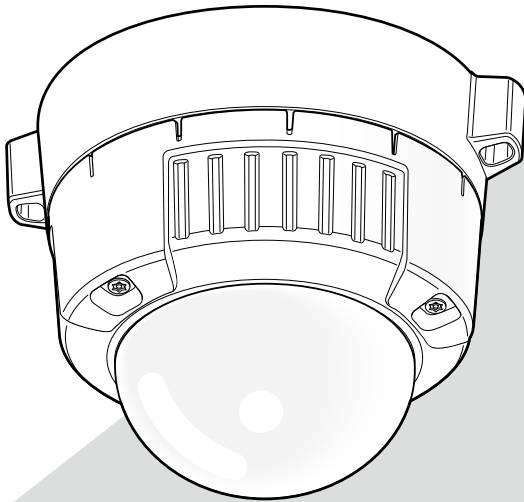


Panasonic

Installation Guide

Color CCTV Camera

Model No. **WV-CW500S/G**
WV-CW504SE



Before attempting to connect or operate this product, please read these instructions carefully and save this manual for future use.

The model number is abbreviated in some descriptions in this manual.

We declare under our sole responsibility that the product to which this declaration relates is in conformity with the standards or other normative documents following the provisions of Directives 2006/95/EC and 2004/108/EC.

Wij verklaren als enige aansprakelijke, dat het product waarop deze verklaring betrekking heeft, voldoet aan de volgende normen of andere normatieve documenten, overeenkomstig de bepalingen van Richtlijnen 2006/95/EC en 2004/108/EC.

Vi erklærer os eneansvarlige for, at dette produkt, som denne deklaration omhandler, er i overensstemmelse med standarder eller andre normative dokumenter i følge bestemmelserne i direktivene 2006/95/EC og 2004/108/EC.


Vi deklarerar härmed vårt fulla ansvar för att den produkt till vilken denna deklaration hänvisar är i överensstämmelse med de standarder eller andra normativa dokument som framställs i direktiv nr 2006/95/EC och 2004/108/EC.

Ilmoitamme yksinomaisella vastuullamme, että tuote, jota tämä ilmoitus koskee, noudattaa seuraavia standardeja tai muita ohjeellisia asiakirjoja, jotka noudattavat direktiivien 2006/95/EC ja 2004/108/EC säädöksiä.


Vi erklærer oss alene ansvarlige for at produktet som denne erklæringen gjelder for, er i overensstemmelse med følgende normer eller andre normgivende dokumenter som følger bestemmelsene i direktivene 2006/95/EC og 2004/108/EC.

WARNING:

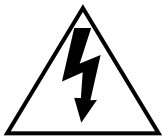
- This apparatus must be earthed.
- Apparatus shall be connected to a mains socket outlet with a protective earthing connection.
- The mains plug or an appliance coupler shall remain readily operable.
- All work related to the installation of this product should be made by qualified service personnel or system installers.
- The connections should comply with local electrical code.



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 SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrow-head 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 (servicing) instructions in the literature accompanying the appliance.

CAUTION:

An ALL-POLE MAINS SWITCH with a contact separation of at least 3 mm in each pole shall be incorporated in the electrical installation of the building.

Turn the power off at the mains to disconnect the main power for all unit.

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.

WARNING: This apparatus must be earthed.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code.

Green-and-yellow:	Earth
Blue:	Neutral
Brown:	Live

As the colours of the wire in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows.

The wire which is coloured **green-and-yellow** must be connected to the terminal in the plug which is marked with the letter **E** or by the earth symbol \perp or coloured **green** or **green-and-yellow**.

The wire which is coloured **blue** must be connected to the terminal in the plug which is marked with the letter **N** or coloured **black**.

The wire which is coloured **brown** must be connected to the terminal in the plug which is marked with the letter **L** or coloured **red**.

Important safety instructions

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Clean only with dry cloth.
- 6) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 7) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 8) 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.
- 9) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 10) Only use attachments/accessories specified by the manufacturer.
- 11) 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.



- 12) Unplug this apparatus during lightning storms or when unused for long periods of time.

Limitation of liability

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THIS PUBLICATION COULD INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS.

CHANGES ARE ADDED TO THE INFORMATION HEREIN, AT ANY TIME, FOR THE IMPROVEMENTS OF THIS PUBLICATION AND/OR THE CORRESPONDING PRODUCT (S).

Disclaimer of warranty

IN NO EVENT SHALL Panasonic Corporation BE LIABLE TO ANY PARTY OR ANY PERSON, EXCEPT FOR REPLACEMENT OR REASONABLE MAINTENANCE OF THE PRODUCT, FOR THE CASES, INCLUDING BUT NOT LIMITED TO BELOW:

- (1) ANY DAMAGE AND LOSS, INCLUDING WITHOUT LIMITATION, DIRECT OR INDIRECT, SPECIAL, CONSEQUENTIAL OR EXEMPLARY, ARISING OUT OF OR RELATING TO THE PRODUCT;
- (2) PERSONAL INJURY OR ANY DAMAGE CAUSED BY INAPPROPRIATE USE OR NEGLIGENT OPERATION OF THE USER;
- (3) UNAUTHORIZED DISASSEMBLE, REPAIR OR MODIFICATION OF THE PRODUCT BY THE USER;
- (4) INCONVENIENCE OR ANY LOSS ARISING WHEN IMAGES ARE NOT DISPLAYED, DUE TO ANY REASON OR CAUSE INCLUDING ANY FAILURE OR PROBLEM OF THE PRODUCT;
- (5) ANY PROBLEM, CONSEQUENTIAL INCONVENIENCE, OR LOSS OR DAMAGE, ARISING OUT OF THE SYSTEM COMBINED BY THE DEVICES OF THIRD PARTY.

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Preface

This product is a 1/3-inch type {1/3"} CCD color CCTV camera. Connection of this product to a video monitor allows users to use this product as a monitoring camera.

- WV-CW504: 24 V AC, 12 V DC power supply
- WV-CW500: 220 to 240 V AC power supply

Features

Introduction of SUPER-D5 (super dynamic function)

Integration of SUPER-D5 into the CCD and signal processing circuit has achieved approximately 160 times higher dynamic range as compared with conventional camera. Thanks to the integration of the darkness compensation function, a subject on which much illuminance difference exists resulting from bright and dark areas can be naturally displayed in an image.

Introduction of newly developed high-resolution CCD

The introduction of the newly developed CCD with 976 of horizontal pixels has led to the horizontal resolution of as high as 650 TV lines (typ.).

Auto back focus (ABF) function equipped

Moving the CCD inside the camera to an optimal position with the operation button of this unit or the setup menu allows users to automatically adjust the back focus.

The back focus is adjustable with the setup menu through the system controller (option) even after installation of this unit.

The auto back focus function also allows users to correct out of focus when changing between color and black-and-white images.

High sensitivity achieved thanks to noise reduction function

The introduction of low noise circuit design has achieved excellently high sensitivity resulting in the minimum illuminance of 0.1 lx in the color mode and 0.01 lx in the black-and-white mode.

Night monochrome image activation function equipped

No operation is required at night because the image automatically changes from the color mode to the black-and-white mode at low illuminance.

Intelligent VMD (i-VMD) functions of motion detection and object abandonment/removal detection equipped

The motion and abandonment/removal of an object are detectable.

The states of covering the camera with a cloth, a cap or others and changing the camera direction notably can be detected (Scene change detection).

The detection resolution has been significantly improved as compared with a conventional type, and the introduction of the newly developed detection method has improved detection accuracy under the condition that the motion detection is prone to malfunction due to leaves swaying.

Note:

- The i-VMD function is not the dedicated function to prevent thefts, fires, etc. We are not responsible for any accidents or damages occurring in case.
-

Optional heater unit can be connected

When using the optional heater unit, the product can be used at temperatures within $-30\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ and humidity below 90 %.

About the user manuals

The operating instructions of the camera consist of 2 sets: this book and Operating Instructions (PDF).

This book explains how to install the camera.

Refer to the "Operating Instructions (PDF)" on the provided CD-ROM for descriptions of how to perform the unit settings. Adobe® Reader® is required to read the PDF file (the Operating Instructions) on the provided CD-ROM.

When the Adobe® Reader® is not installed on the PC, download the latest Adobe® Reader® from the Adobe web site and install it.

Trademarks and registered trademarks

Adobe and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Precautions

The following points as well as the contents of "Warning" and "Caution" shall be observed.

Refer installation work to the dealer.

Installation work requires technique and experiences. Otherwise injury, or damage to the product may result.

Be sure to consult the dealer.

Do not insert objects inside the product.

If water or metallic items enter the product, it may cause fire or electric shock.

