

# CVS3-RA SERIES

MVS Series

CVS Series

CVS Series APPLICATION

CVSE1-RA

CVS1-RA

CVS2-RA

CVS3-RA

CVS4-RA

OPTIONS



## Edge sensor for various application

- All in one color vision sensor
- Easy setup and High performance
- Useful Zoom-in function

### Wide range line-up

CVS3-N20-RA Standard type  
CVS3-N21-RA Narrow view type

### New inspection mode: Contour mode, Differential mode

New inspection mode, Contour mode and Differential mode have been added up on conventional CVS3-RA compatible mode. It has improved search function and improved color/contrast correct function.

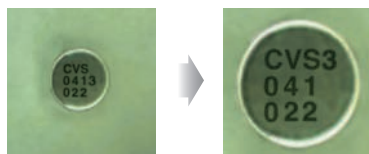
### Masking function

You can mask the area that doesn't have to be checked so that you can get better sensitivity of inspection.



### Zoom function

CVS3-RA has Zoom function so you can zoom in up to twice size.



	Compatible mode	Contour mode	Differential mode
Mode			
Application	<p>Metal parts</p>	<p>Metal parts Contour mode+Monochrome mode</p> <p>For flaw with slight color difference Contour mode+Color inspection</p> <p>For slight color difference and shape Contour mode+inspection of entire area</p>	<p>Checking picture Differential mode</p> <p>For low contrast object Differential mode+Color inspection</p>

### Downloading setup parameters to PC

You can download setup data and reference image data into PC. You can copy the reference image data and the setup data to other CVS3-RA. Please use I/F cable CVS-C2C.

### Up to 15 Bank

15 Banks are available in small all in one package.

### Other FOV type is available

In case you need other FOV type like CVS1-RA or CVS2-RA, please contact our distributor.

## Features

### 7 binarize level

When it compares binarized image between registered image and captured image, it chooses best binarize level to get best image automatically. This is effective when the lighting is not stable.

Existence of graved mark on metal or glass



### Rotate correction

Correction of rotation is available up to +/- 6.2 degree.

Inspection of chocolate shape



Find out best angle rotating the captured image step by step



### Detecting Color edge

Detect edge between different colors and get clear image to inspect.

Inspection of colored label direction



You can detect even red color on green background easily that monochrome camera can't.



### Easy Teaching


You can externally teach CVS3-R just by inputting single Teaching signal. Then, CVS3-RA updates its image for reference automatically.

Verifying shelf life that changes everyday



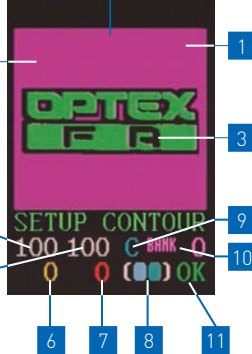
## Display

Compatible mode



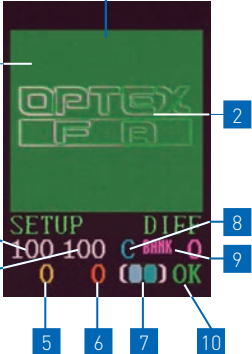
- 1 Captured image  
Image captured by the camera
- 2 Parameters  
Shows parameters
- 3 Lack/Stain pixels  
Shows lack of edge and stain on the background
- 4 Stablensness of threshold level  
↑ : Increase THRESHLD  
↓ : Decrease THRESHLD
- 5 Display mode  
Shows current display mode
- 6 Judge result  
Shows judge result
- 7 Bank No./Response time  
Shows Bank No. in normal mode. Shows response time while setup mode

Contour mode




- 1 Area to detect stain  
It shows pixel in red when it matches to the contour and Stain pixel No. will be increased
- 2 Area to detect lack of contour  
It shows pixel in yellow when it's detected as lack of contour and Lack pixel No. will be increased
- 3 Area to neglect  
It doesn't affect anything even if there is contour in this area
- 4 Threshold of lack of contour
- 5 Threshold of stain
- 6 Lack pixel No.
- 7 Stain pixel No.
- 8 Registered color (bright / dark)
- 9 Display mode
- 10 Bank No.
- 11 Judge result

