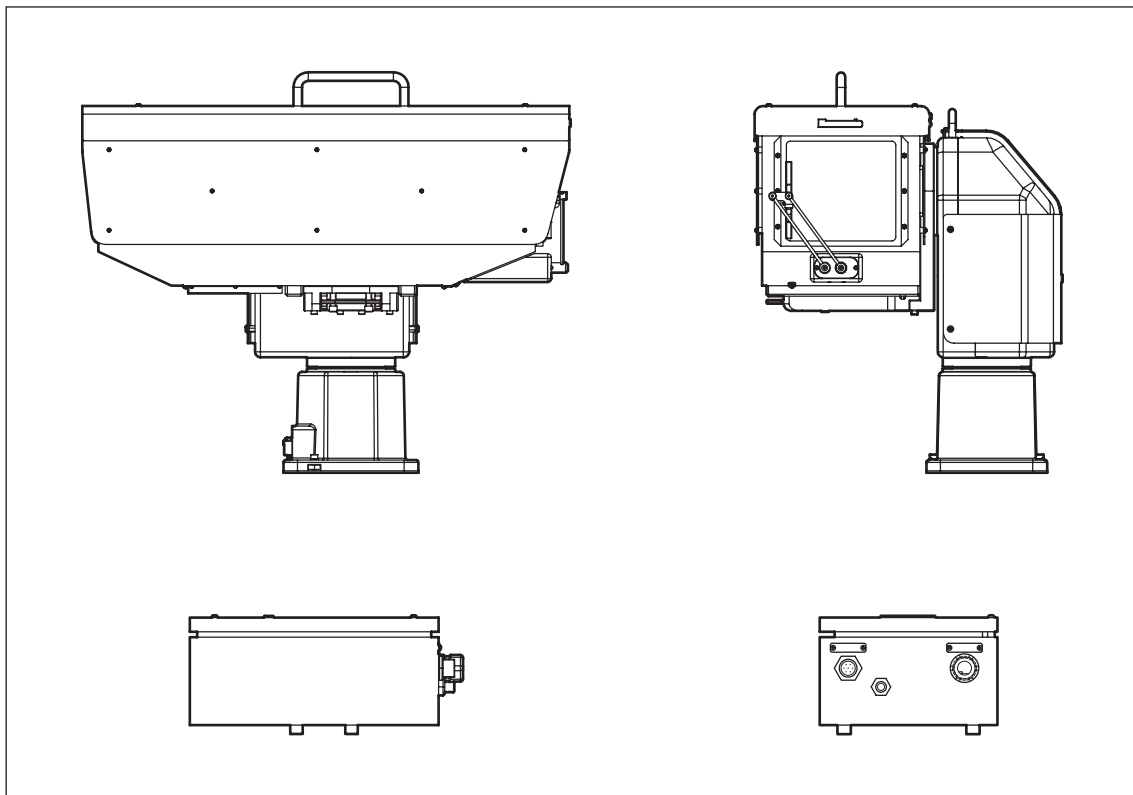


Operating Instructions



Outdoor Pan/Tilt Head AW-PH650N



Panasonic[®]

Before attempting to connect, operate or adjust this product,
please read these instructions completely.

Safety precautions

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER TO SERVICING TO QUALIFIED SERVICE PERSONNEL.		



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the appliance.

For CANADA

This class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

WARNING:

- TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.
- THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

WARNING:

TO PREVENT INJURY, THIS APPARATUS MUST BE SECURELY ATTACHED TO THE FLOOR/WALL IN ACCORDANCE WITH THE INSTALLATION INSTRUCTIONS.

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

FCC Note:

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning:

To assure continued FCC emission limit compliance, the user must use only shielded interface cables when connecting to external units. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate it.

CAUTION:

In order to maintain adequate ventilation, do not install or place this unit in a bookcase, built-in cabinet or any other confined space. To prevent risk of electric shock or fire hazard due to overheating, ensure that curtains and any other materials do not obstruct the ventilation.

Note:

The rating plate (serial number plate) is on the bottom of the unit.

The socket outlet shall be installed near the equipment and easily accessible or the mains plug or an appliance coupler shall remain readily operable.


A warning that an apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.


This product contains a CR Coin Cell Lithium Battery which contains Perchlorate Material — special handling may apply.
See www.dtsc.ca/gov/hazardouswaste.perchlorate.

 indicates safety information.

IMPORTANT SAFETY INSTRUCTIONS

Read these operating instructions carefully before using the unit. Follow the safety instructions on the unit and the applicable safety instructions listed below. Keep these operating instructions handy for future reference.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

 indicates safety information.

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Introduction

- This fitted type of outdoor pan/tilt head can be rotated upward by 50 degrees, downward to 95 degrees and horizontally by 320 degrees.
- Equipment such as a camera and lens with a total weight of 22 lbs (10 kg) can be mounted on the unit. (excluding housing)
- The shooting positions and settings for up to 50 positions can be registered as preset memory data.
- The unit's housing comes with a wiper and defroster.
- The unit's internal temperature is controlled by a heater and ventilating fan.
- The unit meets the IPX4 water-proofing protection standard.

Accessories

Main unit (AW-PH650 U02)	1	Lens holder, string and set of screws	1
Outdoor camera housing (AW-PH650 U03)	1	Camera mounting spacer and set of screws	1
AC adapter (AW-PH650 U01)	1	Pole mounting plate and set of screws	1
Power cable 98.4 ft (30 m) (VEEB0152)	1	Set of Allen keys	1
Multi cable 32.8 ft (10 m) (VEEB0133)	1	Housing mount frame	1
Camera cable 1.3 ft (40 cm) each	1	Filter	1
Convertible camera cable (VEEB0176)	1	Set of cable ties	1
AK-HC900 series cable (VEEB0177)	1		
AK-HC1500 cable (VEEB0178)	1		

• For details on the cables, refer to page 12 and following.

Precautions for use

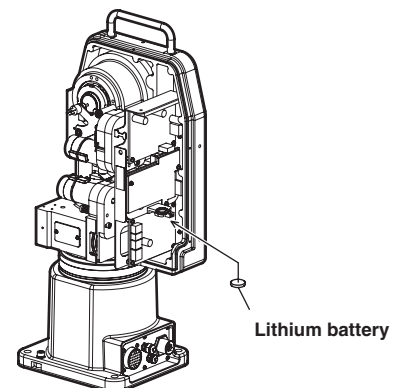
The AW-PH650 uses a manganese dioxide-lithium battery (CR2032).

Before discarding the pan/tilt head or its printed circuit boards, be absolutely sure to remove the battery.

Be absolutely sure to dispose of the removed battery in accordance with the applicable domestic laws and regulations.

Do not throw out the battery along with the general household garbage.

For the procedure to remove the battery, refer to the section on replacing the battery in "Replacement of consumable parts" (page 34).



Installation precautions

- Do not install this unit by suspending it, and do not install it on its side.
- While factoring in the weights of the unit and the load that the unit will bear, select an installation location which is conducive to fastening the unit securely and which is level and without unevenness. Fasten the unit securely so that it will not shake or be rickety when it is at rest or being rotated. Failure to secure the unit properly or looseness of the bolts may cause the product to fall off or fall down, possibly resulting in an accident.
- Bolts for installing the unit are not provided with the unit. Select bolts which are sufficiently strong and made of a material capable of with standing outdoor use.
- The maximum load which the unit can bear is 22 lbs (10 kg) (excluding the housing). The unit cannot be used with a load in excess of 22 lbs (10 kg).
- Upon completion of the pan/tilt head's installation, mount the housing. To prevent looseness in the places where the unit is mounted, be absolutely sure to use parts such as flat washers and spring washers for its installation.
- The power must be off while the installation or connection work is underway.
- Do not set the power switch of the AC adapter to ON until after checking that no mistakes have been made upon completion of all the installation and connection work.
- A ventilating fan is provided inside the housing. The fan can be controlled using the H/F button on the controller but it should normally be left at ON. Furthermore, do not block it or obstruct the ventilation while the unit is operating. Otherwise, heat will build up inside, possibly causing a fire. The ventilating fan is a consumable: as a general rule, replace it after about 40,000 hours of operation. (Be absolutely sure to ask your dealer to replace the fan.)
- **Steps to be taken prior to installation**
The AW-PH650 has function selector switches on its main unit (pan/tilt head) and housing. Since it may prove difficult to change the positions of these switches after installation, refer to ① cable compensation circuit settings (page 15), ② CPU circuit board switch settings (page 16) and ③ settings of the camera control selector switch inside the housing (page 25) prior to installation. Then set the switches to the positions that correspond to the operating conditions.
- Be absolutely sure to use water-proof connecting cables.
- Do not install the unit where the temperature will drop below -4°F (-20°C) or rise above 113°F (45°C) since operation will become unstable under these temperature conditions.
- Be absolutely sure to use the AC adapter provided with the unit as the power source of the pan/tilt head. (Batteries or other power supplies cannot be used.)
- The cable for connecting the power supply to the AC adapter is locally purchased. Read the operating instructions, and heed all the safety precautions to connect the cable.
- Do not turn the rotating part of the pan/tilt head by hand. If it is dropped or subjected to strong impact, it may fail or malfunction.
- Install the unit and set a travel range (limiters) to ensure that it will not come into contact with any objects in the vicinity when the unit including the housing has swiveled.
- Do not operate the controls on the pan/tilt head under any circumstances while installation or other work is underway. Before checking the pan/tilt head's operation and before actually using it, check that nobody is within the range of its rotation.
- Do not install the unit in a kitchen or other location where there is a lot of oil or grease.
- Check the following accessories supplied.

	Product	QTY	Specification
1	Power cable	1	Approx. 98.4 ft. (30 m)
2	Multi cable	1	Approx. 32.8 ft. (10 m)
3	Camera cable	1	For convertible camera
4	Camera cable	1	For AK-HC900 series
5	Camera cable	1	For AK-HC1500
6	Lens holder	1	For a large lens
7	Screws for lens holder	2	For M5 and M6
8	Washers for lens holder	2	$\phi 6$
9	String	1	Approx. 2.8 ft. (85 cm)
10	Camera mounting spacer	1	
11	Screws for camera mounting spacer	4	1/4", length: 13 mm
12	Washers for camera mounting spacer	4	$\phi 6$
13	Positioning screw	1	M5, length: 8 mm
14	Pole mounting plate (AC adapter)	1	
15	Screws for pole mounting plate	4	M8, length: 14 mm
16	Washers for pole mounting plate	8	$\phi 8$
17	Allen keys	3	For M5, M6 and M8
18	Housing mount frame	1	
19	Screws for housing mount frame	4	M5, length: 30 mm
20	Washers for housing mount frame	8	$\phi 5$
21	Filter	1	
22	Cable ties	5	Approx. 100 mm

Mounting (Pan/tilt head)

■ Precautions for installation

- Do not install this unit by suspending it, and do not install it on its side.

- Using the four pan/tilt head mounting holes, fasten the unit securely with bolts which are long enough.

The mounting holes have a diameter of $3/8"$ (10 mm). Use sufficiently long bolts with an $5/16"$ (8 mm) diameter. Do not use bolts with a diameter smaller than $5/16"$ (8 mm). Use hexagon head bolts or hexagon socket head bolts, for instance, which can be tightened up securely using a tool and which are made of a material and with a finish that will withstand outdoor use.

- Be absolutely sure to use parts such as flat washers or spring washers together with the bolts to prevent the bolts from coming loose.

■ How to install

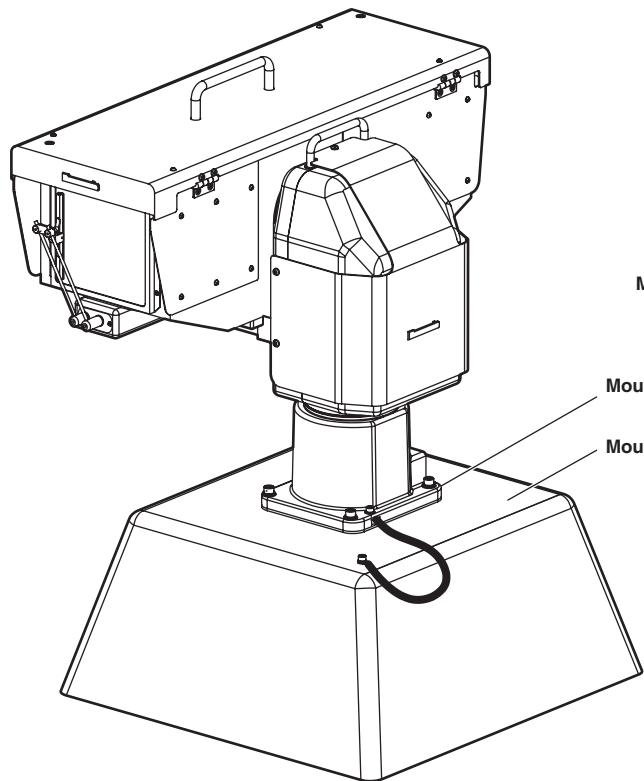
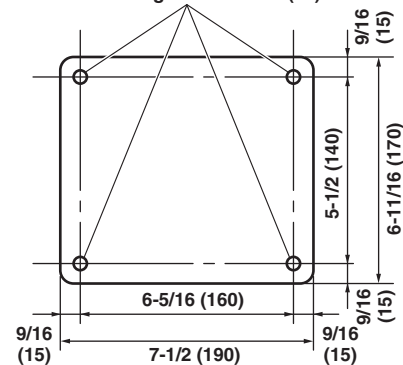
- Attach one end of the anti-fall wire to the mounting hole, and secure the other end to the mounting base or other sturdy place.
The diameter of the hole where the anti-fall wire is attached is 6.5 mm. Attach the wire using the anti-fall wire mounting bolts with a 6 mm diameter and a length of 16 mm, flat washers, spring washers and nuts.

Ensure that the anti-fall wire is strong enough to bear the weight of the entire pan/tilt head (head, housing, camera and cable).

<Dimensions of area where unit is mounted>

Unit: inch (mm)

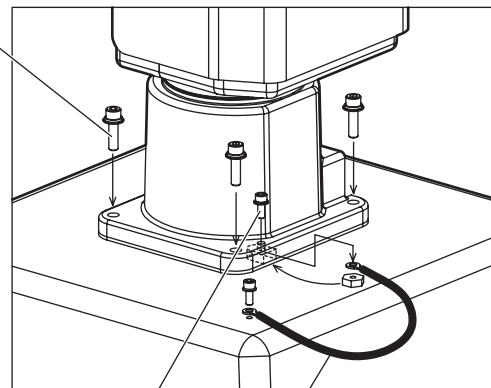
The diameter of the four pan/tilt head mounting holes are $3/8$ (10).



Mounting bolts

Mounting area

Mounting base



Anti-fall wire bolt

Anti-fall wire

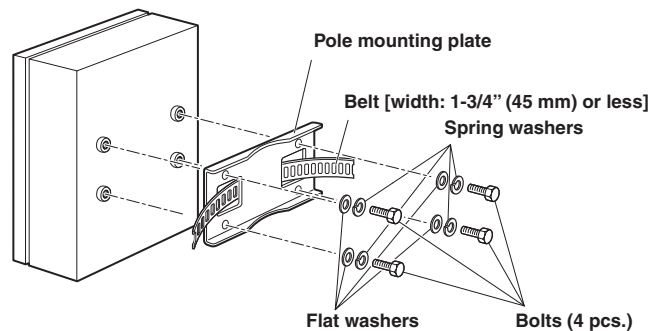
Mounting (AC adapter)

■Precautions for installation

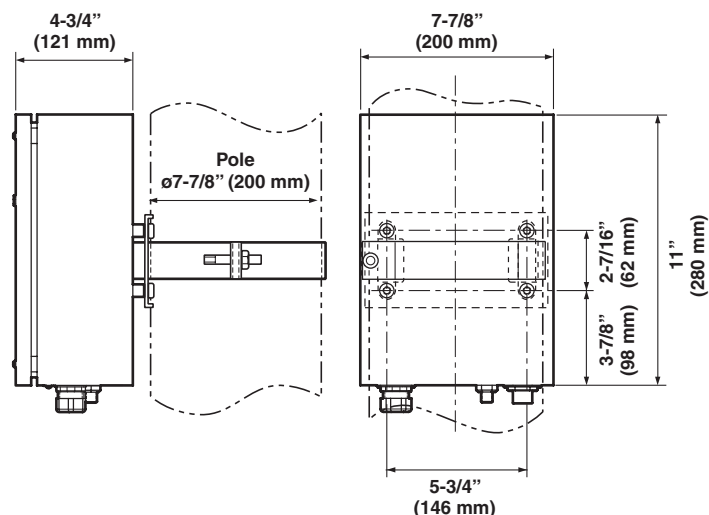
- Be sure to use water-proof connecting cables.
- Be sure to keep AC power switched off during installation and connection.
- Before pressing the power switch on, make sure that all parts, including the housing and pan/tilt head, have been installed and connected completely and free of errors.
- Do not install the AC adapter at a cold place [below -4°F (-20°C)] or a hot place [over 113°F (45°C)] because extremely low or high temperature will cause operation instability.

■How to install

- ① Fasten the pole mounting plate (supplied) and the belt (to be locally purchased) on the back of the AC adapter with the four bolts, flat washers and spring washers (For M8: supplied).

