

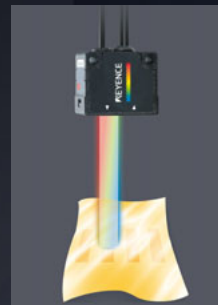
Luster-cancel,  
small beam spot sensor head  
CZ-H37S



Adjustable spot,  
color detection sensor head  
CZ-H32



Luster-cancel,  
color detection sensor head  
CZ-H35S



Fluorescence  
detection UV sensor head  
CZ-H52



The Smartest RGB Sensor in the Industry  
Two new sensor head models have been added to the product line

# The two new sensor heads will further expand the range of applications for the SUPER RGB sensor.

## Four types of sensor heads selectable according to target conditions and size.

The **luster-cancel type** cancels the influence of the luster of a target. The **adjustable spot type** allows adjustment of the beam spot size according to the target. The **fluorescence detection type** can detect fluorescent materials. These sensor heads offer highly stable detection while solving conventional problems.



**Small beam spot type unaffected by luster**

Luster-cancel, small beam spot sensor head **CZ-H37S**

Small beam spot of 0.04" (1mm) diameter at an operating distance of 0.63" (16 mm)



Luster-cancel, color detection sensor head **CZ-H35S**

## Shape, position, inclination, and surface luster

Less affected by changes in target condition

**World's first**

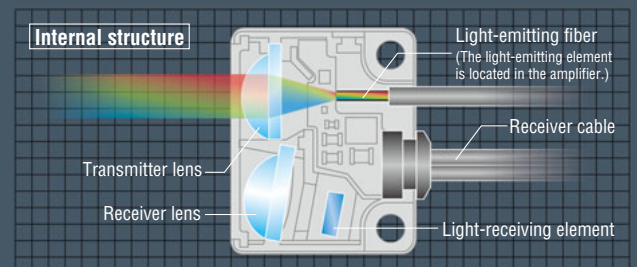
## Extremely high power

Utilizes the world's first hybrid structure

The SUPER RGB sensor was developed by a dramatic redesign of the sensor head structure to improve overall performance.

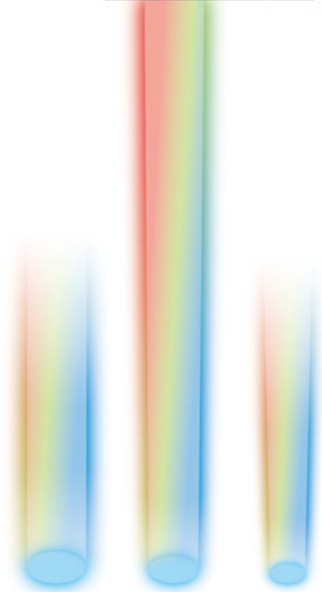
The transmitter uses an optical fiber, which creates an incredibly uniform beam spot and helps reduce the size of the sensor head.

The light-receiving circuit is built into the sensor head, enhancing its detection ability and improving stability.





Adjustable spot,  
color detection  
sensor head  
**CZ-H32**



### Beam spot adjustable in 3 sizes

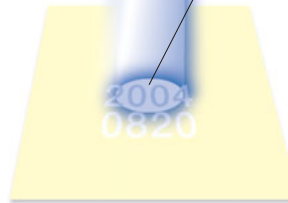
Versatile detection from a long distance



**Fluorescence detection  
UV sensor not affected  
by patterns or colors**

Fluorescence detection  
UV sensor head  
**CZ-H52**

Emits UV light to detect  
fluorescent materials and marks.



### UV light application

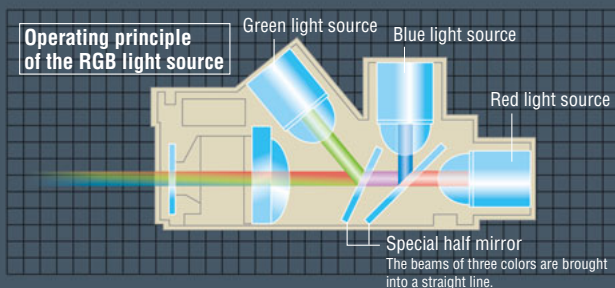
Detecting fluorescent materials and marks

**First-in-its-class**

## RGB light source for triple 16-bit calculation

### Three-color light source for accurate target recognition

The SUPER RGB sensor incorporates three separate color LED's. The signal from each color is converted into 16-bit data in the receiver to enable color recognition. This ensures accurate detection regardless of target vibration.



## Simple sensitivity adjustment

### One-touch calibration

The SUPER RGB sensor can be calibrated with the push of a button. This simple approach eliminates variation between operators and ensures continuous, stable detection.



Dual Digital display,  
amplifier  
**CZ-V21A(P)/V22A(P)**

# Choose the sensor head that is right for your application

## CZ-H35S Luster-cancel, reflective type

**CZ-H37S**  
Distance: 0.63" (16 mm)  
Beam spot diameter: 0.04" (1 mm)

**CZ-H35S**  
Distance: 1.57" (40 mm)  
Beam spot diameter: 0.18" (4.5 mm)

### CZ-H37S Small beam spot type

The beam spot is as small as 0.04" (1 mm) in diameter at an operating distance of 0.63" (16 mm). This ensures reliable detection of objects and components smaller than those detectable with conventional models.

