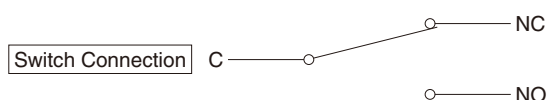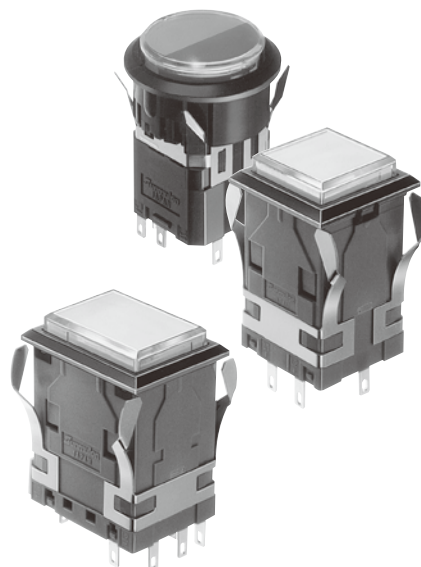# WH Lighted Pushbutton Switch

Only 35mm depth behind panel with built-in resistor

**Reliable Push-Feeling and valiable illumination
Full-Face, Split-Face(2, 3, 4).**

■ FEATURES

- Depth behind panel : Only 35mm
- LED Full-Face, Split-Face(2, 3, 4) Illumination available.
- Built-in resistor for 5V, 12V, 24V use.
- Light Cartridge is removable from front panel.
- Button Size: 19mm square type, 19×26mm rectangular type, 25Φ round type available.
- Precision-snap action switch movement with coil spring assures long life and outstanding tactile feedback. Silver Contact(Gold-Plated) and W/E Alloy #1 Cross-bar Contact provided.
- Accessories: Barriers, Guard Cover, Dust-Proof Cover, etc.

Switch Connection   C — NC / NO

SPECIFICATIONS

Contact	Silver Contact	W/E Alloy #1 Cross-bar Contact
Electrical Rating	AC125V, 250V 5A (Resistive)	AC125V 0.1A, DC30V 0.1A(Resistive)
Insulation Resistance	More than 100MΩ at 500V DC	
Dielectric Strength	1000V AC RMS between NC and NO terminal 2000V AC RMS between terminals and ground 50/60Hz for 60sec. At normal ambient temperature and humidity	600V AC RMS between NC and NO terminal 2000V AC RMS between terminals and ground 50/60Hz for 60sec. At normal ambient temperature and humidity
Contact Resistance	Less than 30mΩ (Initial) at DC6V 1A	Less than 50mΩ (Initial) at DC6V 1A
Mechanical Life	Momentary Action : more then 1,000,000 operations	Alternate Action : more than 200,000 operations
Electrical Life	More than 50,000 operations at max. rated load	More than 100,000 operations at max. rated load
Ambient Temperature	−15°C to +50°C	
Ambient Humidity	80% RH (max.)	

OPERATING CHARACTERISTICS

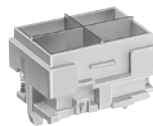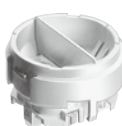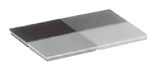| Operating Force (max.)	8.33N	Total Travel (max.)	3.2mm

WH

STRUCTURE

LIGHT CARTRIDGE

LED Illumination
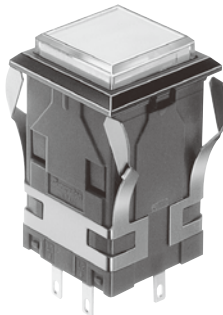
BUTTON (Clear)

LEGEND PLATE (Clear)

