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Find the *JAI / Pulnix CV-M2350* at our website: ***Click HERE***

Micro-head Color Camera Series

CV-M2000 series

OPERATION MANUAL

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CE

DECLARATION OF CONFORMITY

AS DEFINED BY THE COUNCIL DIRECTIVE

89/336/EEC
EMC (ELECTROMAGNETIC COMPATIBILITY)

WE HEREWITH DECLARE THAT THIS PRODUCT

COMPLIES WITH THE FOLLOWING PROVISIONS APPLYING TO IT.

EN-50081-1

EN-50082-1

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ENGLISH VERSION





The lighting 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 (servicing) instructions in the literature accompanying the appliance.



The slash within a circle is intended to alert the user to the presence of prohibition of any kind of operation, maintenance and storage.



The abstraction within a circle is intended to alert the user to presence of prohibition to disassemble the product.



The abstraction within a circle is intended to alert the user to turn the power off on the product and to take out the plug.



The abstraction within a circle intended alert the user to presence of prohibition to expose the product to rain, moisture or any kind of moist surroundings.

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Precautions



Do not attempt to disassemble this camera.



To prevent electric shock, do not remove cover. There are no user-serviceable parts inside. Refer servicing to qualified service personnel.



Do not expose this camera to rain or moisture.



Do not face this camera towards the sun, extreme bright light or light reflecting objects. Even when this camera is not in use, put the supplied lens cap on the lens mount.



Handle this camera with the maximum care.



Operate this camera only from the type of power source indicated on the camera.



Power-off the camera during any modification such as changes of jumper-line and jumper-register.



To connect with or disconnect from CCU, do not hold the camera cable in order to protect from wire-break and short-circuited.



Do not put excessive pressure on the camera cable.



When you connect the camera cable with CCU, please make sure that the pin-guide is set in right manner to avoid damage on the connector pins.



Power off the camera when you connect or disconnect the camera cable.

USER'S RECORD

The production serial number are shown on the bottom of camera

Model Name : Serial No. :

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1. General

The CV-M2000 micro-head color series offers a variety of miniature, remote head camera systems based on the latest DSP technology.
The CV-M2000 series includes an on-screen menu for configuration of wide range of user related image enchancing functions. These include various modes of white balance settings, back-light compensation, automatic gain control, shutter speeds, inverted video (negative/ positive conversion).
Furthermore, the functions of the camera can be controlled via RS 232C interface, by a user-friendly Windows based software. This also offers some additional functionality, to optimize parameters such as back-light compensation and color balance.
As a factory option, this camera series features a built-in memory, allowing up to 4 images to be "frozen" and displayed randomly.
The applications of CV-M2000 series include general imaging/surveillance, medical, microscopy and a wide range of other automated imaging applications.

2. Main Features

- High resolution color 1/2" and 1/3" IT CCD sensor
  1/2" IT CCD sensor for CV-M2200/2250/2200CM
  1/3" IT CCD sensor for CV-M2300/2350

- Effective pixels : 768 (h) x 494 (v) for NTSC, 752 (h) x 582 (v) for PAL

- Remote micro-head

17 mm diameter head	CV-M2200	(2 m cable)
	CV-M2250	(5 m cable)
12 mm diameter head	CV-M2300	(2 m cable)
	CV-M2350	(5 m cable)
C-mount head	CV-M2200CM	(2 m cable)

- ›450 TV lines horizontal resolution

- Composite VBS, Y/C output and RGB output

- S/N ratio : ›48 dB

- White balance automatic, manual and one-push

- Manual shutter up to 1/10,000 sec.

- Functions

On-screen menu:	Full on-screen menu of camera setup assures user-friendly operation directly from front panel or via CR-1000/CR-1100 remote control units.
BLC: (Back Light Compensation)	The BLC circuit will compensate for extreme highlights in the field of view. Two pre-defined patterns are available via the on-screen menu. Custom settings via software.

