# Sunmulon

WH

WH Illuminated 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.
- Precision-snap action switch movement with coil spring assures long life and outstanding tactile feedback. Silver Contact(Gold-Plated) and Cross-bar Contact provided.
- Accessories: Barriers, Guard Cover, Dust-Proof Cover, etc.

Switch Connection C ——— NC / NO
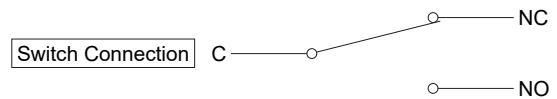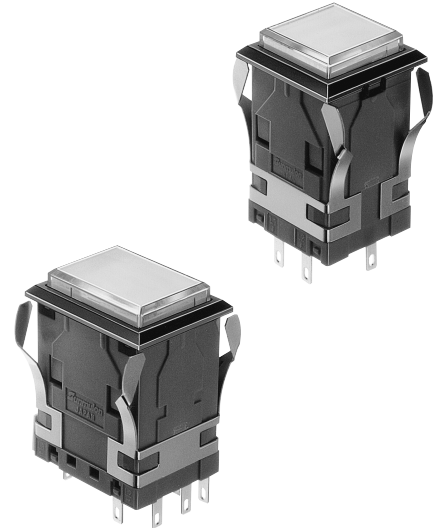
Note : UL certification has been obtained for the Switch unit (LIGHT CARTRIDGE with HOUSING).

SPECIFICATIONS

Contact	Silver Contact	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～50°C	
Ambient Humidity	80% RH (max.)	

OPERATING CHARACTERISTICS

Operating Force (MAX)	8.33N	Total Travel (mm MAX)	3.2

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STRUCTURE

LIGHT CARTRIDGE

BUTTON (Clear)

LEGEND PLATE (Clear)

COLOR FILTER

CARTRIDGE BASE (LED mounted)
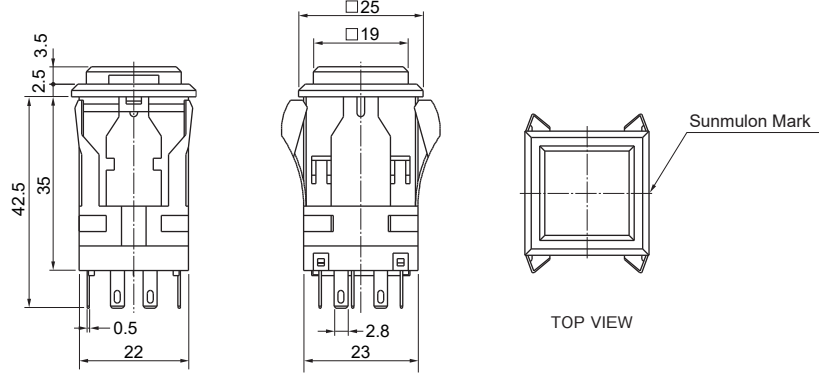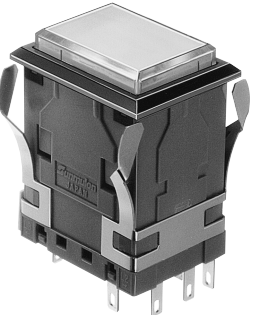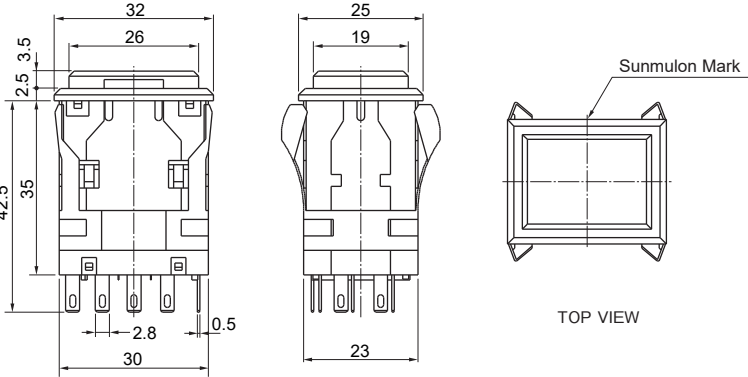
HOUSING

