

# IDEC

## INSTRUCTION SHEET

### HE5B $\phi$ 16 Round

#### Three-Position Enabling Switches

Confirm that the delivered product is what you have ordered. Read this instruction sheet to make sure of correct operation. Make sure that the instruction sheet is kept by the end user.

### SAFETY NOTE

In this operation instruction sheet, safety precautions are categorized in order of importance to Warning and Caution :

### WARNING

Warning notices are used to emphasize that improper operation may cause severe personal injury or death.

### CAUTION

Caution notices are used where inattention might cause personal injury or damage to equipment.

### 1 Type

HE5B-M2P*	
<b>Contact Configuration</b>	<b>Rubber boot material/ Color</b>
3-position Switch : 2 poles	Y : Silicon rubber/ Yellow B : Silicon rubber/ Black N1 : NBR/PVC Polyblend/ Gray

### Rubber boot

blank : Without rubber boot  
P : With a rubber boot attached

### 2 Specifications and Ratings

Applicable Standards	IEC 60947-5-1, EN 60947-5-1, JIS C8201-5-1 IEC 60947-5-8, EN 60947-5-8 UL508, CSA C22.2 No.14, GB/T14048.5	
Standards for Use	ISO 12100, IEC 60204-1, EN 60204-1 ISO 11161 / prEN 11161, ISO 10218 / EN 775 ANSI/RIA R15.06, ANSI B11.19 ISO 13849-1 / EN ISO 13849-1	
Applicable Directives	Low Voltage Directive, Machinery Directive, RoHS Directive	
Operating Condition	Operating Temperature	-25 to +60°C (no freezing) (rubber boot material: without rubber boot/ silicon rubber) -10 to +60°C (no freezing) (rubber boot material: NBR/PVC polyblend)
	Operating Humidity	45 to 85%RH (no condensation) (IEC 60068-2-30)
	Storage Temperature	-40 to +80°C (no freezing)
	Pollution Degree	2 (inside the panel/ terminal side) 3 (outside the panel/ operator side)
Altitude	2000m maximum	
Impulse Withstand Voltage (Uimp)	1.5kV	
Rated Insulation Voltage	125V	
Thermal Current <Ith>	3A	
Contact Ratings (Reference Values) < Ue , Ie >	AC	Resistive load(AC-12) - 0.5A Inductive load(AC-15) - 0.3A
	DC	Resistive load(DC-12) 1A - Inductive load(DC-13) 0.7A -
Operating Frequency	1200 operations/hour	
B10a	100,000 (EN ISO 13849-1 Annex C Table C.1)	
Mechanical Durability	Position 1 $\rightarrow$ 2 $\Rightarrow$ 1: 1,000,000 operations min Position 1 $\rightarrow$ 2 $\Rightarrow$ 3 $\Rightarrow$ 1: 100,000 operations min	
Electrical Durability	100,000 operations min. (Rated operating load) 1,000,000 operations min. (AC/DC 24V 100mA)	
Vibration Resistance	Operating Extremes : 150m/s <sup>2</sup> Damage Limits : 500m/s <sup>2</sup>	
Shock Resistance	Operating Extremes : 5 to 55 Hz, half amplitude 0.5 mm Damage Limits : 5 to 55 Hz, half amplitude 0.5 mm	
Degree of Protection	IP40	HE5B-M2
	IP65	HE5B-M2P*
Conditional short-circuit Current	50A(125V)	
Short-Circuit Protective Device	250V AC, 10A Fuse (IEC 60127-1)	
Actuator Strength	250 N minimum (when pressing the entire surface of the button)	
Weight	Approx. 8g (without rubber boot) Approx. 9g (with a rubber boot)	

### Ratings approved by safety agencies

- |                      |   |
|----------------------|---|
| (1) TÜV rating       | AC-12 125V / 0.5A<br>DC-12 30V / 1A                     |
| (2) UL , c-UL rating | AC 125V / 1A Resistive<br>DC 30V / 1A Resistive         |
| (3) CCC rating       | AC-12 125V / 0.5A<br>DC-12 30V / 1A<br>DC-13 30V / 0.7A |

