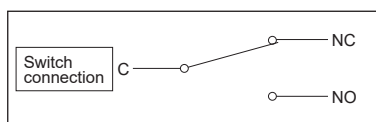
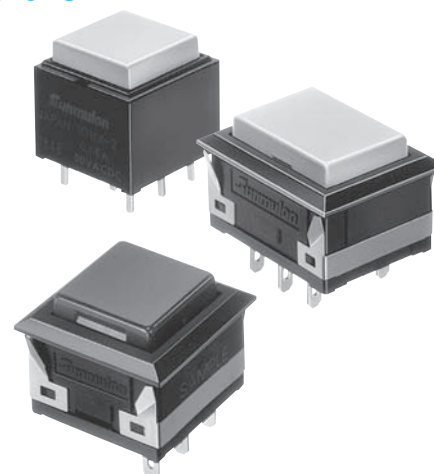


VH Illuminated Pushbutton Switch

Only 10.6 mm depth behind panel.
Micro load and high load contacts available.

- Depth behind panel : Only 10.6 mm
- LED Full-Face, Dual-Color illumination available.
- Terminal shape : IC pitch (2.54 mm)
- Accessories : Barriers, Guard covers, Sockets, etc.



CHARACTERISTICS

Button Size	Square : □12 mm Rectangle : 12×17 mm	
Contact Material	Micro load contact (Gold-plated)	High load contact (Silver with gold-plated)
Rating (Resistive Load)	AC, DC 30 V 0.05 A	AC 125 V, 250 V 5 A
Insulation Resistance	More than 100 MΩ at DC 500 V	
Dielectric Strength	AC 600 V RMS between NC and NO terminal AC 1500 V RMS between terminals and ground 50/60 Hz for 60 sec. at normal ambient temperature and humidity	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
Contact Resistance	Less than 100 mΩ (Initial value) at DC 6 V 0.05 A	Less than 30 mΩ (Initial value) at DC 6 V 1 A
Vibration Resistance	10 to 55 Hz, Amplitude 1.5 mm	
Mechanical Life	Momentary	More than 1,000,000 operations
	Alternate	More than 200,000 operations
Electrical Life (Resistive Load)	More than 200,000 operations at max. rated load	More than 30,000 operations at max. rated load
Operating Force	2.45 N max.	
Total Travel	2.5 mm max.	
Weight	Square : 4 g	Rectangle : 5 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/vh.html



- | | | |
|---|---|--|
| ◇Dimensions : page VH-4 | ◇Accessories : page VH-5 | ◇Ordering code : page VH-6~7 |
| ◇Internal connection arrangements : page VH-9 | ◇LED specifications : page VH-10 | ◇Terminals / PCB hole cutout : page VH-11~12 |
| ◇Mounting design / Panel cutout : page VH-13~14 | ◇Accessories' dimensions / Panel cutout : page VH-15~16 | |

SPECIFICATIONS

		Square	Rectangle
Housing	With Flange	A	A
	Without Flange	A	A
Illumination type	Full-Face	A	A
	Dual-Color	A	A
	Non-illumination	A	A
Contact	SPDT	A	A
	DPDT	A	A
Terminal	Soldering	A	A
	PCB	A	A
RoHS (10 Substances)		Conform to standards	

A : Applicable

CONTACT RATINGS

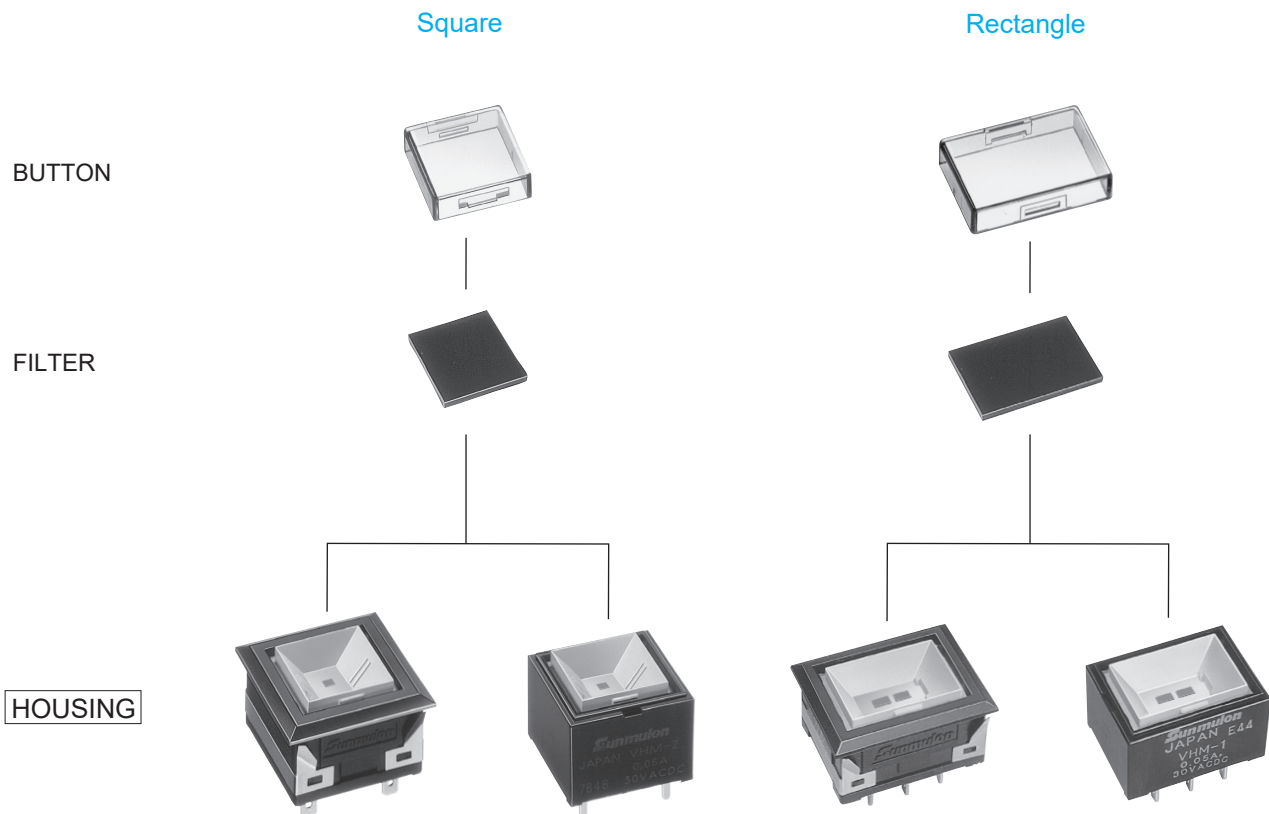
● Micro load contact (Gold-plated)

Rating	AC 30 V 0.05 A (Resistive load)
	DC 30 V 0.05 A (Resistive load)

● High load contact (Silver with 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

