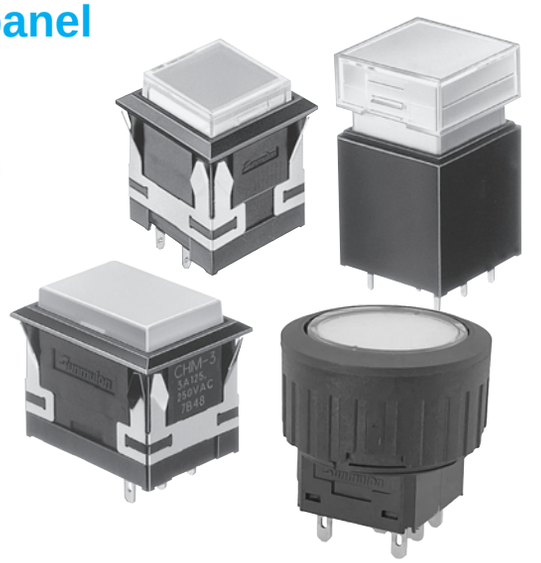
Sunmulon

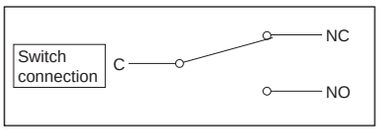
CH Illuminated Pushbutton Switch

CH

Only 16 mm, 20.1 mm depth behind panel with built-in resistor.

- Depth behind panel: Only 16 mm (Square, Rectangle), 20.1 mm (Round)
- LED Full-Face, Dula-Color, 2-Split-Face
- Terminal: Soldering, PCB, Connector
- Accessories: Guard cover, Socket, Matrix fitting frame





CHARACTERISTICS

Button Size		Square : □13.2 mm, □16 mm, Rectangle : 13.2×19.4 mm, Round : ϕ19 mm			
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 0.1 A	(SPDT) AC 100 V 1 A, DC 30 V 1 A (DPDT) AC 50 V 1 A, DC 30 V 1 A	(SPDT) AC 100 V 0.1 A, DC 30 V 0.1 A (DPDT) AC 50 V 0.1 A, DC 30 V 0.1 A
Insulation Resistance		More than 100 MΩ at DC 500 V			
Dielectric Strength		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 (SPDT) : AC 600 V Connector (DPDT) : AC 500 V 50/60 Hz for 60 sec. at normal ambient temperature and humidity	
Contact Resistance		Less than 50 mΩ at DC 6 V 1 A	Less than 50 mΩ at DC 6 V 0.1 A	Less than 60 mΩ Switch contact Less than 50 mΩ DC6 V 1 A	Less than 60 mΩ Switch contact Less than 50 mΩ DC6 V 0.1 A
Vibration Resistance		10 to 55 Hz, Amplitude 1.5 mm			
Mechanical Life	Momentary	More than 1,000,000 operations			
	Alternate	More than 200,000 operations			
Electrical Life (Resistive Load)		More than 30,000 operations at max. rated load			
Operating Force		4.41 N max.			
Total Travel		2.5 mm max.			
Weight		Square: 5 g, Rectangle: 6 g			
Ambient Operating Temperature		−15℃ to +50℃ (No Freeze)			
Ambient Operating Humidity		80%RH MAX. (No Conensation)			
Ambient Storage Temperature		−25℃ to +65℃ (No Freeze)			
Ambient Storage Humidity		80%RH MAX. (No Condensation)			

※ Connector for Round type has no DPDT.

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

◇Dimentions : page CH-4~5
◇Accessories : page CH-6~7
◇Ordering code : page CH-8~19
◇Internal connection arrangements : page CH-21~24
◇LED specifications : page CH-26~28
◇Terminals / PCB hole cutout : page CH-28~29
◇Mounting design / Panel cutout : page CH-31~32
◇Accessories' dimensions : page CH-32~37

SPECIFICATIONS

		Square (□13.2)	Rectangle	Square (□16)	Round
Housing	With Flange	○	○	×	○
	Without Flange	○	○	○	×
Illumination type	Full-Face	○	○	○	○
	Dual-Color	○	○	○	○
	2-Split-Face	○	○	○	×
	Non-illuination	○	○	○	○
Contact	SPDT	○	○	○	○
	DPDT	○	○	○	○
Termnal	Soldering	○	○	×	○
	PCB	○	○	○	○
	Connector	○	○	×	○
RoHS (10 Substances)		Conform to standards			

A : Applicable N/A : Not applicable ※Connector for Round type has no DPDT.

CONTACT RATINGS

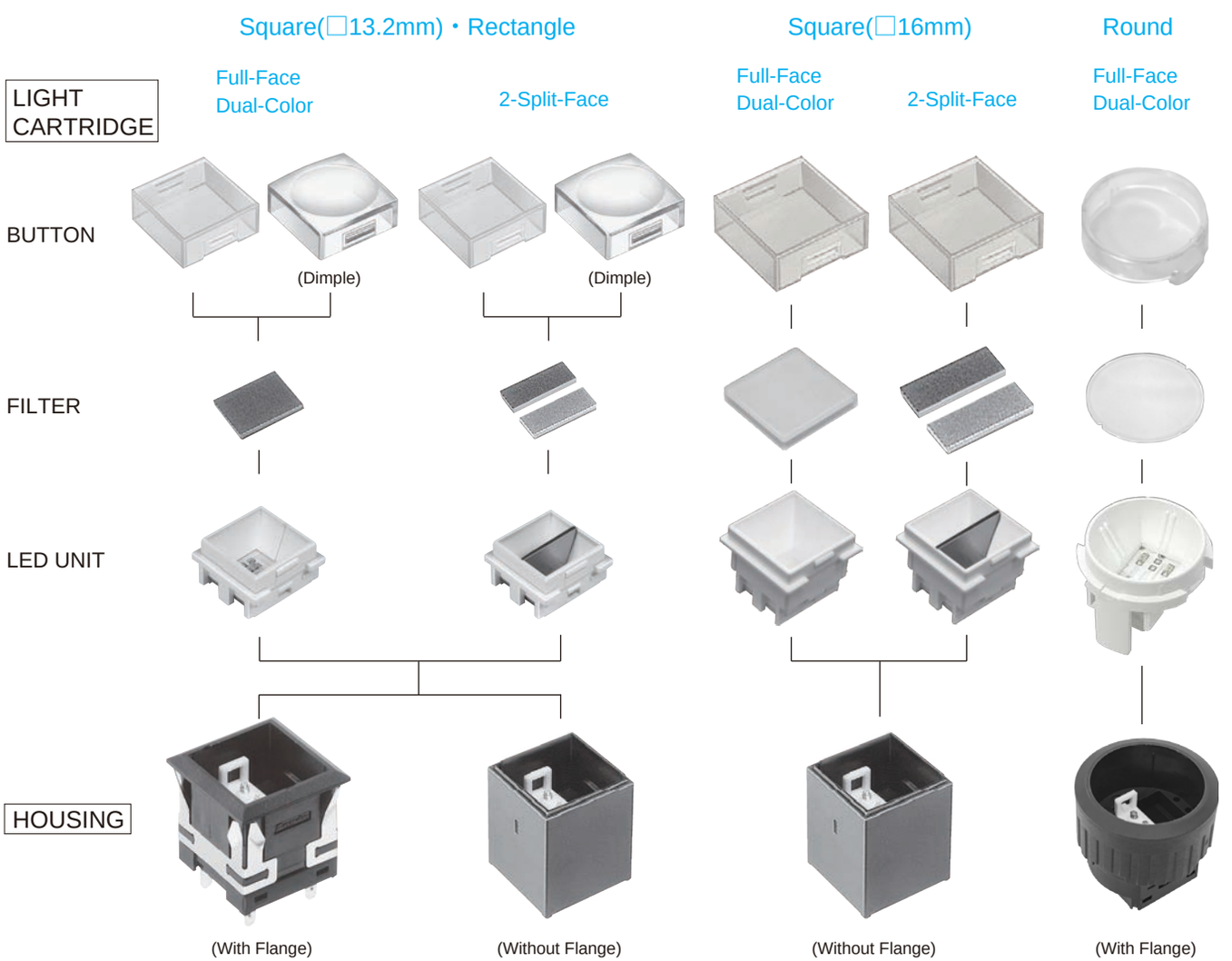
● Silver contact (Gold-plated)

Voltage	Current (A) (Resistive load)
AC 125 V	3
250 V	3
DC 8 V	2
14 V	2
30 V	1
125 V	0.3

● Cross bar contact

Rating	AC125 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



ILLUMINATION TYPE

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	90・16	90・18	14・16	16・18	18・14

2-Split-Face

70 70	70 80	70 90	70 14	70 16	70 18
80 70	80 80	80 90	90 70	90 80	90 90
90 14	90 16	90 18	14 70	14 90	14 14
14 16	14 18	16 70	16 90	16 14	16 16
16 18	18 70	18 90	18 14	18 16	18 18

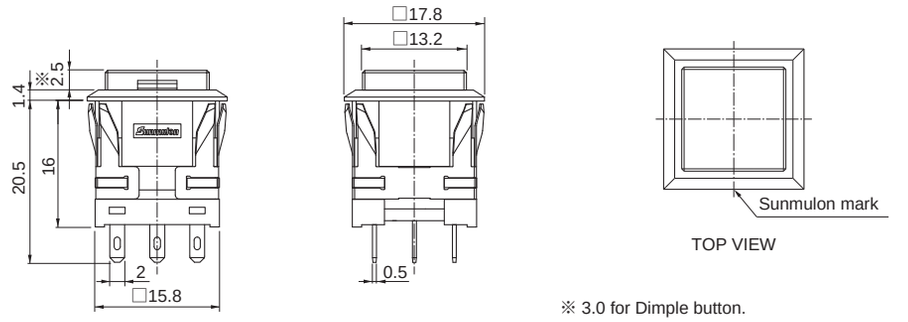
※ Round has no 2-Split-Face.

DIMENSIONS

● With Flange

Square

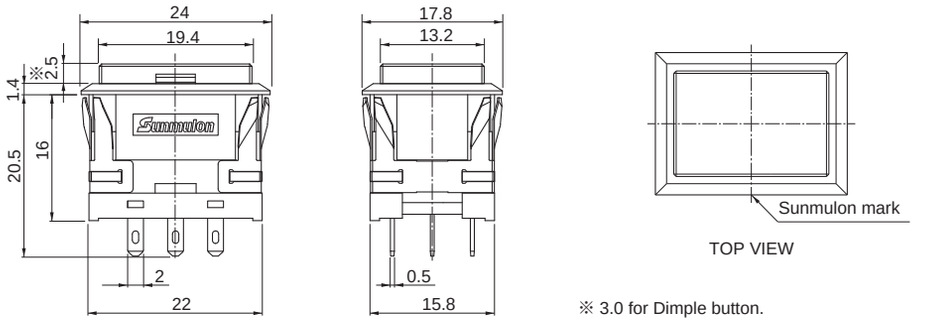
3D
DXF



※ 3.0 for Dimple button.

Rectangle

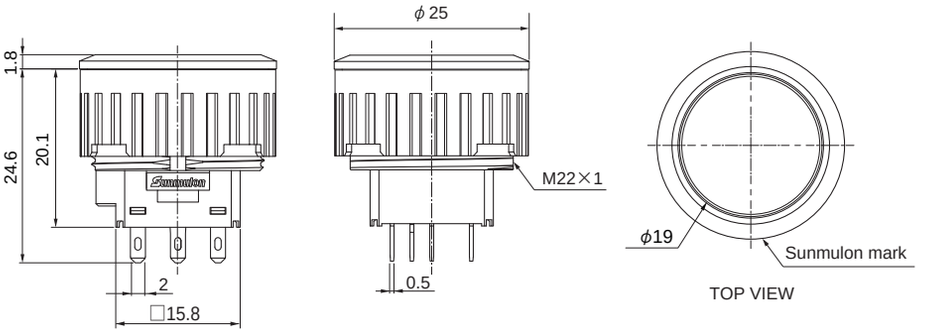
3D
DXF



※ 3.0 for Dimple button.

Round

3D
DXF



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

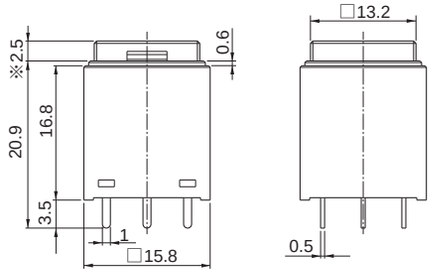
Tolerance：± 0.4mm

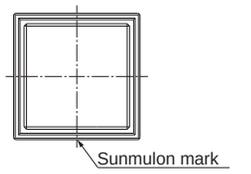
DIMENSIONS

● Without Flange

Square

3D
DXF



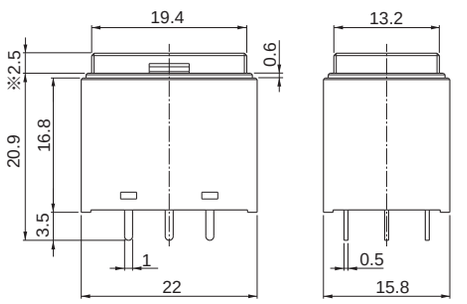


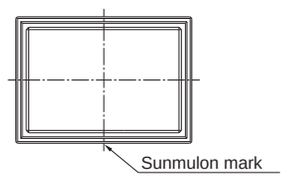
TOP VIEW

※ 3.0 for Dimple button.

Rectangle

3D
DXF



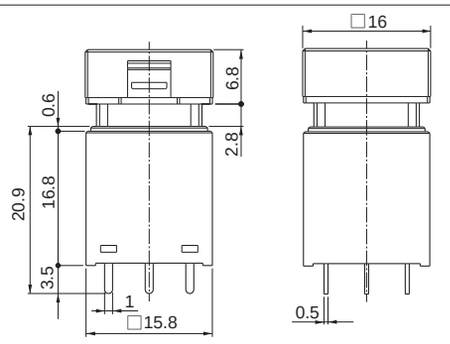


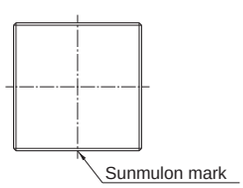
TOP VIEW

※ 3.0 for Dimple button.

