HE6B 3-position Enabling Switch

Five versions—including rectangular mounting hole and ø16mm round mounting hole—are available.

- HE2B
- HE3B
- HE1B
- HE5B
- HE6B

Light operating force model is available, providing comfortable and stress-free operation for many working hours.

- HE1G-L
- HE2G
- HE1G

Ideal for installation in teach pendants for robots.

Compliant with IEC 60947-5-8

Smallest in its class
HE6B Enabling Switch

3-position enabling switch with monitoring contacts—Smallest in its class

- Ergonomically-designed OFF-ON-OFF operation.
- The switch does not turn ON while returning from position 3 (OFF) to position 1 (OFF).
- IEC 60204-1 (2005), 10.9
- IEC 60947-5-8 (2006), 7.1.9
- Some teach pendants are equipped with two 3-position enabling switches, and when one switch is pressed to position 3 (OFF), the other switch must not enable machine operation even when pressed to position 2. Machine operation can resume after both switches are released. The monitoring switches monitor the OFF status of the 3-position enabling switch, whether the button is returned to position 1 or the button is pressed to position 3 (monitor switches have direct opening action mechanism.)
- Two contacts are provided in a 3-position enabling switch so that even if one contact fails, the other contact will still disable machine operation.
- The waterproof rubber boot provides IP65 protection.

<table>
<thead>
<tr>
<th>Types</th>
<th>Contact Configuration/No. of Contacts</th>
<th>Color</th>
<th>Part Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber Boot Included</td>
<td>3-position Switch</td>
<td>Button Return Monitor Switch</td>
<td>Button Depress Monitor Switch</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
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</tr>
</tbody>
</table>

- Specify rubber boot color code in place of * in the Type No.

Part Number Guide

<table>
<thead>
<tr>
<th>Type</th>
<th>3-position Switch</th>
<th>Monitor Switch</th>
<th>Rubber Boot Material, Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE6B-M200Y</td>
<td>3: 2 contacts</td>
<td>00: No monitor contact</td>
<td>Blank: No rubber boot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11: 1 contact of button return monitor switch</td>
<td>Y: Silicon rubber, yellow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20: 2 contacts of button return monitor switch</td>
<td>B: Silicon rubber, black</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02: 2 contacts of button depress monitor switch</td>
<td>N1: NBR/PVC polyblend, gray</td>
</tr>
</tbody>
</table>

Notes
1. Silicon rubber: Can be used in general factories. Remains flexible in cold temperatures. Suitable for applications with a wide range of operating temperatures.
2. NBR/PVC polyblend: Oil-proof. Suitable for environments where machine oil may come in contact with the switch, and for painting robots where silicon rubber cannot be used.

Accessories

- Replacement Rubber Boot

<table>
<thead>
<tr>
<th>Material, Color</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Rubber</td>
<td>HE9Z-D6</td>
</tr>
<tr>
<td>Y: yellow</td>
<td></td>
</tr>
<tr>
<td>B: black</td>
<td></td>
</tr>
</tbody>
</table>

- Specify rubber boot color code in place of * in the part number.

Notes
1. Based on IDEC research as of May 2010
2. IEC 60947-5-8 Control circuit devices and switching elements – Three-position enabling switches
HE6B Enabling Switch

Specifications

| Applicable Standards | IEC 60947-5-1/EN60947-5-1

| Operating Temperature | –25 to +60°C (no freezing)
| Relative Humidity | 45 to 85% RH (no condensation)
| Storage Temperature | –40 to +80°C (no freezing)
| Relative Humidity | 45 to 85% RH (no condensation)
| Pollution Degree | 2 (inside panel, terminal side)
| Contact Resistance | 50mΩ maximum (initial value)
| Insulation Resistance | Between live and dead metal parts: 100MΩ minimum (500V DC megerger) Between terminals of different poles: 10MΩ minimum (500V DC megerger)
| Impulse Withstand Voltage | 2.5kV (monitor switch)
| Operating Frequency | 1200 operations per hour
| Mechanical Durability | Position 1→2→1: 1,000,000 operations minimum
| Electrical Durability | Position 1→2→3→1: 100,000 operations minimum
| Shock Resistance | Operating extremes: 150m/s²
| Vibration Resistance | Operating extremes: 5 to 55 Hz, amplitude 0.5mm
| Terminal Style | Solder terminal
| Applicable Wire | 1 cable, 0.5mm² maximum
| Solder Terminal Heat Resistance | 310 to 350°C, 3 seconds maximum
| Terminal Tensile Strength | 20N minimum
| Locking Ring Recommended Tightening Torque | 0.5 to 0.8N·m
| Degree of Protection | IP65 (IEC 60529)
| Conditional Short-circuit Current | 50A (125V): 3-position switch (Use 120V/10A fast acting type fuse for short circuit protection) (IEC 60127-1)

| Direct Opening Force | 40N minimum (button release monitor and button depress monitor switches)
| Direct Opening Stroke (when pressing the entire button surface) | 0.9mm minimum (button return monitor switch)
| Operator Strength | 250N minimum
| Weight (approx.) | 17g

