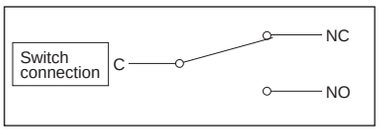
Sunmulon

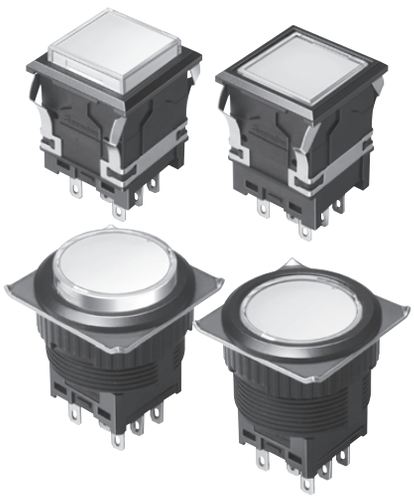
EH-G Illuminated Pushbutton Switch

EH-G

Only 22.5mm depth behind panel with built-in resistor.

- Depth behind panel：Only 22.5 mm (Standard), 25.3 mm (Flat)
- LED Full-Face, Dual-Color illumination available.
- Terminal：#110 Tab・Soldering, PCB, Connector
- Accessories：Socket





CHARACTERISTICS

Button Size		Square：□17 mm　Round：ϕ20.2mm			
Contact Material		Silver contact (Gold-plated)	Cross-bar contact	Connector type Silver contact (Gold-plated)	Connector type Cross-bar contact
Rating (Resistive Load)		AC 125 V 3 A AC 250 V 3 A	AC 125 V 0.1 A DC 30 V 0.1A	(SPDT) AC 100 V 1A , DC 30 V 1A (DPDT) AC 50 V 1A , DC 30 V 1A	(SPDT) AC100V 0.1A , DC30V 0.1A (DPDT) AC50V 0.1A , DC30V 0.1A
Insulation Resistance		More than 100 MΩ at DC 500 V			
Dielectric Strength		AC 1000 V RMS between NC and NO terminal AC 1500 V RMS between terminals and ground 50/60 Hz for 60 sec. at normal ambient temperature and humidity	AC 600 V RMS between NC and NO terminal AC 1500 V RMS between terminals and ground 50/60 Hz for 60 sec. at normal ambient temperature and humidity	Connector AC 800 V RMS (DPDT AC 500 V) 50/60 Hz for 60 sec. at normal ambient temperature and humidity	Connector AC 600 V RMS (DPDT AC 500 V) 50/60 Hz for 60 sec. at normal ambient temperature and humidity
Contact Resistance		Less than 30 mΩ at DC 6 V 1 A	Less than 50 mΩ at DC 6 V 0.1 A	Less than 40 mΩ at DC 6 V 1 A	Less than 60 mΩ at DC 6 V 0.1 A
Vibration Resistance		10 to 55 Hz, Amplitude 1.5 mm			
Mechanical Life	Momentary	More than 2,000,000 operations			
	Alternate	More than 200,000 operations			
Electrical Life (Resistive Load)		Silver contact (Gold-plated)：More then 60,000 operations　Cross-bar contact：100,000 operations			
Operating Force		4.41N max.			
Total Travel		3mm max.			
Weight		Square：12 g　Round：16 g			
Ambient Operating Temperature		−15℃ to 50℃（No Freeze, No Condensation）			
Ambient Operating Humidity		80%RH max.（No Condensation）			
Ambient Storage Temperature		−25℃ to 65℃（No Freeze, No Condensation）			
Ambient Storage Humidity		80%RH max.（No Condensation）			

https://www.sunmulon.co.jp/english/products/switch_e/ehg.html

◇Dimensions：page EHG-4〜5　◇Accessories：page EHG-6　◇Ordering code：page EHG-7〜10
◇Internal connection arrangements：page EHG-12　◇LED specifications：page EHG-13　◇Terminals / PCB hole cutout：page EHG-14〜15
◇Mounting design / Panel cutout：page EHG-16　◇Accessories' dimensions / Panel cutout：EHG-17〜20

SPECIFICATIONS

		Square	Round
Shape	Standard	A	A
	Flat	A	A
Illumination type	Full-Face	A	A
	Dual-Color	A	A
Contact	SPDT	A	A
	DPDT	A	A
Terminal	#110 Tab Soldering	A	A
	PCB	A	A
	Connector	A	A
RoHS (10 Substances)		Conform to standard	

A : Applicable N/A : Not applicable

CONTACT RATINGS

● Silver contact (Gold-plated)

Voltage	Current (A) (Resistive load)
AC 125 V	3
250 V	3
DC 8 V	3
14 V	3
30 V	2
125 V	0.4

● Cross-bar contact

Rating	AC 125 V 0.1 A (Resistive load)
	DC 30 V 0.1 A (Resistive load)
Minimum applicable load	DC 5 V 1 mA (Resistive load)

STRUCTURE

LIGHT CARTRIDGE

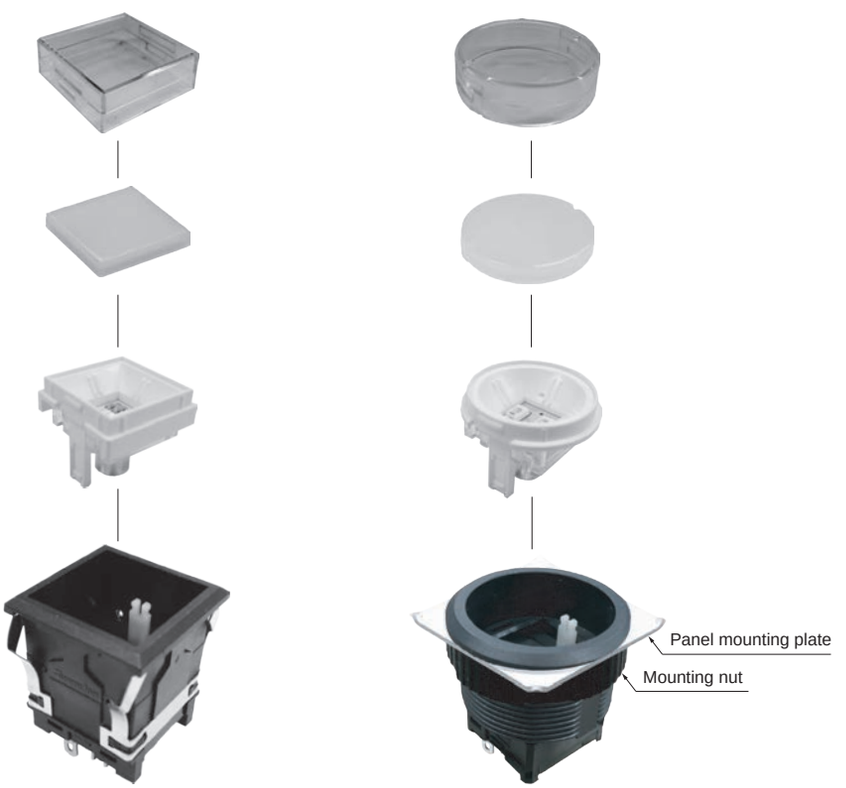
Square Round

BUTTON

FILTER

LED UNIT

HOUSING



ILLUMINATION TYPES

Common for each button size.

LED color symbol

70	Red	80	Green	90	Yellow	14	Super Blue	16	Super White	18	Super Green

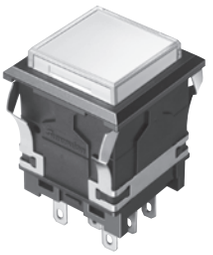
※ Yellow (90) is actually “ORANGE Yellow” not Lemon Yellow.

Full-Face	70 80 90 14 16 18
Dual-Color	70•80 70•14 70•16 70•18 80•90 90•70 90•14 14•16 16•18 18•14