Distance vs. beam spot diameter (Typical)

	Units: inch mm				
Distance	0.47" 12	0.55" 14	0.63" 16	0.71" 18	0.79" 20
Beam spot diameter	0.11" 2.9	0.07" 1.9	0.04" 1	0.05" 1.3	0.08" 2

### Less affected by shape, position, inclination, and surface luster (Patent-pending)

The CZ-H35S/CZ-H37S incorporates a polarizing filter which cancels the reflection from the glossy section and only recognizes targets by their color components. The CZ-H35S/CZ-H37S maintains accurate detection despite changing target conditions.

**What is "luster"?**

As the picture on the right shows, depending on the illumination some sections on a pepper's surface can appear white. Like human eyes, conventional sensors can not recognize the correct colors of such a target.

## CZ-H32 Adjustable spot, reflective type

0.22" (5.5) (Large)  
0.18" (4.5) (Medium)  
0.12" (3) (Small)

### Adjustable beam spot

Three beam spot sizes can be easily selected by adjusting the slide switch, allowing a wide range of targets to be inspected.

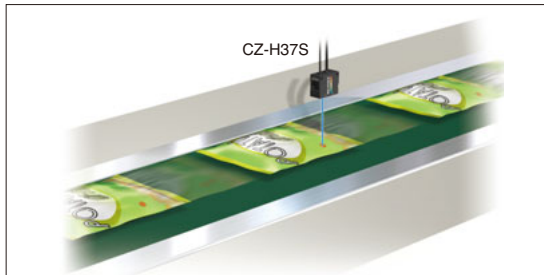
### Long detecting range of 1.97" to 3.74" (50 to 95 mm)

Detection is available within a range of 1.97" to 3.74" (50 to 95 mm). The sensor can be mounted at a long distance and is less affected by changes in target position.

Distance vs. beam spot diameter (Typical)

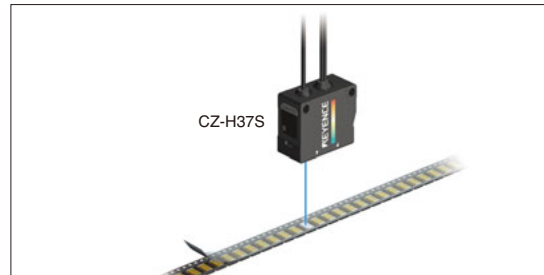
Distance (inch mm)	Large (inch mm)	Medium (inch mm)	Small (inch mm)
1.97" (50)	0.35" (9)	0.20" (5)	0.12" (3)
2.36" (60)	0.32" (8)	0.18" (4.5)	0.12" (3)
2.76" (70)	0.28" (7)	0.16" (4)	0.12" (3)
3.15" (80)	0.24" (6)	0.16" (4)	0.12" (3)
3.54" (90)	0.20" (5)	0.16" (4)	0.12" (3)

# A wide variety of detection applications from every industry



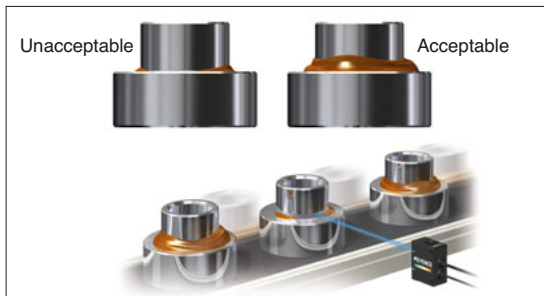
## Detecting marks on bags printed with multiple colors

The luster-cancel type stably detects marks on bags even when the background of the mark vibrates or has luster. The small beam spot ensures reliable detection of even small marks.



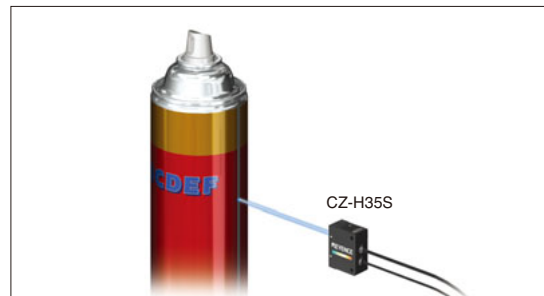
## Differentiation between the front and back sides of chips after being sealed in embossed tape

The luster-cancel type, which cancels the influence of specular reflection, stably differentiates between the front and back sides of chips even through a transparent film.



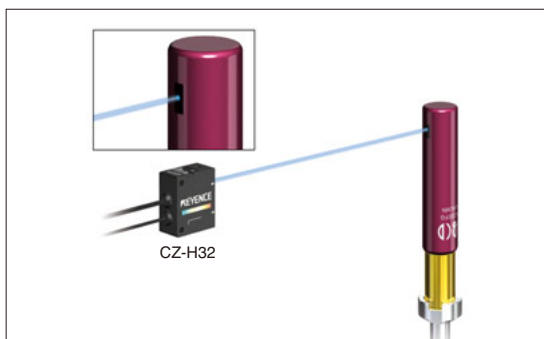
## Detecting the presence/absence of grease

By canceling the influence of surface luster and target position, the CZ-V20 reliably detects grease, despite its non-uniform shape and position.