- RS 232C interface / Windows 95 / 98 / NT setup software

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3. Standard compositions

1)	Camera CCU	x 1
2)	Camera head	x 1
3)	Camera cable*	x 1
4)	Y/C plug (TCP8040-01-520 of Hosiden)	x 1
5)	Operation manual	x 1

*Note :
This cable connects the camera head and the CCU. The cable for CV-M2200 and CV-M2200CM is not detachable.

4. Optional accessories

1) Lenses (OP-735, OP-724, OP-715 for CV-M2200/2250, OP-101, OP-105 for CV-M2300/2350)
2) C-mount adaptors (MP-20 for CV-M2200/2250, MP-25 for CV-M2300/2350)
3) Camera brackets (MP-30 for CV-M2200/2250, MP-35 for CV-M2300/2350)
4) camera head mount (MP-60 for CV-2200CM)
5) Remote control unit (CR-1000 and CR-1100)
6) 6 pin multi connector (HR10A-7P-6S of Hirose)
7) 4 pin multi connector (HR10A-7P-4P of Hirose)



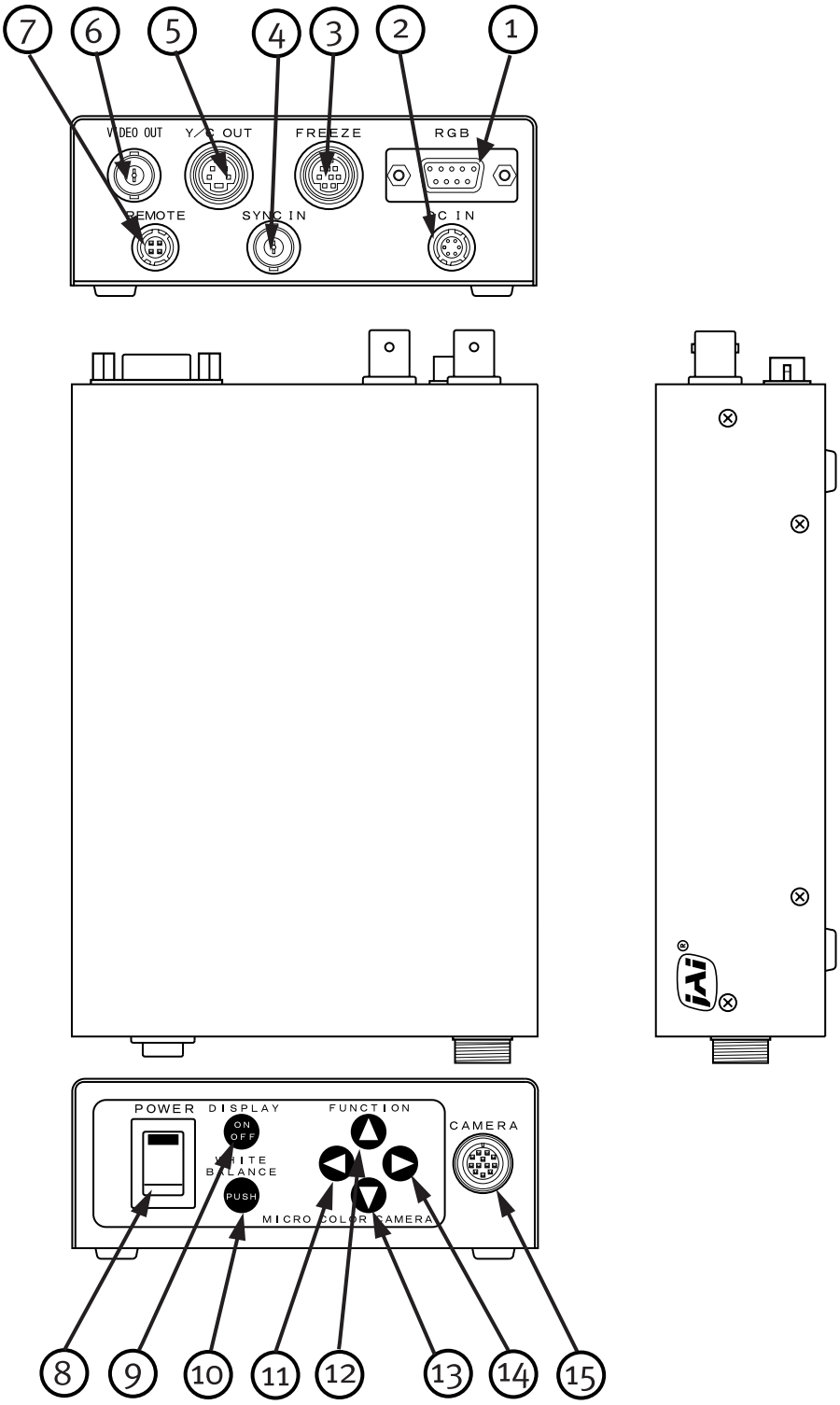
Important Notice !