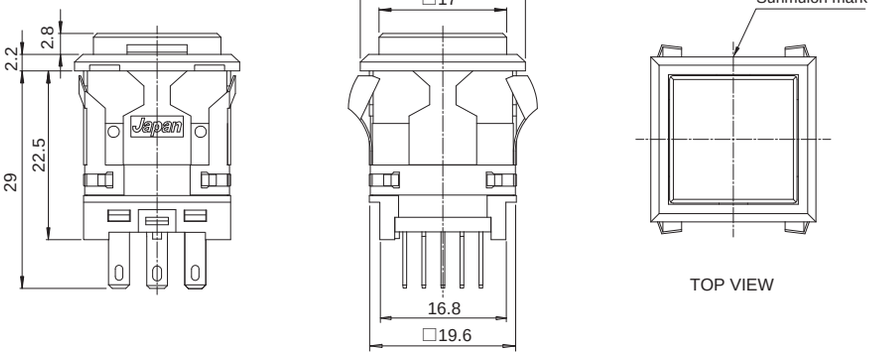
DIMENSIONS

● With Flange

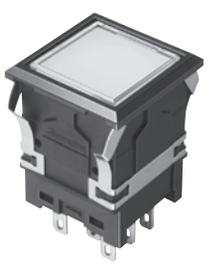
Square Standard



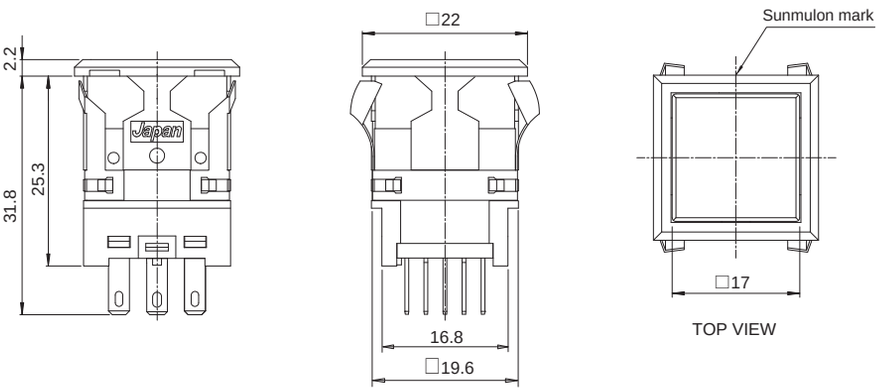
3D
DXF



Square Flat

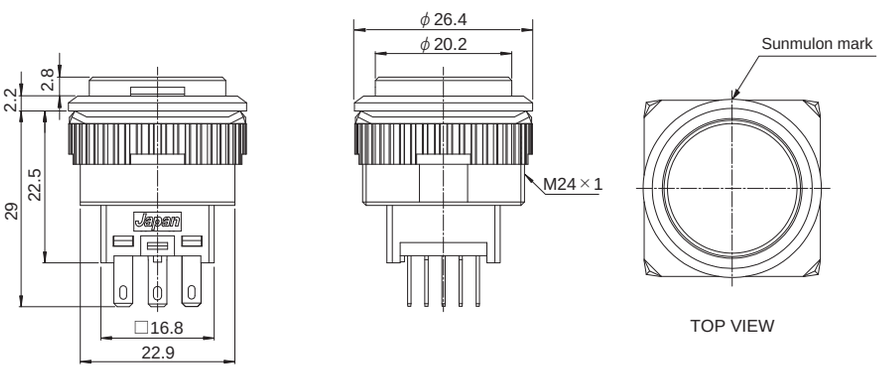


3D
DXF



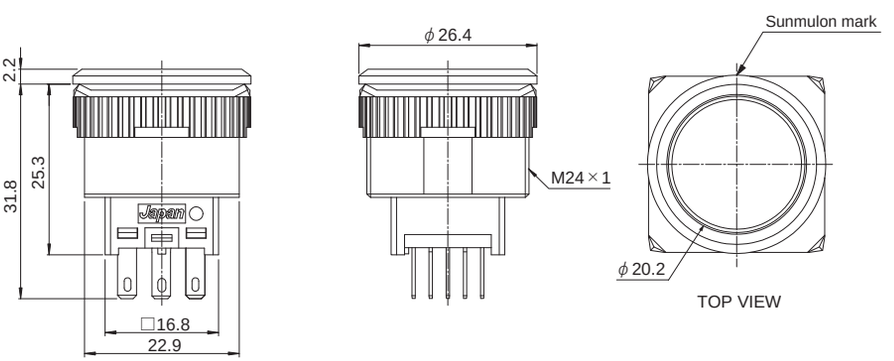
Round Standard

3D
DXF



Round Flat

3D
DXF



The depth of the flat type is different from that of a standard type.

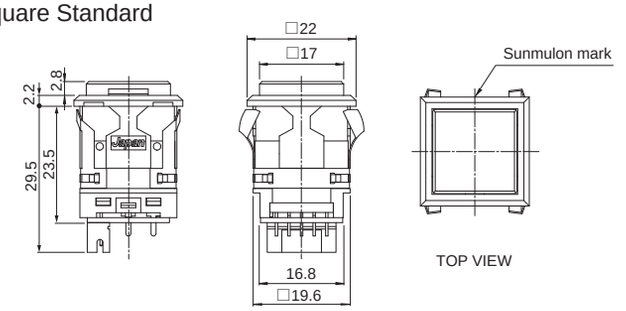
3D・DXF data download site ： **https://www.sunmulon.co.jp/download/**

Tolerance : ± 0.4 mm

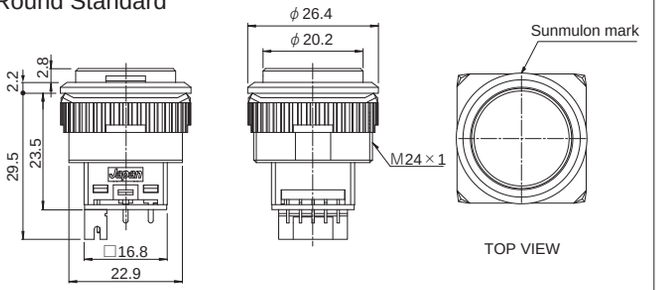
DIMENSIONS

● Connector for SPDT, Indicator

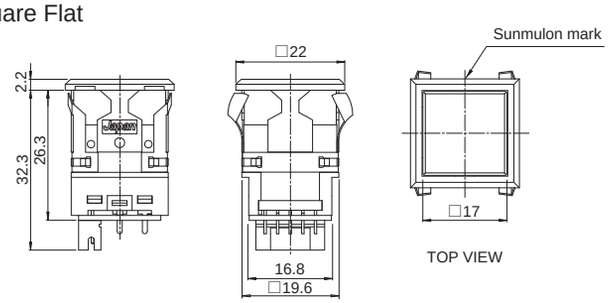
Square Standard



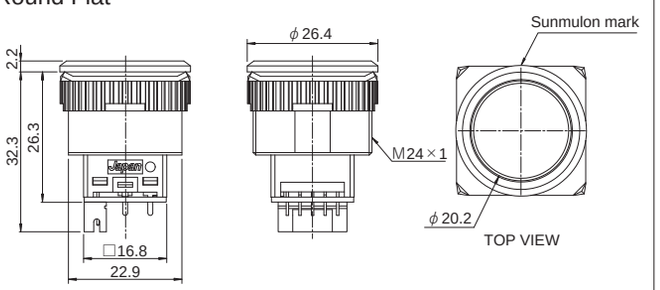
Round Standard



Square Flat

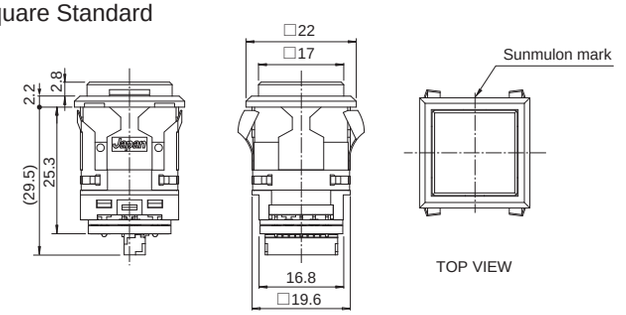


Round Flat

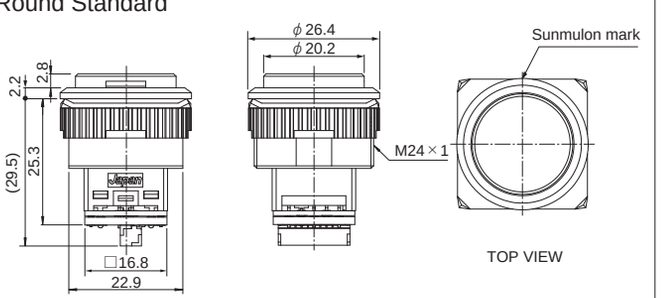


● Connector for DPDT

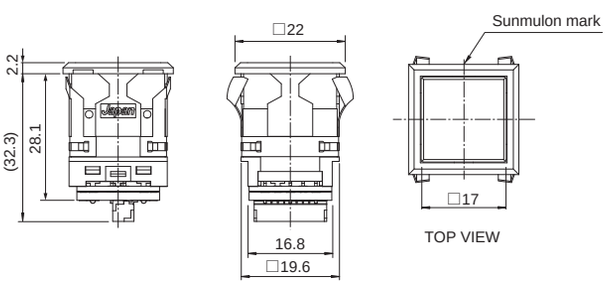
Square Standard



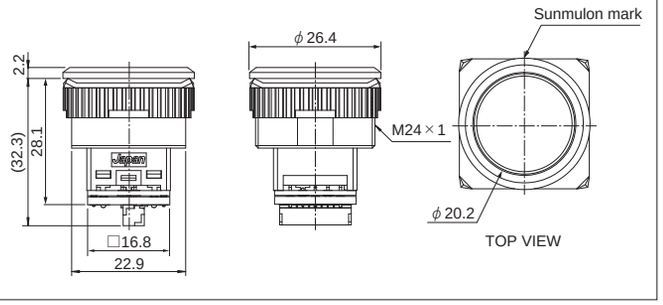
Round Standard



Square Flat



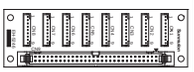
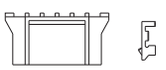
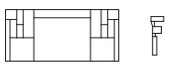
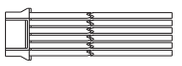
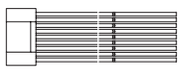
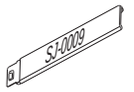
Round Flat



3D・DXF data download site ： **https://www.sunmulon.co.jp/download/**

Tolerance : ± 0.4 mm

ACCESSORIES

Name	Appearance	Classification	Part no.	Precautions for use
Socket 3D DXF		#110 Tab・ Soldering terminal	EH-1088-□ EH-3210-2□	- For combination with housing, refer to page EHG-17. - Use #110 Tab・soldering terminal type for the switch housing.
		PCB terminal	EH-1196-□	
Relay board		For connector type	EH-5246	- Common wiring is possible by simply connecting. Up to eight switch wires can be integrated onto a single board. ※ Connection harnesses are not available from us.
Connector		For SPDT・Indicator	EH-3251	- Housing and contact set for connector type. ※ Please specify whether or not to attach it by ordering code.
		For DPDT	EH-5180	
Wire harness		For SPDT・Indicator	100cm EH-3250-1 200cm EH-3250-2	- Harness for connector type.
		For DPDT	100cm EH-5177-1 200cm EH-5177-2	
Removing tool		For removal light cartridge	SJ-0001	- Be used to remove light cartridge from housing.
		For removal flat indicator	SJ-0009	- Be used to remove light cartridge of Square flat indicator from housing.
		For removal flat indicator	SJ-0002-1	- Be used to remove light cartridge of Round flat indicator from housing.
Tightening tool		For tightening housing screw	EH-4195	- Be used to tightening housing screw of Round type.

