

EU2B Series: 30mm Hazardous Location Switches EC2B Series: Hazardous Location Control Stations



STANDARDS COMPLIANCE

| | Switches | Pilot Lights | Meters | Control Boxes |
|-------|--|--|--|---|
| UL | Class I, Zone 1 AEx d e IIC T6 Gb Class I Div 2, Groups A, B, C and D | | | |
| c-UL | Class I, Zone 1, Ex de IIC T6 Gb Class I, Div 2, Groups A, B, C and D | Class I, Zone 1, Ex de IIB T6 Gb Class I, Div 2, Groups C and D | Class I, Zone 1, Ex de IIC T6 Gb Class I, Div 2, Groups A, B, C and D | |
| ATEX | Ex de IIC tD A21 IP65 | Ex de IIC Gb Ex tb IIIC T80°C Db (dust) | Ex de IIC Gb Ex tb IIIC T80°C Db (dust) | Ex de IIC T6 Gb Ex tb IIIC T80°C Db (dust) |
| IECEX | EEx PTB 15.0006U IECEX PTB 15.0007U | | | Ex de IIC T6 Gb Ex tb IIIC T80°C Db (dust) |

CERTIFICATE NUMBERS

| | | |
|--------------------|--|--|
| UL/c-UL E347230 | ATEX PTB 08 ATEX 1053 U PTB 08 ATEX 1003 U PTB 08 ATEX 1048 | IECEX IECEX PTB 15.0006U IECEX PTB 15.0007U IECEX PTB 15.0032 |
|--------------------|--|--|

APPLICABLE STANDARDS

| Control Units | Standards | Mark |
|--|---|-----------|
| Pushbuttons Selector Switches Key Selector Switches Pilot Lights Meters (EU2B-YM) | EN60947-5-1 | CE |
| | UL60079-0 UL60079-1 UL60079-7 | UL LISTED |
| | CAN/CSA C22.2 No. 60079-0 CAN/CSA C22.2 No. 60079-1 CAN/CSA C22.2 No. 60079-7 | Ex |
| | EN60079-0 EN60079-1 EN60079-7 EN60079-31 | IECEX |
| | IEC60079-0 IEC60079-1 IEC60079-7 IEC60079-31 | IECEX |
| Emergency Stop Switches | EN60947-5-5 | TUV |

PRODUCT DESCRIPTION

Complying with UL, IECEX, and ATEX Directives for hazardous environments, new 30mm EU2B Hazardous Location Switches and EC2B Hazardous Location Control Stations provide increased safety for your applications.

Control Unit Options:

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

Control Station Options:

- Pre-configured stations
- Custom-configured stations
- Open control boxes
- Mounting holes for up to 18 control units

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
- Corrosion resistant stainless steel enclosure (SUS304)
- Melamine coating
- NPT and Metric reducer options



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/s ² Emergency Stop Switch: 150-m/s ² (without Meter) |
| | Damage Limits | 1000-m/s ² |
| Vibration Resistance | Operating Extremes | 5 to 55-Hz, amplitude 0.5 mm Emergency Stop Switch: 5 to 500-Hz, amplitude 0.35-mm, acceleration 50-m/s ² (without Meter) |
| | Damage Limits | 30Hz, amplitude 1.5-mm Emergency Stop Switch: 5 to 500-Hz, amplitude 0.35-mm, acceleration 50-m/s ² |

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/hr) |
| | Selector Switch | 250,000 (switching frequency 900 operations/hr) |
| | Key Selector Switch | 250,000 (switching frequency 900 operations/hr) |
| | Emergency Stop Switch | 50,000 (switching frequency 900 operations/hr) |
| 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.

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 |

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 |
| DC ammeter | Input (CT Ratio) | 1A, 5A |
| | Extended Memory | 3 times, etc |
| | Rated Insulation Voltage (Ui) | 150V |
| | Operation | Moving coil |
| | Impulse Withstand Voltage (Uimp) | 2.5kV |
| DC ammeter | 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.

Control Boxes

| | |
|--------------------------|---|
| Degree of protection | IP65 (IEC60529), Type 4X |
| Housing Material | Stainless steel (SUS304) |
| Standard Coating | Melamine |
| | 1-column: Outside coating 2-, 3-, 4-column: Inside and outside coating |
| Rated Insulation Voltage | 600V |
| | (with pilot light or ET2A-8PE screw terminal block: 500V) Meter AC input: 300V Meter DC input: 150V |
| Insulation Resistance | 100 MΩ minimum (500V DC megger) |
| Operating Temperature | −20 to +50°C (no freezing) |
| Operating Humidity | 45 to 85% (no condensation) |
| Altitude | 2000m maximum |

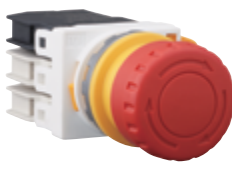
| | | |
|-----------------------------------|---------------------------|--|
| Agency Approvals | | UL/c-UL, IECEx/ATEX certified |
| Applicable Enclosure | | All enclosures expect for 6 Control Units x 4 Column |
| Mounting Style | | Wall Mount |
| Control Unit | Pilot Light | Yes ¹ |
| | Pushbutton | Yes |
| | Emergency Pushbutton | Yes |
| | Selector Switch | Yes |
| | Key Selector Switch | Yes |
| Reducer Screw | Meter | Yes |
| | | NPT Thread (standard) |
| | | Metric Thread |
| Degree of Protection | | IP65, TYPE4X (UL) |
| Grounding Terminal Screw Material | | Stainless Steel |
| Applicable Wire | Stranded Wire (mm2) | 1.5 to 2.5 |
| | Solid Wire (mm2) | 1.2 to 1.6 |
| | Solid/Stranded Wire (AWG) | 16-14 |

1: c-UL explosion protection is different when pilot light is installed.

SWITCHES (CONTROL UNITS)



Pushbuttons



Emergency Stop Switches



Pilot Lights



Selector Switches

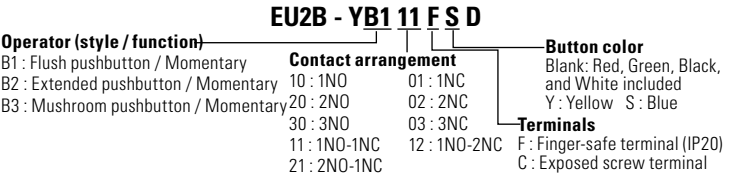


Key Selector Switches



Meters

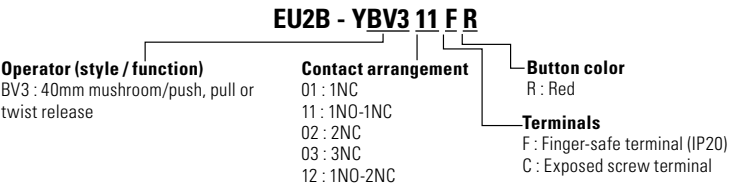
Pushbuttons



| Part Number | Style and Function | Contact Arrangement | Weight (Approx.) | ① Button Color |
|----------------|--------------------|---------------------|------------------|--|
| EU2B-YB110④①-D | Flush Momentary | 1NO | 68g | ① Blank - supplied with red, green, black, and white buttons |
| EU2B-YB101④①-D | | 1NC | | |
| EU2B-YB111④①-D | | 1NO-1NC | 92g | |
| EU2B-YB120④①-D | | 2NO | | |
| EU2B-YB102④①-D | | 2NC | 116g | |
| EU2B-YB121④①-D | | 2NO-1NC | | |
| EU2B-YB112④①-D | | 1NO-2NC | | |
| EU2B-YB130④①-D | | 3NO | | |
| EU2B-YB103④①-D | | 3NC | | |
| EU2B-YB210④①-D | | Extended Momentary | | |
| EU2B-YB201④①-D | 1NC | | | |
| EU2B-YB211④①-D | 1NO-1NC | | 94g | |
| EU2B-YB220④①-D | 2NO | | | |
| EU2B-YB202④①-D | 2NC | | 118g | |
| EU2B-YB221④①-D | 2NO-1NC | | | |
| EU2B-YB212④①-D | 1NO-2NC | | | |
| EU2B-YB230④①-D | 3NO | | | |
| EU2B-YB203④①-D | 3NC | | 76g | |
| EU2B-YB310④①-D | 1NO | | | |
| EU2B-YB301④①-D | 1NC | | | |
| EU2B-YB311④①-D | 1NO-1NC | 101g | | |
| EU2B-YB320④①-D | 2NO | | | |
| EU2B-YB302④①-D | 2NC | 125g | | |
| EU2B-YB321④①-D | 2NO-1NC | | | |
| EU2B-YB312④①-D | 1NO-2NC | | | |
| EU2B-YB330④①-D | 3NO | | | |
| EU2B-YB303④①-D | 3NC | | | |

