FUWEI

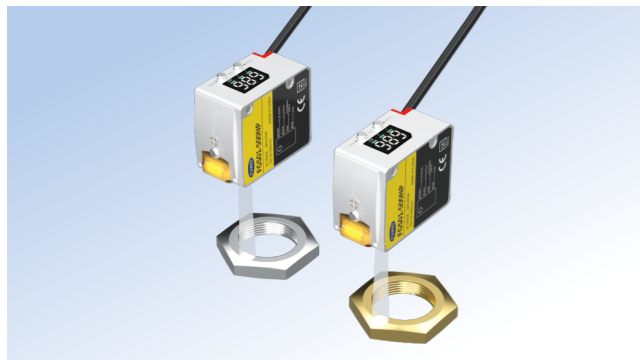Guangzhou FUWEI Electronic Technology Co.,Ltd
www.gzfuwei.com

Integrated white light long-distance color code
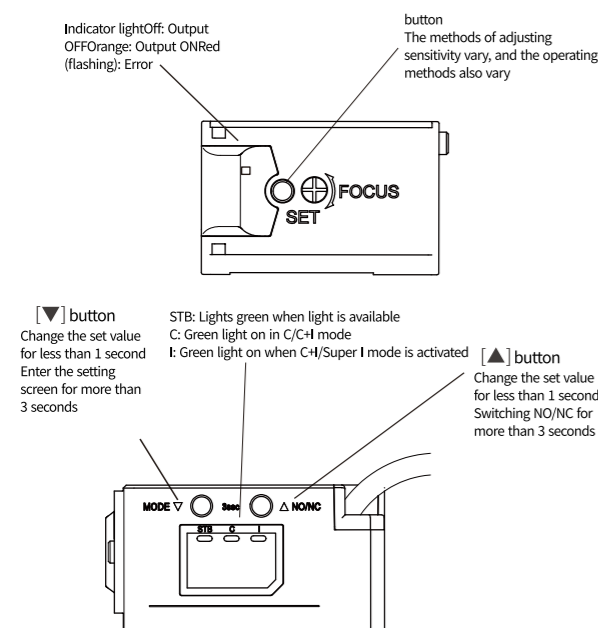
Usage Guide

During installation

· Tightening torque of installation hole: 0.63N·m (M3 screw)

· When the detection is unstable, it may be due to the detection target being glossy. In this case, please tilt the sensor by about 15 to 20 °, or use a gloss removal accessory by 20 °. Or use gloss removal accessories
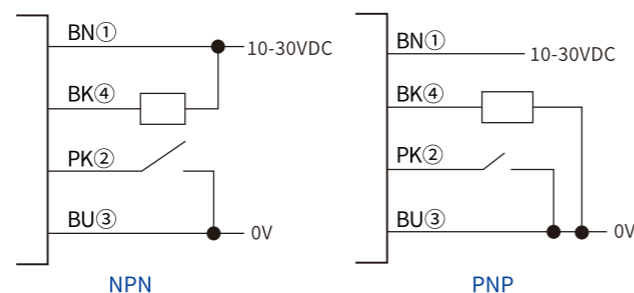
15~20°
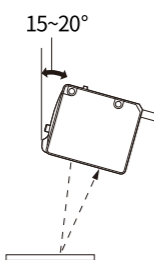
About ambient light

If the high-frequency lighting methods such as frequency converter fluorescent lights directly enter or reflect onto the detection target before entering the receiving part, there is a possibility of misoperation. In this case, please take measures such as installing the sunshade or changing the installation position.
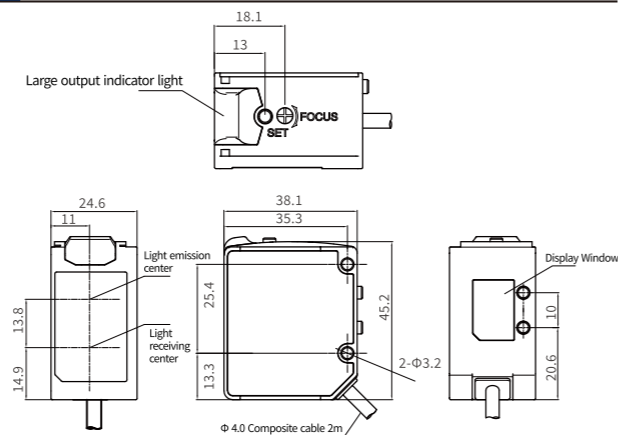
Names of each section

