CVSE1-RA SERIES

Wide range line-up

CVSE1-N20-RA Standard type
CVSE1-N10-RA Long range type
CVSE1-N40-RA Macro view type
CVSE1-N21-RA Narrow view type

Three-Step-Teaching

Teaching is easily done by three steps even in 30 seconds just like a color sensor.

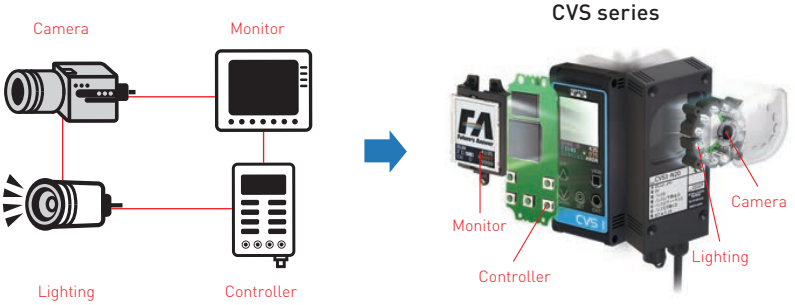
Step1 Set field of view

Step2 Set color

Step3 Completed with the final adjustment

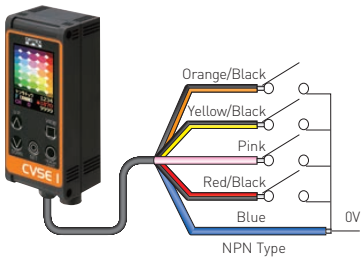
All in one

The sensor has a built-in Camera, LED Lighting, Display monitor and Controller. This structure enables water resistance IP67.



Quick change over

16 Banks are available. You can remotely select the bank to use by PLC or other equipments.



Color Resolution

Up to 15,000 colors are available to detect.

Stable inspection

It calculates color hue of each pixel so stable inspection is available.

Wide coverage line-up

You can choose from 4 inspection range/field of view according to inspection target condition.

High performance

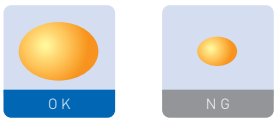
Setup Adjustable while line is running

CVSE1-RA provides output with the setup parameters given even while you are adjusting setup. You don't have to stop the line.

CVSE1-RA has two processing unit individually so it can change parameters while vision processing is running without delay.

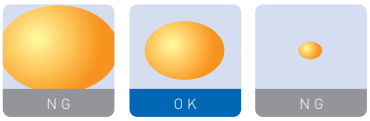
One threshold mode

Determine OK when the area that the color matches exceeds the threshold.



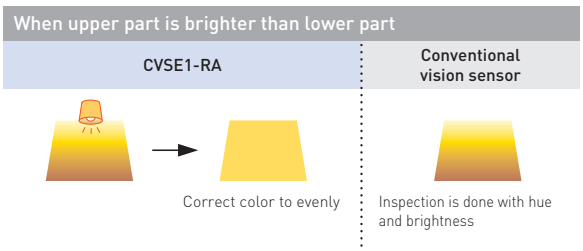
Two threshold mode

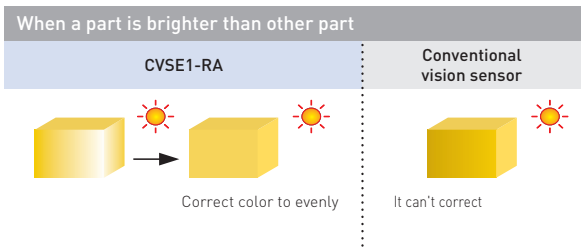
Determine OK when the area that the color matches is in two thresholds.

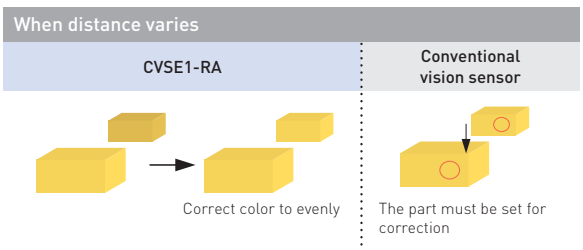


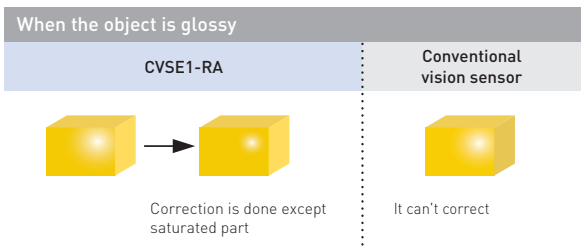
Stable inspection

It calculates color hue of each pixel that prevents miss-inspection affected by external light and brightness changes of lighting. Stable inspection is available and you can setup CVSE1-RA just like you do for photoelectric sensor.