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

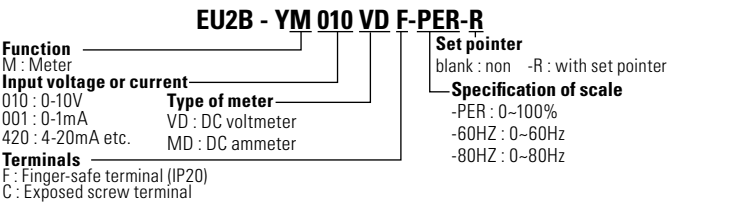
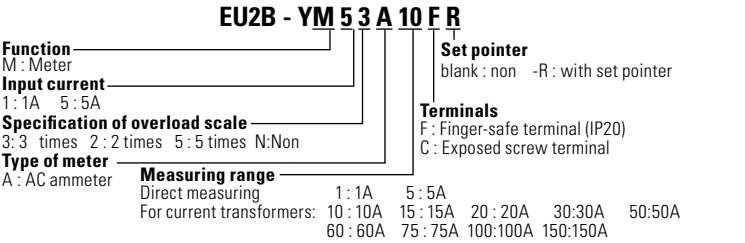
Emergency Stop Switches



| 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)

Meters



| 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)

Pilot Lights

| Part Number | Type | Operating Voltage | Weight (Approx.) | ① Illumination Color Code |
|----------------|--------------|-------------------|------------------|---|
| EU2B-YL1126④D① | Transformer | 120V AC | 150g | R : red G : green A : amber Y : yellow PW : white 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)

2 Position Selector Switches

EU2B - YS 2 11 N1 F A

Operator (style / function)
S : Selector (Knob operator)
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 2NC

Key Removable Position
See option codes below

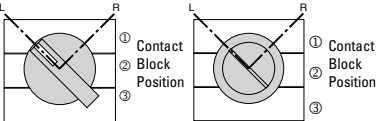
Terminals
F : Finger-safe terminal (IP20)
C : Exposed screw terminal

Circuit Number
Blank : No Designation
N* : See charts

| | | | | Selector Switches | | Key Selector Switches | |
|--------------|---------------|---|---|---|---|---|---|
| Con- tact | Mount- ing | Operator Position | | Maintained | Spring Return from Right | Maintained | Spring Return from Right |
| | |  |  |  |  |  |  |
| NO | 1 | | ● | EU2B-YS210④ | EU2B-YS2110④ | EU2B-YSK210④③ | EU2B-YSK2110④③ |
| | | | | EU2B-YS201④ | EU2B-YS2101④ | EU2B-YSK201④③ | EU2B-YSK2101④③ |
| NC | 3 | ● | | EU2B-YS220④ | EU2B-YS2120④ | EU2B-YSK220④③ | EU2B-YSK2120④③ |
| NO | 1 | | ● | EU2B-YS202④ | EU2B-YS2102④ | EU2B-YSK202④③ | EU2B-YSK2102④③ |
| NC | 3 | ● | | EU2B-YS211④ | EU2B-YS2111④ | EU2B-YSK211④③ | EU2B-YSK2111④③ |
| NO | 1 | | ● | EU2B-YS230④ | EU2B-YS2130④ | EU2B-YSK230④③ | EU2B-YSK2130④③ |
| NO | 3 | | ● | EU2B-YS203④ | EU2B-YS2103④ | EU2B-YSK203④③ | EU2B-YSK2103④③ |
| NC | 2 | ● | | EU2B-YS221④ | EU2B-YS2121④ | EU2B-YSK221④③ | EU2B-YSK2121④③ |
| NC | 3 | ● | | EU2B-YS212④ | EU2B-YS2112④ | EU2B-YSK212④③ | EU2B-YSK2112④③ |
| NC | 3 | ● | | EU2B-YS2R11④ | N/A | EU2B-YSK2R11④③ | N/A |
| 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).

2-position, 2-position/inverse cam
Selector Switch Key Selector Switch



EU2B - YL1 22 F D R

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

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

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)

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

| | | Selector Switches | | Key Selector Switches | |
|----------|-----------|-------------------|---|-----------------------|----------------|
| Con-tact | Mount-ing | Operator Position | | Maintained | Maintained |
| | | L | R | L R | L R |
| NO | 1 | ● | | EU2B-YS2J10④ | EU2B-YSK2J10④③ |
| | | | | EU2B-YS2J01④ | EU2B-YSK2J01④③ |
| NC | 3 | | ● | EU2B-YS2J20④ | EU2B-YSK2J20④③ |
| NO | 1 | ● | | EU2B-YS2J02④ | EU2B-YSK2J02④③ |
| NC | 3 | | ● | EU2B-YS2J11④ | EU2B-YSK2J11④③ |
| NO | 1 | ● | | EU2B-YS2J30④ | EU2B-YSK2J30④③ |
| NC | 3 | | ● | EU2B-YS2J03④ | EU2B-YSK2J03④③ |
| NO | 1 | ● | | EU2B-YS2J21④ | EU2B-YSK2J21④③ |
| NC | 3 | | ● | EU2B-YS2J12④ | EU2B-YSK2J12④③ |
| NO | 1 | ● | | | |
| 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 |

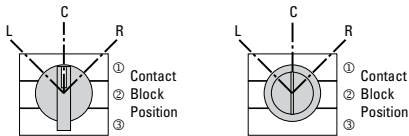
3 Position Selector Switches

| | | | | | Selector Switches | | | | Key Selector Switches | | | |
|---------|----------|-------------------|---|---|-------------------|--------------------------|-------------------------|-----------------------|-----------------------|--------------------------|-------------------------|-----------------------|
| Contact | Mounting | Operator Position | | | Maintained | Spring Return from Right | Spring Return from Left | Spring Return Two Way | Maintained | Spring Return from Right | Spring Return from Left | Spring Return Two Way |
| | | L | C | R | | | | | | | | |
| NO | 1 | ● | | | EU2B-YS320④ | EU2B-YS3120④ | EU2B-YS3220④ | EU2B-YS3320④ | EU2B-YSK320④③ | EU2B-YSK3120④③ | EU2B-YSK3220④③ | EU2B-YSK3320④③ |
| NO | 3 | | | ● | | | | | | | | |
| NO | 2 | ● | | ● | EU2B-YS320N1④ | EU2B-YS3120N1④ | EU2B-YS3220N1④ | EU2B-YS3320N1④ | EU2B-YSK320N1④③ | EU2B-YSK3120N1④③ | EU2B-YSK3220N1④③ | EU2B-YSK3320N1④③ |
| NO | 3 | | | ● | | | | | | | | |
| NC | 1 | | ■ | | | EU2B-YS302④ | EU2B-YS302④ | EU2B-YS3202④ | EU2B-YSK302④③ | EU2B-YSK302④③ | EU2B-YSK3202④③ | EU2B-YSK3302④③ |
| NC | 3 | ■ | | | | | | | | | | |
| NC | 2 | | | ● | EU2B-YS302N1④ | EU2B-YS3102N1④③ | EU2B-YS3202N1④③ | EU2B-YS3302N1④ | EU2B-YSK302N1④③ | EU2B-YSK3102N1④③ | EU2B-YSK3202N1④③ | EU2B-YSK3302N1④③ |
| NC | 3 | ■ | | | | | | | | | | |
| NO | 1 | ● | | | EU2B-YS311④ | EU2B-YS311④ | EU2B-YS3211④ | EU2B-YS3311④ | EU2B-YSK311④③ | EU2B-YSK311④③ | EU2B-YSK3211④③ | EU2B-YSK3311④③ |
| NC | 3 | ■ | | | | | | | | | | |
| NC | 1 | | ■ | | | EU2B-YS311N1④ | EU2B-YS311N1④ | EU2B-YS3211N1④ | EU2B-YSK311N1④③ | EU2B-YSK311N1④③ | EU2B-YSK3211N1④③ | EU2B-YSK3311N1④③ |
| NO | 3 | | | ● | | | | | | | | |
| NO | 1 | ● | | | | | | | | | | |
| NC | 2 | | ● | | EU2B-YS311N2④ | EU2B-YS311N2④ | EU2B-YS3211N2④ | EU2B-YS3311N2④ | EU2B-YSK311N2④③ | EU2B-YSK311N2④③ | EU2B-YSK3211N2④③ | EU2B-YSK3311N2④③ |
| | | | | | | | | | | | | |
| NC | 2 | | ● | | EU2B-YS311N3④ | EU2B-YS311N3① | EU2B-YS3211N3① | EU2B-YS3311N3① | EU2B-YSK311N3④③ | EU2B-YSK311N3④③ | EU2B-YSK3211N3④③ | EU2B-YSK3311N3④③ |
| NO | 3 | | | ● | | | | | | | | |
| | | | | | | | | | | | | |
| NO | 2 | ● | | ● | EU2B-YS311N4④ | EU2B-YS311N4④ | EU2B-YS3211N4④ | EU2B-YS3311N4④ | EU2B-YSK311N4④③ | EU2B-YSK311N4④③ | EU2B-YSK3211N4④③ | EU2B-YSK3311N4④③ |
| NC | 3 | ■ | | | | | | | | | | |
| NO | 1 | ● | | | | | | | | | | |
| NO | 2 | ● | | ● | EU2B-YS330④ | EU2B-YS3130④ | EU2B-YS3230④ | EU2B-YS3330④ | EU2B-YSK330④③ | EU2B-YSK3130④③ | EU2B-YSK3230④③ | EU2B-YSK3330④③ |
| NO | 3 | | | ● | | | | | | | | |
| NC | 1 | | ■ | | | EU2B-YS303④ | EU2B-YS3103④ | EU2B-YS3203④ | EU2B-YS3303④ | EU2B-YSK303④③ | EU2B-YSK3103④③ | EU2B-YSK3203④③ |
| NC | 2 | | ● | | | | | | | | | |
| NC | 3 | ■ | | | | | | | | | | |
| NO | 1 | ● | | | | | | | | | | |
| NC | 2 | | ● | | EU2B-YS321N1④ | EU2B-YS3121N1④ | EU2B-YS3221N1④ | EU2B-YS3321N1④ | EU2B-YSK321N1④③ | EU2B-YSK3121N1④③ | EU2B-YSK3221N1④③ | EU2B-YSK3321N1④③ |
| NO | 3 | | | ● | | | | | | | | |
| NC | 1 | | ■ | | | | | | | | | |
| NO | 2 | ● | | ● | EU2B-YS312N1④ | EU2B-YS3112N1④ | EU2B-YS3212N1④ | EU2B-YS3312N1④ | EU2B-YSK312N1④③ | EU2B-YSK3112N1④③ | EU2B-YSK3212N1④③ | EU2B-YSK3312N1④③ |
| NC | 3 | ■ | | | | | | | | | | |

