

HE1G-L Light Force 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
- Distinctive tactile feedback when shifting to position 2 (enabling position)
- Lighter operating force to on position



Variation

In addition to a monitoring switch, the HE1G grip switch is also available with an emergency stop switch or a momentary pushbutton. Screw terminal and wire-saving internal connector models can be selected.

Part Numbers

Contact Configuration			Rubber Boot	Part Numbers	
3-position Switch	Monitor Switch	Additional Pushbutton Switch		Screw Terminals	Internal Connector
2 contacts	Without		Yellow ¹	HE1G-L21SM	HE1G-L21SMC
			Gray ²	HE1G-L21SM-1N	HE1G-L21SMC-1N
	With (1NC)	Momentary Pushbutton Switch (1NO: AB6M-M1PB) 	Yellow ¹	HE1G-L21SMB	HE1G-L21SMCB
			Gray ²	HE1G-L21SMB-1N	HE1G-L21SMCB-1N
	Without	Emergency Stop Switch (2NC: HA1E-V2S2R) 	Yellow ¹	HE1G-L20ME	HE1G-L20MCE
			Gray ²	HE1G-L20ME-1N	HE1G-L20MCE-1N
Without	Momentary Pushbutton Switch (2NO: AB6M-M2PB) 	Yellow ¹	HE1G-L20MB	HE1G-L20MCB	
		Gray ²	HE1G-L20MB-1N	HE1G-L20MCB-1N	

1: Yellow silicon rubber: Can be used in general factories. Remains flexible at cold temperatures. Suitable to applications in a wide operating temperature range.
 2: Gray NBR/PVC polyblend: Oil-proof. Suitable for environments subjected to machine oil and painting robot where silicon rubber cannot be used.

Overview

XW Series E-Stops

Interlock Switches

Enabling Switches

Safety Control Relays

Light Curtains

AS-Interface Safety at Work

Specifications


Applicable Standards	UL508 (UL listed, screw terminal only) CSA C22.2, No. 14 (c-UL listed, screw terminal only) IEC/EN 60947-5-1 (TÜV/BG approval) GS-ET-22 (TÜV/BG approval)
Applicable Standards for Use	ISO 12100-1, -2, IEC 60204-1/EN 60204-1, ISO11161 / prEN11161, ISO 10218 / EN 775, ANSI/RIA R15.06, ANSI B11.19
Operating Temperature	Silicon rubber boot: -25 to 60°C (no freezing) NBR/PVC Polyblend rubber boot: -10 to 60°C (no freezing)
Relative Humidity	45 to 85% (no condensation)
Storage Temperature	-40 to +80°C (no freezing)
Pollution Degree	3
Contact Resistance	100 mΩ maximum (initial value)
Insulation Resistance	Between live and dead metal parts: 100 MΩ minimum (500V DC megger) Between terminals of different pole: 100 MΩ minimum (500V DC megger)
Impulse Withstand Voltage	Screw terminal: 2.5 kV (momentary pushbuttons: 1.5 kV) Internal connector: 1.5 kV
Electric Shock Protection Class	Class II (IEC 61140)
Operating Frequency	1,200 operations per 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 operations minimum (rated load) 1,000,000 operations minimum (24V AC/DC, 100 mA)
Shock Resistance	Operating extremes: 150 m/s ² Damage limits: 1,000 m/s ²
Vibration Resistance	Operating extremes: 5 to 55 Hz, amplitude 0.5 mm minimum Damage limits: 16.7 Hz, amplitude 1.5 mm minimum
Applicable Wire Size	Screw terminal: 0.14 to 1.5 mm ² (AWG16 to 24) Internal connector: 0.05 to 0.86 mm ² (AWG18 to 30)
Applicable Cable	Outside diameter ø7 to 13 mm
Conduit Port Size	M20 (cable gland is supplied with the grip style enabling switch)
Terminal Tensile Strength	20N minimum
Terminal Screw Tightening Torque	0.5 to 0.6 N·m
Degree of Protection	HE1G-L21SM: IP66 (IEC 60529) HE1G-L20ME: IP65 (IEC 60529) HE1G-L20MB: IP65 (IEC 60529) HE1G-L21SMB: IP65 (IEC 60529)
Conditional Short-circuit Current	50A (250V) (Use 250V/10A fast-blow fuse for short circuit protection.)
Direct Opening Force	70N minimum (monitor switch)
Operator Strength	500N minimum (when pressing the entire button surface)
Weight (approx.)	HE1G-L21SMC: 190g HE1G-L21SM/L21SMCB/L20MCB: 200g HE1G-L21SMB/L20MB: 210g HE1G-L20MCE: 230g HE1G-L20ME: 240g



