## HE1B Series Basic Enabling Switch

HE1B Key features include:

- 3 position funtionality (OFF – ON –OFF) as required for manual robotic control
- Ideally suited for use as enabling (aka "deadman") switch on teach pendants
- Provides a high level of safety based on human behavioral studies that determir personnel may squeeze OR let go when presented with a panic situation
- Positive action contacts "On" (pos. 2) to "Off" (pos. 3) ensure no contact welding EN60947-5-1 / IEC60947-5-1)
- Contacts will not close when released from "Off" (pos. 3) to "Off" (pos. 1) (per IEC60204-1; 9.2.5.8)
- Small, lightweight and highly reliable


### Specifications

| | | |
|---|---|---|
| Conforming to Standards | | IEC60947-5-1, EN60947-5-1, JIS C8201-5-1, UL508, CSA C22.2 No 14 |
| Operating Temperature | | –25 to +60˚C (no freezing) |
| Operating Humidity | | 45 to 85% RH maximum (no condensation) |
| Storage Temperature | | –40 to +80˚C (no freezing) |
| Pollution Degree | | 2 |
| Initial Contact Resistance | | 50mΩ maximum |
| Insulation Resistance | | 100MΩ minimum |
| Impulse Withstand Voltage | | 2.5kV |
| Operating Frequency | | 1200 operations/hour |
| Mechanical Life | | Position 1 2: 1,000,000 operations minimum |
| | | Position 1 2 3 1: 100,000 operations minimum |
| Electrical Life | | 100,000 operations minimum at rated load |
| Shock Resistance | Operating Extremes | 100m/s²(10G) |
| | Damage Limits | 1000m/s²(100G) |
| Vibration Resistance | Operating Extremes | 5 to 55Hz, amplitude 0.5mm minimum |
| | Damage Limits | 16.7Hz, amplitude 1.5mm minimum |
| Terminal Shape | | Solder Terminal |
| Recommended Wire | | 0.5mm² maximum / 1 line (20AWG) |
| Solder Heat Resistance | | 260°C / 3 seconds maximum |
| Terminal Pulling Strength | | 20N minimum |
| Recommended Screw Torque | | HE1B-M1: M3 screw / 0.5 to 0.8Nm |
| Degree of Protection | | IP40 (IEC 60529) excluding terminal part |
| Conditional Short-Circuit Current | | 50A (250V) |
| Recommended Short Circuit Protection | | 250V, 10A fast blow fuse (IEC 60127-1) |
| Weight | | Approx. 6g |
| Circuit Opening Force | | 30N minimum (position 2) |
| Control Resistance (Operating) | | 250N minimum |

## Part Numbers

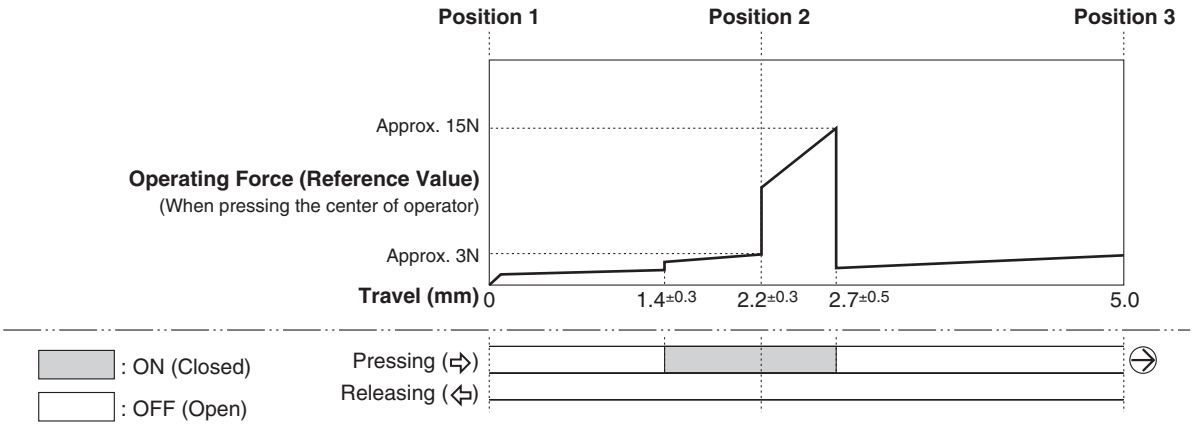
| Item | Installation | Part Number |
|---|---|---|
|  | Side | HE1B-M1 |
| | Front | HE1B-M1N |

## Current Ratings

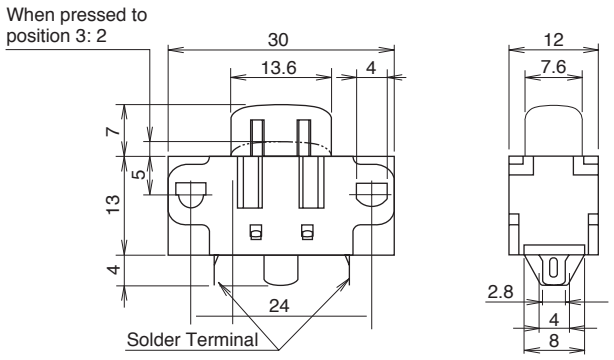
| | | | | | |
|---|---|---|---|---|---|
| **Rated Insulation Voltage (Ui)** | | | AC / DC250V | | |
| **Thermal Current (Ith)** | | | 5A | | |
| **Rated Operating Voltage (Ue)** | | | 30V | 125V | 250V |
| **Rated Operating Current (Ie)** | **AC 50/60Hz** | **Resistive Load (AC-12)** | – | 3A | 1.5A |
| | | **Inductive Load (AC-15)** | – | 1.5A | 0.75A |
| | **DC** | **Resistive Load (DC-12)** | 2A | 0.4A | 0.2A |
| | | **Inductive Load (DC-13)** | 1A | 0.22A | 0.1A |
| **Contact Structure** | | | SPST-NO three position (OFF-ON-OFF) | | |

Minimum applicable load: AC/DC3V • 5mA (For reference only).

