



CCD Monochrome Video Camera

CS3330Bi SERIES

CS3330Bi CS3330BLi

Specification

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BEFORE USE – GENERAL SAFETY INSTRUCTIONS



This instruction manual contains important information for the operator (user) and/or people in the vicinity to avoid personal injury, or property damage.

- Prior to use, read this operation manual carefully to fully understand its instructions for correct use.
- After reading, keep this manual near the equipment for future reference.

WARNINGS & CAUTIONS



[Definition of markings]

The meaning of each mark used in this instruction manual is given below.

 WARNING	This mark warns the user that improper use may cause death or severe personal injury of the user or people in the vicinity.
 CAUTION	This mark warns the user that improper use may cause personal injuries (*1) or material damages (*2) against the user or people in the vicinity.

Notes *1: Personal injury means wounds, burns, electric shocks, and others for which hospitalization or long term care are not required.

*2: Material damage means any direct or consequential damage related to property or material loss.

	This mark indicates what the user SHOULD NOT DO . The details are given adjacent the mark.
	This mark indicates what the user MUST DO . The details are given adjacent the mark.



WARNING



unplug

- **Immediately cease use of the equipment in the event of abnormality or malfunction.**
If abnormal conditions are present, such as smoke, a burning smell, ingress of water or foreign matter, or if the equipment is dropped or malfunctions, fire or electric shock may result. If such abnormalities occur, disconnect the power plug from the outlet and contact your sales representative.



Do not get wet

- **Do not use the equipment in locations subject to water splashes.**
Otherwise, fire or electric shock may result.



Never pull apart

- **Do not disassemble, repair, or modify the equipment.**
Otherwise, fire or electric shock may result. For internal repair, inspection, or cleaning, contact your sales representative.



Avoid

- **Do not place anything on the equipment.**
If metallic objects, liquid, or other foreign matter enters the equipment, fire or electric shock may result.



Avoid

- **Do not install the equipment in an unstable or inclined location or locations subject to vibration or impact.**
Otherwise, the equipment may topple over and cause personal injury.



Do not touch

- **During an electrical storm, do not touch the power cord or connection cable.**
Otherwise, an electric shock may result.



Instruction

- **Use the specified power supply.**
Use of an unspecified power supply may result in fire or electric shock.



Avoid

- **Do not be handled roughly, damaged, fabricated, bent forcefully, pulled, twisted, bundled, places under heavy objects or heated the power cord, connection cable.**
Otherwise, fire or electric shock may result.



CAUTION



Instruction

- **Observe the following when installing the equipment:**
 - Do not cover the equipment with a cloth, etc.
 - Do not place the equipment in a narrow location where heat is likely to accumulate. Otherwise, heat will accumulate inside the equipment, possibly resulting in a fire.
-



Avoid

- **Do not place the equipment in locations subject to high moisture, oil fumes, steam, or dust.** Otherwise, fire or electric shock may result.
-



Avoid

- **Do not install the equipment in locations exposed to direct sunlight or humidity.** Otherwise, the internal temperature of the equipment will rise, which may cause a fire.
-



Avoid

- **Use only specified AC power cables and connection cables.** Otherwise, fire or electric shock may result.
-



Avoid

- **When performing connection, turn off power.** When connecting the power cable or connection cable, turn off the equipment power. Otherwise, fire or electric shock may result.
-



Avoid

- **Do not expose its camera head to any intensive light (such as direct sunlight).** Otherwise, its inner image pickup device might get damaged.
-



Avoid

- **Avoid short-circuiting signal output.** Otherwise, a malfunction may occur.
-



Avoid

- **Avoid giving a strong shock against the camera body.** If your camera is used in a system where its camera connector is subjected to strong repetitive shocks, its camera connector is possible to break down. If you intend to use your camera in such a situation, if possible, bundle and fix a camera cable in the place near the camera, and do not transmit a shock to the camera connector.
-



Instruction

- **Contact your sales representative to request periodic inspection and cleaning (every approx. five years).** Accumulation of dust inside the equipment may result in fire or electric shock. For inspection and cleaning costs, contact your sales representative.
-

CASES FOR INDEMNITY (LIMITED WARRANTY)

We shall be exempted from taking responsibility and held harmless for damage or losses incurred by the user in the following cases.

