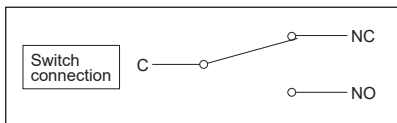


FH Illuminated Pushbutton Switch

Only 19.8 mm depth behind panel
with built-in resistor.

- Depth behind panel : Only 19.8 mm
- LED Full-Face, Spot illumination available.
- Terminal : Soldering
- Accessories : Barriers, Guard covers, Sockets



CHARACTERISTICS

Button Size	Square : □11.4 mm Rectangle : 11.4×16.4 mm	
Contact Material	Silver contact (Gold-plated)	Cross-bar contact ○
Rating (Resistive Load)	AC125V 5A AC250V 5A	AC125V 0.1A DC30V 0.1A
Insulation Resistance	More than 100 MΩ at DC 500 V	
Dielectric Strength	AC 1000 V RMS between NC and NO terminal AC 1500 V RMS between terminals and ground 50/60 Hz for 60 sec. at normal ambient temperature and humidity	AC 600 V RMS between NC and NO terminal AC 1500 V RMS between terminals and ground 50/60 Hz for 60 sec. at normal ambient temperature and humidity
Contact Resistance	Less than 30 mΩ (Initial value) at DC 6 V 1 A	Less than 50 mΩ (Initial value) at DC 6 V 0.1 A
Vibration Resistance	10 to 55 Hz, Amplitude 1.5 mm	
Mechanical Life	Momentary	More than 500,000 operations
	Alternate	More than 200,000 operations
Electrical Life (Resistive Load)	More than 30,000 operations at max. rated load	
Operating Force	4.41N max.	
Total Travel	2.5mm max.	
Weight	Square : 5.5 g	Rectangle : 6 g
Ambient Operating Temperature	-15°C to 50°C (No Freeze, No Condensation)	
Ambient Operating Humidity	80%RH max. (No Condensation)	
Ambient Storage Temperature	-25°C to 65°C (No Freeze, No Condensation)	
Ambient Storage Humidity	80%RH max. (No Condensation)	

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



- | | | |
|-------------------------------------------------|----------------------------------------------------|------------------------------|
| ◇Dimensions : page FH-4 | ◇Accessories : page FH-5 | ◇Ordering code : page FH-6~7 |
| ◇Internal connection arrangements : page FH-9 | ◇LED specifications : page FH-10 | ◇Terminals : page FH-11 |
| ◇Mounting design / Panel cutout : page FH-12~14 | ◇Accessories' dimensions / Panel cutout : FH-15~16 | |

SPECIFICATIONS

		Square	Rectangle
Illumination type	Full-Face	A	A
	Spot	A	A
	Non-illumination	A	A
Contact	SPDT	A	A
	DPDT	A	A
Terminal	Soldering	A	A
RoHS (10 Substances)		Conform to standards	

A : Applicable N/A : Not applicable

CONTACT RATINGS

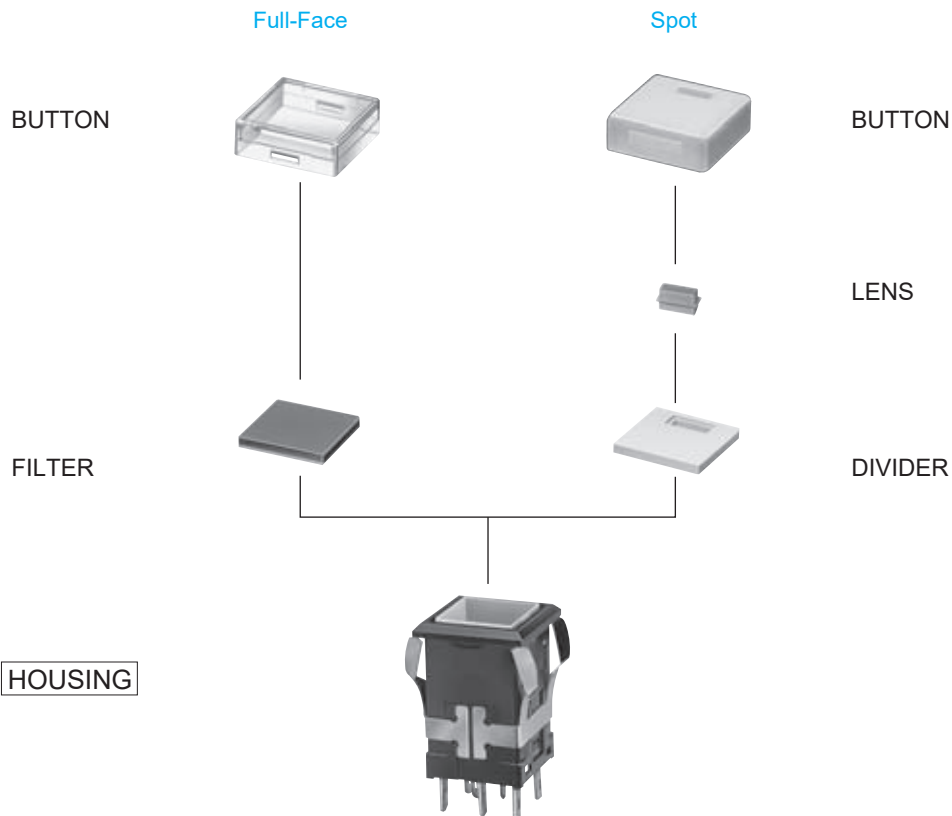
● Silver contact (Gold-plated)

Voltage	Current (A) (Resistive load)
AC 125 V	5
250 V	5
DC 8 V	2
14 V	2
30 V	1
125 V	0.3


