

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

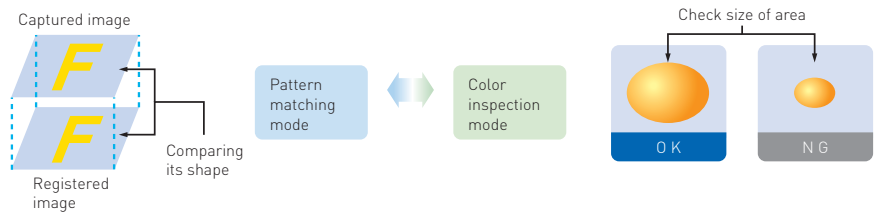
- All in one color vision sensor
- For Pattern matching and Color inspection
- Better sensitivity by Masking function

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.



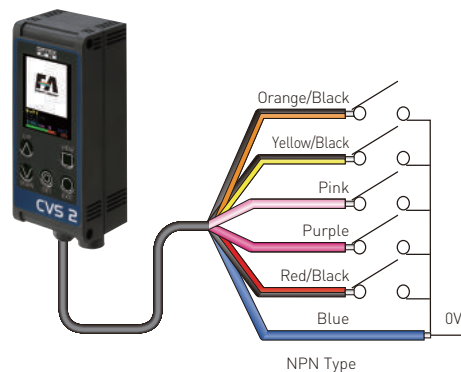
All in one

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.

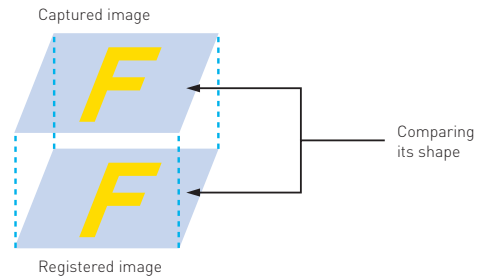


Wide coverage line-up

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

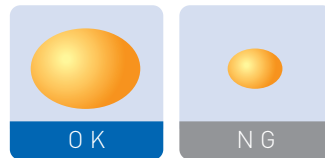
Pattern Matching mode

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

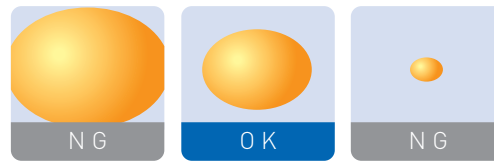


Color Inspection mode

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.

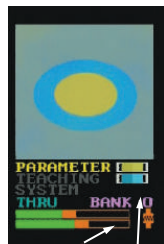


Two Color Inspection at a time

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.

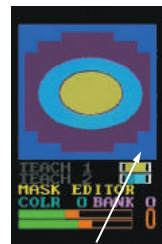


Two bar graphs for two colors

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.

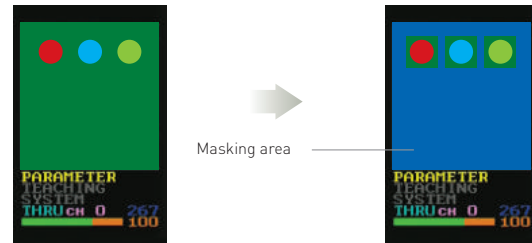


When this parameter is 1, you can sort in two criteria.

Features

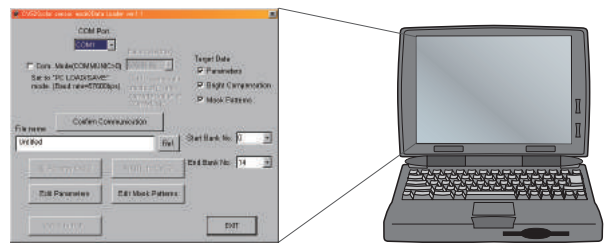
Masking function

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.