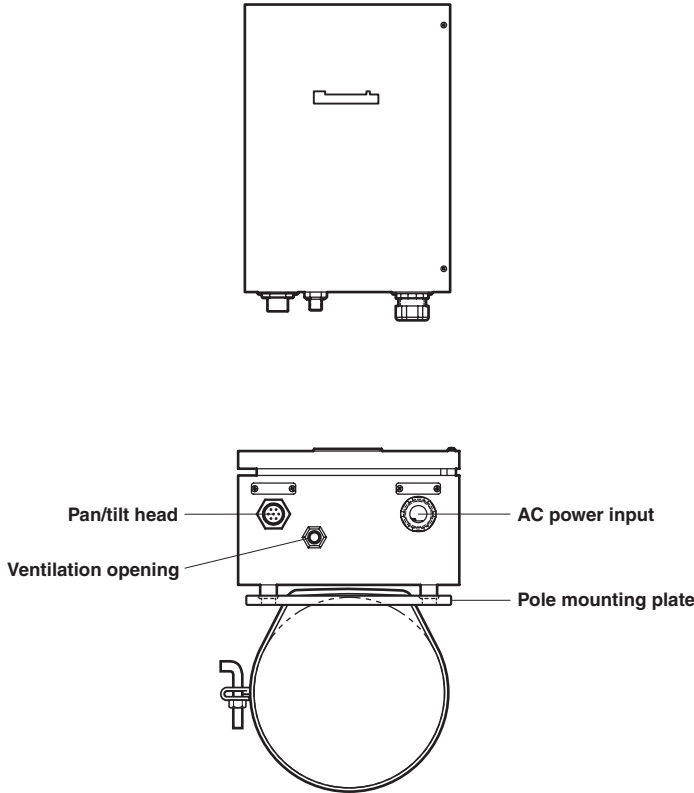


- ② Fasten the AC adapter to the pole using the pole mounting plate and the belt.



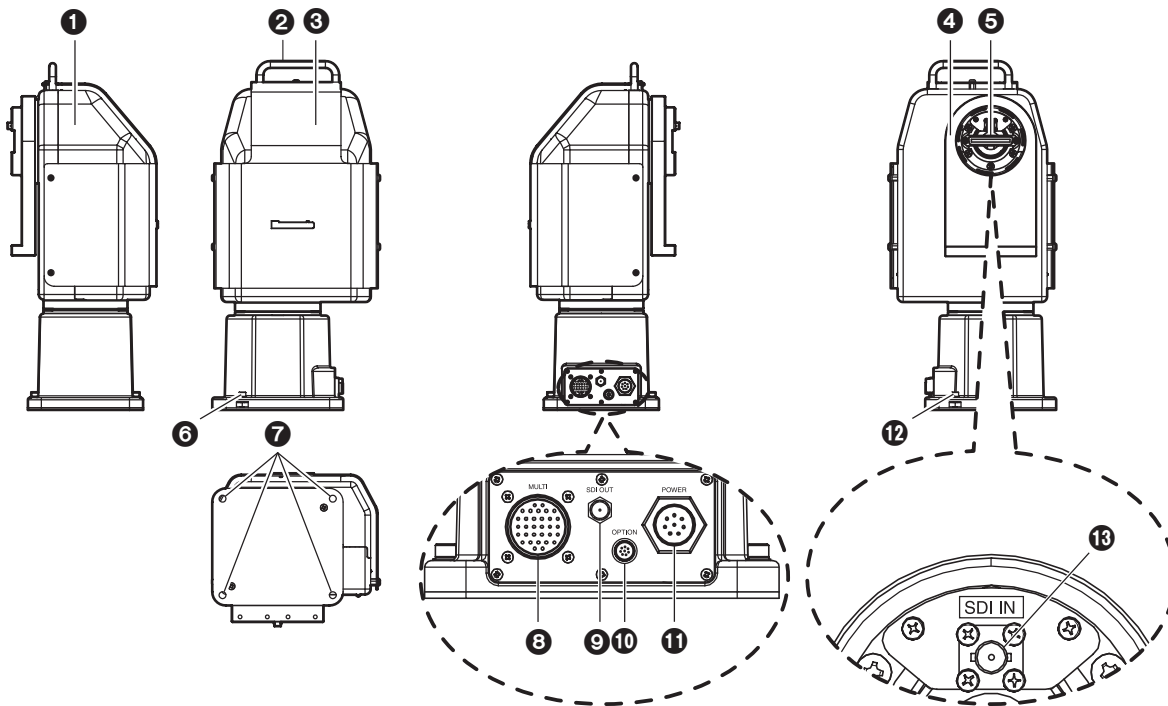
Mounting (AC adapter)

- ③ Connect the cables. (Refer to the “Connections”.)
Make the distance between the AC adapter and pan/tilt head less than the length (30 m) of the power cable supplied.



Parts and their functions

■ Main unit (Pan/tilt head)



1 Main unit cover

The sunshade cover and main unit cover must be removed when the cable compensation circuit or landing characteristics are to be changed.

2 Grip

Used in carrying, installing, or lifting the pan/tilt head.

3 Sunshade cover

This cover protects the pan/tilt head from direct exposure to sunlight.

4 Rotary arm

Mount the housing after having installed the housing mount frame.

5 I/F connector

Connect this to the I/F connector of the camera housing.

6 Anti-fall wire bolt

This bolt fastens the anti-fall wire which prevents the pan/tilt head from falling from its installed position.

7 Pan/tilt head mounting holes (×4)

These holes are used to install and secure the pan/tilt head.

8 Multi connector [MULTI]

The supplied multi cable is connected here.

9 Coaxial connector [SDI OUT]

This is used for outputting the SDI or other signals which have been input from 13.

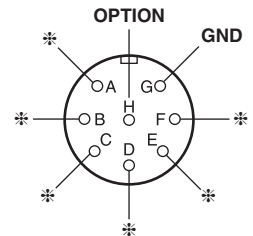
10 Option connector [OPTION]

The control signals of the controller's OPTION button are output from this connector.

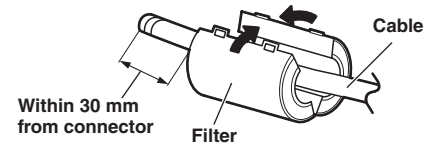
Be absolutely sure to use a water-proof cable.

The compatible connector is the R28-P8M4.8 made by Tajimi Electronics Co., Ltd.

A filter (supplied) must be installed around the cable. Install it at a distance within 30 mm from the connector. Waterproof the filter using tape or tube, for instance.



* Service connector
(View of connector as seen from the cable)



11 Power connector [POWER]

The supplied power cable is connected here.

12 Grounding bolt

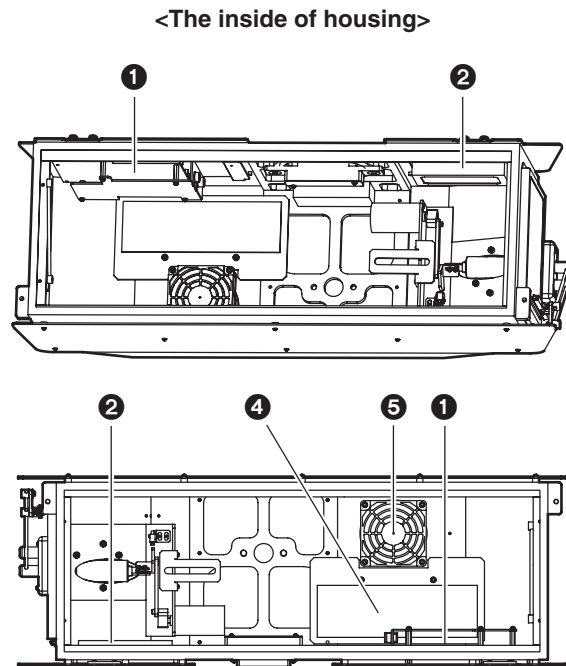
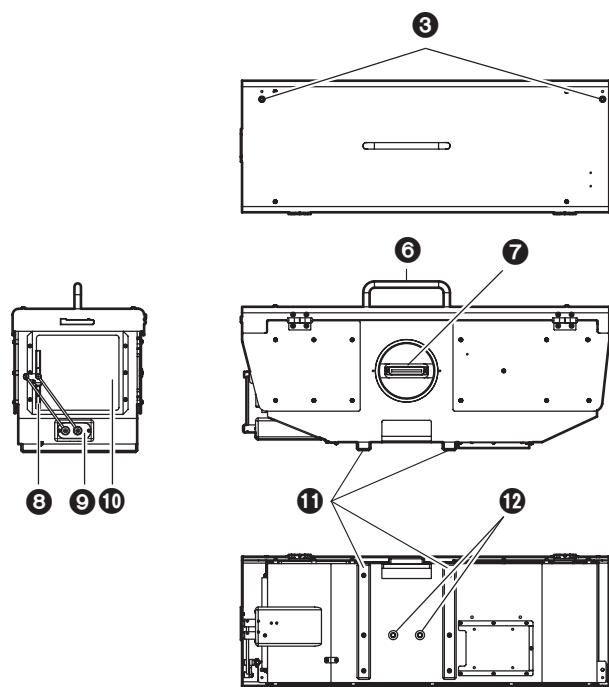
This bolt is used to connect the wire for system grounding (frame grounding bolt).

13 Coaxial connector [SDI IN]

When an SDI card is installed in the camera, this connector is connected to the SDI signal output connector.

Parts and their functions

■ Housing unit



① Camera housing control board

Connect the supplied camera cable.

② Air filter

Air is taken in through the air filter. Replace it when it is clogged up.
(Whenever the air filter needs replacement, ask the store where you purchased the product to do the job.)

③ Top cover open/close bolts (×2)

Loosen using the supplied Allen key, open the top cover.

④ Heater

When the controller's H/F switch is at ON, the heater will come on whenever the temperature inside the camera housing drops.

⑤ Ventilating fan

When the controller's H/F switch is at ON, the fan will come on whenever the temperature inside the camera housing rises.
Depending on the temperature, the fan operates at the high or low setting.
Use the switch at the ON setting because a high camera temperature will adversely affect the camera's performance.

⑥ Grip

Used to carry the camera housing.

⑦ I/F connector

Connect this to the I/F connector on the main unit.

⑧ Wiper blade

Replace the wiper blade when it can no longer wipe off waterdrops well.
How to replace it: Raise the blade at the center, pull it up and off, and fit a new blade in its place.
After replacing the blade, check that the two rods holding the wiper blade are parallel to the glass surface.
(Whenever the wiper blade needs replacement, ask the store where you purchased the product to do the job.)

⑨ Wiper unit

Used to wipe off waterdrops during or after a rain. The wiper operates when the WIP switch on the controller is pressed on.

⑩ Defroster

The anti-fogging heater is vapor-deposited. It turns on when the controller's DEF switch is set to ON, and it is turned off by the thermo switch when the temperature rises above the rating.

⑪ Housing mounting rails

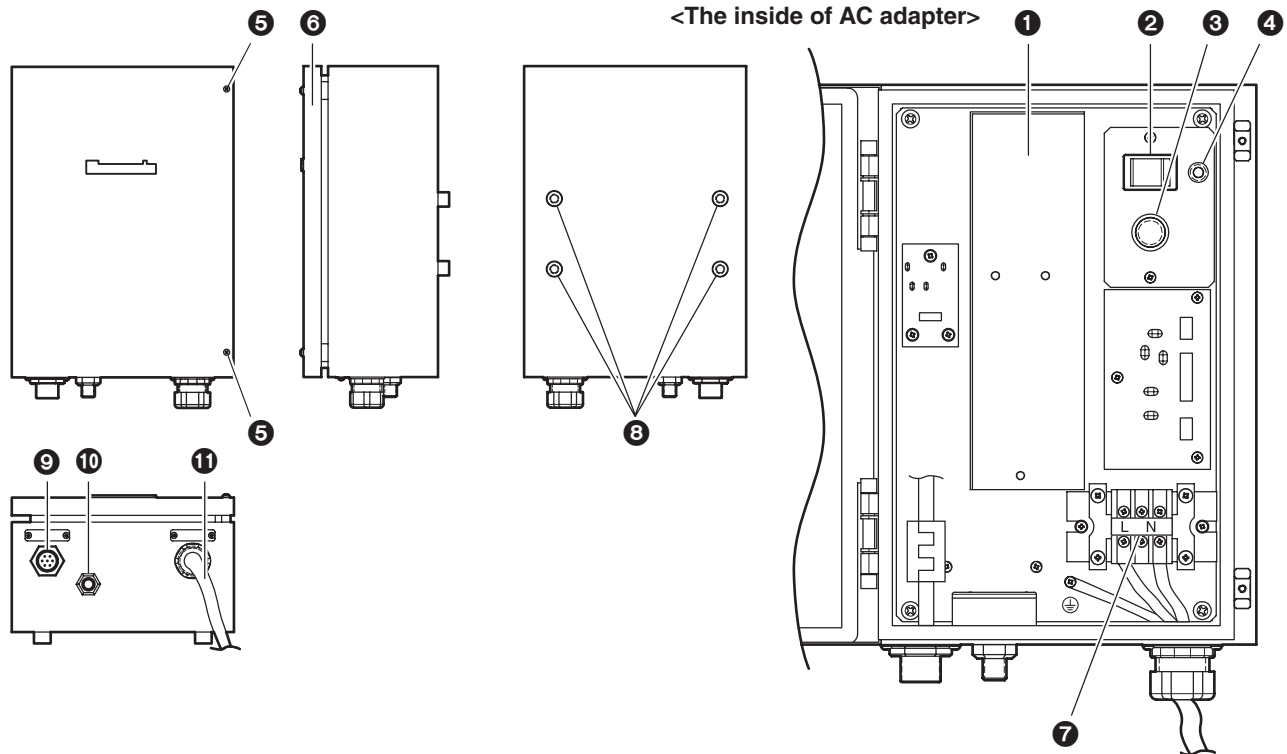
Align the rails with the housing mount frame which is installed on the rotary arm of the main unit, and slide the housing along the rails.

⑫ Housing mounting screw holes (×2)

Use these holes to secure the housing using the housing securing bolts provided with the housing mount frame which has been installed on the rotary arm of the main unit.

Parts and their functions

■ AC adapter unit



① DC power unit

This unit supplies a DC output of 15 V, 10 A (maximum) when an AC input of 120 V is supplied.

② Power switch [POWER ON/OFF]

This switch is used to supply AC power to the DC power unit. Keep the switch in the ON position during use.

③ Fuse holder/fuse

A fuse for protecting the DC power unit is in the fuse holder. A burnt fuse may be caused by a DC power unit defect. In such a case, consult the store where you purchased it.

④ Power LED

This lights up red when the power switch ② is at ON. This is off when the power switch ② is at OFF.

⑤ Cover fastening screws (×2)

To ensure safety, be absolutely sure to tighten up these screws and close the cover upon completion of the installation work.

⑥ Cover

Loosen the two cover fastening screws ⑤ and open the cover to proceed with the connections. When closing the cover, first close the cover, and then be absolutely sure to tighten up the two fastening screws.

Since malfunctions or other trouble may result if the screws are not tightened enough, be absolutely sure to use a screwdriver to tighten them up.

⑦ AC power input terminal board

This terminal board is for connecting AC input power. (AC 120 V, 60 Hz, 120 W)

⑧ AC adapter mounting screw holes (×4)

Attach the supplied pole mounting plate to these screw holes when the AC adapter is to be mounted on a pole or other support.

⑨ DC output connector [DC15 V OUT]

Connect this connector to the [POWER] connector on the main unit using the supplied power cable.

⑩ Ventilation opening

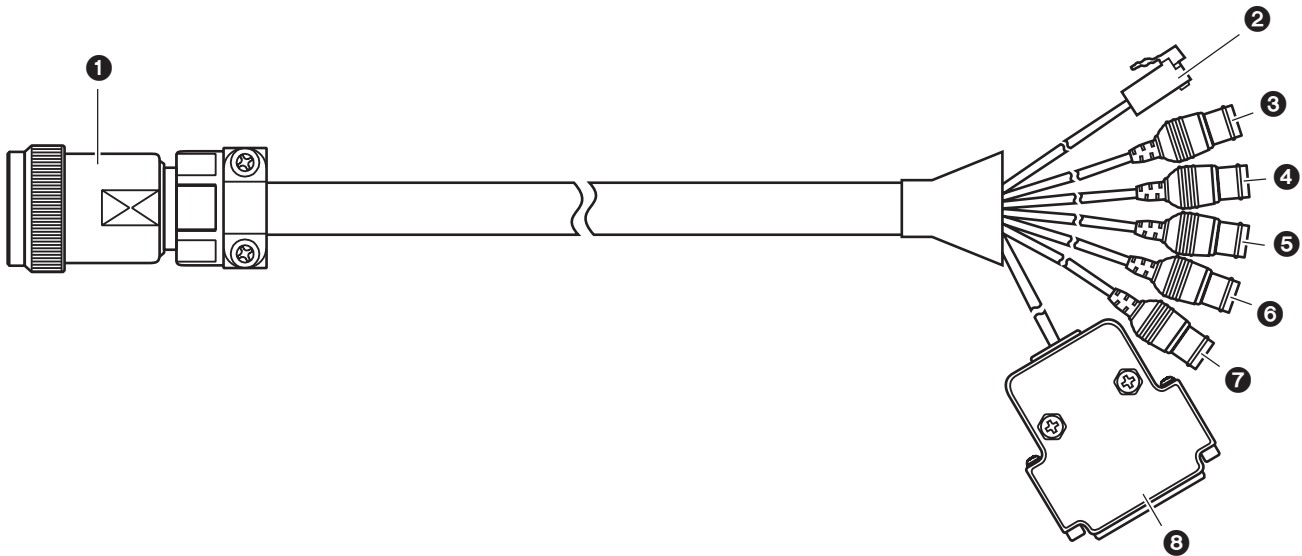
⑪ AC power input cable [AC IN]

This is the AC power input cable. It is held in place by the fixed bushing.

Parts and their functions

■ Supplied cable unit

<Multi cable> (VEEB0133)



① 24P round water-proof plug (male)

Connect this to the multi connector [MULTI] on the main unit.

② RJ-45 modular plug

Connect this to pan/tilt head controller. It can be extended up to 3281 ft. (1000 m). To extend the connection, use a relay adapter purchased on the market and use a 10BASE-T straight cable (UTP category 5) for the extension.

③ VIDEO OUT BNC jack

This is the output connector for the camera's video signals. Use a BNC coaxial cable for the connecting cable.

④ Y OUT BNC jack

This is the output connector for the camera's video signals. Use a BNC coaxial cable for the connecting cable.

⑤ Pr OUT BNC jack

This is the output connector for the camera's video signals. Use a BNC coaxial cable for the connecting cable.

⑥ Pb OUT BNC jack

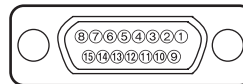
This is the output connector for the camera's video signals. Use a BNC coaxial cable for the connecting cable.

