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HE2B Series Redundant (Double) Basic Enabling Switch

HE2B 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 determine personnel may squeeze OR let go when presented with a panic situation
- Snap acting contacts from Off→On (1→ 2)
- Positive action contacts from On→Off (2→ 3) ensure no contact welding (per EN60947-5-1 / IEC60947-5-1)
- Contacts will not re-close when released from Off→On (3→1) (per IEC60204-1; 9.2.5.8)
- Multiple contacts for enhanced reliability
- Monitoring contacts in addition to main load contacts
- Available with or without rubber cover (cover provides IP65 watertight seal)



Specifications

Conforming to Standards		IEC60947-5-1, EN60947-5-1, JIS C8201-5-1, UL508, CSA C22.2 No 14
Application Standards		ISO12100/EN292, IEC60204-1/EN60204-1, ISO11161/prEN11161, ISO10218/EN775, ANSI/RIA R15.06
Operating Temperature		–25 to +60°C (no freezing)
Operating Humidity		45 to 85% RH (no condensation)
Storage Temperature		–40 to +80°C (no freezing)
Pollution Degree		2 (inside of panel/contact side)
		3 (outside of panel/operating side)
Contact Resistance		50mΩ maximum
Insulation Resistance		Between live and dead metal parts: 100MΩ maximum
		Between positive and negative live parts: 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 (at full rated load)
Shock Resistance	**Operating Extremes**	100m/s² (10 G)
	Damage Limits	1000m/s² (100 G)
Vibration Resistance	**Operating Extremes**	5 to 55Hz, amplitude 0.5mm minimum
	Damage Limits	16.7Hz, amplitude 1.5mm minimum
Terminal		0.110" quick connect / solder terminal
Recommend Wire Size		0.5mm² maximum / 1 line (20AWG)
Solder Heat Resistance		260°C / 3 seconds maximum
Terminal Pulling Strength		20N minimum
Recommended Screw Torque		0.5 to 0.8Nm
Degree of Protection		with rubber cover: IP65, without rubber cover: IP40 (IEC 60529),
Conditional Short-Circuit Current		50A (250V)
Recommended Short Circuit Protection		250V/10A fast blow fuse (IEC 60127-1)
Weight		Approx. 26g (without cover), 30g (with cover)
Circuit Opening Force		60N minimum (button return monitor & button push monitor)
Actuating Force (Operating)		500N minimum

Ordering Information

HE2B - M 2 0 0 P Y

3 Position Switch
2: 2 contacts (DPDT)

Return Monitor Switch
0: None
1: 1 contact
2: 2 contacts

Push Monitor Switch
0: None
1: 1 contact
2: 2 contacts

Rubber Cover
None: without cover
P: with cover

Rubber Cover Color
None: without cover
Y: Yellow
B: Black

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Part Numbers

Model			Number of Contacts			Part Number
			3 Position Switch	Push Monitor Switch	Return Monitor Switch	
	Without Rubber Cover		2	0	0	HE2B-M200
			2	1	1	HE2B-M211
			2	2	2	HE2B-M222
	With Rubber Cover	Yellow	2	0	0	HE2B-M200PY
			2	1	1	HE2B-M211PY
			2	2	2	HE2B-M222PY
		Black	2	0	0	HE2B-M200PB
			2	1	1	HE2B-M211PB
			2	2	2	HE2B-M222PB

Ratings

Contact Ratings

Rated Insulation Volute (Ui)				250V		
Thermal Current (Ith)				3A		
Rated Operating Voltage (Ue)				30V	125V	250V
Rated Operating Current (Ie)	**3 Position Switch**	**AC**	**Resistive Load (AC-12)**	–	1A	0.5A
			Inductive Load (AC-15)	–	0.7A	0.5A
		DC	**Resistive Load (DC-12)**	1A	0.2A	–
			Inductive Load (DC-13)	0.7A	0.1A	–
	Push/return Monitor Switch (NC Contacts)	**AC**	**Resistive Load (AC-12)**	–	2A	1A
			Inductive Load (AC-15)	–	1A	0.5A
		DC	**Resistive Load (DC-12)**	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A

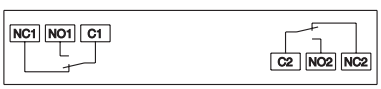
Contact Structure	3 Position Switch	2 contacts (DPDT)
	Button Return Monitor Switch	0 to 2 contacts
	Button Push Monitor Switch	0 to 2 contacts

Minimum applicable load (reference) = AC/DC3V • 5mA (for reference only)

Circuit Diagrams

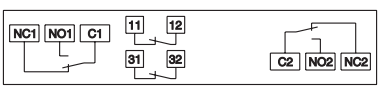
Terminal Circuit Diagrams (bottom view)

