

TL Indicator

Arrange 25 mm squares to free size.

- Display surface : 25 mm Square (1 unit)
(External dimension : 25 mm Square)
- Depth behind panel : 15 mm (1 unit)
- Terminal : Connector (Original connector)
- Mounting : PCB (1 unit), Screw mounting (Free size, Matrix)
- Illumination type : Full-Face, 3-Color
- Accessories : Wire harness (Free size, Matrix)



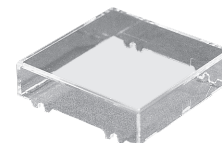
CHARACTERISTICS

Display Surface Size	□25 mm (1 unit)
Illumination Color	Red, Green Yellow, Suer Blue, Super White, Super Green
Illumination Type	Full-Face, 3-Color
Max. Number of Matrixes	Max. 10 columns×10 rows
Supply Voltage	DC 12 V, 24 V ±5%
Consumption Current	25 mA max. (1 unit)
Terminal Shape	Original connector (5 pins)
Insulation Resistance	More than 100 MΩ at DC 500 V
Dielectric Strength	AC 1500 V RMS between terminals and ground 50/60 Hz for 60 sec. at normal ambient temperature and humidity
Peak Reverse Voltage	150V
Ambient Operating Temperature	-10°C to 40°C (No Freeze, No Condensation)
Ambient Operating Humidity	45 to 85%RH max.(No Condensation)
Ambient Storage Temperature	-25°C to 65°C (No Freeze, No Condensation)
Ambient Storage Humidity	85%RH max. (No Condensation)
RoHS (10 Substances)	Conform to standards

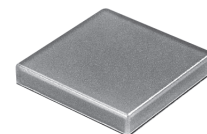
STRUCTURE

(1 unit)

COVER



FILTER



LIGHT CARTRIDGE



https://www.sunmulon.co.jp/english/products/led_e/tl.html



◇Dimensions : page TL-2

◇Internal connection arrangements : page TL-8

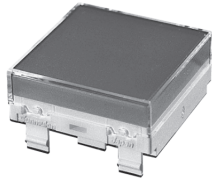
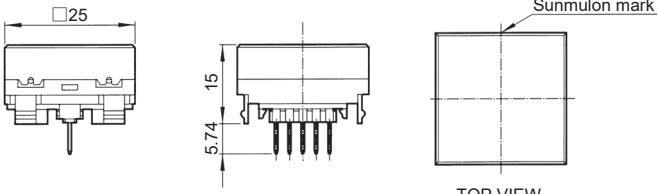
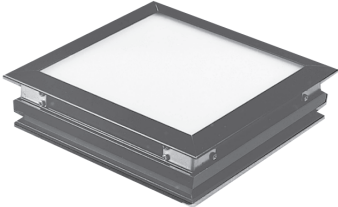
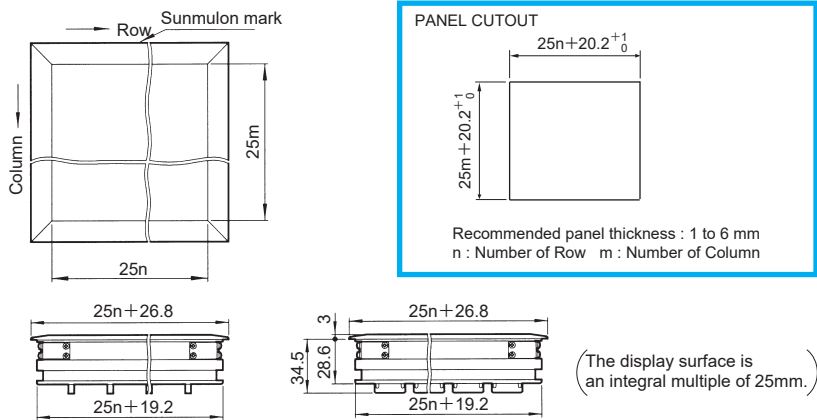

