

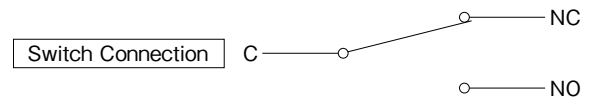
FH Miniature Lighted Pushbutton Switch

Only 19.8mm depth behind panel with built-in resistor

Built-in Resistor LED illumination makes free from wiring resistor.

■ FEATURES

- Depth behind panel : Only 19.8mm
- Full Face and Spot display type available.
- Built-in resistor for 5V,12V,24V use.
- Light Cartridge is removable from front panel.
- Button Size: 11.4mm square type, 11.4×16.4mm 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 Covers, Sockets, etc.



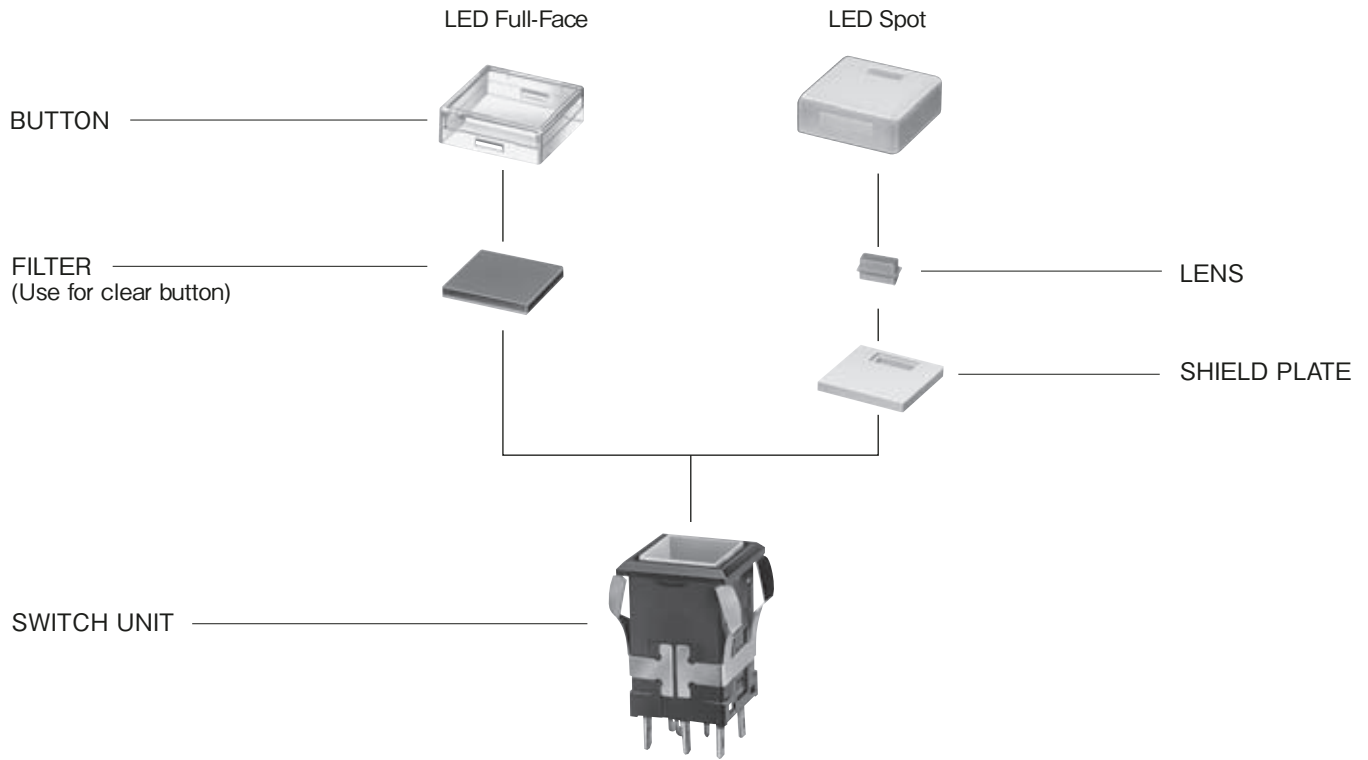
SPECIFICATIONS

Contact	Silver Contact (Gold-Plated)	Cross-bar Contact
Electrical Rating	AC125V,250V 5A(Resistive)	AC125V 0.1A, DC30V 0.1A(Resistive)
Insulation Resistance	More than 100M Ω at 500V DC	
