

# CVSE1-RA SERIES

MVS Series

CVS Series

CVS Series APPLICATION

CVSE1-RA

CVS1-RA

CVS2-RA

CVS3-RA

CVS4-R

OPTIONS



## Simple & Easy setup Color area sensor

- All in one color vision sensor
- Color resolution : 15,000 colors
- Stable color detection by calculating hue of each pixel



### 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

### All in one

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

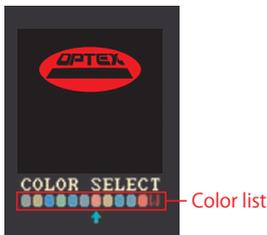
### Three-Step-Teaching

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

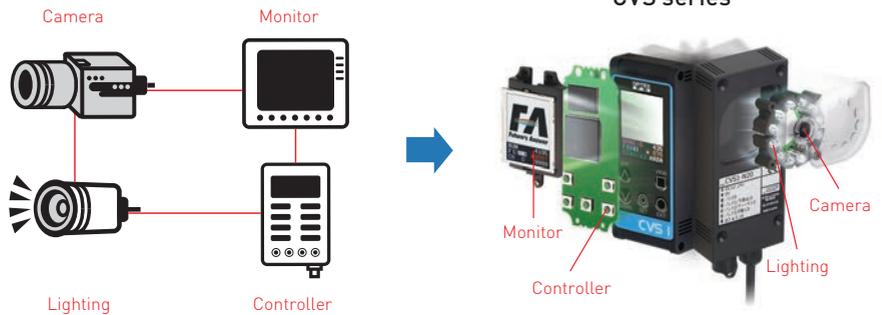
#### Step1 Set field of view



#### Step2 Set color

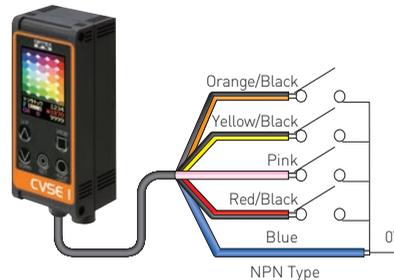


#### Step3 Completed with the final adjustment



### 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.

When upper part is brighter than lower part	
CVSE1-RA	Conventional vision sensor
<p>Correct color to evenly</p>	<p>Inspection is done with hue and brightness</p>

When a part is brighter than other part	
CVSE1-RA	Conventional vision sensor
<p>Correct color to evenly</p>	<p>It can't correct</p>

When distance varies	
CVSE1-RA	Conventional vision sensor
<p>Correct color to evenly</p>	<p>The part must be set for correction</p>

When the object is glossy	
CVSE1-RA	Conventional vision sensor
<p>Correction is done except saturated part</p>	<p>It can't correct</p>

## Display

There are two modes : Normal / Setup

**Normal mode**

- 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

**UP**

Move cursor up and increase parameter value

**VIEW**

Change the display mode  
F: Dark Compensated image  
2: Shows only chosen color area  
D: Shows original image

**DOWN**

Move cursor down and decrease parameter value

**TEACH / EXIT**

Change to Teaching mode by pressing 3 sec. or more.

**SET**

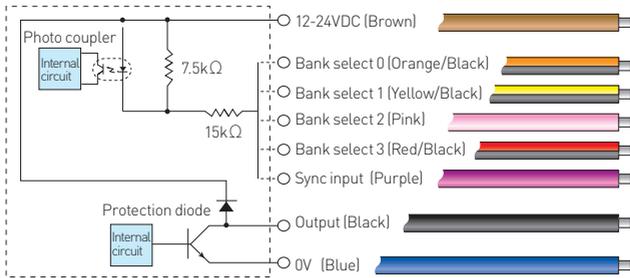
Change to setup mode. Choose the parameter by pressing 3 sec. or more.

