

Panasonic® INSTRUCTION MANUAL
Enabling Grip Switch SG-C1 Series

UK CA CE TUV C UL US MJE-SGC1 No.0103-65V

Always observe

WARNING	Risk of death or serious injury.
 CAUTION	Risk of minor injury or property damage.

Model No. : **SG-C1-21-EMK**☐

3 position switch — **21** : Equipped

Emergency stop switch — **None** : —
E : Equipped

Applicable Standards	EN 60947-5-1: 2017, EN IEC 60947-5-8: 2021, GS-ET-22: 2016									
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, JIS C8201-5-1, UL 508, CSA C22.2 No.14									
Conforming Standards	Machinery Directive (2006/42/EC) , Supply of Machinery (Safety) Regulations (2008/1597)									
Operating Condition	Operating Temperature	-25°C to +60°C (no freezing)								
	Operating Humidity	45% to 85%RH (no condensation)								
	Storage Temperature	-40°C to +80°C (no freezing)								
	Pollution Degree	3 (inside housing 2)								
Altitude	2000m maximum									
Impulse Withstand Voltage (Uimp)	2.5 kV (additional momentary pushbutton switch, key selector switch: 1.5kV)									
Rated Insulation voltage	250V(Additional momentary pushbutton switch and Key selector switch:125V/30V(With Pilot Light)									
Thermal Current <Ith>	3A (Emergency stop switch: 5A)									
Contact Ratings (Reference Values) <Ue, Ie>(Note 1)	Grip Switch	3 position enabling switch (terminal No. NO1-C1 and NO2-C2)	AC		30V	125V	250V			
				Resistive load (AC-12)	—	1A	0.5A			
			DC	Inductive load (AC-15)	—	0.7A	0.5A			
				Resistive load (DC-12)	1A	0.2A	—			
		Push monitor switch, Release monitor switch (terminal No.31-32)	AC	Inductive load (DC-13)	0.7A	0.1A	—			
				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			
		Emergency stop switch (terminal No. 1-2 and 1-2)	AC	Inductive load (DC-13)	2.3A	0.55A	0.27A			
				Resistive load (AC-12)	—	5A	3A			
			DC	Inductive load (AC-15)	—	3A	1.5A			
				Resistive load (DC-12)	2A	0.4A	0.2A			
	Momentary pushbutton switch, Key selector switch (terminal No.C1—NO1—NC1—NO2—NC2)	AC		Inductive load (DC-13)	1A	0.22A	0.1A			
				Resistive load (AC-12)	—	0.5A	—			
		DC		Inductive load (AC-15)	—	0.3A	—			
				Resistive load (DC-12)	1A	0.2A	—			
				Inductive load (DC-13)	0.7A	0.1A	—			
				Resistive load (AC-12)	—	0.5A	—			
Electric Shock Protection Class	Class II (IEC61140) , Class III (With Pilot Light)									
Operation Frequency	1200 operations/hour									
B _{10d}	2,000,000 (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 ²								
	Damage Limits	1000m/s ²								
Free Fall	1.0m 1time (Based on IEC60068-2-32)									
Vibration Resistance	Operating Extremes	5Hz to 55Hz, half amplitude 0.5mm								
	Damage Limits	16.7Hz, half amplitude 1.5 mm								
Degree of Protection	IP66/67	Without Additional switch and Pilot light								
	IP65	With Additional switch and/or Pilot light								
Conditional short-circuit Current	50A (250V)									
Short-Circuit Protective Device	250V AC, 10A Fuse (IEC60127-1)									
Direct Opening Force	60N minimum (Push monitor Switch)									
Direct Opening Travel	4.7mm minimum (Push monitor Switch)									
Actuator Strength	500N minimum (Grip Switch)									
Weight (Approx.)	SG-C1-21 (140g) / SG-C1-21-MM (155g) / SG-C1-21-E (150g) SG-C1-21-EMM (165g) / SG-C1-21-EMK (170g) / SG-C1-21-EG (155g)									

(1) TÜV Rating	Without Pilot Light Type		
	3 position enabling switch	AC-15 0.5A/250V	DC-13 0.1A/125V DC-13 0.7A/30V
	Monitor switch	AC-15 0.75A/250V	DC-13 0.22A/125V
			DC-13 2.3A/30V

	DC 0.1A/125V Pilot Duty
	DC 0.7A/30V Pilot Duty
Monitor switch	AC 0.75A/250V Pilot Duty
Emergency stop switch	AC 1.5A/250V Pilot Duty
	DC 1A/30V Pilot Duty
Momentary pushbutton switch/Key selector switch	AC 0.5A/125V Resistive
	DC 1A/30V Resistive
Pilot Light	DC 15mA/24V
•Ambient Temperature	40°C
•Environmental Rating	Type 4X Indoor Use Only

(This device must be used with cable suitable for wet locations, when using as UL/c-UL recognized component.Extra care shall be taken to make sure that the mating components of the housing are suitably aligned in order to maintain the Type 4X Indoor Use Only rating.)