COLOR FILTER
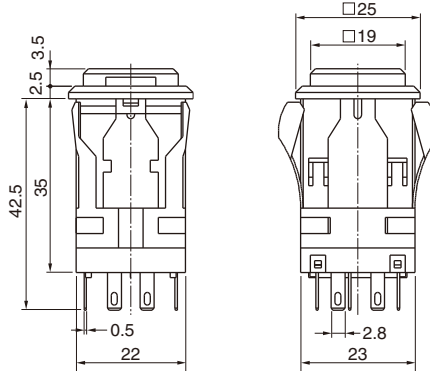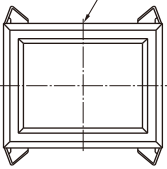
CARTRIDGE BASE (LED mounted)
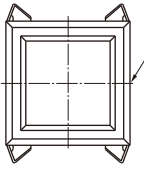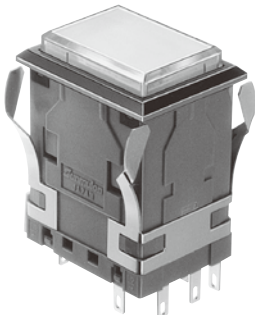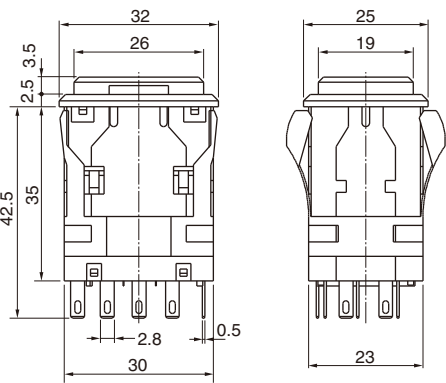
HOUSING

DIMENSIONS

19mm Square Button

□25
□19
3.5
2.5
42.5
35
0.5
22
2.8
23

Sunmulon Mark
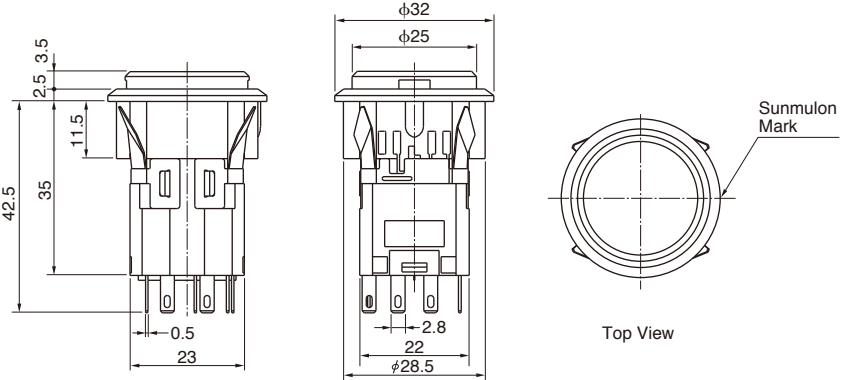
Top View

19×26mm Rectangular Button

32
26
25
19
3.5
2.5
42.5
35
2.8
0.5
30
23

Sunmulon Mark
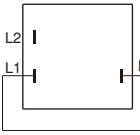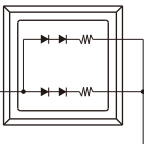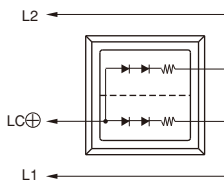
Top View

Tolerance : ±0.4mm
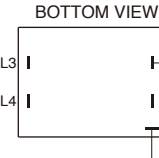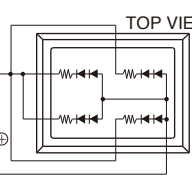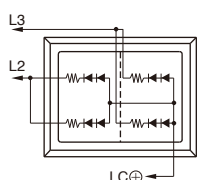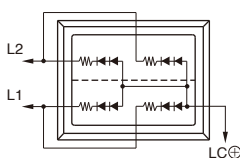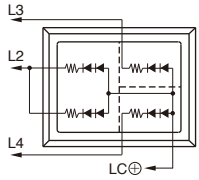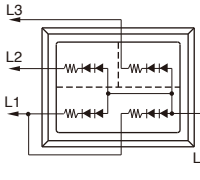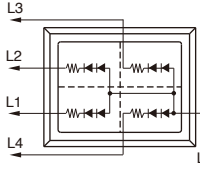
DIMENSIONS

Φ25mm Round Button

φ32
φ25
2.5 3.5
11.5
42.5
35
0.5
23
2.8
22
φ28.5

Sunmulon Mark

Top View

INTERNAL CONNECTION ARRANGEMENTS

● **LED ILLUMINATION**

		Full Face	Split Face
Square	**5V**	BOTTOM VIEW / TOP VIEW L2 L1 LC⊕	L2 / LC⊕ / L1
	12V	L2 L1 LC⊕	L2 / LC⊕ / L1
	24V	L2 L1 LC⊕	L2 / LC⊕ / L1