Square (16 mm)

3D
DXF





TOP VIEW

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

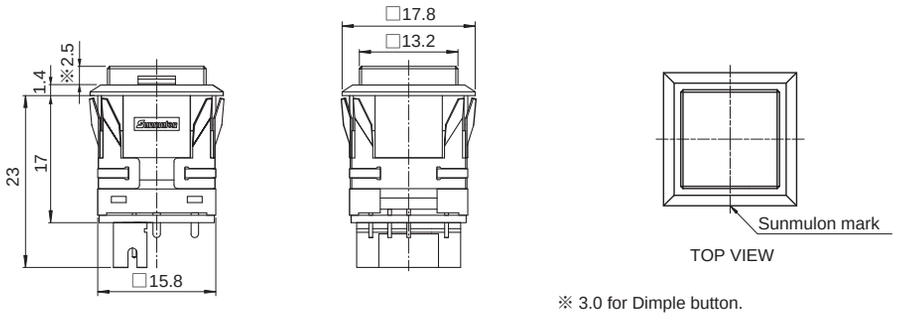
Tolerance：± 0.4mm

DIMENSIONS

● Connector for SPDT, Indicator

Square

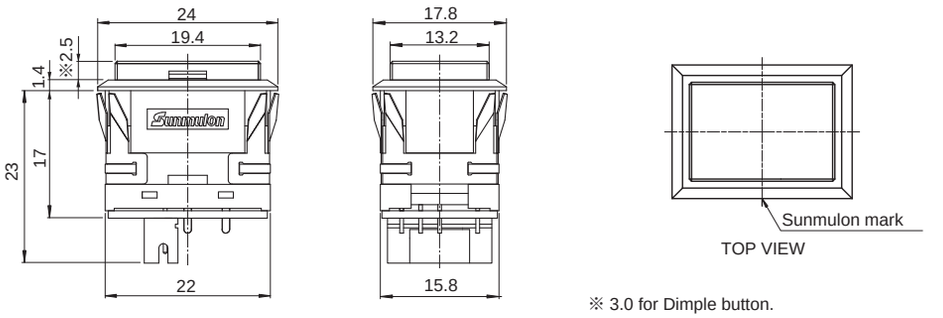
3D
DXF



※ 3.0 for Dimple button.

Rectangle

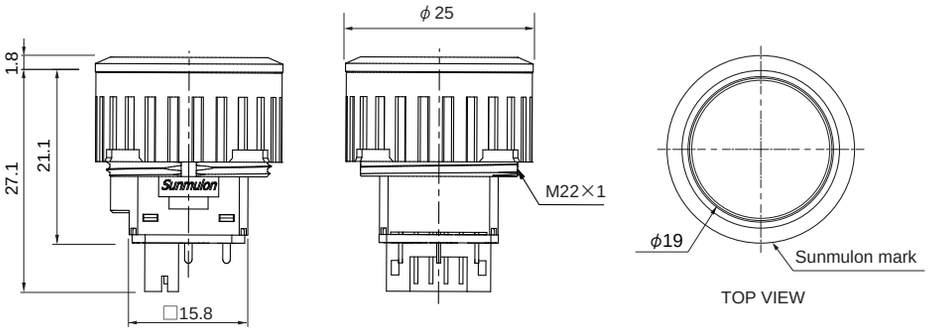
3D
DXF



※ 3.0 for Dimple button.

Round

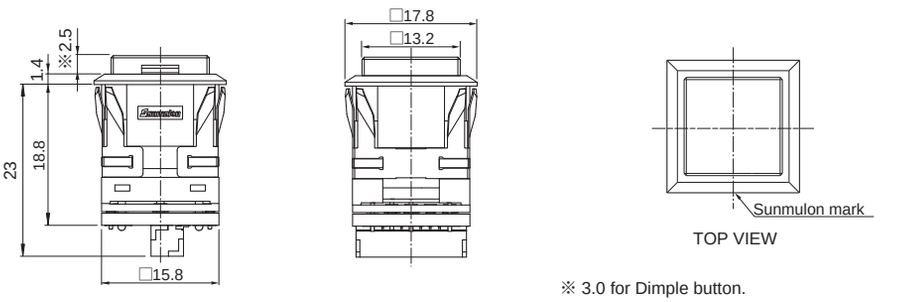
3D
DXF



● Connector for DPDT

Square

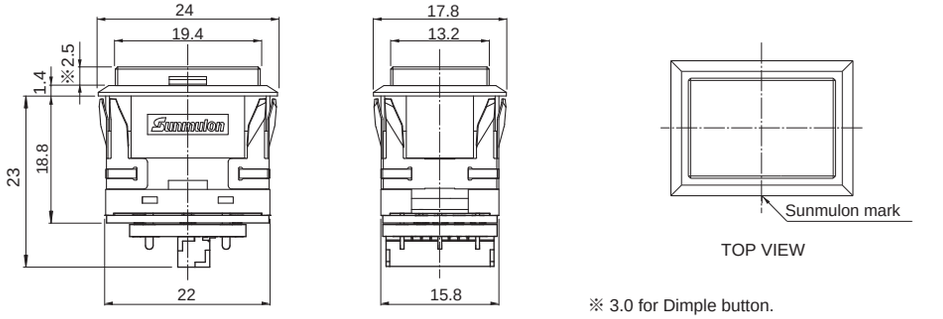
3D
DXF



※ 3.0 for Dimple button.

Rectangle

3D
DXF

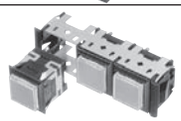
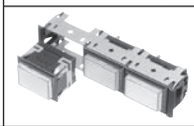


※ 3.0 for Dimple button.

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

Tolerance：± 0.4mm

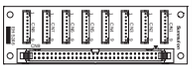
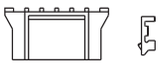
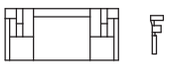
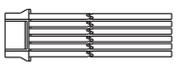
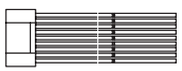
ACCESSORIES

Name	Appearance	Classification	Part no.		Precautions for use
Barrier		Center barrier	Black	VH-0975-K	- Cannot be used with guard cover. - Cannot be used with matrix fitting frame. - Cannot be used with 16 mm, round button.
			Gray	VH-0975-G	
		Side barrier	Black	VH-0976-K	
			Gray	VH-0976-G	
		Center barrier for retrofittable guard cover	Black	CH-4284-K	- Use as a set with the retrofittable guard cover. - Cannot be used with matrix fitting frame. - Cannot be used with 16 mm, round button.
			Gray	CH-4284-H	
3D DXF		Side barrier for retrofittable guard cover	Black	CH-4285-K	
			Gray	CH-4285-H	
Guard cover		For use with barriers for square button	CH-4282		- Use as a set with the barriers. - The cover to be opened 180° and returned by spring force. - Cannot be used with matrix fitting frame. - Cannot be used with Dimple button, 16 mm, round button.
		For use with barriers for rectangle button	CH-4283		
		For square button	Black	CH-2564-K	- Cannot be used with barriers. - The cover to be opened 180° and returned by spring force. - Cannot be used with matrix fitting frame. - Cannot be used with Dimple button, 16 mm, round button.
			Gray	CH-2564-H	
3D DXF		For rectangle button	Black	CH-2565-K	
			Gray	CH-2565-H	
Guard cover for without flange		For square button	Black	CH-2720-K	- Cannot be used with barriers. - The cover to be opened 180° and returned by spring force. - Cannot be used with matrix fitting frame. - Cannot be used with Dimple button, 16 mm, round button.
			Gray	CH-2720-H	
3D DXF		For rectangle button	Black	CH-2721-K	
			Gray	CH-2721-H	
Matrix fitting frame		For square button	Black	CH-2687-K□	□ = number of switch (1～15) for square, (1~10) for rectangle. - Can be used with socket. - Cannot be used with 16 mm, round button, guard cover and barriers.
			Gray	CH-2687-H□	
		For rectangle button	Black	CH-2688-K□	
			Gray	CH-2688-H□	
Socket		Soldering terminal	Black	CH-2479-□	- For combination with housing, refer to page CH-34. - Can be used for both square and rectangle. - Cannot be mounted for without flange type. - Use soldering terminal type for the swith housing.
3D DXF		PCB terminal	Black	CH-2480-□	

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

◇Accessories' dimensions / Panel cutout：page CH-32～36

ACCESSORIES

Name	Appearance	Classification	Part no.		Precautions for use
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. - Round has no DPDT connector type.
		For DPDT	EH-5180		
Wire harness		For SPDT・Indicator	100cm	EH-3250-1	- Harness for connector type. - Connector for Round type has no DPDT.
			200cm	EH-3250-2	
		For DPDT	100cm	EH-5177-1	
			200cm	EH-5177-2	
Removing tool		For removal light cartridge	SJ-0001		- Be used to remove light cartridge of square and rectangle from housing.
		For removal light cartridge	SJ-0002-1		- Be used to remove light cartridge of round from housing.
Tighitening tool		For tightening housing screw	CH-5538		- Be used to tightening housing screw.

◇Accessories' dimensions / Panel cutout：page CH-39～44

ORDERING CODE【Full-Face】

13.2 Square・Rectangle button

Assembled Part (Light cartridge and Housing)

CH □ — □ □ □ □ □ □ □ □ □

● OPERATION

L	Indicator
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

S0	Square	
K0	Square Dimple	※1)
W0	Rectangle	
N0	Rectangle Dimple	※1)

● LED COLOR

70	Red	
80	Green	
90	Yellow	※2)
14	Super-Blue	
16	Super-White	※3)
18	Super-Green	
X	Without LED	※4)

● BUTTON COLOR

R	Red	
G	Green	
Y	Yellow	※2)
B	Blue	
M	Milk-white	
C	Clear	※1)

● HOUSING COLOR

K	Black	※5)
H	Gray	※5)
KN	Black without flange	※8)
HN	Gray without flange	※8)

● FILTER COLOR

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

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

● TERMINAL

S	Soldering	
C	PCB	※8)
K	Connector with Accessories	※5) ※6)
N	Connector without Accessories	※5)
X	No terminals	※4)

● Supply Voltage to LED

1	DC 5V Built-in resistor	※7)
2	DC12V Built-in resistor	※7)
3	DC24V Built-in resistor	※7)
4	DC 5V Non-resistor	
5	DC12V Non-resistor	
6	DC24V Non-resistor	
X	Without LED	

For Non-resistor type, use external protective resistor.

● OPTION

0759	Low brightness	※7)
0001	Cathode common	
Blank	No option	

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

● NOTES

※1) Dimple button type is only clear color. Therefore, button color should be C (Clear).
The guard cover cannot be used for Dimple button.

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

※3) When using Lemon Yellow filter (8), specify LED color Super-White (16).

※4) No terminals can only be specified for Indicator (CHL-0) without LED (X).

※5) For the connector, Housing without flange type cannot be selected.

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

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

※8) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

◇Dimensions：page CH-4～6 ◇Accessories：page CH-7～8 ◇Internal connection arrangements：page CH-26
◇LED specifications：page CH-31 ◇Terminals / PCB hole cut-out：page CH-34～35 ◇Panel layout / Panel cut dimensions：page CH-36～38
◇Accessories' dimensions：page CH-39～44

ORDERING CODE【Full-Face】

13.2 Square・Rectangle button

LIGHT CARTRIDGE

CH — □ □ □ □ □ □

● BUTTON SHAPE

S0	Square
K0	Square Dimple ※1)
W0	Rectangle
N0	Rectangle Dimple ※1)

● LED COLOR

70	Red
80	Green
90	Yellow ※2)
14	Super-Blue
16	Super-White ※3)
18	Super-Green
X	WIthout LED

● BUTTON COLOR

R	Red
G	Green
Y	Yellow ※2)
B	Blue
M	Milk-white
C	Clear ※1)
X	Without button

● FILTER COLOR

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

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

● OPTION

0759	Low brightness ※4)
0001	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 ※4)
2	DC12V Built-in resistor ※4)
3	DC24V Built-in resistor ※4)
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) Dimple button type is only clear color. Therefore, button color should be C (Clear). The guard cover cannot be used for Dimple button.

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

※3) When using Lemon Yellow filter (8), specify LED color Super-White (16).

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

HOUSING

CH □ — □ □ □ □

● OPERATION

L	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

S0	Square
SX	Square without LED ※1)
W0	Rectangle
WX	Rectangle without LED ※1)

● TERMINAL

S	Soldering
C	PCB ※4)
K	Connector with Accessories ※2) ※3)
N	Connector without Accessories ※2)
X	No terminals ※1)

● HOUSING COLOR

K	Black ※2)
H	Gray ※2)
KN	Black without flange ※4)
HN	Gray without flange ※4)

● NOTES

※1) No terminals can only be specified for Indicator (CHL-0) without LED (SX).

※2) For the connector, Housing without flange type cannot be selected.

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

※4) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

ORDERING CODE【Dual-Color】

13.2 Square・Rectangle button

Assembled Part (Light cartridge and Housing)

CH □ — □ □ 1 2 □ □ □ □ □ □

● OPERATION

L	Indicator
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

S3	Square	
K3	Square Dimple	※1)
W3	Rectangle	
N3	Rectangle Dimple	※1)

● 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・9016・9018
1416・1618・1814

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

● BUTTON COLOR ※2)

C	Clear	※1)
M	Milk-white	

● FILTER COLOR ※2)

4	Milk-white
X	Without filter

● HOUSING COLOR

K	Black	※3)
H	Gray	※3)
KN	Black without flange	※7)
HN	Gray without flange	※7)

● TERMINAL

S	Soldering	
C	PCB	※7)
K	Connector with Accessories	※3) ※4)
N	Connector without Accessories	※3)

● Supply Voltage to LED

1	DC 5V Built-in resistor	※5)
2	DC12V Built-in resistor	※5)
3	DC24V Built-in resistor	※5) ※6)
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) ※6)
0001	Cathode common	
Blank	No option	

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

● NOTES

※1) Dimple button type is only clear color. Therefore, button color should be C (Clear).
The guard cover cannot be used for Dimple button.

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

※3) For the connector, Housing without flange type cannot be selected.

※4) For tge 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).

※6) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resisor.

※7) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

◇Dimensions：page CH-4～6 ◇Accessories：page CH-7～8 ◇Internal connection arrangements：page CH-27
◇LED specifications：page CH-32 ◇Terminals / PCB hole cut-out：page CH-34～35 ◇Panel layout / Panel cut dimensions：page CH-36～38
◇Accessories' dimensions：page CH-39～44

ORDERING CODE【Dual-Color】

13.2 Square・Rectangle button

LIGHT CARTRIDGE

CH — □ 1 2 □ □ □ □

● BUTTON SHAPE

S3	Square
K3	Square Dimple ※1)
W3	Rectangle
N3	Rectangle Dimple ※1)

● 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・9016・9018
1416・1618・1814

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

● BUTTON COLOR ※2)

C	Clear ※1)
M	Milk-white
X	Without button

● FILTER COLOR ※2)

4	Milk-white
X	Without filter

● OPTION

0759	Low brightness ※3) ※4)
0001	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 ※3)
2	DC12V Built-in resistor ※3)
3	DC24V Built-in resistor ※3) ※4)
4	DC 5V Non-resistor
5	DC12V Non-resistor
6	DC24V Non-resistor

For Non-resistor type, use external protective resistor.

● NOTES

※1) Dimple button type is only clear color. Therefore, button color should be C (Clear). The guard cover cannot be used for Dimple button.

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

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

※4) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resistor.

HOUSING

CH □ — □ □ □ □

● OPERATION

L	Indicator
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

S2	Square
W2	Rectangle

● TERMINAL

S	Soldering
C	PCB ※3)
K	Connector with Accessories ※1) ※2)
N	Connector without Accessories ※1)

● HOUSING COLOR

K	Black ※1)
H	Gray ※1)
KN	Black without flange ※3)
HN	Gray without flange ※3)

● NOTES

※1) For the connector, Housing without flange type cannot be selected.