STRUCTURE


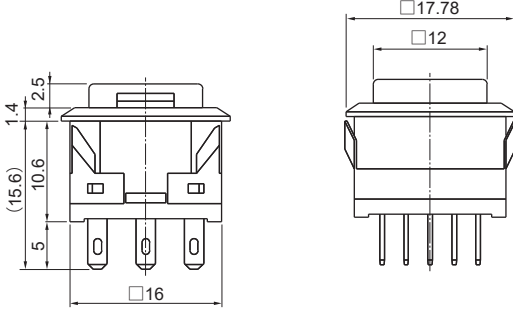
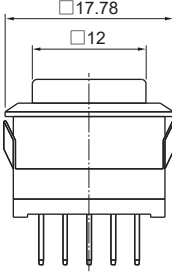
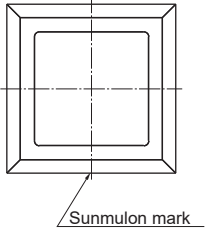
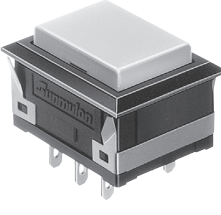
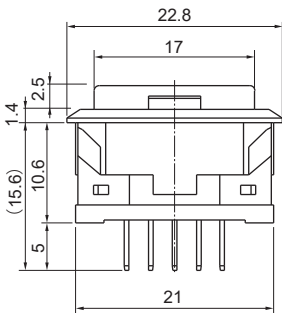
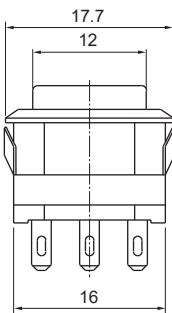
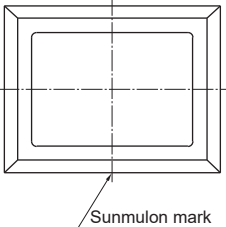


ILLUMINATION TYPES


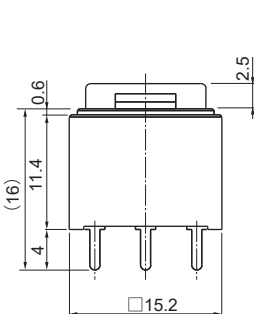
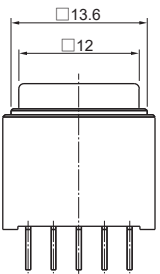
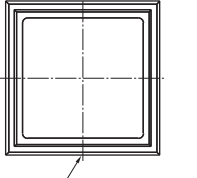

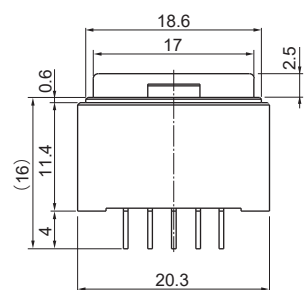
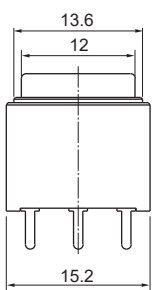
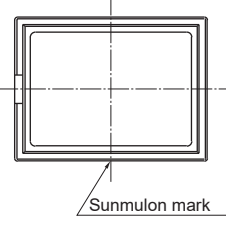
Common for square and rectangle button.													
LED color symbol	<table style="display: inline-table; border: none;"> <tr> <td style="border: 1px solid black; padding: 2px 5px;">70</td> <td style="border: 1px solid black; padding: 2px 5px;">Red</td> <td style="border: 1px solid black; padding: 2px 5px;">80</td> <td style="border: 1px solid black; padding: 2px 5px;">Green</td> <td style="border: 1px solid black; padding: 2px 5px;">90</td> <td style="border: 1px solid black; padding: 2px 5px;">Yellow</td> <td style="border: 1px solid black; padding: 2px 5px;">14</td> <td style="border: 1px solid black; padding: 2px 5px;">Super Blue</td> <td style="border: 1px solid black; padding: 2px 5px;">16</td> <td style="border: 1px solid black; padding: 2px 5px;">Super White</td> <td style="border: 1px solid black; padding: 2px 5px;">18</td> <td style="border: 1px solid black; padding: 2px 5px;">Super Green</td> </tr> </table>	70	Red	80	Green	90	Yellow	14	Super Blue	16	Super White	18	Super Green
70	Red	80	Green	90	Yellow	14	Super Blue	16	Super White	18	Super Green		
※ Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.													
Full-Face	<table style="display: inline-table; border: none;"> <tr> <td style="border: 1px solid black; padding: 2px 5px;">70</td> <td style="border: 1px solid black; padding: 2px 5px;">80</td> <td style="border: 1px solid black; padding: 2px 5px;">90</td> <td style="border: 1px solid black; padding: 2px 5px;">14</td> <td style="border: 1px solid black; padding: 2px 5px;">16</td> <td style="border: 1px solid black; padding: 2px 5px;">18</td> </tr> </table>	70	80	90	14	16	18						
70	80	90	14	16	18								
Dual-Color	<table style="display: inline-table; border: none;"> <tr> <td style="border: 1px solid black; padding: 2px 5px;">7·8</td> <td style="border: 1px solid black; padding: 2px 5px;">8·9</td> <td style="border: 1px solid black; padding: 2px 5px;">9·7</td> </tr> </table>	7·8	8·9	9·7									
7·8	8·9	9·7											

DIMENSIONS

● With Flange

<p>Square</p>  <p>3D DXF</p>			 <p>Sunmulon mark TOP VIEW</p>
<p>Rectangle</p>  <p>3D DXF</p>			 <p>Sunmulon mark TOP VIEW</p>




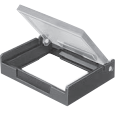




● Without Flange

<p>Square</p>  <p>3D DXF</p>			 <p>Sunmulon mark TOP VIEW</p>
<p>Rectangle</p>  <p>3D DXF</p>			 <p>Sunmulon mark TOP VIEW</p>

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 3D DXF		Center barrier	Black	VH-0975-K	- Cannot be used with guard cover.
			Gray	VH-0975-G	
		Side barrier	Black	VH-0976-K	
			Gray	VH-0976-G	
Guard cover (For With Flange) 3D DXF		For square button	Black	VH-1089-K	- The cover to be opened 90° and stopped. Do not apply any more force.
			Gray	VH-1089-H	
		For rectangle button	Black	VH-2252-K	- Cannot be used with barrier.
			Gray	VH-2252-H	
Guard cover (For Without Flange) 3D DXF		For square button	Black	VH-2026-K	- The cover to be opened 90° and stopped. Do not apply any more force.
			Gray	VH-2026-H	
		For rectangle button	Black	VH-2253-K	
			Gray	VH-2253-H	
Socket 3D DXF		For square button Soldering terminal	Black	VH-3631-□ VH-3632-□ VH-3633-□	- For combination with housing, refer to page VH-16. - Be used for Soldering terminal type of switch unit. - Be used for Full-Face type. - Cannot be used for without flange type.
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/>

◇Accessories' dimensions / Panel cutout : VH-15~16

ORDERING CODE [Full-Face]

Assembled Part

VH

● OPERATION

L	Indicator
M	Momentary
A	Alternate ※1)

● CONTACT

0	Indicator
1	SPDT • Gold-plated (Micro load)
2	DPDT • Gold-plated (Micro load)
3	SPDT • Gold-plated (High load)
4	DPDT • Gold-plated (High load)

● BUTTON SHAPE

S	Square ※1)
W	Rectangle

● LED COLOR

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

For protecting LED,
use external protective resistor.