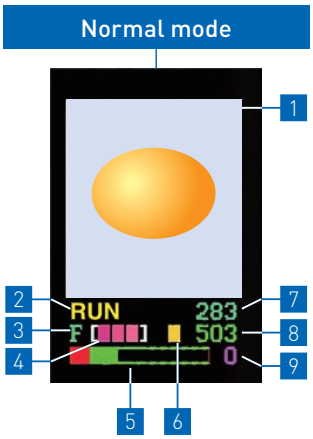






Display

There are two modes : Normal / Setup



1 View
Captured image.

2 Mode
RUN: Sensor running.
Others: Teaching or setting parameter

3 Screen mode
Screen display mode.
D: displays the captured image.
F: displays the image after correction process.
2: displays the detected image.

4 Target colors
To detect colors at image. Left is darkest color and middle is middle tone, right is brightest color.

5 Area bar graph
Displays the Area in the bar graph.
Red: Out of range, Green: Within range.

6 Output
Output status ■ : ON ■ : OFF

7 Response time
Time from snapshot to output. per 0.1ms

8 Area
Area of detected colors.
Red: Out of range, Green: Within range.

9 Bank No.
Current bank number.

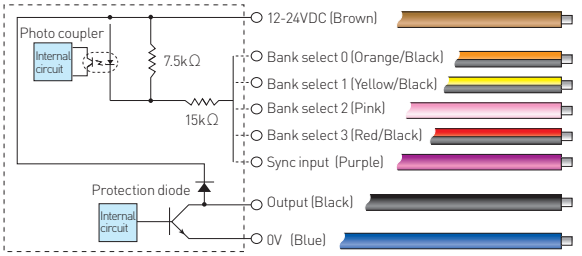
Switches

Specifications

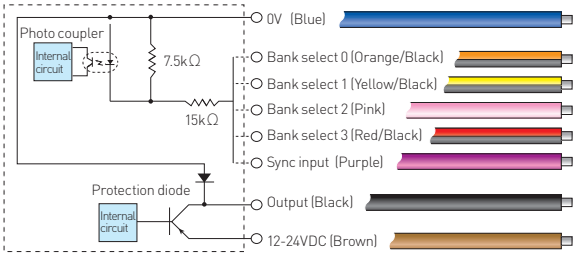
Model	CVSE1-N10-RA CVSE1-P10-RA	CVSE1-N20-RA CVSE1-P20-RA	CVSE1-N21-RA CVSE1-P21-RA	CVSE1-N40-RA CVSE1-P40-RA
Detection angle	10°	20°		40°
Working distance	210 to 270mm	90 to 150mm	31 to 39mm	50 to 100mm
Field of view	40 x 50mm to 55 x 65mm	40 x 50mm to 65 x 75mm	17 x 20mm (±10%)	50 x 65mm to 100 x 115mm
Light source	White LED 12 pcs built-in			
Image sensor	330,000 Pixel CMOS color image sensor			
Supply Voltage	12 to 24V DC±10%			
Power consumption	Max. 120mA/24V DC			
Resolution	5 x12 to 200 x 240			
LED light duration	Approx.50,000 hours (In normal temperature and humidity. Brightness level down by 1/2 of the initial level)			
Response time	2.9 to 27.7ms(Factory setting : 16.7ms) SYNCRO=ON, BRIGHT=100			
Output	NPN or PNP open collector output x 1 max.100mA Residual voltage 1.0V or less			
Input	Bank select 0 to 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)			

Connection diagram

(NPN)



(PNP)



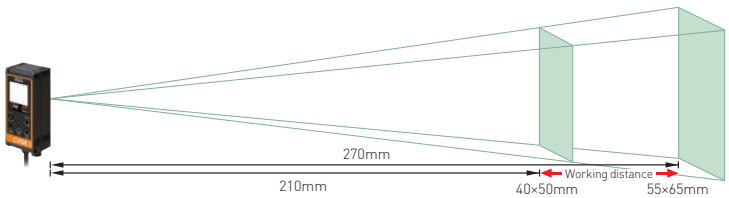
Bank table

Bank No.	Cable Color Signal			
	Orange/Black	Yellow/Black	Pink	Red/Black
	Bank selection 0 input	Bank selection 1 input	Bank selection 2 input	Bank selection 3 input
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

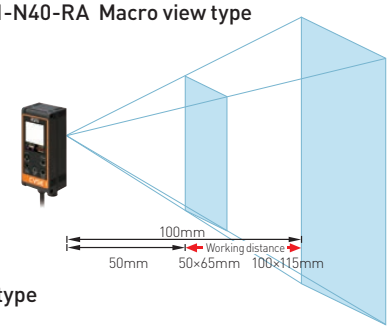
OFF	OPEN or connect with the brown line.
ON	Connect with the blue line.

