MVS Series

CVS Series

CVS Series
APPLICATION

CVSE1-RA

CVS1-RA

CVS2-RA

CVS3-RA

CVS4-R

OPTIONS

CVS4-R SERIES

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

Easy setup

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

User dictionary

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

Up to 16 Bank

16 Banks are available in small all in one package.

Built-in Calendar

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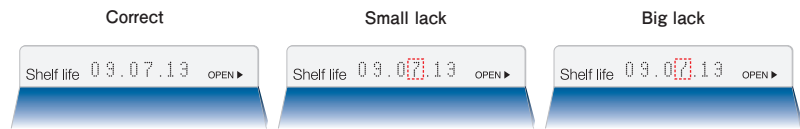
All in one OCR sensor

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.

2009.02.08 CVS4	2009.04 BBD	RA02 090412	2009.03
Thermal printer	Hot printer	Ink-jet printer	Laser marker

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.

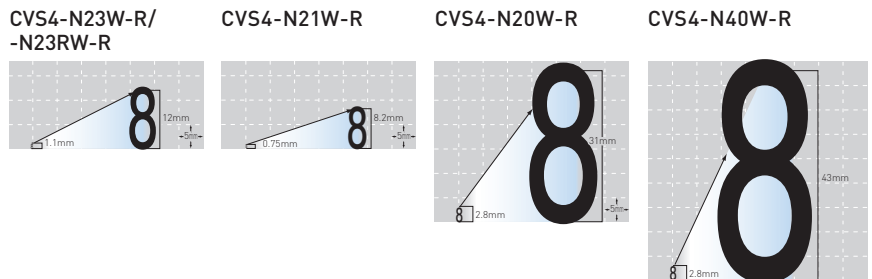| Correct	Small lack	Big lack
Shelf life 09.07.13 OPEN ▶	Shelf life 09.0?.13 OPEN ▶	Shelf life 09.0?.13 OPEN ▶

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.

Wide range of line-up

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

CVS4-N23W-R/ -N23RW-R   CVS4-N21W-R   CVS4-N20W-R   CVS4-N40W-R

8 12mm / 1.1mm / ~5cm   8 8.2mm / 0.75mm / ~5cm   8 31mm / 2.8mm / ~5cm   8 43mm / 2.8mm

Character direction

CVS4-N23W-R/-N21W-R/ -N20W-R/-N40W-R   CVS4-N23RW-R

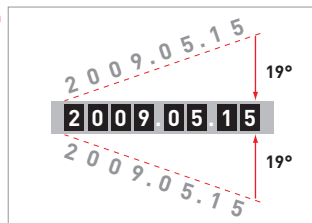A 05 10 17
B 05 10 22

A 05 10 17
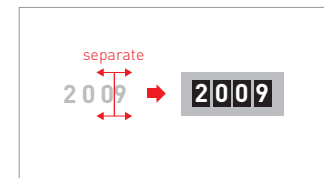B 05 10 22

Features

Rotation search

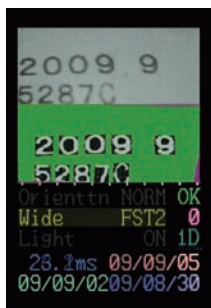It can search the characters rotating up to +/-19 degree.

Recognize connected characters

Connected characters can be separated by adjusting the character width.
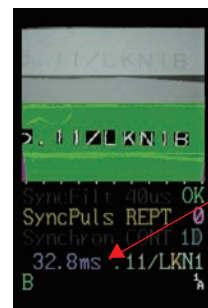

Double shutter

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.
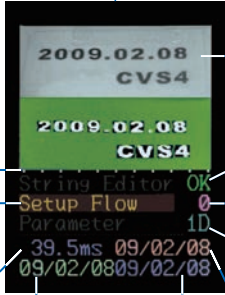
Delayed NG mode

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.

