/Selectors/Pilot Lights <br> AM22 and DM22 <br> Dimensions

## $\square$ Dimensions, mm

- Illuminated selector switches

Knob AM22PL
With transformer


Without transformer


- Pilot lights

Dome DM22DOL
With transformer, with resistor unit


## Without transformer



Short body/with transformer


Terminal screw(M3.5)

[^49]■ Dimensions, mm

- Pilot lights


## Extended DM22E3L

With transformer, with resistor unit


Short body/with transformer


Faceted DM22K0L
With transformer, with resistor unit


Short body/with transformer


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

Without transformer


Without transformer


## Notes on use

## $\square$ Panel cutout hole

Fig. 1 Panel cutout hole dimensions, mm


Note: If key-washer or legend plate are not used, 3.2 mm -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 $1.5 \mathrm{~N} \cdot \mathrm{~m}$.

## 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 $1.5 \mathrm{~N} \cdot \mathrm{~m}$.
- Use the wrench (AR9A001) to mount the button. Note:The correct tightening torque is 0.5 to $1.0 \mathrm{~N} \cdot \mathrm{~m}$.

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.

Fig. 4a


Fig. 4b


- In case of G3R, G8R: Loosen and pull the nut, and the button will come off.

Fig. 5


- AM22M0R, 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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$.
- 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, VOF, 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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$.
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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$.
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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$.
- Attaching the nameplate

Insert the groove of the nameplate onto the protrusion on the plunger.

Fig. 9


- DM22DOL, KOL
- 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 $1.0 \mathrm{~N} \cdot \mathrm{~m}$.
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


## - 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

*Use a small flathead screwdriver with a head that is about 4 mm wide.

## Pushbuttons/Selectors/Pilot Lights

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 $0.5 \mathrm{~N} \cdot \mathrm{~m}$.
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 N•m.

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 <br> including lock-ring and <br> legend plate thicknesses | Number of packings |
| :--- | :---: |
| 1.0 mm to less than 1.6 mm |  |
| 1.6 mm to less than 2.8 mm |  |
| 2.8 mm to less than 3.8 mm | $\square$ |
| 3.8 mm to less than 4.8 mm | $\square$ |
| 4.8 mm to less than 6.0 mm |  |

## ■ 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 30 mm pitch, use it circuit of 380 V or less.
*3 Short body with transformer types: 50mm.
*4 This dimension applies when transformer units or contact blocks face each other.
*5 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

| Discription | Type |
| :---: | :---: |
| Wrench | AR9A004 <br> Dimensions, mm: $30 \times 100 \times 6.5$ <br> Section "B" <br> Use this section to tighten or remove the lens. <br> Applicable type: <br> AM22M3R, M8R, F0L, F5L, E0L, E5L, G4L, <br> G9L, G2L, G7L, DM22E3L <br> Remarks <br> Section "A" : (For AR22 nut tightening) <br> Section "C" : (For AR22V $\square$ , AR30V $\square$ center button tighting) |
| Wrench <br> KKD07-096 | AM9A008 <br> Dimensions, mm: $16 \times 23 \times 0.8$ <br> Application: <br> AM22V $\square$ center button |
| Wrench <br> KK02-098A | AR9A001 <br> Dimensions, mm: $\varnothing 22 \times 35$ <br> Application: <br> AM22M3R, M8R, F0L, F5L, E0L, E5L, G4L, <br> G9L, G2L, G7L, DM22E3L lens tightening |
|  | AR9A006 <br> Dimensions, mm: $\varnothing 40 \times 100$ <br> Application: <br> AM22, DM22 nut tightening |
| Wrench <br> SI-303 | AHX701 <br> Dimensions, mm: ø25 x 72.5 <br> Application: <br> To mount on Protection cover (AM9D762), use this wrench to tighten the nut. |


| Discription | Type <br> Special tool <br> AHX321 <br> Dimensions, mm: $42 \times 130 \times 6.5$ <br> For all types except pilot lights <br> DR9A321-T |
| :--- | :--- |
| Dimensions, mm: $57 \times 130 \times 30$ |  |
| For pilot lights |  |
| - This tool is used to remove contact blocks |  |
| and transformer units. |  |
| - The AHX321 can remove round color lens |  |
| of switches. |  |




| Discription | Type |
| :---: | :---: |
| Panel plug <br> SI-1027 | Round: <br> AHX725-B Black <br> AHX725-H Gray <br> Square: <br> AHX726-B Black <br> AHX726-H Gray <br> Dimensions, mm: ø29.5 x 17 (AHX725) <br> 29.5 sq. x 17 (AHX726) <br> Use this plug to cover up unused panel cutout holes. <br> For oil proof usage, use together with packing (AR9Y730) and a nut (AR9R744). |
| Jumper <br> AF95-153 | APCX029 (For pilot light without transformer) DR9Y001 (For pilot light with transformer) <br> Use this jumper to connect terminals allocated in a 30 mm pich. <br> Rated current is 3A <br> Dimensions, mm |
| Lens for illuminated pushbutton switch and pilot lights <br> KK02-266A <br> KK02-267A <br> KK02-268A <br> KK02-269A | Type Used with <br> AR9C011- $\square^{*}$ AM22F0L, F5L <br> AM9C012- $\square$ AM22E0L, E5L, G4L, G9L, <br>  G2L, G7L, DM22E3L <br> AM9C015- $\square$ AM22M4L, M9L <br> AM9C016- $\square$ AM22M0L, M5L <br> DM9C011- $\square$ DM22D0L <br> DM9C012- $\square$ DM22K0L <br> Replace the $\square$ mark by the lens color code <br> Notes: * When the code is "W" (white), use a lens of clear color. |


| Discription | Type |  |  |
| :---: | :---: | :---: | :---: |
| Lens for pushbutton switch | Type Used with |  |  |
|  | AM9C001- $\square$ AM22F0R, F5R |  |  |
|  | AM9C003- $\square$ AM22E0R, E5R, G3R, G8R |  |  |
|  | AM9C006- $\square$ AM22M4R |  |  |
|  | AM9C007- $\square$ AM22M0R, M3R, M5R, M8R |  |  |
| кK02-268A | Replace the $\square$ mark by the lens color code |  |  |
|  | Color | Green Red | Black White |
|  | Code | G R | B W |
|  | Color | Yellow Orang | Blue |
|  | Code | Y A | B |
| кк02-269A |  |  |  |
| Center button (for AM22V $\square \square$ type) | Type Used with |  |  |
|  | AM9C034-R AM22V0E, VSE |  |  |
|  | AM9C035-R AM22V0F, VSF, VDF |  |  |
|  | Center button color: Red only |  |  |
| KK02-267A |  |  |  |
| Push-lock, turn-reset button <br> (for AM22V $\square \square$ type) | Type Used with |  |  |
|  | AM9C036-R AM22V0E, V0F |  |  |
|  | AM9C037-R AM22VSE, VSF |  |  |
|  | AM9C040-R AM22VDF |  |  |
|  | Button | color: Red only |  |
| Knob | Type Used with |  |  |
|  | AR9M006- $\square$ AM22PR, PCR |  |  |
|  | Replace the $\square$ mark by the knob color code |  |  |
|  | Color | Black Green | Red |
|  | Code | B G | R |
| AF95-43 |  |  |  |


| Discription | Type |
| :---: | :---: |
| Lever <br> AF95-42 |  |
| Knob (for illuminated selector switch) | Type  Used with  <br> AR9M005- $\square$   AM22PL <br> Replace the $\square$ mark by the knob color code    <br> Color Green Red White <br> Code G R W <br> Color Yellow Orange Blue <br> Code Y A S |
| Key <br> KKD09-012 | Type Used with <br> AR9C022- $\square \quad$ AM22JR, JCR  |
| Legend plate <br> AF94-459 | Type $\quad$ Used with <br> AR9P001-W AM22F0L, F5L <br> This part is made of acrylic resin. <br> Use paint or thinner compatible with resin. <br> Dimensions, $\mathrm{mm}: ~$ <br> $17.8 \times 0.9$ |
| Legend plate <br> KK02-273A | Type Used with <br> AR9P002-W AM22E0L, E5L, G4L, G9L, <br>  G2L, G7L <br> This part is made of acrylic resin. Use paint or thinner compatible with resin. Dimensions, mm: $\varnothing 17.8 \times 4.5$ |
| Legeng plate <br> KK02-273A | Type Used with <br> AM9P024-W AM22M0L, M5L, M4L, M9L <br> - This part is made of acrylic resin. Use paint or thinner compatible with resin. <br> - Dimensions, mm: $\varnothing 17.8 \times 10.2$ |


| Discription | Type |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| LED lamp | Type L |  | Lamp voltage |  |
|  | APX510-6 $\square$ 6V AC <br> APX510-D6 $\square$ 6V DC <br> APX510-12 $\square$ 12V AC/DC <br> APX510-15 $\square$ 15V AC/DC <br> APX510-24 $\square$ 24V AC/DC |  |  |  |
|  | Replace the $\square$ mark by the luminous color code |  |  |  |
|  | Luminous color | Yellow | Red | Green |
|  | Code | Y | R | G |
|  | Lens color | Y | R | G |
|  | Luminous color | Amber | Orange | Blue |
|  | Code | A | 0 | S |
|  | Lens color | A | W | S |



Dimensions, mm:


Lamp base: BA9s/13

| Discription | Type |
| :---: | :---: |
| Contact block (1NO) | AR9B290 Standard AR9B290-S Overlap <br> Color: Blue <br> Dimensions, mm: $19.3 \times 29 \times 27$ <br> Note: Terminal cover is not supplied with this. |
| Contact block (1NC) | AR9B291 Standard AR9B291-S Overlap <br> Color: Red <br> Dimensions, mm: $19.3 \times 29 \times 27$ <br> Note: Terminal cover is not supplied with this. |
| Lamp terminal | AR9B292 <br> Color: Black Dimensions, mm: $19.3 \times 29 \times 27$ <br> Note: Terminal cover is not supplied with this. |
| Contact protection cover |  |


| Discription | Type |
| :---: | :---: |
| Transformer unit | Type Primary voltage Used with |
|  | AR9T511-H <br> 100-110V AC <br> Standard type <br> AR9T511-L 115-127V AC <br> AR9T511-M 200-220V AC <br> AR9T511-Q 230-254V AC <br> AR9T511-S $350-380 \mathrm{~V}$ AC <br> AR9T511-T $400-440 \mathrm{~V}$ AC <br> AR9T511-V 480V AC <br> AR9T511-W 500-550V AC <br> AM22VOF, <br> AM9T511-L 115-127V AC <br> AM9T511-M 200-220V AC <br> AM9T511-Q 230-254V AC <br> AM9T511-S 350-380V AC <br> AM9T511-T 400-440V AC <br> AM9T511-V 480V AC <br> AM9T511-W 500-550V AC |
|  | Dimensions, mm: <br> Up to $220 \mathrm{~V} 22.4 \times 30 \times 45$ <br> Over 220 V $25.3 \times 29 \times 48$ <br> Note: With terminal cover |
| Base unit for transformer separate mounting | AR9T003 <br> Use this base in combination with a transformer unit. This base unit can be mounted using screws or rails. <br> Dimensions, mm <br> * Except for the types 110 V AC, 127V AC and 220V AC. |
| Resistor <br> Voltage stabilizer Device for LED lamp flickering | Resistor: AR9T519-H (110V DC) <br> Fit this resistor when using LED of 24V DC rating with 110V DC power. <br> Voltage stabilizer: AR9T001-E <br> This unit allows an LED lamp of 24V DC rating to be used in a circuit with voltage from 27 V to 35 V ( AC or DC ). <br> Flickering device: <br> 6 V AC: AR9T002-A <br> 6V DC: AR9T002-6 <br> 12 to 24 V AC: AR9T002-G * <br> 12 to 24V DC: AR9T002-E * <br> * Used in combination with $12 \mathrm{~V}, 15 \mathrm{~V}$, or 24 V rated LED lamp. <br> Note: With terminal cover |



