

# CVS4-R SERIES

MVS Series

CVS Series

CVS Series APPLICATION

CVSE1-RA

CVS1-RA

CVS2-RA

CVS3-RA

CVS4-R

OPTIONS



## Compact OCR sensor

- All in one OCR sensor
- Easy setup and High performance
- Built-in Calendar



## Wide range line-up

- CVS4-N23W-R Standard type
- CVS4-N21W-R Small character type
- CVS4-N20W-R Long range type
- CVS4-N40W-R Macro view type
- CVS4-N23RW-R Standard vertical type

## All in one OCR sensor

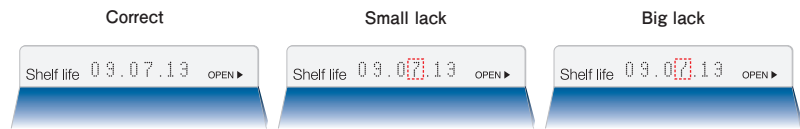
Recognizes Alphabetic, Numeric and Special characters. It can check shelf life, date of manufacture and lot number. It recognizes characters of Thermal printer, Hot printer, Ink-jet printer and laser marker.



## Easy setup

You can setup easily just following the instruction on the screen.

It compares the characters with internal Dictionary. You can setup as it determines NG when single character is wrong. You can also setup as it determines OK when the character has only small lack.



## User dictionary

You can make characters utilizing the images captured and transferred to PC.

## Storing NG image

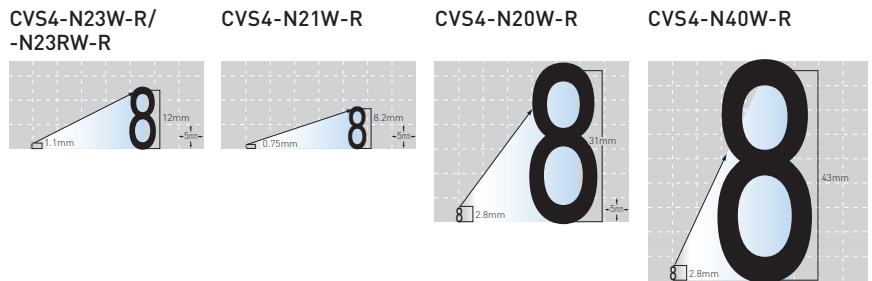
When judge result changed from OK to NG, it stores NG image into internal memory up to 30 images. You can download the image data from CVS4-R through optional cable CVS-C2C.

## Up to 16 Bank

16 Banks are available in small all in one package.

## Wide range of line-up

You can choose a range from 4 ranges of line-up.



## Built-in Calendar

It can check the date continuously overnight referring built-in calendar without error because of its tolerance of time.

## Character direction

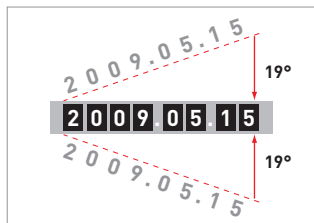


## Features

### Rotation search



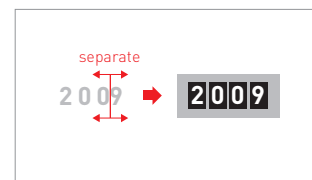
It can search the characters rotating up to +/-19 degree.



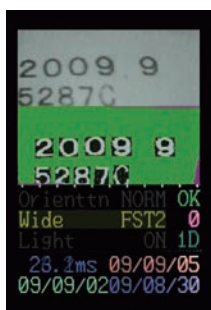
### Recognize connected characters



Connected characters can be separated by adjusting the character width.

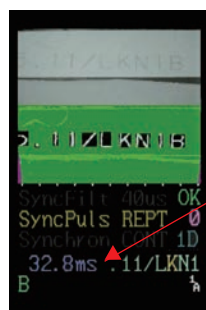


### Double shutter



It captures twice by single trigger. If first image or 2nd image is OK, judge result is OK. This function is effective when the trigger timing is not stable and object position is not stable.

### Continuous capture



It will automatically capture and check the image continuously from single trigger until it gets OK image. If it gets Time-out before getting OK, it outputs NG.

### Expandable FOV



You can expand vertical FOV when the character lines can't be in standard FOV



FOV can be vertically doubled by this function and it can detect the character lines in a FOV.