MVS Series

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CVS Series
APPLICATION

CVSE1-RA

CVS1-RA

CVS2-RA

CVS3-RA

CVS4-R

OPTIONS

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

VIEW
Change the display mode. Press with "UP" and "DOWN" when you change the item to monitor.

DOWN
Move cursor down and decrease parameter value

EXIT
Change the mode from/to Normal mode to/from Teaching mode.

SET
Change the mode. Choose and set the parameters.

DOWN + **SET**
Press both buttons → 3sec.

Set Lock mode, inhibit Teaching and changing parameters of setup.

UP + **SET**
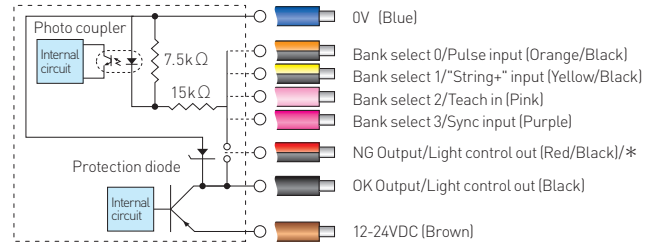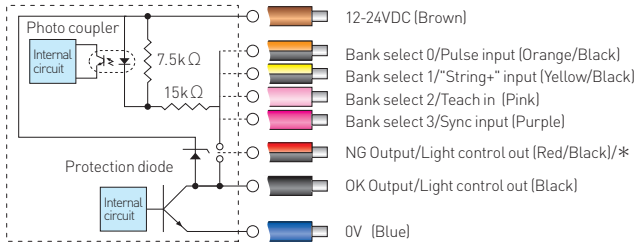Releases Lock mode.

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 to115x53mm	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℃ (No condensation)				
Operating humidity	35 to 85%RH				
Storage temperature/humidity	-20 to 70℃, 35 to 95%RH(No condensation)				
Vibration/shock resistance	10 to 55Hz Amplitude 1.5mm / 50G(500m/s^2)				
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)

Photo coupler
Internal circuit
7.5kΩ
15kΩ
Protection diode
Internal circuit

- 12-24VDC (Brown)
- Bank select 0/Pulse input (Orange/Black)
- Bank select 1/"String+" input (Yellow/Black)
- Bank select 2/Teach in (Pink)
- Bank select 3/Sync input (Purple)
- NG Output/Light control out (Red/Black)/＊
- OK Output/Light control out (Black)
- 0V (Blue)

(PNP)

Photo coupler
Internal circuit
7.5kΩ
15kΩ
Protection diode
Internal circuit

- 0V (Blue)
- Bank select 0/Pulse input (Orange/Black)
- Bank select 1/"String+" input (Yellow/Black)
- Bank select 2/Teach in (Pink)
- Bank select 3/Sync input (Purple)
- NG Output/Light control out (Red/Black)/＊
- OK Output/Light control out (Black)
- 12-24VDC (Brown)

＊ 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

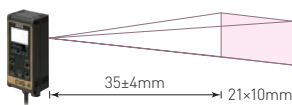| OFF	NPN: OPEN or connect with the brown line. PNP: OPEN or connect with the blue line.
ON	NPN: connect with the blue line. PNP: connect with the brown line.

