

CVS2-RA SERIES

MVS Series

CVS Series

CVS Series APPLICATION

CVSE1-RA

CVS1-RA

CVS2-RA

CVS3-RA

CVS4-R

OPTIONS



Detect Color and Shape for various inspection

- All in one color vision sensor
- For Pattern matching and Color inspection
- Better sensitivity by Masking function

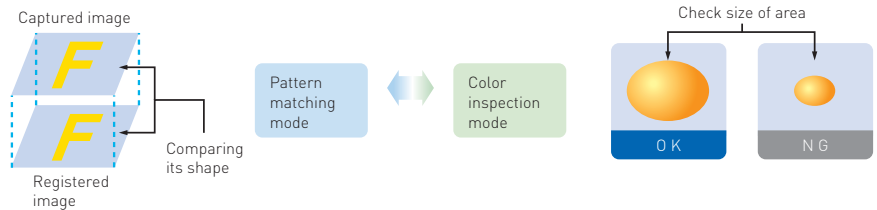


Wide range line-up

- CVS2-N20-RA Standard type
- CVS2-N10-RA Long range type
- CVS2-N40-RA Macro view type
- CVS2-N21-RA Narrow view type

Pattern matching mode and Color inspection mode are available

Inspection of shape and direction of the object is available by pattern matching mode. You can use CVS2-RA as simple Color inspection sensor as well. Sorting by color is also available.



Correct background brightness

CVS2-RA has a function that corrects evenness of background brightness. You register just the background for reference.



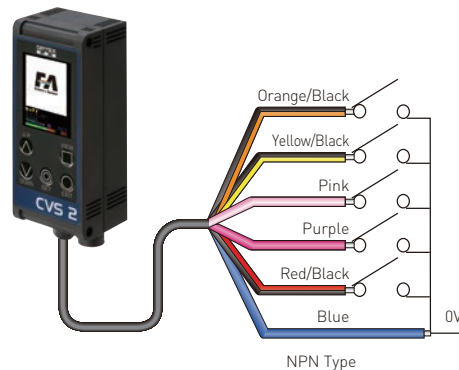
All in one

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



Up to 15 Bank

15 Banks are available in small all in one package.

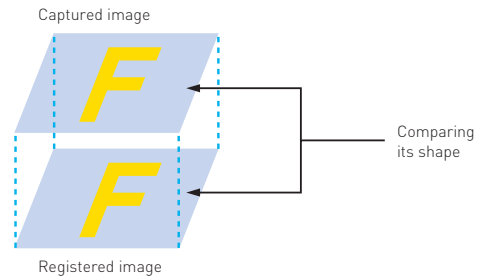


Wide coverage line-up

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

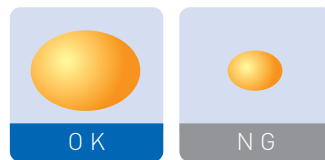
Pattern Matching mode

CVS2-RA detects up to 65,536 colors and checks its shape to compare with registered image.

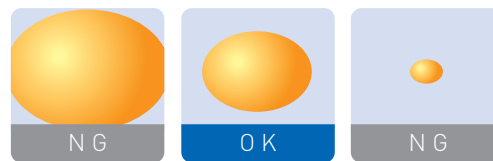


Color Inspection mode

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



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



Two Color Inspection at a time

CVS2-RA can inspect two colors for one application at a time.

Checking Two Color

You can set Upper and Lower threshold for two colors to inspect. You can choose a logic from 4 combination.



Two bar graphs for two colors

Two threshold for two colors each

Masking function

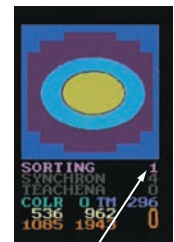
You can mask the area you don't want to detect the color freely in position.



Blue part is masked area

Sorting function

Sorting is available by utilizing two outputs up to 3. You can also increase the sorting number up to 15 by utilizing RS-232C controlling.