Indicator lightOff: Output OFFOrange: Output ONRed (flashing): Error

button
The methods of adjusting sensitivity vary, and the operating methods also vary

FOCUS
SET

[▼] button
Change the set value for less than 1 second
Enter the setting screen for more than 3 seconds

STB: Lights green when light is available
C: Green light on in C/C+I mode
I: Green light on when C+I/Super I mode is activated

[▲] button
Change the set value for less than 1 second
Switching NO/NC for more than 3 seconds

MODE ▽   Seoo   △ NO/NC
STB   C   I

Input/output circuit diagram

BN①   10-30VDC
BK④
PK②
BU③   0V
NPN

BN①   10-30VDC
BK④
PK②
BU③   0V
PNP

Specification

Model	NPN/PNP	FGS01-70NP	FGS01-500NP
Detection distance		30~70mm	50~500mm
Minimum light spot diameter		At 50mm, approximately 1.6x2.9mm	At 100mm, approximately Φ3.5mm At 250mm, approximately Φ9mm At 500mm, approximately Φ20mm
response time		200μs, 1ms, 10ms, 100ms, 500ms	
light source		White LED	
Prevent mutual interference		Set different frequencies, up to 2 units	
Consumption current		Under 50mA at 24 VDC At 12 VDC, below 110mA	At 24V, below 50mA At 12V, below 100mA
supply voltage		10 to 30VDC with ripple (P-P) 10%, Class2 or LPS	
timer		OFF/On delay/Off delay/Single time	
Control output		NPN open collector/PNP open collector switching type Below 30V, below 100mA, residual voltage below 2V NO/NC switching type	
External input		Tune/stop emission switching type	
Environmental lighting		Power reverse protection, power surge protection, output overcurrent protection, output surge protection	
vibration		Incandescent lamp: below 10000lx, sunlight: below 20000lx	
Impact resistance		1000m/s², X. 6 times in each direction of Y and Z	
Vibration resistance		10 to 55Hz, dual amplitude 1.5mm, 2 hours in X, Y, and Z directions	
Protection level		IP65	
material		Shell: zinc casting (chrome plated), indicator light cover: PPSU, button: stainless steel	
weight		128g	

Size

18.1
13
Large output indicator light
FOCUS
SET

24.6
11
38.1
35.3
Light emission center
25.4
Display Window
Light receiving center
45.2
10
13.8
14.9
13.3
20.6
2-Φ3.2
Φ 4.0 Composite cable 2m

Detection mode

| Detection mode	explain
Auto	When adjusting sensitivity, automatically select the most suitable mode from C+mode or C mode
C+I	Using color components (R, G, B) and brightness (detected by light exposure)
C	Detection using color components (R, G, B)
Super I	Using brightness (light exposure) to detect

Panel Display Description

| display	content	Confirmed issues and countermeasures
ErE	1) The set number of rewrites has exceeded 1 million times 2) Memory abnormality	1) When the lifespan of the memory has reached and it is not reset even after reconnecting the power 2) There was a malfunction
UUU	In Auto/C+I/C mode, when there is too much reflected light, it is displayed as a consistency 0 action	Please adjust the angle of the sensor settings to avoid direct and reflected light from entering
∩∩∩	In Auto/C+I/C mode, when the amount of reflected light is insufficient, it is displayed as a consistency 0 action	Please confirm if the detection distance is within the specified range
Loc	Lock function enabled	Please unlock the key
Display bar movement illuminated	Display selection turned off	Please set the display selection to ON