Parameter				Function of Bank selection input				Selectable range
Bank	Synchron	String+	SyncPlus	Orange/Black	Yellow/Black	Pink	Purple	
BKIN	CONT	OFF	Others	Bank selection 0	Bank slctn 1	Bank slctn 2	Bank slctn 3	0~15
			ON		String+			0,1,4,5,8, 9,12,13
		ON,SCLR	Others		Bank slctn 1			0~7
			ON		String+			
	UP,HIGH DOWN, LOW	OFF	Others	Pulse que	Bank slctn 1		Synchronous input	0,2,4,6
			ON		Pulse que			0,1,4,5
		ON,SCLR	Others	Bank slctn0	String+			0,4
			ON	Pulse que				
TCH	CONT	OFF	Others	Bank selection 0	Bank slctn 1	External Teaching	Bank slctn 3	0~3, 8~11
			ON		String+			
		ON,SCLR	Others		Bank slctn 1			0,1,8,9
			ON		String+			
	UP,HIGH DOWN, LOW	OFF	Others	Pulse que	Bank slctn 1		Synchronous input	0~3
			ON		Pulse que			0,2
		ON,SCLR	Others	Bank slctn0	String+			0,1
			ON	Pulse que				0
0~15, COMM	CONT	OFF	Others	NA	NA	NA	NA	0~15 (Bank is set by parameter and through RS232I/F)
			ON		String+			
		ON,SCLR	Others		NA			
			ON		String+			
	UP,HIGH DOWN, LOW	OFF	Others	Pulse que	NA		Synchronous input	
			ON					
		ON,SCLR	Others	NA	String+			
			ON	Pulse que				

Field of View

CVS4-N23W-R

50±6mm → 30×15mm

CVS4-N21W-R

35±4mm → 21×10mm

CVS4N23RW-R

50±6mm → 15×30mm

CVS4-N20W-R

150mm
90mm
Working distance
53×25mm   79×38mm

CVS4-N40W-R

100mm
40mm
Working distance
53×25mm   115×53mm

CVS Series
APPLICATION

CVSE1-RA

CVS1-RA

CVS2-RA

CVS3-RA

CVS4-R

OPTIONS
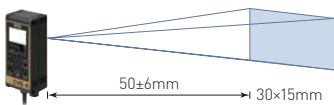
RS232 Communication

Available functions

1.Setup	2.User DIC	3.Downloading NG image	4.Remote control	5.Timer setup	6.Code recognition
You can download/modify/upload setup from/to CVS4-R.	You can make unique character referring the image from CVS4-R.	You can refer NG image and check what happened.	You can control CVS4-R through RS232 I/F.	You can set the timer of CVS4-R copying from PC.	You can modify code table that shows simple codes mean Date/Time.
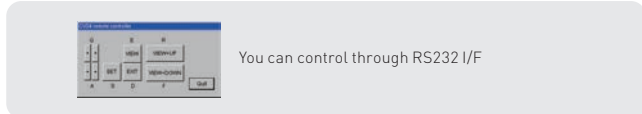
Main menu

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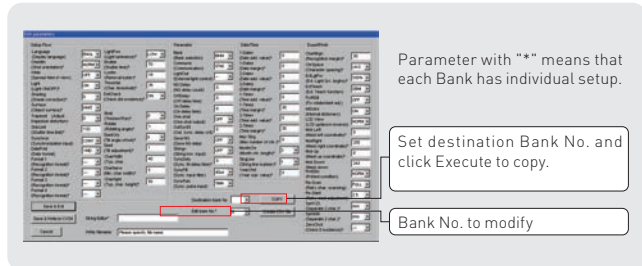- Microsoft Windows 7
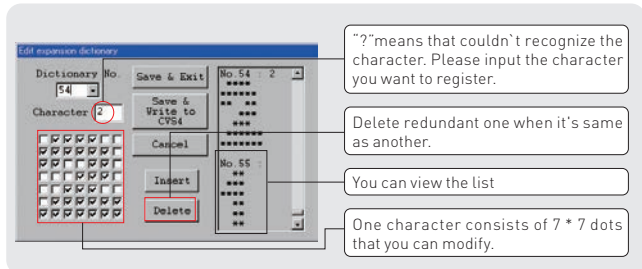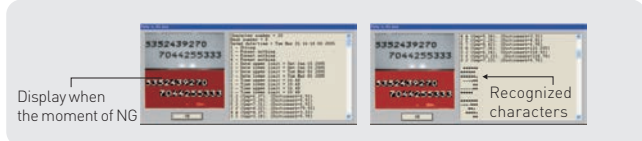- RS232 I/F
- Cable CVS-C2C

**Downloadable from
http://www.optex-fa.com**

I/F cable
CVS-C2C

1. Setup Modification

Parameter with "*" means that each Bank has individual setup.