### Mirror capture

It can capture mirror reversed image

### Fast capture mode

It has Fast capture mode reducing vertical resolution down to half. This is effective for the objects that move fast.

### Delayed Output function

It has timer to delay activating output for the period. This function can be utilized for controlling sorting stage located after the inspection stage.

### Check character number

It can just check number of characters to see existence of the printing for example.

### Delayed NG mode

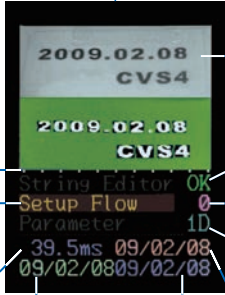
It can turn output to NG only when it detect NG certain times continuously. This is effective for detecting ink runs out and some special error that happens rarely.

### Wild card for verifying characters

You can use "?" as a wild card to determine a character as OK whatever the character is. This function is effective when the character can be any characters.


## Display

**Normal mode**



- 1** Captured image  
You can change by VIEW button. When it's detached mode, background is Green for OK and Red for NG.
- 2** Scale  
Scale for adjust character size in FOV
- 3** Display mode  
Shows display mode in yellow
- 4** Judge result  
OK : Data/Time is in threshold and string matches  
NG : Any lines doesn't match  
ER : Backup error of calendar timer
- 5** Current Bank No.
- 6** Inspection item on screen  
1D : The 1st date 2D : The 2nd date  
1T : The 1st time 2T : The 2nd time  
CH : Number of characters and character string
- 7** Response time from Sync. input to Judge output
- 8** Recognized Date/Time
- 9** Upper limit of Date/Time
- 10** Lower limit of Date/Time

## Switches



- UP** (▲): Move cursor up and increase parameter value
- DOWN** (▼): Move cursor down and decrease parameter value
- SET** (○): Change the mode. Choose and set the parameters.
- VIEW** (○): Change the display mode. Press with "UP" and "DOWN" when you change the item to monitor.
- EXIT** (○): Change the mode from/to Normal mode to/from Teaching mode.

**DOWN + SET**: Set Lock mode, inhibit Teaching and changing parameters of setup.  
Press both buttons → 3sec.

**UP + SET**: Releases Lock mode.

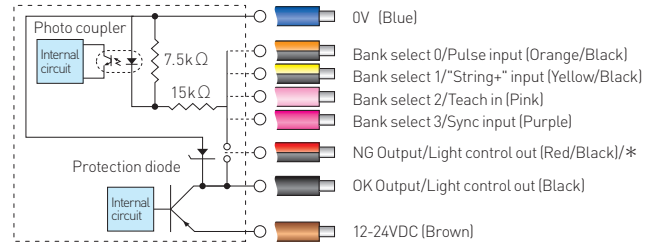
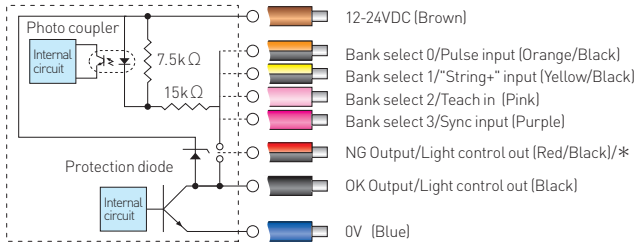
## Specifications