Differential mode



- 1 Area without contour  
It shows pixel in yellow or red when it detect contour and differential rate will be increased
- 2 Area with contour should exist  
It shows pixel in yellow or red when it doesn't detect contour and differential rate will be increased
- 3 Threshold of differential rate
- 4 Threshold of color area rate
- 5 Differential rate
- 6 Color area rate
- 7 Registered color (bright / dark)
- 8 Display mode
- 9 Bank No.
- 10 Judge result

## Switches



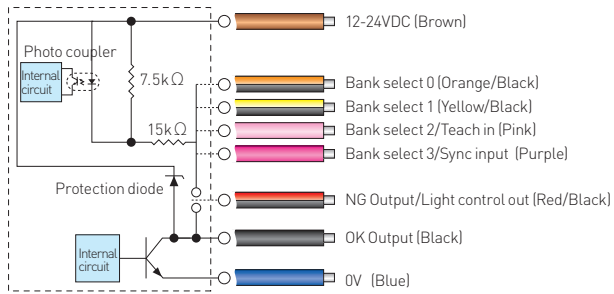
- UP**  
Move cursor up and increase parameter value
- DOWN**  
Move cursor down and decrease parameter value
- VIEW**  
Change the display mode  
F: Dark Compensated image  
2: Shows only chosen color area  
D: Shows original image
- EXIT**  
Use this button when you quit changing parameter and going back to previous menu.
- SET**  
Change and set the parameters.

## Specifications

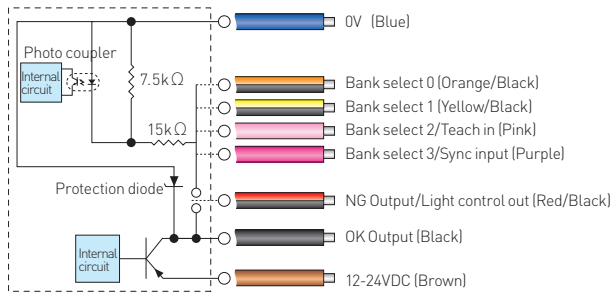
Model	CVS3-N20-RA CVS3-P20-RA	CVS3-N21-RA CVS3-P21-RA
Detection angle	20°	
Working distance	90 to 150mm	31 to 39mm
Field of view	40 x 50mm to 65 x 75mm	17 x 20mm (±10%)
Light source	White LED 12 pcs built-in	
Image sensor	330,000 Pixel CMOS color image sensor	
Supply Voltage	12 to 24V DC±10%	
Power consumption	Max. 140mA/24V DC	
Resolution	16 x 16 to 208 x 236	
LED light duration	Approx.50,000 hours(In normal temperature and humidity. Brightness level down by 1/3 of the initial level)	
Response time	Contour mode : 148ms (Factory Settings)	
Output	NPN or PNP open collector output x 2 max. 100mA Residual voltage 1.0V or less	
Input	Totally 4: Bank select 0-3, Bank select 2 (switchable to Bank select 3 or NG output)	
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

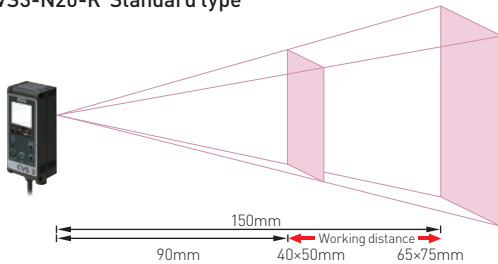
Set up	BANK	0-14		15		16	
	SYNCHRON	4	0-3	4	0-3	4	0-3
External Input	Bank select 0	NA		Active			
	Bank select 1	NA		Active			
	Bank select 2	External Teach-in				Active	
	Bank select 3	NA	Synch.In	Active	Synch.In	Active	Synch.In

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
0	ON	ON	ON	ON

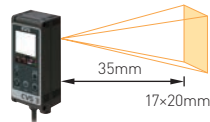
OFF	NPN: OPEN or connect with the brown line. PNP: OPEN or connect with the blue line.
ON	NPN: connect with the blue line. PNP: connect with the brown line.