Dielectric Strength	1000V AC RMS between NC and NO terminal 1500V AC RMS between terminals and ground 50/60Hz for 60sec. at normal ambient temperature and humidity	600V AC RMS between NC and NO terminal 1500V AC RMS between terminals and ground 50/60Hz for 60sec. at normal ambient temperature and humidity
Contact Resistance	Less than 30m Ω (Initial) at DC6V 1A	Less than 50m Ω (Initial) at DC6V 0.1A
Mechanical Life	Momentary Action :more than 500,000 operations Alternate Action : more than 200,000 operations	
Electrical Life	More than 30,000 operations at max. rated load	
Ambient Temperature	- 15 °C to +50 °C	
Ambient Humidity	80% RH (max.)	


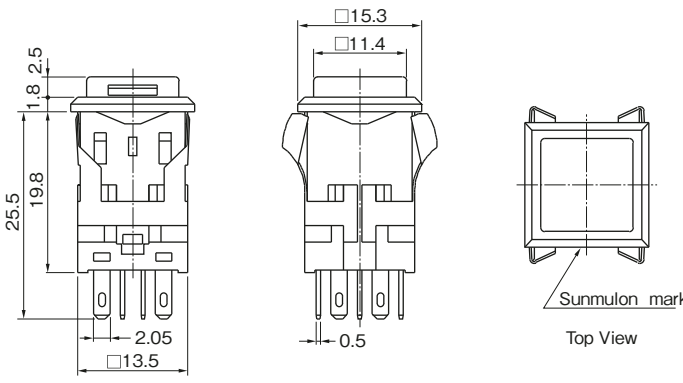

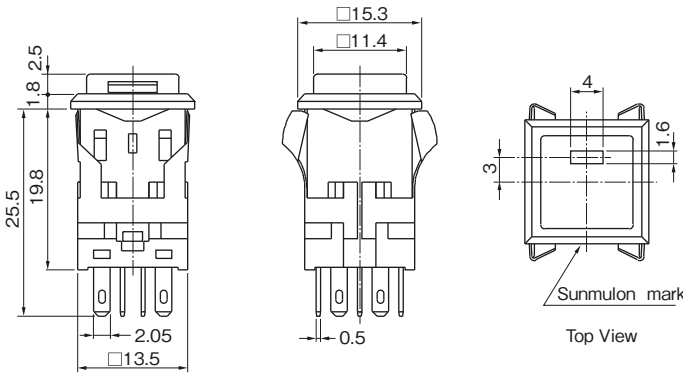
OPERATING CHARACTERISTICS

Operating Force (max.)	4.41N	Total Travel (max.)	2.5mm
------------------------	-------	---------------------	-------


