

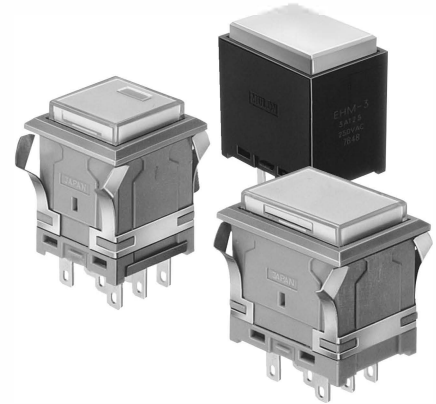
EH / EH-N illuminated Pushbutton Switch

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 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 Cross-bar Contact provided.
- Accessories: Barriers, Guard Covers, Sockets, etc.



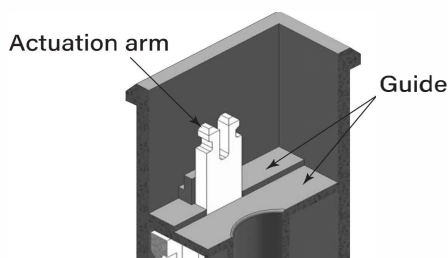
High reliability EH-N type

- EH-N type is enhanced the shape of crossbar contact, superior to stabilize a condition of contact compared with conventional EH type.
- Superior contact reliability was obtained by improving the dust resistance.
- EH-N type is Full-Face, Dual-Face, Split-Face illumination only.
- EH and EH-N type are incompatible due to different internal structure. Please combine and use a part between the same models respectively.

FEATURE (EH-N type)

Dust proof structure

EH-N type prevents dust from getting inside due to removed a conventional opening, installed a guide around the switch actuation arm.



Dust resistance test

Test method: operate 5,000 frequency as rub a surface of button with towel cloth.

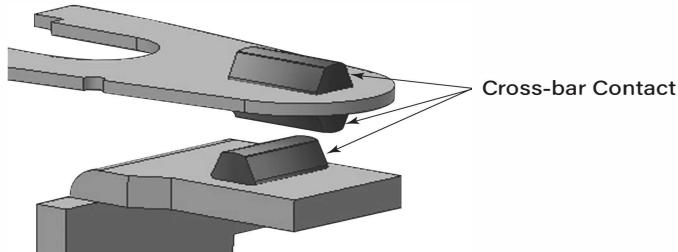
As a result of the test, EH-N type have virtually not entered fiber inside of the switch.



FEATURE (EH-N type)

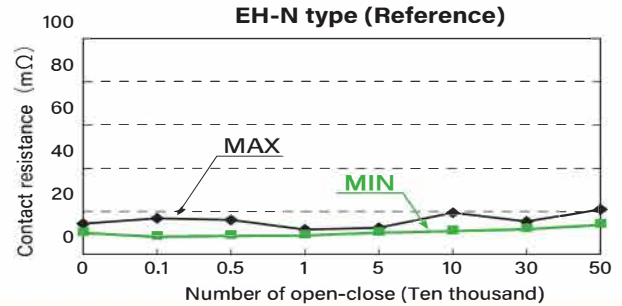
● Enhanced the shape of crossbar contact

EH-N type Crossbar contact shape have upgraded for superior contact reliability obtained. Additionally, it can be obtained high reliability with stable long-term contact condition under the microload.



Contact resistance test for microload

After the work 500,000 turns with resistance load DC5V 1mA, EH-N type is exceptionally stable for contact condition.



CONTACT RATING (EH-N type)

● Cross-bar Contact

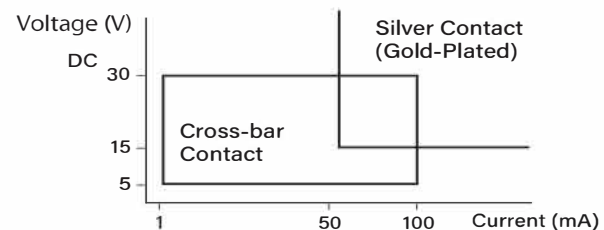
Electrical Rating	DC30V 0.1A(Resistive)
	AC125V 0.1A(Resistive)
Minimum Application Load	DC5V 1mA(Resistive)

The minimum applicable load is the N-level reference value (JIS C5003). This level indicates only one random failure caused by unstable contact resistance for every two million operations.

● Silver Contact (Gold-Plated)

DC Supply Voltage (V)	Resistance Load (A) Closing Load / Open Load
AC125	3
250	3
DC 8	3
14	3
30	2
125	0.4

● Micro Load Application Range



Using switch rated for 3A max during the opening and closing of microload circuit, it may cause the loose connection. Please see diagram above and use switch within an acceptable range.

Microload application range changes and differs depending on the type of load, operating conditions, environment conditions.

SPECIFICATIONS (EH-N type / EH type)

Contact	Silver Contact (Gold-Plated)	Cross-bar Contact
Electrical Rating	AC125V,250V 3A(Resistive)	AC125V 0.1A, DC30V 0.1A(Resistive)
Insulation Resistance	More than 100MΩ at 500V DC	
Dielectric Strength	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	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
Contact Resistance	Less than 30mΩ (Initial) at DC6V 1A	Less than 50mΩ (Initial) at DC6V 0.1A
Vibration	Frequency of vibration 10 to 55 Hz, Amplitude 1.5mm (operating limit)	
Shock resistance	30G (operating limit), 50G (sustained)	
Mechanical Life	Alternate Action : more than 200,000 operations Momentary Action : more than 2,000,000 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 (EH-N type / EH type)

Operating Force (max.)	4.41N	Total Travel (max.)	3mm
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DC Rated (Silver Contact)

Rated voltage (V)	Resistance Load (A)
DC 8	3
14	3
30	2
125	0.4

STRUCTURE

LIGHT CARTRIDGE

BUTTON
(Poly-Carbonate)

COLOR PLATE
(Used for clear button)

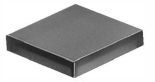
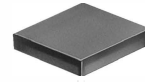
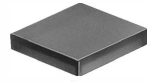
CARTRIDGE BASE
(LED mounted)

LED Full-Face

LED Spot

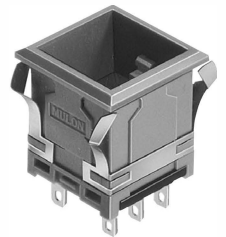
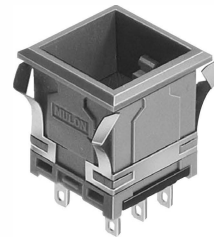
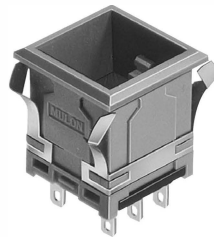
LED Dual-Color

EH Non-illuminated



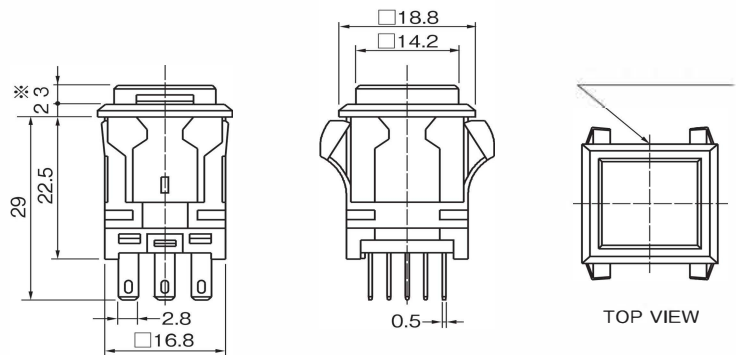
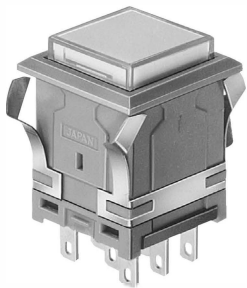
Dimple Button

