

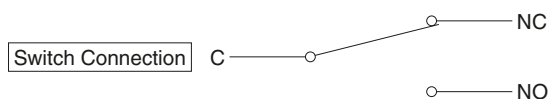
MH Subminiature Lighted Pushbutton Switch

Only 22mm depth behind panel with $\phi 16$ panel cutout.

Screw mounting and Snap-in mounting available.

■ FEATURES

- Depth behind panel : only 22mm
- Button size : 14.2mm square type, 14.2×20.2mm rectangular type and 15mm round type.
- Incorporating precision snap action switch mechanism assures long life (Mechanical : 2,000,000 operations min.).
- Contact mechanism has wiping action, and it's self-cleaning effect permits high reliability.



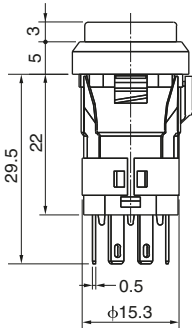
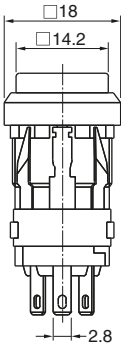
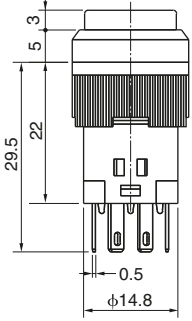
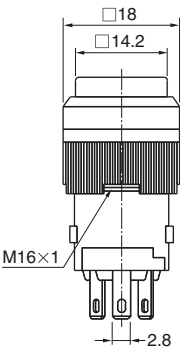
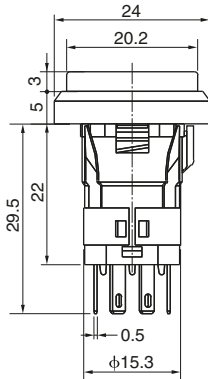
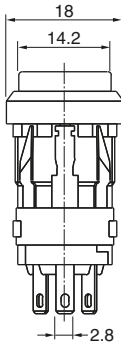
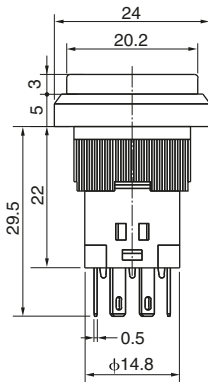
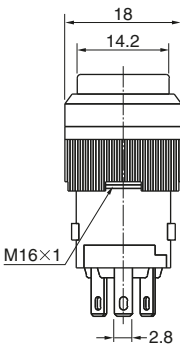
SPECIFICATIONS

Contact	Silver Contact (Gold-Plated)
Rating	3A 125, 250V AC (Res. Load)
Insulation Resistance	Over 100M Ω at 500V DC Meger
Dielectric Strength	Between terminals : 1,000V AC RMS
	Between terminals & Ground : 1,500V AC RMS
	Both 50/60Hz in normal temperature & humidity in one minute
Contact Resistance	Under 30m Ω (at initial) at 1A 6VDC
Mechanical Life	Momentary : 2,000,000 operations (min.), Alternate : 200,000 operations (min.)
Electrical Life	70,000 operations (min., at rated load)
Ambient Temperature	-15°C~50°C
Ambient Humidity	Under 80% RH

OPERATING CHARACTERISTICS

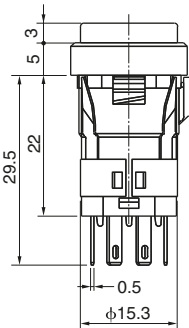
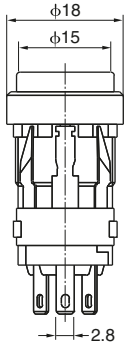
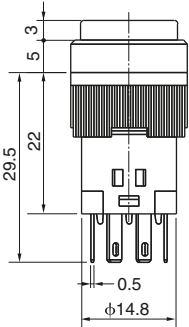
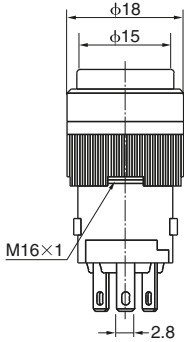
Operating Force (Max.)	4.41N {450gf}	Total Travel (mm Max.)	2.5
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DIMENSIONS

14.2 Square Button		Snap-in Type	
			
			
14.2×20.2 Rectangular Button		Snap-in Type	
			
			

