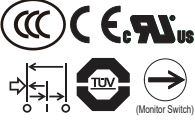


# IDEC

## INSTRUCTION SHEET (ORIGINAL)

### HE6B Three-Position Enabling Switch

B-1241(5)



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

HE6B-M200*	
3-position switch	Rubber boot
2 : 2 contacts	[blank] : Without rubber boot
monitor switch	Y : Silicon rubber/Yellow
0 : blank	B : Silicon rubber/Black
11 : Release monitor switch 1 contact	[N1] : NBR/PVC Polyblend rubber/Gray
	Push monitor switch 1 contact
[20] : Release monitor switch 2 contacts	
[02] : Push monitor switch 2 contacts	

Type Nos. in [ ] are not supplied as standard. Contact IDEC if required.

#### 2 Specifications and Ratings

Applicable Standards	IEC 60947-5-1, EN 60947-5-1 IEC 60947-5-8, EN 60947-5-8, GS-ET-22 (TUV approved) UL508, CSA C22.2 No.14, GB/T14048.5			
Standards for Use	ISO 12100 / EN ISO 12100, IEC 60204-1 / EN 60204-1, ISO 11161 / EN ISO 11161, ISO 10218-1 / EN ISO 10218-1, ANSI / RIA / ISO 10218-1, 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(3-position Switch)/2.5kV(Monitor Switch)			
Rated Insulation Voltage	125V(3-position Switch)/250V(Monitor Switch)			
Thermal Current <Ith>	3A(3-position Switch/Monitor Switch)			
Contact Ratings (Reference Values) <Ue, Ie>	30V	125V	250V	
	Resistive load(AC-12)	-	0.5A	-
3-position Switch	AC	Inductive load(AC-15)	-	0.3A
	DC	Resistive load(DC-12)	1A	-
		Inductive load(DC-13)	0.7A	-
Release/Push Monitor Switch	AC	Resistive load(AC-12)	-	2.5A 1.5A
	DC	Inductive load(AC-15)	-	1.5A 0.75A
		Resistive load(DC-12)	2.5A	1.1A 0.55A
		Inductive load(DC-13)	2.3A	0.55A 0.27A
Operation Frequency	1200 operations/hour			
B10d	100,000 (EN ISO 13849-1 Annex C Table C.1)			
Mechanical Durability	Position 1→2⇒1: 1,000,000 operations min Position 1⇒2⇒3⇒1: 100,000 operations min			
Electrical Durability	100,000 operations min. (Rated operating load) 1,000,000 operations min. (AC/DC 24V 100mA)			

Shock Resistance	Operating Extremes : 150m/s <sup>2</sup>	
	Damage Limits : 500m/s <sup>2</sup>	
Vibration Resistance	Operating Extremes : 5 to 55 Hz, half amplitude 0.5 mm	
	Damage Limits : 16.7 Hz, half amplitude 1.5 mm	
Degree of Protection	IP40	Without rubber boot (IEC 60529)
	IP65	With rubber boot (IEC 60529)
Direct Opening Force	40N minimum (Release/Push monitor switch)	
Direct Opening Travel	Release monitor switch : 0.9mm minimum	
	Push monitor switch : 4.0mm minimum	
Conditional short-circuit Current	50A (125V) : 3-position switch 50A (250V) : monitor switch	
Short-Circuit Protective Device	125V AC, 10A Fuse (IEC 60127-4) : 3-position switch 250V AC, 10A Fuse (IEC 60127-4) : monitor switch	
Actuator Strength	250 N minimum (when pressing the entire surface of the button)	
Weight	Approx. 14g (without rubber boot)	
	Approx. 17g (with a rubber boot)	

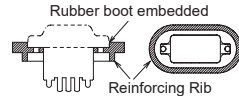
#### Ratings approved by safety agencies