Model	CVS4-N20W-R CVS4-P20W-R	CVS4-N21W-R CVS4-P21W-R	CVS4-N40W-R CVS4-P40W-R	CVS4-N23W-R CVS4-P23W-R	CVS4-N23RW-R CVS4-P23RW-R
Detection angle	20°		40°	20°	
Working distance	90 to 150mm	31 to 39mm	50 to 100mm	44 to 56mm	44 to 56mm
Field of view	53x25mm to 79x38mm	21x10mm (±10%)	53x25mm to 115x53mm	30x15mm (±10%)	30x15mm (±10%)
Light source	White LED 12 pcs built-in				
Image sensor	330,000 Pixel CMOS monochrome image sensor				
Supply Voltage	12 to 24V DC±10%				
Power consumption	Max. 140mA / 24V DC				
Resolution	512 x 244				244 x 512
LED light duration	Approx.100,000 hours(In normal temperature and humidity. Brightness level down by 1/2 of the initial level)				
Response time	23ms to 48ms (20 characters in 2 lines,Rotation search up to ±10°)				
Output	NPN or PNP open collector output x 2 (OK/NGoutput,External light control output) max. 100mA Residual voltage 1.0V or less				
Input	Bank select 0 (Pulse input), Bank select 1 ("String +" input), Bank select 2 (Teach in), Bank select 3 (Sync input)				
Operating temperature	0 to 40°C (No condensation)				
Operating humidity	35 to 85%RH				
Storage temperature/humidity	-20 to 70°C, 35 to 95%RH(No condensation)				
Vibration/shock resistance	10 to 55Hz Amplitude 1.5mm / 50G(500m/s <sup>2</sup> )				
Material	Case:ABS / Display and Lens : Acryl or Polycarbonate				
Protection structure	IP67				
Weight	Approx.200g (including cable)				
Recognizable character number	60 characters / 6 lines				
Character number per line	30 characters				
Number of date/time/string	Up to 2 x Date / 2 x Time / 4 x Strings with 22 characters (up to 4 items)				
User Dictionary	56 characters				
Built-in Timer accuracy	-45 sec. to 75 sec. per month				
Back up period of built-in timer	5 years by built-in non-rechargeable battery / Life of super capacitor : 7.8 years ( when its capacity gets down to the level that keep timer 3 days )				

# Connection diagram

(NPN)

(PNP)



\* Bank select 0 to 3/"String+"/Teach in

# Bank table

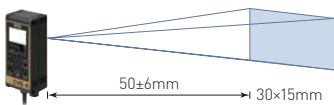
Bank No.	Bank select input			
	3(Purple)	2(Pink)	1(Yellow/Black)	0(Orange/Black)
0	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

OFF	NPN: OPEN or connect with the brown line. PNP: OPEN or connect with the blue line.
ON	NPN: connect with the blue line. PNP: connect with the brown line.

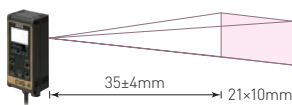
Bank	Parameter			Function of Bank selection input				Selectable range
	Synchron	String+	SyncPlus	Orange / Black	Yellow / Black	Pink	Purple	
BKIN	CONT	OFF	Others ON	Bank selection 0	Bank slctn 1 String+	Bank slctn 2	Bank slctn 3	0-15
		ON,SCLR	Others ON					Pulse que Bank slctn 0
	UP,HIGH DOWN, LOW	OFF	Others ON	Bank selection 0	Bank slctn 1 String+	Bank slctn 2	Bank slctn 3	0-7
		ON,SCLR	Others ON					Pulse que Bank slctn 0
TCH	CONT	OFF	Others ON	Bank selection 0	Bank slctn 1 String+	Bank slctn 2	Bank slctn 3	0-3, 8-11
		ON,SCLR	Others ON					Pulse que Bank slctn 0
	UP,HIGH DOWN, LOW	OFF	Others ON	Bank selection 0	Bank slctn 1 String+	Bank slctn 2	Bank slctn 3	0-3
		ON,SCLR	Others ON					Pulse que Bank slctn 0
0-15, COMM	CONT	OFF	Others ON	NA	NA	External Teaching	NA	0-15 (Bank is set by parameter and through RS232C/F)
		ON,SCLR	Others ON					Pulse que
	UP,HIGH DOWN, LOW	OFF	Others ON	NA	NA	External Teaching	NA	0-15 (Bank is set by parameter and through RS232C/F)
		ON,SCLR	Others ON					Pulse que