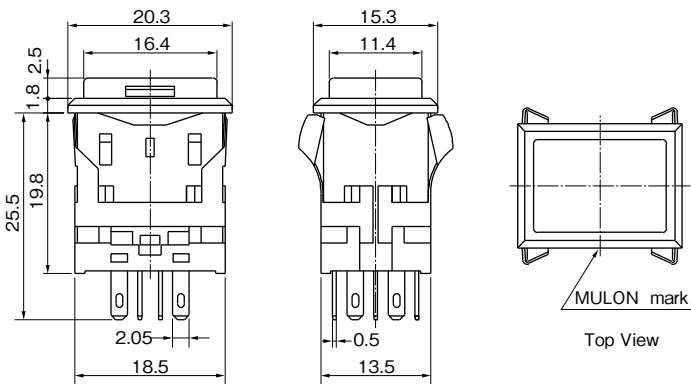

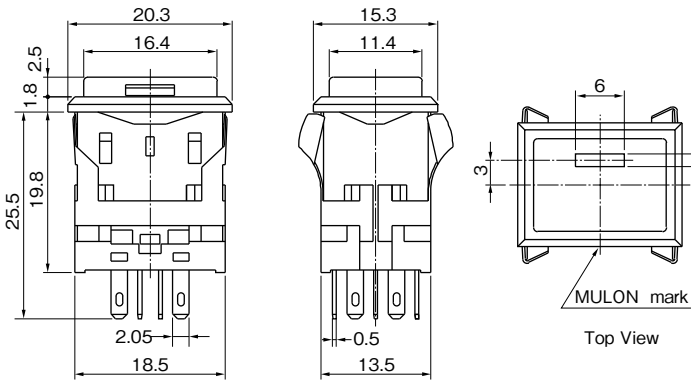
STRUCTURE



DIMENSIONS

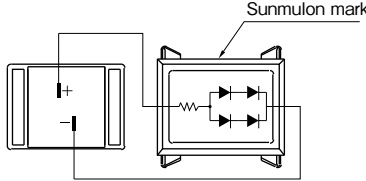
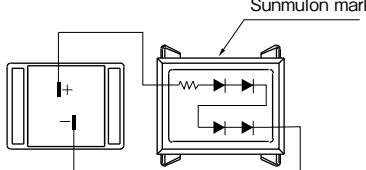
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">11.4mm Square Button (Full-Face)</p> 	 <p>Technical drawings for the 11.4mm Square Button (Full-Face) showing dimensions:</p> <ul style="list-style-type: none"> Front view: Total height 25.5, LED height 1.8, LED width 2.5, LED offset 19.8, LED width 13.5, LED offset 2.05. Side view: LED width 15.3, LED offset 11.4, LED offset 0.5. Top view: Sunmulon mark.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">11.4mm Square Button (Spot)</p> 	 <p>Technical drawings for the 11.4mm Square Button (Spot) showing dimensions:</p> <ul style="list-style-type: none"> Front view: Total height 25.5, LED height 1.8, LED width 2.5, LED offset 19.8, LED width 13.5, LED offset 2.05. Side view: LED width 15.3, LED offset 11.4, LED offset 0.5. Top view: Sunmulon mark, LED width 4, LED offset 1.6, LED offset 3.

DIMENSIONS

<p>11.4 × 16.4mm Rect. Button (Full-Face)</p> 	 <p>Dimensions: 20.3, 16.4, 1.8, 2.5, 25.5, 19.8, 2.05, 18.5, 15.3, 11.4, 0.5, 13.5. Top View: MULON mark.</p>
<p>11.4 × 16.4mm Rect. Button (Spot)</p> 	 <p>Dimensions: 20.3, 16.4, 1.8, 2.5, 25.5, 19.8, 2.05, 18.5, 15.3, 11.4, 0.5, 13.5. Top View: MULON mark, 6, 3, 1.6.</p>

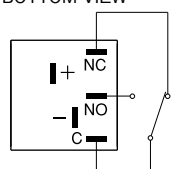
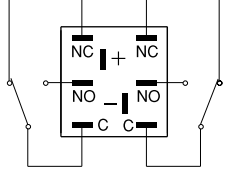
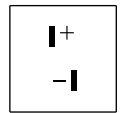
INTERNAL CONNECTION ARRANGEMENTS

● LED (Square, Rect.)

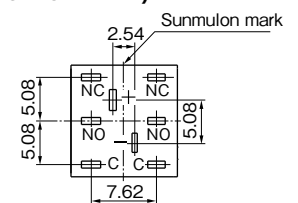
<p>5 V</p>	<p>Full-Face, Spot</p> 
<p>12 V 24 V</p>	

TERMINALS

● TERMINALS LAYOUT (Square, Rectangular)

<p>STDP</p> <p>BOTTOM VIEW</p> 	<p>DTDP</p> 	<p>INDICATOR</p> 
---	--	---

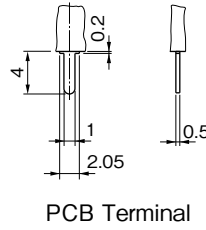
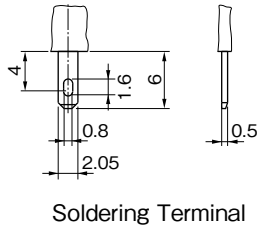
● TERMINALS DIMENSIONS (BOTTOM VIEW)