- In the case damage or losses are caused by fire, earthquake, or other acts of God, acts by a third party, deliberate or accidental misuse by the user, or use under extreme operating conditions.

 - In the case of indirect, additional, consequential damages (loss of business interests, suspension of business activities) are incurred as result of malfunction or non-function of the equipment, we shall be exempted from responsibility for such damages.

 - In the case damage or losses are caused by failure to observe the information contained in the instructions in this instruction manual and specifications.

 - In the case damage or losses are caused by use contrary to the instructions in this instruction manual and specifications.

 - In the case damage or losses are caused by malfunction or other problems resulting from use of equipment or software that is not specified.

 - In the case damage or losses are caused by repair or modification conducted by the customer or any unauthorized third party (such as an unauthorized service representative).

 - Expenses we bear on this product shall be limited to the individual price of the product.

 - About the item which does not have a publication in the specifications and manual of this product, it considers as the outside for a guarantee.
-

RESTRICTION FOR USE

- Should the equipment be used in the following conditions or environments, give consideration to safety measures and inform us of such usage:
 1. Use of the equipment in the conditions or environment contrary to those specified, or use outdoors.
 2. Use of the equipment in applications expected to cause potential hazard to people or property, which require special safety measures to be adopted.

 - This product can be used under diverse operating conditions. Determination of applicability of equipment or devices concerned shall be determined after analysis or testing as necessary by the designer of such equipment or devices, or personnel related to the specifications. Such designer or personnel shall assure the performance and safety of the equipment or devices.

 - This product is not designed or manufactured to be used for control of equipment directly concerned with human life (*1) or equipment relating to maintenance of public services/functions involving factors of safety (*2). Therefore, the product shall not be used for such applications.
 - (*1): Equipment directly concerned with human life refers to:
 - Medical equipment such as life-support systems, equipment for operating theaters.
 - Exhaust control equipment for exhaust gases such as toxic fumes or smoke.
 - Equipment mandatory to be installed by various laws and regulations such as the Fire Act or Building Standard Law
 - Equipment related to the above
 - (*2) Equipment relating to maintenance of public services/functions involving factors of safety refers to:
 - Traffic control systems for air transportation, railways, roads, or marine transportation
 - Equipment for nuclear power generation
 - Equipment related to the above
-

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Usage Precautions

- **Handle carefully**
Do not drop the equipment or allow it to be subject to strong impact or vibration, as such action may cause malfunctions. Further, do not damage the connection cable, since this may cause wire breakage.

- **Environmental operating conditions**
Do not use the product in locations where the ambient temperature or humidity exceeds the specifications. Otherwise, image quality may be degraded or internal components may be adversely affected. In particular, do not use the product in areas exposed to direct sunlight. Moreover, during shooting under high temperatures, vertical stripes or white spots (noise) may be produced, depending on the subject or camera conditions (such as increased gain). However, such phenomena are not malfunctions.

- **Do not shoot under intense light.**
Avoid intense light such as spot lights on part of the screen because it may cause blooming or smears. If intense light falls on the screen, vertical stripes may appear on the screen, but this is not a malfunction.

- **Occurrence of moiré**
If you shoot thin stripe patterns, moiré patterns (interference fringes) may appear. This is not a malfunction.

- **Do not expose the camera's image-pickup-plane to sunlight or other intense light directly.**
Its inner CCD (charge-coupled device) might be damaged.

- **Occurrence of noise on the screen**
If an intense magnetic or electromagnetic field is generated near the camera or connection cable, noise may be generated on the screen. If this occurs, move the camera or the cable.

- **Handling of the protective cap**
If the camera is not in use, attach the lens cap to the camera to protect the image pickup surface.

- **If the equipment is not to be used for a long duration**
Turn off power to the camera for safety.

- **Maintenance**
Turn off power to the equipment and wipe it with a dry cloth.
If it becomes severely contaminated, gently wipe the affected areas with a soft cloth dampened with diluted neutral detergent. Never use alcohol, benzene, thinner, or other chemicals because such chemicals may damage or discolor the paint and indications.
If the image pickup surface becomes dusty, contaminated, or scratched, consult your sales representative.