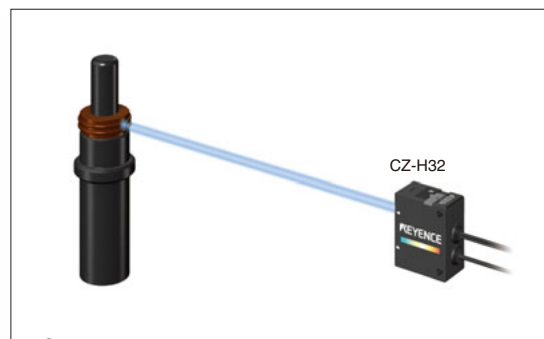
## Detecting the seam on a spray can

Even when patterns are printed on spray cans, the sensor detects only the seam.



## Detecting a mark on a tube

Selecting the small beam spot allows stable detection of small marks even from a long distance.



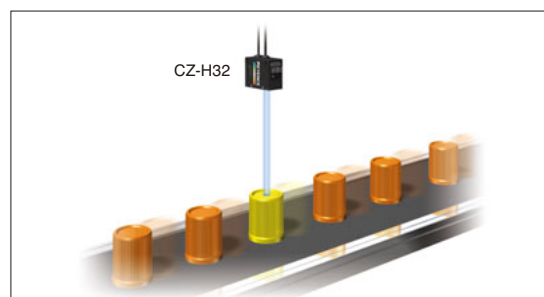
## Checking parts assembly

The enhanced detection ability ensures stable detection of dark-colored targets.



## Detecting improperly positioned labels

Detection is stable because the color recognition is not affected by the change in bottle colors. The interference prevention function assures successful detection when two sensor heads are mounted in close proximity.



## Detecting caps of different colors

The CZ-V20 Series stably detects subtle color differences that are difficult to detect with conventional sensors. Since detection is based on RGB components, it is less affected by target position or vibration.

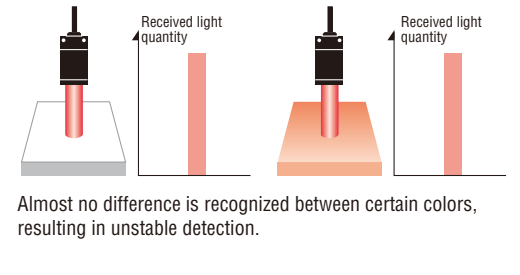
# High resolution amplifier for triple 16-bit calculation

## RGB light source for diversified target recognition

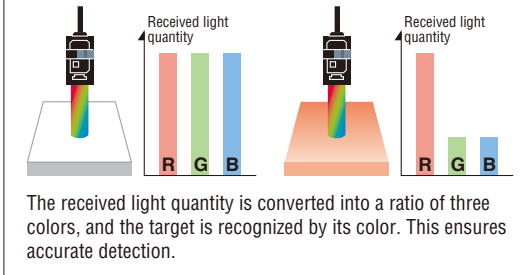
The SUPER RGB sensor enables stable detection by using a three-color light source.

### Advantage of the RGB light source 1 Accurate target recognition

#### Single-color light source

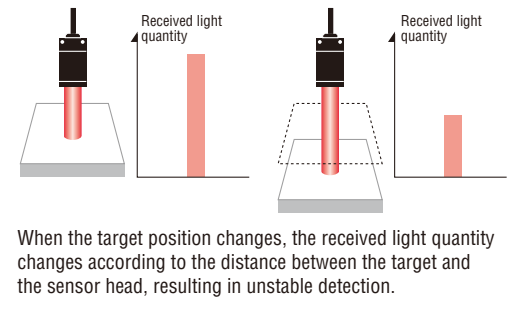


#### Three-color light source

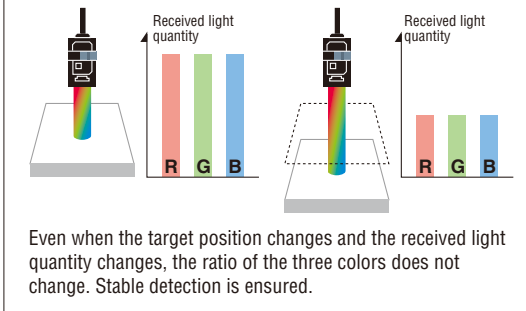


### Advantage of the RGB light source 2 Less affected by changes in target position

#### Single-color light source



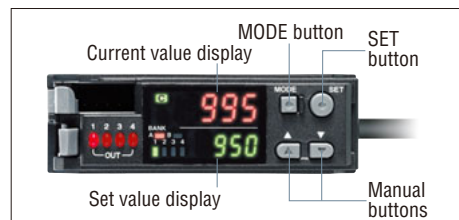
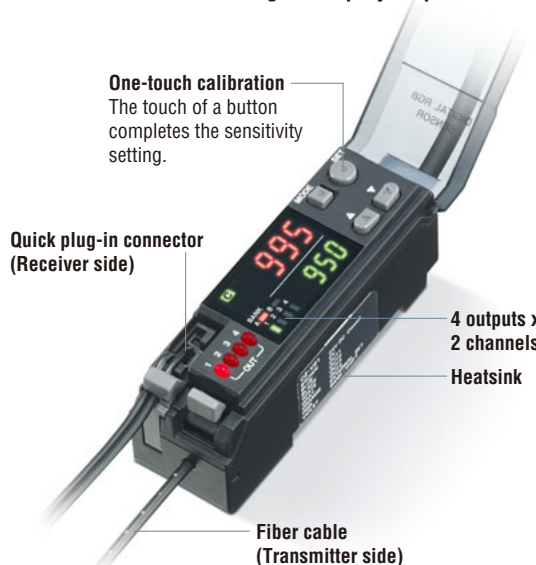
#### Three-color light source



