Coaxial Lights **LFV3(A) Series**

LED Light for Machine Vision and Industrial Inspection

Instruction Guide

CE

Thank you for purchasing a CCS product. To ensure proper use of the product, please read this instruction guide before use and keep it for your future reference.

1 Important Information for Equipment Safety - Read Before Use -

This product has been designed with full consideration of safety. However, incorrect usage of the product may result in fire, electric shock, or other serious damages. Please ensure to follow the conditions below.

The following symbols are used in this instruction guide to indicate and classify the relative importance of warnings and cautions.

⚠ **Warning**	Indicates that incorrect usage may result in serious injury or death.	⚠ **Caution**	Indicates that incorrect usage may result in injury or property damage.

The following symbols in the instruction guide indicate and classify the precautions.

PROHIBITED / DISASSEMBLY PROHIBITED / DO NOT TOUCH WITH WET HANDS / DO NOT SUBJECT TO MOISTURE These symbols indicate prohibited actions.	MANDATORY ACTIONS This symbol indicates required actions.

⚠ Warning			
Do not disassemble or modify the Light Unit. Doing so may result in fire or electric shock.	DISASSEMBLY PROHIBITED	LED light radiation may cause corneal or retinal abnormalities if you look directly at the light. To prevent harmful light exposure, never look directly at the LED light.	MANDATORY ACTIONS
Do not touch the Light Unit with wet hands. Doing so may result in electric shock.	DO NOT TOUCH WITH WET HANDS	This Light Unit generates high temperatures. Do not touch the product while it is turned on or immediately after it is turned off, or burning may result. Provide cooling with a fan or other ventilation if the product is to be used in a closed space.	MANDATORY ACTIONS
Make sure that the Light Unit is free of moisture or any liquid. Exposure to water may result in fire, electric shock.	DO NOT SUBJECT TO MOISTURE	Connect or disconnect the light cable only after turning off the power source. Failure to do so may result in circuit damage, fire caused by a minute spark, or electric shock.	MANDATORY ACTIONS
If abnormal condition occurs such as fuming, heat, smell, noise, or so on, stop using the Light Unit immediately, and turn off the power source. A fire or electric shock may result if the Light Unit is kept used.			MANDATORY ACTIONS

⚠ Caution			
Do not use user-made cables. Doing so may cause Light Unit failure. Use the CCS extension cable if it is necessary to extend the distance between the Light Unit and the Control Unit.	PROHIBITED	Use a Control Unit that is suitable for the Light Unit ratings. Using an incorrect Control Unit can cause Light Unit failure.	MANDATORY ACTIONS
Be careful of static electricity. Damage to the LED light may occur, if a person charged with static electricity touches it. Keep the Light Unit away from all items charged with static electricity.	PROHIBITED	Use a standard Extension Cable that is manufactured by CCS. However, if the cable is too long, the light intensity will decrease due to voltage drop caused by the DC resistance of the cable.	MANDATORY ACTIONS
Do not drop the Light Unit or subject it to impact. Doing so may cause the Light Unit to malfunction.	PROHIBITED		

Do not use the Light Unit in the following situations.

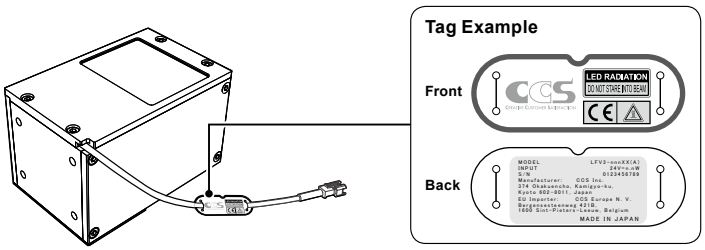
- Under conditions or in an environment not described in this instruction guide.
- In nuclear energy control systems, railroad systems, aviation systems, vehicles, combustion equipment, medical equipment, amusement machines, or safety equipment.
- In applications involving serious risk to life or property, particularly applications demanding a high level of safety.

Please install the Light Unit to locations with following conditions. Incorrect installation location may cause Light Unit failure.

- In a flat and stable location with minimal vibration.
- Well-ventilated places with minimal dust.
- Places that are not subject to sudden temperature changes.
- Places free from any water, oil, liquid, chemical, or steam.
- Places free from corrosive or combustible gas.
- Places away from water faucets, boilers, humidifiers, air conditioners, heaters, or stoves.

