# Sunmulon

3L

3L Indicator

Updated gorgeous design.
Soft round chamfering surface.

■ Display surface：30 mm, 30×62 mm
　（External dimension：36 mm, 36×68 mm）
■ Depth behind panel：28 mm
■ Terminal：Connector and screw
■ Mounting：Snap-in mounting（Matrix mounting with joint）
■ Illumination type：Full-Face, Dual-Color, 3-Color, 2-Split-Face, Negative
■ Accessories：Wire harness, joint wiring bar and terminal cover

Negative illumination : The engraved letters are clearly visible only when the light is on,
and when the light is off, the engraved characters are hidden by the semitransparent black cover.
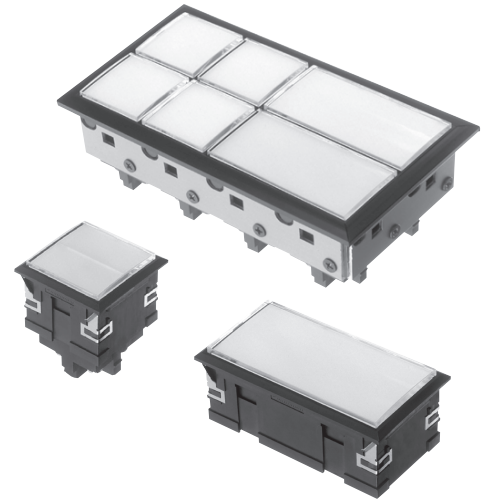
CHARACTERISTICS

Display Surface Size	□ 30 mm, 30×62 mm
Illumination Color	Red, Green, Yellow Super Bule, Super White, Super Green
Illumination Type	Full-Face, Dual-Color, 3-Color, 2-Split-Face, Negative
Display Surface Shape	R-face
Max. Number of Matrixes	Max. 10 columns×10 rows （Rectangles is calculated by two of square.）
Supply Voltage	DC5V, DC12V, DC24V, AC/DC12V, 24V, 48V ±5%
Consumption Current	140 mA max.（1 unit）
Terminal Shape	Connector, Screw
Insulation Resistance	More than 100 MΩ at DC 500 V
Dielectric Strength	AC 2000 V RMS between terminals and ground 50/60 Hz for 60 sec. at normal ambient temperature and humidity
Peak Reverse Voltage	150 V
Ambient Operating Temperature	−10℃ to 40℃　（No Freeze, No Condensation）
Ambient Operating Humidity	45 to 85%RH max.(No Condensation)
Ambient Storage Temperature	−25℃ to 65℃　（No Freeze, No Condensation）
Ambient Storage Humidity	85%RH max.　（No Condensation）
RoHS（10 Substances）	Conform to standards

SPECIFICATIONS

		DC5V	AC/DC12V・24V・48V
Illumination type	Full-Face	A	A
	Full-Face （Low brightness）	A	A
	Dual-Color	A	A　Simultaneous lighting is not possible for AC/DC48V.
	2-Split-Face	A	A　Simultaneous lighting is not possible for AC/DC48V.
	3-Color	N/A	Only DC12V・DC24V surpported.

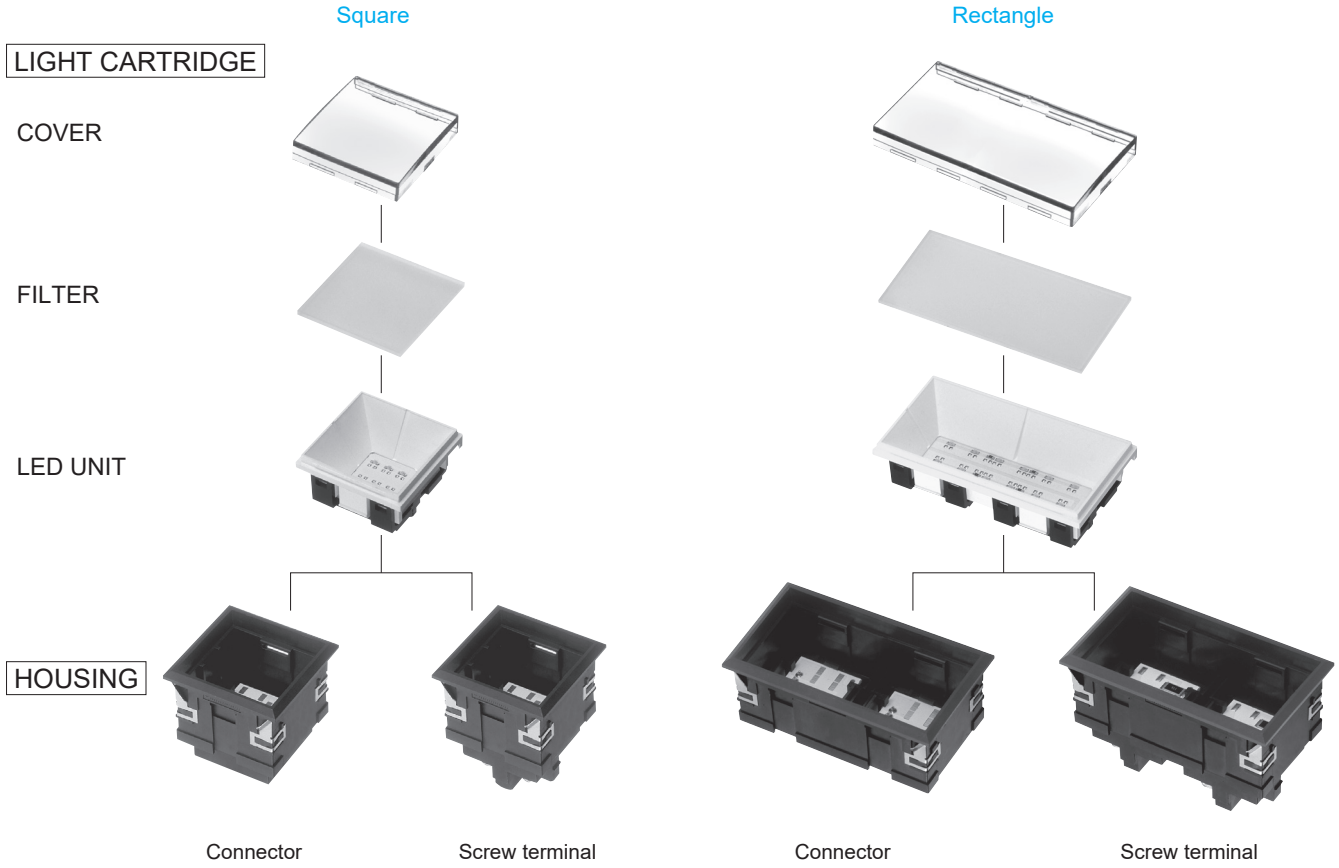|		Square	Rectangle
Illumination Color	Red（7）	○	○
	Green（8）	○	○
	Yellow（9）	○	○
	Super Blue（14）	○	○
	Super White（16）	○	○
	Super Green（18）	○	○
Negative		○	○

A : Applicable　　N/A : Not applicable

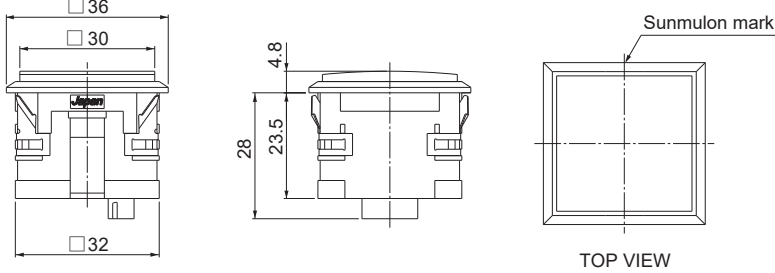https://www.sunmulon.co.jp/english/products/led_e/3l.html

STRUCTURE

Square

Rectangle

LIGHT CARTRIDGE

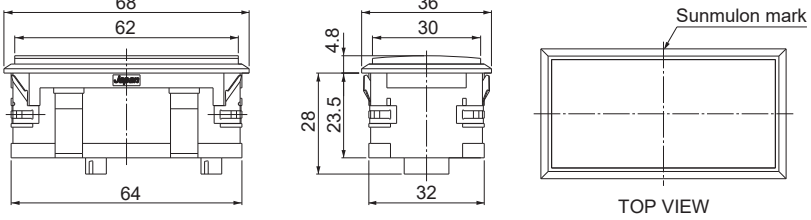COVER

FILTER

LED UNIT

HOUSING

| Connector | Screw terminal | Connector | Screw terminal |

● Connector

Square

3D
DXF

□36
□30
4.8
28
23.5
□32

Sunmulon mark
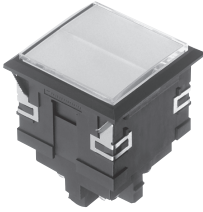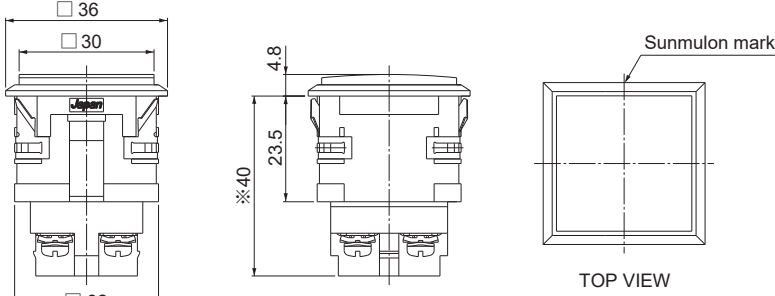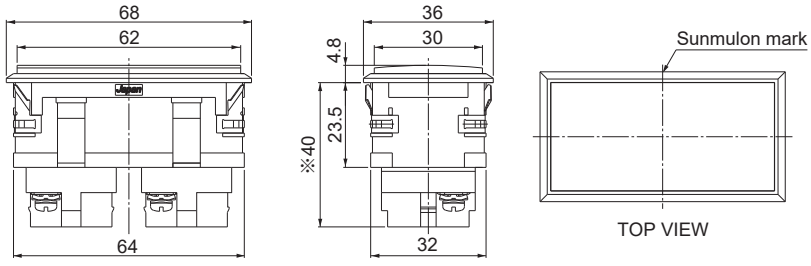
TOP VIEW

Rectangle

3D
DXF

68
62
64
36
30
4.8
28
23.5
32

Sunmulon mark

TOP VIEW

● Screw terminal

Square

3D
DXF

□36
□30
4.8
23.5
※40
□32

Sunmulon mark

TOP VIEW

※ 2 mm longer when the terminal cover (3L-0884) is attached.