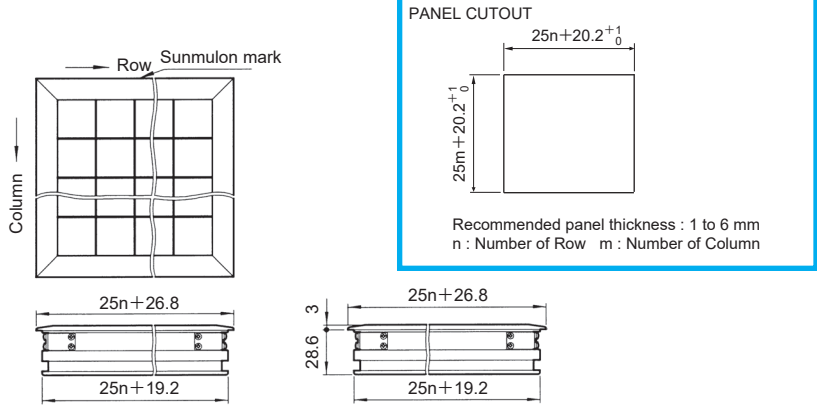
◇Accessories : page TL-3

◇LED specifications : page TL-9

◇Ordering code : page TL-4~6

◇Mounting design / Panel cutout : page TL-9

DIMENSIONS





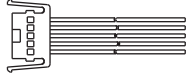



<p>1 unit</p>  <p>3D DXF</p>	 <p style="text-align: center;">TOP VIEW</p>
<p>Free size</p>  <p>3D DXF</p>	 <p style="text-align: center;">(The display surface is an integral multiple of 25mm.)</p>
<p>With Matrix frame</p>  <p>3D DXF</p>	

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

n : Number of indicator

Tolerance : ± 0.4 mm

ACCESSORIES

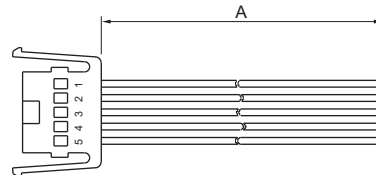
Name	Appearance	Classification	Part no.		Precautions for use
Connector		Housing	BL-0077		- Housing and contact set. - Contact is Honda Tsushin Kogyo's product HKP-F403. ※ Please specify whether or not to attach it by ordering code.
		Contact			
Contact pulling tool		For contact	—		- Honda Tsushin Kogyo's product HKP-KF. We do not sell this product.
Contact crimping tool		Crimping tool	—		- Honda Tsushin Kogyo's product KP-309. We do not sell this product.
Wire harness		Wire harness	50cm	CL-0230	- For other dimensions, please contact us. ※ The pin assignment is different from BL, CL and HL.
			100cm	CL-0231	
Matrix frame mounting bracket		For Free size For Matrix mounting	BL-0073		- Fittings that secure the matrix frame to the panel. ※ The quantity required for free size and matrix type will be attached.
Removing tool		For removal cover	SJ-0002-1		- Be used to remove cover from housing.
Removing tool		For removal light cartridge	CL-0218-2		- Be used to remove light cartridge from housing.

Wire harness

Part no.	CL-0230	CL-0231
A length	50cm	100cm

Wire : UL1061 AWG26

- ※ For other dimensions, please contact us.
- ※ The pin assignment is different from BL, CL and HL.



※ No number on the actual item.

Pin No.	5	4	3	2	1
Wire Color	Red	Green	Yellow	Blue	Gray

ORDERING CODE [Full-Face]

Assembled Part
1 unit



TL — [] [] [] [] [] C [] []

● LED TYPE

S0	Standard LED	※1)
S4	Super bright LED	※2)

● LED COLOR ※3) ※4)

7	Red	※1)
8	Green	Standard LED
9	Yellow	
14	Super Blue	※2)
16	Super White	Super bright LED
18	Super Green	
X	Without LED	※1)

● COVER COLOR

C	Transparent
X	Without cover

● FILTER COLOR

1	Red	
2	Green	
3	Yellow	※3)
4	Milk white	
6	Blue	
8	Lemon Yellow	※4)
X	Without filter	

● Supply Voltage to LED

1	DC12V	
2	DC24V	
X	Without LED	※1)

● TERMINAL

C	PCB
---	-----

● NOTES

- ※1) Standard LED (S0), specify LED color from 7, 8, 9. For non-illumination, specify Without LED (X).
- ※2) Super bright LED (S4), specify LED color form 14, 16, 18.
- ※3) The color of "Yellow" for LED (9) and filter (3) is actually "Orange Yellow" not Lemon Yellow.
- ※4) When using Lemon Yellow filter (8), specify LED color Green (8) .