● BUTTON COLOR

R	Red
G	Green
Y	Yellow ※2)
K	Black
M	Milk-white
C	Clear
X	Without button ※3)

● TERMINAL

S	Soldering
C	PCB

● FILTER COLOR

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

Filters cannot be used for
buttons other than clear button.

● HOUSING COLOR

K	Black
G	Gray

● FLANGE

1	Without flange
2	With flange

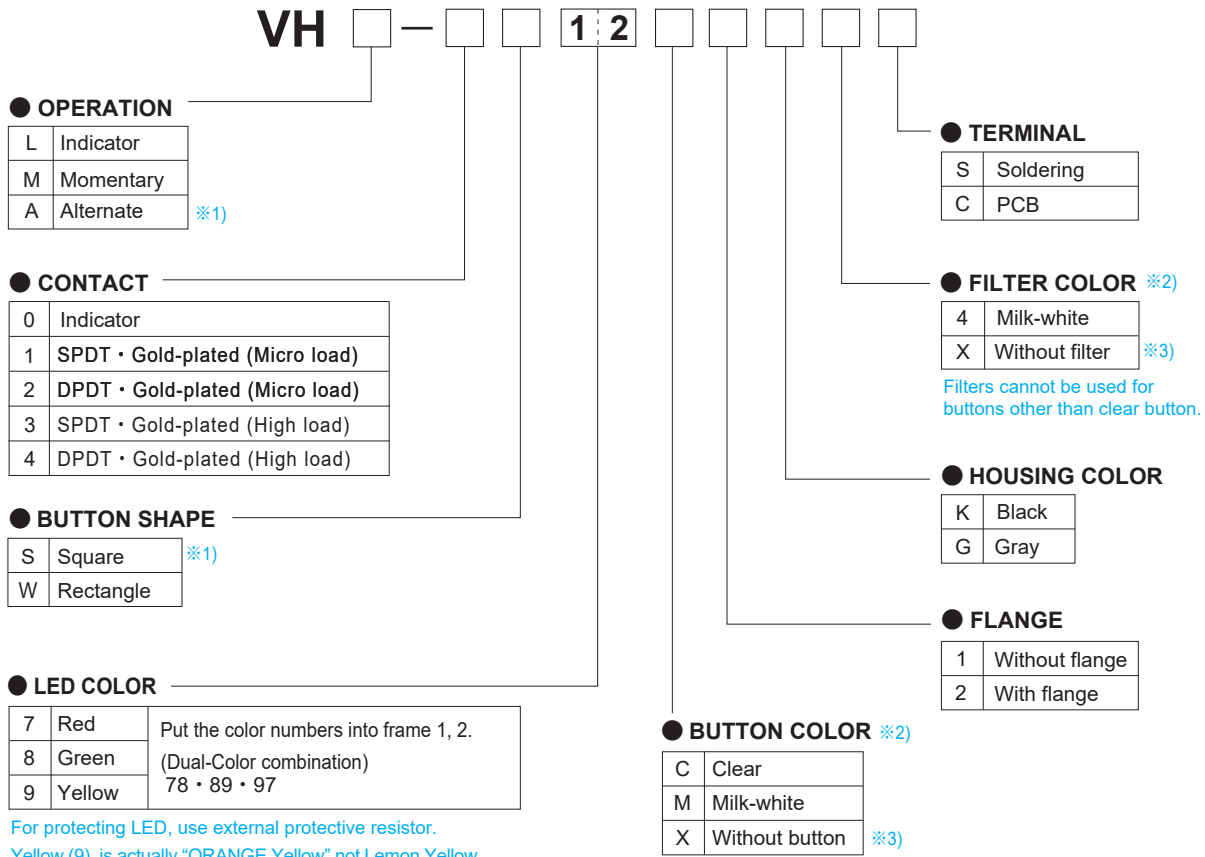
● NOTES

- ※1) Alternate type is available only for Square button, not for Rectangle button.
- ※2) The color of "Yellow" for LED (90), button (Y) and filter (3) is actually "Orange Yellow" not Lemon Yellow.
- ※3) For without button (X), specify without filter (X).

◇Dimensions : page VH-4	◇Accessories : page VH-5	◇Terminals / PCB hole cutout : page VH-11
◇Internal connection arrangements : page VH-9	◇LED specifications : page VH-10	
◇Mounting design / Panel cutout : page VH-13~14	◇Accessories' dimensions / Panel cutout : page VH-15~16	

ORDERING CODE 【Dual-Color】

Assembled Part



● NOTES

- ※1) Alternate type is available only for Square button, not for Rectangle button.
- ※2) Button should be C (Clear) with Milk-white filter (4) or M (Milk-white) without filter (X).
- ※3) For without button (X), specify without filter (X).

◇Dimensions : page VH-4	◇Accessories : page VH-5	◇Terminals / PCB hole cutout : page VH-12
◇Internal connection arrangements : page VH-9	◇LED specifications : page VH-10	
◇Mounting design / Panel cutout : page VH-13~14	◇Accessories' dimensions / Panel cutout : page VH-15~16	

REPLACEMENT PARTS

● Full-Face BUTTON/FILTER

		Red	Green	Yellow	Milk-White	Clear
BUTTON	Square	VH-0858-1R	VH-0858-1G	VH-0858-1Y	VH-0858-1M	VH-0858-2C
	Rectangle	VH-2193-1R	VH-2193-1G	VH-2193-1Y	VH-2193-1M	VH-2193-2C
FILTER	Square	VH-0859-R	VH-0859-G	VH-0859-Y	VH-0859-M	/
	Rectangle	VH-2195-R	VH-2195-G	VH-2195-Y	VH-2195-M	/

● Dual-Color BUTTON/FILTER

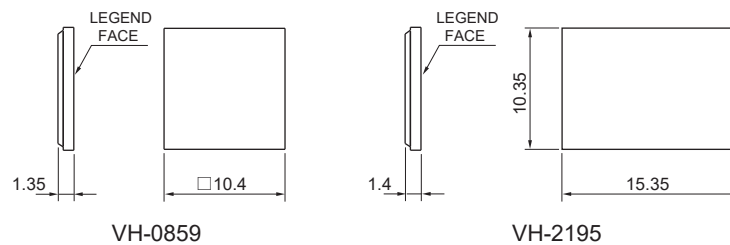
		Milk-White	Clear
BUTTON	Square	VH-0858-1M	VH-0858-2C
	Rectangle	VH-2193-1M	VH-2193-2C
FILTER	Square	VH-0859-M	/
	Rectangle	VH-2195-M	/

● Non-illumination BUTTON/FILTER

		Red	Green	Yellow	Black	Milk-White	Clear
BUTTON	Square	VH-0858-1R	VH-0858-1G	VH-0858-1Y	VH-0858-1K	VH-0858-1M	VH-0858-2C
	Rectangle	VH-2193-1R	VH-2193-1G	VH-2193-1Y	VH-2193-1K	VH-2193-1M	VH-2193-2C
FILTER	Square	VH-0859-R	VH-0859-G	VH-0859-Y	/	VH-0859-M	/
	Rectangle	VH-2195-R	VH-2195-G	VH-2195-Y	/	VH-2195-M	/

※ Black buttons do not transmit light.