The CV-M2000 series has inter-changeability between camera head and CCU within the same model. (e.g. The CV-M2200 camera head can ***be connected / work*** with other CCU sets of CV-2200.
However, the CV-M2200 camera head ***cannot be connected /work*** with CCUs from CV-M2250/2300/2350/2200CM).

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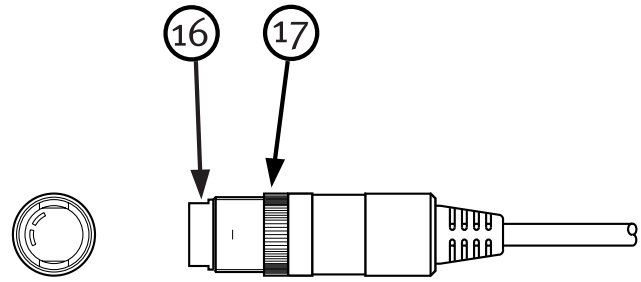
5. Location and functions

a) CCU

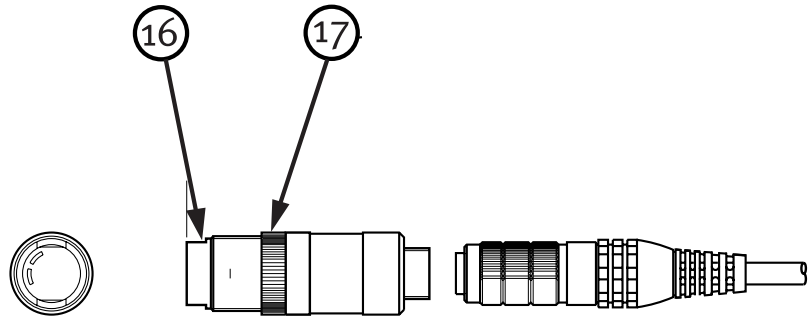


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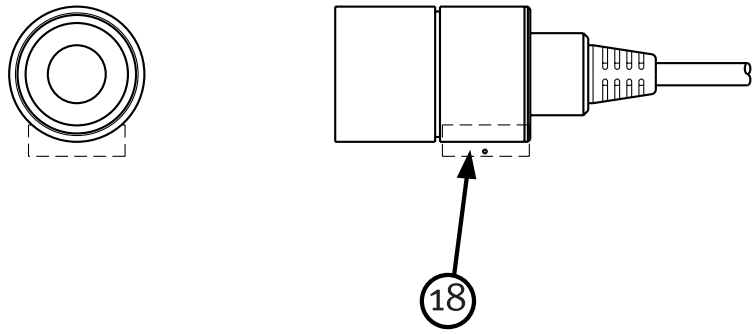
a) CCU