Free size indicator

TL — [] X [] [] [] C [] K [] []

● COLUMN

01	1
⋮	⋮
10	10

● ROW

01	1
⋮	⋮
10	10

● LED TYPE

S0	Standard LED	※1)
S4	Super bright LED	※2)

● LED COLOR ※3) ※4)

7	Red	※1)
8	Green	Standard LED
9	Yellow	
14	Super Blue	※2)
16	Super White	Super bright LED
18	Super Green	

● COVER COLOR

C	Transparent
---	-------------

● FILTER COLOR

1	Red	
2	Green	
3	Yellow	※3)
4	Milk white	
6	Blue	
8	Lemon Yellow	※4)

● MATRIX FRAME

K	Black
S	Silver

● Supply Voltage to LED

2	DC12V
3	DC24V

● TERMINAL

K	Connector
---	-----------

● NOTES

- ※1) Standard LED (S0), specify LED color from 7, 8, 9.
- ※2) Super bright LED (S4), specify LED color form 14, 16, 18.
- ※3) The color of "Yellow" for LED (9) and filter (3) is actually "Orange Yellow" not Lemon Yellow.
- ※4) When using Lemon Yellow filter (8), specify LED color Green (8) .

The display surface of Free size indicator is an integral multiple of 25 mm. Free size indicator of 01 × 01 cannot be manufactured.

No changes can be made after the order has been placed.

Covers and filters cannot be replaced for free size indicator.

◇Dimensions : page TL-2

◇Internal connection arrangements : page TL-8

◇Accessories : page TL-3

◇LED specifications : page TL-9

◇Mounting design / Panel cutout : page TL-9

ORDERING CODE [3-Color]

Assembled Part
1 unit



TL - S3 1 2 4 C

● LED TYPE
S3 3-Color

● LED COLOR ※1)

7	Red	Put the color numbers into frame 1, 2. (Dual-Color combination) 87 · 89 · 97
8	Green	
9	Yellow	

Yellow (9) is actually "ORANGE Yellow" not Lemon Yellow.

● COVER COLOR

C	Transparent
X	Without cover

● FILTER COLOR

4	Milk white
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● Supply Voltage to LED

1	DC12V
2	DC24V

● TERMINAL

C	PCB
---	-----

● NOTES

※1) The three colors of 3-Color illumination are 87 (Green · Red · simultaneous lighting color), 89 (Green · Yellow · simultaneous lighting color) and 97 (Yellow · Red · simultaneous lighting color).

Free size indicator

TL - × S3 1 2 C 4 K

● COLUMN

01	1
⋮	⋮
10	10

● ROW

01	1
⋮	⋮
10	10

● LED TYPE
S3 3-Color

● LED COLOR ※1)

7	Red	Put the color numbers into frame 1, 2. (Dual-Color combination) 87 · 89 · 97
8	Green	
9	Yellow	

Yellow (9) is actually "ORANGE Yellow" not Lemon Yellow.

● COVER COLOR

C	Transparent
---	-------------

● FILTER COLOR

4	Milk white
---	------------

● MATRIX FRAME

K	Black
S	Silver

● Supply Voltage to LED

2	DC12V
3	DC24V

● TERMINAL

K	Connector
---	-----------

● NOTES

※1) The three colors of 3-Color illumination are 87 (Green · Red · simultaneous lighting color), 89 (Green · Yellow · simultaneous lighting color) and 97 (Yellow · Red · simultaneous lighting color).

The display surface of Free size indicator is an integral multiple of 25 mm. Free size indicator of 01 × 01 cannot be manufactured.

No changes can be made after the order has been placed.

Covers and filters cannot be replaced for free size indicator.