⑦ G/L IN BNC jack

This is the gen-lock signal input jack. Use a BNC coaxial cable for the connecting cable.

⑧ D-SUB 15P connector (male)

Connect the controller used for the multi purpose camera to this connector. When connecting it directly, remove the stud prior to use.



Pin No.	Signal name
1	---
2	9
3	10
4	11
5	12
6	13
7	14
8	15

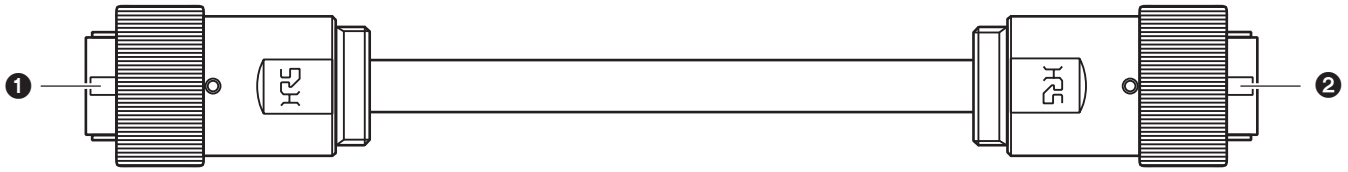
	GND

	TXD (C)

	RXD (H)
	TXD (H)
	RXD (C)

Parts and their functions

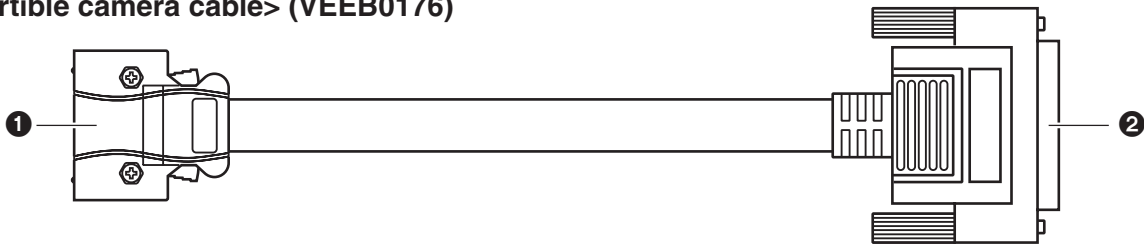
<Power cable> (VEEB0152)



- 1 7P round water-proof plug (female)**
Connect this to the power connector [POWER] on the main unit.

- 2 7P round water-proof plug (male)**
Connect this to the DC output connector [DC 15V OUT] on the AC adapter.

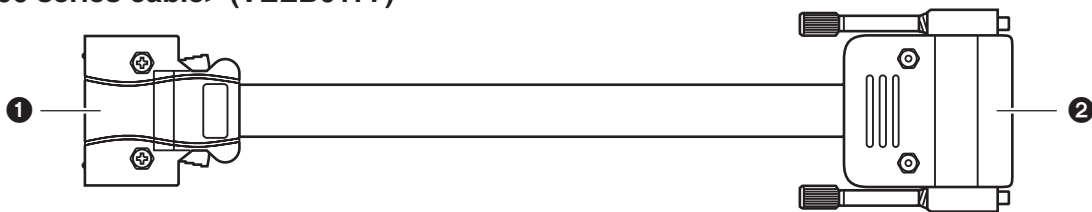
<Convertible camera cable> (VEEB0176)



- 1 26P connector (male)**
Connect this to the CAMERA I/F connector [CAMERA I/F] on the housing.

- 2 50P connector (male)**
Connect this to the CAMERA I/F connector [CAMERA I/F] on the convertible camera.

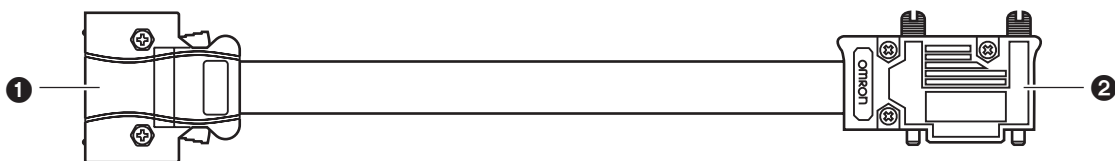
<AK-HC900 series cable> (VEEB0177)



- 1 26P connector (male)**
Connect this to the CAMERA I/F connector [CAMERA I/F] on the housing.

- 2 D-SUB 15P connector (female)**
Connect this to the I/F connector [CAMERA I/F] on the AK-HC900 series.

<AK-HC1500 cable> (VEEB0178)



- 1 26P connector (male)**
Connect this to the CAMERA I/F connector [CAMERA I/F] on the housing.

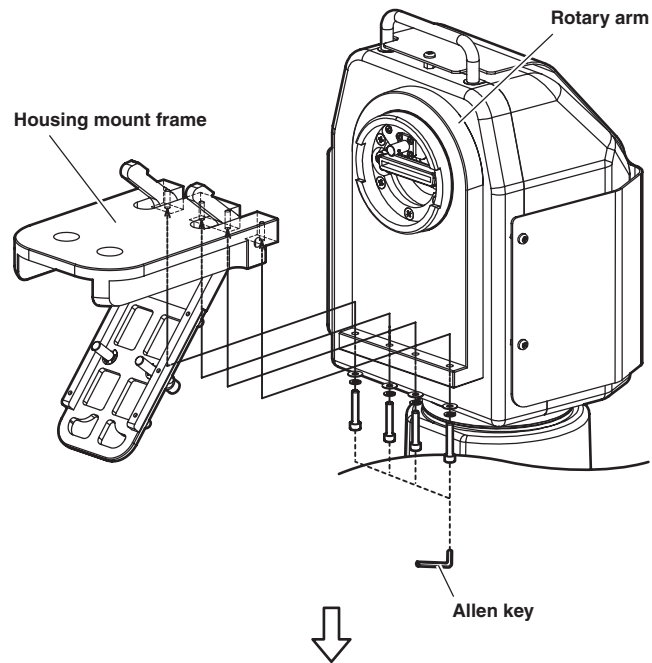
- 2 High-density D-SUB 15P connector (male)**
Connect this to the I/F connector [I/F] on the AK-HC1500.

Installation

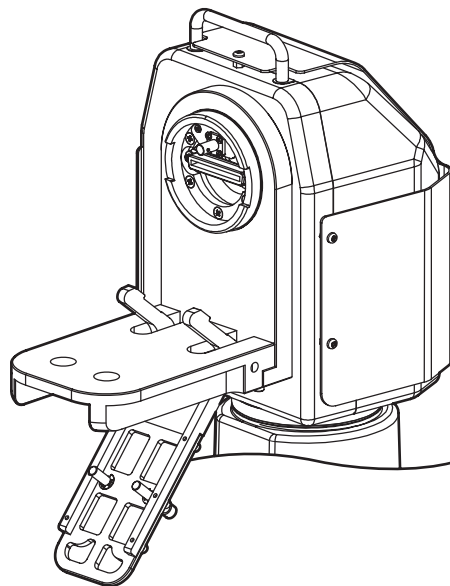
■ Installing the housing mount frame

Attach the housing mount frame (supplied) to the rotary arm of the main unit.

- ① Attach the housing mount frame to the rotary arm as shown in the figure below. The screws must be installed together with the flat washers and spring washers (supplied).
 - Using the supplied Allen key, install the frame securely to prevent looseness in the four places where the screws are used.



<Housing mount frame installed on rotary arm>

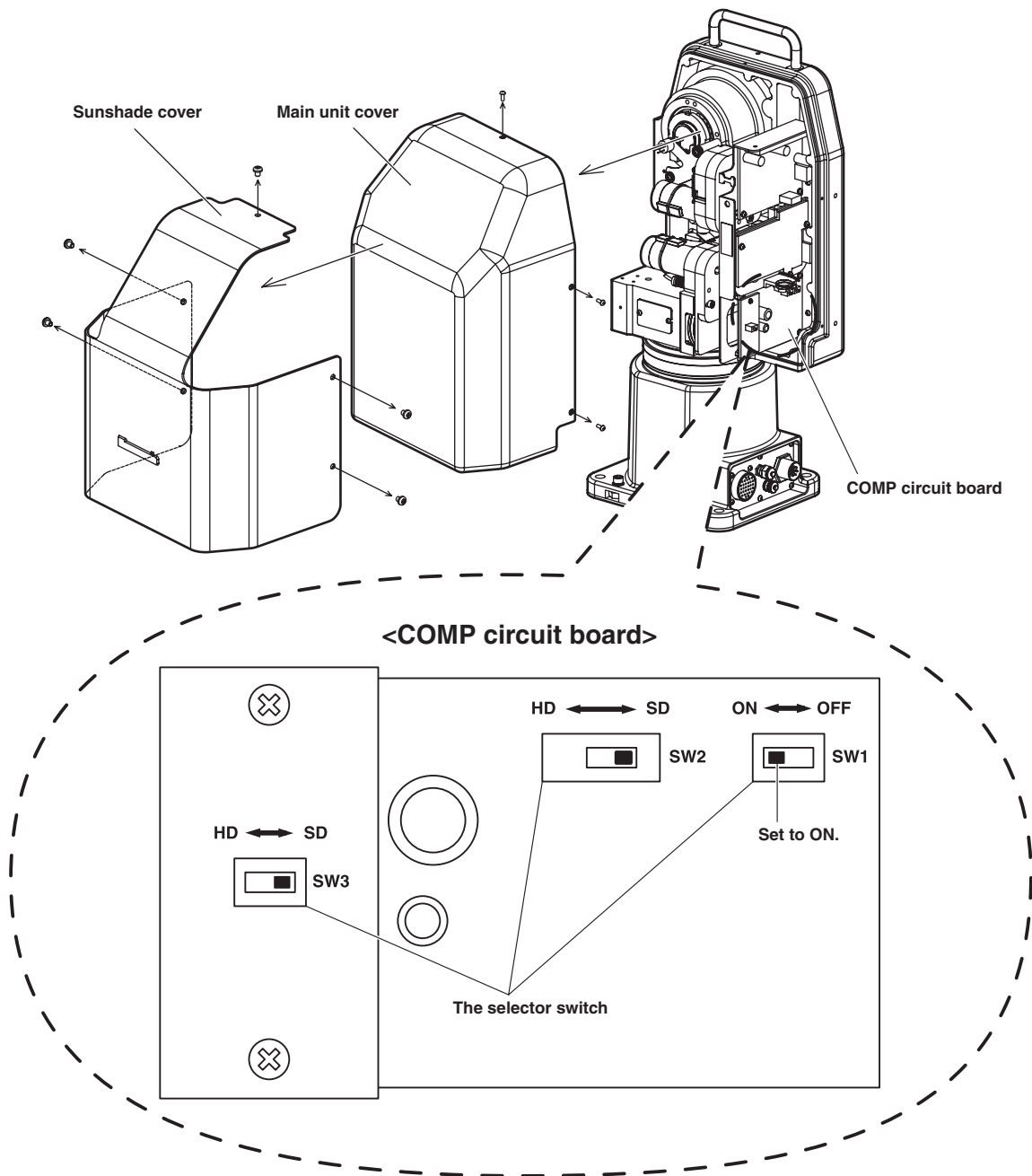


Installation

■ Cable compensation circuit settings

When the pan/tilt head and controller have been connected, the maximum allowable length of the connecting cables is 3281 ft. (1000 m) for the 10BASE-T straight cable (UTP category 5) and coaxial cable (BELDEN 8281). However, when using the cables beyond a distance of 1640 ft. (500 m), set the cable compensation circuit to ON by following the steps. (The factory setting is OFF.)

- ① Remove the five screws used to attach the sunshade cover to keep direct sunlight off the unit, and remove this cover.
- ② Remove the five screws used to attach the pan/tilt head main unit cover, and remove this cover.
- ③ Set the SW1 on the internal COMP circuit board to ON.
- ④ Return the main unit cover and sunshade cover to their original positions, and use the mounting screws to fasten them securely.

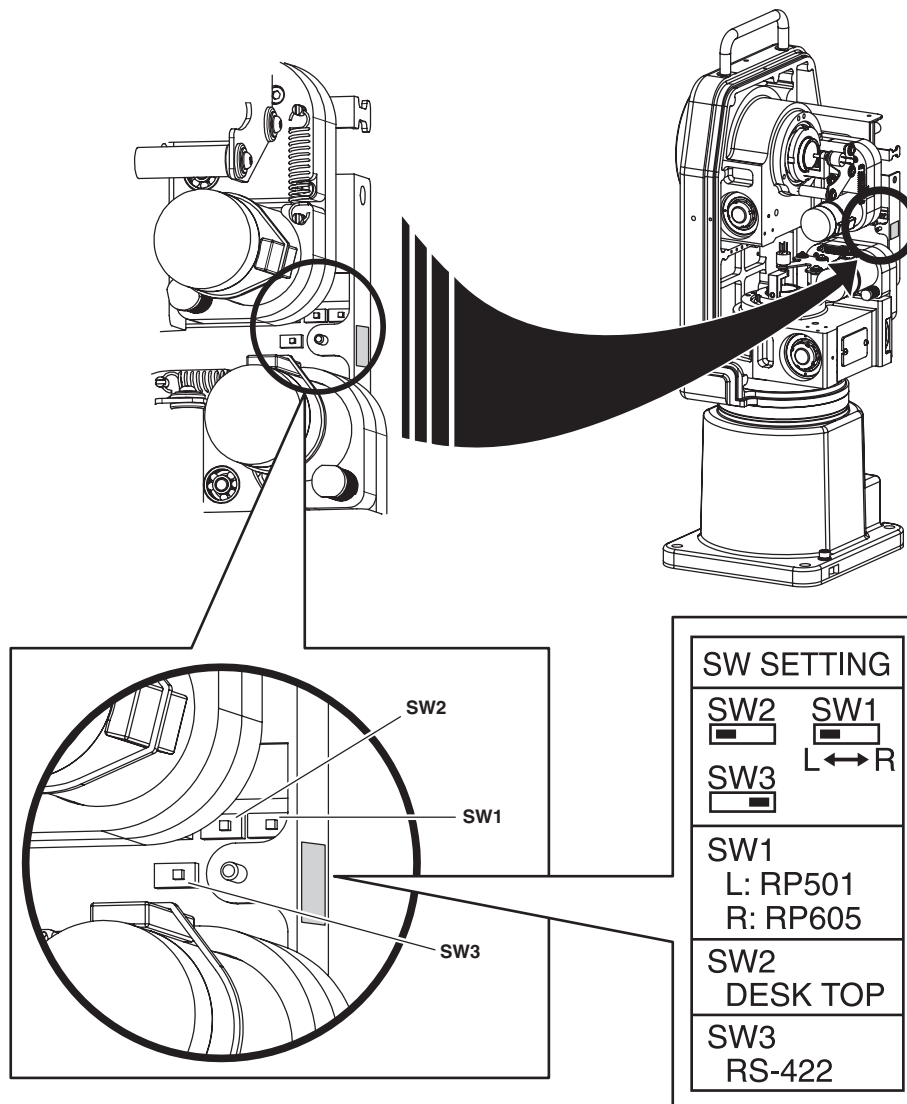


When sending HD analog component signals using the AK-HC910 or AK-HC900, set SW2, SW3 to HD. At this switch setting, the cable compensation circuit will not work even if SW1 is set to ON so set SW1 to OFF.

Installation

■ CPU circuit board switch settings

Set switches SW1, SW2 and SW3 on the CPU circuit board as follows.



- ① SW1 (Selector switch for landing characteristics)
For a soft landing: Set SW1 to the left position (RP501). (Factory setting)
For an exact landing: Set SW1 to the right position (RP605).
- ② SW2
Do not change the position of this switch. Continue to use it at the DESK TOP position.
- ③ SW3
Do not change the position of this switch. Continue to use it at the RS-422 position.

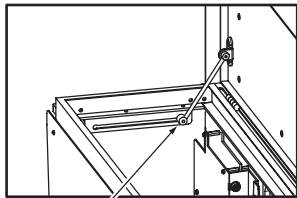
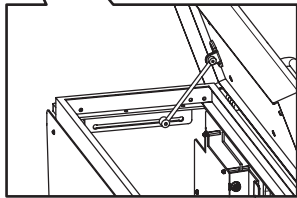
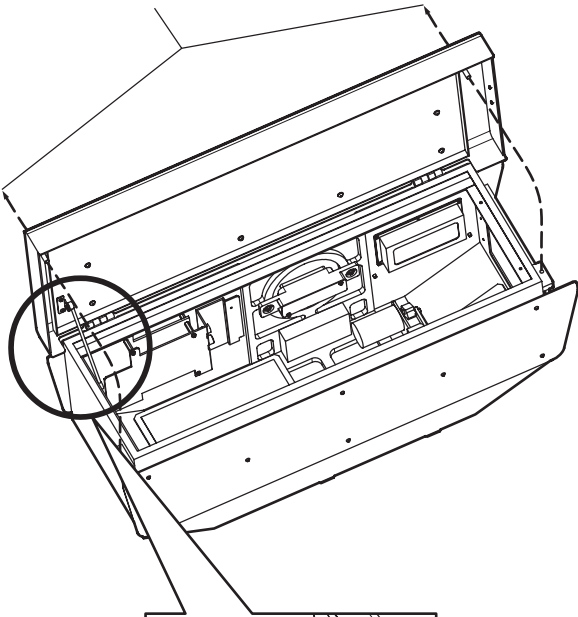
- Before setting these switches, be absolutely sure to turn off the power of the AC adapter connected to the pan/tilt head.
- The switch settings are not changed simply by changing the position of the switches.
After changing the position of a switch, turn the power off and then back on to actually change the setting of that switch.

Installation

How to install the camera

- ① Loosen the bolts for opening and closing the top cover, and open the top cover.