3D・DXF data download site ： **https://www.sunmulon.co.jp/download/**

◇Accessories' dimensions / Panel cutout：EHG-17～20

ORDERING CODE 【Full-Face】

Assembled Part (Light cartridge and Housing)

EH□ –G□ □ □ □ □ □ □ □ □ □ □

● OPERATION

L	Indicator
F	Flat Indicator ※1)
M	Momentary
A	Alternate

● CONTACT

0	Indicator
3	SPDT・Silver (Gold-Plated)
4	DPDT・Silver (Gold-Plated)
5	SPDT・Crossbar
6	DPDT・Crossbar

● BUTTON SHAPE

L0	Square Standard ※1)
F0	Square Flat
R0	Round Standard ※1)
Y0	Round Flat

● LED COLOR

70	Red
80	Green
90	Yellow ※2)
14	Super-Blue
16	Super-White
18	Super-Green
X	Without LED

● BUTTON COLOR

R	Red
G	Green
Y	Yellow ※2)
M	Milk-white
B	Blue
C	Clear

For without button type,
specify part numbers of light cartridge
and housing separately.

● HOUSING COLOR

K	Black
H	Gray
S	Silver ※3)

● OPTION

0759	Low brightness ※5)
001	Cathode common
Blank	No option

For other options except for the above,
please contact us.

● Supply Voltage to LED

1	DC 5V Built-in resistor ※5)
2	DC12V Built-in resistor ※5)
3	DC24V Built-in resistor ※5)
4	DC 5V Non-resistor
5	DC12V Non-resistor
6	DC24V Non-resistor
X	Without LED

For Non-resistor type,
use external protective resistor.

● TERMINAL

P	#110 Tab・Soldering
C	PCB
K	Connector with Accessories ※4)
N	Connector without Accessories

● FILTER COLOR

1	Red
2	Green
3	Yellow ※2)
4	Milk-white
6	Blue
X	Without filter

Generally, in case of using color button,
filter is not necessary.

● NOTES

※1) Flat indicaor (F) can be selected standard button shape (L0 or R0) only.
Indicator (L) can be selected for all button shape.

※2) The color of "Yellow" for LED (90) , button (Y) and filter (3) is actually "Orange Yellow" not Lemon Yellow.

※3) Housing color Silver (H) is painted silver only on the flange.

※4) For the connector, refer to Accessories page.

※5) For optional low brightness type (0759), specify supply voltage to LED 1, 2, or 3 (Built-in resistor type).

◇Dimensions：page EHG-4～5
◇Accessories：page EHG-6
◇Internal connection arrangements：page EHG-12
◇LED specifications：page EHG-13
◇Terminals / PCB hole cutout：page EHG-14～15
◇Mounting design / Panel cutout：page EHG-16
◇Accessories' dimensions / Panel cutout：EHG-17～20

ORDERING CODE 【Full-Face】

LIGHT CARTRIDGE

EH－G□ □ □ □ □ □

● BUTTON SHAPE

L0	Square Standard
F0	Square Flat
R0	Round Standard
Y0	Round Flat

● LED COLOR

70	Red
80	Green
90	Yellow ※1)
14	Super-Blue
16	Super-White
18	Super-Green
X	Without LED

● BUTTON COLOR

R	Red
G	Green
Y	Yellow ※1)
M	Milk-white
C	Clear
B	Blue
X	Without button

● FILTER COLOR

1	Red
2	Green
3	Yellow ※1)
4	Milk-white
6	Blue
X	Without filter

● OPTION

0759	Low brightness ※2)
001	Cathode common
Blank	No option

For other options except for the above, please contact us.

● Supply Voltage to LED

1	DC 5V Built-in resistor ※2)
2	DC12V Built-in resistor ※2)
3	DC24V Built-in resistor ※2)
4	DC 5V Non-resistor
5	DC12V Non-resistor
6	DC24V Non-resistor
X	Without LED

For Non-resistor type, use external protective resistor.

● NOTES

※1) The color of "Yellow" for LED (90), button (Y) and filter (3) is actually "Orange Yellow" not Lemon Yellow.

※2) For optional low brightness type (0759), specify supply voltage to LED 1, 2, or 3 (Built-in resistor type).

HOUSING

EH□－G□ □ □ □ □

● OPERATION

L	Indicator
F	Flat Indicator ※1)
M	Momentary
A	Alternate

● CONTACT

0	Indicator
3	SPDT・Silver (Gold-Plated)
4	DPDT・Silver (Gold-Plated)
5	SPDT・Crossbar
6	DPDT・Crossbar

● BUTTON SHAPE

L0	Square Standard ※1)
F0	Square Flat
R0	Round Standard ※1)
Y0	Round Flat

● TERMINAL

P	#110 Tab・Soldering
C	PCB
K	Connector with Accessories ※3)
N	Connector without Accessories

● HOUSING COLOR

K	Black
H	Gray
S	Silver ※2)

● NOTES

※1) Flat indicaor (F) can be selected standard button shape (L0 or R0) only.
Indicator（L）can be selected for all button shape.

※2) Housing color Silver (H) is painted silver only on the flange.

※3) For the connector, refer to Accessories page.

ORDERING CODE 【Dual-Color】

Assembled Part (Light cartridge and Housing)

EH□ —G□ □ 1 2 □ □ □ □ □ □

● OPERATION

L	Indicator
F	Flat Indicator ※1)
M	Momentary
A	Alternate

● CONTACT

0	Indicator
3	SPDT・Silver (Gold-Plated)
4	DPDT・Silver (Gold-Plated)
5	SPDT・Crossbar
6	DPDT・Crossbar

● BUTTON SHAPE

L3	Square Standard ※1)
F3	Square Flat
R3	Round Standard ※1)
Y3	Round Flat

● LED COLOR

70	Red
80	Green
90	Yellow
14	Super-Bule
16	Super-White
18	Super-Green

Put the color numbers into frame 1, 2.
(Dual-Color combination)
7080・7014・7016・7018
8090・9070・9014・1416
1618・1814

Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● BUTTON COLOR ※2)

M	Milk-white
C	Clear

● HOUSING COLOR

K	Black
H	Gray
S	Silver ※3)

● FILTER COLOR ※2)

4	Milk-white
X	Without filter

● TERMINAL

P	#110 Tab・Soldering
C	PCB
K	Connector with Accessories ※4)
N	Connector without Accessories

● Supply Voltage to LED

1	DC 5V Built-in resistor ※5)
2	DC12V Built-in resistor ※5)
3	DC24V Built-in resistor ※5)
4	DC 5V Non-resistor
5	DC12V Non-resistor
6	DC24V Non-resistor

For Non-resistor type, use external protective resistor.

● OPTION

0759	Low brightness ※5)
001	Cathode common
Blank	No option

For other options except for the above, please contact us.

● NOTES

※1) Flat indicaor (F) can be selected standard button shape (L3 or R3) only.
Indicator (L) can be selected for all button shape.

※2) Button should be C (Clear) with Milk-white filter or M (Milk-white) without filter.

※3) Housing color Silver (H) is painted silver only on the flange.

※4) For the connector, refer to Accessories page.

※5) For optional low brightness type (0759), specify supply voltage to LED 1, 2, or 3 (Built-in resistor type).

For simultaneous lighting in Dual-Color

Simultaneous lighting is not possible for Built-in resistor type, cause heat. Please select Non-resistor type and apply required external resistor or socket for simultaneous lighting.

Supply Voltage to LED		Simultaneous lighting	Lighting condition
1	DC5V Built-in resistor	N/A	2 to 3 minutes possible.
2	DC12V Built-in resistor	N/A	2 to 3 minutes possible.
3	DC24V Built-in resistor	N/A	2 to 3 minutes possible.
4	DC 5V Non-resistor	A	Use external resistor 36Ω1/4W or use socket EH-3210-2C
5	DC12V Non-resistor	A	Use external resistor 270Ω1/4W or use socket EH-3210-2D
6	DC24V Non-resistor	A	Use external resistor 1.1KΩ1/2W or use socket EH-3210-2E

In case of Built-in resistor type with optional low brightness (0759) is possible for simultaneous lighting.