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

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

3-position, 3-position/inverse cam Selector Switch Key Selector Switch



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) |

CONTROL BOXES

1 control unit

EC2B-B21B011①②-U

2 control units

EC2B-B21B021①②-U

3 control units

EC2B-B31B031①②-U

4 control units

EC2B-B51B041①②-U

5 control units

EC2B-B51B051①②-U

4 control units

EC2B-B32B042①②-U

6 control units

EC2B-B32B062①②-U

8 control units

EC2B-B52B082①②-U

10 control units

EC2B-B52B102①②-U

6 control units

EC2B-B33B063①②-U

9 control units

EC2B-B33B093①②-U

12 control units

EC2B-B53B123①②-U

15 control units

EC2B-B53B153①②-U

18 control units

EC2B-B63B183①②-U

① Thread Size

| Code | Description |
|------|-------------|
| M1 | M16 |
| M2 | M20 |
| M3 | M25 |
| M4 | M32 |
| M5 | M40 |
| N1 | NPT1/2 |
| N2 | NPT3/4 |
| N3 | NPT1 |
| N4 | NPT1 1/4 |

② Terminal Block Style

| Code | Description |
|-------|-------------------------|
| blank | no terminal block |
| C | Exposed screw terminals |
| F | Finger-safe terminals |

Specify thread size in place of ① in part number.
Specify terminal block style in place of ② in part number
(standard versions do not contain a terminal block).

STANDARD CONTROL STATIONS

1 Control Unit × 1 Column

1 pushbutton

EC2B-1102BN2N□1-U

①

Flush momentary
1NO contact
Nameplate ON
Button color: black, green, red, and white
1NO-1NC contact

EC2B-1102BN2N□2-U

①

Flush momentary
1NC contact
Nameplate OFF
Button color: black, green, red, and white

EC2B-1102BN2N□3-U

①

Flush momentary
1NO-1NC contact
Nameplate ON
Button color: black, green, red, and white

EC2B-1102BN2N□4-U

①

Flush momentary
1NO-1NC contact
Nameplate OFF
Button color: black, green, red, and white

1 pilot light

EC2B-1101BN2□11-U

①

120V AC
Illumination color: red

EC2B-1101BN2□12-U

①

240V AC
Illumination color: red

EC2B-1101BN2□13-U

①

24V AC/DC
Illumination color: red

EC2B-1101BN2□13-U

①

120V AC
Illumination color: green

EC2B-1101BN2□14-U

①

240V AC
Illumination color: green

EC2B-1101BN2□6-U

①

24V AC/DC
Illumination color: green

1 selector switch

EC2B-1106BN2N□1-U

①

Knob selector
2-position main-
tained
1NO-1NC contact
Name plate
OFF-ON

EC2B-1106BN2N□4-U

①

Key selector
2-position maintained
(removable at all
positions)
1NO-1NC contact
Nameplate OFF-ON

1 e-stop switch

EC2B-1102BN2N□7-U

①

Emergency stop switch
2NC contact
Nameplate EMER-
GENCY STOP
Button color (red)

2 Control Units × 1 Column

2 flush pushbuttons

EC2B-2102BN2N□1-U

①

Flush momentary
1NO contact, Nameplate ON
Button color (black, green, red, and white buttons)

②

Flush momentary
1NC contact, Nameplate OFF
Button color (black, green, red, and white buttons)

2 Mushroom Pushbuttons

EC2B-2102BN2N□4-U

①

Mushroom momentary
1NO-1NC contact, Nameplate ON
Button color (black)

②

Mushroom momentary
1NO-1NC contact, Nameplate OFF
Button color (red)

1 pilot light/1 pushbutton

EC2B-2110BN2N□5-U

①

120V AC
Illumination color: red

②

Flush momentary
1NO-1NC contact
Name plate STOP
Button color (black, green, red, and white buttons)

EC2B-2110BN2N□6-U

①

240V AC
Illumination color: red

②

Flush momentary
1NO-1NC contact
Name plate STOP
Button color (black, green, red, and white buttons)

EC2B-2110BN2N□3-U

①

24V AC/DC
Illumination color: red

②

Flush momentary
1NO-1NC contact
Name plate STOP
Button color (black, green, red, and white buttons)

Specify terminal style code in place of □ in part no. C (standard screw terminal), F (finger-safe screw terminal)

2 Control Units × 1 Column

| 1 pilot light / 1 selector switch | EC2B-2117BN2N□3-U | EC2B-2117BN2N□4-U |
|-----------------------------------|---|---|
| | ① 120V AC Illumination color: red | 240V AC Illumination color: red |
| | ② Knob, 2-position, 1NO-1NC contact Maintained, Name plate OFF-ON | Knob, 2-position, 1NO-1NC contact Maintained, Name plate OFF-ON |

3 Control Units × 1 Column

| 1 pilot light / 2 pushbuttons | EC2B-3110BN2N□5-U | EC2B-3110BN2N□6-U | EC2B-3110BN2N□3-U |
|-------------------------------|---|--|--|
| | ① 120V AC Illumination color: red | 240V AC Illumination color: red | 24V AC/DC Illumination color: red |
| | ② Flush momentary 1NO contact, Nameplate ON Button color (black, green, red, and white buttons) | Flush momentary 1NO contact, Nameplate ON Button color (black, green, red, and white buttons) | Flush momentary 1NO contact, Nameplate ON Button color (black, green, red, and white buttons) |
| | ③ Flush momentary 1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) | Flush momentary 1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) | Flush momentary 1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) |
| 3 pushbuttons | EC2B-3102BN2N□1-U | 1 meter / 2 pushbuttons | EC2B-3152BN2N□1△-U |
| | ① Flush momentary 1NO-1NC contact, Blank nameplate Button color (black, green, red, and white buttons) | | ① Specify input, capacity, and scale |
| | ② | | ② Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) |
| | ③ | | ③ Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) |