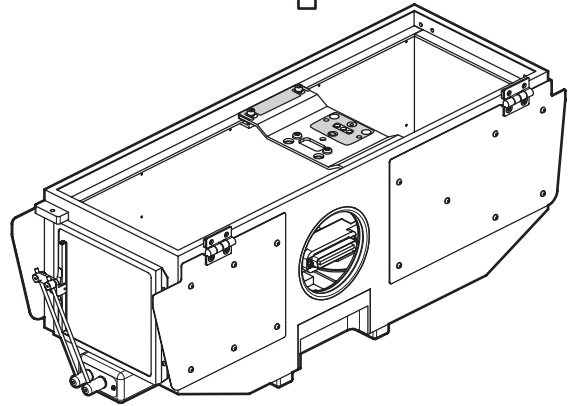
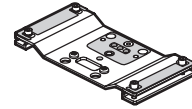
Loosen the top cover open/close bolts



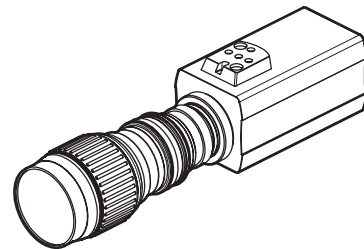
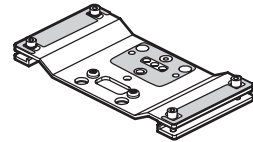
The support arm completely enters the groove.

- * Open the top cover until the support arm completely enters the groove.
Bear in mind that it will not be possible to lock the top cover if the arm is not completely in.

- ② Remove the camera mount.



- ③ Install the camera on the camera mount.

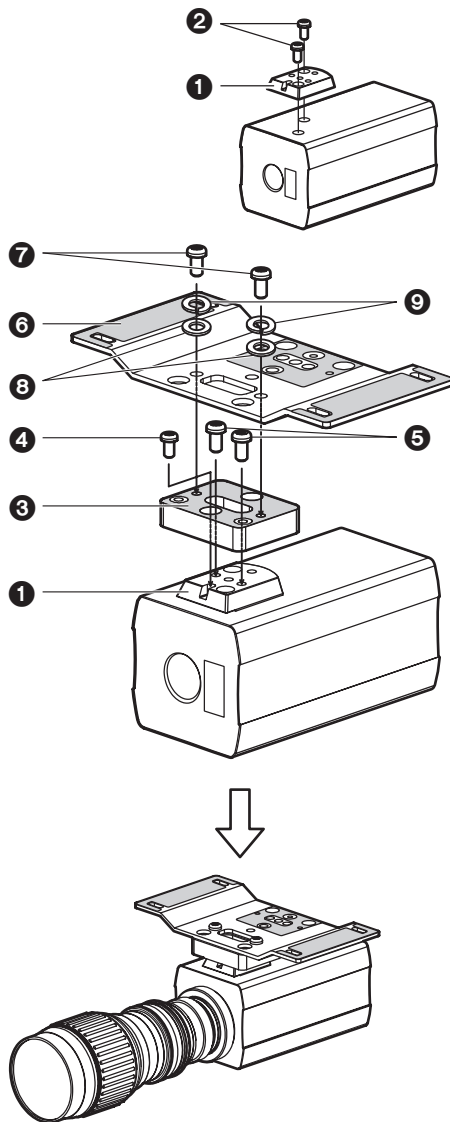


- * For details on how to install the camera and mount, refer to the instructions on the following pages.

Installation

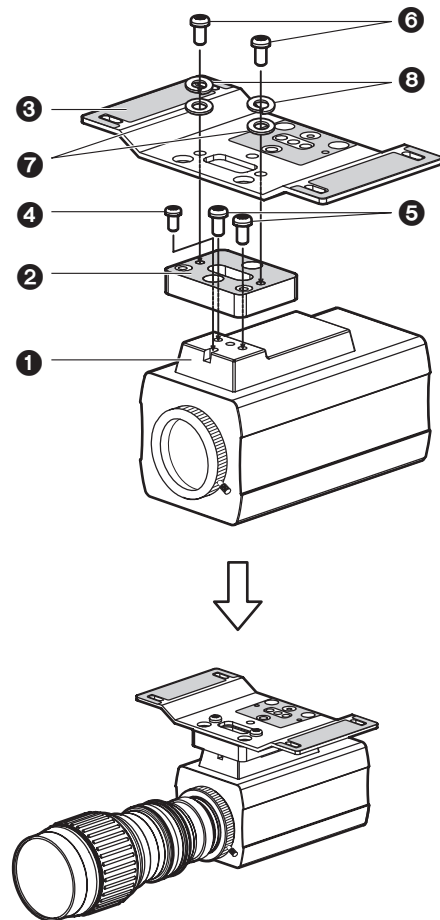
<When the AW-E350 or AW-E650 camera is used>

- ① Use the 2 screws ② supplied with the camera to attach the mounting adapter ① (supplied with the camera) to the top panel of the camera.
- ② Attach the positioning screw ④ (supplied) to the camera mounting spacer ③.
- ③ Use the 2 screws ⑤ (supplied) to attach the camera mounting spacer ③ to the mounting adapter ① (supplied with camera) on the top panel of the camera.
- ④ Attach the camera mount ⑥ to the camera mounting spacer ③ using the 2 screws ⑦, flat washers ⑧ and spring washers ⑨ (supplied).
(Make sure that the two sides of the camera mount are higher than the central area that is attached.)
- ⑤ Attach the lens to the camera.
Remove the lens hood and zoom lever.



<When the AW-E750 or AW-E860 camera is used>

- ① Attach the positioning screw ④ (supplied) to the camera mounting spacer ②.
- ② Use the 2 screws ⑤ (supplied) to attach the camera mounting spacer ② to the fan mounting seat ① on the top panel of the camera.
- ③ Attach the camera mount ③ to the camera mounting spacer ② using the 2 screws ⑥, flat washers ⑦ and spring washers ⑧ (supplied).
(Make sure that the two sides of the camera mount are higher than the central area that is attached.)
- ④ Attach the lens to the camera.
Remove the lens hood and zoom lever.



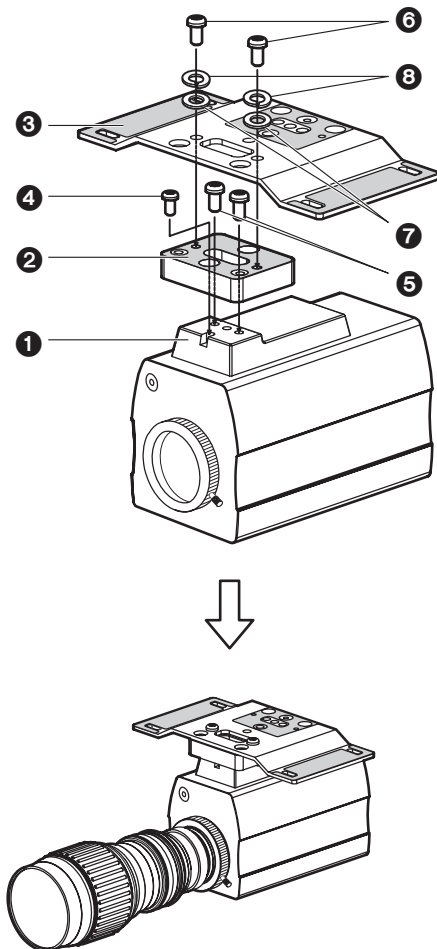
The camera mount in the opposite direction from when the AW-E655 is used as the camera.

To ensure that none of the screws are loose, use a tool to tighten them up securely.

Installation

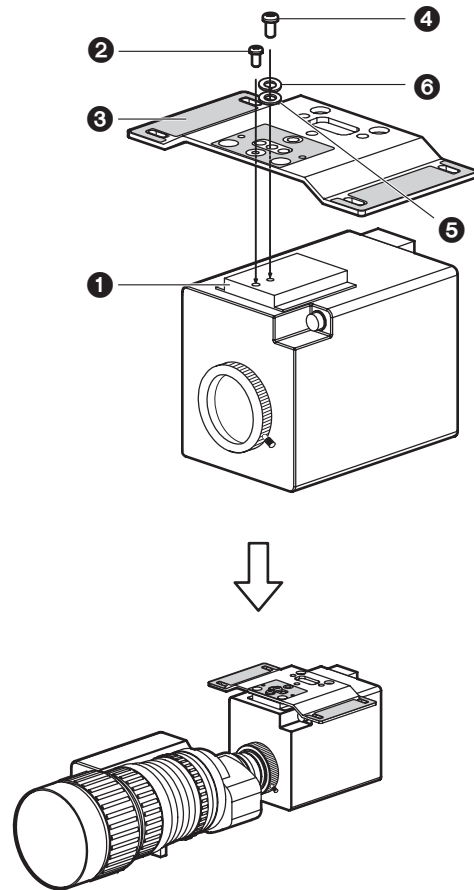
<When the AW-E655 camera is used>

- ① Attach the positioning screw ④ (supplied) to the camera mounting spacer ②.
- ② Use the 2 screws ⑤ (supplied) to attach the camera mounting spacer ② to the fan mounting seat ① on the top panel of the camera.
- ③ Attach the camera mount ③ to the camera mounting spacer ② using the 2 screws ⑥, flat washers ⑦ and spring washers ⑧ (supplied).
(Make sure that the two sides of the camera mount are lower than the central area that is attached.)
- ④ Attach the lens to the camera.
Remove the lens hood and zoom lever.



<When the AK-HC910 camera is used>

- ① Attach the positioning 1 screw ② (supplied) to the camera mount ③.
- ② Attach the camera mount ③ to the fan mounting part ① on the top panel of the camera using the 1 screw ④, flat washer ⑤ and spring washer ⑥ (supplied). (The camera mount points toward the front or back in the opposite way from a convertible camera. For pointing upward or downward, make sure that the two sides of the camera mount are lower than the central area that is attached.)
- ③ Attach the lens to the camera.
Remove the lens hood and zoom lever.



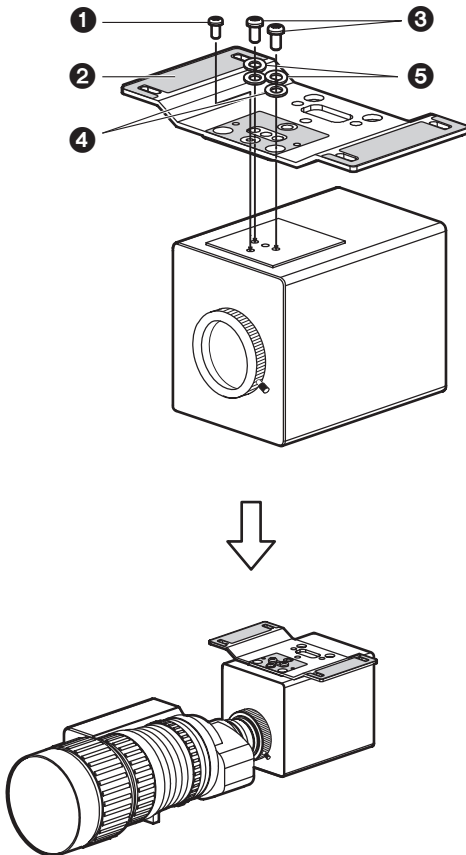
The camera mount in the opposite direction from when the AW-E750, AW-E860 is used as the camera.

To ensure that none of the screws are loose, use a tool to tighten them up securely.

Installation

<When the AK-HC1500 camera is used>

- ① Attach the positioning 1 screw ① (supplied) to the camera mount ②.
- ② Attach the camera mount ② using the 2 screws ③, flat washers ④ and spring washers ⑤ (supplied).
(The camera mount points toward the front or back in the opposite way from a convertible camera. For pointing upward or downward, make sure that the two sides of the camera mount are higher — which is the opposite from when the AK-HC910 is used — than the central area that is attached.)
- ③ Attach the lens to the camera.
Remove the lens hood and zoom lever.



The camera mount in the opposite direction from when the AK-HC910 is used as the camera.

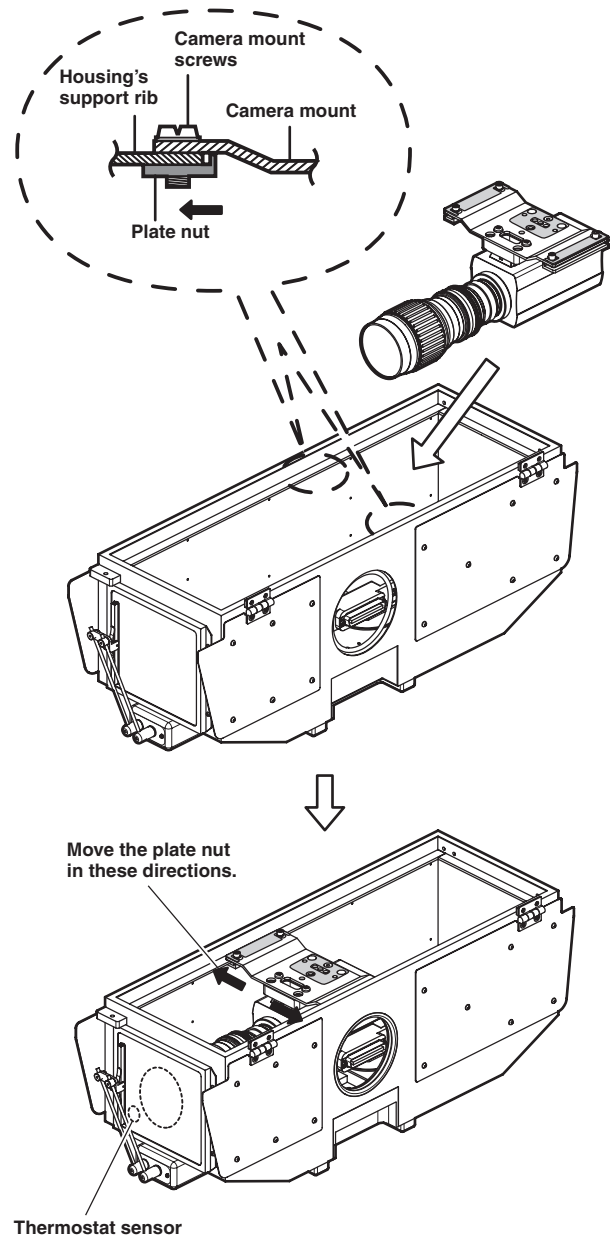
To ensure that none of the screws are loose, use a tool to tighten them up securely.

Installation

<When a regular lens is used>

- ① Sandwich the housing's support rib between the camera mount and plate nut of the camera on which the camera mount has been installed, and provisionally secure it using the camera mount screws.
- ② Connect the camera with the lens to the interior of the housing using the cable.
- ③ Upon completion of the connection, loosen the camera mount screws, and move the entire camera so that the front of the camera lens comes as close as possible to the inside surface of the glass. Bear in mind the following points.
 - (1) Set to a position where the lens and glass will not come into contact when the lens is maximally zoomed out.
 - (2) Check that the inside surface of the glass and lens glass surface are more or less parallel with each other and that the thermostat sensor and lens do not touch.
- ④ Upon completion of all the settings, move the plate nut in the directions of the arrows, sandwich the housing's support rib tightly between the plate nut and camera mount, and securely tighten up the 4 screws for installing the camera mount.
- ⑤ Close the top cover, and tighten the two bolts for opening and closing the top cover securely.

A portable lens (grip equipped type) cannot be used.



Installation

<When a large lens is used>

A large lens can be attached to the AK-HC910 or AK-HC1500, and stowed inside the housing for use. In a case like this, attach it by following the steps below.

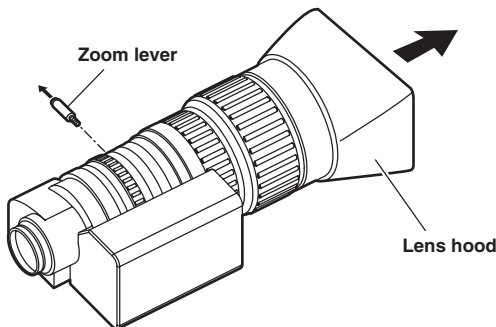
Use any of the large lenses listed below.

- HA42 × 13.5 BERD or A42 × 13.5 BERD made by Fujinon Corporation
- HJ40 × 14B IASD-V or J35e × 15B IASD made by Canon Inc.

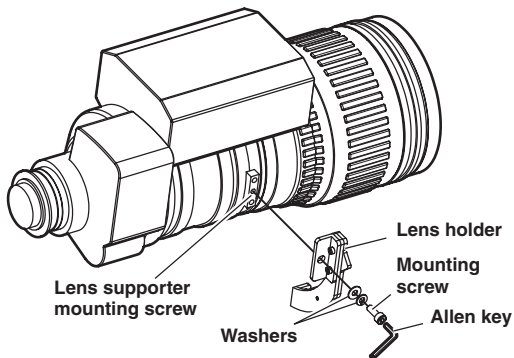
No other lenses can be used.

■ How to attach the lens

- ① Remove the lens hood and zoom lever of the large lens.



- ② Attach the lens holder (supplied) to the lens supporter mounting screw on the bottom of the lens.

