



# Luci EFRO


## Instruction Manual


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### To ensure safe usage

The following is the safety cautions to prevent any harms or damages to others.  
If the product is used against cautions, it may cause damages・electrifications・smoke.

**Only supply power through the lead wire on one side using the dedicated connection cable for this product.**  
Supplying power through the lead wires on both sides may cause failure and fire.


 Do not supply the power through the lead wire from both sides.


 Supply the power through the lead wire from one side.





DC24V DC24V DC24V Attach the connector cover.


 **Electrical work certificate is needed to install and inspect this product. Please ask electrician for the installation.**


 Use a DC24 V power supply.  
Never connect to any other power supply.  
Always use a circuit breaker of suitable capacity in the power supply.  
If the capacity is not suitable, the breaker may not work when abnormal current occurs, creating risk of fire.


 Always shut off the main power supply before performing work or inspection.  
Do not connect or disconnect the lead wires of the LED fixture while power is supplied.

 Firmly insert and connect the connectors.  
Incomplete connection may cause heating, smoke, and fire.

 Do not touch the ends of the connectors. Risk of electrical shock.


 When there is abnormal situations, please cut off the power immediately, consult with electricians, and do not touch the LED fixture with hands.

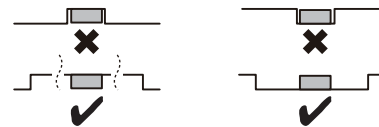
 Do not place a heatable object such as a cloth or paper or an insulating material on top of the LED fixture or cover it with such a material. It may cause the fixture not to turn on or fire.  
Do not put a piece of metal or a flammable object in clearance of the LED fixture.  
The outline of the LED fixture main unit must not contact equipment in or out of the ceiling. It may cause fall, electric shock, or fire.  
Do not operate the fixture with wet hands. It may result in an electric shock.


 Important notice for storage  
Observe the storing temperature of our LED fixtures: 0 °C to 55°C  
Please do not store the carton or the packages of our LED fixtures in the following conditions:  
- wet location  
- places of high humidity  
- places with much litter or dust  
- places of exposing against sun light directly  
- places a solvent such as a paint liquid is stored


During storing period, please do not leave the cartons or individual packages vertically.  
Please do not open individual package until just before installing LED fixtures to avoid any damage to the LED fixtures.  
Please do not place heavy object on the carton.  
Please do not use our LED fixtures as the working light during construction period.


 Always test before connecting the LED fixture to a switch or dimmer.


 The product must be allowed to dissipate heat.  
Risk of shortened service life and fire.  
Allow sufficient space for ventilation (heat dissipation) between the LED fixture and building structure.  
When installing the LED fixture in a box, please make sure to provide the air ventilation hole.




 Do not use the product if the cover is damaged.  
Risk of an accident and electrical shock.  
When cleaning the interior of the bathroom, do not spray detergent directly on the LED fixture. If this happens, immediately rinse with water.


 If the product is dirty, wipe with a dry cloth.  
Do not use thinner, benzene, or other organic solvents to clean the product, and do not wash with water.

 Do not use a brush or an abrasive to polish metal parts.  
Risk of damage and corrosion.

 Do not use in the following environments:  
- A location at high temperature (+35°C or higher)  
(usage environment temperature is 0°C to +35°C).  
- A location where water collects, and under the water.



 - Place with a constantly high humidity level (sauna, public bath, etc.)  
- A dusty location.  
- A location with corrosive or inflammable gases.  
- A highly airtight location.  
- A location where the product is directly exposed to salt water or organic solvents.  
- A location where the product is exposed to direct sunlight.  
- A location subject to the effects of electric or magnetic fields.  
- A location subject to intense vibration or shock, or a location subject to continuous vibration.

 Do not do the following to the LED fixture:  
- Forcibly remove the product after mounting it.  
- Disassemble, modify, or add holes to the product.  
- Forcibly pull or twist the product.  
- Cut or damage the power cable. Use a damaged cable.  
- Press down on the product.  
- Drop the product or subject the product to intense vibration or shock.