Rectangle

3D
DXF

68
62
64
36
30
4.8
23.5
※40
32

Sunmulon mark

TOP VIEW

※ 2 mm longer when the terminal cover (3L-0884) is attached.

3D・DXF data download site ： **https://www.sunmulon.co.jp/download/**

Tolerance : ± 0.4 mm

● Matrix Mounting

Recommended panel thickness : 1 to 6 mm

With Matrix frame

$32.1n+64.2m+12$

$32.1n+64.2m+12$

PANEL CUTOUT

$32.1n+64.2m+5 {}^{+1}_{0}$

$32.1n+64.2m+5 {}^{+1}_{0}$

A

B

A

A

Square

Rectangle

※ n：Number of A size (Row/Column)
　 m：Number of B size (Row/Column)

5.8

23.5

Max35

$32.1n+64.2m+2.8$

$32.1n+64.2m+18.8$

Connector

$32.1n+64.2m+2.8$

$32.1n+64.2m+18.8$

5.8

※39

$32.1n+64.2m+2.8$

$32.1n+64.2m+18.8$

Screw

$32.1n+64.2m+2.8$

$32.1n+64.2m+18.8$
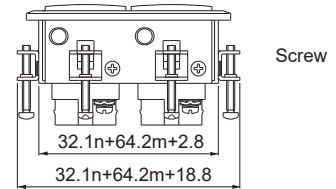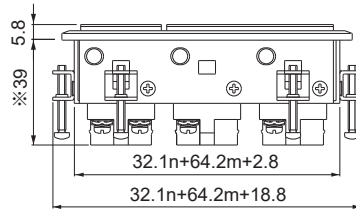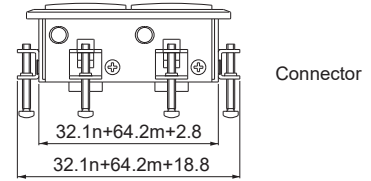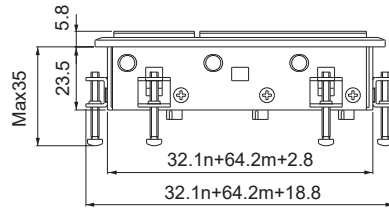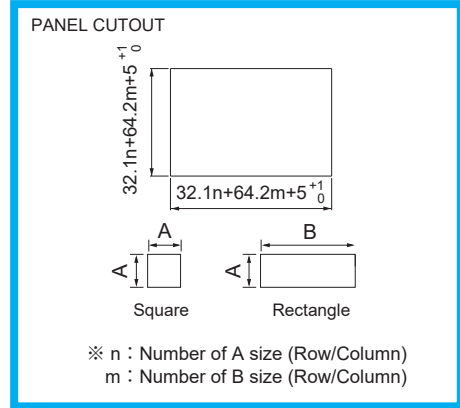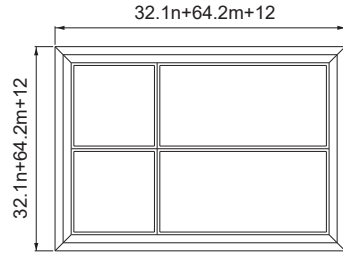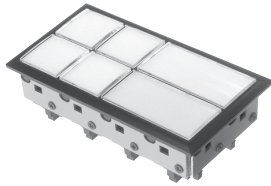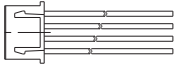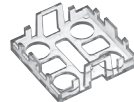
※ 2 mm longer when the terminal cover (3L-0884) is attached.

※ Refer to page 3L-14 the ordering code for Matrix.

Tolerance : ± 0.4 mm

ACCESSORIES

Name	Appearance	Classification	Part no.		Precautions for use
Connector		Housing	3L-0922		- 1 Housing and 4 contacts set. ※Please specify whether or not to attach it by ordering code. ※Please contact JST for mor information about contact crimping tools.
		Contact			
Wire harness		Wire harness	50cm	3L-0921-1	- For other dimensions, please contact us.
			100cm	3L-0921-2	
Matrix frame mounting bracket		For Matrix mounting	BL-0073		- Fittings that secure the matrix frame to the panel. ※The quantity required for with matrix frame type will be attached.
Joint bar		For Matrix mounting Screw terminal	3L-0892-1		- Be used to joint for cross wiring.
		For Matrix mounting Screw terminal	3L-0892-2		- Be used to joint for cross wiring.
Terminal cover		For Screw terminal	3L-0884		- Attached to the scew terminal.
Removing tool		For removal light cartridge	SJ-0010-1		- Be used to remove light cartridge from housing.

Connector

| Part no. | 3L-0922 |

※Please specify whether or not to attach it
  by ordering code.

1 Housing & 4 contact pins to be appended.

4　　1

Indication of circuit No.1
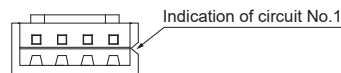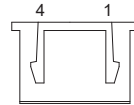
Housing
（JST made XHP-4）

Contact pin
（JST made SXH-001T-P0.6）

Wire harness

Part no.	3L-0921-1	3L-0921-2
A length	50 cm	100 cm

Wire：UL1061　AWG22

※ For other dimensions, please contact us.

Indication of circuit No.1
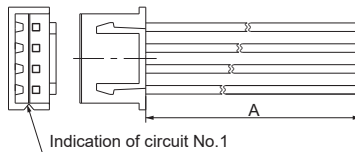
Pin No.	1	2	3	4
Wire Color	Brown	Red	Orange	Yellow

Joint wiring bar   Use as cross wiring for Matrix mounting (screw terminal ony).

| Part no. | 3L-0892-1 |

32

| Part no. | 3L-0892-2 |

64
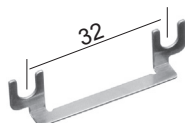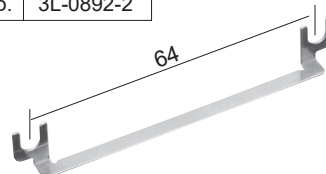
Assembled Part

3L − ▢ ▢ ▢ ▢ ▢ ▢ ▢ ▢

● **SHAPE**

S0	Square
W0	Rectangle

● **LED COLOR**

7	Red
8	Green
9	Yellow
14	Super-Blue
16	Super-White
18	Super-Green
X	Without LED

Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● **COVER COLOR**

C	Transparent
SK	Semitransparent (For Negative) ※1)

● **HOUSING COLOR**

K	Black
H	Gray

● **LOW BRIGHTNESS**

1	Unnecessary
2	Necessary

● **MOUNTING** ※3)

1	For Horizontal Mtg.
2	For Vertical Mtg.
X	Without Snap spring

● **Supply Voltage to LED**

1	DC 5V
2	AC/DC 12V
3	AC/DC 24V
5	AC/DC 48V
X	Without LED

● **TERMINAL**

K	Connector with Accessories ※2)
N	Connector without Accessories
B	Screw

● **FILTER COLOR**

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

● **NOTES**

※1) For Negative illumination, specify filter Milk-white (4). The filter for negative illumination has black silk printing on one side.

※2) Attached to 3L-0922. For the connector, refer to Accessories page.

※3) Snap spring metal plates come out Left / Right direction for Vertical mounting, and Top / Bottom direction for Horizontal mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 1 Horizontal ordinary)

ORDERING CODE 〔Full-Face〕

LIGHT CARTRIDGE
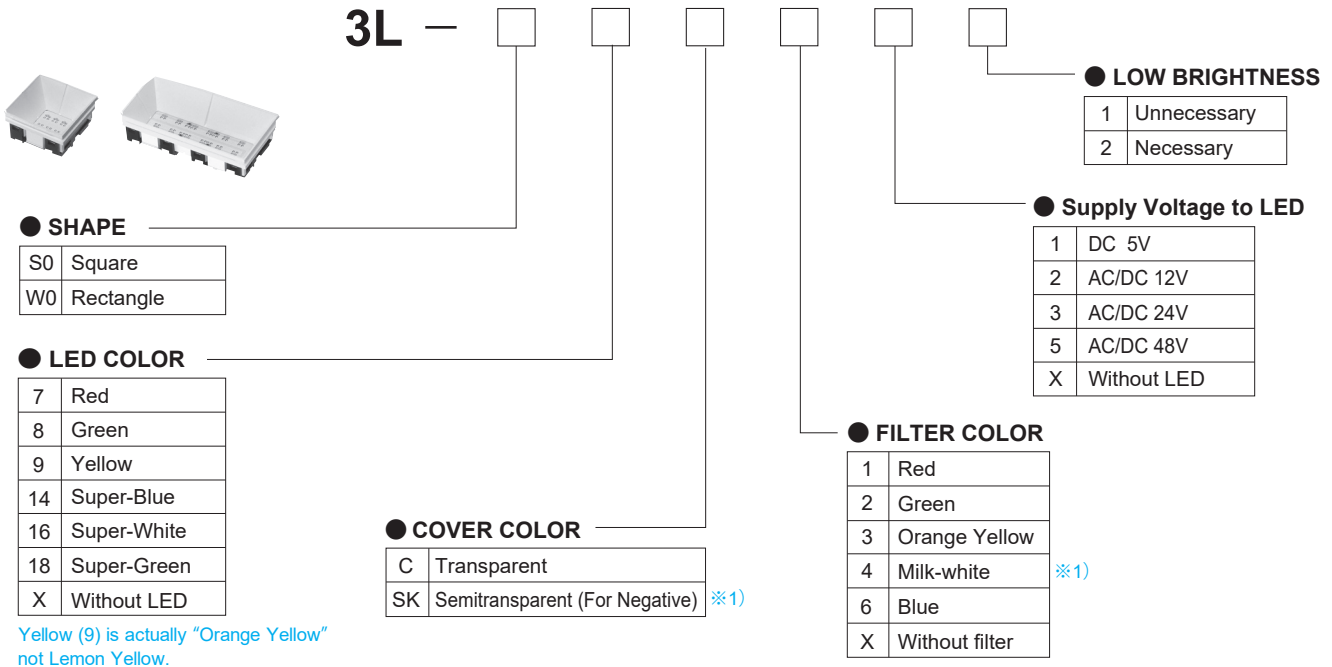
3L − ☐ ☐ ☐ ☐ ☐ ☐

● **LOW BRIGHTNESS**

1	Unnecessary
2	Necessary

● **Supply Voltage to LED**

1	DC 5V
2	AC/DC 12V
3	AC/DC 24V
5	AC/DC 48V
X	Without LED

● **FILTER COLOR**

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

● **SHAPE**

S0	Square
W0	Rectangle

● **LED COLOR**

7	Red
8	Green
9	Yellow
14	Super-Blue
16	Super-White
18	Super-Green
X	Without LED

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

● **COVER COLOR**

C	Transparent	
SK	Semitransparent (For Negative)	※1)

● **NOTES**

※1) For Negative illumination, specify filter Milk-white (4). The filter for negative illumination has black silk printing on one side.