Field of View

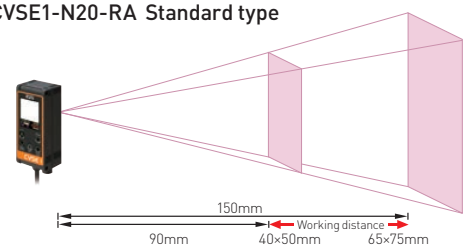
CVSE1-N10-RA Long range type



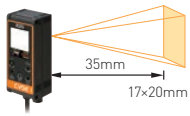
CVSE1-N40-RA Macro view type



CVSE1-N20-RA Standard type

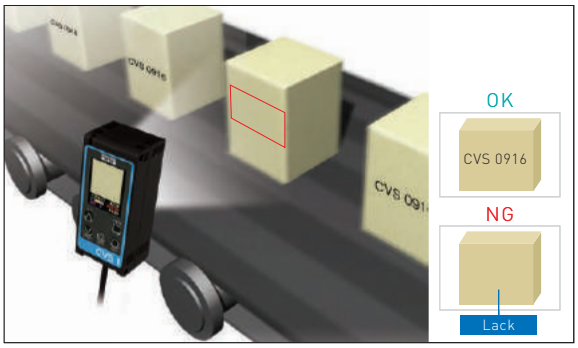


CVSE1-N21-RA Narrow view type



CVS SERIES APPLICATION

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

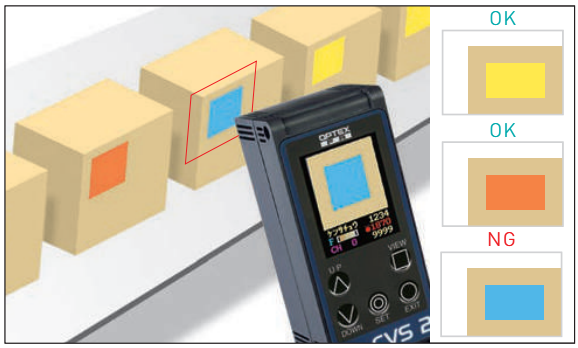
2. Checking the lid of instant foods

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

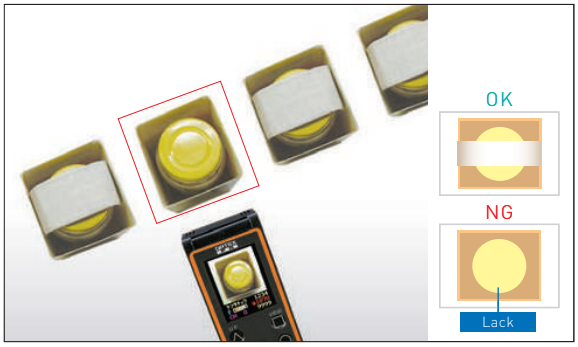
9. Checking shelf life on the milk package

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

13. Checking marking on electric components

CVSE1-RA
Set the color of the marking and check its area in the field of view. Narrow angle view version can zoom up small area.

14. Checking ON/OFF of LED on PWB

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

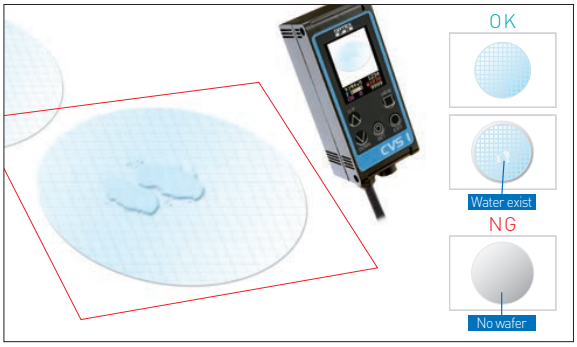
15. Checking order of the color of wires

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

16. Checking existence of bad marking on parts

CVS2-RA
Check color of the parts and color of bad marking on the parts to detect existence of bad parts

17. Checking existence of wafer



CVS1-RA
Set the color of the wafer as its reference and detect existence of the wafer even there are some water on it