Turn the power off immediately and contact qualified service personnel for service.

Do not attempt to disassemble or modify the product.

Failure to observe this may cause fire or electric shock.

Consult the dealer for the repair or inspections.

Stop operation immediately when something is wrong with the product.

When smoke goes up from the product or the smell of smoke comes from the product, continued use will result in fire, injury, or damage to the product.

Turn the power off immediately and contact qualified service personnel for service.

Select an installation area that can support the total weight.

Selecting an inappropriate installation surface may cause the product to fall down or topple over, resulting in injury.

Installation work shall be started after sufficient reinforcement.

Periodic inspections shall be conducted.

Rust on the metal parts or screws may cause the product to fall down resulting in injury.

Consult the dealer for the inspections.

This product shall be installed in a vibration-free place.

Failure to observe this may cause screws and bolts to be loosened and consequently to fall resulting in injury.

Install this product high enough to ensure that people don't hit their heads.

Failure to observe this may cause a drop resulting in injury or accidents.

Do not strike or give a strong shock to this product.

Failure to observe this may cause injury or fire.

Be sure to turn off the power before wiring.

Failure to observe this may cause electric shock. A short circuit or wrong wiring may cause fire.

Do not use the product in an atmosphere of flammable gases.

Failure to observe this may cause injury by explosion.

Avoid installing the product in locations where it is subject to damage by salt or corrosive gas.

Otherwise the mounting fixtures will deteriorate, causing the product to fall down and leading to accidents.

Use the specified mount bracket.

Failure to observe this may cause a drop resulting in injury or accidents.

Do not rub the edges of metal parts with your hand.

Failure to observe this may cause injury.

Tighten screws and mounting fixtures to the specified torque.

Failure to observe this may cause a drop resulting in injury or accidents.

[Precautions for use]

This product has no power switch.

Turn the power off when cleaning the product.

To keep on using with stable performance

Parts of this product may deteriorate and it may shorten the lifetime of this product when using in locations subject to high temperatures and high humidity. (Recommended operating temperature: +35 °C or lower)

Do not expose this product to direct heat sources such as a heater.

Handle this product with care.

Do not abuse this product. Avoid striking, shaking, etc. The product could be damaged by improper handling or storage. If a strong shock or vibration is applied to the enclosure, it may cause damage or allow water to enter this product.

Do not touch the dome cover with your bare hands.

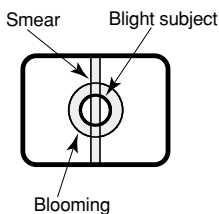
A dirty dome cover causes deterioration of picture quality.

Discoloration on the CCD color filter

When continuously shooting a bright light source such as a spotlight, the color filter of the CCD may have deteriorated and it may cause discoloration. Even when changing the fixed shooting direction after continuously shooting a spotlight for a certain period, the discoloration may remain.

Do not aim this product at strong light sources.

A light source such as a spot light causes a blooming (light bleeding) or a smear (vertical lines).



Cleaning this product body

Turn the power off when cleaning the product. Do not use strong abrasive detergent when cleaning this product. Otherwise, it may cause discoloration. When using a chemical cloth for cleaning, read the caution provided with the chemical cloth product.

To remove stubborn stains

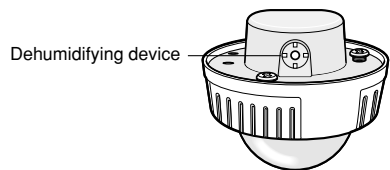
When the dirt is hard to remove, use a mild detergent and wipe gently. Then, wipe off the remaining detergent with a dry cloth.

What to do if OVER HEAT appears on the display

This message indicates that the inside of the camera has become extremely hot. Immediately turn off the power of the camera and contact your dealer.

About the dehumidifying device

- This product has dehumidifying device to keep the inside at low moisture level, preventing condensation.
- Dew may be produced depending on the conditions of temperature, humidity, winds, and rain, and it may take time to dehumidify.
- Never seal the surfaces of the dehumidifying device.



Precautions for Installation

The following points as well as the contents of "Warning" and "Caution" shall be observed.

Installation work shall be performed in accordance with the technology standard of the electric installation.

The product is designed to be installed under eaves.

Keep the product out of direct sunlight.

Installing place

Contact your dealer for assistance if you are unsure of an appropriate place in your particular environment.

- Make sure that the installation area is strong enough to hold the product, such as a concrete ceiling.
- Install the camera in the foundation area of the architecture or where sufficient strength is assured.
- If a ceiling board such as plaster board is too weak to support the total weight, the area shall be sufficiently reinforced.

Avoid installing this product in the following locations.

- Locations where a chemical agent is used such as a swimming pool.
- Locations subject to steam and oil smoke such as a kitchen, Locations near flammable gas or vapor.
- Locations where radiation or x-ray emissions are produced.
- Locations where corrosive gas is produced, Locations where it may be damaged by briny air such as seashores.
- Locations where the temperature is not within $-10\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$. (When using the optional heater unit, the product can be used at temperatures within $-30\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ and humidity below 90 %.)
- Locations subject to vibrations. (This product is not designed for on-vehicle use.)

Avoid moist or dusty places to install this system.

Otherwise, lifetime of the internal parts may be shortened.

Avoid installing the camera in a place with a high level of noise.

Installation near an air conditioner, an air cleaner, a vending machine, or the like causes noise.

Be sure to remove this product if it is not in use.

Keep the camera cable away from the lighting cable.

Failure to observe this may cause noise.

Radio interference

When the camera is used near TV/radio antenna, strong electric field or magnetic field (near a motor or a transformer), images may be distorted and noise sound may be produced.

In such a case, run the camera cable through specialized steel conduit tubes.

Locally procure the screws

Screws are not supplied with this product. Prepare the screws according to the material, structure, strength and other factors of the mounting area and the total weight of objects to be mounted.

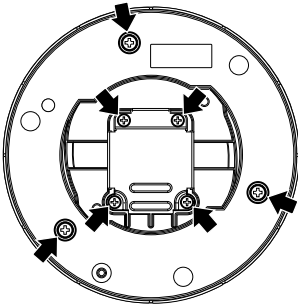
Mounting screws

- The screws and bolts must be tightened with an appropriate tightening torque according to the material and strength of the installation area.
- Do not use an impact driver. Failure to observe this may cause overtightening and consequently damage to the screws.
- When a screw is tightened, make the screw at a right angle to the surface. After tightening the screws or bolts, perform visual check to ensure tightening is enough and there is no backlash.

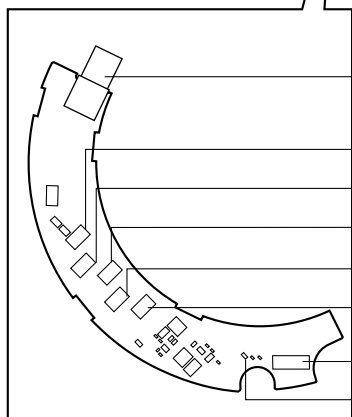
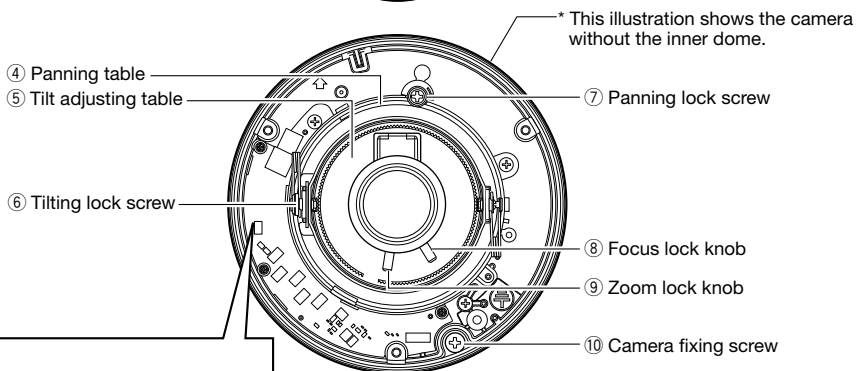
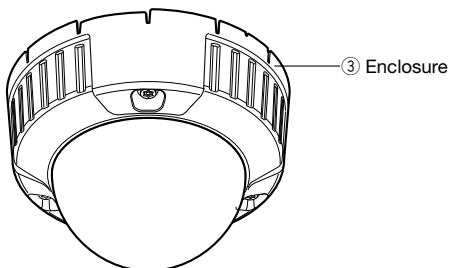
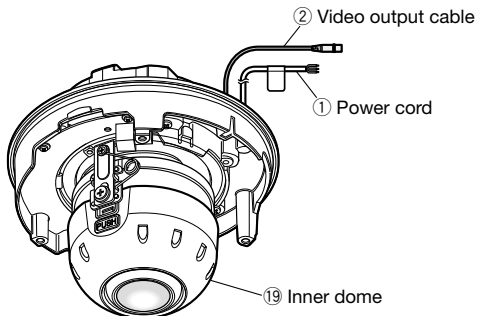
Do not remove or loosen the screws.