DIMENSIONS

19mm Square Button

□25
□19
2.5 3.5
42.5
35
0.5
22
2.8
23
Sunmulon Mark
TOP VIEW

19×26mm Rectangular Button

32
26
25
19
2.5 3.5
42.5
35
2.8
0.5
30
23
Sunmulon Mark
TOP VIEW

Tolerance : ±0.4mm

INTERNAL CONNECTION ARRANGEMENTS

● **LED ILLUMINATION**

		Full Face	Split Face
Square	5V	BOTTOM VIEW / TOP VIEW — Sunmulon mark — L2, L1, LC⊕	L2, LC⊕, L1
	12V	Sunmulon mark — L2, L1, LC⊕	L2, LC⊕, L1
	24V	Sunmulon mark — L2, L1, LC⊕	L2, LC⊕, L1
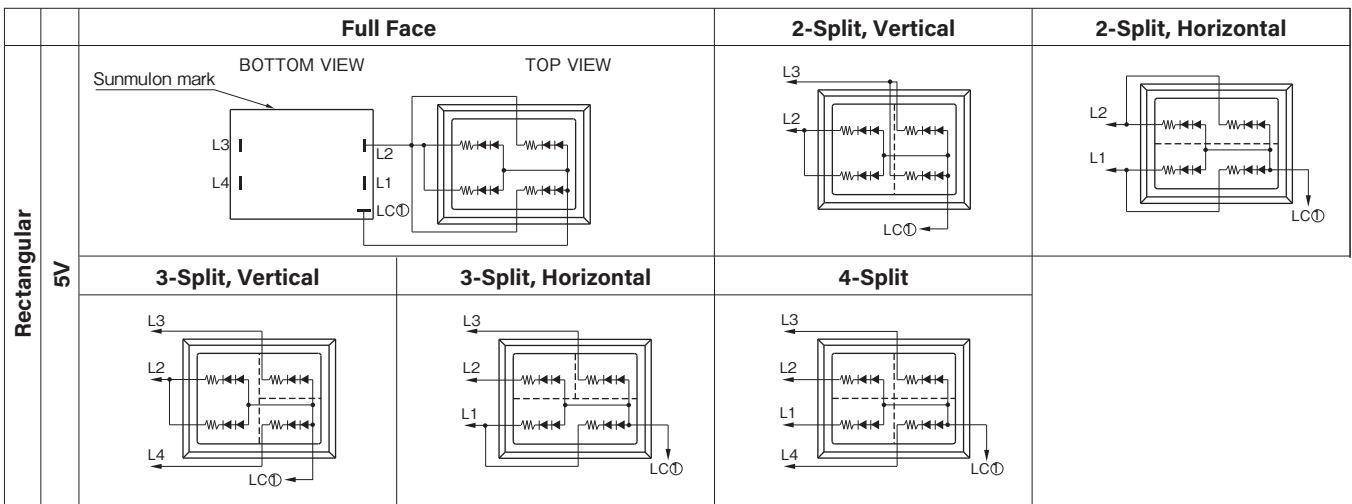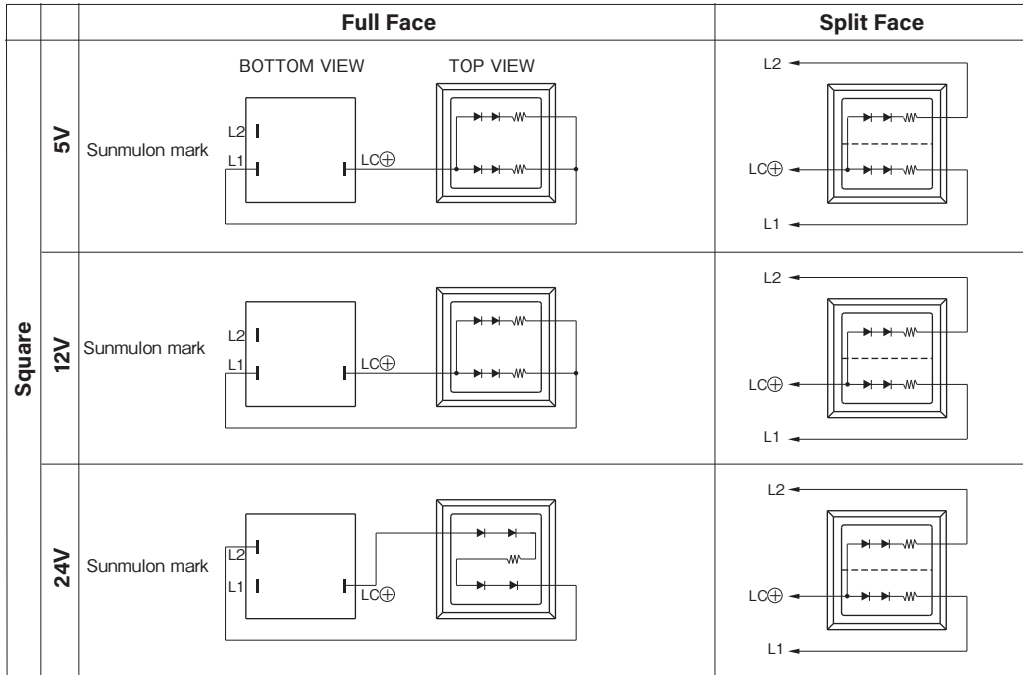
		Full Face	2-Split, Vertical	2-Split, Horizontal
Rectangular	5V	Sunmulon mark — BOTTOM VIEW / TOP VIEW — L3, L4, L2, L1, LC①	L3, L2, LC①	L2, L1, LC①