- **Disposal**
When disposing of the camera, it may be necessary to disassemble it into separate parts, in accordance with the laws and regulations of your country and/or municipality concerning environmental contamination.

1. PRODUCT DESCRIPTION

Model CS3330Bi/BLi is monochrome video camera with charge coupled device (CCD). These cameras are composed of camera head and camera controller (CCU).

2. FEATURES

The video cameras have the following technical features.

(1) High resolution

A 380,000 pixel CCD incorporated in the unit provides horizontal resolution of 570 lines.

(2) High reliability

Realize extremely low graphic distortion and after-images levels. Offers high reliability, high stability, long life and resistance against impact and vibration.

(3) Compact and light weight

The camera head and camera control unit are separately designed. The camera head is designed to minimize use of parts and is ultra-compact and light weight.

(4) External synchronization

The unit is automatically switched over between internal and external synchronization. When HD and VD signals are input from an external device, the external synch is automatically set and HD and VD signals are output.

(5) Electronic shutter

Variable speed electronic shutter (TV sync) with 8 steps from 1/60sec to 1/10,000sec. (standard feature)

(6) Electronic lines display (CS3330BLI)

Video signals can be overlapped using two sets of vertical and horizontal lines which are displayed as electronic lines on the monitor. In addition, there is also an option of displaying a reticle mark on the monitor to conveniently position and size up the images.

3. CONSTITUTION

Camera head without lens (includes 3m camera cable)	1 set
Camera control unit (CCU)	1 set
Accessories	
(1) Video cable (3C-2V ,with BNC plug on both ends 0.5m)	1 set
(2) AC cable(2.0m)	1 set
(3) Fuse(0.5A / 250V)	2 set
(4) Camera head mount metal fitting	1 set
(5) Lens mount screw	1 set
(6) adapter(3P-2P)	1 set
(7) Operation manual (this document)	1 copy

4. SPECIFICATION

4-1 Mechanical specifications

Overall dimensions and weight

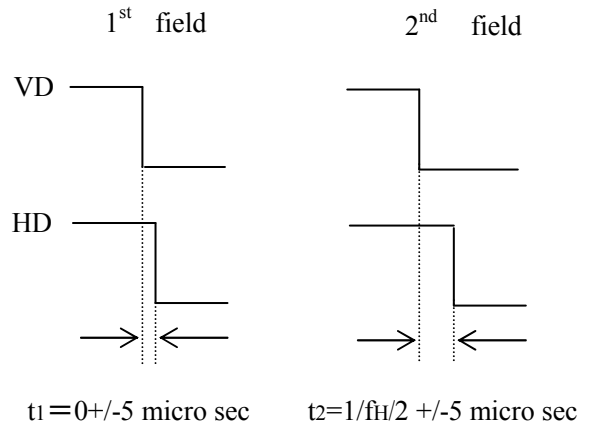
Camera head:	Refer to the attached camera head diagram.
Camera control Unit:	220(w) x 60(H) x 240(D) mm (excluding rubber casters) Mass : approx. 2.6 kg
Camera cable:	6.3mm(dia.) x 3 m length
Lens mount:	C mount

4-2 Electrical specifications

TV system:	Based on EIA standard
Pickup Device:	Interline transfer CCD ICX422AL
Effective pixels:	768(H) x 494(V) pixels
Unit cell size:	11.6(H) x 13.5(V) micro m
Sensing area:	8.8(H) x 6.6(V) mm (Equivalent to type-2/3 normal optical image size respectively.)
Scanning method:	525 lines, 2:1 interlace
Sync. system:	automatic switching between internal / external synchronization
Scanning frequency:	horizontal; 15.734kHz Vertical; 59.94Hz
Aspect rate:	4:3
Subject illumination:	
Standard:	100 lx, F4(3100K),(AGC OFF, gamma=1.0)
Minimum:	0.3 lx, F1.4,(gamma=0.45 with maximum gain)
Video output:	VS: 1.0V(p-p)/ 75 ohm
Horizontal resolution:	570 TV lines
Vertical resolution:	350 TV lines
S/N:	56dB (AGC OFF, gamma=1.0)
External sync input:	
Input level:	2 to 6 V(p-p) for both HD and VD signals
Input impedance:	1 k ohm for both HD and VD signals
Method:	2:1 interlace
Polarity:	Negative
Pulse width:	HD: 6.4 +/- 3 micro sec VD: 150 to 800 micro sec
Repeat frequency:	$f_H = 15.734 \text{ kHz} \pm 2\%$ $f_V = 2 f_H / 525$
Scanning lines:	525 lines