HOUSING



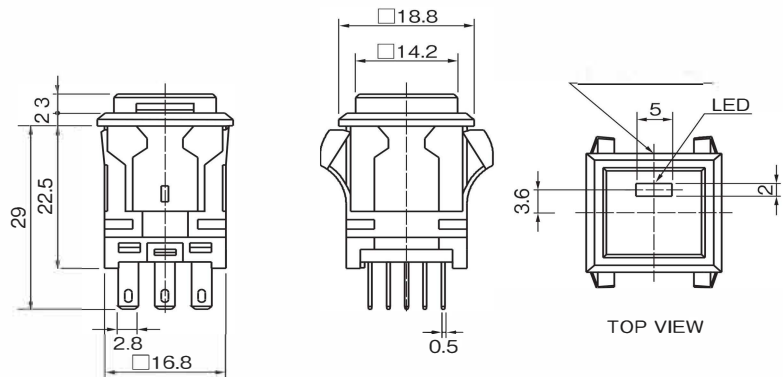
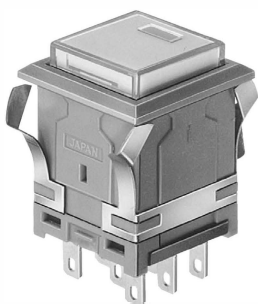
DIMENSIONS

14.2mm Square Button (Full-Face)



※3.9 for Dimple Button

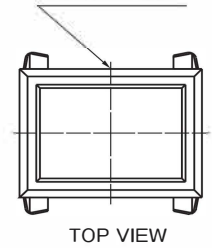
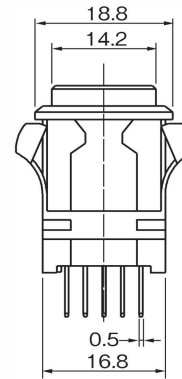
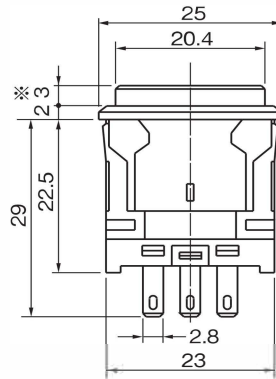
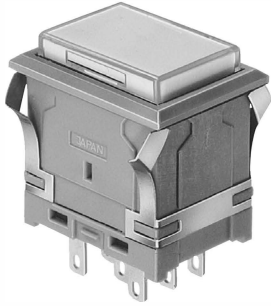
14.2mm Square Button (Spot)



Tolerance : ±0.4mm

DIMENSIONS

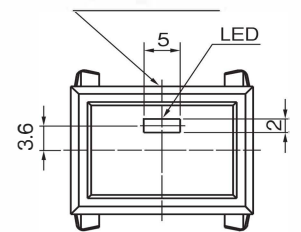
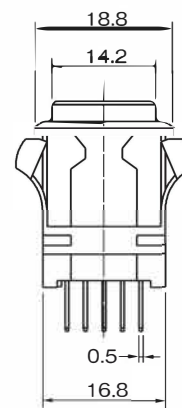
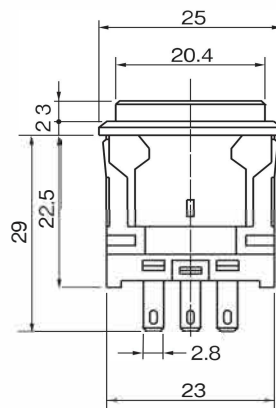
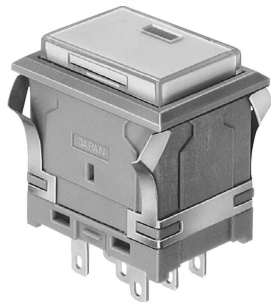
14.2×20.4mm Rectangular Button
(Full-Face)



TOP VIEW

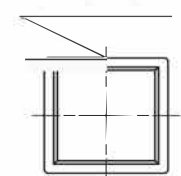
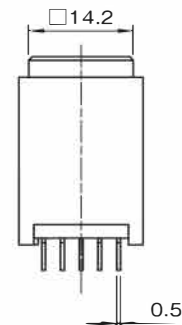
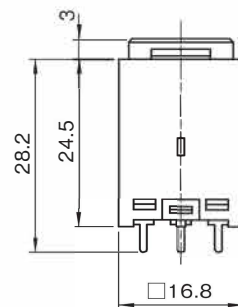
※3.9 for Dimple Button

14.2×20.4mm Rectangular Button
(Spot)



TOP VIEW

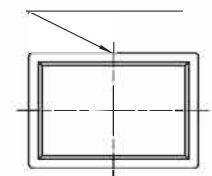
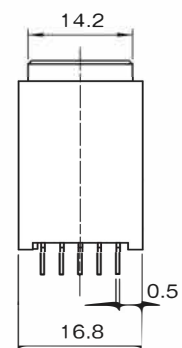
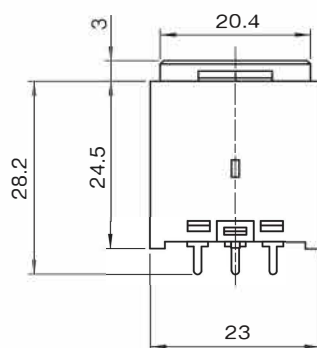
14.2mm Square Button
without Flange



TOP VIEW

※3.9 for Dimple Button

14.2×20.4mm Rectangular Button
without Flange



TOP VIEW

※3.9 for Dimple Button

Tolerance : ±0.4mm

INTERNAL CONNECTION ARRANGEMENTS

● LED (Red, Green, Yellow)

	Full-Face	Dual-Color	Split-Face
5V			
12V			
24V			<p>※ Cannot apply built-in resistor type for 24V</p>

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

	Full-Face	Dual-Color	Split-Face
5V			
12V			
24V			<p>※ Cannot apply built-in resistor type for 24V</p>

● LED combination with Hi-Bright LED

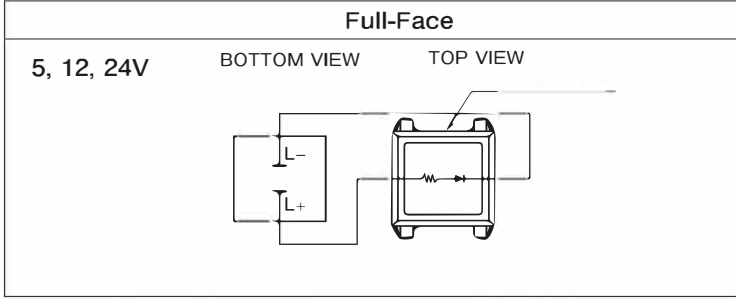
	Dual-Color	Split-Face (Vertical)	Split-Face (Horizontal)
5V			
12V			
24V		<p>※ Cannot apply built-in resistor type for 24V</p>	<p>※ Cannot apply built-in resistor tpe for 24V</p>

● Dual-Color Combination

LC-L1	Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Red	Red	Yellow
LC-L2	Green	Yellow	Red	Super White	Super Green	Super Blue	Super Blue	Super White	Super Green	Super Blue

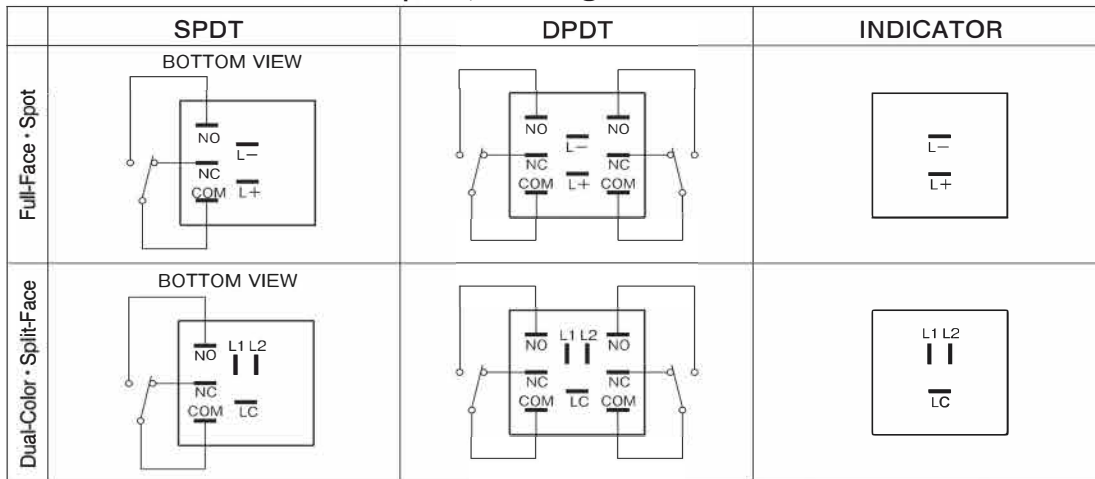
INTERNAL CONNECTION ARRANGEMENTS

● LED Spot (Square, Rectangular)