◇Dimensions：page EHG-4～5
◇Accessories：page EHG-6
◇Internal connection arrangements：page EHG-12
◇LED specifications：page EHG-13
◇Terminals / PCB hole cutout：page EHG-14～15
◇Mounting design / Panel cutout：page EHG-16
◇Accessories' dimensions / Panel cutout：EHG-17～20

ORDERING CODE 【Dual-Color】

LIGHT CARTRIDGE

EH－G □ 1 2 □ □ □ □

● BUTTON SHAPE

L3	Square Standard
F3	Square Flat
R3	Round Standard
Y3	Round Flat

● LED COLOR

70	Red
80	Green
90	Yellow
14	Super-Blue
16	Super-White
18	Super-Green

Put the color numbers into frame 1, 2.
(Dual-Color combination)
7080・7014・7016・7018
8090・9070・9014・1416
1618・1814

Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● BUTTON COLOR ※1)

M	Milk-white
C	Clear
X	Without button

● FILTER COLOR ※1)

4	Milk-white
X	Without filter

● OPTION

0759	Low brightness	※2)
001	Cathode common	
Blank	No option	

For other options except for the above, please contact us.

● Supply Voltage to LED

1	DC 5V Built-in resistor	※2)
2	DC12V Built-in resistor	※2)
3	DC24V Built-in resistor	※2)
4	DC 5V Non-resistor	
5	DC12V Non-resistor	
6	DC24V Non-resistor	

For Non-resistor type, use external protective resistor.

● NOTES

※1) Button should be C (Clear) with Milk-white filter or M (Milk-white) without filter.

※2) For optional low brightness type (0759), specify supply voltage to LED 1, 2, or 3 (Built-in resistor type).

HOUSING

EH □ －G □ □ □ □

● OPERATION

L	Indicator	
F	Flat Indicator	※1)
M	Momentary	
A	Alternate	

● CONTACT

0	Indicator
3	SPDT・Silver (Gold-Plated)
4	DPDT・Silver (Gold-Plated)
5	SPDT・Crossbar
6	DPDT・Crossbar

● BUTTON SHAPE

L3	Square Standard	※1)
F3	Square Flat	
R3	Round Standard	※1)
Y3	Round Flat	

● TERMINAL

P	#110 Tab・Soldering	
C	PCB	
K	Connector with Accessories	※3)
N	Connector without Accessories	

● HOUSING COLOR

K	Black	
H	Gray	
S	Silver	※2)

● NOTES

※1) Flat indicaor (F) can be selected standard button shape (L3 or R3) only.
Indicator (L) can be selected for all button shape.

※2) Housing color Silver (H) is painted silver only on the flange.

※3) For the connector, refer to Accessories page.

REPLACEMENT PARTS

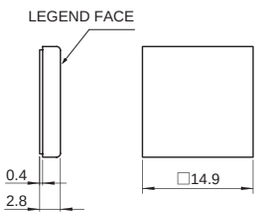
● Full-Face BUTTON／FILTER

		Red	Green	Yellow	Blue	Milk-white	Clear
BUTTON	Square	EH-4146-1LR	EH-4146-1LG	EH-4146-1LY	EH-4146-1LB	EH-4146-1LM	EH-4146-2CC
	Round	EH-4147-1LR	EH-4147-1LG	EH-4147-1LY	EH-4147-1LB	EH-4147-1LM	EH-4147-2CC
FILTER	Square	EH-4148-LR	EH-4148-LG	EH-4148-LY	EH-4148-LB	EH-4148-LM	
	Round	EH-4149-LR	EH-4149-LG	EH-4149-LY	EH-4149-LB	EH-4149-LM	

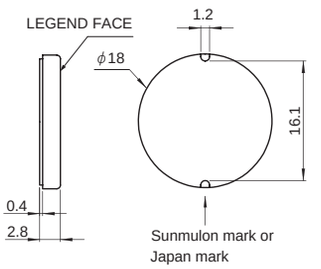
● Dual-Color BUTTON／FILTER

		Milk-white	Clear
BUTTON	Square	EH-4146-1LM	EH-4146-2CC
	Round	EH-4147-1LM	EH-4147-2CC
FILTER	Square	EH-4148-LM	
	Round	EH-4149-LM	

FILTER DIMENSIONS



EH-4148

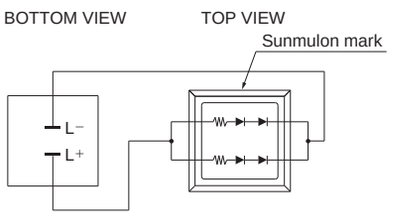
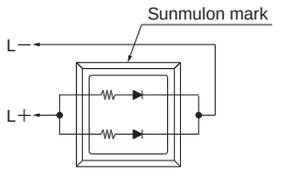
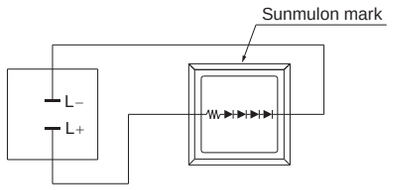
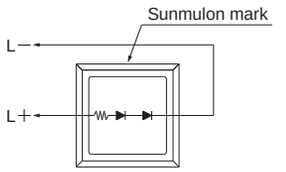


EH-4149

Tolerance : ± 0.4 mm

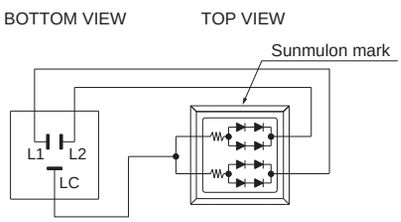
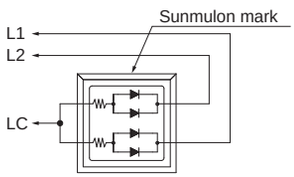
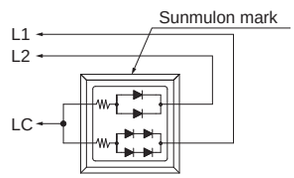
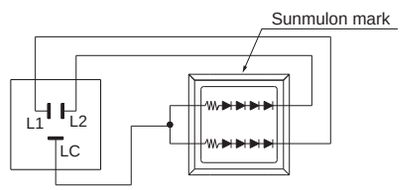
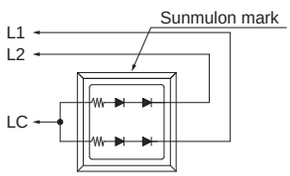
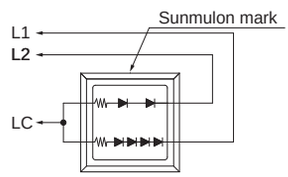
INTERNAL CONNECTION ARRANGEMENTS

● Full-Face (Common for each button size)

Voltage	LED (70・80・90)	LED (14・16・18)
DC5V		
DC12V DC24V		

LED color : 70 (Red), 80 (Green), 90 (Yellow), 14 (Super-Blue), 16 (Super-White), 18 (Super-Green)

● Dual-Color (Common for each button size)

Voltage	LED（7080・8090・9070）	LED（1416・1618・1814）	LED（7014・7016・7018・9014）
DC5V			
DC12V DC24V			

LED color : 70 (Red), 80 (Green), 90 (Yellow), 14 (Super-Blue), 16 (Super-White), 18 (Super-Green)

● Dual-Color combination (Common for each voltage)

Terminals	LED Color									
LC-L1	Red	Red	Red	Red	Green	Yellow	Yellow	Super Blue	Super White	Super Green
LC-L2	Green	Super Blue	Super White	Super Green	Yellow	Red	Super Blue	Super White	Super Green	Super Blue

※ These are all internal connection diagrams for built-in resistor type.

※ For Non-resistor type, the resistor part in the diagram should be short- circuited.

※ The common diagram is for Anode Common type.
For Cathode Common type, LED polarity (current flow direction) is opposite.

LED SPECIFICATIONS 【Full-Face】

● BUILT-IN RESISTOR (Common for each button size)

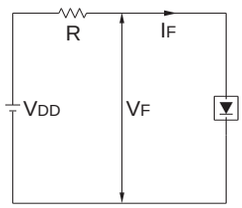
Voltage	Rated Current (mA)											
	Red	Green	Yellow	Super Blue	Super White	Super Green	Low brightness type					
							Red	Green	Yellow	Super Blue	Super White	Super Green
DC 5V ±5%	30	30	30	12	18	10	6	22	10	8	10	6
DC12V ±5%	15	15	15	6	10	6	4	8	5	4	5	3
DC24V ±5%	9	9	9	6	10	6	4	7	4	4	5	3

● NON-RESISTOR (EXTERNAL RESISTOR) (Common for each button size)

Supply Voltage		DC5V			DC12V・24V			DC5V			DC12V・24V		
LED Color		Red	Green	Yellow	Red	Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green
Max. Forward Current I_{FM} (mA)		50	40	50	25	20	25	40	40	40	20	20	20
DC Reverse Voltage V_R (V)		10	10	10	20	20	20	5	5	5	10	10	10
Forward Voltage $V_{F(Typ.)}$ (V)		3.8	4.2	3.8	7.6	8.4	7.6	2.9	2.9	3	5.8	5.8	6
Derating (Operating temperature) (over 25℃ working temperature) (mA/℃)		0.66			0.33			0.54			0.27		
Pulse Lighting	Pulse Width PW (μs)				100						100		1000
	Duty Ratio DR				10^{-1}						10^{-1}		1/20
	I_{FM} (mA)				90						50		48

Forward Voltage V_F of LED color : Red・Green・Yellow【IF=20mA】
Super Blue・Super White・Super Green【IF=5mA】

● Wiring Diagram



Refer to the following formula to calculate external resistance values.

$$R = \frac{V_{DD} - V_F}{I_F}$$

V_{DD} : Supply Voltage
V_F : Forward Voltage
I_F : Forward Current

I_F (Forward Current) : Refer to the Rated Current of BUILT-IN RESISTOR type, and be sure to set less than I_{FM} (Max. Forward Current).

