



- World's first 2D sensing utilizing the BGS method
- Size (area/presence), number and position of object detected with compound eye utilizing a pulsating light and 3072 points of reference
- Reflective sensor using a new system integrating transmitter / receiver amplifier and monitor function in one unit
- Anti-Interference feature

## Type

Detection method	Detecting distance	Model	Operation mode	Output mode
Compound eye detection	 80~200mm	<b>VS-S20R</b>	Judgment	NPN open collector
		<b>VS-S20B</b>		
	 100~500mm	<b>VS-S50RNF</b>		
		<b>VS-S50BNF</b>		

## Optional Parts

Type	Model	Description
Special mounting bracket	<b>DX-B1</b>	H-shaped (for face mounting)
	<b>DX-B2</b>	L-shaped (for side mounting)

## BGS method

Unique pulsating light emission employed for less influence of background and increased stability against disturbing light.

## MSR feature

Provided with a feature to minimize the effect of mirror surface (VS-S20R, VS-S20B) for accurate object detection

## Long distance/wide field of view

Wide detection field with a detecting area of 250 x 180 mm at a distance of 500 mm (VS-S50RNF, VS-S50BNF; MSR feature not provided).

## Anti-Interference feature

Anti-interference detection feature in master/slave mode is available for use of two sensors installed in parallel or face-to-face.

## Rating/Performance/Specification

Type	VS-S20R/VS-S20B※2	VS-S50RNF/VS-S50BNF※2
Detecting distance	80 - 200mm	100 - 500mm
Detecting area (field of view)	100 (H) x 75 (V) mm at 200 mm	250 (H) x 180 (V) mm at 500 mm
Detecting resolution	Total number of points in detecting area (field of view) 3072 point = 64 (H) x 48 (V)	
Minimum detectable object	φ 1 mm (at detecting distance of 200 mm, 2 x zoom)	
Power supply	24V DC ±10% / Ripple 10% max.	
Current consumption	300mA max.	
Output	2 NPN open collector 2 outputs	
	Sink current 50 mA (30 VDC) max. Residual voltage: 2 V max.	
Input	2 inputs	
	Rating: 5mA 24VDC	
Response time	25 ms max. in Continuous mode and at shutter speed 240	
Mirror surface rejection	Provided	Not provided
Light source (wavelength)	Red LED (639nm) Blue LED (466nm) *2	
Light-sensitive element	2D photo diode array	
Indicator	LCD display	
Operating switch	3 pushbutton switches for UP, DOWN, ENTER	
Material	Body: aluminum / Lens: acrylic / Front/rear panel: ABS	
Connection	6-pin waterproof plastic connector connection	
Mass	Approx. 250g	
Accessory	Cord with connector *1, operation manual	

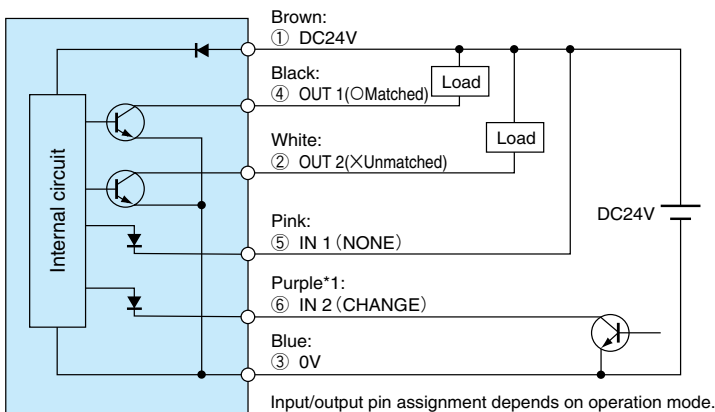
\*1: 0.2 mm<sup>2</sup> x 6 / 2 m (outer diameter: 5 mm)

\*2: Blue light source

## Environmental Specification

Environment	Specification
Ambient light	1,000 lx max. (on light receiving surface)
Ambient temperature	-10 - +45 -C (non-freezing)
Ambient humidity	35 - 85%RH (non-condensing)
Protective structure	IP65
Vibration	10 - 55 Hz / 1.5 mm amplitude / 2 hours each in 3 direction
Shock	500 m/s <sup>2</sup> / 3 times each in 3 directions
Dielectric strength	1,000 VAC 50/60Hz for 1 minute
Insulation resistance	500 VDC, 20 MΩ or higher

