

# HE1G Grip Switch Operating Instructions

Type: HE1G-21SM/20ME

Use the grip switch according to the following instructions after confirming that the product is what you have ordered.

## ⚠ Precautions for Safety

- Read this instruction sheet to make sure of correct operation before starting installation, wiring, operation, maintenance, and inspection. Also, keep this instruction sheet at the end user.
- Turn off the power to the grip switch before starting installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shocks or fire hazard.
- Use proper size wires to meet voltage and current requirements. Tighten the terminal screws to a recommended tightening torque. Loose terminal screws will cause unexpected heating and fire hazard during operation.

### (1) Purpose

This grip switch is a device used for enabling a machine (robot, etc.) when teaching the machine in a hazardous area manually. Configure the enabling system so that the machine can operate when the switch is in position 2.

### (2) Unpacking

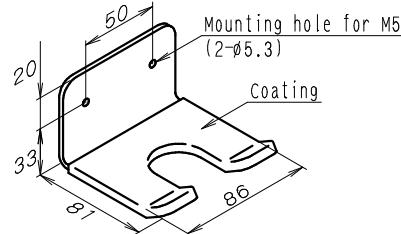
Check if the product is what you have ordered and there are no lacks of parts or damages by a transport accident, before use.

- The grip switch  
Type No.: HE1G-21SM(3-position switch: 2 poles, monitor switch: 1 pole)  
HE1G-20ME(3-position switch: 2 poles, Emergency stop pushbutton switch: 2 poles)
- The accessories

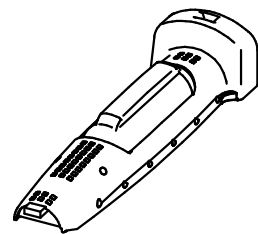
Item	Type No.	Qty.
Connector	Applicable cable: external diameter $\phi$ 7-13 mm	1
Instruction	HE1G Grip-type Enabling Switch Operating Instructions	1

### (3) Option (separate order)

- Mounting bracket  
Type No.: HE9Z-GH1  
(to mount a grip switch)
- Rubber boot frame (for replacement)  
Type No.: HE9Z-GB1



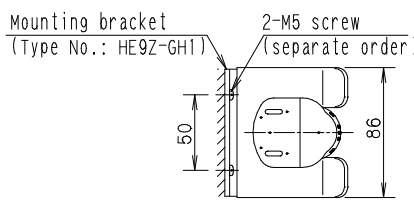
Material : SUS304  
Thickness: t=3.0 mm



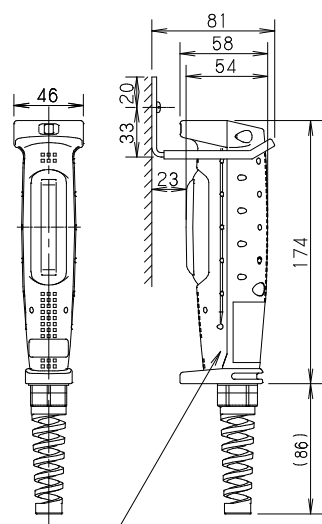
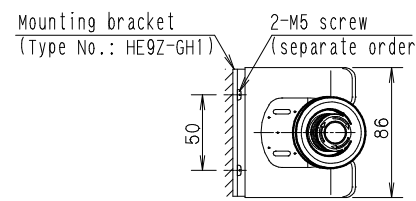
Rubber boot Material: Silicon rubber  
Rubber boot Color : Yellow

### (4) External Dimensions

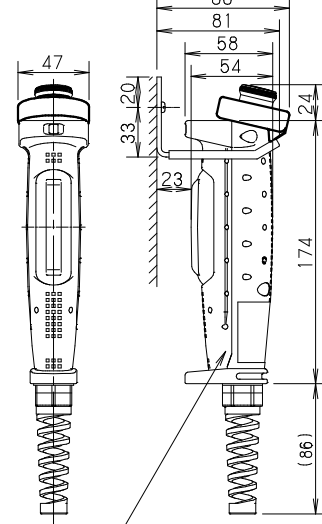
#### 4-1. HE1G-21SM



#### 4-2. HE1G-20ME



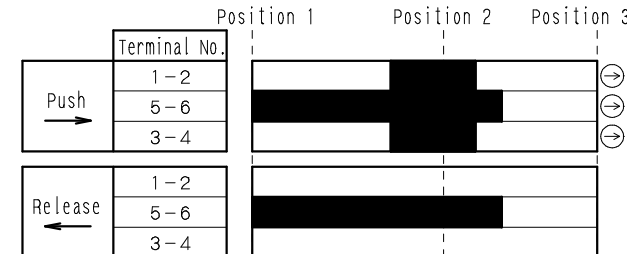
Grip switch  
(Type No.: HE1G-21SM)