### Please read before the usage

- The product has been manufactured with the utmost care; however, please understand that slight deviations in LED color are unavoidable due to the characteristics of the product.
- To mount in the mounting position, use mounting clips (Accessories) and confirm that the mounting clip is securely fixed.

**Caution regarding installation environment of power supply**

**Regarding the temperature, humidity, and other conditions of the operating environment, follow the instructions in the manual for the power supply.**

### Maintenance and Inspection

- LED fixture has a life span.
- Degradation occurs inside after 8-10 years of installation even when the fixture looks fine from the outside.  
Parts of the LED fixture degrade due to heat when the light is on for a long time. This causes not only safety issues, but also reduces power efficiency and it is recommended to have regular maintenance and inspection.
- Cleaning and inspection should be performed at least once every 6 months.
- Inspection by a specialist, such as a product contractor, should be performed at least once every 3 years.
- If the LED fixture is used for a long time without having an inspection, there is a small possibility that it could lead to fuming, igniting, electric shock and the like.

#### Inspection Methods

- Is LED operating normally?
- Is there any unusual smell, sound or heat?
- Are there any cracks, splits, or detached parts on any parts or joints?

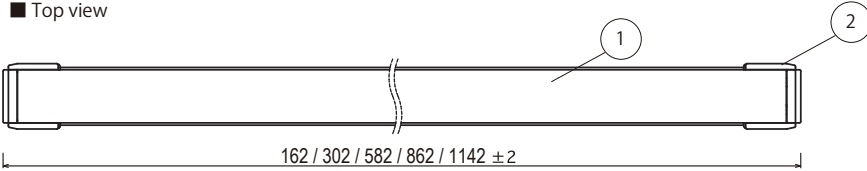
#### Cleaning Method

- Lightly wipe the LED fixture with a soft cloth.
- To best clean the LED fixture, wipe dirt with a soft cloth which has been soaked in a neutral detergent diluted with water and wrung firmly. To finish off, wipe it with a damp cloth and dry it.

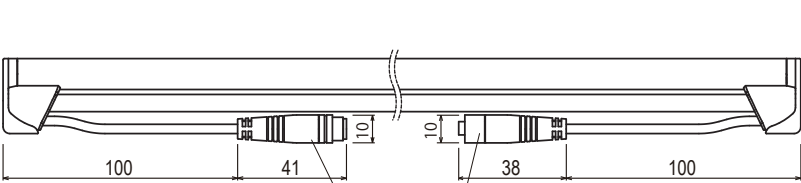
## Product specifications

※unit of measure=mm

### Top view



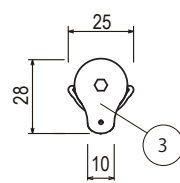
### Front view



### DC input side



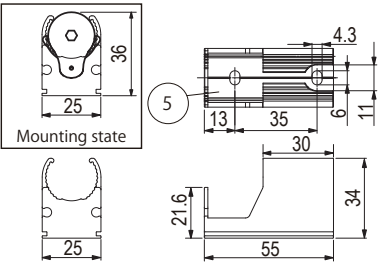
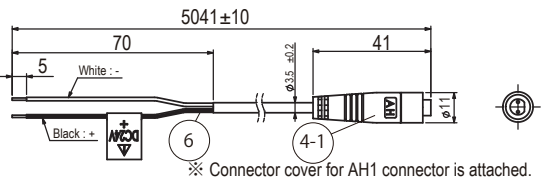
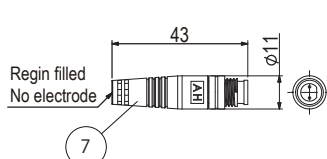
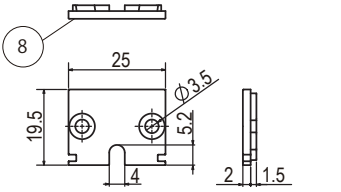
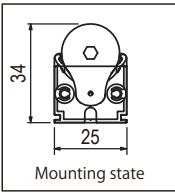
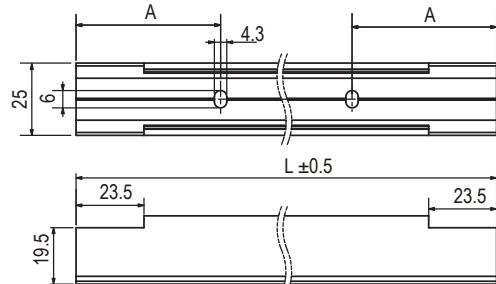
### Side view