Do not remove or even loosen the screws (7 pieces) on the rear of the camera.

Otherwise, water exposure may cause damage or malfunction of camera, or camera dropping may result in injury.



Major operating controls and their functions



Operation buttons

- ① **Power cord**
- ② **Video output cable**
- ③ **Enclosure**
- ④ **Panning table**
Rotate this table to adjust the panning angle of the camera.
- ⑤ **Tilt adjusting table**
Adjust the azimuth angle of the image.
- ⑥ **Tilting lock screw**
Locks the tilt position.
- ⑦ **Panning lock screw**
Fixes the panning table.
- ⑧ **Focus lock knob**
Locks the focal point.
- ⑨ **Zoom lock knob**
Locks the zoom point.
- ⑩ **Camera fixing screw**
Fix the attachment on the camera body.
- ⑪ **Monitor output connector**
Connect the monitor for adjustment to this output connector.
- ⑫ **Right button [(RIGHT), FAR]**
Moves the cursor to the right, selects the mode and adjusts some levels.
- ⑬ **Left button [(LEFT), NEAR]**
Moves the cursor to the left, selects the mode and adjusts some levels.
- ⑭ **Up button [(UP)]**
Moves the cursor upward and selects items in the setup menu.
- ⑮ **Down button [(DOWN), ABF1]**
Moves the cursor downward and selects items in the setup menu. Refer to page 24 for further information about [ABF1].
- ⑯ **Setting button [(SET), ABF2/MENU]**
Confirms the setting contents. Refer to page 26 for further information about [ABF2].
- ⑰ **Heater output connector**
The cable of heater unit (option) is connected to this connector. (☞ page 31)
- ⑱ **ABF operation indicator**
Indicates the status of ABF operation.
- ⑲ **Inner dome**

Preparations

When installing the camera on a wall or a ceiling, there are two methods as specified below.
(☞ Next page)

- Using a two-gang junction box
- Using the camera mount bracket (accessory)

Refer to all work related to the installation of this product to qualified service personnel or system installer.

Important:

- Prepare the mounting screw according to the material of the area where the camera attachment (accessory) is to be installed. In this case, wood screws and nails should not be used. For mounting a camera on a concrete ceiling, use an anchor bolt (M4) or an AY plug bolt (M4) for securing.
(Recommended tightening torque M4: 1.6 N·m)
 - When using the provided camera attachment, make sure that either of the arrow marks faces upward.
 - Required pull-out capacity of a single screw/bolt is 196 N or more.
 - If a ceiling board such as plaster board is too weak to support the total weight, the area shall be sufficiently reinforced.
 - When using an optional mounting bracket, refer to the operating instructions of the bracket in use.
-

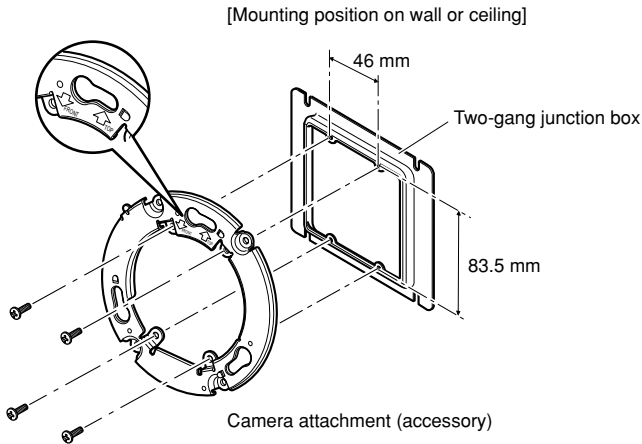
The mounting conditions of the camera mount bracket are described as follows:

Installation place	Applicable mount bracket	Recommended screw	Number of screw	Minimum pull-out strength (per 1 pc.)
Ceiling/wall	(Two-gang junction box)	M4 or equivalent	4 pcs.	196 N
Ceiling/wall	Camera mount bracket (approx. 350 g)	M4 or equivalent	4 pcs.	196 N
Ceiling	WV-Q169 (approx. 700 g)	–	–	*

* Make sure that the installed mount bracket can support more than 5 times of the weight of the camera.

Using a two-gang junction box

- When the camera is installed using the two-gang junction box, mount the camera attachment (accessory) to the embedded box installed on the wall or ceiling as a first step.



Note:

- For wall mounting:
Installation shall be performed in such a manner that "↑TOP" of the camera attachment faces upward.
 - For ceiling mounting:
The front side (model number indication face) of the camera shall be aligned in the direction of the arrow in "↓FRONT" on the camera attachment.
-

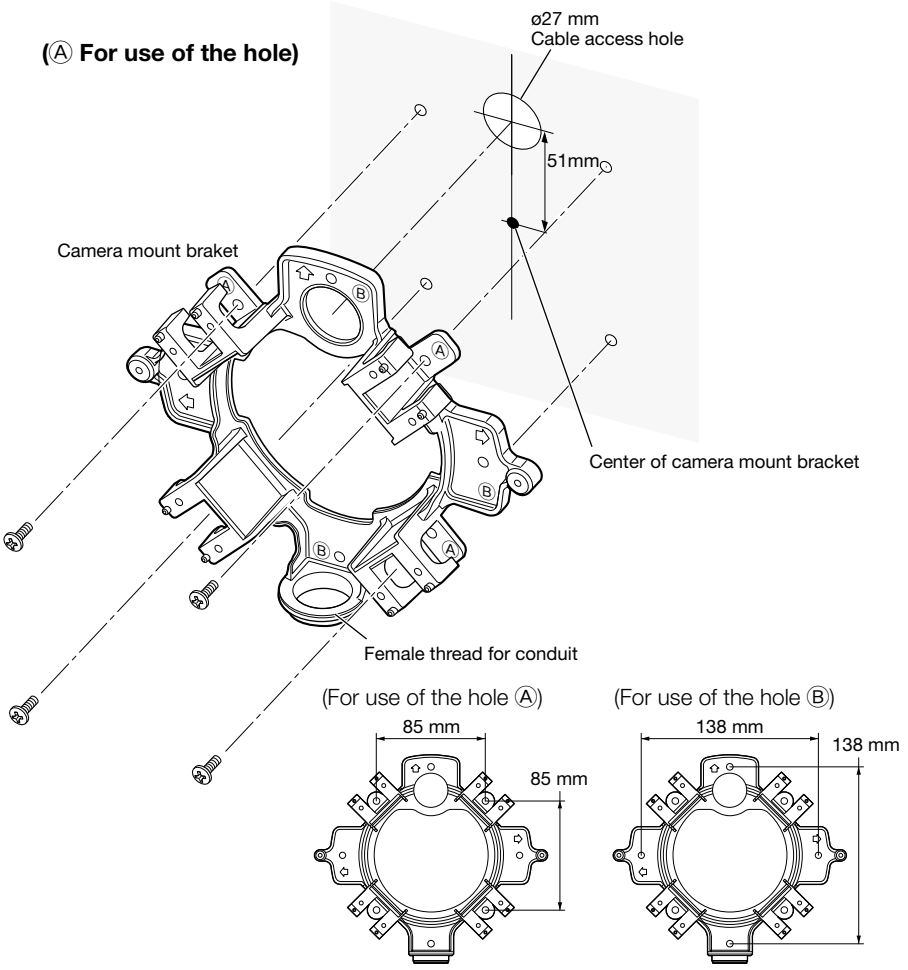
Using the camera mount bracket (accessory)

- When installing the camera with the camera mount bracket, attach the camera mount bracket to the wall or ceiling in the first place. (☞ next page.)
Mount the camera attachment (accessory) by using the screws supplied with mounting bracket. (☞ next page.)
(Recommended tightening torque: 0.78 N·m)

Note:

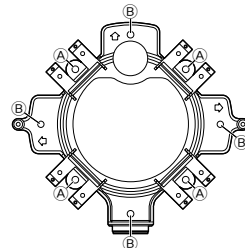
- When installing the camera on the wall or ceiling where cable holes are already provided, or when installing the camera with exposed wiring, the mount bracket shall be used.
 - The female screws for piping conform to G3/4 of ISO 228-1.
The female screws for piping shall be removed with a hexagon wrench.
 - To connect conduit from the top, refer to page 28.
-

1 Install the camera mount bracket on the wall/ceiling.



Note:

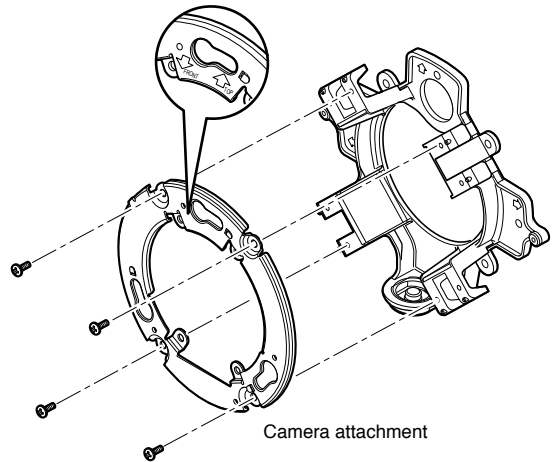
- Only the same type of holes, (A) or (B), shall be used for mounting.