2 Confirming Product Information

The following tag is attached to the cable on the LED Light. The color of the label indicates the luminescence color of the Light. The back of the tag there is a name label that gives the model number, power consumption, and serial number.
Be sure to check the contents before using the product and handle the label with care. If the label is missing or damaged and the contents cannot be checked, please contact CCS Inc.



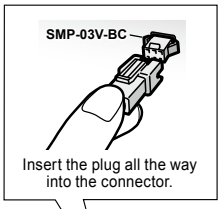
3 Operating Instructions

❶ Connect the light cable of the product to the Control Unit.

- Connect to the Control Unit equipped with **SMP-03V-BC** Connectors for power output.

For information on applicable Control Units and cables, refer to the product catalogs or the CCS website.

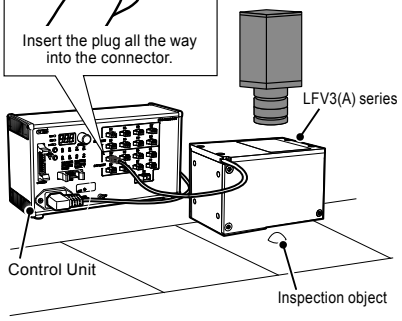
MANDATORY ACTIONS — Make sure that the Control Unit is turned OFF before connecting.



❷ Turn ON the Control Unit to turn ON the light.

Read the instruction guide of the Control Unit before use.

❸ Adjust light range, light angle, and radiant quantity to optimize images.

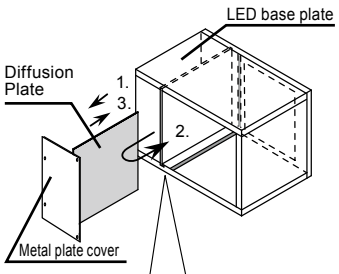


- Conceptual Diagram -

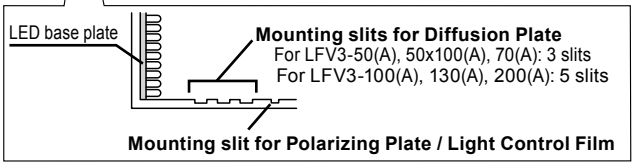
MANDATORY ACTIONS — When using color image processing equipment, readjust the white balance of the camera according to the operating conditions.

Changing the Position of the Diffusion Plate

You can change the position of the Diffusion Plate from the default position to adjust the uniformity and intensity of the light. To change the position, move the Diffusion Plate to another slit.
(Applicable models: LFV3-50(A), 50x100(A), 70(A), 100(A), 130(A), 200(A))



1. **Remove the metal plate cover.**
   * Make sure that the LED base plate and Diffusion Plate do not slip off.
2. **Pull out the Diffusion Plate and insert it into one of the other slits.**
   * Do not insert the Diffusion Plate into the mounting slit for the Polarizing Plate / Light Control Film.
3. **Attach the metal plate cover.**



- The Diffusion Plate has a front side and a back side. Install it with the glossy, smooth side facing the LED base plate.
- The uniformity and intensity of the light depend on the distance between the slit and the LED base plate.

Slit	Close to the LED base plate	Away from the LED base plate
Uniformity	Low	High
Intensity	High	Low

3 Operating Instructions (Continued)

Optional Accessories (Sold Separately)

The following optional products are available as required.
(Applicable models: LFV3-35(A), 50(A), 50x100(A), 70(A), 100(A), 130(A), 200(A))

Product name	Model name
Polarizing Plate	PL-LFV3-35, 50, 50x100, 70, 100, 130, 200
Light Control Film	LC-LFV3-35, 50, 50x100, 70 ,100, 130, 200
Diffusion Plate	DF-LFV3-35, 50, 50x100, 70, 100, 130, 200 DF-LFV3-35-UF, 50-UF, 50x100-UF, 70-UF, 100-UF, 130-UF, 200-UF

Refer to “Operation Guide for Optional Products” before using optional products.