## 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.

## $\square$ Type

AM22 $\square$ 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

| Type | Contact arrangement | Remarks |
| :---: | :---: | :---: |
| - Pushbuttons <br> - Emergency stop pushbuttons | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC}, \\ & 2 \mathrm{NO}^{* 1}, 2 \mathrm{NC} \end{aligned}$ | For use with a 1-step contact |
| - Selectors | $1 \mathrm{NO}+3 \mathrm{NC}, 2 \mathrm{NO}+2 \mathrm{NC}$, $3 \mathrm{NO}+1 \mathrm{NC}, 4 \mathrm{NO}{ }^{* 1}, 4 \mathrm{NC}$ | For use with a 2-step contact |
| - Illuminated pushbuttons (without transformer) | $1 \mathrm{NO}^{* 2}$, 1NC | For use with a 1-step contact |
| - Emergency stop illuminated pushbuttons (without transformer) <br> - llluminated selectors (without transformer) | $\begin{aligned} & \text { 1NO+2NC, 2NO+1NC, } \\ & 3 \mathrm{NO}^{* 2}, 3 \mathrm{NC} \end{aligned}$ | For use with a 2-step contact |

Notes: *1 Except for emergency stop pushbutton switch
*2 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.

## $\square$ Type

AM22 $\square$ Z9, DM22 $\square$ 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)

## 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.

## $\square$ Type

AM22 $\square$ ZB, DM22 $\square$ 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

## $\square$ 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 shortbody types)

## - Dimensions, mm

## AM22/Pushbutton switches



DM22/Without transformer


DM22/With transformer


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

## Metal nut (aluminum) types

## $\square$ Features

The nut is an aluminum ring.
Other ratings and specifications are the same as those of the standard model.

## $\square$ Type

AM22 $\square$ ZM
DM22 $\square$ ZM
Specify "ZM" at the end of the type number of the standard type.

## $\square$ Dimensions, mm

Same as those of the standard types.

## - Applicable types

AM22 (except for G4L, G9L, M3R, M8R, V $\square \mathrm{E}^{*}, ~ V \square \mathrm{~F}^{*}$ 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).

## $\square$ Type

AM22 $\square \mathrm{Z4}$, DM22 $\square \mathbf{Z 4}$
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 $37^{\circ} \mathrm{C}$
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

| Type | 1-contact | 2-contact | 4-contact |
| :--- | :--- | :--- | :--- |
| F0R <br> F5R | 28 | 38 | 57 |
| E0R <br> E5R | 29 | 39 | 58 |
| G3R, M4R <br> G8R | 31 | 41 | 60 |
| M0R <br> M5R | 33 | 43 | 62 |
| M3R <br> M8R | 49 | 59 | 78 |

- Illuminated pushbutton switches

| Type | Without transformer |  | With transformer |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | 1-contact | 2-contact | 4-contact | 1-contact | 2-contact |
| FOL | 42 | 51 | 70 | 88 | 97 |
| F5L | 42 | 51 | - | 88 | 97 |
| EOL | 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

| Type | 1-contact | 2-contact | 4-contact |
| :--- | :--- | :--- | :--- |
| VSE | 42 | 52 | 71 |
| V0E | 51 | 61 | 80 |
| VME | 53 | 63 | 82 |

- Emergency stop illuminated pushbutton switches

| Type | Without transformer |  | With transformer* |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 1-contact | 2-contact | 1-contact | 2-contact |
| VSF | 53 | 62 | 99 | 108 |
| VDF | 60 | 69 | 106 | 115 |
| VOF | 62 | 71 | 108 | 117 |

- Pilot lights

| Type | Without transformer | With transformer | With resistor |  |
| :--- | :--- | :--- | :--- | :--- |
|  | Standard | Standard* |  | unit |
| DOL | 22 | 74 | 72 | 36 |
| E3L, K0L | 23 | 75 | 73 | 37 |

- Selector switches

| Type | 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

| Type | 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

## - CCC approved

- AM22/DM22 series


## Pushbutton switches

| Bezel | Operator | Type |  |
| :---: | :---: | :---: | :---: |
|  |  | 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 ( 40 mm 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 | Type |  |  |
| :--- | :--- | :--- | :---: | :---: |
|  |  | 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 | Type |  |
| :---: | :---: | :---: | :---: |
|  |  | 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 <br> Without transformer <br> Momentary action: within 6 contacts <br> Alternate action: within 3 contacts <br> With transformer <br> Momentary action: within 4 contacts <br> Alternate action: within 2 contacts <br> -Color of button <br> Green, red, white, yellow, orange, blue <br> - Light source <br> LED lamp, incandescent lamp <br> - Operating voltage of lamp <br> Without transformer <br> LED: 6V AC, 6V DC, 12V AC/DC <br> Incandescent lamp: 5.5 V AC/DC, 20 V AC/DC <br> LED, incandescent lamp: 15 V AC/DC, 24 V AC/DC <br> With transformer <br> LED, incandescent lamp: $100-110 \mathrm{~V}$ AC, $115-127 \mathrm{~V}$ AC, $200-220 \mathrm{~V}$ AC, $230-254 \mathrm{~V}$ AC, $350-380 \mathrm{~V} \mathrm{AC}, 400-440 \mathrm{~V}$ AC, 480 V AC, $500-550 \mathrm{~V} \mathrm{AC}$ |  |

Emergency stop illuminated pushbutton switches


## Selector switches

| Bezel | Operator | Type |  |
| :--- | :--- | :--- | :--- |
|  |  | 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 | Type |
| :--- | :--- | :--- |
|  |  | 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 | Type |
| :--- | :--- | :--- |
|  |  | 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)

| Type | Certificate No. |
| :--- | :--- |
| AM22 $\square$ ZB | 2003010305063372 |
| DM22 $\square$ ZB | 2003010305063383 |

Note: Certified for all types listed in the above items
except for short-body transformer of pilot light.

## 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 ( $5 \mathrm{~V}, 5 \mathrm{~mA}$ ) 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 1 NO or 1 NC contacts.

## $\square$ 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 (1L)
CSA certified

For further infomation related to approved type, see page 04CD/3/2 to 04CD/3/4

Pushbuttons/Selectors/Pilot Lights
AH25
Quick reference guide

■ Pushbutton switches

| Type | Description | Type | Description |
| :---: | :---: | :---: | :---: |
| AH25-F <br> Flush round head <br> (ㄴ). 1 | The button surface is flush with the locking nut. Momentary type. <br> See page 04CD/3/10 | AH25-M <br> Mushroom head <br> (11)(1) <br> SG-185 | Mushroom head button. Momentary type. <br> See page 04CD/3/10 |
| AH25-F5 <br> Flush round head /Alternate action <br> (11) ${ }^{15}$ | The button surface is flush with the locking nut. Push-ON/push-OFF type. <br> See page 04CD/3/10 | AH25-M5 <br> Mushroom head /Alternate action <br> (14) | Mushroom head button. Push-ON/push-OFF type. <br> See page 04CD/3/10 |
| AH25-E <br> Extended round head <br> (14)(1) <br> AF87-314 | The button surface projects 7 mm from the locking nut. <br> Momentary type. <br> See page 04CD/3/10 | AH25-V <br> Push-lock, turn-reset | Locked when the button is pushed. To reset turn the button to the right. <br> See page 04CD/3/11 |
| AH25-E5 <br> Extended round head /Alternate action <br> (1L) (1) | The button surface projects 7 mm from the locking nut. Push-ON/push-OFF type. <br> See page 04CD/3/10 | AH25-U Wobble stick <br> (41) (1) | The contact works when the lever is moved in any direction. Spring return action. <br> See page 04CD/3/11 |
| AH25-G <br> Extended with half guard <br> (11) (1) | The upper half of the button has a guard ring to help prevent operating errors. Momentary type. <br> See page 04CD/3/10 | AH25-SF <br> Flush square head <br> (41) ${ }^{1}$ <br> SG-208 | The button surface is flush with the guard. Momentary type. Operator protection conforms to IP40. <br> See page 04CD/3/11 |
| AH25-G5 <br> Extended with half guard /Alternate action <br> (11) (1) | The upper half of the button has a guard ring to help prevent operating errors. <br> Push-ON/push-OFF type. <br> See page 04CD/3/10 | AH25-SF5 <br> Flush square head /Alternate action <br> (14) | The button surface is flush with the guard. Push-ON/push-OFF type. Operator protection conforms to IP40. <br> See page 04CD/3/11 |
| AH25-G1 <br> Extended with full guard <br> (11) (1) <br> AF87-179 | The button has a guard ring to help prevent operating errors. Momentary type. <br> See page 04CD/3/10 | AH25-SE <br> Extended square head <br> (11)(1) | The button surface projects 7 mm from the guard. Momentary type. Operator protection conforms to IP40. <br> See page 04CD/3/11 |
| AH25-G6 <br> Extended with full guard /Alternate action <br> (14) (1) | The button has a guard ring to help prevent operating errors. Push-ON/push-OFF type. <br> See page 04CD/3/10 | AH25-SE5 <br> Extended square head /Alternate action <br> (14) SG-207 | The button surface projects 7 mm from the guard. Push-ON/push-OFF type. Operator protection conforms to IP40. <br> See page 04CD/3/11 |


| Type | Description |
| :--- | :--- |
| AH25-S1, S2, S3, S4, S5, S6 | Turning the ring to the left or right |
| Pushbotton with selector ring(2- | changes over the contact. |
| position) |  |
| (LL) |  |


| Type | Description |
| :---: | :---: |
| AH25-■/D <br> Mechanically interlocked | Two buttons are interlocked by a lever. When on is ON , the other is OFF. |
| (14)(1) AF89-610 | See page 04CD/3/14 |

■ Illuminated pushbutton switches
Type
AH25-L
Extended round head
Description
The surface of the illuminated button
projects about 15 mm from the locking
nut.

