# BZJ-$\frac{4}{5}$11 type
# Operating Instruction

## Overview

BZJ series photoelectric sensor using optical transmitting and receiving principle, a modulated light, reflected light receiving the object, and to distinguish between different colors according to the scattered light signal strength, or recognize the existence of objects. In the automatic control system of packaging machinery, printing machinery, textile and paper making machinery in use as sensors, matched with other instruments on color, or other marker pattern color, lines, or object without testing, can realize automatic positioning, fixed length, color, deviation, on version, counting function.

This series of sensor integrated optical technology, semiconductor optoelectronic technology, modulation and demodulation technology, using SMT advanced surface mount technology, has the advantages of high sensitivity, quick response speed, strong ability of anti interference of background light, compact structure, convenient use etc..

The BZJ-$\frac{4}{5}$11 type is the company according to the development of new varieties of user requirements, it is particularly suitable for miniature photoelectric sensor particles, liquid, powder, paste the vertical packaging machine, pillow packing machine, bag making machine.

## Type Spectrum

BZJ—□□□□—□

Design sequence:
1, 2,...
Optical classification:
1 coaxial reflection type /2 non coaxial reflex
Source classification:
1 single light source /2 light source
The light source color classification:
G- green B- blue R- red W- white BG- blue and green

Continuous output signal classification:
(no this function is not standard)
$I_1$:0~10mA direct current output indicator
$I_2$:4~20mA direct current output indicator
V:0~5 level output
$V_A$:0~5V level output light switch output
$V_B$:0~5V level output and dark switch output

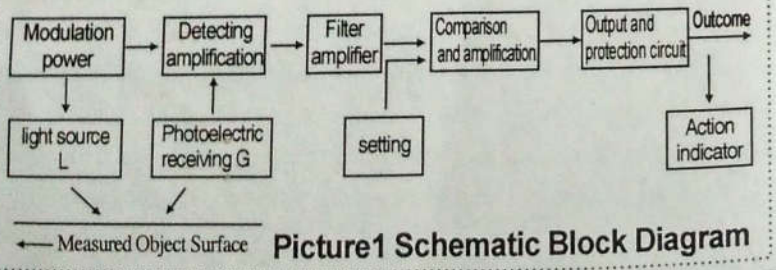
## Technical Parameter

| Model | | BZJ-411G | BZJ-411□ | BZJ-411□-VAVB | BZJ-511G |
|---|---|---|---|---|---|
| The light source | | Green | Blue, Blue/green, White | Blue, Blue/green, White | Green |
| Response time | | 200μS | 100μS | 200μS/100μS | 500μS |
| Detection distance | | 9mm | | | 9mm |
| Output Form | Switch output | Through The Dark Bright + Two Line Output (NPN Type) | Light Through The Output (NPN) / Dark Output (NPN) | | Through The Dark Bright + Two Line Output (NPN Type) |
| | Continuous signal output | ——— | 0.5–5v Continuous Level Signal Output, Resistance To 10k | | ——— |
| Switch output current | | <200mA | | | |
| Switch output level | | Low level (pass):<1.5V Gao Dianping (broken): the supply voltage of -0.7V (RL=∞) | | | |
| The power supply voltage and current | | 10–30VDC、≤80mA | | | |
| Protection function | | The power reverse protection, load short-circuit protection | | | |
| Work environment | | A temperature of 0–50 ℃, <10000Lux sunshine | | | |
| Weight | | 200g | | 180g | |
| Size and shape | | 23(W)×40(H)×56(L)mm, Lead long 2m | | 23(W)×40(H)×56(L)mm, Lead long 2m | |

## Operational Principle

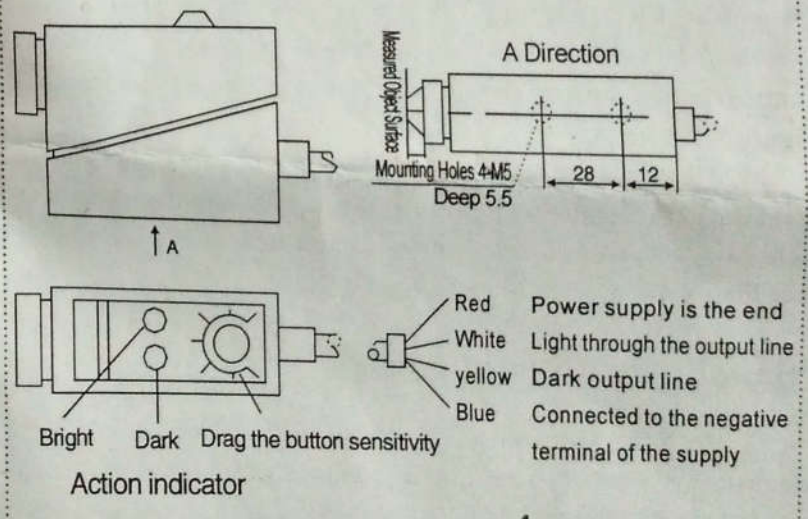
The objects with different colors to the same color of the incident light with different reflectivity; the same shade of a constant intensity, according to the reflected light of the received signal strength, can distinguish between different colors, or discriminate objects have no. The sensor working principle as shown in figure 1. The light source L sends pulse modulated light, reflected light signal of the photoelectric receiving element receives the G object, and converted to electrical signals, then by detecting, amplifying, filtering, amplification, comparing the output level driving signal (switch).