# Field of View

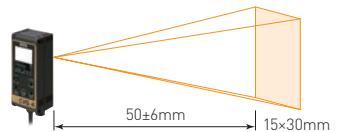
CVS4-N23W-R



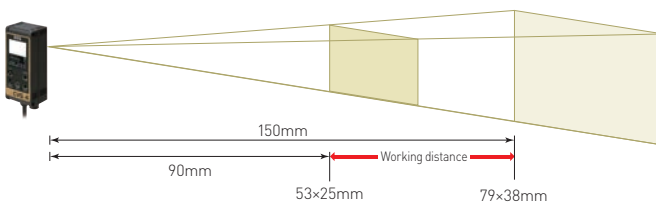
CVS4-N21W-R



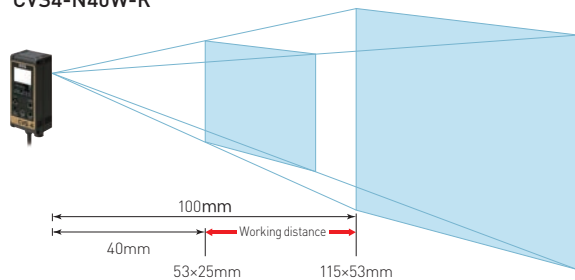
CVS4N23RW-R



CVS4-N20W-R



CVS4-N40W-R



# RS232 Communication

## Available functions

### 1.Setup

You can download/modify/upload setup from/to CVS4-R.

### 2.User DIC

You can make unique character referring the image from CVS4-R.

### 3.Downloading NG image

You can refer NG image and check what happened.

### 4.Remote control

You can control CVS4-R through RS232 I/F.

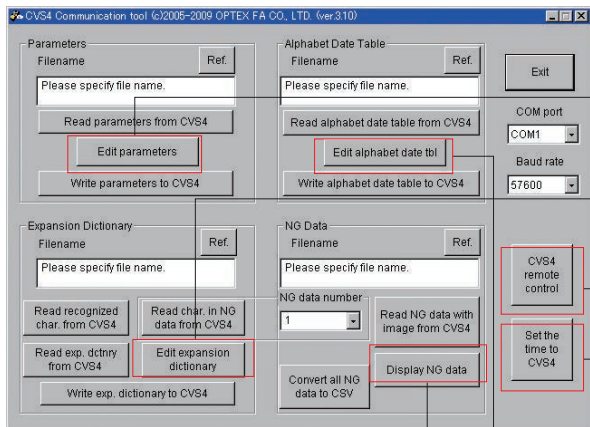
### 5.Timer setup

You can set the timer of CVS4-R copying from PC.

### 6.Code recognition

You can modify code table that shows simple codes mean Date/Time.

## Main menu



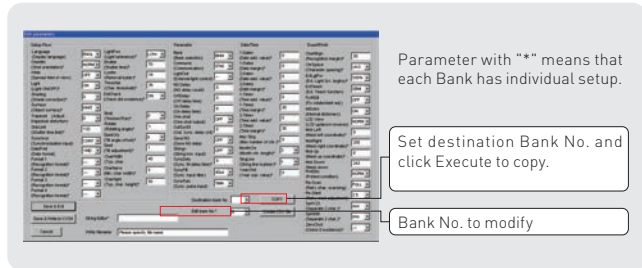
Required PC spec.  
 - Microsoft Windows 7  
 - RS232 I/F  
 - Cable CVS-C2C