HOUSING

3L − ☐ ☐ ☐ ☐ ☐

● **MOUNTING** ※2)

1	For Horizontal Mtg.
2	For Vertical Mtg.
X	Without Snap spring

● **Supply Voltage to LED**

1	DC 5V
2	AC/DC 12V
3	AC/DC 24V
5	AC/DC 48V
X	Without LED

● **TERMINAL**

K	Connector with Accessories	※1)
N	Connector without Accessories	
B	Screw	

● **SHAPE**

S	Square
W	Rectangle

● **HOUSING COLOR**

K	Black
H	Gray
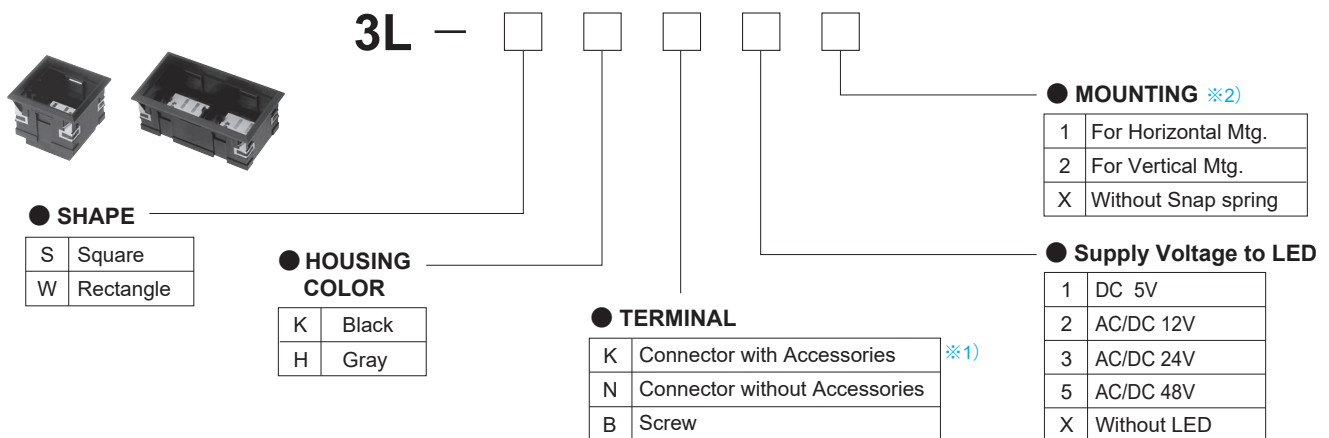
● **NOTES**

※1) Attached to 3L-0922. For the connector, refer to Accessories page.

※2) Snap spring metal plates come out Left / Right direction for Vertical mounting, and Top / Bottom direction for Horizontal mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 1 Horizontal ordinary)

ORDERING CODE 〖Dual-Color〗

Assembled Part

3L － ☐ 1 2 ☐ ☐ 4 ☐ ☐ ☐ 1

● **SHAPE**

S3	Square
W3	Rectangle

● **LED COLOR**

7	Red
8	Green
9	Yellow
14	Super-Blue
16	Super-White
18	Super-Green

Put the color numbers into frame 1, 2.
（Dual-Color combination）

78・79・714・716・718
89・814・816・818・914
916・918・1416・1418・1618

Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● **COVER COLOR**

C	Transparent
SK	Semitransparent (For Negative) ※1)

● **HOUSING COLOR**

K	Black
H	Gray

● **LOW BRIGHTNESS**

1	Unnecessary

● **MOUNTING** ※3)

1	For Horizontal Mtg.
2	For Vertical Mtg.
X	Without Snap spring

● **Supply Voltage to LED**

1	DC 5V
2	AC/DC 12V
3	AC/DC 24V
5	AC/DC 48V ※4)

● **TERMINAL**

K	Connector with Accessories ※2)
N	Connector without Accessories
B	Screw

● **FILTER COLOR**

4	Milk-white ※1)

● **NOTES**

※1） The filter for negative illumination has black silk printing on one side.

※2） Attached to 3L-0922. For the connector, refer to Accessories page.

※3） Snap spring metal plates come out Left / Right direction for Vertical mounting, and Top / Bottom direction for Horizontal mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 1 Horizontal ordinary)

※4） Simultaneous lighting is not possible for AC/DC48V.

ORDERING CODE 〔Dual-Color〕

LIGHT CARTRIDGE
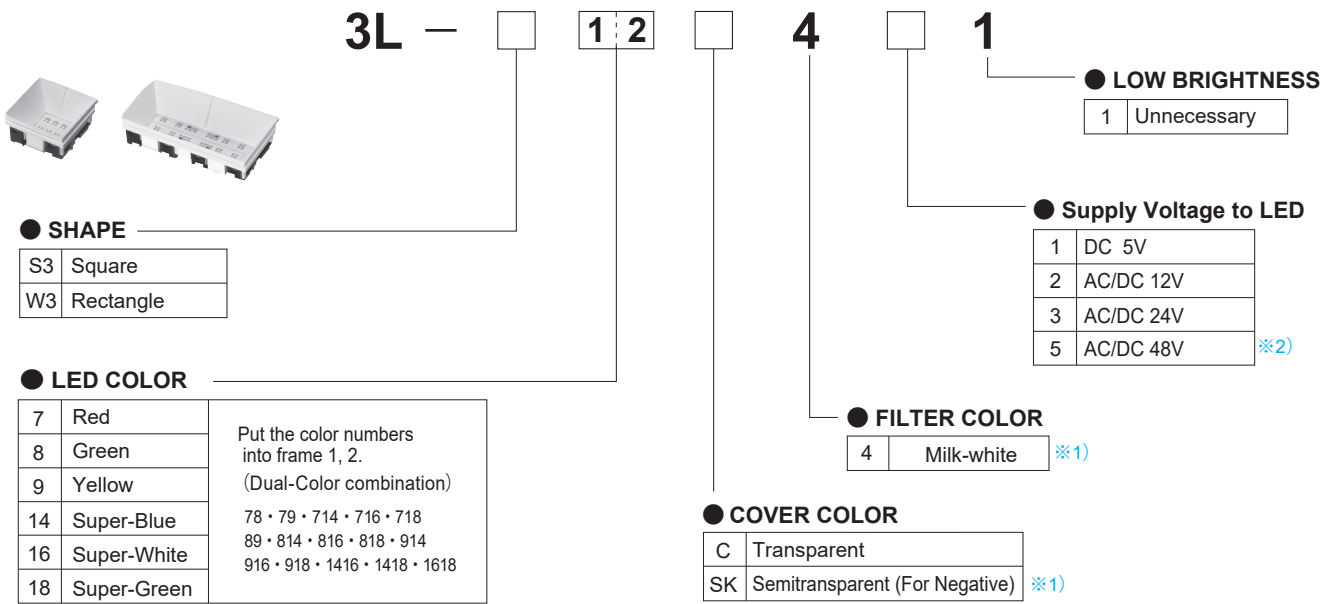
3L － ☐ 1:2 ☐ 4 ☐ 1

● **SHAPE**

S3	Square
W3	Rectangle

● **LED COLOR**

7	Red	Put the color numbers into frame 1, 2. （Dual-Color combination）
8	Green	78・79・714・716・718
9	Yellow	89・814・816・818・914
14	Super-Blue	916・918・1416・1418・1618
16	Super-White	
18	Super-Green	

Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● **COVER COLOR**

C	Transparent
SK	Semitransparent (For Negative) ※1)

● **FILTER COLOR**

4	Milk-white ※1)

● **Supply Voltage to LED**

1	DC 5V
2	AC/DC 12V
3	AC/DC 24V
5	AC/DC 48V ※2)

● **LOW BRIGHTNESS**

1	Unnecessary

● **NOTES**

※1）The filter for negative illumination has black silk printing on one side.