- This device has only been investigated for shock and fire to UL508.
- This device is not intended for connection to rigid metallic conduit.

- A grip style 3 position enabling switch (consisting of a base and a rubber boot frame)
- A connector (applicable cable diameter: $\varnothing 4.5$ to 10 mm)
- An instruction sheet
- Key (with key selector switch)

- Dimensions

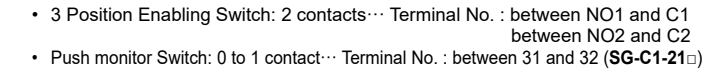
5 NOTES FOR OPERATION

- **SG-C1-21** series 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 and an additional "start" is pushed to initiate the operation.
- In order to ensure safety of the control system, connect each pair of the contacts of the 3 position enabling switch (terminal NO.NO1-C1 and NO2-C2) to a discrepancy detection circuit such as a safety relay module. (ISO13849-1)
- The base and the plastic part of rubber boot frame are made of glass-reinforced ABS/PBT.
- The rubber boot is made of silicone rubber. The screw is made of iron.
- When cleaning the **SG-C1-21** series, use a detergent compatible with the materials.
- Do not press the rubber boot with excessive pressure to an inappropriate direction.
- As for momentary pushbutton switch and key selector switch of additional control unit, do not connect NO and NC contacts of a micro switch to different voltages or different power sources to prevent a dead short-circuit.
- Do not operate key selector switch of additional control unit without completely insertion of the key.
- The rubber boot may deteriorate depending on the operating environment and conditions.

- Use proper size wires to meet voltage and current requirements.
- Do not apply an excessive shock to the **SG-C1-21** series.
- Wire the switch correctly after reading a catalog or this instruction sheet.
- When wiring, prevent dust, water, or oil from entering the grip switch.
- If used in wet locations, this device must be used with cable suitable for wet locations.
- 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.

- Turn off the power to the **SG-C1-21** series before starting installation, removal, wiring, maintenance, and inspection. 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 grip switch function, otherwise a breakdown or an accident will result.
- When using the **SG-C1-21** series 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 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.
- Please note that permanent installation of the grip switch at the machine is inadmissible.

☒ : ON (Contact close) ☐ : OFF (Contact open)

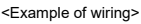


- Key selector switch



A diagram of a battery terminal. It shows a metal terminal with a plastic cover. Labels with arrows point to the following parts: 'Negative Terminal' points to the top of the terminal; 'White Paint Marking' points to a white mark on the side of the terminal; 'Terminal (plastic)' points to the plastic cover; and 'Positive Terminal' points to the bottom of the terminal.

	Grip switch						Momentary pushbutton switch/ Key selector switch			Emergency stop switch		Pilot Light	
	NO1	C1	31	32	NO2	C1	C	NO	NC	1	2	+	-
Wire Length L1 (mm)	40	45	50	60	85	80	120			110		115	
Wire stripping Length L2 (mm)	L2=5mm												



- Direct wiring: Max 0.5mm² (AWG 20)
Wire SG-C1-21 series according to IEC60204-1

- Solder the terminal at 310 to 350°C within 3 seconds using a 60W soldering iron. Sn-Ag-Cu type is recommended when using lead-free solder.
- When soldering, do not touch the control unit 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 rosin flux.
- Because the terminal spacing is narrow, use protective tubes or heat shrinkable tubes to avoid burning of wire coating or short circuit.
- When using a stranded wire, make sure that adjoining terminals are not short-circuited with protruding core wires.
- Use copper Wire 60/75 degree C only. (UL508)
- The wiring has to be installed according to GS-ET-22:2016, 4.2.6.

	Screw position	Recommended screw tightening torque
For mounting rubber boot frame on the base (M4 screw×4)	A	1.1 to 1.3N·m
Cable gland to Grip switch	B	2.7 to 3.3N·m
Cable gland to Cable gland	C	2.7 to 3.3N·m

The torques of screws B and C in the table above are values when the connector described in (3) is used. When using a cable gland other than the recommended cable gland in (3), refer to the specification of the cable gland to be used.

Note : When installing **SG-C1-21** series on the walls, attach hand strap to **SG-C1-21** series and hang on a hook

Dispose of SG-C1-21 series as an industrial waste.

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Product: Enabling Grip Switch

Model Name: SG-C1 Series

Trade Name: Panasonic

Application of Council Directive: 2006/42/EC Machinery Directive
2011/65/EU RoHS Directive

Applicable standards: EN 60947-5-1 EN IEC 60947-5-8
GS-ET-22 EN IEC 63000

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Product Name: Enabling Grip Switch
Trade Name: Panasonic
Model Number: SG-C1 Series
Statutory Instruments: 2008 No.1597 Supply of Machinery (Safety) Regulations 2008
 2012 No.3032 RoHS Regulations 2012
Designated Standards: EN 60947-5-1 EN IEC 60947-5-8
 GS-ET-22 EN IEC 63000

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