3-Split, Vertical	3-Split, Horizontal	4-Split
L3, L2, L4, LC①	L3, L2, L1, LC①	L3, L2, L1, L4, LC①

WH

INTERNAL CONNECTION ARRANGEMENTS

● LED ILLUMINATION

TERMINALS

● TERMINALS LAYOUT

	SPDT	DPDT	TPDT
Square	Sunmulon Mark — BOTTOM VIEW — L2, C, NC, L1, NO, LC+	L2, C, NC, NC, L1, NO, NO, LC+	
Rectangular	Sunmulon Mark — BOTTOM VIEW — L3, L4, C, L2, NC, L1, NO, LC+	L3, L4, C, C, NC, NC, NO, NO, L2, L1, LC+	L3, L4, C, C, C, NC, NC, NC, NO, NO, NO, L2, L1, LC+
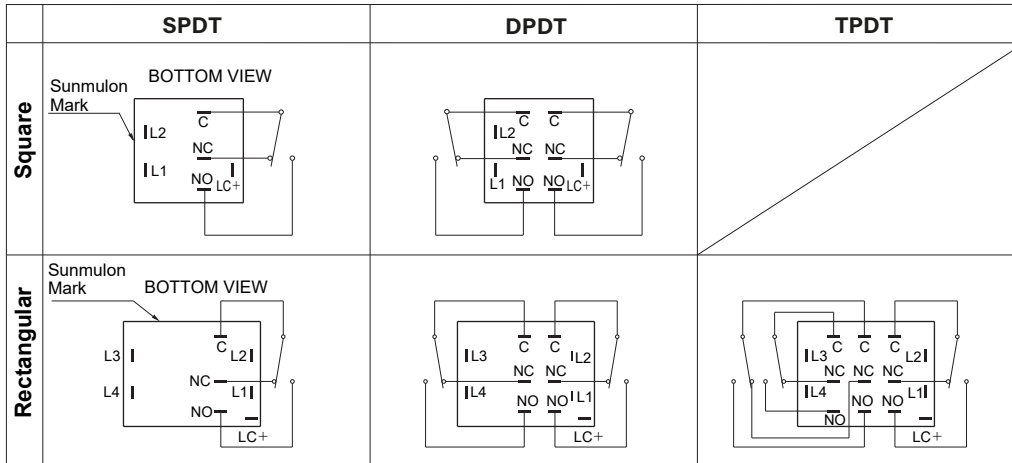
● TERMINALS DIMENSIONS (BOTTOM VIEW)