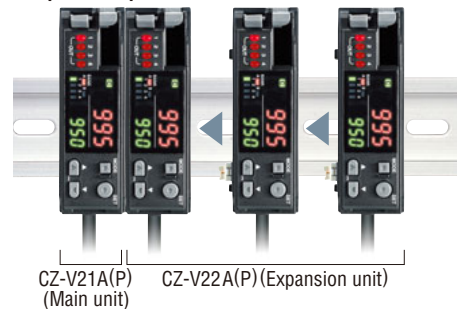
## Dual digital display & Direct access

Both the current value and set value are displayed simultaneously. Sensitivity and fine adjustment can also be done manually.

### CZ-V21A(P)/V22A(P) Digital display amplifier



1-line connection supported. Interference prevention for up to 2 amplifiers



Power is supplied through the connector on the side, saving connection cables.

# Detections that were once difficult can easily and reliably be achieved. (Super I Mode)

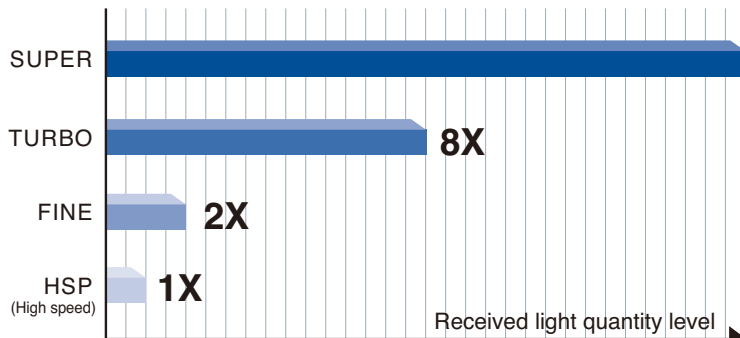
## **World's First** Automatic selection of 7 different light combinations (Patent pending)

In the Super I mode, the sensor detects the received light quantity and automatically selects the most stable light from seven patterns. (There is no need for complicated settings because the light source is automatically selected during the sensitivity setting.)\*

\* In reality, the color of the emitted light does not change because the light combination is selected by the receiver.



## SUPER mode + 3 LEDs for exceptionally powerful detection



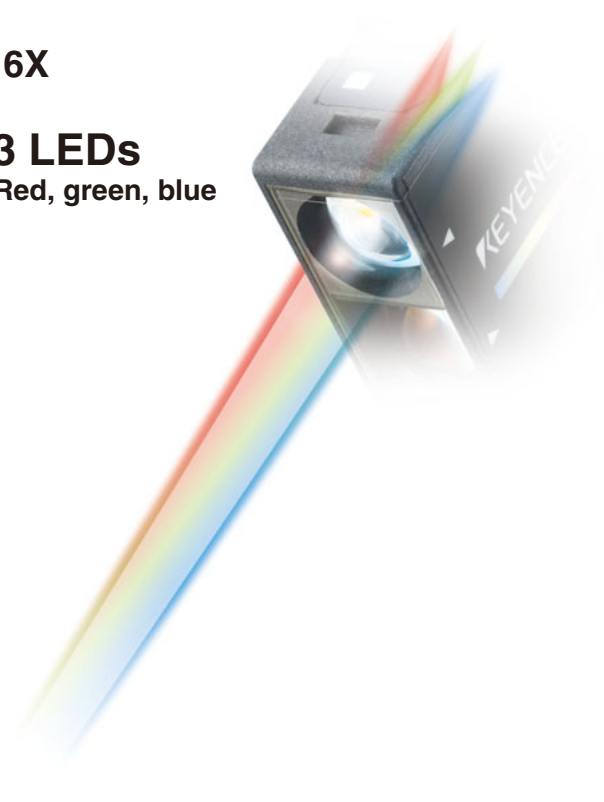
16X

**3 LEDs**  
Red, green, blue

The combination of the SUPER mode + 3 high-intensity LEDs has achieved unrivaled detection power. Even dark-colored targets can be reliably inspected.

### Three detection modes for every target

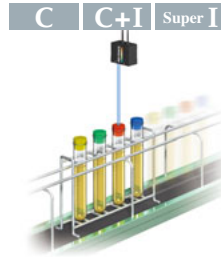
<b>Super I</b>	<b>C</b>	<b>C+I</b>
Detects the received light quantity	Detects the color components	Detects the color components and received light quantity



# Advanced features that provide 100% reliability

## Four independent outputs

This function is useful for target differentiation. The sensor stores data of four types of targets simultaneously and allows the setting and output for each target independently. When the C or C+I mode is used, the bank function enables differentiation of up to eight different types of targets.



## Shift function

This function is useful for detecting subtle color difference. When there is a change in the surrounding environment over time, the displayed value can be compensated with the external shift input. (Patent pending)



When the difference in sensitivity between the target and the background is small, providing shift inputs periodically will compensate for data variations.

## External calibration function

The sensitivity can be adjusted by using an external device such as a PLC.