Set destination Bank No. and click Execute to copy.

Bank No. to modify

2. User Dictionary

"?"means that couldn`t recognize the character. Please input the character you want to register.

Delete redundant one when it's same as another.

You can view the list

One character consists of 7 * 7 dots that you can modify.

3. Downloading NG image

Display when the moment of NG

Recognized characters

4. Remote control

You can control through RS232 I/F

5. Timer setup

You can copy the timer setup of PC to CVS4-R

6. Code recognition

CVS4-R can recognize Code of Month/Date/Hour/Minute. Example: "CAO H" -→ "March 15th, 7 O'clock"

CVS SERIES APPLICATION

1. Checking existence of printing on the box

OK

CVS 0916

NG

Lack
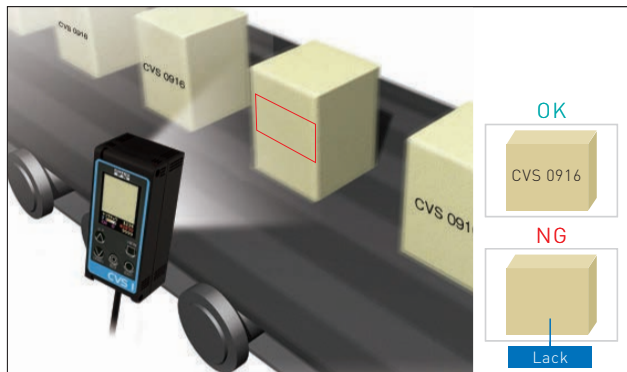
CVS1-RA
Set the extracted color from the printing and check its area in the field of view

2. Checking the lid of instant foods

OK

塩ラーメン

NG

醤油ラーメン

NG

みそラーメン

CVS2-RA
Check the color and shape by its pattern matching function

3. Checking existence of cutting tape on the film

OK

NG

NG

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

OK

OK

NG

CVS2-RA
Check existence of multiple color on the box registering multiple colors as reference

5. Checking existence of seasoning bag

OK

NG

Lack

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

OK

Shelf life
2009.02.08

NG

Shelf life
2009.02.07

Wrong print

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

OK

NG

Lack

CVSE1-RA

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

8. Checking existence of needle cap

OK   NG   OK   OK   OK

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

OK

2009.11.01

NG

2009.10.31

Wrong date

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

OK

CVS20121

NG

CVS20120

Wrong print

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

OK

NG

Lack

CVSE1-RA

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

12. Checking overlapping of the label

OK

NG

Overlapping

CVS3-RA

Check the overlapping label by its edge detection function

19. Checking position of welded part

OK

Masking area

NG

No 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

OK

NG

Gap exists

CVS3-RA
Check the shape of the assembled parts by edge detecting function utilizing back lighting

21. Checking direction of the parts on conveyor

OK

NG

Wrong direction

CVS2-RA
Check the color and position of the surface pattern by its color pattern matching function

22. Checking size of the nut

OK

NG

Wrong size

CVS3-RA
Check size of the nut by edge detecting function

23. Checking characters on metal parts

050208

OK

050208

NG

050209

Wrong mark

CVS4-R
Check the characters engraved on the metal parts by its OCR function

24. Checking existence of lot number on the spark plugs

OK

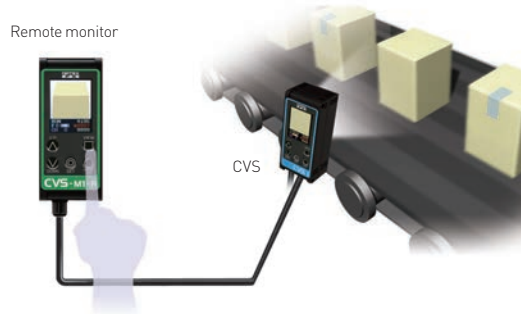OPTEXFA

NG

Lack of print

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

Remote monitor
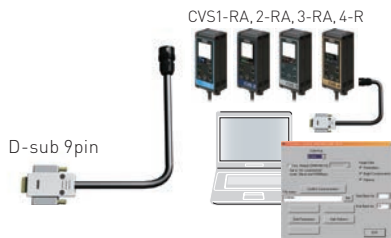
CVS

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)