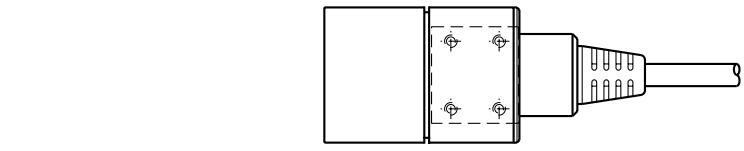
Camera head CV-M2200

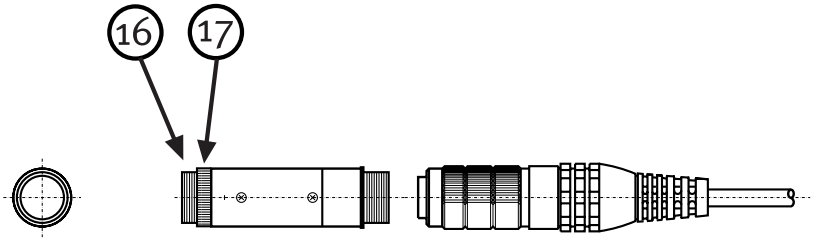


Camera head CV-M2250



Camera head CV-M2200CM





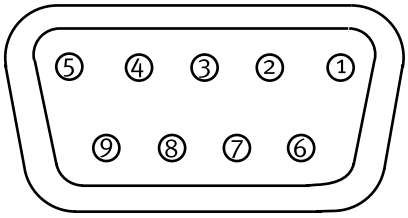
Camera head CV-M2300/2350

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①	RGB connector	:	RGB, video and Sync. signal output
②	DC IN connector	:	+12V DC power and ext. Sync. signal input
③	FREEZE connector	:	Optional memory board (Factory option) control
④	SYNC IN connector	:	Sync. and VBS signal input
⑤	Y/C OUT connector	:	Y and C signal output
⑥	VIDEO OUT connector	:	Video signal output
⑦	REMOTE connector	:	For RS 232C interface and remote control
⑧	Power switch	:	Power OFF or ON
⑨	DISPLAY button	:	On-screen menu ON or OFF
⑩	WHITE BALANCE button	:	One push white balance
⑪	FUNCTION button	:	To control the on-screen menu.
⑫	FUNCTION button	:	
⑬	FUNCTION button	:	
⑭	FUNCTION button	:	
⑮	CAMERA connector	:	Connector for the camera head
⑯	Lens mount	:	Special lens for CV-M2200/2250/2300/2350. C-mount type (only for CV-M2200CM).
⑰	Focus lock ring	:	Mechanical adjustment ring for locking focus.
⑱	Camera head mount	:	Optional accessory for CV-M2200CM (MP-60)

6. Pin assignment

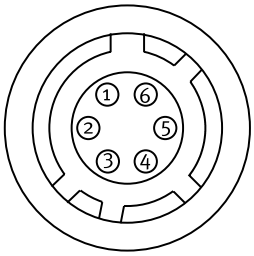
6-1. RGB connector - D.sub 9pin connector -



1 : Ground
2 : Ground
3 : R output
4 : G output
5 : B output
6 : Video output
7 : Sync. output
8 : Ground
9 : Ground

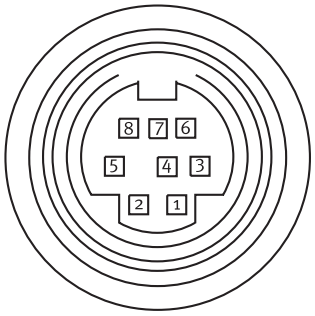
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6-2. DC IN connector - HR10A-7R-6PB of Hirose -



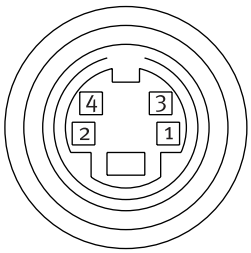
1 : NC
2 : Sync. input
3 : Ground
4 : Ground
5 : NC
6 : +12V DC input

6-3. FREEZE connector (Factory option) - TCS7888-01-101 of Hoshiden -



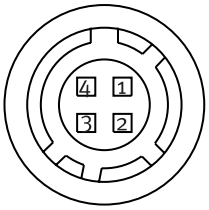
1 : Full/Div
2 : Sep 1
3 : Sep 2
4 : Sep 3
5 : Sep 4
6 : Frame / Field
7 : Live / Memory
8 : Ground