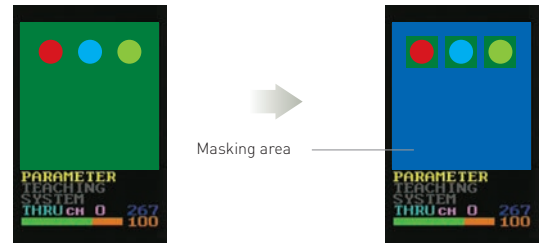


When this parameter is 1, you can sort in two criteria.

Features

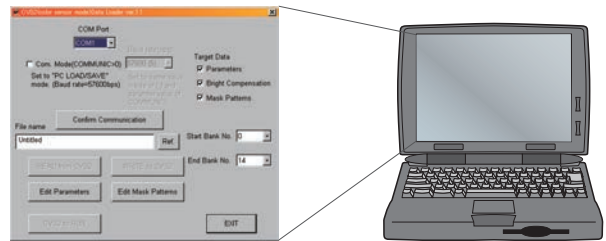
Masking function

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



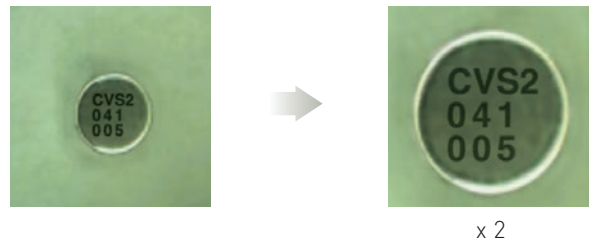
Downloading setup parameters to PC

You can download setup data and image data into PC. You can use the image data on PC and can copy setup to other CVS2-RA. Please use I/F cable CVS-C2C.



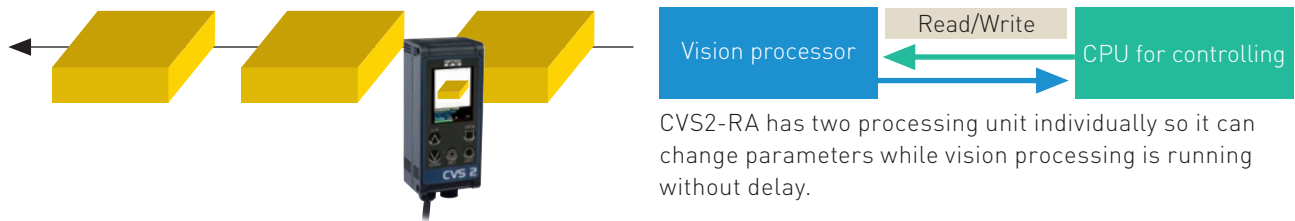
Zoom function

CVS2-RA has Zoom function so you can zoom in up to twice size.



Setup Adjustable while line is running

CVS2-R provides output with the setup parameters given even while you are adjusting setup. You don't have to stop the line.



CVS2-RA has two processing unit individually so it can change parameters while vision processing is running without delay.