## Field of View

CVS3-N20-R Standard type



CVS3-N21-R Narrow view type



### 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

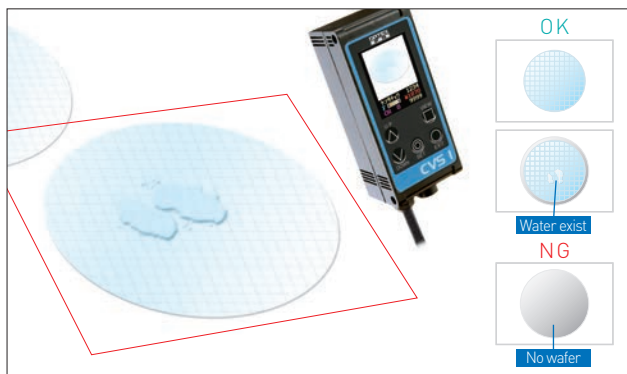
### 16. Checking existence of bad marking on parts



#### 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

### 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

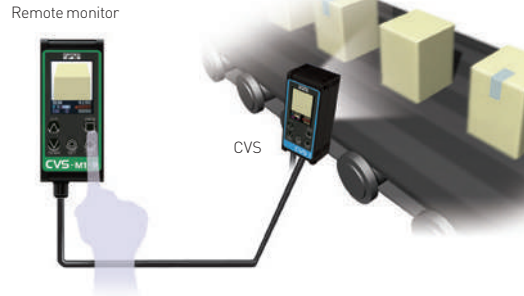
Check the color area of the printed characters on the spark plugs

## Accessories for CVS series

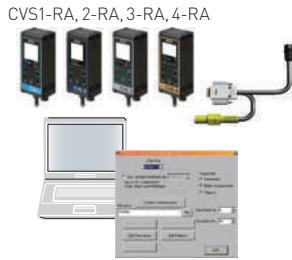
### Remote monitor (with 3m cable)



**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.



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

**Required PC spec.**  
 - Microsoft Windows 7,8,1,10  
 - RS232C I/F  
 Software is downloadable from <http://www.optex-fa.com>

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



**CVS-C2Y**  
For CVS1-RA,2-RA,3-RA,4-RA  
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-RA  
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**