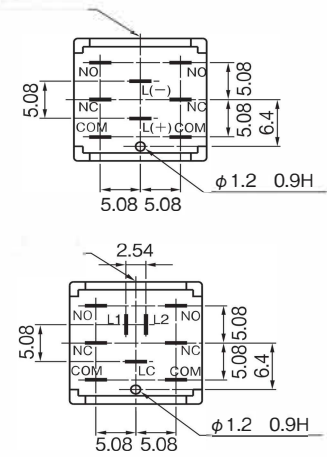


TERMINALS

● TERMINALS LAYOUT (Square, Rectangular)

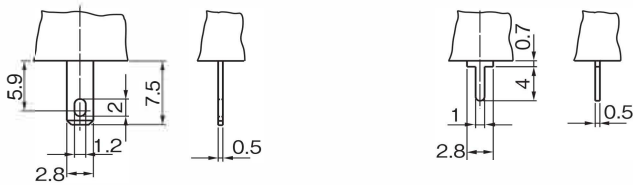


● DIMENSIONS (BOTTOM VIEW)



TERMINAL SHAPE / PCB HOLE CUT-OUT

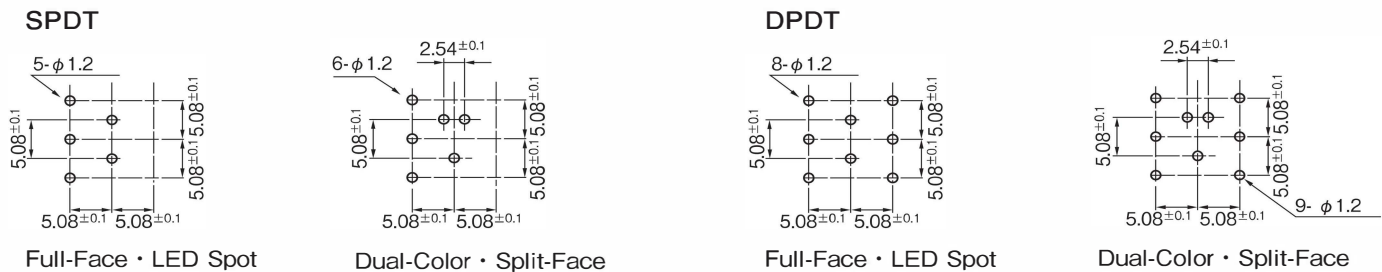
● TERMINAL SHAPE



#110 Tab Soldering Terminal

PCB Terminal

● PCB hole cut-out (BOTTOM VIEW)



Tolerance : ± 0.4 mm

LED DATA

LED RATINGS

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

DC Supply Voltage (V)	Full-face Dual-Color			Split-Face			Hi-Bright Full-face			Hi-Bright Dual-Color			Hi-Bright Sprit-face			Spot		
	R	G	Y	R	G	Y	SB	SW	SG	SB	SW	SG	SB	SW	SG	R	G	Y
5(±5%)	30			15			12	18	10	12	18	10	6	9	5	3	15	7
12(±5%)	15						6	10	6	6	10	6	6	10	6	3	15	7
24(±5%)	9			/			6	10	6	6	10	6	/			3	15	7

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.

ITEM	Full-Face Dual-Color						Split-Face			Hi-Bright Full-Face Dual-Color						Hi-Bright Split-Face			Spot		
	DC5V			DC12V,24V			DC5V,12V,24V			DC5V			DC5V,12V,24V			DC12V,24V			DC5V,12V,24V		
	R	G	Y	R	G	Y	R	G	Y	SB	SW	SG	SB	SW	SG	SB	SW	SG	R	G	Y
Max. operating current IFM (mA)	50	40	50	25	20	25	25	20	25	40	40	40	20	20	20	20	20	20	30	25	30
DC reverse voltage VR (V)	10	10	10	20	20	20	10	10	10	5	5	5	10	10	10	5	5	5	5	5	5
Forward voltage VF (V)	3.8	4.2	3.8	7.6	8.4	7.6	3.8	4.2	3.8	2.9	2.9	3.0	5.8	5.8	6.0	2.9	2.9	3.0	2	2.2	2.1
Recommended operating current IF (mA)	30	30	30	15	15	15	15	15	15	12	18	10	6	10	6	6	10	6	3	15	7
Current Reduced Factor (Over 25°C working Temperature)	0.66mA/°C			0.33mA/°C			0.33mA/°C			0.54mA/°C			0.27mA/°C			0.27mA/°C			0.33mA/°C	0.33mA/°C	0.33mA/°C
Pulse Lighting	/			100			100			/			100	1000	100	1000	100	100			
				10 ⁻¹			10 ⁻¹						10 ⁻¹	1/20	10 ⁻¹	1/20	10 ⁻¹				
				90			90						50	48	50	48	100				
Wiring diagram	Fig. 1		Fig. 2			Fig. 2			Fig. 1		Fig. 2			Fig. 2			Fig. 1				

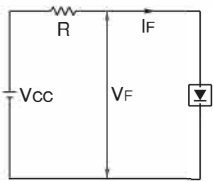


Fig.1

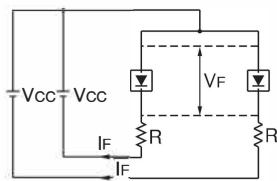


Fig.2

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

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

V_{CC}: Supply Voltage

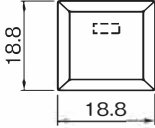
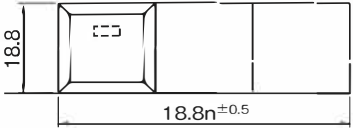
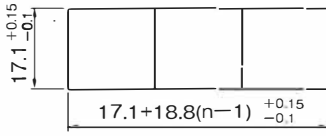
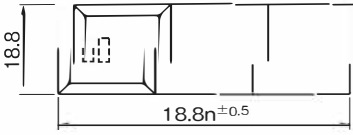
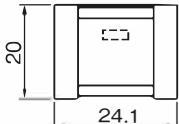
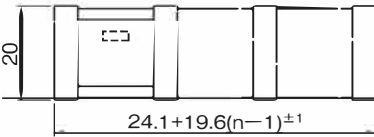
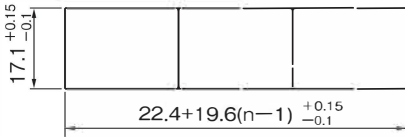
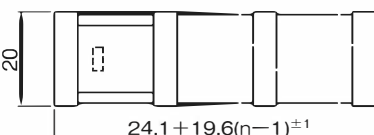
V_F: Forward Voltage

I_F: Recommend operating current

Panel Layout/Panel Cut Dimensions

● 14.2mm Square

Panel thickness: 1.0 ~ 3.2mm

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent		
	Serial (Horizontal)		
	Serial (Vertical)		
With Barriers	Independent		
	Serial (Horizontal)		
	Serial (Vertical)	 In case of Serial (Vertical) mounting, please add 002 suffix to ordering code of switch, which retaining clip come out horizontally.	

Converting horizontally mounting switch to vertically mounting, just rotate retaining clip 90° for square type. And in case of rectangular type, 2pcs. of Long version retaining clips are necessary.

n : number of switches
Tolerance : ±0.4mm

Panel Layout / Panel Cut Dimensions

● 14.2×20.4mm Rectangular

Panel thickness: 1.0~ 3.2mm

		Panel Layout	Panel Cut Dimensions
Without Barriers	Independent (Horizontal)		
	Serial (Horizontal)		
	Independent (Vertical)		
	Serial (Vertical)	 In case of Serial (Vertical) mounting, please add 002 suffix to ordering code of switch, which retaining clip come out horizontally	
With Barriers	Independent (Horizontal)		
	Serial (Horizontal)		
	Independent (Vertical)		
	Serial (Vertical)	 In case of Serial (Vertical) mounting, please add 002 suffix to ordering code of switch, which retaining clip come out horizontally	

※ 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		

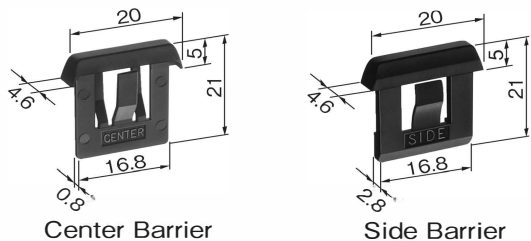
n : number of switches
Tolerance : ±0.4mm

ACCESSORIES

BARRIERS

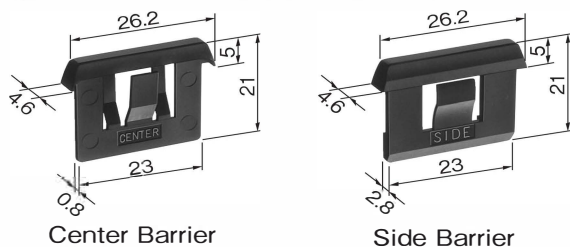
In case of mounting switches in series, Barriers can be used to prevent inadvertent pushing neighbor switch.

