





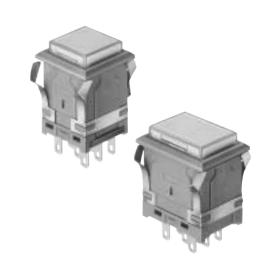
# **EH Miniature Lighted Pushbutton Switch**

# Only 22.5mm depth behind panel with built-in resistor

Bright and Variable Illumination makes easy planning of multiple design.

#### **FEATURES**

- Depth behind panel: Only 22.5mm
- LED Full-Face, Split-Face, Dual-Color, Spot and Lamp Illumination available.
- Hi-Bright LED Super Blue, Super White, Super Green added to Red, Green, Yellow.
- · Built-in resistor for 5V,12V,24V use.
- · Light Cartridge is removable from front panel.
- Button Size : 14.2mm square type, 14.2×20.4mm rectangular type
- Precision-snap action switch movement with coil spring assures long life and outstanding tactile feedback.
- Silver Contact(Gold-Plated) and W/E Alloy #1 Cross-bar Contact provided.
- · Accessories: Barriers, Guard Covers, Sockets, etc.





#### **SPECIFICATIONS**

| Contact               | Silver Contact (Gold-Plated)                                  | W/E Alloy #1 Cross-bar Contact                                |  |  |  |
|-----------------------|---|---|--|--|--|
| Electrical Rating     | AC125V,250V 3A(Resistive)                                     | AC125V 0.1A, DC30V 0.1A(Resistive)                            |  |  |  |
| Insulation Resistance | More than 100MΩ at 500V DC                                    |   |  |  |  |
|                       | 1000V AC RMS between NC and NO terminal                       | 600V AC RMS between NC and NO terminal                        |  |  |  |
| Dielectric Strength   | 1500V AC RMS between terminals and ground                     | 1500V AC RMS between terminals and ground                     |  |  |  |
|                       | 50/60Hz for 60sec. at normal ambient temperature and humidity | 50/60Hz for 60sec. at normal ambient temperature and humidity |  |  |  |
| Contact Resistance    | Less than 30mΩ (Initial) at DC6V 1A                           | Less than 50m $\Omega$ (Initial) at DC6V 0.1A                 |  |  |  |
| Mechanical Life       | Momentary Action :more than 2,000,000 operations              | Alternate Action : more than 200,000 operations               |  |  |  |
| Electrical Life       | More than 100,000 operations at max. rated load               |   |  |  |  |
| Ambient Temperature   | −15°C to +50°C  |   |  |  |  |
| Ambient Humidity      | 80% RH (max.)   |   |  |  |  |

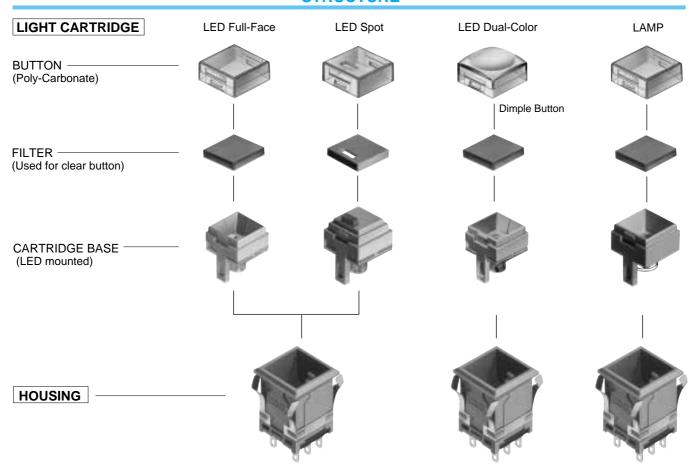
#### **OPERATING CHARACTERISTICS**

| Operating Force (max.) 4.41N | Total Travel (max.) | 3mm |
|------------------------------|---------------------|-----|
|------------------------------|---------------------|-----|