(1) TUV rating	3-position switch	AC-12 125V / 0.5A DC-12 30V / 1A DC-13 30V / 0.7A AC-15 250V / 0.75A DC-13 125V / 0.22A DC-13 30V / 2.3A
	Monitor switch	AC-12 125V / 0.5A Resistive DC 30V / 1A Resistive DC 30V / 0.7A Pilot Duty AC 250V / 0.75A Pilot Duty AC 250V / 0.5A General Use DC 30V / 2.3A Pilot Duty DC 30V / 1A General Use
(2) UL, c-UL rating	3-position switch	AC-12 125V / 0.5A DC-12 30V / 1A DC-13 30V / 0.7A AC-15 250V / 0.75A DC-13 125V / 0.22A DC-13 30V / 2.3A
	Monitor switch	AC-12 125V / 0.5A DC-12 30V / 1A DC-13 30V / 0.7A AC-15 250V / 0.75A DC-13 125V / 0.22A DC-13 30V / 2.3A
(3) CCC rating	3-position switch	AC-12 125V / 0.5A DC-12 30V / 1A DC-13 30V / 0.7A AC-15 250V / 0.75A DC-13 125V / 0.22A DC-13 30V / 2.3A
	Monitor switch	AC-12 125V / 0.5A DC-12 30V / 1A DC-13 30V / 0.7A AC-15 250V / 0.75A DC-13 125V / 0.22A DC-13 30V / 2.3A

- \* For use on a flat surface of a Type 1 Enclosure
- \* For use in Pollution Degree 2 Environment
- \* Maximum Surrounding Air Temperature Rating 60°C

#### 3 Notes for Operation

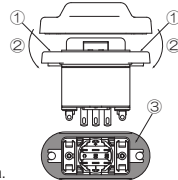
- The enabling switch permits machine operation only while the enabling switch is manually operated for robot teaching or other purposes in hazardous areas. Make sure that the control system is designed to activate the machine only when the enabling switch is at position 2 (3mm operating stroke).
- In 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.
- The ridge on the bottom of rubber boot serves as a seal, and waterproof characteristics are attained when the ridge is lightly pressed to the mounting panel. When the mounting panel is bent and the ridge cannot be pressed to the panel, add reinforcing ribs 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.
- When using the HE6B 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-D6Y	Silicon rubber	Yellow
HE9Z-D6B	Silicon rubber	Black
[HE9Z-D6N1]	NBR/PVC polyblend rubber	Gray

- Note: Type Nos. in [ ] are not supplied as standard.  
Contact IDEC if required.  
Installing the rubber boot as shown below.  
Do not break the rubber boot during installation.



- Installing the Rubber Boot
- Put M3 nuts into the hexagonal holes.
- Wrap the rubber boot around the flange. (Keep foreign objects from entering the rubber boot to prevent malfunction.)
- Viewing from the terminal side, check that the rubber boot is installed correctly on the [ ] area.

#### CAUTION

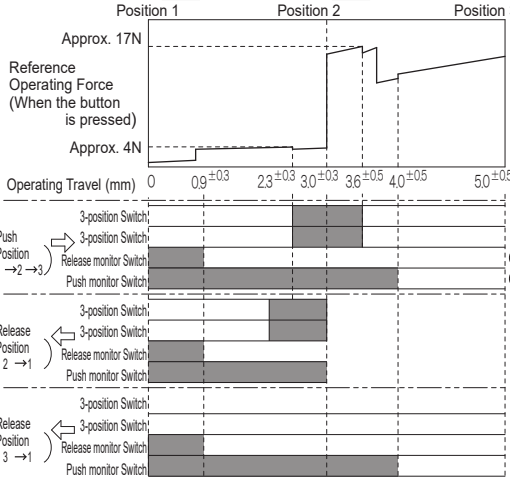
- This product has been designed for industrial purposes. Use of this product for residential, commercial, or lighting purposes may cause unwanted electromagnetic disturbances in which case the user may be required to take adequate mitigation measures. (clause 5.3 of IEC 60947-1)
- Use wires of proper 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.
- If multiple safety components are wired in series, the Performance Level to EN ISO 13849-1 will be reduced due to the restricted error detection under certain circumstance.
- The entire concept of the control system, in which the safety component is integrated, must be validated to EN ISO 13849-2.