Specify the meter's capacity and scale in place of △ in the part number

4 Control Units × 1 Column

| 2 pilot lights / 2 pushbuttons | EC2B-4110BN3N□5-U | EC2B-4110BN3N□6-U | EC2B-4110BN3N□3-U |
|---|--|--|--|
| | ① 120V AC, Illumination color: red | 240V AC, Illumination color: red | 24V AC/DC, Illumination color: red |
| | ② 120V AC, Illumination color: green | 240V AC, Illumination color: green | 24V AC/DC, Illumination color: green |
| | ③ Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) |
| | ④ Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) |
| 1 pilot light / 2 pushbuttons / 1 selector switch | EC2B-4113BN3N□5-U | EC2B-4113BN3N□6-U | EC2B-4113BN3N□3-U |
| | ① 120V AC, Illumination color: red | 240V AC, Illumination color: red | 24V AC/DC, Illumination color: red |
| | ② Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) |
| | ③ Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) |
| | ④ Knob, 2-position, maintained 1NO-1NC contact Nameplate HAND-AUTO | Knob, 2-position, maintained 1NO-1NC contact Nameplate HAND-AUTO | Knob, 2-position, maintained 1NO-1NC contact Nameplate HAND-AUTO |

5 Control Units × 1 Column

| 2 pilot lights / 2 pushbuttons / 1 selector switch | EC2B-5113BN3N□5-U | EC2B-5113BN3N□6-U | EC2B-5113BN3N□3-U |
|--|--|--|--|
| | ① 120V AC, Illumination color: red | 240V AC, Illumination color: red | 24V AC/DC, Illumination color: red |
| | ② 120V AC, Illumination color: green | 240V AC, Illumination color: green | 24V AC/DC, Illumination color: green |
| | ③ Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate ON Button color (black, green, red, and white buttons) |
| | ④ Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) | Flush momentary 1NO-1NC contact, Nameplate OFF Button color (black, green, red, and white buttons) |
| | ⑤ Knob, 2-position, Maintained, 1NO-1NC contact, Name plate HAND-AUTO | Knob, 2-position, Maintained, 1NO-1NC contact Name plate HAND-AUTO | Knob, 2-position, Maintained, 1NO-1NC contact Name plate HAND-AUTO |

Specify terminal style code in place of □ in part no. C (standard screw terminal), F (finger-safe screw terminal)

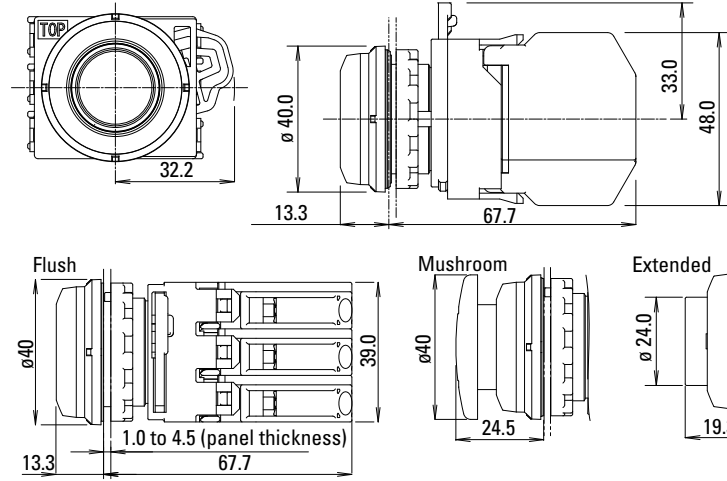
DIMENSIONS

All dimensions in mm

Control Units

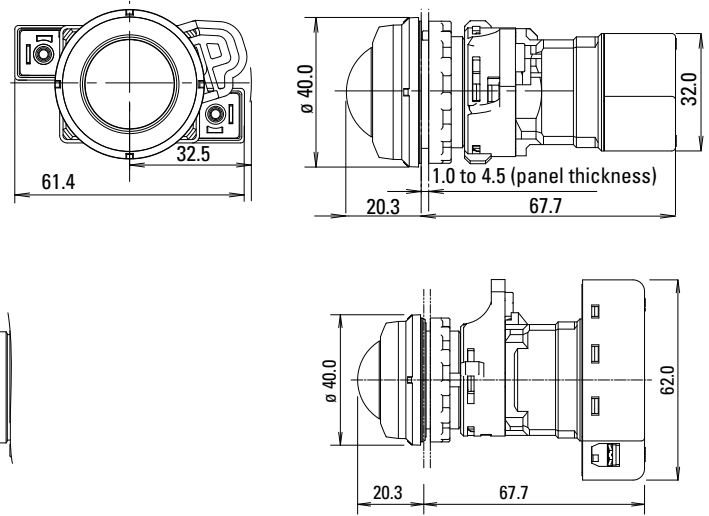
Pushbuttons

Shown with finger-safe contacts



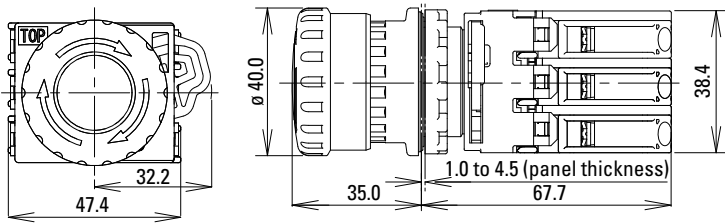
Pilot Lights

Shown with finger-safe contacts



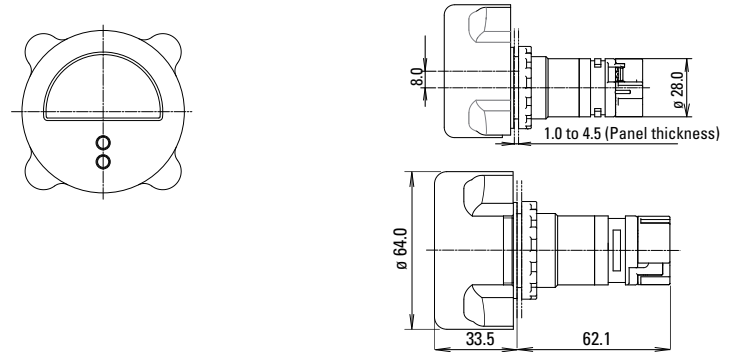
Emergency Stop Switches

Shown with finger-safe contacts



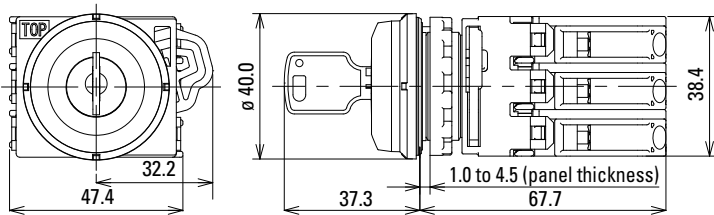
Meters

Shown with finger-safe contacts

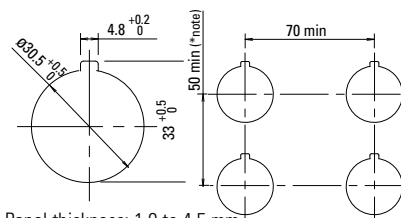


Selector Switches

Shown with finger-safe contacts



Mounting Hole Dimensions

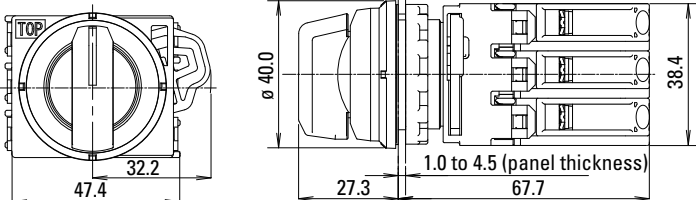


Panel thickness: 1.0 to 4.5 mm.

*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.