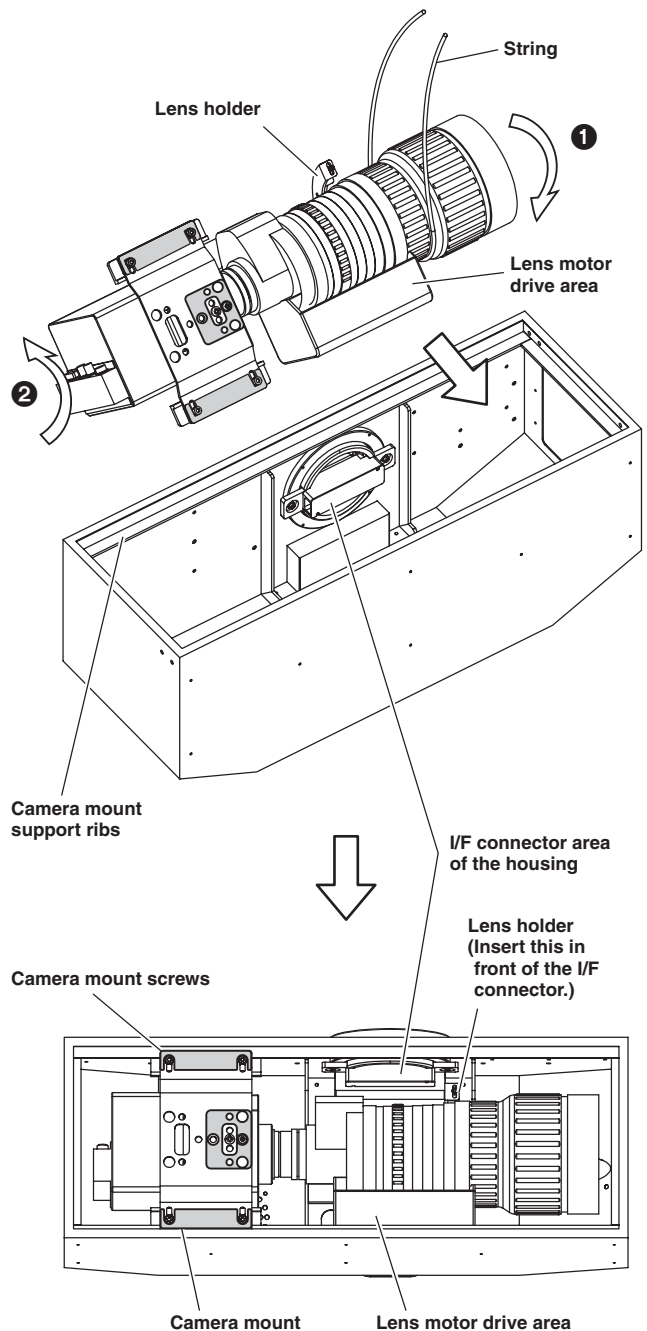


M6 mounting screws (supplied) are used for a Fujinon lens; M5 mounting screws (supplied) are used for a Canon lens.

- ③ Fit the camera and lens together. Mount the camera mount on the top panel of the camera. For details on how to mount it, refer to the section on how to mount the cameras and mount.
- ④ Connect the supplied camera cable to the I/F REMOTE connector at the back of the camera.

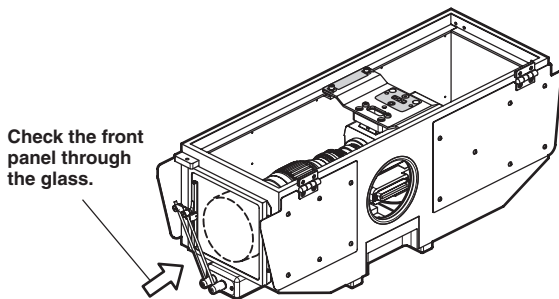
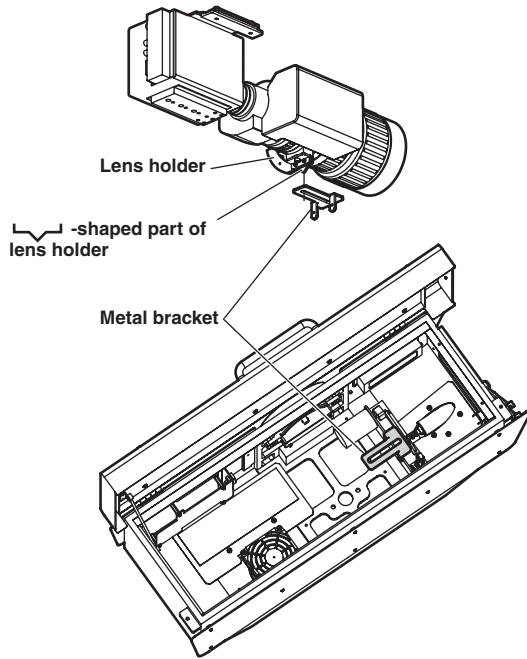
In order to make it easier to connect the cable after stowing the lens unit, the cable must be connected here when a large lens is to be used.

- ⑤ Place the assembly of the camera mount, camera and large lens inside the housing from the front edge of the lens. Hook a piece of string (supplied) around the lens barrel, and stow the assembly inside the housing. At this point, with the assembly tilted at an angle of around 45 degrees (1) as shown in the figure below, position the entire lens motor drive area at the front right inside the inner wall of the housing and the lens holder in front of the I/F connector, and insert it diagonally with the front end of the lens first. After stowing the lens unit, return the tilted camera to its original angle (2), place the camera mount up against the support ribs on both sides of the housing, and fit these areas between the plate nut and mount.

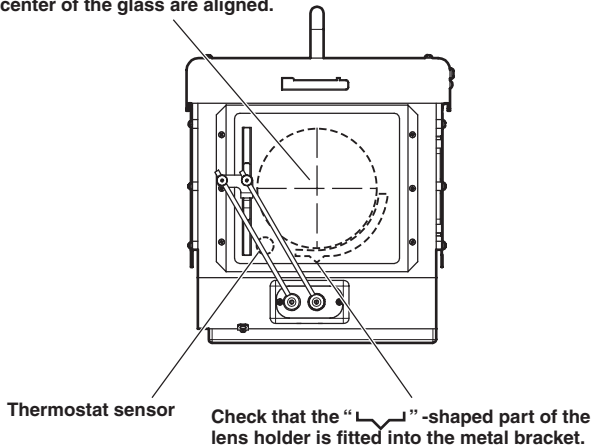


Installation

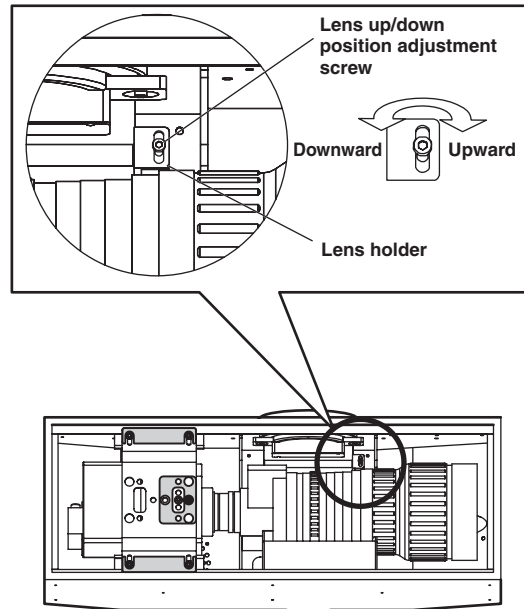
- ⑥ Check whether the “L-shaped” part of the lens holder attached to the bottom of the lens is inside the elongated hole of the metal bracket inside the housing. If it is not inside, lift the lens slightly, and put it back again.



Check whether the center of the lens and center of the glass are aligned.



Also visually check from the front of the housing whether the centers of the lens and camera are aligned. If they deviate significantly, turn the lens up/down position adjustment screw on the lens holder to move the lens position up or down. (When the screw is turned clockwise, the lens position moves up; conversely, when it is turned counterclockwise, it moves down.)

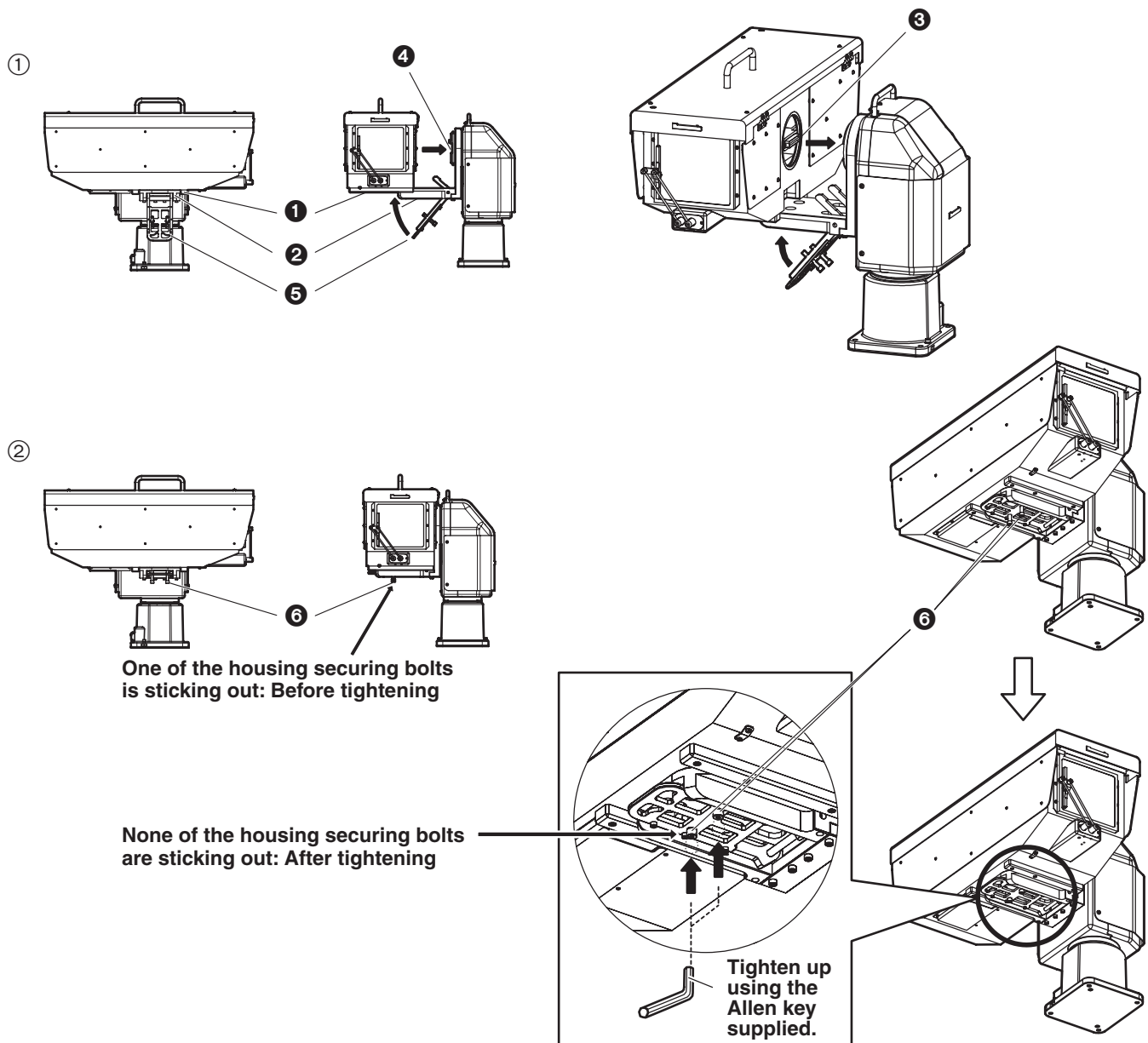


- ⑦ Connect the camera with the lens to the interior of the housing using the cable. (Refer to the section on the connections.)
- ⑧ Bring the front edge of the lens and inside of the glass as close together as possible. Bear in mind the following points.
- (1) Set to a position where the lens and glass will not come into contact when the lens is maximally zoomed out.
 - (2) Check that the inside surface of the glass and lens glass surface are more or less parallel with each other and that the thermostat sensor and lens do not touch.
- ⑨ Upon completion of all the settings, securely tighten up the 4 camera mount screws.
- ⑩ Close the top cover, and tighten the two bolts for opening and closing the top cover securely.

Installation

How to install the housing

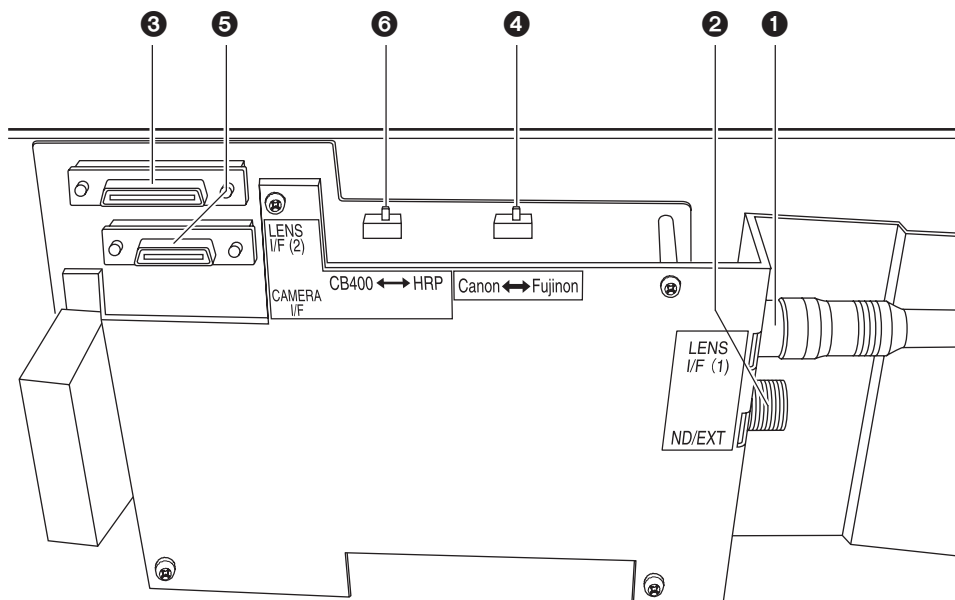
- Align the mounting rails (1) on the bottom of the housing with the housing mount frame (2) on the main unit, and fit the housing onto the side of the main unit.
Move the housing to the rear, and push the I/F connector (3) on the housing in the direction of the arrow into the I/F connector (4) on the main unit. Also move the lock lever (5) on the bottom of the housing mount frame in the direction of the arrow (up), and plug the connector all the way in.
*** In order to prevent the housing from falling, the housing which has been placed on top of the housing mount frame must be immediately inserted all the way into the I/F connector on the main unit by operating the lock lever. If the housing is not inserted all the way in, it may become dislodged or fall down.**
- Provisionally secure by hand the 2 housing securing bolts (6) of the housing mount frame (2) from the bottom surface, and use the supplied Allen key to tighten them up to secure the housing.
*** If these bolts are not tightened up enough, the housing may become dislodged or fall down and it may not be possible to ensure the prescribed operations and performance. Therefore, tighten up both bolts securely.**



Connections

Concerning the connectors inside the housing

The connectors shown in the figure below are provided inside the housing. Check the connection instructions for each of the cameras concerned, and connect them.



1 LENS I/F (1) connector

This is provided for controlling the zooming and focusing of the motorized lens unit. Connect the remote (zoom/focus) control cable of the motorized lens unit to this connector.

2 ND/EXT connector

This is provided for controlling the ND filter or lens extender of the motorized lens unit. Connect it when using a motorized lens unit with an ND filter or lens extender function.

3 LENS I/F (2) connector

Connect this when using a Canon IAS lens, WAS lens or VAS lens or a Fujinon RD lens.

Check that the lens can be stowed inside the housing, because some lenses cannot be stowed according to the position of the connector on the bottom the lens.

4 LENS I/F (2) control selector switch [Shipment setting: Fujinon]

Set the LENS I/F (2) control selector switch to the position that corresponds to the lens used.

Fujinon: RD lens made by Fujinon

Canon: IAS lens, WAS lens or VAS lens made by Canon

5 CAMERA I/F connector

This is provided for controlling a camera. Connect it to the camera REMOTE connector using the camera cable supplied with the AW-PH650.

6 Camera control selector switch [Shipment setting: HRP]

Camera	Switch setting	
Convertible camera	HRP	
AK-HC900 series	HRP	
AK-HC1500	Control exercised from HRP150	Control exercised from CB400
	HRP	CB400

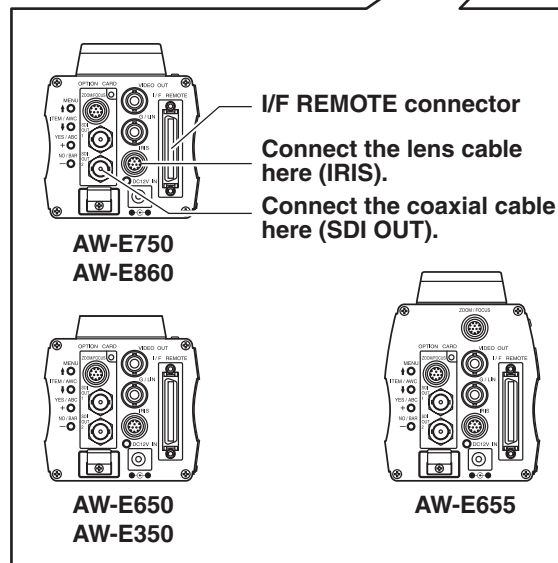
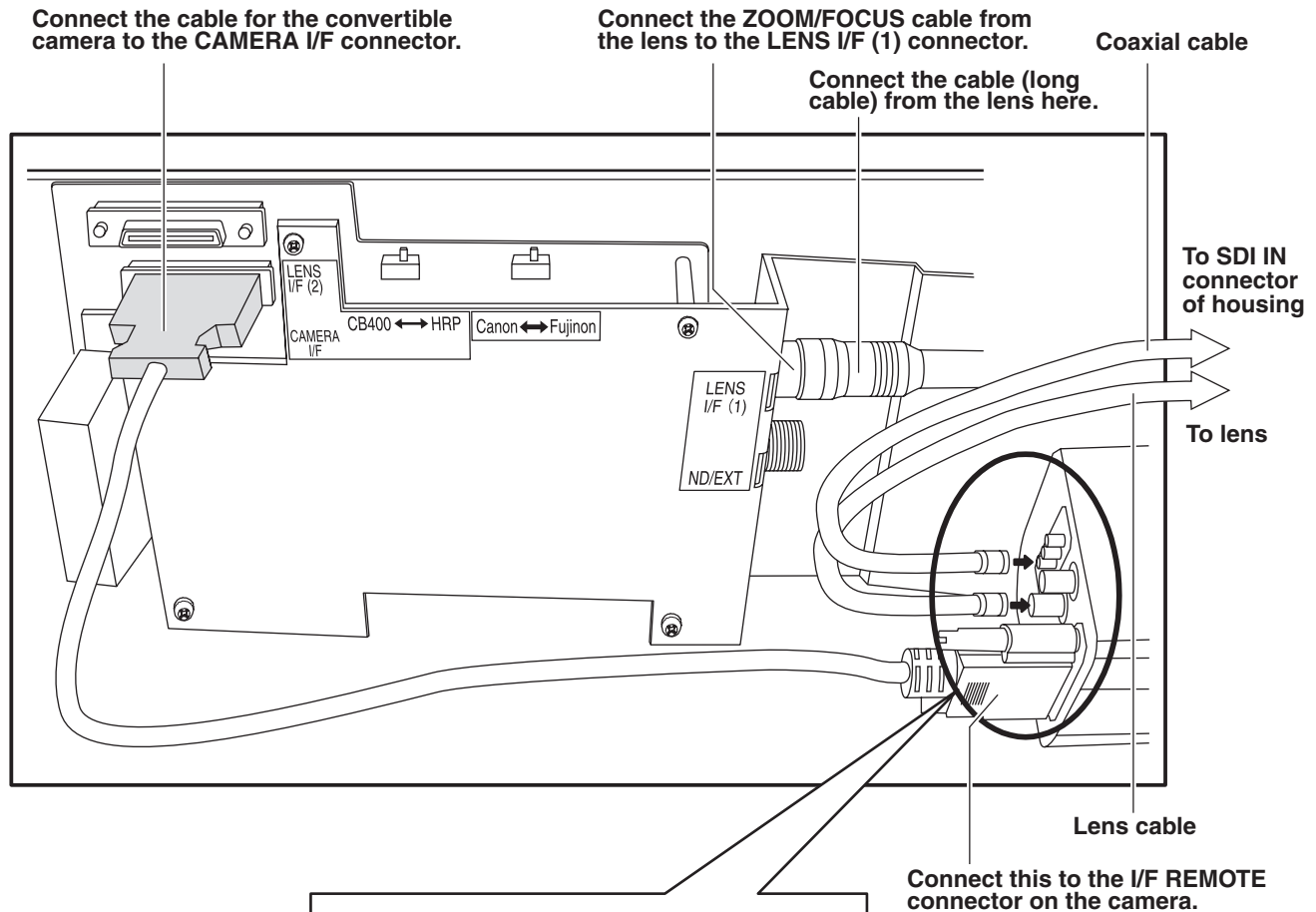
- Use this switch at the HRP setting when using a convertible camera. It cannot be controlled from the AK-HRP150. Use a camera controller for a convertible camera.
- Similarly, use the switch at the HRP setting when using the AK-HC900 series. It cannot be controlled from the AW-CB400. Use the AK-HRP150.
- When using the AK-HC1500, there is a need to select the switch using the camera controller used. Set the switch to the HRP setting when exercising control from the AK-HRP150 or at the CB400 setting when exercising control from the AW-CB400.