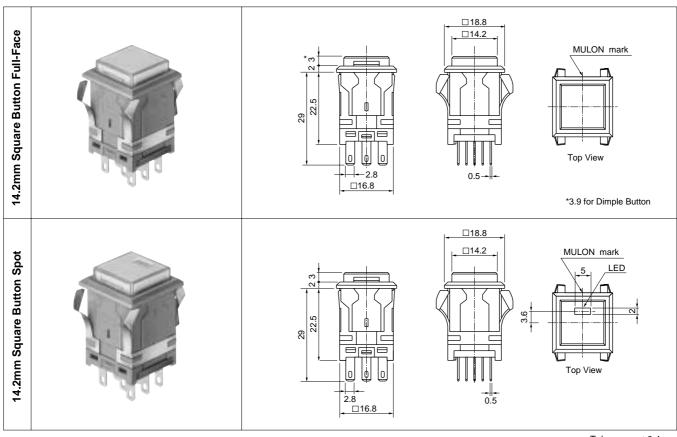




## **STRUCTURE**



## **DIMENSIONS**

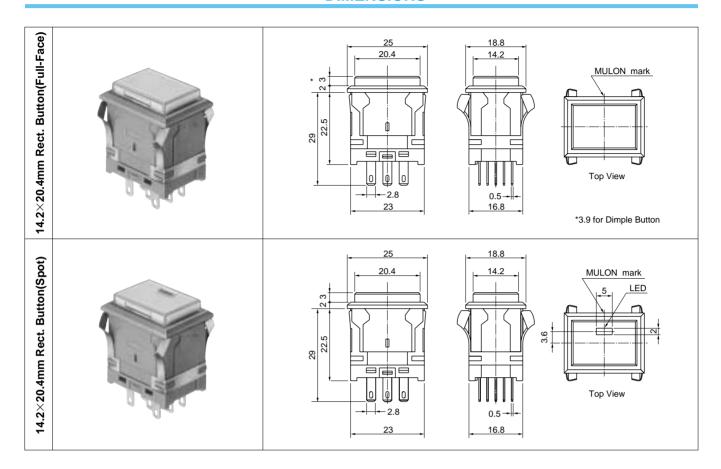


Tolerance :  $\pm 0.4$ mm



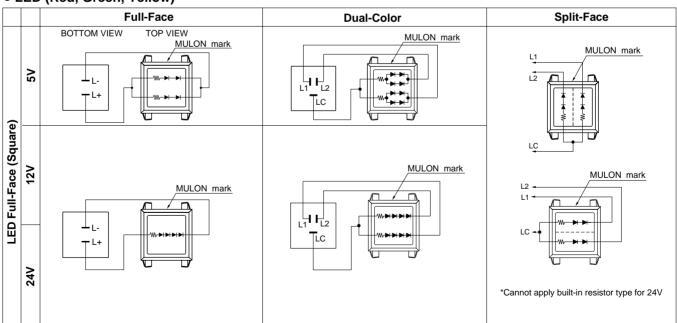


## **DIMENSIONS**



## **INTERNAL CONNECTION ARRANGEMENTS**

#### ● LED (Red, Green, Yellow)



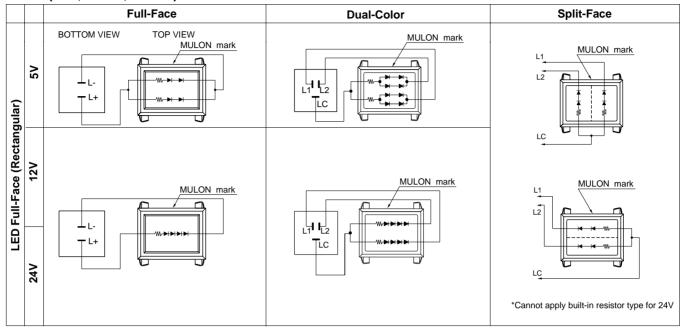
Tolerance : ±0.4mm





## **INTERNAL CONNECTION ARRANGEMENTS**

#### ● LED (Red, Green, Yellow)

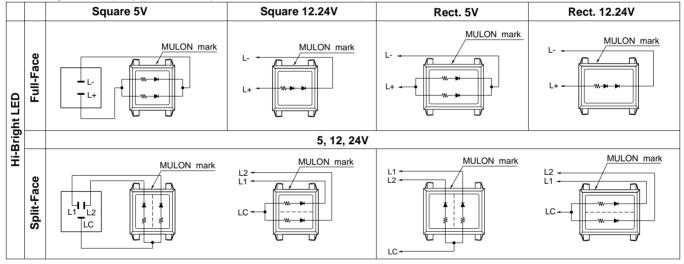


<sup>\*</sup> Please inquire when cathode common type needed.

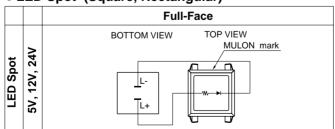
#### Dual-Color Combination

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

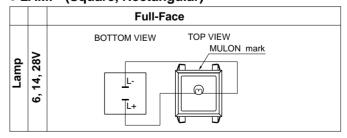
#### ● Hi-Bright LED (Super Blue, Super White , Super Green)