※2）Simultaneous lighting is not possible for AC/DC48V.
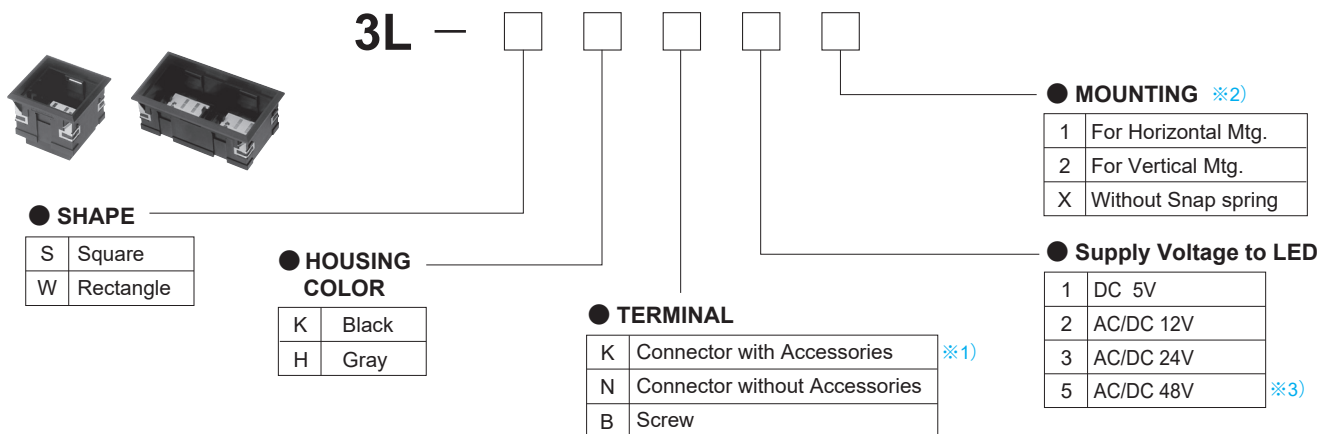
HOUSING

3L － ☐ ☐ ☐ ☐

● **SHAPE**

S	Square
W	Rectangle

● **HOUSING COLOR**

K	Black
H	Gray

● **TERMINAL**

K	Connector with Accessories ※1)
N	Connector without Accessories
B	Screw

● **Supply Voltage to LED**

1	DC 5V
2	AC/DC 12V
3	AC/DC 24V
5	AC/DC 48V ※3)

● **MOUNTING** ※2)

1	For Horizontal Mtg.
2	For Vertical Mtg.
X	Without Snap spring

● **NOTES**

※1）Attached to 3L-0922. For the connector, refer to Accessories page.

※2）Snap spring metal plates come out Left / Right direction for Vertical mounting, and Top / Bottom direction for Horizontal mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 1 Horizontal ordinary)

※3）Simultaneous lighting is not possible for AC/DC48V.

Assembled Part

3L － ☐ 1 2 ☐ ☐ 4 ☐ ☐ ☐ 1

● **SHAPE**

S6	Square
W6	Rectangle

● **LED COLOR**

7	Red
8	Green
9	Yellow
14	Super-Blue
16	Super-White
18	Super-Green

Put the color numbers into frame 1, 2.
（3-Color combination）

78・79・714・716・718
89・914・916・918
1416・1418・1618

Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● **COVER COLOR**

C	Transparent
SK	Semitransparent (For Negative) ※1)

● **HOUSING COLOR**

K	Black
H	Gray

● **LOW BRIGHTNESS**

1	Unnecessary

● **MOUNTING** ※3)

1	For Horizontal Mtg.
2	For Vertical Mtg.
X	Without Snap spring

● **Supply Voltage to LED**

2	DC 12V
3	DC 24V

● **TERMINAL**

K	Connector with Accessories	※2)
N	Connector without Accessories	
B	Screw	

● **FILTER COLOR**

4	Milk-white	※1)

● **NOTES**

※1) The filter for negative illumination has black silk printing on one side.

※2) Attached to 3L-0922. For the connector, refer to Accessories page.

※3) Snap spring metal plates come out Left / Right direction for Vertical mounting, and Top / Bottom direction for Horizontal mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 1 Horizontal ordinary)

LIGHT CARTRIDGE

3L ─ ☐ **1 2** ☐ **4** ☐ **1**

● **LOW BRIGHTNESS**

1	Unnecessary

● **Supply Voltage to LED**

2	DC 12V
3	DC 24V

● **SHAPE**

S6	Square
W6	Rectangle

● **LED COLOR**

7	Red
8	Green
9	Yellow
14	Super-Blue
16	Super-White
18	Super-Green

Put the color numbers into frame 1, 2.
（3-Color combination）

78・79・714・716・718
89・914・916・918
1416・1418・1618

Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● **FILTER COLOR**

4	Milk-white	※1)

● **COVER COLOR**

C	Transparent	
SK	Semitransparent (For Negative)	※1)

● **NOTES**

※1) The filter for negative illumination has black silk printing on one side.

HOUSING

3L ─ ☐ ☐ ☐ ☐ ☐

● **MOUNTING** ※2)

1	For Horizontal Mtg.
2	For Vertical Mtg.
X	Without Snap spring

● **Supply Voltage to LED**

2	DC 12V
3	DC 24V

● **SHAPE**

S	Square
W	Rectangle

● **HOUSING COLOR**

K	Black
H	Gray

● **TERMINAL**

K	Connector with Accessories	※1)
N	Connector without Accessories	
B	Screw	

● **NOTES**

※1) Attached to 3L-0922. For the connector, refer to Accessories page.

※2) Snap spring metal plates come out Left / Right direction for Vertical mounting, and Top / Bottom direction for Horizontal mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 1 Horizontal ordinary)

ORDERING CODE 【2-Split-Face】

Assembled Part

3L — ☐ **1 2** ☐ ☐ **1 2** ☐ ☐ ☐ **1**

● **SHAPE**

S2	Square
W1	Rectangle (Vertical)
W2	Rectangle (Horizontal)

● **LED COLOR** ※1)

7	Red	Put the color numbers into frame 1, 2.
8	Green	
9	Yellow	
14	Super-Blue	
16	Super-White	For Non-illuminated Put XX into frame 1, 2.
18	Super-Green	
X	Without LED	

The combination of With LED and Without LED cannot be specified.
Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● **COVER COLOR**

C	Transparent
SK	Semitransparent (For Negative) ※2)

● **HOUSING COLOR**

K	Black
H	Gray

● **LOW BRIGHTNESS**

1	Unnecessary

● **MOUNTING** ※4)

1	For Horizontal Mtg.
2	For Vertical Mtg.
X	Without Snap spring

● **Supply Voltage to LED**

1	DC 5V	
2	AC/DC 12V	
3	AC/DC 24V	
5	AC/DC 48V	※5)
X	Without LED	

● **TERMINAL**

K	Connector with Accessories	※3)
N	Connector without Accessories	
B	Screw	

● **FILTER COLOR** ※1) ※2)

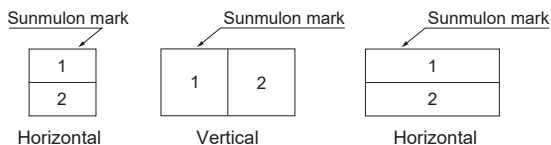| 1	Red	Put the color numbers into frame 1, 2.
2	Green	
3	Orange Yellow	
4	Milk-white	
6	Blue	For Without filter Put XX into frame 1, 2.
X	Without filter	

The combination of With filter and Without filter cannot be specified.

● **NOTES**

※1) How to specify the color of LED and filter
Select the color symbols listed in the ordering code, and put them into the frame 1 and 2 referring to the figure below.
The numbers in the figure match the location specified in the ordering code.

Sunmulon mark
1
2
Horizontal

Sunmulon mark
1	2
Vertical

Sunmulon mark
1
2
Horizontal

※2) For Negative illumination, specify filter Milk-white (44). The filter for negative illumination has black silk printing on one side.

※3) Attached to 3L-0922. For the connector, refer to Accessories page.

※4) Snap spring metal plates come out Left / Right direction for Vertical mounting, and Top / Bottom direction for Horizontal mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 1 Horizontal ordinary)

※5) Simultaneous lighting is not possible for AC/DC48V.

ORDERING CODE 【2-Split-Face】

LIGHT CARTRIDGE

3L − ☐ **1 2** ☐ **1 2** ☐ **1**

● **LOW BRIGHTNESS**

1	Unnecessary

● **SHAPE**

S2	Square
W1	Rectangle (Vertical)
W2	Rectangle (Horizontal)

● **LED COLOR** ※1)

7	Red	Put the color numbers into frame 1, 2.
8	Green	
9	Yellow	
14	Super-Blue	
16	Super-White	For Non-illuminated Put XX into frame 1, 2.
18	Super-Green	
X	Without LED	

The combination of With LED and Without LED cannot be specified.
Yellow (90) is actually "ORANGE Yellow" not Lemon Yellow.

● **COVER COLOR**

C	Transparent
SK	Semitransparent (For Negative) ※2)

● **FILTER COLOR** ※1) ※2)

1	Red	Put the color numbers into frame 1, 2.
2	Green	
3	Orange Yellow	
4	Milk-white	
6	Blue	For Without filter Put XX into frame 1, 2.
X	Without filter	

The combination of With filter and Without filter cannot be specified.

● **Supply Voltage to LED**

1	DC 5V
2	AC/DC 12V
3	AC/DC 24V
5	AC/DC 48V ※3)
X	Without LED

● **NOTES**

※1) How to specify the color of LED and filter
Select the color symbols listed in the ordering code, and put them into the frame 1 and 2 referring to the figure below.
The numbers in the figure match the location specified in the ordering code.

Sunmulon mark
1
2
Horizontal

Sunmulon mark
1	2
Vertical

Sunmulon mark
1
2
Horizontal

※2) For Negative illumination, specify filter Milk-white (44). The filter for negative illumination has black silk printing on one side.

※3) Simultaneous lighting is not possible for AC/DC48V.

HOUSING

3L − ☐ ☐ ☐ ☐ ☐

● **SHAPE**

S	Square
W	Rectangle

● **HOUSING COLOR**

K	Black
H	Gray

● **TERMINAL**

K	Connector with Accessories ※1)
N	Connector without Accessories
B	Screw

● **MOUNTING** ※2)

1	For Horizontal Mtg.
2	For Vertical Mtg.
X	Without Snap spring

● **Supply Voltage to LED**

1	DC 5V
2	AC/DC 12V
3	AC/DC 24V
5	AC/DC 48V ※3)
X	LEDなし

● **NOTES**

※1) Attached to 3L-0922. For the connector, refer to Accessories page.

※2) Snap spring metal plates come out Left / Right direction for Vertical mounting, and Top / Bottom direction for Horizontal mounting to avoid interfering mutually. Therefore, in case of independent use, it does not matter. (select 1 Horizontal ordinary)

※3) Simultaneous lighting is not possible for AC/DC48V.

ORDERING CODE 【Matrix】

MATRIX HOUSING

3L － ☐ ☐ X ☐ ☐ ☐ ☐

● **SHAPE**

S	Square
W	Rectangle

● **COLUMN** ※2)

01	1
02	2
03	3
:	:
10	10

● **ROW** ※2)

01	1
02	2
03	3
:	:
10	10

● **MATRIX FRAME** （**Flange**）

K	Black
H	Gray

● **Supply Voltage to LED**

1	DC5V
2	AC/DC12V
3	AC/DC24V
5	AC/DC48V
X	Without LED

● **TERMINAL**

K	Connector with Accessories	※1)
N	Connector without Accessories	
B	Screw	

※1) Attached to 3L-0922. For the connector, refer to Accessories page.