6-4. Y/C OUT connector - TCS7848-01-101 of Hoshiden -



1 : Ground
2 : Ground
3 : Y output
4 : C output

6-5. REMOTE connector - HR10A-7R-4SB of Hirose -



1 : TXD output
2 : RXD input
3 : Ground
4 : +3.3V input

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7. Functions and operations

7-1. On-screen menu

Full on-screen menu of camera setup assures user-friendly operation directly from front panel or via CR-1000/1100 remote control units.

7-1-1. Functions

The following functions are adjustable at on-screen menu.

- White balance
- Shutter
- AGC
- Back light compensation
- Video reversal on Y/C

a) White balance

This function corrects the color temperature.

3200 K	:	For incandescent lamp or halogen lamp.
4600 K	:	For white fluorescent lamp.
5600 K	:	For daylight.
Auto	:	The TTL (Through the Lens) system is employed for auto white balance. It detects the highest video level in objects to recognize a white color. Avoid light source in the field of view.
Manual	:	To adjust the color temperature.
One push	:	To use the one-push white balance, place a white object (e.g. a sheet of paper) in the field of view, and press the button. When released, the white balance has been calibrated.

Note : Factory pre-set is 3200 K.

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b) Shutter

Nine exposure time settings are avaliable.

OFF	:	1/60 sec. (NTSC), 1/50 sec. (PAL)
Selectable shutter	:	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10,000 sec.
Flicker-less	:	1/100 sec. (NTSC), 1/120 sec. (PAL)
Auto	:	Shutter speed changes automatically. (1/60 sec. to 1/10000 sec. (NTSC), 1/50 sec. to 1/10,000 sec.(PAL)

Note : Factory pre-set is OFF.

CAUTION

1. Under certain unique light conditions, the following may appear.
   - Strong smear and/or blooming on highlighted objects.
   - Noticeable flicker in the picture.

2. Auto (CCD iris)
   The variable electronic shutter controls the exposure time of the CCD sensor, depending on the incoming light level. When this mode is selected, manual iris lens can be used instead of an auto iris lens.

c) AGC (Auto gain control)

OFF	:	Gain is fixed at minimum o dB
ON	:	AGC ON (-6 dB to +12 dB)
Manual	:	Manual gain (-6 dB to +12 dB)

Note : Factory pre-set is AGC OFF.

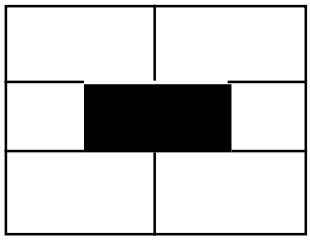
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d) BLC (Back Light Compensation)

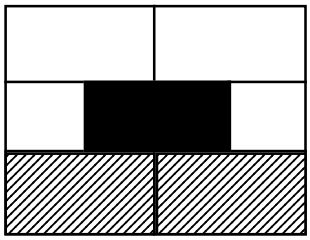
BLC circuit will compensate for extreme highlights in the field of view.

There are two pre-defined patterns that can be selected. These are shown below.
The higher the priority, the more backlight compensation.

Patten 1



Patten 2

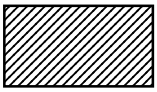


Priority area to detect

1st priority



2nd priority



Note : Factory pre-set is OFF.

CAUTION

1. The BLC works under the following conditions :

BLC	○	○	○	×
AGC	ON	ON	OFF	OFF
CCD iris	ON	OFF	ON	OFF

○ : Effective
× : Not effective

2. It is recommended to set to the “BLC OFF” when using the camera with pan/tilt head or if the scene illumination changes rapidly.

3. With “BLC ON” the regulation speed of the CCD iris is decreased.

e) Video reversal on Y/C (Negative/positive reversal)

OFF : Positive
ON : Negative

Note : Factory pre-set is OFF.