#### ● LED Spot (Square, Rectangular)



#### ● LAMP (Square, Rectangular)

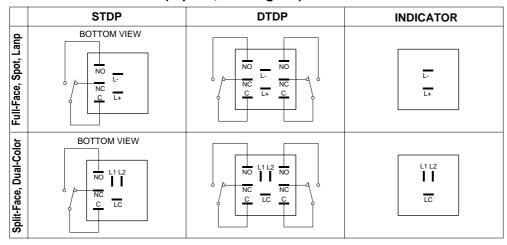




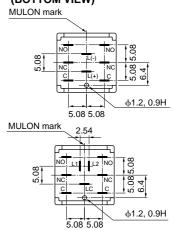


## **TERMINALS**

#### • TERMINALS LAYOUT (Square, Rectangular)

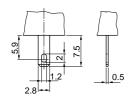


# ●TERMINALS DIMENSIONS (BOTTOM VIEW)



#### **TERMINAL SHAPE**

#### **● TERMINAL SHAPE**



#110 TAB Soldering Terminal

#### **LED DATA**

\* Red=R, Yellow=Y, Green=G, Super Blue=SB, Super White=SW, Super Green=SG

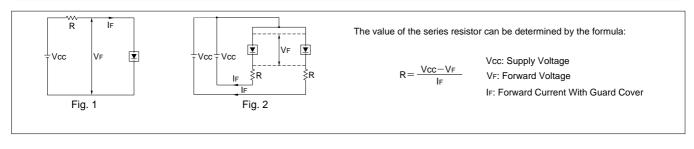
#### LED RATINGS

|                       | Full-fac | ce Dua | al-Color | Split-Face |           |           | Hi-Bright Full-f | ace Split-Face | Spot |    |    |
|-----------------------|----------|--------|----------|------------|-----------|-----------|------------------|----------------|------|----|----|
|                       |          |        |          | Curre      | ent Ratio | Current R | ating (mA)       |                |      |    |    |
| DC Supply Voltage (V) | R        | G      | Υ        | R          | G         | Υ         | SB, SW           | SG             |      |    |    |
|                       |          |        |          |            |           |           |                  |                | R    | 5  |    |
| 5(±5%)                |          | 30     |          |            |           |           | 32               | 16             | G    | 20 |    |
|                       |          |        |          | 15         |           |           |                  |                | Y    | 10 |    |
|                       |          |        |          |            | 13        |           |                  |                | R    | 5  |    |
| 12(±5%)               |          | 15     |          |            |           |           | 16               | 8              | G    | 20 |    |
|                       |          |        |          |            |           |           |                  |                | Υ    | 10 |    |
|                       |          |        |          |            |           |           |                  |                | R    | 5  |    |
| 24(±5%)               |          | 9      |          | Nil        | Nil       |           | Nil              | 8              | 3    | G  | 20 |
| i                     |          |        |          |            |           |           |                  |                | Υ    | 10 |    |

#### **• EXTERNAL RESISTOR**

Switches are normally fitted with internal resistors to operate on 5,12,24V DC supply. In case of non-resistor type, suitable external current limiting resistors must be installed as shown by the table and formula.

|                   |   | Full-Face<br>Dual-Color |                  | Split-Face   | Hi-Bright |                  | Hi-Bright Split-Face |      | Spot         |        |               |              |               |
|-------------------|---|-------------------------|------------------|--------------|-----------|------------------|----------------------|------|--------------|--------|---------------|--------------|---------------|
|                   | ITEM  | DC5V                    | DC12V,24V        | DC5V,12V,24V | DC        | 5V               | DC12V                | ,24V | DC5V,1       | 2V,24V | DC5           | V,12V        | ,24V          |
|                   |   | R,G,Y                   | R,G,Y            | R,G,Y        | BW        | G                | SB,SW                | SG   | SB,SW        | SG     | R             | G            | Υ             |
| Max. op           | erating current IFM (mA)                              | 40                      | 20               | 20           | 50        | 50               | 25                   | 25   | 25           | 25     | 10            | 30           | 20            |
| DC reve           | DC reverse voltage VR (V)                             |                         | 16               | 8            | 5         | 5                | 10                   | 10   | 5            | 5      | 5             | 5            | 4             |
| Forward           | Forward voltage VF (V)                                |                         | 8                | 4            | 3.6       | 3.5              | 7.2                  | 7    | 3.6          | 3.5    | 1.9           | 2.1          | 1.9           |
| Recomm            | Recommended operating current IF (mA)                 |                         | 15               | 15           | 32        | 16               | 16                   | 8    | 16           | 8      | 5             | 20           | 10            |
|                   | Current Reduced Factor(Over 25°C working Temperature) |                         | 0.0<br>mA/       |              | 1.<br>mA  | 6<br>/°C         |                      |      | 0.4<br>mA/°C |        | 0.13<br>mA/°C | 0.4<br>mA/°C | 0.26<br>mA/°C |
| D 1               | Pulse Width PW (μS)                                   |                         | 100              |              |           | ≤10 <sup>4</sup> |                      |      |              | 100    |               |              |               |
| Pulse<br>Lighting | Lighting Duty Ratio D <sub>R</sub>                    |                         | 10 <sup>-1</sup> |              |           |                  |                      |      |              |        |               |              |               |
|                   | I <sub>FM</sub> (mA)                                  |                         | 120              | 120          |           |                  | 80                   | )    | 8            | 0      |               | 50           |               |
| Wiring            | diagram   | Fig.                    | 1 Fig. 2         | Fig. 2       |           | F                | ig. 1                |      | Fig          | ı. 2   |               | Fig. 1       |               |







## **LAMP DATA**

#### LAMP RATING

| DC Supply Voltage (V) | Current Rating (mA) | Life (H)          | Temperature                        |
|-----------------------|---------------------|-------------------|------------------------------------|
| 6                     | 200                 | <b>5000</b>       |                                    |
| 14                    | 80                  | 5000<br>(Average) | Less than 50°C<br>(Button surface) |
| 28                    | 40                  | , 3-7             | (24.15.1. 0411400)                 |

Lamp Life is subject to AC use. In case of DC use, approximately 2500H.