2 Previously run the cables from the wall or ceiling through the cable access hole.

3 Mount the attachment onto the mount bracket.

Recommended tightening torque: 0.78 N·m



Note:

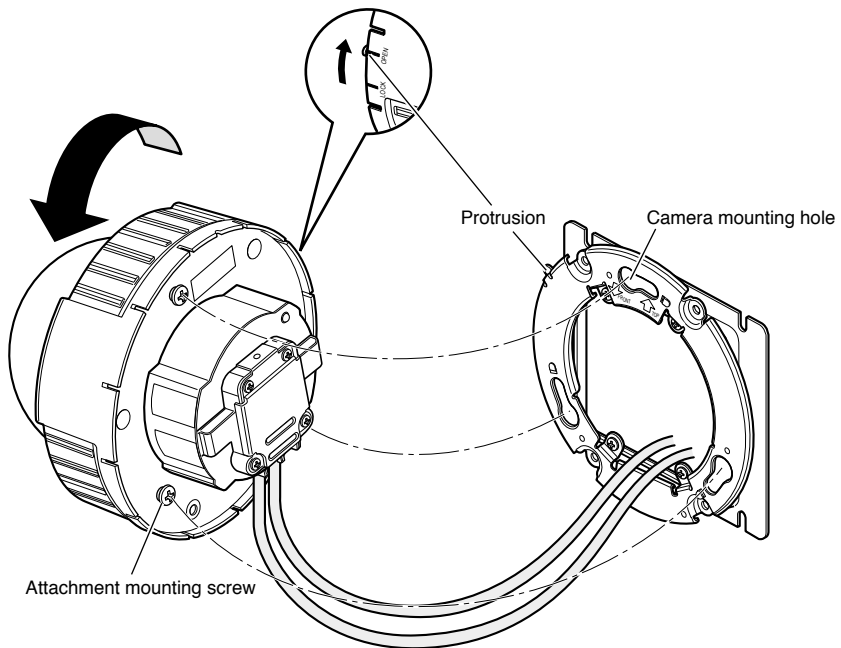
- For wall mounting:
Installation shall be performed in such a manner that "↑TOP" of the camera attachment faces upward. (Except for the case of connecting the conduit from the top. (☞ page 28))
 - For ceiling mounting:
The front side (model number indication face) of the camera shall be aligned in the direction of the arrow in "↓FRONT" on the camera attachment.
 - Ensure that any one of the arrows on the mount bracket is aligned with the arrow of "↑TOP" on the attachment.
-

Camera installation

1 Mount the camera.

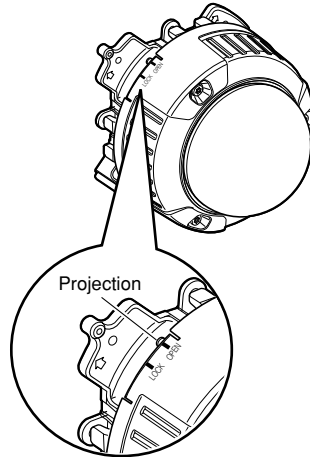
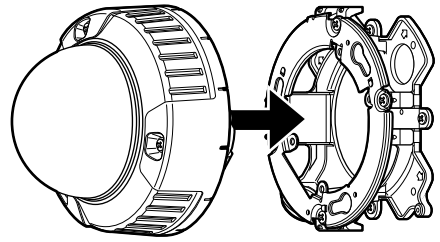
<To mount the camera on a two-gang junction box>

- ① Connect the power cord and the video output cable. (☞ page 29)
- ② Align the "OPEN" mark of the camera with the protrusion of the camera attachment.
- ③ Engage the attachment mounting screw of the camera with the camera mounting hole of the camera attachment and rotate the camera in the direction of the arrow to the "LOCK" position to secure the camera to the camera attachment without any backlash.



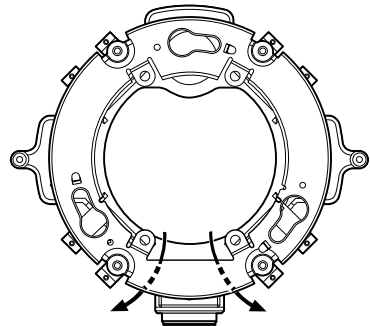
<To use the camera mount bracket>

- ① Attach the camera onto the camera attachment while aligning the "OPEN" mark of the camera with the projection of the camera attachment.

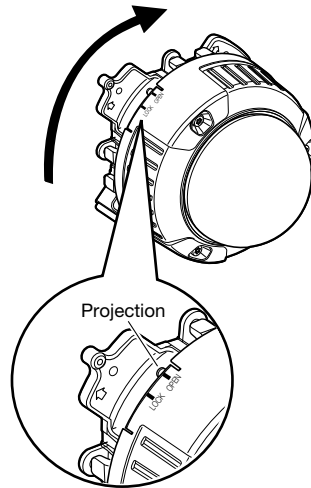


Important:

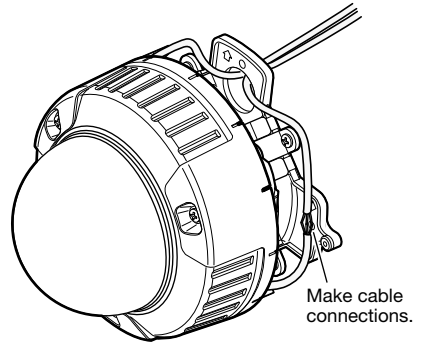
- When mounting the camera body, cables shall be run between the camera attachment and camera mount bracket as indicated by the arrow in the illustration.
- * Cable running as indicated by the arrow is an example. Cable running shall be varied with installation environment.



- ② Engage the attachment mounting screw of the camera with the camera mounting hole of the camera attachment and rotate the camera in the direction of the arrow to the "LOCK" position to secure the camera to the camera attachment without any backlash.



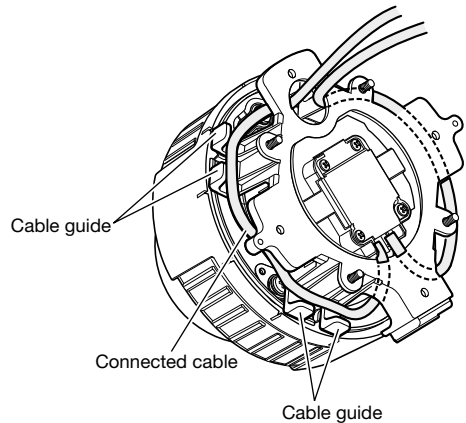
- ③ Connect the power cord and the video output cable at the side of the camera mount bracket. (☞ page 29)
Apply waterproof treatment to the connected section. (☞ page 27)



- ④ Accommodate the connected cables inside the cable guide of the camera mount bracket.

Important:

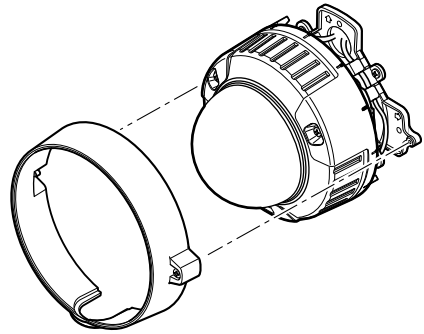
- To prevent the cables from being caught when the cover is attached, keep the cables inside the cable guide.
-



- ⑤ Mount the supplied base cover on the camera mount bracket.

