HE1G Basic Grip Enabling Switch

Key features:

- 3 position functionality (Off – On – Off) as required for manual robotic control
- Ideally suited for use as an enabling (aka "deadman") switch for 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 RIA 15.06 robotics standards
- Optional momentary pushbutton or E-Stop built in

(HE1B installed)

Part Numbers

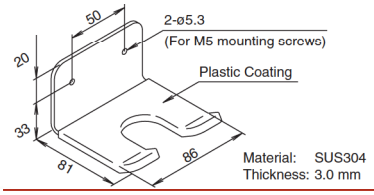
Contact Configuration			Rubber Boot	Part No.
3-position Switch	Monitor Switch	Pushbutton		
2 contacts	With (1NC)	–	Silicon Rubber / yellow	HE1G-21SM
			NBR/PVC Polyblend / gray	HE1G-21SM-1N
		Momentary Pushbutton (1NO) (1NO: AB6M-M1PB)	Silicon Rubber / yellow	HE1G-21SMB
			NBR/PVC Polyblend / gray	HE1G-21SMB-1N
	Without	Emergency Stop Switch (2NC) (2NC: HA1E-V2S2R)	Silicon Rubber / yellow	HE1G-20MF
			NBR/PVC Polyblend / gray	HE1G-20ME-1N
		Momentary Pushbutton (2NO) (2NO: AB6M-M2PB)	Silicon Rubber / yellow	HE1G-20MB
			NBR/PVC Polyblend / gray	HE1G-20MB-1N

Accessories

Replacement Rubber Cover

Appearance	Part Number	Material	Color
	HE9Z-GBK1	Silicon Rubber	Yellow
	HE9Z-GBK1-1N	NBR/PVC	Gray

Mounting Plate (secures grip switch)

Appearance	Part Number	Material
	HE9Z-GH1	Metal

Specifications

Conforming to Standards	UL508 (UL listed), CSA C22.2, No. 14 (c-UL listed), IEC/EN 60947-5-1 (TÜV/BG approval), GS-ET-22 (TÜV/BG approval)
Applicable Standards	ISO 12100-1, -2, EN12100-1, -2, IEC 60204-1 / EN 60204-1, ISO11161 / prEN11161, ISO 10218 / EN 775, ANSI/RIA R15.06, ANSI B11.19
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
Insulation Resistance	Between live & dead metal parts: 100MΩ maximum Between positive & negative live parts: 100MΩ minimum

Enabling Switches

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Impulse Withstand Voltage		2.5kV
Operating Frequency		1200 operations/hour
Mechanical Life		Position 1→ 2→ 1: 1,000,000 operations minimum
		Position 1→ 2→ 3→ 1: 100,000 operations minimum
Electrical Life		100,000 minimum at rated load
Shock Resistance	Operating Extremes	150m/s² (15 G)
	Damage Limits	1000m/s² (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 1.5mm² (24AWG - 16AWG)
Recommend Cable Size		ø7 to 13mm
Conduit Size		M20
Terminal Pulling Strength		20N minimum
Terminal Screw Torque		0.5 to 0.6Nm
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.)		HE1G-21SM: 210g HE1G-20ME: 250g HE1G-20MB/HE1G-21SMB: 220g

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	1.5A
			Inductive Load (AC-15)	–	1.5A	0.75A
		DC	Resistive Load (DC-12)	2A	0.4A	0.2A
			Inductive Load (DC-13)	1A	0.22A	0.1A
	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

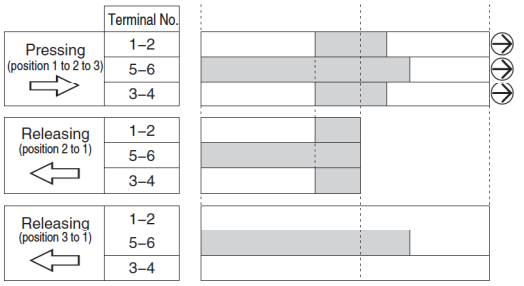
Contact Configuration	3 Position Switch	2 Contacts
	Monitor Switch	0 or 1 Contact
	Emergency Stop Pushbutton	0 or 2 Contacts
	Momentary Pushbutton	0 to 2 contacts

The minimum load (reference) = AC/DC3V • 5mA (for reference only.