Adjusting the diameter of the light spot

· You can use the knob on the side to adjust the diameter of the light spot
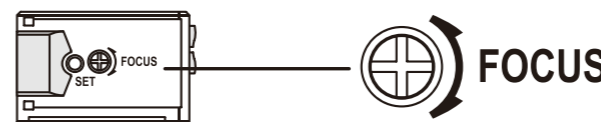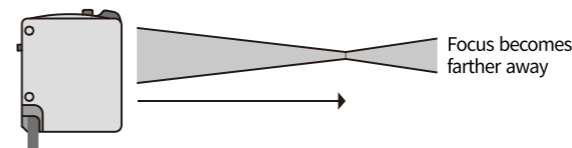
FOCUS
SET

attention	Torque when adjusting the knob: below 0.2N·m

· Turning to the right brings the focus distance closer

Focus becomes closer
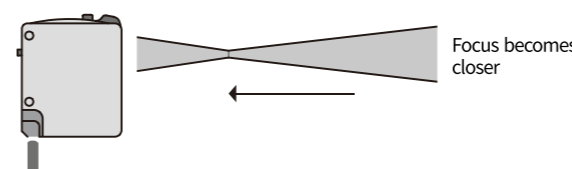
· Turning to the left causes the focus distance to become farther away
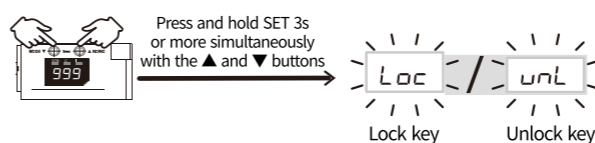
Focus becomes farther away

Switch NO/NC

SET NO/NC
· n_o(Lon)
If the set conditions are met, output ON (ON when entering light)
· n_C(don)
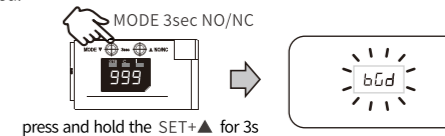If the set conditions are not met, output ON (ON when not in light)

RUN
987   Over 3s   n_o ⇄ n_C
3s
987   RUN

Lock key

Press and hold SET 3s or more simultaneously with the ▲ and ▼ buttons
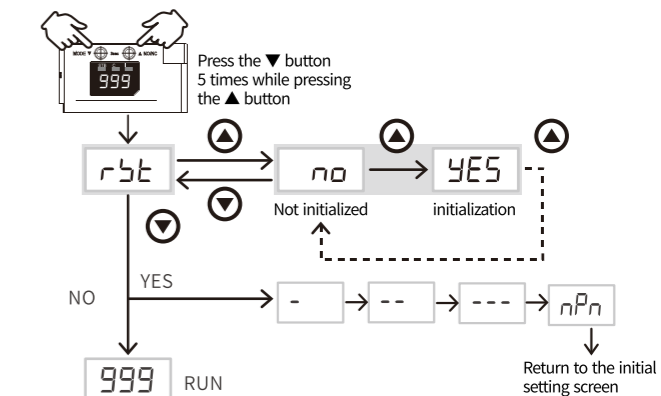
999

Loc / unL
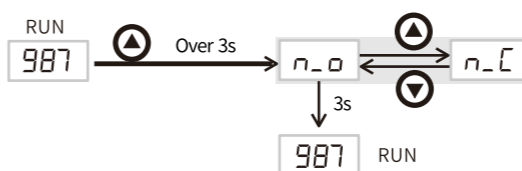
Lock key   Unlock key

Eliminate background

When the detected object is similar in color to the background, press and hold the SET+▲ for 3 seconds while facing the background. After the screen flashes, release the button to display to eliminate the current detected background. When resetting the sensitivity, this function is automatically cancelled.

MODE 3sec NO/NC
999

bGd

press and hold the SET+▲ for 3s

initialization

999

Press the ▼ button 5 times while pressing the ▲ button

rbt ⇄ no → YES
Not initialized   initialization

NO   YES

999   RUN

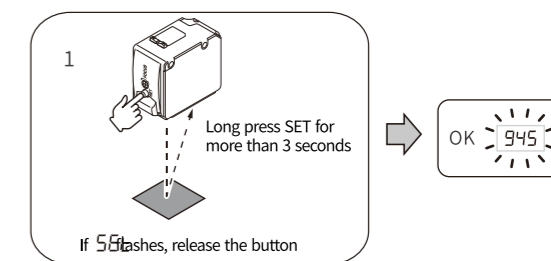- → -- → --- → nPn
Return to the initial setting screen