● 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, Long Side)



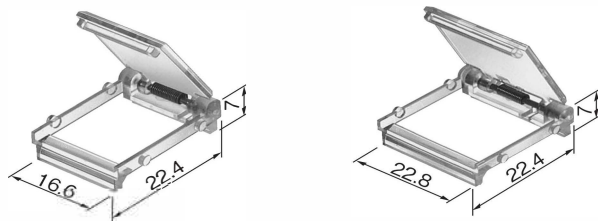
PARTS NO.		
Color	Long Center Barrier	Long Side Barrier
Black	EH-1086-K	EH-1087-K
Gray	EH-1086-H	EH-1087-H

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.

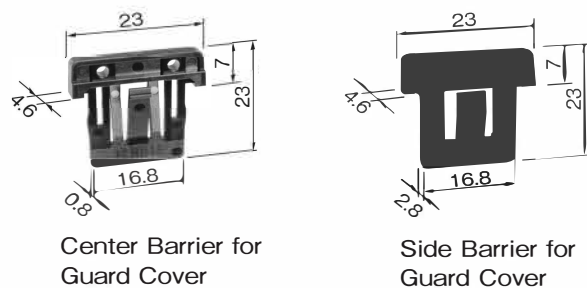
● 14.2mm Square

● 14.2×20.4mm Rectangular



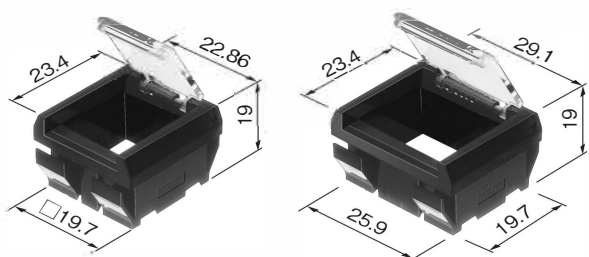
PART NO.	
Square	EH-1080
Rect.	EH-1081

※The cover to be opened 180° and returned by spring force.
 ※Guard Cover with barrier for guard cover.



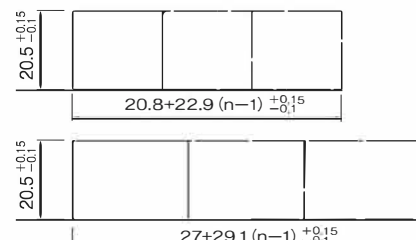
PART NO.		
Color	Center Barrier for Guard Cover	Side Barrier for Guard Cover
Black	EH-1091-K	EH-1092-K
Gray	EH-1091-H	EH-1092-H

Guard Cover for PCB terminal switch (without Flange type)



PART NO.		
Color	Square	Rectangular
Black	EH-1545-K	EH-3409-K
Gray	EH-1545-H	EH-3409-H

● Panel Cut Dimensions



n : number of switch Panel thickness : 1~3.2mm
 Tolerance : ±0.4mm

ACCESSORIES

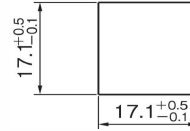
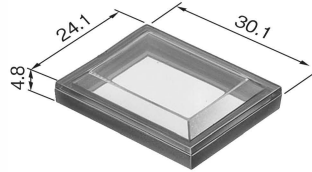
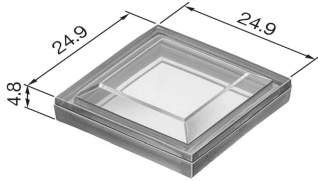
Dust-Proof Cover

Cannot be used for Dimple Button.

● 14.2mm Square

● 14.2×20.4mm Rectangular

● Panel Cut Dimensions



Panel thickness : 1~2.5mm

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

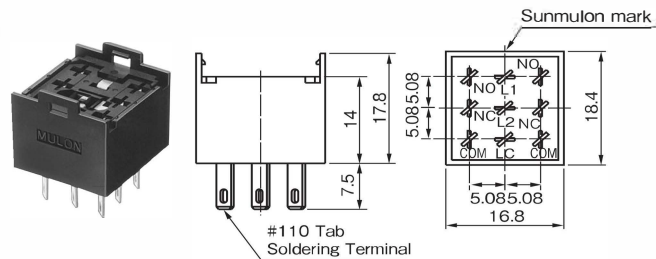
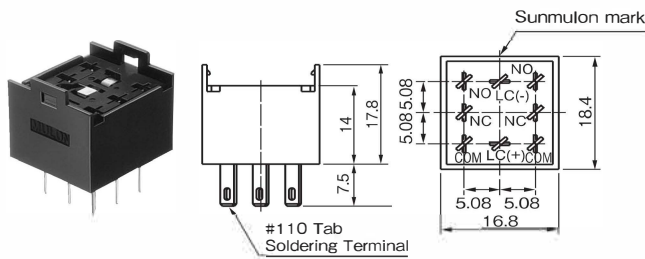
SOCKET

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

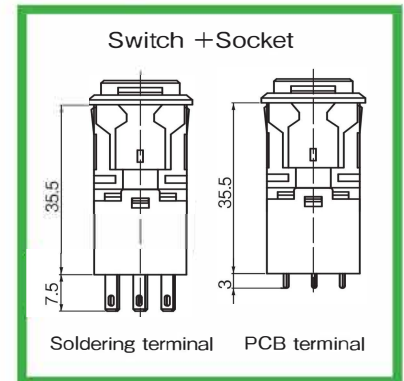
● Solering Terminal

Full-Face, Spot

Split-Face, Dual-Color



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

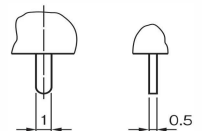
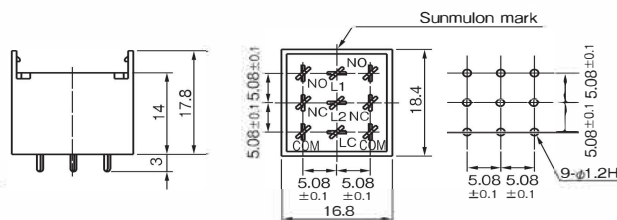
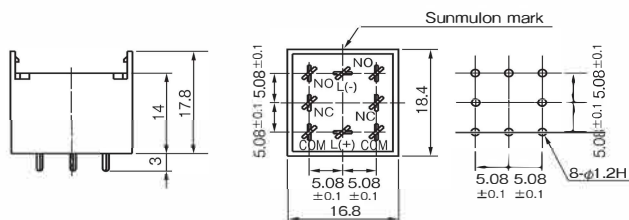


● Socket for PCB terminal switch (non-resistor type)

Full-Face, Spot

Split-Face, Dual-Color

● Terminal Shape



PART NO.			
Application	Resistance	Part No.	Note
Full-Face, Spot	0Ω	EH-1196-1	Use for Sodering terminal Housing
Split-Face, Dual-Color	0Ω	EH-1196-2	

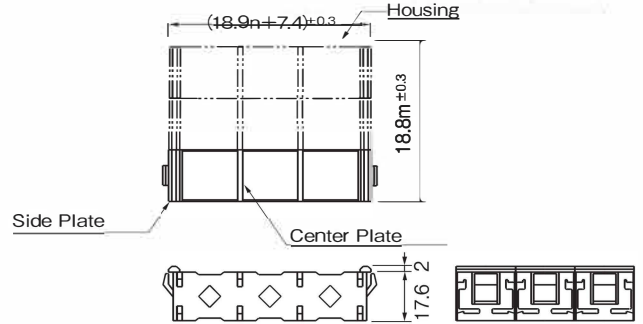
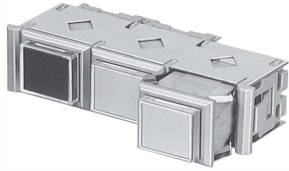
Tolerance : ±0.4mm

ACCESSORIES

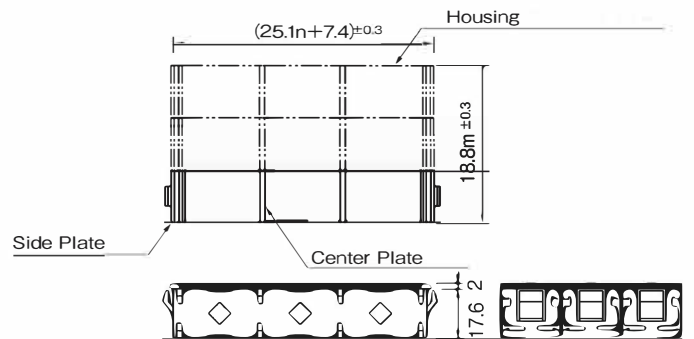
MATRIX FITTING FRAME

When using a matrix fitting frame, use a vertical mounting type switch.
For vertical mounting type, please specify 002 at the end of the Switch model number.