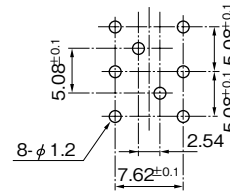
Tolerance : ±0.4mm

TERMINAL SHAPE

● TERMINAL SHAPE



● PCB HOLE DIMENSIONS (BOTTOM VIEW)



LED RATINGS

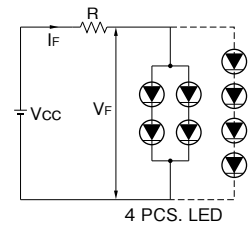
● LED RATINGS

	LED			
	DC5V(SERIES PARALLEL)		DC12, 24V (ALL SERIES)	
	Red, Yellow	Green	Red, Yellow	Green
Max. operating current I_{FM} (mA)	40	40	20	20
DC reverse voltage V_R (V)	10	10	20	20
Forward voltage V_F (V)	4	4.2	8	8.4
Recommended operating current I_F (mA)	15	25	8	13

※ In case of non-resistor type, suitable external current limiting resistors must be installed as shown by the table and formula.

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

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



PANEL LAYOUT/PANEL CUT DIMENSIONS

● 11.4mm Square Button

Panel thickness: 1mm ~ 3.2mm

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent		
	Serial (Horizontal) ※1		
	Serial (Vertical) ※2		

n : number of switches

PANEL LAYOUT/PANEL CUT DIMENSIONS

●11.4mm Square Button

Panel thickness : 1mm~3.2mm
 Panel thickness for Guard Cover use : 1mm~2.5mm

		Panel Layout	Panel Cut Dimensions
With Barriers	Independent		
	Serial (Horizontal)		
	Serial (Vertical)		
With Guard Covers	Independent		
	Serial (Horizontal)		

●11.4×16.4 Rect. Button

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent		
	Serial (Horizontal)		

n : number of switches
 Tolerance : ±0.4mm

PANEL LAYOUT/PANEL CUT DIMENSIONS

● 11.4mm×16.4mm Rectangular Button

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent		
	Serial (Vert.)		
With Barriers	Independent		
	Serial (Horiz.)		
	Independent		
	Serial (Vert.)		
With Guard Covers	Independent		
	Serial (Horiz.)		

n : number of switches
 Panel thickness : 1mm~3.2mm
 Panel thickness for Guard Cover use : 1mm~2.5mm
 Tolerance : ±0.4mm

PANEL LAYOUT / PANEL CUT DIMENSIONS

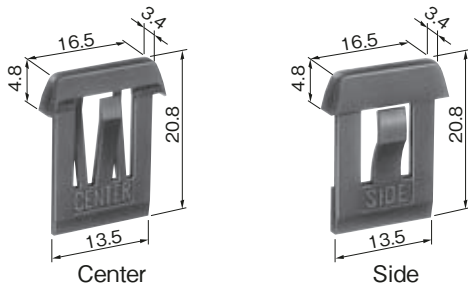
Without Barriers	With Barriers
<p>In case of block mounting, leave space between arrays as a figure.</p>	<p>In case of block mounting, leave space between arrays as a figure.</p>

ACCESSORIES

BARRIERS

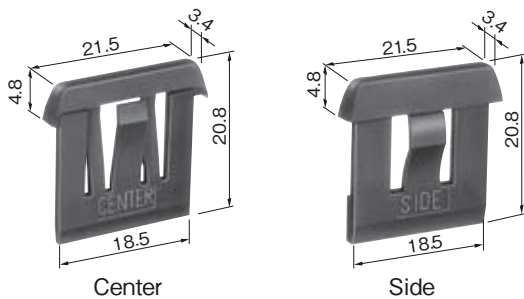
In case of mounting switches in series, barriers can be used to prevent inadvertent pushing neighbor switches.