Adjusting sensitivity

Auto/C+I/C

About Displaying Values
· Consistency
Display the degree of consistency between the "color" of the detection target set as the benchmark and the "color" of the current detection target.
Display range: 0 to 999 (the more consistent the value, the larger it will be)
· Set value
The degree to which the "color" of the detection target set as the benchmark is consistent is determined as the same "color", and this degree is displayed as a threshold. When confirming or manually adjusting the set value, please refer to the tutorial on confirming and adjusting the set value
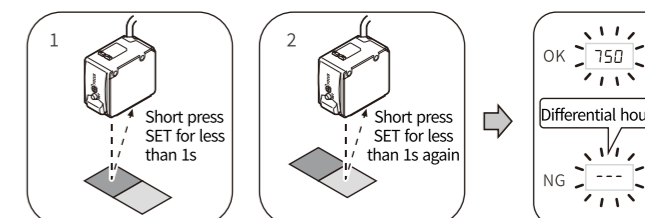*The flashing display value after tuning is the set value.

Set sensitivity (choose one of the following three methods)

· 1-point tuning (when detecting a specified "color")

Set the "color" of the detection target to be used as a benchmark. When selecting [Auto], it acts as a "C+I mode" action.

1
Long press SET for more than 3 seconds

OK 945

If SET flashes, release the button

· 2-point tuning (when distinguishing between 2 "colors")

Set the "color" of the detection target to be used as a benchmark and the "color" of the detection target to be distinguished. (The first point is the reference color)

1
Short press SET for less than 1s

2
Short press SET for less than 1s again

OK 750
Differential hours
NG ---

· Standard tuning (allowing for deviations within the same detection target)

Display the degree of consistency between the "color" of the detection target set as the benchmark and the "color" of the current detection target.

Allowing for uneven color and deviation of the set detection target. When short pressing the [SET] button, register the "color" of the benchmark, and continuously sample on time. Set to add a benchmark in the sampling and determine it as the same "color"

When adding a benchmark, the indicator light flashes green (once).

When performing standard tuning, the set value becomes 950 (initial value). When changing this value, adjust the standard sample tuning setting value

Additionally, when selecting [Auto], it serves as the [C+] mode] action.
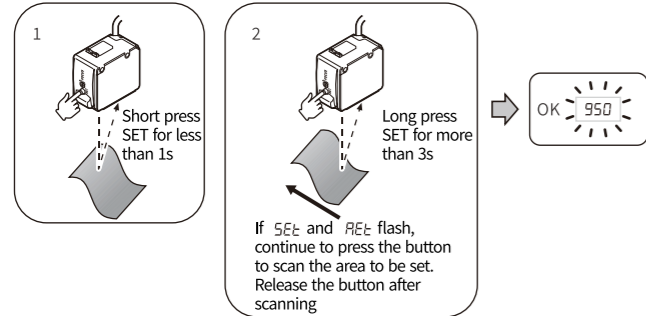
*When the setting state is saturated, "--" flashes.

■ Allow deviations between individual workpieces

· Additional tuning of standard samples (when adding allowable workpieces)

Set the "color" that has been set using other tuning methods and the detection target that needs to be determined to be the same "color", long press the [SET] button+[▼] button.

If the additional setting is successful, the "set value" will flash 3 times and return to the normal screen (at this time, the set value will not change).

The "color" between the initially set "color" and the added "color" is also supplemented with settings.

If Add flashes, release the button

<Precautions for adding tuning to the standard sample>
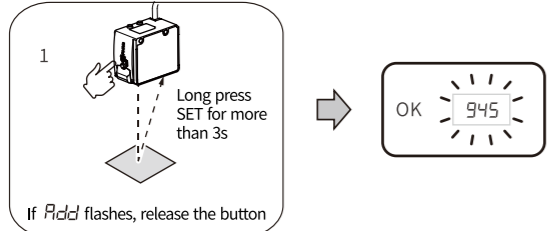
When clearing the standard sample and adding tuning, please perform other tuning.