## Automatic calibration adjustment

After the sensitivity setting is complete, the set value can be finely adjusted by detecting actual acceptable or unacceptable targets and adding (increasing) or excluding (decreasing) the set value. (Patent pending)

## Attenuation function

When the reflection from a target is too strong, the attenuation function can be used to decrease the sensitivity.

## Three types of timer functions

Three types of timers are available: ON-delay, OFF-delay, and One-shot. The timer value can be set between 1 ms and 1,000 ms.

## Specifications

### Sensor head

Type	Adjustable spot	Luster cancel	Luster-cancel, small beam spot	Fluorescence detection UV
Model	CZ-H32	CZ-H35S	CZ-H37S	CZ-H52
Detection range	1.97" to 3.74" 50 to 95 mm (Recommended: 2.76" 70 mm)	1.10" to 2.05" (28 to 52 mm) (Recommended: 1.57" 40 mm)	0.43" to 0.79" (11 to 20 mm) (Recommended: 0.59" 15 mm)	0.98" to 2.17" (25 to 55 mm) (Recommended: 1.38" 35 mm)
Smallest spot diameter	Small: 0.12" 3 mm dia. Medium: 0.18" 4.5 mm dia. Large: 0.22" 5.5 mm dia. at respective reference distance <sup>1</sup> .	0.18" 4.5 mm dia. at reference distance of 1.57" 40 mm	0.04" 1 mm dia. at reference distance of 0.63" 16 mm	0.39" 10 mm dia. at reference distance of 0.98" 25 mm
Light source	Red LED (665 nm)/Green LED (520 nm)/Blue LED (465 nm)			UV (ultraviolet) LED (375 nm) <sup>2</sup>
Receivable wavelength (Receiver)	—			425 to 550 nm
Minimum bend radius of fiber	0.98" 25 mm		0.59" 15 mm	—
Ambient light	Incandescent lamp: 10,000 lux max., Sunlight: 20,000 lux max.			
Ambient temperature	-10 to +55°C (14 to 131°F), No condensation			
Vibration	10 to 55 Hz, 0.06" (1.5 mm) double amplitude in X, Y, and Z directions, 2 hours respectively			
Enclosure rating	IP-40			
Material	Housing	Fiberglass reinforced plastic		
	Lens cover	Polyarylate	Triacetate, Polyarylate (Metal section: TYPE 304 stainless steel)	Glass
Weight	Approx. 40 g (with 6.6' 2-m cable)		Approx. 45 g (with 6.6' 2-m cable)	Approx. 40 g (with 6.6' 2-m cable)

1. Reference distance: 2.56" 65 mm for Small, 2.36" 60 mm for Medium, and 1.97" 50 mm for Large

2. The CZ-H52 emits ultraviolet light from the transmitter. Do not directly look at the light source while in operation.

### Amplifier

Model	NPN	CZ-V21A	CZ-V22A
	PNP	CZ-V21AP	CZ-V22AP
Unit type (Main/expansion)	Main unit		Expansion unit
Response time	200 μs (HIGH SPEED)/1 ms (FINE)/4 ms (TURBO)/8 ms (SUPER)		
Control output <sup>1</sup>	NPN (PNP) open-collector x 4 channels, 40 VDC (30 VDC) max., Up to 100 mA for one output, Up to 200 mA in total of 4 outputs, Residual voltage: 1.0 V max.		
Protection circuit	Reverse-polarity protection, overcurrent protection, surge absorber		
External calibration input	Input time: 20 ms min.		
External bank switch input (C/C+I mode), External shift input (Super I mode)	Input time: 20 ms min.		
Timer function	Timer OFF/OFF-delay/ON-delay/One-shot, Timer time: 1 to 1,000 ms adjustable (for each bank respectively)		
Power supply	24 VDC, Ripple (P-P): 10% max.		
Current consumption	Normal mode: 1.5 W (62.5 mA max.), Eco-mode: 1 W (42.0 mA max.)		
Ambient temperature <sup>2</sup>	-10 to +55°C (14 to 131°F), No condensation		
Vibration	10 to 55 Hz, 0.06" 1.5 mm double-amplitude in X, Y, and Z directions, 2 hours respectively		
Material	Housing, cover: Polycarbonate		
Weight (with 2-m cable)	Approx. 110 g		Approx. 100 g

1. 20 mA max. when several units are connected.

2. When several units are connected, the acceptable ambient temperature varies depending on the conditions given below. To connect several units, be sure to mount them to a DIN rail and to limit the output current to a maximum of 20 mA.