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

※3) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

ORDERING CODE【2-Split-Face】

13.2 Square・Rectangle button

Assembled Part (Light cartridge and Housing)

CH □ — □ □ 1 2 C □ 1 2 □ □ □

● OPERATION

L	Indicator
M	Momentary
A	Alternate

※3)

● CONTACT

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

● BUTTON SHAPE

S2	Square
K2	Square Dimple ※1)
W2	Rectangle
N2	Rectangle Dimple ※1)

● LED COLOR ※2) ※3)

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

Put the color numbers into frame 1, 2.
（2-Split-Face combination）
7070・7080・7090・7014
7016・7018・8070・8080
8090・9070・9080・9090
9014・9016・9018・1470
1490・1414・1416・1418
1670・1690・1614・1616
1618・1870・1890・1814
1816・1818
For Non-illuminated : XX

The combination of With LED and Without LED cannot be specified.

● BUTTON COLOR

C	Clear

● HOUSING COLOR

K	Black	※4)
H	Gray	※4)
KN	Black without flange	※8)
HN	Gray without flange	※8)

● OPTION

0759	Low brightness	※6) ※7)
0001	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	※6)
2	DC12V Built-in resistor	※6)
3	DC24V Built-in resistor	※6) ※7)
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

S	Soldering	
C	PCB	※8)
K	Connector with Accessories	※4) ※5)
N	Connector without Accessories	※4)
X	No terminals	※3)

● FILTER COLOR ※2)

1	Red
2	Green
3	Yellow
4	Milk-white
6	Blue
8	Lemon Yellow
X	Without filter

Put the color numbers into frame 1, 2.

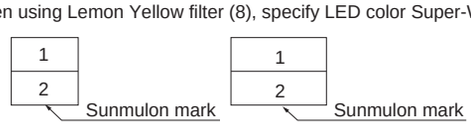
For without filter : XX

The combination of With filter and Without filter cannot be specified.

● NOTES

※1) Dimple button type is only clear color. Therefore, button color should be C (Clear).
The guard cover cannot be used for Dimple button.

※2) How to specify the color of LED and filter
Select the color symbols listed in the ordering code, and put them into the frame 1 and 2, referring to the figure below.
The numbers in the figure match the location specified in the ordering code.
The color of “Yellow” for LED (90) and filter (3) is actually “Orange Yellow” not Lemon Yellow.
When using Lemon Yellow filter (8), specify LED color Super-White (16).



※3) Can only be specified for Indicator (CHL-0) without LED (XX).

※4) For the connector, Housing without flange type cannot be selected.

※5) For tge connector, refer to Accessories page.

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

※7) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resisor.

※8) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

◇Dimensions：page CH-4～6 ◇Accessories：page CH-7～8 ◇Internal connection arrangements：page CH-29～30
◇LED specifications：page CH-33 ◇Terminals / PCB hole cut-out：page CH-34～35 ◇Panel layout / Panel cut dimensions：page CH-36～38
◇Accessories′ dimensions：page CH-39～44

ORDERING CODE【2-Split-Face】

13.2 Square・Rectangle button

LIGHT CARTRIDGE

CH — □ 12 □ 12 □ □

● BUTTON SHAPE

S2	Square
K2	Square Dimple ※1)
W2	Rectangle
N2	Rectangle Dimple ※1)

● LED COLOR ※2)

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

Put the color numbers into frame 1, 2.
(2-Split-Face combination)
7070・7080・7090・7014
7016・7018・8070・8080
8090・9070・9080・9090
9014・9016・9018・1470
1490・1414・1416・1418
1670・1690・1614・1616
1618・1870・1890・1814
1816・1818
For Non-illuminated : XX

The combination of With LED and Without LED cannot be specified.

● BUTTON COLOR

C	Clear
X	Without button

● FILTER COLOR ※2)

1	Red
2	Green
3	Yellow
4	Milk-white
6	Blue
8	Lemon Yellow
X	Without filter

Put the color numbers into frame 1, 2.

For without filter : XX

The combination of With filter and Without filter cannot be specified.

● OPTION

0759	Low brightness ※3) ※4)
0001	Cathode common
Blank	No option

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

● Supply Voltage to LED

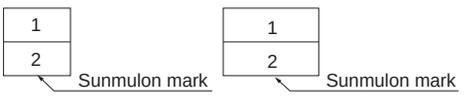
1	DC 5V Built-in resistor ※3)
2	DC12V Built-in resistor ※3)
3	DC24V Built-in resistor ※3) ※4)
4	DC 5V Non-resistor
5	DC12V Non-resistor
6	DC24V Non-resistor
X	Without LED

For Non-resistor type, use external protective resistor.

● NOTES

※1) Dimple button type is only clear color. Therefore, button color should be C (Clear).
The guard cover cannot be used for Dimple button.

※2) How to specify the color of LED and filter
Select the color symbols listed in the ordering code, and put them into the frame 1 and 2, referring to the figure on the right.
The numbers in the figure match the location specified in the ordering code.
The color of "Yellow" for LED (90) and filter (3) is actually "Orange Yellow" not Lemon Yellow.
When using Lemon Yellow filter (8), specify LED color Super-White (16).



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

※4) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resisor.

HOUSING

CH □ — □ □ □ □

● OPERATION

L	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

S2	Square
SX	Square without LED ※1)
W2	Rectangle
WX	Rectangle without LED ※1)

● TERMINAL

S	Soldering
C	PCB ※4)
K	Connector with Accessories ※2) ※3)
N	Connector without Accessories ※2)
X	No terminals ※1)

● HOUSING COLOR

K	Black ※2)
H	Gray ※2)
KN	Black without flange ※4)
HN	Gray without flange ※4)

● NOTES

※1) No terminals can only be specified for Indicator (CHL-0) without LED (SX or WX).

※2) For the connector, Housing without flange type cannot be selected.

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

※4) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

ORDERING CODE【Full-Face】

16 Square button

Assembled Part (Light cartridge and Housing)

CH □ – □ P0 □ □ KN □ □ □ □

● OPERATION

L	Indicator ※2)
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

P0	16 Square

● LED COLOR

70	Red
80	Green
90	Yellow ※1)
14	Super-Blue
16	Super-White
18	Super-Green
X	Without LED ※2)

● BUTTON COLOR

R	Red
G	Green
Y	Yellow ※1)
B	Blue
M	Milk-white
C	Clear

● HOUSING COLOR

KN	Black without flange ※4)

● OPTION

0759	Low brightness ※3)
0001	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 ※3)
2	DC12V Built-in resistor ※3)
3	DC24V Built-in resistor ※3)
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

C	PCB ※4)
X	No terminals ※2)

● FILTER COLOR

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

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

● NOTES

※1) The color of “Yellow” for LED (90) , button (Y) and filter (3) is actually “Orange Yellow” not Lemon Yellow.
※2) No terminals can only be specified for Indicator (CHL-0) without LED (X).
※3) For optional low brightness type (0759), specify supply voltage to LED 1, 2 or 3 (Built-in resistor type).
※4) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

◇Dimensions：page CH-5 ◇Accessories：page CH-7～8 ◇Internal connection arrangements：page CH-26
◇LED specifications：page CH-31 ◇Terminals / PCB hole cut-out：page CH-34～35 ◇Panel layout / Panel cut dimensions：page CH-39
◇Accessories' dimensions：page CH-39～44

ORDERING CODE【Full-Face】

16 Square button
LIGHT CARTRIDGE

CH－P0 □ □ □ □ □

● BUTTON SHAPE

P0	16 Square

● 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)
B	Blue
M	Milk-white
C	Clear
X	Without button

● FILTER COLOR

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

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

● OPTION

0759	Low brightness ※2)
0001	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

●注意事項

※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

CH □ － □ □ KN □

● OPERATION

L	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

S0	Square
SX	Square without LED ※1)

● TERMINAL

C	PCB ※2)
X	No terminals ※1)

● HOUSING COLOR

KN	Black without flange ※2)

● NOTES

※1）No terminals can only be specified for Indicator (CHL-0) without LED (SX).
※2）PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

ORDERING CODE【Dual-Color】

16 Square button

Assembled Part (Light cartridge and Housing)

CH □ – □ P3 1 2 □ KN □ C □ □

● OPERATION

L	Indicator
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

P3	16 Square

● 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・9016・9018
1416・1618・1814

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

● BUTTON COLOR ※1)

C	Clear
M	Milk-white

● HOUSING COLOR

KN	Black without flange ※4)

● TERMINAL

C	PCB ※4)

● FILTER COLOR ※1)

4	Milk-white
X	Without filter

● OPTION

0759	Low brightness ※2) ※3)
0001	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) ※3)
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).

※3) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resisor.

※4) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

◇Dimensions：page CH-5 ◇Accessories：page CH-7～8 ◇Internal connection arrangements：page CH-27
◇LED specifications：page CH-32 ◇Terminals / PCB hole cut-out：page CH-34～35 ◇Panel layout / Panel cut dimensions：page CH-39
◇Accessories' dimensions：page CH-39～44

ORDERING CODE【Dual-Color】

16 Square button
LIGHT CARTRIDGE

CH — □ 1 2 □ □ □ □

● BUTTON SHAPE

P3	16 Square

● 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・9016・9018
1416・1618・1814

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

● BUTTON COLOR ※1)

C	Clear
M	Milk-white
X	Without button

● FILTER COLOR ※1)

4	Milk-white
X	Without filter

● OPTION

0759	Low brightness	※2) ※3)
0001	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) ※3)
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).
※3) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resistor.

HOUSING

CH □ — □ S2 KN C

● OPERATION

L	Indicator
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

S2	Square

● TERMINAL

C	PCB	※1)

● HOUSING COLOR

KN	Black without flange	※1)

● NOTES

※1) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

ORDERING CODE【2-Split-Face】

16 Square button

Assembled Part (Light cartridge and Housing)

CH □ – □ P2 1 2 C □ 1 2 □ □ □

● OPERATION

L	Indicator ※2)
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

P2	16 Square

● LED COLOR ※1) ※2)

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

Put the color numbers into frame 1, 2.
（2-Split-Face combination）
7070・7080・7090・7014
7016・7018・8070・8080
8090・9070・9080・9090
9014・9016・9018・1470
1490・1414・1416・1418
1670・1690・1614・1616
1618・1870・1890・1814
1816・1818
For Non-illuminated : XX

The combination of With LED and Without LED cannot be specified.

● BUTTON COLOR

C	Clear

● HOUSING COLOR

KN	Black without flange ※5)

● FILTER COLOR ※1)

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

Put the color numbers into frame 1, 2.

For without filter : XX

The combination of With filter and Without filter cannot be specified.

● OPTION

0759	Low brightness ※3) ※4)
0001	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 ※3)
2	DC12V Built-in resistor ※3)
3	DC24V Built-in resistor ※3) ※4)
4	DC 5V Non-resistor
5	DC12V Non-resistor
6	DC24V Non-resistor
X	Without LED

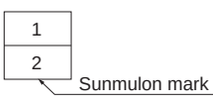
For Non-resistor type, use external protective resistor.

● TERMINAL

C	PCB ※5)
X	No terminals ※2)

● NOTES

※1) How to specify the color of LED and filter
Select the color symbols listed in the ordering code, and put them into the frame 1 and 2, referring to the figure below.
The numbers in the figure match the location specified in the ordering code.
The color of “Yellow” for LED (90) and filter (3) is actually “Orange Yellow” not Lemon Yellow.



※2) Can only be specified for Indicator (CHL-0) without LED (XX).

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

※4) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resisor.

※5) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

◇Dimensions：page CH-5 ◇Accessories：page CH-7～8 ◇Internal connection arrangements：page CH-29～30
◇LED specifications：page CH-33 ◇Terminals / PCB hole cut-out：page CH-34～35 ◇Panel layout / Panel cut dimensions：page CH-39
◇Accessories' dimensions：page CH-39～44

ORDERING CODE【2-Split-Face】

16 Square button
LIGHT CARTRIDGE

CH − P2 [1][2] □ [1][2] □ □

● BUTTON SHAPE

P2	16 Square

● LED COLOR ※1)

70	Red	Put the color numbers into frame 1, 2. (2-Split-Face combination) 7070・7080・7090・7014 7016・7018・8070・8080 8090・9070・9080・9090 9014・9016・9018・1470 1490・1414・1416・1418 1670・1690・1614・1616 1618・1870・1890・1814 1816・1818 For Non-illuminated : XX
80	Green	
90	Yellow	
14	Super-Blue	
16	Super-White	
18	Super-Green	
X	Without LED	

The combination of With LED and Without LED cannot be specified.

● BUTTON COLOR

C	Clear
X	Without button

● FILTER COLOR ※1)

1	Red	Put the color numbers into frame 1, 2. For without filter : XX
2	Green	
3	Yellow	
4	Milk-white	
6	Blue	
X	Without filter	

● OPTION

0759	Low brightness	※2) ※3)
0001	Cathode common	
Blank	No option	

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

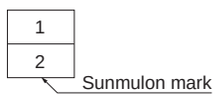
● Supply Voltage to LED

1	DC 5V Built-in resistor	※2)
2	DC12V Built-in resistor	※2)
3	DC24V Built-in resistor	※2) ※3)
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) How to specify the color of LED and filter
Select the color symbols listed in the ordering code, and put them into the frame 1 and 2, referring to the figure on the right.
The numbers in the figure match the location specified in the ordering code.
The color of “Yellow” for LED (90) 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).

※3) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resisor.

HOUSING

CH □ − □ □ KN □

● OPERATION

L	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

S2	Square	
SX	Square without LED	※1)

● TERMINAL

C	PCB	※2)
X	No terminals	※1)

● HOUSING COLOR

KN	Black without flange	※2)

● NOTES

※1) No terminals can only be specified for Indicator (CHL-0) without LED (SX).

※2) PCB terminals of Housing without flange type are with flux prevention except for Indicator type.

ORDERING CODE【Full-Face】

19 Round button

Assembled Part (Light cartridge and Housing)

CH □ – □ Y0 □ □ □ □ □ □ □

● OPERATION

L	Indicator ※3)
M	Momentary
A	Alternate

● CONTACT

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

● BUTTON SHAPE

Y0	Round Flat

● LED COLOR

70	Red
80	Green
90	Yellow ※1)
14	Super-Blue
16	Super-White ※2)
18	Super-Green
X	Without LED ※3)

● BUTTON COLOR

R	Red
G	Green
Y	Yellow ※1)
B	Blue
M	Milk-white
C	Clear

● HOUSING COLOR

K	Black
H	Gray

● OPTION

0759	Low brightness ※6)
0001	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 ※6)
2	DC12V Built-in resistor ※6)
3	DC24V Built-in resistor ※6)
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

S	Soldering
C	PCB
K	Connector with Accessories ※4) ※5)
N	Connector without Accessories ※4)
X	No terminals ※3)

● FILTER COLOR

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

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

● NOTES

※1) The color of “Yellow” for LED (90) , button (Y) and filter (3) is actually “Orange Yellow” not Lemon Yellow.
※2) When using Lemon Yellow filter (8), specify LED color Super-White (16).
※3) No terminals can only be specified for Indicator (CHL-0) without LED (X).
※4) For the connector, DPDT type cannot be selected.
※5) For the connector, refer to Accessories page.
※6) For optional low brightness type (0759), specify supply voltage to LED 1, 2 or 3 (Built-in resistor type).