Precautions

- Ghost images (double vision) of the inspection object may appear due to reflection from the half mirror inside the light. It is impossible to remove these images because of the characteristics of the light.
  (Relevant models: LFV3-34(A), 35(A), 40(A), 50(A), 50x100(A), 70(A), 100(A), 130(A), 200(A))

- An image of the emitting surface of the light may be reflected by the inspection object. In that case, install an optional light control film into the light.
  (Applicable models: LFV3-35(A), 50(A), 50x100(A), 70(A), 100(A), 130(A), 200(A))

- Dust, dirt, or fingerprints on the glass portions of the light may affect the captured image. In that case, clean the light as follows:
  - Remove dust and dirt by blowing it off with air. Do not touch the light with your hand.
  - Use a soft, finely woven cloth to wipe away any marks, such as fingerprints.
  - Use a soft, finely woven cloth soaked with diluted neutral detergent to remove any heavy dirt.

  Also, handle the light with care during daily use. Make sure no dust, dirt, or fingerprints adhere to the light.

4 Main Specifications

Common Specifications

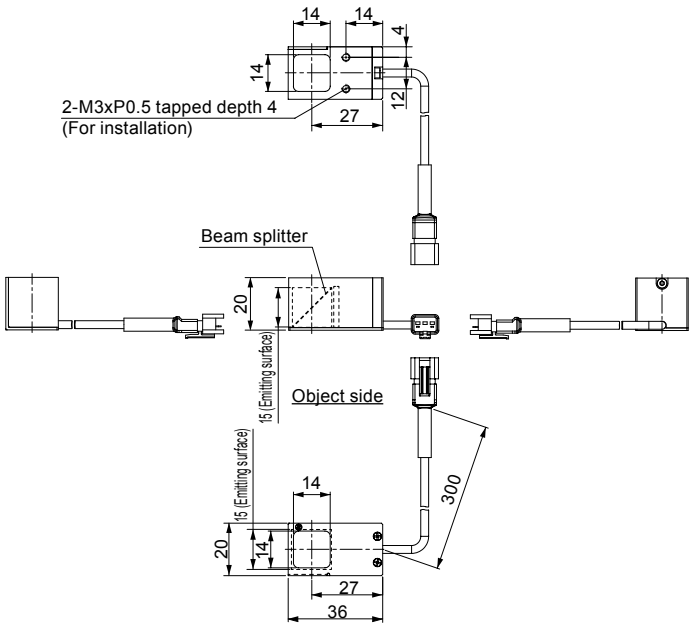
Input voltage	24 VDC
Connector	SMR-03V-B
Polarity	1:(+), 2:NC, 3:(–)
Cable length	300 mm
Cooling method	Natural air-cooling
Operating environment (indoors only)	Temperature: 0 to 40°C, Humidity: 20 to 85%RH (with no condensation)
Storage environment	Temperature: -20 to 60°C, Humidity: 20 to 85%RH (with no condensation)
CE marking	Safety standard: Conforms to EN62471
Case material	Aluminum alloy, Glass, Resin (for LFV3-34(A), 40(A) only), Steel sheet (for LFV3-CP-13, CP-18, 200(A) only)