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7-1-2. Operations

a) Direct control from CCU front panel (On-screen menu)

Screen display (example)

White balance	3200K
Shutter	Off
AGC	Off
Back-light	Off
NEGA	Off

Note : The functions flashes when selected.

(1) To enter the menu, push “DISPLAY” button and the menu will appear on the monitor as above.

(2) Use ▲ or ▼ key to select functions. (e.g. White balance, Shutter, etc.) The selected function will flash.

(3) While function is flashing, press ▶ key to select mode. (e.g. Off, On, etc.) The selected mode will be flashing.

(4) Press ▲ or ▼ key to change the mode.

(5) Go to the next function if needed, and repeat (2) to (4).

Note :

When white balance and AGC are selected at manual, each level can be adjusted as below.

Cursor	AGC	White balance
▲	To red	To max.
▼	To blue	To min.
PUSH	Return to mid-range value	

b) Control via optional remote control unit (CR-1000/1100)

With the optional remote control unit CR-1000/1100, all functions and modes can be controlled.

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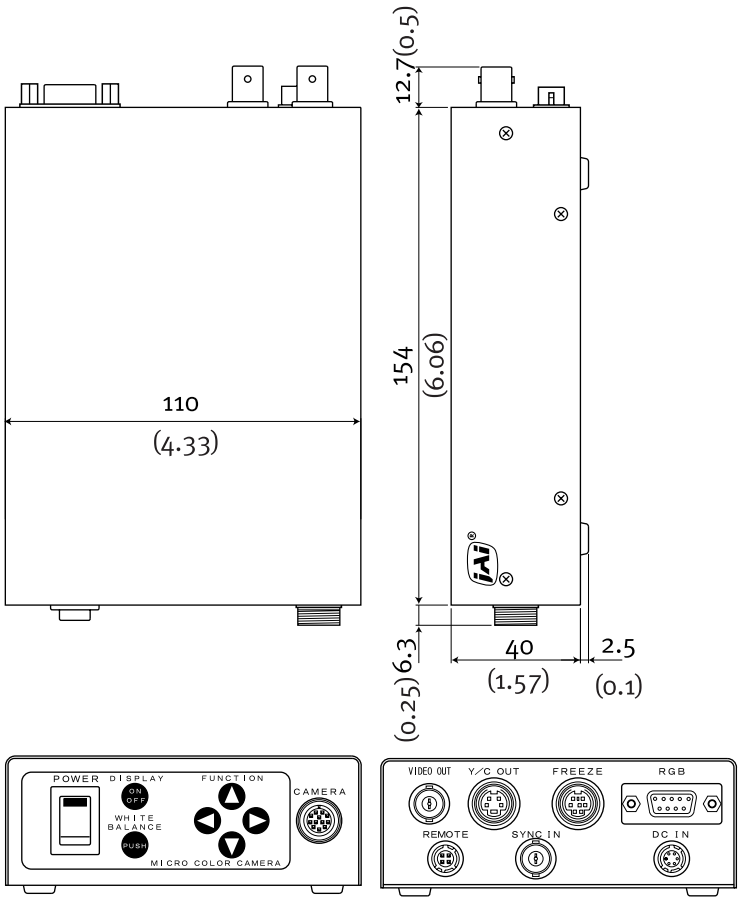
7-2. RS 232C functions

a)	White balance	:	To adjust the color temperature
b)	Electronic shutter	:	To adjust the shutter speed
c)	Auto gain control	:	OFF, auto, manual
d)	Back light compensation	:	To select the area and priority of BLC
e)	Gamma	:	0.45, 0.6, 1.0
f)	Video reversal on Y/C	:	Negative (Y/C), positive (Y/C)
g)	Level	:	To adjust set up, white clip and CCD iris level
h)	Hue	:	To adjust R-YB, R-YG, B-YR and B-YG
i)	Enhancer	:	H/V aperture correction
j)	Chroma	:	To adjust R-Y and B-Y