Input voltage  
DC24V

#	Item	Name Materials etc.
①	Body	Polycarbonate, Diffuser
②	Cable guide	Polycarbonate, Clear
③	Side cover	Polycarbonate, Diffuser
④	AH1 connector	4-1:AH-M08-0402MFW-113 4-2:AH-M08-0402FMW-113
⑤	Mounting Clip A for EFRO	Polycarbonate, Clear
⑥	Lead Wire	AWG22 black: + white: -
⑦	Connector cover for AH1 connector	CC-MJ-O
⑧	End cap for EFRO aluminum rail	Polycarbonate, Clear
⑨	Aluminum mounting rail for EFRO	Aluminum, Silver

### Option parts

Attachments : Mounting clip A for EFRO (2-3 pcs / 1 bag) Option parts: Mounting clip A for EFRO (3 pcs / 1 bag) (LRO-PT-A)	Option parts Power supply cable 5000mm for AH1 connector OD3.5 (CAD-VA5000-FJNN-O)	Option parts Connector cover for AH1 connector (CC-MJ-O)																		
	 <p>※ Connector cover for AH1 connector is attached.</p>																			
Option parts End cap for EFRO aluminum rail (2pcs / 1 bag) (LRO-RL-EC)	Option parts Aluminum mounting rail for EFRO (LRO-RL0164-AL, LRO-RL0304-AL, LRO-RL0584-AL, LRO-RL0864-AL, LRO-RL1144-AL)																			
 <p>※ Screws (4 pcs of Flat head, M3L8) are attached.</p>	<table border="1"> <thead> <tr> <th>L (mm)</th><th>Number of holes</th><th>A (mm)</th></tr> </thead> <tbody> <tr> <td>164</td><td>2</td><td>30</td></tr> <tr> <td>304</td><td>2</td><td>50</td></tr> <tr> <td>584</td><td>3</td><td>100</td></tr> <tr> <td>864</td><td>4</td><td>100</td></tr> <tr> <td>1144</td><td>5</td><td>100</td></tr> </tbody> </table> <p>※ End cap for EFRO aluminum rail is attached.</p>	L (mm)	Number of holes	A (mm)	164	2	30	304	2	50	584	3	100	864	4	100	1144	5	100	 
L (mm)	Number of holes	A (mm)																		
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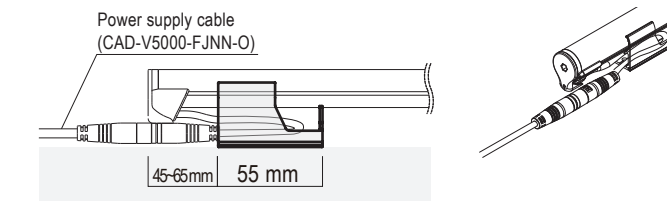
## Installing the product

### For horizontal installation

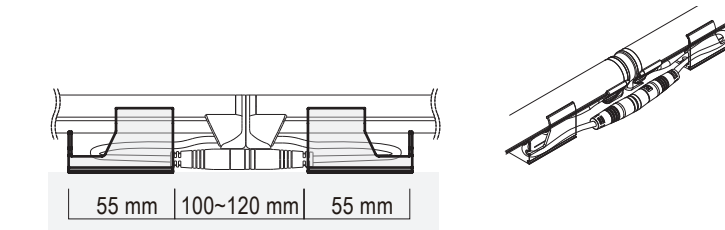
Attach Mounting clip for EFRO (LRO-PT-A) at below position with screws supplied by installer (Pan head screws M4 recommended), and insert the LED fixture with considering the direction of the connector of power supply cable side. See below picture for holding the cable and connector underneath the LED fixture. Downwards installation is available as well.