#### WARNING

- Turn off the power to the enabling switch before starting installation, removal, wiring, maintenance, and inspection on the enabling switch. Failure to turn power off may cause electrical shocks or fire hazard.
- Do not disassemble or modify the switch. Also do not attempt to disable the enabling switch function, otherwise a breakdown or an accident will result.
- When using the HE6B 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, protection from a teaching pendant may cause the enabling switch to be actuated by the weight of the teaching pendant.
- Provide sufficient strength to the part where the 3-position enabling switch will be installed. Insufficient strength or excessive pressing force on the switch may cause electric shock or fire. (Strong force may be applied to a 3-position enabling switch when pressed to position 3.)

#### 4 Wiring

- Operating Characteristics  
(Pressing the center of the button without boot: reference value)  
<HE6B-M211>



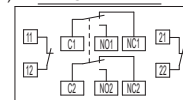
- Note1: The operating force of the enabling switch with rubber boot depends on the ambient temperature.  
Note2: The above chart shows the operating characteristics when the button center is pressed.

#### Configuration of Contacts and Number of Poles

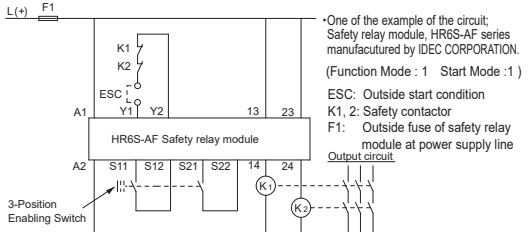
- 3-position Switch: 2 contacts  
...Terminal No. : between NO1 and C1, between NO2 and C2
- Release monitor Switch: 0 to 2 contacts  
...Terminal No. : between 11 and 12 (HE6B-M211)  
between 11 and 12, between 21 and 22 (HE6B-M220)
- Push monitor Switch: 0 to 2 contacts  
...Terminal No. : between 21 and 22 (HE6B-M211)  
between 11 and 12, between 21 and 22 (HE6B-M202)

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

- Terminal Configuration (BOTTOM VIEW)
- Applicable Wire Size
- 0.5mm<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. Do not use flow or dip soldering.
- 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 resizing Safety Category4



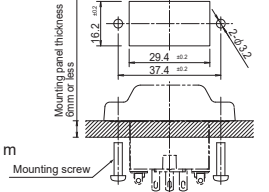
Note: The insulation of the cable has to withstand environmental influences.

#### 5 Mounting

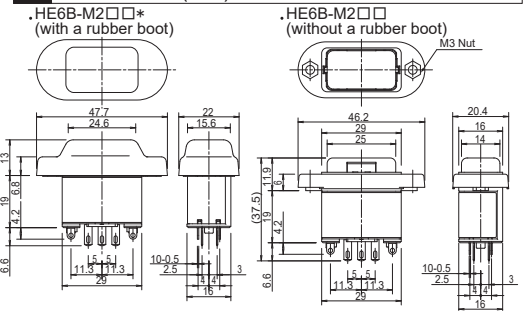
- Mounting Hole Layout (mm)

- Mounting Screws : M3x2 pcs
- Mounting panel thickness plus washer thickness plus 5 to 6mm

- Recommended Screw
- Tightening Torque : 0.5 to 0.8 N·m



#### 6 Dimensions (mm)



#### 7 Precaution for Disposal

Dispose of HE6B Enabling Switch as an industrial waste.

### IDEC CORPORATION

DECLARATION OF CONFORMITY  
We, IDEC CORPORATION declare under our sole responsibility that the product:

Description: Three-Position Enabling Switch  
Model No: HE6B

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 Nishimiyaahara 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),  
Machinery Directive (2006/42/EC),  
RoHS Directive (2011/65/EU)

Applicable Standard(s) : EN 60947-5-8, GS-ET-22, 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,  
Supply of Machinery (Safety) Regulations 2008. The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012  
Applicable Standard(s) : EN 60947-5-8, DIN EN ISO 12100-1 (Note), DIN EN ISO 13849-1 (Note), DIN EN ISO 13849-2 (Note), EN IEC 63000  
Note: Based on the evaluation results of the items quoted by the GS-ET standard.