※2) For matrix, the light cartridge is ordered separately. Order the appropriate number of light cartridges for the matrix housing and attach them to the matrix housing.

Any combination of illuminated types and LED colors is possible, but only combinations with squares or rectangles mounted in the same direction are allowed. （※3） Please specify the number of column and rows by referring to the figure below.

A maximum of 10 rows and 10 columns can be specified. The longitudinal direction of a rectangle is equal to two squares, so the maximum of 10 columns and 5 rows.

1 Row — Sunmulon mark

Square A type

1 column

2 Row — Sunmulon mark

Rectangle B type

1 column
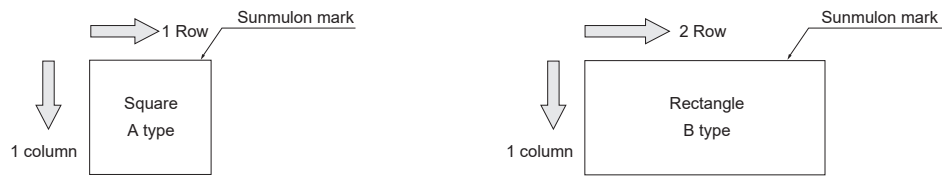
※3) Combinations of square and rectangle, or a mixture of rectangle vertical and horizontal, are also possible. In this case, please draw a solid line through the dotted line on the custom-made sheet and let us know the desired combination.

3L Matrix custom-made sheet
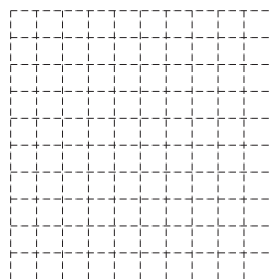
Custom-made Example：4×6 Matrix （Square×8, Rectangle×8）

Example：Square 4 — S01 × 04

Rectangle 4 — W01 × 08
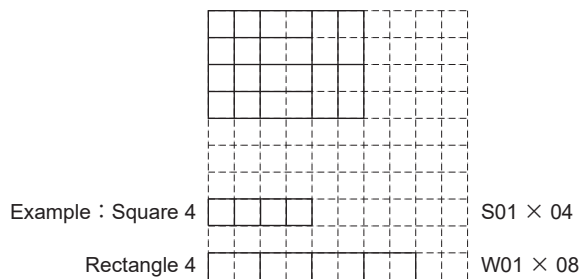
※ One column×one row （01×01） must be specified by assembled part ordering code.

● Lighting restrictions for Matrix mounting

Voltage	Full-Face・Dual-Color・2-Split-Face Mono-color lighting	Dual-Color・2-Split-Face Simultaneous lighting	3-Color
DC5V	A	Limited lighting ※	———
DC12V・24V	A	Limited lighting ※	A
AC12V・24V	Limited lighting ※	Limited lighting ※	———
AC/DC48V	Limited lighting ※	N/A （5 minutes possible）	———

※ Please inquire for details on lighting restrictions.

● Full-Face COVER／FILTER

		Shape	Red	Green	Orange Yellow	Milk-white	Blue	Transparent	Negative
COVER	Square							3L-0867-CC	3L-0867-SK
	Rectangle							3L-0868-CC	3L-0868-SK
FILTER	Square	A	3L-0869-LR	3L-0869-LG	3L-0869-L0	3L-0869-LM	3L-0869-LB		3L-0916-LM
	Rectangle	C	3L-0870-LR	3L-0870-LG	3L-0870-L0	3L-0870-LM	3L-0870-LB		3L-0917-LM

※ The filter for negative illumination has black silk printing on one side.

● Dual-Color・3-Color COVER／FILTER

		Shape	Milk-white	Transparent	Negative
COVER	Square			3L-0867-CC	3L-0867-SK
	Rectangle			3L-0868-CC	3L-0868-SK
FILTER	Square	A	3L-0869-LM		3L-0916-LM
	Rectangle	C	3L-0870-LM		3L-0917-LM

※ The filter for negative illumination has black silk printing on one side.
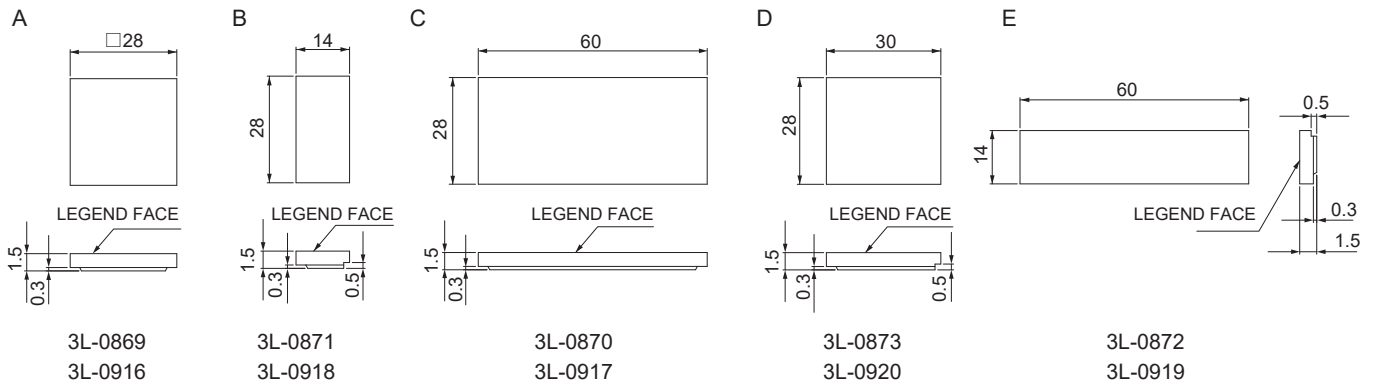
● 2-Split-Face COVER／FILTER

		Shape	Red	Green	Orange Yellow	Milk-white	Blue	Transparent	Negative
COVER	Square							3L-0867-CC	3L-0867-SK
	Rectangle							3L-0868-CC	3L-0868-SK
FILTER	Square	B	3L-0871-LR	3L-0871-LG	3L-0871-L0	3L-0871-LM	3L-0871-LB		3L-0918-LM
	Rectangle Vertical	D	3L-0873-LR	3L-0873-LG	3L-0873-L0	3L-0873-LM	3L-0873-LB		3L-0920-LM
	Rectangle Horizontal	E	3L-0872-LR	3L-0872-LG	3L-0872-L0	3L-0872-LM	3L-0872-LB		3L-0919-LM

※ The filter for negative illumination has black silk printing on one side.

● DIVIDER

	Square・Rectangle Vertical	Rectangle Horizontal
Part no.	3L-0889	3L-0890

FILTER DIMENSIONS

A □28
28
LEGEND FACE
1.5
0.3
3L-0869
3L-0916

B 14
28
LEGEND FACE
1.5
0.3
0.5
3L-0871
3L-0918

C 60
28
LEGEND FACE
1.5
0.3
3L-0870
3L-0917

D 30
28
LEGEND FACE
1.5
0.3
0.5
3L-0873
3L-0920

E 60
14
LEGEND FACE
0.5
0.3
1.5
3L-0872
3L-0919

Tolerance：± 0.4 mm

● Full-Face

Voltage	Square	Rectangle
DC 5V	BOTTOM VIEW　TOP VIEW Sunmulon mark 1234	Sunmulon mark L　1234　1234　R
AC/DC12V AC/DC24V AC/DC48V	Sunmulon mark 1234	Sunmulon mark L　1234　1234　R

● Full-Face (Low brightness)

Voltage	Square	Rectangle
DC 5V	BOTTOM VIEW　TOP VIEW Sunmulon mark 1234	Sunmulon mark L　1234　1234　R
AC/DC12V AC/DC24V AC/DC48V	Sunmulon mark 1234	Sunmulon mark L　1234　1234　R

※ When using a Low brightness type, please install a switching circuit or other circuit as shown in the figure below to prevent the current from being routed to another circuit.

（Example）　DC 5V

1
3
V_{DD} + 5V　SW　2
4

（Example）　AC/DC 12V・24V・48V

SW　1
3
2
4

INTERNAL CONNECTION ARRANGEMENTS 【Connector】

● Dual-Color

Voltage	Square	Rectangle
DC 5V	BOTTOM VIEW TOP VIEW / Sunmulon mark / 1234	L / 1234 / 1234 / R / Sunmulon mark
AC/DC12V AC/DC24V AC/DC48V	Sunmulon mark / 1234	L / 1234 / 1234 / R / Sunmulon mark
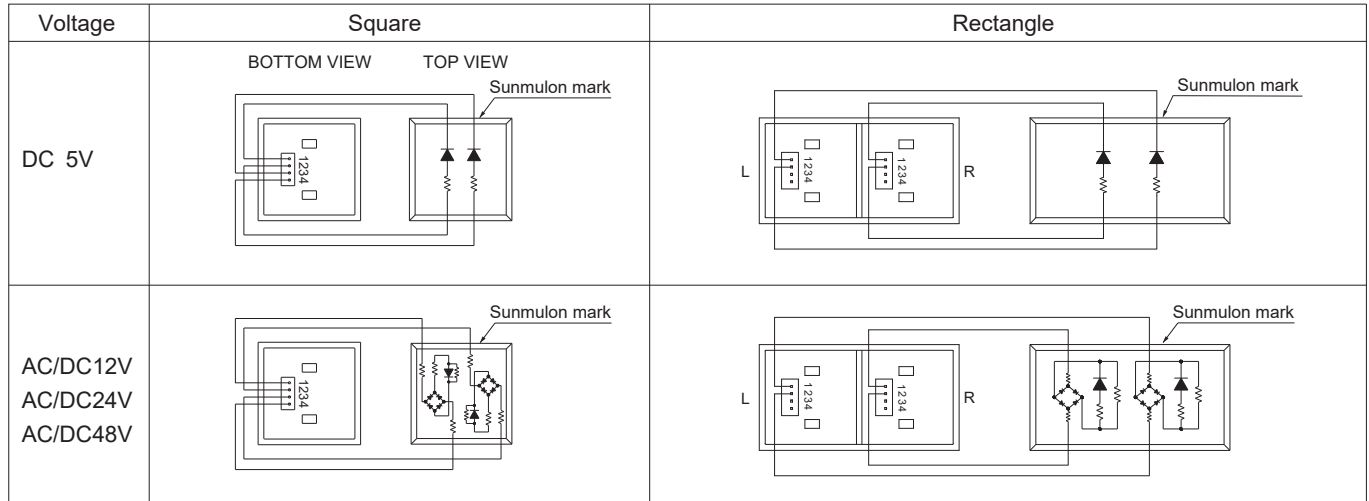
● Square Dual-Color combination (DC 5V)