## **Panel Layout/Panel Cut Dimensions**

• 14.2mm Square Panel thickness: 1.0  $\sim$  3.2mm **Panel Layout Panel Cut Dimensions** Independent Serial (Horizontal) Without Barriers 18.8n<sup>±0.5</sup>  $17.1 + 18.8(n-1)^{+0.15}_{-0.1}$ Serial (Vertical) 18.8n<sup>±0.5</sup> Independent CES 24.1 Serial (Horizontal) With Barriers 24.1+19.6(n-1)<sup>±1</sup>  $22.4+19.6(n-1)_{-0.1}^{+0.15}$ Serial (Vertical) In case of Serial (Vertical) mounting, please add 002 suffix to ordering code of switch, which retaining clip come out horizontally.





## **Panel Layout / Panel Cut Dimensions**

#### ● 14.2×20.4mm Rectangular

Panel thickness: 1.0  $\sim$  3.2mm



\*\* Panel Cut Dimension should be after panel paintings.

| Note   | Without Barriers              | With Barriers |
|--|-------------------------------|---------------|
| In case of Group Mounting, please leave space as below.  ( )=Vertical Mounting | more than 3.0 (more than 3.0) | more than 3.0 |

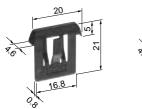


## **ACCESSORIES**

#### BARRIERS

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

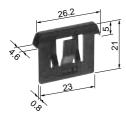
#### Short Barrier

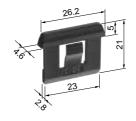




|       | PART NO.             |                    |  |  |  |
|-------|----------------------|--------------------|--|--|--|
| Color | Short Center Barrier | Short Side Barrier |  |  |  |
| Black | EH-1084-K            | EH-1085-K          |  |  |  |
| Gray  | EH-1084-H            | EH-1085-H          |  |  |  |

• Long Barrier (Rectangular, Longer Side)





| PART NO. |                     |                   |  |  |
|----------|---------------------|-------------------|--|--|
| Color    | Long Center Barrier | Long Side Barrier |  |  |
| Black    | EH-1086-K           | EH-1087-K         |  |  |
| Gray     | EH-1086-H           | EH-1087-H         |  |  |

#### **GUARD COVER**

Guard Cover prevents inadvertent and unintentional operations. In EH series Guard Cover should be used with Side /Center Barriers for Guard Cover. Panel cut-out dimension is same as "with barrier". Cannot be used for Dimple Button.

#### •14.2mm Square

#### • 14.2×20.4mm Rectangular





| PART NO. |         |  |  |
|----------|---------|--|--|
| Square   | EH-1080 |  |  |
| Rect.    | EH-1081 |  |  |

- \* The cover to be opened 180° and returned by spring force. (Square)
- \* The cover to be opened 90° and returned by spring force. (Rectangular)

| 23<br>N<br>N<br>N<br>N<br>N |
|-----------------------------|
|-----------------------------|



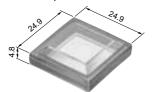


Side Barrier for Guard Cover

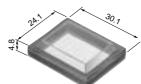
|   | PART NO.  |           |  |  |  |
|---|-----------|-----------|--|--|--|
| Color Center Barrier for Guard Cover Side Barrier for Guard C |           |           |  |  |  |
| Black   | EH-1091-K | EH-1092-K |  |  |  |
| Gray  | EH-1091-H | EH-1092-H |  |  |  |

#### **Dust-Proof Cover**



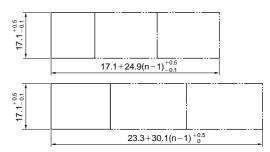


●14.2×20.4mm Rectangular



| PART NO       |                         |  |
|---------------|-------------------------|--|
| 14.2mm Square | 14.2×20.4mm Rectangular |  |
| DH-361        | EH-1083                 |  |

#### • Panel Cut Dimensions







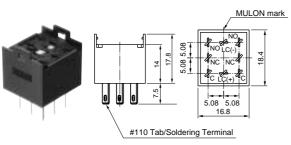
## **ACCESSORIES**

#### SOCKET

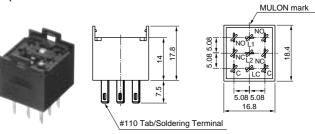
For easy maintenance. (Can be used for both square and rectangular)

Soldering Terminal

Full-Face, Spot



Split-Face Dual-Color



|                        | PART No    |            |                        |
|------------------------|------------|------------|------------------------|
| Application            | Resistance | Part No.   | Note                   |
| Full-Face, Spot, Lamp  | 0Ω         | EH-1088-1  | Use for built-in       |
| Split-Face, Dual-Color | 0Ω         | EH-1088-2  | resistor type          |
| Split-Face 12V         | 510Ω 1/4W  | EH-3210-2A |                        |
| Split-Face 24V         | 1.3kΩ 1/2W | EH-3210-2B | Use for non-resistor   |
| Dual-Color 5V          | 36Ω 1/4W   | EH-3210-2C | type                   |
| Dual-Color 12V         | 270Ω 1/4W  | EH-3210-2D | *Simultaneous lighting |
| Dual-Color 24V         | 1.1kΩ 1/2W | EH-3210-2E | is possible.           |