◇Dimensions : page TL-2

◇Internal connection arrangements : page TL-8

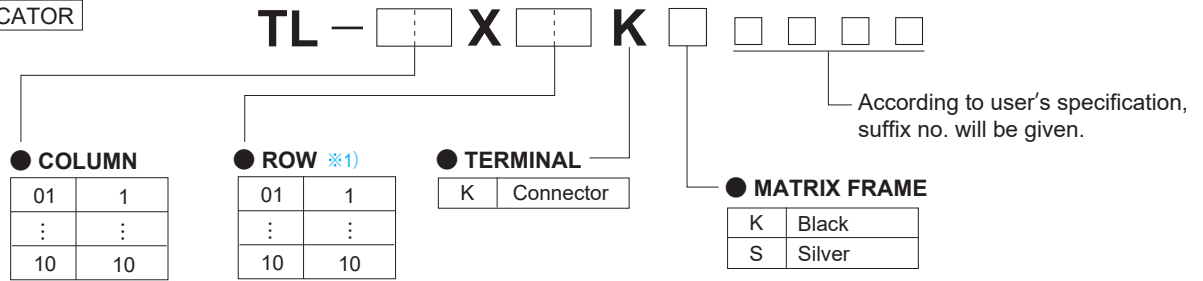
◇Accessories : page TL-3

◇LED specifications : page TL-9

◇Mounting design / Panel cutout : page TL-9

ORDERING CODE [Matrix]

MATRIX INDICATOR



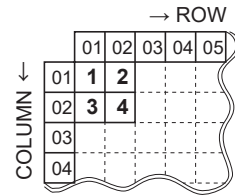
Matrix indicator of 01×01 cannot be manufactured.
No changes can be made after the order has been placed.

◆Please specify the desired matrix shape and the single model to be placed by number as shown in the table below.

[Example to specify]



No.	Part no.	Q'ty
1	TL-S09C4C2	1
2	TL-S08C4C2	1
3	TL-S07C4C2	1
4	TL-S09C4C2	1



No.	Part no.	Q'ty
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

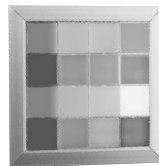
↓ COLUMN

	→ ROW									
	01	02	03	04	05	06	07	08	09	10
01										
02										
03										
04										
05										
06										
07										
08										
09										
10										

Applications



① 1×10 for Back light



② 4×4 Matrix indicator



③ 5×10 Free size indicator

REPLACEMENT PARTS

1 Unit

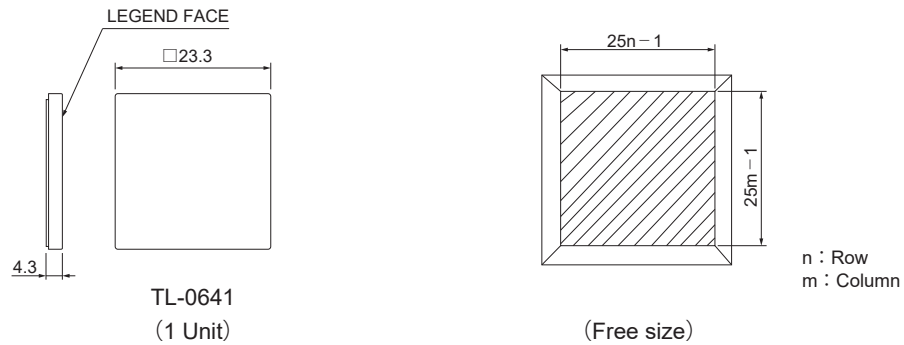
● Full-Face COVER/FILTER

	Red	Green	Yellow	Milk-white	Blue	Lemon Yellow	Transparent
COVER	/						TL-0640
FILTER	TL-0641-LR	TL-0641-LG	TL-0641-LO	TL-0641-LM	TL-0641-LB	TL-0641-LY	/

