

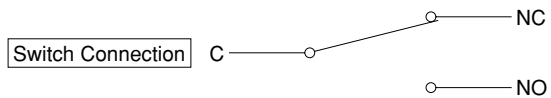
# VH Super Miniature Lighted Pushbutton Switch

**Only 10.6mm depth behind panel permits space saving on machinery.**

**Flanged type for panel mounting and without flange type for PCB available.**

### ■ FEATURES

- Depth behind panel : Only 10.6mm
- LED Full-Face, Dual-Color illumination available.
- Button Size: 12mm square type, 12×17mm rectangular type
- Incorporated leaf spring snap action switch assures high reliability and light operating touch.
- Signal Load Current and High Capacity Contact provided.
- Accessories: Barriers, Guard Covers, Sockets, etc.
- High Brightness LED type, Super Blue, Super White, Super Green available.



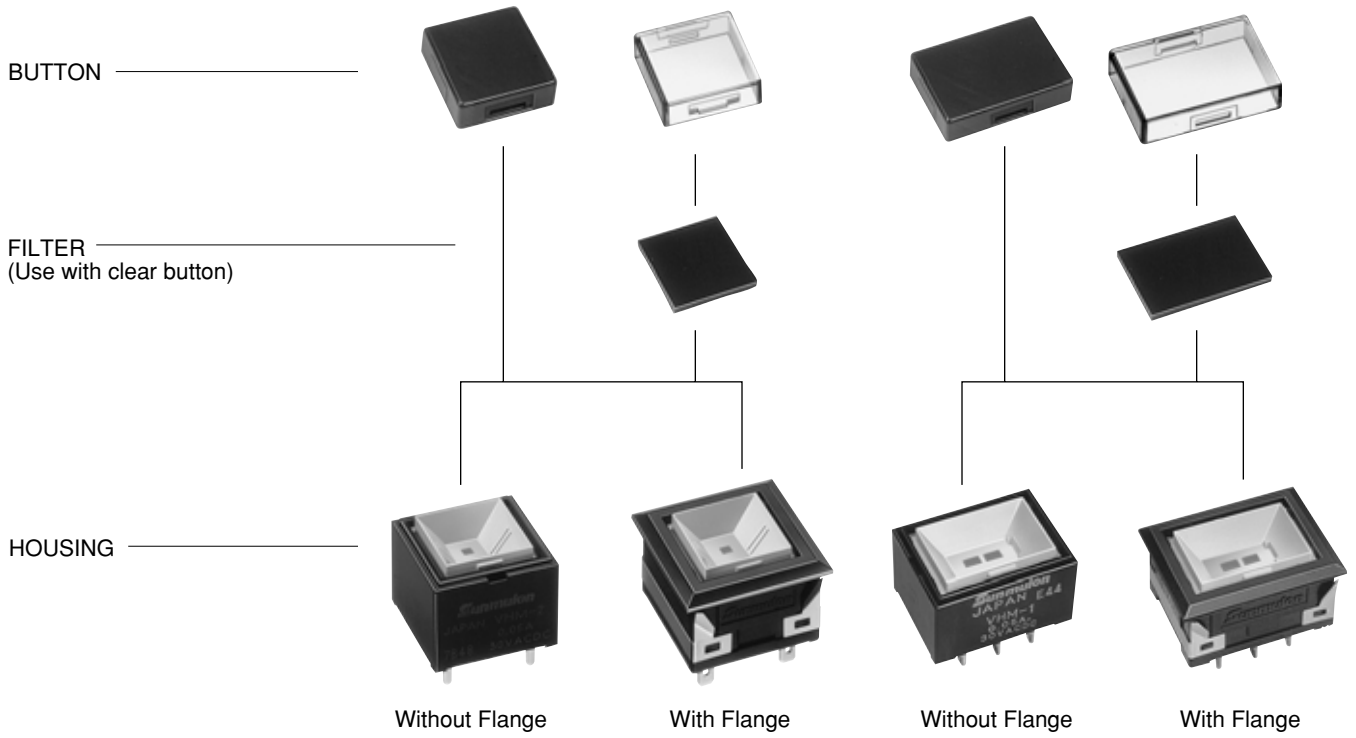
## SPECIFICATIONS

Contact	Signal Load Current Type (Gold plated)	High Capacity Type (Silver contact with gold plated)
Electrical Rating	AC, DC30V 0.05A(Resistive)	AC125V, 250V 5A(Resistive)
Insulation Resistance	More than 100MΩ at 500V DC	
Dielectric Strength	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	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
Contact Resistance	Less than 100mΩ (Initial) at DC6V 0.05A	Less than 30mΩ (Initial) at DC6V 1A
Mechanical Life	Momentary Action :more than 1,000,000 operations	Alternate Action : more than 200,000 operations
Electrical Life	More than 200,000 operations at max. rated load	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.)	2.45N	Total Travel (max.)	2.5mm