● Cross-bar contact

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

STRUCTURE

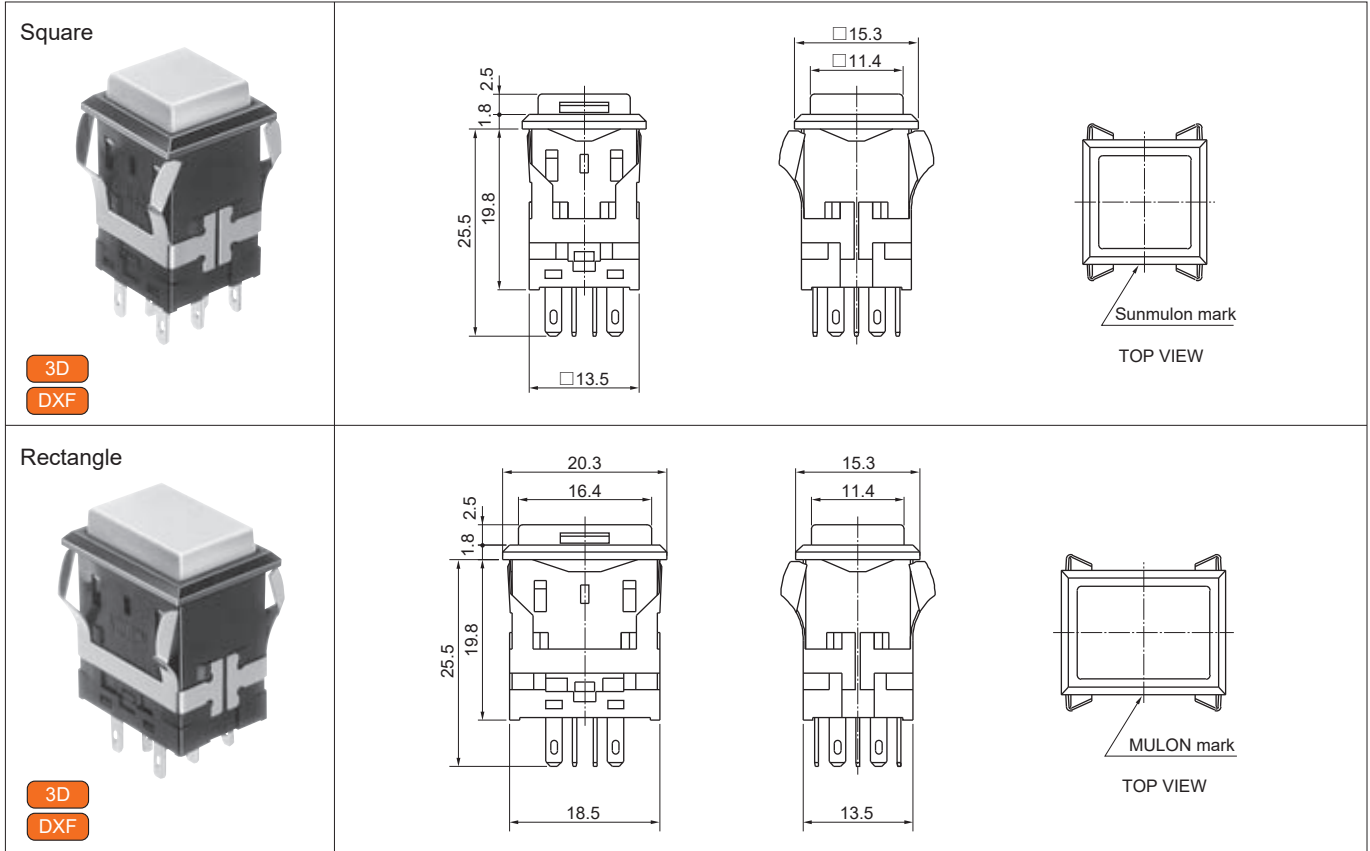


ILLUMINATION TYPES

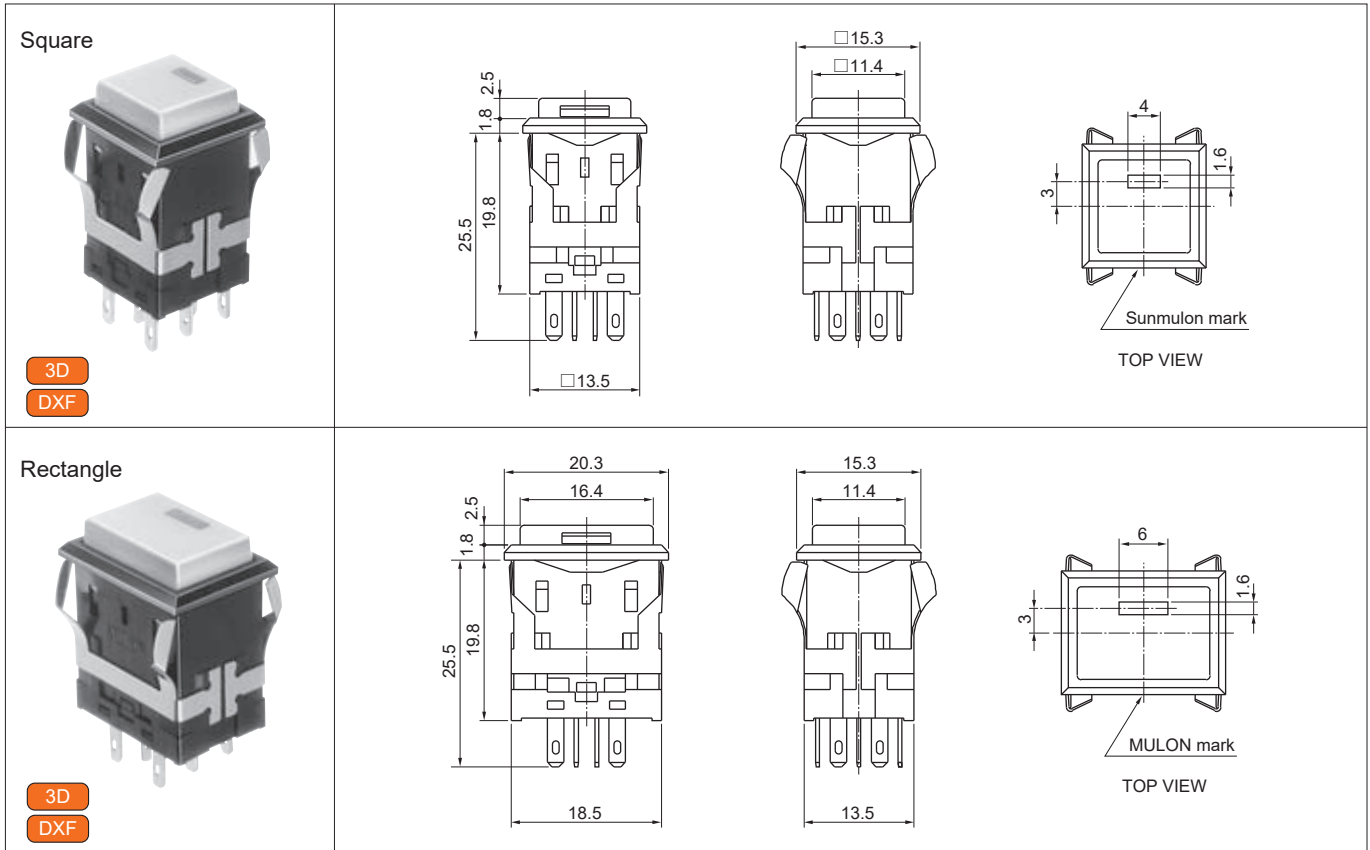
Common for each button size.	
LED color symbol 70 Red 80 Green 90 Yellow	
※ Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.	
Full-Face	70 80 90
Spot	 Spot LED Color 70 Red 80 Green 90 Yellow