● 3-Color COVER/FILTER

	Milk-white	Transparent
COVER	/	
FILTER	TL-0641-LM	/

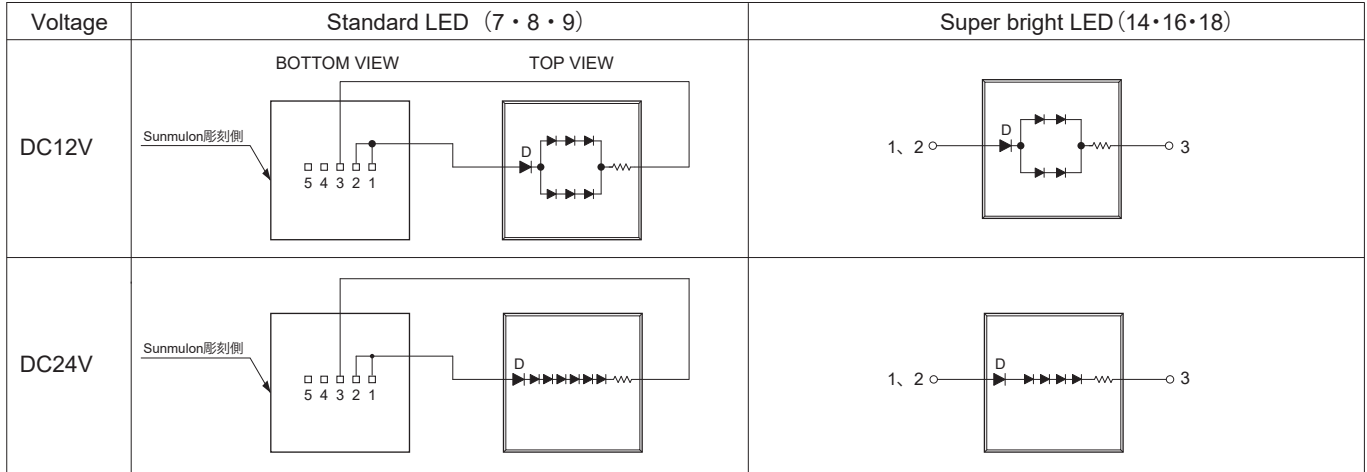
FILTER DIMENSIONS



Tolerance : ± 0.4 mm

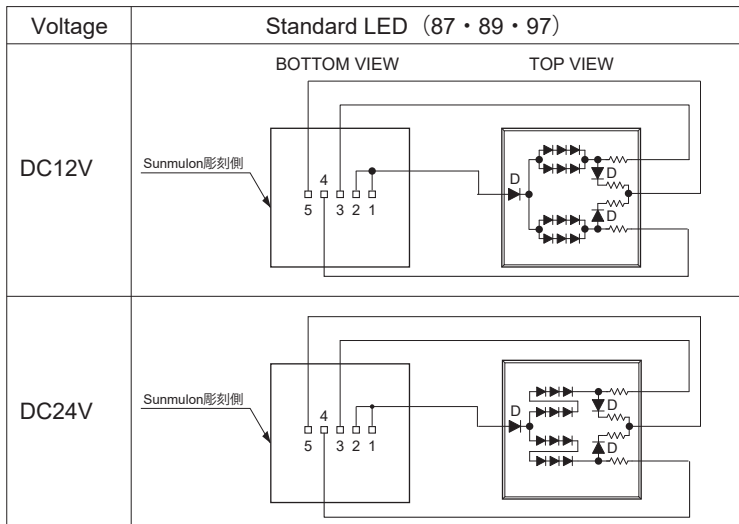
INTERNAL CONNECTION ARRANGEMENTS

● Full-Face



LED color : 7 (Red), 8 (Green), 9 (Yellow), 14 (Super-Blue), 16 (Super-White), 18 (Super-Green)

● 3-Color



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

● 3-Color combination (Common for each voltage)

Terminals	LED Color		
1, 2-3	Green	Yellow	Yellow
1, 2-4	Red	Green	Red
1, 2-5	Simultaneous lighting color		

LED SPECIFICATIONS

● Full-Face

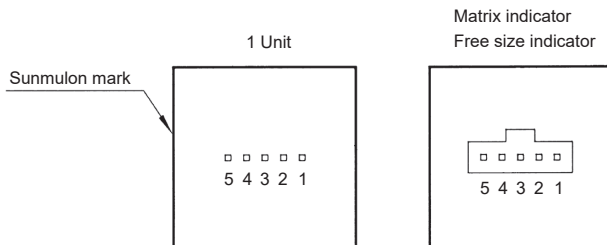
Voltage	Rated Current (mA)					
	Red	Green	Yellow	Super Blue	Super White	Super Green
DC12V ±5%	12	21	17	21	9	14
DC24V ±5%	7	11	10	11	5	8