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## STRUCTURE



## DIMENSIONS

With Flange	12mm Square Button				
	12×17mm Rect. Button				

Tolerance : ±0.4mm

DIMENSIONS

Without Flange	12mm Square Button				
	12x17mm Rect. Button				

INTERNAL CONNECTION ARRANGEMENTS

● LED (Red, Green, Yellow)

LED Full-Face (Square)	Any Voltage	<b>Mono-Color</b>		<b>Dual-Color</b>	
		BOTTOM VIEW	TOP VIEW	BOTTOM VIEW	TOP VIEW
LED Full-Face (Rectangular)	Any Voltage	<b>Mono-Color</b>		<b>Dual-Color</b>	
		BOTTOM VIEW	TOP VIEW	BOTTOM VIEW	TOP VIEW

● Dual-Color Combination

LC(+)-L1	Red	Green	Yellow
LC(+)-L2	Green	Yellow	Red

Tolerance : ±0.4mm

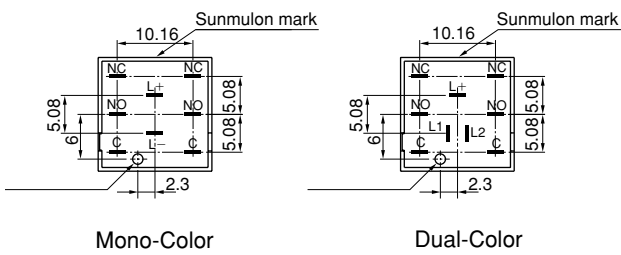
## TERMINALS

### ● TERMINALS LAYOUT

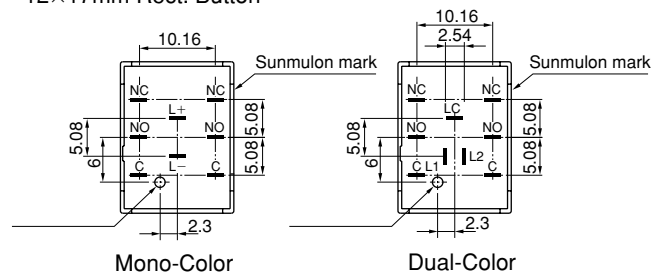
		STDP	DTDP	INDICATOR
12mm Square Button	Mono-Color	BOTTOM VIEW 		
	Dual-Color	BOTTOM VIEW 		
12x17mm Rect. Button	Mono-Color	BOTTOM VIEW 		
	Dual-Color	BOTTOM VIEW 		

### ● TERMINALS DIMENSIONS (BOTTOM VIEW)

12mm Square Button

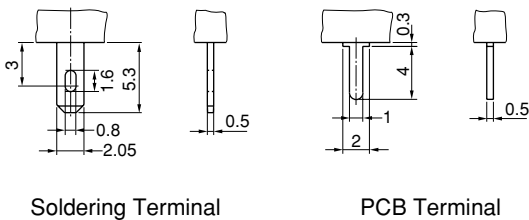


12x17mm Rect. Button

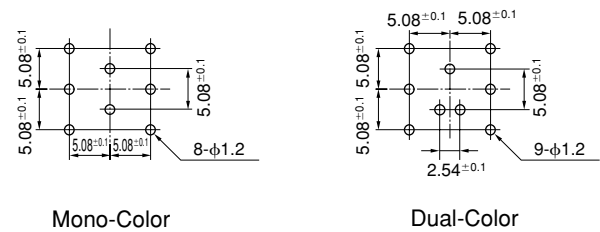


## TERMINAL SHAPE / PCB HOLE CUT-OUT

### ● TERMINAL SHAPE



### ● PCB hole cut-out (BOTTOM VIEW)



In case of mounting switches side by side, Please note there is a 90° difference between Square type and Rectangular type.