DIMENSIONS

● Full-Face









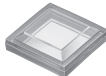
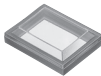


● Spot



3D · DXF data download site : <https://www.sunmulon.co.jp/download/>

Tolerance : ± 0.4 mm

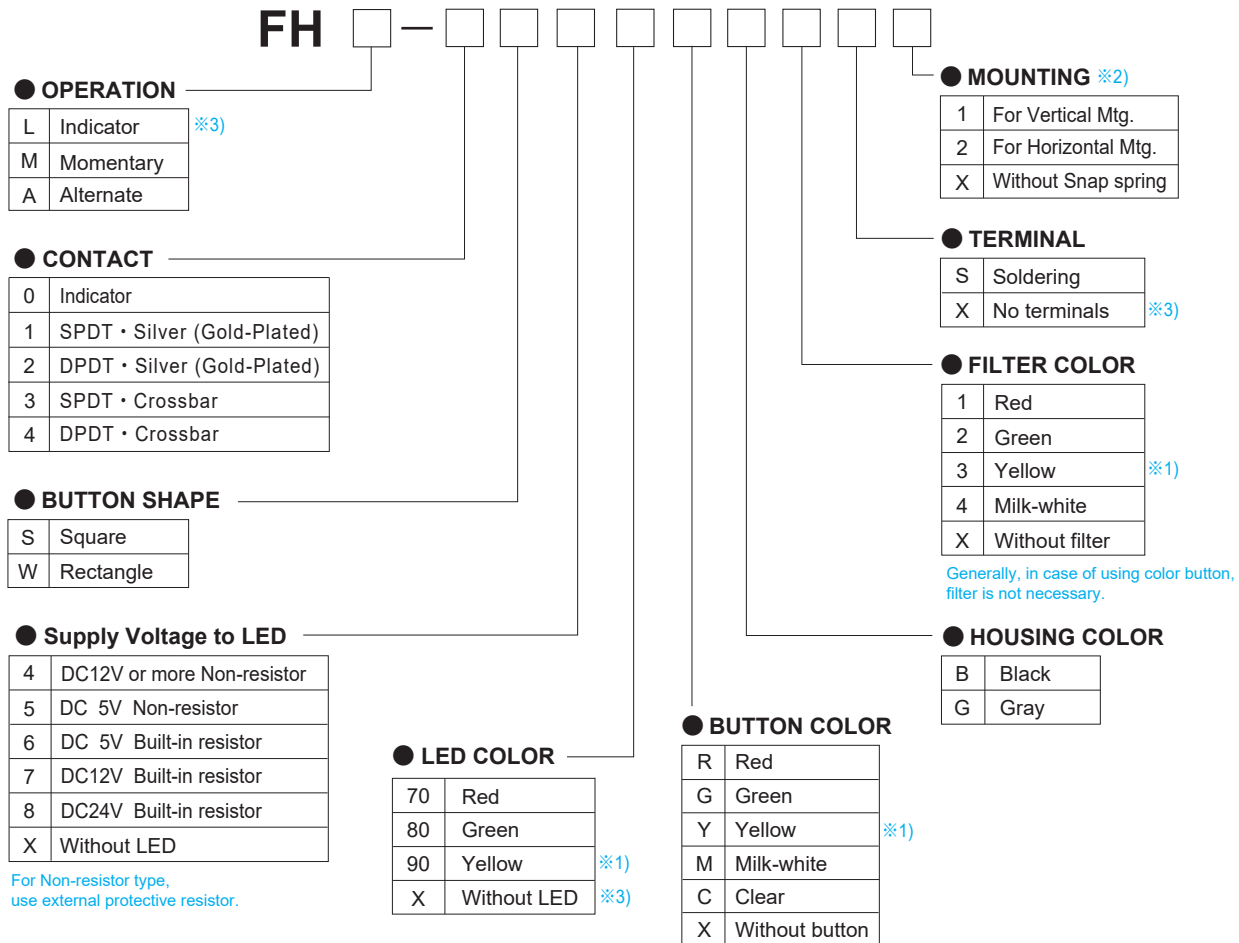
ACCESSORIES

Name	Appearance	Classification	Part no.		Precautions for use
Barrier		Short center barrier	Black	FH-592-K	- Cannot be used with guard cover and dust proof cover.
			Gray	FH-592-G	
		Short side barrier	Black	FH-593-K	
			Gray	FH-593-G	
		Long center barrier	Black	FH-594-K	- Cannot be used with guard cover and dust proof cover.
			Gray	FH-594-G	
	Long side barrier	Black	FH-595-K		
		Gray	FH-595-G		
Guard cover	 3D	For square button	Black	FH-596-K	- The cover to be opened 90° and stopped. Do not apply any more excessive force.
			Gray	FH-596-G	
	 DXF	For rectangle button	Black	FH-597-K	
			Gray	FH-597-G	
Dust proof cover		For square button	FH-598		- Cannot be used with barriers and guard cover.
		For rectangle button	FH-599		
Socket		Soldering terminal	Black	FH-0735	- Use built-in resistor type for the switch housing.
		PCB terminal	Black	FH-0736	
Removing tool		For removal button	SJ-0001		- Be used to remove button from housing.

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

ORDERING CODE 【Full-Face】

Assembled Part (Light cartridge and Housing)