### Recommended position of Monting clips

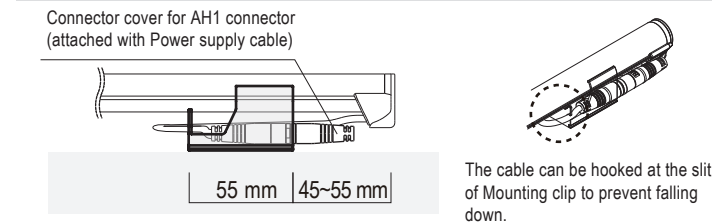
#### Power supply side of LED fixture



#### Between two LED fixtures



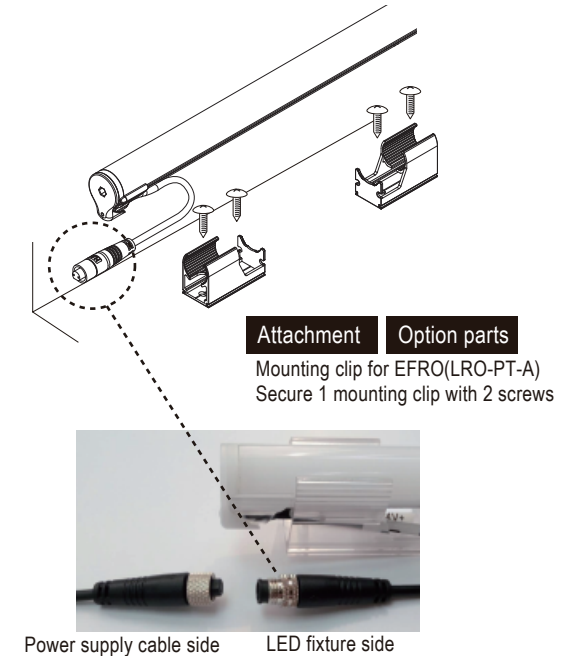
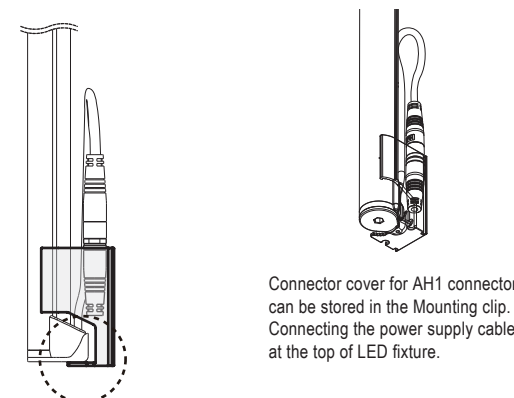
#### Terminal of LED fixture



### For vertical installation

Make sure the bottom of LED fixture hook on the edge of the Mounting clip in accordance with the diagram. Caution: If the weight of the LED fixture is not supported by the edge of the Mounting clip, it may slide down and fall.

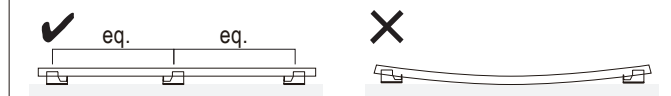
#### Terminal of LED fixture



### Cautions: Use accurate number of Mounting parts

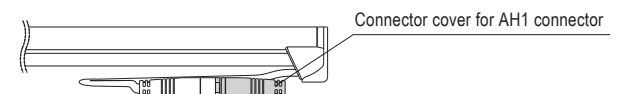
Install 3pcs of Mounting clips at the middle and both edge sides of LED fixture if the LED fixture is longer than 862mm. Otherwise, the LED fixture will bow by its weight and may defect.

- Number of Mounting clips (LRO-PT-A)
- 2 pcs for 582 mm or shorter
- 3 pcs for 862 mm or longer



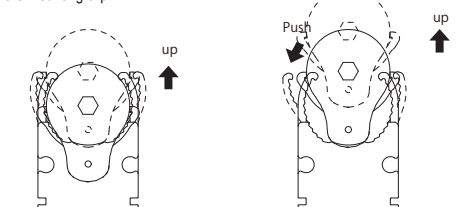
### Cautions: Waterproofing process for terminal connector

The unenclosed connector at the terminal of LED fixture must be sealed with connector cover for AH1 connector which is attached with power supply cable (CAD-V5000-FJNN-O). Make sure to rotate the fastening part until no longer can rotate.