## Specifications

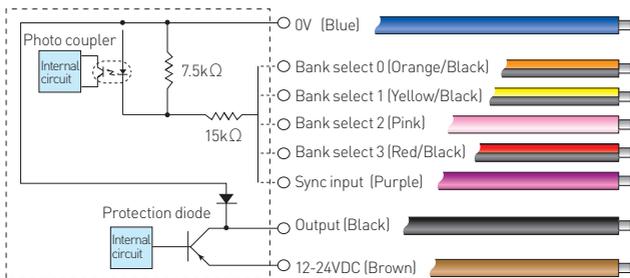
Model	CVSE1-N10-RA CVSE1-P10-RA	CVSE1-N20-RA CVSE1-P20-RA	CVSE1-N21-RA CVSE1-P21-RA	CVSE1-N40-RA CVSE1-P40-RA
Detection angle	10°	20°		40°
Working distance	210 to 270mm	90 to 150mm	31 to 39mm	50 to 100mm
Field of view	40 x 50mm to 55 x 65mm	40 x 50mm to 65 x 75mm	17 x 20mm (±10%)	50 x 65mm to 100 x 115mm
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°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)			

## Connection diagram

(NPN)



(PNP)



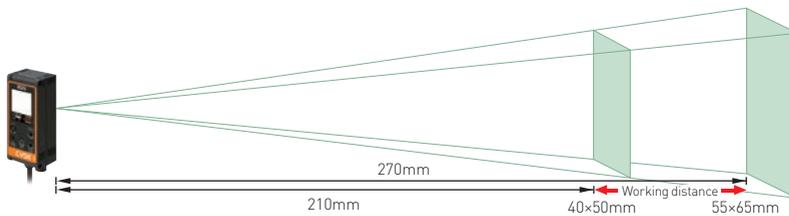
## Bank table

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

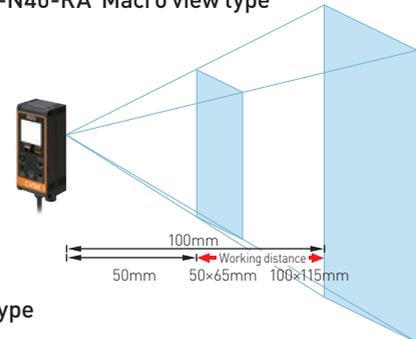
OFF	OPEN or connect with the brown line.
ON	Connect with the blue line.

