# 30mm Hazardous Location Switches:
## EU2B Series



## PRODUCT DESCRIPTION

Complying with UL and ATEX Directives for hazardous environments, new 30mm EU2B Hazardous Location Switches provide increased safety for your applications.

Available models include:

- Pushbuttons
- Pilot Lights
- Selector Switches
- Key Selector Switches
- Emergency Stop Switches
- Meters

## KEY FEATURES

- Class I, Zone 1/Division 2
- Applicable in explosive gas atmospheres (AEx de IIC T6 Gb)
- UL Type 4X rated
- Up to 3 contact blocks
- Selector switches available with lever or key
- Selector switches available with overlapping contacts
- Exposed and finger-safe (IP20) screw terminals available

## STANDARDS COMPLIANCE

|  | Switches | Pilot Lights | Meters |
|---|---|---|---|
| UL | Class I, Zone 1, AEx de IIC T6 Gb<br>Class I, Div 2, Groups A, B, C and D | Class I, Zone 1, AEx de IIC T6 Gb<br>Class I, Div 2, Groups A, B, C and D | Class I, Zone 1, AEx de IIC T6 Gb<br>Class I, Div 2, Groups A, B, C and D |
| c-UL | Class I, Zone 1, Ex de IIC T6 Gb<br>Class I, Div 2, Groups A, B, C and D | Class I, Zone 1, Ex de IIB T6 Gb<br>Class I, Div 2, Groups C and D | Class I, Zone 1, Ex de IIC T6 Gb<br>Class I, Div 2, Groups A, B, C and D |
| ATEX |  | Ⓔⓧ II2G  Ex de IIC<br>Ⓔⓧ II2D  tD A21 IP65 | Ⓔⓧ II2G  Ex de IIC Gb<br>Ⓔⓧ II2D  Ex tb IIIC Db IP65 |

## CERTIFICATE NUMBERS

| UL/cUL | E347230 |
|---|---|
| ATEX | PTB 08 ATEX 1053 U<br>PTB 08 ATEX 1003 U |

## APPLICABLE STANDARDS

| Products | Applicable Standards | Mark | Certifications |
|---|---|---|---|
| Pushbuttons<br>Selector Switches<br>Key Selector Switches<br>Pilot Lights | EN60947-5-1 | CE | EU Low Voltage Directive |
| Emergency Stop Switches | EN60947-5-5 | TÜV | TÜV SÜD |
|  |  | CE | EU Low Voltage Directive |

cULus  CE  Ⓔⓧ

IECEx is pending approval

## SPECIFICATIONS

### General Specifications

| Degree of Protection | IP65 (IEC60529), Type 4X | | |
|---|---|---|---|
| Insulation Resistance | 100 MΩ minimum (500V DC megger) | | |
| Operating Temperature | –20 to +50°C (no freezing) | | |
| Operating Humidity | 45 to 85% (no condensation) | | |
| Altitude | 2,000m Maximum | | |
| Pollution Degree | 3 | | |
| Shock Resistance | Operating Extremes | 100-m/s²<br>Emergency Stop Switch:<br>150-m/s² (without Meter) | |
| | Damage Limits | 1000-m/s² | |
| Vibration Resistance | Operating Extremes | 5 to 55-Hz, amplitude 0.5 mm<br>Emergency Stop Switch:<br>5 to 500-Hz, amplitude 0.35-mm, acceleration 50-m/s² (without Meter) | |
| | Damage Limits | 30Hz, amplitude 1.5-mm<br>Emergency Stop Switch:<br>5 to 500-Hz, amplitude 0.35-mm, acceleration 50-m/s² | |

### Contact Rating (Switches)

| Rated Insulation Voltage (Ui) | | | 600V | | | |
|---|---|---|---|---|---|---|
| Rated Thermal Current (Ith) | | | 10A* | | | |
| Rated Operating Voltage (Ue) | | | 24V | 120V | 240V | 500V |
| Rated Operating Current (Ie) | AC 50/60Hz | Resistive Load (AC12) | 10A* | 10A* | 6A | 2.8A |
| | | Inductive Load (AC15) | 10A* | 6A | 3A | 1.4A |
| | DC | Resistive Load (DC12) | 8A | 2.2A | 1.1A | — |
| | | Inductive Load (DC13) | 4A | 1.1A | 0.55A | — |

Note: Up to 2 contacts (per control unit): 10A
3 contacts (per control unit): 9A
Minimum applicable load: 3V AC/DC, 5mA
Applicable operating locations may vary according to operating conditions and load types.

| Contact Rating Code Designation | Thermal Continuous Test Current Amperes | Maximum current, Amperes | | | | | | | | Maximum Volt-Amperes | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 120 Volt | | 240 Volt | | 480 Volt | | 600 Volt | | 600 Volt | |
| | | Make | Break | Make | Break | Make | Break | Make | Break | Make | Break |
| A600 | 10 | 60 | 6.00 | 30 | 3.00 | 15 | 1.5 | 12 | 1.2 | 7200 | 720 |

### Switches

| Rated Insulation Voltage | | 600V |
|---|---|---|
| Contact Resistance | | 50mΩ maximum (initial value) |
| Impulse Withstand Voltage (Uimp) | | 6kV |
| Insulation Resistance | | 100MΩ minimum (500V DC megger) |
| Short-Circuit Protection | | 250V/10A fuse (Type aM IEC60269-1/IEC60269-2) |
| Conditional Short-Circuit Current | | 1,000A |
| Mechanical Life | Pushbutton | 1,000,000 operations minimum |
| | Selector Switch | 500,000 operations minimum |
| | Key Selector Switch | 500,000 operations minimum |
| | Emergency Stop Switch | 50,000 operations minimum |
| Electrical Life | Pushbutton | 250,000 (switching frequency 1800 operations/h) |
| | Selector Switch | 250,000 (switching frequency 900 operations/h) |
| | Key Selector Switch | 250,000 (switching frequency 900 operations/h) |
| | Emergency Stop Switch | 50,000 (switching frequency 900 operations/h) |
| Minimum Operator Stroke Required for Direct Opening Action | Emergency Stop Switch | 7.0mm |
| Maximum Operator Stroke | Emergency Stop Switch | 9.0mm |

Note: Contacts will bounce during operation of pushbuttons and selector switches (reference value: 20-ms). Be sure to take contact bounce time into consideration when designing a control circuit.

### Pilot Lights

| Rated Insulation Voltage (Ui) | | 500V |
|---|---|---|
| Rated Operating Voltage (Ue) | Voltage | 6V, 12V, 24V AC/DC |
| | Transformer | 120V, 230V, 240V, 380V, 480V AC |
| Impulse Withstand Voltage (Uimp) | | 4kV |
| Insulation Resistance | | 100 MΩ minimum (500V DC) |
| Frequency | | 50/60Hz |
| Power Consumption (approx.) | Full Voltage | 0.3W |
| | Transformer | 1.5VA |
| Life (reference value) | | Approx. 40,000 hours |

Note: Because the built-in LED lamp is a high-brightness version, the lamp may light dimly due to induction even when power is off.