### 3 Notes for Operation

- 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 stroke).
- In order to ensure safety of the control system, connect each pair of the contacts of the 3-position switch to a discrepancy detection circuit such as a safety relay module. (EN 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. In this case, it is recommended to use a control that does not detect an error only due to a time gap between the two contact operations.
- In the unlikely event that an error is detected due to a time gap between two contact operations, it is recommended that the error be reset by once releasing the switch button (both contacts OFF).
- With an enabling switch with rubber boot mounted on a hermetically -sealed control box, a large change in internal air pressure may cause the rubber boot to expand and shrink, affecting the performance of the enabling switch. Check periodically to make sure that the enabling switch operates correctly.
- If the mounting panel is deformed when mounting an enabling switch with rubber boot, the normal waterproof characteristic is not assured. Keep a sufficient strength of the mounting panel.
- When using the HE5B with rubber boot, do not press the rubber boot with excessive pressure to an inappropriate direction, otherwise the waterproof function is impaired.
- When using the HE5B without rubber boot, provision for protection is required to prevent button malfunction.
- The rubber boot may deteriorate depending on the operating environment and conditions. Immediately replace the deformed or cracked rubber boot with new ones.

### Replacement rubber boot(separate order)

Type	Rubber boot Material	Rubber boot Color
HE9Z-D5Y	Silicon rubber	Yellow
HE9Z-D5B	Silicon rubber	Black
HE9Z-D5N1	NBR/PVC polyblend	Gray

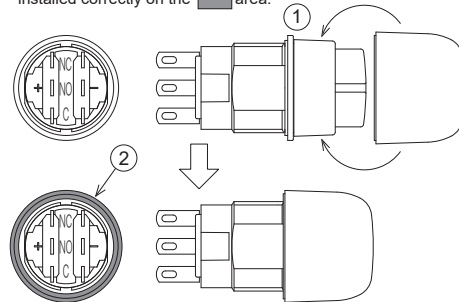
Note: Installing the rubber boot as shown below.

Do not break the rubber boot during installation.

### Installing the Rubber Boot

① Wrap the rubber boot around the flange.  
(Keep foreign objects from entering the rubber boot to prevent malfunction.)

② Viewing from the terminal side, check that the rubber boot is installed correctly on the  area.



### WARNING

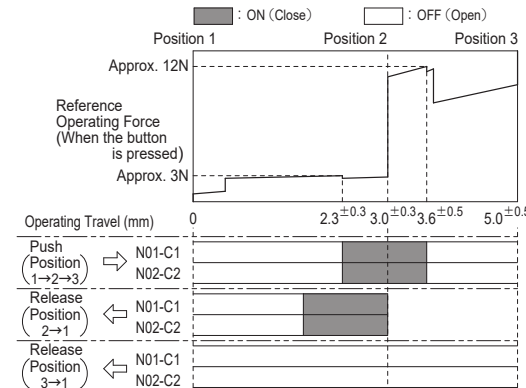
- This product has been designed for environment A. Use of this product in B environment may cause unwanted electromagnetic disturbances in which case the user may be required to take adequate mitigation measures. (clause 5, 3 of IEC 60947-1)
- Turn off the power to the Interlock switch before starting installation, removal, wiring, maintenance, and inspection on the Interlock switch. Failure to turn power off may cause electrical shocks or fire hazard.
- Use wires of proper size to meet voltage and current requirements. Using improper wires may cause fire hazard due to abnormal heat generation.
- Do not apply an excessive shock to the switch.
- Wire the switch correctly after reading a catalog or this instruction sheet.

### CAUTION

- When using the HE5B for safety-related equipment in a control system, refer to the safety standards and regulations in each country and region depending on the application purpose of the actual machines and installations to make sure of correct operation. Also, perform risk assessment to make sure of safety before starting operation.
- Do not tie the enabling switch around the button with a tape or string, or distort the rubber boot to keep the switch in position 2. Otherwise the original function of the enabling switch is lost, posing a great risk of danger.
- Perform a sufficient risk assessment against the high operating force at transition to the OFF position when the button is pressed to the bottom.
- Perform a sufficient risk assessment against the shape and structure where the enabling switch is mounted, in order to prevent unintended actuation. For example, protrusion from a teaching pendant may cause the enabling switch to be actuated by the weight of the teaching pendant.
- When mounting the HE5B, make sure of sufficient strength of the mounting panel against the anticipated operating physical force. (High operating physical force is expected especially at transition to the OFF position when the button is pressed to the bottom.)
- Strength of the HE5B operator is 250N. If the operating force over 250N is expected, use an actuator with a stopper for the switch operation.

