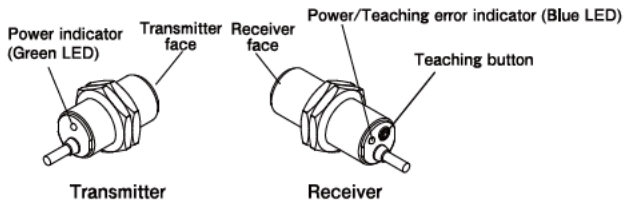


### 1 PARTS DESCRIPTION



### 2 SAFETY PRECAUTIONS

To ensure safety, be sure to follow the precautions below.

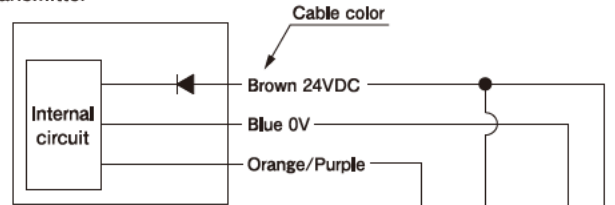
1. Do not use this product for life safety or critical applications.
2. Do not use this product when its housing or cable is damaged.
3. Do not attempt to disassemble, repair, or modify this product.
4. Do not use this product in an environment containing flammable, explosive, or corrosive gas.
5. Do not use this product in an environment exposed to chemicals or oils.
6. Do not use this product in an environment exposed to water including outdoors or under the water.
7. Use this product within the product ratings.
8. Do not expose this product to direct sunlight.
9. Do not use this product in an environment exposed to vibration or shock.
10. Clean the sensor housing using a soft and dry cloth. Do not use organic solvent such as alcohol and thinner.
11. Perform a daily operation check, weekly periodical inspections, and prescribed maintenance procedures to ensure correct operation.
12. This product should be disposed of as an industrial waste.

### 3 PRECAUTIONS DURING USE

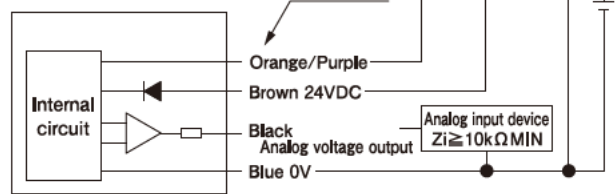
1. Be sure to route the sensor cables separate from any power transmission or high voltage line, or else use shielded cables. Using the same conduit or duct as high voltage or power lines will cause malfunctions or damage because of electromagnetic induction.
2. Do not apply excessive force to the cable.
3. When using a switching regulator, be sure to ground the frame ground (FG) terminal.
4. The sensor starts operation 100 msec after power is supplied. Always power on the sensor first.
5. Turn off the power of the load first, as this product may generate an output pulse when the power is turned off.
6. Avoid turning the power on and off consecutively.
7. When extending the cables, use conductors of at least 0.5mm<sup>2</sup> cross-sectional area and check the voltage drop.
8. Limit the current of the power supply to 2A.
9. The sensors are supplied in coordinated pairs of an ultrasonic transmitter and a receiver each of which has a matching serial No. Be sure to use the units of the same serial No. in a pair.
10. Adjacent installation of multiple sensors may cause malfunctions due to mutual interference.
11. To use the sensor in a space where a high frequency sound like metallic sound, sound from air nozzle or glass cutter is generated may cause a malfunction.
12. Do not use the sensor in a space with a rapid temperature change (ex. close to a heat source) or strong air convection (ex. close to a duct of air-conditioner) as air is a medium of sound. The sensor does not work in a vacuum, pressurized, or decompressed state.
13. Prevent the ultrasonic element (the white portion on the sensor face) from being wet by water. When it is wet with water, the detection range becomes shorter and the performance deteriorates.

### 4 CONNECTION

#### ● Transmitter



#### ● Receiver

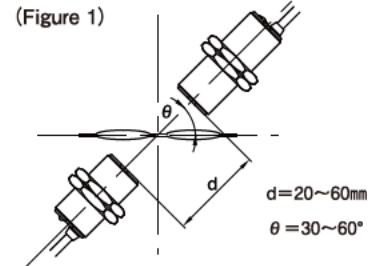


The sensors are supplied in coordinated pairs of an ultrasonic transmitter and a receiver each of which has a matching serial No.