● 14.2mm Square



● 14.2×20.2mm Rectangular



● Panel Cut Dimensions

14.2mm Square	14.2×20.4mm Rectangular

Color	14.2mm Square	14.2×20.4mm 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 : 1mm~3.2mm

Tolerance : ±0.4mm

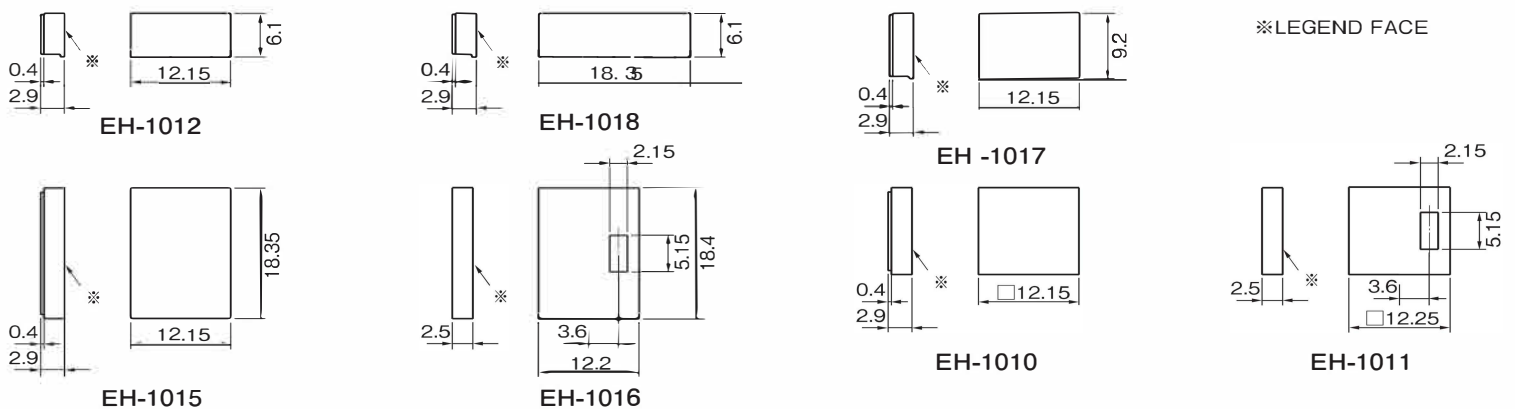
Removing Tool

Using a removing tool makes it easy to remove the Light cartridge.

PART NO.	SJ-0001
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COLOR PLATE DIMENSIONS



REPLACEMENT PARTS

Please order replacement parts with Part No.

● Button/Color Plate for LED illumination

Item \ Color	Red	Green	Yellow	Blue	Milk-White	Clear	Concave
14.2 Square Button	EH-1008-1LR	EH-1008-1LG	EH-1008-1LY	EH-1008-1LB	EH-1008-1LM	EH-1008-2C	EH-2374-2C
14.2×20.4 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 Plate	EH-1010-LR	EH-1010-LG	EH-1010-LY	EH-1010-LB	EH-1010-LM	/	/
Rect. Full-Face Plate	EH-1015-LR	EH-1015-LG	EH-1015-LY	EH-1015-LB	EH-1015-LM		
Square Split-Face Plate	EH-1012-LR	EH-1012-LG	EH-1012-LY	EH-1012-LB	EH-1012-LM		
Rect. Split-Face (horiz.)	EH-1018-LR	EH-1018-LG	EH-1018-LY	EH-1018-LB	EH-1018-LM		
Rect. Split-Face (vert.)	EH-1017-LR	EH-1017-LG	EH-1017-LY	EH-1017-LB	EH-1017-LM		

※Concave Button is transparent.

● Divider for Split-Face

	Split-Face Square, Rect.(vertical)	Split-Face Rect.(horizontal)
EH type	EH-3182	EH-3183
EH-N type	EH-3593	EH-3594

● Button/Color Plate for Spot

Item \ Color	Red	Green	Yellow	Milk-White	Blue	Black	Clear
14.2 Square Button	EH-1009-R	EH-1009-G	EH-1009-Y	EH-1009-M	EH-1009-B	EH-1009-K	EH-1009-C
14.2×20.4 Rect. Button	EH-1014-R	EH-1014-G	EH-1014-Y	EH-1014-M	EH-1014-B	EH-1014-K	EH-1014-C
Square Spot Plate	EH-1011-R	EH-1011-G	EH-1011-Y	EH-1011-M	EH-1011-B	EH-1011-K	/
Rect. Spot Plate	EH-1016-R	EH-1016-G	EH-1016-Y	EH-1016-M	EH-1016-B	EH-1016-K	

● Button/Color Plate for Non-illuminated type

Item \ Color	Red	Green	Yellow	Milk-White	Blue	Black	Clear
14.2 Square Button	EH-1008-1R	EH-1008-1G	EH-1008-1Y	EH-1008-1M	EH-1008-1B	EH-1008-1K	EH-1008-2C
14.2×20.4 Rect. Button	EH-1013-1R	EH-1013-1G	EH-1013-1Y	EH-1013-1M	EH-1013-1B	EH-1013-1K	EH-1013-2C
Square Full-Face Plate	EH-1010-R	EH-1010-G	EH-1010-Y	EH-1010-M	EH-1010-B	EH-1010-K	/
Rect. Full-Face Plate	EH-1015-R	EH-1015-G	EH-1015-Y	EH-1015-M	EH-1015-B	EH-1015-K	

● Long Retaining Clip for vertical mounting

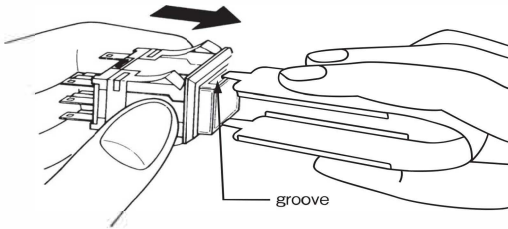
Two pieces are required per Housing.

Part No.	EH-1034-2
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ASSEMBLY & DISASSEMBLY

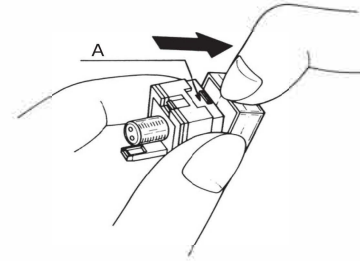
1. Removing Light cartridge

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



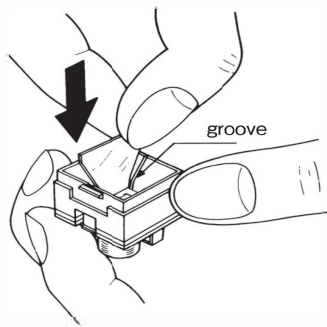
2. Removing Button

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



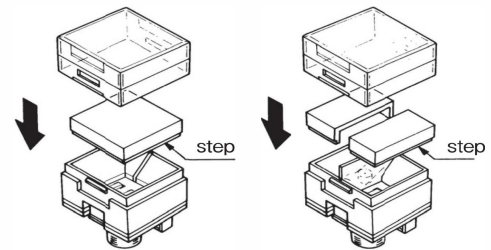
3. Fitting Divider (Split-Face)

Insert Fit divider on the groove accordingly.



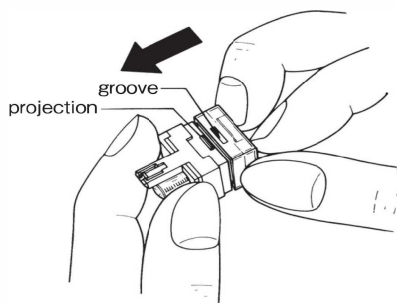
4. Fiting Plate(s)

Set Plate(s) with the flat face upwards on the Light cartridge, then put button on.