8. External appearance

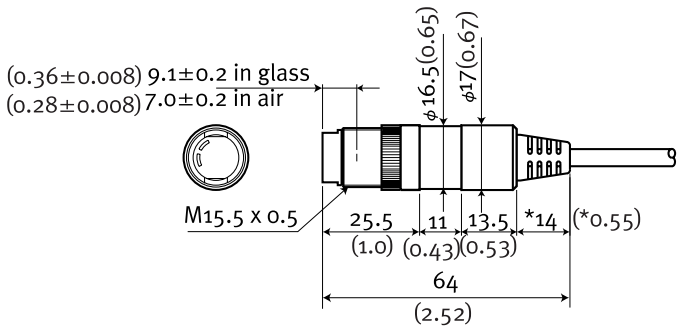
Unit : mm (inches)

a) CCU

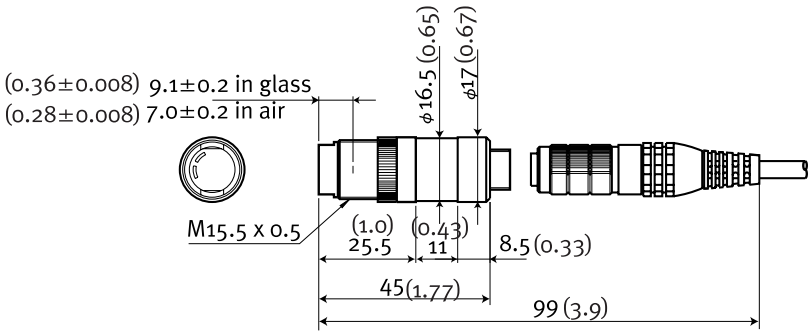


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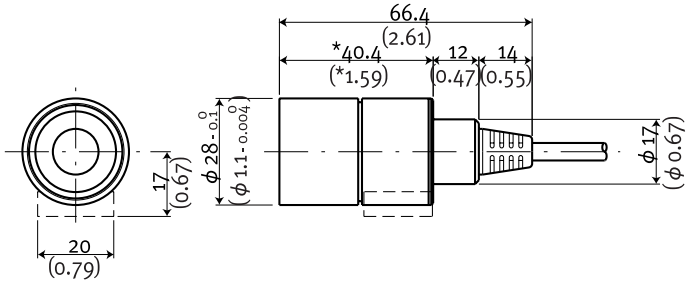
b) Camera head