Phase difference:

The phase difference between the trailing edge of VD and the trailing edge of HD must be as shown below.



Output signal:

HD, VD negative polarity

Level:

3.5 to 4.5V(p-p) / 1k ohm terminated

8.0 to 9.0V(p-p) / high

Pulse width:

HD: 6.36±0.5 micro sec

VD: 572±5 micro sec

Repeat frequency:

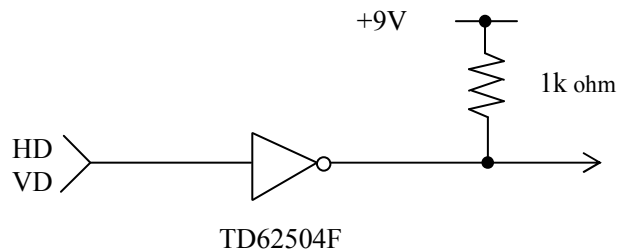
$f_H = 15.73426 \text{ kHz}$

$f_V = 2 f_H/525$

Scanning lines:

525 lines

Output circuit:



Electronic line display or reticle (CS3330BLi ONLY)

NO. of lines:

2 horizontal lines, 2 vertical lines

Movable range:

Entire monitor screen

Line width:

Horizontal line: 1 scanning line/field

Vertical line: approx. 0.5 micro sec

Polarity :

White(POSITIVE) / black(NEGATIVE) selectable

ON/OFF:

switching

Electronic line / reticle:

Internal selector switch

(Factory preset is electronic line.)

Gamma:

0.45/1 selectable

AGC:

ON/OFF switching

Electronic shutter:	ON/OFF switching
(TV synchronization):	
Shutter speed:	Selectable at 1/60sec, 1/125sec, 1/250sec, 1/500sec, 1/1,000sec, 1/2,000sec, 1/4,000sec, 1/10,000sec and flicker less
(during exposure):	
CCD operation mode:	frame store mode
Power supply:	AC100V +/-10%, 50/60Hz, 150mA ± 20%
Ambient condition:	
Temperature:	From 0 through 40 degrees
Humidity:	From 30 through 90% (No condensing)