When 1 or 2 units are connected: -10 to +50°C (14 to 122°F)

When 3 units are connected: -10 to +45°C (14 to 113°F)

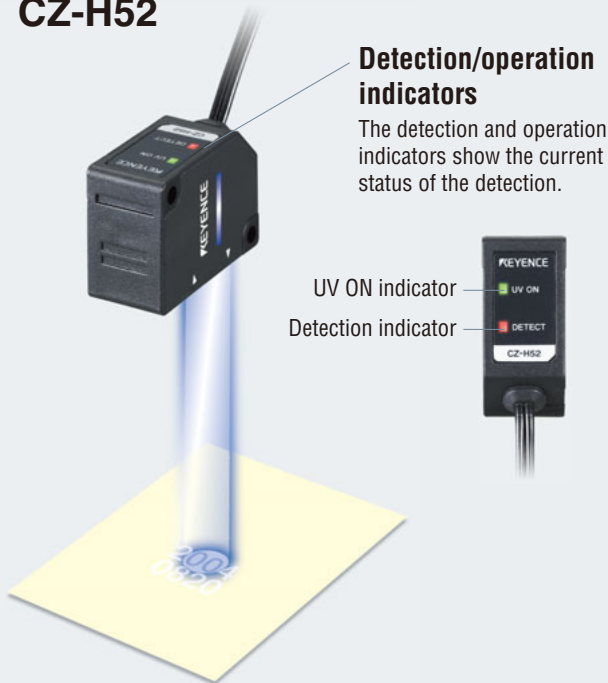
Note: The expansion unit of the FS-V20 Series cannot be connected to the main unit of the CZ-V20 Series. To connect the FS and CZ Series units, connect the expansion unit of the CZ-V20 Series to the main unit of the FS-V20 Series. To connect two or more expansion units, connect the CZ-V20 Series units on the right of the FS-V20 Series units.



# Fluorescence detection UV sensor suitable for the detection of fluorescent materials and paints



## CZ-H52



### Detection/operation indicators

The detection and operation indicators show the current status of the detection.

UV ON indicator  
Detection indicator

### Detecting fluorescent marks without being affected by patterns or colors

The CZ-H52 emits UV light from the transmitter and detects the reflected light which was converted into visible light by the fluorescent material. Fluorescent materials and paints are normally invisible, however, they reflect visible light when UV light is applied.

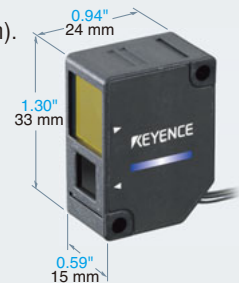
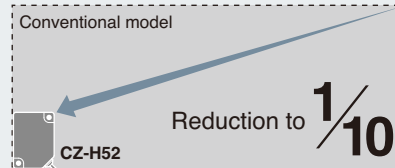
#### Targets which may contain fluorescent materials/paints

- Fluorescent label ■ Fluorescent chalk ■ Fluorescent lubricant
- Fluorescent dye ■ Paper ■ Adhesive ■ Marking tool/ink-jet printer
- Fluorescent color ■ Label ■ Sticker ■ Optically bright materials
- Transparent film ■ Marking ink ■ Grease ■ Ink and varnish/lacquer
- Felt-tip pen ■ Printing ink And so on

The CZ-H52 may be effective for detecting the above targets.

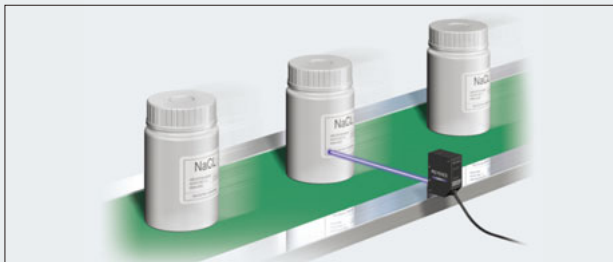
### Super-small head for space saving

The small sensor head measures only 0.59" (W) x 1.30" (H) x 0.94" (D) (15 x 33 x 24 mm). It can be easily mounted in tight spaces.



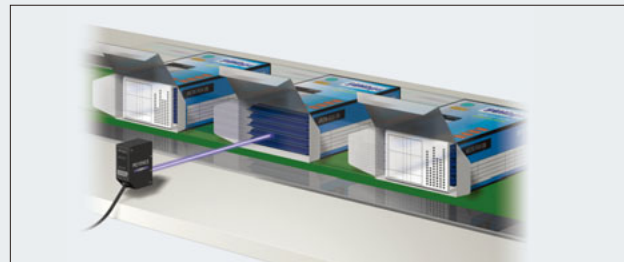
## Applications

Many targets contain fluorescent materials or paints. The fluorescence detection UV sensor may be able to detect targets which cannot be detected with photoelectric sensors. Try your target in an actual situation.



### Detecting labels on white containers

The fluorescent component contained in a label is detected to check for the presence/absence of the label. Since the detection uses the fluorescent components, it can stably detect even white labels on white containers.



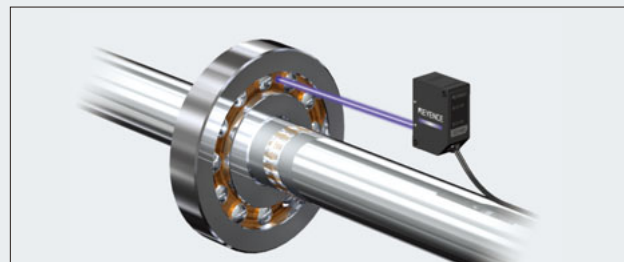
### Detection of presence/absence of instruction sheets (package insert)

The CZ-H52 detects the fluorescent component contained in paper to check whether the instruction sheet (package insert) is properly inserted into each medicine package.



### Detection of presence/absence of invisible print

The CZ-H52 detects the presence or absence of the print in invisible ink which contains a fluorescent component. The fluorescence detection UV sensor can stably detect print which cannot be detected with reflective type photoelectric sensors.