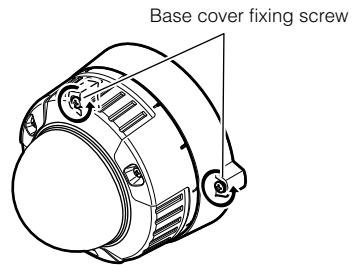
Important:

- To prevent the cables from being caught when the base cover is attached, keep the cables inside the cable guide.
-



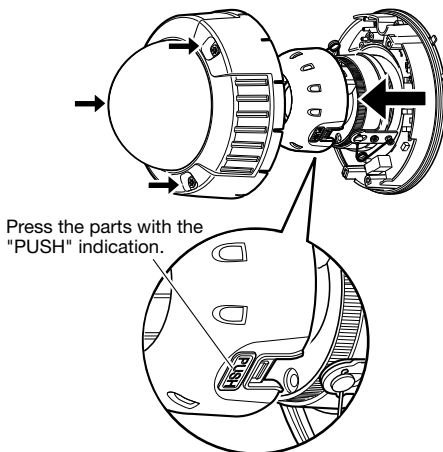
Base cover

- ⑥ Use the bit for tamperproof screw (accessory) to tighten the fixing screws provided on both sides of the base cover. (Recommended tightening torque: 0.78 N·m)



2 Remove the enclosure and inner dome from the main body by loosening the three fixing screws.

Loosen the three fixing screws by using the provided bit for tamperproof screw. Detach the inner dome while pushing the parts with the "PUSH" indication.



Important:

- Do not hold the inner dome when carrying the camera. Otherwise, the camera part may fall and it may damage the camera.

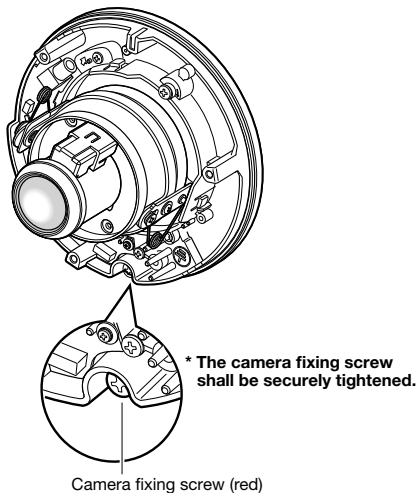
Note:

- Perform the same procedure when replacing with the optional dome cover WV-CW4S.

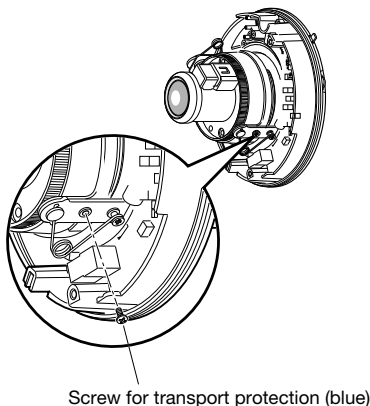
3 Secure the camera to the bracket with the camera fixing screw (red, 1 position).

Important:

- The camera fixing screw shall be securely tightened. Otherwise, water exposure may cause damage or malfunction of camera, or camera dropping may result in injury. (Recommended tightening torque: 0.78 N·m)



4 Remove the screw (blue, 1 position) for transport protection with a Phillips screw driver.

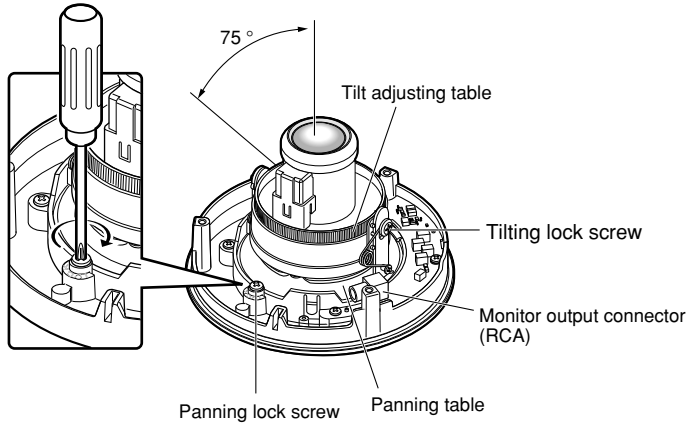


Adjust the camera

1 Be sure to view the monitor for adjustment when the camera angle is adjusted.

Connect the monitor for adjustment (e.g. a small LCD) to the monitor output connector, and adjust the camera angle.

When determining the camera angle, repeat fine follow the adjusting procedure of ①, ②, and ③ shown below.



- ① Loosen the panning lock screw and rotate the camera head horizontally to adjust panning, and tighten the panning lock screw.
- ② Loosen the tilting lock screws and rotate the camera head vertically to adjust tilting, and tighten the tilting lock screw.
- ③ Rotate the tilt adjusting table, and adjust the azimuth angle of the image.

Important:

- The panning lock screw and the tilting lock screw shall be securely tightened.
(Recommended tightening torque: 0.59 N·m)
-

Note:

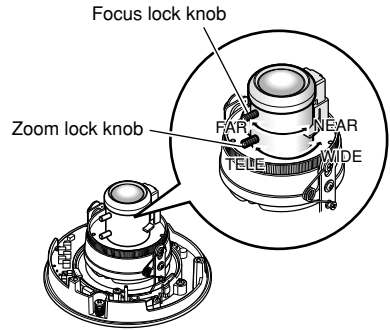
- The video output to the BNC connector will be interrupted while an adjusting monitor is connected to the monitor output connector.
 - At the same time for the pan and tilt adjustments, make focus adjustments of Step 2.
-

2 Adjusts the focus.

Focus adjustment shall be performed when camera angle adjustment are performed.

Adjust the focus by following the adjusting procedure of ①, ②, and ③ shown below.

- ① Loosen the zoom lock knob and move the knob between TELE and WIDE to obtain the appropriate angle of view, and then tighten the zoom lock knob.
- ② Loosen the focus lock knob, make coarse adjustment of the focus, and then tighten the focus lock knob.
- ③ Perform major adjustment of back focus through the setup menu or perform major adjustment by following Steps 3 and 4 below (☞ Operating Instructions (PDF)).

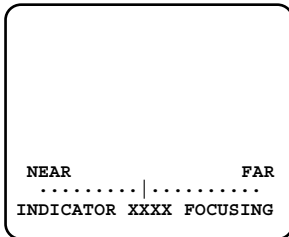


Note:

- Reset the back focus position to the CS mount default position before the back focus adjustment. (Hold down the right and left buttons simultaneously for 2 seconds or more, or move the cursor to "MANUAL-ADJ" of "BACK-FOCUS SETUP" in the setup menu and press the right and left buttons simultaneously for 2 seconds or more after pressing the setting button.)
-

3 Press the [ABF1] button after adjusting the view angle while viewing the monitor for adjustment.

The ABF operation indicator (☞ page 12) lights, the focus position is displayed in the lower part of the screen, and the back focus is automatically adjusted.



4 To perform fine adjustment of the back focus after the ABF operation indicator goes off and automatic back focus is adjusted, use the right or left button.

Note:

- No operation for 10 seconds or more automatically clears the focus position indicator.
 - To change the angle of view by moving the zoom adjustment ring, also move the focus lock knob to adjust the focus.
 - The originally adjusted focus may be slightly off depending on the iris state resulting from the focal depth of the lens. In such a case, open the aperture by darkening the subject as much as possible in the same way of taking picture, and then adjust the focus. Defocus can be prevented.
 - Use of "ABF" or "BACK-FOCUS" in the setup menu (☰ Operating Instructions (PDF)) allows users to adjust the focus optimally in the range of the capability to automatically follow the variation in illuminance.
 - The out-of-focus level in the near-infrared light region may be higher than that in the visible light region.
Setting "C/L ↔ B/W" of "BACK-FOCUS SETUP" to "AUTO" or "PRESET" in the setup menu (☰ Operating Instructions (PDF)) allows users to adjust the focus in both the near-infrared light and visible light regions (The variation in illuminance is not followed after focus adjustment.).
-

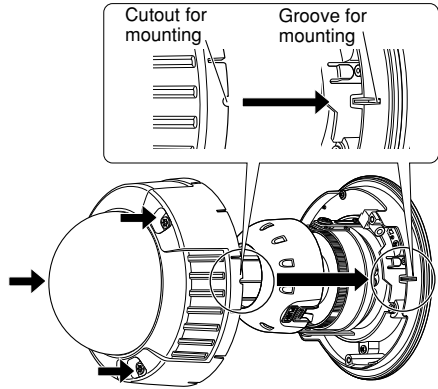
5 Mount the enclosure and inner dome.

Tighten the screws that have been loosened in Step 2 in page 22 using the supplied driver bit.