FILTER DIMENSIONS



Tolerance : ± 0.4 mm

INTERNAL CONNECTION ARRANGEMENTS

● Full-Face

	Voltage	LED (70 · 80 · 90)	LED (14 · 16 · 18)
Square	Common for each voltage	BOTTOM VIEW TOP VIEW 	

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

● Dual-Color

	Voltage	LED (7 · 8 · 9)
Square	Common for each voltage	BOTTOM VIEW TOP VIEW

LED color : 7 (Red), 8 (Green), 9 (Yellow)

● Dual-Color combination (Common for each voltage)

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

LED SPECIFICATIONS [Full-Face]

LED Color	Red	Green	Yellow	Super Blue	Super White	Super Green
Max. Forward Current I_{FM} (mA)	30	30	30	20	20	20
DC Reverse Voltage V_R (V)	10	10	10	4	5	4
Forward Voltage V_F (Typ.) (V)	4.2	4.2	4.2	2.9	2.9	2.9
Derating (Operating temperature) (over 25°C working temperature) (mA/°C)	0.4	0.4	0.4	0.28	0.3	0.28
Pulse Lighting	Pulse Width PW (μ S)		100			
	Duty Ratio DR		10^{-1}			
	Allowable forward current I_{FP} (mA)		100		50	
Wiring Diagram	Diagram 1			Diagram 2		

Forward Voltage V_F of LED color : Red • Green • Yellow 【 $I_F=20\text{mA}$ 】
 Super Blue • Super Green 【 $I_F=10\text{mA}$ 】 Super White 【 $I_F=5\text{mA}$ 】

● Reference external resistor

Since LED protection resistors are not built-in, connect resistors in series referring to the table below.

(Standard brightness)

Voltage	Red	Green	Yellow	Super Blue	Super White	Super Green
DC 5V $\pm 5\%$	130 Ω 1/8W	51 Ω 1/8W	130 Ω 1/8W	470 Ω 1/8W	240 Ω 1/8W	620 Ω 1/8W
DC12V $\pm 5\%$	1300 Ω 1/4W	510 Ω 1/4W	1300 Ω 1/4W	2000 Ω 1/4W	1300 Ω 1/4W	2700 Ω 1/4W
DC24V $\pm 5\%$	3300 Ω 1/2W	1300 Ω 1/2W	3300 Ω 1/2W	4700 Ω 1/2W	3000 Ω 1/2W	6200 Ω 1/2W
Reference forward current (mA)	7	16	7	9.2	6.8	3.8

※ Super-White : The above values make the LEDs brighter than other colors. For matching the brightness with LEDs of other colors, use the following "Low brightness" LED protection resistance values.

※ For using a socket, please contact us since the built-in resistance of the socket will also change.

(Low brightness)

Voltage	Red	Green	Yellow	Super Blue	Super White	Super Green
DC 5V $\pm 5\%$	240 Ω 1/8W	91 Ω 1/8W	270 Ω 1/4W	910 Ω 1/8W	550 Ω 1/8W	1500 Ω 1/8W
DC12V $\pm 5\%$	1800 Ω 1/4W	830 Ω 1/4W	2700 Ω 1/4W	4300 Ω 1/4W	2700 Ω 1/4W	6800 Ω 1/4W
DC24V $\pm 5\%$	4300 Ω 1/2W	2200 Ω 1/2W	5600 Ω 1/2W	10K Ω 1/4W	6800 Ω 1/4W	15K Ω 1/4W

● Wiring Diagram

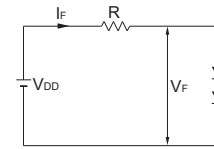


Diagram 1

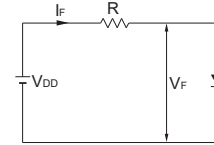


Diagram 2

Refer to the following formula to calculate external resistance values.

$$R = \frac{V_{DD} - V_F}{I_F} \quad \begin{array}{l} V_{DD} : \text{Supply Voltage} \\ V_F : \text{Forward Voltage} \\ I_F : \text{Forward Current} \end{array}$$

I_F (Forward Current) :
 Refer to the Rated Current in the table on the left, and be sure to set less than I_{FM} (Max. Forward Current).

LED SPECIFICATIONS [Dual-Color]

LED Color	Red	Green	Yellow
Max. Forward Current I_{FM} (mA)	30	30	30
DC Reverse Voltage V_R (V)	10	10	10
Forward Voltage V_F (Typ.) 【 $I_F=20\text{mA}$ 】 (V)	4	4.4	4.2
Derating (Operating temperature) (over 25°C working temperature) (mA/°C)	0.4		
Pulse Lighting	Pulse Width PW (μ S)		100
	Duty Ratio DR		10^{-1}
	Allowable forward current I_{FP} (mA)		50

● Reference external resistor

Since LED protection resistors are not built-in, connect resistors in series referring to the table below.

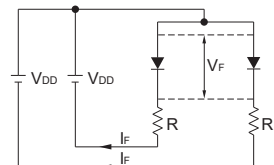
Voltage	Red	Green	Yellow
DC 5V $\pm 5\%$	51 Ω 1/8W	33 Ω 1/8W	43 Ω 1/8W
DC12V $\pm 5\%$	430 Ω 1/4W	390 Ω 1/4W	390 Ω 1/4W
DC24V $\pm 5\%$	1000 Ω 1/2W	1000 Ω 1/2W	1000 Ω 1/2W
Reference forward current (mA)	20	20	20

For resistance value calculation

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

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

● Wiring Diagram



Refer to the following formula to calculate external resistance values.