CVS1-RA, 2-RA, 3-RA, 4-R

D-sub 9pin

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)

RCA Plug

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

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 + 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.

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

OPB-5015W2-B
50x15mm

OPB-10015W2-B
100x15mm

OPDB-50x15WS

Power supply LED controller

OPPD-15

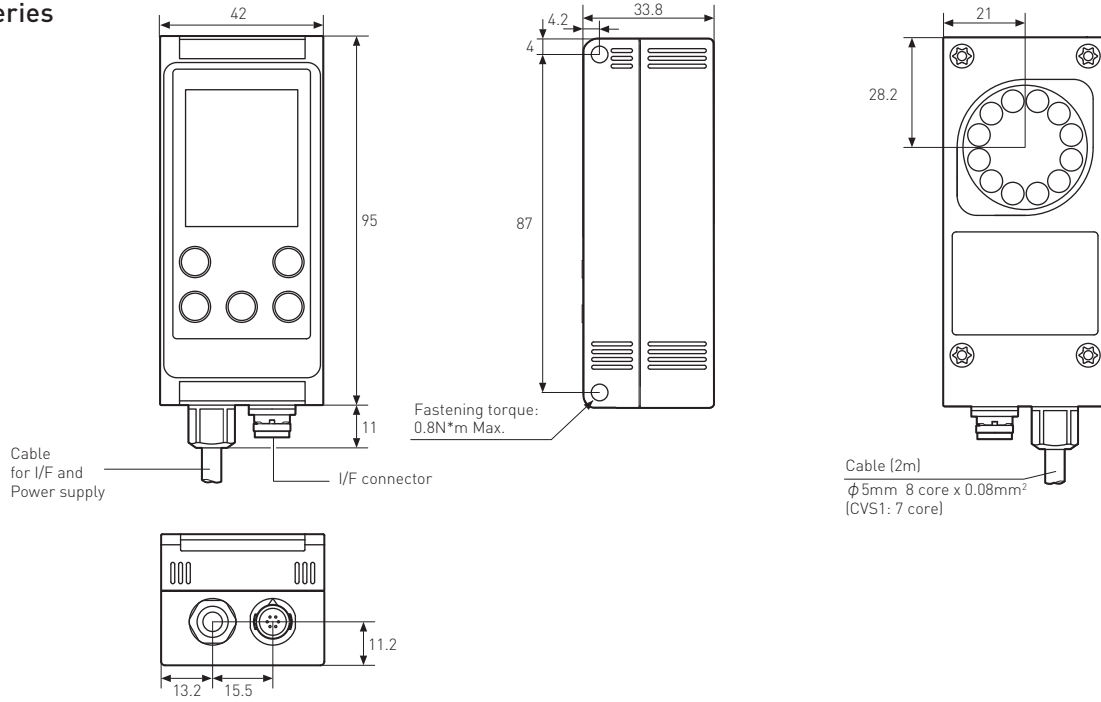**Bracket for Lighting**

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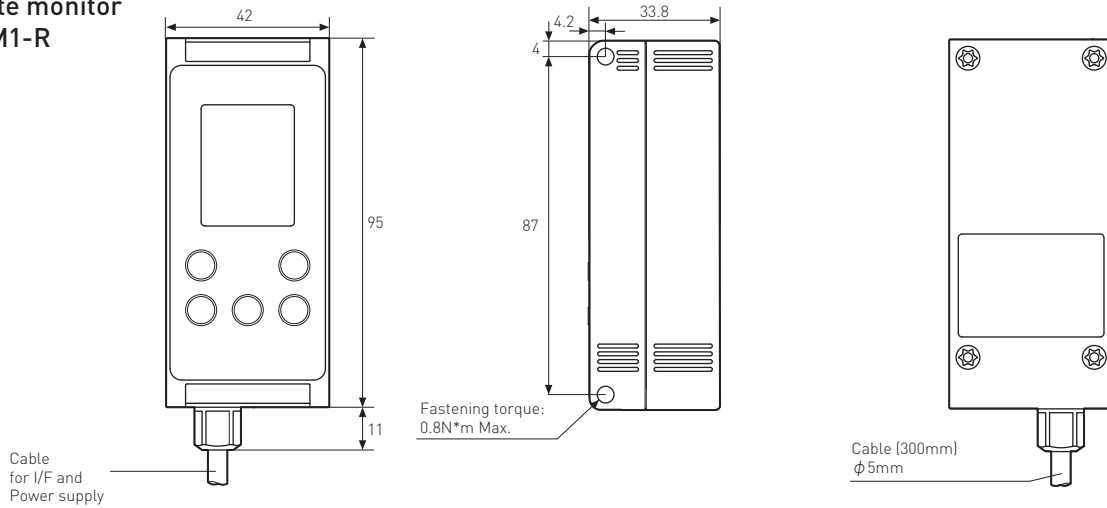**CVS-OPDB-6080**

2 OPDB-50x15WS and CVS-OPDB-2000