Terminals	LED Color														
2−1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
4−3	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
2-1, 4-3	Simultaneous lighting color														

● Square Dual-Color combination (AC/DC 12V・24V)

Terminals	LED Color														
1−2 / 2−1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
3−4 / 4−3	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
1-2, 2-1 3-4, 4-3	Simultaneous lighting color														

● Square Dual-Color combination (AC/DC 48V)

Terminals	LED Color														
1−2 / 2−1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
3−4 / 4−3	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green

● Rectangle Dual-Color combination (DC 5V)

Terminals	LED Color														
R2−1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
L2−1	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
R2-1, L2-1	Simultaneous lighting color														

● Rectangle Dual-Color combination (AC/DC 12V・24V)

Terminals	LED Color														
R1−2 / R2−1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
L1−2 / L2−1	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
R1-2, 2-1 L1-2, 2-1	Simultaneous lighting color														

● Rectangle Dual-Color combination (AC/DC 48V)

Terminals	LED Color														
R1−2 / R2−1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
L1−2 / L2−1	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green

● 3-Color

Voltage	Square	Rectangle
DC12V DC24V		

● Square 3-Color combination (DC 12V・24V)

Terminals	LED Color											
1－2	Red	Red	Red	Red	Red	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
1－3	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
1－4	Simultaneous lighting color											

● Rectangle 3-Color combination (DC 12V・24V)

Terminals	LED Color											
R1－R2	Red	Red	Red	Red	Red	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
R1－L1	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
R1－L2	Simultaneous lighting color											

● 2-Split-Face (Horizontal)

Voltage	Square	Rectangle
DC 5V		
AC/DC12V AC/DC24V AC/DC48V		

● 2-Split-Face (Vertical)

Voltage	Square	Rectangle
DC 5V		
AC/DC12V AC/DC24V AC/DC48V		

● Full-Face

Voltage	Square	Rectangle
DC 5V		
AC/DC12V AC/DC24V AC/DC48V		

● Full-Face (Low brightness)

Voltage	Square	Rectangle
DC 5V		
AC/DC12V AC/DC24V AC/DC48V		

※ When using a Low brightness type, please install a switching circuit or other circuit as shown in the figure below to prevent the current from being routed to another circuit.

（Example） DC 5V

（Example） AC/DC 12V・24V・48V

INTERNAL CONNECTION ARRANGEMENTS【Screw】

● Dual-Color

Voltage	Square	Rectangle
DC 5V	BOTTOM VIEW / TOP VIEW / Sunmulon mark	Sunmulon mark
AC/DC12V AC/DC24V AC/DC48V	Sunmulon mark	Sunmulon mark
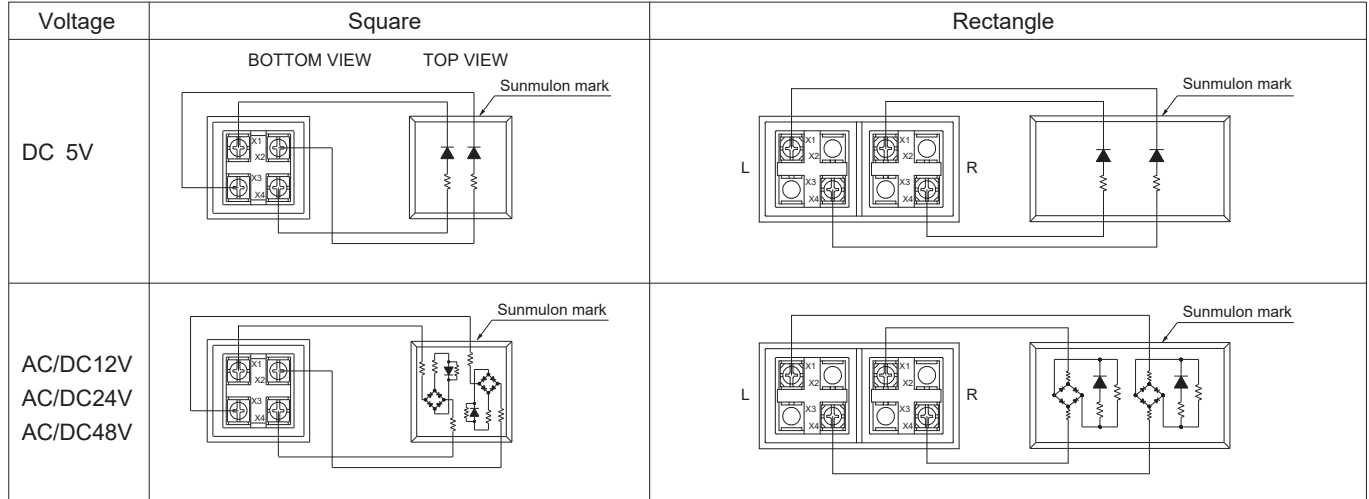
● Square Dual-Color combination (DC 5V)

Terminals	LED Color														
X4－X1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
X2－X3	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
X4-X1, X2-X3	Simultaneous lighting color														

● Square Dual-Color combination (AC/DC 12V・24V)

Terminals	LED Color														
X1－X4 / X4－X1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
X3－X2 / X2－X3	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
X1-X4, X4-X1 X3-X2, X2-X3	Simultaneous lighting color														

● Square Dual-Color combination (AC/DC 48V)

Terminals	LED Color														
X1－X4 / X4－X1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
X3－X2 / X2－X3	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green

● Rectangle Dual-Color combination (DC 5V)

Terminals	LED Color														
RX4－X1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
LX4－X1	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
RX4-X1, LX4-X1	Simultaneous lighting color														

● Rectangle Dual-Color combination (AC/DC 12V・24V)

Terminals	LED Color														
RX1－X4 / RX4－X1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
LX1－X4 / LX4－X1	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
RX1-X4, X4-X1 LX1-X4, X4-X1	Simultaneous lighting color														

● Rectangle Dual-Color combination (AC/DC 48V)

Terminals	LED Color														
RX1－X4 / RX4－X1	Red	Red	Red	Red	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
LX1－X4 / LX4－X1	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super Blue	Super White	Super Green	Super White	Super Green	Super Green

● 3-Color

Voltage	Square	Rectangle
DC12V DC24V		

● Square 3-Color combination (DC 12V・24V)

Terminals	LED Color											
X1—X4	Red	Red	Red	Red	Red	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
X1—X3	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
X1—X2	Simultaneous lighting color											

● Rectangle 3-Color combination (DC 12V・24V)

Terminals	LED Color											
RX1—RX4	Red	Red	Red	Red	Red	Green	Yellow	Yellow	Yellow	Super Blue	Super Blue	Super White
RX1—LX1	Green	Yellow	Super Blue	Super White	Super Green	Yellow	Super Blue	Super White	Super Green	Super White	Super Green	Super Green
RX1—LX4	Simultaneous lighting color											

● 2-Split-Face (Horizontal)

Voltage	Square	Rectangle
DC 5V		
AC/DC12V AC/DC24V AC/DC48V		

● 2-Split-Face (Vertical)

Voltage	Square	Rectangle
DC 5V		
AC/DC12V AC/DC24V AC/DC48V		
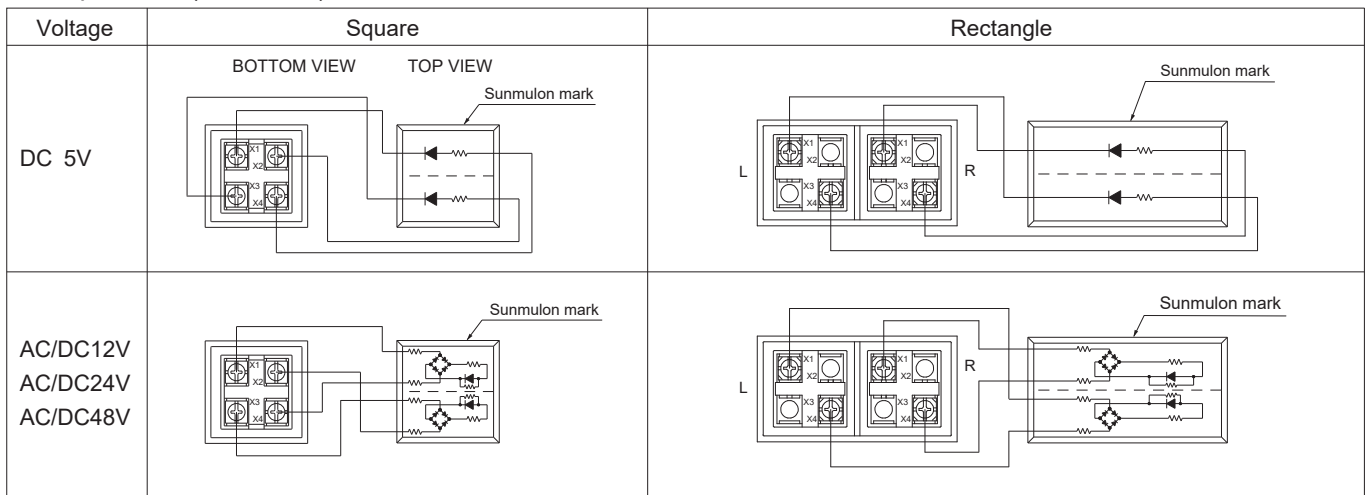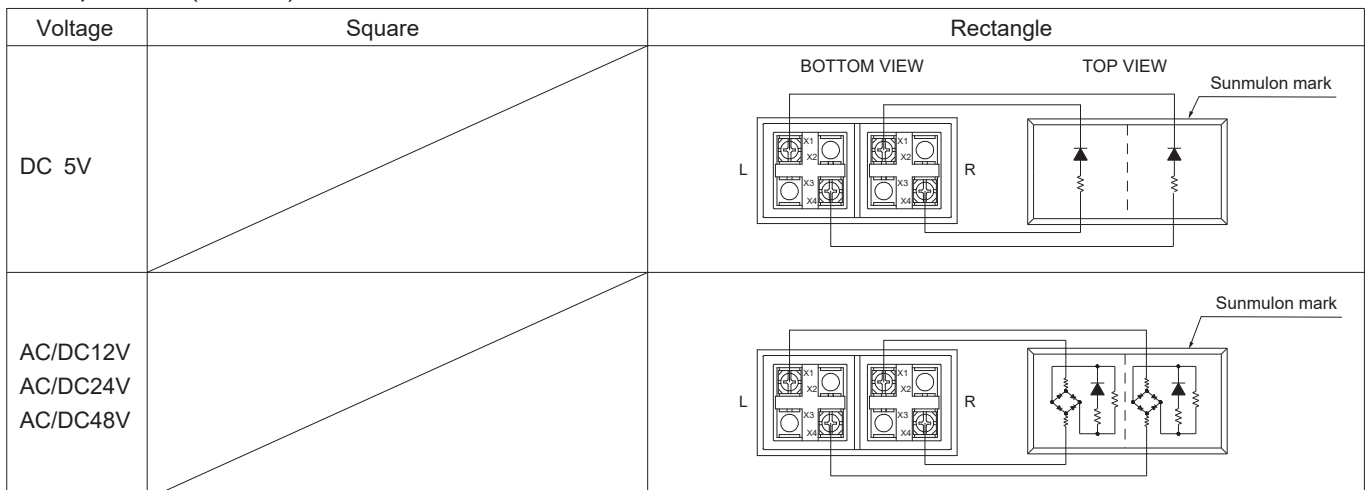
LED SPECIFICATIONS