### Meters

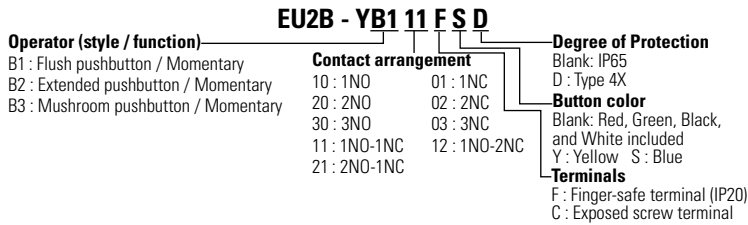| Accuracy Class | | 2.5 |
|---|---|---|
| Insulation Resistance | | 100 MΩ minimum (500V DC megger) |
| AC ammeter | Rated Insulation Voltage (Ui) | 300V |
| | Operation | Moving core |
| | Impulse Withstand Voltage (Uimp) | 4kV |
| | Power Consumption | 1VA |
| | Measurement | 5A, 10A, 30A, 50A, etc |
| | Input (CT Ratio) | 1A, 5A |
| | Extended Memory | 3 times, etc |
| DC ammeter | Rated Insulation Voltage (Ui) | 150V |
| | Operation | Moving coil |
| | Impulse Withstand Voltage (Uimp) | 2.5kV |
| | Input | 0 to10V DC, 4 to 20mA, etc. |
| | Power Consumption | 0.15W |
| | Consumption Current | 1mA |

Note: Use a commercially available CT (current transformer) for all AC ammeters, and install the CT in a non-hazardous location.

## PART NUMBERS

### Pushbuttons



#### Part Number Structure

**EU2B - YB1 11 F S D**

**Operator (style / function)**
B1 : Flush pushbutton / Momentary
B2 : Extended pushbutton / Momentary
B3 : Mushroom pushbutton / Momentary

**Contact arrangement**
10 : 1NO          01 : 1NC
20 : 2NO          02 : 2NC
30 : 3NO          03 : 3NC
11 : 1NO-1NC      12 : 1NO-2NC
21 : 2NO-1NC

**Degree of Protection**
Blank: IP65
D : Type 4X

**Button color**
Blank: Red, Green, Black, and White included
Y : Yellow    S : Blue

**Terminals**
F : Finger-safe terminal (IP20)
C : Exposed screw terminal

Note: Use only when interpreting part numbers.  Do not use for developing part numbers.

| Part Number | Style and Function | Contact Arrangement | Weight (Approx.) | ① Button Color |
|---|---|---|---|---|
| EU2B-YB110④①② | Flush Momentary | 1NO | 68g | ① Blank - supplied with red, green, black, and white buttons<br><br>For yellow or blue buttons, specify Y (yellow) or S (blue). |
| EU2B-YB101④①② | | 1NC | | |
| EU2B-YB111④①② | | 1NO-1NC | 92g | |
| EU2B-YB120④①② | | 2NO | | |
| EU2B-YB102④①② | | 2NC | | |
| EU2B-YB121④①② | | 2NO-1NC | 116g | |
| EU2B-YB112④①② | | 1NO-2NC | | |
| EU2B-YB130④①② | | 3NO | | |
| EU2B-YB103④①② | | 3NC | | |
| EU2B-YB210④①② | Extended Momentary | 1NO | 70g | Specify a button color code in place of ① in the part number<br><br>B : black<br>G : green<br>R : red<br>S : blue<br>W : white<br>Y : yellow |
| EU2B-YB201④①② | | 1NC | | |
| EU2B-YB211④①② | | 1NO-1NC | 94g | |
| EU2B-YB220④①② | | 2NO | | |
| EU2B-YB202④①② | | 2NC | | |
| EU2B-YB221④①② | | 2NO-1NC | 118g | |
| EU2B-YB212④①② | | 1NO-2NC | | |
| EU2B-YB230④①② | | 3NO | | |
| EU2B-YB203④①② | | 3NC | | |
| EU2B-YB310④①② | Mushroom Momentary | 1NO | 76g | |
| EU2B-YB301④①② | | 1NC | | |
| EU2B-YB311④①② | | 1NO-1NC | | |
| EU2B-YB320④①② | | 2NO | 101g | |
| EU2B-YB302④①② | | 2NC | | |
| EU2B-YB321④①② | | 2NO-1NC | 125g | |
| EU2B-YB312④①② | | 1NO-2NC | | |
| EU2B-YB330④①② | | 3NO | | |
| EU2B-YB303④①② | | 3NC | | |

Note: ① Button Color.

For ②, select –D for Type 4X (UL only) version, or leave blank for IP65 (ATEX/UL) version.
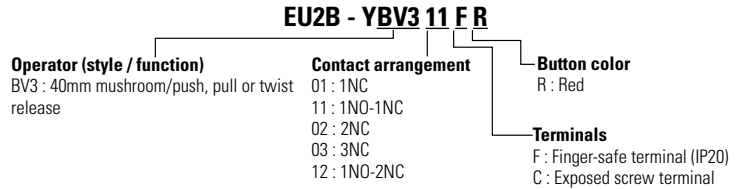
Specify a contact terminal style in place of ④ in the part number: F (Finger-safe terminal), C (Exposed screw terminal)

For Type 4X models, installation of a rubber boot is required on flush and extended versions; see page 10 for ordering information. This is only applicable to the flush and extended pushbuttons. All other models are Type 4X without any boot.

### Emergency Stop Switches



#### Part Number Structure

**EU2B - YBV3 11 F R**

**Operator (style / function)**
BV3 : 40mm mushroom/push, pull or twist release

**Contact arrangement**
01 : 1NC
11 : 1NO-1NC
02 : 2NC
03 : 3NC
12 : 1NO-2NC

**Button color**
R : Red

**Terminals**
F : Finger-safe terminal (IP20)
C : Exposed screw terminal

Note: Use only when interpreting part numbers.  Do not use for developing part numbers.

| Part Number | Operator | Contact Arrangement | Weight (Approx.) | Button Color |
|---|---|---|---|---|
| EU2B-YBV301④R | ø40 Mushroom | 1NC | 96g | R : Red |
| EU2B-YBV311④R | | 1NO-1NC | 120g | |
| EU2B-YBV302④R | | 2NC | | |
| EU2B-YBV312④R | | 1NO-2NC | 144g | |
| EU2B-YBV303④R | | 3NC | | |

Specify a terminal style in place of ④ in the part number: F (Finger-safe terminal), C (Exposed screw terminal)

### Pilot Lights



#### Part Number Structure
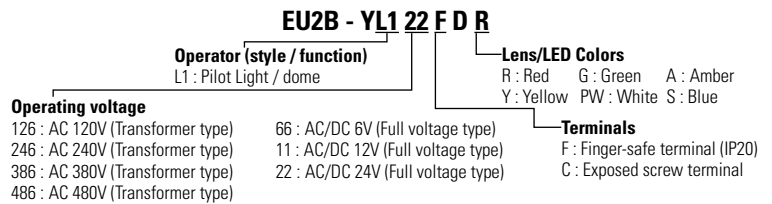
**EU2B - YL1 22 F D R**

**Operator (style / function)**
L1 : Pilot Light / dome

**Operating voltage**
126 : AC 120V (Transformer type)
246 : AC 240V (Transformer type)
386 : AC 380V (Transformer type)
486 : AC 480V (Transformer type)
66 : AC/DC 6V (Full voltage type)
11 : AC/DC 12V (Full voltage type)
22 : AC/DC 24V (Full voltage type)

**Lens/LED Colors**
R : Red      G : Green      A : Amber
Y : Yellow   PW : White    S : Blue

**Terminals**
F : Finger-safe terminal (IP20)
C : Exposed screw terminal

Note: Use only when interpreting part numbers.  Do not use for developing part numbers.