### Caution when remove the LED fixture from Mounting clip A

1. Pull the LED fixture until the sideward ledge part of the LED fixture hits the hook part of the mounting clip.
2. Take out the LED fixture by widening the one side of hook part of the mounting clip.



Item / Product Name	Luci EFRO				
Model No.	LRO-0162- *-DF-IW	LRO-0302- *-DF-IW	LRO-0582- *-DF-IW	LRO-0862- *-DF-IW	LRO-1142- *-DF-IW
Power consumption	0.9 W	1.8 W	3.6 W	5.4 W	7.3 W
Input current	(0.04 A max)	(0.08 A max)	(0.17 A max)	(0.25 A max)	(0.34 A max)
LED fixture length (L)	162 mm	302 mm	582 mm	862 mm	1142 mm
Number of LEDs	28 LED	56 LED	112 LED	168 LED	224 LED
Weight	62 g	100 g	172 g	234 g	310 g
Environment	Indoor (bathroom, washroom), Outdoor(only alminum mounting rail attached), IP65				
Operating temperature	0 °C～+35℃				
Max. sets connectable	4.5 m				
Material (Body)	Polycarbonate				
Attachments	Mounting clip A for EFRO (2pcs)			Mounting clip A for EFRO (3pcs)	
Option parts	Mounting clip A for EFRO, Power supply cable 5000mm for AH1 connector, Connector cover for AH1 connector, End Cap for EFRO aluminum rail, Aluminum mounting rail for EFRO				
Dimmable	✓				
Light source color (※)	White(W), Warm white 3500K(WW), Warm white 3000K(L30), Warm white 2700K(L27), Warm white 2400K(L24)				

## Installing the product

For horizontal installation with aluminum mounting rail

1. Attach Aluminum mounting rail for EFRO (LRO-RL\*\*\*\*-AL) at below position with screws supplied by installer (Pan head screws M4 recommended)
2. Insert the LED fixture with considering the direction of the connector of power supply cable side.
3. After passing the cable through the cable outlet of the end cap, fix the end cap to the rail by screws attached with the products.

Note: The order of installation can be changed by the situation of the site.

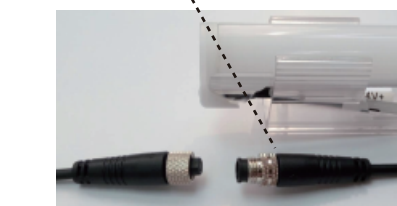
Note: Please fix with the same number of screws as the number of screw holes.

### Option parts

Aluminum mounting rail for EFRO (LRO-RL\*\*\*\*-AL)

Cable outlet

※ Screws  
(4 pcs of Flat head, M3L8)



Power supply cable side

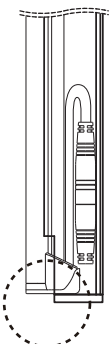
LED fixture side

Before attaching the LED fixture to the rail, please put the connector connection completely inside the rail.

For vertical installation with aluminum mounting rail

Make sure the bottom of LED fixture hook on the edge of the end cap for aluminum rail in accordance with the diagram.

Caution: If the weight of the LED fixture is not supported by the end cap for aluminum mounting rail, it may slide down and fall.

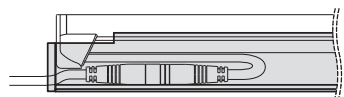


Connector cover for AH1 connector can be stored in the Mounting rail. Connecting the power supply cable at the top of LED fixture.

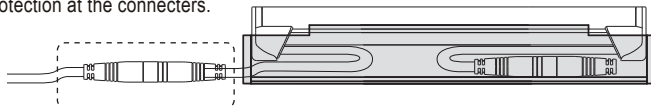
Position of connector

Power supply side of LED fixture

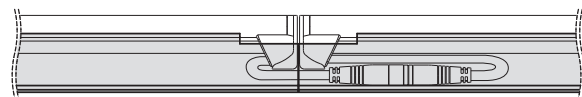
- Below LED fixture



When using L162 alone, one side of the connector cannot be placed into the aluminum rail. Please do the appropriate treatment of water-proof and UV protection at the connectors.