Tolerance: ±0.4mm

#### MATRIX FITTING FRAME

●14.2mm Square



Switch Housing MULON mark



 $(25.1n+7.4)^{\pm0.3}$ 

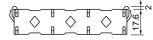


Switch Housing MULON mark

• 14.2×20.2mm Rectangular



|         |              |   | <u> </u> | 1                     |  |
|---------|--------------|---|----------|-----------------------|--|
| <b></b> | <del> </del> |   |          | 18.8m <sup>±0.3</sup> |  |
|         |              |   |          | 18                    |  |
| u.u.    | "            | ' |          | <u>'</u> -            |  |





| 14.2mm Square   | 14.2×20.2mm Rectangular     |
|-----------------|-----------------------------|
| (18.9n+4.6)±0.2 | (25.1n+4.6) <sup>±0.2</sup> |

| Color | 14.2mm Square | 14.2×20.2mm Rectangular |
|-------|---------------|-------------------------|
| Black | EH-1610-K□    | EH-1815-K□              |
| Gray  | EH-1610-H□    | EH-1815-H□              |

= number of switch (1-15)

n : number of switches (Horizontal)

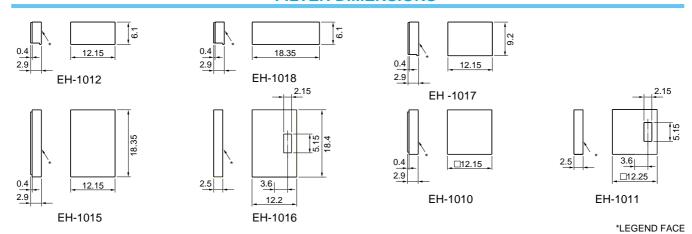
m : number of switches (Vertical)

Panel thickness: 1.0  $\sim$  3.2mm





## **FILTER DIMENSIONS**



## **REPLACEMENT PARTS**

Please order replacement parts with Part No.

#### Button/Filter for LED Illumination

| Item                            | Red          | Green       | Yellow      | Blue        | Milk-White  | Clear      | Dimple     |
|---------------------------------|--------------|-------------|-------------|-------------|-------------|------------|------------|
| 14.2mm Square Button            | EH-1008-1LR  | EH-1008-1LG | EH-1008-1LY | EH-1008-1LB | EH-1008-1LM | EH-1008-2C | EH-2374-2C |
| 14.2×20.4mm Rect. Button        | EH-1013-1LR  | EH-1013-1LG | EH-1013-1LY | EH-1013-1LB | EH-1013-1LM | EH-1013-2C | EH-2375-2C |
| Square Full-Face Filter         | EH-1010-LR   | EH-1010-LG  | EH-1010-LY  | EH-1010-LB  | EH-1010-LM  |            |            |
| Rect. Full-Face Filter          | EH-1015-LR   | EH-1015-LG  | EH-1015-LY  | EH-1015-LB  | EH-1015-LM  |            |            |
| Square Split-Face Filter        | EH-1012-LR   | EH-1012-LG  | EH-1012-LY  | EH-1012-LB  | EH-1012-LM  |            |            |
| Rect. Split-Face (horiz.)Filter | EH-1018-LR   | EH-1018-LG  | EH-1018-LY  | EH-1018-LB  | EH-1018-LM  |            |            |
| Rect. Split-Face (vert.) Filte  | r EH-1017-LR | EH-1017-LG  | EH-1017-LY  | EH-1017-LB  | EH-1017-LM  |            |            |

#### ● Divider for Split-Face

|          | Square Split-Face | Rect. Split-Face(vertical) | Rect. Split-Face(horizontal) |
|----------|-------------------|----------------------------|------------------------------|
| Part No. | E                 | H-3182                     | EH-3183                      |

#### ● Button/Filter for Spot

| Item color               | Red       | Green     | Yellow    | Milk-White | White     | Blue      | Black     | Clear     |
|--------------------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|
| 14.2mm Square Button     | EH-1009-R | EH-1009-G | EH-1009-Y | EH-1009-M  | EH-1009-W | EH-1009-B | EH-1009-K | EH-1009-C |
| 14.2×20.4mm Rect. Button | EH-1014-R | EH-1014-G | EH-1014-Y | EH-1014-M  | EH-1014-W | EH-1014-B | EH-1014-K | EH-1014-C |
| Square Full-Face Filter  | EH-1011-R | EH-1011-G | EH-1011-Y | EH-1011-M  | EH-1011-W | EH-1011-B | EH-1011-K |           |
| Rect. Full-Face Filter   | EH-1016-R | EH-1016-G | EH-1016-Y | EH-1016-M  | EH-1016-W | EH-1016-B | EH-1016-K |           |