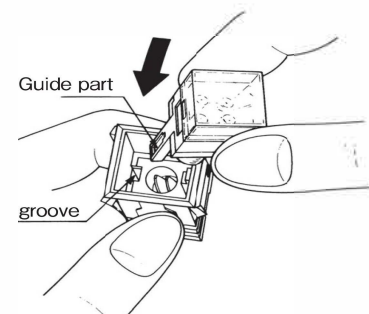
5. Fitting Button

Align the groove on the button, the projection on the Light cartridge, and fit the button until click.



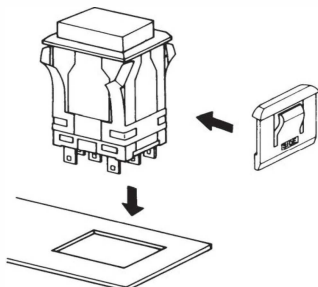
6. Fitting Light cartridge

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



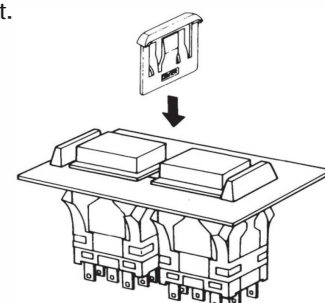
7. Installing Barriers

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



● Installing Barriers (Serial)

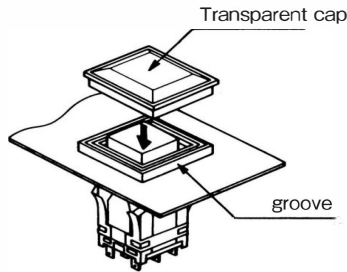
Insert the center barrier between the switches after mounting the switches with side barriers into the panel cut-out.



ASSEMBLY & DISASSEMBLY

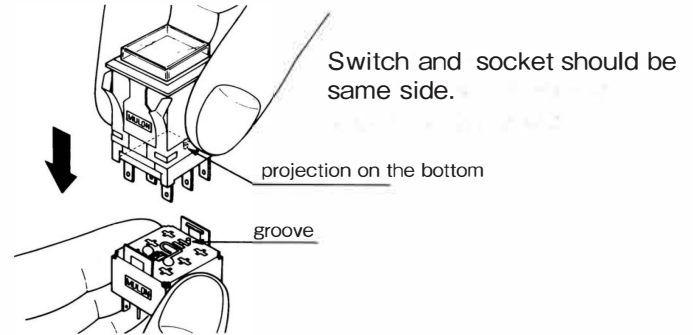
8. installing Dustproof Cover

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



9. Fitting Socket

Insert switch into socket with right direction and push until stop.



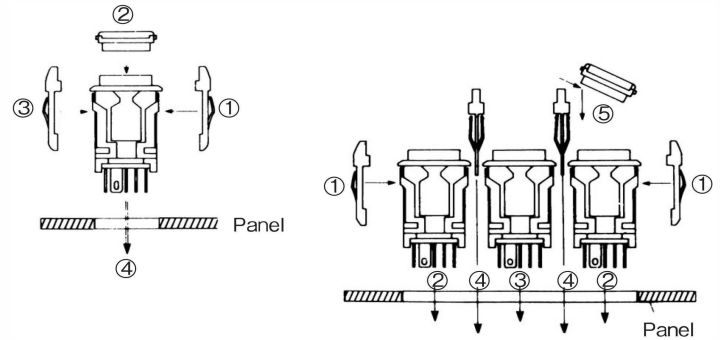
10. Installing Guard cover

●Independent mounting

Fit one side barrier and switch, then fit guard cover and the other side barrier. After that mount on panel.

●Serial mounting

Fit one side barrier and switch, then mount on panel. Install center barriers between switches, attached the guard cover while inserting the round convex part of the guard cover into the hole of the barrier one by one.



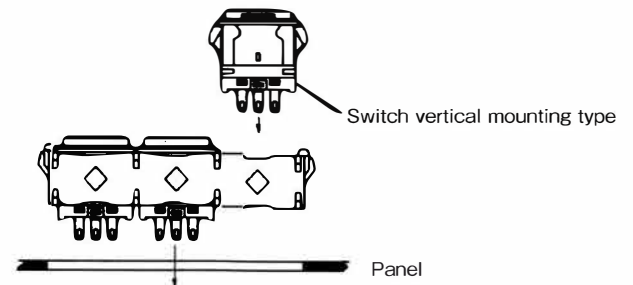
11. Notation for LED voltage supply rating

DC voltage supply rating for LED is on the side of Light cartridge.

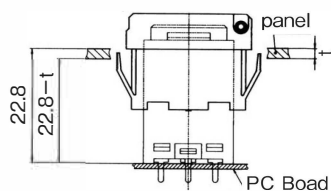
12. Matrix Fitting frame

Fit switch into the matrix fitting frame. After that mount on panel.

※Cannot be used with Barriers, Guard cover, Dustproof cover.



13. Installing Guard cover of without Flange type



ORDERING CODE (EH-N type) as a Set [Light Cartridge]+[Housing]

Full-Face, Dual-Color, Split-Face

EH - N 1 2 1 2

● OPERATION

M	Momentary
A	Alternate
L	Indicator
※ F	Flat Indicator

※ Button level is flat. (locked position)

● CONTACT

0	Indicator
3	SPDT Silver (Gold-Plated)
4	DPDT Silver (Gold-Plated)
5	SPDT Crossbar
6	DPDT Crossbar

● BUTTON SHAPE ILLUMINATION TYPE

S0	Square Full-Face	K0	ConcaveB. Square Full-Face
W0	Rect. Full-Face	K1	ConcaveB. Split-Face (Vert.)
S1	Square Split-Face (Vert.)	K2	ConcaveB. Split-Face (Horiz.)
S2	Square Split-Face (Horiz.)	K3	Concave B. Square Dual-Color
W1	Rect. Split-Face (Vert.)	N0	Concave B. Rect. Full-Face
W2	Rect. Split-Face (Horiz.)	N1	Concave B. Rect. Split-Face (Vert.)
S3	Square Dual-Color	N2	Concave B. Rect. Split-Face (Horiz.)
W3	Rect. Dual-Color	N3	Concave B. Rect. Dual-Color

● LED COLOR

70	Red	Full-Face : Put color no. into the frame 1 Split-Face : Put color no. into the frame 1,2 7070 , 7080 , 7090 , 8070 , 8080 , 8090 9070 , 9080 , 9090 , 1414 , 1416 , 1418 1614 , 1616 , 1618 , 1814 , 1816 , 1818 7014 , 7016 , 7018 , 9014 , 1470 , 1670 1870 , 1490 Combination only
80	Green	
90	Yellow	
14	Super Blue	
16	Super White	
18	Super Green	
X	Without LED	Dual-Color : Put color no. into the frame 1,2 7080 , 8090 , 9070 , 7014 , 7016 , 7018 9014 , 1416 , 1618 , 1814 Combination only

● Supply Voltage to LED

1	5V Built-in Resistor
2	12V Built-in Resistor
3	24V Built-in Resistor(not for Split-Face)
4	5V Non-Resistor, Split-Face non resistor
5	12V Non-Resistor
6	24V Non-Resistor
X	Without LED

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	#110Tab, Soldering
C	PCB
K	Connector with Accessories
N	Connector without Accessories

● COLOR PLATE

1	Red
2	Green
3	Yellow
4	Milk White
6	Blue
X	Without Color Plate

Full-Face : Put color no. into the frame 1
Split-Face : Put color no. into the frame 1, 2

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

● BUTTON COLOR

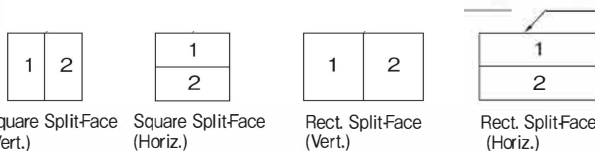
R	Red
G	Green
Y	Yellow
M	Milk White
B	Blue
C	Clear

● HOUSING COLOR

K	Black
H	Gray
KN	Black without Flange
HN	Gray without Flange

● NOTES

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



- In case of Split-Face, button color should be C (clear).
- In case of Dual-Color, button should be C (clear) with Milk-White filter or Milk-White button.
- 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.
- For Accessories, EH-3251 for SPDT, Indicator is a set of 1 housing and 6 contacts. EH-5180 for DPDT is a set of 1 housing and 9 contacts. If you purchase a wire harness separately, please specify Terminal N (Connector without accessories).