		Full Face	2-Split, Vertical	2-Split, Horizontal
Rectangular	**5V**	BOTTOM VIEW / TOP VIEW L3 L4 L2 L1 LC⊕	L3 / L2 / LC⊕	L2 / L1 / LC⊕

		3-Split, Vertical	3-Split, Horizontal	4-Split
		L3 / L2 / L4 / LC⊕	L3 / L2 / L1 / LC⊕	L3 / L2 / L1 / L4 / LC⊕

Tolerance : ±0.4mm

WH

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● **LED ILLUMINATION**

		Full Face	2-Split, Vertical	2-Split, Horizontal
Rectangular	**12V**	BOTTOM VIEW / TOP VIEW L3 L4 L2 L1 LC⊕	L3 L2 LC⊕	L3 L4 LC⊕
		3-Split, Vertical	**3-Split, Horizontal**	**4-Split**
		L3 L2 L4 LC⊕	L3 L2 L1 LC⊕	L3 L2 L1 L4 LC⊕
		Full Face	**2-Split, Vertical**	**2-Split, Horizontal**
	24V	BOTTOM VIEW / TOP VIEW L3 L4 L2 L1 LC⊕	L3 L2 LC⊕	L3 L4 LC⊕
		3-Split, Vertical	**3-Split, Horizontal**	**4-Split**
		L3 L2 L4 LC⊕	L3 L2 L1 LC⊕	L3 L2 L1 L4 LC⊕

		Full Face	2-Split, Horizontal	3-Split, Vertical
Round	**5V**	BOTTOM VIEW / TOP VIEW L4 L3 LC⊕ L1 L2	L3 L2 LC⊕	L4 L2 LC⊕ L1
		3-Split, Horizontal	**4-Split**	
		L4 L3 L2 LC⊕	L4 L3 L2 LC⊕ L1	

INTERNAL CONNECTION ARRANGEMENTS

● **LED ILLUMINATION**

		Full Face	2-Split, Horizontal	3-Split, Vertical
Round	**12V**	BOTTOM VIEW / TOP VIEW L4 L3 LC⊕ L1 L2	L3 L2 LC⊕	L4 L2 LC⊕ L1

3-Split, Horizontal
L4
L3
L2
LC⊕

4-Split
L4
L3
L2
LC⊕
L1

		Full Face	2-Split, Horizontal	3-Split, Vertical
	24V	BOTTOM VIEW / TOP VIEW L4 L3 LC⊕ L1 L2	L3 L2 LC⊕	L4 L2 LC⊕ L1

3-Split, Horizontal
L4
L3
L2
LC⊕

4-Split
L4
L3
L2
LC⊕
L1

WH
Sunmulon

TERMINALS

● TERMINALS LAYOUT

	STDP	DTDP	TTDP	INDICATOR
Square	BOTTOM VIEW			
Rectangular	BOTTOM VIEW			
Round	BOTTOM VIEW			

● TERMINALS DIMENSIONS (BOTTOM VIEW)

Square — 18.3, 6.6, 8.15, 8, 1.65, 6.5

Rectangular — 26, 6.7, 6.7, 8.15, 8, 1.65, 6.5, 5.7, 0.37, 5.95

Round — 1.65, 6.5, 8.15, 18.3, 6.6, 5.1, 8

TERMINAL SHAPE

#110 TAB-Soldering Terminal — 5.9, 2.5, 7.5, 1.2, 2.8, 0.5

LED DATA

● LED RATINGS

		Full Face			2-split Face						3-split Face						4-split Face			
Type																				
Voltage	Color	1	1	1	1	2	1	2	1	2	1	2	3	1	2	3	1	2	3	4
5V	Red	8	16	16	4	4	8	8	8	8	8	4	4	4	4	8	4	4	4	4
	Green	16	32	32	8	8	16	16	16	16	16	8	8	8	8	16	8	8	8	8
	Yellow	12	24	24	6	6	12	12	12	12	12	6	6	6	6	12	6	6	6	6
12V	Red	8	8	8	4	4	8	8	4	4	8	4	4	4	4	8	4	4	4	4
	Green	16	16	16	8	8	16	16	8	8	16	8	8	8	8	16	8	8	8	8
	Yellow	12	12	12	6	6	12	12	6	6	12	6	6	6	6	12	6	6	6	6
24V	Red	4	4	4	4	4	8	8	4	4	8	4	4	4	4	8	4	4	4	4
	Green	8	8	8	8	8	16	16	8	8	16	8	8	8	8	16	8	8	8	8
	Yellow	6	6	6	6	6	12	12	6	6	12	6	6	6	6	12	6	6	6	6