Correct background brightness

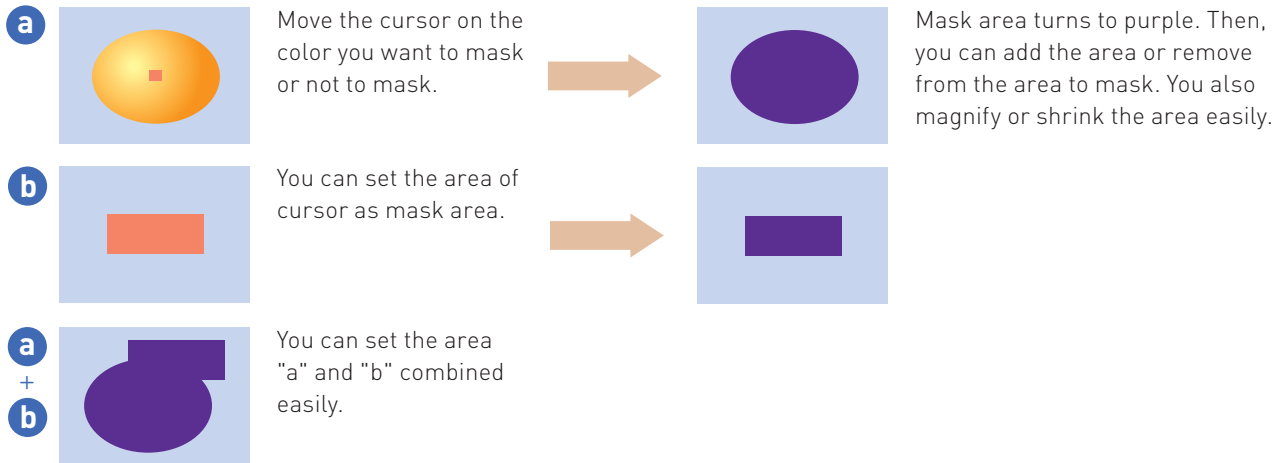
CVS2-RA has a function that corrects evenness of background brightness. You register just the background for reference.



Masking

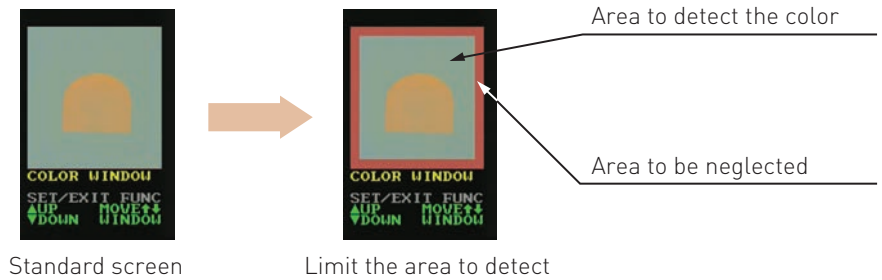
You can mask the area that doesn't have to be checked so that you can get better sensitivity of color inspection.

Setup You can setup the area to mask as follows.

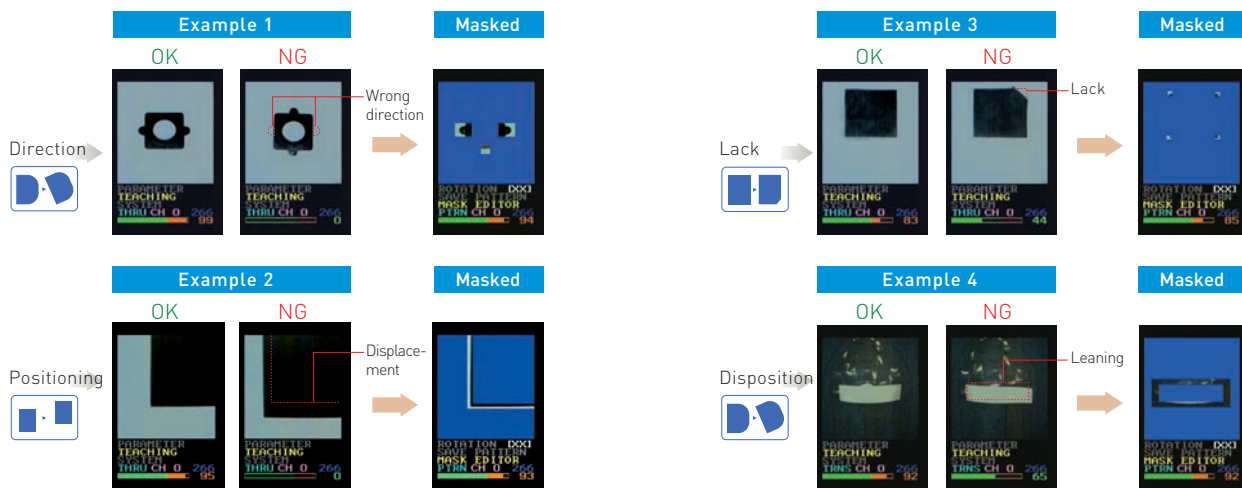


Color inspect area

You can limit the area to inspect color from. This prevents miss-detection of color at the edge of the FOV.



