HE2B Double Three-position Enabling Switches

Multi-contact 3-position enabling switches Ideal for installing in large teach pendants

(Monitor Switch) (some models only)

• See website for details on approvals and standards.

HE2B

Shape	Style		Contact Configuration: 3-position Switch	Return Monitor Switch	Depress Monitor Switch	Part No.	Ordering No.	Package Quantity
	With Rubber Boot	Rubber Boot Material: Silicon Rubber Color: B: black Y: yellow	2	0	0	HE2B-M200P∗	HE2B-M200P∗	1
							HE2B-M200P∗PN10	10
			2	1	1	HE2B-M211P∗	HE2B-M211P∗	1
							HE2B-M211P∗PN10	10
			2	2	2	HE2B-M222P∗	HE2B-M222P∗	1
							HE2B-M222P∗PN10	10
		Rubber Boot Material: NBR/PVC Polyblend Color: gray	2	0	0	HE2B-M200PN1	HE2B-M200PN1	1
							HE2B-M200PN1PN10	10
			2	1	1	HE2B-M211PN1	HE2B-M211PN1	1
							HE2B-M211PN1PN10	10
			2	2	2	HE2B-M222PN1	HE2B-M222PN1	1
							HE2B-M222PN1PN10	10

Note: Specify a rubber boot color code in place of ∗ in the Ordering No.

Part No. Development

HE2B - M 2 0 0 P ∗

- 3-position Switch
  2: 2 contacts
- Button Return Monitor Switch
  0: Without switch
  1: 1 contact
  2: 2 contacts
- Button Depress Monitor Switch
  0: Without switch
  1: 1 contact
  2: 2 contacts
- Rubber Boot Material, Color
  Y: Silicon rubber, yellow
  B: Silicon rubber, black
  N1: NBR/PVC polyblend, gray
- Rubber Boot
  P: With rubber boot

Ratings

Contact Ratings

Rated Insulation Voltage (Ui)				250V		
Rated Thermal Current (Ith)				3A		
Rated Voltage (Ue)				30V	125V	250V
Rated 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	—
	Button Return Monitor Switch Button Depress Monitor Switch	AC	Resistive Load (AC-12)	—	2.5A	1.5A
			Inductive Load (AC-15)	—	1.5A	0.75A
		DC	Resistive Load (DC-12)	2.5A	1.1A	0.55A
			Inductive Load (DC-13)	2.3A	0.55A	0.27A
Contact Configuration	3-position Switch			2 contacts		
	Return Monitor Switch			0 to 2 contacts		
	Depress Monitor Switch			0 to 2 contacts		

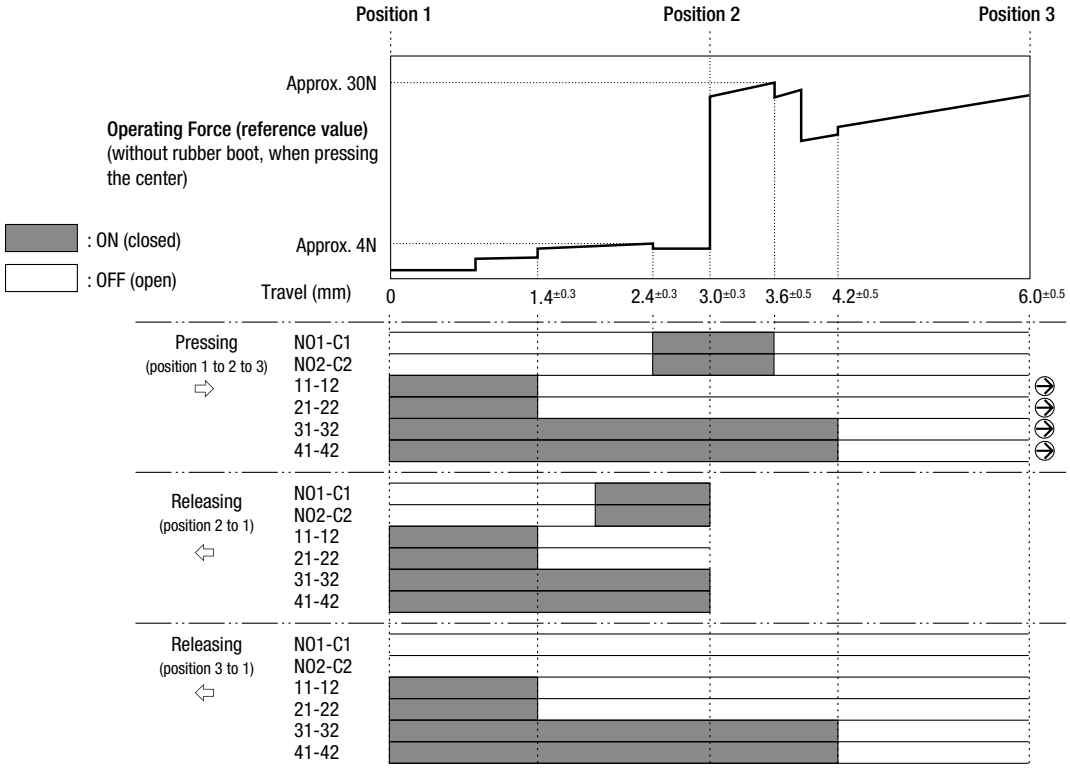
• Minimum applicable load (reference value): 3V AC/DC, 5 mA (monitor switch), 5V AC/DC, 1 mA (3-position switch)
(Applicable range is subject to the operation conditions and load.)