## Field of View

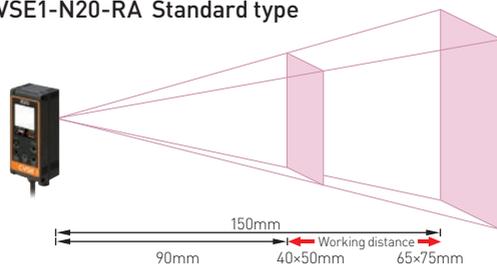
CVSE1-N10-RA Long range type



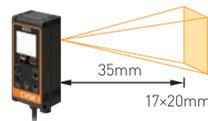
CVSE1-N40-RA Macro view type



CVSE1-N20-RA Standard type



CVSE1-N21-RA Narrow view type



# CVS SERIES APPLICATION

MVS Series

CVS Series

CVS Series APPLICATION

CVSE1-RA

CVS1-RA

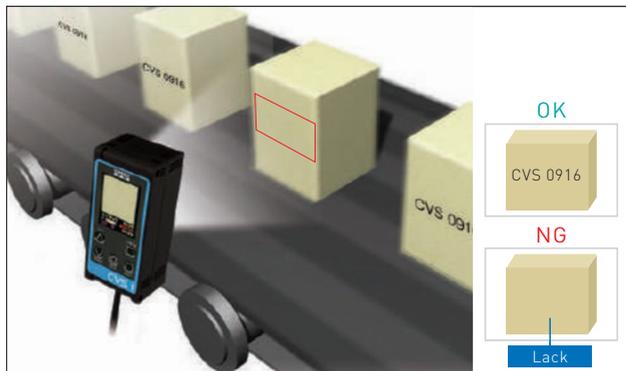
CVS2-RA

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

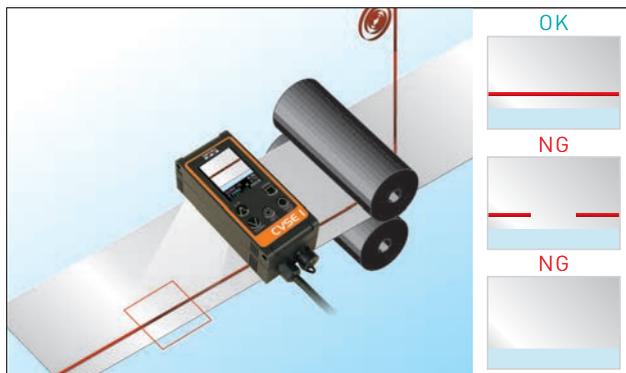
## 2. Checking the lid of instant foods



### 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

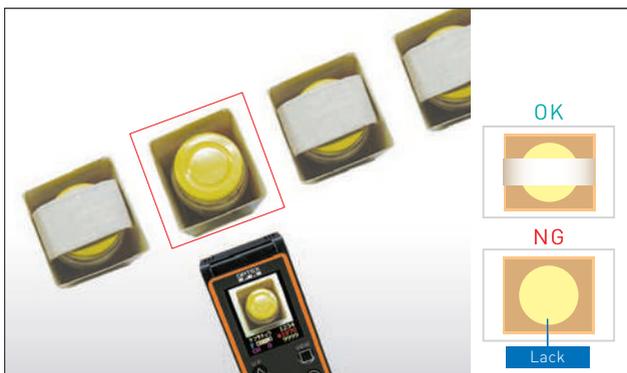
### 10. Checking expiration date on the package



#### 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

### 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

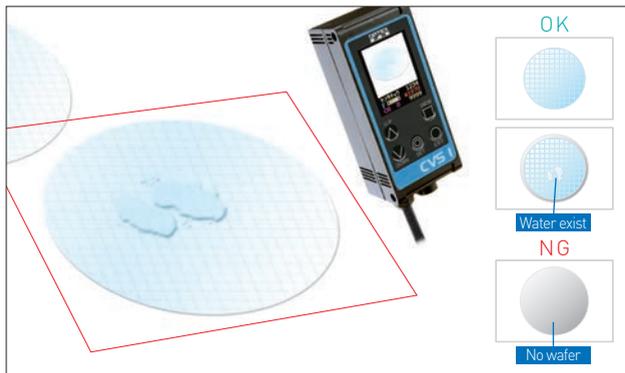
### 16. Checking existence of bad marking on parts



#### 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

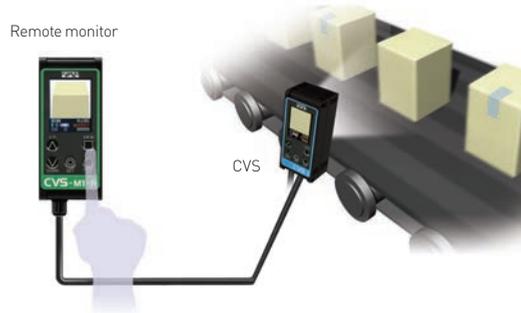
Check the edge of the marking on the IC package and detect direction of it