## Input/Output Circuit and Sample Connection (in Continuous mode)

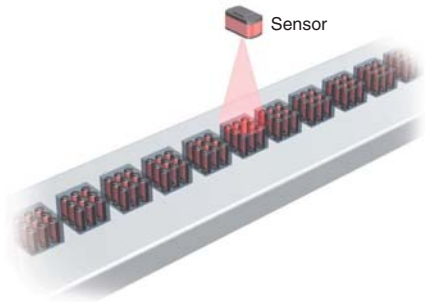


\*1 Connect unused purple line (6) IN2 (CHANGE) to 24 VDC.

## Sample Applications

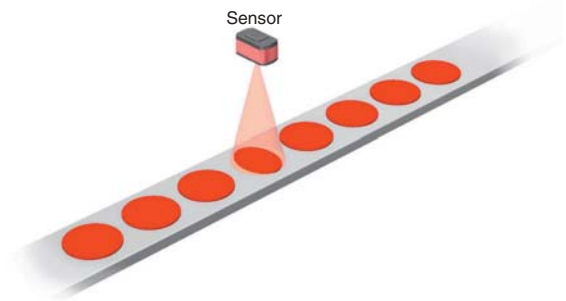
- **Checking of quantity in field of view**

Field examined to check for any missing work.



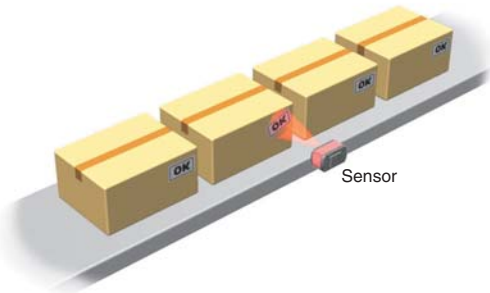
- **Work area judgment**

Field examined to check for nonstandard size.



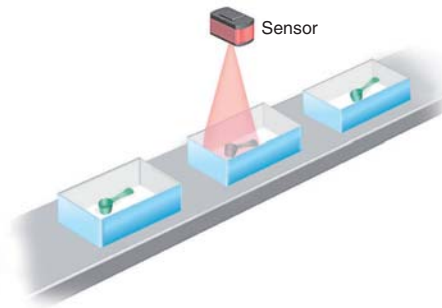
- **Detection of label at specified position**

Presence of label at specified position checked by XY coordinate teaching.



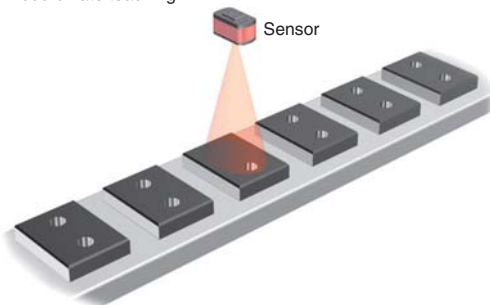
- **Detection of parts in containers**

Presence of measuring cups in containers checked.



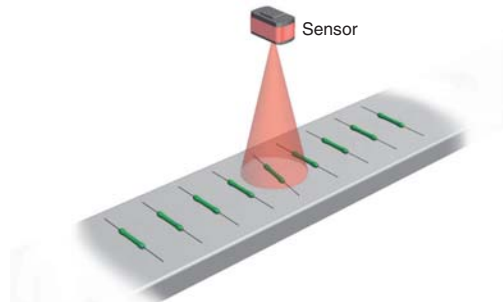
- **Detection of hole at specified position**

Presence of bored hole at specified position checked by XY coordinate teaching



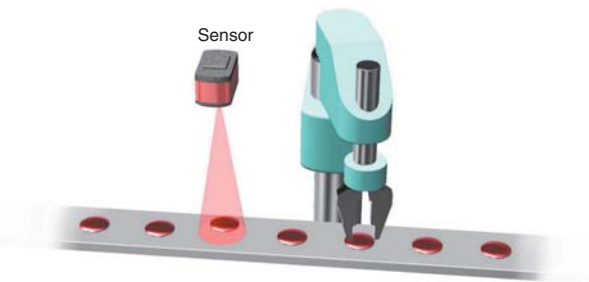
- **Checking for angular displacement**

Angular displacement of parts, etc. arranged in parallel checked by main axis angle detection feature.