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:

① 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 510Ω 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 1.3kΩ 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 36Ω 1/4W, 270Ω 1/4W, 1.1kΩ 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.

ORDERING CODE (EH-N type) Individually [Light Cartridge, Housing]

It is possible to order individually Light Cartridge and Housing.

LIGHT CARTRIDGE

EH - N

● BUTTON SHAPE ILLUMINATION TYPE

S0	Square Full-Face
W0	Rect. Full-Face
S1	Square Split-Face (Vert.)
S2	Square Split-Face (Horiz.)
W1	Rect. Split-Face (Vert.)
W2	Rect. Split-Face (Horiz.)
S3	Square Dual-Color
W3	Rect. Dual-Color

K0	Concave B. Square Full-Face
K1	Concave B. Split-Face (Vert.)
K2	Concave B. Split-Face (Horiz.)
K3	Concave B. Square Dual-Color
N0	Concave B. Rect Full-Face
N1	Concave B. Rect Split-Face (Vert.)
N2	Concave B. Rect Split-Face (Horiz.)
N3	Concave B. Rect Split-Face

● LED COLOR

70	Red	Full-Face : Put color no. into the frame 1 Split-Face : Put color no. into the frame 1,2
80	Green	
90	Yellow	7070 , 7080 , 7090 , 8070 , 8080 , 8090 9070 , 9080 , 9090 , 1414 , 1416 , 1418 1614 , 1616 , 1618 , 1814 , 1816 , 1818 7014 , 7016 , 7018 , 9014 , 1470 , 1670 1870 , 1490 Combination only
14	Super Blue	Dual-Color : Put color no. into the frame 1,2 7080 , 8090 , 9070 , 7014 , 7016 , 7018 9014 , 1416 , 1618 , 1814 Combination only
16	Super White	
18	Super Green	
X	Without LED	

● Supply Voltage to LED

1	5V Built-in Resistor
2	12V Built-in Resistor
3	24V Built-in Resistor(not for Split-Face)
4	5V Non-Resistor, Split-Face non-resistor
5	12V Non-Resistor
6	24V Non-Resistor
X	Without LED

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

● COLOR PLATE

1	Red
2	Green
3	Yellow
4	Milk White
6	Blue
X	Without Color Plate

● BUTTON COLOR

R	Red
G	Green
Y	Yellow
M	Milk White
C	Clear
B	Blue
X	Without Button

HOUSING

EH - N

● OPERATION

M	Momentary
A	Alternate
L	Indicator
* F	Flat Indicator

* Button level is flat.(locked position)

● CONTACT

0	Indicator
3	SPDT Silver (Gold-Plated)
4	DPDT Silver (Gold-Plated)
5	SPDT Crossbar
6	DPDT Crossbar

● TERMINAL

P	#110Tab/Soldering
C	PCB
K	Connector with Accessories
N	Connector without Accessories

● HOUSING COLOR

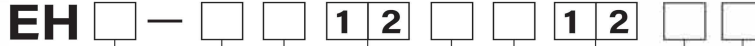
K	Black
H	Gray
KN	Black without Flange
HN	Gray without Flange

● BUTTON SHAPE ILLUMINATION TYPE

S0	Square Full-Face
W0	Rect. Full-Face
S1	Square Split-Face, Dual-Color
W1	Rect. Split-Face, Dual-Color

ORDERING CODE (EH type) as a Set [Light Cartridge]+[Housing]

Full-Face, Dual-Color, Split-Face



● OPERATION

M	Momentary
A	Alternate
L	Indicator
※ F	Flat Indicator

※ Button level is flat. (Locked position)

● CONTACT

0	Indicator
3	SPDT Silver (Gold-Plated)
4	DPDT Silver (Gold-Plated)
5	SPDT Crossbar
6	DPDT Crossbar

● BUTTON SHAPE ILLUMINATION TYPE

S0	Square Full-Face	K0	Concave B. Square Full-Face
W0	Rect. Full-Face	K1	Concave B. Split-Face (Vert.)
S1	Square Split-Face (Vert.)	K2	Concave B. Split-Face (Horiz.)
S2	Square Split-Face (Horiz.)	K3	Concave B. Square Dual-Color
W1	Rect. Split-Face (Vert.)	N0	Concave B. Rect. Full-Face
W2	Rect. Split-Face (Horiz.)	N1	Concave B. Rect. Split-Face (Vert.)
S3	Square Dual-Color	N2	Concave B. Rect. Split-Face (Horiz.)
W3	Rect. Dual-Color	N3	Concave B. Rect. Dual-Color

● LED COLOR

70	Red	Full-Face : Put color no. into the frame 1 Split-Face : Put color no. into the frame 1,2 7070, 7080, 7090, 8070, 8080, 8090 9070, 9080, 9090, 1414, 1416, 1418 1614, 1616, 1618, 1814, 1816, 1818 7014, 7016, 7018, 9014, 1470, 1670 1870, 1490 Combination only
80	Green	
90	Yellow	
14	Super Blue	
16	Super White	Dual-Color : Put color no. into the frame 1,2 7080, 8090, 9070, 7014, 7016, 7018 9014, 1416, 1618, 1814 Combination only
18	Super Green	

● Supply Voltage to LED

1	5V Built-in Resistor
2	12V Built-in Resistor
3	24V Built-in Resistor(not for Split-Face)
4	5V Non-Resistor, Split-Face non resistor
5	12V Non-Resistor
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	#110Tab, Soldering
C	PCB
K	Connector with Accessories
N	Connector without Accessories

● COLOR PLATE

1	Red	Full-Face : Put color no. into the frame 1 Split-Face : Put color no. into the frame 1, 2
2	Green	
3	Yellow	
4	Milk White	
6	Blue	
★ X	Without Color Plate	

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

● BUTTON COLOR

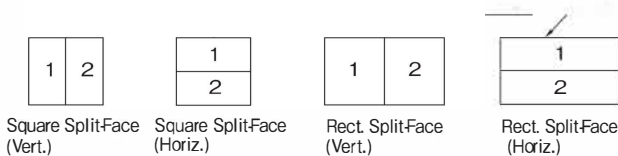
R	Red
G	Green
Y	Yellow
M	Milk White
B	Blue
C	Clear

● HOUSING COLOR

K	Black
H	Gray
KN	Black without Flange
HN	Gray without Flange

● NOTES

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



- In case of Split-Face, button color should be C (clear).
- In case of Dual-Color, button should be C (clear) with Milk-White filter or Milk-White button.
- 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.
- For Accessories, EH-3251 for SPDT, Indicator is a set of 1 housing and 6 contacts. EH-5180 for DPDT is a set of 1 housing and 9 contacts. If you purchase a wire harness separately, please specify Terminal N (Connector without accessories).

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:

1) 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 510Ω 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 1.3kΩ 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 36Ω 1/4W, 270Ω 1/4W, 1.1kΩ 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.

ORDERING CODE (EH type) as a Set [Light Cartridge]+[Housing]

LED SPOT

EH -

● OPERATION

M	Momentary
A	Alternate
L	Indicator
※ F	Flat Indicator

※ Button level is flat.(locked position)

● CONTACT

0	Indicator
3	SPDT Silver (Gold-Plated)
4	DPDT Silver (Gold-Plated)
5	SPDT Crossbar
6	DPDT Crossbar

● LED COLOR

4	Red
5	Green
6	Yellow

● BUTTON SHAPE

S0	Square
W0	Rect.

● TERMINAL

P	#110Tab/Soldering
C	PCB
K	Connector with Accessories
N	Connector without Accessories

● Supply Voltage to LED

1	5V Built-in Resistor
2	12V Built-in Resistor
3	24V Built-in Resistor
4	Non-Resistor

● COLOR PLATE

1	Red
2	Green
3	Yellow
4	Milk-White
6	Blue
7	Black
×	Without Color Plate

● HOUSING COLOR

K	Black
H	Gray
KN	Black without Flange
HN	Gray without Flange

● BUTTON COLOR

R	Red
G	Green
Y	Yellow
M	Milk White
B	Blue
K	Black
C	Clear

Non-illuminated

EH - 0

● OPERATION

M	Momentary
A	Alternate
L	Indicator
※ F	Flat Indicator

※ Button level is flat.(locked position)

● CONTACT

0	Indicator
3	SPDT Silver (Gold-Plated)
4	DPDT Silver (Gold-Plated)
5	SPDT Crossbar
6	DPDT Crossbar

● BUTTON SHAPE

S	Square
W	Rect.
K	Square Concave
N	Rect. Concave

● TERMINAL

P	#110Tab/Soldering
C	PCB
K	Connector with Accessories
N	Connector without Accessories

● COLOR PLATE

1	Red
2	Green
3	Yellow
4	Milk-White
6	Blue
7	Black
×	Without Color Plate

● HOUSING COLOR

K	Black
H	Gray
KN	Black without Flange
HN	Gray without Flange

● BUTTON COLOR

R	Red
G	Green
Y	Yellow
M	Milk White
B	Blue
K	Black
C	Clear

ORDERING CODE (EH type) Individually [Light Cartridge, Housing]

It is possible to order individually Light Cartridge and Housing.