◇Dimensions：page CH-4 ◇Accessories：page CH-7～8 ◇Internal connection arrangements：page CH-26
◇LED specifications：page CH-31 ◇Terminals / PCB hole cut-out：page CH-34～35 ◇Panel layout / Panel cut dimensions：page CH-38
◇Accessories' dimensions：page CH-39～44

ORDERING CODE【Full-Face】

19 Round button
LIGHT CARTRIDGE

CH－Y0 □ □ □ □ □

● BUTTON SHAPE

Y0	Round Flat

● LED COLOR

70	Red	
80	Green	
90	Yellow	※1)
14	Super-Blue	
16	Super-White	※2)
18	Super-Green	
X	WIthout LED	

● BUTTON COLOR

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

● FILTER COLOR

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

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

● OPTION

0759	Low brightness	※3)
0001	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	※3)
2	DC12V Built-in resistor	※3)
3	DC24V Built-in resistor	※3)
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) When using Lemon Yellow filter (8), specify LED color Super-White (16).
※3) For optional low brightness type (0759), specify supply voltage to LED 1, 2 or 3 (Built-in resistor type).

HOUSING

CH □ － □ □ □ □

● OPERATION

L	Indicator	※1)
M	Momentary	
A	Alternate	

● CONTACT

0	Indicator	
3	SPDT・Silver（Gold-Plated）	※2)
4	DPDT・Silver（Gold-Plated）	
5	SPDT・Crossbar	※2)
6	DPDT・Crossbar	

● BUTTON SHAPE

Y0	Round Flat	
YX	Round Flat without LED	※1)

● TERMINAL

S	Soldering	
C	PCB	
K	Connector with Accessories	※2) ※3)
N	Connector without Accessories	※2)
X	No terminals	※1)

● HOUSING COLOR

K	Black
H	Gray

● NOTES

※1) No terminals can only be specified for Indicator (CHL-0) without LED (YX).
※2) For the connector, DPDT type cannot be selected.
※3) For the connector, refer to Accessories page.

ORDERING CODE【Dual-Color】

19 Round button

Assembled Part (Light cartridge and Housing)

CH □ – □ Y3 1 2 □ □ □ □ □ □

● OPERATION

L	Indicator
M	Momentary
A	Alternate

● CONTACT

0	Indicator
3	SPDT・Silver（Gold-Plated） ※2)
4	DPDT・Silver（Gold-Plated）
5	SPDT・Crossbar ※2)
6	DPDT・Crossbar

● BUTTON SHAPE

Y0	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・9016・9018
1416・1618・1814

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

● BUTTON COLOR ※1)

C	Clear
M	Milk-white

● HOUSING COLOR

K	Black
H	Gray

● FILTER COLOR ※1)

4	Milk-white
X	Without filter

● TERMINAL

S	Soldering
C	PCB
K	Connector with Accessories ※2) ※3)
N	Connector without Accessories ※2)

● Supply Voltage to LED

1	DC 5V Built-in resistor ※4)
2	DC12V Built-in resistor ※4)
3	DC24V Built-in resistor ※4)※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 ※4)※5)
0001	Cathode common
Blank	No option

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

● NOTES

※1) Button should be C (Clear) with Milk-white filter or M (Milk-white) without filter.
※2) For the connector, DPDT type cannot be selected.
※3) For the connector, refer to Accessories page.
※4) For optional low brightness type (0759), specify supply voltage to LED 1, 2 or 3 (Built-in resistor type).
※5) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resisor.

◇Dimensions：page CH-4 ◇Accessories：page CH-7～8 ◇Internal connection arrangements：page CH-26
◇LED specifications：page CH-31 ◇Terminals / PCB hole cut-out：page CH-34～35 ◇Panel layout / Panel cut dimensions：page CH-38
◇Accessories' dimensions：page CH-39～44

ORDERING CODE【Dual-Color】

19 Round button
LIGHT CARTRIDGE

CH − Y3 [1][2] □ □ □ □

● BUTTON SHAPE

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・9016・9018
1416・1618・1814

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

● BUTTON COLOR ※1)

C	Clear
M	Milk-white
X	Without button

● FILTER COLOR ※1)

4	Milk-white
X	Without filter

● OPTION

0759	Low brightness	※2) ※3)
0001	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) ※3)
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).
※3) Simultaneous lighting is not possible for DC24V Built-in resistor type, cause heat, please select DC24V Non-resistor type and apply required external resistor.

HOUSING

CH □ − □ Y2 □ □

● OPERATION

L	Indicator
M	Momentary
A	Alternate

● CONTACT

0	Indicator	
3	SPDT・Silver（Gold-Plated）	※1)
4	DPDT・Silver（Gold-Plated）	
5	SPDT・Crossbar	※1)
6	DPDT・Crossbar	

● BUTTON SHAPE

Y2	Round Flat

● TERMINAL

S	Soldering	
C	PCB	
K	Connector with Accessories	※1) ※2)
N	Connector without Accessories	※1)

● HOUSING COLOR

K	Black
H	Gray

● NOTES

※1) For the connector, DPDT type cannot be selected.
※2) For the connector, refer to Accessories page.

REPLACEMENT PARTS

● Full-Face BUTTON／FILTER

		Red	Green	Yellow	Blue	Lemon Yellow	Milk-white	Clear	Dimple
BUTTON	Square	CH-2325-LR	CH-2325-LG	CH-2325-LY	CH-2325-LB		CH-2325-LM	CH-2325-CC	CH-2524-CC
	Rectangle	CH-2466-LR	CH-2466-LG	CH-2466-LY	CH-2466-LB		CH-2466-LM	CH-2466-CC	CH-2525-CC
	16 Square	CH-2624-LR	CH-2624-LG	CH-2624-LY	CH-2624-LB		CH-2624-LM	CH-2624-CC	
	Round	CH-5511-LR	CH-5511-LG	CH-5511-LY	CH-5511-LB		CH-5511-LM	CH-5511-CC	
FILTER	Square	CH-2326-LR	CH-2326-LG	CH-2326-LY	CH-2326-LB	CH-2326-YY	CH-2326-LM		
	Rectangle	CH-2467-LR	CH-2467-LG	CH-2467-LY	CH-2467-LB	CH-2467-YY	CH-2467-LM		
	16 Square	CH-2625-LR	CH-2625-LG	CH-2625-LY	CH-2625-LB		CH-2625-LM		
	Round	CH-5512-LR	CH-5512-LG	CH-5512-LY	CH-5512-LB	CH-5512-YY	CH-5512-LM		

● Dual-Color BUTTON／FILTER

		Milk-white	Clear	Dimple
BUTTON	Square	CH-2325-LM	CH-2325-CC	CH-2524-CC
	Rectangle	CH-2466-LM	CH-2466-CC	CH-2525-CC
	16 Square	CH-2624-LM	CH-2624-CC	
	Round	CH-5511-LM	CH-5511-CC	
FILTER	Square	CH-2326-LM		
	Rectangle	CH-2467-LM		
	16 Square	CH-2625-LM		
	Round	CH-5512-LM		

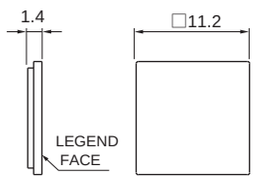
● 2-Split-Face BUTTON／FILTER

		Red	Green	Yellow	Blue	Lemon Yellow	Milk-white	Clear	Dimple
BUTTON	Square							CH-2325-CC	CH-2524-CC
	Rectangle							CH-2466-CC	CH-2525-CC
	16 Square							CH-2624-CC	
FILTER	Square	CH-2327-LR	CH-2327-LG	CH-2327-LY	CH-2327-LB	CH-2327-YY	CH-2327-LM		
	Rectangle	CH-2468-LR	CH-2468-LG	CH-2468-LY	CH-2468-LB	CH-2468-YY	CH-2468-LM		
	16 Square	CH-2626-LR	CH-2626-LG	CH-2626-LY	CH-2626-LB		CH-2626-LM		

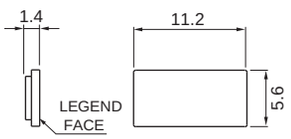
● DIVIDER

2-Split-Face	Part no.
Square	CH-2333
Rectangle	CH-2469
16 Square	CH-2627

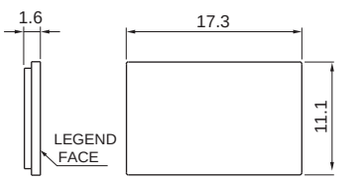
FILTER DIMENSIONS



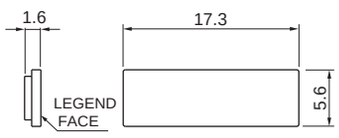
CH-2326



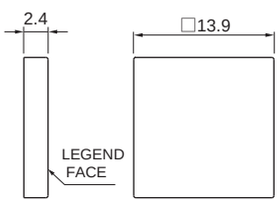
CH-2327



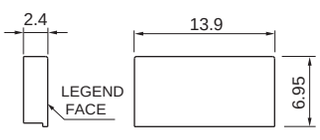
CH-2467



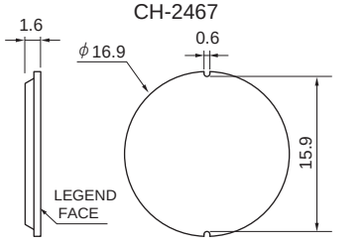
CH-2468



CH-2625



CH-2626

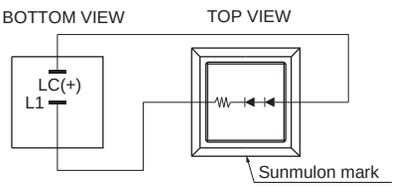
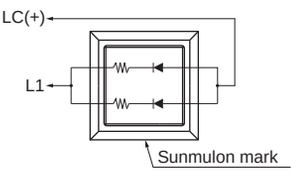
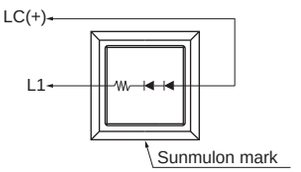
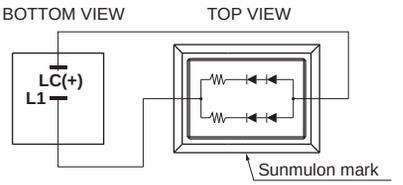
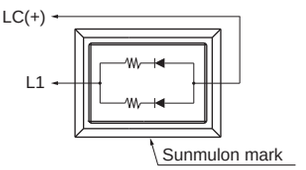
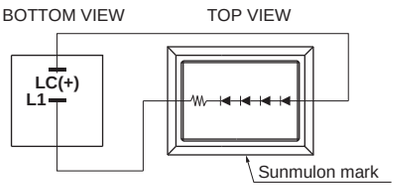
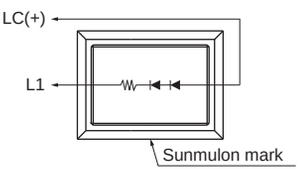
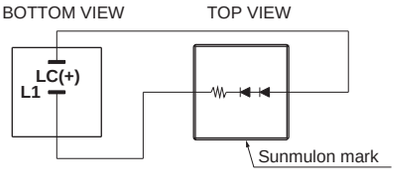
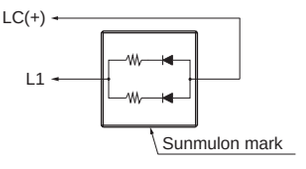
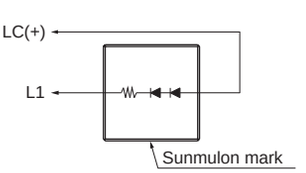
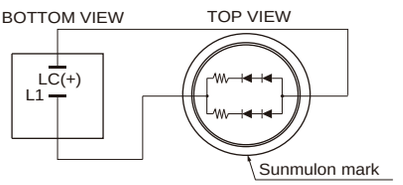
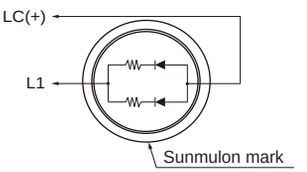
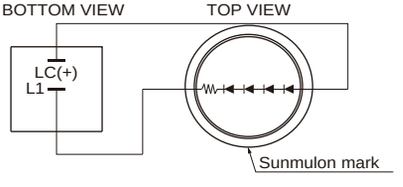
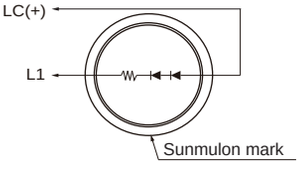


CH-5512

Tolerance : ± 0.4 mm

INTERNAL CONNECTION ARRANGEMENTS

● Full-Face

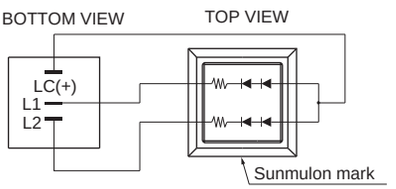
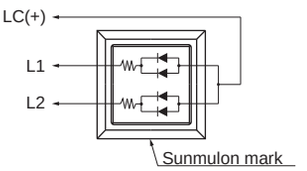
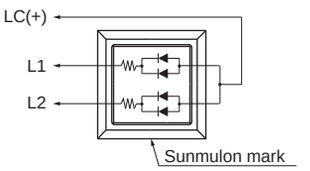
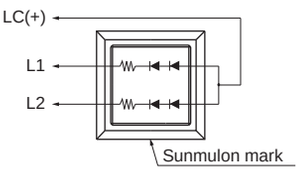
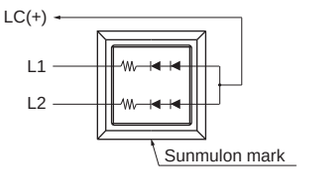
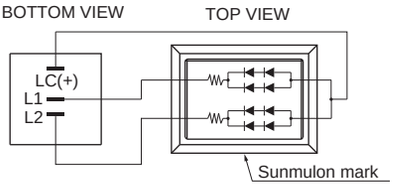
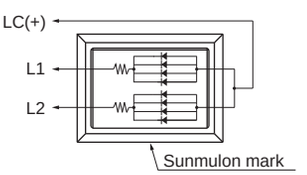
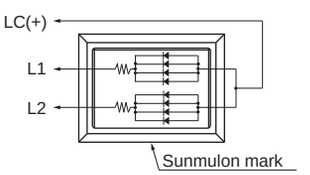
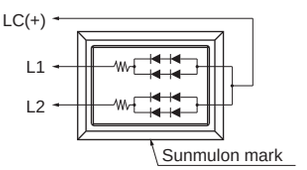
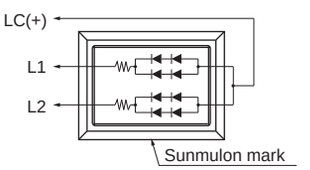
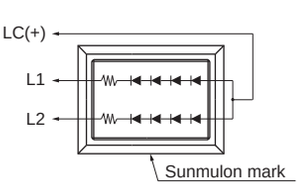
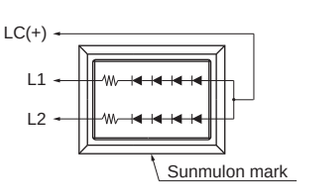
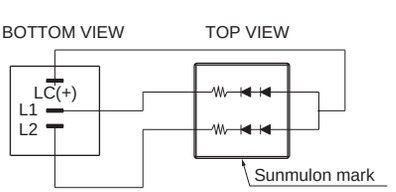
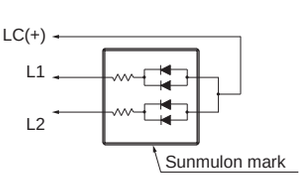
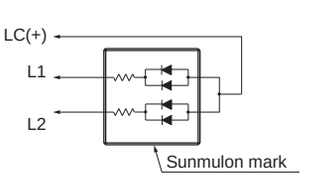
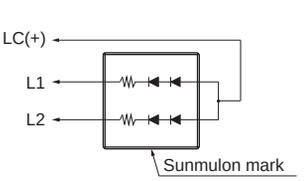
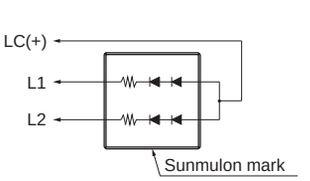
	Voltage	LED(70・80・90)	LED(14・16・18)
Square	DC5V		
	DC12V DC24V		
Rectangle	DC5V		
	DC12V DC24V		
16 Square	DC5V		
	DC12V DC24V		
Round	DC5V		
	DC12V DC24V		

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

※ 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.
※ For Cathode Common type, LED polarity (current flow direction) is opposite.