Square

18.3, 6.6, 8.15, 1.65, 6.5, 8, C, C, L1, NC, NC, L2, NO, NO, LC+
Sunmulon Mark

Rectangular

26, 6.7, 6.7, 8.15, 1.65, 6.5, 8, 5.7, 0.37, 5.95, C3, C2, C1, L3, L2, L1, NC3, NC2, NC1, NO3, NO2, NO1, L4, LC+
Sunmulon Mark

TERMINAL SHAPE

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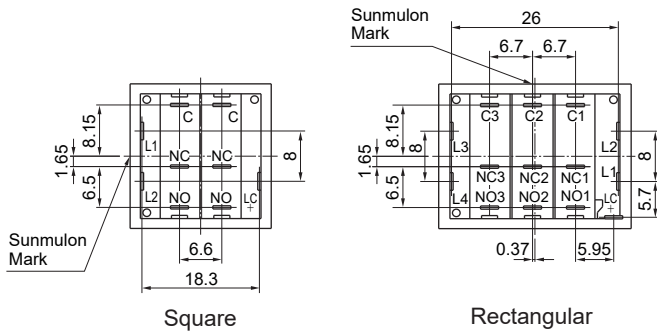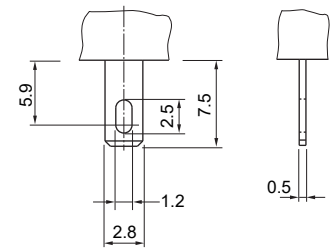
#110 TAB-Soldering Terminal

LED DATA

● LED RATINGS

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

Current Rating (mA)

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

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 / $32n^{\pm0.5}$	$30.3+32(n-1)^{+0.15}_{-0.1}$

※ In case of Serial (Vertical) mounting, please add 011 suffix to ordering code of switch.

※Panel Cut Dimension should be after panel paintings.

n : number of switches
Tolerance : ±0.4mm

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● **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 / $32.4+26.2(n-1)^{\pm1}$	※ In case of Serial (Vertical) mounting, please add 011 suffix to ordering code of switch.
	Independent (Horizontal)	27 / 39.4	$23.3^{+0.15}_{-0.1}$ / $35.1+33.2(n-1)^{+0.15}_{-0.1}$
	Serial (Horizontal)	27 / $39.4+33.2(n-1)^{\pm1}$	

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

※ more than 6mm : In case of Serial (Vertical) mounting.

Tolerance : ±0.4mm

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ACCESSORIES

BARRIERS (Square/Rect.)

In case of mounting switches in series, Barriers can be used to prevent inadvertent pushing neighbor switch.
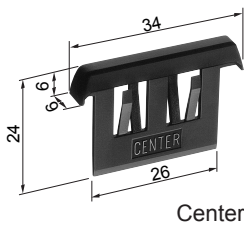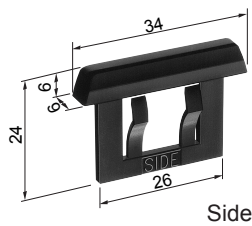
● Short Barrier
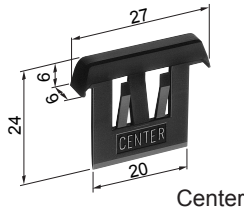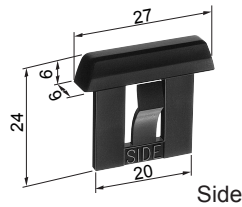
Center   Side

● Long Barrier (For Rectangular long side)
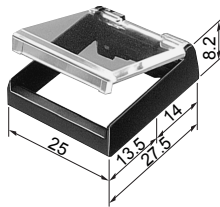

Center   Side

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

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.

