

# CVS1-RA SERIES

MVS Series

CVS Series

CVS Series APPLICATION

CVSE1-RA


CVS1-RA

CVS2-RA

CVS3-RA


CVS4-R

OPTIONS



## Easy setup Color sensor

- All in one color vision sensor
- High speed : 0.6 - 22ms
- Stable color detection by calculating hue of each pixel



### Wide range line-up

CVS1-N20-RA Standard type  
 CVS1-N10-RA Long range type  
 CVS1-N40-RA Macro view type  
 CVS1-N21-RA Narrow view type

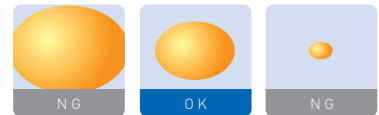
### One threshold mode

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.



### Easy Teaching

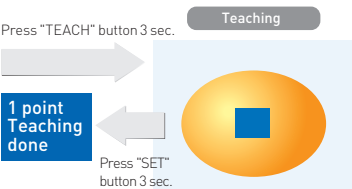
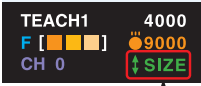
Teaching is easily done by moving the teaching cursor on the part that you want to teach the color and just set it.

Press "TEACH" button 3 sec.

Teaching

1 point Teaching done

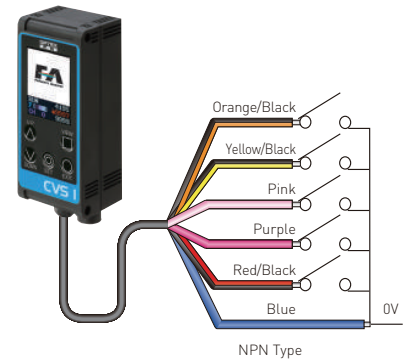
Press "SET" button 3 sec.

Shows changeable parameter here. This is vertical size of Teaching window.

### Up to 16 Bank

16 Banks are available in small all in one package.



### High Speed

Newly developed vision processor enables high speed inspection.

### Zoom function

You can zoom in a part of the object. You can inspect 16 parts of the object changing Bank efficiently.

### Stable inspection

It calculates color hue of each pixel that prevent miss-inspection.

### Wide coverage line-up

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

## High performance

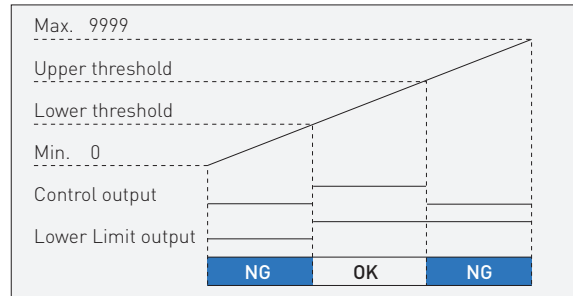
### Setup Adjustable while line is running

CVS1-RA provides output with the setup parameters given even while you are adjusting setup. You don't have to stop the line.



### Lower Limit output

You can see which the NG output is lower than lower threshold or higher than upper threshold.



### Stable inspection

It calculates color hue of each pixel that prevent miss-inspection affected by external light and brightness changes of lighting. Stable inspection is available and you can setup CVS1-RA just like you do for photoelectric sensor.

| When upper part is brighter than lower part |                                                   |
|---------------------------------------------|---------------------------------------------------|
| CVS1-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 |                            |
|-----------------------------------------|----------------------------|
| CVS1-RA                                 | Conventional vision sensor |
| <p>Correct color to evenly</p>          | <p>It can't correct</p>    |

| When distance varies           |                                            |
|--------------------------------|--------------------------------------------|
| CVS1-RA                        | Conventional vision sensor                 |
| <p>Correct color to evenly</p> | <p>The part must be set for correction</p> |

| When the object is glossy                       |                            |
|-------------------------------------------------|----------------------------|
| CVS1-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**

**Setup mode**

- 1 Captured image**  
Image captured by the camera
- 2 Mode**  
RUN : Normal mode  
TEACH : Teaching mode  
CAPTURE : Image storing mode  
TCH LOW : 2nd point teaching  
Other : Setup parameters
- 3 Display mode**  
F: Dark Compensated image  
2: Shows only chosen color area  
D: Shows original image
- 4 Bank No.**  
Current Bank No.
- 5 Registered color**  
Min. Center and Max. color
- 6 Output**  
● : ON × : OFF
- 7 Upper threshold (0 - 9999)**  
Shows upper threshold
- 8 Color match area**  
Shows area that color matches
- 9 Lower threshold (0 - 9999)**  
Shows lower threshold
- 10 Setup parameter**  
Shows setup parameter
- 11 Parameter value**  
Shows setup parameter value
- 12 Process time**  
Shows process time