LIGHT CARTRIDGE

EH — 1 2 1 2

● BUTTON SHAPE ILLUMINATION TYPE

S0	Square Full-Face
W0	Rect. Full-Face
S1	Square Split-Face (Vert.)
S2	Square Split-Face (Horiz.)
W1	Rect. Split-Face (Vert.)
W2	Rect. Split-Face (Horiz.)
S3	Square Dual-Color
W3	Rect. Dual-Color

K0	Concave B. Square Full-Face
K1	Concave B. Split-Face (Vert.)
K2	Concave B. Split-Face (Horiz.)
K3	Concave B. Square Dual-Color
N0	Concave B. Rect. Full-Face
N1	Concave B. Rect. Split-Face (Vert.)
N2	Concave B. Rect. Split-Face (Horiz.)
N3	Concave B. Rect. Split-Face

● LED COLOR

70	Red	Full-Face : Put color no. into the frame 1 Split-Face : Put color no. into the frame 1,2
80	Green	7070 , 7080 , 7090 , 8070 , 8080 , 8090 9070 , 9080 , 9090 , 1414 , 1416 , 1418 1614 , 1616 , 1618 , 1814 , 1816 , 1818 7014 , 7016 , 7018 , 9014 , 1470 , 1670 1870 , 1490 Combination only
90	Yellow	
14	Super Blue	
16	Super White	Dual-Color : Put color no. into the frame 1,2 7080 , 8090 , 9070 , 7014 , 7016 , 7018 9014 , 1416 , 1618 , 1814 Combination only
18	Super Green	

● Supply Voltage to LED

1	5V Built-in Resistor
2	12V Built-in Resistor
3	24V Built-in Resistor(not for Split-Face)
4	5V Non-Resistor, Split-Face non-resistor
5	12V Non-Resistor
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.

● COLOR PLATE

1	Red
2	Green
3	Yellow
4	Milk White
6	Blue
X	Without Color Plate

● BUTTON COLOR

R	Red
G	Green
Y	Yellow
M	Milk White
C	Clear
B	Blue
X	Without Button

LED SPOT

EH —

● BUTTON SHAPE

S0	Square
W0	Rect.

● LED COLOR

4	Red
5	Green
6	Yellow

● BUTTON COLOR

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

● Supply Voltage to LED

1	5V Built-in Resistor
2	12V Built-in Resistor
3	24V Built-in Resistor
4	Non-Resistor

● COLOR PLATE

1	Red	6	Blue
2	Green	7	Black
3	Yellow	X	Without Color Plate
4	Milk-White		

ORDERING CODE (EH type) Individually [Light Cartridge, Housing]

LIGHT CARTRIDGE

Non-illuminated

EH - 0

● BUTTON SHAPE

S	Square
W	Rect.
K	Square Concave
N	Rect. Concave

● BUTTON COLOR

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

● COLOR PLATE

1	Red	6	Blue
2	Green	7	Black
3	Yellow	X	Without Color Plate
4	Milk-White		

HOUSING

EH -

● OPERATION

M	Momentary
A	Alternate
L	Indicator
* F	Flat Indicator

* Button level is flat.(locked position)

● CONTACT

0	Indicator
3	SPDT Silver (Gold-Plated)
4	DPDT Silver (Gold-Plated)
5	SPDT Crossbar
6	DPDT Crossbar

● TERMINAL

P	#110Tab/Soldering
C	PCB
K	Connector with Accessories
N	Connector without Accessories

● HOUSING COLOR

K	Black
H	Gray
KN	Black without Flange
HN	Gray without Flange

● BUTTON SHAPE ILLUMINATION TYPE

S	Square Non-illuminated
W	Rect. Non-illuminated
S0	Square Full-Face, Spot
W0	Rect. Full-Face, Spot
S1	Square Split-Face, Dual-Color
W1	Rect. Split-Face, Dual-Color

• Connector Type

Without soldering, mounting and maintenance is a connector type available.

• Reduced Wiring

There are dedicated connectors for SPDT and Indicator and for DPDT.
Wire harness is also dedicated to each contact.
Please refer to ACCESSORIES for details.

SPECIFICATIONS

Contact	Silver Contact (Gold-Plated)	Cross-bar Contact
Electrical Rating	AC100V 1A, DC30V 1A (Resistive)	AC100V 0.1A, DC30V 0.1A (Resistive)
Insulation Resistance	More than 100MΩ at 500V DC	
Dielectric Strength	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	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
Contact Resistance	Less than 40mΩ (Initial) at DC6V 1A	Less than 60mΩ (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.)	

DIMENSIONS (SPDT, Indicator Type)

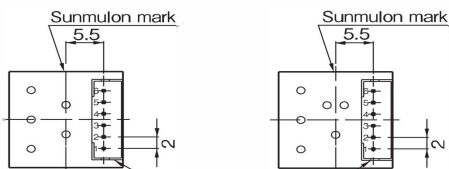
SPDT, Indicator

14.2mm Square Button				
				TOP VIEW ※ 3.9 for Dimple Button
14.2X20.4mm Rect. Button				
				TOP VIEW ※ 3.9 for Dimple Button

TERMINAL LAYOUT

SPDT, Indicator

- Full-Face, Spot
- Split-Face, Dual-Color



Connector for JST made
(B 6B-PH-K-S)

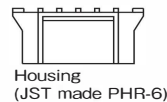
6	L2 (L-)
5	L1 (L-)
4	LC
3	NO
2	NC
1	COM
Pin No.	Terminal

SPDT, Indicator

- Connector

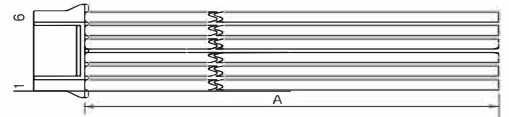
Part No | EH-3251

Connector (1 Housing & 6 Contact Pins)
to be appended.



Applicable wire : AWG#30 ~ #24

- Wire Harness
Wire : UL1061, AWG26 equivalent



A length	Part No
100cm	EH-3250-1
200cm	EH-3250-2

Pin no.	1	2	3	4	5	6
Wire Color	Brown	Red	Orange	Yellow	Green	Blue

DIMENSIONS (DPDT Type)

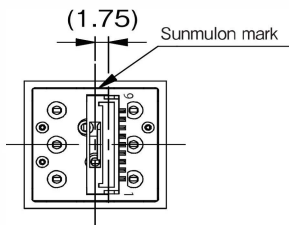
DPDT

14.2mm Square Button			<p>TOP VIEW</p> <p>※ 3.9 for Dimple Button</p>
14.2 x 20.4mm Rect. Button			<p>TOP VIEW</p> <p>※ 3.9 for Dimple Button</p>

TERMINAL LAYOUT

DPDT

9	NO2
8	NC2
7	COM2
6	L2
5	L1
4	LC
3	NO1
2	NC1
1	COM1
Pin No.	Terminal



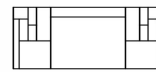
(BOTTOM VIEW)

Connector
JST made
BM09B-GHS-TBT

ACCESSORIES

DPDT

● **Connector** Part No **EH-5180** Connector (1 Housing & 9 contact Pins) to be appended.



Housing
(JST made GHR-09V-S)

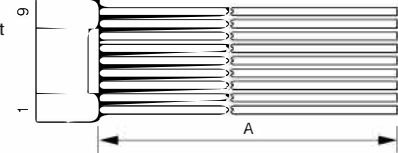


Contact Pin
(JST made SSSL-002T-P02)

● **Wire Harness**

Wire : UL1061, AWG26 equivalent

Applicable wire : AWG#30~#26



A length	Part No
100cm	EH-5177-1
200cm	EH-5177-2

Pin no.	1	2	3	4	5	6	7	8	9
Wire Color	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White