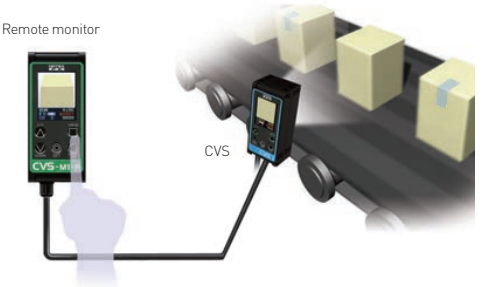
18. Checking direction of the parts

CVS3-RA
Check the edge of the marking on the IC package and detect direction of it

Accessories for CVS series

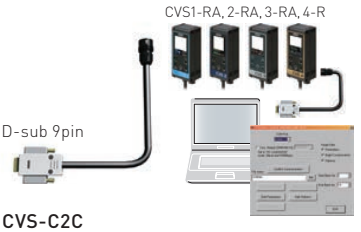
Remote monitor (with 3m cable)

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

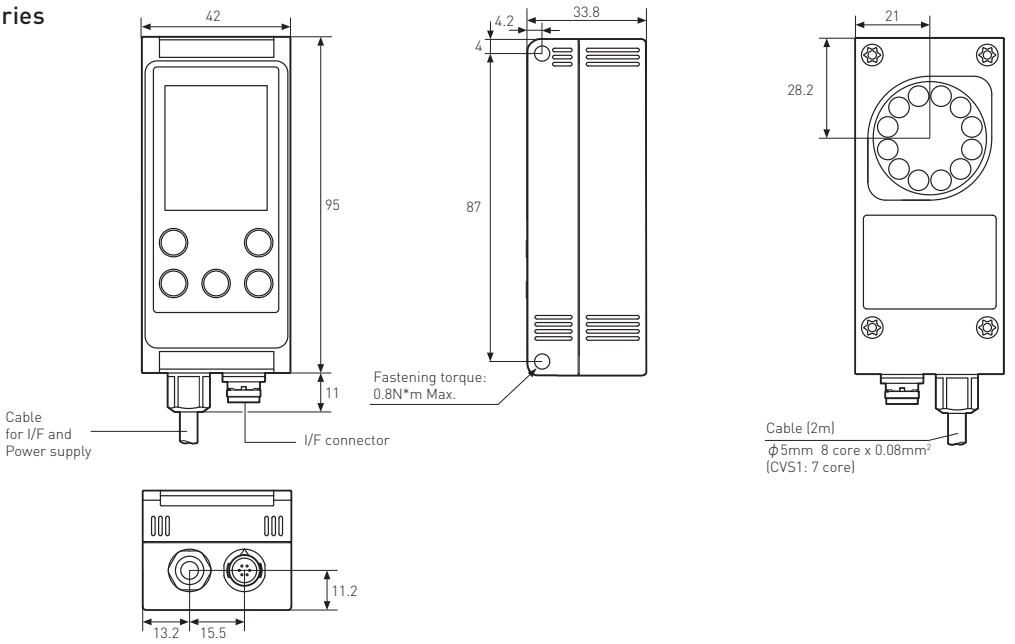
CVS-OPDB-2000
CVS-OPDB-3040
CVS-OPDB-6080

2 OPDB-50x15WS and CVS-OPDB-2000

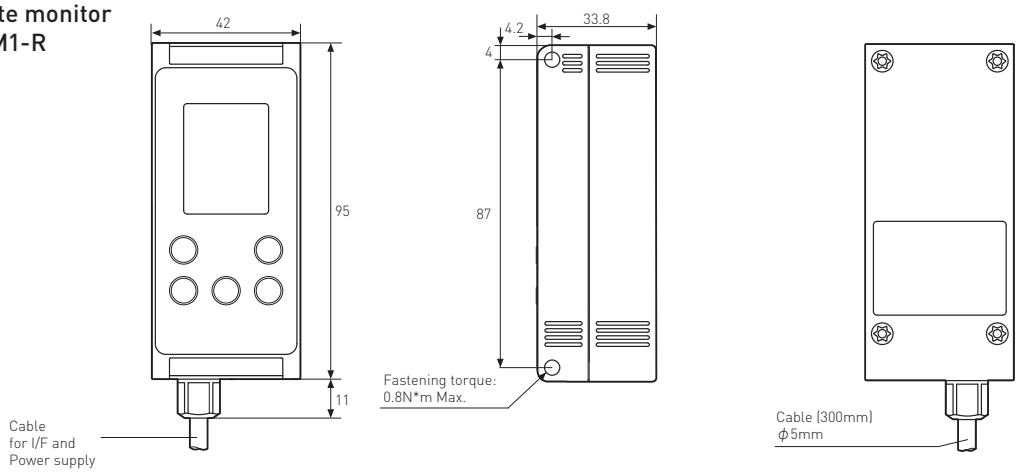
CVS-OP1000L
This is for mounting CVS series and external LED lighting.

