



Waterproof Color CCD Camera

WAT- 400D

Operation Manual

This Operation Manual covers safety, camera functions, installation and the correct operating procedure for the WAT-400D. First, we ask you to read this Operation Manual thoroughly, then install and operate the WAT-400D as advised. In addition, for future reference, we also advise safe keeping of this manual.

Please contact the distributor or dealer from which the WAT-400D was purchased, if you do not understand the installation, operation or safety instructions laid out in this manual. Not understanding the contents of the Operation Manual sufficiently may cause damage to the camera.

Guide to the safety symbols

The meanings of the symbols used in this operation manual are:

Danger When you do not adhere to or take notice of the "Danger" sign, it may lead to a serious accident such as death or injury caused by fire or electric shock.

Warning When you do not adhere to or take notice of the "Warning" sign, it may cause severe damage such as a physical injury.

Caution When you do not adhere to or take notice of the "Caution" sign, it may incur injury and cause damage to peripheral objects in the immediate surroundings.

Cautions for safety

The WAT-400D is designed to be used safely; however, electrical goods may lead to a physical accident caused by fire and electric shock if not used correctly. Therefore, please keep and read the "Cautions for safety" for protection against accidents.

Danger

- Do not disassemble and/or modify the WAT- 400D.
- Do not operate any current-carrying part with wet hands.

Warning

- Use only the AD-156 with the WAT- 400D.
- Do not use the WAT- 400D under unusual environmental conditions.

The WAT-400D is specified as waterproof. However, the WAT-400D is not compliant with dust-proof and explosion-proof standards.

- Should the camera not work properly, switch off the power immediately. Then check the camera according to the "Problems and Trouble shooting" section.

Caution

- Avoid the striking of hard objects or dropping the WAT- 400D. The WAT-400D uses high quality electrical parts and precision components.
- The WAT-400RX must be used with the WAT-400D. Connect the WAT-400RX with the AD-156, monitor, and the WAT-400D.
- Do not install the WAT- 400D in a position subject to direct sunlight. Sunlight shining directly onto the WAT-400D lens can cause damage to the CCD.
- Select a stable place for installation of the WAT- 400D. Use a support of durable strength around an installation position on a ceiling or wall when a camera stand or tripod is used.
- Do not move the WAT- 400D with the cables connected. Before moving the WAT-400D, always remove the video cable and power cable from the rear of the camera first.

- Avoid using the WAT- 400D near any strong electromagnetic field. Avoid emission sources of electromagnetic waves when the WAT-400D is installed into main equipment.
- Dry the WAT- 400D well after use. When the WAT-400D is used in seawater, flush well with pure water, and then wipe. If the WAT-400D is steeped in water for many hours or left without wiping after use, the surface of the WAT-400D may become white.

EMC Conformity

The WAT-400D is in conformity with EMC test standards carried out by authorized organizations in Japan.

NTSC FCC Part15 class B

Danger Do not modify the WAT-400D. A Modified camera may not conform to EMC test standards.

Waterproof Conformity

The external body of the WAT- 400D is in conformity with the following waterproof standard.

JIS C 0920 (IEC60529)
Degrees of protection provided by enclosures: IPX8
(Water pressure: 2kgf/cm², Test time: 2 hours)

※Waterproof capability of the WAT-400D is confirmed according to the above conditions. This waterproof standard does not cover the quality of the operation under unusual condition.

Caution For ④VIDEO OUT/POWER IN, this part is not included in the compatible range of the waterproof standard. Treat the connector area for waterproofing if needed.

Problems and Trouble Shooting

If any of the following problems occur when using the WAT- 400D,

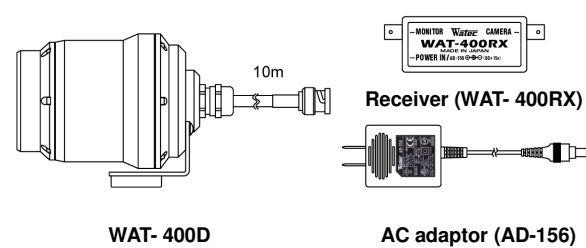
- An optimal picture cannot be obtained, after checking that all the cables and connections are correctly in place.
- Smoke or any unusual odor emerges from the WAT-400D.
- An object becomes embedded or a quantity of liquid seeps into the camera housing.
- More than the recommended voltage or/and amperage has been applied to the WAT-400D by mistake.
- Anything unusual occurring to any equipment connected to the WAT-400D.

Disconnect the camera immediately according to the following procedures:

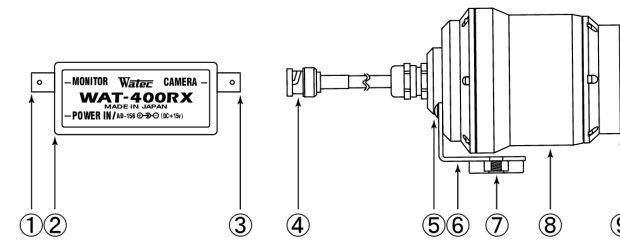
- Switch off the main power supply to the camera.
- Remove the power and video cables connected to the WAT-400D.
- Contact the distributor or dealer from which the WAT-400D was purchased.

Contents

Check to make sure all parts are present before use.