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

MVS Series

CVS Series

CVS Series
APPLICATION

CVSE1-RA

CVS1-RA

CVS2-RA

CVS3-RA

CVS4-R

OPTIONS

Dimensions

CVS Series

42

95

87

4.2

4

33.8

11

21

28.2

Cable
for I/F and
Power supply

I/F connector

Fastening torque:
0.8N*m Max.

Cable (2m)
φ5mm 8 core x 0.08mm²
(CVS1: 7 core)

11.2

13.2   15.5

Remote monitor CVS-M1-R

42

95

87

4.2

4

33.8

11

Cable
for I/F and
Power supply

Fastening torque:
0.8N*m Max.

Cable (300mm)
φ5mm
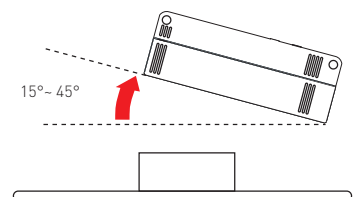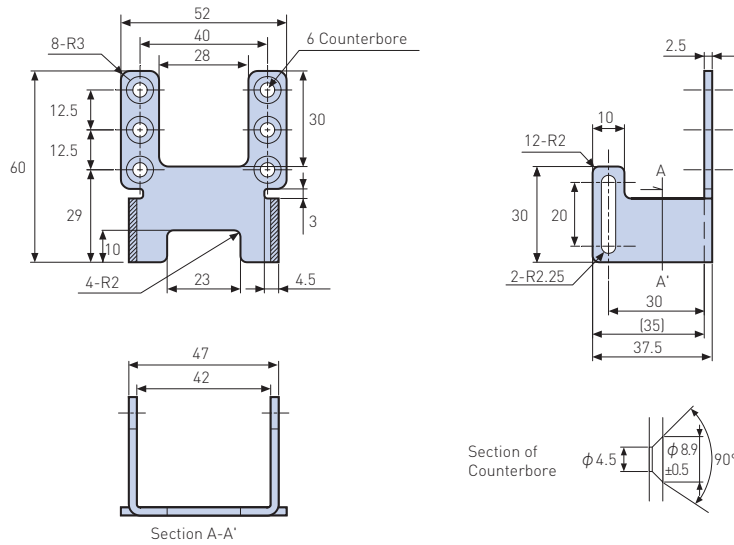
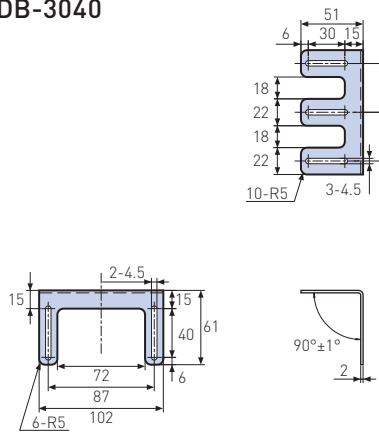(unit: mm)