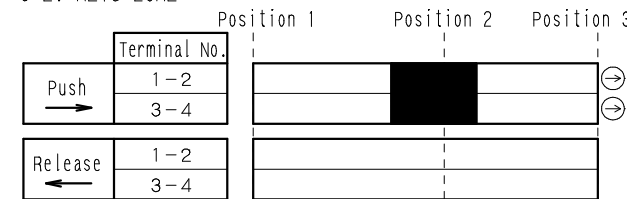
Grip switch  
(Type No.: HE1G-20ME)

### (5) Operating Characteristics

#### 5-1. HE1G-21SM



#### 5-2. HE1G-20ME



Emergency stop pushbutton switch: 2NC contacts  
(Terminal No.5-6 and 7-8)

■ ON (Contact close) □ OFF (Contact open)

note) The terminal Nos.1-2, 3-4, and 5-6 will be positive opening circuit(⊕) when the switch operates from position 2 to 3.

Use contacts of terminal Nos.1-2 and 3-4 for the output of enabling system.

The above operating characteristics illustrate the performance when the center of the yellow button is pressed. Pressing the edge activates one of the two 3-position switches inside earlier than the other, and may cause a delay in the operation of the grip switch.

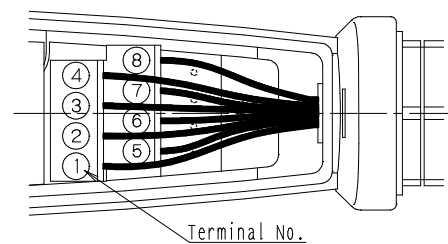
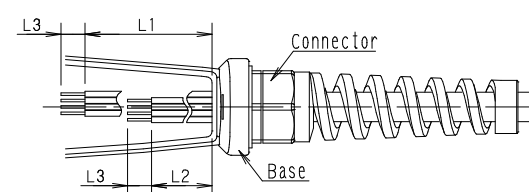
### (6) Specifications and Ratings

Applicable Standards	IEC60947-5-1, EN60947-5-1 (DEMKO-BIA approval)					
	JISC8201-5-1					
Applicable Standards for use	UL508 (UL listing)					
	CSA C22.2 No.14 (c-UL listing)					
Operating Temperature	-25 to +60°C					
	Thermal Current (Ith)					
Rated Operating Voltage (Ue)	3-position switch (terminal No.1-2 and 3-4)	AC	Resistive Load (AC12)	30V	125V	250V
		DC	Inductive Load (AC15)	-	1.5A	0.75A
Rated Operating Current (Ie)	Monitoring switch (terminal No.5-6 on HE1G-21SM)	AC	Resistive Load (AC12)	2A	0.4A	0.2A
		DC	Inductive Load (DC13)	1A	0.22A	0.1A
Rated Operating Current (Ie)	Emergency stop switch (terminal No.5-6 and 7-8 HE1G-20ME)	AC	Resistive Load (AC12)	-	2A	1A
		DC	Inductive Load (DC13)	-	1A	0.22A
Operating Frequency	1200 operations/hour					
	Class of Equipment					
Degree of Protection	Class II (IEC61140)					
	IP66	HE1G-21SM				
Pollution Degree	3 (inside housing: 2)					
	IP65	HE1G-20ME				
Rated Insulation Voltage (Ui)	250V					
Impulse Withstand Voltage (Uimp)	2.5 kv					
Conditional short-circuit Current	50A (250V)					
Short-Circuit Protection Device	250V AC, 10A Fuse (IEC60127-1)					
Direct Opening Force	90N (minimum)					
Actuator Strength	500N (minimum)					

### (7) Wiring

- Wire Length inside the grip switch

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



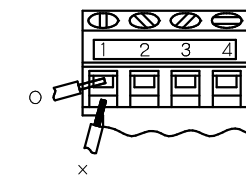
- Applicable Wire Size  
<Direct Mounting> : 0.14 to 1.5 mm<sup>2</sup> × 1pc  
(Note) when using a stranded wire, make sure that adjoining terminals are not short-circuited with protruding core wires. Also, do not solder the core wires to avoid protruding wires.