HE2B Double Three-position Enabling Switches

Specifications

Applicable Standards	IEC/EN60947-5-8 (TÜV approval), IEC/EN60947-5-1 UL508 (UL recognized), CSA C22.2 No. 14 (c-UL recognized), GB/T14048.5 (CCC approval)
Applicable Standards for Use	ISO12100-1, -2/EN12100-1, -2, IEC60204-1/EN60204-1, ISO11161/prEN11161 ISO10218/EN775, ANSI/RIA R15.06, ANSI B11.19
Operating Temperature	–25 to +60°C (no freezing) (without rubber boot, with silicon rubber boot) –10 to +60°C (no freezing) (with NBR/PVC polyblend rubber boot)
Relative Humidity	45 to 85% RH (no condensation)
Storage Temperature	–40 to +80°C (no freezing)
Pollution Degree	2 (inside panel, terminal side) 3 (outside panel, operator side)
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	Between live and dead metal parts: 100 MΩ minimum (500V DC megger) Between terminals of different poles: 100 MΩ minimum (500V DC megger)
Impulse Withstand Voltage	2.5 kV
Operating Frequency	1,200 operations per hour
Mechanical Durability	Position 1 → 2 → 1: 1,000,000 operations minimum Position 1 → 2→ 3 → 1: 100,000 operations minimum
Electrical Durability	100,000 operations minimum
Shock Resistance	Operating extremes: 150 m/s² Damage limits: 1,000 m/s²
Vibration Resistance	Operating extremes: 5 to 55 Hz, amplitude 0.5 mm Damage limits: 16.7 Hz, amplitude 1.5 mm
Terminal Style	Solder terminal
Applicable Wire	1 cable, 0.5 mm² maximum
Terminal Soldering Heat Resistance	310 to 350 °C, 3 seconds maximum
Terminal Tensile Strength	20N minimum
Mounting Screw Recommended Tightening Torque	0.5 to 0.8 N·m
Degree of Protection	IP40 (without rubber boot) IP65 (with rubber boot) (IEC 60529)
Conditional Short-circuit Current	50A (250V) (Use 250V/10A fast-blow fuse for short-circuit protection.)
Direct Opening Force	60N minimum (monitor switch)
Direct Opening Action Stroke	1.7mm minimum (return monitor switch), 4.7mm minimum (depress monitor switch)
Operator Strength	500N minimum (when pressing the entire button surface)
Weight (approx.)	26g (without rubber boot) 30g (with rubber boot)

Operation Characteristics



Notes:

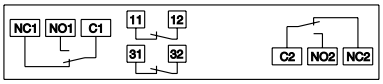
- When a rubber boot is used, the operating force depends on the operating temperature.
- The operating force to shift the switch from position 2 to position 3 can be changed. For details, contact IDEC.

Terminal Arrangement (Bottom View)

IDEC Logo Side

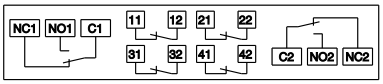
HE2B-M200

IDEC Logo Side



HE2B-M211

IDEC Logo Side



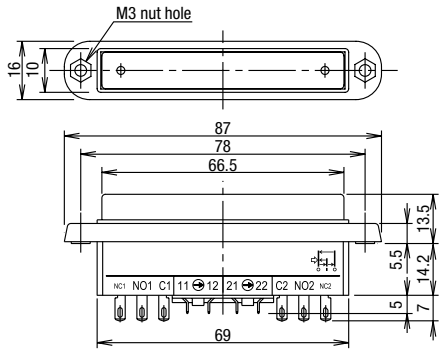
HE2B-M222

- 3-position switch (note): 2 contacts, terminal nos. between NO1 – C1, NO2 – C2
- Button return monitor switch: 0 to 2 contacts, terminal nos. between 11 – 12, 21 – 22
- Button depress monitor switch: 0 to 2 contacts, terminal nos. between 31 – 32, 41 – 42

Note: Use NO and C terminals for OFF → ON → OFF 3-position switch (NC terminal is not used).