5. APPEARANCES

5-1 Appearance of the camera head

Specifications

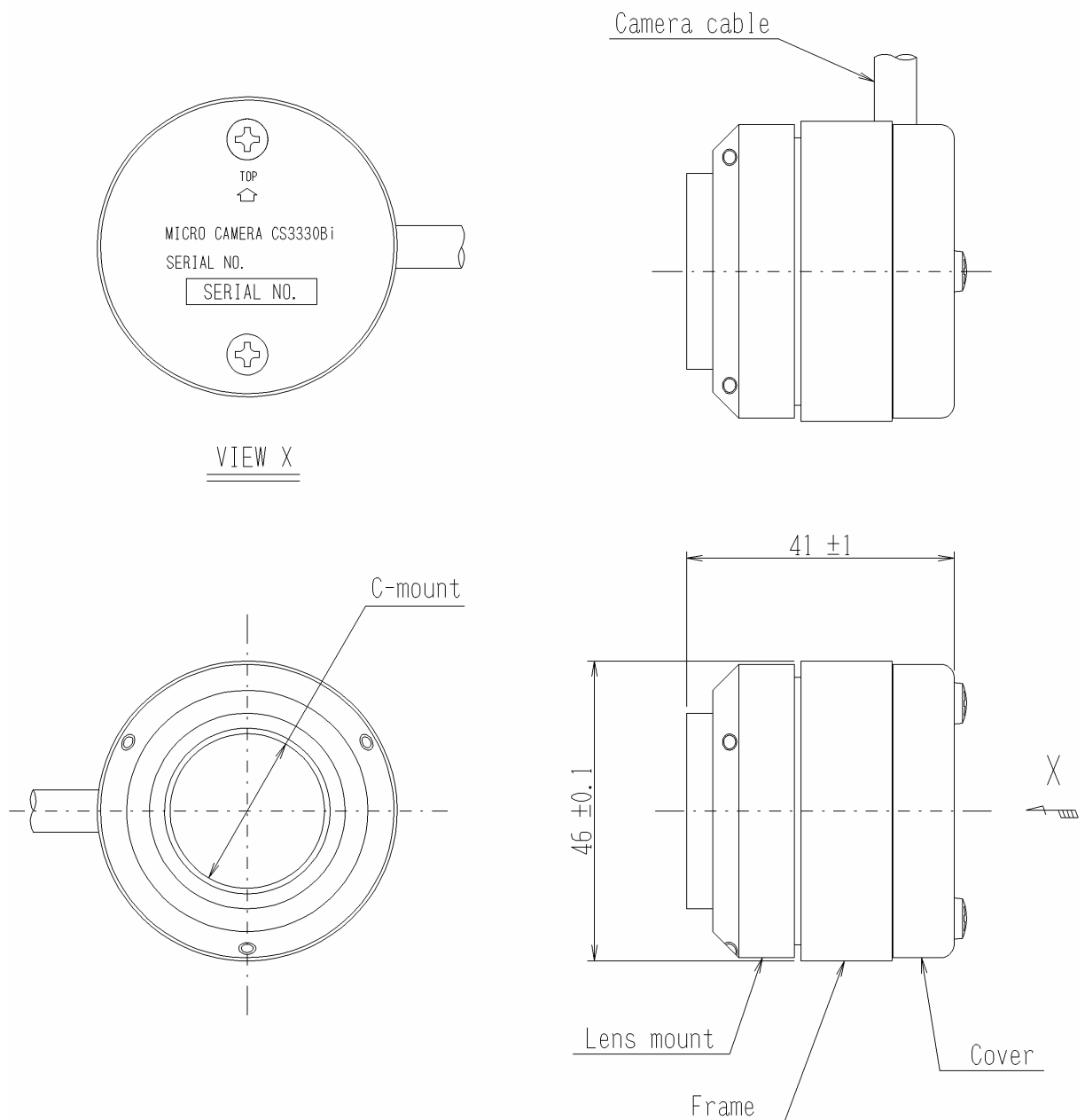
Material:

Lens mount: Stainless steel

Frame, cover: Aluminum alloy

Finish coating:

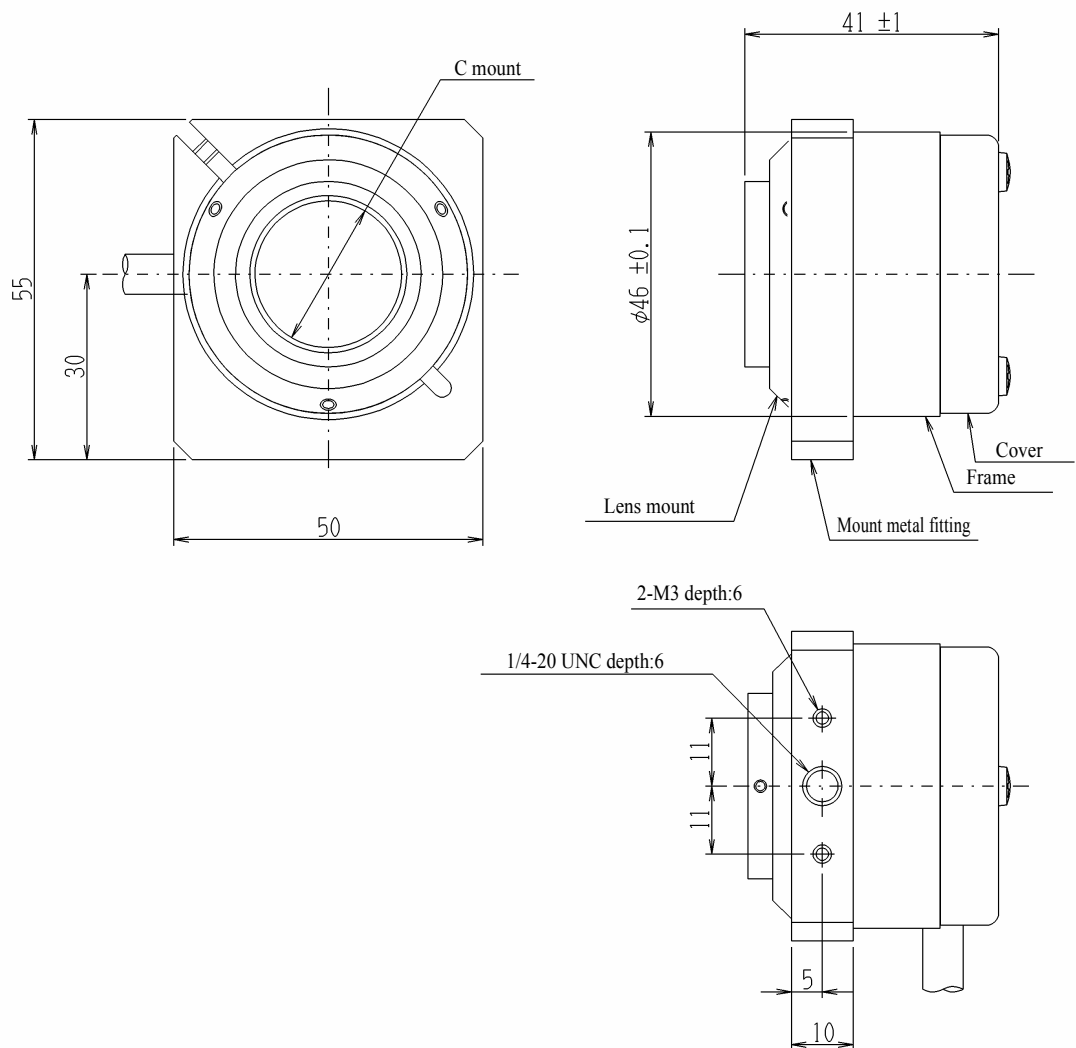
Frame, cover: Black alumite finish



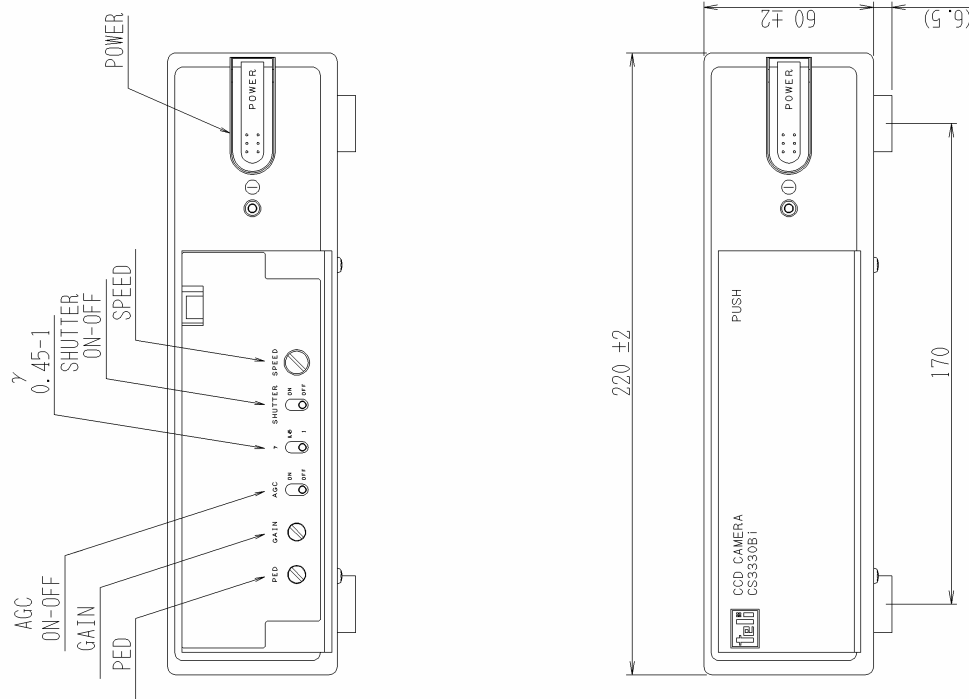
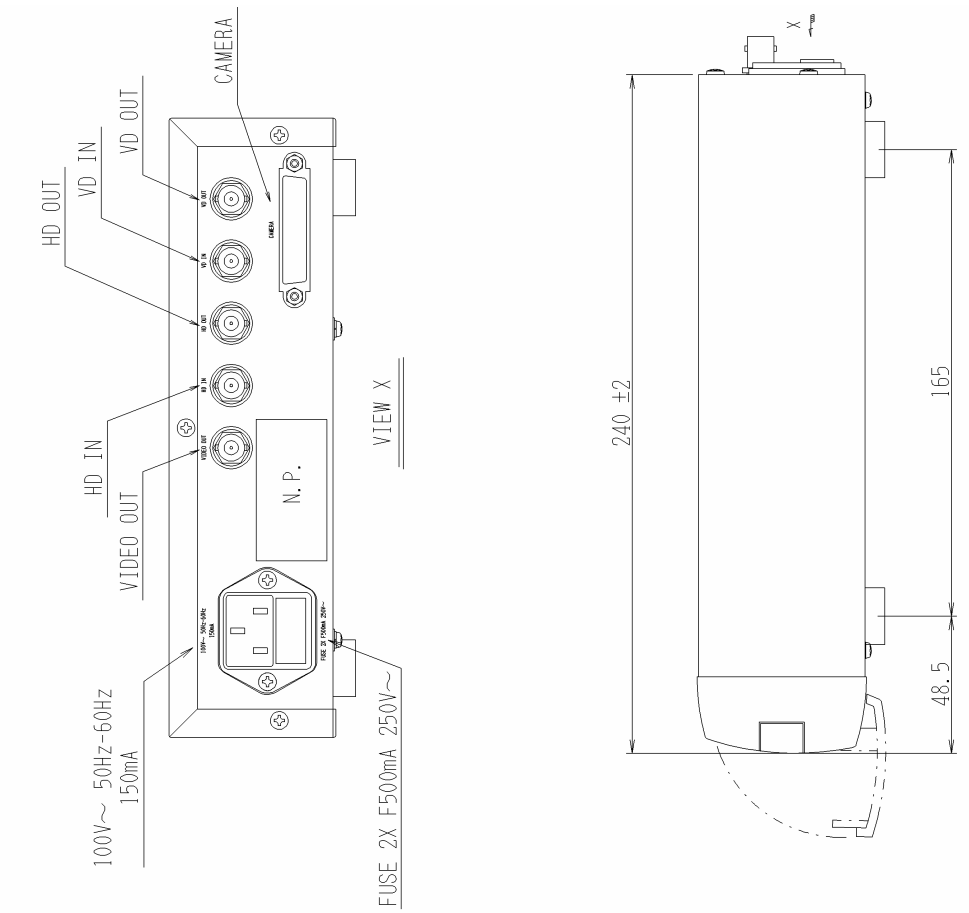
5-2 Appearance of the camera head with mount metal fitting

Specifications

Material:	
Lens mount:	Stainless steel
Frame, cover:	Aluminum alloy
Mount metal fitting:	Aluminum alloy
Finish coating:	
Frame, cover:	Black alumite finish
Mount metal fitting:	Elidite finish