Between two LED fixture

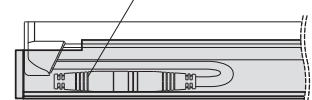


To reduce the gap of two LED fixtures, end caps are not necessary to use.

Terminal of LED fixture

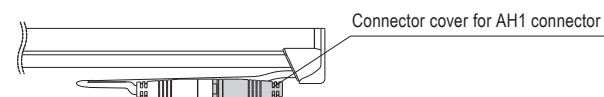
- Below LED fixture

Connector cover for AH1 connector (attached with Power supply cable)



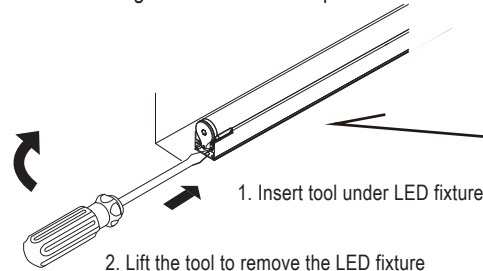
### Cautions: Waterproofing process for terminal connector

The unenclosed connector at the terminal of LED fixture must be sealed with connector cover for AH1 connector which is attached with power supply cable (CAD-V5000-FJNN-O). Make sure to rotate the fastening part until no longer can rotate.



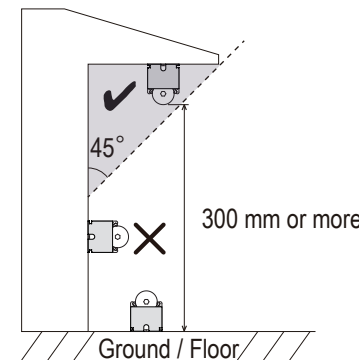
### Caution when remove the LED fixture from Aluminum mounting rail

Use a hard and long tool such as minus driver. Insert the tool under the light fixture and lift it up to remove it.



Caution :  
Do not attach or detach the LED fixture repeatedly.  
Do not apply excessive force to the LED fixture.  
Do not damage the cable.  
Please carefully remove the LED fixture. Otherwise, the LED fixture may be damaged and lost the waterproofness.

## Prohibited installation places



When using EFRO in semi-outdoor, it must be installed with the aluminum rail for EFRO. Please installed the LED fixture and the cable within the range of 45° eaves of the roof and 300 mm or more away from the ground or the floor. Please do not install the LED fixture and cables in the follow place:

- water directly fall on or pooled
- the sunlight directly shines on
- liquids including choline or chemicals fall on
- high temperature and high humidity such as saunas
- coastal areas which are affected by sea spray

## Connecting to the power supply

■ Cables used for connecting LED fixtures and Power supply must be a suitable type and gauge.

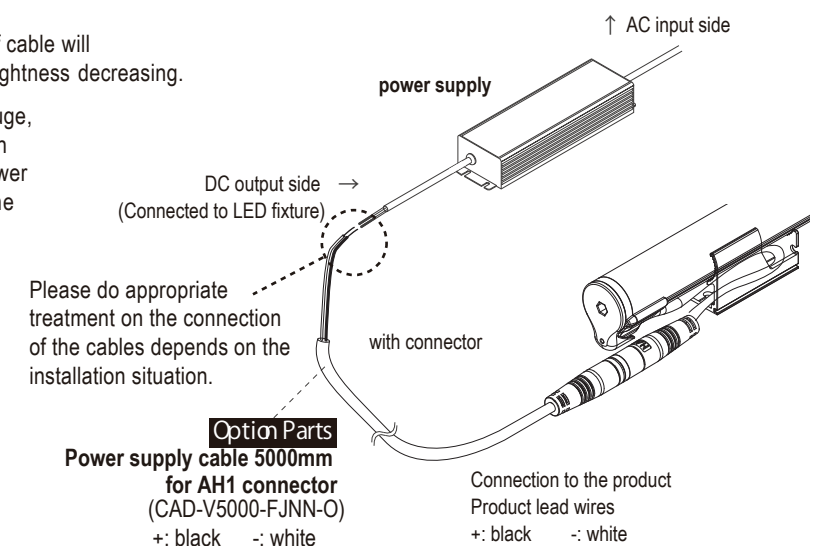
■ Cables should be joined with suitable terminal block or methods as appropriate to the installation and operating environment.