## 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**

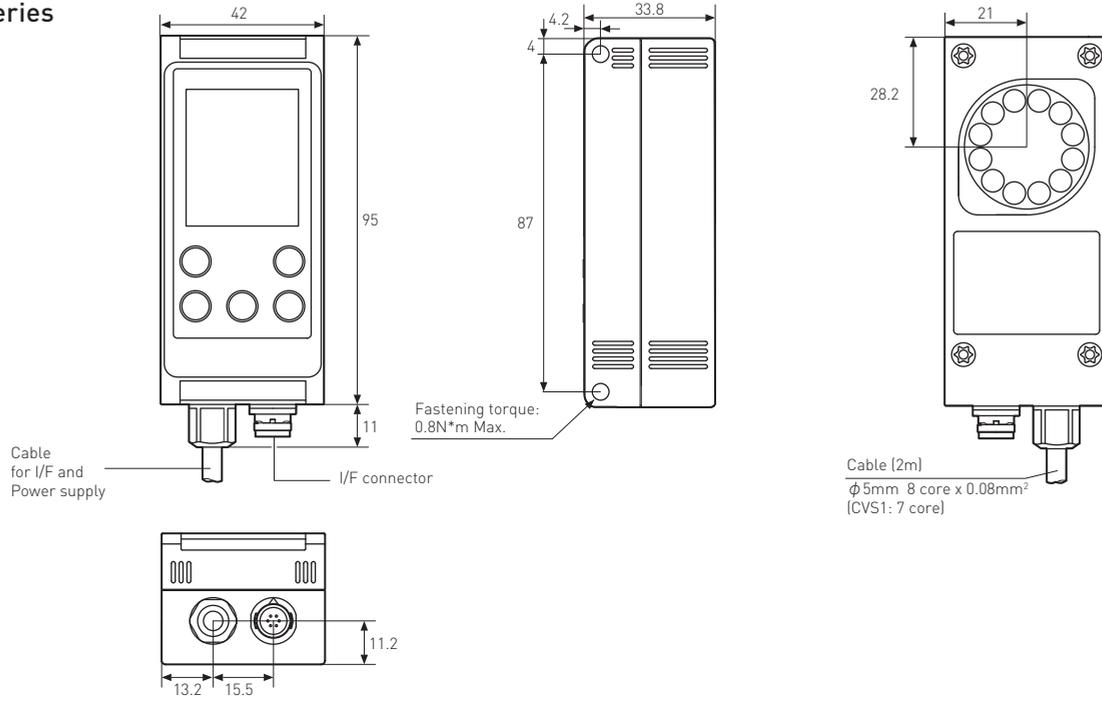
2 OPDB-50x15WS and CVS-OPDB-2000



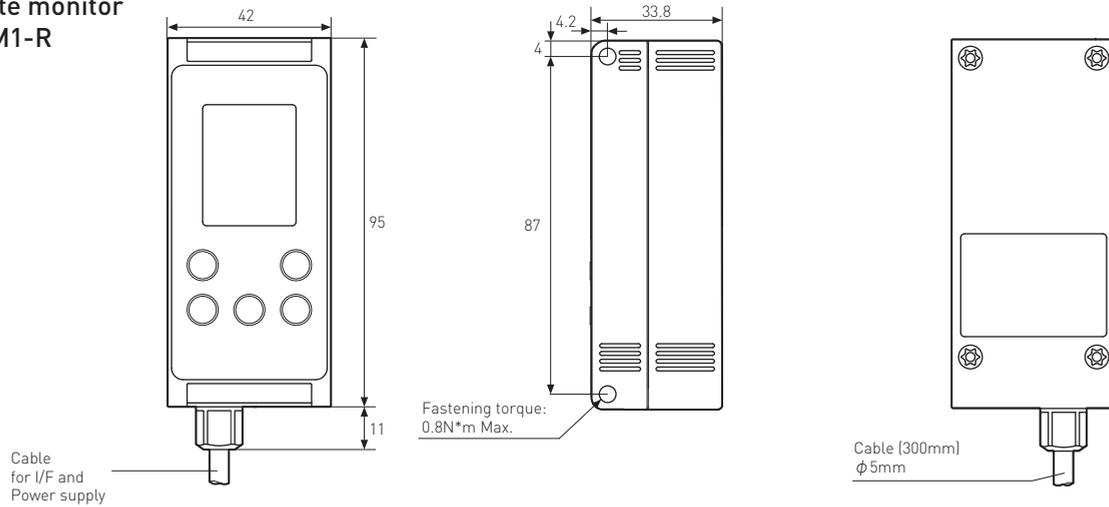
**CVS-OP1000L**  
This is for mounting CVS series and external LED lighting.