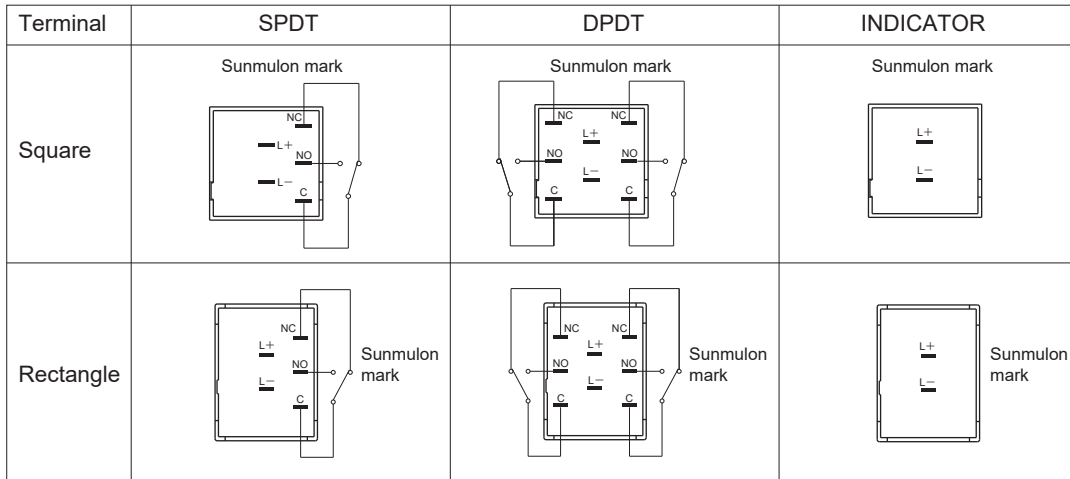
$$R = \frac{V_{DD} - V_F}{I_F} \quad \begin{array}{l} V_{DD} : \text{Supply Voltage} \\ V_F : \text{Forward Voltage} \\ I_F : \text{Forward Current} \end{array}$$

I_F (Forward Current) :
 Refer to the Rated Current in the table on the left, and be sure to set less than I_{FM} (Max. Forward Current).

TERMINALS / PCB HOLE CUTOUT

■ Full-Face

● TERMINALS LAYOUT (BOTTOM VIEW)

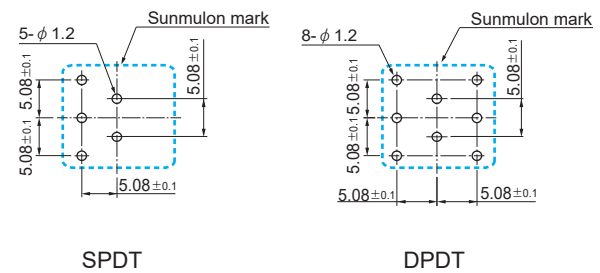
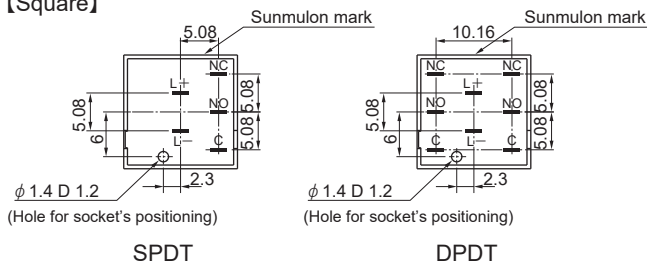


※ When "Without LED (X)" is specified, there are no LED terminals (L+, L-).

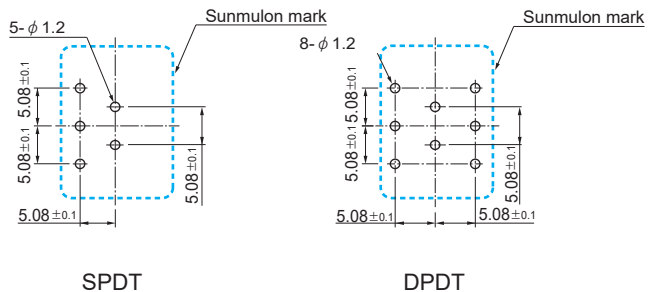
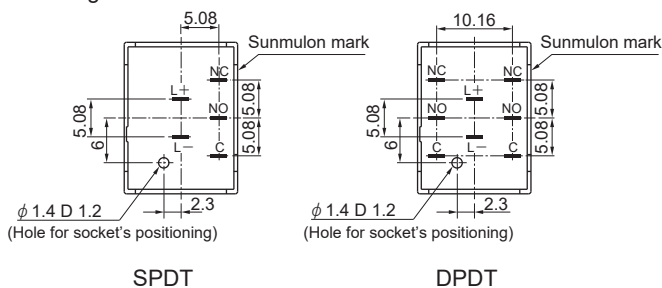
● TERMINALS DIMENSIONS (BOTTOM VIEW)

● PCB hole cut-out (TOP VIEW)

[Square]



[Rectangle]



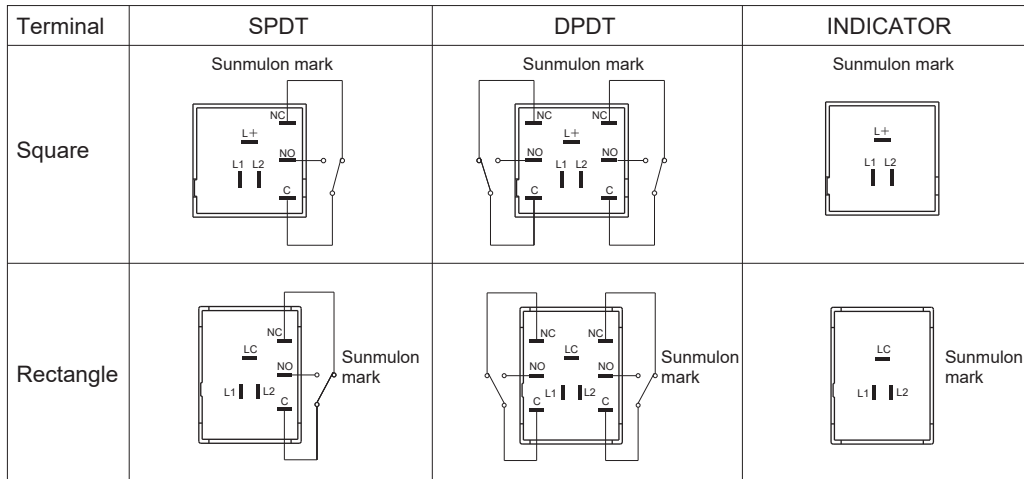
※ When "Without LED (X)" is specified, there are no LED terminals (L+, L-).

Tolerance : ± 0.4 mm

TERMINALS / PCB HOLE CUTOUT

■ Dual-Color

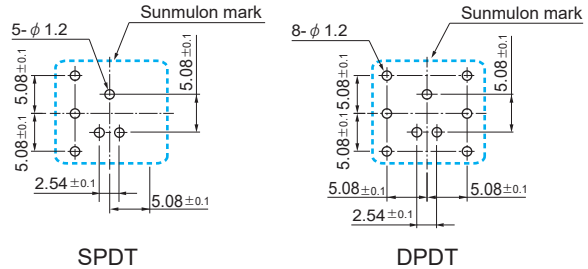
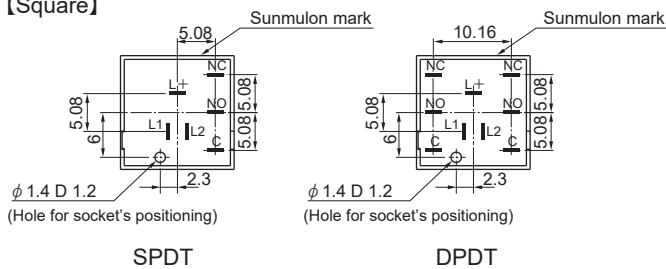
● TERMINALS LAYOUT (BOTTOM VIEW)