● Short Barrier



PART NO.		
Color	Short Center Barrier	Short Side Barrier
Black	FH-592-K	FH-593-K
Gray	FH-592-G	FH-593-G

● Long Barrier (For Rectangular, Longer Side)

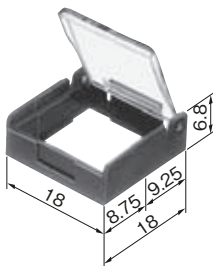


PART NO.		
Color	Long Center Barrier	Long Side Barrier
Black	FH-594-K	FH-595-K
Gray	FH-594-G	FH-595-G

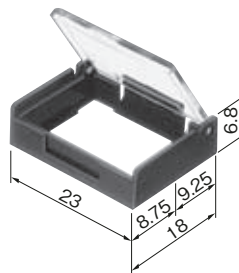
GUARD COVER

Guard Cover prevents inadvertent and unintentional operations. (cannot be used with barriers.)

● 11.4mm Square Button



● 11.4×16.4mm Rect. Button



PART NO.		
Sq.	Black	FH-596-K
	Gray	FH-596-G
Rect.	Black	FH-597-K
	Gray	FH-597-G

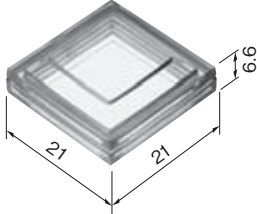
※The cover to be opened 90° and stopped.

Tolerance : ±0.4mm

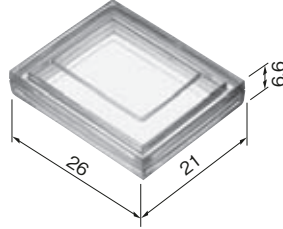
ACCESSORIES

Dust-Proof Cover

● 11.4mm Square Button

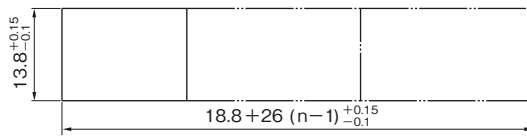
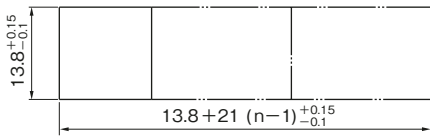


● 11.4×16.4mm Rectangular Button



PART NO.	
Square	Rectangular
FH-598	FH-599

● Panel Cut Dimensions for Dust-Proof Cover use.

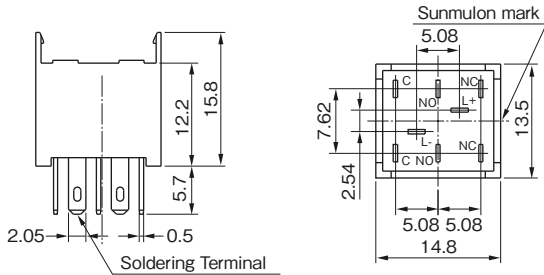


Panel Thickness : 1~2.5mm

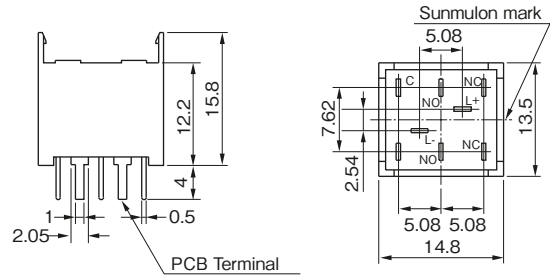
SOCKET

For easy maintenance. (Can be used for both square and rectangular)

● Soldering Terminal Socket

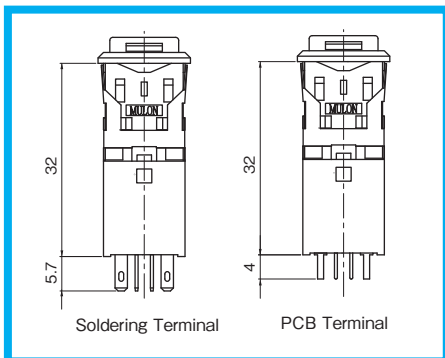


● PCB Terminal Socket



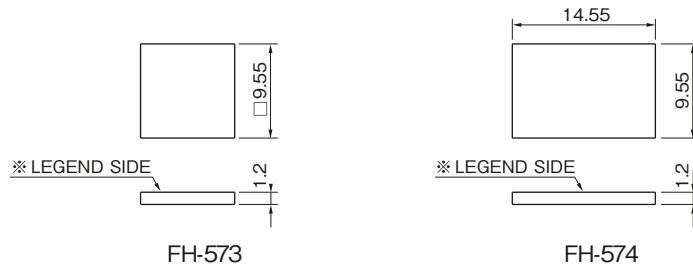
※ Switch Unit Terminal should be Soldering Type for both sockets.