Dimensions

CVS Series



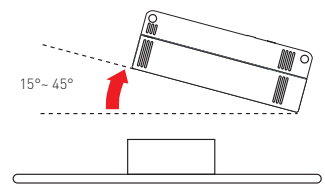
Remote monitor CVS-M1-R



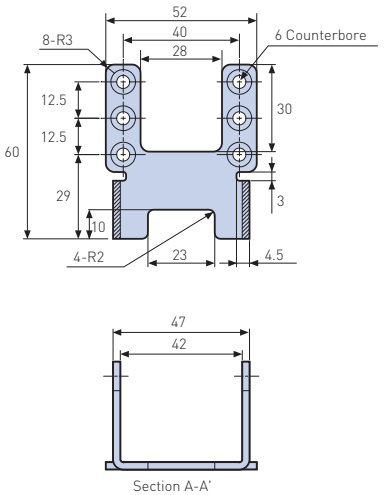
(unit: mm)

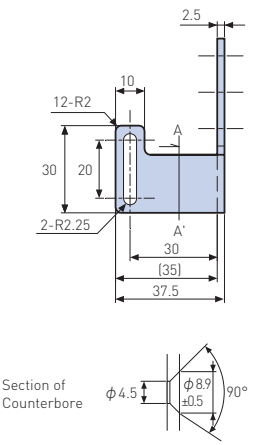
Tips for mounting CVS series

- 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.

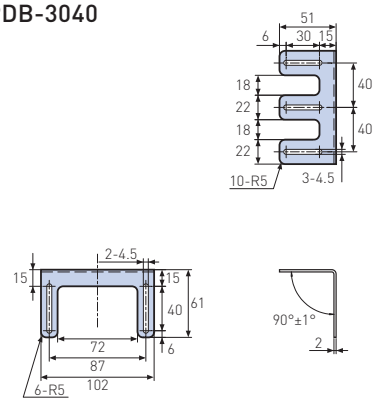


Bracket for Lighting
CVS-OPDB-2000

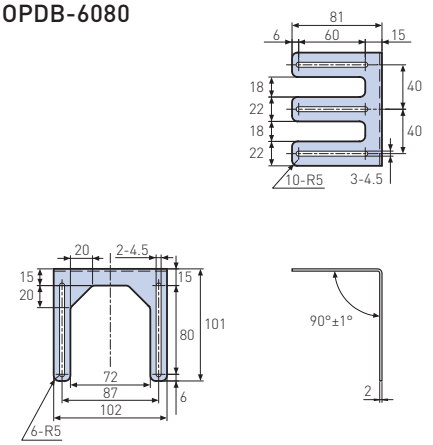




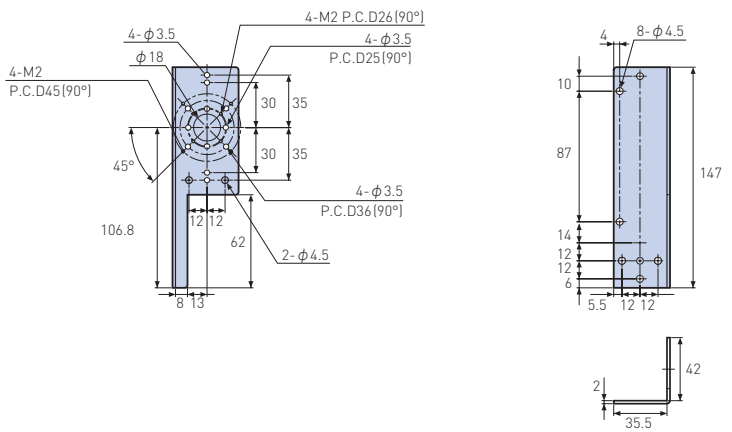
CVS-OPDB-3040

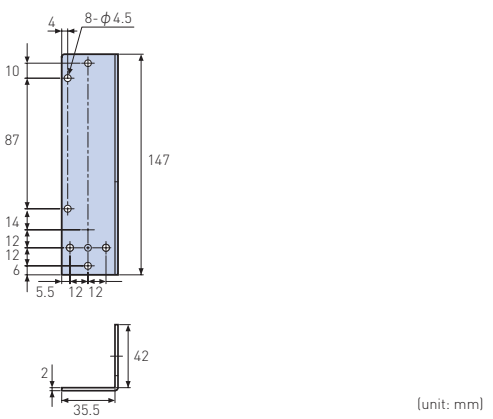


CVS-OPDB-6080



CVS-OP-1000L





(unit: mm)