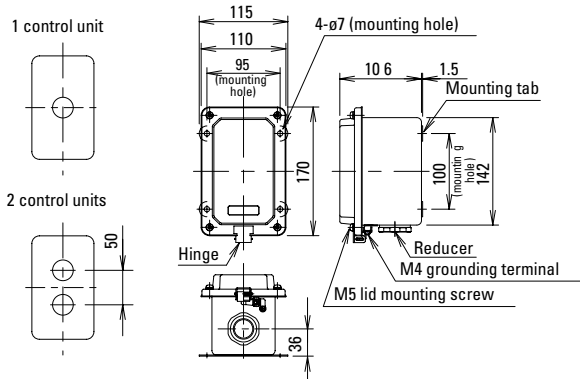
Key Selector Switch

Shown with finger-safe contacts



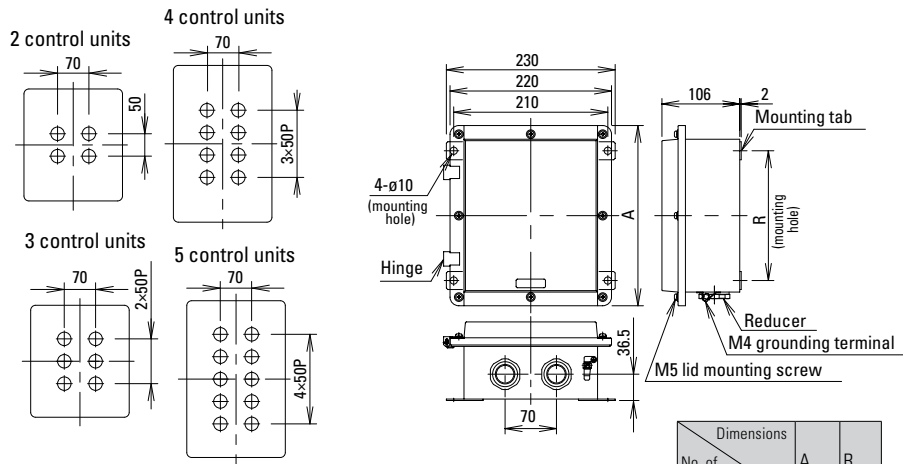
1, 2 control units x 1 column

weight: 1.2kg/1.4kg



2, 3, 4, 5 control units x 2 columns

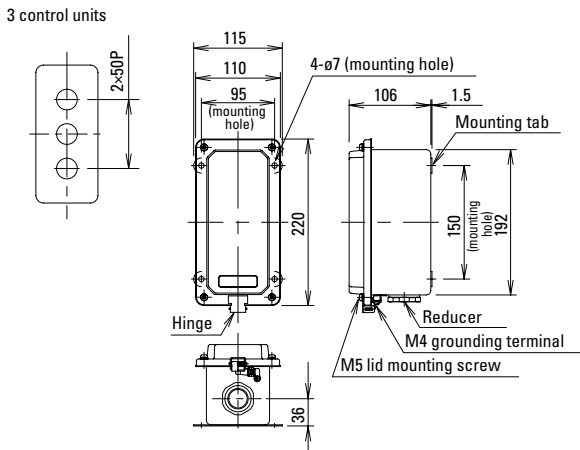
weight: 3.8/4.2/4.6/5.0 kg



| Dimensions No. of Control Units | A | R |
|---------------------------------------|-----|-----|
| 2 or 3 | 250 | 180 |
| 4 or 5 | 350 | 280 |

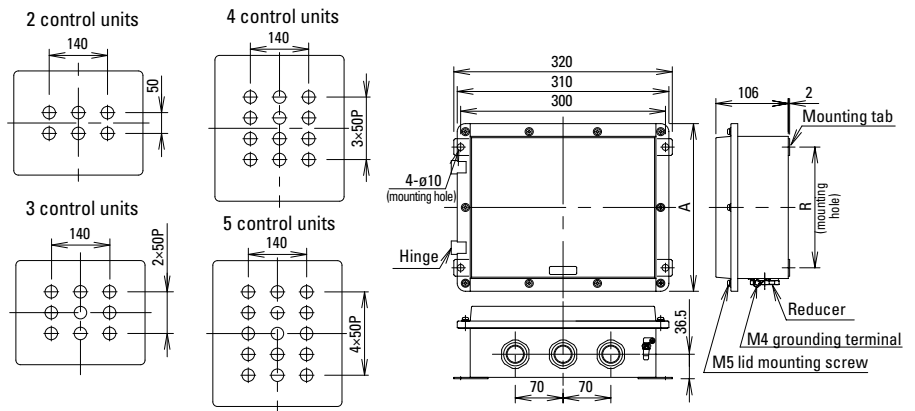
3 control units x 1 column

weight: 1.8kg



2, 3, 4, 5 control units x 3 columns

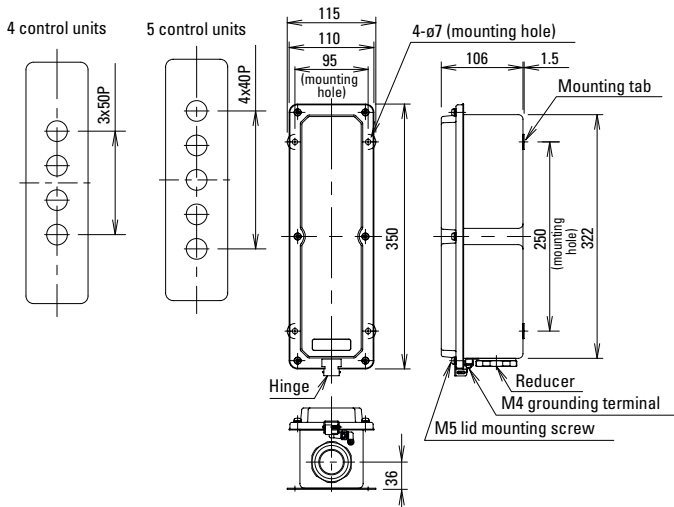
weight: 4.8/5.2/6.5/7.1 kg



| Dimensions No. of Control Units | A | R |
|---------------------------------------|-----|-----|
| 2 or 3 | 250 | 180 |
| 4 or 5 | 350 | 280 |

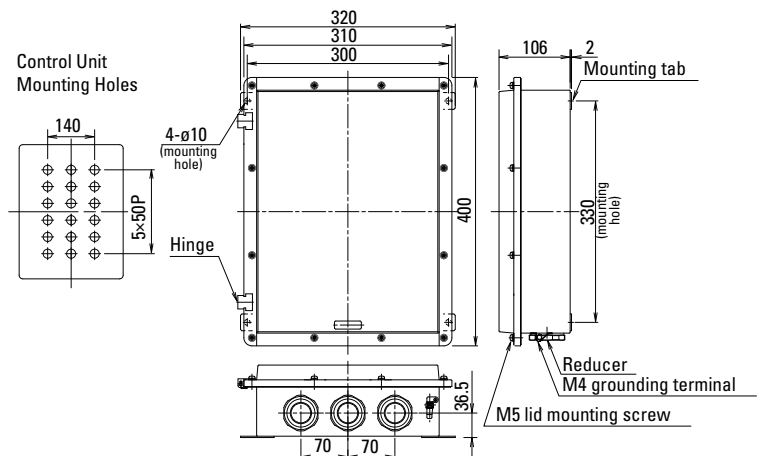
4, 5 control units x 1 column

weight: 2.4kg



6 control units x 3 columns

weight: 8.1kg

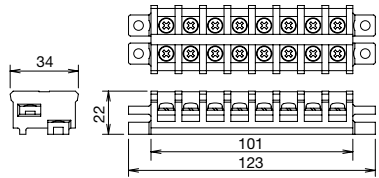


Terminal Blocks

Terminal blocks are not supplied with the standard control boxes (without wiring). When wiring inside the control box is required, specify the wiring circuit. The terminal block type used on the control boxes with wiring depends on the terminal style of the control unit.

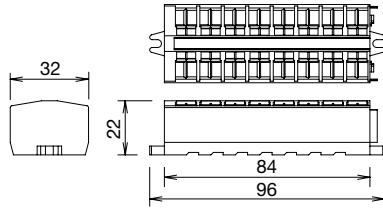
C terminal style

exposed screw terminal
ET2A-8PE
polyamide
IECEX TUR 15.0043U,
TÜV 15 ATEX 7799U



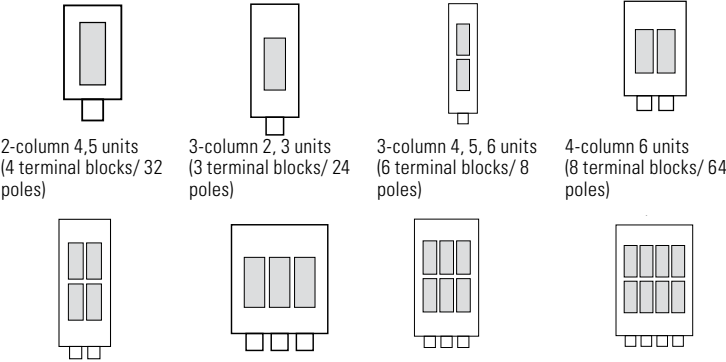
F terminal style

finger-safe screw terminal
IP20 clamp terminal: 264-238 (WAGO)
polyamide
ECEx PTB 04.0003U, PTB 98 ATEX
3129U



The number of terminal blocks, poles, and the installation direction that can be installed on the control box are as follows:

1-column 1, 2 units (1 terminal block/8 poles) 1-column 3 units (1 terminal block/ 8 poles) 1-column 4, 5 units (1 terminal block/ 8 poles) 2-column 2, 3 units (2 terminal blocks/16 poles)



ACCESSORIES

All dimensions in mm

Nameplates

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

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

Fittings and Reducers

Reducers installed at the bottom of the control box are as follows: 1 column: 1 reducer, 2 columns: 2 reducers, 3 columns: 3 reducers, 4 columns: 4 reducers. Material is nickel-plated brass. Use cable lead-in fittings that are commercially available. See the following table for optional reducers.