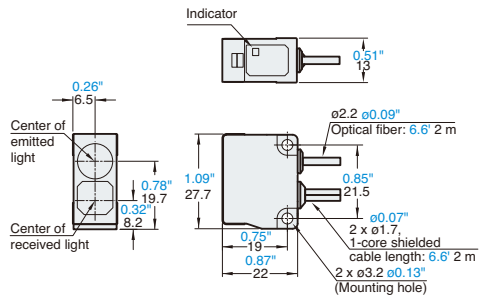
### Checking grease application on ball bearings

The grease application is checked by detecting the presence/absence of the fluorescent component contained in it. Even glossy metal targets can be stably detected by ignoring the influence of specular reflection.

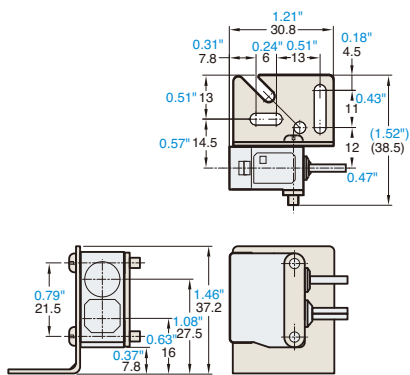
# Dimensions

Unit: inch mm

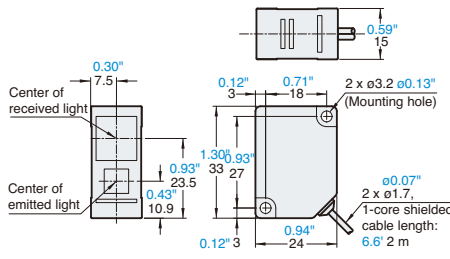
## CZ-H37S



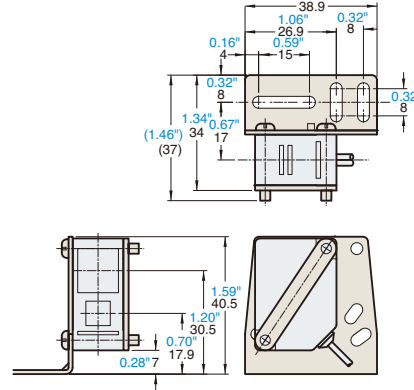
When a mounting bracket is attached



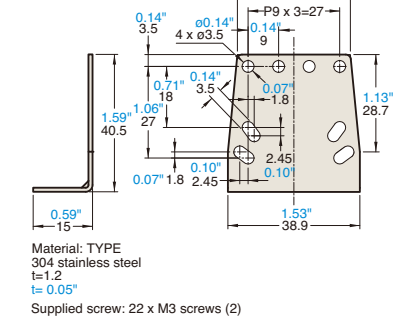
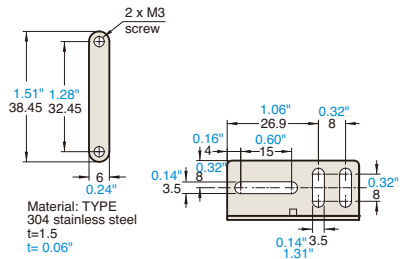
## CZ-H52



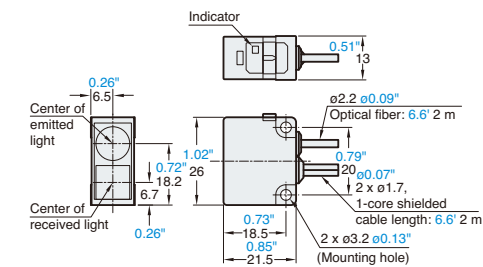
When a mounting bracket is attached



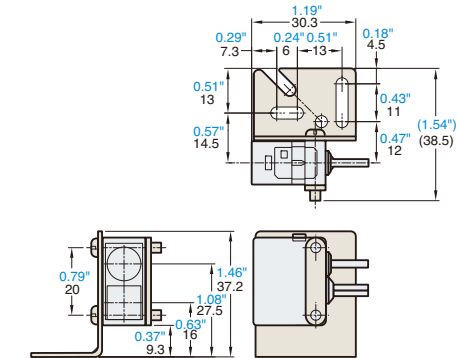
## Mounting bracket (Supplied with the CZ-H52)



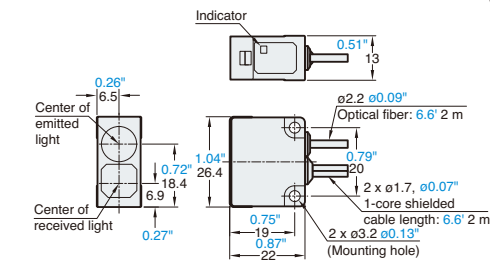
## CZ-H32



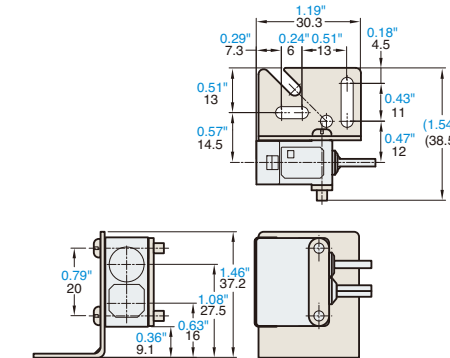
When a mounting bracket is attached



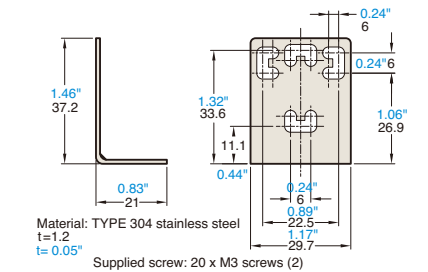
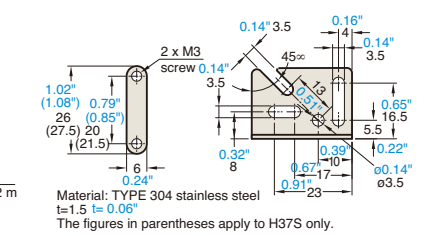
## CZ-H35S