Specifications by Model

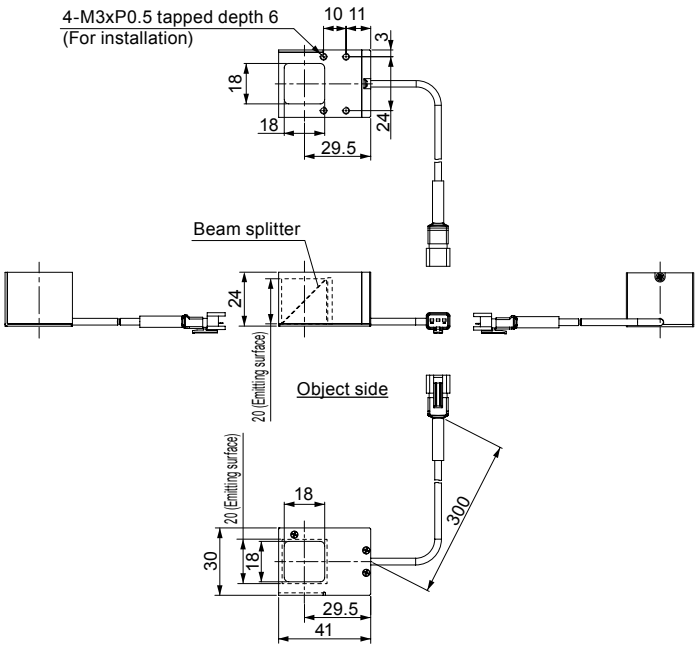
Model name	LED color	Peak wavelength/ Correlated color temperature (typ.)	Power consumption (max.)	Weight (max.)
LFV3-CP-13RD	Red	635 nm	2.1 W	37 g
LFV3-CP-13SW	White	6000 K	2.3 W	
LFV3-CP-13BL	Blue	470 nm	1.3 W	
LFV3-CP-18RD	Red	635 nm	3.3 W	70 g
LFV3-CP-18SW	White	6000 K	4.1 W	
LFV3-CP-18BL	Blue	470 nm	3.4 W	
LFV3-34RD(A)	Red	635 nm	3.7 W	80 g
LFV3-34SW(A)	White	6000 K	3.2 W	
LFV3-34BL(A)	Blue	470 nm	3.2 W	
LFV3-35RD(A)	Red	630 nm	3.1 W	175 g
LFV3-35SW(A)	White	6500 K	3.7 W	
LFV3-35BL(A)	Blue	460 nm	3.1 W	
LFV3-40RD(A)	Red	635 nm	4.6 W	100 g
LFV3-40SW(A)	White	6000 K	4.6 W	
LFV3-40BL(A)	Blue	470 nm	4.6 W	
LFV3-50RD(A)	Red	630 nm	8.1 W	335 g
LFV3-50SW(A)	White	6500 K	11 W	
LFV3-50BL(A)	Blue	460 nm	9.1 W	
LFV3-50x100RD(A)	Red	630 nm	17 W	530 g
LFV3-50x100SW(A)	White	6500 K	20 W	
LFV3-50x100BL(A)	Blue	460 nm	17 W	
LFV3-70RD(A)	Red	630 nm	13 W	620 g
LFV3-70SW(A)	White	6500 K	19 W	
LFV3-70BL(A)	Blue	460 nm	16 W	
LFV3-100RD(A)	Red	630 nm	22 W	1060 g
LFV3-100SW(A)	White	6500 K	27 W	
LFV3-100BL(A)	Blue	460 nm	27 W	
LFV3-130RD(A)	Red	630 nm	31 W	1750 g
LFV3-130SW(A)	White	6500 K	46 W	
LFV3-130BL(A)	Blue	460 nm	38 W	
LFV3-200RD(A)	Red	630 nm	43 W	4350 g
LFV3-200SW(A)	White	6500 K	60 W	
LFV3-200BL(A)	Blue	460 nm	53 W	