Tolerance : ±0.4mm

## LED DATA

### ● LED RATINGS

ITEM	Mono-Color					Dual-Color		
	Red, Yellow	Green	S. Blue	S. White	S. Green	Red	Green	Yellow
Max. operating current $I_{FM}$ (mA)	20	20	20	20	20	30	30	30
DC reverse voltage $V_R$ (V)	10	10	4	4	4	10	10	10
Forward voltage $V_F$ (V)	4.2	4.2	3.3	3.3	3.3	4	4.4	4.2
Recommended operating current $I_F$ (mA)	7	16	9.2	6.8	3.8	20	20	20
Current Reduced Factor (Over 25°C working Temperature)	0.4mA/°C					0.4mA/°C		
Wiring Diagram	Fig.1					Fig.2		

### ● LED PROTECTION RESISTOR

As LED protection resistor is not built-in, please apply external resistor according to following:

#### Standard Brightness

Voltage (V)	Mono-Color					Dual-Color		
	Red, Yellow	Green	S. Blue	S. White	S. Green	Red	Green	Yellow
5(±5%)	130Ω 1/8W	51Ω 1/8W	160Ω 1/8W	240Ω 1/8W	510Ω 1/8W	51Ω 1/8W	33Ω 1/8W	43Ω 1/8W
12(±5%)	1300Ω 1/4W	510Ω 1/4W	910Ω 1/4W	1300Ω 1/4W	2400Ω 1/4W	430Ω 1/4W	390Ω 1/4W	390Ω 1/4W
24(±5%)	3300Ω 1/2W	1300Ω 1/2W	2200Ω 1/2W	3000Ω 1/2W	5600Ω 1/2W	1000Ω 1/2W	1000Ω 1/2W	1000Ω 1/2W

#### Lower Brightness

Voltage (V)	Mono-Color					
	Red	Green	Yellow	S. Blue	S. White	S. Green
5(±5%)	240Ω 1/8W	91Ω 1/8W	270Ω 1/8W	430Ω 1/8W	550Ω 1/8W	1500Ω 1/8W
12(±5%)	1800Ω 1/4W	830Ω 1/4W	2700Ω 1/4W	2200Ω 1/4W	2700Ω 1/4W	6800Ω 1/4W
24(±5%)	4300Ω 1/2W	2200Ω 1/2W	5600Ω 1/2W	5100Ω 1/4W	6800Ω 1/4W	15KΩ 1/4W

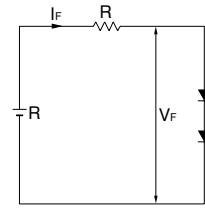


Fig.1

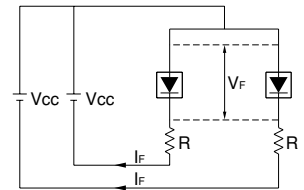


Fig.2

The value of the series resistor can be determined by the formula:

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

$V_{cc}$ : Supply Voltage

$V_F$ : Forward Voltage

$I_F$ : Forward Current With Guard Cover

\* Pulse Lighting

Pulse Width  $P_w = 100\mu s$

Duty Ratio  $DR = 10^{-1}$

$I_{FM} = 120mA$  (any color)

## PANEL LAYOUT / PANEL CUT DIMENSIONS

### ● 12mm Square Button

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent		
	Serial		
With Barriers	Independent		
	Serial		

\* Panel Cut Dimension should be after panel paintings.