Tolerance : ±0.4mm

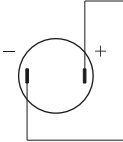
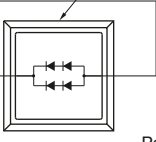
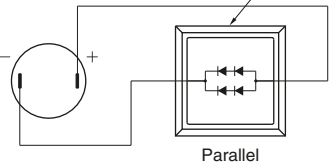
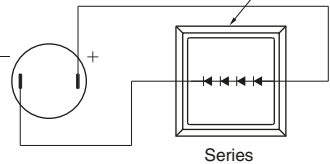
DIMENSIONS

Φ15 Round Button	Snap-in Type	  
	Screw Type	  

Tolerance : ±0.4mm

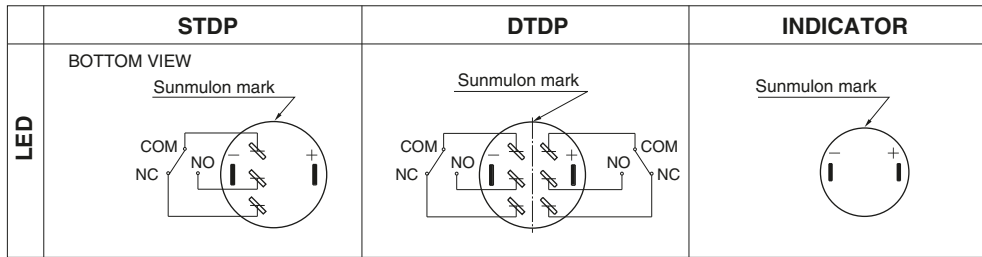
INTERNAL CONNECTION ARRANGEMENTS

● LED (Any size)

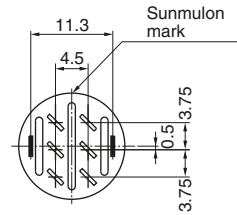
LED	V	BOTTOM VIEW		TOP VIEW	
	5 V				
	12 V 24 V				

TERMINALS

● TERMINALS LAYOUT(Any size)

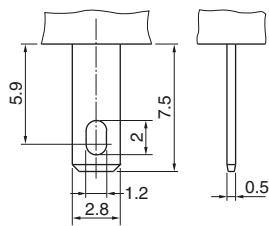


● TERMINALS DIMENSIONS (BOTTOM VIEW)

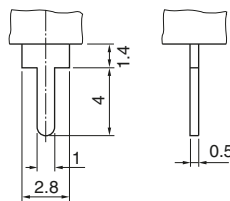


TERMIINAL SHAPES / DIMENSIONS

● TERMINAL SHAPE

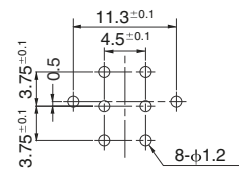


Solder/Tab Terminal



Printed circuit Terminal

● Printed circuit Terminal Hole (BOTTOM VIEW)



LED RATING

● LED Rating (Calculated at 4-chip LED)

Item	LED			
	Parallel		Series	
	Red, Yellow	Green	Red, Yellow	Green
Max. Operating Current I _{FM} (mA)	40	40	20	20
DC Reverse Voltage V _R (V)	10	10	20	20
Forward Voltage V _F (V)	4.2	4.2	8.4	8.4
Forward Current I _F (mA)	7	25	4	13

※ In case of pulse lighting, please note following conditions.

I_{FM}=120mA (DC current for one LED. all colors)

Where : Pulse width (PW)=100msec.

Duty Ratio (DR)=10⁻¹

EXTERNAL RESISTOR

● Internal LED protective resistor is not incorporated.

Refer to the following valued series connection.

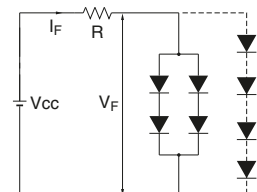
(Calculated at 4-chip LED)

Voltage(V)	Parallel		Series	
	Red, Yellow	Green	Red, Yellow	Green
5(±5%)	130Ω 1/8W	33Ω 1/8W		
12(±5%)	1200Ω 1/4W	330Ω 1/4W	1100Ω 1/8W	300Ω 1/8W
24(±5%)	3300Ω 1/2W	820Ω 1/2W	4300Ω 1/2W	1300Ω 1/2W

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



PANEL LAYOUT T / PANEL CUT DIMENSIONS

● 14.2 Square Button

	Panel Layout	Panel Cut Dimensions
Normal		
With Guard Cover		

● 14.2×20.2 Rect. Button

	Panel Layout	Panel Cut Dimensions
Normal		
With Guard Cover		

● φ15 Round Button

	Panel Layout	Panel Cut Dimensions
Normal		
With Guard Cover		

※ Panel Cut Dimension should be after Panel Painting.

n : number of switches(horizontal)
m : number of switches(vertical)