5 Dimensional Diagrams (mm)

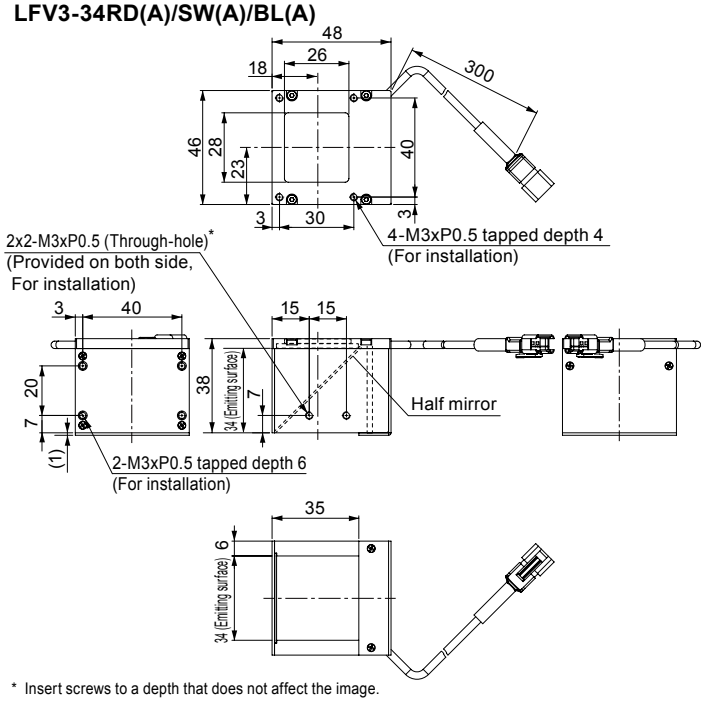
LFV3-CP-13RD/SW/BL



LFV3-CP-18RD/SW/BL

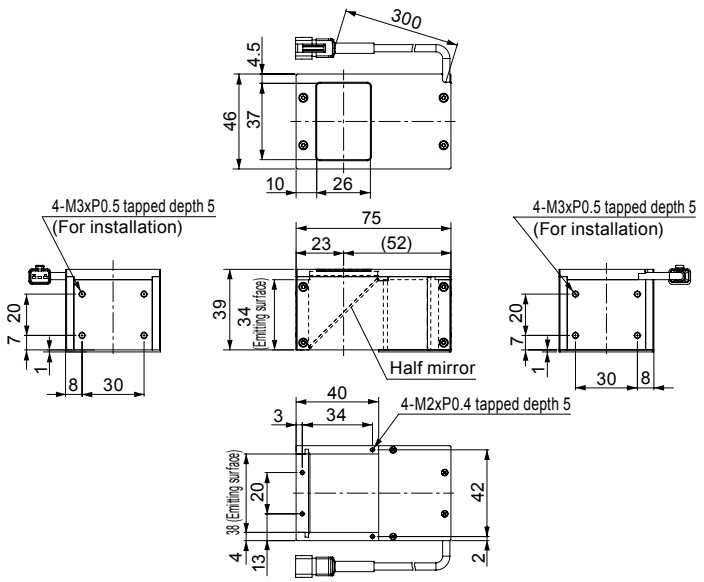


LFV3-34RD(A)/SW(A)/BL(A)

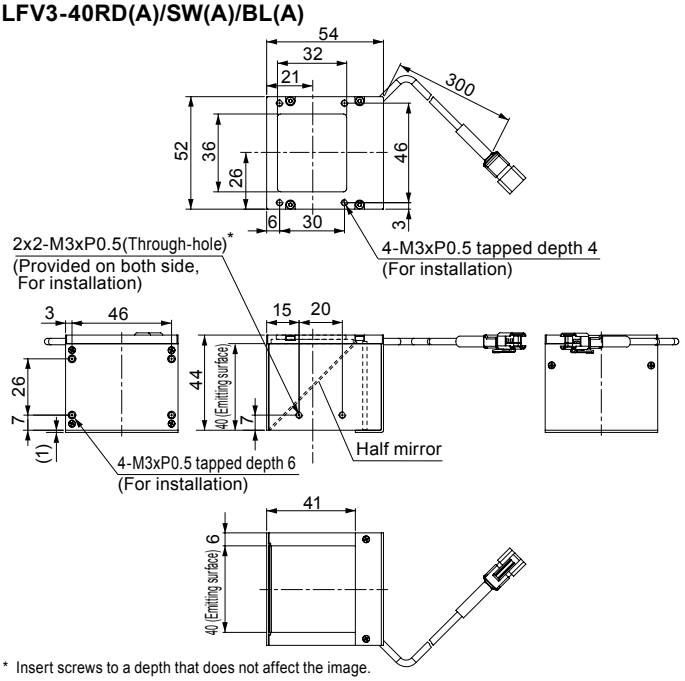


* Insert screws to a depth that does not affect the image.

LFV3-35RD(A)/SW(A)/BL(A)

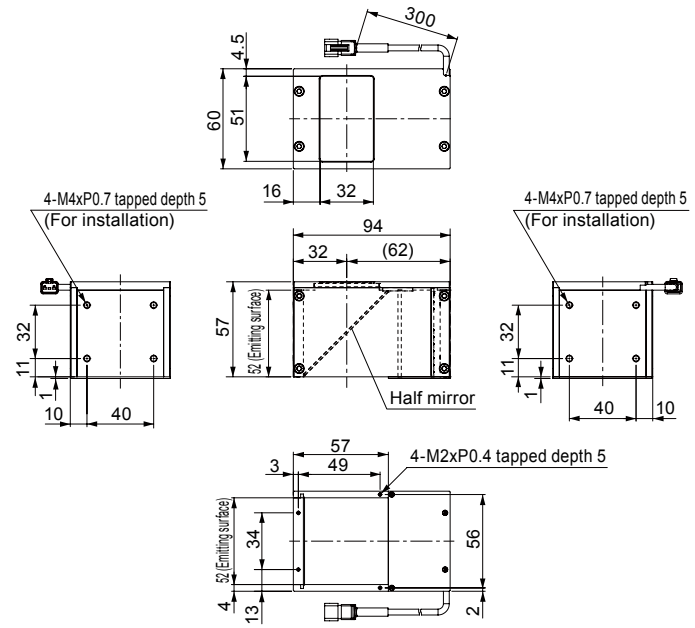


LFV3-40RD(A)/SW(A)/BL(A)