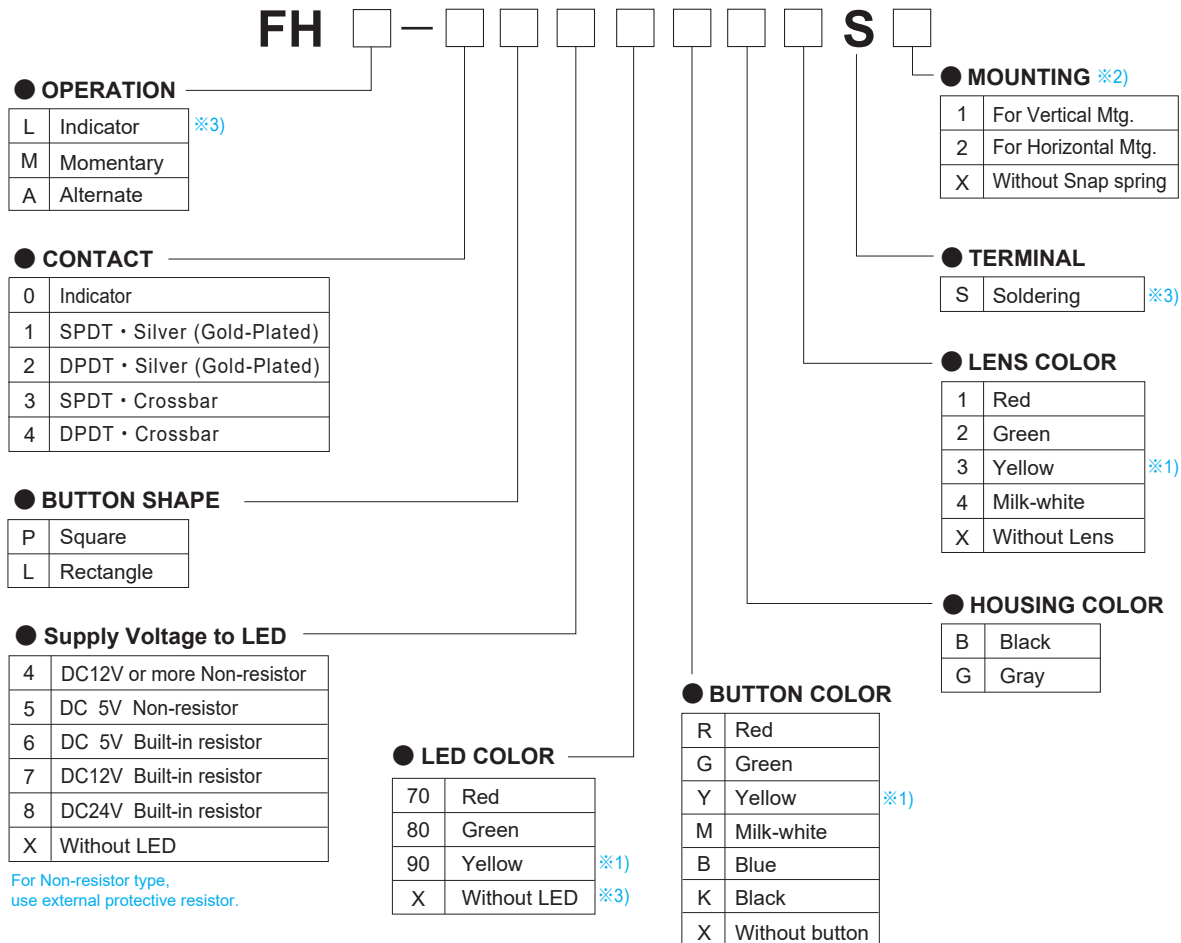
● NOTES

- ※1) The color of "Yellow" for LED (90) , button (Y) and filter (3) is actually "Orange Yellow" not Lemon Yellow.
- ※2) 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)
- ※3) In case of Indicator (L) without LED (X), specify No terminals (X).

◇Dimensions : page FH-4	◇Accessories : page FH-5	◇Terminals : page FH-11
◇Internal connection arrangements : page FH-9	◇LED specifications : page FH-10	
◇Mounting design / Panel cutout : page FH-12~14	◇Accessories' dimensions / Panel cutout : FH-15~16	

ORDERING CODE [Spot]

Assembled Part (Light cartridge and Housing)



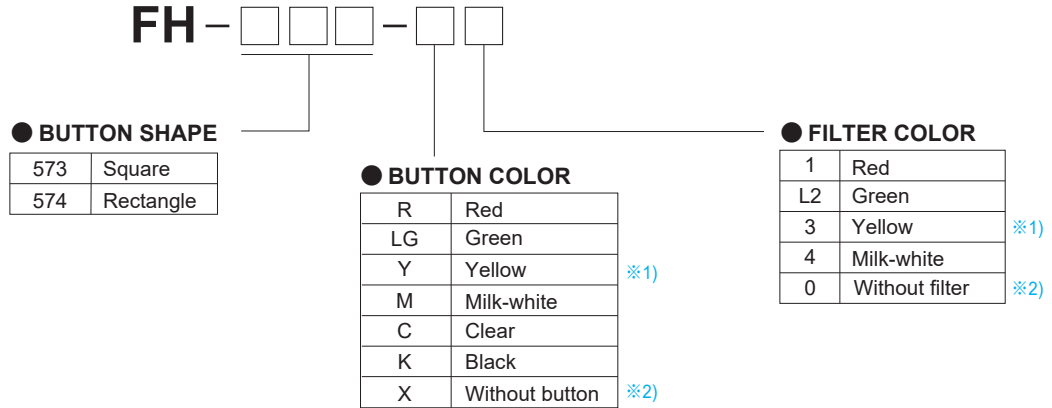
● NOTES

- ※1) The color of "Yellow" for LED (90) , button (Y) and filter (3) is actually "Orange Yellow" not Lemon Yellow.
- ※2) 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)
- ※3) In case of Indicator (L) without LED (X), there is no terminal but specify soldering terminal (S).

◇Dimensions : page FH-4	◇Accessories : page FH-5	◇Terminals : page FH-11
◇Internal connection arrangements : page FH-9	◇LED specifications : page FH-10	
◇Mounting design / Panel cutout : page FH-12~14	◇Accessories' dimensions / Panel cutout : FH-15~16	

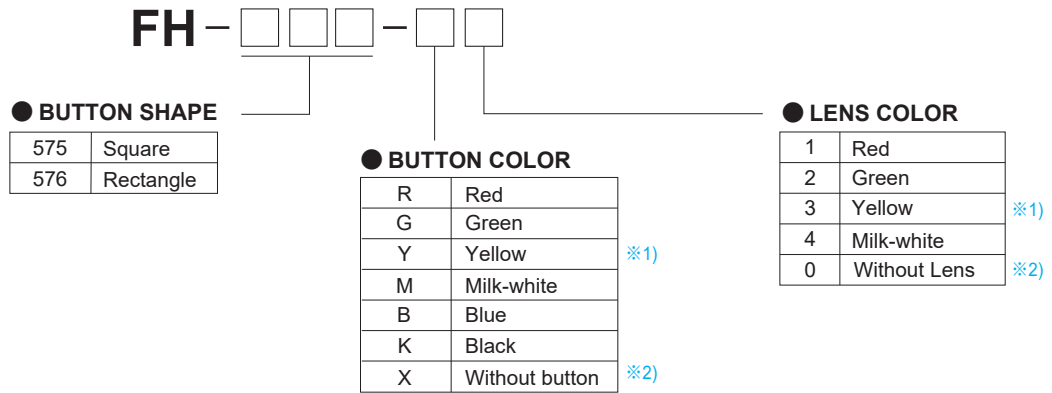
REPLACEMENT PARTS

● Full-Face BUTTON/FILTER



※1) The color of "Yellow" for button (Y) and filter (3) is actually "Orange Yellow" not Lemon Yellow.
 ※2) If only a button is required, specify without filter (0). If only a filter is required, specify without button (X).
 ※Black button do not transmit light.

