

HE1G Series Grip Style Enabling Switch

HE1G

Key features include:

- 3 position functionality (Off – On – Off) as required for manual robotic control
- Ideally suited for use as enabling (aka "deadman") switch for second operator in robotic cells
- 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
- Contacts will not re-close when released from Off→On (3→1) (per IEC60204-1; 9.2.5.8)
- Optional E-Stop switch built in
- Connection for conduit and cable strain relief built in
- IP66 waterproof sealing
- Meets ANSI robotics standards
- Optional momentary pushbutton or E-Stop built in



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Safety Products



Direct Opening Action



Double Insulation

Specifications	Conforming to Standards		IEC60947-5-1, EN60947-5-1, JIS C8201-5-1, E69867, UL508, CSA C22.2 No 14
	Approvals		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 maximum (no condensation)
	Storage Temperature		-40 to +80°C (no freezing)
	Pollution Degree		3
	Contact Resistance		100mΩ maximum (beginning stage)
	Insulation Resistance		Between live & dead metal parts: 100MΩ maximum (at 500VDC mega) Between positive & negative live parts: 100MΩ minimum (at 500VDC mega)
	Impulse Withstand Voltage		2.5kV
	Operating Frequency		1200 operations/hour
	Mechanical Life		Position 1→2 1 million minimum Position 1→2→3→1: 100,000 minimum
	Electrical Life		100,000 minimum at rated load
	Shock Resistance	Operating Extremes	100m/s ² (10 G)
		Damage Limits	1000m/s ² (100 G)
	Vibration Resistance	Operating Extremes	5 to 55Hz, amplitude 0.5mm minimum
		Damage Limits	16.7Hz, amplitude 1.5mm minimum
	Recommend Wire Size		0.14 to 1.5mm ²
	Recommend Cable Size		ø7 to 13mm
	Conduit Size		M20
	Terminal Pulling Strength		20N minimum
Terminal Screw Torque		0.5 to 0.6N • m	
Degree of Protection		HE1G-21SM: IP66, HE1G-20MB: IP65 HE1G-20ME: IP65, HE1G-21SMB: IP65	
Conditional Short Circuit Current		50A (250V)	
Recommended Short Circuit Protection		250V/10A fast blow fuse (IEC 60127-1)	
Weight		Approx. 250g (HE1G-20ME) Approx. 210g (HE1G-21SM)	

Part Numbers

Part Numbers

Part Numbers	3 Position Switch	Monitor Switch	Emergency Stop Pushbutton	Momentary Pushbutton
HE1G-21SM	2 Contacts	Yes (1NC)	No	No
HE1G-20ME	2 Contacts	No	Yes (2NC)	No
HE1G-21SMB	2 Contacts	Yes (1NC)	No	Yes (1NO)
HE1G-20MB	2 Contacts	No	No	Yes (2NO)

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Safety Products

Ratings

Contact Ratings

Rated Insulation Voltage (Ui)		250V				
Thermal Current (Ith)		3A				
Rated Operating Voltage (Ue)		30V	125V	250V		
Rated Operating Current (Ie)	3 Position Switch (Terminal No.1-2, 3-4)	AC	Resistive Load (AC-12)	–	3A	0.5A
			Inductive Load (AC-15)	–	1.5A	0.5A
		DC	Resistive Load (DC-12)	2A	0.4A	–
			Inductive Load (DC-13)	1A	0.22A	–
	Monitor Switch (Terminal No. 5-6 of HE1G-21SM)	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
	Emergency Stop Pushbutton (Terminal No. 5-6, 7-8 of HE1G-20ME)	AC	Resistive Load (AC-12)	–	–	–
			Inductive Load (AC-15)	–	–	0.5A
		DC	Resistive Load (DC-12)	–	–	–
			Inductive Load (DC-13)	–	–	0.1A
Contact Structure	3 Position Switch		2 Contacts			
	Monitor Switch		0 or 1 Contact			
	Emergency Stop Pushbutton		0 or 2 Contacts			
	Momentary Pushbutton		0 to 2 Contacts			