Example of masking



You can get better result by masking the area that doesn't show characteristics of the target object.

Display

Pattern matching mode

- Captured image**
Image captured by the camera
- Parameters**
Shows parameters
- Display mode**
You can change display mode by VIEW button
- Bar graph**
Shows how big the area that the color matches. Threshold is at the border of green and orange.
- Bank No.**
Shows current Bank.
- Auxiliary output**
Status of auxiliary output.
● : means ON
- Response time**
Shows response time. Unit : 0.1ms.
Example : 266 = 26.6ms
- Color match area**
Shows area that color matches.
Orange : ON, Green : OFF

CVS1 compatible mode

- Captured image**
Image captured by the camera
- Parameters**
Shows parameters
- Display mode**
Shows display mode
- Display mode**
Shows how big the area that the color matches.
- Registered color**
Min. Center and Max. color
- Bank No.**
Shows current Bank.
- Output/Sorting status**
Orange: ON, Green: OFF
Shows sorting No. when it's active.
- Monitoring Bank No.**
Shows Bank No. for sorting.

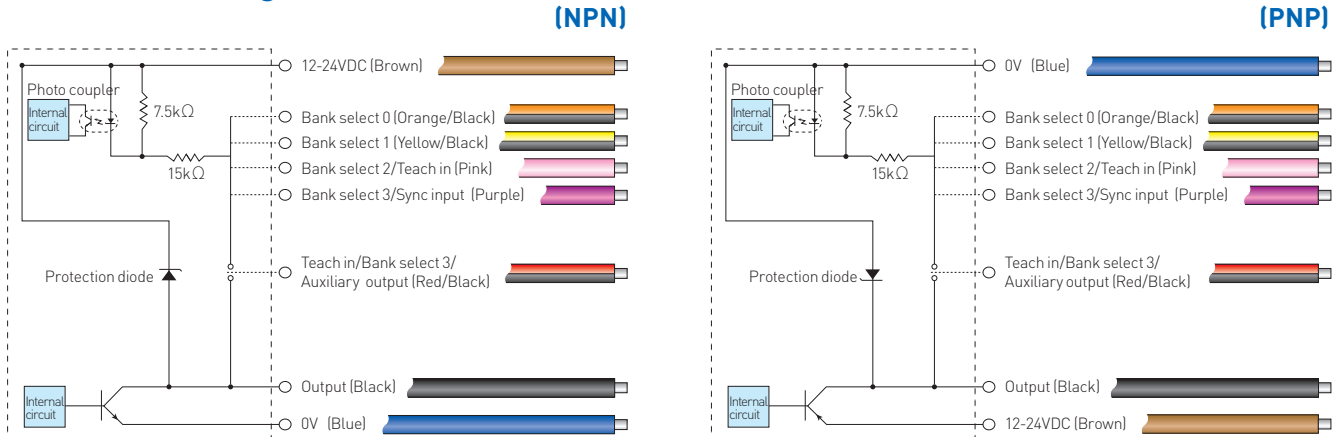
Switches

- UP**: Move cursor up and increase parameter value
- DOWN**: Move cursor down and decrease parameter value
- VIEW**: Change the display mode
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 to setup mode. Choose the parameter by pressing 3 sec. or more.