| Part Number | Type | Operating Voltage | Weight (Approx.) | ① Illumination Color Code |
|---|---|---|---|---|
| EU2B-YL1126④D① | Transformer | 120V AC | 150g | R : red<br>G : green<br>A : amber<br>Y : yellow<br>PW : white<br>S : blue |
| EU2B-YL1236④D① | | 230V AC | | |
| EU2B-YL1246④D① | | 240V AC | | |
| EU2B-YL1386④D① | | 380V AC | | |
| EU2B-YL1486④D① | | 480V AC | | |
| EU2B-YL166④D① | Full Voltage | 6V AC/DC | 108g | |
| EU2B-YL111④D① | | 12V AC/DC | | |
| EU2B-YL122④D① | | 24V AC/DC | | |

Note: ① Illumination Color.
Specify a contact terminal style in place of ④ in the part number: F (Finger-safe terminal), C (Exposed screw terminal)

## Selector Switches

**Part Number Structure**

<div align="center">

**EU2B - YS 2 11 N1 F**

</div>

**Operator (style / function)**
S : Selector (Knob operator)

**Number of Positions / Spring Return Action**

| | |
|---|---|
| 2 : 2-position / Maintained | 3 : 3-position / Maintained |
| 2R : 2-position / Maintained (Overlap) | 31 : 3-position / Spring return from right |
| 2J : 2-position / Maintained (Special function) | 32 : 3-position / Spring return from left |
| 21 : 2-position / Spring return from right | 33 : 3-position / Spring return two-way |

**Contact arrangement**

| | |
|---|---|
| 10 : 1NO | 03 : 3NC |
| 11 : 1NO-1NC | 02 : 2NC |
| 01 : 1NC | 21 : 2NO-1NC |
| 30 : 3NO | 12 : 1NO-2NC |
| 20 : 2NO | |

**Terminals**
F : Finger-safe terminal (IP20)
C : Exposed screw terminal

**Circuit Number**
Blank : No Designation
N* : See charts

Note: Use only when interpreting part numbers. Do not use for developing part numbers.

### 2-Position Selector Switches

| Contact | Mounting | Operator Position L | Operator Position R | Maintained | Spring Return from Right | Weight (approx) |
|---|---|---|---|---|---|---|
| NO | 1 | | ● | EU2B-YS210④ | EU2B-YS2110④ | 74g |
| | | | | | | |
| | | | | EU2B-YS201④ | EU2B-YS2101④ | |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | EU2B-YS220④ | EU2B-YS2120④ | 98g |
| NO | 3 | | ● | | | |
| NC | 1 | ● | | EU2B-YS202④ | EU2B-YS2102④ | |
| | | | | | | |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | EU2B-YS211④ | EU2B-YS2111④ | |
| | | | | | | |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | EU2B-YS230④ | EU2B-YS2130④ | 122g |
| NO | 2 | | ● | | | |
| NO | 3 | | ● | | | |
| NC | 1 | ● | | EU2B-YS203④ | EU2B-YS2103④ | |
| NC | 2 | ● | | | | |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | EU2B-YS221④ | EU2B-YS2121④ | |
| NO | 2 | | ● | | | |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | EU2B-YS212④ | EU2B-YS2112④ | |
| NC | 2 | ● | | | | |
| NC | 3 | ● | | | | |
| NO | 1 | ▬▬ | | EU2B-YS2R11④ | N/A | 98g |
| | | | | | | |
| NC | 2 | ▬▬ | | | | |

Specify a terminal style in place of ④ in the part number: F (Finger-safe terminal), C (Exposed screw terminal)

### 2-Position Selector Switches (Inverse Cam)

| Contact | Mounting | Operator Position L | Operator Position R | Maintained | Weight (approx) |
|---|---|---|---|---|---|
| NO | 1 | ● | | EU2B-YS2J10④ | 74g |
| | | | | | |
| | | | | EU2B-YS2J01④ | |
| NC | 3 | | ● | | |
| NO | 1 | ● | | EU2B-YS2J20④ | 98g |
| NO | 3 | ● | | | |
| NC | 1 | | ● | EU2B-YS2J02④ | |
| NC | 3 | | ● | | |
| NO | 1 | ● | | EU2B-YS2J11④ | |
| NC | 3 | | ● | | |
| NO | 1 | ● | | EU2B-YS2J30④ | 122g |
| NO | 2 | ● | | | |
| NO | 3 | ● | | | |
| NC | 1 | | ● | EU2B-YS2J03④ | |
| NC | 2 | | ● | | |
| NC | 3 | | ● | | |
| NO | 1 | ● | | EU2B-YS2J21④ | |
| NO | 2 | ● | | | |
| NC | 3 | | ● | | |
| NO | 1 | ● | | EU2B-YS2J12④ | |
| NC | 2 | | ● | | |
| NC | 3 | | ● | | |

←Contact Block 1
←Contact Block 2
←Contact Block 3

## 3-Position Selector Switches

| Contact | Mounting | Operator Position L | Operator Position C | Operator Position R | Maintained | Spring Return from Right | Spring Return from Left | Spring Return Two Way | Weight (approx) |
|---|---|---|---|---|---|---|---|---|---|
| NO | 1 | ● | | | EU2B-YS320④ | EU2B-YS3120④ | EU2B-YS3220④ | EU2B-YS3320④ | |
| NO | 3 | | | ● | | | | | |
| NO | 2 | ● | | ● | EU2B-YS320N1④ | EU2B-YS3120N1④ | EU2B-YS3220N1④ | EU2B-YS3320N1④ | |
| NO | 3 | | | ● | | | | | |
| NC | 1 | | ▬ | ▬ | EU2B-YS302④ | EU2B-YS302④ | EU2B-YS3202④ | EU2B-YS3302④ | |
| NC | 3 | ▬ | ▬ | | | | | | |
| NC | 2 | | ● | | EU2B-YS302N1④ | EU2B-YS3102N1④③ | EU2B-YS3202N1④③ | EU2B-YS3302N1④ | |
| NC | 3 | ▬ | ▬ | | | | | | |
| NO | 1 | ● | | | EU2B-YS311④ | EU2B-YS311④ | EU2B-YS3211④ | EU2B-YS3311④ | 98g |
| NC | 3 | ▬ | ▬ | | | | | | |
| NC | 1 | | ▬ | ▬ | EU2B-YS311N1④ | EU2B-YS3111N1④ | EU2B-YS3211N1④ | EU2B-YS3311N1④ | |
| NO | 3 | | | ● | | | | | |
| NO | 1 | ● | | | EU2B-YS311N2④ | EU2B-YS3111N2④ | EU2B-YS3211N2④ | EU2B-YS3311N2④ | |
| NC | 2 | | ● | | | | | | |
| NC | 2 | | ● | | EU2B-YS311N3④ | EU2B-YS3111N3① | EU2B-YS3211N3① | EU2B-YS3311N3① | |
| NO | 3 | | | ● | | | | | |
| NO | 2 | ● | | ● | EU2B-YS311N4④ | EU2B-YS3111N4④ | EU2B-YS3211N4④ | EU2B-YS3311N4④ | |
| NC | 3 | ▬ | ▬ | | | | | | |
| NO | 1 | ● | | | EU2B-YS330④ | EU2B-YS3130④ | EU2B-YS3230④ | EU2B-YS3330④ | |
| NO | 2 | ● | | ● | | | | | |
| NO | 3 | | | ● | | | | | |
| NC | 1 | | ▬ | ▬ | EU2B-YS303④ | EU2B-YS3103④ | EU2B-YS3203④ | EU2B-YS3303④ | |
| NC | 2 | | ● | | | | | | |
| NC | 3 | ▬ | ▬ | | | | | | 122g |
| NO | 1 | ● | | | EU2B-YS3 21N1④ | EU2B-YS3121N1④ | EU2B-YS3221N1④ | EU2B-YS3321N1④ | |
| NC | 2 | | ● | | | | | | |
| NO | 3 | | | ● | | | | | |
| NC | 1 | | ▬ | ▬ | EU2B-YS3 12N1④ | EU2B-YS3112N1④ | EU2B-YS3212N1④ | EU2B-YS3312N1④ | |
| NO | 2 | ● | | ● | | | | | |
| NC | 3 | ▬ | ▬ | | | | | | |