LED SPECIFICATIONS 【Dual-Color】

● BUILT-IN RESISTOR

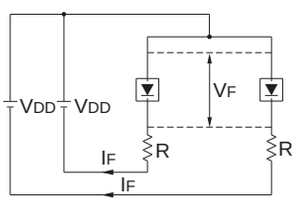
Voltage	Rated Current (mA)											
	Red	Green	Yellow	Super Blue	Super White	Super Green	Low brightness type					
							Red	Green	Yellow	Super Blue	Super White	Super Green
DC 5V ±5%	30	30	30	12	18	10	6	24	11	8	10	6
DC12V ±5%	15	15	15	6	10	6	4	8	5	4	5	3
DC24V ±5%	9	9	9	6	10	6	4	7	4	4	5	3

● NON-RESISTOR (EXTERNAL RESISTOR)

Supply Voltage		DC5V			DC12V・24V			DC5V			DC12V・24V		
LED Color		Red	Green	Yellow	Red	Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green
Max. Forward Current I_{FM} (mA)		50	40	50	25	20	25	40	40	40	20	20	20
DC Reverse Voltage V_R (V)		10	10	10	20	20	20	5	5	5	10	10	10
Forward Voltage $V_{F(Typ.)}$ (V)		3.8	4.2	3.8	7.6	8.4	7.6	2.9	2.9	3	5.8	5.8	6
Derating (Operating temperature) (over 25℃ working temperature) (mA/℃)		0.66			0.33			0.54			0.27		
Pulse Lighting	Pulse Width PW (μs)				100						100		1000
	Duty Ratio DR				10^{-1}						10^{-1}		1/20
	I_{FM} (mA)				90						50		48

Forward Voltage V_F of LED color : Red・Green・Yellow【IF=20mA】
Super Blue・Super White・Super Green【IF=5mA】

● Wiring Diagram



Refer to the following formula to calculate external resistance values.

$$R = \frac{V_{DD} - V_F}{I_F}$$

V_{DD} : Supply Voltage
V_F : Forward Voltage
I_F : Forward Current

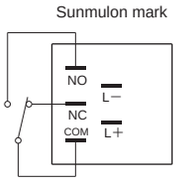
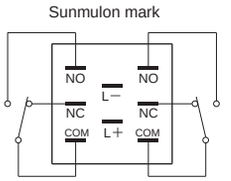
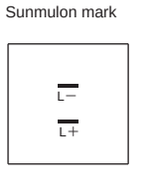
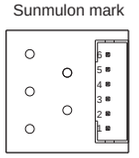
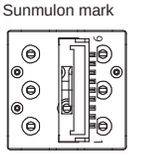
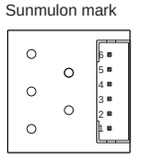
I_F (Forward Current) : Refer to the Rated Current of BUILT-IN RESISTOR type, and be sure to set less than I_{FM} (Max. Forward Current).

For resistance value calculation
https://www.sunmulon.co.jp/english/products/led.html
The resistance value can be calculated just by entering the items.

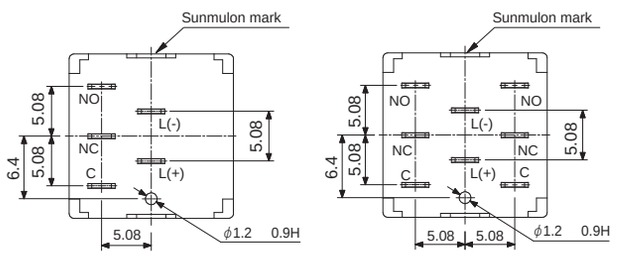
TERMINALS／PCB HOLE CUTOUT

■ Full-Face・Non-illumination

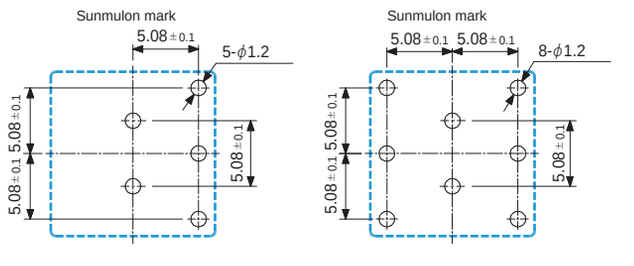
● TERMINALS LAYOUT（BOTTOM VIEW）

Terminal	SPDT	DPDT	INDICATOR
#110 Tab・Soldering PCB	Sunmulon mark 	Sunmulon mark 	Sunmulon mark 
Connector	Sunmulon mark 	Sunmulon mark 	Sunmulon mark 

● TERMINALS DIMENSIONS（BOTTOM VIEW）

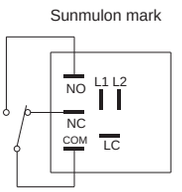
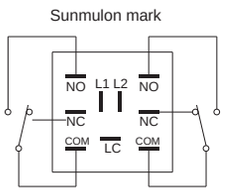
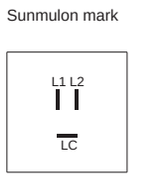
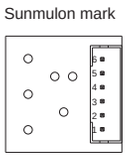
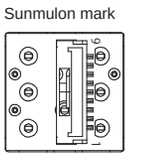
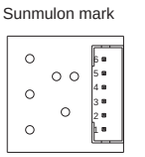


● PCB hole cut-out（TOP VIEW）

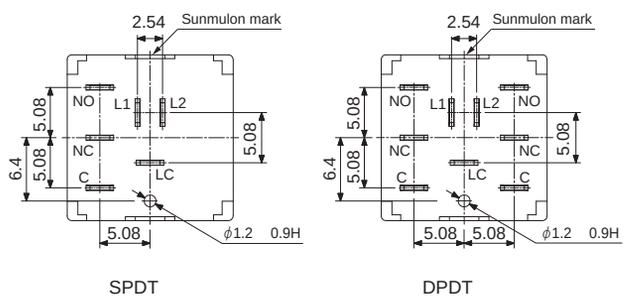


■ Dual-Color

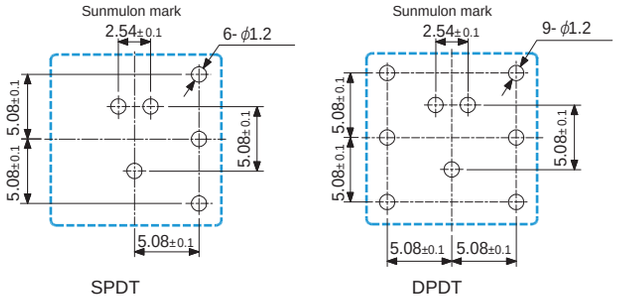
● TERMINALS LAYOUT（BOTTOM VIEW）

Terminal	SPDT	DPDT	INDICATOR
#110 Tab・Soldering PCB	Sunmulon mark 	Sunmulon mark 	Sunmulon mark 
Connector	Sunmulon mark 	Sunmulon mark 	Sunmulon mark 

● TERMINALS DIMENSIONS（BOTTOM VIEW）



● PCB hole cut-out（TOP VIEW）

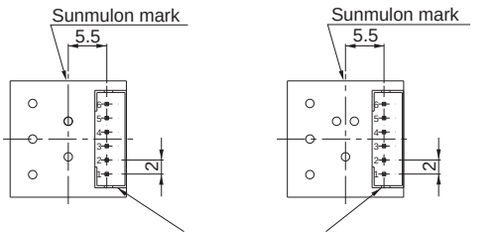


Tolerance : ± 0.4 mm

TERMINALS／CONNECTOR

● SPDT・INDICATOR (BOTTOM VIEW)

Full-Face, Non-illumination　　Dual-Color



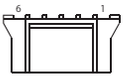
	Full-Face, Non-illumination	Dual-Color
6	——	L2
5	L (−)	L1
4	L (+)	LC
3	NO	NO
2	NC	NC
1	COM	COM
Pin No.	Terminal	Terminal

※ Non-illumination has no L (+) , L (−) terminals.

Connector

Part no.	EH-3251

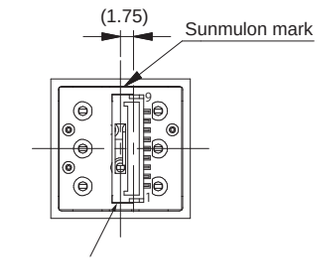
1 Housing & 6 contact pins to be appended.



Housing
(JST made PHR-6)

Contact pin
(JST made SPH-002T-P0.5S)
Applicable wiere : AWG#30～#24

● DPDT (BOTTOM VIEW)



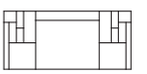
	Full-Face, Non-illumination	Dual-Color
9	NO2	NO2
8	NC2	NC2
7	COM2	COM2
6	——	L2
5	L (−)	L1
4	L (+)	LC
3	NO1	NO1
2	NC1	NC1
1	COM1	COM1
Pin No.	Terminal	Terminal

※ Non-illumination has no L (+) , L (−) terminals.

Connector

Part no.	EH-5180

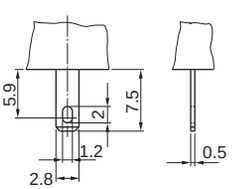
1 Housing & 9 contact pins to be appended.



