

## HE1B Series Basic Enabling Switch

### HE1B Key features include:


- 3 position functionality (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 determine 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 (per 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


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

Part Numbers

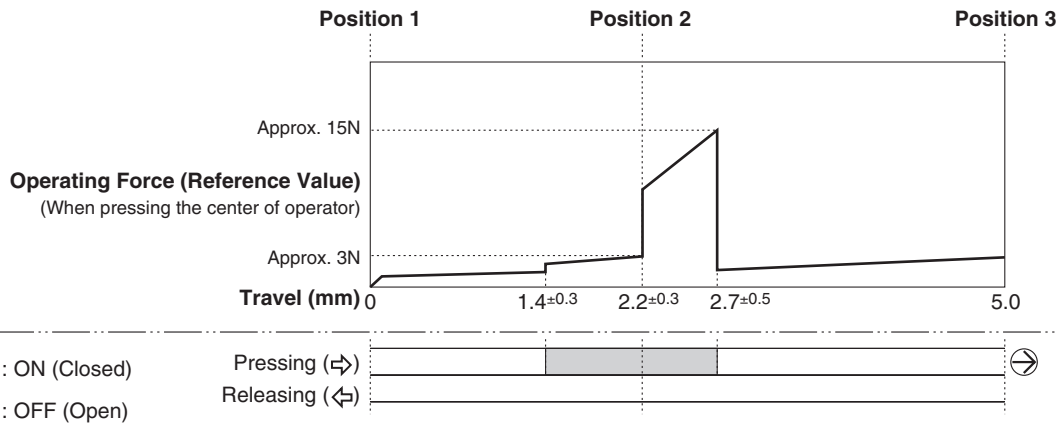
Item	Installation	Part Number
	Side	HE1B-M1
	Front	HE1B-M1N

Current Ratings

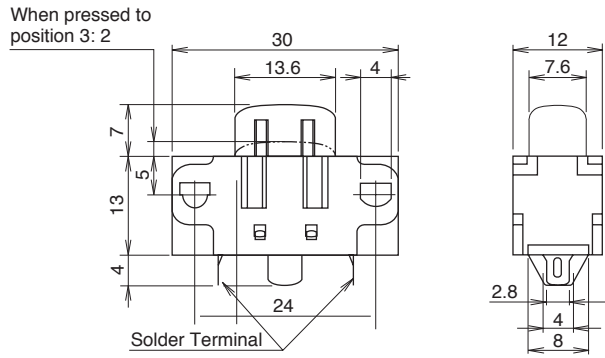
<b>Rated Insulation Voltage (Ui)</b>		AC / DC250V			
<b>Thermal Current (Ith)</b>		5A			
<b>Rated Operating Voltage (Ue)</b>		30V	125V	250V	
<b>Rated Operating Current (Ie)</b>	<b>AC 50/60Hz</b>	<b>Resistive Load (AC-12)</b>	–	3A	1.5A
		<b>Inductive Load (AC-15)</b>	–	1.5A	0.75A
	<b>DC</b>	<b>Resistive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

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

Operating Characteristics



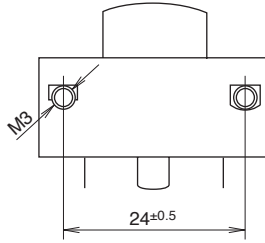
Dimensions (mm)



Installation Dimensions (mm)

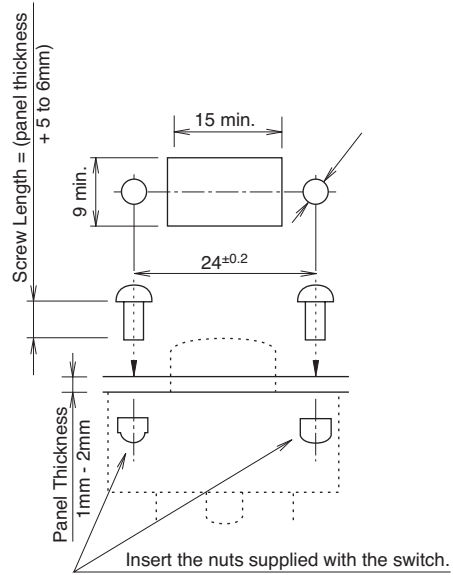
HE1B-M1 (Side Mounting)

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

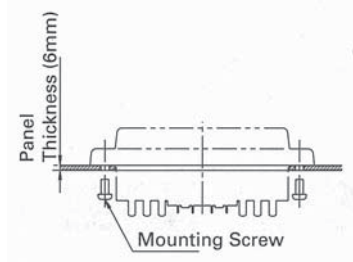
- In order to avoid electric shock or fire, turn power off before installation, removal, wire connection, maintenance or inspection of switch.
- Follow specification when installing. Improper electrical load may damage switch, cause electric shock, or fire.

- 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.



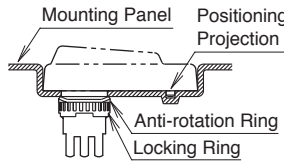
HE2B/HE3B

- 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.

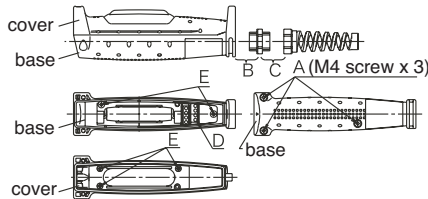


Wiring Precautions

HE1B/HE2B/HE3B

- Applicable wire size is 0.5mm<sup>2</sup> (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.

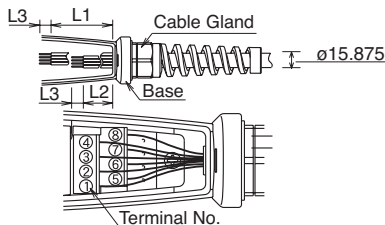
- Recommended Torque



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 1.5mm<sup>2</sup> (24 - 16AWG, one wire per terminal)

	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 accidentally activated. For example, a protrusion from a teaching pendant could cause the enabling switch to be activated by the weight of the teaching pendant.