Specify a terminal style in place of ④ in the part number: F (Finger-safe terminal), C (Exposed screw terminal)



←Contact Block 1
←Contact Block 2
←Contact Block 3
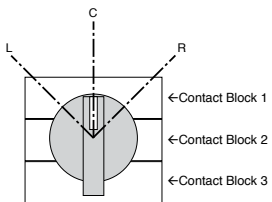
# Key Selector Switches

## Part Number Structure

**EU2B - YSK 2 11 N1 F A**

**Operator (style / function)**
SK: Key selector (Key operator)

**Number of Positions / Spring Return Action**
2 : 2-position / Maintained
2R : 2-position / Maintained (Overlap)
2J : 2-position / Maintained (Special function)
21 : 2-position / Spring return from right

3 : 3 -position / Maintained
31 : 3-position / Spring return from right
32 : 3-position / Spring return from left
33 : 3-position / Spring return two-way

**Contact arrangement**
10 : 1NO        03 : 3NC
11 : 1NO-1NC  02 : 2NC
01 : 1NC        21 : 2NO-1NC
30 : 3NO        12 : 1NO-2NC
20 : 2NO

**Key Removable Position**
See Key removable option codes below

**Terminals**
F : Finger-safe terminal (IP20)
C : Exposed screw terminal

**Circuit Number**
Blank : No Designation
N* : See the following charts

Note: Use only when interpreting part numbers.  Do not use for developing part numbers.

## 2-Position Key Selector Switches

| Contact | Mounting | Operator Position L | Operator Position R | Maintained L ⌄ R | Spring Return from Right L ⌄→R | Weight (approx) |
|---|---|---|---|---|---|---|
| NO | 1 | | ● | | | |
| | | | | EU2B-YSK210④③ | EU2B-YSK2110④③ | |
| | | | | | | 96g |
| | | | | EU2B-YSK201④③ | EU2B-YSK2101④③ | |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | | | |
| | | | | EU2B-YSK220④③ | EU2B-YSK2120④③ | |
| NO | 3 | | ● | | | |
| NC | 1 | ● | | | | |
| | | | | EU2B-YSK202④③ | EU2B-YSK2102④③ | 120g |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | | | |
| | | | | EU2B-YSK211④③ | EU2B-YSK2111④③ | |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | | | |
| NO | 2 | | ● | EU2B-YSK230④③ | EU2B-YSK2130④③ | |
| NO | 3 | | ● | | | |
| NC | 1 | ● | | | | |
| NC | 2 | ● | | EU2B-YSK203④③ | EU2B-YSK2103④③ | |
| NC | 3 | ● | | | | 144g |
| NO | 1 | | ● | | | |
| NO | 2 | | ● | EU2B-YSK221④③ | EU2B-YSK2121④③ | |
| NC | 3 | ● | | | | |
| NO | 1 | | ● | | | |
| NC | 2 | ● | | EU2B-YSK212④③ | EU2B-YSK2112④③ | |
| NC | 3 | ● | | | | |
| NO | 1 | ▬▬▬ | | | | |
| | | | | EU2B-YSK2R11④③ | N/A | 120g |
| NC | 2 | ▬▬▬ | | | | |

Key is removable in all maintained positions. Specify key removal position in place of ③ in the part number. See table.

Specify a terminal style in place of ④ in the part number: F (Finger-safe terminal), C (Exposed screw terminal).

Operator Position

Contact Block Position
← Contact Block 1
← Contact Block 2
← Contact Block 3
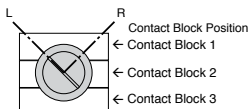
The key can be released in any maintained position.

## 2-Position Key Selector Switches (Inverse Cam)

| Contact | Mounting | Operator Position L ↖ | Operator Position R ↗ | Maintained L ⌄ R | Weight (approx) |
|---|---|---|---|---|---|
| NO | 1 | ● | | | |
| | | | | EU2B-YSK2J10④③ | |
| | | | | | 96g |
| | | | | EU2B-YSK2J01④③ | |
| NC | 3 | | ● | | |
| NO | 1 | ● | | | |
| | | | | EU2B-YSK2J20④③ | |
| NO | 3 | ● | | | |
| NC | 1 | | ● | | |
| | | | | EU2B-YSK2J02④③ | 120g |
| NC | 3 | | ● | | |
| NO | 1 | ● | | | |
| | | | | EU2B-YSK2J11④③ | |
| NC | 3 | | ● | | |
| NO | 1 | ● | | | |
| NO | 2 | ● | | EU2B-YSK2J30④③ | |
| NO | 3 | ● | | | |
| NC | 1 | | ● | | |
| NC | 2 | | ● | EU2B-YSK2J03④③ | |
| NC | 3 | | ● | | 144g |
| NO | 1 | ● | | | |
| NO | 2 | ● | | EU2B-YSK2J21④③ | |
| NC | 3 | | ● | | |
| NO | 1 | ● | | | |
| NC | 2 | | ● | EU2B-YSK2J12④③ | |
| NC | 3 | | ● | | |

## ③ Key Removable Option Codes (2-position)

| Code | Description |
|---|---|
| A | Key removable in any position |
| B | Key removable in left position |
| C | Key removable in right position |

## 3-Position Key Selector Switches

| Contact | Mounting | Operator Position L | C | R | Maintained | Spring Return from Right | Spring Return from Left | Spring Return Two Way | Weight (approx) |
|---|---|---|---|---|---|---|---|---|---|
| NO | 1 | ● | | | EU2B-YSK320④③ | EU2B-YSK3120④③ | EU2B-YSK3220④③ | EU2B-YSK3320④③ | |
| NO | 3 | | | ● | | | | | |
| NO | 2 | ● | | ● | EU2B-YSK320N1④③ | EU2B-YSK3120N1④③ | EU2B-YSK3220N1④③ | EU2B-YSK3320N1④③ | |
| NO | 3 | | | ● | | | | | |
| NC | 1 | | ▬▬ | | EU2B-YSK302④③ | EU2B-YSK302④③ | EU2B-YSK3202④③ | EU2B-YSK3302④③ | |
| NC | 3 | ▬▬ | | | | | | | |
| NC | 2 | | | ● | EU2B-YSK302N1④③ | EU2B-YSK3102N1④③ | EU2B-YSK3202N1④③ | EU2B-YSK3302N1④③ | |
| NC | 3 | ▬▬ | | | | | | | |
| NO | 1 | ● | | | EU2B-YSK311④③ | EU2B-YSK311④③ | EU2B-YSK3211④③ | EU2B-YSK3311④③ | |
| NC | 3 | ▬▬ | | | | | | | 120g |
| NC | 1 | | ▬▬ | | EU2B-YSK311N1④③ | EU2B-YSK3111N1④③ | EU2B-YSK3211N1④③ | EU2B-YSK3311N1④③ | |
| NO | 3 | | | ● | | | | | |
| NO | 1 | ● | | | EU2B-YSK311N2④③ | EU2B-YSK3111N2④③ | EU2B-YSK3211N2④③ | EU2B-YSK3311N2④③ | |
| NC | 2 | | ● | | | | | | |
| NC | 2 | | ● | | EU2B-YSK311N3④③ | EU2B-YSK3111N3④③ | EU2B-YSK3211N3④③ | EU2B-YSK3311N3④③ | |
| NO | 3 | | | ● | | | | | |
| NO | 2 | ● | | ● | EU2B-YSK311N4④③ | EU2B-YSK3111N4④③ | EU2B-YSK3211N4④③ | EU2B-YSK3311N4④③ | |
| NC | 3 | ▬▬ | | | | | | | |
| NO | 1 | ● | | | | | | | |
| NO | 2 | ● | | ● | EU2B-YSK330④③ | EU2B-YSK3130④③ | EU2B-YSK3230④③ | EU2B-YSK3330④③ | |
| NO | 3 | | | ● | | | | | |
| NC | 1 | | ▬▬ | | | | | | |
| NC | 2 | | ● | | EU2B-YSK303④③ | EU2B-YSK3103④③ | EU2B-YSK3203④③ | EU2B-YSK3303④③ | 144g |
| NC | 3 | ▬▬ | | | | | | | |
| NO | 1 | ● | | | | | | | |
| NC | 2 | | ● | | EU2B-YSK321N1④③ | EU2B-YSK3121N1④③ | EU2B-YSK3221N1④③ | EU2B-YSK3321N1④③ | |
| NO | 3 | | | ● | | | | | |
| NC | 1 | | ▬▬ | | | | | | |
| NO | 2 | ● | | ● | EU2B-YSK312N1④③ | EU2B-YSK3112N1④③ | EU2B-YSK3212N1④③ | EU2B-YSK3312N1④③ | |
| NC | 3 | ▬▬ | | | | | | | |