## ● Button/Filter for Lamp

| ltem color               | Red        | Green      | Yellow     | Milk-White | White      | Blue       | Black      | Clear      |
|--------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 14.2mm Square Button     | EH-1008-1R | EH-1008-1G | EH-1008-1Y | EH-1008-1M | EH-1008-1W | EH-1008-1B | EH-1008-1K | EH-1008-2C |
| 14.2×20.4mm Rect. Button | EH-1013-1R | EH-1013-1G | EH-1013-1Y | EH-1013-1M | EH-1013-1W | EH-1013-1B | EH-1013-1K | EH-1013-2C |
| Square Full-Face Filter  | EH-1010-R  | EH-1010-G  | EH-1010-Y  | EH-1010-M  | EH-1010-W  | EH-1010-B  | EH-1010-K  |            |
| Rect. Full-Face Filter   | EH-1015-R  | EH-1015-G  | EH-1015-Y  | EH-1015-M  | EH-1015-W  | EH-1015-B  | EH-1015-K  |            |

#### Long Retaining Clip

| Part No. | EH-1034-2 |
|----------|-----------|
|          |           |

## ● Lamp T-1 3/4 midget grooved base

| Voltage  | 6V       | 14V      | 28V      |  |
|----------|----------|----------|----------|--|
| Part No. | MU-089-1 | MU-089-2 | MU-089-3 |  |

 $Tolerance: \pm 0.4 mm$ 

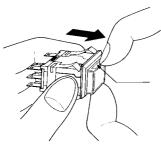




## **ASSEMBLY & DISASSEMBLY**

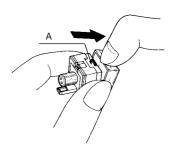
#### 1. Removing Light Cartridge

Hang the cartridge with hooking fingernails in the groove, and pull out.



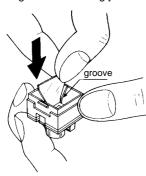
#### 2. Removing Button

Hook fingernails at A and gently release the clip, and release another side as well.



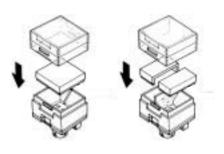
#### 3. Fitting Divider (Split-Face)

Fit divider on the groove accordingly.



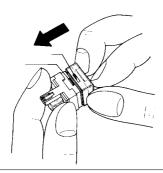
#### 4. Fitting Filter(s)

Set Filter(s) as shown onto cartridge carefully, then put button on.



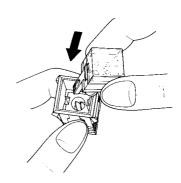
#### 5. Fitting Button

Fit the button as shown until click.



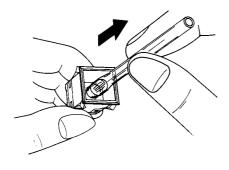
## 6. Fitting Light Cartridge

Insert Light Cartridge into Housing with right direction and push in until click.



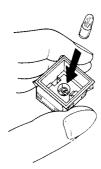
#### 7. Removing Lamp

Pull out Lamp with the tool (DH-409).



#### 8. Fitting Lamp

Fit Lamp as shown until click.



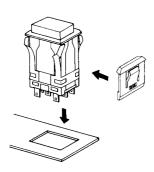




## **ASSEMBLY & DISASSEMBLY**

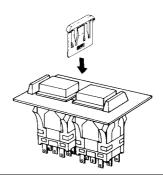
#### 9. Installing Barriers (Independent)

Install Side Barriers with Switch as shown.



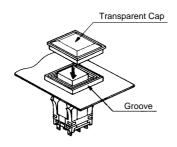
#### Installing Barriers (Serial)

Install Side Barriers with Switch and install Center Barrier between Switches.



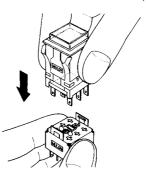
#### 10. Installing Dustproof Cover

Put the switch through the Frame of cover and mount on panel. And then, install transparent cap with fitting projection and groove of frame.



#### 11. Fitting Socket

Insert Switch into Socket with right direction ( MULON mark of switch and socket should be same side) and push until stop.

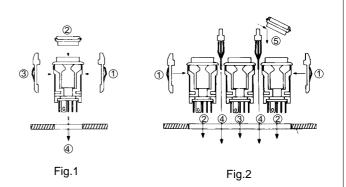


#### 12. Installing Guard Cover

Independent mounting (Fig. 1)

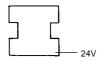
Fit side barriers, cover and switch as shown and mount together.

Fit side barriers and switches and mount on panel, and install center barriers, finally install covers with extending barriers' head. (Fig.2)



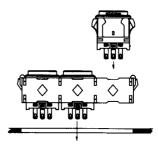
#### 13. LED voltage supply rating

DC voltage supply rating for LED is shown on the underside of Light Cartridge.



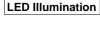
#### 14. Matrix Fitting Frame

Install switches with frame and mount on panel as shown.