● Spot BUTTON/FILTER

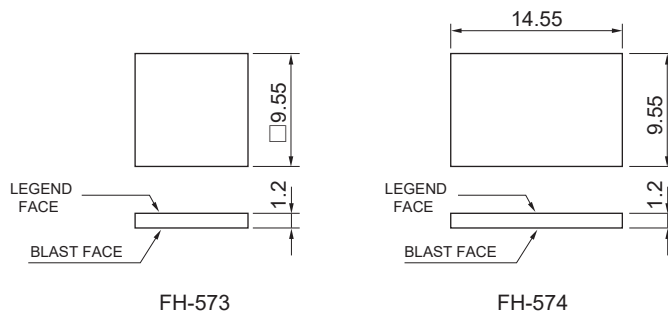


※1) The color of "Yellow" for button (Y) and filter (3) is actually "Orange Yellow" not Lemon Yellow.
 ※2) If only a button is required, specify without Lens (0). If only a Lens is required, specify without button (X).
 ※Black button do not transmit light.

● DIVIDER

Square	FH-535
Rectangle	FH-536

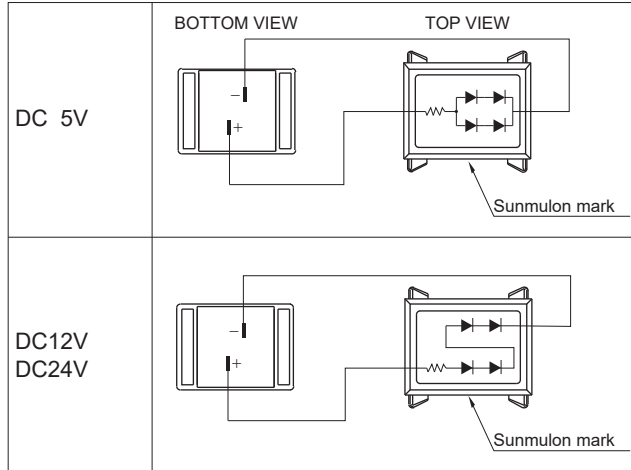
FILTER DIMENSIONS



Tolerance : ± 0.4 mm

INTERNAL CONNECTION ARRANGEMENTS

● Full-Face / Spot



LED SPECIFICATIONS [Full-Face]

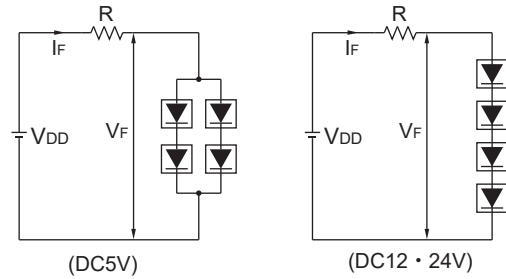
● BUILT-IN RESISTOR

Voltage		Rated Current (mA)		
		Red	Green	Yellow
DC 5V	±5%	15	25	15
DC12V	±5%	8	13	8
DC24V	±5%	8	13	8

● NON-RESISTOR (EXTERNAL RESISTOR)

Supply Voltage		DC5V			DC12V · 24V		
LED Color		Red	Green	Yellow	Red	Green	Yellow
Max. Forward Current	I_{FM} (mA)	40	40	40	20	20	20
DC Reverse Voltage	V_R (V)	10	10	10	20	20	20
Forward Voltage	V_F (Typ.) (V)	4	4.2	4	8	8.4	8
Derating (Operating temperature) (over 25°C working temperature) (mA/°C)		0.36					
Pulse Lighting	Pulse Width PW (μs)	100					
	Duty Ratio DR	10^{-1}					
	I_{FM} (mA)	100					

● Wiring Diagram



Refer to the following formula to calculate external resistance values.

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

V_{DD} : Supply Voltage

V_F : Forward Voltage

I_F : Forward Current

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

LED SPECIFICATIONS [Spot]

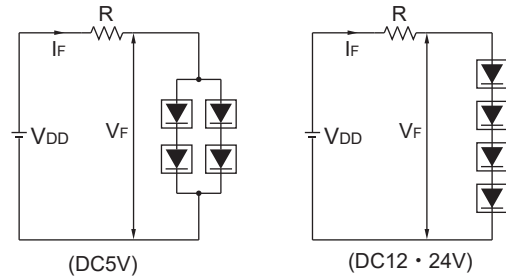
● BUILT-IN RESISTOR

Voltage		Rated Current (mA)		
		Red	Green	Yellow
DC 5V	±5%	15	25	15
DC12V	±5%	8	13	8
DC24V	±5%	8	13	8

● NON-RESISTOR (EXTERNAL RESISTOR)

Supply Voltage		DC5V			DC12V · 24V		
LED Color		Red	Green	Yellow	Red	Green	Yellow
Max. Forward Current	I_{FM} (mA)	40	40	40	20	20	20
DC Reverse Voltage	V_R (V)	10	10	10	20	20	20
Forward Voltage	V_F (Typ.) (V)	4	4.2	4	8	8.4	8
Derating (Operating temperature) (over 25°C working temperature) (mA/°C)		0.36					
Pulse Lighting	Pulse Width PW (μs)	100					
	Duty Ratio DR	10^{-1}					
	I_{FM} (mA)	100					

● 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

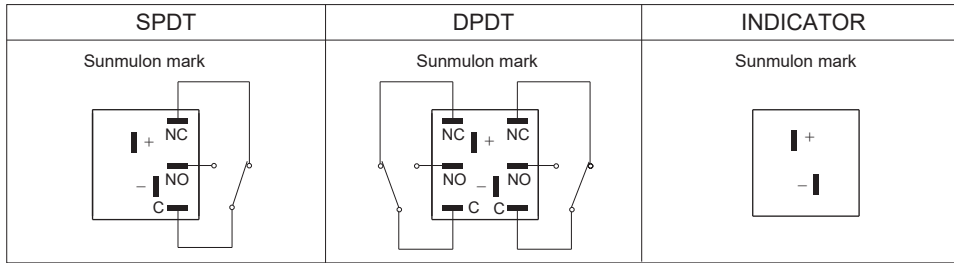
<https://www.sunmulon.co.jp/english/products/led.html>

The resistance value can be calculated just by entering the items.