Printed Side



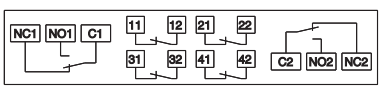
HE2B-M200

Printed Side



HE2B-M211

Printed Side

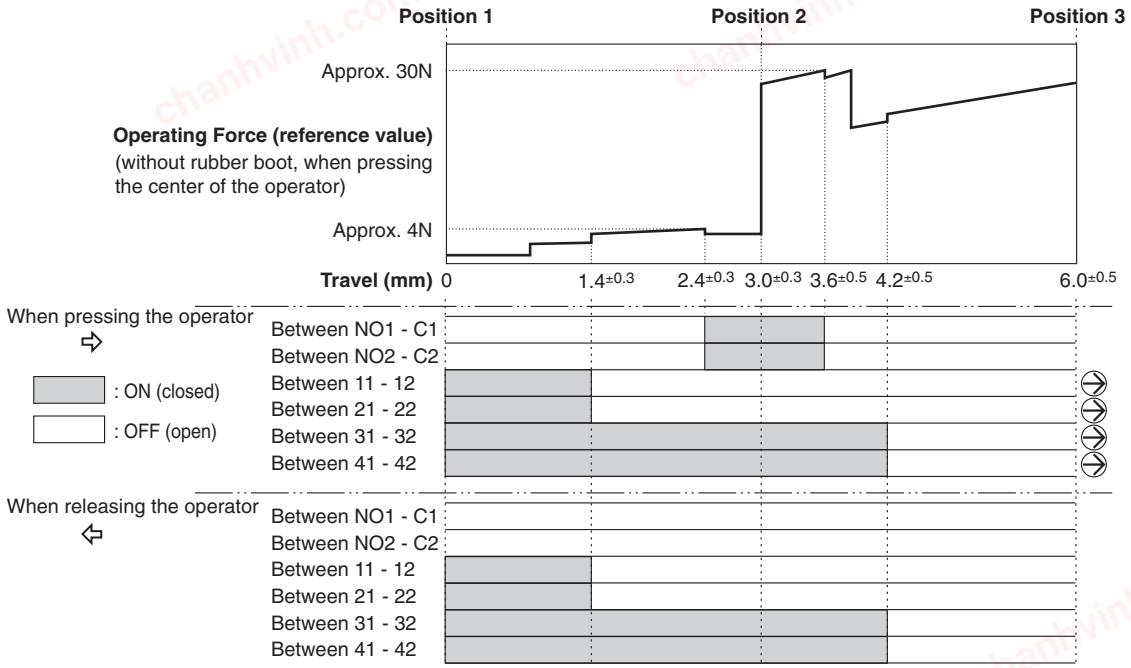


HE2B-M222

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Operating Characteristics

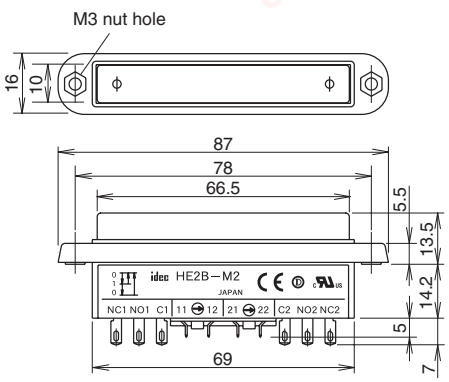
Operating Characteristics (without rubber cover/center of button being pushed)



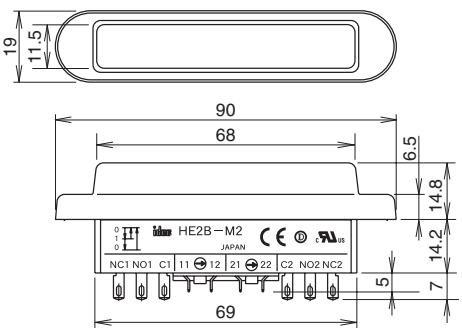
Using rubber cover will change the operating load because the operating temperature would increase

Dimensions (mm)

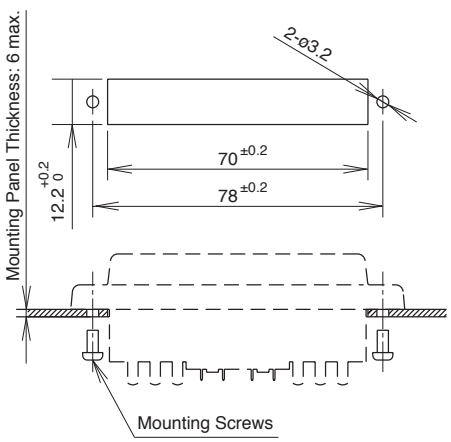
Without Rubber Cover



With Rubber Cover



Mounting Hole Layout



Accessories

Replacement Rubber Cover

Apperance	Color	Part Number	Material
	Yellow	HE9Z-D2Y	Silicon Rubber
	Black	HE9Z-D2B	

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General Information

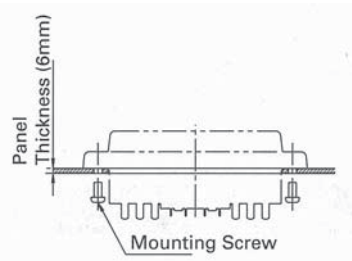
Safety Precautions

- 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.

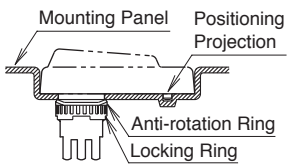


HE2B/HE3B

- 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

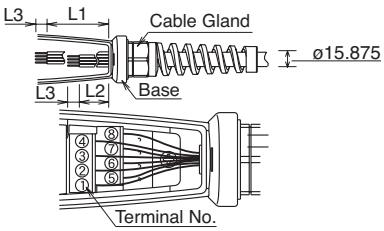
HE1B/HE2B/HE3B

- 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.

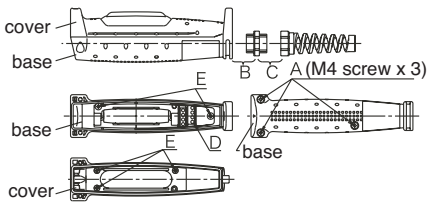
HE1G

- 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.