## 

#### OPERATION

|          | М | Momentary      |
|----------|---|----------------|
|          | Α | Alternate      |
|          | L | Indicator      |
| <b>(</b> | F | Flat Indicator |

Button level is flat.(locked position)

#### • CONTACT

| ı | 0 | Indicator                 |
|---|---|---------------------------|
| I | 3 | SPDT Silver (Gold-Plated) |
|   | 4 | DPDT Silver (Gold-Plated) |
| I | 5 | SPDT W/E Alloy #1Crossbar |
| Γ | 6 | DPDT W/E Alloy #1Crossbar |

#### • BUTTON SHAPE ILLUMINATION TYPE

| Square Full-Face           |
|----------------------------|
| Rect. Full-Face            |
| Square Split-Face (Vert.)  |
| Square Split-Face (Horiz.) |
| Rect. Split-Face (Vert.)   |
| Rect. Split-Face (Horiz.)  |
| Square Dual-Color          |
| Rect. Dual-Color           |
|                            |

| , | MINATION III L |                                     |  |  |  |  |
|---|----------------|-------------------------------------|--|--|--|--|
|   | K0             | Dimple B. Square Full-Face          |  |  |  |  |
|   | K1             | Dimple B. Split-Face (Vert.)        |  |  |  |  |
|   | K2             | Dimple B. Split-Face (Horiz.)       |  |  |  |  |
|   | КЗ             | Dimple B. Square Dual-Color         |  |  |  |  |
|   | N0             | Dimple B. Rect. Full-Face           |  |  |  |  |
|   | N1             | Dimple B. Rect. Split-Face (Vert.)  |  |  |  |  |
|   | N2             | Dimple B. Rect. Split-Face (Horiz.) |  |  |  |  |
|   | N3             | Dimple B. Rect. Dual-Color          |  |  |  |  |

#### LED COLOR

| 70 | Red         |  |  |  |
|----|-------------|--|--|--|
| 80 | Green       |  |  |  |
| 90 | Yellow      |  |  |  |
| 14 | Super Blue  |  |  |  |
| 16 | Super White |  |  |  |
| 18 | Super Green |  |  |  |

Full-Face: Put color no. into the frame 1 Split-Face: Put color no. into the frame 1,2 70,80,90 combination or 14,16,18 combination only (same color combination available like 7070, 1414) Dual-Color: Put color no. into the frame 1,2 (7080,8090, 9070 combination only, not available 14,16,18)

#### NOTES

1) In case of Split-Face, LED and Filter color location should be specified as follow:

|                           | M | ULOI       | N m | ark M | ULON r              | nark      | MUL | .ON m             | <u>ark</u>       | MULO | N mark |
|---------------------------|---|------------|-----|-------|---------------------|-----------|-----|-------------------|------------------|------|--------|
| 1                         | 2 |            |     | 1 2   |                     | 1         | 2   |                   |                  | 1 2  |        |
| Square Split-Face (Vert.) |   | Squ<br>(Ho |     | Face  | Rect. Sp<br>(Vert.) | olit-Face |     | Rect. S<br>(Horiz | Split-Face<br>.) |      |        |

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

#### Supply Voltage to LED

|   | 1 5V Built-in Resistor |   |  |
|---|------------------------|---|--|
|   | 2                      | 12V Built-in Resistor                     |  |
|   |                        | 24V Built-in Resistor(not for Split-Face) |  |
|   |                        | 5V Non-Resistor, Split-Face non resistor  |  |
| ſ | 5                      | 12V Non-Resistor                          |  |
| ſ | 6                      | 24V Non-Resistor                          |  |

In case of Split-Face non resistor type, please select 4 though the circuits are same for 5, 12, 24v, for our convenience.

#### • TERMINAL

P #110 Tab, Soldering

#### • FILTER COLOR

| t | 6<br>× | Blue       | Without Filter                              |
|---|--------|------------|---|
|   | 4      | Milk White | the frame 1,2                               |
|   | 3      | Yellow     | the frame 1 Split-Face : Put color no. into |
|   | 2      | Green      | Full-Face : Put color no. into              |
|   | 1      | Red        | (   |

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

## BUTTON COLOR

|   | R | Red        |  |  |  |  |
|---|---|------------|--|--|--|--|
|   | G | Green      |  |  |  |  |
| r | Υ | Yellow     |  |  |  |  |
|   | М | Milk White |  |  |  |  |
|   | В | Blue       |  |  |  |  |
|   | С | Clear      |  |  |  |  |
|   |   |            |  |  |  |  |

#### Housing

| K | Black |
|---|-------|
| Н | Gray  |

#### Notes for Split-Face and Dual-Color Illumination type

In case of using Split-Face & Dual-Color, sometimes built-in resistor type cannot be used because of heating. Please note followings:

#### Split-Face

5V use : Select 1 (5V built-in resistor). Simultaneous lighting is possible.

12V use : Select 2 (12V built-in resistor). However in case of simultaneous lighting, please select 4 (non resistor) and apply external resistor 510  $\Omega$  1/4W in series or use socket (EH-3210-2A)

24V use: Either do or not do simultaneous lighting, cannot select 3 (24V built-in resistor). Please select 4 (non resistor) and apply external resistor 1.3k $\Omega$  1/2W in series or use socket (EH-3210-2B). Simultaneous lighting is possible for both way.

In 5V, 12V, 24V Split-Face non resistor type, they are the same circuits actually, however please select 4 (Split-Face non resistor) for our convenience.