Downloadable from <http://www.optex-fa.com>

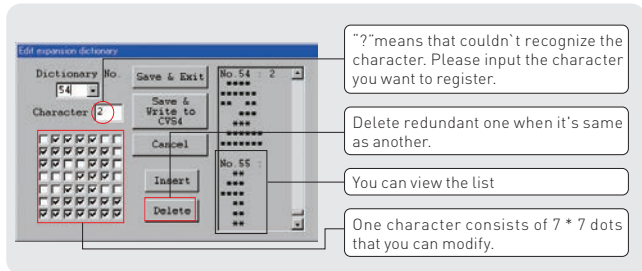


I/F cable CVS-C2C

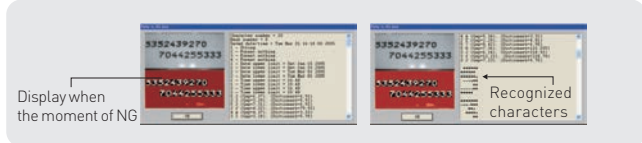
### 1. Setup Modification



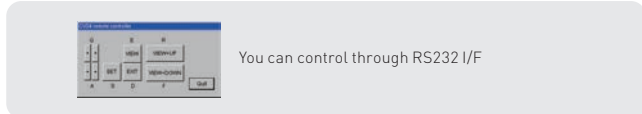
### 2. User Dictionary



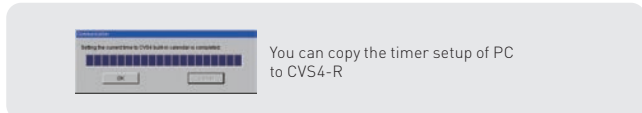
### 3. Downloading NG image



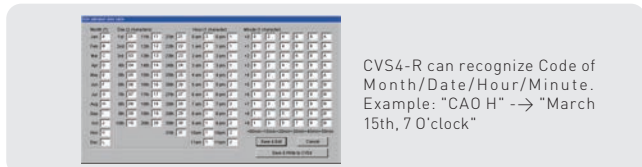
### 4. Remote control



### 5. Timer setup



### 6. Code recognition





# CVS SERIES APPLICATION

MVS Series

CVS Series

CVS Series APPLICATION

CVSE1-RA

CVS1-RA

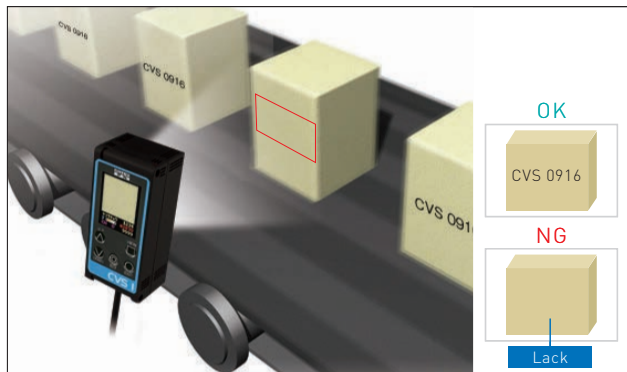
CVS2-RA

CVS3-RA

CVS4-R

OPTIONS

## 1. Checking existence of printing on the box



### CVS1-RA

Set the extracted color from the printing and check its area in the field of view

## 2. Checking the lid of instant foods



### CVS2-RA

Check the color and shape by its pattern matching function

## 3. Checking existence of cutting tape on the film



### CVSE1-RA

Set the extracted color from the cutting tape and check its area in the field of view

## 4. Checking multiple colors on the box



### CVS2-RA

Check existence of multiple color on the box registering multiple colors as reference

## 5. Checking existence of seasoning bag



### CVSE1-RA

Set the extracted color from the seasoning bag and check its area in the field of view

## 6. Checking shelf life on the packaging film



### CVS4-R

Check the date of shelf life on packaging film. It has calendar function so checking overnight is available

### 7. Checking existence of label on package



#### CVSE1-RA

Set the major color on the label and check its area in the field of view

### 8. Checking existence of needle cap



#### CVS1-RA

Existence of needle cap can be detected easily by color area inspection even in a big FOV

### 9. Checking shelf life on the milk package



#### CVS4-R

Check the date of shelf life on milk package. It has calendar function so checking overnight is available

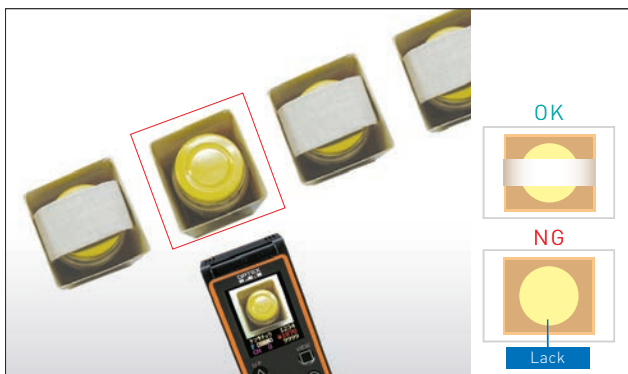
### 10. Checking expiration date on the package



#### CVS4-R

Check the expiration date on the package. It can just check number of character as well

### 11. Checking existence of description of pills



#### CVSE1-RA

Set the color area of description of pills in the field of view

### 12. Checking overlapping of the label



#### CVS3-RA

Check the overlapping label by its edge detection function

### 19. Checking position of welded part



#### CVS2-RA

Set the color of the pipe and welded part and detect welded part stably by its pattern matching function

### 20. Checking shape of assembled parts



#### CVS3-RA

Check the shape of the assembled parts by edge detecting function utilizing back lighting

### 21. Checking direction of the parts on conveyor



#### CVS2-RA

Check the color and position of the surface pattern by its color pattern matching function