(Recommended tightening torque:
0.78 N·m)

Important:

- Attach the inner dome in accordance with the lens direction to not to change the lens direction.
 - Check if the tabs of the inner dome are firmly fit.
 - Remove the cushioning (pink sheet) from the inside of the dome and the protection sheet from the outside of the dome.
-



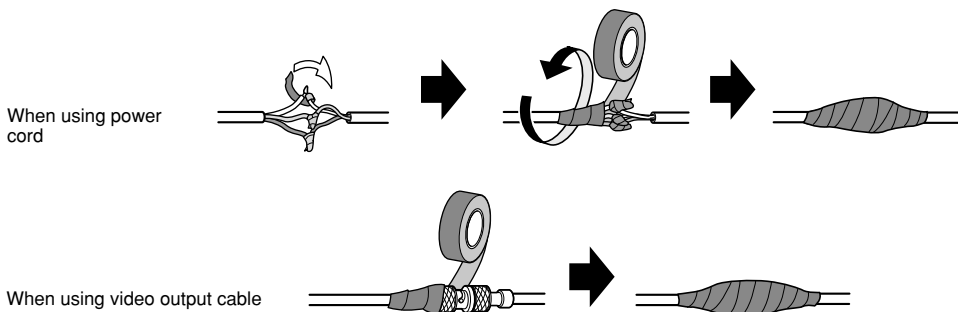
Note:

- Defocus may be caused by the reinstalled enclosure. When using a system controller (option), adjust the back-focus on the setup menu after attaching the enclosure. (☞ Operating Instructions (PDF))
 - When not using a system controller, by using the [ABF2] button back-focus adjustment is available after attaching the enclosure. The procedure for the use of the [ABF2] button is as specified below.
 - ① Press the [ABF2] button. → The ABF operation indicator will start blinking.
 - ② While the indicator is blinking (for around 3 minutes), attach the enclosure to the camera.
 - ③ When the indicator changes to steady light, back-focus will be adjusted automatically. After the back-focus is adjusted, the indicator will go out.
 - * Do not aim the camera to objects continuously moving.
 - * If the indicator blinks again after changing to steady light, back-focus adjustment may have failed. In this case, check the back-focus on the LCD monitor.
To adjust the back-focus again, perform Step ① to ③ again.
-

Waterproof treatment for the cable joint sections

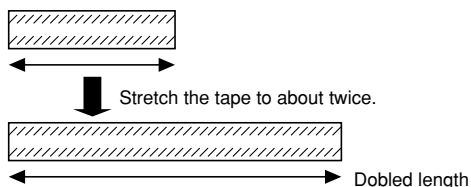
Adequate waterproof treatment is required for the cables when the camera with exposed cables is installed by means of the camera mount bracket or it is installed under the eaves. The camera body is waterproof, but the cable ends are not waterproof.

Be sure to use the supplied butyl tape at the connection parts of the power cord and video output cable to apply waterproof treatment in the following procedure. Failure to observe this may cause water leakage resulting in malfunction.



<How to wind the supplied butyl tape>

Stretch the tape by approx. twice (see the illustration below) and wind it around the cable. Insufficient tape stretch causes insufficient waterproofing.

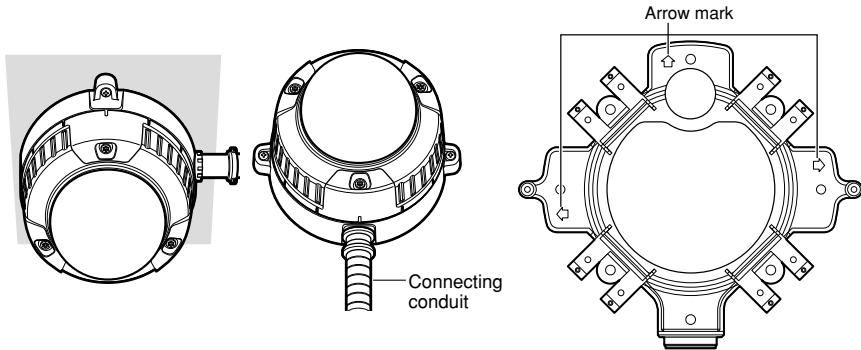
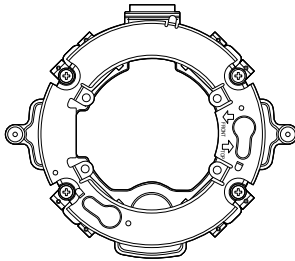


Note:

- To install this product outdoors, be sure to waterproof the cables. The camera body is waterproof (IEC IP66 or equivalent) only when installation specified in this document and appropriate waterproofing are properly performed. The bracket is not waterproof.
 - The cable shall be wound with butyl tape in a half-overlapping manner.
-

Important:

- If open wiring is conducted, be sure to use conduits and run the cables inside the tubes to protect the cables from direct sunlight.
- When the conduit is connected at the lateral or bottom position, either of the arrow marks on the bracket shall be the top position.
- When the conduit is connected from the top, the arrow mark on the attachment shall be either of the right or left position.

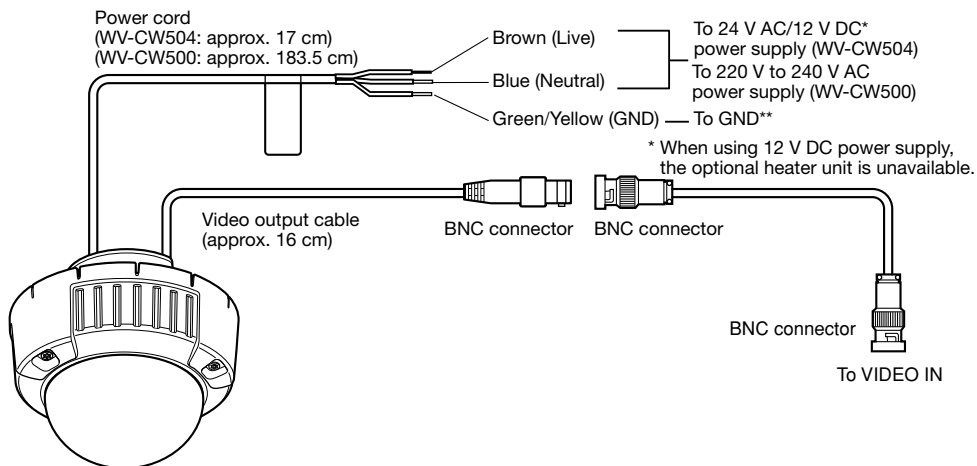
<To connect conduit from the side or bottom>**<To connect conduit from the top>**

- For installation on the wall, do not connect the dehumidifying device at the upper side to prevent water from being stored in the dehumidifying device. If water remains inside, the dehumidifying device cannot function properly.
 - Installation work shall be such that there is no intrusion of water into the architecture through the conduits having been joined.
-

Make a connection

Cautions:

- ONLY CONNECT WV-CW504 TO 24 V AC OR 12 V DC CLASS 2 POWER SUPPLY. (WV-CW504)
- Be sure to connect the grounding lead to the GND terminal.



● Video output connection

The video output connector is connected to the monitor or other system devices with a coaxial cable (locally procured).

The maximum extensible length is shown in the table.

Type of coaxial cable	RG-59/U (3C-2V)	RG-6/U (5C-2V)	RG-11/U (7C-2V)	RG-15/U (10C-2V)
Recommended maximum cable length	m 250	500	600	800

● Power connection

Precaution:

The following connections should be made by qualified service personnel or system installers in accordance with local electrical code.

● Wire colors & functions

Camera power cord

<WV-CW504>

Wire color	24 V AC	12 V DC
Brown	24 V AC (L)	Positive
Blue	24 V AC (N)	Negative
Green/yellow	To GND	** (not in use)

<WV-CW500>

Wire color	220 V to 240 V AC
Brown	220 V to 240 V AC (L)
Blue	220 V to 240 V AC (N)
Green/yellow	To GND

Cautions:

- Be sure to connect the GND (grounding) lead of the camera and grounding terminal of the power supply when using a 24 V AC (WV-CW504) or 220 V to 240 V AC (WV-CW500) power source.

- Shrinking the cable-entry seal is a onetime procedure. Do not shrink the cable-entry seal until it has been ascertained that unit is functioning.
ONLY CONNECT THIS TO 24 V AC or 12 V DC CLASS 2 POWER SUPPLY.

Important:

When using 12 V DC power supply, the heater is unavailable.

• **Cord length and wire gauge**

24 V AC

The recommended cord length and copper wire size are shown in the table for reference.

The voltage supplied to the camera should be between 19.5 V AC and 28 V AC.

Recommended wire gauge for 24 V AC line.

Copper wire size (AWG)	#24 (0.22 mm ²)	#22 (0.33 mm ²)	#20 (0.52 mm ²)	#18 (0.83 mm ²)
Length of cable (approx.) m	20	30	45	75

12 V DC

The recommended resistance and copper wire size are shown in the table for reference.