Specifications

Model	CVS2-N10-RA CVS2-P10-RA	CVS2-N20-RA CVS2-P20-RA	CVS2-N21-RA CVS2-P21-RA	CVS2-N40-RA CVS2-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. 140mA/24V DC			
Resolution	8 x 16 to 200 x 240			
LED light duration	Approx.50,000 hours(In normal temperature and humidity. Brightness level down by 1/3 of the initial level)			
Response time	Pattern matching mode	9.2/15.2/21.2/27.3ms (Standard mode) 6.7/10.9/15.2/19.5ms (Double speed mode)		
	CVS1 compatible mode	8.7/14.8/20.8/26.8ms (Standard mode) 5.7/9.7/13.5/17.3ms (Double speed mode)		
Output	NPN or PNP open collector output x 2 max. 100mA Residual voltage 1.0V or less			
Input	Bank select 0 to 1, Bank select 2 (switchable to Teach input), Bank select 3 (switchable to Sync input), Teach in (switchable to Bank select 3 or Auxiliary 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 ²)			
Material	Case:ABS / Display and Lens : Acryl or Polycarbonate			
Protection structure	IP67			
Weight	Approx.200g (including cable)			

Connection diagram



Auxiliary output

- AUX OUT=0: Ready - Turns OFF after switching Bank. Turns ON when Output is ready
- AUX OUT=1: Judge timing - Turns ON when Judge timing
- AUX OUT=2: Light timing - Turns ON when Lighting
- AUX OUT=3: Searching result - Turns ON when each search result is in its criteria, MAGNIFY%, POSIT% X, POSIT% Y, ROTATE%.

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

Sorting output

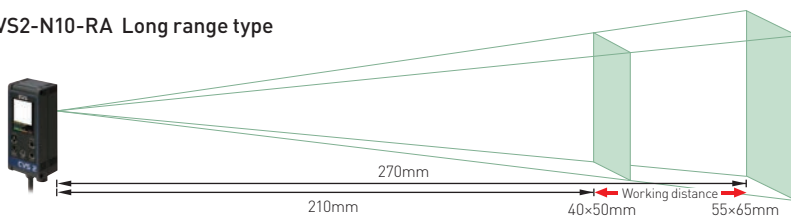
You can get sorting output from following table that shows which bank matches by combination of Output (Black) and Auxiliary output (Red/Black) signals.

Bank No.	Output(Black)	Auxiliary output(Red/Black)
Current Bank	ON	OFF
+1	OFF	ON
+2	ON	ON

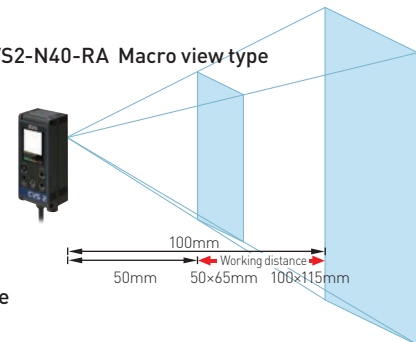
OFF	NPN: OPEN or connect with the brown line. PNP: OPEN or connect with the blue line.
ON	NPN: connect with the blue line. PNP: connect with the brown line.