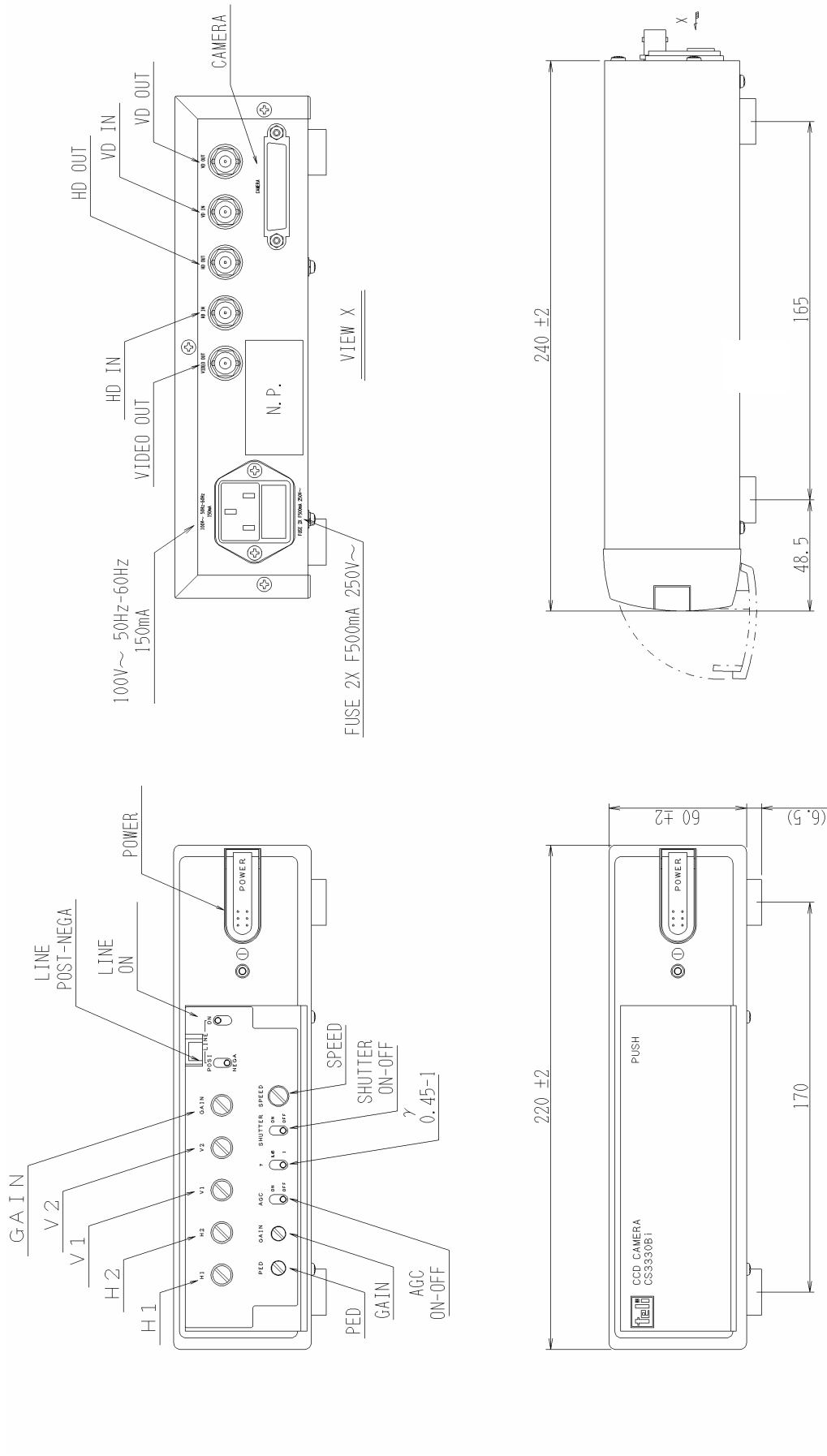
5-3 Appearance of the camera control unit for CCD camera (CS3330Bi)



Specifications

- Material:
- Chassis: Zinc plated steel plate
- Cover: Elio steel plate, stone ivory (munsel) 4.8Y7.9/1 equivalent)
- Front frame, front cover: ABS resin, stone ivory (munsel) 4.8Y7.9/1 equivalent)
- Control panel, rear panel: PC (back lettering on white background)

5-4 Appearance of the camera control unit for CCD camera (CS3330BLi)



Specifications

Material:

- Chassis: Zinc plated steel plate
- Cover: Elio steel plate, stone ivory (munshell 4.8Y7.9/1 equivalent)
- Front frame, front cover: ABS resin, stone ivory (munshell 4.8Y7.9/1 equivalent)
- Control panel, rear panel: PC (back lettering on white background)

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