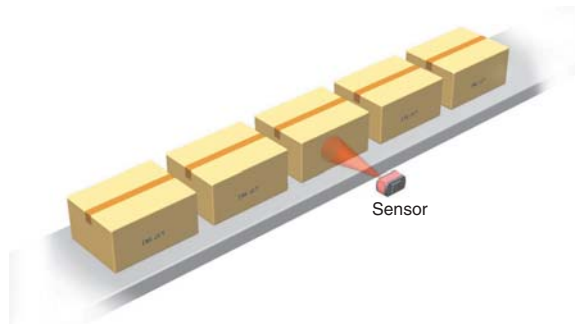
- **Checking of position in detecting area**

Position of work checked during picking by robot.

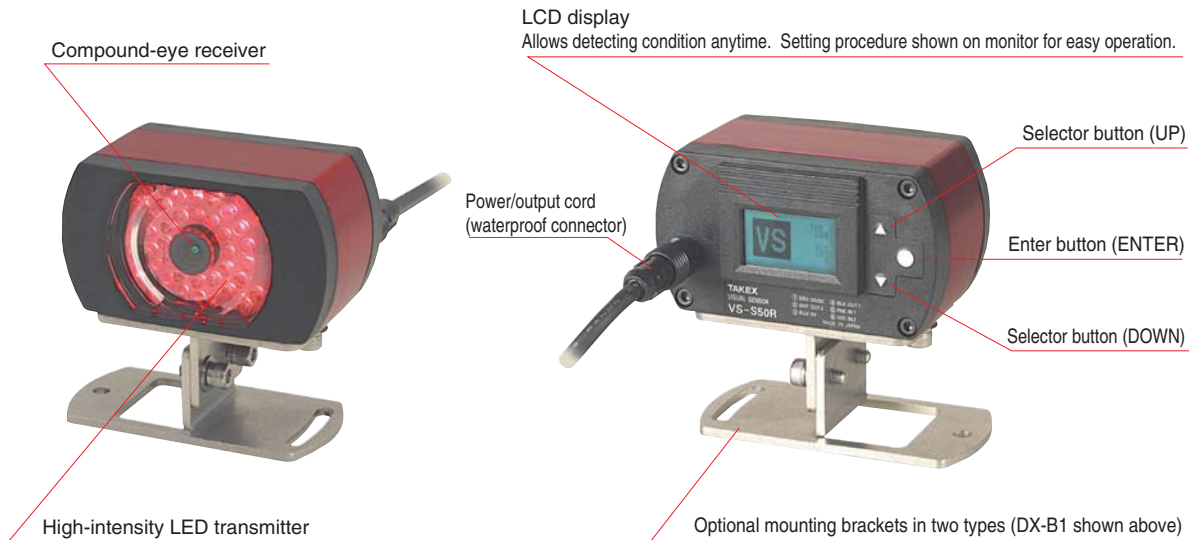


- **Detection of presence in detecting area**

Presence of print by inkjet printer checked.



## Appearance and Part Names

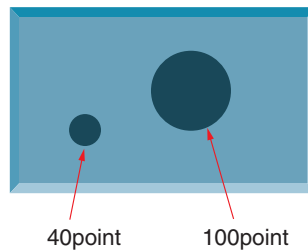


## Detection/Judgment Feature

### Detection of size (area/presence)

#### Applications

- Detection of nonstandard shape, etc.
- Checking of presence of print, label, etc.

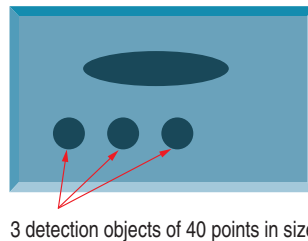


Two or more (up to 100) objects in the field can be individually detected to determine size, which allows the detection of a particular object alone by setting the upper and lower limits of the size (area). Presence can also be checked.