Key is removable in all maintained positions. Specify key removal position in place of ③ in the part number.  See table.

Specify a terminal style in place of ④ in the part number: F (Finger-safe terminal), C (Exposed screw terminal)③

### Key Removable Option Codes (3-Position)
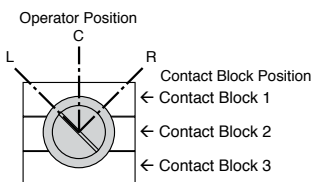
| Code | Description |
|---|---|
| A | Key removable in any position |
| B | Key removable in left and center positions |
| C | Key removable in center and right positions |
| D | Key removable in center position |
| E | Key removable in left and right positions |
| G | Key removable in left position |
| H | Key removable in right position) |

Operator Position
C
L     R

Contact Block Position
← Contact Block 1
← Contact Block 2
← Contact Block 3

The key can be released in any maintained position.

**Meters**



**Part Number Structure - AC Ammeter**

### EU2B - YM 5 3 A 10 F R

**Function**
M : Meter
**Input current**
1 : 1A    5 : 5A
**Specification of overload scale**
3 : 3  times  2 : 2 times  5 : 5 times  N:Non
**Type of meter**
A : AC ammeter
**Measuring range**
Direct measuring       1 : 1A       5 : 5A
For current transformers:  10 : 10A  15 : 15A  20 : 20A  30:30A  50:50A
                           60 : 60A  75 : 75A  100:100A  150:150A   etc.

**Set pointer**
blank : non   -R : with set pointer
**Terminals**
F : Finger-safe terminal (IP20)
C : Exposed screw terminal

Note: Use only when interpreting part numbers.  Do not use for developing part numbers.

**Part Number Structure - DC Ammeter or Voltmeter**

### EU2B - YM 010 VD F-PER-R
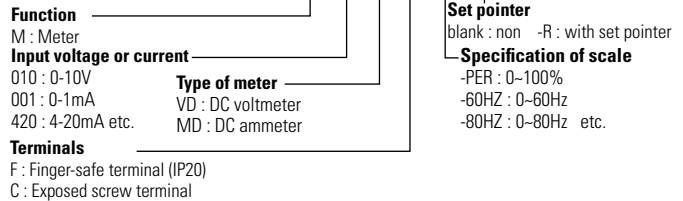
**Function**
M : Meter
**Input voltage or current**
010 : 0-10V
001 : 0-1mA
420 : 4-20mA etc.
**Type of meter**
VD : DC voltmeter
MD : DC ammeter
**Terminals**
F : Finger-safe terminal (IP20)
C : Exposed screw terminal

**Set pointer**
blank : non   -R : with set pointer
**Specification of scale**
-PER : 0~100%
-60HZ : 0~60Hz
-80HZ : 0~80Hz  etc.

Note: Use only when interpreting part numbers.  Do not use for developing part numbers.

| Input | Part Number | Description | | Weight (approx.) |
|---|---|---|---|---|
| AC input meter (ammeter) | EU2B-YM53A5④ | Capacity: 5A | Expansion scale: x3 | 270g |
| | EU2B-YM53A10④ | Capacity:10/5A | Expansion scale: x3 | |
| | EU2B-YM13A10④ | Capacity:10/1A | Expansion scale: x3 | |
| | EU2B-YM53A15④ | Capacity:15/5A | Expansion scale: x3 | |
| | EU2B-YM13A15④ | Capacity:15/1A | Expansion scale: x3 | |
| | EU2B-YM13A20④ | Capacity:20/1A | Expansion scale: x3 | |
| | EU2B-YM53A30④ | Capacity:30/5A | Expansion scale: x3 | |
| | EU2B-YM13A30④ | Capacity:30/1A | Expansion scale: x3 | |
| | EU2B-YM53A50④ | Capacity:50/5A | Expansion scale: x3 | |
| | EU2B-YM53A60④ | Capacity:60/5A | Expansion scale: x3 | |
| | EU2B-YM53A75④ | Capacity:75/5A | Expansion scale: x3 | |
| | EU2B-YM53A100④ | Capacity:100/5A | Expansion scale: x3 | |
| | EU2B-YM53A150④ | Capacity:150/5A | Expansion scale: x3 | |
| DC input meter | EU2B-YM010VD④-PER | 0-10V DC Input | Scale: 0 to 100% | |
| | EU2B-YM010VD④-60HZ | 0-10V DC Input | Scale: 0 to 60Hz | |
| | EU2B-YM001MD④-PER | 0-1mA DC Input | Scale: 0 to 100% | |
| | EU2B-YM001MD④-60HZ | 0-1mA DC Input | Scale: 0 to 60Hz | |
| | EU2B-YM001MD④-80HZ | 0-1mA DC Input | Scale: 0 to 80Hz | |
| | EU2B-YM420MD④-PER | 4-20mA DC Input | Scale: 0 to 100% | |
| | EU2B-YM420MD④-60HZ | 4-20mA DC Input | Scale: 0 to 60Hz | |

Specify a terminal style in place of ④ in the part number: F (Finger-safe terminal), C (Exposed screw terminal)