Dimensions (mm) Mounting Hole Layout

- Mounting screws: M3 screw x 2 (not attached and must be supplied by the user)
- Mounting screw length: 5 to 6 mm (panel thickness + gasket)

Ratings

| Rated Insulation Voltage (Ui) | 125V (monitor switch: 250V) |
| Rated Thermal Current (Ie) | 3A |

| Rated Voltage (Ue) | 30V | 125V | 250V |
| Rated Current (Ie) | 3-position switch: |

| AC | Resistive Load (AC-12) | – | 0.5A | – |
| DC | Inductive Load (AC-15) | – | 0.3A | – |

| DC | Resistive Load (DC-12) | 1A | – | – |
| DC | Inductive Load (DC-13) | – | 0.7A | – |

| Button return monitor switch | Button depress monitor switch N(C) |
| AC | Resistive Load (AC-12) | – | 2A | – |
| DC | Inductive Load (AC-15) | – | 1A | 0.5A |

| Inductive Load (DC-12) | 2A | 0.4A | 0.2A |
| Inductive Load (DC-13) | 1A | 0.22A | 0.1A |

- 3-position switch 2 contacts

- Button return monitor switch: 0 or 1 contact
- Button depress monitor switch: 0 or 1 contact

- Minimum applicable load (reference value): 3V AC/DC, 5mA

TUV ratings:

| 3-position switch: |

| AC-12 125V/0.5A | DC-12 30V/1A |
| DC-13 30V/0.7A |

UL ratings:

| 3-position switch: |

| AC-15 250V/0.5A | DC-13 125V/0.22A |
| DC-13 30V11A |

Operating Characteristics

- **HE6B-M211**

Terminal Arrangement (bottom view)

- 3-position switch 2 contacts

- Button return monitor switch: 1 contact, terminals 11-12
- Button depress monitor switch: 1 contact, terminals 21-22
- There are no terminals 11-22 and 21-22 for HE6B-M200 type.

Note: When a rubber boot is used, the operating force depends on the operating temperature.

When pressing the center of the operator:

Notes:

- When a rubber boot is used, the operating force depends on the operating temperature.
- The operating force to move the button from position 2 to position 3 can be changed. For details, contact IDEC.
HE6B Enabling Switch

Safety Precautions

- The HE6B enabling switch has been designed for industrial applications. Use of the HE6B enabling switch for residential, commercial, or lighting applications may cause unintended electromagnetic disturbances and the user may be required to take adequate mitigation measures.
- In order to avoid electric shock or fire, turn the power off before installation, removal, wiring, maintenance, or inspection of the enabling switch.
- Because strong force may be applied to a 3-position enabling switch, during the period of use, the user may be required to take adequate mitigation measures.
- To avoid this, always press the center of the button.
- Perform a risk assessment in actual applications as strong force may be applied to a 3-position enabling switch when depressed to position 3.
- Perform a risk assessment for the shape and structure of the mounting area, where the enabling switch is installed, to prevent unintended operation of the enabling switch.
- Because strong force may be applied to a 3-position enabling switch when depressed to position 3, provide sufficient strength to the area where the 3-position enabling switch will be mounted.

Installation

- The ridge on the bottom of rubber boot serves as a seal, and waterproof characteristics are attained when the ridge is firmly installed in a mounting panel. When the mounting panel is bent and the ridge cannot be pressed flush to the panel, add a reinforcing rib to secure the boot to the mounting panel.
- If the surface of mounting panel is uneven, waterproof characteristics of the enabling switch with rubber boot cannot be achieved. In addition, make sure that the mounting panel has sufficient strength to properly mount the enabling switch.
- When an enabling switch with a rubber boot is mounted in a hermetically-sealed control box, a large change in internal pressure may cause the rubber boot to inflate and deflate, affecting the performance of the enabling switch. Check periodically to make sure that the enabling switch is operating correctly.

Wiring Instructions

- Applicable wire size: 0.5 mm² maximum × 1 pc.
- Solder the terminal at a temperature of 310 to 350°C maximum within 3 seconds using a soldering iron. Do not use flow solder.
- When soldering, do not touch the enabling switch with the soldering iron. Also ensure that no tensile force is applied to the terminals.
- 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.
- 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.

Operating Instructions

- 3-position enabling switches on teach pendants are used to enable machine operation in a hazardous area only when the enabling switch is in position 2 only.

Instructions

- Perform a risk assessment for the shape and structure of the enabling switch.
- Because the 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.
- Depress the edge of the button turns on one contact earlier than the other contact, causing a delay in operation.
- In order to ensure a high level of system safety, connect the enabling switch in series with the machine's 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.

Specifications and other descriptions in this catalog are subject to change without notice.

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