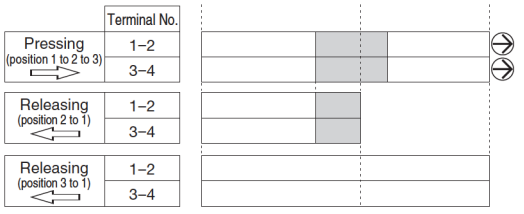
Operating Characteristics

Contact Movement

HE1G-21SM



HE1G-20ME



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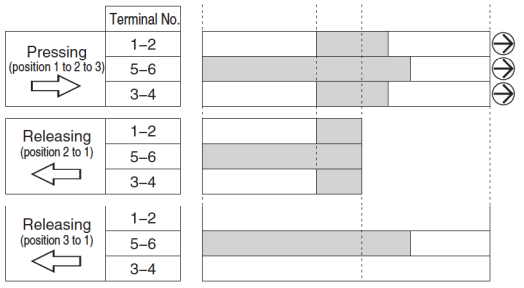
Emergency Stop Switch: 2NC contact (terminal no. 5-6, 7-8)

HE1G-21SMB



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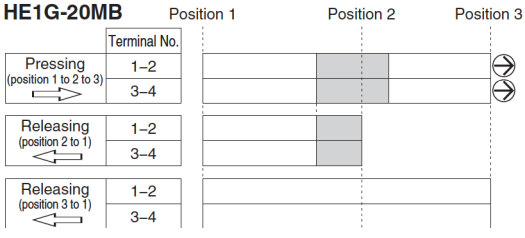
Momentary Pushbutton: 1NO contact (terminal no. 7-8)

HE1G-20MB



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Momentary Pushbutton: 2NO contact (terminal no. 5-6, 7-8)

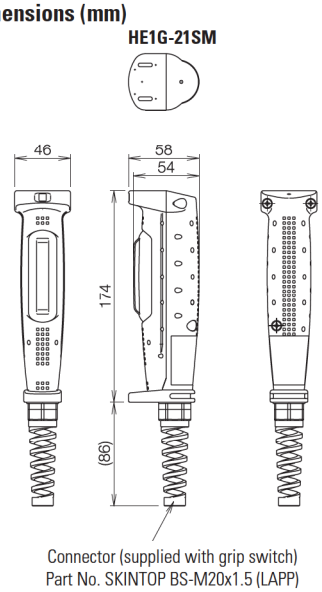
: contact ON (closed) : contact OFF (open)

Notes:

1. 3-position switches operate with direct opening action ⊖ when shifting from position 2 to position 3.
2. For the output of the enabling device, use terminals 1-2 and 3-4.
3. The above operation characteristics show when the center of the button is pressed. Pressing the edge of a button turns on one contact earlier than the other contact, causing a delay in operation.

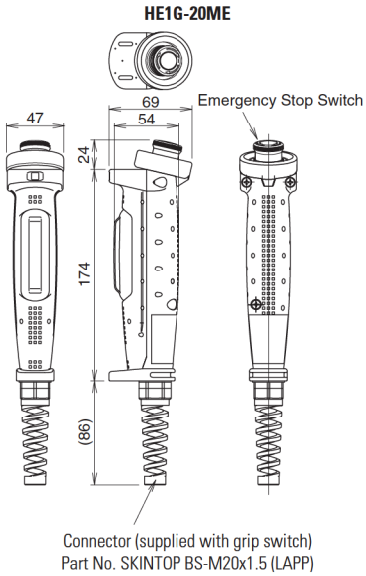
Dimensions (mm)

HE1G-21SM



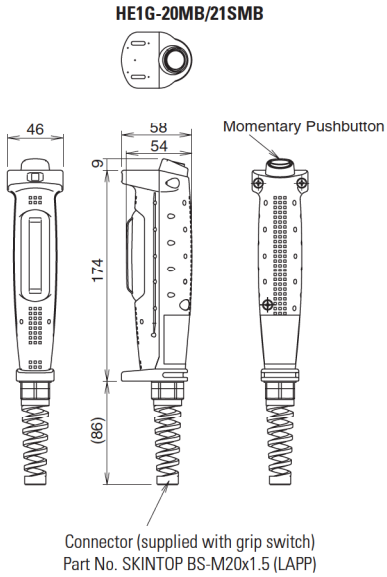
Connector (supplied with grip switch)
Part No. SKINTOP BS-M20x1.5 (LAPP)

HE1G-20ME



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

HE1G-20MB/21SMB

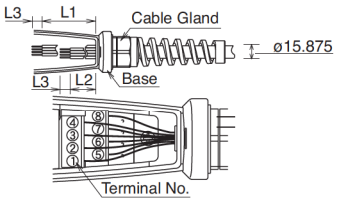


Connector (supplied with grip switch)
Part No. SKINTOP BS-M20x1.5 (LAPP)

Wiring Precautions
HE1G

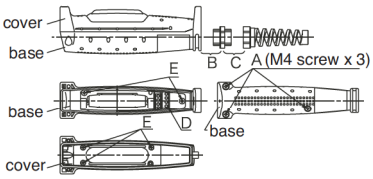
- Wire Stripping Information

Wire Length	Terminal Number 1-4	Terminal Number 5-8
L1, L2 (mm)	L1=40mm	L2=27mm
L3 (mm)	L3=6mm	



- Applicable Wire Size:0.14 to 1.5mm² (24 - 16AWG, one wire per terminal)

- Recommended Torque



	See Drawing Above	Recommended Torque
Rubber Boot & Base	A	1.2±0.1Nm
Connector & Grip Switch	B	4.0±0.3Nm
Connector	C	4.0±0.3Nm
Terminal Screw	D	0.5±0.6Nm
Do Not Remove	E	