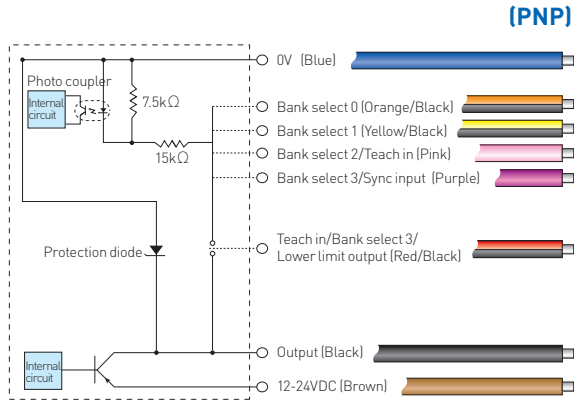
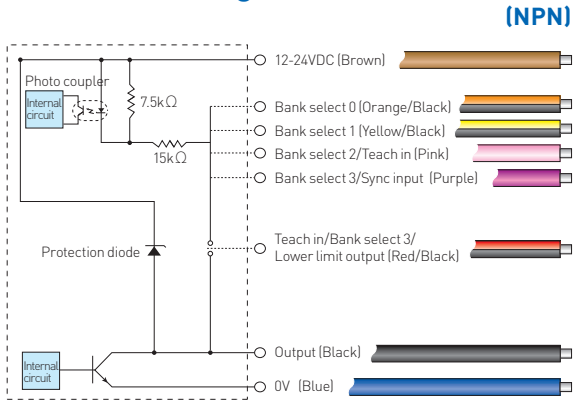
## Switches

- 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
- SET**  
Change to setup mode.  
Choose the parameter by pressing 3 sec. or more.
- TEACH**  
Change to Teaching mode by pressing 3 sec. or more.

## Specifications

| Model                        | CVS1-N10-RA<br>CVS1-P10-RA                                                                                                                     | CVS1-N20-RA<br>CVS1-P20-RA | CVS1-N21-RA<br>CVS1-P21-RA | CVS1-N40-RA<br>CVS1-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                   | 8 x 16 to 208 x 236                                                                                                                            |                            |                            |                            |
| LED light duration           | Approx.50,000 hours [In normal temperature and humidity. Brightness level down by 1/2 of the initial level]                                    |                            |                            |                            |
| Response time                | 15ms to 36.3ms (Factory setting : 18.8ms)                                                                                                      |                            |                            |                            |
| Output                       | NPN or PNP open collector output x 2 [one of them is "Lower limit output" selectable by bank input #1] max.100mA Residual voltage 1.0V or less |                            |                            |                            |
| Input                        | Totally 4: Bank select 0-2, Bank select 3 (switchable to Sync input), Teach in (switchable to Bank select 3 or Lower limit 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

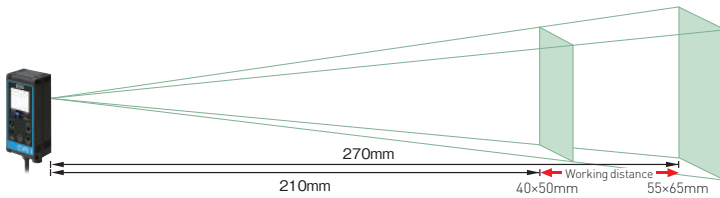


## Bank table

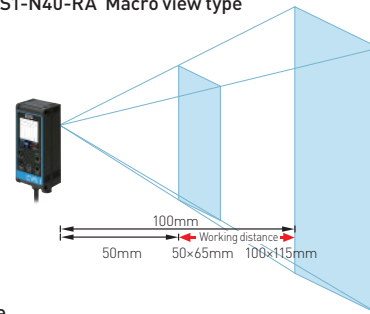
| Bank No. | Bank select input |         |                 |                 |
|----------|-------------------|---------|-----------------|-----------------|
|          | 3(Purple)         | 2(Pink) | 1(Yellow/Black) | 0(Orange/Black) |
| 0        | OFF               | OFF     | OFF             | OFF             |
| 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             |
| 15       | ON                | ON      | ON              | ON              |

## Field of View

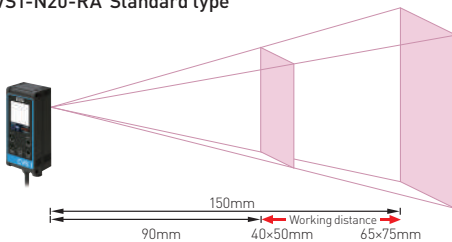
CVS1-N10-RA Long range type



CVS1-N40-RA Macro view type



CVS1-N20-RA Standard type



CVS1-N21-RA Narrow view type