Current Rating (mA)

Tolerance : ±0.4mm

PANEL LAYOUT / PANEL CUT DIMENSIONS

● **19mm Square Button Type**

Panel Thickness 1mm~5mm

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent	25 / 25	$23.3^{+0.15}_{-0.1}$
	Serial	25 / $25n^{\pm0.5}$	$22.3+25(n-1)^{+0.15}_{-0.1}$
With Barriers	Independent	27 / 32.4	$23.3^{+0.15}_{-0.1}$
	Serial	27 / $32.4+26.2(n-1)^{\pm1}$	$28.1+26.2(n-1)^{+0.15}_{-0.1}$

※ Vertical Serial Mounting is impossible for 19mm Square Button type.

● **19×26mm Rectangular Button**

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent (Vertical)	32 / 25	$30.3^{+0.15}_{-0.1}$
	Serial (Vertical)	32 / $25n^{\pm0.5}$	$23.3+25(n-1)^{+0.15}_{-0.1}$
	Independent (Horizontal)	25 / 32	$23.3^{+0.15}_{-0.1}$
	Serial (Horizontal)	25 / $32n^{\pm0.5}$	$30.3+32(n-1)^{+0.15}_{-0.1}$

n : number of switches
Tolerance : ±0.4mm

WH

PANEL LAYOUT / PANEL CUT DIMENSIONS

● **19×26mm Rectangular Button Type**　　　　Panel Thickness 1mm~5mm

		Panel Layout	Panel Cut Dimensions
With Barriers	**Independent (Vertical)**	34 / 32.4	$30.3^{+0.15}_{-0.1}$ / $28.1+26.2(n-1)^{+0.15}_{-0.1}$
	Serial (Vertical)	34 / $32.4+26.2(n-1)^{\pm1}$	
	Independent (Horizontal)	27 / 39.4	$23.3^{+0.15}_{-0.1}$ / $35.1+33.2(n-1)^{+0.15}_{-0.1}$
	Serial (Horizontal)	27 / $39.4+33.2(n-1)^{\pm1}$	

※ In case of Vertical Serial Mounting, please add suffix no. 011 after the order code.

n : number of switches

● In case of block mounting, leave space between arrays as a figure.

Square	Square, with barriers	Rectangular	Rectangular, with barriers
more than 3mm / more than 6mm	2 / more than 6mm / more than 6mm	※more than 3mm / more than 6mm	2 / more than 6mm / more than 6mm

● **φ25mm Round Button Type**　　　　Panel Thickness 1mm~5mm

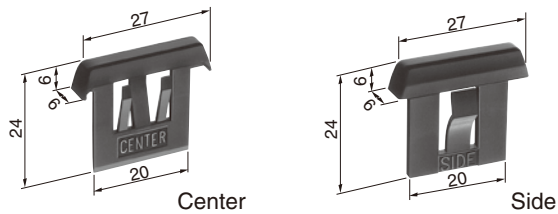| Panel Layout	Panel Cut Dimensions
min.32 / min.32 / min.32	$\phi29^{+0.2}_{-0}$ / R3.2 / $R15^{+0.2}_{-0}$ / min.32 / Sunmulon Mark / min.32 / min.32

Tolerance : ±0.4mm

ACCESSORIES

BARRIERS (Square/Rect.)

In case of mounting switches in series, Barriers can be used to prevent inadvertent pushing neighbor switch.