Connections

■ Connecting the cameras and housing

1. Connections with a convertible camera

- ① Use the supplied camera cable for these connections.
- ② Provide a coaxial cable [approx. 3.3 ft (1 m) long] (Size: 3C-FB or equivalent)
- ③ Upon completion of the connections, bundle the routed cables together using the cable ties (supplied), making sure that the cables will not be placed near a heater or fan.



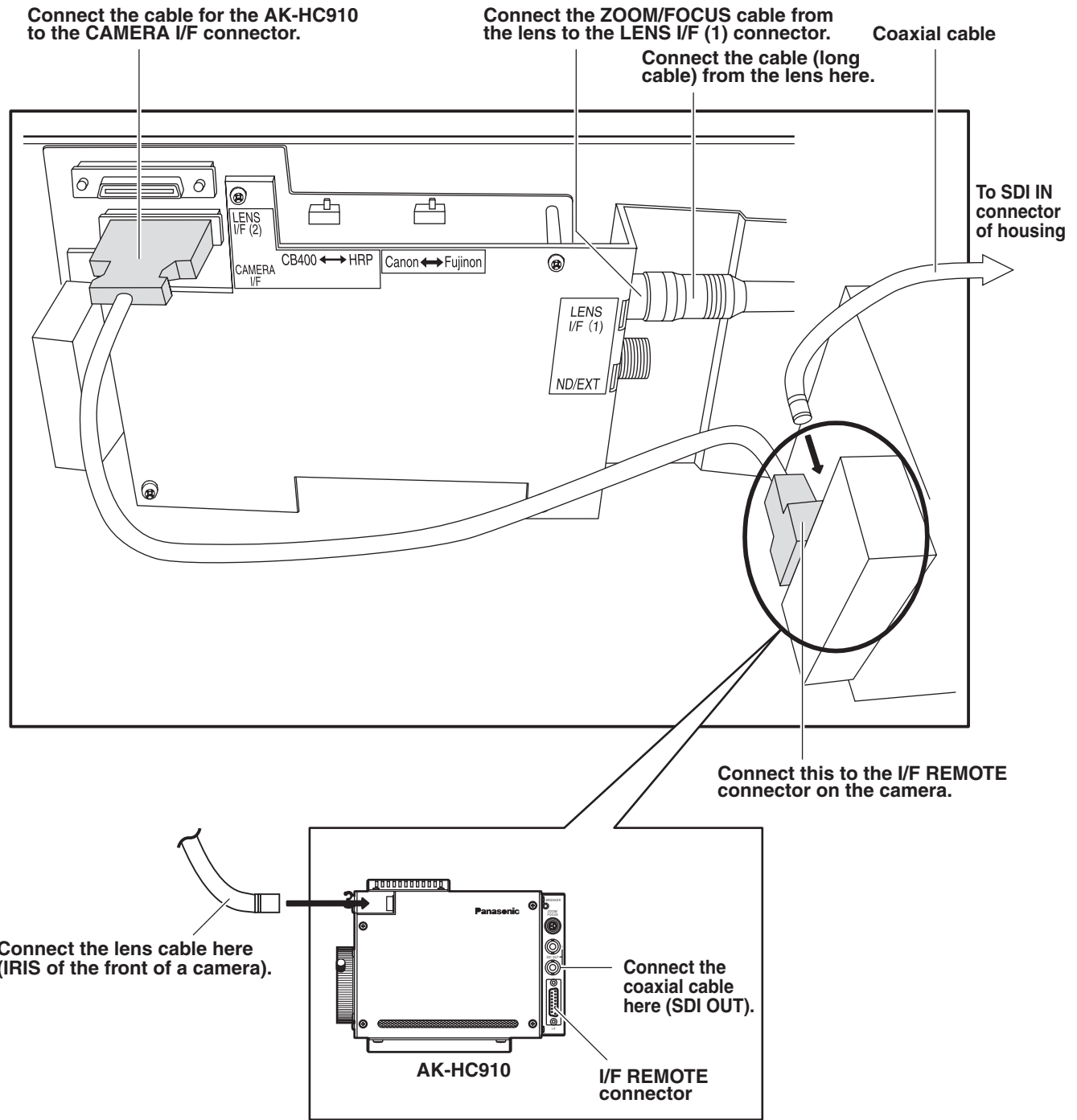
When SDI signals are to be output, the SDI card must be installed in the camera.

Connections

2. Connections with the AK-HC910 series

In order to facilitate the connection procedure, stow the camera after connecting its I/F REMOTE connector. (Particularly when using a large lens, this connector must be connected before the camera is stowed.)

- ① Use the supplied camera cable for these connections.
- ② Provide a coaxial cable [approx. 3.3 ft (1 m) long] (Size: 3C-FB or equivalent)
- ③ Upon completion of the connections, bundle the routed cables together using the cable ties (supplied), making sure that the cables will not be placed near a heater or fan.

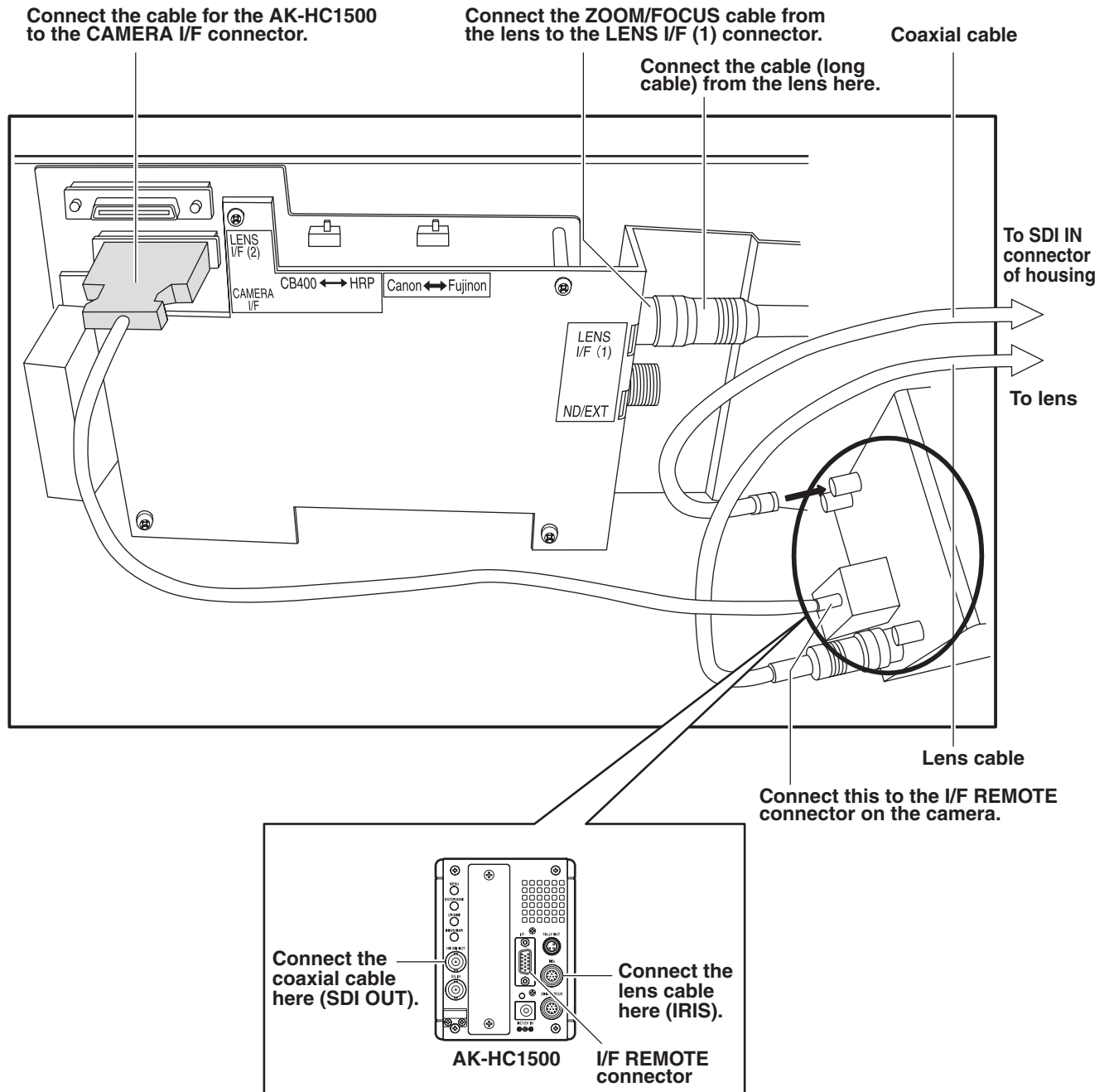


Connections

3. Connections with the AK-HC1500

In order to facilitate the connection procedure, stow the camera after connecting its I/F REMOTE connector. (Particularly when using a large lens, this connector must be connected before the camera is stowed.)

- ① Use the supplied camera cable for these connections.
- ② Provide a coaxial cable [approx. 3.3 ft (1 m) long] (Size: 3C-FB or equivalent)
- ③ Upon completion of the connections, bundle the routed cables together using the cable ties (supplied), making sure that the cables will not be placed near a heater or fan.



Connections

■ Precautions when controlling the AK-HC1500 from the AW-CB400

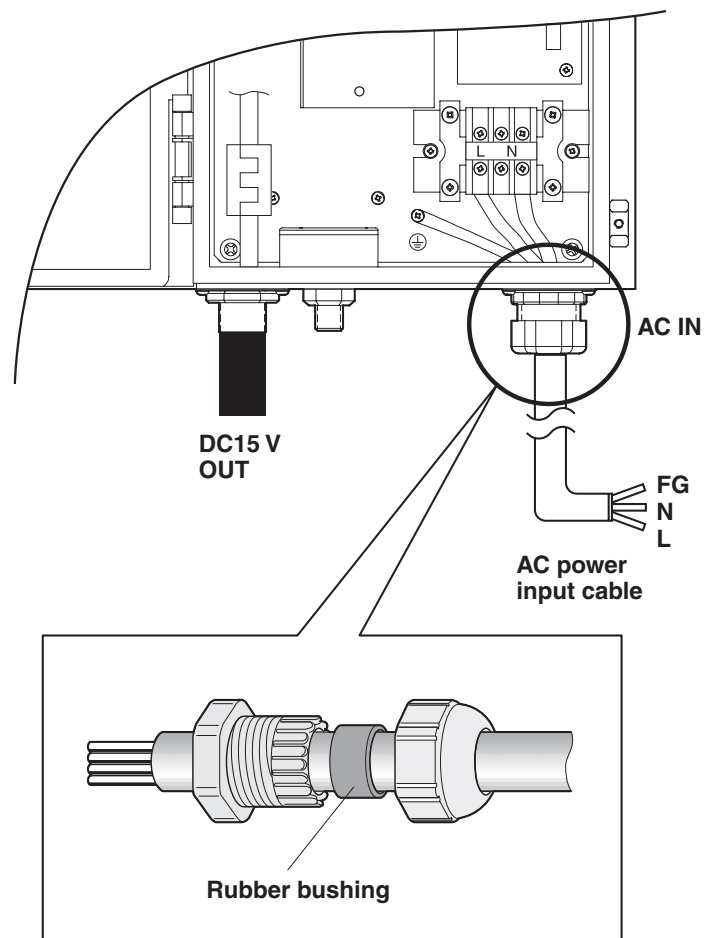
The AK-HC1500 supports the AK-HRP150 protocol and AW-CB400 protocol, and it is the AK-HRP150 protocol which was set before the AK-HC1500 was shipped from the factory.

When controlling the AK-HC1500 using the AW-CB400, follow the steps below to change the protocol setting of AK-HC1500 from AK-HRP150 to AW-CB400.

- **When changing the protocol before installation**
Refer to the operating instructions of the AK-HC1500, and change the protocol.
- **When changing the protocol after installation**
 - ① Proceed with the installation following the steps given in the section entitled "Installation".
 - ② Loosen the two top cover open/close bolts of the camera housing, and open the top cover.
 - ③ Set the power switch of the AC adapter to ON.
 - ④ When the power of the AK-HC1500 has been turned on, refer to the operating instructions of the AK-HC1500, and change the protocol. (Change the PROTOCOL setting on the SETTING menu to "4.")
 - ⑤ Set the power switch of the AC adapter to OFF.

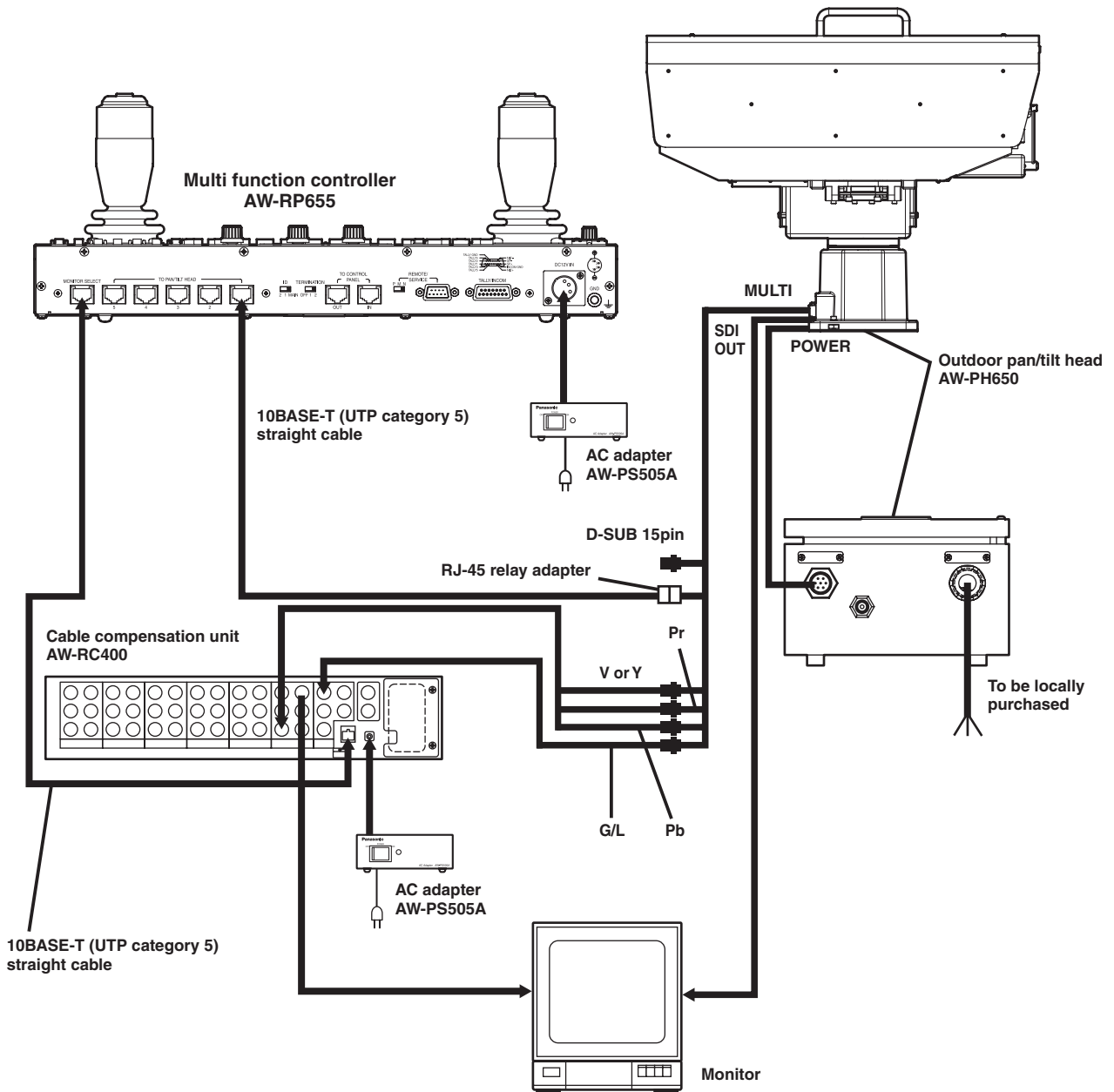
■ Connections with AC adapter

- Disconnect the AC power cable which was already attached.
- The cable used is purchased locally. Purchase a water-proof cable designed to be used outdoors.
- Use a cable which has a high enough capacity (AC 120 V 2 A or more).
- Pass the cable through the rubber bushing for the AC power input cable, and tighten it securely so that rain water or drops of water will not seep inside.
[Thickness of compatible cable: 1/4" to 5/16" (6.5 to 8.5 mm) diameter]
- Attach the power line (N, L) to the terminal block.
- Attach the ground line (FG) to the grounding screw (⊕).