INTERNAL CONNECTION ARRANGEMENTS

● Dual-Color

	Voltage	LED（7080, 8090, 9070）	LED（1416, 1618, 1814）	LED（7014, 7016, 7018, 9014, 9016, 9018）
Square	DC5V			
	DC12V DC24V			
Rectangle	DC5V			
	DC12V			
	DC24V			
16 Square	DC5V			
	DC12V DC24V			

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

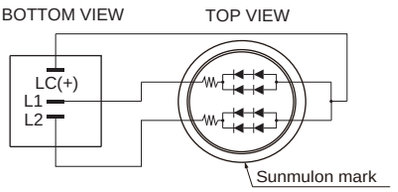
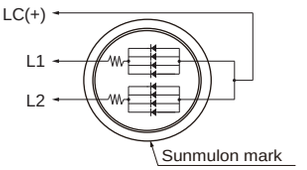
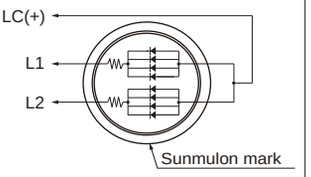
● Dual-Color combination (Common for each voltage)

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

※ 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.
※ For Cathode Common type, LED polarity (current flow direction) is opposite.

INTERNAL CONNECTION ARRANGEMENTS

● Dual-Color

<table>
<tr><th></th><th>Voltage</th><th>LED（7080, 8090, 9070）</th><th>LED（1416, 1618, 1814）</th><th>LED（7014, 7016, 7018,
9014, 9016, 9018）</th></tr>
<tr><td rowspan="3">Round</td><td>DC5V</td><td rowspan="2"> 
</td><td> 
</td><td> 
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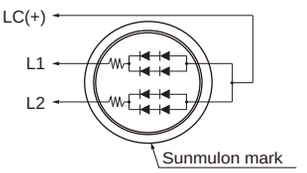
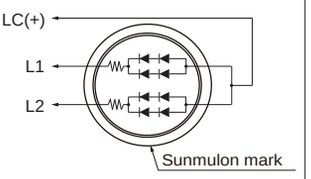
<tr><td>DC12V</td><td> 
</td><td> 
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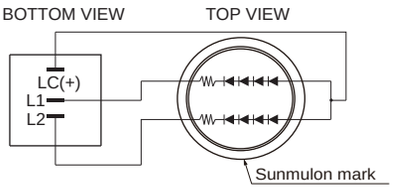
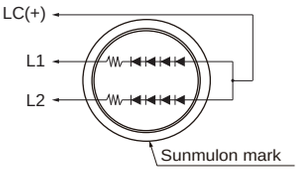
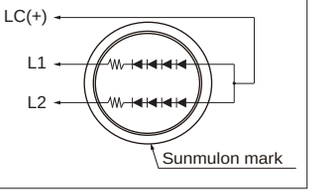
<tr><td>DC24V</td><td> 

DC12V・DC24V 共通</td><td> 
</td><td> 
</td></tr>
</table>

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

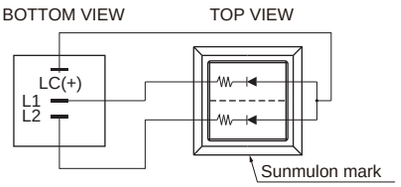
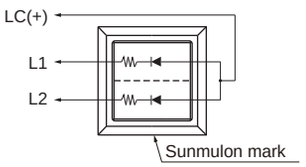
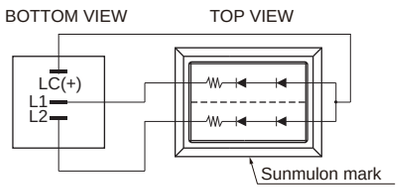
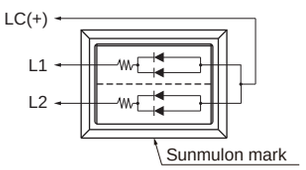
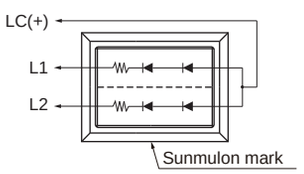
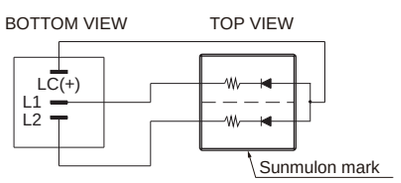
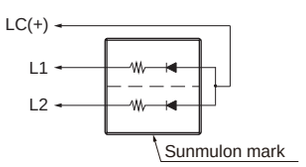
● Dual-Color combination (Common for each voltage)

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

※ 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.
※ For Cathode Common type, LED polarity (current flow direction) is opposite.

INTERNAL CONNECTION ARRANGEMENTS

● 2-Split-Face

	Voltage	LED（7070, 7080, 7090, 8070, 8080, 8090, 9070, 9080, 9090）	LED（1414, 1416, 1418, 1614, 1616, 1618, 1814, 1816, 1818）
Square	DC5V DC12V DC24V		
Rectangle	DC5V		
	DC12V DC24V		
16 Square	DC5V DC12V DC24V		

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

● 2-Split-Face combination (Common for each voltage)

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

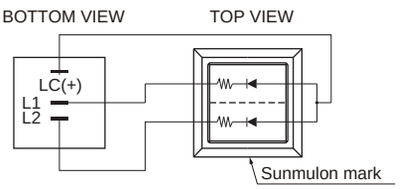
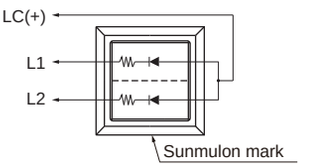
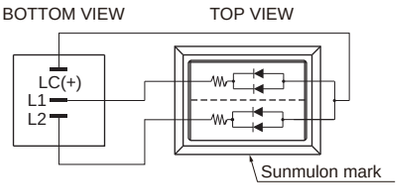
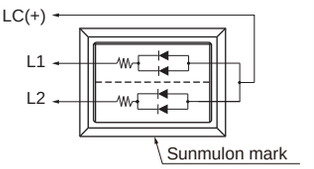
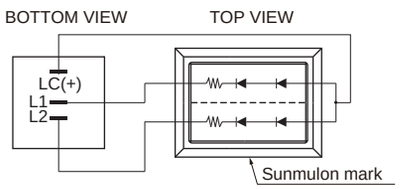
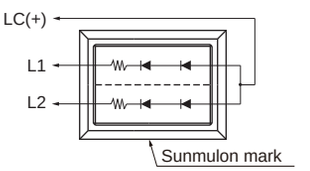
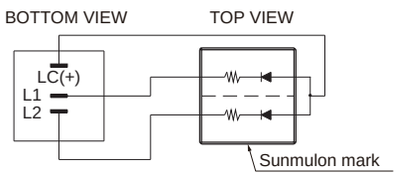
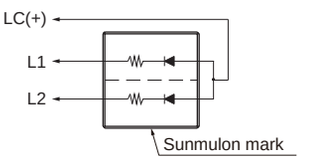
Terminals	LED Color											
LC-L1	Yellow	Super Blue	Super Blue	Super Blue	Super Blue	Super Blue	Super White	Super White	Super White	Super White	Super Green	Super Green
LC-L2	Super Blue	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green	Red	Super Blue	Super White

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

※ 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.
※ For Cathode Common type, LED polarity (current flow direction) is opposite.

INTERNAL CONNECTION ARRANGEMENTS

● 2-Split-Face

	Voltage	LED（7014, 7016, 7018, 9014, 9016, 9018）	LED（1470, 1490, 1670, 1690, 1870, 1890）
Square	DC5V DC12V DC24V		
Rectangle	DC5V		
	DC12V DC24V		
16 Square	DC5V DC12V DC24V		

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

● 2-Split-Face combination (Common for each voltage)

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

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

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

※ 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.
※ For Cathode Common type, LED polarity (current flow direction) is opposite.

LED SPECIFICATIONS 【Full-Face】

● BUILT-IN RESISTOR

Square・16 Square

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
DC5V ±5%	9	11	9	18	14	11	2	6	4	5	7	4
DC12V ±5%	9	11	9	11	9	6	2	6	4	3	4	2
DC24V ±5%	7	9	7	9	7	4	2	6	4	3	3	2

Rectangle・Round

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
DC5V ±5%	18	18	18	18	14	11	4	10	8	5	7	4
DC12V ±5%	9	9	9	9	7	6	2	5	4	3	4	2
DC24V ±5%	7	9	7	9	7	4	2	5	4	3	3	2

● NON-RESISTOR (EXTERNAL RESISTOR)

Square・16 Square

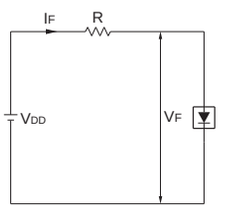
Supply Voltage		DC5V			DC12V・24V			DC5V			DC12V・24V		
LED Color		Red	Green	Yellow	Red	Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green
Max. Forward Current I_{FM} (mA)		20	20	20	20	20	20	40	40	40	20	20	20
DC Reverse Voltage V_R (V)		8	8	8	8	8	8	5	5	5	10	10	10
Forward Voltage V_F (V)		3.6	4.2	3.6	3.6	4.2	3.6	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					
	Duty Ratio DR	10^{-1}						10^{-1}					
	I_{FM} (mA)	100						100					

Rectangle・Round

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)		40	40	40	20	20	20	40	40	40	20	20	20
DC Reverse Voltage V_R (V)		8	8	8	16	16	16	5	5	5	10	10	10
Forward Voltage V_F (V)		3.6	4.2	3.6	7.2	8.4	7.2	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					
	Duty Ratio DR	10^{-1}						10^{-1}					
	I_{FM} (mA)	100						100					

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.

LED SPECIFICATIONS 【Dual-Color】

● BUILT-IN RESISTOR

Square・16 Square

Voltage	Rated Current (mA)										
	Combination of LED (70・80・90)			Combination of LED (14・16・18)			Combination of LED (70・90+14・16・18)				
	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green
DC5V ±5%	9	11	9	18	14	8	14	14	18	14	8
DC12V ±5%	9	11	9	11	9	6	9	9	11	9	6
DC24V ±5%	7	9	7	9	7	4	7	7	9	7	4

Rectangle・Round

Voltage	Rated Current (mA)										
	Combination of LED (70・80・90)			Combination of LED (14・16・18)			Combination of LED (70・90+14・16・18)				
	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green
DC5V ±5%	12	14	12	24	20	9	22	22	24	20	9
DC12V ±5%	9	9	9	14	11	6	12	12	14	11	6
DC24V ±5%	7	9	7	9	7	4	7	7	9	7	4

Square・16 Square (Low brightness type)

Voltage	Rated Current (mA)										
	Combination of LED (70・80・90)			Combination of LED (14・16・18)			Combination of LED (70・90+14・16・18)				
	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green
DC5V ±5%	2	6	4	5	7	4	4	8	5	7	4
DC12V ±5%	2	6	4	3	4	2	2	4	3	4	2
DC24V ±5%	2	6	4	3	3	2	2	4	3	3	2

Rectangle・Round (Low brightness type)

Voltage	Rated Current (mA)										
	Combination of LED (70・80・90)			Combination of LED (14・16・18)			Combination of LED (70・90+14・16・18)				
	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green
DC5V ±5%	4	10	8	10	8	7	8	16	10	8	7
DC12V ±5%	2	5	4	5	7	4	4	8	5	7	4
DC24V ±5%	2	5	4	3	3	2	2	4	3	3	2

● NON-RESISTOR (EXTERNAL RESISTOR)

Square・16 Square

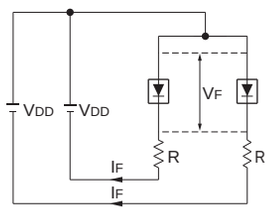
Supply Voltage		DC5V			DC12V・24V			DC5V			DC12V・24V		
LED Color		Red	Green	Yellow	Red	Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green
Max. Forward Current I_{FM} (mA)		20	20	20	20	20	20	40	40	40	20	20	20
DC Reverse Voltage V_R (V)		8	8	8	8	8	8	5	5	5	10	10	10
Forward Voltage V_F (V)		3.6	4.2	3.6	3.6	4.2	3.6	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					
	Duty Ratio DR	10^{-1}						10^{-1}					
	I_{FM} (mA)	100						100					

Rectangle・Round

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)		40	40	40	20	20	20	40	40	40	20	20	20
DC Reverse Voltage V_R (V)		8	8	8	16	16	16	5	5	5	10	10	10
Forward Voltage V_F (V)		3.6	4.2	3.6	7.2	8.4	7.2	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					
	Duty Ratio DR	10^{-1}						10^{-1}					
	I_{FM} (mA)	100						100					

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.