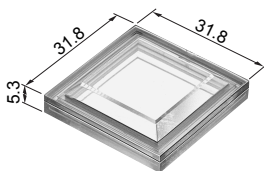● 19mm Square   ● 19×26mm Rectangular
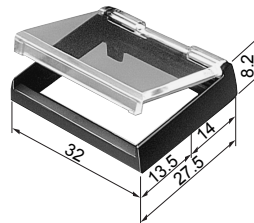
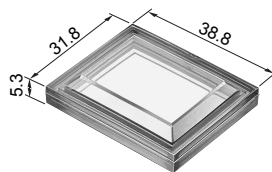| PART NO.		
	Square	Rectangular
Black	WH-0781-K	WH-0782-K
Gray	WH-0781-G	WH-0782-G

※ 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".
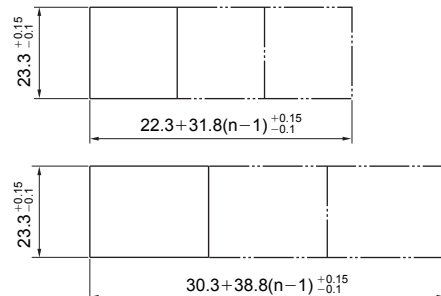
Dust-Proof Cover (Square/Rect.)

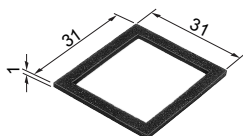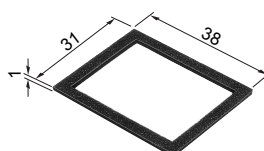● 19mm Square   ● 19×26mm Rectangular

✳ In case of Oil&Water-Proof usage (IP63), plase also use Rubber Packing sheet.

Rubber Packing sheet

● 19mm Square   ● 19X26mm 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

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

Tolerance : ±0.4mm

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● **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

※ Please refer No. of figures and following chart.

No	1	2	3	4	5	6
Type	Square Full Face	Split Face	Rectangular Full Face	2-Split (V)	2-Split (H)	4-Split
Red	WH-0705-R	WH-0713-R	WH-0706-R	WH-0715-R	WH-0714-R	WH-0716-R
Green	WH-0705-G	WH-0713-G	WH-0706-G	WH-0715-G	WH-0714-G	WH-0716-G
Yellow	WH-0705-Y	WH-0713-Y	WH-0706-Y	WH-0715-Y	WH-0714-Y	WH-0716-Y
Milky-White	WH-0705-M	WH-0713-M	WH-0706-M	WH-0715-M	WH-0714-M	WH-0716-M

ORDERING CODE Ordering as a Set ([Light Cartridge] + [Housing])

WH☐ - ☐☐ 1234 C☐ 1234 P☐

● OPERATION

M	Momentary
A	Alternate

● CONTACT

1	SPDT Silver	
2	DPDT Silver	
5	SPDT Crossbar	
6	DPDT Crossbar	
7	TPDT Silver	(Rectangular Only)
9	TPDT Crossbar	(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
S2	Square 2-Split Face
W1	Rect. 2-Split Face (Vert.)
W2	Rect. 2-Split Face (Horiz.)
W5	Rect. 3-Split Face (Vert.)
W6	Rect. 3-Split Face (Horiz.)
W7	Rect. 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
	X		Without Filter

● Frange Color

K	Black
H	Gray
X	Without Frange

Note:
※ 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:

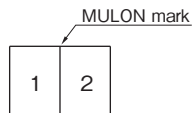1) In case of Split-Face, LED and Filter color location should be specified as follow:

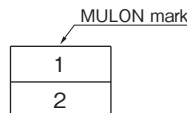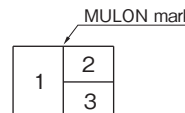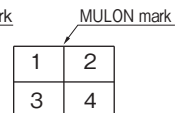| Square	Rectangular				
Square 2-Split Face	Rect. 2-Split Face (Vert.)	Rect. 2-Split Face (Horiz.)	Rect. 3-Split Face (Vert.)	Rect. 3-Split Face (Horiz.)	Rect. 4-Split Face