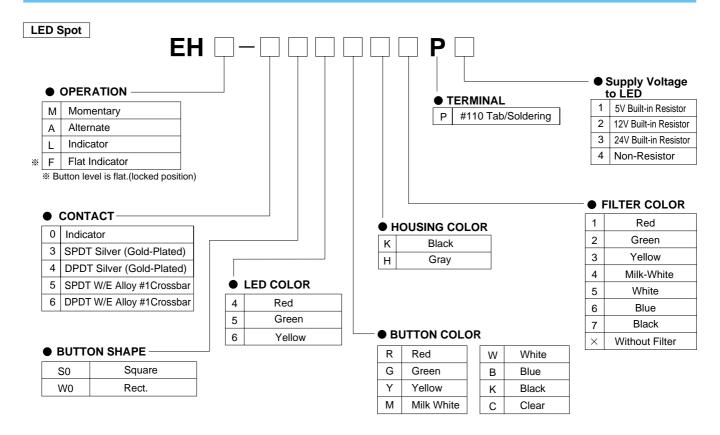
#### 2 Dual Color

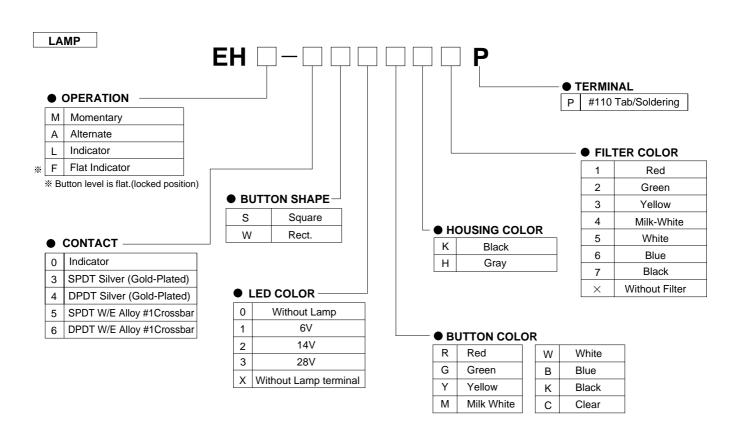
It is impossible to do simultaneous lighting with all 5V,12V,24V. In case of simultaneous lighting , please select 4,5,6 respectively and apply external resistor  $36\Omega$  1/4W,  $270\Omega$  1/4W,  $1.1k\Omega$  1/2W in series or use socket (EH-3210-2C),(EH-3210-2D)(EH-3210-2E) respectively.

In 5V, 12V, 24V Dual-Color non resistor type, the circuit is different. Even a case of "simultaneous lighting impossible", it is all right for couple of minutes









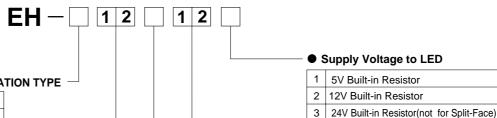




It is possible to order individually Light Cartridge and Housing.

#### ● LIGHT CARTRIDGE





#### ● BUTTON SHAPE ILLUMINATION TYPE -

| S  | ) | Square Full-Face           |
|----|---|----------------------------|
| W  | 0 | Rect. Full-Face            |
| S1 | 1 | Square Split-Face (Vert.)  |
| S2 | 2 | Square Split-Face (Horiz.) |
| W. | 1 | Rect. Split-Face (Vert.)   |
| W  | 2 | Rect. Split-Face (Horiz.)  |
| S  | 3 | Square Dual-Color          |
| W: | 3 | Rect. Dual-Color           |
|    |   |                            |

| K0 | Dimple B. Square Full-Face          |
|----|-------------------------------------|
| K1 | Dimple B. Split-Face (Vert.)        |
| K2 | Dimple B. Split-Face (Horiz.)       |
| К3 | Dimple B. Square Dual-Color         |
| N0 | Dimple B. Rect. Full-Face           |
| N1 | Dimple B. Rect. Split-Face (Vert.)  |
| N2 | Dimple B. Rect. Split-Face (Horiz.) |
| N3 | Dimple B. Rect. Split-Face          |
|    |                                     |

# ● BUTTON

| COLOR |                |  |  |  |
|-------|----------------|--|--|--|
| R     | Red            |  |  |  |
| G     | Green          |  |  |  |
| Υ     | Yellow         |  |  |  |
| М     | Milk White     |  |  |  |
| С     | Clear          |  |  |  |
| В     | Blue           |  |  |  |
| X     | Without Button |  |  |  |

#### • FILTER COLOR

In case of Split-Face non resistor type, please select 4 though the circuits are same for 5, 12,

5V Non-Resistor, Split-Face non resistor

12V Non-Resistor

24V Non-Resistor

24v, for our convenience.

6

| 1 | Red            |
|---|----------------|
| 2 | Green          |
| 3 | Yellow         |
| 4 | Milk White     |
| 6 | Blue           |
| × | Without Filter |

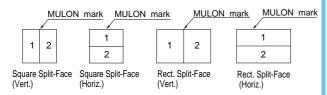
#### • LED COLOR

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In 5V, 12V, 24V Dual-Color non resistor type, the circuit is different. Even a case of "simultaneous lighting impossible", it is all right for couple of minutes.