# DIMENSIONS

All dimensions in mm

## Pushbuttons

Shown with finger-safe contacts



Flush
Mushroom
Extended
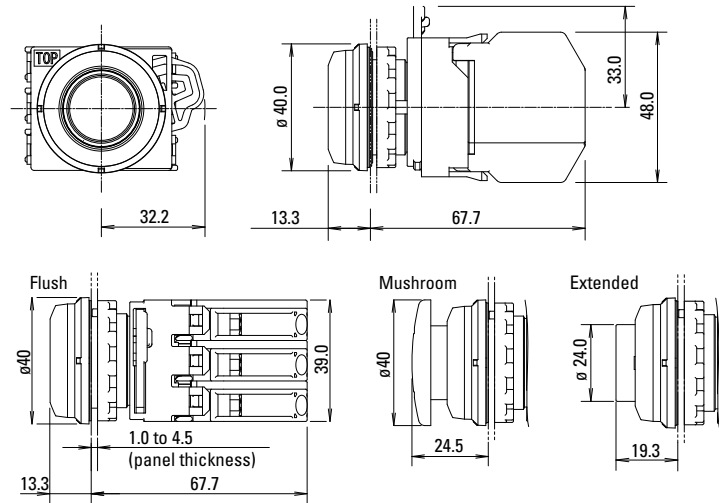
## Pilot Lights

Shown with finger-safe contacts
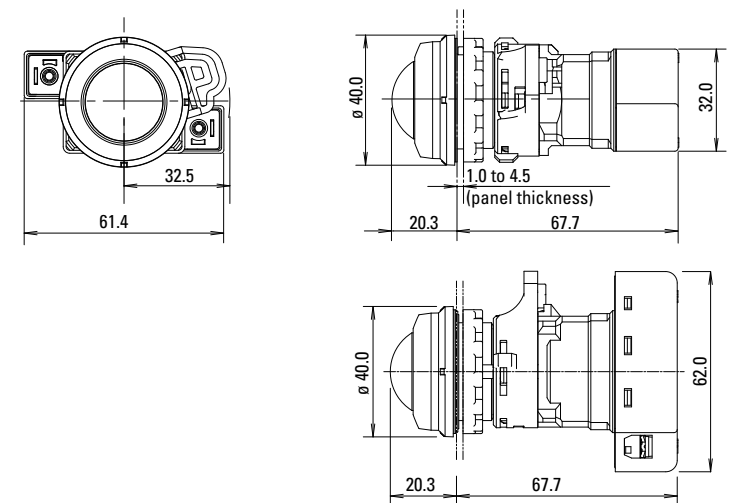


## Emergency Stop Switches

Shown with finger-safe contacts
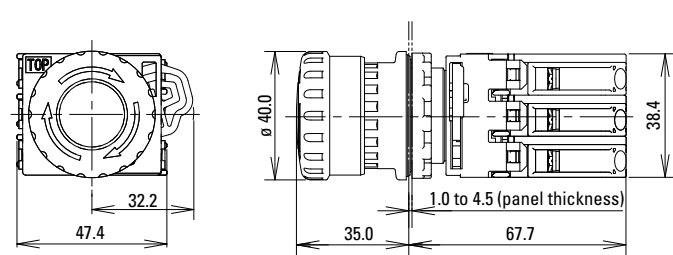


## Meters

Shown with finger-safe contacts
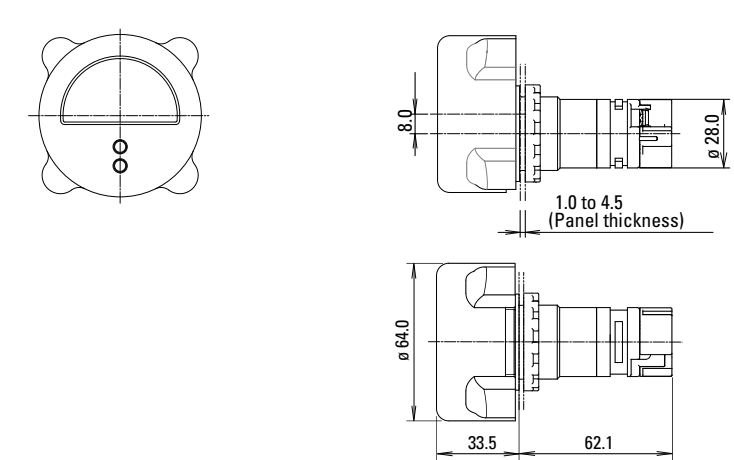


## Selector Switches

Shown with finger-safe contacts
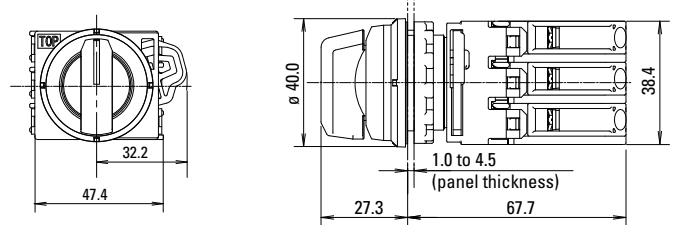


## Mounting Hole Dimensions

Panel thickness: 1.0 to 4.5 mm.

*Note: The meter can be mounted on the top mounting holes of a standard 50mm mounting centers. The meter can be mounted on any mounting hole with a 70mm or larger mounting center.

## Key Selector Switch

Shown with finger-safe contacts
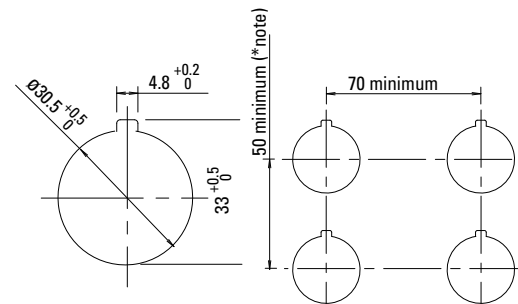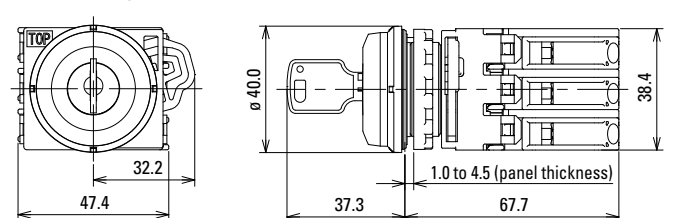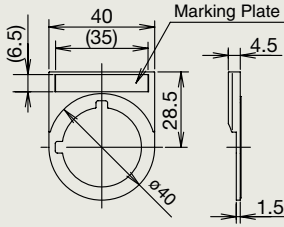
## ACCESSORIES
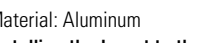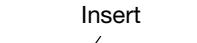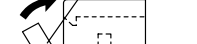
All dimensions in mm

### Nameplates

Used for pilot light, pushbutton, selector switch, and key selector switch.

| Appearance | Part Number | Dimensions |
|---|---|---|
|  | EU9Z-NM |  |

### Nameplate Inserts

| Appearance | Legend | Part Number |
|---|---|---|
|  | Blank | EU9Z-NP0 |
| | ON | EU9Z-NP1 |
| | OFF | EU9Z-NP2 |
| | START | EU9Z-NP3 |
| | STOP | EU9Z-NP4 |
| | OFF-ON | EU9Z-NP31 |
| | HAND-AUTO | EU9Z-NP35 |
| | HAND-OFF-AUTO | EU9Z-NP53 |

Material: Aluminum

**Installing the Insert to the Nameplate**
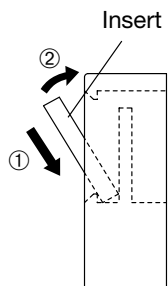
Insert



**Removing the Insert from the Nameplate**



- Flat screwdriver
- Insert
- Nameplate
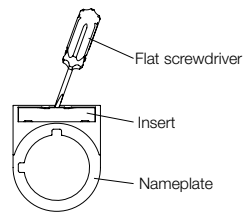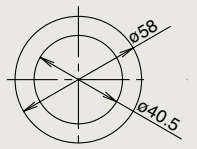
To remove the Insert, insert a flat screwdriver between the Insert and Nameplate.