### 22. Checking size of the nut



#### CVS3-RA

Check size of the nut by edge detecting function

### 23. Checking characters on metal parts



#### CVS4-R

Check the characters engraved on the metal parts by its OCR function

### 24. Checking existence of lot number on the spark plugs



#### CVS1-RA

Check the color area of the printed characters on the spark plugs

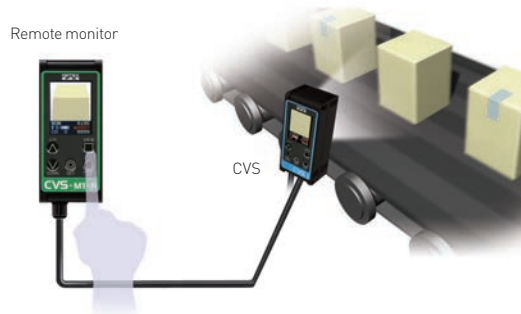


## Accessories for CVS series

### Remote monitor (with 3m cable)

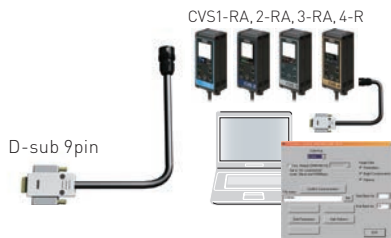


**CVS-M1-R**  
For CVS series



You can control from Remote monitor that has LCD and buttons to control remotely. The buttons work same as CVS series itself.

### PC I/F cable (2m)



**CVS-C2C**  
For CVS1-RA, 2-RA, 3-RA, 4-R

You can download the I/F software from our homepage. You can setup CVS1-RA, CVS2-RA, CVS3-RA and CVS4-R through each software and can get registered image. You can also modify mask area easily on the PC display.

**Required PC spec.**  
- Microsoft Windows 7  
- RS232 I/F  
Software is downloadable from <http://www.optex-fa.com>

### Video cable (3m)



**CVS-CN**  
For CVS series  
You can see the display image connecting standard TV monitor (NTSC).

### PC I/F cable + I/F cable for Video Out (2m)



**CVS-C2Y**  
For CVS1-RA,2-RA,3-RA,4-R  
You can connect PC and CVS-M1-R. You can see the screen image on the CVS-M1-R.  
\* You can't control through CVS-M1-R.

### Extension cable for Remote monitor (3m)



**CVS-C3S**  
For CVS-M1-R  
You can connect Remote monitor through this cable up to 15m (4 CVS-C3S = 12m + 3m cable of Remote monitor)

### PC I/F cable + Video cable (2m)



**CVS-C2P(2m)**  
For CVS1-RA,2-RA,3-RA,4-R  
You can connect PC and get video signal at a time.

## External LED lighting

When you need brighter lighting and/or lighting from other direction to get better image, you can utilize external LED lighting. Please refer Page 54 for other lighting and power supply.