LED SPECIFICATIONS 【2-Split-Face】

● BUILT-IN RESISTOR

Square・16 Square

Voltage	Rated Current (mA)										
	Combination of LED (70・80・90)			Combination of LED (14・16・18)			Combination of LED (70・90+14・16・18)				
	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green
DC5V ±5%	8	11	8	11	10	6	8	8	11	10	6
DC12V ±5%	8	11	8	11	10	4	8	8	11	10	4
DC24V ±5%	7	10	7	9	8	4	7	7	9	8	4

Rectangle・Round

Voltage	Rated Current (mA)										
	Combination of LED (70・80・90)			Combination of LED (14・16・18)			Combination of LED (70・90+14・16・18)				
	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green
DC5V ±5%	8	9	8	18	14	10	14	14	18	14	10
DC12V ±5%	8	9	8	9	7	5	8	8	9	7	5
DC24V ±5%	7	9	7	9	7	5	7	7	9	7	5

Square・16 Square (Low brightness type)

Voltage	Rated Current (mA)										
	Combination of LED (70・80・90)			Combination of LED (14・16・18)			Combination of LED (70・90+14・16・18)				
	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green
DC5V ±5%	2	6	4	3	4	2	2	4	3	4	2
DC12V ±5%	2	6	4	3	3	2	2	4	3	3	2
DC24V ±5%	2	6	4	3	3	2	2	4	3	3	2

Rectangle・Round (Low brightness type)

Voltage	Rated Current (mA)										
	Combination of LED (70・80・90)			Combination of LED (14・16・18)			Combination of LED (70・90+14・16・18)				
	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Yellow	Super Blue	Super White	Super Green
DC5V ±5%	2	5	4	5	7	4	8	16	5	7	4
DC12V ±5%	2	5	4	3	4	2	2	4	3	4	2
DC24V ±5%	2	5	4	3	3	2	2	4	3	3	2

● NON-RESISTOR (EXTERNAL RESISTOR)

Square・8 Square

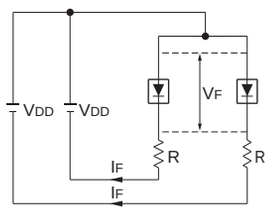
Supply Voltage		DC5V			DC12V・24V			DC5V			DC12V・24V		
LED Color		Red	Green	Yellow	Red	Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green
Max. Forward Current I_{FM} (mA)		20	20	20	20	20	20	20	20	20	20	20	20
DC Reverse Voltage V_R (V)		4	4	4	4	4	4	5	5	5	5	5	5
Forward Voltage V_F (V)		1.8	2.1	1.8	1.8	2.1	1.8	2.9	2.9	3	2.9	2.9	3
Derating (Operating temperature) (over 25℃ working temperature) (mA/℃)		0.66			0.33			0.54			0.27		
Pulse Lighting	Pulse Width PW (μs)	100						100					
	Duty Ratio DR	10^{-1}						10^{-1}					
	I_{FM} (mA)	100						100					

Rectangle・Round

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)		20	20	20	20	20	20	40	40	40	20	20	20
DC Reverse Voltage V_R (V)		8	8	8	8	8	8	5	5	5	10	10	10
Forward Voltage V_F (V)		3.6	4.2	3.6	7.2	8.4	7.2	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					
	Duty Ratio DR	10^{-1}						10^{-1}					
	I_{FM} (mA)	100						100					

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

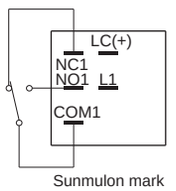
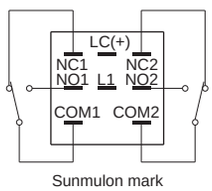
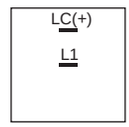
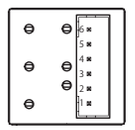
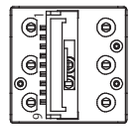
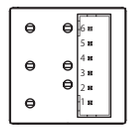
I_F (Forward Current) :
Refer to the Rated Current of BUILT-IN RESISTOR type, and be sure to set less than I_{FM} (Max. Forward Current).

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

● TERMINALS LAYOUT（BOTTOM VIEW）

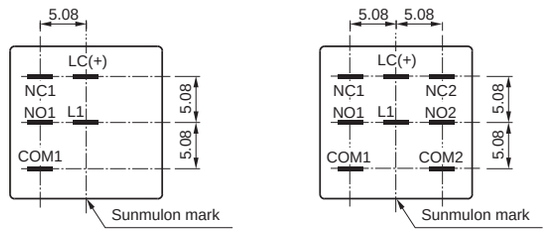
Terminal	SPDT	DPDT	INDICATOR
Soldering PCB			
Connector			

※ When “Without LED (X) ” for INDICATOR is specified, only “No terminals (X)” is selected.

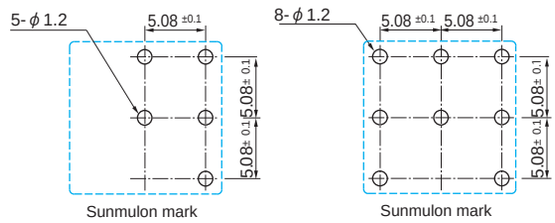
※ When “Without LED (X)” is specified, there is no LED terminal.

※ Connector for Round type has no DPDT.

● TERMINALS DIMENSIONS（BOTTOM VIEW）



● PCB hole cut-out（TOP VIEW）

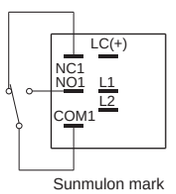
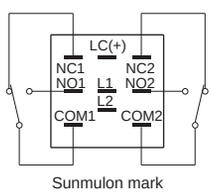
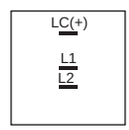
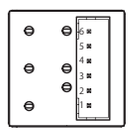
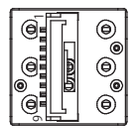
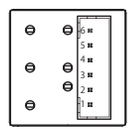


※ Actually, the terminal function letters are upside down.(e.g. NC →ↃN)

※ When “Without LED (X)” is specified, there is no LED terminal.

■ Dual-Color • 2-Split-Face

● TERMINALS LAYOUT（BOTTOM VIEW）

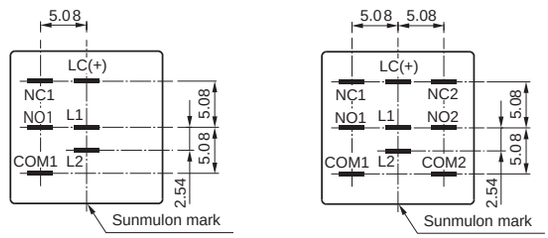
Terminal	SPDT	DPDT	INDICATOR
Soldering PCB			
Connector			

※ When “Without LED (X) ” for INDICATOR is specified, only “No terminals (X)” is selected.

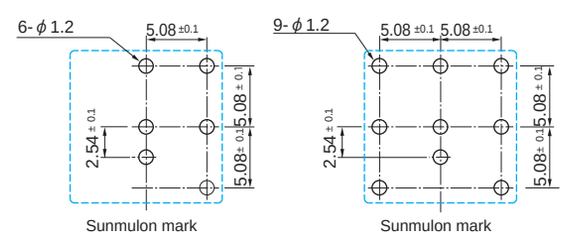
※ When “Without LED (X)” is specified, there is no LED terminal.

※ Connector for Round type has no DPDT.

● TERMINALS DIMENSIONS（BOTTOM VIEW）



● PCB hole cut-out（TOP VIEW）



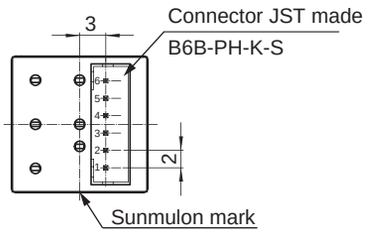
※ Actually, the terminal function letters are upside down.(e.g. NC →ↃN)

※ When “Without LED (X)” is specified, there is no LED terminal.

Tolerance : ± 0.4 mm

TERMINALS／CONNECTOR

● SPDT･INDICATOR (BOTTOM VIEW)



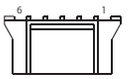
※ The connector pin numbers shown on the board have the letters upside down.

	Full-Face Non-illumination	Dual-Color 2-Split-Face
6	——	L2
5	L1	L1
4	LC	LC
3	NO	NO
2	NC	NC
1	COM	COM
Pin No.	Terminal	Terminal

Connector

Part no.	EH-3251

1 Housing & 6 contact pins to be appended.

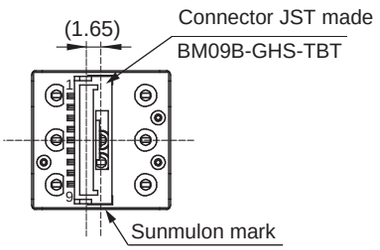


Housing
(JST made PHR-6)

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

● DPDT (BOTTOM VIEW)

※ Connector for Round type has no DPDT.

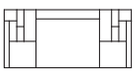


	Full-Face Non-illumination	Dual-Color 2-Split-Face
9	NO2	NO2
8	NC2	NC2
7	COM2	COM2
6	——	L2
5	L1	L1
4	LC	LC
3	NO1	NO1
2	NC1	NC1
1	COM1	COM1
Pin No.	Terminal	Terminal

Connector

Part no.	EH-5180

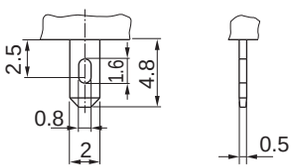
1 Housing & 9 contact pins to be appended.



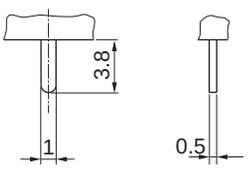
Housing
(JST made GHR-09V-S)

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

TERMINAL SHAPE



Soldering Terminal

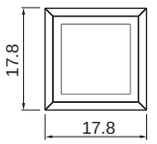
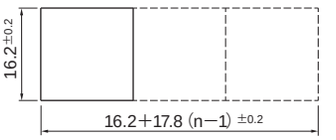
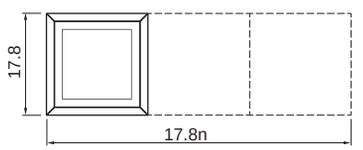
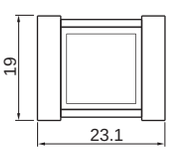
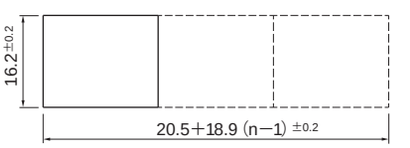
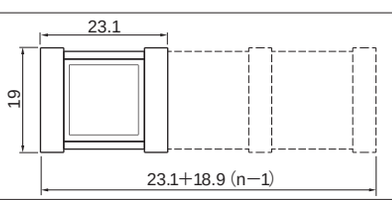
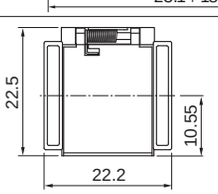
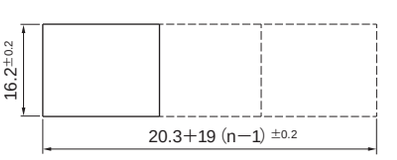
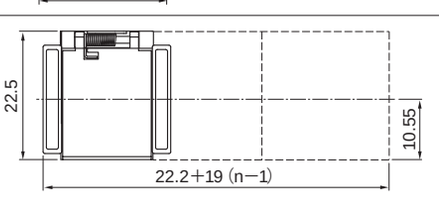
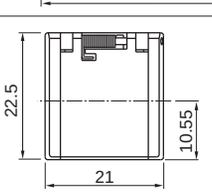
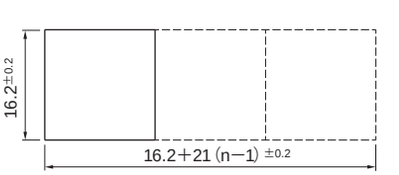
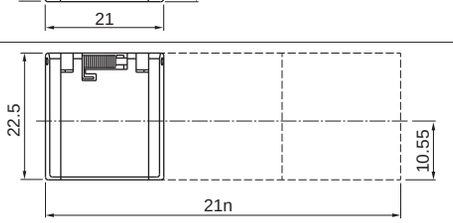


PCB Terminal

Tolerance : ± 0.4 mm

MOUNTING DESIGN／PANEL CUTOUT

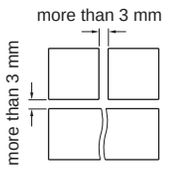
● Square

	Mounting design	Panel cutout
Without Barriers	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) 	n : Number of Units
With Barriers	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) 	n : Number of Units
With Retrofittable Guard cover	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) 	Use with the retrofittable center barrier and side barrier. n : Number of Units
With Guard cover	Individual (Horizontal) 	Recommended panel thickness : 1 to 2.5 mm 
	Multiple (Horizontal) 	n : Number of Units

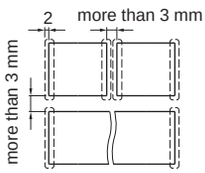
※ If the panel is to be finished (e.g. coated), make sure that the panel meets the specified dimensions after the coating.
In case the panel cut dimension is too small, it may cause malfunction.
※ When mounting on stainless steel, drill holes with a dimensional tolerance of $^{+0}_{-0.2}$.
※ After the panel-cutting process, make sure to remove burrs on the surface.

● Panel cut spacing dimensions for spaced individual mounting (Common for Square, Rectangle)

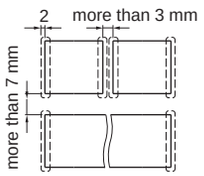
With Flange



With Barriers
(Common for each barrier)



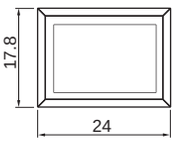
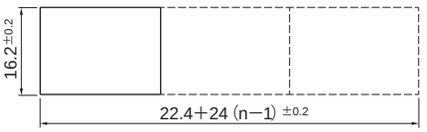
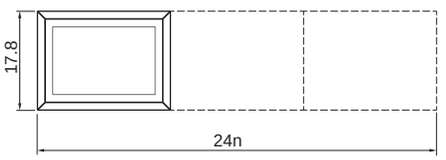
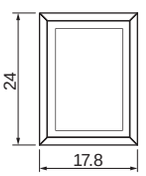
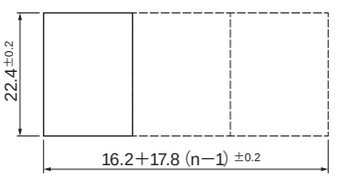
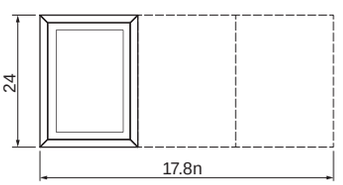
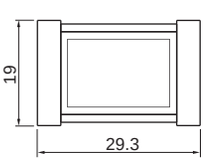
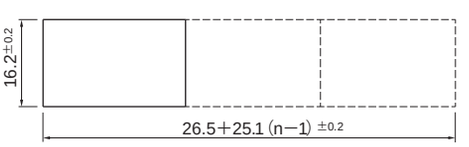
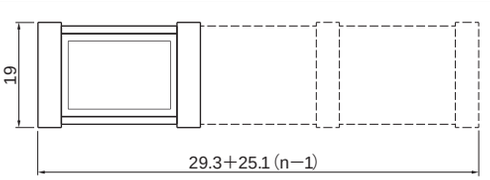
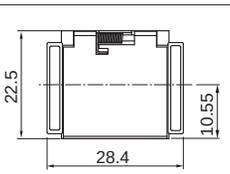
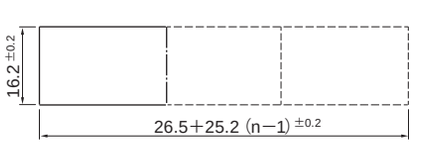
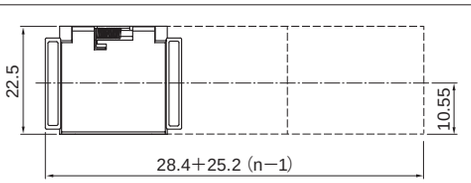
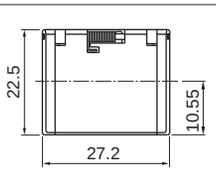
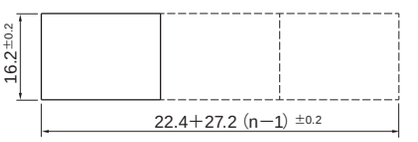
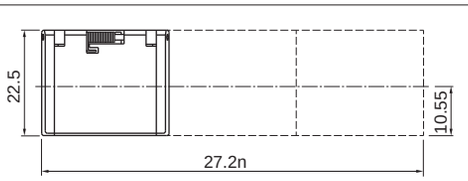
With Barriers for
Retrofittable Guard cover



Tolerance : ± 0.4 mm

MOUNTING DESIGN／PANEL CUTOUT

● Rectange

	Mounting design	Panel cutout
Without Barriers	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) 	n : Number of Units
	Individual (Vertival) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Vertical) 	n : Number of Units
With Barriers	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) 	n : Number of Units
With Retrofittable Guard cover	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) 	Use with the retrofittable center barrier and side barrier. n : Number of Units
With Guard cover	Individual (Horizontal) 	Recommended panel thickness : 1 to 2.5 mm 
	Multiple (Horizontal) 	n : Number of Units

※ 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.