Momentary type. | AH25-L4 |
| :--- |
| Extend with transparent full |
| guard |

Pushbuttons/Selectors/Pilot Lights
AH25
Quick reference guide

## $■$ Selector switches

| Type | Description | Type | Description |
| :---: | :---: | :---: | :---: |
| AH25-P <br> Knob <br> (1L) <br> (1) <br> SG-188 | This switch works when the knob is turned. <br> Operating positions : 2 or 3 <br> Operating : Maintained, spring return, and spring/manual return. <br> See page 04CD/3/18 | AH25-SJ <br> Key with square bezel <br> (11) (1) <br> SG-226 | This switch works with a key inserted. Operator protection conforms to IP40. Operating positions : 2 or 3 Operating : Maintained. <br> See page 04CD/3/18 |
| AH25-PC <br> Knob operated control type <br> (나) <br> AF89-596 | 21 types of operation are available using a cam for performing complex controls. <br> See page 04CD/3/22 | AH25-PW <br> Lever <br> (41) (1) | The lever extends out 13 mm from the knob. <br> Operating positions : 2 or 3 <br> Operating : Maintained, spring return, and spring/manual return. <br> See page 04CD/3/18 |
| AH25-J <br> Key <br> (나) (1) <br> SG-233 | This switch works when the key is inserted. <br> Operating positions : 2 or 3 <br> Operating : Maintained, spring return, and spring/manual return. <br> See page 04CD/3/18 | AH25-PL <br> Illuminated knob | Illuminated switch with a lamp built into the knob. <br> Operating positions : 2 or 3 Operating : Maintained. <br> See page 04CD/3/23 |
| AH25-SP <br> Knob with square bezel <br> (14) (1) <br> SG-196 | This switch works when the knob is turned. <br> Operator protection conforms to IP40. Operating positions : 2 or 3 <br> Operating : Maintained. <br> See page 04CD/3/18 | - | - |

$\square$ Pilot lights

| Type | Description | Type | Description |
| :---: | :---: | :---: | :---: |
| AH25-ZM ${ }^{\star}$ <br> Dome <br> (11) (1) <br> SF-1095 | This pilot light uses a round transparent colored lens. <br> See page 04CD/3/25 | AH25-ZN <br> Flush square with legend plate <br> (4) (1) SF-1092 | This pilot light has a built-in square legend plate on which characters and symbols can be marked. <br> Operator protection conforms to IP40. <br> See page 04CD/3/25 |
| AH25-ZK ${ }^{*}$ <br> Faceted <br> (14) (1) <br> SF-1094 | This pilot light uses a faceted transparent colored lens. <br> See page 04CD/3/25 | AH25-ZM $\square 8, \square 9$ <br> Dome (Short-body with transformer) <br> (14) (1) | This pilot light has a short-body transformer. <br> See page 04CD/3/25 |
| AH25-ZS Extended square <br> (1L) | This pilot light uses a square lens. Operator protection conforms to IP40. <br> See page 04CD/3/25 | - | - |

[^50]
## Type number nomenclature <br> \section*{Pushbuttons}

| $\frac{\mathrm{AH} 25}{(1)}-\frac{\mathrm{E}}{\mathrm{Z})} \frac{\mathrm{R}}{(3)} \frac{11}{(4)}$ |  |
| :---: | :---: |
| (1) Product category AH25: 25 mm -dia. pushbutton |  |
|  |  |
| (2) Operator |  |
| F: Flush round hea |  |
| F5: Flush round head(Alternate action) |  |
| E: Extended round head |  |
| E5: Extended round head(Alte |  |
| $\mathrm{G}: \quad \mathrm{Extended}$ with half gu |  |
| G5: Extended with | half guard (Altern |
| G1: Extended with full guard |  |
| G6: Extended with full guard (Alternate |  |
| M: Mushroom head |  |
| M5: Mushroom head (Alternate action) |  |
| V: Push-lock, turn |  |
|  |  |
| SF: Flush square head |  |
| SF5: Flush square head (Alternate action) |  |
| SE: Extended square head |  |
| SE5: Extended square head (Alternate a |  |
| S1-S6:Pushbutton w | th selector ring (2-p |
| (3) Color of button |  |
| $\mathrm{G}:$ Green | D: Dark green |
| R: Red | Y: Yellow |
| W: White | B: Black* |
| S: Sky-blue | O : Orange |
| *AH25-U type: ball color Black only. |  |
| (4) Contact arrangement |  |
| 10: 1NO | 30: 3NO |
| 01: 1NC | 03: 3NC |
| 11: $1 \mathrm{NO}+1 \mathrm{NC}$ | 33: $3 \mathrm{NO}+3 \mathrm{NC}$ |
| 20: 2 NO | 40: 4NO |
| 02: 2NC | 04: 4NC |
| 22: $2 \mathrm{NO}+2 \mathrm{NC}$ | 44: $4 \mathrm{NO}+4 \mathrm{NC}$ |

Mechanically interlocked pushbutton switches


## Product category

AH25: 25mm-dia. interlocked pushbutton

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)
E5/E: Extended (Push-locked)/Extended (Momentary)
M5/M: Mushroom (Push-locked)/Mushroom (Momentary)

Button color
G: Green
R: Red
Black
Dark green
Yellow
White
: Sky-blue
O: Orange

# Pushbuttons/Selectors/Pilot Lights AH25 <br> Type number nomenclature 

## Selector and illuminated selector switches

## AH25-PL $\quad \underline{\underline{G}} \underline{22}$ E $\underline{\square} \square$ <br> (1) (2) (3) (4) (5) (6) (7) (8) (9)

## (1) Product category

AH25: 25mm-dia. selector and illuminated selector switch

## (2) Operator

P: Knob
PC: Knob operated control type
J: Key
SP: Knob with square bezel
SJ: Key with square bezel
PW: Lever
PL: Illuminated knob

## Operating

2-position,maintained
2-position,spring return (Right to left)
3-position,maintained
3-position,spring/manual return (Left to center)
3 -position,spring/manual return (Right to center)
3 -position,center spring return
Blank: 3-position,maintained (Control type only)


## Pilot lights

```
AH25 - ZM W Q 3
    (1) (2) (3) (4) (5
(1) Product category
AH25: 25mm-dia. pilot light
(2) Lens
ZM: Dome
ZK: Faceted
ZS: Extended square*
ZN: Flush square with legend plate*
* Incandescent lamp only
(3) Color of lens
W: White O: Orange
* For LED lamp: Not available
4) Lamp voltage
-Without transformer:
    Incandescent LED
Blank 5.5V AC/DC
A - 6V AC
AD - 6V DC
B - 12V AC/DC
C 15V AC/DC 15V AC/DC
D 20V AC/DC
E 24V AC/DC 24V AC/DC
With transformer:
        Incandescent LED
H - 110V DC*
H 100-110V AC 100-110V AC
L 115-127V AC 115-127V AC
M 200-220V AC 200-220V AC
Q 230-254V AC 230-254V AC
S 350-380V AC 350-380V AC
T 400-440V AC 400-440V AC
V 480V AC 480V AC
W 500-550V AC 500-550V AC
* With resistor unit only
(5) Type of lamp
Blank: Incandescent lamp
    Incandescent lamp/Short-body with transformer
    LED lamp
    LED lamp/With resistor unit
    LED lamp/Short-body with transformer
```

| G: Green | S: Sky-blue* |
| :--- | :--- | :--- |
| R: Red | Y: Yellow |

(1) Product category

AH25: 25mm-dia. pilot light
(2) Lens

ZM: Dome
Faceted
ZN : Flush square with legend plate*

* Incandescent lamp only

3) Color of lens

R: Red Y: Yellow
W: White O: Orange

* For LED lamp: Not available

4. Lamp voltage

- Without transformer:

Incandescent LED
Blank 5.5V AC/DC
A - GV AC
12V AC/DC
15 V AC/DC
E 24 V AC/DC 24 V AC/DC
With transformer:
Incandescent LED
110V DC*
100-110V AC
$\begin{array}{lll}\mathrm{M} & 115-127 \mathrm{~V} \text { AC } & 115-127 \mathrm{VAC} \\ \text { 200-220V AC } & 200-220 \mathrm{~V} \text { AC }\end{array}$
Q 230-254V AC $230-254 V$ AC
T $400-440 \mathrm{~V}$ AC $400-440 \mathrm{VAC}$
W 500-550V AC 500-550V AC
With resistor unit only

Type of lamp
Blank: Incandescent lamp
Incandescent lamp/Short-body with transformer
LED lamp/With resistor unit
LED lamp/Short-body with transformer

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

## 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 |  |
| Mechanical durability | See the table below | - |
| Electrical durability | 500,000 operations at 220 V AC 6 A 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 | $100 \mathrm{M} \Omega$ or more (500V DC megger) |  |
| Pollution degree | 3 |  |
| Vibration | Resonance: 10 to 55 Hz , double amplitude 0.1 mm Constant: 16.7 Hz , double amplitude 3 mm |  |
| Shock | Malfunction durability: $100 \mathrm{~m} / \mathrm{s}^{2}$ Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ | Mechanical durability: $500 \mathrm{~m} / \mathrm{s}^{2}$ |
| Ambient temperature <br> (No condensation or no icing) | $-20 \text { to }+70^{\circ} \mathrm{C}$ <br> (Illuminated type: -20 to $+50^{\circ} \mathrm{C}$ ) | -20 to $+50^{\circ} \mathrm{C}$ |
| Storage temperature | -40 to $+80^{\circ} \mathrm{C}$ |  |
| Humidity | 45 to $85 \%$ RH (within -5 to $+40^{\circ} \mathrm{C}$ ) |  |
| Degree of protection | IP65*3 |  |

Notes: *1 ${ }^{\text {Illuminated type without transformer: } 250 \mathrm{~V} \text { AC/DC }}$
*2 Illuminated type without transformer: 1500 V AC, 1 minute
*3 Square type : IP40

## - Mechanical durability

| Description | Momentary action | Operations |
| :--- | :--- | :--- |
| Pushbutton switch | Alternate action | 5 million |
| Illuminated pushbutton switch | With selector ring | 1 million |
|  | Push-lock, turn-reset | 200,000 |
| Mechanically interlocked pushbutton | Latched/Latched, Latched/Unlatched | 100,000 |
| switch |  |  |
| Selector switch | Maintained, spring return, spring/manual return | 1 million |
|  | Control type | 200,000 |
| Illuminated selector switch | Maintained, spring return, spring/manual return | 1 million |

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

- Key type 10,000

Pushbuttons/Selectors/Pilot Lights AH25
Ratings and Specifications

## ■ Contact ratings

- UL/CSA standards

| Voltage [V] | Application |  | Continuous current$[\mathrm{A}]$ | $\mathrm{AC}(\operatorname{COS} \phi=0.35$ or less) |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | UL | CSA |  | Make [A] | Break [A] |
| 110-120 | $\bullet$ |  | 10 | 60 | 6.0 |
| 120 |  | $\bullet$ |  |  |  |
| 220-240 | $\bullet$ |  |  | 30 | 3.0 |
| 240 |  | $\bullet$ |  |  |  |
| 440-480 | $\bullet$ |  |  | 15 | 1.5 |
| 480 |  | $\bullet$ |  |  |  |
| 550-600 | $\bullet$ |  |  | 12 | 1.2 |
| 600 |  | $\bullet$ |  |  |  |
|  |  |  |  |  |  |
| Voltage [V] | Application |  | DC |  |  |
|  | UL | CSA | Make and break currents [A] |  |  |
| 115-125 | $\bullet$ |  | 1.1 |  |  |
| 115 |  | $\bullet$ |  |  |  |  |  |
| 230-250 | $\bullet$ |  | 0.55 |  |  |

Note: AH25-J3, -J5, -P3, -P1, -S1, -S3, -S4, -S5 types cannot be used in DC circuit.