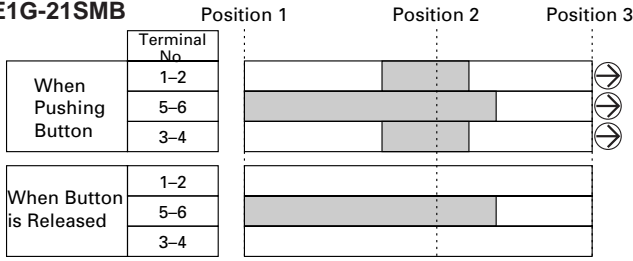


The minimum load (reference) = AC/DC3V • 5mA
(for reference only, varies depending on operating conditions)

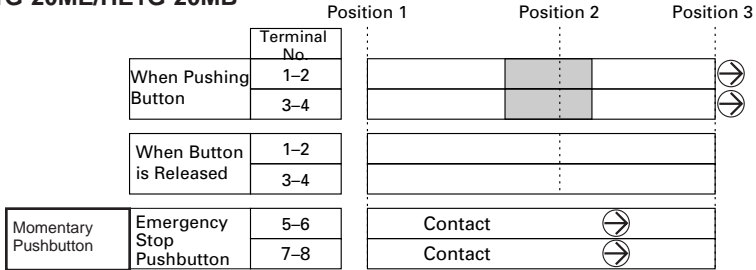
Operation Characteristics

Contact Movement

HE1G-21SM/HE1G-21SMB



HE1G-20ME/HE1G-20MB



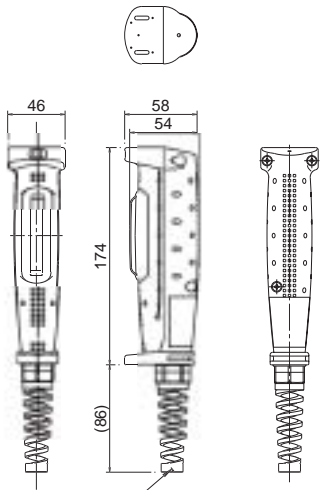
■ : Contact ON (Close) □ : Contact OFF (Open)



1. Terminals No. 1-2, 3-4, 5-6 will become positive action when moving from position 2 to 3.
2. Use terminal contacts 1-2 and 3-4 for safest circuit.

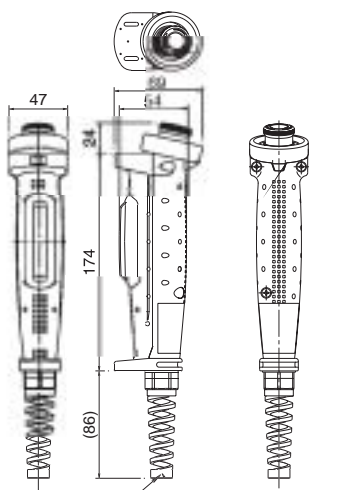
Dimensions

HE1G-21SM



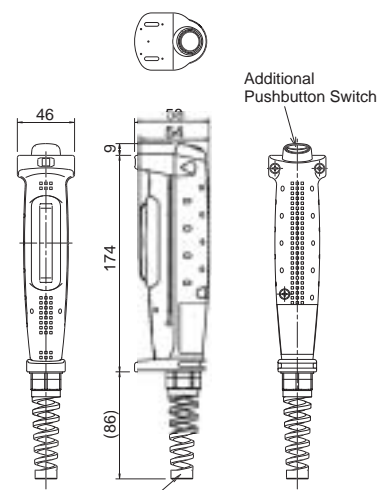
Connector (supplied with grip switch)
Type No. SKINTOP BS-M20x1.5 (LAPP)

HE1G-20ME



Connector (supplied with grip switch)
Type No. SKINTOP BS-M20x1.5 (LAPP)

HE1G-20MB/21SMB



Connector (supplied with grip switch)
Type No. SKINTOP BS-M20x1.5 (LAPP)

All dimensions in mm.