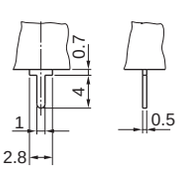
Housing
(JST made GHR-09V-S)

Contact pin
(JST made SSHL-002T-P02)
Applicable wiere : AWG#30～#26

TERMINAL SHAPE



#110 Tab・Soldering Terminal

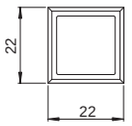
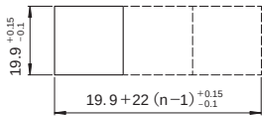
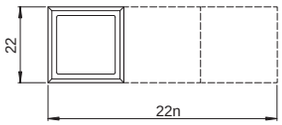


PCB Terminal

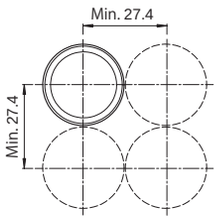
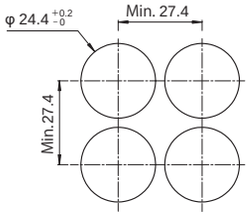
Tolerance : ± 0.4 mm

MOUNTING DESIGN／PANEL CUTOUT

● Square

Mounting design	Panel cutout
Individual  	Recommended panel thickness : 1 to 3.2 mm  n : Number of Units
Multiple  	

● Round

Mounting design	Panel cutout
 	Recommended panel thickness : 1 to 3.2 mm 

※ If the panel is to be finished (e.g. coated), make sure that the panel meets the specified dimensions after the coating.
In case the panel cut dimension is too small, it may cause malfunction.
※ To change a horizontal mounting type to a vertical mounting type, replace 2 short snap springs with these 2 long snap springs (Part no. EH-1034-2).
※ After the panel-cutting process, make sure to remove burrs on the surface.

Tolerance : ± 0.4 mm

ACCESSORIES

SOCKET

※ When using a socket, use #110 Tab･Soldering terminal for the Housing.

● Full-Face

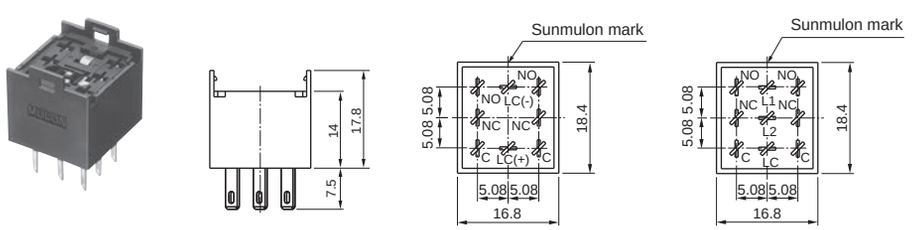
Socket terminal shape	Type to be used	Part no.	Resistance value	Remarks
#110 Tab・Soldering terminal	Built-in resistor type	EH-1088-1	0 Ω	Housing should be a built-in resistor type.
PCB terminal		EH-1196-1	0 Ω	Housing should be a #110 Tab・Soldering terminal type with built-in resistor.

● Dual-Color

Socket terminal shape	Type to be used	Part no.	Resistance value	Remarks
#110 Tab・Soldering terminal	Built-in resistor type	EH-1088-2	0 Ω	Housing should be a built-in resistor type.
	Non-resistor type for DC5V	EH-3210-2C	36 Ω 1/4W	Housing should be a Non-resistor type. ※ Simultaneous lighting is possible.
	Non-resistor type for DC12V	EH-3210-2D	270 Ω 1/4W	
	Non-resistor type for DC24V	EH-3210-2E	1.1k Ω 1/2W	
PCB terminal	Built-in resistor type	EH-1196-2	0 Ω	Housing should be a #110 Tab・Soldering terminal type with built-in resistor.

● #110 Tab・Soldering Terminal

Full-Face　　Dual-Color

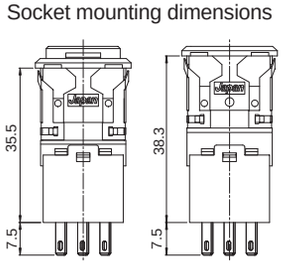


(BOTTOM VIEW)

3D
DXF

※ When installing, align the sunmulon mark side of the socket and the Housing.

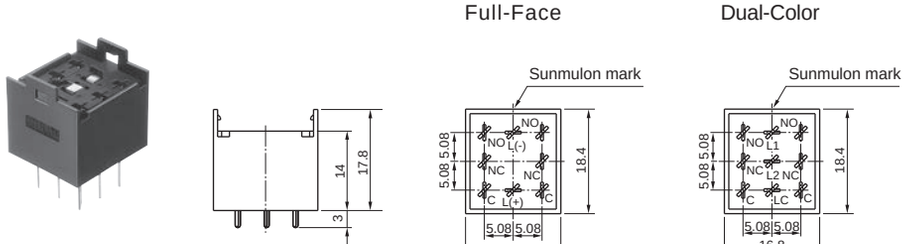
Socket mounting dimensions



※Round type has the same depth.

● PCB Termial

Full-Face　　Dual-Color

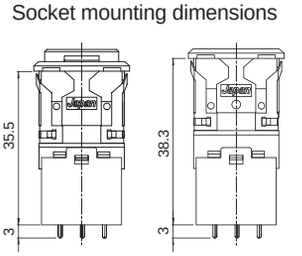


(BOTTOM VIEW)

3D
DXF

※ When installing, align the sunmulon mark side of the socket and the Housing.

Socket mounting dimensions

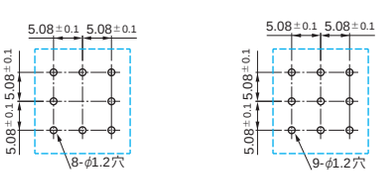


※Round type has the same depth.

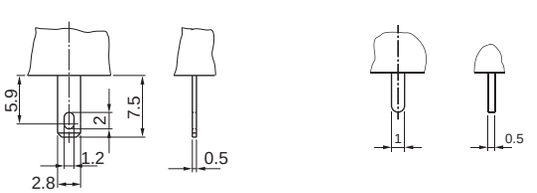
● PCB hole cut-out

(TOP VIEW)

Full-Face　　Dual-Color



● Terminal shape



110 Tab・Soldering Terminal　　PCB Terminal

3D・DXF data download site ： **https://www.sunmulon.co.jp/download/**

Tolerance：± 0.4 mm

ACCESSORIES

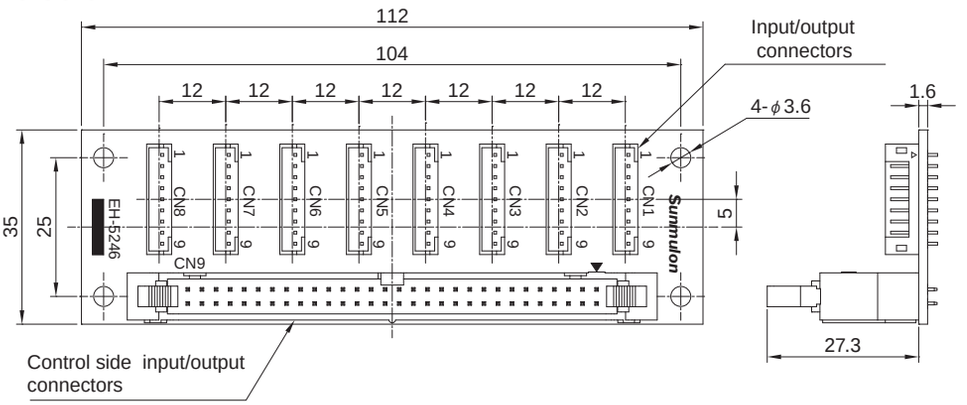
RELAY BOARD

• We do not sell connection harnesses, so please prepare your own.

Part no.	EH-5246

Simply connect it to the common wiring.
Wiring for up to 8 switched can be integrated onto a single board.

Dimensions



【Applicable connectors】
・Output connector

HRS made
HIF3BB-60D-2.54R（IDC）
HIF3BB-60D-2.54C（Crimp）
HIF3-2022SC（Crimping terminal）
HIF3-2226SC（Crimping terminal）
HIF3-2428SC（Crimping terminal）