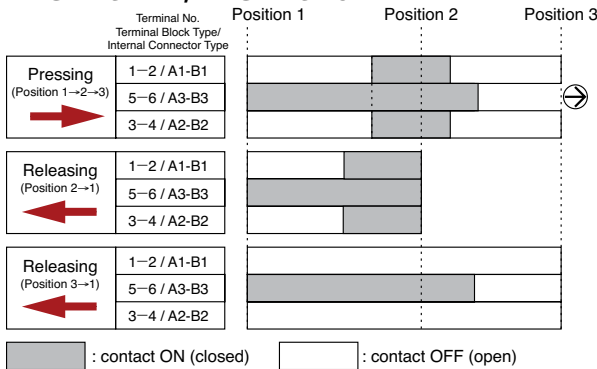
See grip switch catalog for complete list of specifications.

Contact Ratings

Rated Insulation Voltage (Ui)		250V (momentary pushbutton: 125V)					
Rated Thermal Current (Ith)		2.5A (Note)					
Rated Voltage (Ue)		30V	125V	250V			
Rated Current (Ie)	Grip Style Enabling Switch 3-position Switch (Terminal No.1-2/A1-B1,3-4/A2-B2)	AC	Resistive Load (AC-12)	—	1A	0.5A	
			Inductive Load (AC-15)	—	0.7A	0.5A	
		DC	Resistive Load (DC-12)	1A	0.2A	—	
			Inductive Load (DC-13)	0.7A	0.1A	—	
	Grip Style Enabling Switch Monitor Switch (HE1G-L21SM/ HE1G-L21SMB, Terminal No.5-6/A3-B3)	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	
	Pushbutton	Emergency Stop Switch (HE1G-L20M, Terminal No. 5-6/A3-B3, 7-8/A4-B4)	AC	Resistive Load (AC-12)	—	—	—
				Inductive Load (AC-15)	—	—	0.5A
			DC	Resistive Load (DC-12)	—	—	—
				Inductive Load (DC-13)	—	—	0.1A
Momentary Pushbutton (HE1G-L20M, Terminal No.5-6/A3-B3,7-8/A4-B4) (HE1G-L21SM, Terminal No.7-8/A4-B4)		AC	Resistive Load (AC-12)	—	0.5A	—	
			Inductive Load (AC-15)	—	0.3A	—	
		DC	Resistive Load (DC-12)	1A	0.2A	—	
			Inductive Load (DC-13)	0.7A	0.1A	—	

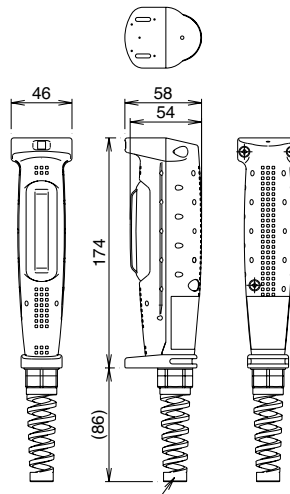
 Minimum applicable load (reference value): 3V AC/DC, 5 mA (Applicable range is subject to the operating conditions and load.)
Note: Operating temp. 40 to up to +50°C (not included): 2A (4 circuits) 50 to +60°C: 1.5A (3 or 4 circuits)

Operating Characteristics
HE1G-L21SM, HE1G-L21SMC,
HE1G-L21SM-1N, HE1G-L21SMC-1N



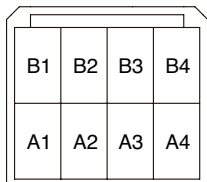
Terminals 1-2/A1-B1 and 3-4/A2-B2 are outputs of the 3-position enabling switch.
Terminals 5-6/A3-B3 are outputs of the monitor switch.
The above operation characteristics show when the center of the grip switch button is pressed. Because two contacts are designed to operate independently, pressing the edge of the button turns on one contact earlier than the other contact, causing a delay in operation. To avoid this, always press the center of the button.

Dimensions (mm)
HE1G-L21SM, HE1G-L21SMC,
HE1G-L21SM-1N, HE1G-L21SMC-1N



Cable Gland (supplied with grip switch)
Type No.: SKINTOP BS-M20 x 1.5 (LAPP)

Internal Connector Terminal No.



Connector
Tyco Electronics D-1200D series
Receptacle housing: 1-1827864-4
Receptacle contact
1827586-2: AWG28 to 30
(Hand tool: 1762952-1)
1827587-2: AWG22 to 28
(Hand tool: 1762846-1)
1827588-2: AWG22 to 28
(Hand tool: 1762950-1)
1827589-2: AWG18 to 22
(Hand tool: 1762625-1)