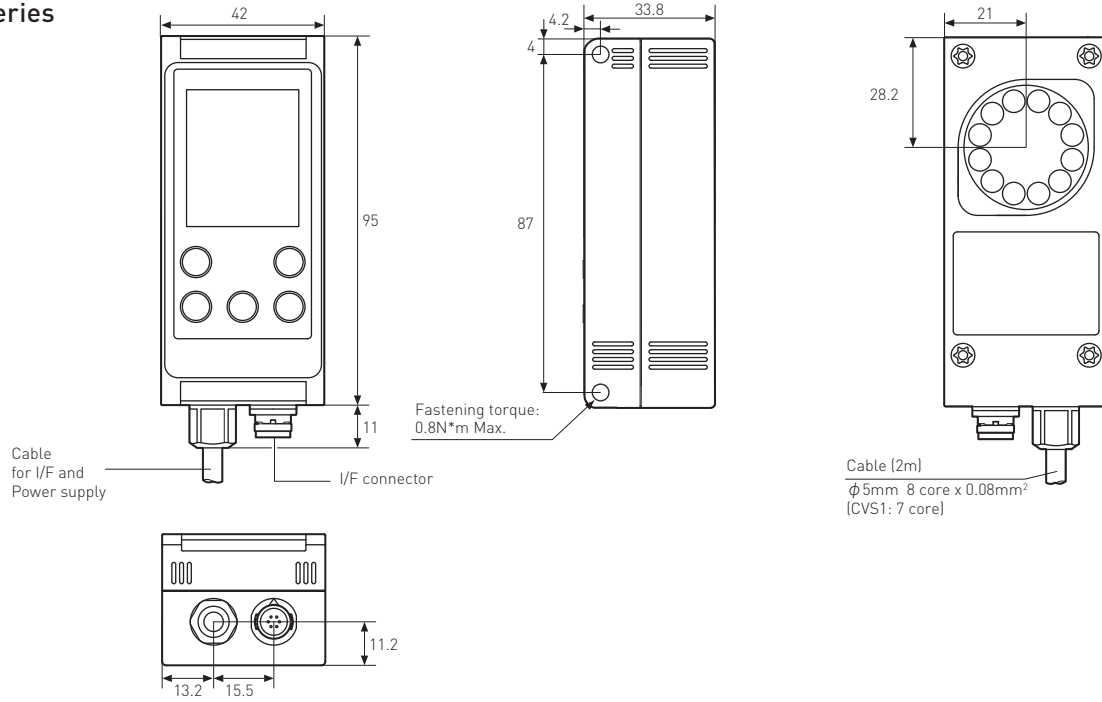
2 OPDB-50x15WS and CVS-OPDB-2000



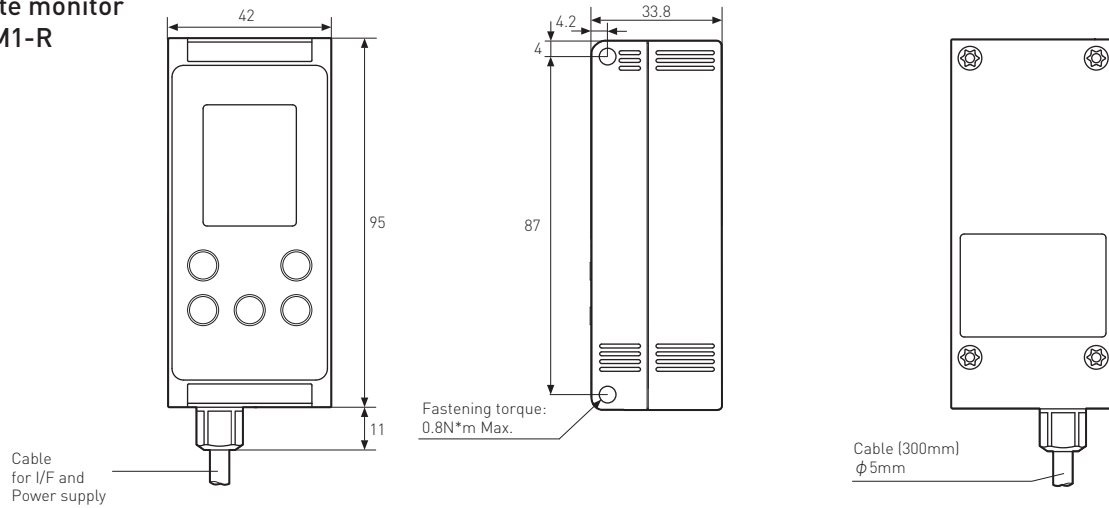
**CVS-OP1000L**  
This is for mounting CVS series and external LED lighting.