● Short Barrier

Center

Side

PART NO.		
Short Barrier		
	Center Barrier	Side Barrier
Black	WH-0738-K	WH-0739-K
Gray	WH-0738-G	WH-0739-G

● Long Barrier (For Rectangular long side)
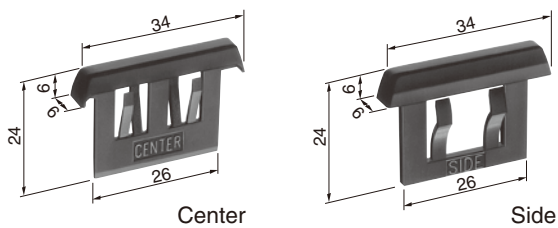
Center

Side
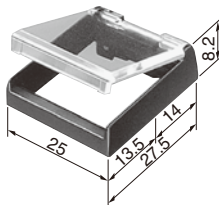
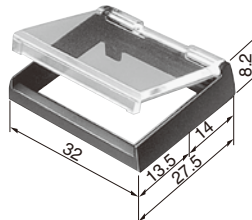| PART NO.		
Long Barrier		
	Center Barrier	Side Barrier
Black	WH-0741-K	WH-0740-K
Gray	WH-0741-G	WH-0740-G

GUARD COVER (Square/Rect.)

Guard Cover prevents inadvertent and unintentional operations. It is impossible to use with Barriers.

● 19mm Square

● 19×26mm Rectangular

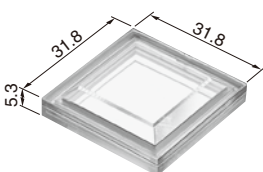| PART NO.		
	Square	Rectangular
Black	WH-0781-K	WH-0782-K
Gray	WH-0781-G	WH-0782-G

※ The cover opens 90° and returns by spring force. In case of serial mounting (horizontal mounting only), panel cut dimension to be same as "without barriers".
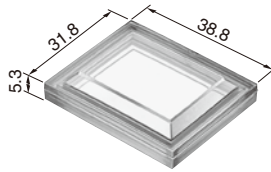
※ In case of Guard Cover use, please select type of "without frange".
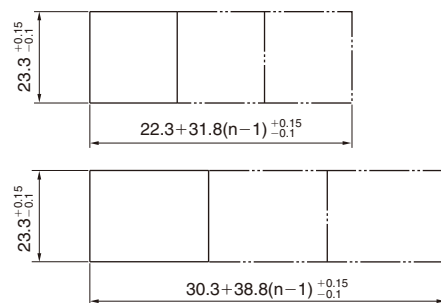
Dust-Proof Cover (Square/Rect.)

● 19mm Square

● 19×26mm Rectangular

● Panel Cut Dimensions

$23.3 ^{+0.15}_{-0.1}$

$22.3 + 31.8(n-1) ^{+0.15}_{-0.1}$

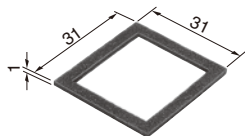$23.3 ^{+0.15}_{-0.1}$

$30.3 + 38.8(n-1) ^{+0.15}_{-0.1}$

n : number of switches
Panel Thickness 1mm~4.5mm

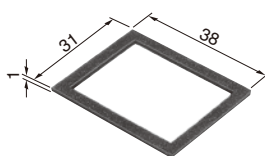※ In case of Oil&Water-Proof cover(IP63), plase also use gum packing sheet.(please see next page)

Tolerance : ±0.4mm

WH

Sunmulon

● 19mm Square

31
31
1

● 19×26mm Rectangular

31
38
1

PART NO.		
	Square	Rectangular
Dust-Proof Cover	WH-0783	WH-0784
Rubber Packing	WH-0767	WH-0768

REPLACEMENT PARTS

● **FILTER**

19mm Square

1

Square Full Face

2
2

Split Face

19×26mm Rectangular

3

Rectangular Full Face

4	4

2-Split (V)

5
5

2-Split (H)

4	6
	6

3-Split (V)

6	6
5	

3-Split (H)

6	6
6	6

4-Split

φ25 Round Button Type

7

Round Full Face

8
8

2-Split (H)

8	9
	9

3-Split (V)

9	9
8	

3-Split (H)