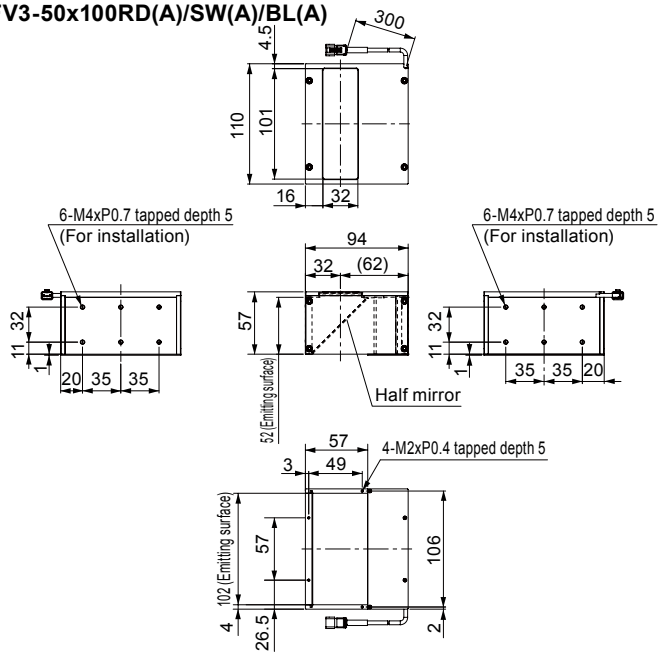
* Insert screws to a depth that does not affect the image.

LFV3-50RD(A)/SW(A)/BL(A)