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
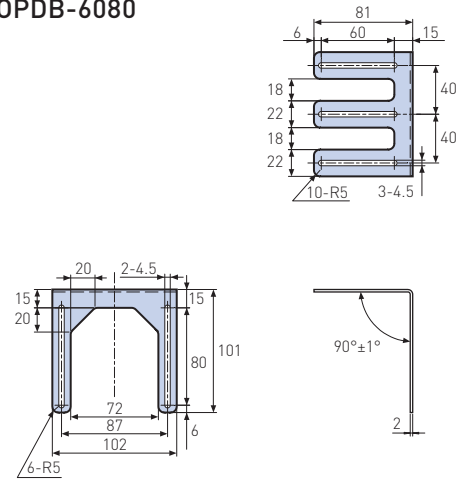lighting to get better image. Please try external lighting in this case.
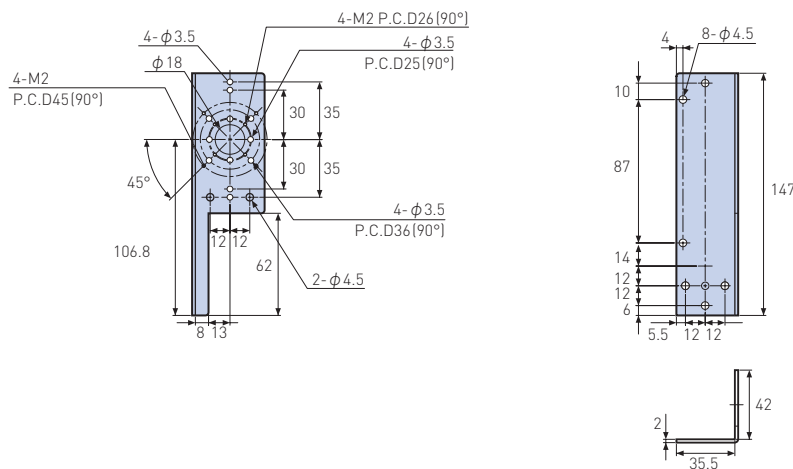
15°~ 45°

Bracket for Lighting
CVS-OPDB-2000

8-R3
6 Counterbore
52
40
28
12.5
12.5
60
30
29
3
10
4-R2
23
4.5

2.5
10
12-R2
A
30
20
2-R2.25
A'
30
(35)
37.5

47
42

Section A-A'

Section of Counterbore
φ4.5
φ8.9 ±0.5
90°

CVS-OPDB-3040

51
6
30
15
18
22
18
22
40
40
10-R5
3-4.5

2-4.5
15
15
40
61
72
87
102
6
6-R5
90°±1°
2

CVS-OPDB-6080

81
6
60
15
18
22
18
22
40
40
10-R5
3-4.5

20
2-4.5
15
20
15
80
101
72
87
102
6
6-R5
90°±1°
2

CVS-OP-1000L

4-M2 P.C.D26 (90°)
4-φ3.5
4-φ3.5 P.C.D25 (90°)
φ18
4-M2 P.C.D45 (90°)
30
35
30
35
45°
106.8
4-φ3.5 P.C.D36 (90°)
12 12
62
2-φ4.5
8 13

4
8-φ4.5
10
87
147
14
12
12
6
5.5
12 12

2
42
35.5

(unit: mm)