**The sensor output part of the electric principle diagram see Figure 3, figure 4**

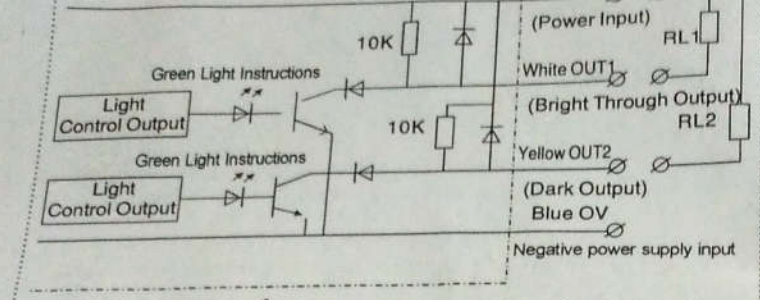



Picture1 Schematic Block Diagram

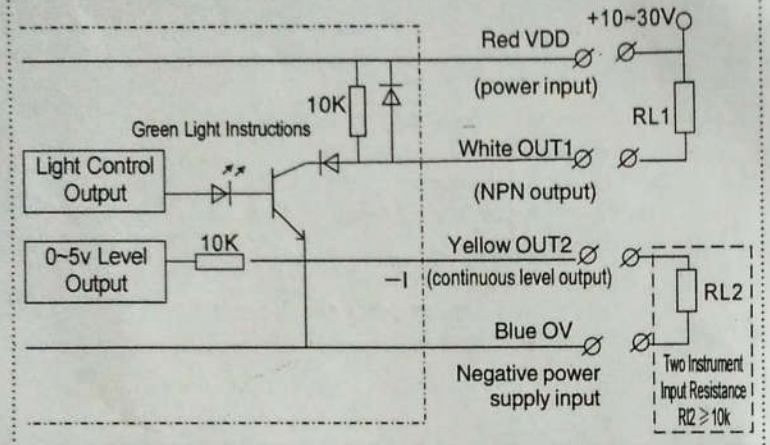
## Operational Principle




Picture1 BZJ-$\frac{4}{5}$11Type Contour




**Picture3 BZJ-$\frac{4}{5}$11□Output switch output circuit and external wiring reference map**




**Picture 4 Bzj-411 / -VaVb Continuous Level Output The Output Circuit And The External Connection Reference Map**

(Note: the switch output BZJ-411 - -VA is on open output,BZJ-411 - VB is a dark output. )

## Installation, Wiring

1. installation: the sensor size is shown in figure 2. The sensor should be installed vertically to the tested surface. Between the sensor and the measured object surface distance available at around 9mm, sensor mounting seat board should 10mm vertical distance adjustment.

The 2 connection: the sensor outlet line is 4 (see Figure 2), according to the color distinction. Users should refer to figure 3, or figure 4 wiring. Red, blue respectively positive and negative power line. DC power supply; white light through the output line, yellow to dark output line. This two line as a sensor of NPN switch control output, the user should be selected according to a line (see Figure 3, figure 4).

BZJ-411 - -VA/VB type Pinout: the yellow line to the 0~5V level output line: the white line as the switch output wire dark or light pass, according to the requirements of users in order to indicate (see Figure 4).

## Sensitivity Adjustment

1 adjust the mounting position: properly connected line after electrifying, carefully adjust the installation position, the projected on the object to be measured on the surface of the clear spot, the brightest.

If the measured object surface mirror, detection is not ideal sensitivity knob background and color adjusting position A, B, [(see second) too close, as the test is not ideal, may be appropriate to adjust the sensor and the measured surface inclination.

2. BZJ- type 11 adjustment method:

The general said, (whether deep color or light spot alignment block) sensitivity knob clockwise (OUT2) can make the lights bright, counterclockwise turn to red (OUTl) light.

Step (1): spot aligning the measured surface dark in color (dark) color (usually color), sensitivity adjustment knob. The lights are just out of the state, remember when the rotary knob which refers to the location (assuming denoted as A):

Step (2): the spot at the shallow color (light) color (usually for the background), counterclockwise sensitivity adjustment knob, the light is just out of the state, remember the knob is refers to the position (assuming denoted as B).

Step (3): and then the knob adjustment in the middle location A, B.

Note: the ZBJ series of single coil and multi turn potentiometer potentiometer two different structure, if the sensitivity adjustment is a multi turn potentiometer, in addition to record the position A, B, remember A to B co rotating several times, and then returned to the screwed to the middle ring of A to 8 of the number.

3. continuous signal output type: sensor with continuous output voltage, the output voltage and the measured surface reflected light intensity is proportional to the. In case of a mirror reflecting the strongest, its output voltage is maximum, lens suspension (no reflection) output voltage minimum. This type of sensor gain is fixed (knob on the panel as sensitivity switch output setpoint adjusting knob, has nothing to do with the continuous signal output), the user can through the output voltage changes measured distance or angle industry size.

## Matters Need Attention

1. switch output load resistor or inductor properties should be, not with a capacitor, so as not to cause a short-circuit protection circuit malfunction which make output cutoff. Should from the strong electromagnetic field, Qiang Guangyuan, high fever, strong vibration and corrosive gas installation, black shield should be grounded reliably. When the lens is dirt contamination, should use lens paper or soft cloth gently wipe, prevent the damage of mirror.

2. if the switching power supply output load (VL) and the power supply sensor (VDD) are not equal, must meet VL ≤ VDD.

3. when the switch output load resistance is large, in order to improve the output waveform control sensor (make up rate), the control output and between the positive supply a 1-5k pull-up resistor, the rising waveform becomes more steep.

Between the 4 series of the sensor line and line to the shell between the maximum allowed voltage of 35VPP, beyond this limit will make the sensor damage. The output switch with short circuit protection and overload protection, protection for high level output (output resistance 20K), in this case, the user should first identify the wiring is correct, whether the output line and power line short circuit, load factors and load whether it contains capacitance properties.

The 5 suggested users using 12V or 15V DC stabilized power