## Operating Characteristics



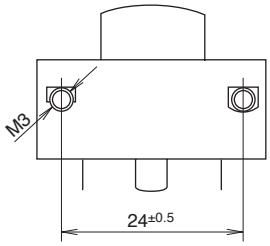
## Dimensions (mm)




### Installation Dimensions (mm)

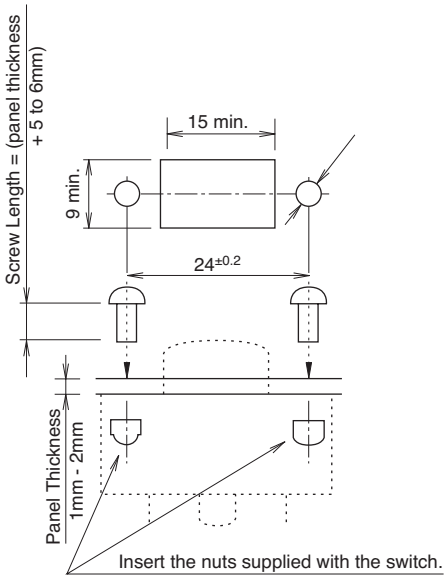
#### HE1B-M1 (Side Mounting)

1. M3 Screw (not provided)
2. Thread built in




#### HE1B-M1N (Front Mounting)

1. M3 Screw (not provided)
2. Locking nut (2 pcs) included




When using a panel thicker than 2mm, the button will be lower than the surface of the panel

# General Information

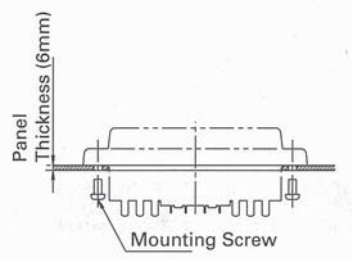
## Safety Precautions

- In order to avoid electric shock or fire, turn power off before installation, removal, wire connection, maintenance or inspection of switch.
- Follow specification when installing. Improper electrical load may damage switch, cause electric shock, or fire.
- Use proper wire diameter to meet voltage and current requirements. Using improper wires or incomplete soldering may cause fire due to abnormal heat generation.

## Installation Precautions

### HE2B

- M3 nut is inside the rubber cover.

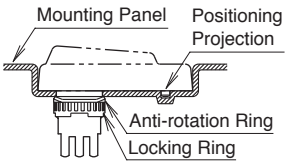



### HE2B/HE3B

- A change in internal air pressure may cause the rubber boot to expand and shrink on an enabling switch that has the rubber boot sealed. This may affect the performance of the switch. Periodically check to ensure that the enabling switch is operating correctly.
- If the panel is not level when mounting an enabling switch, the waterproof feature cannot be guaranteed.

### HE3B

- The rubber boot has a tab to be used for orientation. When making a positioning hole in a panel, do not make a hole in the rubber boot, or the waterproof feature cannot be guaranteed. When the positioning hole is not on the panel, remove the tab, but do not make a hole in the rubber boot.
- When tightening the locking ring, secure the flange to prevent the enabling switch from rotating. In applications where the enabling switch is to be rotated, mount the switch in a recess on the panel as shown.




## Wiring Precautions

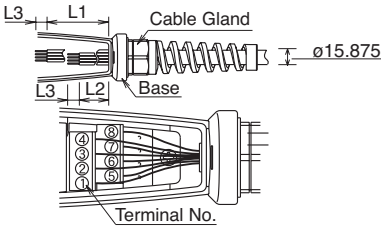
### HE1B/HE2B/HE3B

- Applicable wire size is 0.5mm² (20AWG) (maximum) / 1 line.
- When soldering the terminal, solder at a temperature of 260°C within 3 seconds. Use non-corrosive liquid rosin as soldering flux.

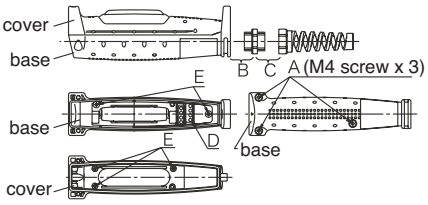
### HE1G

- Wire Stripping Information

| Wire Length | Terminal Number 1-4 | Terminal Number 5-8 |
|---|---|---|
| L1, L2 (mm) | L1=40mm | L2=27mm |
| L3 (mm) | L3=6mm | |




- Applicable Wire Size:0.14 to 1.5mm² (24 - 16AWG, one wire per terminal)
- Recommended Torque




| | See Drawing Above | Recommended Torque |
|---|---|---|
| Rubber Boot & Base | A | 1.2±0.1Nm |
| Connector & Grip Switch | B | 4.0±0.3Nm |
| Connector | C | 4.0±0.3Nm |
| Terminal Screw | D | 0.5±0.6Nm |
| Do Not Remove | E | |

## Use Precautions

### HE2B/HE3B/HE1G

- To ensure the highest level of reliability connect both contacts to a monitoring device such as a safety relay.

### HE1B/HE2B/HE3B

- When installing the enabling switch ensure that it cannot be accidently activated. For example, a protrusion from a teaching pendant could cause the enabling switch to be activated by the weight of the teaching pendant.