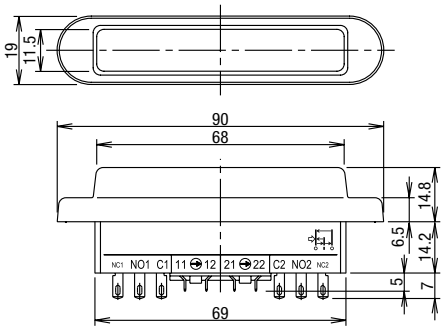
Dimensions

Without Rubber Boot



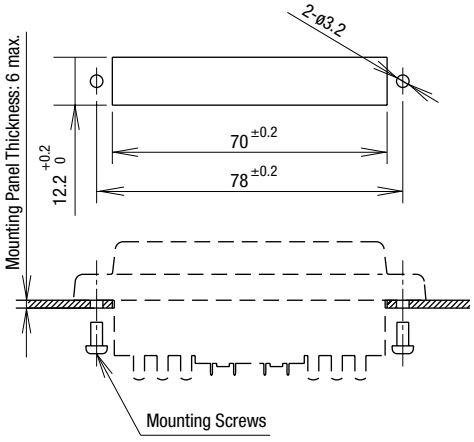
- M3 nuts are supplied with the HE2B enabling switch.

With Rubber Boot



- M3 nuts are installed in the rubber boot.

Mounting Hole Layout



- Mounting screw: Two M3 screws
- Length of mounting screw: Mounting panel thickness + 4 to 5 mm

All dimensions in mm.

Accessories

Replacement Rubber Boot

Material	Color	Part No.	Ordering No.	Package Quantity
Silicon Rubber	Y: yellow B: black	HE9Z-D2∗	HE9Z-D2∗PN10	10
NBR/PVC Polyblend	Gray	HE9Z-D2N1	HE9Z-D2N1PN10	

Note: Specify a rubber boot color code in place of ∗ in the Ordering No.

- Can be installed on HE2B (without rubber boot)

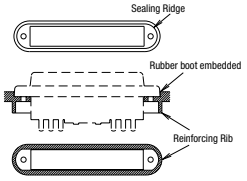
⚠ Safety Precautions

- The enabling switches have been designed for industrial purposes. Use for residential, commercial, or lighting purposes may cause unwanted electromagnetic disturbances in which case the user may be required to take adequate mitigation measures. (IEC60947-1, Clause 5.3)
- In order to avoid electric shock or fire, turn the power off before installation, removal, wiring, maintenance, or inspection of the enabling switch.
- Do not assemble or modify the enabling switches and do not disable the enabling function. Otherwise, failure of accidents may occur.
- When using the enabling switch in a safety related part of a control system, use the enabling switch properly in accordance with the safety standards and regulations of the actual machine, system, and application, of the country or region where the enabling switch is used. Also, perform a risk assessment before using the enabling switch.
- Do not disable the safety function of the enabling switch by using tape, elastic band, or by disfiguring the rubber boot, otherwise the loss of enabling switch function may cause serious accidents.
- Perform a risk assessment in actual applications as strong force may be applied to the switch when depressed to position 3.
- Perform a risk assessment for the shape and structure of the part where the enabling switch is installed, to prevent unintended operation of the enabling switch. For example, an enabling switch protruding from the teach pendant may result in an unintended operation of the enabling switch.
- Strong force may be applied to a 3-position enabling switch when pressed to position 3. Provide sufficient strength to the part where 3-position enabling switches will be installed.
- Use wires of the proper size to meet voltage and current requirements, and solder the wires correctly according to the wiring instruction described below. If soldering is incomplete, the wire may heat during operation, causing a fire hazard.
- Do not apply excessive force to the enabling switch.
- Follow the wiring instructions mentioned in the instruction manual.

Instructions

Operating Instructions

- The enabling switch permits machine operation only while the enabling switch is manually operated for robot teaching or other purposes in hazardous areas. Make sure that the control system is designed to activate the machine only when the enabling switch is at position 2 (3mm) operating travel.
- To achieve a high level of safety, connect the two contacts of the 3-position switch to a disparity detection circuit (e.g., safety relay module) (ISO 13849-1).
- Because two contacts are designed to operate independently, pressing the edge of a button turns on one contact earlier than the other contact, causing a delay in operation. To avoid this, always press the center of the button.
- The ridge on the bottom of rubber boot serves as a seal, and waterproof characteristics are attained when the ridge is tightly pressed to the mounting panel. When the mounting panel is bent and the ridge cannot be pressed to the panel, add a reinforcing rib to secure the boot to the mounting panel.
- The edge of rubber boot may stick out if excessive force is applied on the rubber boot. When such event is anticipated, it is recommended to embed the rubber boot in the mounting panel as shown in the figure below.



- Using enabling switches without rubber boots in an environment where foreign particles or dust exist may lead to malfunction. Order an optional rubber boot or add extra protection.
- The rubber boot may deteriorate depending on the operating environment and conditions. When the rubber boot is deformed or cracked, replace with new ones.

Installation Instructions

- Provide sufficient strength to the mounting panel. Insufficient strength of the mounting panel or excessive operating force may damage the enabling switch, resulting in electric shock or fire.

Wiring Instructions

- Applicable wire size: 0.5 mm^2 maximum × 1 pc.
- Solder the terminal at a temperature of 310 to 350°C within 3 seconds using a soldering iron. Sn-Ag-Cu type is recommended when using lead-free solder. Do not use flow or dip soldering.
- When soldering, take care not to touch the enabling switch with the soldering iron. Also ensure that no tensile force is applied to the terminal. Do not bend the terminal or apply excessive force to the terminal.
- Use non-corrosive liquid rosin as soldering flux.