Connections

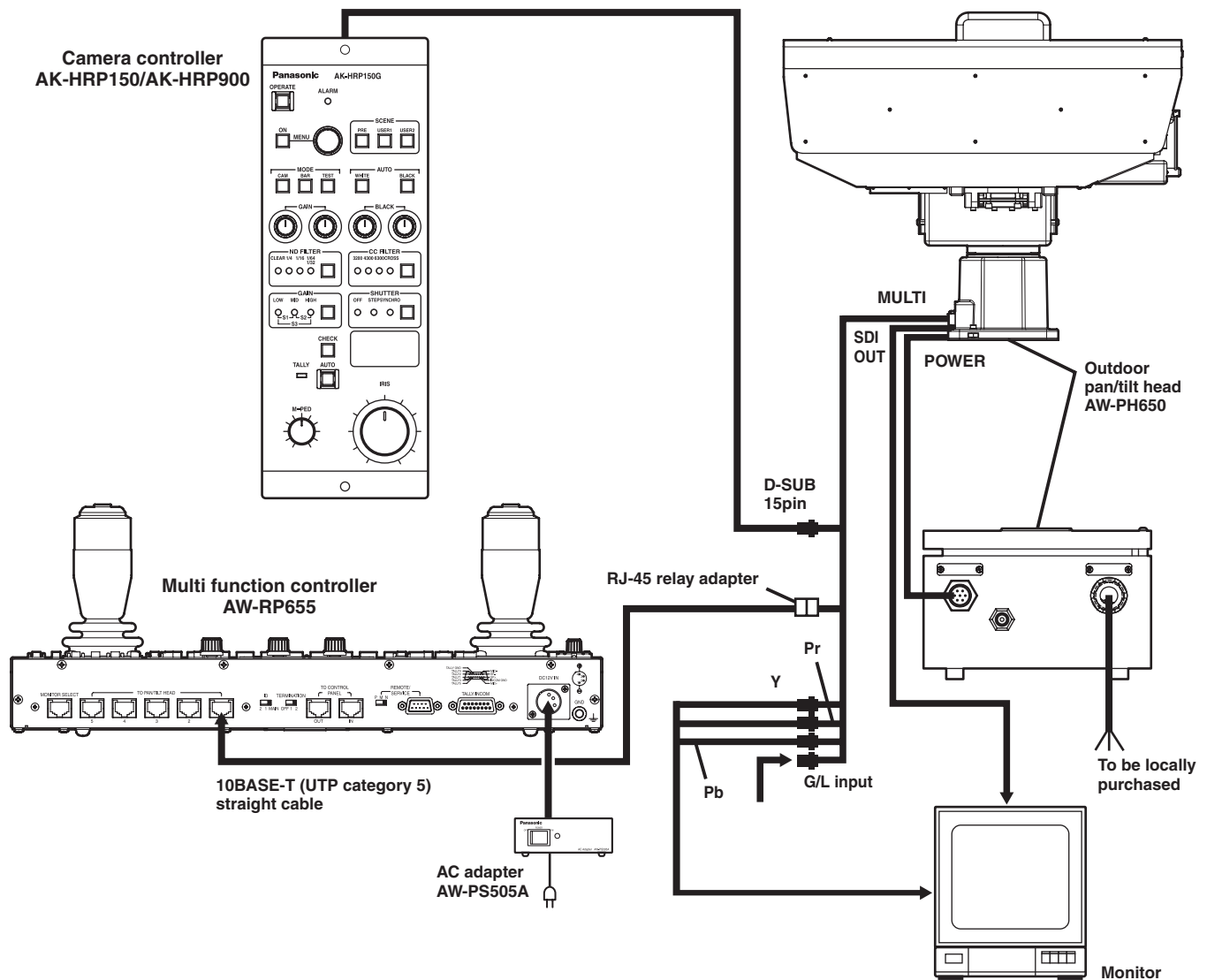
■ Example of connections when using a convertible camera



The AW-RP555 can also be used as the controller.

Connections

Example of connections when using a multi purpose camera



Precautions when using the AK-HC910

The AK-HC910 is capable of outputting HD-SDI signals and Y/PB/PR signals, but when the Y/PB/PR signals are used as the main line, do not connect any signals to the SDI IN/OUT connector. Connect signals to the SDI OUT connector only when using HD-SDI signals as the main line.

<Concerning iris control>

Iris operation	AW-RP655	AK-HRP150
AUTO	AUTO	AUTO
AK-HRP150 MANUAL	AUTO	MANUAL
AW-RP655 MANUAL	MANUAL (※)	—

※ Set to MANUAL when using the presets and tracing memory.

- Since the iris control of the AK-HRP150 and AW-RP655 is not coordinated, it may vary significantly when it is operated initially after the controller used to exercise control has been switched.
- The IRIS indicator on the AW-RP655 can be displayed only when the iris data can be imported from the camera; when it cannot be imported, the CLOSE display appears or no display appears but this does not mean that something is wrong with the iris control.
- When the AK-HC1500 is used, no signals are output from the Y/PR/PB connectors.

Limiters

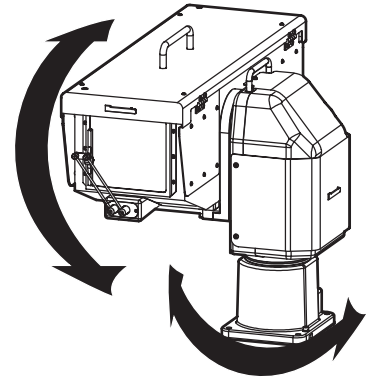
Be absolutely sure to set the limiters (travel range) of the pan/tilt head before use. Depending on where the pan/tilt head system has been installed, obstacles may be present within the travel range with which the camera may come into contact. Contact with any such obstacle by the camera may cause malfunctioning or accidents.

In this case, contact can be prevented by setting the limiters directly before any such obstacle.

Multi function controller (AW-RP655) is used to set the limiters.

The positions of four limiters — namely, the upper, lower, left-most and right-most limits of the travel range — can be set.

Once they have been set, the positions will not be lost even after the power has been turned off.



■ Setting the limiters

• Setting the upper limit of operating range

1. Operate the controller, and turn the camera to the position which will serve as the upper limit.
2. While holding down the OK button on the controller, press TRACING/PRESET MEMORY button 47 \uparrow .
3. The setting is completed when TRACING/PRESET MEMORY button 41 [LIMIT ON] lights.
4. Operate the controller, and check that the upper limit has been set properly.

• Setting the lower limit of operating range

1. Operate the controller, and turn the camera to the position which will serve as the lower limit.
2. While holding down the OK button on the controller, press TRACING/PRESET MEMORY button 46 \downarrow .
3. The setting is completed when TRACING/PRESET MEMORY button 41 [LIMIT ON] lights.
4. Operate the controller, and check that the lower limit has been set properly.

• Setting the left-most limit of operating range

1. Operate the controller, and turn the camera to the position which will serve as the left-most limit.
2. While holding down the OK button on the controller, press TRACING/PRESET MEMORY button 44 \leftarrow .
3. The setting is completed when TRACING/PRESET MEMORY button 41 [LIMIT ON] lights.
4. Operate the controller, and check that the left-most limit has been set properly.

• Setting the right-most limit of operating range

1. Operate the controller, and turn the camera to the position which will serve as the right-most limit.
2. While holding down the OK button on the controller, press TRACING/PRESET MEMORY button 45 \rightarrow .
3. The setting is completed when TRACING/PRESET MEMORY button 41 [LIMIT ON] lights.
4. Operate the controller, and check that the right-most limit has been set properly.

Limiters

■ Releasing the limiters

The set limits can be release by taking the following steps.

- **Releasing the upper limit of operating range**

1. While holding down the OK button on the controller, press TRACING/PRESET MEMORY button 47 ↑.
2. The release is completed when TRACING/PRESET MEMORY button 50 [LIMIT OFF] lights.

- **Releasing the lower limit of operating range**

1. While holding down the OK button on the controller, press TRACING/PRESET MEMORY button 46 ↓.
2. The release is completed when TRACING/PRESET MEMORY button 50 [LIMIT OFF] lights.

- **Releasing the left-most limit of operating range**

1. While holding down the OK button on the controller, press TRACING/PRESET MEMORY button 44 ←.
2. The release is completed when TRACING/PRESET MEMORY button 50 [LIMIT OFF] lights.

- **Releasing the right-most limit of operating range**

1. While holding down the OK button on the controller, press TRACING/PRESET MEMORY button 45 →.
2. The release is completed when TRACING/PRESET MEMORY button 50 [LIMIT OFF] lights.

■ Setting the limiter again

The same steps set and release the limiter alternately. To set the limiter again, release the current limit and set it again.

A set limit can be set again by taking the following steps.

1. Release the desired limit to be set again, referring to “Releasing the limiters”.
2. Set the limit again, referring to “Setting the limiters”.

Replacement of consumable parts

■ Replacing the battery

The battery lasts for about 5 years.

The pan/tilt head stores the preset positions, limiter positions and other data in its memory. Although this data is retained even after the power has been turned off, it will be lost when the power is turned off once the battery has reached the end of its service life.

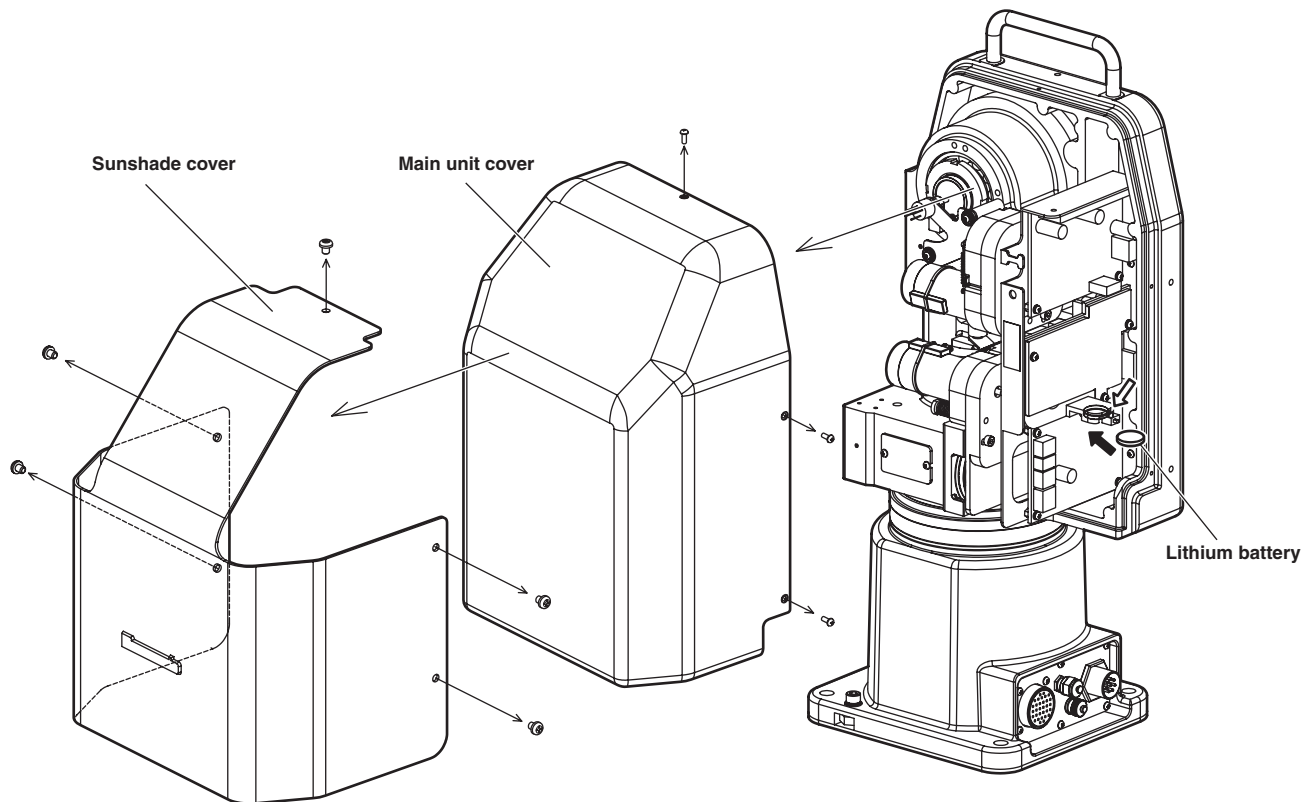
Replace the battery once it has lost its effectiveness. (The pan/tilt head uses a CR2032 manganese dioxide-lithium battery.)

■ Removing the battery

- ① Remove the 5 cover screws, and remove the sunshade cover.
- ② Remove the 5 cover screws, and remove the main unit cover.
- ③ Press the battery in the direction shown by the arrow ← in the figure, and pull the battery out to remove it completely.

■ Installing the new battery

- ① Position the new battery with its “+” side facing down, insert one end into the holder in the direction indicated by the arrow ←, and push it into place.
- ② Attach the main unit cover and sunshade cover using the 5 screws for each cover.



Replacement of consumable parts

■ Replacing the motor

Replace the motor when it ceases to operate properly.
For details on the motor replacement, consult your dealer.

■ Replacing the belt

Replace the belt when the preset stop accuracy has deteriorated.
For details on the belt replacement, consult your dealer.

■ Replacing the gear

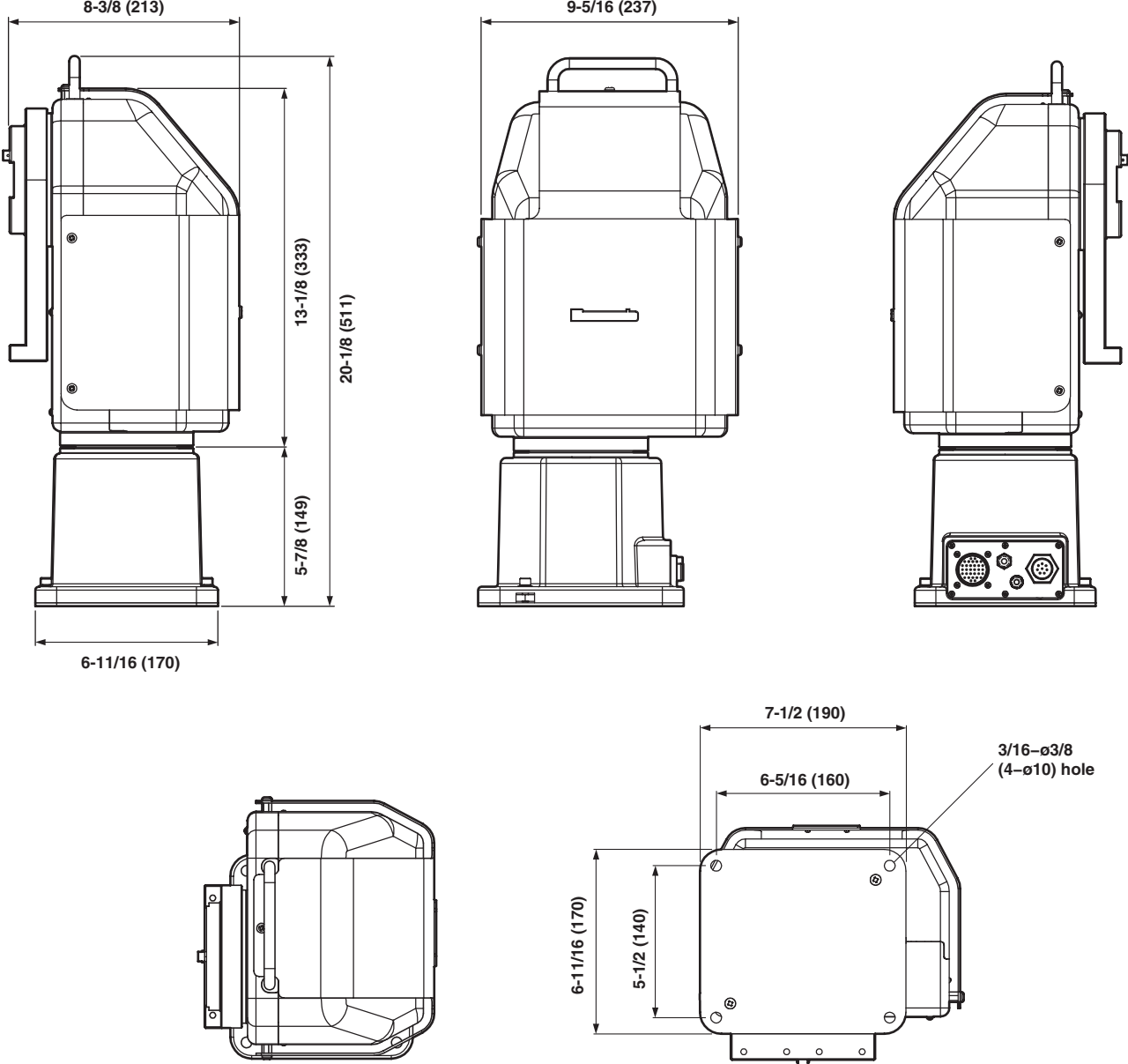
Replace the gear when the preset stop accuracy has deteriorated.
For details on the gear replacement, consult your dealer.