## Dimensions

### CVS Series



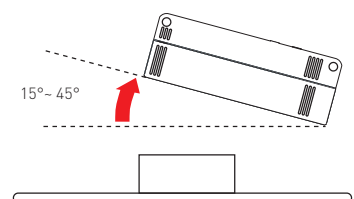
### Remote monitor CVS-M1-R



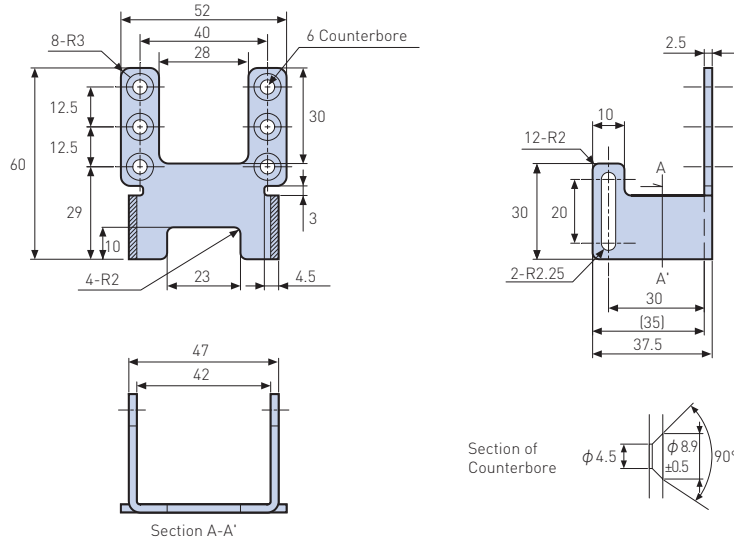
(unit: mm)

### Tips for mounting CVS series

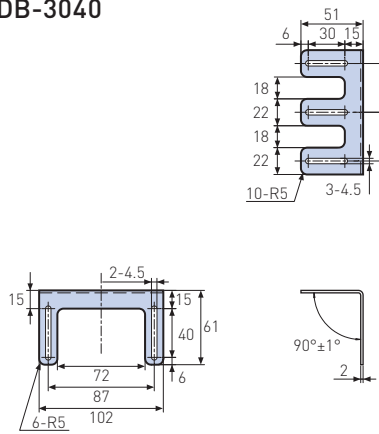
- Please determine Working distance and Field of View so that you choose correct model number of CVS series.
- Please use M4 \* 50mm screws to mount CVS series
- Please take care about distance between CVS and target object to get stable size of Field of View.
- Please mount CVS at 15 to 45 degree to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



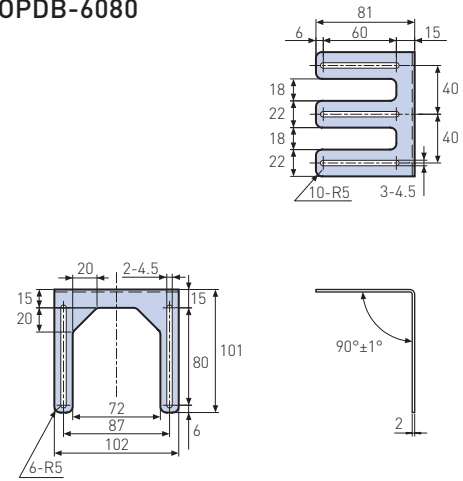
**Bracket for Lighting  
CVS-OPDB-2000**



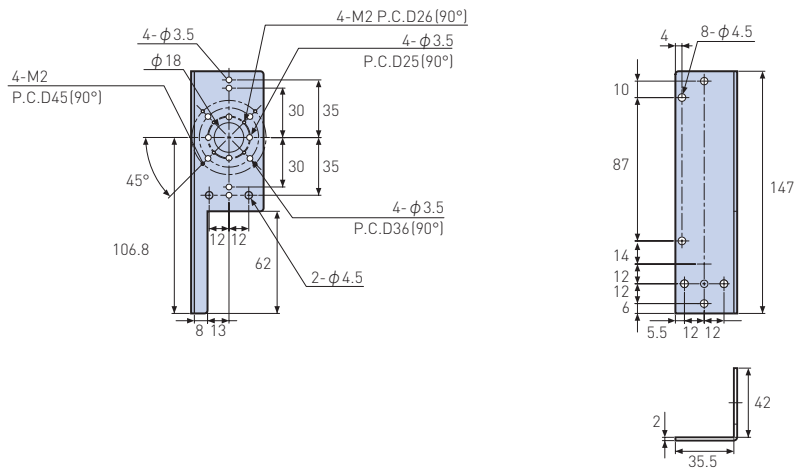
**CVS-OPDB-3040**



**CVS-OPDB-6080**



**CVS-OP-1000L**



(unit: mm)