TERMINALS

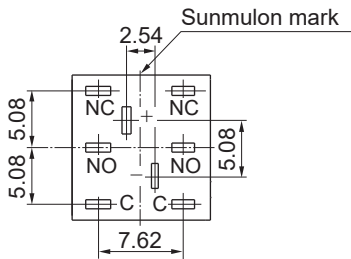
■ Full-Face • Spot • Non-illumination

● TERMINALS LAYOUT (BOTTOM VIEW)



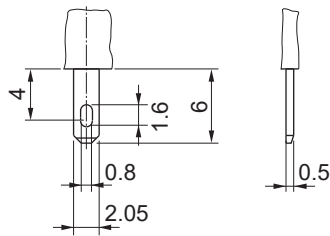
※ When "Without LED (X)" is specified, there is no LED terminal. (+, -)

● TERMINALS DIMENSION (BOTTOM VIEW)



※ When "Without LED (X)" is specified, there is no LED terminal. (+, -)

TERMINAL SHAPE

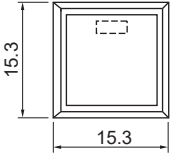
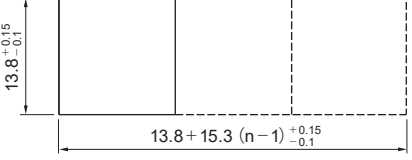
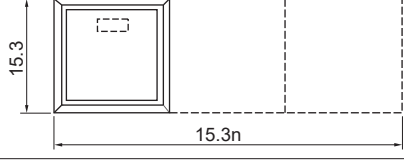
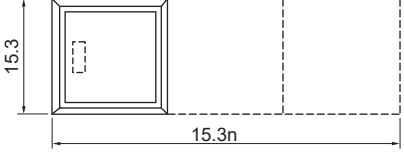
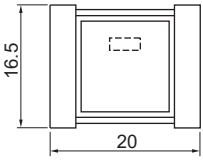
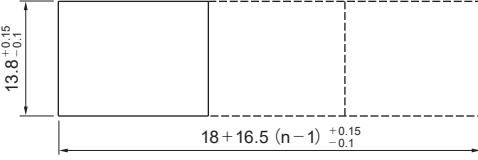
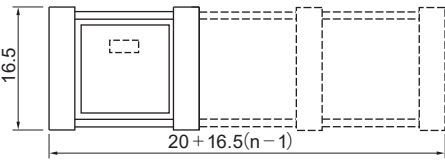
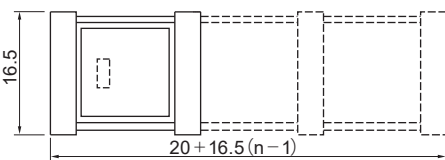
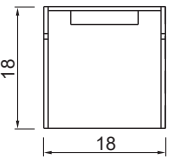
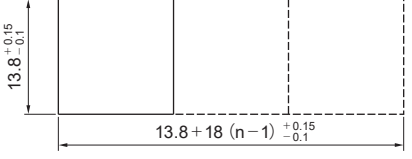
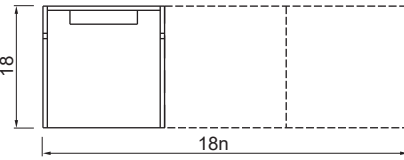


Soldering Terminal

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) ※2 	
	Multiple (Vertical) ※1 	
n : Number of Units		
With Barriers	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) ※2 	
	Multiple (Vertical) ※1 	
n : Number of Units		
With Guard cover	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 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.

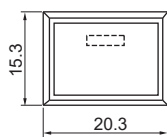
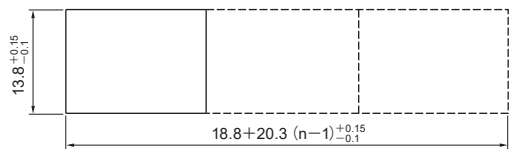
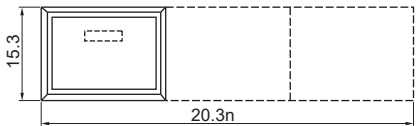
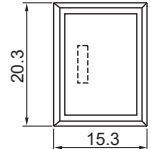
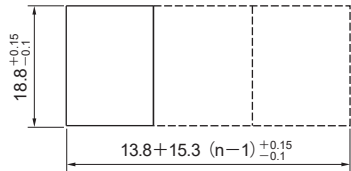
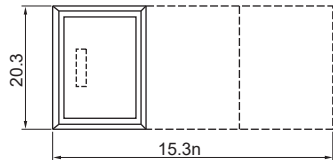
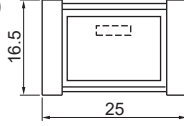
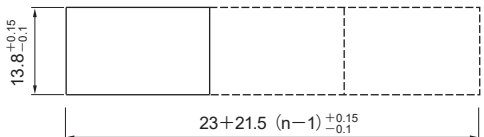
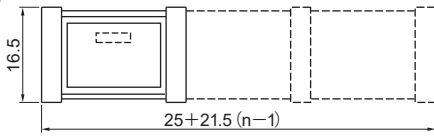
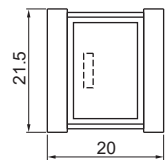
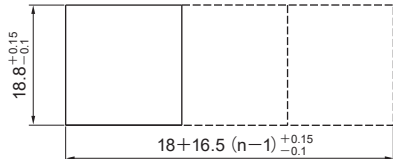
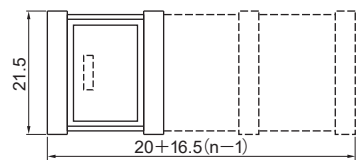
In case the panel cut dimension is too small, it may cause malfunction.

- ※ 1) For vertical mounting, specify the ordering code 1 (For Vertical Mtg.).
- ※ 2) For horizontal mounting, specify the ordering code 2 (For Horizontal Mtg.).
- ※ After the panel-cutting process, make sure to remove burrs on the surface.

Tolerance : ± 0.4 mm

MOUNTING DESIGN / PANEL CUTOUT

● Rectangle

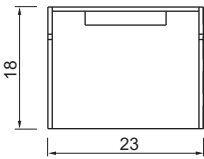
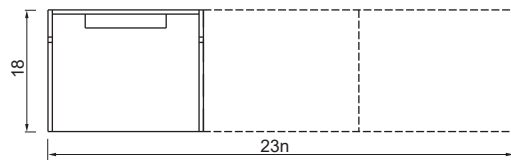
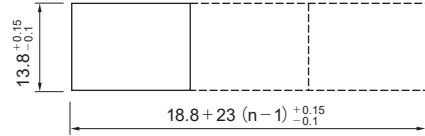
Mounting design		Panel cutout
Without Barriers	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) ※2 	
	Individual (Vertical) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Vertical) ※1 	
With Barriers	Individual (Horizontal) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Horizontal) ※2 	
	Individual (Vertical) 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple (Vertical) ※1 	

- ※ 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.
- ※ 1) For vertical mounting, specify the ordering code 1 (For Vertical Mtg.).
- ※ 2) For horizontal mounting, specify the ordering code 2 (For Horizontal Mtg.).
- ※ After the panel-cutting process, make sure to remove burrs on the surface.