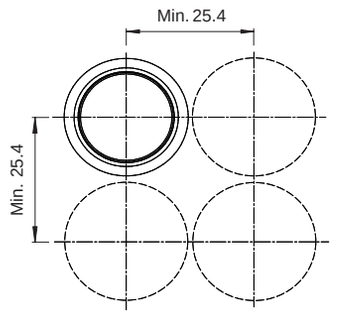
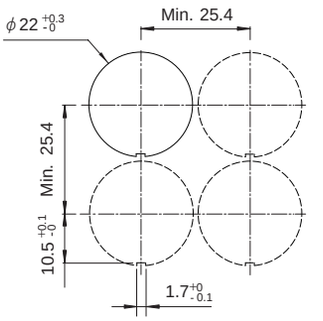
※ When mounting on stainless steel, drill holes with a dimensional tolerance of $^{+0}_{-0.2}$.

※ After the panel-cutting process, make sure to remove burrs on the surface.

Tolerance : ± 0.4 mm

MOUNTING DESIGN／PANEL CUTOUT

● Round

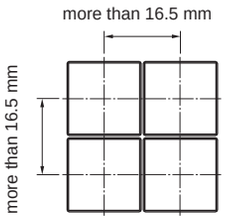
Mounting design	Panel cutout
	Recommended panel thickness : 1 to 3.2 mm 

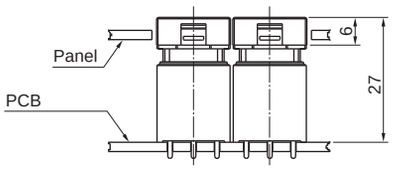
※ If the panel is to be finished (e.g. coated), make sure that the panel meets the specified dimensions after the coating.
In case the panel cut dimension is too small, it may cause malfunction.
※ When mounting on stainless steel, drill holes with a dimensional tolerance of $^{+0}_{-0.2}$.
※ After the panel-cutting process, make sure to remove burrs on the surface.

Tolerance : ± 0.4 mm

PANEL LAYOUT

● 16 Square button



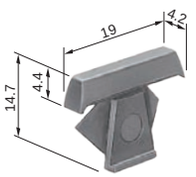


ACCESSORIES

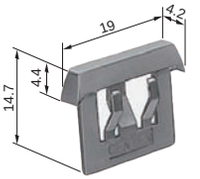
BARRIER

Color	Side barrier	Center barrier
Black	VH-0976-K	VH-0975-K
Gray	VH-0976-G	VH-0975-G

※ Cannot be used with guard cover and matrix fitting frame.
※ Cannot be used with 16 Square button and Round button.



Side barrier



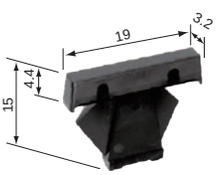
Center barrier

3D
DXF

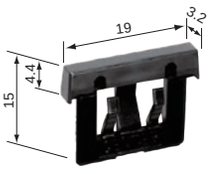
BARRIER for GUARD COVER

Color	Side barrier	Center barrier
Black	CH-4285-K	CH-4284-K
Gray	CH-4285-H	CH-4284-H

※ Can be used with the retrofittable guard cover.
※ Cannot be used with matrix fitting frame,
16 Square button and Round button.



Side barrier



Center barrier

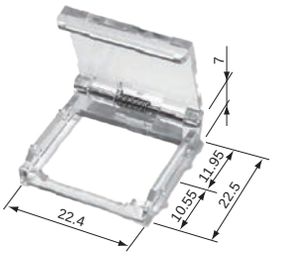
3D
DXF

GUARD COVER used with BARRIERS

Square	CH-4282
Rectangle	CH-4283

※ Use as a set with the barrier for guard cover.
※ The cover to be opened 180° and returned by spring force.
※ Cannot be used with matrix fitting frame, dimple button,
16 Square button and Round button.

Square



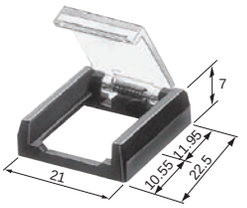
Rectangle

3D
DXF

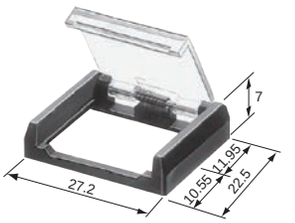
GUARD COVER

Square	Black	CH-2564-K
	Gray	CH-2564-H
Rectangle	Black	CH-2565-K
	Gray	CH-2565-H

※ The cover to be opened 180° and returned by spring force.
※ Cannot be used with matrix fitting frame, dimple button,
16 Square button and Round button.



Square



Rectangle

3D
DXF

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

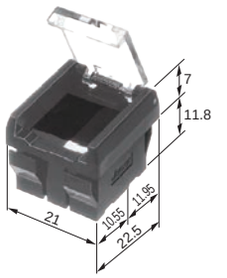
Tolerance : ± 0.4 mm

ACCESSORIES

GUARD COVER without Flange

Square	Black	CH-2720-K
	Gray	CH-2720-H
Rectangle	Black	CH-2721-K
	Gray	CH-2721-H

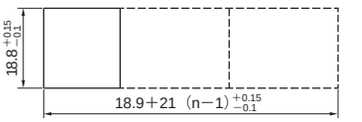
※ The cover to be opened 180° and returned by spring force.
※ Cannot be used with matrix fitting frame, dimple button, 16 Square button and Round button.



3D
DXF

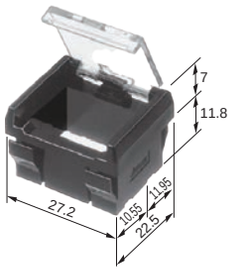
Square

Panel cutout



n : Number of Units

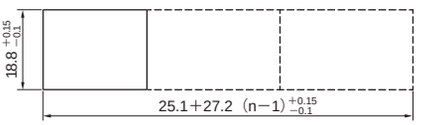
Recommended panel thickness : 1 to 3.2 mm



3D
DXF

Rectangel

Panel cutout



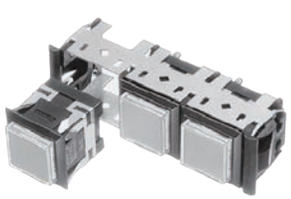
n : Number of Units

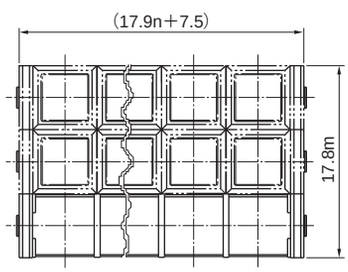
Recommended panel thickness : 1 to 3.2 mm

MATRIX FITTING FRAME

Square	Black	CH-2687-K□	□ = Number of switch (1～15)
	Gray	CH-2687-H□	
Rectangle	Black	CH-2688-K□	□ = Number of switch (1～10)
	Gray	CH-2688-H□	

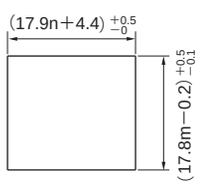
※ Cannot be used with barrier and guard cover, 16 Square button and Round button..
※ Can be used with socket.



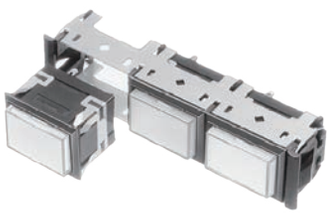


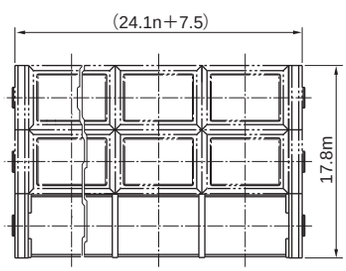
n=number of Units

Panel cutout



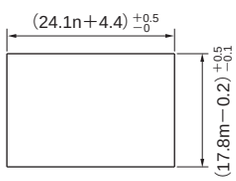
Recommended panel thickness : 1 to 3.2 mm
n : Number of Units (Horizontal)
m : Number of Units (Vertical)





n=number of Units

Panel cutout



Recommended panel thickness : 1 to 3.2 mm
n : Number of Units (Horizontal)
m : Number of Units (Vertical)

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

Tolerance : ± 0.4 mm

ACCESSORIES

SOCKET

※ When using a socket, use Soldering terminal for the Housing.
※ Cannot be used without flange type.

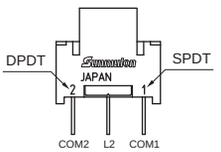
● Full-Face

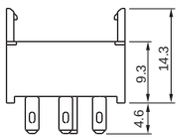
Socket terminal shape	Type to be used	Part no.	Resistance value	Remarks
Soldering Terminal	Built-in resistor type	CH-2479-1	0 Ω	Housing should be a built-in resistor type.
PCB Terminal		CH-2480-1	0 Ω	Housing should be a Soldering terminal type with built-in resistor.

● Dual-Color・2-Split-Face

Socket terminal shape	Type to be used	Part no.	Resistance value	Remarks
Soldering Terminal	Built-in resistor type	CH-2479-2	0 Ω	Housing should be a built-in resistor type.
	Non-resistor type for DC24V	CH-2479-2A	2kΩ	Housing should be a Non-resistor type. ※ Simultaneous lighting is possible.
PCB Terminal	Built-in resistor type	CH-2480-2	0 Ω	Housing should be a Soldering terminal type with built-in resistor.

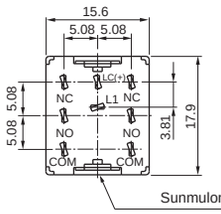
● Soldering Terminal (Square, Rectangle, Round)



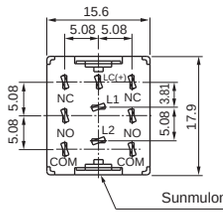


3D
DXF

Full-Face



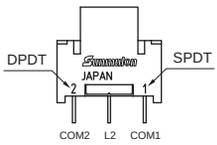
Dual-Color, 2-Split-Face

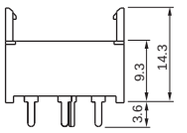


(BOTTOM VIEW)

※ In the actual poduct, the terminal function letters are upside down.

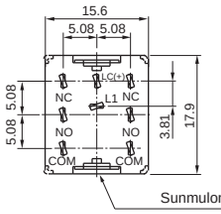
● PCB Terminal (Square, Rectangle, Round)



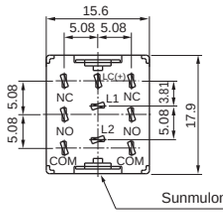


3D
DXF

Full-Face



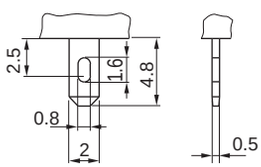
Dual-Color, 2-Split-Face



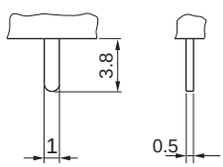
(BOTTOM VIEW)

※ In the actual poduct, the terminal function letters are upside down.

● Terminal shape



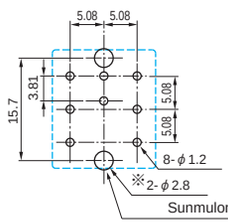
Soldering Terminal



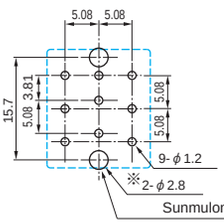
PCB Terminal

● PCB hole cut-out (TOP VIEW)

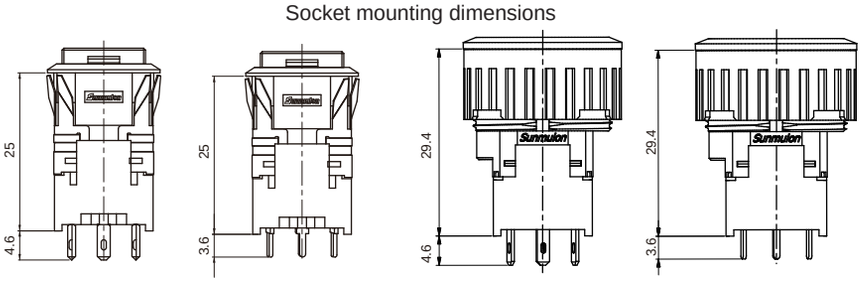
Full-Face



Dual-Color, 2-Split-Face



Socket mounting dimensions



※ To remove the socket, drill a hole and inset a screwdriver.