- NECA standards

| Description | Rated thermal current (A) | AC |  | DC |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Voltage <br> (V) | Operational current (A) AC15(Ind.) | Voltage (V) | Operational current (A) |  |
|  |  |  |  |  | DC13(Ind.) | DC12(Res.) |
| Pushbutton switch Illuminated pushbutton switch Selector switch (2-position) | 10 | $\begin{aligned} & 24 \\ & 110 \\ & 220 \\ & 440 \\ & 550 \end{aligned}$ | $\begin{array}{\|l\|} \hline 6 \\ 6 \\ 6 \\ 2.5 \\ 2 \end{array}$ | $\begin{aligned} & \hline 24 \\ & 110 \\ & 220 \\ & - \\ & - \end{aligned}$ | $\begin{aligned} & \hline 6 \\ & 1.3 \\ & 0.45 \end{aligned}$ | $\begin{aligned} & 6 \\ & 2.5 \\ & 1 \\ & - \\ & - \end{aligned}$ |
| Selector switch (3-position) <br> Pushbutton switch with selector ring <br> Pushbutton switch with selector lever | 10 | $\begin{aligned} & \hline 24 \\ & 110 \\ & 220 \\ & 440 \\ & 550 \end{aligned}$ | $\begin{array}{\|l\|} \hline 3 \\ 3 \\ 3 \\ 1.3 \\ 1 \end{array}$ | $\begin{array}{\|l} 24 \\ 110 \\ 220 \\ - \\ - \end{array}$ | $\begin{aligned} & 3 \\ & 0.65 \\ & 0.23 \end{aligned}$ - | $\begin{aligned} & 3 \\ & 1.3 \\ & 0.5 \\ & - \\ & - \end{aligned}$ |

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

- llluminated pushbuttons, illuminated selectors, pilot lights

| Transformer | Lamp voltage | LED (lamp base: BA9S/13) |  |  | Incandescent (lamp base: BA9S/13) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Type | Rated voltage | Consumption | Type | Rated voltage | Consumption |
| Without transformer | $\begin{aligned} & \text { 5.5V AC/DC } \\ & 6 \mathrm{~V} \mathrm{AC} \end{aligned}$ | APX508-6 $\square$ APX510-6 | $6 \mathrm{~V} \mathrm{AC}$ | Green, red, orange, amber: 7mA AC Yellow: 50mA AC | AHX135 | $6.3 \mathrm{~V} \mathrm{AC/DC}$ | $0.9 \mathrm{~W}$ |
|  | $6 \mathrm{~V} D \mathrm{DC}$ | APX508-D6 $\square$ APX510-D6 $\square$ | $6 \mathrm{~V} D \mathrm{DC}$ | Green, red, orange, amber: 11mA DC Yellow: 33mA DC | - | - | - |
|  | $12 \mathrm{~V} \text { AC/DC }$ | APX508-12 $\square$ APX510-12 $\square$ | 12V AC/DC | Green, red, orange, amber: $14 \mathrm{~mA} A C, 11 \mathrm{~mA}$ DC Yellow: 28mA AC, 22mA DC | - | - |  |
|  | 15V AC/DC | APX508-15 $\square$ APX510-15 $\square$ | 15V AC/DC | Green, red, orange, amber: $13 \mathrm{~mA} A C, 11 \mathrm{~mA} \mathrm{DC}$ Yellow: 26mA AC, 22mA DC | AHX279 | 18V AC/DC | 0.8W |
|  | 20 V AC/DC | - - |  |  | AHX144 | 24 V AC/DC | 0.9W |
|  | 24 V AC/DC | APX508-24 $\square$ APX510-24 $\square$ | 24V AC/DC | $12 \mathrm{~mA} \mathrm{AC}$, | AHX129 | 30V AC/DC | 0.8W |
| With transformer | $\begin{aligned} & \hline 110 \mathrm{~V} \mathrm{AC} \\ & 127 \mathrm{~V} \text { AC } \\ & 220 \mathrm{~V} \mathrm{AC} \end{aligned}$ | APX508-6 $\square$ APX510-6 $\square$ | 6V AC | 1.5VA | AHX135 | 6.3V AC/DC | $\begin{aligned} & \hline 2 \mathrm{VA} \\ & 2 \mathrm{VA} \\ & 2 \mathrm{VA} \end{aligned}$ |
|  | 254 V AC | APX508-6 $\square$ APX510-6 $\square$ | 6V AC | 2.5VA | AHX135 | 6.3V AC/DC | 2.5VA |
|  | 380 V AC |  |  |  |  |  | 2.5 VA |
|  | 440V AC |  |  |  |  |  | 2.5VA |
|  | 480 V AC |  |  |  |  |  | 2.5 VA |
|  | 550 V AC |  |  |  |  |  | 2.5VA |
| With resistor unit | 110V DC | APX508-24 $\square$ APX510-24 $\square$ | 24V AC/DC | 1.2W | - | - | - |

Note: Replace the $\square$ mark by the lamp luminous color code.

- 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 |

Note: $\bullet$ 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 $\mathrm{Ta}=25^{\circ} \mathrm{C}$

- Durability is affected by temperature, humidity, and voltage fluctuation.
■ Combination of lens color and LED luminous color
Lens color

(lens or color plate) | LED lamp |
| :--- |
| (high-brightness) |

[^51]Incandescent lamp voltage characteristics


| Operator | Contact | Momentary action Type | Alternate action Type | Operator dimensions, mm |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Flush round head <br> AF87-312 | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-F } \square \mathbf{1 0} \\ & \text { AH25-F } \square \mathbf{0 1} \\ & \text { AH25-F } \square \mathbf{1 1} \\ & \text { AH25-F } \square \mathbf{2 0} \\ & \text { AH25-F } \square \mathbf{0 2} \\ & \text { AH25-F } \square \mathbf{2 2} \end{aligned}$ | AH25-F5 $\square 10$ <br> AH25-F5 $\square 01$ <br> AH25-F5 $\square 11$ <br> AH25-F5 $\square 20$ <br> AH25-F5 $\square 02$ <br> AH25-F5 $\square 22$ |  |  |
| Extended round head <br> AF87-314 | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH25-E $\square 10$ <br> AH25-E $\square 01$ <br> AH25-E $\square 11$ <br> AH25-E $\square 20$ <br> AH25-E $\square 02$ <br> AH25-E $\square 22$ | AH25-E5 $\square 10$ <br> AH25-E5 $\square 01$ <br> AH25-E5 $\square 11$ <br> AH25-E5 $\square 20$ <br> AH25-E5 $\square 02$ <br> AH25-E5 $\square 22$ |  |  |
| Extended with half guard | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-G } \square 10 \\ & \text { AH25-G } \square 01 \\ & \text { AH25-G } \square 11 \\ & \text { AH25-G } \square 20 \\ & \text { AH25-G } \square 02 \\ & \text { AH25-G } \square 22 \end{aligned}$ | $\begin{aligned} & \text { AH25-G5 } \square 10 \\ & \text { AH25-G5 } \square \mathbf{0 1} \\ & \text { AH25-G5 } \square 11 \\ & \text { AH25-G5 } \square \mathbf{2 0} \\ & \text { AH25-G5 } \square 02 \\ & \text { AH25-G5 } \square \mathbf{2 2} \end{aligned}$ |  |  |
| Extended with full guard <br> SG-179 | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-G1 } \square 10 \\ & \text { AH25-G1 } \square 01 \\ & \text { AH25-G1 } \square 11 \\ & \text { AH25-G1 } \square 20 \\ & \text { AH25-G1 } \square 02 \\ & \text { AH25-G1 } \square 22 \end{aligned}$ | AH25-G6 $\square 10$ <br> AH25-G6 $\square 01$ <br> AH25-G6 $\square 11$ <br> AH25-G6 $\square 20$ <br> AH25-G6 $\square 02$ <br> AH25-G6 $\square 22$ |  |  |
| Mushroom head <br> SG-185 | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-M } \square \mathbf{1 0} \\ & \text { AH25-M } \square \mathbf{0 1} \\ & \text { AH25-M } \square \mathbf{1 1} \\ & \text { AH25-M } \square \mathbf{2 0} \\ & \text { AH25-M } \square \mathbf{0 2} \\ & \text { AH25-M } \square \mathbf{2 2} \end{aligned}$ | $\begin{aligned} & \text { AH25-M5 } \square 10 \\ & \text { AH25-M5 } \square 01 \\ & \text { AH25-M5 } \square 11 \\ & \text { AH25-M5 } \square 20 \\ & \text { AH25-M5 } \square 02 \\ & \text { AH25-M5 } \square 22 \end{aligned}$ |  |  |

[^52]- Contact block dimensions: See page 04CD/3/12

| Operator | Contact | Momentary action Type | Operator dimensions, mm |  |
| :---: | :---: | :---: | :---: | :---: |
| Push-lock, turn-reset | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-V } \square 10 \\ & \text { AH25-V } \square 01 \\ & \text { AH25-V } \square \mathbf{1 1} \\ & \text { AH25-V } \square \mathbf{2 0} \\ & \text { AH25-V } \square 02 \\ & \text { AH25-V } \square \mathbf{2 2} \end{aligned}$ |  |  |
| Wobble stick | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH25-UB10 <br> AH25-UB01 <br> AH25-UB11 <br> AH25-UB20 <br> AH25-UB02 <br> AH25-UB22 |  |  |

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 <br> SG-208 | $\begin{array}{\|l\|} \hline 1 \mathrm{NO} \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \\ 2 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \end{array}$ | AH25-SF $\square 10$ AH25-SF $\square 01$ AH25-SF $\square 11$ AH25-SF $\square 20$ AH25-SF $\square 02$ AH25-SF $\square 22$ | AH25-SF5 $\square 10$ AH25-SF5 $\square 01$ AH25-SF5 $\square 11$ AH25-SF5 $\square 20$ AH25-SF5 $\square 02$ AH25-SF5 $\square \mathbf{2 2}$ |  |  |
| Extended square head | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH25-SE $\square 10$ <br> AH25-SE $\square 01$ <br> AH25-SE $\square 11$ <br> AH25-SE $\square 20$ <br> AH25-SE $\square 02$ <br> AH25-SE $\square 22$ | AH25-SE5 $\square 10$ AH25-SE5 $\square 01$ AH25-SE5 $\square 11$ AH25-SE5 $\square 20$ AH25-SE5 $\square 02$ AH25-SE5 $\square 22$ |  |  |

- Button color

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

| Button color | Green | Red | Black | Yellow | White |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | B | Y | W |
|  |  |  |  |  |  |
| Button color | Dark green | Sky-blue | Orange |  |  |
| Code | D | S | O |  |  |

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

|  |  | $\begin{aligned} & \hline 1 \mathrm{NO}, 1 \mathrm{NC}, \\ & 2 \mathrm{NO}, 2 \mathrm{NC}, \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & 3 \mathrm{NO}, 3 \mathrm{NC}, \\ & 4 \mathrm{NO}, 4 \mathrm{NC}, \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $3 \mathrm{NO}+3 \mathrm{NC}$ | 4NO+4NC |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{A}$ | F,E,M,G,G1 | 45 | 67 | 89 | 111 |
|  | F5,E5,M5,G5,G6 | 67 | 89 | - | - |
|  | V | 48.5 | 70.5 | - | - |
|  | 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 | - | - |

* When attaching the terminal cover, the dimension of externals increase 1.5 mm .