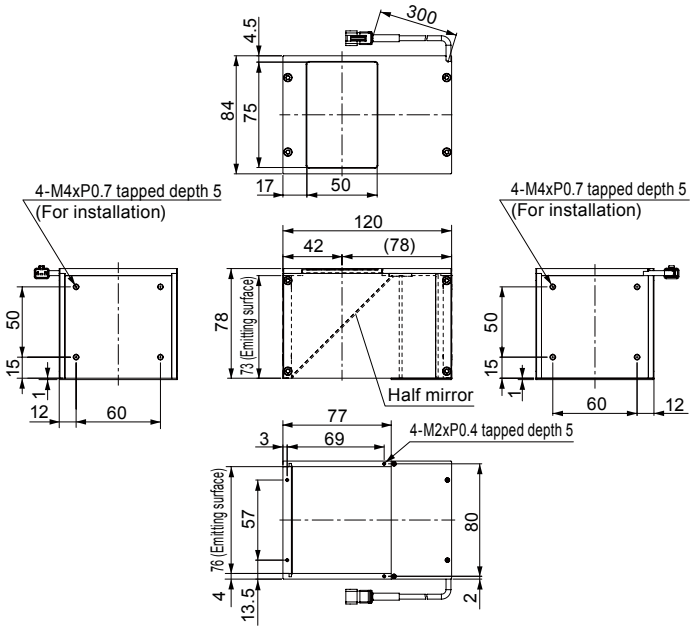


5 Dimensional Diagrams (mm) (Continued)

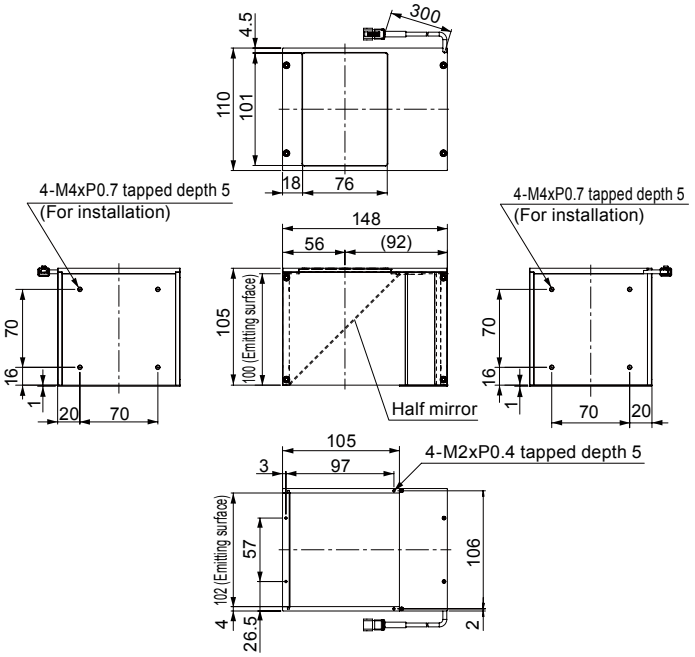
LFV3-50x100RD(A)/SW(A)/BL(A)



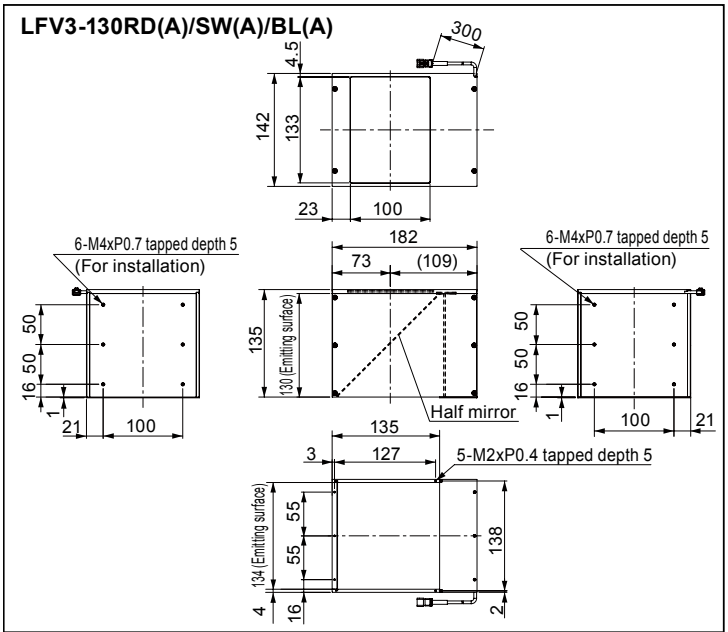
LFV3-70RD(A)/SW(A)/BL(A)



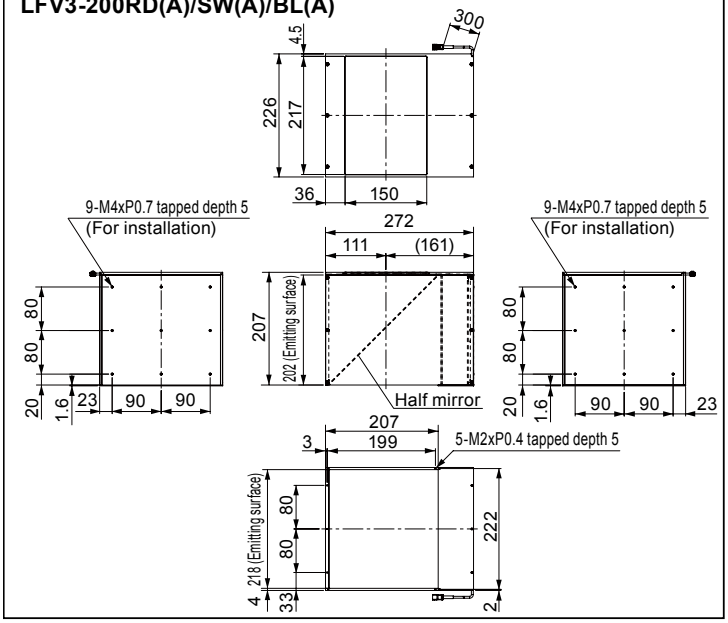
LFV3-100RD(A)/SW(A)/BL(A)



LFV3-130RD(A)/SW(A)/BL(A)



LFV3-200RD(A)/SW(A)/BL(A)



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