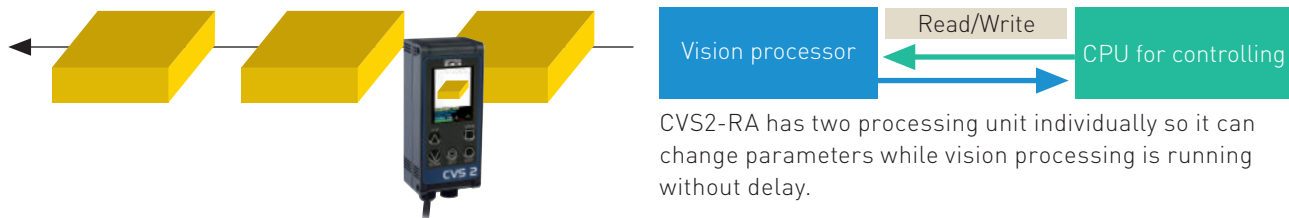
Zoom function

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

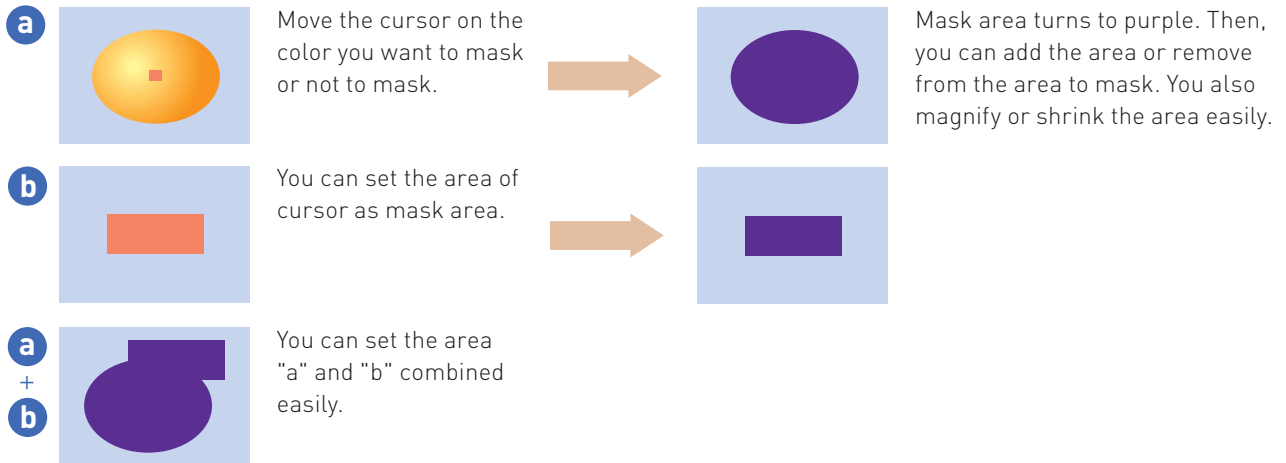
CVS2-RA has a function that corrects evenness of background brightness. You register just the background for reference.



Masking

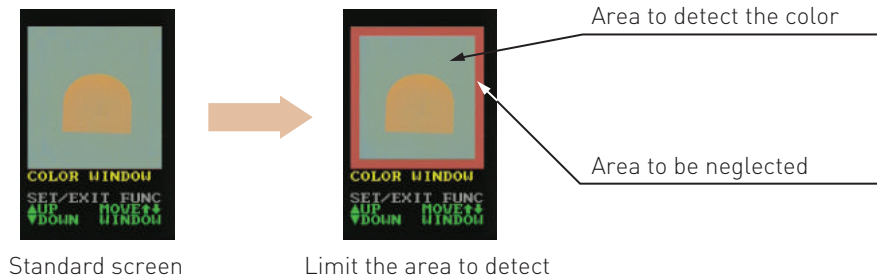
You can mask the area that doesn't have to be checked so that you can get better sensitivity of color inspection.

Setup You can setup the area to mask as follows.

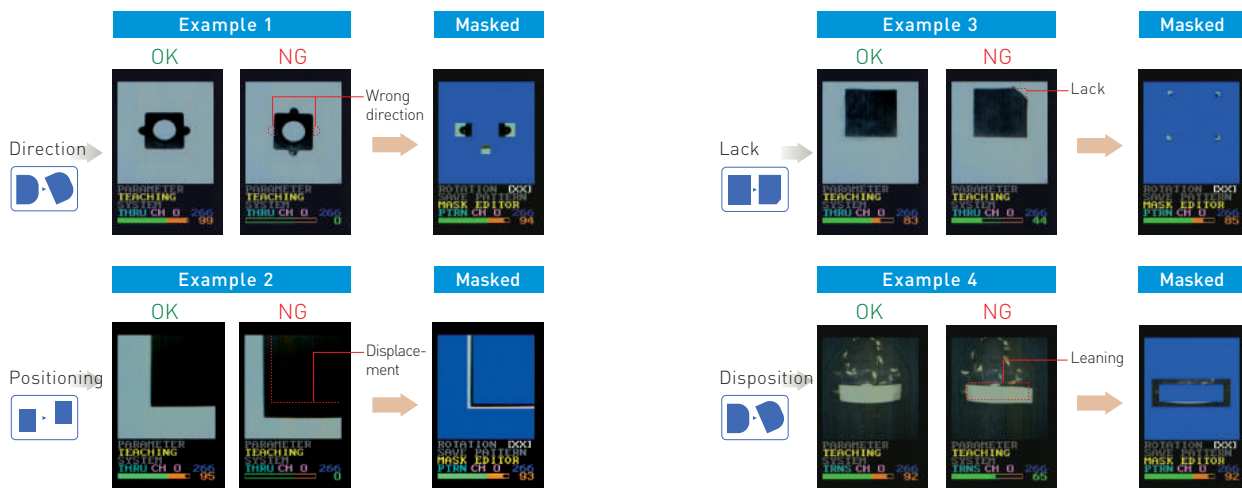


Color inspect area

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.