Field of View

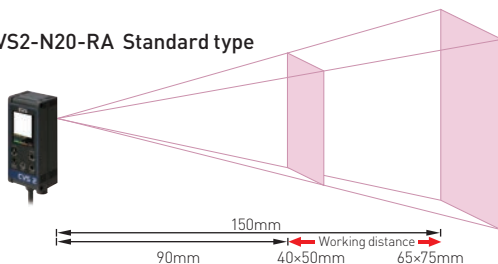
CVS2-N10-RA Long range type



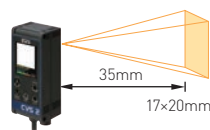
CVS2-N40-RA Macro view type



CVS2-N20-RA Standard type



CVS2-N21-RA Narrow view type



* Input/Output selectable by setup

CVS SERIES APPLICATION

MVS Series

CVS Series

CVS Series APPLICATION

CVSE1-RA

CVS1-RA

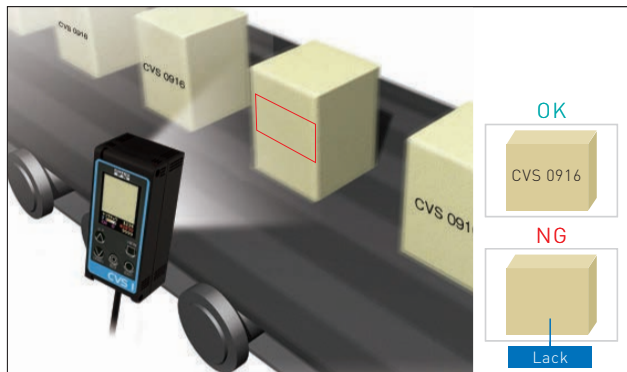
CVS2-RA

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

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

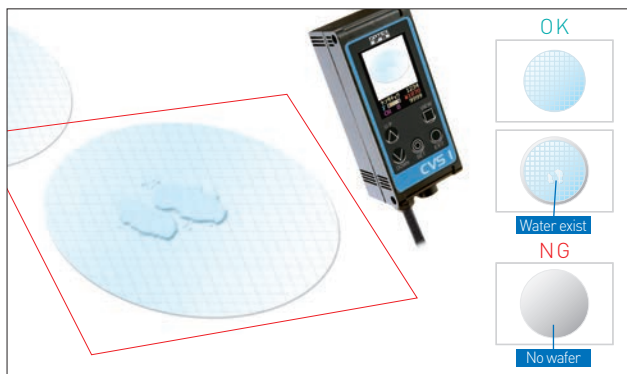
16. Checking existence of bad marking on parts



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

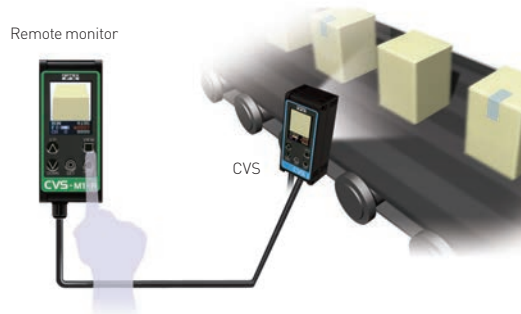
Check the color area of the printed characters on the spark plugs

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.