- Button color

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

| Button color | Green | Red | Black | Yellow | White |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | B | Y | W |
|  |  |  |  |  |  |
| Button color | Dark green | Sky-blue | Orange |  |  |
| Code | D | S | O |  |  |

- The contact arrangement is $2 \mathrm{NO}+2 \mathrm{NC}$ 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 1.5 mm .

Pushbuttons

## AH25

## ■ Mechanically interlocked pushbutton switches

| Exterior view | Operator | Contact block | Cat. No. |
| :---: | :---: | :---: | :---: |
| Latched/Latched <br> AF89-610 | Flush/Flush <br> Flush/Extended <br> Flush/Mushroom | $\begin{aligned} & 1 \mathrm{NO} / 1 \mathrm{NO} \\ & 1 \mathrm{NO}+1 \mathrm{NC} / 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO} / 1 \mathrm{NO} \\ & 1 \mathrm{NO}+1 \mathrm{NC} / 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO} / 1 \mathrm{NO} \\ & 1 \mathrm{NO}+1 \mathrm{NC} / 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AH25-F5 $\square 10 /$ F5 $\square 10$ <br> AH25-F5 $\square 11 /$ F5 $\square 11$ <br> AH25-F5 $\square 10 / E 5 \square 10$ <br> AH25-F5 $\square 11 / E 5 \square 11$ <br> AH25-F5 $\square 10 / \mathrm{M} 5 \square 10$ <br> AH25-F5 $\square 11 / \mathrm{M} 5 \square 11$ |
| Latched/Unlatched <br> AF89-615 | Flush/Flush <br> Flush/Extended <br> Flush/Mushroom | $\begin{aligned} & 1 \mathrm{NO} / 1 \mathrm{NO} \\ & 1 \mathrm{NO}+1 \mathrm{NC} / 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO} / 1 \mathrm{NO} \\ & 1 \mathrm{NO}+1 \mathrm{NC} / 1 \mathrm{NO}+1 \mathrm{NC} \\ & 1 \mathrm{NO} / 1 \mathrm{NO} \\ & 1 \mathrm{NO}+1 \mathrm{NC} / 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | AH25-F5 $\square 10 / F \square 10$ <br> AH25-F5 $\square 11 / \mathrm{F} \square 11$ <br> AH25-F5 $\square 10 / E \square 10$ <br> AH25-F5 $\square 11 / \mathrm{E} \square 11$ <br> AH25-F5 $\square 10 / \mathrm{M} \square 10$ <br> AH25-F5 $\square 11 / \mathrm{M} \square 11$ |

- Button color

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

| Button color | Green | Red | Black | Yellow | White |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | B | Y | W |
|  |  |  |  |  |  |
| Button color | Dark green | Sky-blue | Orange |  |  |
| Code | D | S | O |  |  |

- Up to 2-contacts can be made.
- Dimensions, mm

AH25- $\square / \square$
Terminal screw
Panel thickness

M3.5

| Contact arrangement | $1 \mathrm{NO}, 1 \mathrm{NC}$ | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> $2 \mathrm{NO}, 2 \mathrm{NC}$ |
| :--- | :--- | :--- |
| $\mathrm{A}^{*}$ | 46.5 | 68.5 |

* When attaching the terminal cover, the deimension of externals increase 1.5 mm .

| Button | F, F5 | E, E5 | M, M5 |
| :--- | :--- | :--- | :--- |
| B | 7.5 | 14 | 22.5 |


| Operator | Contact | Momentary action Type | Alternate action Type | Operator dimensions, mm |
| :---: | :---: | :---: | :---: | :---: |
| Extended round head | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-L } \square 10 \square \\ & \text { AH25-L } \square 01 \square \\ & \text { AH25-L } \square 11 \square \\ & \text { AH25-L } \square 20 \square \\ & \text { AH25-L } \square 02 \square \\ & \text { AH25-L } \square 22 \square \end{aligned}$ | AH25-L5 $\square 10$ AH25-L5 $\square 01$ AH25-L5 $\square 11$ AH25-L5 $\square 20$ AH25-L5 $\square 02$ AH25-L5 $\square 22$ |  |
| Extended with full guard <br> (With openings) <br> 10-267 | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-L2 } \square 10 \square \\ & \text { AH25-L2 } \square 01 \square \\ & \text { AH25-L2 } \square 11 \square \\ & \text { AH25-L2 } \square 20 \square \\ & \text { AH25-L2 } \square 02 \square \\ & \text { AH25-L2 } \square 22 \square \end{aligned}$ | AH25-L6 $\square 10$ AH25-L6 $\square 01$ AH25-L6 $\square 11$ AH25-L6 $\square 20$ AH25-L6 $\square 02$ AH25-L6 $\square 22$ |  |
| Extended with full guard | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH25-L3 $\square 10$ ■ <br> AH25-L3 $\square 01 \square$ <br> AH25-L3 $\square 11$ ■ <br> AH25-L3 $\square 20 \square$ <br> AH25-L3 $\square 02$ <br> AH25-L3 $\square 22$ | $\begin{aligned} & \text { AH25-L7 } \square 10 \\ & \text { AH25-L7 } \square 01 \\ & \text { AH25-L7 } \square 11 \\ & \text { AH25-L7 } \square 20 \\ & \text { AH25-L7 } \square 02 \\ & \text { AH25-L7 } \square 22 \end{aligned}$ |  |
| Extended with transparent full guard | $\begin{array}{\|l} \hline 1 \mathrm{NO} \\ 1 \mathrm{NC} \\ 1 \mathrm{NO}+1 \mathrm{NC} \\ 2 \mathrm{NO} \\ 2 \mathrm{NC} \\ 2 \mathrm{NO}+2 \mathrm{NC} \end{array}$ | $\begin{aligned} & \text { AH25-L4 } \square 10 \square \\ & \text { AH25-L4 } \square 01 \square \\ & \text { AH25-L4 } \square 11 \square \\ & \text { AH25-L4 } \square 20 \square \\ & \text { AH25-L4 } \square 02 \square \\ & \text { AH25-L4 } \square 22 \square \end{aligned}$ |  |  |

- Lens color

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

| Button color | Green | Red | Yellow | White | Sky-blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | Y | W | S | O |

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 $\square$ mark by the lamp voltage code

| Transformer |  | $\begin{aligned} & \text { Code } \\ & \text { LED } \end{aligned}$ | Incandescent |
| :---: | :---: | :---: | :---: |
| Without transformer | 6V DC 6V AC 5.5V AC/DC 12V AC/DC 15V AC/DC 20V AC/DC 24V AC/DC | AD3 <br> A3 <br> B3 <br> C3 <br> E3 | $\overline{\text { Blank }}$ $\overline{\text { C }}$ D E |
| With transformer | $\begin{aligned} & \hline 100-110 \mathrm{~V} \text { AC } \\ & 115-127 \mathrm{~V} \text { AC } \\ & 200-220 \mathrm{~V} \text { AC } \\ & 230-254 \mathrm{VAC} \\ & 350-380 \mathrm{~V} \text { AC } \\ & 400-440 \mathrm{AC} \\ & 480 \mathrm{~V} \text { AC } \\ & 500-550 \mathrm{~V} \end{aligned}$ | H3 L3 M3 Q3 S3 T3 V3 W3 | $H$ $H$ $M$ $Q$ $Q$ $S$ T V $W$ |

## AH25

| Operator | Contact | Momentary action Type | Alternate action Type | Operator dimensions, mm |
| :---: | :---: | :---: | :---: | :---: |
| Extended square head | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH25-SL $\square 10$ ■ <br> AH25-SL $\square 01 \square$ <br> AH25-SL $\square 11$ ■ <br> AH25-SL $\square 20$ ■ <br> AH25-SL $\square 02 \square$ <br> AH25-SL $\square 22$ I | AH25-SL5 $\square 10 \square$ <br> AH25-SL5 $\square 01 \square$ <br> AH25-SL5 $\square 11 \square$ <br> AH25-SL5 $\square 20 \square$ <br> AH25-SL5 $\square 02 \square$ <br> AH25-SL5 $\square 22$ |  |
| Flush square head | $\begin{aligned} & 1 \mathrm{NO} \\ & 1 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO} \\ & 2 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-SL1 } \square 10 \square \\ & \text { AH25-SL1 } \square 01 \square \\ & \text { AH25-SL1 } \square 11 \square \\ & \text { AH25-SL1 } \square 20 \square \\ & \text { AH25-SL1 } \square 02 \square \\ & \text { AH25-SL1 } \square 22 \square \end{aligned}$ | AH25-SL6 $\square 10 \square$ <br> AH25-SL6 $\square 01 \square$ <br> AH25-SL6 $\square 11$ I <br> AH25-SL6 $\square 20 \square$ <br> AH25-SL6 $\square 02 \square$ <br> AH25-SL6 $\square 22$ |  |

Notes: For SL,SL1,SL5 and SL6,switches with incandescent lamp only.

| Operator | Contact | Type | Operator dimensions, mm |
| :--- | :--- | :--- | :--- |
| Push-lock, <br> turn-reset | 1 NO | AH25-VL $\square \mathbf{1 0}$ |  |
|  | 1 NC | AH25-VL $\square \mathbf{0 1 ■}$ |  |

- Lens color

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

| Button color | Green | Red | Yellow | White | Sky-blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | Y | W | S | O |

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 $\square$ mark by the lamp voltage code

| Transformer |  | Code <br> LED | Incandescent |
| :--- | :--- | :--- | :--- |
| Without transformer | 6 V DC | AD3 | - |
|  | 6 V AC | A3 | - |
|  | 5.5 V AC/DC | - | Blank |
|  | 12 V AC/DC | B3 | - |
|  | 15 V AC/DC | C3 | C |
|  | 20 V AC/DC | - | D |
|  | 24 V AC/DC | E3 | E |
| With transformer | $100-110 \mathrm{~V}$ AC | H3 | H |
|  | $115-127 \mathrm{~V}$ AC | L3 | L |
|  | $200-220 \mathrm{~V}$ AC | M3 | M |
|  | $230-254 \mathrm{~V}$ AC | Q3 | Q |
|  | $350-380 \mathrm{~V}$ AC | S3 | S |
|  | $400-440 \mathrm{~V}$ AC | T3 | T |
|  | 480 V AC | V3 | V |
|  | $500-550 \mathrm{~V}$ AC | W3 | W |