Accessories

Part Numbers: Replacement Rubber Cover

Appearance	Part Number	Material	Color
	HE9Z-GBK1	Silicon Rubber	Yellow

Part Numbers: Mounting Plate (secures grip switch)

Appearance	Part Number	Material
	HE9Z-GH1	Metal

General Information for Enabling Switches

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.

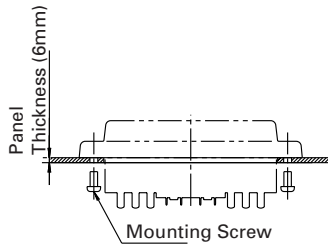
B2

Safety Products

Installation Precautions

HE2B

- M3 nut is inside the rubber cover.



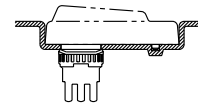
HE2B/HE3B

- 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

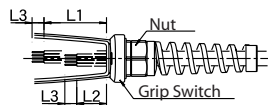
HE1B/HE2B/HE3B

- Applicable wire size is 0.5mm (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.

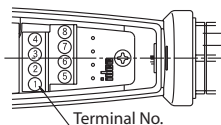
HE1G

- Wire Stripping Information

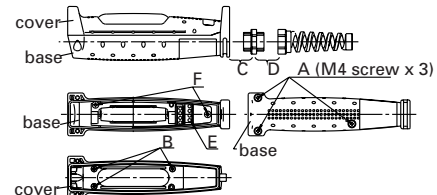
Wire Length	Terminal No. 1-4	Terminal No. 5-8
L1, L2 (mm)	L1=40mm	L2=27mm
L3 (mm)	L3=6mm	



- Applicable Wire Size: 0.14 to 1.5mm² (one wire per terminal)



- Recommended Torque (wire diameter range .276 - .512")



	See Drawing Above	Recommended Torque
Case Installation	A	1.2±0.1N • m
Rubber Installation	B	.09±0.1N • m
Connector	C	3.0±0.3N • m
Strain Relief	D	6.0±0.3N • m
Wire terminals	E	0.3±0.2N • m
Do Not Remove	F	-



The above values apply when using IDEC strain relief. If using other, contact manufacturer.

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 accidentally activated. For example, a protrusion from a teaching pendant could cause the enabling switch to be activated by the weight of the teaching pendant.

IDEC Oiltight Emergency Stop Pushbuttons

Pushlock Turn Resets

L6 Series

(see page A2-33 for more information)

B2

Safety Products



HA1B ø25 mm

- ø25 mm red button
- Mounting hole: ø16.2 mm
- Solder or PC board terminal
- 1NC or 2NC contacts
- Contact rating: 250V AC/1.5A
- Positive action contacts
- Degree of protection: IP65

HW Series

(see page A3-57 for more information)

HW1B ø29 mm

- ø29 mm red button
- Mounting hole: ø22.3 mm
- 1NO-1NC, 1NC, 1NO-1NC, or 2NC contacts
- Contact rating: 220V AC/3A
- EN418 compliance
- Degree of protection: IP65



HW1E ø40 mm Unibody

- ø40 mm red button
- Mounting hole ø22.3 mm
- 1NO-1NC, 1NC, 1NO-1NC, or 2NC contacts
- Contact rating: 220V AC/3A
- EN418 compliance
- Degree of protection: IP65



HW1X E-stop Station

- ø40 mm red button
- 1NO-1NC, 1NC, 1NO-1NC, or 2NC contacts
- Contact rating: 220V AC/3A
- Box color: Yellow (top), Black (bottom)
- EN418 compliance
- Degree of protection: IP65