$n$ : number of switches  
Tolerance:  $\pm 0.4mm$

## PANEL LAYOUT / PANEL CUT DIMENSIONS

		Panel Layout	Panel Cut Dimensions
With Guard Cover	Independent		
	Serial		

### ● 12×17mm Rect. Button

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent		
	Serial		
With Barriers	Independent		
	Serial		
With Guard Cover	Independent		
	Serial		

Panel thickness: 1.0 ~ 3.2mm

Panel thickness: 1.0 ~ 2.5mm(Guard Cover use)

n : number of switches

Tolerance : ±0.4mm

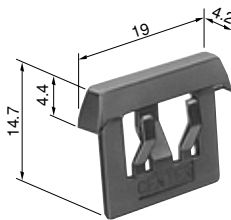
PANEL LAYOUT / PANEL CUT DIMENSIONS

With Flange	With Flange, With Barriers
<p>In case of Group Mounting, please leave space as below.</p>	<p>In case of Group Mounting, please leave space as below.</p>

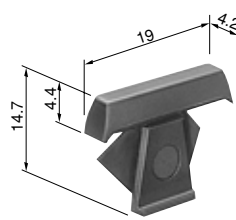
ACCESSORIES

BARRIERS

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



Center Barrier



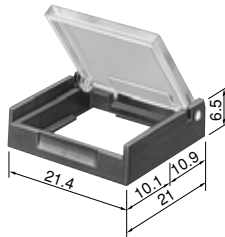
Side Barrier

Part No.		
	Center Barrier	Side Barrier
Black	VH-0975-K	VH-0976-K
Gray	VH-0975-G	VH-0976-G

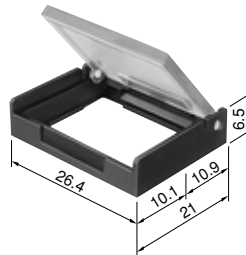
GUARD COVER (WITH FLANGE)

Guard Cover prevents inadvertent and unintentional operations.

● 12mm Square Button



● 12×17mm Rectangular Button

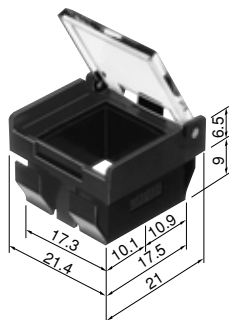


Part No.		
Square	Black	VH-1089-K
	Gray	VH-1089-H
Rect.	Black	VH-2252-K
	Gray	VH-2252-H

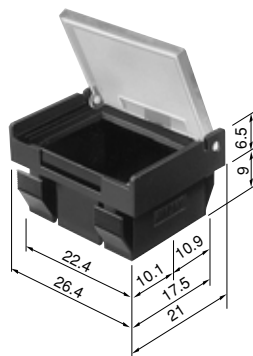
\* The cover to be opened 90° and stopped.

GUARD COVER (WITHOUT FLANGE)

● 12mm Square Button



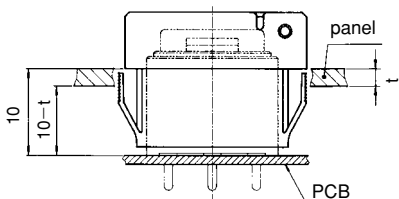
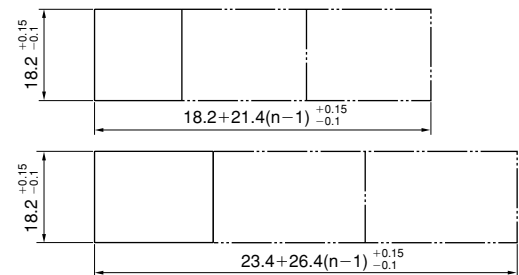
● 12×17mm Rectangular Button



Part No.		
Square	Black	VH-2026-K
	Gray	VH-2026-H
Rect.	Black	VH-2253-K
	Gray	VH-2253-H

\* The cover to be opened 90° and stopped.