## - Contact block dimensions, mm



With transformer


Without transformer (For VL type)


Without transformer

|  | Contact block <br> Operator | 1NO, 1NC | $\begin{aligned} & \hline 2 \mathrm{NO}, 2 \mathrm{NC}, \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | 3NO, 3NC | $\begin{aligned} & 4 \mathrm{NO}, 4 \mathrm{NC}, \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $3 \mathrm{NO}+3 \mathrm{NC}$ | 4NO+4NC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A | L | 64.5 |  | 86.5 |  | 108.5 | 130.5 |
| *1 | L5 | 86.5 |  | 108.5 |  | - | - |
|  | L2,L3,L4 | 63.5 |  | 85.5 |  | 107.5 | 129.5 |
|  | L6,L7 | 85.5 |  | 107.5 |  | - | - |
|  | VL | 48.5 | 70.5 | 70.5 | 92.5 | - | - |
|  | SL,SL1 | 66 |  | 88 |  | 110 | 132 |
|  | SL5,SL6 | 88 |  | 110 |  | - | - |

With transformer

|  |  | 2NO, 2NC <br> $1 \mathrm{NO}+1 \mathrm{NC}$ | 3NO, 3NC | 4NO, 4NC <br> $2 N O+2 N C$ |
| :--- | :--- | :--- | :--- | :--- |
| *2 | L | L5 | 81 | 86.5 |
| L2,L3,L4 | 103 | 108.5 | 130.5 | 152.5 |
| L6,L7 | 80 | 85.5 | 107.5 | 129.5 |
| VL | 102 | 107.5 | 129.5 | 151.5 |
| SL,SL1 | 62 | 70.5 | - | - |
| SL5,SL6 | 83 | 88 | 110 | 132 |

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 1.5 mm .
*2 When attaching the terminal cover, the dimension of externals increase 1.5 mm . (Except for 1 NO and 1NC)

Selector Switches

- 2-position


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

- $\square$, ( ) 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 <br> Operator | $\begin{aligned} & \hline 1 \mathrm{NO}, 1 \mathrm{NC}, \\ & 2 \mathrm{NO}, 2 \mathrm{NC}, \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \hline 3 \mathrm{NO}, 3 \mathrm{NC}, \\ & \text { 4NO, 4NC, } \\ & \text { 2NO+2NC } \end{aligned}$ | 3NO+3NC | 4NO+4NC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A | 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 1.5 mm .

- Up to 8-contact block of the contact arrangement can be made.
- Knob color

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

| Knob color | Green | Red | Black |
| :--- | :--- | :--- | :--- |
| Code | G | R | B |

The standard knob color is black.

- Key code No.

Replace the $\square$ 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 | A | D | B |
| :---: | :---: | :---: | :---: |
| Removable position | $\underbrace{45^{\circ}}$ | $\underbrace{45^{\circ}-\frac{85}{2}}_{8}$ | $\frac{4_{5}^{\circ}-450}{(3)}$ |
| J2 | $\bullet$ | $\bullet$ | $\bullet$ |
| J0 | $\bullet$ | - | - |
| SJ2 | $\bullet$ | $\bullet$ | - |

$\bullet$ : Available -: Not available

Selector Switches

## AH25



[^53]Operator dimensions: See page 04CD/3/19

## - Contact block dimensions, mm

|  |  | $\underbrace{$ Contact  <br>  block $\|}_{\text {Operator }}$ | $\begin{aligned} & 1 \mathrm{NO}, 1 \mathrm{NC} \\ & 2 \mathrm{NO}, 2 \mathrm{NC} \\ & 1 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { 3NO, 3NC } \\ & \text { 4NO, 4NC } \\ & \text { 2NO+2NC } \end{aligned}$ | 3NO+3NC | 4NO+4NC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $A$ | 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 1.5 mm .

- Up to 8 -contact block of the contact arrangement can be made

For spring return switches, up to 4-contact block can be made.

- Key removable positions

Replace the ( ) mark by the following code No.

| Code | A | B | C | D | E | F | G |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Removable position | $\underbrace{45^{\circ}+\frac{85}{0}}$ | $\underbrace{40}_{\left(35^{\circ}-450\right.}$ | $\underbrace{45^{\circ}+450}$ | $\underbrace{45^{\circ}+450}_{8}$ | $\underbrace{45^{\circ}+450}$ | $\frac{45^{\circ}+\frac{85}{5}}{\sqrt[3]{3}}$ | $\underbrace{45^{\circ}}_{4}$ |
| J3, SJ3 J5 J6 | $\stackrel{-}{-}$ | - | - |  | $\bullet$ |  | - |

- Contact operation (Example)

3-position

| Type | Contact arrangement | Operator position |  |
| :---: | :---: | :---: | :---: |
|  |  | $\begin{array}{lll} \hline L & C & R \\ (1) & (1) & \cap \end{array}$ | $\begin{array}{lll} \hline \mathrm{L} & \mathrm{C} & \mathrm{R} \\ (\mathrm{O} & (1) & \bigcirc \end{array}$ |
| P3, PW3, SP3, J3, SJ3, P5, PW5, J5 | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) | Upper contact | Lower contact |
| P6, PW6, J6 | $1 \mathrm{NO}+1 \mathrm{NC}$ <br> (1) (2) | Upper contact | Lower contact |
| P1, PW1 | $2 \mathrm{NO}+2 \mathrm{NC}$ <br> (1) (2) <br> (3) (4) | Upper contact | Lower contact |
| - Contact closed <br> Note: (1)-(2),(3)-4) : Contact block terminal No. <br> - Up to 8-contact block of the contact arrangement can be made. <br> For P1, PW1 types, up to 4 -contact block can be made. |  |  |  |

## - Position of contact block



Selector Switches

## AH25

## ■ Selector switches (control type)

3-position

| Operator | Operation | Knob color or key removable position | Contact arrangement (2NO+2NC only) | Type |
| :---: | :---: | :---: | :---: | :---: |
| Knob | Maintained each $60^{\circ}$ | Color code: <br> B: Black (Standard) Color other than above are available <br> $\binom{$ G: Green }{ R: Red } <br> R: Red | Replace the mark by type arrangement code (shown on under table). | AH25-PCB |
|  |  |  |  | AH25-PCR■ |
|  |  |  |  | AH25-PCG■ |

## Contact operation ( $2 \mathrm{NO}+2 \mathrm{NC}$ )

| Code | Operation | Contact operation |  |
| :---: | :---: | :---: | :---: |
|  |  | Upper contact | Lower contact |
| 012 | Maintained <br> each 60 |  | (2) |
| 032 |  | (1) | (2) |
| 052 |  |  |  |
| 072 |  | $(1)$ $(3)$ | ${ }_{(4)}^{(2)}$ |
| 092 |  | $\left(\begin{array}{l}1 \\ (3) \\ (1)\end{array}\right.$ <br>  |  |
| 112 |  |  | (2) |
| 132 |  |  | (2) $(\mathbb{1}){ }^{2}{ }^{2}{ }^{3}-2$ |
| 152 |  | $(1)$ $(3)$ |  |
| 172 |  | $(1)$ $(3)$ |  |
| 192 |  | $\left(\begin{array}{l}1 \\ (3) \\ (3)\end{array}\right.$ |  |
| 212 |  | (1) |  |


| Code | Operation | Contact operation |  |
| :---: | :---: | :---: | :---: |
|  |  | Upper contact | Lower contact |
| 022 | Maintained <br> each $60^{\circ}$ | (1) (3) | (2) |
| 042 |  | (1) (3) | (2) |
| 062 |  | (1) (3) | (2) <br> (4) (3) |
| 082 |  | (1) (3) | (2) |
| 102 |  | (1) $(3)$ | (2) 10 |
| 122 |  | (1) | (2) $\begin{aligned} & 1 \\ & (4) \\ & 3\end{aligned}$ |
| 142 |  | (1) $(3)$ | (2) |
| 162 |  | (1) | (2) <br> (4) (3) |
| 182 |  | (1) $(3)$ | (2) <br> (4) |
| 202 |  | (1) (3) | (2) <br> (4) |
|  |  |  | - Contact closed |

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

- Dimensions, mm


[^54]| Operator | Operation | Contact | Type |
| :---: | :---: | :---: | :---: |
| Knob | Maintained each $90^{\circ}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-PL2 } \square 11 \square \\ & \text { AH25-PL2 } \square 22 \square \end{aligned}$ |
|  | Spring return $90^{\circ}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { AH25-PLO } \square 11 \square \\ & \text { AH25-PLO } \square 22 \square \end{aligned}$ |

- Operator dimensions, mm

- 3-position

| Operator | Operation | Contact | Type |
| :---: | :---: | :---: | :---: |
| Knob | Maintained <br> each $45^{\circ}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH25-PL3 $\square 11 \square$ <br> AH25-PL3 $\square 22$ |
|  | Manual/ spring return <br> (1) each $45^{\circ}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH25-PL6 $\square 11 \square$ <br> AH25-PL6 $\square 22$ |
|  | Manual/ spring return <br> (1) each $45^{\circ}$ | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ | AH25-PL7 $\square 11$ ■ <br> AH25-PL7 $\square 22$ |

Notes: $\square \square$, $\square$ and contact arrangements: See page 04CD/3/24
-3 -position, spring return type is not available.