● 3-Color

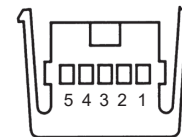
Voltage	Rated Current (mA)								
	Green · Red			Green · Yellow			Yellow · Red		
	Green	Red	Simultaneous lighting color	Green	Yellow	Simultaneous lighting color	Yellow	Red	Simultaneous lighting color
DC12V ±5%	21	12	18	21	17	19	17	12	18
DC24V ±5%	11	7	11	11	10	11	10	7	11

TERMINALS

● TERMINALS LAYOUT



● Connector



Terminal layout with the projection on top.
No number on the actual item.

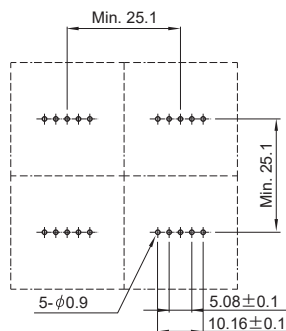
● Applicable wire

Wire size	Coating outer diameter
AWG #24-28	φ 1.0 – 1.5 mm

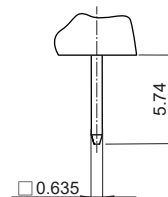
Pin No.	Full-Face	3-Color		
		Green · Red	Green · Yellow	Yellow · Red
1	Anode (+)	Anode (+)	Anode (+)	Anode (+)
2	Anode (+)	Anode (+)	Anode (+)	Anode (+)
3	Cathode (-)	Cathode (-) Green	Cathode (-) Yellow	Cathode (-) Yellow
4		Cathode (-) Red	Cathode (-) Green	Cathode (-) Red
5		Cathode (-) Green · Red Simultaneous lighting color	Cathode (-) Green · Yellow Simultaneous lighting color	Cathode (-) Yellow · Red Simultaneous lighting color

※ Simultaneous lighting is impossible while Pin No. 3, 4, 5 for 3-Color type.
※ The pin assignment is different from BL, CL and HL.

● PCB hole cut-out (1 Unit)



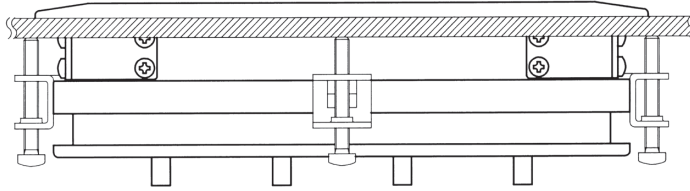
● TERMINAL SHAPE



Tolerance : ± 0.4 mm

ASSEMBLY & DISASSEMBLY

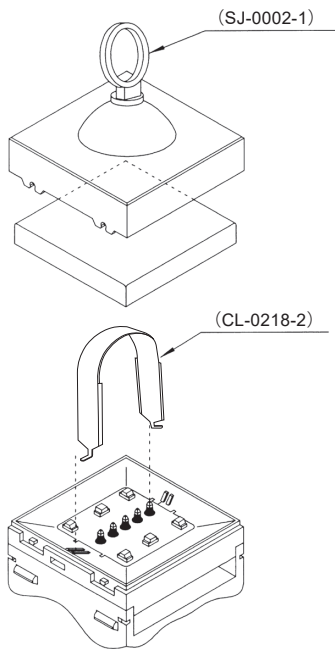
1. Fixing of the assembly with matrix frame to the panel



※ The tightening torque of the mounting nut when attaching to the panel should be 0.78 N·m or less.

Place the assembly on top of the panel and secure with mounting screws from the back of the panel.