● Full-Face

	Voltage	Rated Current (mA)											
		Standard brightness type						Low brightness type					
		Red	Green	Yellow	Super Blue	Super White	Super Green	Red	Green	Yellow	Super Blue	Super White	Super Green
Square	DC5V ±5%	50	70	50	34	34	40	30	40	50	20	20	24
	AC/DC12V ±5%	22	26	22	18	18	22	12	16	22	10	10	12
	AC/DC24V ±5%	11	13	11	9	9	11	6	8	11	5	5	6
	AC/DC48V ±5%	11	13	11	9	9	11	6	8	11	5	5	6
Rectangle	DC5V ±5%	100	140	100	68	68	75	60	80	100	40	40	48
	AC/DC12V ±5%	44	52	44	36	36	44	24	32	44	20	20	24
	AC/DC24V ±5%	22	26	22	18	18	22	12	16	22	10	10	12
	AC/DC48V ±5%	11	13	11	9	9	11	6	8	11	5	5	6

● Dual-Color

	Voltage	Rated Current (mA)					
		Red	Green	Yellow	Super Blue	Super White	Super Green
Square	DC5V ±5%	50	70	50	34	34	40
	AC/DC12V ±5%	22	26	22	18	18	22
	AC/DC24V ±5%	11	13	11	9	9	11
	AC/DC48V ±5%	11	13	11	9	9	11
Rectangle	DC5V ±5%	100	140	100	68	68	75
	AC/DC12V ±5%	44	52	44	36	36	44
	AC/DC24V ±5%	22	26	22	18	18	22
	AC/DC48V ±5%	11	13	11	9	9	11

● 3-Color

	Voltage	Rated Current (mA)						
		Red	Green	Yellow	Super Blue	Super White	Super Green	Simultaneous Lighting
Square	DC12V ±5%	18	18	22	14	14	16	20
	DC24V ±5%	9	9	11	7	7	8	10
Rectangle	DC12V ±5%	36	36	44	28	28	32	40
	DC24V ±5%	18	18	22	14	14	16	20

● 2-Split-Face

|	Voltage	Rated Current (mA)					
		Red	Green	Yellow	Super Blue	Super White	Super Green
Square	DC5V ±5%	25	25	35	17	17	22
	AC/DC12V ±5%	11	11	13	9	9	11
	AC/DC24V ±5%	11	11	13	9	9	11
	AC/DC48V ±5%	11	11	13	9	9	11
Rectangle	DC5V ±5%	50	50	70	34	34	40
	AC/DC12V ±5%	22	22	26	18	18	22
	AC/DC24V ±5%	11	11	13	9	9	11
	AC/DC48V ±5%	11	11	13	9	9	11

※Lighting may be limited due to temperature rise caused by LED heat generation.

TERMINALS 【Connector】

● TERMINALS LAYOUT (BOTTOM VIEW)

Sunmulon mark

Square

Sunmulon mark

L   R

Rectangle

● Connector

4   1
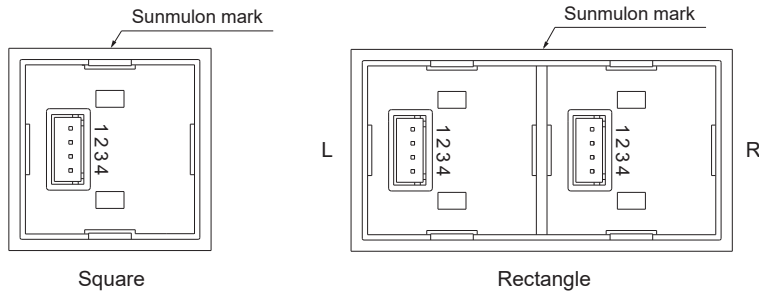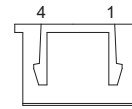
● Applicable wire

Wire size	Coating outer diameter
AWG＃22-28	0.9－1.9 mm

● Square

Pin No.	Mono-Color		Mono-Color (Low brightness)			Dual-Color			3-Color		2-Split-Face (Horiz.)		
	DC5V	AC/DC12・24・48V	Br.	DC5V	AC/DC12・24・48V	LED ※	DC5V	AC/DC12・24・48V	LED ※	DC12・24V	LED ※	DC5V	AC/DC12・24・48V
1	Cathode	Anode／Cathode	Std.	Cathode	Anode／Cathode	Frame 1	Cathode	Anode／Cathode	Common	Anode	Upper	Cathode	Anode／Cathode
2	Anode	(No polarity)		Anode	(No polarity)		Anode	(No polarity)	Frame 1	Cathode		Anode	(No polarity)
3	－	－	Low	Cathode	Anode／Cathode	Frame 2	Cathode	Anode／Cathode	Frame 2	Cathode	Lower	Cathode	Anode／Cathode
4	－	－		Anode	(No polarity)		Anode	(No polarity)	Simultaneous	Cathode		Anode	(No polarity)

● Rectangle

Pin No.	Mono-Color		Mono-Color (Low brightness)			Dual-Color			3-Color	
	DC5V	AC/DC12・24・48V	Br.	DC5V	AC/DC12・24・48V	LED ※	DC5V	AC/DC12・24・48V	LED ※	DC12・24V
R1	Cathode	Anode／Cathode	Std.	Cathode	Anode／Cathode	Frame 1	Cathode	Anode／Cathode	Common	Anode
R2	Anode	(No polarity)		Anode	(No polarity)		Anode	(No polarity)	Frame 1	Cathode
L1	－	－	Low	Cathode	Anode／Cathode	Frame 2	Cathode	Anode／Cathode	Frame 2	Cathode
L2	－	－		Anode	(No polarity)		Anode	(No polarity)	Simultaneous	Cathode

Pin No.	2-Split-Face (Vert.ical)			2-Split-Face (Horizontal)		
	LED ※	DC5V	AC/DC12・24・48V	LED ※	DC5V	AC/DC12・24・48V
R1	Frame 1 (Left)	Cathode	Anode／Cathode	Frame 1 (Upper)	Cathode	Anode／Cathode
R2		Anode	(No polarity)		Anode	(No polarity)
L1	Frame 2 (Right)	Cathode	Anode／Cathode	Frame 2 (Lower)	Cathode	Anode／Cathode
L2		Anode	(No polarity)		Anode	(No polarity)

※The LED color specified in frame 1 and 2 are illuminated. Please refer to Ordering code.

※For 3-Color illumination, simultaneous lighting of terminal 2, 3 and 4 of Square, the right side terminal 1 and the left side terminal 2 of Rectangle are not possible.
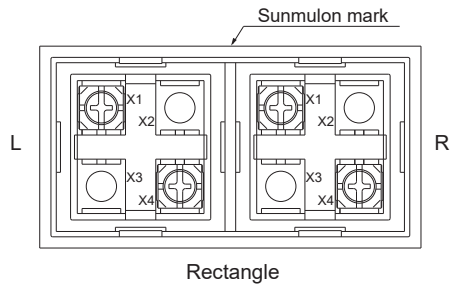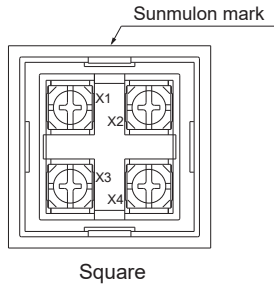
● TERMINALS LAYOUT (BOTTOM VIEW)

Square

Rectangle

● Square

Pin No.	Mono-Color		Mono-Color (Low brightness)			Dual-Color			3-Color		2-Split-Face (Horizontal)		
	DC5V	AC/DC12・24・48V	Br.	DC5V	AC/DC12・24・48V	LED ※	DC5V	AC/DC12・24・48V	LED ※	DC12・24V	LED ※	DC5V	AC/DC12・24・48V
×1	Cathode	Anode／Cathode (No polarity)	Std.	Cathode	Anode／Cathode (No polarity)	Frame 1	Cathode	Anode／Cathode (No polarity)	Common	Anode	Frame 1 (Upper)	Cathode	Anode／Cathode (No polarity)
×2	—	—	Low	Anode	Anode／Cathode (No polarity)	Frame 2	Anode	Anode／Cathode (No polarity)	Simultaneous	Cathode	Frame 2 (Lower)	Anode	Anode／Cathode (No polarity)
×3	—	—		Cathode			Cathode		Frame 2	Cathode		Cathode	
×4	Anode	Anode／Cathode (No polarity)	Std.	Anode	Anode／Cathode (No polarity)	Frame 1	Anode	Anode／Cathode (No polarity)	Frame 1	Cathode	Frame 1 (Upper)	Anode	Anode／Cathode (No polarity)