- Contact block dimensions, mm

Switch: with transformer Switch: without transformer


|  | Operator $\quad$Contact <br> block |  | 1NO, 1NC | $\begin{aligned} & 1 \mathrm{NO}+1 \mathrm{NC} \\ & 2 \mathrm{NO}, 2 \mathrm{NC} \end{aligned}$ | 3NO, 3NC | $\begin{aligned} & 2 \mathrm{NO}+2 \mathrm{NC} \\ & 4 \mathrm{NO}, 4 \mathrm{NC} \end{aligned}$ | $3 \mathrm{NO}+3 \mathrm{NC}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A | AH25 | Without transformer | 48.5 | 70.5 | 70.5 | 92.5 | 114.5 |
| *1 | -PL | With transformer | 62 | 70.5 | 92.5 | 114.5 | - |

[^55]${ }^{* 2}$ When attaching the terminal cover, the dimension of external increase 1.5 mm . (Except for 1 NO and 1 NC )

## AH25

- Replace the $\square$ mark by the following lamp voltage code

| Transformer | Voltage | Code LED | Incandescent |
| :---: | :---: | :---: | :---: |
| Without | $\begin{aligned} & 5.5 \mathrm{~V} \mathrm{AC/DC} \\ & \text { 6V DC } \\ & \text { 6V AC } \\ & \text { 12V AC/DC } \\ & \text { 15V AC/DC } \\ & \text { 20V AC/DC } \\ & \text { 24V AC/DC } \end{aligned}$ | AD3 <br> A3 <br> B3 <br> C3 <br> - <br> E3 | Blank <br> - <br> - <br> - <br> C <br> D <br> E |
| With | $\begin{aligned} & 100-110 \mathrm{~V} \text { AC } \\ & 115-127 \mathrm{~V} \text { AC } \\ & 200-220 \mathrm{~V} \text { AC } \\ & 230-254 \mathrm{~V} \text { AC } \\ & 350-380 \mathrm{~V} \\ & 400-440 \mathrm{~V} \text { AC } \\ & 480 \mathrm{~V} \text { AC } \\ & 500-550 \mathrm{~V} \end{aligned}$ | H3 <br> L3 <br> M3 <br> Q3 <br> S3 <br> T3 <br> V3 <br> W3 | H L M Q S T V W |

## - Contact arrangement and operator position

2-position

| Transformer | Contact arrangement | Contact block |  | Operator position |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mounting position | Type | Left <br> $\bigcirc$ | Right <br> $\bigcirc$ |
| With/without | 1NO | (1) | NO | - | $\bullet$ |
| With/without | 1NC | (1) | NC | $\bullet$ | - |
| Without | 1NO+1NC | $\begin{aligned} & \hline(1) \\ & (2) \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | - |  |
| With | 1NO+1NC | $\begin{aligned} & \text { (1) } \\ & (2) \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { NC } \\ & \text { NO } \end{aligned}$ |  | $\bullet$ |
| With/without | 2NO | (1) (2) | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ |  |  |
| Without | $2 \mathrm{NO}+2 \mathrm{NC}$ | (1) <br> (2) <br> (3) (4) | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | - $\bullet$ - $\bullet$ |  |
| With | ${ }_{\star 1}^{2 N O+2 N C}$ | (1) <br> (2) <br> (3) <br> (4) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NC} \\ & \mathrm{NO} \\ & \mathrm{NO} \end{aligned}$ | $\stackrel{-}{\bullet}$ |  |

Notes: *1: AH25-PL2

- : Contact closed, - : Contact open
- Replace the $\square$ mark by the following knob color code

| Color | Green | Red | White | Sky-blue | Yellow | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | W | S | Y | O |

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 <br> position | Operation | Without <br> transformer | With <br> 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 |

3-position

| Transformer | Contact arrangement | Contact block |  | Operator position |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Mounting position | Type | Left 0 | Center | Right $\bigcirc$ |
| Without | ${ }_{\star 1}^{1 N O}+1 \mathrm{NC}$ | (1) <br> (2) | $\begin{aligned} & \mathrm{NO} \\ & \mathrm{NC} \end{aligned}$ | $\bullet$ - | - | $-$ |
|  | $\begin{aligned} & \text { 1NO }+1 \mathrm{NC} \\ & { }^{2} \end{aligned}$ | $\begin{aligned} & (1) \\ & (2) \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathrm{NO} \\ \mathrm{NC} \end{array}$ | $-$ | - |  |
|  | $\begin{aligned} & \text { 2NO+2NC } \\ & * 3 \end{aligned}$ | (1) <br> (2) <br> (3) <br> (4) | NO <br> NC <br> NO <br> NC |  |  |  |
| With | ${\underset{\star 1}{ } 1 \mathrm{NO}+1 \mathrm{NC}}^{2}$ | (1) <br> (2) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NO} \end{aligned}$ | $-$ | - |  |
|  | ${\underset{* 2}{ } 1 \mathrm{NO}+1 \mathrm{NC}}^{2}$ | (1) (2) | $\begin{aligned} & \mathrm{NC} \\ & \mathrm{NO} \end{aligned}$ |  | - | $-$ |
|  | ${\underset{* 3}{2 N O}+2 N C}^{2}$ | (1) <br> (2) <br> (3) <br> (4) | $\begin{array}{\|l} \mathrm{NC} \\ \mathrm{NC} \\ \mathrm{NO} \\ \mathrm{NO} \end{array}$ |  | $\begin{aligned} & - \\ & - \\ & - \\ & - \end{aligned}$ |  |

Notes: *1: AH25-PL3, PL6 *3 : AH25-PL3
*2: AH25-PL7

- : Contact closed, - : Contact open

With transformer


- Incandescent lamp

| Lens | Lamp voltage |  | Type |
| :---: | :---: | :---: | :---: |
| Dome | Without transformer | 15V DC <br> 24V DC | AH25-ZM $\square$ <br> AH25-ZM $\square E$ |
|  | With transformer | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \mathrm{AC} \end{aligned}$ | $\begin{aligned} & \text { AH25-ZM } \square \mathrm{H} \\ & \text { AH25-ZM } \square \mathrm{M} \end{aligned}$ |
|  | Without transformer | $\begin{aligned} & 15 \mathrm{~V} D C \\ & 24 \mathrm{~V} \mathrm{DC} \end{aligned}$ | $\left\lvert\, \begin{aligned} & \text { AH25-ZK } \square \\ & \text { AH25-ZK } \square E \end{aligned}\right.$ |
|  | With transformer | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \mathrm{AC} \end{aligned}$ | $\begin{aligned} & \text { AH25-ZK } \square \mathrm{H} \\ & \text { AH25-ZK } \square \mathrm{M} \end{aligned}$ |
|  | Without transformer | $\begin{aligned} & 15 \mathrm{~V} \mathrm{DC} \\ & 24 \mathrm{~V} \mathrm{DC} \end{aligned}$ | $\begin{aligned} & \text { AH25-ZS } \square \\ & \text { AH25-ZS } \square E \end{aligned}$ |
|  | With transformer | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \text { AC } \end{aligned}$ | $\begin{aligned} & \text { AH25-ZS } \square \mathbf{H} \\ & \text { AH25-ZS } \square \text { M } \end{aligned}$ |
| Flush square, with legend plate | Without transformer | $\begin{aligned} & 15 \mathrm{~V} D C \\ & 24 \mathrm{~V} D C \end{aligned}$ | $\begin{aligned} & \text { AH25-ZN } \square \\ & \text { AH25-ZN } \square E \end{aligned}$ |
|  | With transformer | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \mathrm{AC} \end{aligned}$ | $\begin{aligned} & \text { AH25-ZN } \square \mathbf{H} \\ & \text { AH25-ZN } \square \mathbf{M} \end{aligned}$ |
| Dome/short-body with transformer |  | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \text { AC } \end{aligned}$ | $\begin{aligned} & \text { AH25-ZM } \square \text { H8 } \\ & \text { AH25-ZM } \square \text { M8 } \end{aligned}$ |

## Lens color

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

| Button color | Green | Red | Yellow | White | Sky-blue | Orange |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Code | G | R | Y | W | S | O |

Pilot light with LED lamp, sky-blue is not available.

- LED lamp

| Lens | Lamp voltage |  | Type |
| :---: | :---: | :---: | :---: |
| Dome | Without transformer | $\begin{aligned} & 12 \mathrm{VDC} \\ & 24 \mathrm{VDC} \end{aligned}$ | $\begin{aligned} & \text { AH25-ZM } \square \text { B3 } \\ & \text { AH25-ZM } \square \text { E3 } \end{aligned}$ |
|  | With transformer | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \text { AC } \end{aligned}$ | $\begin{aligned} & \text { AH25-ZM } \square \mathbf{H 3} \\ & \text { AH25-ZM } \square \text { M3 } \end{aligned}$ |
|  | Without transformer | $\begin{aligned} & 12 \mathrm{~V} D C \\ & 24 \mathrm{~V} \mathrm{DC} \end{aligned}$ | $\begin{aligned} & \text { AH25-ZK } \square \text { B3 } \\ & \text { AH25-ZK } \square \text { E3 } \end{aligned}$ |
|  | With transformer | $\left\|\begin{array}{l} 110 \mathrm{~V} \mathrm{AC} \\ 220 \mathrm{VAC} \end{array}\right\|$ | $\begin{aligned} & \text { AH25-ZK } \square \mathrm{H} 3 \\ & \text { AH25-ZK } \square \mathrm{M} 3 \end{aligned}$ |
| Dome/ short-body with transformer |  | $\begin{aligned} & 110 \mathrm{~V} \mathrm{AC} \\ & 220 \mathrm{~V} \text { AC } \end{aligned}$ | $\begin{aligned} & \text { AH25-ZM } \square \text { H9 } \\ & \text { AH25-ZM } \square \text { M9 } \end{aligned}$ |

- Voltage

Available lamp voltage are as follow.

| Description | Voltage | Code <br> 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 | C |
|  | 20V AC/DC | - | D |
|  | 24V AC/DC | E3 | E |
| With transformer | 100-110V AC | H3 | H |
|  | 115-127V AC | L3 | L |
|  | 200-220V AC | M3 | M |
|  | 230-254V AC | Q3 | Q |
|  | $350-380 \mathrm{~V}$ AC | S3 | S |
|  | $400-440 \mathrm{~V}$ AC | T3 | T |
|  | 480 V 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.
${ }^{* 2}$ When attaching the terminal cover, the dimension of externals increase 1.0 mm .

## 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

V, VL

${ }^{* 1}$ G, G5 type: 42
*2 This dimension applies SF, SF5, SE, SE5, SL, SL5, SL1, SL6, SP, SJ types.
${ }^{* 3}$ L, SL type: 44 (not meet with the live section.)

## - Pilot light

- Panel cutout hole

ZM, ZK,
ZS, ZN

${ }^{* 4}$ ZS, ZN type: In case of horizontal mounting

## 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 AHX106, 155
Dust-proof cap AHX025, 026, 027
AHX046, 047, 048
AHX105, 112, 114
When attached to the panel in combination with a water-proof or dustproof cap, the water-proof cap or dustproof cap may sink downward and prevent the depressed button from returning to its original position. As shown in the following figure, cut an approximately $5-\mathrm{mm}$ 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 $2.5 \mathrm{~N} \cdot \mathrm{~m}$.


## Degree of protection

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

## - Adjustment packing

Four 1.6 mm 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 1.6 mm , one 1.6 mm packing is needed (Purchased separately).

Mounting panel thickness and number of packings (reference)


Notes:

1. 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.

| Illuminated pushbutton switch | Illuminated selector switch (PL) | Pilot light |
| :---: | :---: | :---: |
| (Without transformer)* | Illuminated push-lock switch (VL) | (Without transformer)* |
|  | (Without transformer)* |  |
| Transformer(AHX511- $\square$ ) | Resister unit (AHX519) <br> Voltage stabilizing unit (AHX518) <br> Flicker unit (AHX516) |  |
| Terminal No.X1,X2 | Terminal No.X1 (-),X2 (+) |  |
| 1NO(AHX290,2901 to 2902) | 1NC(AHX291,2911 to 2914) |  |

Other items are the same as for the AR22 and DR22 series, see page 04/53 to 04/57.