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

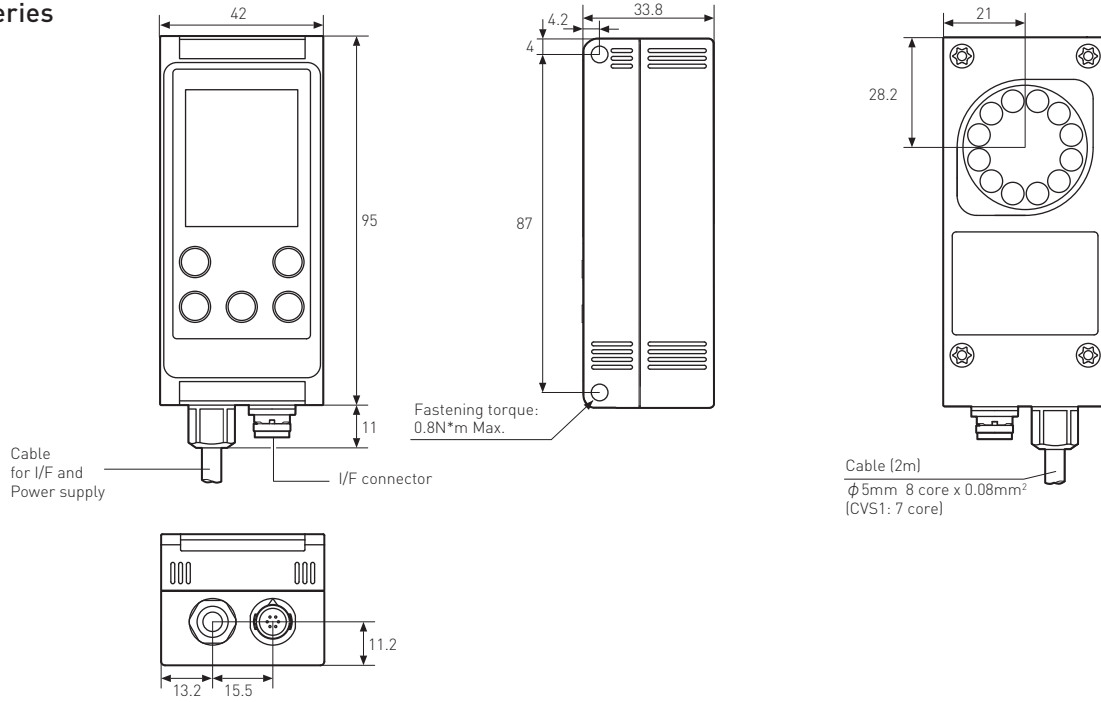
2 OPDB-50x15WS and
CVS-OPDB-2000



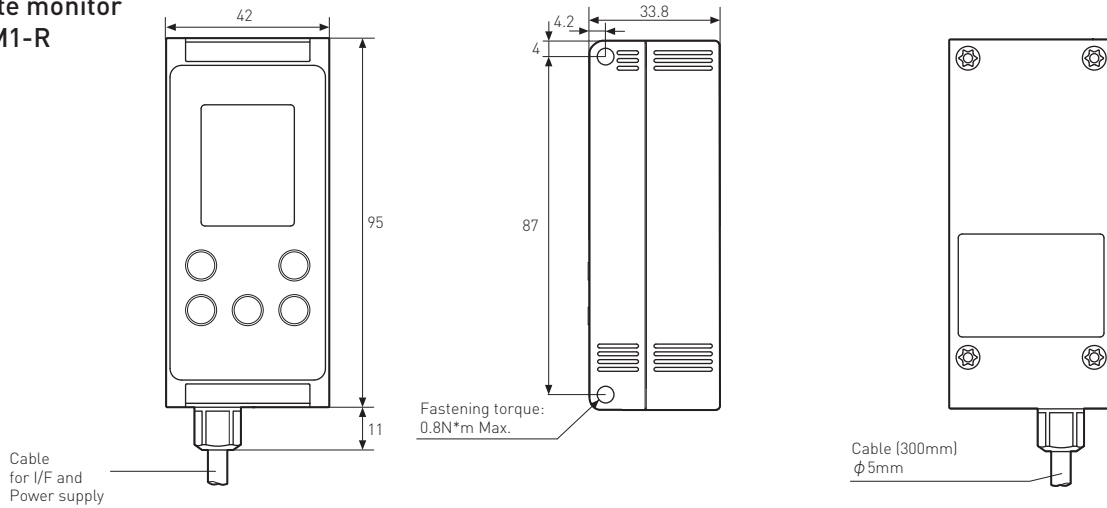
CVS-OP1000L
This is for mounting CVS series and external LED lighting.