2. Removing Light cartridge

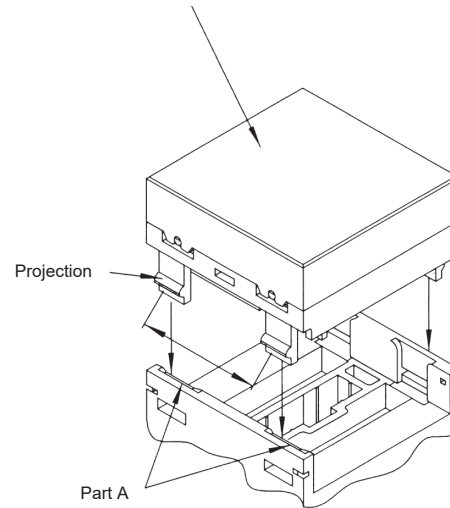


1. Adsorb the removing tool (SJ-0002-1) on the cover and filter surface and pull it straight out.
2. After removing the cover and filter, hang the cartridge with the removing tool (CL-0218-2) in the groove, and pull it straight out.

3. Fitting Light cartridge

When replacing the light cartridge for matrix indicator, after removing the light cartridge, assemble it as shown in the above.

Fitting the cover and filter to the light cartridge.



Place the hook part on part A and push it in until click. It cannot be incorporated in the wrong direction. (Match the spacing of the projection on the light cartridge and part A.)

PRECAUTIONS FOR CORRECT USE

1. Please select the panel thickness after careful consideration of the product weight and wiring weight.
2. Solder quickly and correctly at 320°C max. and for 3 seconds or less.

※ For handling instructions and precautions other than the above, please refer to "Safety Precautions for All Indicators".

Tolerance : ± 0.4 mm

As of July 2023

Safety Precautions for All Indicators

1. Notes on contents of Catalogs

- (1) Rated values, performance values, and specification values of Sunmulon products listed in this catalog are values acquired under respective conditions in independent testing, and do not guarantee values gained in combined conditions.
- (2) The ambient operating temperature(humidity) is guaranteed by evaluation based on characteristics, and does not guarantee continuous use for a long period of time near the upper or lower limit of the ambient operating temperature(humidity) or permanent use at that temperature(humidity).
- (3) Reference data and reference values listed in catalogs are for reference purposes only, and do not guarantee that the product will always operate appropriately in that range.
- (4) The specifications / appearance and accessories of Sunmulon products listed in catalogs are subject to change or termination of sales without notice, for improvement or other reasons.
- (5) The content of catalogs is subject to change without notice.

2. Note on applications

- (1) If using Sunmulon products in combination with other products, confirm the following suitability by yourself. Sunmulon shall provide no guarantees regarding the combination suitability.
 - (a) Regulations, standards, or laws to which your machinery, equipment, etc. must conform
 - (b) Functionality and safety of your machinery and equipment
- (2) Wiring and installation that ensures the Sunmulon product used in your system, machine, device, or the like can perform and function according to its specifications.
- (3) When using Sunmulon products, be cautious when implementing the following.
 - (a) Use of Sunmulon products with sufficient allowance for rating and performance.
 - (b) Safety design, including redundant design and malfunction prevention design that prevents other danger and damage even in the event that Sunmulon product fails.
- (4) Sunmulon products are designed and manufactured as general-purpose products for general industrial products. They are not intended for use in the following applications, and in the event that you use Sunmulon product for these applications, unless otherwise agreed upon between you and Sunmulon, Sunmulon shall provide no guarantees whatsoever regarding Sunmulon products.
 - (a) Safety devices intended for human body protection
 - (b) Direct control of transport equipment (railroads / airplanes / ships / vehicles / vehicle instruments, etc.)
 - (c) Space equipment, submarine equipment
 - (d) Nuclear power control equipment, radiation related equipment
 - (e) Combustion equipment, electric heat equipment
 - (f) Disaster prevention and security equipment
 - (g) Elevating equipment
 - (h) Amusement facilities
 - (i) Facilities subject to government or industry regulations
 - (j) Use in applications that require a high degree of safety, any other equipment, instruments, or the like that could endanger life or human health