**The motor, gear and belt are consumables.
They need to be replaced at periodic intervals.**

Appearance

■ Main unit

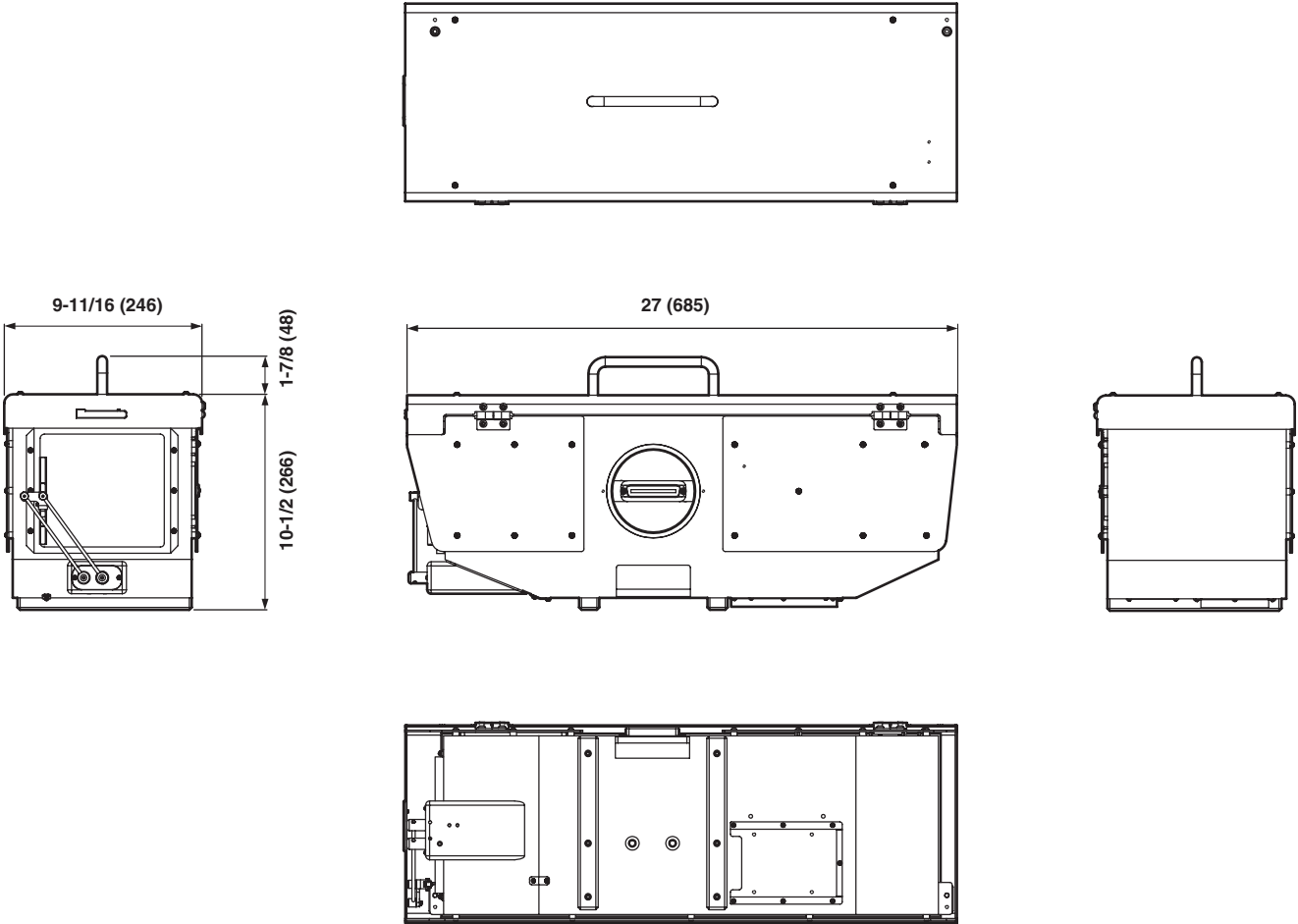
Unit: inch (mm)



Appearance

■ Housing unit

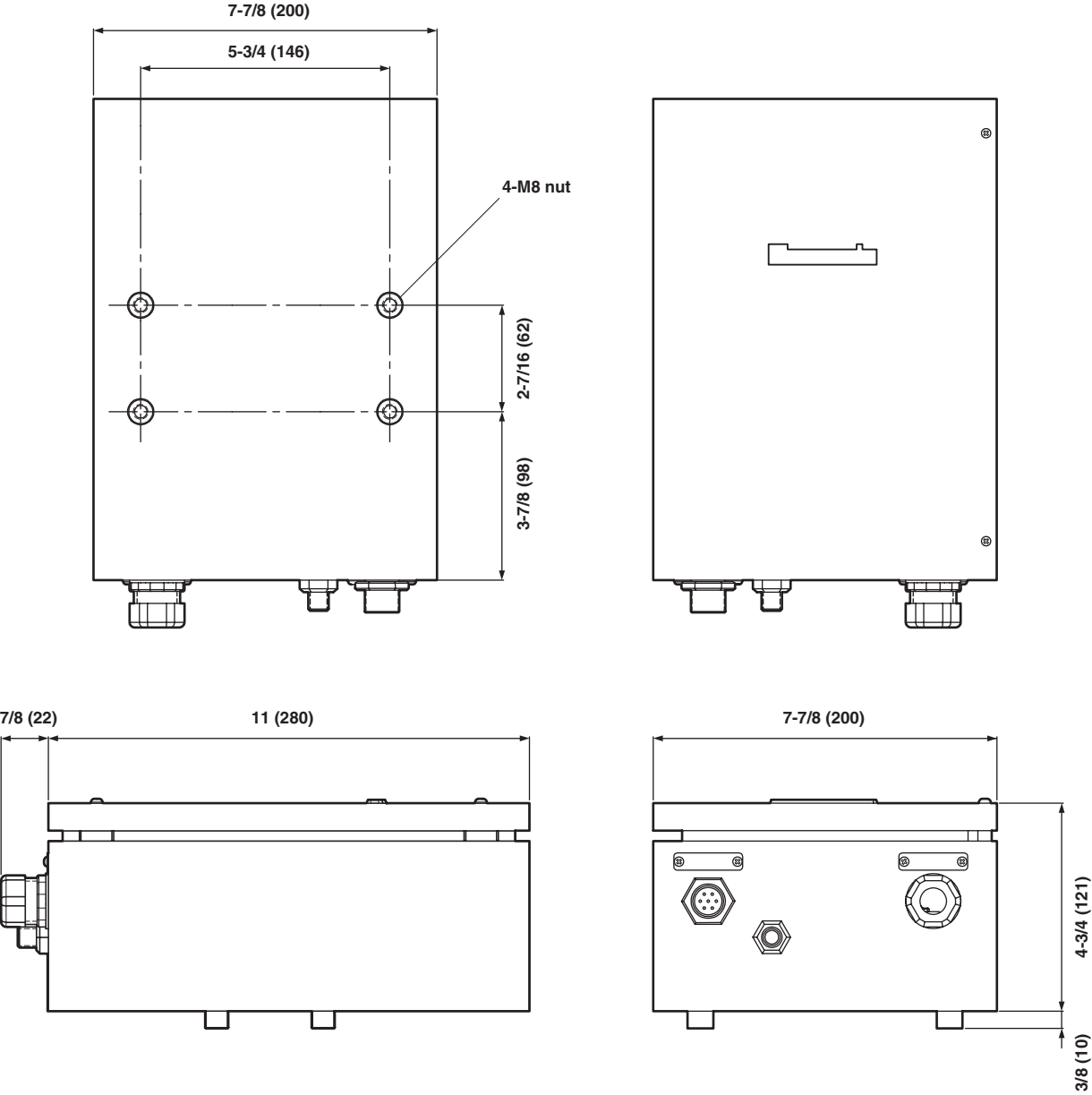
Unit: inch (mm)



Appearance

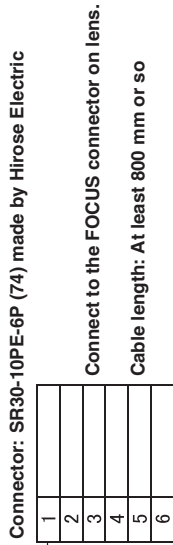
■ AC adapter unit

Unit: inch (mm)

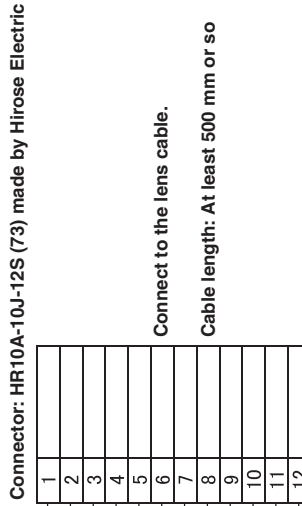
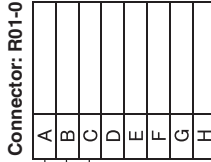
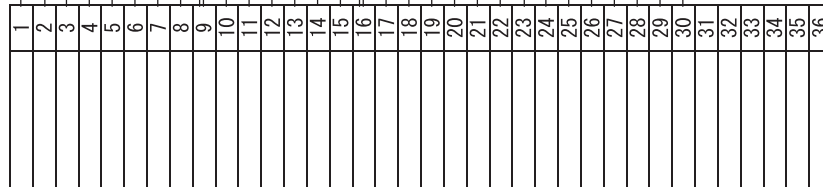


Cable specifications

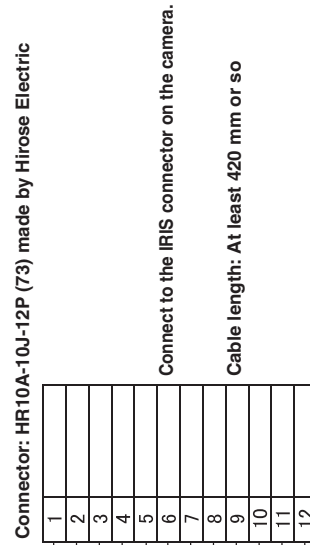
When an IAS, WAS or VAS lens (analog drive) made by Canon is used



Connector: 10136-3000VE made by Sumitomo 3M
Case: 10336-52F0-008 made by Sumitomo 3M



Connect to the LENS I/F2 connector in housing.



※ The cable lengths are approximate. Ensure that their lengths are appropriate for the actual system used.

Cable specifications

When an IASD, WASD or VASD lens (digital drive) made by Canon is used

Connector: HR25-9P-20P (72) made by Hirose Electric

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Connector: 10136-3000VE made by Sumitomo 3M
Case: 10336-52F0-008 made by Sumitomo 3M

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Connect to the ZOOM/FOCUS connector on lens.

Cable length: At least 800 mm or so

Connector: HR10A-10J-12S (73) made by Hirose Electric

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Connect to the lens cable.

Cable length: At least 500 mm or so

Connector: HR10A-10J-12P (73) made by Hirose Electric

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Connect to the IRIS connector on the camera.

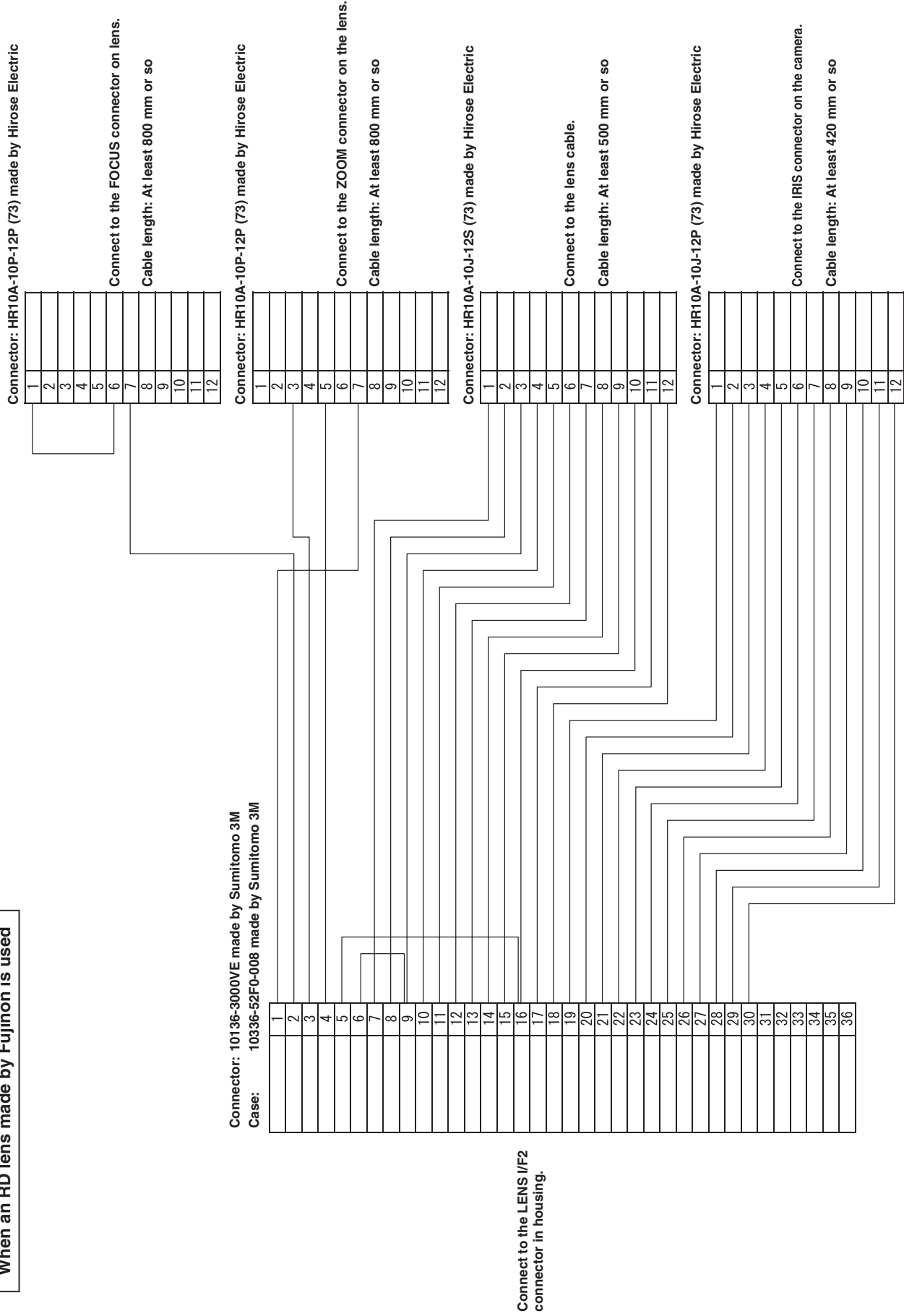
Cable length: At least 420 mm or so

Connect to the LENS I/F2 connector in housing.

※ The cable lengths are approximate. Ensure that their lengths are appropriate for the actual system used.

Cable specifications

When an RD lens made by Fujinon is used




Connect to the LENS I/F2 connector in housing.

※ The cable lengths are approximate. Ensure that their lengths are appropriate for the actual system used.

Specifications

Power supply: AC 120 V 60 Hz

Power consumption: 120 W

 indicates safety information.

■ General

Ambient operating temperature

−4°F to 113°F (−20°C to +45°C)

Ambient operating humidity

30% to 90% (no condensation)

Water-proofing standard supported

IPX4

Weight

Main unit: 41.9 lbs (19 kg)

Housing unit: 39.7 lbs (18 kg)

AC adapter unit: 9.3 lbs (4.2 kg)

Dimensions (W×H×D)

Main unit:

9-5/16"×20-1/8"×8-3/8" (237×511×213 mm)

(excluding protrusions)

Housing unit:

9-11/16"×12-3/8"×27" (246×314×685 mm)

(excluding protrusions)

AC adapter unit:

7-7/8"×5-3/16"×11 (200×131×280 mm)

(excluding protrusions)

Finish

AV ivory paint (color resembling Munsell 7.9Y 6.8/0.8)

Controller supported

AW-RP605A, AW-RP605, AW-RP655, AW-RP555,

AK-HRP150, AK-HRP900

Cameras supported

AW-E860, AW-E750, AW-E655, AW-E650, AW-E350,
AW-E800A, AW-E800, AW-E600, AW-E300A, AW-E300,
AK-HC900 Series, AK-HC1500

[Main unit]

Genlock input

BNC jack (24P round water-proof connector)

Black burst, composite video or 3 value SYNC

Camera video output

VIDEO: BNC jack (24P round water-proof connector),
75 Ω output

Y: BNC jack (24P round water-proof connector),
75 Ω output

Pr/C: BNC jack (24P round water-proof connector),
75 Ω output

Pb: BNC jack (24P round water-proof connector),
75 Ω output

SDI: Coaxial water-proof connector (C15 model)

Pan/tilt head control

RJ-45, modular plug (24P round water-proof connector),
RS-422

Camera control

AW series: RJ-45, modular plug (24P round water-proof connector), RS-422

AK series: D-SUB 15 pin (24P round water-proof connector), RS-422

Housing connecting I/F

Ribbon connector 50 pin

Functions/performance

Maximum load capacity:

22 lbs (10 kg) (excluding housing)

Panning range:

320 degrees (approx. ±160 degrees) or over

Tilt range: +50 degrees, −95 degrees or over

Maximum operating speed:

20 degrees/sec.

Repeatability:

Less than ±5'

Noise level: Less than NC40

[Housing unit]

Applicable lenses:

AW-LZ17MD9, AW-LZ16MD73,
AW-LZ16AF7, AW-LZ16MD55,
HA42× 13.5BERD, A42× 13.5BERD,
HJ40× 14B IASD-V, J35e× 15B IASD

Heater: ON/OFF controllable, ON at about 41°F (5°C)
or below

Wiper: ON/OFF controllable

Defroster: ON/OFF controllable, OFF at about 104°F
(40°C) or above

Fan: ON/OFF controllable, ON at about 68°F
(20°C) or above

Maximum load capacity:

22 lbs (10 kg) (Camera and lens)

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.



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