Tolerance : ± 0.4 mm

MOUNTING DESIGN / PANEL CUTOUT

● Rectangle

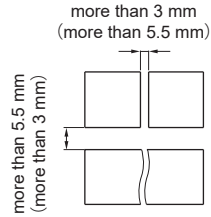
	Mounting design	Panel cutout
With Guard cover	<p>Individual (Horizontal)</p>  <p>Multiple (Horizontal)</p> 	<p>Recommended panel thickness : 1 to 3.2 mm</p>  <p style="text-align: right;">n : Number of Units</p>

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

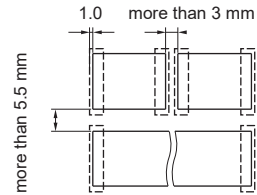
● Panel cut spacing dimensions for spaced individual mounting

Without Barriers

The figures are all for horizontal individual.
For vertical individual, the dimensions are shown in brackets.



With Barriers



Tolerance : ± 0.4 mm

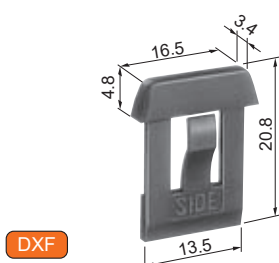
ACCESSORIES

BARRIER

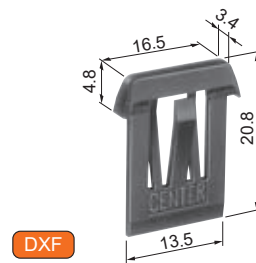
● SHORT BARRIER

Color	Side barrier	Center barrier
Black	FH-593-K	FH-592-K
Gray	FH-593-G	FH-592-G

※ Cannot be used with guard cover and dust proof cover.



Side barrier

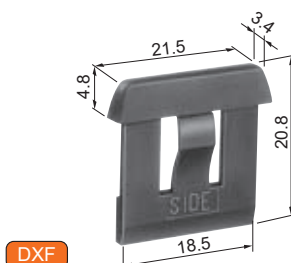


Center barrier

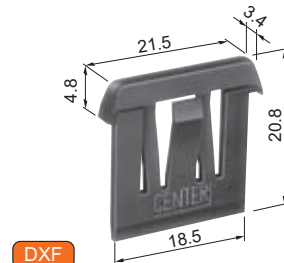
● LONG BARRIER

Color	Side barrier	Center barrier
Black	FH-595-K	FH-594-K
Gray	FH-595-G	FH-594-G

※ Cannot be used with guard cover and dust proof cover.



Side barrier



Center barrier

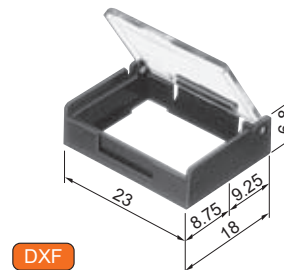
GUARD COVER

Square	Black	FH-596-K
	Gray	FH-596-G
Rectangle	Black	FH-597-K
	Gray	FH-597-G

※ The cover to be opened 90° and stopped.
Do not apply any more excessive force.



Square

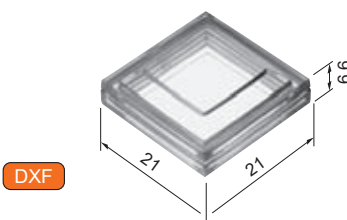


Rectangle

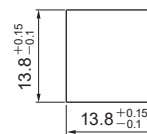
Dust-Proof Cover

Square	FH-598
Rectangle	FH-599

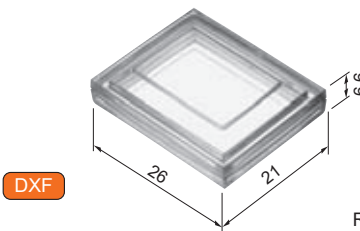
※ Cannot be used with barriers and guard cover.



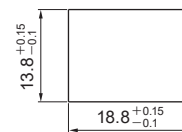
Panel cutout



Recommended panel thickness : 1 to 2.5 mm



Panel cutout



Recommended panel thickness : 1 to 2.5 mm

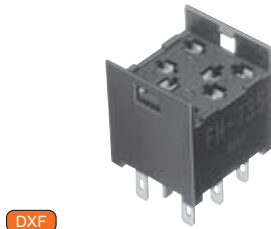
ACCESSORIES

SOCKET

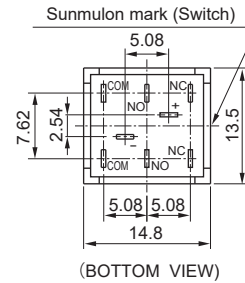
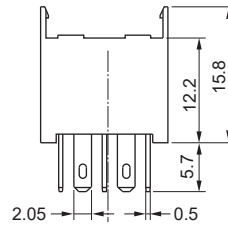
● Full-Face / Spot

Socket terminal shape	Type to be used	Part no.	Resistance value	Remarks
Soldering terminal	Built-in resistor type	FH-0735	0 Ω	Housing should be a built-in resistor type.
PCB terminal		FH-0736	0 Ω	Housing should be a built-in resistor type.

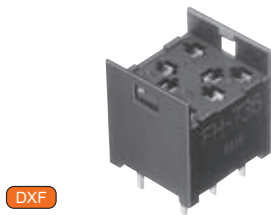
● Soldering Terminal (Square, Rectangle)



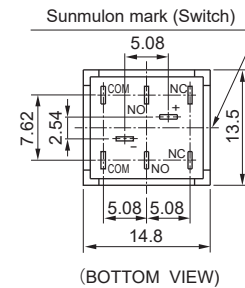
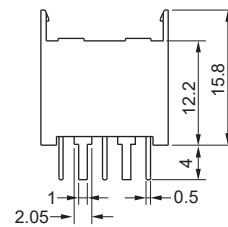
DXF



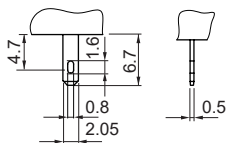
● PCB Terminal (Square, Rectangle)