## Dimensions

### CVS Series



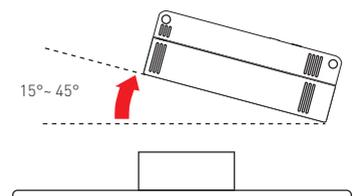
### Remote monitor CVS-M1-R



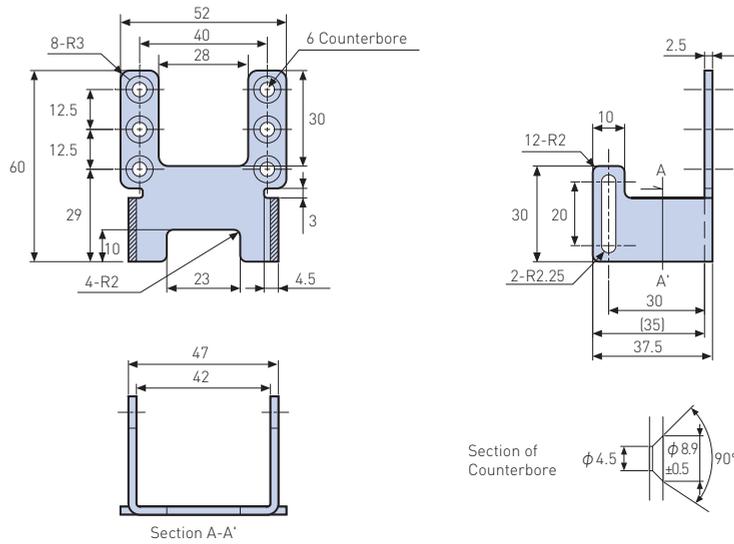
(unit: mm)

### Tips for mounting CVS series

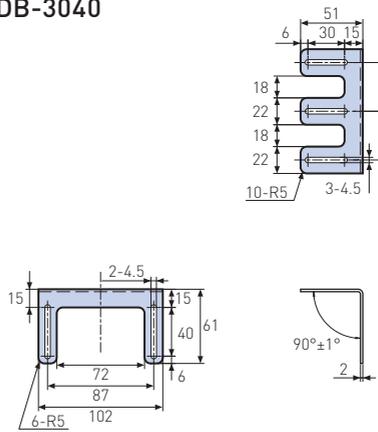
- Please determine Working distance and Field of View so that you choose correct model number of CVS series.
- Please use M4 \* 50mm screws to mount CVS series
- Please take care about distance between CVS and target object to get stable size of Field of View.
- Please mount CVS at 15 to 45 degree to 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.



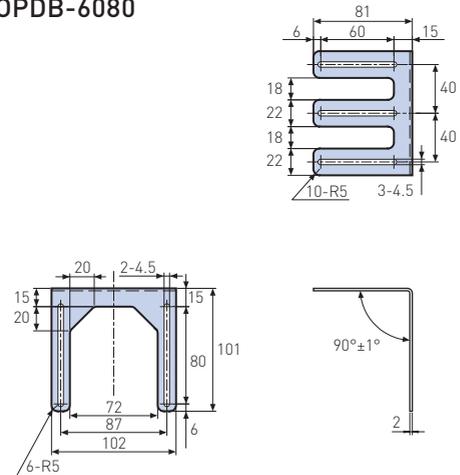
**Bracket for Lighting  
CVS-OPDB-2000**



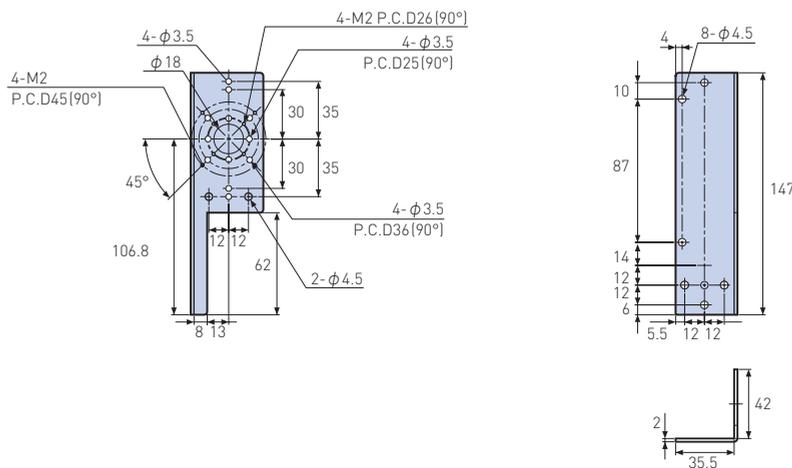
**CVS-OPDB-3040**



**CVS-OPDB-6080**



**CVS-OP-1000L**



(unit: mm)