### Rubber Boots

| Appearance | Description/Usage | Part Number |
|---|---|---|
| For Flush Pushbuttons  | Not for use with name plate | EU9Z-DB1 |
| For Flush Pushbuttons  | For use with name plate | EU9Z-DB1N |
| For Extended Pushbuttons  | Not for use with name plate | EU9Z-DB2 |
| For Extended Pushbuttons  | For use with name plate | EU9Z-DB2N |

Note: Rubber boot must be mounted on flush or extended pushbuttons to achieve UL Type 4X rating

### Emergency Stop Switch Nameplate Stickers
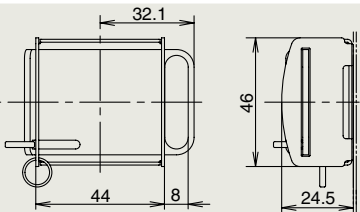
| Appearance | Legend | Part Number | Dimensions |
|---|---|---|---|
|  | Blank | EU9Z-NVS0 |  |
|  | Emergency Stop | EU9Z-NVS27 |  |

Material: synthetic paper Background: yellow Legend: black

### Padlock Cover

EU2B-YB2 extended pushbutton: to maintain latched status
EU2B-YB1 flush pushbutton/EU2B-YSK key selector switch: to prevent operation
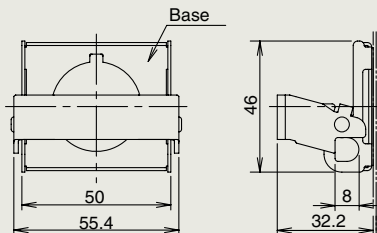
| Appearance | Part Number | Dimensions |
|---|---|---|
|  | EU9Z-PC |  |

Material: Stainless Steel

### Emergency Stop Switch Padlock Cover
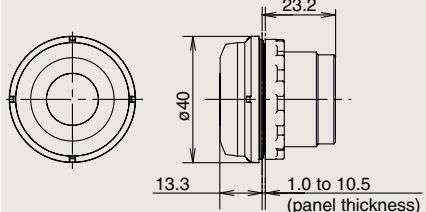
Used with EU2B-YBV emergency stop switch to maintain the switch in the latched status.

| Appearance | Part Number | Dimensions |
|---|---|---|
|  | EU9Z-PCE |  |

Coating: yellow Material: Stainless Steel

### Mounting Hole Plug

Used to plug unused mounting holes (ø30.5) on the mounting panel.

| Appearance | Part Number | Dimensions / Usage |
|---|---|---|
|  | EU9Z-BP |  |

## Buttons

| Appearance | Style | Part Number | Button Color Code |
|---|---|---|---|
| | Flush | HW1A-B1① | Specify a color code in place of ① in the Ordering Number.<br>R : red<br>G : green<br>B : black<br>Y : yellow<br>W : white<br>S : blue |
| | Extended | HW1A-B2① | |
| | ø40 Mushroom | HW1A-B4① | |

Material: Polyacetal

## LED Lamps



| Operating Voltage | Current Draw | | Part Number | Illumination Color Code | Base |
|---|---|---|---|---|---|
| | AC | DC | | | |
| 6V AC/DC±10% | 8mA | 7mA (A, R, W)<br>5.5mA (G, PW, S) | LSTD-6① | Specify a color code in place of ① in the part number<br>R : red<br>G : green<br>A : amber<br>PW : white<br>S : blue<br>Use a white (PW) LED with yellow (Y) lens. | BA9S/13 |
| 12V AC/DC±10% | 11mA | 10mA | LSTD-1① | | |
| 24V AC/DC±10% | 11mA | 10mA | LSTD-2① | | |

## Lenses

| Appearance | Lens Color | Part Number |
|---|---|---|
| | Red | EU9Z-LR |
| | Green | EU9Z-LG |
| | Amber | EU9Z-LA |
| | Yellow | EU9Z-LY |
| | White | EU9Z-LW |
| | Blue | EU9Z-LS |

Material: AS resin (gasket supplied)

## OPERATING INSTRUCTIONS

### Wiring

#### Applicable Wires

Stranded wire: 1.5 to 2.5 mm², solid wire: ø1.2 to ø1.6 mm (AWG16 to 14)

Note: Do not connect more than 2 wires to the same terminal.

#### Applicable crimping terminal

Ring and spade terminals cannot be used with IP20 finger-safe terminal blocks.

When connecting 2 ferrules to the EU2B control unit, use ferrules without insulating sheath.
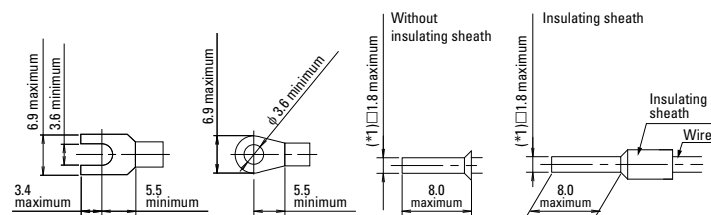


Recommended crimping terminal (WAGO)

Ferrule with insulating sheath: 216-204

Ferrule without insulating sheath: 216-104

Crimping plier: 206-204

#### Recommended Tightening Torque

EU2B control units (M3.5): 1.0 to 1.3 N·m

### Warning

Incorrect wiring may cause fire hazard. Observe the following conditions.

- Be sure to install an insulating sheath on the crimping terminal or the crimping terminal with insulation.
- When connecting solid wires or stranded wires directly, strip the insulation, mentioned below, and insert the wire all the way in.
    EU2B Control units: 8.6 mm maximum
    Crimping terminal: 8 to 9 mm
- When using stranded wires, make sure that there are no wire whiskers.
- Make sure that the spade crimping terminals and ferrules are inserted all the way in.
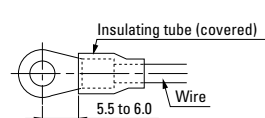
### Removing and Installing the Contact Unit / Lamp

## Unit

To remove the contact unit or the lamp unit from the operator, pull the protruding yellow part of the locking lever outwards as shown in the figure below using a screwdriver, and turn it to the left. The contact unit or lamp unit can be removed.
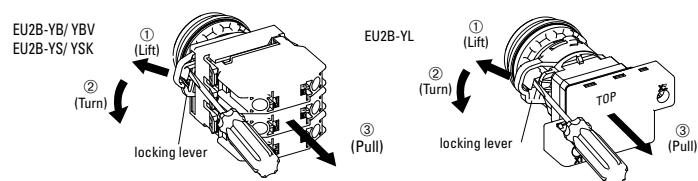


When the contact unit is removed from the emergency stop switch operator, the NO contact closes and the NC contact opens.

Do not turn the locking lever when the contact unit is removed from the operator (the red indicator is protruding out. See the figure below) or the switch can be damaged.
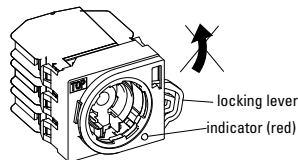


## Panel mounting for the operator, lens unit and meter

Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from the panel front into the panel hole. Place the projection on the operator with TOP marking upward and the recess on the mounting panel in the same direction. (The meter has no projection.)

Tighten the locking ring using ring wrench XN9Z-T1 to a torque of 2.5 Nm. When using a nameplate or padlocking cover, install it between the operator and panel. Make sure that the groove of the namplate or padlocking cover and the projection on the TOP marking of the operator are in the same direction.

Note: The locking ring for emergency stop switches and meter is metallic. The meter can't mount the nameplate or podlocking cover.