3. Warranty

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

4. Handling precautions for indicator

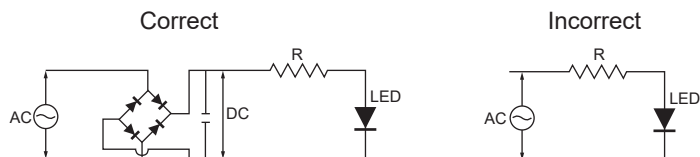
- (1) Wire the terminals with correct polarity. Connecting connectors backwards may cause a power short, resulting in burnout.
- (2) Turn off the power to the product before starting installation, removal, wiring, maintenance, or inspection. Failure to turn power off may cause electrical shock or fire.
- (3) Be careful of electrostatic breakdown when handling.
- (4) Do not drop or otherwise apply strong force to the indicator.
- (5) Do not place heavy objects on the indicator.
- (6) Do not operate or use the housing by itself. Use the indicator with assembled the cover.
- (7) When removing the cover and filter, using a sharp object (screwdrivers, tweezers, etc.), hard object (metal, etc.), or with a large or sudden force, may cause deform or damage the indicator.
- (8) Do not use the indicator under loads that exceed the rated capacity or other ratings. Doing so may result in burnout accidents.

Safety Precautions for All Indicators

- (9) Assemble correctly according to the handling instructions. Do not assemble or disassemble the product other than as described in the catalog, as this may cause defects or accidents.

(10) Illumination

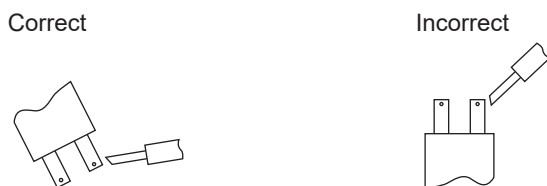
- (a) Do not apply a voltage between the LED terminal that is greater than the rated voltage. Doing so may damage the LED, cause lighting failure.
(b) LEDs cannot be lit directly by AC circuit should be provided rectifier smoothing circuit for products other than AC input type.



- (c) When wiring, pay attention to the polarity of the terminals.
(d) Simultaneous lighting may not be possible with Dual-Color, 3-Color illumination or Split-Face illumination, check the catalog.
(e) Apply voltage directly to LEDs of Non-built-in resistor type will damage the LEDs, so connect an appropriate external resistor.

(11) Wiring

- (a) When tightening terminals or connecting connectors, do not apply more force than necessary from the back side. Support the indicator with one hand as it may slip out of the front of the panel.
(b) Use the applicable connectors listed in the catalog for each model.
(c) Do not apply a soldering iron to the indicator housing. Doing so may deform the terminals and cause defects.
(d) Hand solder with the terminals facing down to prevent flux from penetrating into the indicator.



- (e) Use the appropriate wire size for the applied voltage and current, and solder properly. Use of the product with incomplete soldering may cause abnormal heat generation, resulting in a fire hazard.

(12) Usage environment

- (a) Do not use in the presence of flammable or explosive gases such as gasoline, thinner, LPG, etc.
(b) Avoid using the product in places where corrosive or silicon gas is generated, high temperature, high humidity, sea breeze or direct sunlight.
(c) Provide appropriate protection when using the product in places where it is exposed to water, oil, metal powder, or dust.
(d) Do not use the product in a place subject to vibration or shock. It may cause malfunction or damage.
(e) When installed in a close grouping or continuously lit, the ambient temperature may exceed the specified value due to heat generation. Take measures such as ventilation and lowering the operating voltage.
(f) When checking the actual equipment, load conditions and operating environment should be the same as the actual operating conditions.
(g) The ambient temperature for storage is -25°C to 65°C (No freeze, no condensation).

- (13) When wiping off dirt on the indicator, wipe lightly with a soft, dry cloth. Organic solvents such as thinner, benzene, alcohol, or other acidic chemicals may cause deformation, discoloration, or malfunction.

- (14) Store the product away from malignant gases, dust, high temperature and high humidity, and keep it in our packing condition.

(15) Periodic inspection and replacement

- (a) Although mechanical and electrical durability are listed in the specifications column, deterioration of various parts (deterioration of resins and corrosion of metal parts) is possible due to the operating environment and method of use. We ask that you implement inspections for Sunmulon products to prevent accidents from occurring by conducting periodic inspections and replacements.

(16) Service scope

- The price of Sunmulon products do not include the cost of services, such as dispatching technicians.