Dimensions

CVS Series



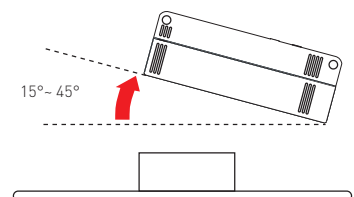
Remote monitor CVS-M1-R



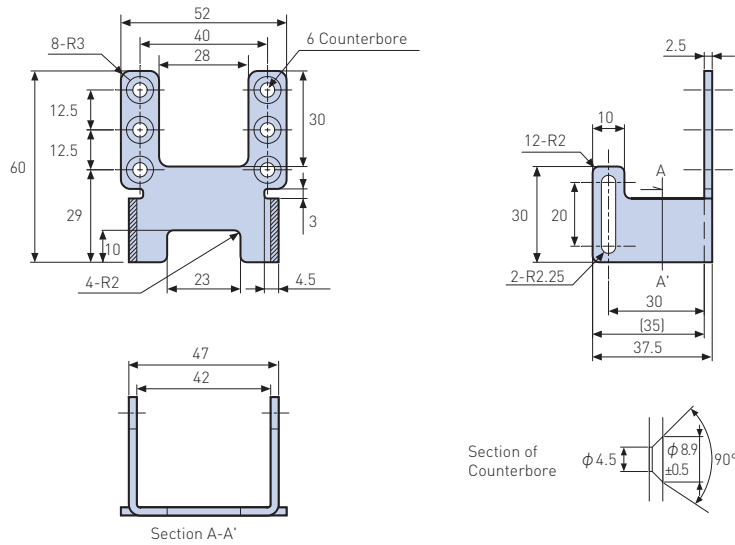
(unit: mm)

Tips for mounting CVS series

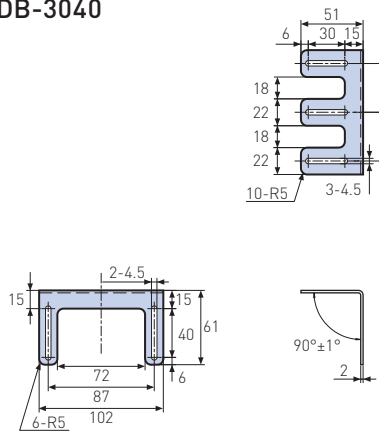
- Please determine Working distance and Field of View so that you choose correct model number of CVS series.
- Please use M4 * 50mm screws to mount CVS series
- Please take care about distance between CVS and target object to get stable size of Field of View.
- Please mount CVS at 15 to 45 degree to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



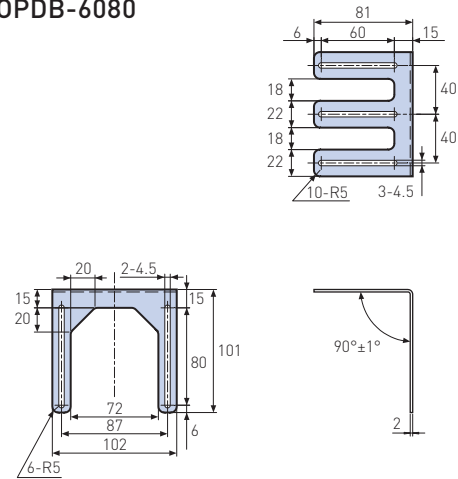
**Bracket for Lighting
CVS-OPDB-2000**



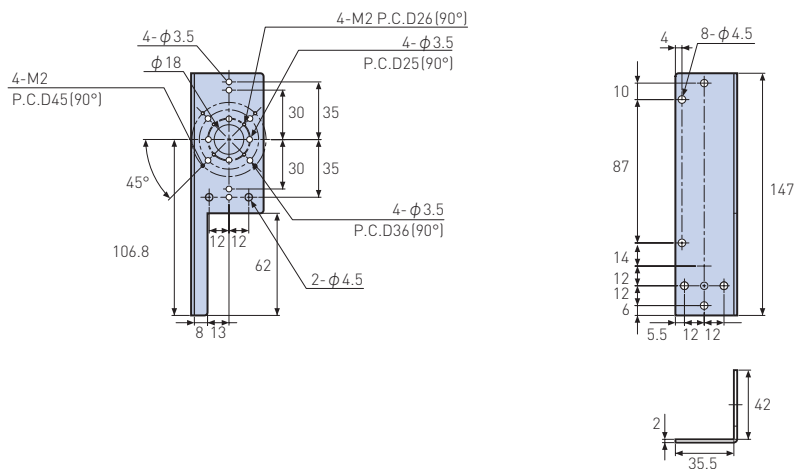
CVS-OPDB-3040



CVS-OPDB-6080



CVS-OP-1000L



(unit: mm)