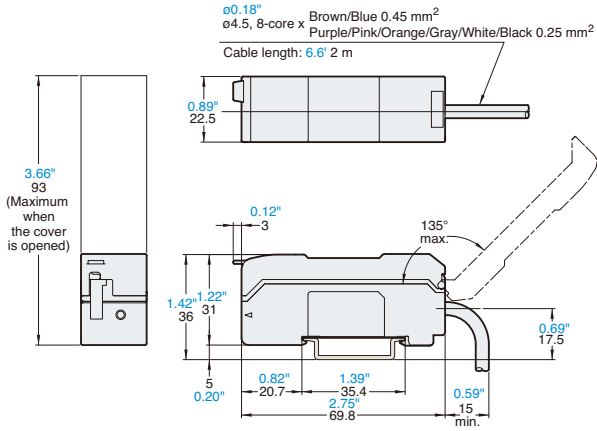
When a mounting bracket is attached



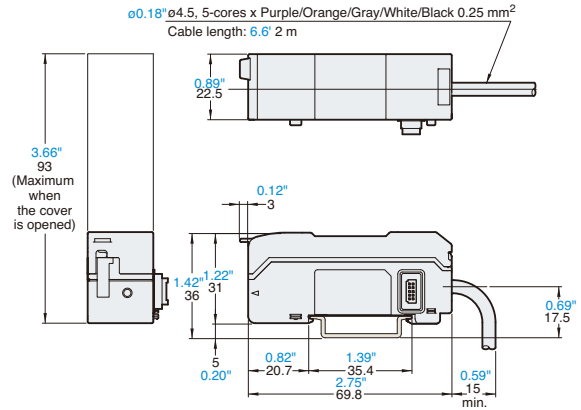
## Mounting bracket (Supplied with the CZ-H32, H35S, and H37S)



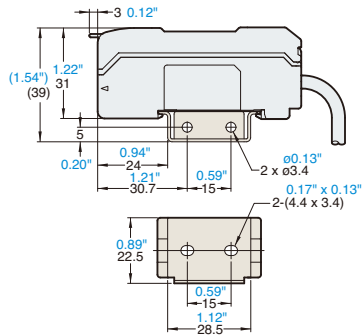
### CZ-V21A/CZ-V21AP



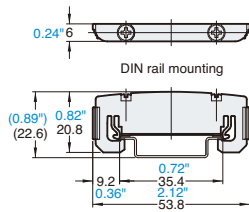
### CZ-V22A/CZ-V22AP



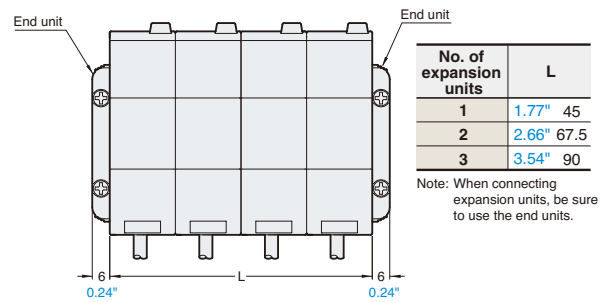
#### When a mounting bracket is attached (supplied with the CZ-V21A/V21AP)



#### End unit (supplied with the CZ-V22A/V22AP)

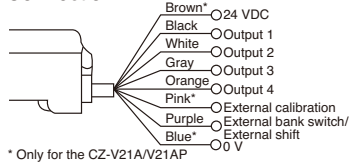


#### When several units are connected

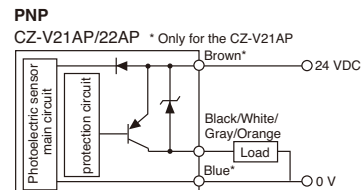
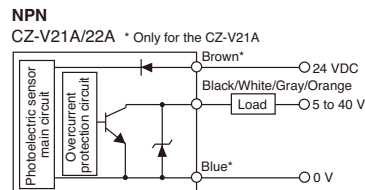


### Input/output circuit diagram

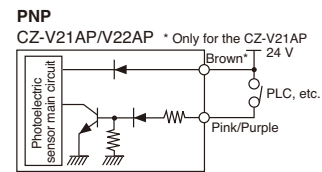
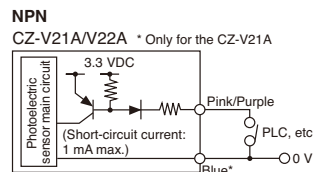
#### Connection



#### Output circuit



#### Input circuit



# SUPER RGB SENSOR



Specifications are subject to change without notice.



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