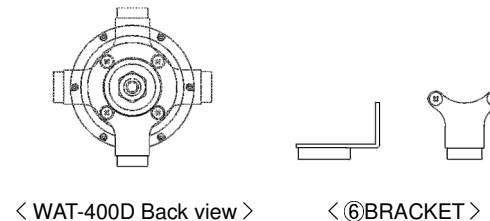
Description of parts



- VIDEO OUT (MONITOR)
 - BNC for connecting with the monitor. Use a cable with 75Ω impedance, such as RG-58/U.
- POWER IN (POWER IN)
 - The terminal for connecting the AD-156.
- BNC for connection of the WAT-400D (CAMERA)
 - BNC for connecting with ④VIDEO OUT/POWER IN.
- VIDEO OUT/POWER IN
 - The BNC coaxial cable for video out and power in.
- BRACKET MOUNTING SCREWS
 - The screws for mounting the bracket to the camera.
- BRACKET
 - The bracket for fixing to the camera.
- TRIPOD MOUNTING SCREW HOLES
 - Mounting holes for stands. The size of these threads are 1/4", 20 threads, 4.5±0.2mm, which is the same as any standard camera tripod (U1/4").
- HOUSING MAIN BODY
 - This case is uses aluminum and is given alumite treatment
- FRONT GLASS (Tempered glass)
 - Dirt, water or oil deposits on the front glass will cause an unclear picture on the monitor and scratches might become permanent damage. Do not dismount the front glass.

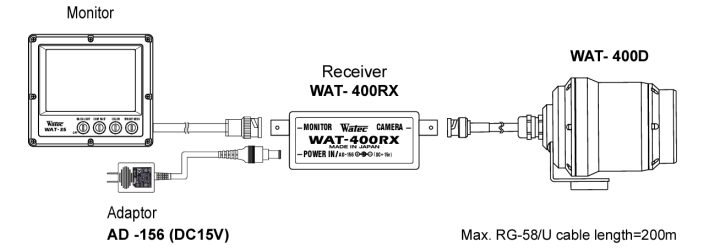
Set-up and Operation

- Ensure that the power to the WAT-400D and the peripheral equipment is turned off before making any connections.
- Connect the BNC ④VIDEO OUT/POWER IN of the WAT-400D to ③BNC to the WAT-400RX. When extending the cable beyond 10 meters, use a coaxial cable with 75Ω impedance, such as an RG-58/U. The maximum cable length is 200m using RG-58/U.
- Connect ①VIDEO OUT (MONITOR) on the WAT-400RX with the monitor, using a coaxial cable with 75Ω impedance, such as an RG-58/U. Select a monitor with the same television system as the WAT-400D: NTSC or PAL. A monitor with more than 500TV lines is recommended.
- Connect the attached AC adaptor (AD-156) to ②POWER IN on the WAT-400RX.
- Turn on the power to the WAT-400D, monitor and all other allied equipment. When a picture cannot be obtained on the monitor, check and follow the procedure mentioned in the [Problems and Trouble Shooting] section.
- When a change of installation position is required, set ⑥BRACKET to your required position after removing ⑤ BRACKET MOUNTING SCREWS from the WAT-400D, then retighten ⑤BRACKET MOUNTING SCREWS firmly. Angular settings for ceiling and wall are also available.



Wiring Diagram

The following diagram is the basic connection of the WAT-400D with the AD-156 and monitor.



Specifications

Model	WAT- 400D (NTSC)
Pick-up Element	1/3 inch interline transfer CCD image sensor
Number of Total Pixels	811(H)×508(V)
Number of Effective Pixels	768(H)×494(V)
Unit Cell Size	6.4 μm(H)×7.5 μm(V)
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip
Sync. System	Internal
Scanning System	2:1 interlaced
Video Output	Composite video, 1.0 V(p-p), 75Ω(Unbalanced)
Resolution (H)	More than 450TVL (Center)
Minimum Illumination	1.2 lx. F1.2
S/N	More than 50dB (AGC=3dB, γ=1.0)
A/E mode	1/60 sec.
White Balance	ATW
AGC	3 - 24dB
Gamma Characteristics	γ≒0.45
Back Light Compensation	ON
Power Supply	DC+15V±10%
Power Consumption	2.03W (135mA)
Operating Temperature	-10 - +50°C
Operating Humidity	Less than 95% RH (Without condensation)
Storage Temperature	-30 - +70°C
Storage Humidity	Less than 95% RH (Without condensation)
Built-in Lens	Auto-iris lens (f=2.8 F1.2)
Cable Length	RG-58/U 10m
Max. Cable Length	RG-58/U 200m*
Size	φ72 × 116 (mm)
Weight	Approx. 900g (Including RG-58/U 10m cable)

※Maximum cable length should be 200 meters using a RG-58/U cable to ensure an adequate electrical performance, but waterproof performance is not guaranteed. For waterproof, please refer to the [Waterproof Conformity] section.

SELECTABLE FACTORY SETTING

AE mode (Fixed)	1/60, 1/100 sec. 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000, 1/50000 sec.
White balance	ATW, Preset (3200K, 5100K, 8200K)
Mirror image	ON / OFF

- Design and specifications are subject to change without notice.
- Watec is not responsible for any inconvenience or the attendant damages to the video and monitoring recording equipment caused by misuse, mis-operation or improper wiring of our equipment.
- If for any reason the WAT-400D does not work properly, or if you have any questions regarding installation or operation, please contact the distributor or dealer from which it was purchased.

Contact information



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