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Light Catridge

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

| S | 19 Square |
| W | 19×26 Rect. |

● ILLUMINATION TYPE

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

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

● LED COLOR ※1)

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
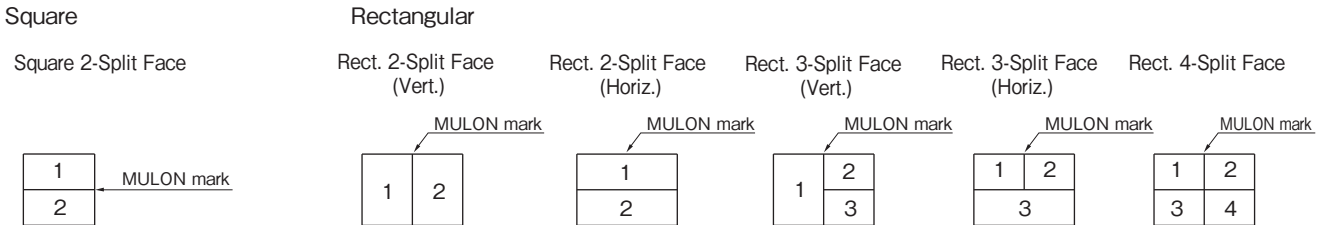
● FILTER COLOR ※2)

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 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 |

Housing

WH☐ — ☐☐☐ — S

● OPERATION

| M | Momentary |
| A | Alternate |

● CONTACT

1	SPDT Silver	
2	DPDT Silver	
5	SPDT Crossbar	
6	DPDT Crossbar	
7	TPDT Silver	(Rectangular Only)
9	TPDT Crossbar	(Rectangular Only)

● Frange Color

K	Black
G	Gray
X	Without Frange

Note:
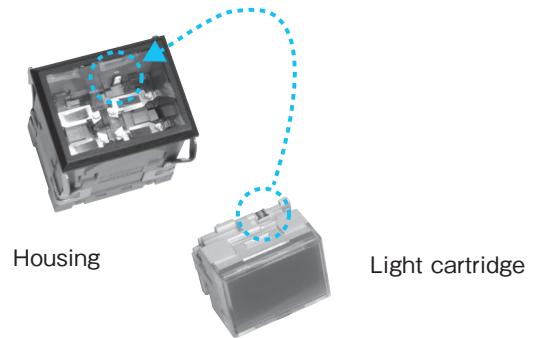※ In case of Guard Cover use, please select type of "without frange"

● Frange Shape

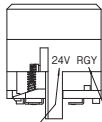| S | 19 Square |
| W | 19×26Rect. |

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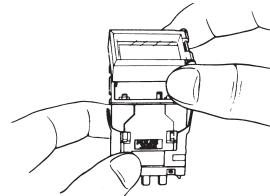
19 square
19×26 Rect.

24V RGY

Supply voltage to LED   LED Color

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

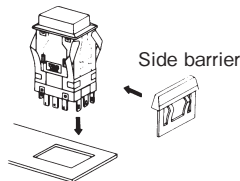### 4. Installing Guard Cover (Square / Rect.)

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.
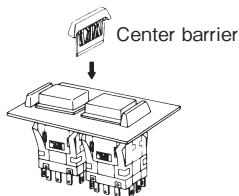
3. Installing Barriers (Square / Rect.)

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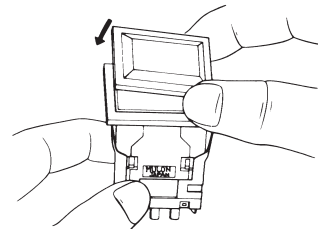
Side barrier

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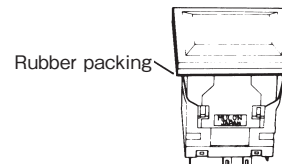
Center barrier

5. 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.