| Control Box Style | Part No. | Thread Size | Symbol | UL c-UL |
|--|----------------|-------------|--------|---------|
| 1 column (1 to 3 control units) 2, 3 columns (2, 3 control units) | EC9E-H3M16E-UL | M16 | M1 | ○ |
| | EC9E-H3M20-UL | M20 | M2 | ○ |
| | EC9E-H3M25-UL | M25 | M3 | ○ |
| | EC9E-H3M32-UL | M32 | M4 | ○ |
| | EC9E-H3NPT1-UL | NPT 1/2 | N1 | ○ |
| | EC9E-H3NPT2-UL | NPT 3/4 | N2 | ● |
| 1, 2, 3 columns (4, 5 control units) 3, 4 columns (6 control units) | EC9E-H3NPT3-UL | NPT 1 | N3 | ○ |
| | EC9E-H4M25-UL | M25 | M3 | ○ |
| | EC9E-H4M32-UL | M32 | M4 | ○ |
| | EC9E-H4M40-UL | M40 | M5 | ○ |
| | EC9E-H4NPT2-UL | NPT 3/4 | N2 | ○ |
| | EC9E-H4NPT3-UL | NPT 1 | N3 | ● |
| | EC9E-H4NPT4-UL | NPT 1 1/4 | N4 | ○ |

●: Standard reducer ○: non-standard reducer

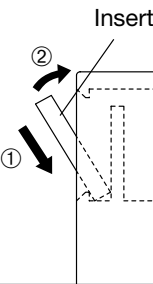
The reducers in the table above are for replacement use only. All EC2B boxes are supplied with a reducer that has been secured to the housing per UL regulations. If it is necessary to replace a reducer, the user should follow appropriate UL standards for securing to EC2B housing.

Nameplate Inserts

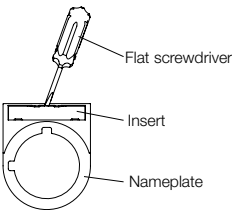
| Appearance | Legend | Part Number |
|------------|---------------|-------------|
| | Blank | EU9Z-NP0 |
| | ON | EU9Z-NP1 |
| | OFF | EU9Z-NP2 |
| | START | EU9Z-NP3 |
| | STOP | EU9Z-NP4 |
| | OFF-ON | EU9Z-NP31 |
| | HAND-AUTO | EU9Z-NP35 |
| | HAND-OFF-AUTO | EU9Z-NP53 |

Material: Aluminum

Installing the Insert to the Nameplate



Removing the Insert from the Nameplate


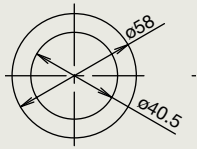

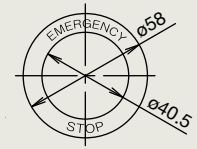


To remove the Insert, insert a flat screwdriver between the Insert and Nameplate.

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 |

Emergency Stop Switch Nameplate Stickers


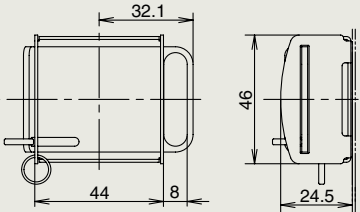
| Appearance | Legend | Part Number | Dimensions |
|--|----------------|-------------|---|
|  | Blank | EU9Z-NVS0 |  |
|  | Emergency Stop | EU9Z-NVS27 |  |

Material: yellow vinyl Legend: black

Padlock Cover

EU2B-YB2 extended pushbutton: to maintain latched status

EU2B-YB1 flush pushbutton/EU2B-YSK key selector switch: to prevent operation


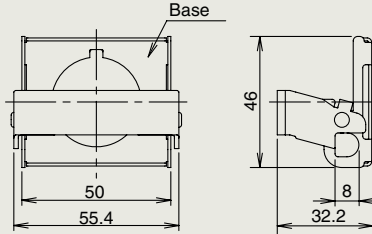
| Appearance | Part Number | Dimensions |
|--|-------------|---|
|  | EU9Z-PC |  |

Note: mounted to outside of enclosure with screws, not provided by IDEC

Material: Stainless Steel

Emergency Stop Switch Padlock Cover


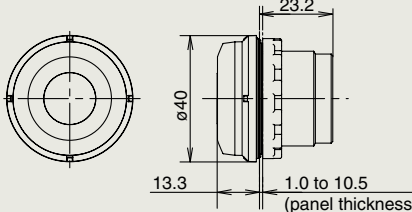
Used with EU2B-YBV emergency stop switch to maintain the switch in the latched status.

| 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. R : red G : green B : black Y : yellow W : white S : blue |
|  | Extended | HW1A-B2① | |
|  | ø40 Mushroom | HW1A-B4① | |

Material: Polyacetal

Lenses

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

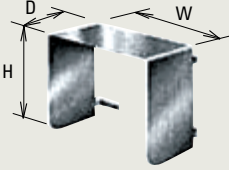
Material: AS resin (gasket supplied)

LED Lamps



| Operating Voltage | Current Draw | | Part Number | Illumination Color Code | Base |
|-------------------|--------------|---|-------------|--|---------|
| | AC | DC | | | |
| 6V AC/ DC±10% | 8mA | 7mA (A, R, W) 5.5mA (G, PW, S) | LSTD-6① | Specify a color code in place of ① in the part number R : red G : green A : amber PW : white S : blue 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 | | |

Control Box Shade

| Shape | Part No. | Applicable Control Box | Dimensions (mm) | | |
|---|-------------|------------------------|-----------------|-----|-----|
| | | | H | W | D |
|  Material: stainless steel Thickness: 1mm Photo: Part No. EC9Z-F2A52 | EC9Z-F2A21M | EC2B-11*B EC2B-21*B | 180 | 160 | 160 |
| | EC9Z-F2A31M | EC2B-31*B | 230 | 160 | 160 |
| | EC9Z-F2A51 | EC2B-41*B EC2B-51*B | 360 | 160 | 160 |
| | EC9Z-F2A32 | EC2B-22*B EC2B-32*B | 260 | 420 | 160 |
| | EC9Z-F2A52 | EC2B-42*B EC2B-52*B | 360 | 420 | 160 |
| | EC9Z-F2A33 | EC2B-23*B EC2B-33*B | 260 | 510 | 160 |
| | EC9Z-F2A53 | EC2B-43*B EC2B-53*B | 360 | 510 | 160 |
| | EC9Z-F2A63 | EC2B-63*B | 410 | 510 | 160 |
| | EC9Z-F2A64 | EC2B-64*B | 410 | 580 | 160 |

Protects control units from direct sunlight and rain. The surface of the control box shade is uncoated. Can be installed by tightening to the mounting tabs on the control box. Control box shade cannot be installed later. Specify shade at time of order.

OPERATING INSTRUCTIONS

Installation Area

Do not install the EC2B control box in an environment where more than IP65 protection degree (more than Type 4X in North America) is required.

Use the EC2B control box under ambient temperature of -20 to +50°C. If the control box is exposed to direct sunlight and the surface temperature may rise above 50°C, provide a shade to keep the surface temperature below 50°C.

Installation

Use four M6 bolts for 1-column, four M8 bolts for 2- and 3-column, or other methods with equivalent strength to install the control box. Mounting tab thickness is 1.5mm for 1 column and 2mm for 2, 3, and 4 columns.

- If bolts become may loose due to vibration, use spring washers.
- If bolt corrosion is anticipated, use anti-corrosion bolts or other countermeasures.

Notes on Emergency Stop Switches

When using the emergency stop switches on safety-related parts of the control system, observe safety standards and regulations of the relevant country or region. Also be sure to perform a risk assessment before operation.

Opening/Closing the Lid

Use a Philips screwdriver to loosen lid mounting screws. While holding the unhinged side, open the lid slowly without exerting excessive force on the hinge.

Before closing the lid, make sure of the following:

- No foreign substances are on the packing or joint surfaces.
- No displacement of the waterproof packing.
- Wires are not caught between the joint surfaces.
- Next, close the lid slowly and tighten the screws to a proper torque of 1.6 to 2.4 N·m.

Limitation of the Operating Current

Major heat sources comes from the wiring which is connected to the control box. Therefore, not only the operating current but wiring conditions (size, no. of wires, no. of wire bundles) may cause temperature rise. When wiring, observe the following conditions.

Stranded wire: 1.5 to 2.5 mm² (UL-c-UL certified) / Solid wire: ø1.2 to ø1.6 mm (16 to 14 AWG)

- Maximum no. of wires per bundle: 16
- Maximum operating current: 10A

When using the control box under an operating environment of 40°C minimum, use a heat resistant cable of 70°C minimum.