Caution: When using a long cable with thin dimension, the resistance of cable will increase. Voltage drop and heat discharging may occur and result in brightness decreasing.

Caution: When separating one cable to multiple circuits in the same gauge, the current loading focuses on the junction of the branch circuit and high temperature will liberate on there. Please consider the loading of the power supply (quantity of LED fixture) and review the wiring system to avoid the above problem.

■ When connecting the dimmer driver with power supply, unpredicted noise might occur. It is a characteristic of electronic devices, not a malfunction of the LED fixture. Please choose an appropriate power supply and consider a place to install. Reducing the loading factor of LED fixture might improve the noise from the power supply while the noise for the LED fixtures might be improved by splitting the circuit of LED fixtures into multiple.

■ When you adjust the length of the power supply cable, please be careful not to damage the core wire.

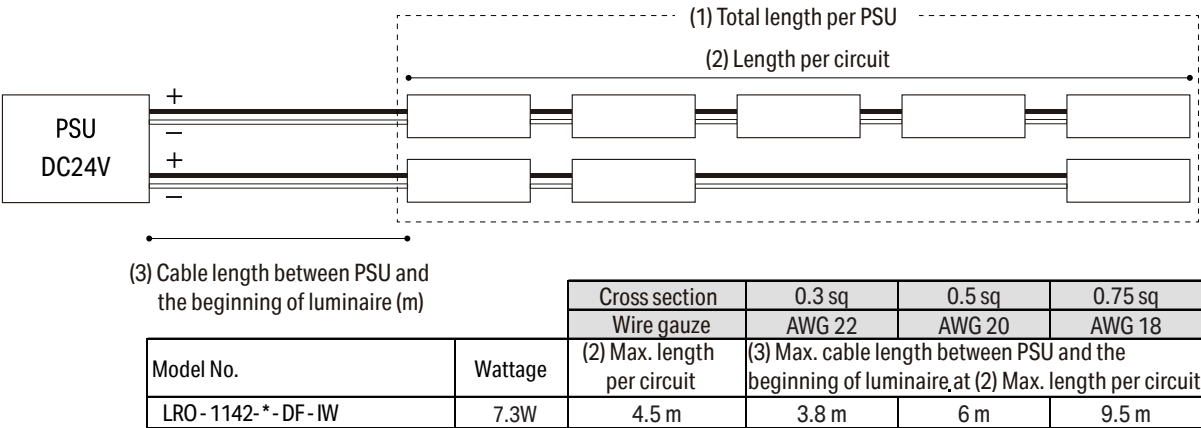


Option Parts  
Power supply cable 5000mm for AH1 connector (CAD-V5000-FJNN-O)  
+: black -: white

Connection to the product  
Product lead wires  
+: black -: white

## System configuration diagram

1. Total product length per power supply depends on capacity of the power supply. Recommended loading factor is 60% ( without dimming ) .
2. Product length per circuit shall not exceed maximum product length per circuit. If the product length per circuit exceeds the maximum, split into mulitple circuits.
3. To minimize voltage drop, select appropriate wire gauge / diameter and consider the cable length between PSU and the beginning of luminaire referring to the following table. If longer cable distances are required, use thicker wires or reduce the loading of the lighting fixtures in the circuit.



※The length of cable that can be connected varies depending on the voltage drop.

## ⚠ Cautions

The number of LED fixtures that can be connected to the power supply depends on the output (W) of the power supply.

For Luci EFRO, the **maximum number connectable in series is 4.5 m**. If more than the maximum number must be connected, connect in separate systems.

**LED fixture lengths** can be combined freely, however, **the maximum number of meters connectable in series (4.5 m) must** be strictly observed.

Small noise may be emitted from the appliance and the dimmer while using the dimmer, but it is normal. Load capacity of 60% is recommended to reduce noise.(normal operation: 70%)

Max. connectable length per power supply	
Length of LED fixture (70% loading factor) *=split into multiple circuits	PSU
3.3m	50W power supply
8.3m*	100W power supply
16.6m*	150W power supply