## Installing the contact unit and lamp unit

To install the contact unit, place the TOP marking on the operator and the TOP marking on the contact block adapter in the same direction, and attach the contact unit to the operator. Then turn the locking lever to the right. Follow the same procedure when installing the lamp unit.

When installing the lamp unit, check that the inner lens is not loose.

The contact block adapters for emergency stop switches cannot be used for the pushbutton, selector and key selector switches.
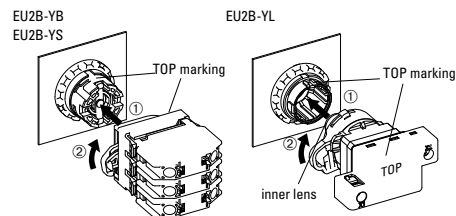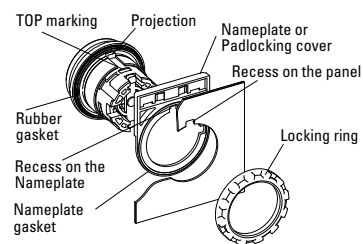




## Removing the Contact Block

To remove the contact block, insert a flat screwdriver under the latch of the contact block adaptor and disengage the latch as shown in the figure below.
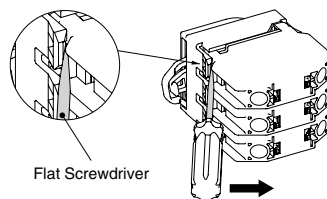


## Installing the Contact block

When installing the contact block after maintenance or wiring, make sure that the contact configuration is correct. Installing the contact block in the incorrect position or incomplete installation may cause malfunction of the switch.

Remove the contact block from the operator before installing the contact block to the contact block adaptor. Also make sure that the contact block is correctly installed to the contact block adaptor before attaching the operator. Do not install the contact block adaptor with the operator attached. Otherwise, malfunction may result.

## Accessories

### Padlock Cover

The following padlocks and hasps can be used.

| (Padlock Size) | a | b | c |
|---|---|---|---|
| Flush/extended pushbutton/key selector switch | ø3.5 to 7.0 mm | 15 mm min. | 70 mm max. |
| Emergency Stop Switch | ø5.5 to 7.0 mm | — | — |

### Recommended Hasp

| Manufacturer | Part No. |
|---|---|
| Panduit | PSL-1, PSL-1A, PSL-1.5, PSL-1.5A, PSL-HD1 |
| Master Lock | 420, 421 |

Padlock and hasp are available in various shapes and sizes. Make sure that they do not interfere with the control units. Note: Not supplied by IDEC.

Keep the total weight of padlock and hasp under 1500g max, otherwise the switch may malfunction or result in failure. No vibration should be applied when padlock or hasp are installed. When padlock or hasp are disfigured, stop usage immediately.

Ensure that no shock or electric sparks are generated.

When using the plate lock padlock cover with the extended pushbutton, the switch contact may turn on/off when the cover is being installed. Ensure to provide functional safety measure to prevent unexpected startup.

When using the padlock cover on the safety-related part of the control system, observe safety standards and regulations of the relevant country or region. Also be sure to perform risk assessment before operation.

### Installing EU9Z-PC Padlock Cover

(Flush/extended pushbtton/key selector switch)

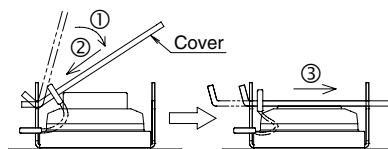EU9Z-PC can be installed in the following two ways.

Remove the cover in the reverse step of installing the cover. Do not install or remove the cover forcefully, or it will cause failure.
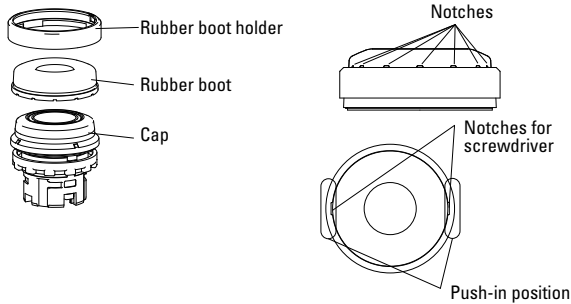
[Installation A]



[Installation B]

This method is effective when the neighboring control unit interferes when installing in method A.

## Installing EU9Z-DB Rubber Boots

To install the rubber boot on flush and extended pushbuttons, place the rubber boot on the cap and push the rubber boot holder straight. The notches around the rubber boot must show evenly.



Push the rubber boot holder further around on the two notches on the holder so that the holder fits the button completely

Make sure that the rubber boot and rubber boot holder are installed straight.

On Nameplate Types, the EU2B and the rubber boot holder must be aligned so that when installed, the anti-rotation projection on the EU2B comes to the center of the groove on the holder.

Make sure that the rubber boot is installed completely, otherwise Type 4X degree of protection cannot be obtained. Water droplets might enter the rubber boot, but no water will enter the control box.
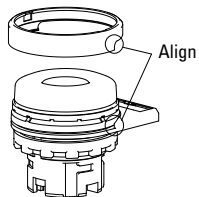


To remove the rubber boot from the flush and extended pushbuttons, gently insert the slotted screwdriver (0.5t x 4w or below) inside a notch on the rubber boot holder and tilt to the direction shown by the arrow ①. To prevent damage, do not apply excessive force to the EU2B when removing the rubber boot.
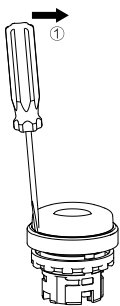


## Maintenance and Inspection

EU2B switches should be installed in an appropriate control box.

## Maintenance and Inspection Method

Perform daily or periodical maintenance and inspection for items such as damage and temperature rise of the EU2B switches listed in the Maintenance and Inspection table below.

## Maintenance and Inspection

| Inspection Items | Inspection Method | Inspections | Measures |
|---|---|---|---|
| Enclosure base | Visual | No rusting<br>No damages | Cleaning<br>Rust-resistant treatment |
| Tightening bolt, screws | Visual, tactile | No loosening<br>No rusting | Tightening<br>Cleaning |
| Packings | Visual | No cracks<br>No apparent deformation | Replacement |
| Connecting parts | Visual, tactile | No loosening of screws<br>No dirt on insulation materials | Tightening<br>Cleaning |
| Temperature rise | Thermometer, tactile | Surface temperature 80ºC max. | Investigate the cause |

## Disposal

Observe laws and regulations set by each country concerning refuse disposal.

## Safety Precautions

Use EU2B switches that are applicable for use in hazardous areas (potentially explosive atmosphere where explosive gas or vapor may exist), otherwise explosion or fire hazard may result.

- EU2B switches can be installed only in zones 1 and 2. Do not use in zone 0.
- Turn power off to the EU2B switches before installation, removal, wiring, or maintenance, otherwise explosion, fire hazard, or electric shock may result.
- Do not disassemble, repair, or modify, otherwise damage or accident may result.
- Do not use damaged EU2B switches, otherwise damage or accident may result.
- When connecting external devices, make sure that each cable is connected to the correct terminal, otherwise electric shock, fire hazard, or explosion may result.
- Use wires of a proper size to meet voltage and current requirements. Incorrect wiring may cause abnormal temperature rise and lead to fire hazard and explosion.
- Connect the grounding terminal to a proper ground, otherwise electric shock, fire hazard, or explosion may result.
- Operate the EU2B switches at the rated current and voltage specified in this catalog, otherwise short-circuiting, fire hazard, or explosion may result.
- Stop operation immediately if abnormal operation occurs. Otherwise, a secondary accident may occur.

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