PART NO	
Soldering Terminal Socket	PCB Terminal Socket
FH-0735	FH-0736



Tolerance : ±0.4mm

FILTER DIMENSIONS



Tolerance : ±0.4mm

REPLACEMENT PARTS

Please order buttons and filters as replacement parts as follow.

LED Full-Face



● **BUTTON SHAPE**

573	11.4mm Square Button
574	11.4×16.4mm Rect. Button

● **BUTTON COLOR**

R	Red
LG	Green
※ Y	Yellow
M	Milk White
C	Clear
K	Black
×	Without Button

● **FILTER COLOR**

1	Red
L2	Green
※ 3	Yellow
4	Milk White
0	Without Filter

LED SPOT



● **BUTTON SHAPE**

575	11.4mm Square Button
576	11.4×16.4mm Rect. Button

● **BUTTON COLOR**

R	Red
G	Green
※ Y	Yellow
M	Milk White
B	Blue
K	Black
×	Without Button

● **LENS COLOR**

1	Red
2	Green
※ 3	Yellow
4	Milk White
0	Without LED

ORDERING CODE

LED Full-Face

● OPERATION

M	Momentary
A	Alternate
L	Indicator

● CONTACT

0	Indicator
1	SPDT · Silver (Gold-Plated)
2	DPDT · Silver (Gold-Plated)
3	SPDT · Crossbar
4	DPDT · Crossbar

● BUTTON SHAPE

S	11.4mm Square Button
W	11.4×16.4mm Rect. Button

● Supply Voltage to LED

4	Non-Resistor (All Series)
5	Non-Resistor (Series Pararell)
6	5V Built-in Resistor
7	12V Built-in Resistor
8	24V Built-in Resistor
×	Without LED

● LED COLOR

70	Red
80	Green
90	Yellow
×	Without LED

● BUTTON COLOR

R	Red
G	Green
Y	Yellow
M	Milk White
C	Clear
×	Without Button

● HOUSING COLOR

B	Black
G	Gray

● MOUNTING ※1

1	For Vertical Mtg.
2	For Horizontal Mtg.

● TERMINAL

S	Soldering
---	-----------

● FILTER COLOR

1	Red
2	Green
3	Yellow
4	Milk White
×	Without Filter

★ Generally, in case of using color button, filters are not necessary.

※ "Yellow" color for LED/Button/Filter is actually "Orange Yellow".

※1) Snap-spring metal plates come out Left/Right direction for Vertical Mounting, and Top/Bottom direction for Horizontal Mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 2 Horizontal ordinary)

LED SPOT

● OPERATION

M	Momentary
A	Alternate
L	Indicator

● CONTACT

0	Indicator
1	SPDT · Silver (Gold-Plated)
2	DPDT · Silver (Gold-Plated)
3	SPDT · Crossbar
4	DPDT · Crossbar

● BUTTON SHAPE

P	11.4mm Square Button
L	11.4×16.4mm Rect. Button

● Supply Voltage to LED

4	Non-Resistor (All Series)
5	Non-Resistor (Series Pararell)
6	5V Built-in Resistor
7	12V Built-in Resistor
8	24V Built-in Resistor
×	Without LED

● LED COLOR

70	Red
80	Green
90	Yellow
×	Without LED

● BUTTON COLOR

R	Red
G	Green
Y	Yellow
M	Milk White
B	Blue
K	Black
×	Without Button

● HOUSING COLOR

B	Black
G	Gray

● MOUNTING ※1

1	For Vertical Mtg.
2	For Horizontal Mtg.

● TERMINAL

S	Soldering
---	-----------

● LENS COLOR

1	Red
2	Green
3	Yellow
4	Milk White

※ "Yellow" color for LED/Button/Lens is actually "Orange Yellow".

※1) Snap-spring metal plates come out Left/Right direction for Vertical Mounting, and Top/Bottom direction for Horizontal Mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 2 Horizontal ordinary)