### Determination of count

#### Applications

- Checking of package for smaller number of objects than specified
- Checking of connector lead count



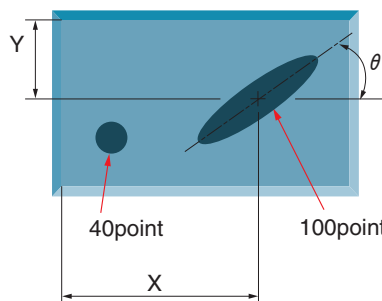
Two or more (up to 100) objects in the field can be individually detected for size determination, this provides determination of the number of detection objects of a given size as:

- Larger than the setting,
- Equal to the setting, or
- Smaller than the setting.

### Checking of position

#### Applications

- Checking for displaced stickers
- Checking for wrong type mixed in



Two or more (up to 100) objects in the field can be individually detected for size determination, which therefore allows the user to determine the position of one detected object of a given size by:

- X-coordinate of the center of gravity,
- Y-coordinate of the center of gravity, and
- Inclination ( $\theta$ ).

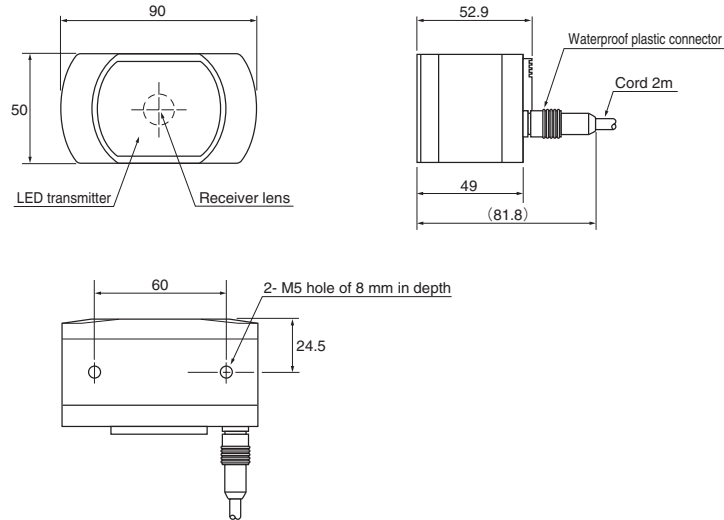
## Judgment Output Timing Chart

Operation mode	Input/output setting	Operation timing chart
<p>Continuous/Self synchronization mode</p>	<p>OUT1 : OK</p> <p>OUT2 : NG</p>	
<p>External synchronization mode</p> <p>If a TRIGGER signal is input while the READY output is active, a RUN is started.</p> <p>The READY output is deactivated during a RUN.</p> <p>The output mode factory setting is OK, which means that the signal is output when the detection is judged OK.</p>	<p>IN1 : TRIGGER</p> <p>OUT1 : OK/NG</p> <p>OUT2 : READY</p>	
<p>External synchronization mode</p> <p>When NG is selected as the output mode, the signal is output when the detection is judged NG.</p>	<p>IN1 : TRIGGER</p> <p>OUT1 : OK/NG</p> <p>OUT2 : READY</p>	

## Dimensions (in mm)

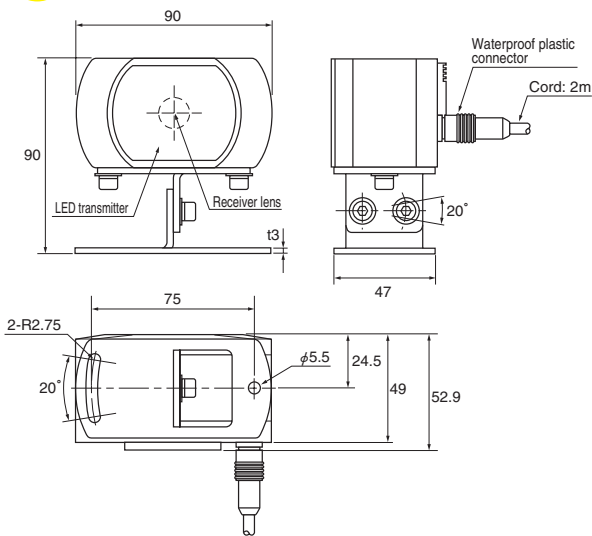
Body

CAD



With mounting bracket model DX-B1 attached  
Mounting brackets are optional.

CAD



With mounting bracket model DX-B2 attached  
Mounting brackets are optional.

CAD