### High brightness Bar LED lighting with bracket



OPDB-50x15WS

**OPB-5015W2-B**  
50x15mm  
**OPB-10015W2-B**  
100x15mm

### Power supply LED controller



OPPD-15

### Bracket for Lighting



**CVS-OPDB-2000**  
**CVS-OPDB-3040**  
**CVS-OPDB-6080**

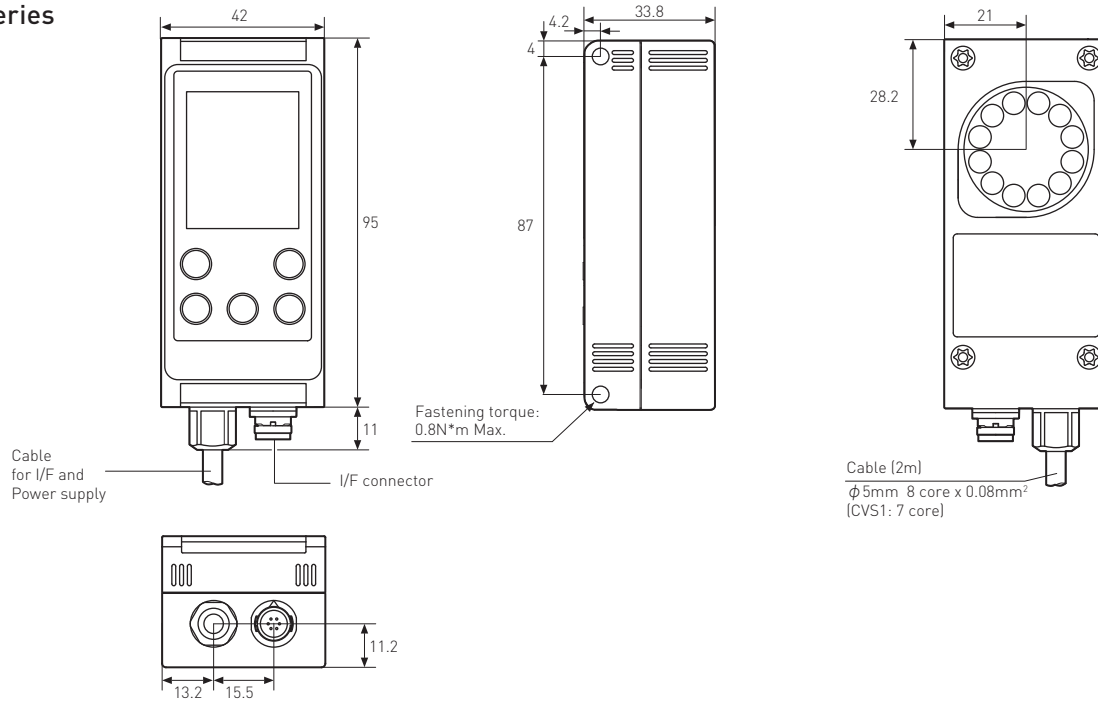
2 OPDB-50x15WS and CVS-OPDB-2000



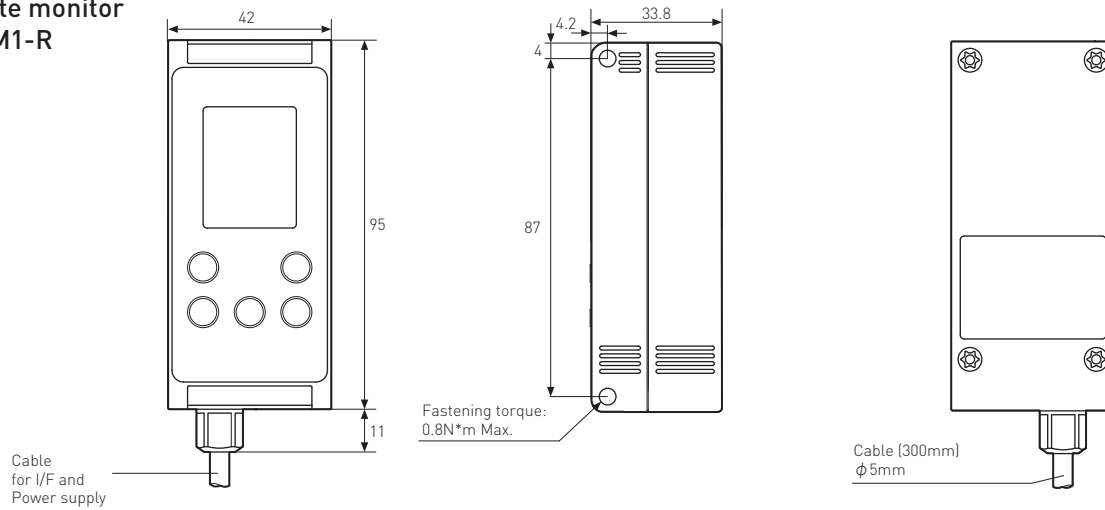
**CVS-OP1000L**  
This is for mounting CVS series and external LED lighting.