9	9
9	9

4-Split

※ **Please refer No. of figures and following chart.**

No	1	2	3	4	5	6	7	8	9
Type	Square Full Face	Split Face	Rectangular Full Face	2-Split (V)	2-Split (H)	4-Split	Round Full Face	2-Split (H)	4-Split
Red	WH-0705-R	WH-0713-R	WH-0706-R	WH-0715-R	WH-0714-R	WH-0716-R	WH-2349-RR	WH-2350-RR	WH-2351-RR
Green	WH-0705-G	WH-0713-G	WH-0706-G	WH-0715-G	WH-0714-G	WH-0716-G	WH-2349-GG	WH-2350-GG	WH-2351-GG
Yellow	WH-0705-Y	WH-0713-Y	WH-0706-Y	WH-0715-Y	WH-0714-Y	WH-0716-Y	WH-2349-YY	WH-2350-YY	WH-2351-YY
Milky-White	WH-0705-M	WH-0713-M	WH-0706-M	WH-0715-M	WH-0714-M	WH-0716-M	WH-2349-MM	WH-2350-MM	WH-2351-MM

ORDERING CODE Ⅰ

LED Illumination

WH☐ － ☐☐ 1234 C☐ 1234 P☐

● **OPERATION**

M	Momentary
A	Alternate
L	Indicator

● **CONTACT**

0	Indicator	
1	SPDT Silver	
2	DPDT Silver	
5	SPDT W/E Alloy #1Crossbar	
6	DPDT W/E Alloy #1Crossbar	
7	TPDT Silver	(Rectangular Only)
9	TPDT W/E Alloy #1Crossbar	(Rectangular Only)

2,3 or 4 sprit-face:
Simultaneous lighting is possible except all green LED type with 12V or 24V.

● **BUTTON SHAPE-ILLUMINATION TYPE**

S0	Square Full Face
W0	Rect. Full Face
R0	Round Full Face
S2	Square 2-Split Face
W1	Rect. 2-Split Face (Vert.)
W2	Rect. 2-Split Face (Horiz.)
R2	Round 2-Split Face
W5	Rect. 3-Split Face (Vert.)
R5	Round 3-Split Face (Vert.)
W6	Rect. 3-Split Face (Horiz.)
R6	Round 3-Split Face (Horiz.)
W7	Rect. 4-Split Face
R7	Round 4-Split Face

● **Supply Voltage to LED**

1	5V	Built-in Resistor
2	12V	Built-in Resistor
3	24V	Built-in Resistor

● **FILTER COLOR**

1	Red	Full Face : Put color no. into the frame 1
2	Green	2-Split Face : Put color no. into the frame 1,2
※ 3	Yellow	3-Split Face : Put color no. into the frame 1,2,3
4	Milk-White	4-Split Face : Put color no. into the frame 1,2,3,4
×		Without Filter

● **Frange / Housing Color**

K	Black
H	Gray
×	Without Frange

Note:
1. Put frange color for Square/Rect. type and housing color for Round type.
2. In case of Guard Cover use, please select type of "without frange"

● **LED COLOR**

70	Red	Full Face : Put color no. into the frame 1
80	Green	2-Split Face : Put color no. into the frame 1, 2
※ 90	Yellow	3-Split Face : Put color no. into the frame 1, 2 ,3
		4-Split Face : Put color no. into the frame 1, 2, 3, 4

※ Please be noted that the color of "Yellow" for LED, Filter is actually "Orange Yellow" not Lemon Yellow.

◆ **Note:**

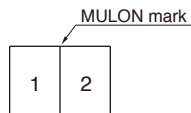1) In case of Split-Face, LED and Filter color location should be specified as follow:
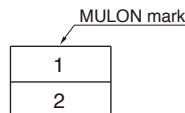
Square
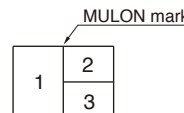
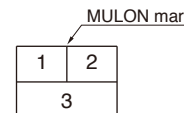Square 2-Split Face

Rectangular

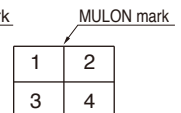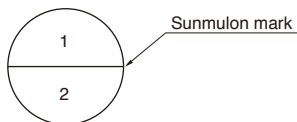Rect. 2-Split Face (Vert.) Rect. 2-Split Face (Horiz.) Rect. 3-Split Face (Vert.) Rect. 3-Split Face (Horiz.) Rect. 4-Split Face
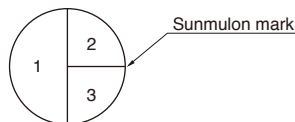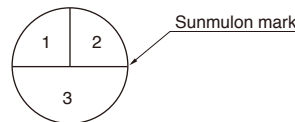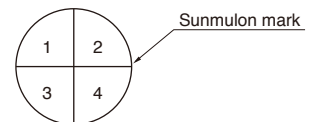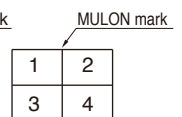