The voltage supplied to the camera should be between 10.8 V DC and 16 V DC.

Resistance of copper wire [20 °C]

Copper wire size (AWG)	#24 (0.22 mm ²)	#22 (0.33 mm ²)	#20 (0.52 mm ²)	#18 (0.83 mm ²)
Resistance (Ω/m)	0.078	0.050	0.03	0.018

Use the formula below to calculate the power cord and power supply.

"L", "R", "V_A", "I" shall satisfy the inequality below.

$$10.8 \text{ V DC} \leq V_A - 2(R \times I \times L) \leq 16 \text{ V DC}$$

L: Cord length (m)

R: Resistance of copper wire (Ω/m)

V_A: DC output voltage of power supply unit

I: DC current consumption (A). See specifications.

Optional Heater Unit WV-CW5H (option)

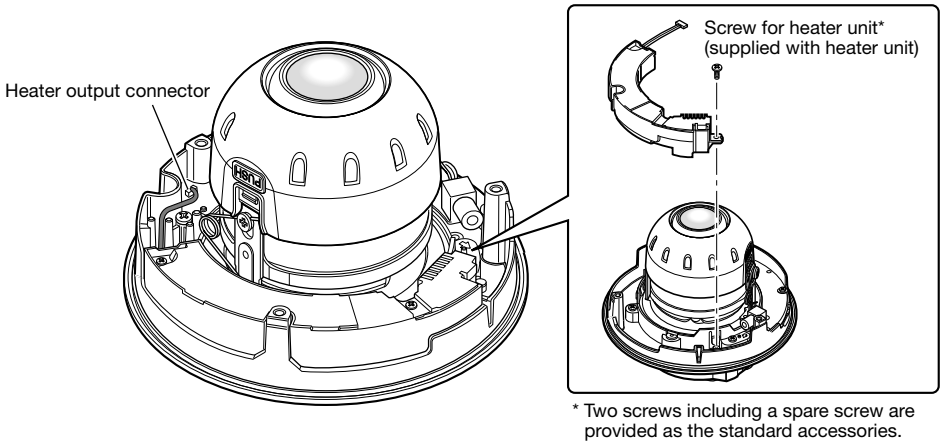
Installing the heater unit enables the camera to operate in a low-temperature environment below $-30\text{ }^{\circ}\text{C}$. The heater turns on automatically when the temperature inside the camera drops below $+10\text{ }^{\circ}\text{C}$ and turns off when the temperature rises. A small fan inside the unit will minimize condensation on the surface of the enclosure caused by changes in ambient temperature unless temperatures change too rapidly.

Important:

- When using 12 V DC power supply, the optional heater unit is unavailable (WV-CW504).
 - Turning the heater on and off may disturb the camera images.
 - The power supply of the camera shall be turned off when mounting or dismantling the heater. When servicing, pay attention to high temperature on the surface of the heater unit. Disconnect the harness and wait until the heater unit cools.
 - When the camera is installed and operated in low temperatures below $-10\text{ }^{\circ}\text{C}$, normal images may not be obtained immediately after startup. In such a case, wait approximately 60 minutes or more.
-

How to install the heater unit

- ① Remove the camera's enclosure and mount it in the specified position with the supplied screw.
- ② Connect the heater unit cable to the connector of the camera.



Important:

- After mounting the heater unit, arrange the harness cable as shown in the drawing so as not to be tangled around the enclosure, safety wire, and equipment inside the camera.
-

About the setup menus

Performing each setting item in the setup menu should be completed in advance to use this unit. Perform the settings for each item in accordance with the conditions of the camera shooting area. Refer to the operating instructions (PDF) for further information.

Setup menu list

Setup item	Description
CAMERA ID	This item specifies the camera title. The camera title that indicates the camera location and other information about the camera is created with alphanumeric characters and symbols, and is displayed on the screen.
CAMERA	Performs the camera operation settings.
SCENE1/SCENE2	Selects a scene file. It is possible to register and save the settings as a scene file in case that it is necessary to change the settings such as when shooting at night or on holidays.
ALC	Selects the method of controlling the quantity of light.
SHUTTER	Specifies the electronic shutter speed.
AGC	Specifies gain adjustment.
SENS UP	Specifies electronic sensitivity enhancement.
WHITE BAL	Specifies white balance adjustment.
DNR	Selects the level of the digital noise reduction function.
BW MODE	Performs each setting regarding the black-and-white mode such as switching between color and black-and-white images.
i-VMD	Performs settings regarding intelligent VMD (Video Motion Detector) such as motion detection and object abandonment/removal detection.
SYSTEM	Performs the settings regarding the camera system such as synchronization and privacy zone.
SYNC	Specifies the synchronization type.
LENS	Performs automatic adjustment of the focus.
PRIVACY ZONE	Hides undesired portions in the camera shooting area.
STABILIZER	Decides whether or not to enable the image stabilizer.
EL-ZOOM	Toggles the electronic zoom on and off.
UPSIDE-DOWN	Enables the vertical and horizontal flip function.
BACK-FOCUS	Selects the back focus setting type and performs fine adjustment.

Setup item	Description
SPECIAL	
CHROMA GAIN	Adjusts the chroma level.
AP GAIN	Adjusts the aperture level.
PEDESTAL	Adjusts the pedestal (brightness) level.
PIX OFF	Corrects image defects such as flaws.
CAMERA RESET	Restores the settings in the setup menu to the default settings.
SER.NO.	Displays the serial number of this unit.
LANGUAGE	Selects a language to be used in the setup menu.

Basic operation

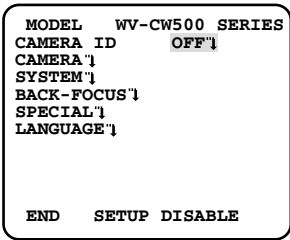
The description below explains how to operate the setup menu basically.

The operations in the setup menu are performed with the operation buttons (see page 12) after calling up the setup menu on the connected video monitor.

The operations in the setup menu can also be performed through the system controller (option).

Screenshot 1

Hold down the setting button for more than 2 seconds to call up the top screen of the setup menu.



Step 1

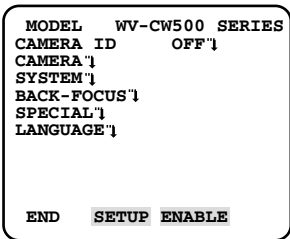
Press the up button or the down button to move the cursor to "END".

Step 2

Press the right button to move the cursor to "SETUP", and press the setting button to change the setup mode from "DISABLE" to "ENABLE".

Screenshot 2

The setup mode changes to "ENABLE", and the setup menu becomes ready to be set.



Step 3

Move the cursor to the item to be set, and press the setting button.

Screenshot 3

The selected setup screen in the setup menu appears on the screen.

```

**CAMERA SETUP**
SCENE1
ALC      ALC1
SHUTTER  OFF
AGC      ON(HIGH)
SENS UP  OFF
WHITE BAL ATW11
DNR      HIGH
BW MODE  AUTO11
i-VMD1
RET TOP END
```

Note:

- If the top screen of the setup menu is called up with the operation buttons while a camera image is displayed, the setup mode is always "DISABLE" to prevent operation errors. To configure the settings in the setup menu, change the setup mode to "ENABLE".
 - The cursor is a reversely highlighted part.
-