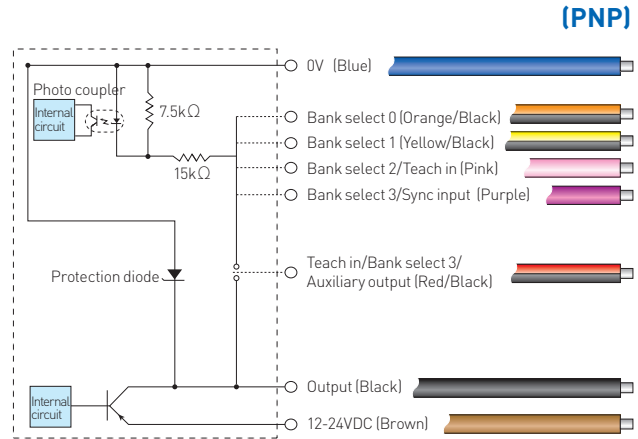
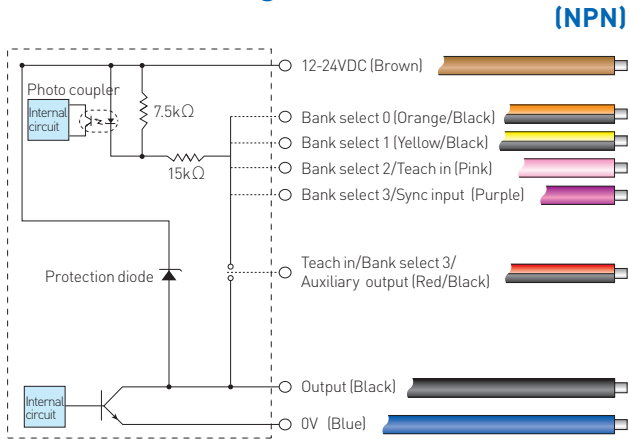
Switches

- 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
F: Dark Compensated image
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

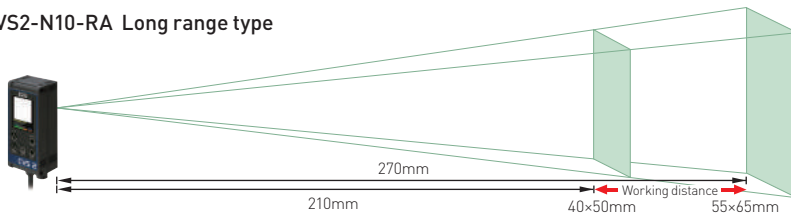
You can get sorting output from following table that shows which bank matches by combination of Output (Black) and Auxiliary output (Red/Black) signals.

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

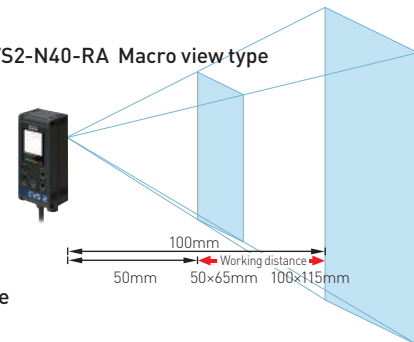
| | |
|-----|---|
| OFF | NPN: OPEN or connect with the brown line. PNP: OPEN or connect with the blue line. |
| ON | NPN: connect with the blue line. PNP: connect with the brown line. |

Field of View

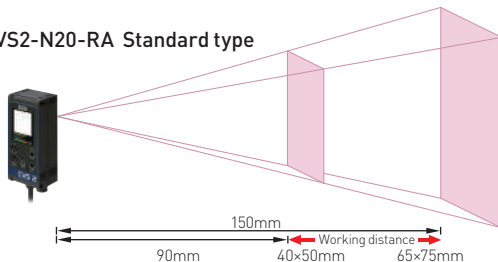
CVS2-N10-RA Long range type



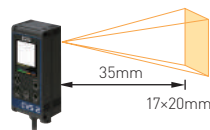
CVS2-N40-RA Macro view type



CVS2-N20-RA Standard type



CVS2-N21-RA Narrow view type



* Input/Output selectable by setup