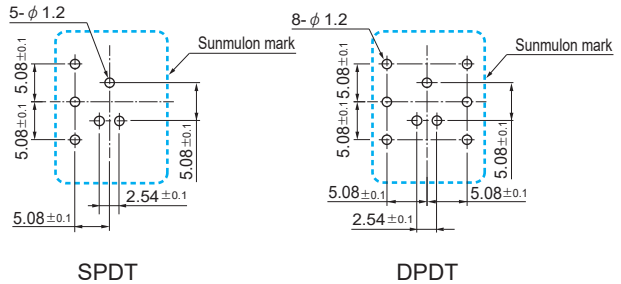
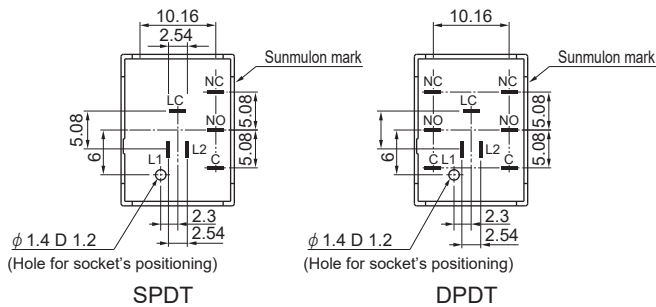
● TERMINALS DIMENSIONS (BOTTOM VIEW)

● PCB hole cut-out (TOP VIEW)

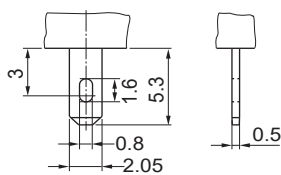
[Square]



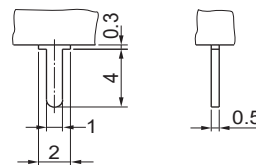
[Rectangle]



TERMINAL SHAPE



Soldering Terminal

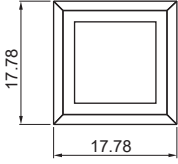
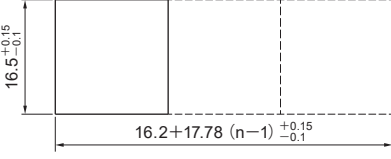
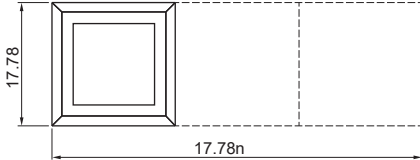
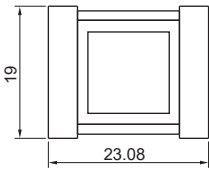
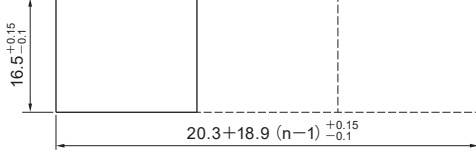
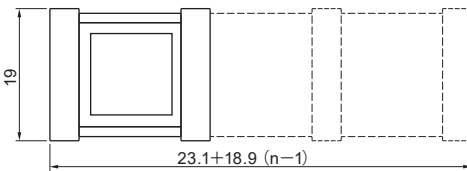
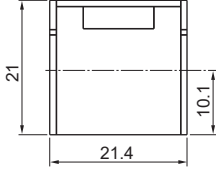
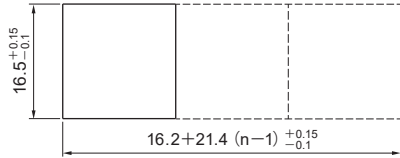
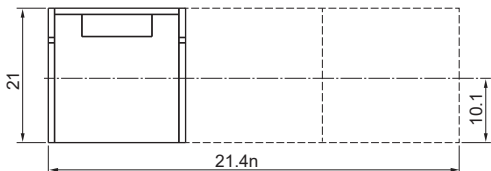


PCB Terminal

Tolerance : ± 0.4 mm

MOUNTING DESIGN / PANEL CUTOUT

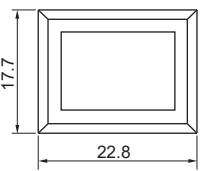
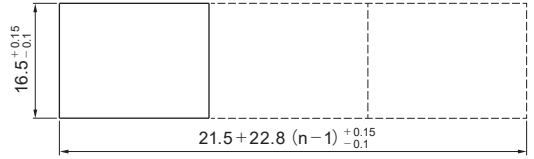
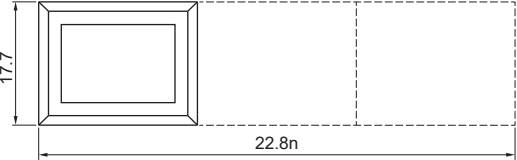
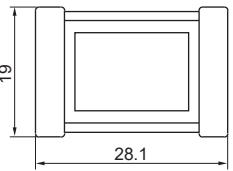
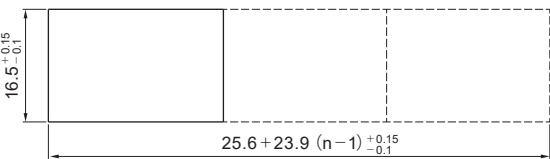
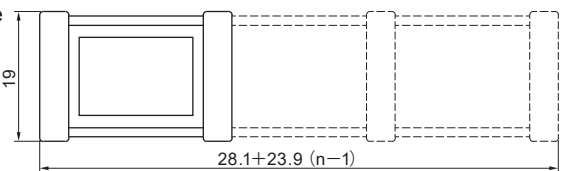
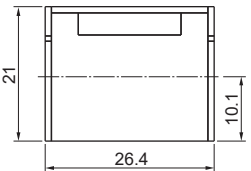
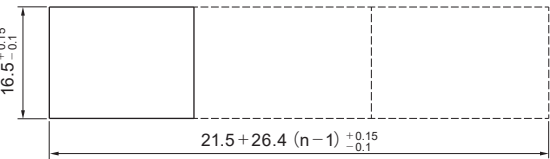
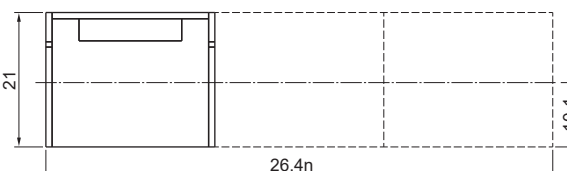
● Square

Mounting design		Panel cutout
Without Barriers	Individual 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple 	
With Barriers	Individual 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple 	
With Guard cover	Individual 	Recommended panel thickness : 1 to 2.5 mm 
	Multiple 	

- ※ 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.
- ※ Placing consecutive vertical direction for neither Square nor Rectangle is available.
- ※ After the panel-cutting process, make sure to remove burrs on the surface.