● Rectangle

Pin No.	Mono-Color		Mono-Color (Low brightness)			Dual-Color			3-Color	
	DC5V	AC/DC12・24・48V	Br.	DC5V	AC/DC12・24・48V	LED ※	DC5V	AC/DC12・24・48V	LED ※	DC12・24V
R×1	Cathode	Anode／Cathode (No polarity)	Std.	Cathode	Anode／Cathode (No polarity)	Frame 1	Cathode	Anode／Cathode (No polarity)	Common	Anode
R×4	Anode			Anode			Anode		Frame 1	Cathode
L×1	—	—	Low	Cathode	Anode／Cathode (No polarity)	Frame 2	Cathode	Anode／Cathode (No polarity)	Frame 2	Cathode
L×4	—	—		Anode			Anode		Simultaneous	Cathode

Pin No.	2-Split-Face (Vert.ical)			2-Split-Face (Horizontal)		
	LED ※	DC5V	AC/DC12・24・48V	LED ※	DC5V	AC/DC12・24・48V
R×1	Frame 1 (Left)	Cathode	Anode／Cathode (No polarity)	Frame 1 (Upper)	Cathode	Anode／Cathode (No polarity)
R×4		Anode	(No polarity)		Anode	(No polarity)
L×1	Frame 2 (Right)	Cathode	Anode／Cathode (No polarity)	Frame 2 (Lower)	Cathode	Anode／Cathode (No polarity)
L×4		Anode	(No polarity)		Anode	(No polarity)

※The LED color specified in frame 1 and 2 are illuminated. Please refer to Ordering code.

※For 3-Color illumination, simultaneous lighting of terminal X2, X3 and X4 of Square, the right side terminal 4 and the left side terminal 1 and 4 of Rectangle are not possible.
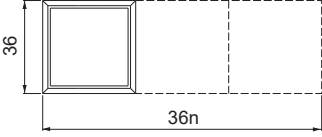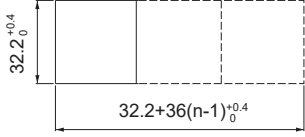
TERMINAL SHAPE

M3.5 with SP with 7.8 square washer ± common pan head screw
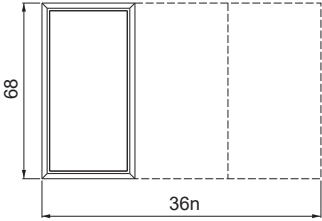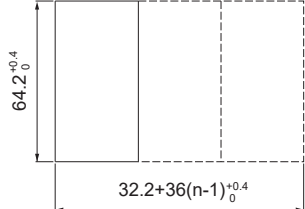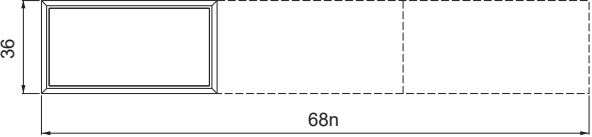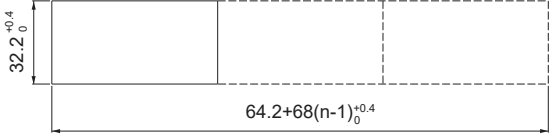
Screw terminal

Sunmulon Co., Ltd.

3L-24

MOUNTING DESIGN／PANEL CUTOUT

● Square

Mounting design	Panel cutout
Horizontal 36 / $36n$	$32.2^{+0.4}_{0}$ / $32.2+36(n-1)^{+0.4}_{0}$

● Rectangle

Mounting design	Panel cutout
Vertical 68 / $36n$	$64.2^{+0.4}_{0}$ / $32.2+36(n-1)^{+0.4}_{0}$
Horizontal 36 / $68n$	$32.2^{+0.4}_{0}$ / $64.2+68(n-1)^{+0.4}_{0}$

※ If the panel is to be finished (e.g. coated), make sure that the panel meets the specified dimensions after the coating.

※ After the panel-cutting process, make sure to remove burrs on the surface.

n : Number of Units

Torelance：$\pm$ 0.4 mm

1. Removing Light cartridge

Adsorb the removing tool (SJ-0010-1)
on the cover surface and pull it straight out.
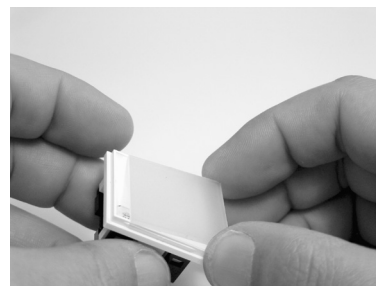
2. Removing Cover and Filter

1）Fitting and removing Cover
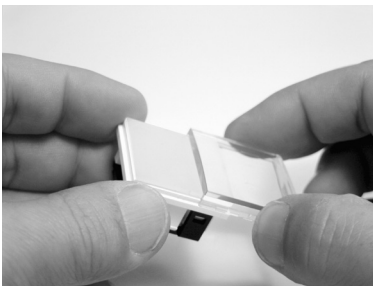
The cover of the Light cartridge can be fitted
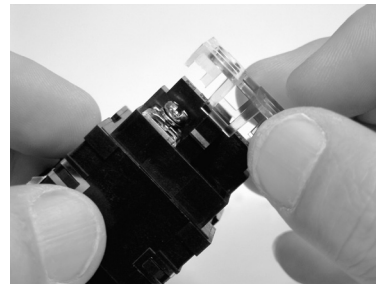or removed by sliding it to the side.

2）Fitting Filter

Place the filter with the glossy side up,
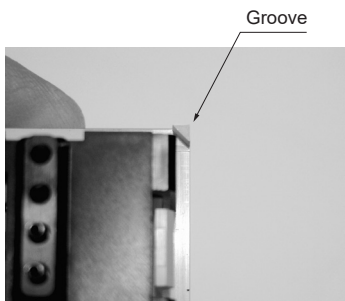then fit the cover by sliding it to the side.

3）Fitting Divider

Insert the divider into the groove inside the LED unit.
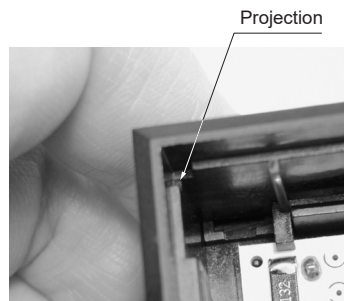
4）Fitting Terminal cover for screw terminal

Align the base of screw terminal with the fook part
of terminal cover and fit them together.

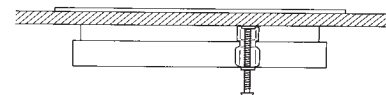3. Fitting Light cartridge

Groove

Projection

Light cartridge

Housing

Align the groove on the LED unit and the projection on the Housing,
and fit them together.

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

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

PRECAUTIONS FOR CORRECT USE

1. Be sure to turn off the power supply when mounting , dismounting, wiring, or performing maintenance and inspection of the light cartridge. Failure to do so may result in electric shock, damage, non-lighting, or short-circuit due to contamination by foreign objects.

2. For wiring, use a power supply size appropriate for the applied voltage and current. Tighten the screws of the screw terminals with the proper tightening torque 1.0～1.3N・m.

3. Do not tighten the matrix frame mounting bracket screws more than the proper tightening torque 0.2～0.3N・m as it may cause damage to the mounting panel or mounting bracket.

4. Although a lighting control resistor is built in to prevent incorrect lighting, check for incorrect lighting after wiring since incorrect lighting is possible due to induced current from the surrounding AC line at the site.

5. Character firms are not included. If preparing the character film separately, use a heat-resistant film with a thickness of 0.1mm. For dimensions, please refer to the figure below.

$\square 28^{+0}_{-0.2}$ $60^{+0}_{-0.2}$ $28^{+0}_{-0.2}$

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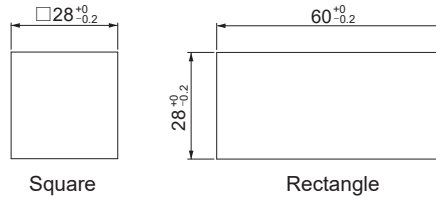
For handling instructions and precautions other than the above, please refer to "Safety Precautions for All Indicators".

Tolerance : $\pm$ 0.4 mm

As of November 2023

Sunmulon Co., Ltd.

Safety Precautions for All Indicators

1. Notes on contents of Catalogs

(1) Rated values, performance values, and specification values of Sumulon 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 improvemnet 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, satndards, or laws to which your machinery, equipment, ect. 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 Sumulon 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 equipmnt (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 cause 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.

(9) Assemble correctly according to the handing 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.

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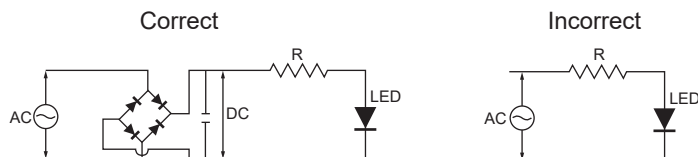
    (c) When wiring, pay attention to the polarity of the terminals.
    (d) Simultaneous lighting may not be possible with Dual-Color, 3-Color illumination or Split-Face illumination, check the catalog.
    (e) Apply voltage directly to LEDs of Non-built-in resistor type will damage the LEDs, so connect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

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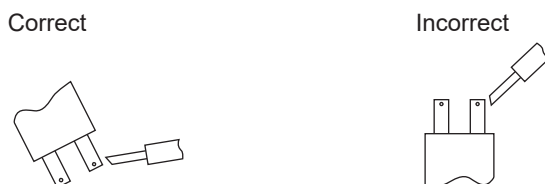
    (e) Use the appropriate wire size for the applied voltage and current, and solder properly. Use of the product with incomplete soldering may cause abnormal heat generation, resulting in a fire hazard.

(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 $-25℃$ to $65℃$ (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.