○ Panel thickness Screw 0.5mm~5mm
 Snap-in 1mm~3.2mm
 With guard cover 0.5mm~2.7mm

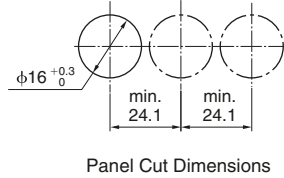
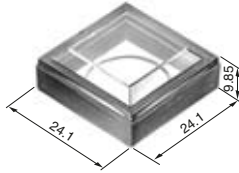
Tolerance : ±0.4mm

OPTIONAL ACCESSORIES

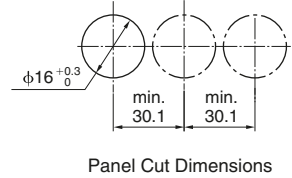
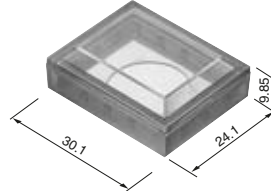
Water-Proof Cover

※ USE FOR SCREW TYPE ONLY

● $\phi 15$ Round Button/ $\square 14.2$ Square Button



● 14.2×20.2 Rectangular



● Please indicate part numbers when order.

Button Shape	Part Nos.
$\phi 15$ Round Button, $\square 14.2$ Square Button	MH-456
14.2×20.2 Rectangular	MH-494

Guard Cover

Guard Cover prevents inadvertent or unintentional operations. Button can not be operated unless open clear cover.

※ USE FOR SCREW TYPE ONLY

● $\phi 15$ Round Button,
 $\square 14.2$ Square Button



● 14.2×20.2 Rectangular Button



Button Shape	Black	Gley
$\phi 15$ Round Button, $\square 14.2$ Square Button	MH-0931-B	MH-0931-G
14.2×20.2 Rectangular Button	MH-0930-B	MH-0930-G

Panel Thickness : 0.5mm~2.7mm

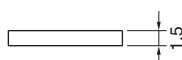
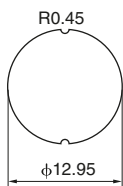
Mounting Wrench (Part No. MH-448)

To mount screw type tightly.



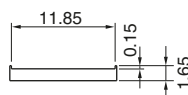
FILTER DIMENSIONS

● $\phi 15$ Round Button



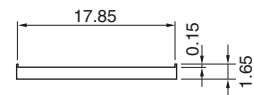
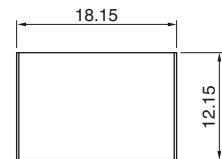
MH-399

● 14.2 Square Button



DH-339

● 14.2×20.2 Rectangular Button



MH-486

Tolerance : $\pm 0.4\text{mm}$

REPLACEMENT PARTS

Please indicate part numbers when order.

● Buttons/Filters

Color	Red	Green	Yellow	Milk White	Clea
φ15 Round Button	MH-393-1LR	MH-393-1LG	MH-393-1LY	MH-393-1LM	MH-393-2C
14.2 Square Button	MH-400-1LR	MH-400-1LG	MH-400-1LY	MH-400-1LM	MH-400-2C
14.2×20.2 Rectangular Button	MH-485-1LR	MH-485-1LG	MH-485-1LY	MH-485-1LM	MH-485-2C
φ15 Round Filter	MH-399-LR	MH-399-LG	MH-399-LY	MH-399-LM	
14.2 Square Filter	DH-339-LR	DH-339-LG	DH-339-LY	DH-339-M	
14.2×20.2 Rectangular Filter	MH-486-LR	MH-486-LG	MH-486-LY	MH-486-LM	

ORDERING CODE

LED Full Face

MH —

● Operation

M	Momentary
A	Alternate
L	Indicator

● Contact

Blank	Indicator
1	Silver, SPDT
2	Silver, DPDT

● Button Shape

R	φ15 Round
S	□ 14.2 Square
W	14.2×20.2 Rectangular

● LED Color

Parallel		Series	
70	Red	71	Red
80	Green	81	Green
※ 90	Yellow	※ 91	Yellow

★ Please select Parallel for using less than 9V.

● Mounting

1	Snap-in
2	Screw

● Terminal Shape

S	#110 Tab/Solder
C	PCB

● Filter (For only Clear Button)

Blank	Without Filter
1	Red
2	Green
※ 3	Yellow
4	Milk White

★ Without Filter for colored Button.

● Case Color

B	Black
G	Gray

● Button Color

R	Red
G	Green
※ Y	Yellow
M	Milk White
C	Clear

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

ASSEMBLY & DISASSEMBLY

● Fixing Water-proof cover

Insert switch into round hole of packing and mount to the the panel. Screw tightly with fitted nut. Fix transparent cap to the packing firmly.