<Ferrules> : Recommended ferrules (Phoenix Contact)

Type No.	Applicable Wire
A10.5-8WH	0.34 to 0.5 mm <sup>2</sup>
A10.75-8GY	0.5 to 0.75 mm <sup>2</sup>
A11.0-8RD	0.75 to 1.0 mm <sup>2</sup>
A11.5-8BK	1.0 to 1.5 mm <sup>2</sup>

Crimping Tool : CRIMPFOX UD6

### • Wiring Instruction

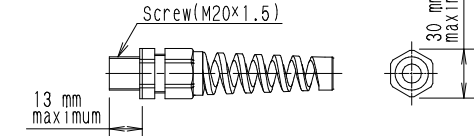


When wiring terminals 1 to 4, make sure to insert wires into the correct openings, as the wire marked with ○ in the figure on the left. If wired into the wrong openings, as the wire marked with X, electrical connection is not ensured, because the wires cannot be clamped tightly.

### (8) Connector (1 connector included with enabling switch)

Use a connector with the specification below when replacing.

- Dimensions

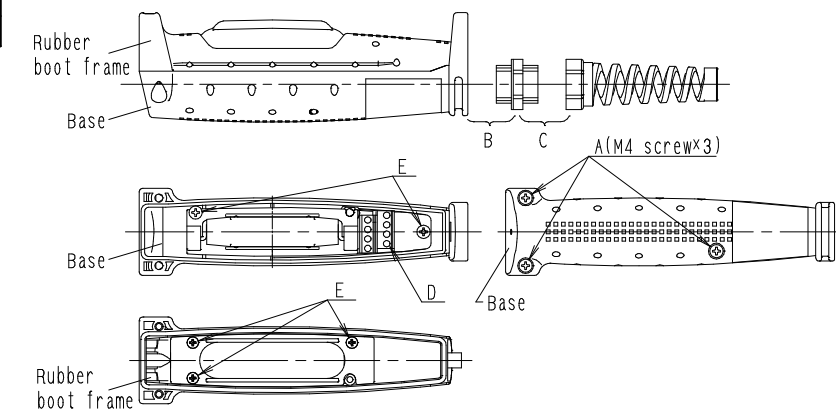


- Degree of Protection ..... Use a connector of IP66 or higher protection.
- Recommended connector ..... Type No.: SKINTOP-BS-M20X1.5-B (made by LAPP, Germany/imported by K.MECS)
- Applicable cable diameters .. Outside diameter 7 to 13 mm

### (9) Recommended screw tightening torque

	Screw position	Screw tightening torque
For mounting rubber boot frame on the base (M4 screw×3)	A	1.2 ±0.1 N·m
Connector to Grip Switch	B	4.0 ±0.3 N·m
Connector to Connector	C	4.0 ±0.3 N·m
Terminal Screw (M3 ×8)	D	0.5 to 0.6 N·m
Do not remove screws	E	-

The torques of screws B and C in the table above are values when the connector described in (8) is used. When using a connector other than the recommended connector in (8), refer to the specification of the connector to be used.



### (10) Precautions for Operation

- Do not apply an excessive shock to the switch.
- Wire the switch correctly after reading a catalog or this instruction sheet.
- In order to ensure safety of the control system, connect each pair of the contacts of the 3-position switch (terminal No.1-2 and 3-4) to a discrepancy detection circuit such as a safety relay module. (ISO13849-1/EN954-1)
- When wiring, prevent dust, water, or oil from entering the grip switch.
- Do not tie the grip switch around the button with a tape or string to keep the switch in position 2. Otherwise the original function of the switch is not utilized, posing a great risk of danger.