・Input connector

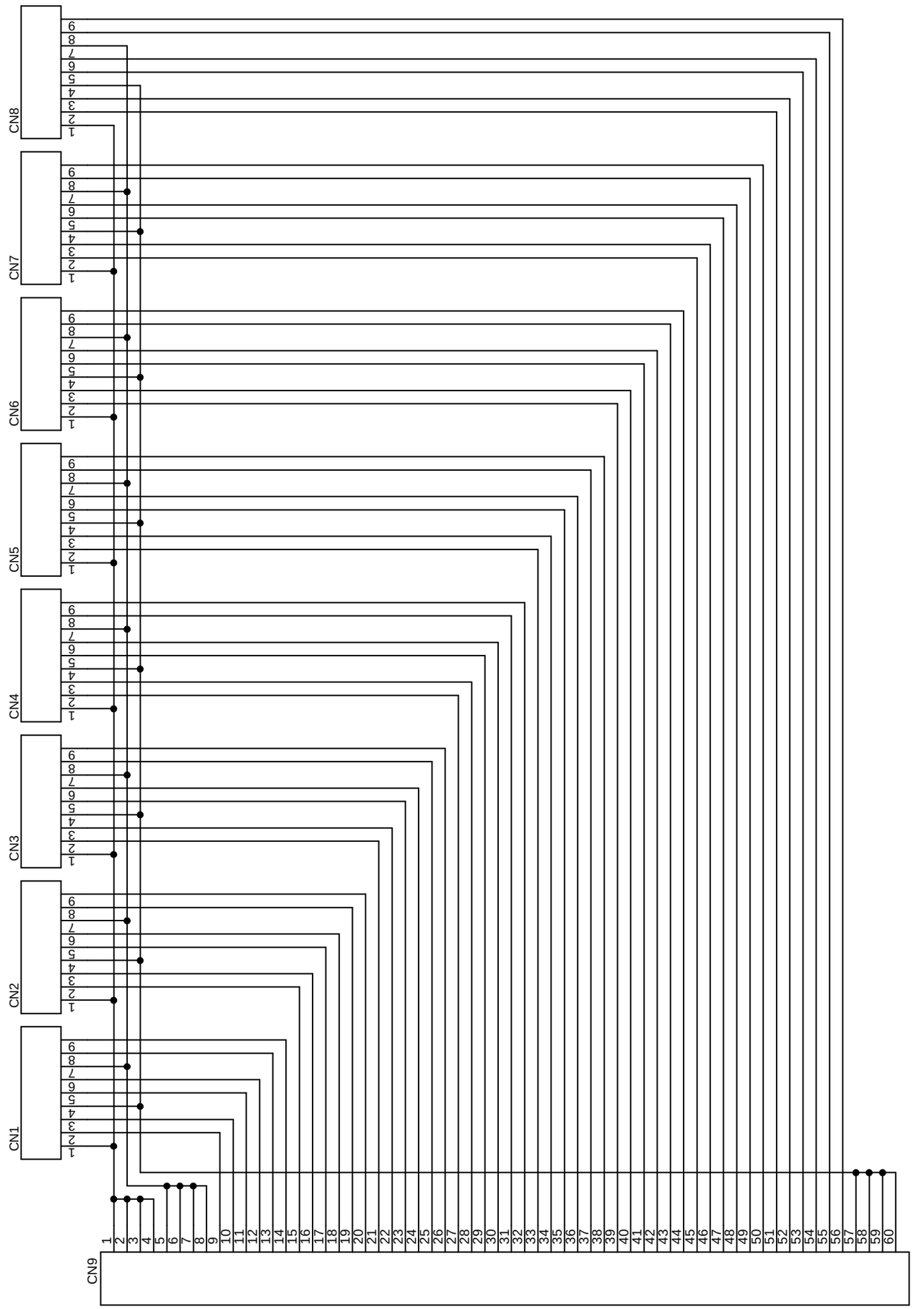
JST made
PHR-9（Housing）
SPH-002-T-P0.5S（Contact）
SPH-002-T-P0.5L（Contact）

Input/Output terminal list

CN1～CN8 Pin No.		CN9 Pin No.		CN1～CN8 Pin No.	
Connector No.	Pin No.			Pin No.	Connector No.
CN1～CN8	1	1	2	1	CN1～CN8
		3	4		
CN1～CN8	7	5	6	7	CN1～CN8
		7	8		
CN1	2	9	10	3	CN1
	5	11	12	6	
	8	13	14	9	
CN2	2	15	16	3	CN2
	5	17	18	6	
	8	19	20	9	
CN3	2	21	22	3	CN3
	5	23	24	6	
	8	25	26	9	
CN4	2	27	28	3	CN4
	5	29	30	6	
	8	31	32	9	
CN5	2	33	34	3	CN5
	5	35	36	6	
	8	37	38	9	
CN6	2	39	40	3	CN6
	5	41	42	6	
	8	43	44	9	
CN7	2	45	46	3	CN7
	5	47	48	6	
	8	49	50	9	
CN8	2	51	52	3	CN8
	5	53	54	6	
	8	55	56	9	
CN1～CN8	4	57	58	4	CN1～CN8
		59	60		

Torelance：±0.4 mm

● Relay Board wiring diagram **(EH-5246)**



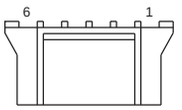
ACCESSORIES

● SPDT • INDICATOR

Connector

Part no.	EH-3251

Connector (1 Housing & 6 Contact Pins) to be appended.



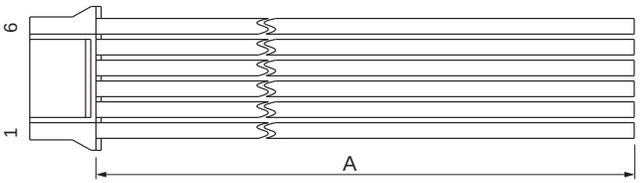
Housing
(JST made PHR-6)

Contact Pin
(JST made SPH-0002T-P0.5S)
Applicable wire： AWG#30～#24

Wire Harness

Part no.	EH-3250-1	EH-3250-2
A length	100cm	200cm

Wire：UL1061 AWG26



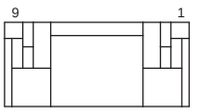
Pin No.	1	2	3	4	5	6
Wire Color	Brown	Red	Orange	Yellow	Green	Blue

● DPDT

Connector

Part no.	EH-5180

Connector (1 Housing & 9 Contact Pins) to be appended.



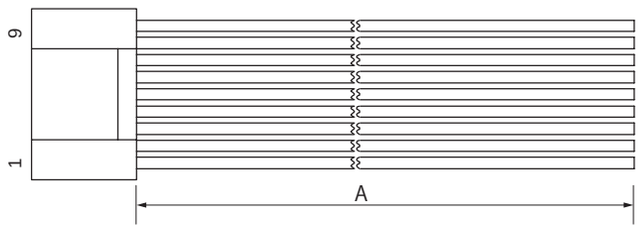
Housing
(JST made GHR-09V-S)

Contact Pin
(JST made SSHL-002T-P02)
Applicable wire： AWG#30～#26

Wire Harness

Part no.	EH-5177-1	EH-5177-2
A length	100cm	200cm

Wire：UL1061 AWG26

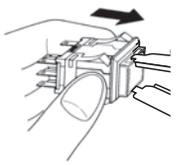


Pin No.	1	2	3	4	5	6	7	8	9
Wire Color	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White

ASSEMBLY & DISASSEMBLY

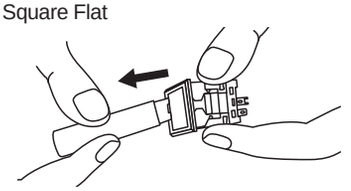
1. Removing Light cartridge

Standard



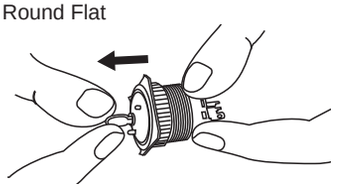
Be sure to remove with the removing tool (SJ-0001).
Hang the cartridge with the removing tool in the groove,
and pull it straight out.

Square Flat



Be sure to remove with the removing tool (SJ-0009).
Hang the cartridge with the removing tool in the groove,
and pull it straight out.

Round Flat

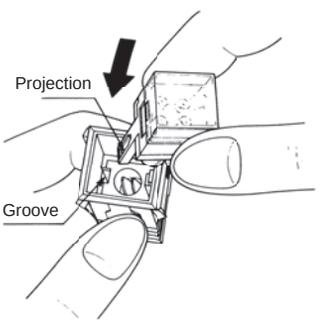


Be sure to remove with the removing tool (SJ-0002-1).
When pulling out he alternate type, press down on the suction cup to lock it,
and pull it out as it is to avoid damage.
After pressing down on the suction cup, be sure to return it to the unlocked state
before pulling it out.

※ In case removing in any other way than the above, it may cause damage to light cartridge.
※ Do not touch the other parts such as spring incorporated in light cartridge.

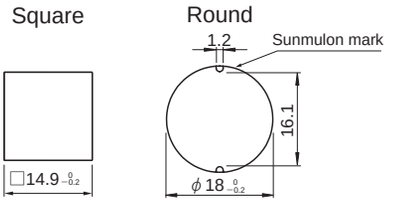
2. Fitting Light cartridge

Be sure to check the correct orientation.
Align the projection on the LED uint and the the groove on the Housing,
then push in until click.
Be sure not to insert strongly with the wrong orientation as it may cause
malfunction.



PRECAUTIONS FOR CORRECT USE

1. Solder quickly and correctly at 380℃ max. and 3 seconds or less. Be careful not to touch the soldering iron to the main body.
2. Wait for one minute during and after soldering before exerting any external force on the solder.
3. The rated voltage is shown on the side of the LED unit.
4. Character films are not included.
   If preparing the character film separately, use a heat-resistant film with a thickness of 0.1 mm. For the dimensions, please refer to the figure on the right.
5. The tightening torque of the mounting nut when attaching to the panel should be 1.0 N・m or less.



※ For handling instructions and precautions other than the above, please refer to “Safety Precautions for All illuminated Pushbutton Switches”.

Tolerance：± 0.4 mm

As of September 2024

Safety Precautions for All Illuminted Pushbutton Switches

1. Notes on contents of Catalogs

(1) Rated values, performance values, and specification values of Sumulon products listed in this catalog are values acquired under respective conditions in independent testing, and do not guarantee values gained in combined conditions.

(2) The ambient operating temperature(humidity) is guaranteed by evaluation based on characteristics, and does not guarantee continuous use for a long period of time near the upper or lower limit of the ambient operating temperature(humidity) or permanent use at that temperature(humidity).

(3) Reference data and reference values listed in catalogs are for reference purposes only, and do not guarantee that the product will always operate appropriately in that range.

(4) The specifications / appearance and accessories of Sunmulon products listed in catalogs are subject to change or termination of sales without notice, for improvemnet or other reasons.

(5) The content of catalogs is subject to change without notice.