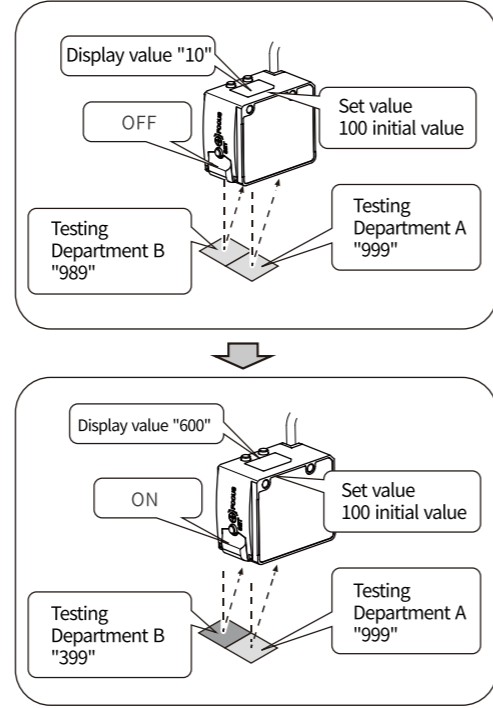When the setting fails or the setting state is saturated, "--" is displayed.

■ Confirm and adjust the set values

The larger the set value, the stricter the detection, while the smaller the value, the looser it becomes.
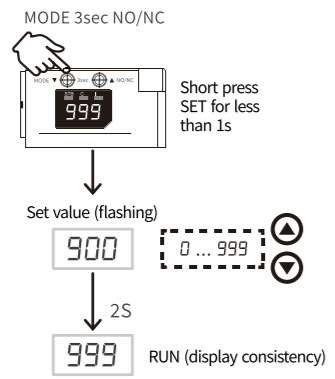
■ Differential mode (FGS01-70NP only)

· Detect the difference between two colors without tuning

This is a function that detects the difference in consistency between one side of the light spot and the other side of the light spot. No tuning homework is required.

For example, if the "color" of two light points is exactly the same, the display value becomes "0", and the larger the color difference, the greater the display value.


*When confirming or manually adjusting the set value, please refer to the above instructions. In differential mode, the larger the value of the set value, the looser the detection, while the smaller the value, the stricter the detection.

■ Matching mode (FGS01-70NP only)

· Set sensitivity

Detected when the consistency of two light points exceeds the set value ※ 1

Register as a benchmark color combination and detect ※ 2
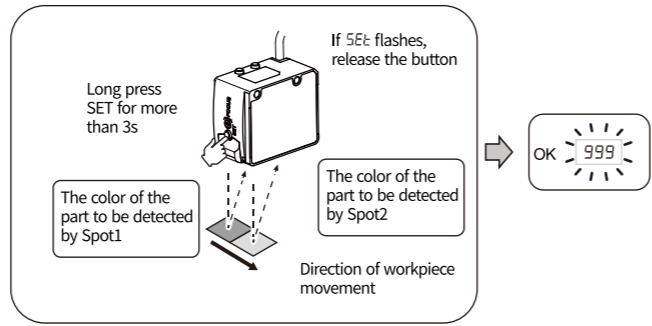
When confirming or manually adjusting the set value, please refer to the above operation to confirm and adjust the set value.

When the amount of light received is saturated or insufficient, sometimes " ∪∪∪ " or " ∩∩∩ " may be displayed, but if the above registration is performed, brightness control may also be performed and can be detected.

<Precautions during standard sample tuning>
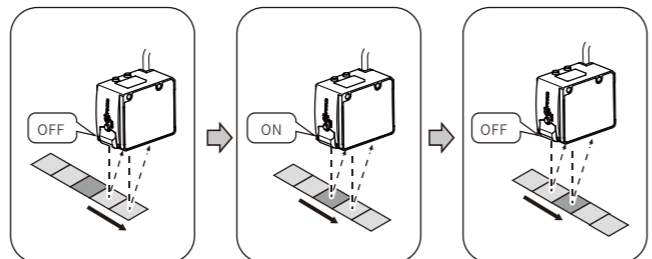
Continue until the green light indicating the additional benchmark no longer lights up.

If standard tuning is performed again after standard tuning, the setting content of the earliest standard tuning will be overwritten.

When adding an allowable range after tuning the standard sample, please perform additional tuning on the standard sample.