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

Tolerance : ± 0.4 mm

ACCESSORIES

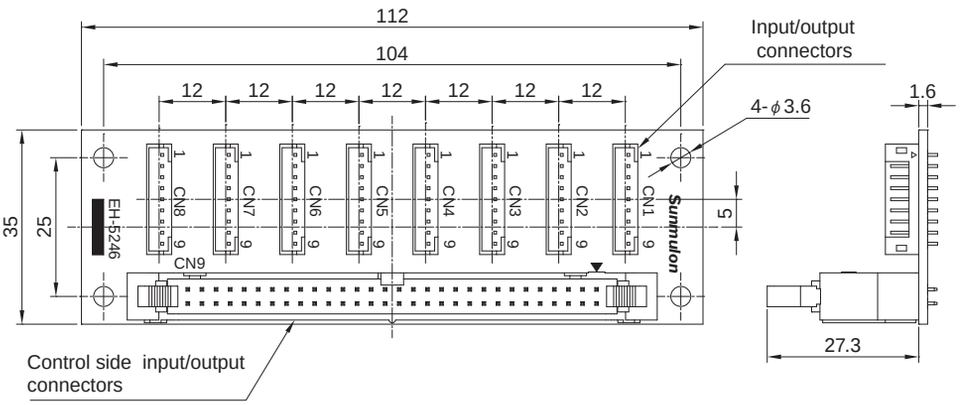
RELAY BOARD

• 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

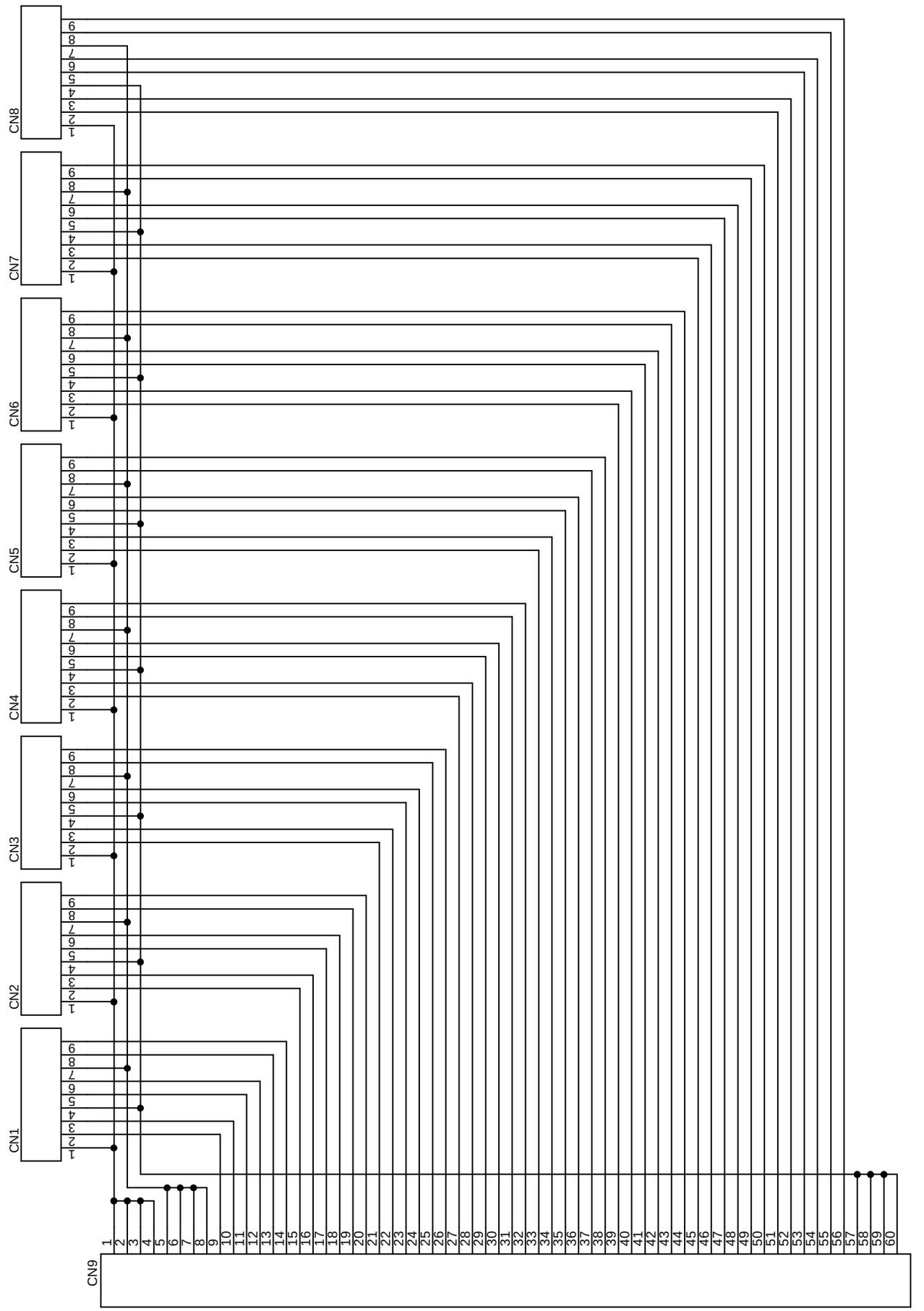
JST made
PHR-9（Housing）
SPH-002-T-P0.5S（Contact）
SPH-002-T-P0.5L（Contact）

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		

Tolerance : ± 0.4 mm

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



ACCESSORIES

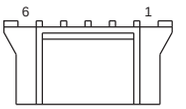
CONNECTOR • WIRE HARNESS

● SPDT • INDICATOR

Connector

Part no.	EH-3251

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



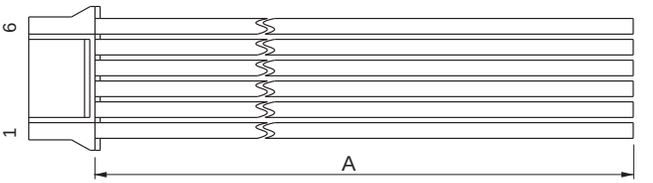
Housing
(JST made PHR-6)

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

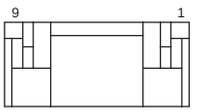
● DPDT

※ Connector for Round type has no DPDT.

Connector

Part no.	EH-5180

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



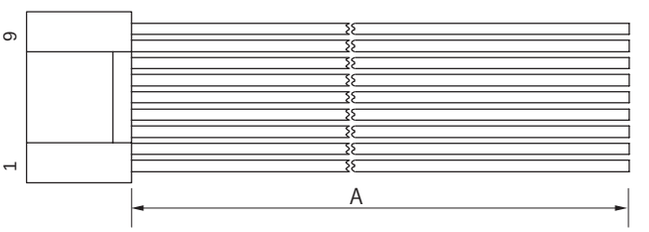
Housing
(JST made GHR-09V-S)

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

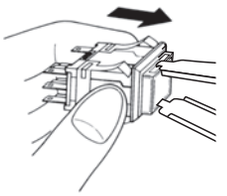


Pin No.	1	2	3	4	5	6	7	8	9
Wire Color	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White

1. Removing Light cartridge

Square・Rectangle

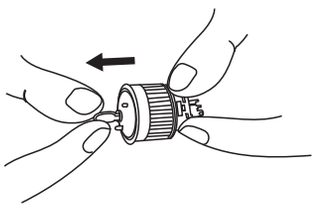
Be sure to remove with the removing tool (SJ-0001).
Hang the cartridge with the removing tool in the groove, and pull it straight out.



※ 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.

Round Flat

Be sure to remove with the removing tool (SJ-0002-1).

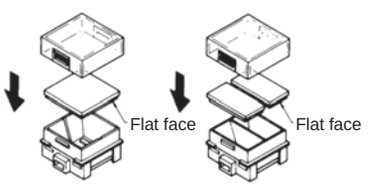


Be sure to remove with the removing tool (SJ-0002-1).
When pulling out he alternate type, press down on the suction cup to lock it, and pull it out as it is to avoid damage.
After pressing down on the suction cup, be sure to return it to the unlocked state before pulling it out.

2. Fitting Filter

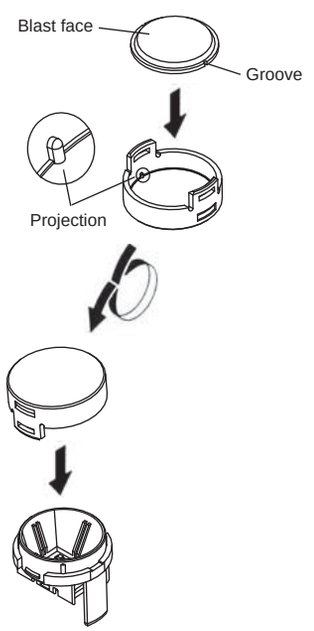
Square・Rectangle

Place the filter with the flat face upward on to the LED unit, then put button on it.



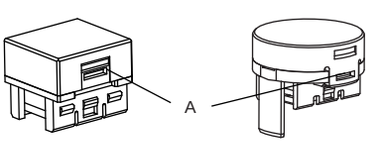
Round Flat

Place the filter with the blast face up inside the button.
For the round type, align the groove on the sides of the filter with the projection inside of the button, and place in.



3. Removing Button

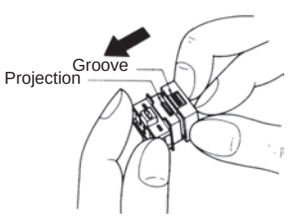
Remove the part A by pushing it open.



Do not reuse buttons that have been removed and deformed.

4. Fitting Button

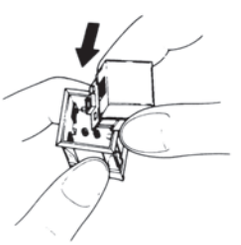
Align the groove on the button, the projection on the LED unit, and fit the button until click.



※ If it is not assembled properly, it may cause malfunction.

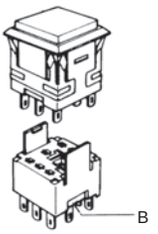
5. Fitting Light cartridge

Be sure to check the correct orienation and push in until click.



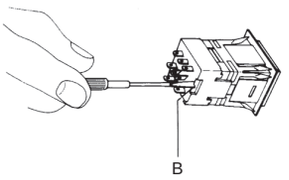
6. Installing Socket

Be sure to check the socket part B (metal plate) is down on both sides as shown below.
Align the Sunmulon mark on switch and socket, then insert the switch until it stops.



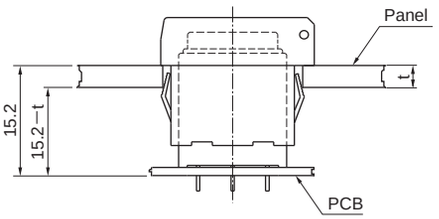
7. Removing Socket

Push up both sides of the socket part B (metal plate) by flathead screwdriver, then pull out the socket.

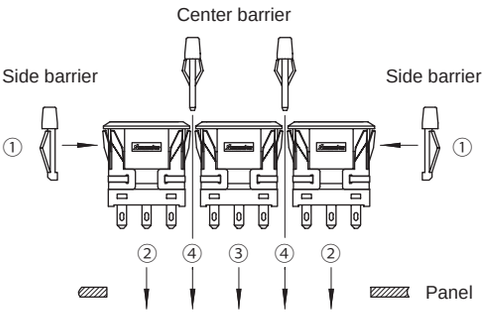


8. Installing Guard cover without Flange

The installation is as shown below.

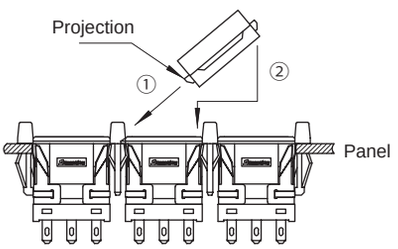


9. Installing Barriers for Retrofittable guard cover



※ Bew sure to remove the light cartridge before installation.
After setting the side barrier① on the housing with the light cartridge removed②, and insert it into the panel cut-out. Insert the housing③ into the panel cut-out. Finally, insert the center barrier between the housing④.

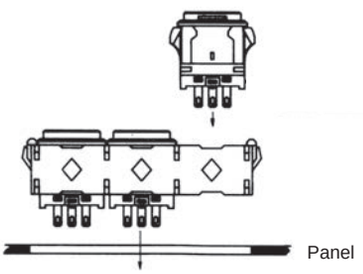
10. Installing Retrofittable guard cover



Place projection of the guard cover in the hole in the barrier on one side at a time and install it.
Be sure to chech the correct orientation of the housing and the light cartridge, then push in until click.

※ Note that the switch is activated when installing the light cartridge.

11. Installing Matrix fitting frame

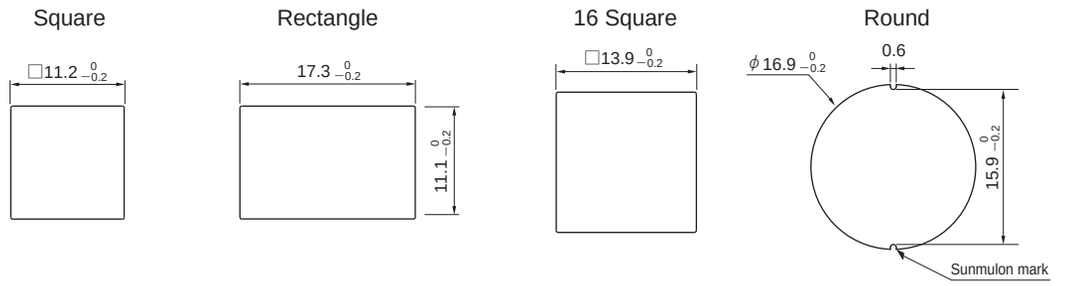


After inserting the switches into the matrix fitting frame, and then into the panel cut-out.

※ Cannot be used with barrier and guard cover.

PRECAUTIONS FOR CORRECT USE

1. Solder quickly and correctly at 350℃ 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 tightening torque of the mounting nut when attaching to the panel should be 0.6 N･m or less.
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 below.
5. Do not touch the backside of the light cartridge with your hands and be careful not to attach dust.



※ 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.

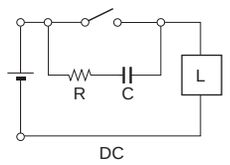
(4) Do not place heavy objects on the switch.

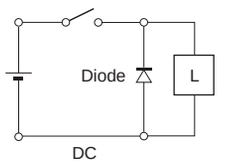
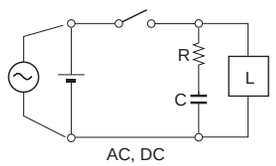
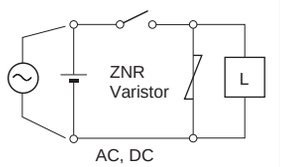
(5) Do not operate or use the housing (switch unit) by itself. Use the switch with assembled the illuminated part (LED module or button).

(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.

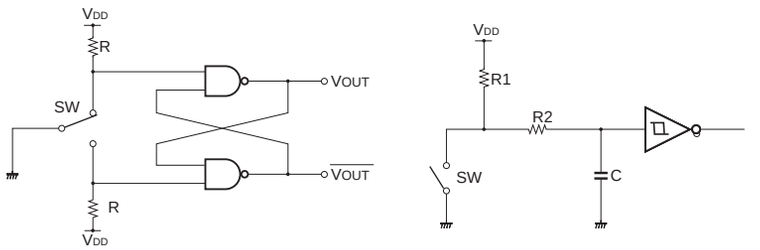
(7) Do not use the switch under loads that exceed the rated switching capacity or other contact ratings. Doing so may result in welding of the contact, or burnout accidents.

(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>

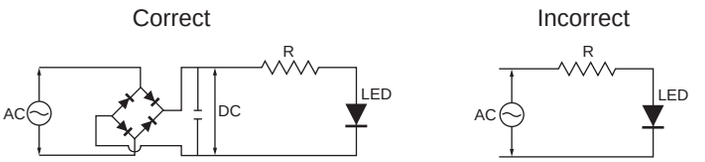
(9) Following circuits show examples of an anti-chattering circuit.



(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.

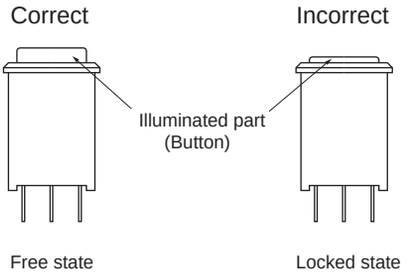
(f) After wiring is completed, maintain an appropriate insulation distance.

(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.