## Dimensions

### CVS Series



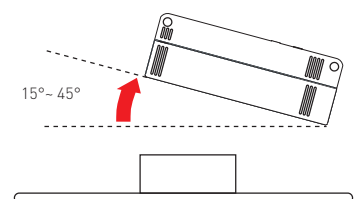
### Remote monitor CVS-M1-R



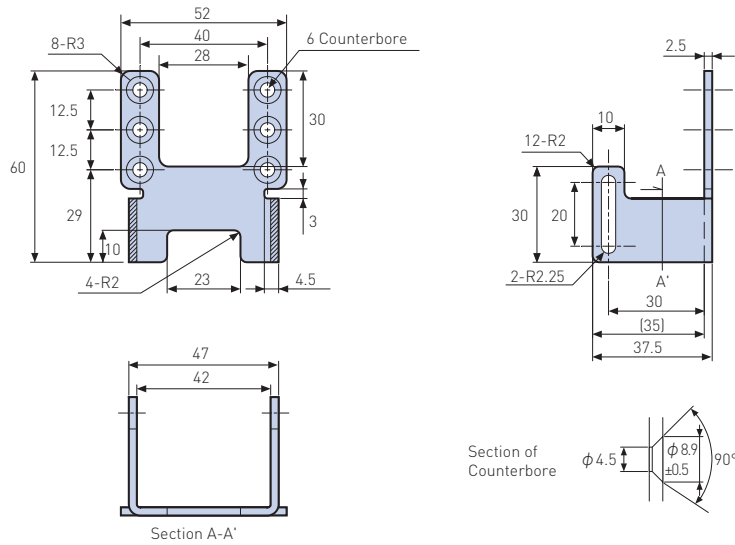
(unit: mm)

### Tips for mounting CVS series

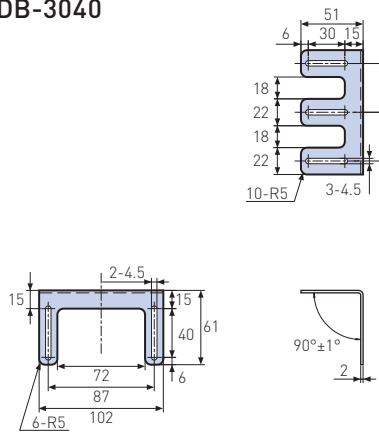
- Please determine Working distance and Field of View so that you choose correct model number of CVS series.
- Please use M4 \* 50mm screws to mount CVS series
- Please take care about distance between CVS and target object to get stable size of Field of View.
- Please mount CVS at 15 to 45 degree to prevent specular reflection from the object especially from glossy object.
- When the object moves fast, you have to set shutter speed shorter. Then, you will need brighter lighting to get better image. Please try external lighting in this case.



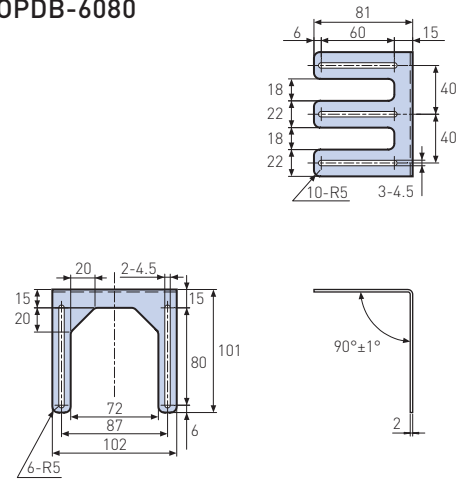
**Bracket for Lighting  
CVS-OPDB-2000**



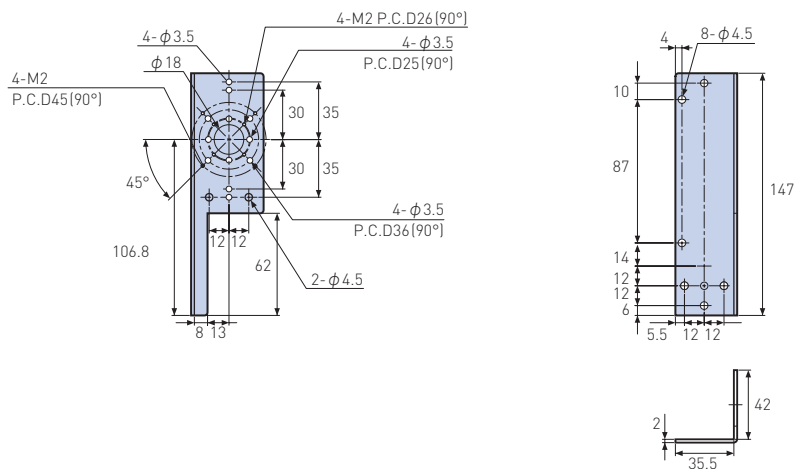
**CVS-OPDB-3040**



**CVS-OPDB-6080**



**CVS-OP-1000L**



(unit: mm)