Determine the operating current so that the total heat value of 1 wire bundle is below 300 [A²×wires]. Also, when calculating the heat value, take the current fluctuation (10%) into consideration. [calculation example: EC2B-41**B (8 circuit)]

- ① Apply 10A to 1 circuit, 1A to the remaining 7 circuits:
 $\{(10A \times 1.1)^2 \times 2 \text{ wires}\} + \{(1A \times 1.1)^2 \times 14 \text{ wires}\} \approx 259$ (can be used because < 300)
- ② Apply 10A to 1 circuit, 2A to the remaining 7 circuits:
 $\{(10A \times 1.1)^2 \times 2 \text{ wires}\} + \{(2A \times 1.1)^2 \times 14 \text{ wires}\} \approx 310$ (cannot be used because > 300)

See the table below for the allowable operating current when applying current evenly to each control box.

Allowable Operating Current

| Control Box Part No. | Max. No. of Circuits | Max No. of Wires per Bundle (*1) [wires] ([wires]×[bundle]) | | Allowable Operating Current (reference) (*2) |
|----------------------|----------------------|--|----------------------|--|
| | | Without terminal-blocks | With terminal blocks | |
| EC2B-11 | 3 | 16 (16×1) | 8 (8×1) | 7A |
| EC2B-21 | 6 | 16 (16×1) | 8 (8×1) | 5A |
| EC2B-31 | 9 | 16 (16×1) | 8 (8×1) | 4A |
| EC2B-41 | 12 | 16 (16×1) | 16 (16×1) | 3A |
| EC2B-51 | 15 | 16 (16×1) | 16 (16×1) | 3A |
| EC2B-22 | 12 | 32 (16×2) | 16 (8×2) | 5A |
| EC2B-32 | 18 | 32 (16×2) | 16 (8×2) | 4A |
| EC2B-42 | 24 | 32 (16×2) | 32 (16×2) | 3A |
| EC2B-52 | 30 | 32 (16×2) | 32 (16×2) | 3A |
| EC2B-23 | 18 | 48 (16×3) | 24 (8×3) | 5A |
| EC2B-33 | 27 | 48 (16×3) | 24 (8×3) | 4A |
| EC2B-43 | 36 | 48 (16×3) | 48 (16×3) | 3A |
| EC2B-53 | 45 | 48 (16×3) | 48 (16×3) | 3A |
| EC2B-63 | 54 | 48 (16×3) | 48 (16×3) | 3A |
| EC2B-64 | 72 | 64 (16×4) | 64 (16×4) | 3A |

*1: Make sure that the number of wires per bundle is a maximum of 16 by reducing the wiring or by jumper wiring. The maximum number of wires per bundle may need to be further reduced depending on the wire size, lead-in fitting, or conduit size.

*2: The allowable current value (reference) when applying current evenly to all circuits of the maximum number of circuits.

Wiring

Wiring Construction

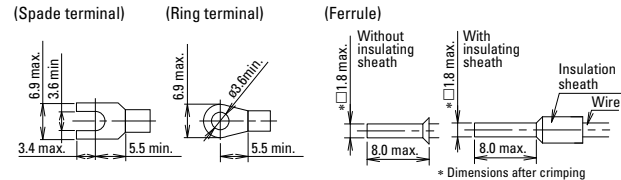
Observe the laws and regulations in each country concerning wiring construction. Use cable wiring or metal conduit wiring for installation in hazardous locations. If foreign objects or water may enter the box, install a sealing fitting near the cable entry of the box and seal the control box using a compound. Standard type control boxes do not contain a terminal block. Wire the control units directly.

Applicable Wires

Stranded wire: 1.25 to 2.5 mm², solid wire: ϕ 1.2 to ϕ 1.6 mm (AWG16 to 14). Do not connect more than 2 wires to the same terminal.

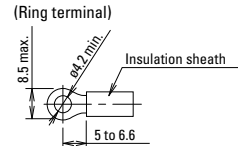
Applicable crimping terminal

Ring and spade terminals cannot be used for EU2B control units with IP20 finger-safe terminals. Ring and spade terminals cannot be used for IP20 clamp type terminal blocks. When connecting two ferrules to an EU2B control unit, use ferrules without insulating sheath.



For screw terminal ET2A-8PE

For IP20 clamp terminal
(WAGO: 264-238)



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) and ET2A-8PE terminal block (M4): 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 as mentioned below, and insert the wire all the way in.

EU2B Control units: 8.6 mm maximum

IP20 crimping terminal: 8 to 9 mm

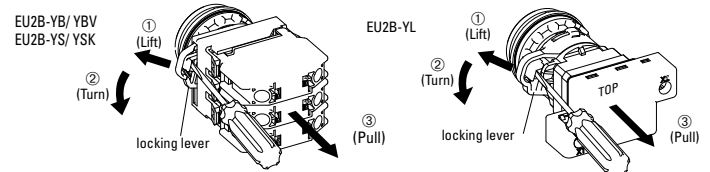
When using stranded wires, make sure that there are no wire whiskers.

Make sure that the spade crimping terminals and ferrules are inserted all the way in.

Use insulated ring terminals for the ET2A-8PE terminal block. Use only applicable crimping terminals and do not directly connect stranded wires or solid wires.

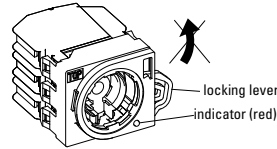
Removing and Installing the Contact Unit / Lamp Unit

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.



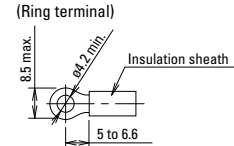
When the contact unit is removed from the emergency stop switch operator, the NO contact closes and the NC contact opens.

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



Panel mounting for the operator, lens unit and meter

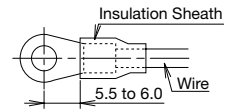
Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from the panel front into the panel hole. Place the projection on the operator with TOP



marking upward and the recess on the mounting panel in the same direction. Meters have 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 nameplate 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 padlocking cover.

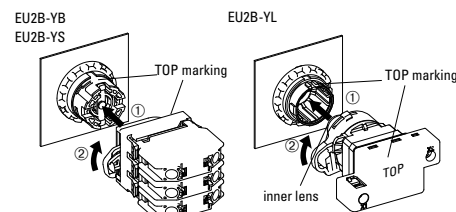
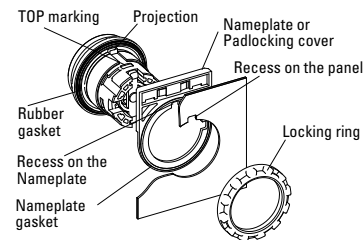


Installing the contact unit and lamp unit

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 then attach the contact unit to the operator. Then turn the locking lever to the right. Follow the same procedure when installing the lamp unit.

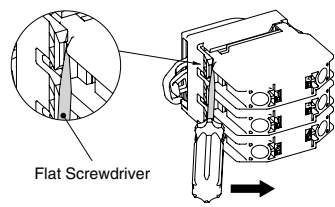
When installing the lamp unit, check that the inner lens is not loose.

The contact block adapters for emergency stop switches cannot be used for pushbuttons, selector, or 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.

Protective Grounding

Protective grounding must be performed according to the installation environment and rating requirements. Observe laws and regulations set by each country.

- Connect the M4 grounding terminal of the EC2B control box to a proper ground (grounding resistance 10Ω maximum). When operating the EC2B control box by connecting to circuits of 300V or below, the grounding resistance must be 100Ω maximum.
- When using cables, connect one of the cable cores to the grounding terminal in the enclosure.
- If the grounding terminal in the enclosure cannot be used, use the M4 grounding terminal on the outside of the enclosure.

Recommended tightening torque:

M4: 1.0 to 1.3 Nm

M6: 3.9 to 5.4 Nm

- For grounding, use appropriate wires (size, material, insulation) that can tolerate the expected maximum grounding current. Be sure to protect the grounding wire with protection, such as metal conduit, from external damage.

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.

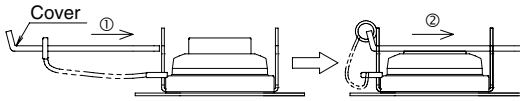
Installing EU9Z-PC Padlock Cover

(Flush/extended pushbutton/key selector switch)

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

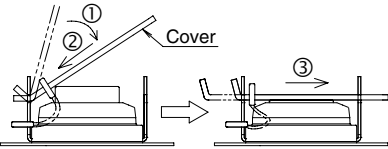
Remove the cover in the reverse step of installing the cover. Do not install or remove the cover forcefully, or it will cause failure.