When the setting state is saturated, it displays " ∩∩ ". When adding an allowable range, please lower the standard tuning setting value and perform the standard tuning again.

After tuning the standard sample, even if the tuning set value is changed, the set value will not take effect.

■ Super I mode

■ About Displaying Values

· photolepsy

Display the current amount of light received. Display range: 0 to 999 (the more light received, the greater the value)

· Set value

To what extent is the light received, it is determined that there is a detection target, which is displayed as a threshold. When confirming or manually adjusting values, please refer to the tutorial on confirming and adjusting set values.

The flashing display value after tuning is the set value.

■ Set sensitivity (choose one of the following three methods)

· 2-point tuning (basic)
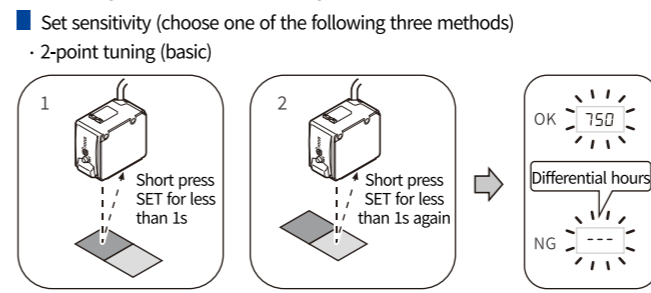
■ Maximum sensitivity tuning (when adjusting sensitivity to maximum)

If SEt flashes, release the button
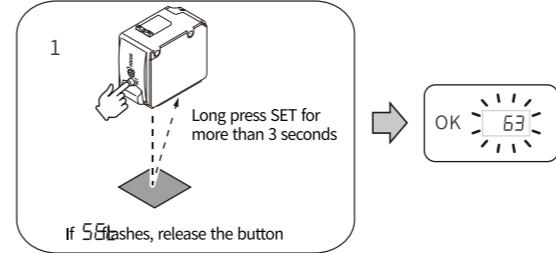
■ Fully automatic tuning (when unable to stop moving detection targets)

If SEt flashes, keep pressing the button to pass the detection target

Release the button after passing

■ Confirm and adjust the set values

■ External input selection

tuning [SEt]

Perform the same function as the [SET] button.

hold fire [LoF]

Stop LED emission.

Detailed settings

MODE 3sec NO/NC

999

▼ >3s

RUN
(Long press the ▼ button during the setting process to exit the setting.)

Light Spot/Mode Selection (FGS01-70NP Only) — `5Pt` ⇄ `15P` → `A-1` → `A-2`
- 1 Spot
- 2 Spot Differential mode
- 2 Spot Matching pattern

Detection mode — `Fnc` ⇄ `Aut` → `C-1` → `C` → `5_1`
- Auto
- C+I
- C
- SUPER I

response time — `4Hd` ⇄ `10` → `100` → `500` → `h5P` → `1`
- 10 ms
- 100 ms
- 500 ms
- 200 µs
- 1 ms

timer — `dLY` ⇄ `oFF` → `ond` → `oFd` → `5ht`
- OFF
- Connection delay
- Disconnect delay
- Single time

The timer time is only limited to when [dLY] is not selected in [oFF] — `dt1` ⇄ `10` → `20` → `100` → `900` → `1`
- 10 ms
- 20 ms
- 100 ms
- 900 ms
- 1 ms

Can only change the position of the highest level. 1, 2, · · · 9, 10, 20, · · · 90, 100, 200 · · · 900

External input selection — `in` ⇄ `oFF` → `5Et` → `LoF`
- OFF
- tuning
- hold fire

Display Selection — `d5P` ⇄ `on` → `oFF`
- ON
- OFF

Prevent mutual interference function — `5cn` ⇄ `A` → `b`
- A(Standard)
- B (different frequencies)

Determine light source selection ※ Only when selecting Super I mode — `L15` ⇄ `Aut` → `rGb` → `r` → `G` → `b`
- Auto
- R+G+B
- R
- G
- B

Standard tuning set value — `thr` ⇄ `950` → `999` → `0`
- 950(initial value)
- 999
- 0

(Press up or down to increase or decrease the value.)

`E` → `En` → `End`