2. Note on applications

(1) If using Sunmulon products in combination with other products, confirm the following suitability by yourself. Sunmulon shall provide no guarantees regarding the combination suitability.
(a) Regulations, satndards, or laws to which your machinery, equipment, ect. must conform
(b) Functionality and safety of your machinery and equipment

(2) Wiring and installation that ensures the Sunmulon product used in your system, machine, device, or the like can perform and function according to its specifications.

(3) When using Sunmulon products, be cautious when implementing the following.
(a) Use of Sunmulon products with sufficient allowance for rating and performance.
(b) Safety design, including redundant design and malfunction prevention design that prevents other danger and damage even in the event that Sumulon product fails.

(4) Sunmulon products are designed and manufactured as general-purpose products for general industrial products. They are not intended for use in the following applications, and in the event that you use Sunmulon product for these applications, unless otherwise agreed upon between you and Sunmulon, Sunmulon shall provide no guarantees whatsoever regarding Sunmulon products.
(a) Safety devices intended for human body protection
(b) Direct control of transport equipmnt (railroads / airplanes / ships / vehicles / vehicle instruments, etc.)
(c) Space equipment, submarine equipment
(d) Nuclear power control equipment, radiation related equipment
(e) Combustion equipment, electric heat equipment
(f) Disaster prevention and security equipment
(g) Elevating equipment
(h) Amusement facilities
(i) Facilities subject to government or industry regulations
(j) Use in applications that require a high degree of safety, any other equipment, instruments, or the like that could endanger life or human health

3. Warranty

(1) The warranty period for Sunmulon products shall be 1 year after purchase or delivery to the specified location.

(2) Warranty scope should a failure occur in Sunmulon product during the above warranty period for reasons attributable to Sunmulon, then Sunmulon shall provide that product, free of charge, the same quantity. Further, in no event shall liability of Sunmulon exceed the individual price of the product on which liability is asserted.

(3) Failures cause by the following reasons shall be deemed outside the scope of this warranty.
(a) The product was handled or used deviating from conditions / environment listed in the catalogs
(b) The failure was caused by reasons other than Sunmulon product
(c) Modification or repair was performed by a party other than Sunmulon
(d) Replacement of maintenance parts, installation of accessories, or the like was not performed properly in accordance with the user's manual and catalogs
(e) The failure could not have been predicted with the scientific and technical standards at the time when the product was shipped from Sunmulon
(f) The failure was due to other causes not attributable to Sunmulon (including cases of force majeure such as natural disasters and other disasters)

(4) The warranty listed in this Safety Precautions is the full and complete warranty for Sunmulon products, and Sunmulon shall bear no liability whatsoever regarding special damages, indirect damages, incidental damages, or passive damages that occurred due to Sunmulon product.

4. Handling precautions for switch

(1) Do not perform wiring with power supplied to the switch. Do not touch the terminals or other charged parts of the switch while power is being supplied. Doing so may result in electric shock.

(2) Be careful of electrostatic breakdown when handling.

(3) Do not drop or otherwise apply strong force to the switch.

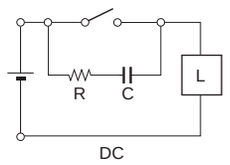
(4) Do not place heavy objects on the switch.

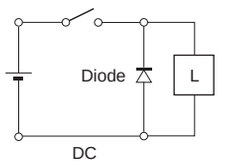
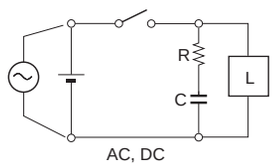
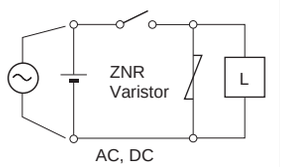
(5) Do not operate or use the housing (switch unit) by itself. Use the switch with assembled the illuminated part (LED module or button).

(6) Pushbutton switches are designed to be operated by fingertips. Operating the switch using a sharp object (screwdrivers, tweezers, etc.), hard object (metal, etc.), or with a large or sudden force, may cause deform or damage the switch.

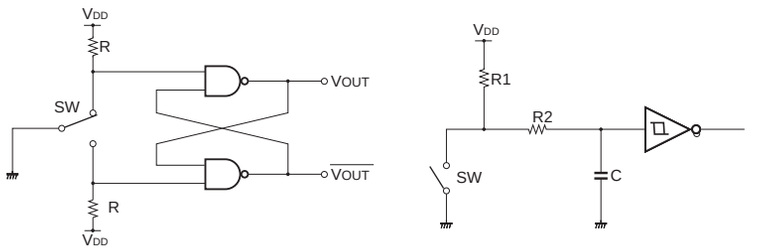
(7) Do not use the switch under loads that exceed the rated switching capacity or other contact ratings. Doing so may result in welding of the contact, or burnout accidents.

(8) For inductive load, the arc by back EMF may cause contact failure. Insertion of arc prevention circuit as the following is recommended.

<table>
<tr><th>Circuit</th><th>Element selection</th><th>Circuit</th><th>Element selection</th></tr>
<tr><td> 
</td><td rowspan="2">C：1 to 0.5 μF × switch current (A)
R：0.5 to 1 Ω × switch voltage (V)

The values may change according to the characteristics of the load. Determine ideal capacitance and resistance values through testing.</td><td> 
</td><td>The diode must withstand a peak inverse voltage 4 times higher than the power supply voltage and regarding a forward current must as high or higher than the load current.</td></tr>
<tr><td> 
</td><td> 
</td><td>Use a varistor that can withstand the power supply voltage sufficiently. (1.5 times or more)</td></tr>
</table>

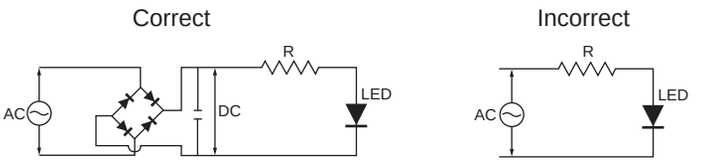
(9) Following circuits show examples of an anti-chattering circuit.



(10) Illumination

(a) Do not apply a voltage between the LED terminal that is greater than the rated voltage. Doing so may damage the LED, cause lighting failure.

(b) LEDs cannot be lit directly by AC circuit should be provided rectifier smoothing circuit for products other than AC input type.



(c) When wiring, pay attention to the polarity of the terminals.

(d) Simultaneous lighting may not be possible with Dual-Color illumination or Split-Face illumination (2, 3, or 4 split illumination), check the catalog.

(e) Apply voltage directly to LEDs of Non-built-in resistor type will damage the LEDs, so connect an appropriate external resistor.

(11) Wiring

(a) Do not apply a soldering iron to the switch housing. Doing so may deform the terminals and cause defects.

(b) See catalog for models compatible with flux prevention measures terminal. Be careful not to allow flux to panetrate sliding parts such as buttons. Use non-corrosive rosin solution as flux for dip soldering.

(c) For soldering other than flux-preventive models, hand solder with the terminals facing down to prevent flux from penetrating into the switch.

(d) The housing of KA, K2, and K9 series are designed for reflow soldering.

(e) Use the appropriate wire size for the applied voltage and current, and solder properly. Use of the product with incomplete soldering may cause abnormal heat generation, resulting in a fire hazard.

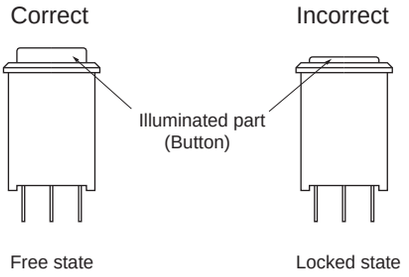
(f) After wiring is completed, maintain an appropriate insulation distance.

(12) Usage environment
(a) Do not use in the presence of flammable or explosive gases such as gasoline, thinner, LPG, etc.
(b) Avoid using the product in places where corrosive or silicon gas is generated, high temperature, high humidity, sea breeze or direct sunlight.
(c) Provide appropriate protection when using the product in places where it is exposed to water, oil, metal powder, or dust.
(d) Do not use the product in a place subject to vibration or shock. It may cause malfunction or damage.
(e) When installed in a close grouping or continuously lit, the ambient temperature may exceed the specified value due to heat generation. Take measures such as ventilation and lowering the operating voltage.
(f) When checking the actual equipment, load conditions and operating environment should be the same as the actual operating conditions.
(g) The ambient temperature for storage is －25℃ to 65 ℃ (No freeze, no condensation).

(13) When wiping off dirt on the exterior of the switch and accessories such as side plates, wipe lightly with a soft, dry cloth. Organic solvents such as thinner, benzene, alcohol, or other acidic chemicals may cause deformation, discoloration, or malfunction.

(14) Store the product away from malignant gases, dust, high temperature and high humidity, and keep it in our packing condition.

(15) When removing the illuminated part (or button) from the alternate switch housing, switch state should be in a free state.



Removal in a locked state may cause malfunction or damage to alternate switch.

(16) Periodic inspection and replacement
(a) Although mechanical and electrical durability are listed in the specifications column, deterioration of various parts (deterioration of resins and corrosion of metal parts) is possible due to the operating environment and method of use. We ask that you implement inspections for Sunmulon products to prevent accidents from occurring by conducting periodic inspections and replacements.
(b) When the switch is left unused or stored for long periods, contact reliability may deteriorate due to oxidation of contacts, which may cause continuity failure, etc. Therefore, it is necessary to check the operation before use.

(17) Service scope
The price of Sunmulon products do not include the cost of services, such as dispatching technicians.