[Installation A]



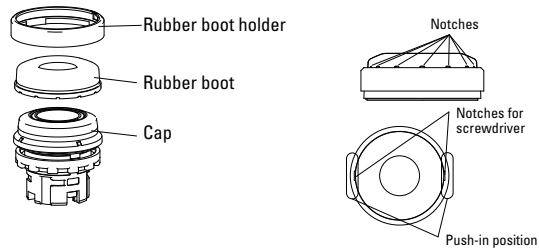
[Installation B]

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.

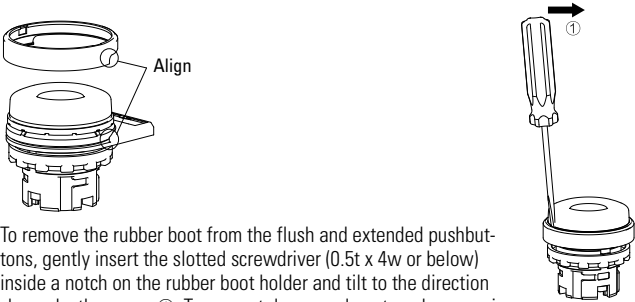


Push the rubber boot holder further around on the two notches on the holder so that the holder fits the button completely

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 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.

Observe laws and regulations set by each country. Do not open the lid when inspecting the EC2B while it is energized. Never disassemble the control box. Do not use tools that cause sparks during maintenance and inspection. When using measuring devices, use explosion-protected types. When the EC2B needs to be disassembled or assembled for maintenance or repair, contact IDEC.

Maintenance and Inspection

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

Disposal

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

Safety Precautions

EU2B Control Units

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.
- Use explosion-proof electrical equipment 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.

EC2B Control Boxes

- EC2B control boxes can be installed only in zones 1 and 2. Do not use in zone 0. In North America, the EC2B can be installed in Division 2 areas, but cannot be installed in Division 1 areas.
- Turn power off to the EC2B control box before installation, removal, wiring, or maintenance, otherwise explosion, fire hazard, or electric shock may result.
- Special skills and knowledge of explosion protection, electric system installation, and relevant laws/regulations are required to transport, install, wire, operate, repair, and inspect the EC2B control box. People without such expertise must not use the EC2B control box, otherwise damage or accident may result.
- Do not modify the EC2B, otherwise damage or accident may result.
- Do not use a damaged EC2B control box, 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.
- Do not sit on or hang from the EC2B control box, otherwise damage, personal injury, or accident may result.
- Do not open the lid of the EC2B control box when it is energized, otherwise electric shock, fire hazard, or explosion may result.
- Operate the EC2B control box at the rated current and voltage specified in this catalog, otherwise short-circuiting, fire hazard, or explosion may result.
- When measuring the insulation resistance of the EC2B control box, make sure that potentially explosive atmosphere of explosive gas or vapor does not exist in the vicinity, otherwise explosion may result. Also, do not touch the terminals without paying attention, otherwise electric shock will result.
- Do not place any obstacles in front of the nameplate.
- Do not remove the nameplate.
- When opening the lid for wiring, maintenance or inspection, make sure that substances such as dust, concrete powder, or metal powder do not enter inside the box, otherwise contact failure or insulation failure may result.
- Do not drop the EC2B control box during transportation.
- Be sure to open the carton the right way up, otherwise damage or personal injury may result.
- Check that the product is what you have ordered. Using an incorrect model might result in malfunction or accident.
- Stop operation immediately if abnormal operation occurs. Otherwise, a secondary accident may occur.
- The surface temperature of the EC2B control box may become extremely hot during operation. Before maintenance or inspection of the EC2B, be sure to wear gloves to prevent burning your hand.

TO: IDEC Corporation

Company: _____

TEL: _____

No. of Control Box



Contact Person: _____

FAX: _____

Select the required specifications by checking the checkboxes, and specify the details.

Control box size

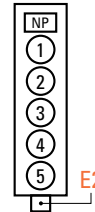
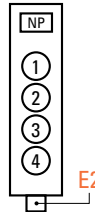
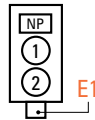
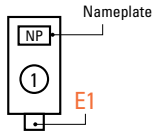
☐ EC2B-110

☐ EC2B-210

☐ EC2B-310

☐ EC2B-410

☐ EC2B-510



Nameplate (NP)

Material: Acrylic (53 mm × 12 mm, plate thickness 2 mm)
Legend color: black letter, white background
Maximum no. of letters: 19 letters per line (up to 2 lines)

☐ No nameplate

☐ 1 line

☐ 2 lines

| | |
|----------|--|
| 1st line | |
| 2nd line | |

Control Units

| Position | Control Unit Part No. | Control Unit Nameplate | | | | |
|----------|-----------------------|--|------------------------------------|--|-------------------------------|---|
| ① | | <input type="checkbox"/> ON | <input type="checkbox"/> OFF | <input type="checkbox"/> START | <input type="checkbox"/> STOP | <input type="checkbox"/> EMERGENCY STOP |
| | | <input type="checkbox"/> OFF ON | <input type="checkbox"/> HAND AUTO | <input type="checkbox"/> HAND OFF AUTO | | <input type="checkbox"/> Blank |
| | | <input type="checkbox"/> No nameplate <input type="checkbox"/> Specify letters () | | | | |
| ② | | <input type="checkbox"/> ON | <input type="checkbox"/> OFF | <input type="checkbox"/> START | <input type="checkbox"/> STOP | <input type="checkbox"/> EMERGENCY STOP |
| | | <input type="checkbox"/> OFF ON | <input type="checkbox"/> HAND AUTO | <input type="checkbox"/> HAND OFF AUTO | | <input type="checkbox"/> Blank |
| | | <input type="checkbox"/> No nameplate <input type="checkbox"/> Specify letters () | | | | |
| ③ | | <input type="checkbox"/> ON | <input type="checkbox"/> OFF | <input type="checkbox"/> START | <input type="checkbox"/> STOP | <input type="checkbox"/> EMERGENCY STOP |
| | | <input type="checkbox"/> OFF ON | <input type="checkbox"/> HAND AUTO | <input type="checkbox"/> HAND OFF AUTO | | <input type="checkbox"/> Blank |
| | | <input type="checkbox"/> No nameplate <input type="checkbox"/> Specify letters () | | | | |
| ④ | | <input type="checkbox"/> ON | <input type="checkbox"/> OFF | <input type="checkbox"/> START | <input type="checkbox"/> STOP | <input type="checkbox"/> EMERGENCY STOP |
| | | <input type="checkbox"/> OFF ON | <input type="checkbox"/> HAND AUTO | <input type="checkbox"/> HAND OFF AUTO | | <input type="checkbox"/> Blank |
| | | <input type="checkbox"/> No nameplate <input type="checkbox"/> Specify letters () | | | | |
| ⑤ | | <input type="checkbox"/> ON | <input type="checkbox"/> OFF | <input type="checkbox"/> START | <input type="checkbox"/> STOP | <input type="checkbox"/> EMERGENCY STOP |
| | | <input type="checkbox"/> OFF ON | <input type="checkbox"/> HAND AUTO | <input type="checkbox"/> HAND OFF AUTO | | <input type="checkbox"/> Blank |
| | | <input type="checkbox"/> No nameplate <input type="checkbox"/> Specify letters () | | | | |

Lead-in Fitting (E1/E2)

Without specification
(standard reducer)

With specification

| | | EC2B-110, 210, 310 | | EC2B-410, 510 | | | |
|-------------------------------|----------------------|--------------------------|---------------|---------------|----------------------|--------------------------|---------------|
| UL/c-UL, IECEx/ATEX certified | | NPT 3/4 | | NPT 1 | | | |
| EC2B-110, 210, 310 | | | | EC2B-410, 510 | | | |
| Code | Cable lead-in method | Check | Specification | Code | Cable lead-in method | Check | Specification |
| E1 | Reducer | <input type="checkbox"/> | M16 | E2 | Reducer | <input type="checkbox"/> | M25 |
| | | <input type="checkbox"/> | M20 | | | <input type="checkbox"/> | M32 |
| | | <input type="checkbox"/> | M25 | | | <input type="checkbox"/> | M40 |
| | | <input type="checkbox"/> | M32 | | | <input type="checkbox"/> | NPT 3/4 |
| | | <input type="checkbox"/> | NPT 1/2 | | | <input type="checkbox"/> | NPT 1 |
| | | <input type="checkbox"/> | NPT 3/4 | | | <input type="checkbox"/> | NPT 1 1/4 |
| | | <input type="checkbox"/> | NPT 1 | | | | |

• Specify wiring diagram when wiring is required.

• Specify when other accessories are required.

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