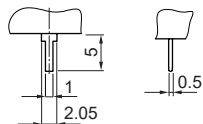
DXF



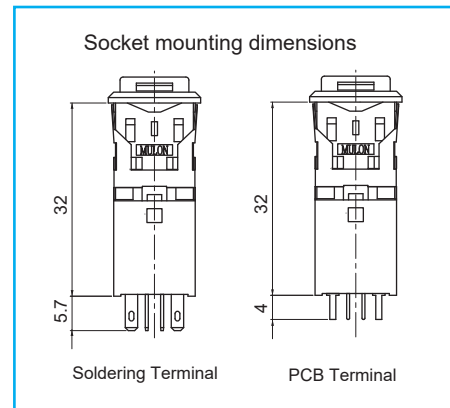
● Terminal shape



Soldering Terminal



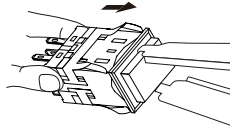
PCB Terminal



Tolerance : ± 0.4 mm

ASSEMBLY & DISASSEMBLY

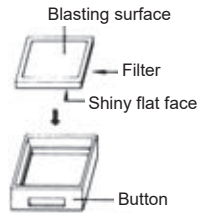
1. Fitting Button, Lens, Filter



Removing Button

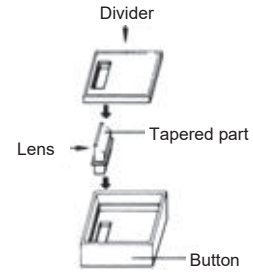
Be sure to remove with the removing tool (SJ-0001). Hang the button with the removing tool in the groove, and pull it straight out.

※ In case removing in any other way than the above, it may cause damage.



For Full-Face

Insert the shiny flat face side of the filter into the button.

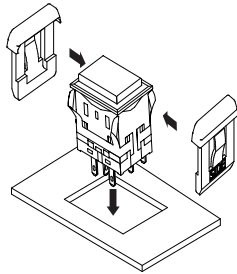


For Spot

Insert the Lens into the button hole with the tapered part facing the divider.

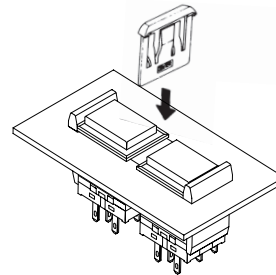
2. Installig Barriers

After setting the side barriers on the Housing, and insert it into the panel cut-out.



Installing Barriers (Multiple)

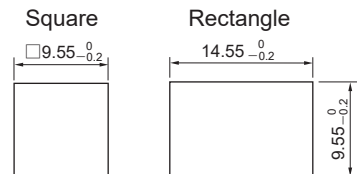
Insert the center barrier between the switches after mounting the switches with the side barriers into the panel cut-out.



PRECAUTIONS FOR CORRECT USE

1. Solder quickly and correctly at 380°C 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. Supply voltage to LED is indicated on the side of the Housing.
4. Character films are not included.

If preparing the character film separately, use a heat-resistant film with a thickness of 0.1 mm. For the dimensions, please refer to the figure on the right.



※ 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 Illuminated Pushbutton Switches

1. Notes on contents of Catalogs

- (1) Rated values, performance values, and specification values of Sunmulon 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 improvement 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, standards, or laws to which your machinery, equipment, etc. 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 Sunmulon 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 equipment (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

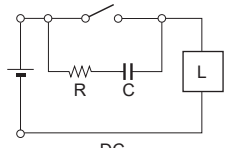
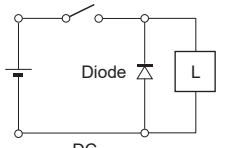
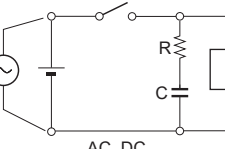
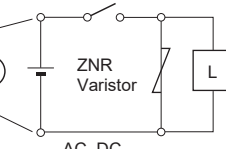
- (1) The warranty period for Sunmulon products shall be 1 year after purchase or delivery to the specified location.
- (2) Warranty scope should a failure occur in Sunmulon product during the above warranty period for reasons attributable to Sunmulon, then Sunmulon shall provide that product, free of 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 caused 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

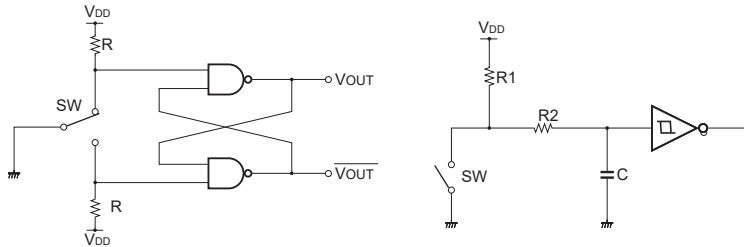
- (1) Do not perform wiring with power supplied to the switch. Do not touch the terminals or other charged parts of the switch while power is being supplied. Doing so may result in electric shock.
- (2) Be careful of electrostatic breakdown when handling.
- (3) Do not drop or otherwise apply strong force 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.

Safety Precautions for All Illuminated Pushbutton Switches

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

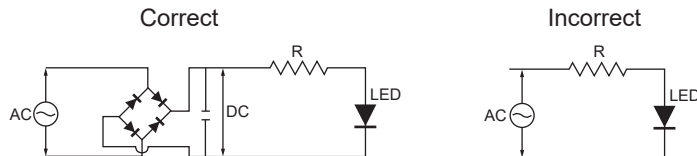
Circuit	Element selection	Circuit	Element selection
 <p>DC</p>	<p>C : 1 to 0.5 μF \times switch current (A) R : 0.5 to 1 Ω \times switch voltage (V)</p> <p>The values may change according to the characteristics of the load. Determine ideal capacitance and resistance values through testing.</p>	 <p>DC</p>	<p>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.</p>
 <p>AC, DC</p>		 <p>AC, DC</p>	

(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 penetrate 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.

Safety Precautions for All Illuminated Pushbutton Switches

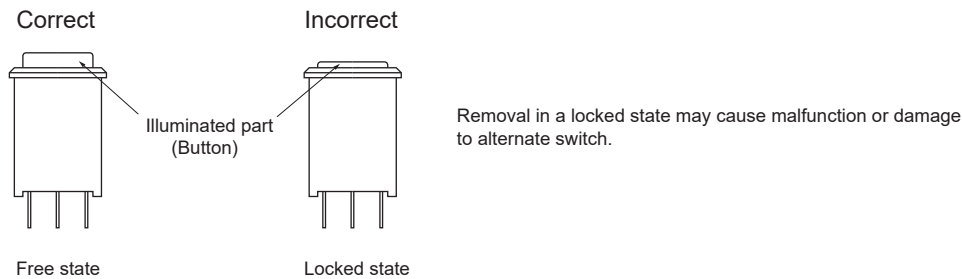
(12) Usage environment

- (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°C to 65°C (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.



(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.