Tolerance : ±0.4 mm

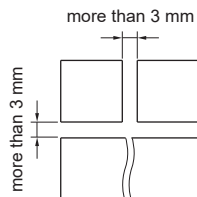
● Rectangle

Mounting design		Panel cutout
Without Barriers	Individual 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple 	
With Barriers	Individual 	Recommended panel thickness : 1 to 3.2 mm 
	Multiple 	
With Guard cover	Individual 	Recommended panel thickness : 1 to 2.5 mm 
	Multiple 	

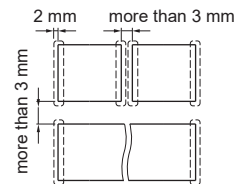
- ※ If the panel is to be finished (e.g. coated), make sure that the panel meets the specified dimensions after the coating. In case the panel cut dimension is too small, it may cause malfunction.
- ※ Placing consecutive vertical direction for neither Square nor Rectangle is available.
- ※ After the panel-cutting process, make sure to remove burrs on the surface.

● Panel cut spacing dimensions for spaced individual mounting

With Flange



With Barriers



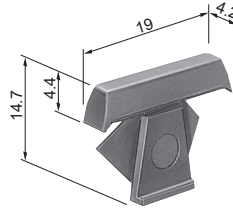
Tolerance : ±0.4 mm

ACCESSORIES

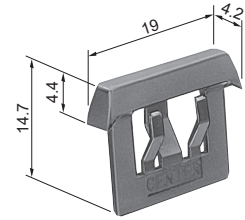
BARRIER

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

※ Cannot be used with guard cover.



Side barrier



Center barrier

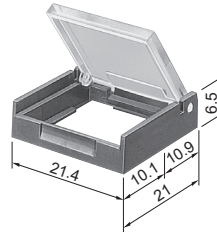
3D
DXF

GUARD COVER for with Flange type

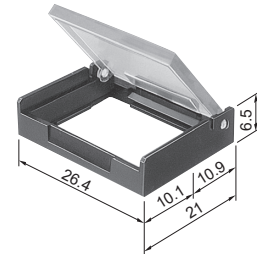
Square	Black	VH-1089-K
	Gray	VH-1089-H
Rectangle	Black	VH-2252-K
	Gray	VH-2252-H

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

※ Cannot be used with barrier.



Square



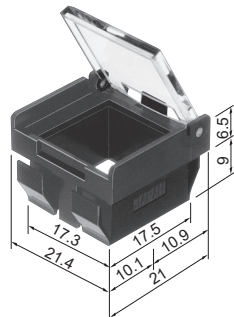
Rectangle

3D
DXF

GUARD COVER for without Flange type

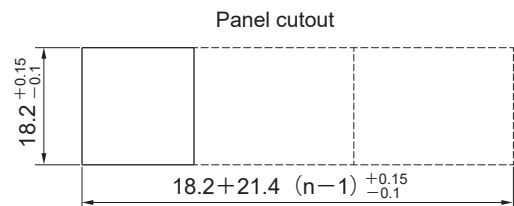
Square	Black	VH-2026-K
	Gray	VH-2026-H
Rectangle	Black	VH-2253-K
	Gray	VH-2253-H

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



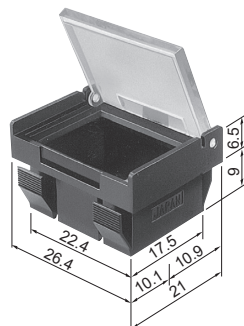
Square

3D
DXF



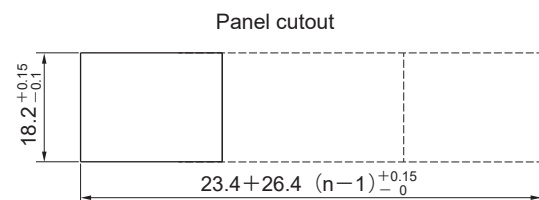
n : Number of Units

Recommended panel thickness : 1 mm ~ 3.2 mm



Rectangle

3D
DXF



n : Number of Units

Recommended panel thickness : 1 mm ~ 3.2 mm

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

Tolerance : ±0.4 mm

ACCESSORIES

SOCKET

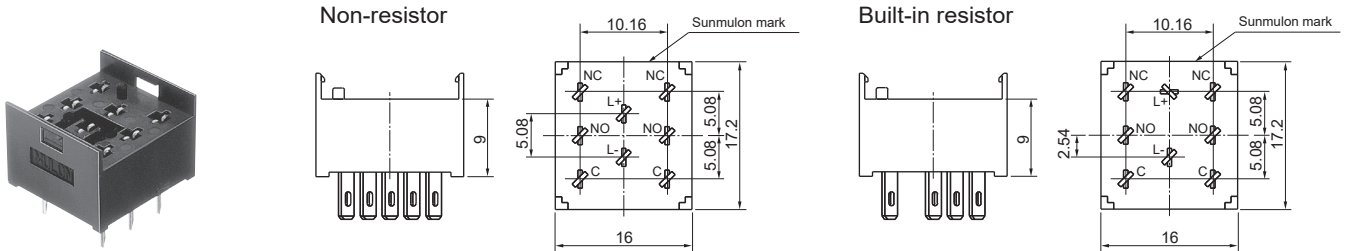
- ※ When using a socket, use soldering terminal for the Housing.
- ※ Cannot be used for Rectangle button.

● Full-Face

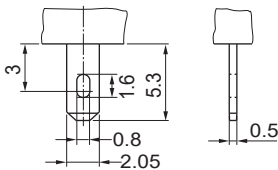
Socket terminal shape	Type to be used	Part no.	Resistance value	Remarks	
Soldering terminal	Non-resistor type (Common for each voltage)	VH-1052	0 Ω	Use external protective resistor. Cannot be used for Rectangle button. Cannot be used for Dual-Color type. Cannot be mounted for without flange type.	
	Built-in resistor type for DC 5 V	Red / Yellow	VH-3631-1	130 Ω 1/2W	Cannot be used for Rectangle button. Cannot be used for Dual-Color type. Cannot be mounted for without flange type.
		Green	VH-3631-2	51 Ω 1/2W	
		Super-Blue	VH-3631-3	470 Ω 1/8W	
		Super-White	VH-3631-4	240 Ω 1/2W	
		Super-Green	VH-3631-5	620 Ω 1/8W	
	Built-in resistor type for DC 12 V	Red / Yellow	VH-3632-1	1300 Ω 1/2W	
		Green	VH-3632-2	510 Ω 1/2W	
		Super-Blue	VH-3632-3	2000 Ω 1/4W	
		Super-White	VH-3632-4	1300 Ω 1/2W	
		Super-Green	VH-3632-5	2700 Ω 1/4W	
	Built-in resistor type for DC 24 V	Red / Yellow	VH-3633-1	3300 Ω 1/2W	
		Green	VH-3633-2	1300 Ω 1/2W	
		Super-Blue	VH-3633-3	4700 Ω 1/2W	
		Super-White	VH-3633-4	3000 Ω 1/2W	
		Super-Green	VH-3633-5	6200 Ω 1/2W	

※ Socket insertion durability : 30 cycles max.