Round

Round 2-Split Face Round 3-Split Face (Vert.) Round 3-Split Face (Horiz.) Round 4-Split Face

WH

sunmulon

LED Illumination

WH — ☐ ☐ — | 1 | (Full Face)
| 1 | 2 | (2-Split Face)
| 1 | 2 | 3 | (3-Split Face)
| 1 | 2 | 3 | 4 | (4-Split Face) ※1) — | 1 | (Full Face)
| 1 | 2 | (2-Split Face)
| 1 | 2 | 3 | (3-Split Face)
| 1 | 2 | 3 | 4 | (4-Split Face) ※2) ☐

● **BUTTON SHAPE**

R	25 Round
S	19 Square
W	19×26 Rect.

● **ILLUMINATION TYPE**

1	Full Face Mono color
2	Round, Square 2-Split Face
3	Rect. 2-Split Face (Vert.)
4	Rect. 2-Split Face (Horiz.)
5	Round, Rect. 3-Split Face (Vert.)
6	Round, Rect. 3-Sprit Face (Horiz.)
7	Round, Rect. 4-Sprit Face

2,3,4-Sprit Face :Simultaneous lighting isi possible except all green LED type with 12V or 24V.

● **LED COLOR**

70	Red
80	Green
※ 90	Yellow

Full Face: Put color no. into the frame 1
2-Split Face: Put color no. into the frame 1, 2
3-Split Face: Put into color no. into the frame 1, 2, 3
4-Split Face: Put color no. into the frame 1, 2, 3, 4

● **FILTER COLOR**

R	Red
G	Green
※ Y	Yellow
M	Milk-White
X	Without Filter

Full Face: Put color no. into the frame 1
2-Split Face: Put color no. into the frame 1, 2
3-Split Face: Put into color no. into the frame 1, 2, 3
4-Split Face: Put color no. into the frame 1, 2, 3, 4

※ Please be noted that the color of "Yellow" for LED, Filter is actually "Orange Yellow" not Lemon Yellow.

● **Supply Voltage to LED**

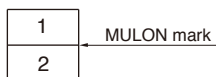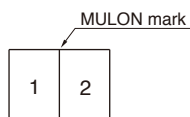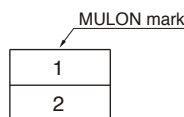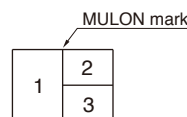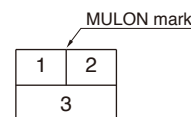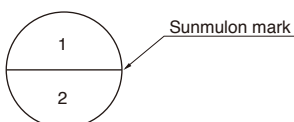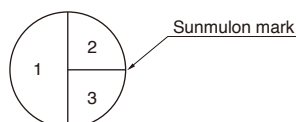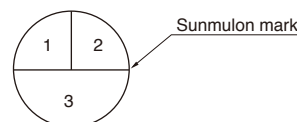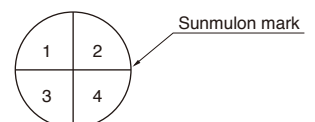| 1	5V Built-in Resistor
2	12V Built-in Resistor
3	24V Built-in Resistor

Note: In case of Indicator, please change top of ordering code WH to WL.
It is difference structure of illumination parts between WH (switch) and WL (Indicator).

Indicator type: **WL** — ☐☐ — ☐ ☐ ☐ ☐ ☐ ☐

Note: In case of Split-Face, LED and Filter color location should be specified as follow:

Square

Square 2-Split Face

1
2	← MULON mark

Rectangular

Rect. 2-Split Face (Vert.) — MULON mark
| 1 | 2 |

Rect. 2-Split Face (Horiz.) — MULON mark
| 1 |
| 2 |

Rect. 3-Split Face (Vert.) — MULON mark
| 1 | 2 |
| | 3 |

Rect. 3-Split Face (Horiz.) — MULON mark
| 1 | 2 |
| | 3 |

Rect. 4-Split Face — MULON mark
| 1 | 2 |
| 3 | 4 |

Round

Round 2-Split Face — Sunmulon mark
1 / 2

Round 3-Split Face (Vert.) — Sunmulon mark
1 / 2 / 3

Round 3-Split Face (Horiz.) — Sunmulon mark
1 / 2 / 3

Round 4-Split Face — Sunmulon mark
1 / 2 / 3 / 4

ORDERING CODE II

Housing

WH□－□□□－S

● **OPERATION**

M	Momentary
A	Alternate
L	Indicator

● **CONTACT**

0	Indicator	
1	SPDT Silver	
2	DPDT Silver	
5	SPDT W/E Alloy #1Crossbar	
6	DPDT W/E Alloy #1Crossbar	
7	TPDT Silver	(Rectangular Only)
9	TPDT W/E Alloy #1Crossbar	(Rectangular Only)

● **Frange / Housing Color**

K	Black
H	Gray
✕	Without Frange

Note:
1. Put frange color for Square/Rect. type and housing color for Round type.
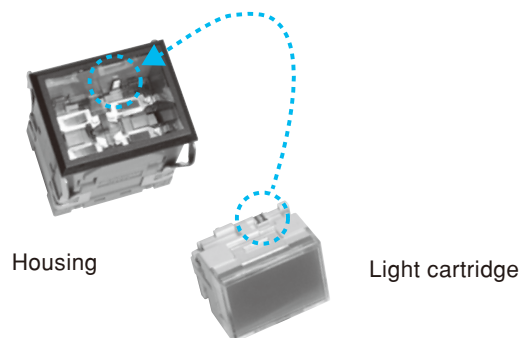2. In case of Guard Cover use, please select type of "without frange"

● **Frange Shape**

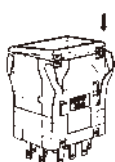| R	25 Round
S	19 Square
W	19✕26Rect.

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ASSEMBLY & DISASSEMBLY

1. Fitting Light cartridge

Insert Light cartridge into Housing with correct position of metal fittings as shown.
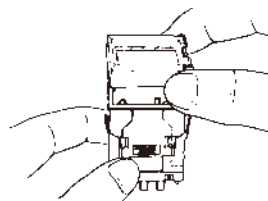
Housing　　　　　　Light cartridge

2. Installing Flange (Square / Rect.)

Attach the flange, aligning the groove on the flange with the protruding portions on the Housing.
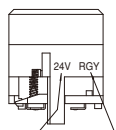Fit the flange as shown until click.
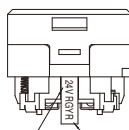
5. Installing Guard Cover(Square / Rect.)

Attach the Guard Cover, aligning the groove on the Guard Cover with the protruding portions on the Housing.
Fit the Guard Cover as shown until click.

3. Indicating Supply voltage to LED and LED color
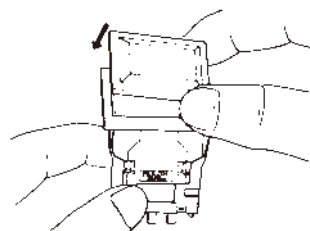
19 square
19×26 Rect.

φ25　round

24V　RGY

24V RGY R

Supply voltage to LED　　LED Color　　Supply voltage to LED　　LED Color

DC voltage supply rating to LED is shown on the side of Light cartridge.

4. Installing Barriers(Square / Rect.)

① Switch(Independent mounting)
Set side barrier on the side of switch Housing, then insert it into the panel.

Side barrier

② Switches (Serial muonting)
Insert switches with side barrier into the panel, then install center barrier between switches.
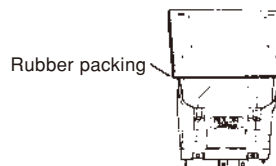
Center barrier

6. Installing Dust-Proof Cover(Square / Rect.)

（1） Dust-Proof Cover

Put the switch through the frame cover, and mount on panel. Afterwards install soft cover accordingly.
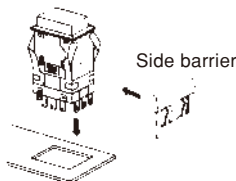
（2） Oli and Water-Proof Cover

Rubber packing

In case of Oil and Water-tight use, please apply rubber packing between panel and frame cover.