### 5 SETTING

#### (1) Mounting

As in the figure below, tilt the sensor to the detection target for mounting. (Figure 1)



#### (2) Initial setting

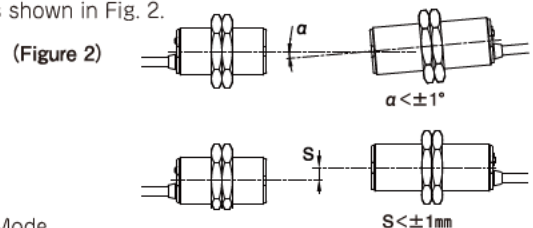
Ensure that nothing (no detection target) is present between the transmitter and the receiver. In this condition, perform the initial teaching by pressing the teaching button on the receiver once (for approximately 0.5 sec or more).

(When the mounting or setting conditions need to be changed, be sure to perform teaching again as in the initial setting.)

- The ultrasonic intensity (sound input level) depends on the material, thickness of the detection target, and the mounting angle  $\theta$  of the sensor. Ensure appropriate setting.

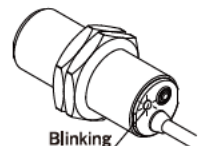
#### (3) Axis position

When the axis angle or position of the transmitter is not aligned with that of the receiver, the output voltage may become deficient due to gain shortage. Be sure to use the sensor within the ranges shown in Fig. 2.



#### (4) Error Mode

- When there is gain shortage during teaching or when no synchronizing line is connected, the Power/Teaching error indicator (blue) of the receiver blinks, and the output voltage becomes 0V. When the error occurs, check the mounting/wiring status and turn ON the power again.
- Disconnection of the synchronizing line during operation results in the error, and the operation stops (output voltage will be 0V).



Blinking  
Power/Teaching error indicator

## 6 SPECIFICATIONS

Model	US-T04AN
Detection method	Through
Detection distance	20 to 60mm (optimum distance: 40mm)
Operational power	24VDC±10%, Ripple 10% or less
Power consumption	39mA or less
Response time	3ms or less
Output mode	Analog output: 1 to 4V
Operation mode	Output proportional to input ultrasonic intensity
Ultrasonic frequency	380kHz±15kHz
Indicator	Transmitter: Power indicator (Green) Receiver: Power/Teaching error indicator (Blue)
Operation method	Teaching type
Auxiliary functions	Protection against reverse power connection
Material	Case: SUS303, Detection surface: glass epoxy, polyurethane form, ABS
Connection method	Attached cable: 3.5mm O.D. Transmitter: 0.15mm <sup>2</sup> ×3 cores, 2m, Receiver: 0.15mm <sup>2</sup> ×4 cores, 2m
Weight	Approx. 130g (including cable)
Accessories	Instruction Manual, Resin nut: 4 pcs (*1)

\*1: SUS nut (optional): Model: US-N2

## ENVIRONMENTAL SPECIFICATION

Ambient temperature	-10 to +55°C (no freezing)
Ambient humidity	35 to 85%RH (no condensation)
Protective structure	I P 65
Vibration	10 to 55Hz/1.5mm double amplitude/ 2 hours each in 3 directions (X,Y,Z)
Shock	300m/s <sup>2</sup> , 3 directions (X,Y,Z) for each three times
Dielectric withstanding	500VAC, one minute
Insulation resistance	500V megger, 20MΩ or more

## 7 INDICATOR

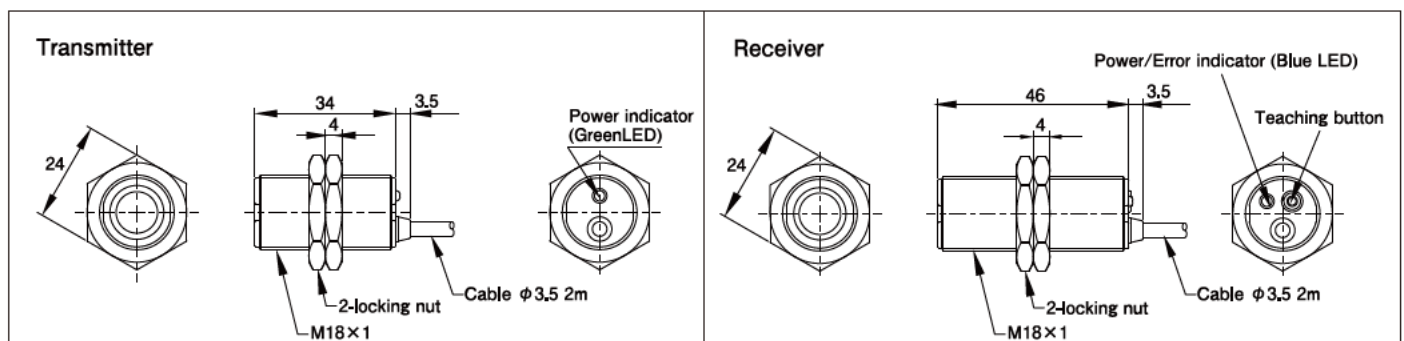
During normal operation:

- Transmitter: Power indicator (Green): ON
- Receiver: Power/Teaching error indicator (Blue): ON

When an error occurs:

- Transmitter: Power/Teaching error indicator (Blue): Blinks
- When the teaching error indicator blinks and the operation stops, check the mounting/wiring status and turn the power ON again.

## 8 DIMENSIONS (unit : mm)



## 9 WARRANTY

The product is covered by a warranty based on the Quality Regulations of Takenaka Electronic Industrial Co., LTD. (Takenaka). Regarding the warranty, please feel free to ask any questions to Takenaka, Takex sales office or authorized distributors.

### 1. (Warranty period)

The warranty period is one (1) year after delivery to a designated location. This warranty does not apply to expendable supplies like batteries or relays, and products of other manufacturers which Takenaka markets.

### 2. (Scope of warranty)

If any defect is found during the warranty period, Takenaka will, at its option, repair or replace the defective product at the location of delivery. This warranty is void and of no effect if the product is subject to improper use or handling, improper maintenance, modification, repair made by persons not authorized by Takenaka or a lack of reasonable care. The warranty does not cover defects caused by the other product, reason including fire, flood, earthquake, lightning surge and other natural disasters.

- ① If the product is used inappropriately or used under inappropriate conditions that are not described in the instruction manual or specifications.
- ② If the defect is caused by improper maintenance, including a failure to replace consumable or periodical parts as described in the instruction manual or specifications.
- ③ If the defect is not directly caused by the warranted product.
- ④ If the products is modified or repaired by persons not authorized by Takenaka.
- ⑤ If the defect is caused by rough handling, dropping, or collision after the product is delivered.
- ⑥ If the defect could not be predicted from a technical viewpoint at the time Takenaka made the agreement for, manufactured, or installed the product.
- ⑦ If the defect is caused by a natural disaster such as a fire, flood, earthquake, lightning (including a lightning surge) and so on, or an accident such as an abnormal voltage that Takenaka is not responsible for.

The warranty provided here is only for the Takenaka product and does not cover any secondary damage caused by problems related to the product.

### 3. (Target of Warranty)

- (1) In case that the product is used in combination with other products or as a part of a system, Buyer should confirm the compatibility of the product to the application by relevant laws, decrees, standards and regulations.
- (2) This product is designed and manufactured for use in general industries. This warranty does not cover the application of the product to:
  - ① Nuclear power facilities including power station, incineration plant, public utilities including railway, vehicle and airway facilities, medical devices, amusement machines, safety devices and facilities that are governed by regulation of government or industrial organization.
  - ② Facilities that may cause danger or serious effects on human life and assets.
  - ③ Utilities like electricity, gas or water facilities. Facilities that are required 24 hour continuous operation.
  - ④ Outdoor use or use in improper conditions or environment.
  - ⑤ Other facilities which requires broad and detail consideration concerning safety and reliability equivalent to the above.

This warranty may cover these application in case that Takenaka is notified about the application of the product before sale and Buyer approves the compatibility and the specifications of the product by written agreement and / or by providing required safety measures.

## 10 DISCLAIMER

- This product is designed to detect a presence or passage of an object. This product does not have any function to prevent accidents, death or injuries. Takenaka will assume no responsibility for damages or losses resulting from accidents or disasters caused by a failure of the product, complete wiring or installation or any act that does not follow the instruction manual.
- Earthquakes, lightning (including lightning surges), fires that we are not responsible for, acts or incidents caused by third parties, intentional or accidental misuse, or usage under other abnormal conditions.
- Any secondary damage caused by the usage, faulty operation, or malfunction of the product like spend operation or malfunction of a connected device or system, damage to a device, loss of profit, interruption of business, corruption or loss of memory contents, cost of restoration, etc.
- Misuse, failure related to maintenance, installation or deinstallation, or failure to follow the contents of the instruction manual.
- Any malfunction (including false alarm or lost alarm) caused by the combination with a connected device or software over that we have no control.
- The responsibility of Takenaka is limited to the extent of repair or replacement of the product. The expenses we are liable for will not exceed the original product cost.