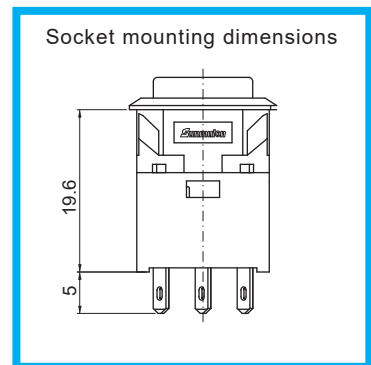
● Soldering terminal (Square only)



● Terminal shape



Soldering terminal



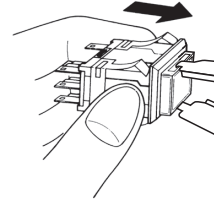
Tolerance : ± 0.4 mm

ASSEMBLY & DISASSEMBLY

1. 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.
- ※ Do not reuse buttons that have been removed and deformed.



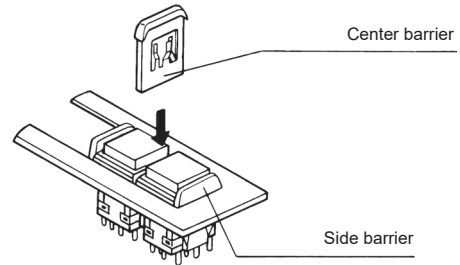
2. Installing Barriers

① Side Barriers

After setting the side barriers on the sides of the housing,
insert it into the panel cut-out.

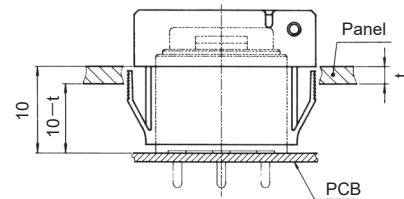
② Center Barriers

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



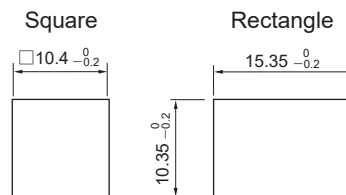
3. Installing Guard cover without Flange

The installation is as shown on the right.



PRECAUTIONS FOR CORRECT USE

1. Solder quickly and correctly at 380°C max. and for 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. Character films are not included.
If preparing the character film separately, use a heat-resistant film with a thickness of 0.1 mm.
For dimensions, please refer to the figure below.
4. The LEDs cannot be replaced because they are assembled into the housing.



- ※ 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

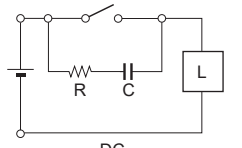
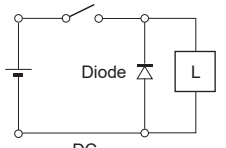
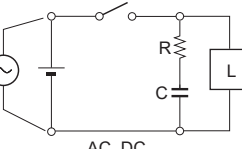
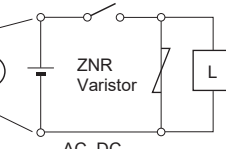
- (1) The warranty period for Sunmulon products shall be 1 year after purchase or delivery to the specified location.
- (2) Warranty scope should a failure occur in Sunmulon product during the above warranty period for reasons attributable to Sunmulon, then Sunmulon shall provide that product, free of 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 cause by the following reasons shall be deemed outside the scope of this warranty.
 - (a) The product was handled or used deviating from conditions / environment listed in the catalogs
 - (b) The failure was caused by reasons other than Sunmulon product
 - (c) Modification or repair was performed by a party other than Sunmulon
 - (d) Replacement of maintenance parts, installation of accessories, or the like was not performed properly in accordance with the user's manual and catalogs
 - (e) The failure could not have been predicted with the scientific and technical standards at the time when the product was shipped from Sunmulon
 - (f) The failure was due to other causes not attributable to Sunmulon (including cases of force majeure such as natural disasters and other disasters)
- (4) The warranty listed in this Safety Precautions is the full and complete warranty for Sunmulon products, and Sunmulon shall bear no liability whatsoever regarding special damages, indirect damages, incidental damages, or passive damages that occurred due to Sunmulon product.

4. Handling precautions for switch

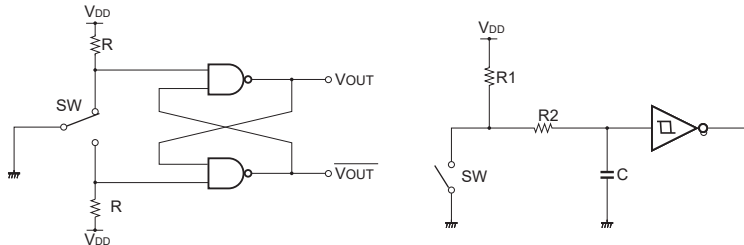
- (1) Do not perform wiring with power supplied to the switch. Do not touch the terminals or other charged parts of the switch while power is being supplied. Doing so may result in electric shock.
- (2) Be careful of electrostatic breakdown when handling.
- (3) Do not drop or otherwise apply strong force to the switch.
- (4) Do not place heavy objects on the switch.
- (5) Do not operate or use the housing (switch unit) by itself. Use the switch with assembled the illuminated part (LED module or button).
- (6) Pushbutton switches are designed to be operated by fingertips. Operating the switch using a sharp object (screwdrivers, tweezers, etc.), hard object (metal, etc.), or with a large or sudden force, may cause deform or damage the switch.
- (7) Do not use the switch under loads that exceed the rated switching capacity or other contact ratings. Doing so may result in welding of the contact, or burnout accidents.

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.

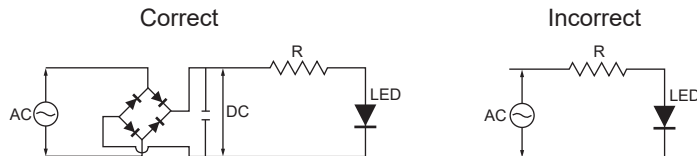
Circuit	Element selection	Circuit	Element selection
 <p style="text-align: center;">DC</p>	<p>C : 1 to 0.5 μF \times switch current (A) R : 0.5 to 1 Ω \times switch voltage (V)</p> <p>The values may change according to the characteristics of the load. Determine ideal capacitance and resistance values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

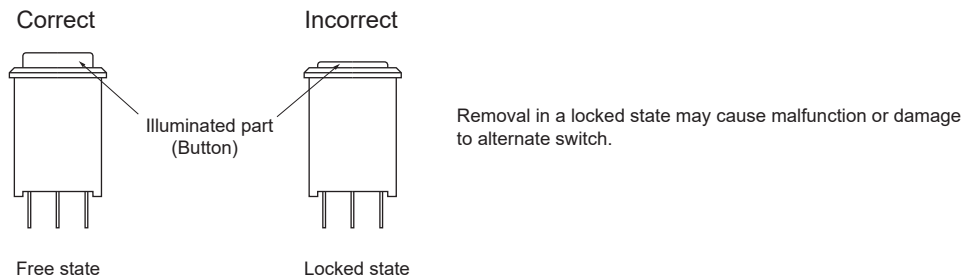
(12) Usage environment

- (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.