● Panel Cut Dimensions for without flange guard cover

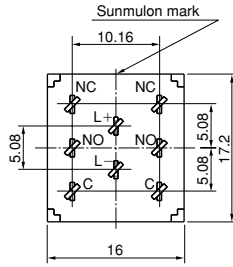
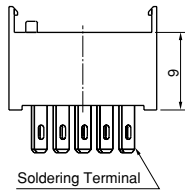


Panel thickness: 1.0~3.2mm  
Tolerance : ±0.4mm

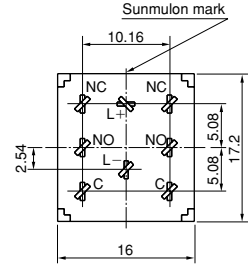
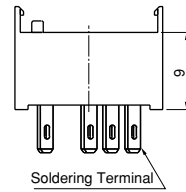
## ACCESSORIES

### SOCKET

#### • Non Resistor



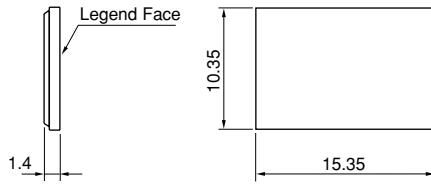
#### • Built-in Resistor



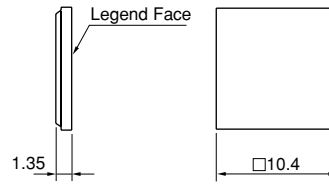
Soldering Terminal	Voltage \ Color	Red, Yellow	Green	S. Blue	S. White	S. Green
	5V	VH-3631-1 130Ω 1/2W	VH-3631-2 51Ω 1/2W	VH-3631-3 160Ω 1/2W	VH-3631-4 240Ω 1/2W	VH-3631-5 510Ω 1/2W
12V	VH-3632-1 1300Ω 1/2W	VH-3632-2 510Ω 1/2W	VH-3632-3 910Ω 1/2W	VH-3632-4 1300Ω 1/2W	VH-3632-5 2400Ω 1/2W	
24V	VH-3633-1 3300Ω 1/2W	VH-3633-2 1300Ω 1/2W	VH-3633-3 2200Ω 1/2W	VH-3633-4 3000Ω 1/2W	VH-3633-5 5600Ω 1/2W	
Non Resistor	VH-1052					

- Note 1. Socket to be used for Solder terminal type of Switch Unit.
- Note 2. Socket not to be used for Rectangular switch unit.
- Note 3. Socket not to be used for Dual-Color type.

## FILTER DIMENSIONS



VH-2195



VH-0859

## REPLACEMENT PARTS

Please order replacement parts with Part No.

#### • Button/Filter

Item \ Color	Red	Green	Yellow	Milk-White	Clear	* Black
Square Button	VH-0858-1R	VH-0858-1G	VH-0858-1Y	VH-0858-1M	VH-0858-2C	VH-0858-1K
Rect. Button	VH-2193-1R	VH-2193-1G	VH-2193-1Y	VH-2193-1M	VH-2193-2C	VH-2193-1K
Square Filter	VH-0859-R	VH-0859-G	VH-0859-Y	VH-0859-M		
Rect. Filter	VH-2195-R	VH-2195-G	VH-2195-Y	VH-2195-M		

\* Non illuminated only  
Tolerance : ±0.4mm



**ORDERING CODE**

**LED Illumination**



● **OPERATION**

M	Momentary
A	Alternate
L	Indicator

※ Please note Alternate type is available only for Square Button

● **CONTACT**

0	Indicator
1	SPDT 0.05A30VAC DC
2	DPDT 0.05A30VAC DC
3	SPDT 5A125V / 250VAC
4	DPDT 5A125V / 250VAC

● **BUTTON SHAPE**

S	Square
W	Rect.

● **ILLUMINATION TYPE**

70	Red	Full-Face : Put color no. into the frame 1
80	Green	
90	Yellow	
14	S. Blue	
16	S. White	
18	S. Green	
×	Without LED	

7	Red	Dual-Color : Put color no. into the frame 1,2 (78,89,97)
8	Green	
9	Yellow	

● **TERMINAL**

S	Solder
C	PCB

● **FILTER**

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

Note : Filter not to be used with colored button.

● **HOUSING COLOR**

K	Black
G	Gray

● **FLANGE**

1	Without Flange
2	With Flange

● **BUTTON COLOR**

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

※

\*

\* Non illuminated only

● **NOTES**

- 1) In case of Dual-Color, button should be C (clear) with Milk-White filter or Milk-White button.
- 2) Please be noted that the color of "Yellow" for LED, Button, Filter is actually "Orange Yellow" not Lemon Yellow.