Pushbuttons/Selectors/Pilot Lights
AH25
Accessories

## Accessories

| Description | Type |
| :---: | :---: |
| Wrench | AHX001 |
| Panel plug | AHX003 <br> Color: Silver (metal) Dimensions, mm |
| Dust-tight cap (indoor use) | F type Red AHX046 Dimensions, mm <br> Green AHX047 $\phi 34 \times 17.3$ <br>  Black AHX048   <br> E type Red <br>  <br> Green AHX025 Dimensions, mm <br>  AH026 $\phi 34 \times 17.3$  <br> Black AHX027   <br> M type Red AHX105-R Dimensions, <br> Green AHX105-G mm  <br>  Black AHX105-B $\phi 45 \times 25$ <br>  Yellow AHX105-Y  <br>  White AHX105-W  |
| Dust-tight cap (outdoor use) | F type Red AHX112-R Dimensions, <br>  Green AHX112-G mm <br>  Black AHX112-B  <br> E type Red AHX114-R Dimensions, <br>  Green AHX114-G mm <br>  Black AHX114-B ${ }^{\phi} 34 \times 17.3$ |
| Water-tight cap | E type $\quad$ AHX106 L type Nomensions, $\mathrm{mm} \phi 31 \times 18$ Note: The only color available is transparent. |
| Lamp changer | AHX029 For Incandescen lamp AHX790 For LED lamp |





Pushbuttons/Selectors/Pilot Lights
AH25
Accessories


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


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

| Description | Type |
| :---: | :---: |
| Locking attachment for E type | AHX053 <br> Locks the button as it is pressed, easily attached and removed with the nut. |
| Special tool SG-873 | AHX321 <br> This is a special tool for removing contact blocks and transformers. It can also remove round color lens. |
| Legend plate (Standard) Y-1545 | AHX351( ) |
| Legend plate (Unprinted) <br> AF-87-49 | Unprinted aluminume AHX351-A <br> Unprinted aluminume, short AHX351-AS <br> size  |

Pushbuttons/Selectors/Pilot Lights
AH25
Mass

- Mass, gram

AH25 series

| Type |  | $\begin{gathered} \hline 1 \mathrm{NO} \\ (1 \mathrm{NC}) \end{gathered}$ | $\begin{gathered} \hline 2 \mathrm{NO} \\ (2 \mathrm{NC}) \\ (1 \mathrm{NO}+1 \mathrm{NC}) \end{gathered}$ | $\begin{gathered} \hline 2 \mathrm{NC} \\ + \\ 2 \mathrm{NO} \end{gathered}$ | $\begin{gathered} \text { 3NC } \\ + \\ 3 \mathrm{NO} \end{gathered}$ | $\begin{gathered} \text { 4NC } \\ + \\ 4 \mathrm{NO} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 | - | - |


| Type | 1NO(1NC)/1NO(1NC) | 2NO(2NC)/2NO(2NC) <br> $1 \mathrm{NO}+1 \mathrm{NC} / 1 \mathrm{NO}+1 \mathrm{NC}$ |
| ---: | :---: | :---: |
| 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 $22 \mathrm{~mm}, 25 \mathrm{~mm}$ ，and 30 mm 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．）


AF92－388
AF92－277

## $\square$ Type number nomenclature

## $\frac{\mathrm{AHX}}{\mathrm{A}} 9 \frac{0}{(2)} \frac{1}{3} \frac{\mathrm{~A}}{4}$

（1）Product category
AHX：Type
（2）Size of mounting hole
2： 22 mm dia．series
1： 25 mm dia．series
$0: 30 \mathrm{~mm}$ 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 22 mm 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口1A |
|  |  | AHX9 ${ }^{\text {a }}$ A |
|  |  | AHX9 $\square 3 \mathrm{~A}$ |
|  |  | AHX9 ${ }^{\text {a }}$ A |
|  |  | AHX9 $\mathrm{C}^{\text {A }}$ |
| Dust protected type， protected against water jets | Dedicated box with one hole． | AHX929W |
|  |  | AHX919W |
|  |  | AHX909W |
|  |  | AHX9口1W |
|  |  | AHX9口2W |
|  |  | AHX9口3W |
|  |  | AHX924W |

Replace the $\square$ 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 <br> (No condensation or no icing) | -25 to $+50^{\circ} \mathrm{C}$ |  |  |
| Humidity | 45 to $85 \%$ RH(with in -5 to $+40^{\circ} \mathrm{C}$ ) |  |  |
| Applicable type *1 | $22,25,30 \mathrm{~mm}$ dia.Command switch series <br> AK22, RC310-F Cam type <br> selector switch <br> 30 mm dia. short-body type meter | See the description in the bellow: <br> Mountable switches and degree of protection |  |
| Depth | 73 mm | 84 mm |  |
| Laed hole | Knockout hole (22mm dia. top side, 27mm dia. bottom side) |  |  |
| Options | Mounting bracket: A mounting <br> bracket is available, with which <br> the command box can be <br> mounted vertical or at an angle <br> of 15 (see page 04CD/4/4) |  |  |
|  | Command boxes incorporating switches are available |  |  |

Note: *1 Check the effective depth of the box when selecting mountable switches.

## $\square$ 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)
-25 mm dia. 30 mm 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)
$\cdot 25 \mathrm{~mm}$ 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.


Fig. 1


Fig. 2

Dimensions, mm:

- Enclosed type


| Number of <br> holes | Dimension $: \mathrm{mm}$ |  |  |
| :--- | :--- | :--- | :--- |
|  | A | B | C |
| 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)


22 mm dia. series


25 mm dia. series


## ■ Accessories (for Enclosed type)

- Mounting bracket

| Number of <br> holes | Mounting method | Type |
| :--- | :--- | :--- |
| 1 | Vertical type <br> Angle type | AJ91S <br> AJ91K |
| 2 | Vertical type | AJ92S |
| Angle type | AJ92K |  |
| 3 | Vertical type | AJ93S |
|  | Angle type | AJ93K |
| 4 | Vertical type <br> Angle type | AJ94S |
| AJ94K |  |  |
| 5 | Vertical type <br> Angle type | AJ95S <br> AJ95K |

Dimensions, mm:

 (Vertical type)


| Type | Dimension:mm |  |  |
| :--- | :--- | :--- | :--- |
|  | A | B | $C^{\circ}$ |
| 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

| Type | Mass | Type | Mass | Type | 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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- 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.
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## INDIVIDUAL CATALOG 04

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[^0]:    Note: Control type: See page 04/29 to 04/31

[^1]:    Note: $\square \square$ See page 04/19

[^2]:    Note: $\square \square$ See page 04/21

[^3]:    Notes: • Button color : Red only

[^4]:    Notes: AR22VGF: LED 24V AC/DC and neon only

[^5]:    Note: $\square$ See page 04/37

[^6]:    Note: Recommended tightening torque is from 1 to $1.5 \mathrm{~N} \cdot \mathrm{~m}$

[^7]:    Notes: *1 AR22M0 $\square$, M5 $\square$, V5 $\square$, V0 $\square$, V2 $\square$, V7R, VG $\square: 42 \mathrm{~mm}$ AR22M3R, M8R: 49mm

[^8]:    Notes: * White: APX509-24O

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

[^9]:    Note：$\square \square$ See page 04／72

[^10]:    Note: $\square \square$ See page 04/74

[^11]:    Notes: • Button color: Red only

[^12]:    Notes: • (1) to (4): Contact block mounting position

    - (1) - (2), (3) - (4): Contact block terminal No.
    - Contact arrangements: See page 04/80

[^13]:    Notes: ©: Contact closed

[^14]:    Note: $\square$ See page 04/90

[^15]:    Note: ${ }^{* 1}$ Except for the types 110 V AC, 127 V AC and 220 V AC.

[^16]:    Note : Contact arrangements indicated in the table can be supplied

[^17]:    Notes: ${ }^{-1} \mathrm{~A}$ combination of the translucent button and the white legend plate comes to white.
    ${ }^{2}$ The protective cover and button of the thin type are made of an integral structure.
    ${ }^{*}{ }^{3}$ The protective cover of the thin type is available for momentary action only.
    ${ }^{* 4}$ Available for standard type only.

[^18]:    Note: ${ }^{* 1} \mathrm{~A}$ combination of the translucent lens and the white legend plate comes to white lens (except for dome type).

[^19]:    Note:
    means the contact closed (ON)

[^20]:    Note: ${ }^{*} \bullet \longrightarrow$ means the contact closed (ON)

[^21]:    Note: *1 A combination of the transparent button and the white legend plate comes to white.

[^22]:    Note: *1 A combination of the transparent lens and the white legend plate comes to white (except for dome type).

[^23]:    O: Available -: Not available

[^24]:    Note: *1 A combination of the translucent button and the white legend plate comes to white lens.

[^25]:    Note: *1 A combination of the transparent lens and the white legend plate comes to white.

[^26]:    O: Available -: Not available

[^27]:    Note: © : See page 04/292

[^28]:    Note: Replace the $\square$ mark by the button color code, see page 04/196.

[^29]:    Note: Replace the $\square$ mark by the button color code, see page 04/198.

[^30]:    - 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.

[^31]:    Note: Replace the $\square$ mark by the following color code, see page 04/215.

[^32]:    Note: Replace the $\square$ mark by the following color code, see page 04/217.

[^33]:    U: Upper contact block

[^34]:    Note: *1 For 1NC
    *2 For 2NC

[^35]:    Notes: • Maximum power consumption per one square window, except for half-size window.

[^36]:    INH: Inhibit terminal
    P: Parity check terminal
    C: Common terminal

    - : Turned ON

[^37]:    Note: $\square$ : Type of operation
    Contact arrangement - See page 04/265.

[^38]:    Note: If a micro switch is equipped, it will be activated when the handle is pulled.

[^39]:    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.

[^40]:    Notes: - Certified lamp: LED, incandescent lamp and neon

    - Certified operating lamp voltage: 6, 12 and 24 V DC (LED)/ 5, 12, 15 and 24 V AC/DC (incandescent lamp)/

    110, 120, 220 and 240 V AC (neon) $/ 110,220 \mathrm{~V}$ AC (LED and incandesent lamps with transformer)

    - The spot LED type have not been approved.

[^41]:    Note: The operator position shown is where the nameplate-stuck-surface is positioned toward you.

[^42]:    L5: Alternate action
    ${ }^{* 1}$ Combined indicators and contact unit. *2 Combined indicators and sockets.

[^43]:    Note © : See page 04CD/2/50

[^44]:    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.

[^45]:    Note：$\square \square$ See page 04CD／2／14

[^46]:    Notes: • Button color: Red only

[^47]:    Notes: © Contact closed

[^48]:    Note: $\square$ See page 04CD/2/28

[^49]:    Note: * Except for the types 110V AC, 127V AC and 220V AC

[^50]:    Note: * With resistor unit types: Not approved standard

[^51]:    Notes: *1 For pilot lights

    - Replace the mark by the lamp voltage code

[^52]:    Notes: $\bullet \square$ See page 04CD/3/11

[^53]:    Notes: • $\square, \square$, ( ) and contact arrangements: See page 04CD/3/21

[^54]:    * When attaching the terminal cover, the dimmension of externals increase 1.5 mm .

[^55]:    Notes: ${ }^{*}{ }^{*}$ When attaching the terminal cover, the dimension of external increase 1.5 mm