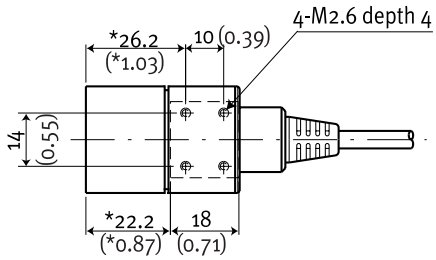


CV-M2200

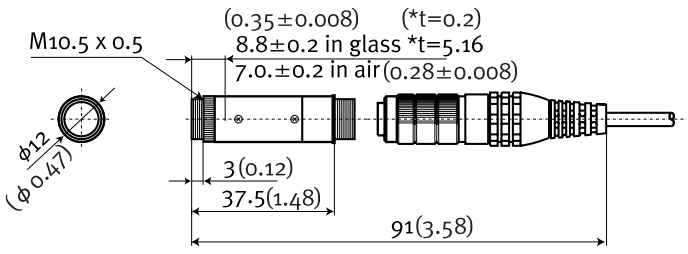


CV-M2250





CV-M2200CM



CV-M2300/2350

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9. Specification

Model name	CV-M2300	CV-M2350	CV-M2200	CV-M2250	CV-M2200CM
TV standard	NTSC / PAL				
Scanning system	NTSC : 525 lines, 30 frames/sec., 2:1 interlace PAL : 625 lines, 25 frames/sec., 2:1 interlace				
Scanning frequency	NTSC : 15.734 kHz (h), 59.94 Hz (v) PAL : 15.625 kHz (h), 50.0 Hz (v)				
CCD sensor	Color 1/3" IT CCD sensor		Color 1/2" IT CCD sensor		
Effective pixels	NTSC : 768 (h) x 494 (v) PAL : 752 (h) x 582 (v)				
Cell size	NTSC : 6.35 (h) x 7.4 (v) µm PAL : 6.5 (h) x 6.25 (v) µm		NTSC : 8.4 (h) x 9.8 (v) µm PAL : 8.6 (h) x 8.3 (v) µm		
Resolution (horizontal)	>450 TV lines				
Sensitivity (on sensor)	0.34 lux (AGC on, 50% video)		0.25 lux (AGC on, 50% video)		
S/N ratio	>48 dB (AGC OFF, Gamma=1.0)				
Gamma	1.0, 0.6, 0.45				
Gain	Off, auto or manual				
White balance	3200K, 4600K, 5600K, auto, manual, one-push				
Back light compensation	Off, pattern 1, pattern 2				
Video output	VBS 1.0 Vpp at 75 Ohm Y output 0.7 Vpp at 75 Ohm, C output 0.28 Vpp at 75 Ohm RGB output 0.7 Vpp at 75 Ohm				
Video reversal	Positive / negative				
Syncronization	Internal / external sync. or VBS 1.0 Vpp				
Shutter	OFF (1/60 at NTSC, 1/50 at PAL), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, CCD iris, Flicker-less (NTSC : 1/100, PAL : 1/120)				
Serial interface	RS 232C				
Rs 232C functions	Electronic shutter, CCD iris, Flicker-less, White balance, Back light compensation Video reversal, Gamma, Gain, Chroma, Hue, Enhancer				
Operating enviroment	Temperature : -5℃ to +45℃ Humidity : 20% to 80% non-condensing				
Power	+12 VDC ±10%, 4.5W (without memory board) +12 VDC±10%, 6.0W (with memory board)				
Lens mount	Special mount				C-mount
Cable length	2 m	5 m	2 m	5 m	2 m
Dimensions of CCU	40 x110 x 154 (HxWxD) mm				
Dimensions of head	12 x 91 mm		17 x 61 mm	17 x 99 mm	28 x 66.4 mm
Weight of CCU	550 g approx.				
Weight of head	5.7 g	5.7 g	5.7 g	5.7 g	90 g

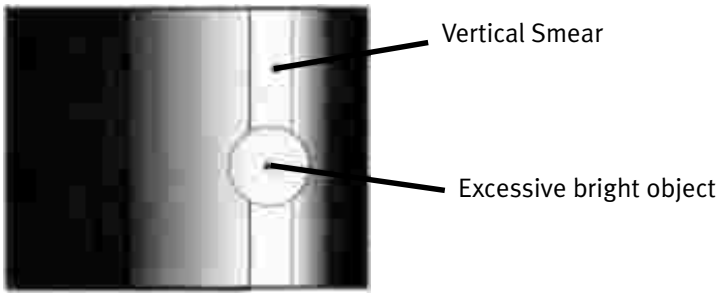
Note : Above specifications are subject to change without notice.

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Typical CCD characteristics

The following effects may be observed on the video monitor screen. They do not indicate any fault of the CCD camera, but do associate with typical CCD characteristics.

- V. smear
  Due to an excessive bright object such as electric lighting, sun or strong reflection, vertical smear may be visible on the video monitor screen.
  This phenomenon is related to the characteristics of Interline Transfer system employed in the CCD.



Video monitor screen

- V. aliasing
  When the CCD camera shoots stripes, straight lines or similar patterns, jagged image on the monitor may appear.

- Blemishes
  Some pixel defects can ocur, but this does affect pratical operation.

  Patterned noise
- When the CCD camera shoots a dark object at high temperature, fixed pattern noise (dots) may appear on the monitor.

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