### 4 Wiring

Operating Characteristics (reference values: without rubber boot)



Note: The operating force of the enabling switch with rubber boot depends on the ambient temperature.

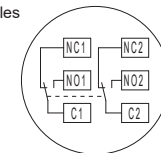
### Configuration of Contacts and Number of Poles

3-position Switch: 2 poles

Terminal No.: between NO1 and C1

between NO2 and C2

Note: Use the NO and C terminals (OFF $\rightarrow$ ON $\rightarrow$ OFF)  
(Do not use the NC terminals.)



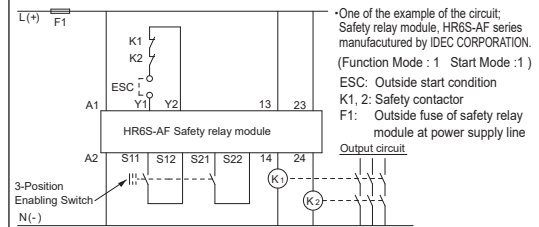
### Applicable Wire Size

0.5 mm<sup>2</sup> (maximum) x 1 pc.

### Terminal Soldering

- 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.
- 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.

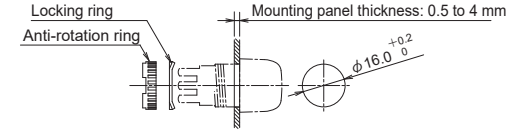
### Example of wiring Diagram realizing Safety Category 4



Note: The insulation of the cable has to withstand environmental influences.

### 5 Mounting

Mounting Hole Layout (mm)

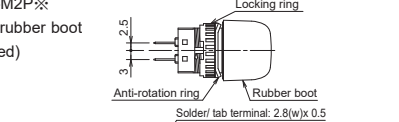


- Recommended tightening torque of locking ring : 0.29 to 0.49 N · m
- Note: Tighten the locking ring using the ring wrench (Type: MT-001).  
When tightening the locking ring, secure the flange part to prevent the enabling switch from rotating.

### 6 Dimensions

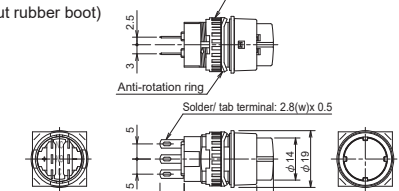
HE5B-M2P\*\*

(With a rubber boot attached)



HE5B-M2

(Without rubber boot)



### 7 Precaution for Disposal

Dispose of HE5B Enabling Switch as an industrial waste.

## IDEC CORPORATION <http://www.idec.com>

**DECLARATION OF CONFORMITY**  
We, IDEC CORPORATION declare under our sole responsibility that the product:  
*Description: Three-Position Enabling Switch*  
*Model No: HE5B*

Applied Union harmonized legislation and references to the relevant harmonization standards used or references the other technical specifications in relation to which conformity is declared.

**Manufacturer: IDEC CORP.**  
2-6-64 Nishimiyahara Yodogawa-ku, Osaka 532-0004, Japan  
**EU Authorized Representative: APEM SAS**  
55, Avenue Edouard Herriot BP1, 82303 Caussade Cedex, France  
Applicable EU Directive : Low Voltage Directive (2014/35/EU),  
RoHS Directive (2011/65/EU)

Applicable Standard(s) : EN 60947-5-8, EN IEC 63000  
**UK Authorized Representative: APEM COMPONENTS LIMITED**  
Drakes Drive, Long Crendon, Buckinghamshire, HP18 9BA, UK  
Applicable UK Legislation : Electrical Equipment (Safety) Regulations 2016,  
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012  
Applicable Standard(s) : EN 60947-5-8, EN IEC 63000