Step 4

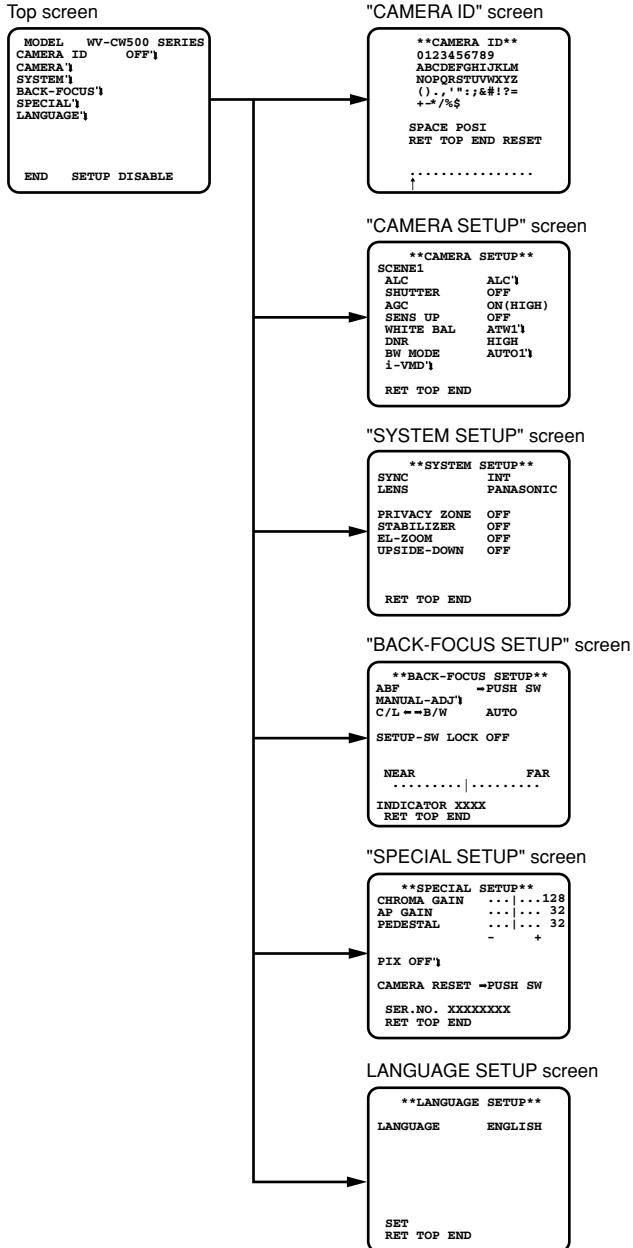
Perform the settings for each item.

- Selection of setting item:
Press the up or down button to move the cursor.
- Change of settings:
Press the right or left button.
- Display of advanced setup screen:
Press the setting button when "↵" is attached to the target setting item.
- Return to previous setup screen:
Move the cursor to "RET" and press the setting button.
- Return to the top screen:
Move the cursor to "TOP" and press the setting button.

Step 5

To return to the camera image screen, move the cursor to "END" and press the setting button.

Screen transition diagram



Troubleshooting

Before asking for repairs, check the symptoms with the following table.

Contact your dealer if a problem cannot be solved even after checking and trying the solution in the table or a problem is not described below.

Symptom	Cause/solution	Reference pages
No image displayed	<ul style="list-style-type: none"> • Are the power cord and coaxial cable connected appropriately? → Check whether the connection is appropriately established. 	29
	<ul style="list-style-type: none"> • Is the adjusting monitor connected? → Check whether connection is established. 	23
	<ul style="list-style-type: none"> • Is the monitor brightness appropriately adjusted, or is the contrast appropriately adjusted? → Check whether the monitor settings are appropriate. 	–
	<ul style="list-style-type: none"> • Were the shock absorbers in the dome cover already removed? → Confirm whether the shock absorbers have been already removed. 	–
Blurred image	<ul style="list-style-type: none"> • Is the dome cover free from contamination and/or flaws? → Check the dome cover. 	–
	<ul style="list-style-type: none"> • Is the focus adjusted correctly? → Check if the focus is adjusted correctly. 	24
	<ul style="list-style-type: none"> • Is the lens of the camera soiled with dirt or dust? → Check whether the lens of the camera is clean. 	–
Damaged power cord sheathing	<p>The power cord and connector is damaged. Use of the damaged cord or connector may cause electric shock or fire. Turn off the power immediately and request repair to your dealer.</p>	–
Heated portion of power line consisting of power cord during use		
Warmed power cord or loosened connection by bending or stretching during use		

Specifications

• Basic

Power source:	WV-CW500: 220 to 240 V AC 50 Hz WV-CW504: 24 V AC 50 Hz, 12 V DC
Power consumption:	WV-CW500: 5.1 W (without heater unit) 16 W (with heater unit) WV-CW504: 24 V AC: 3.4 W (without heater unit) 14 W (with heater unit) 12 V DC: 280 mA*
Ambient operating temperature:	-10 °C to +50 °C -30 °C to +50 °C**
Ambient operating humidity:	Less than 90 % (no condensation)
Water resistance:	Camera: IEC60529 (IP66)***
Shock resistance:	50J, IEC60068-2-75
Video output:	VBS: 1.0 V [p-p]/75 Ω, PAL, BNC connector
Dimensions:	ø164 mm x 146 mm (H), 191.5 mm (W) (Base Cover)
Weight:	WV-CW500: Approx. 1.9 kg WV-CW504: Approx. 1.7 kg Camera attachment: 100 g Mounting bracket: 350 g
Finish:	Main body: Aluminum die cast, light gray Dome cover: Clear polycarbonate resin

* When using 12 V DC power supply, the optional heater unit is unavailable.

** With heater unit WV-CW5H (option)

*** Applicable only when the installation and waterproof process are done properly.

• Camera

Image sensor:	1/3 inch interline transfer CCD
Effective pixels:	976 (H) x 582 (V)
Scanning area:	4.8 mm (H) x 3.6 mm (V)
Scanning system:	2:1 interlace
Scanning frequency:	Horizontal: 15.625 kHz Vertical: 50 Hz
Synchronization:	INT (internal sync)/VD2/LL* (Power supply synchronization) * Phase adjustable
Resolution:	Horizontal: 650 TV lines typ. (color mode) 700 TV lines or more (BW mode), Vertical: 400 TV lines or more (at center)
Minimum illumination:	When using clear dome cover: Color Mode: 0.1 lx at F1.4 WIDE 0.003 lx (sensitivity up x32, at F1.4 WIDE)* BW mode: 0.01 lx at F1.4 WIDE 0.0003 lx (sensitivity up x32, at F1.4 WIDE)*

	When using smoke dome cover (option):
	Color Mode: 0.2 lx at F1.4 WIDE 0.006 lx (sensitivity up x32, at F1.4 WIDE)*
	BW mode: 0.02 lx at F1.4 WIDE 0.0006 lx (sensitivity up x32, at F1.4 WIDE)*
	* Converted value
Signal-to-noise ratio:	50 dB (AGC Off)
Dynamic range:	54 dB typ. (Super Dynamic 5 ON)
Monitor output:	VBS: 1.0 V [p-p]/75 Ω, PAL, RCA jack
Functions:	
Camera title:	Up to 16 characters (alphanumeric characters, marks)
Light control mode setting:	ALC/ALC+
Super Dynamic 5:	ON/ON (i-VMD)/OFF
Electronic shutter speed:	OFF (1/50), 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 s
AGC:	ON (HIGH, MID, LOW)/OFF
Sensitivity up:	OFF/AUTO (x2, x4, x6, x10, x16, x32)/FIX (x2, x4, x6, x10, x16, x32)
White balance:	ATW1/ATW2/AWC
Digital noise reduction:	HIGH/LOW
Color/BW:	AUTO1/AUTO2/ON/OFF
Intelligent VMD (i-VMD):	Motion detection Object abandonment/removal detection Scene change detection
Number of scene file:	2
Lens:	PANASONIC/OTHER
Privacy zone:	ON (1)/ON (2)/OFF
Image stabilizer:	ON/OFF
Electronic zoom:	ON (Up to 2x)/OFF
Image flip:	ON/OFF
Auto back focus:	ABF/MANUAL/switching between color and BW interlocking
Display language:	JAPANESE/ENGLISH/FRANÇAIS/ESPAÑOL/DEUTSCH/ ITALIANO/РУССКИЙ

• Lens

Type:	2x variable focal lens
Focal length:	3.8 mm - 8.0 mm
F number:	F1.4 (WIDE) - F1.8 (TELE)
Focus range:	∞ - 1.2 m
Angle of view:	Horizontal: 35.6 ° (TELE) - 73.6 ° (WIDE) Vertical: 26.6 ° (TELE) - 53.4 ° (WIDE)
Adjusting angle:	Panning range: ±170 ° Tilting range: ±75 ° Azimuth range: ±100 °

Dimensions and Weight indicated are approximate.
Specifications are subject to change without notice.

Standard accessories

CD-ROM* 1 pc.

Installation Guide (this book) 1 pc.

*The CD-ROM contains the operating instructions (PDF).

The following parts are used during installation procedures.

Base cover 1 pc.

Camera mount bracket 1 pc.

Fixing screw for camera mount bracket 5 pcs.

(incl. 1 spare screw)

Camera attachment 1 pc.

Bit for tamperproof screw 1 pc.

Butyl tape 1 pc.

Optional Accessories

Dome cover

WV-CW4S Weight: Approx. 110 g

Heater unit

WV-CW5H Weight: Approx. 50 g

Ceiling mount bracket

WV-Q169 Weight: Approx. 700 g

Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)



This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis. Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.

Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union.

If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

Panasonic Corporation

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Panasonic Marketing Europe GmbH
Winsbergring 15, 22525 Hamburg F.R.Germany

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Ns0409-3010/1

3TR006038DZA

Printed in China