TAKEX
Ultrasonic Sensor

US SERIES Instruction Manual

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FEATURES

- This is an amp built-in ultrasonic sensor.
- Through type is ideal for detecting transparent packaging or container.
- Reflective model is suitable for detecting either a black sheet or a transparent container.
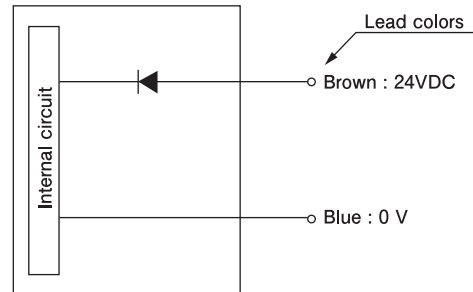
RATING/PERFORMANCE/SPECIFICATION CE

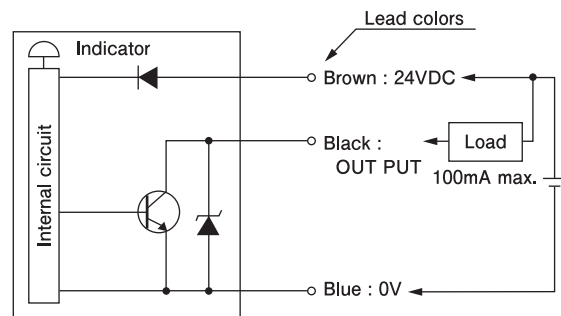| Model	NPN output	US−T50	US−R25
	PNP output	US−T50PN	US−R25PN
Detection method		Through	Reflective
Detecting distance		500mm or less	60-250mm
Detection object		10×30mm	30×30mm ∗
Power supply		24VDC ±10% / Ripple 10% or less	
Current consumption		TE50: 25mA or less / TD50: 15mA or less	25mA or less
Response time		10ms or less	ON: 30ms or less / OFF: 50ms or less
Output mode	NPN output	Rating : Sink current 100mA (30VDC) or less	
	PNP output	Rating : Source current 100mA (30VDC) or less	
Operation mode		Detect ON	Detect ON
Operating angle		20° (receiver)	————
Hysteresis		————	10% or less
Ultrasonic frequency		380kHz±15kHz	
Indicator		Operation indicator (red LED) / Stability indicator (green LED)	
Volume		Sensitivity adjustment	Distance adjustment
Material	Case	Heat resistant ABS resin	
	Delection side	Glass reinforced Epoxy Conductive EPDM	
Connection		Attached cable (φ4) Transmitter: 0.2mm²×2 cores, 2m Receiver: 0.2mm²×3 cores, 2m	Attached cable (φ4) 0.2mm²×3 cores, 2m
Weight		80g or less (transmitter/receiver)	80g or less
Accessory		Operation manual, mounting bracket, screw for adjustment	
Ambient temperature		−10−+55℃ (non-freezing)	
Ambient humidity		35−85%RH (non-condensing)	
Ambient wind speed		1 m/s max.	
Protective structure		IP54 (no drops of water allowed on head)	
Vibration		10−55Hz/1.5mm double amplitude/2 hours each in 3 directions	
Shock		500m/s²/3 times each in 3 directions (ultrasonic element excluded)	

∗ Sample object: 1mm thick aluminum plate
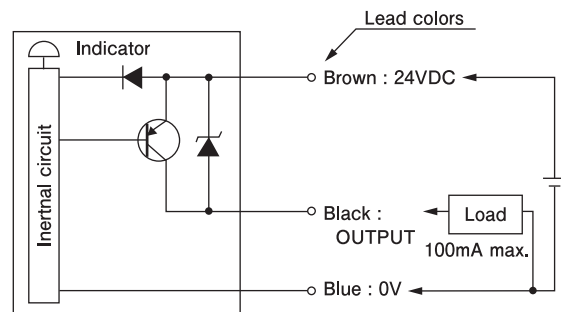
INPUT/OUTPUT CIRCUIT AND CONNECTION

- Model US−TE50

Lead colors
Brown : 24VDC
Blue : 0 V
Internal circuit

(NPN output type)
Model : US−TD50
Model : US−R25

Indicator
Internal circuit
Lead colors
Brown : 24VDC
Black : OUT PUT
Load 100mA max.
Blue : 0V

(PNP output type)
Model : US−TD50PN
Model : US−R25PN

Indicator
Inertial circuit
Lead colors
Brown : 24VDC
Black : OUTPUT
Load 100mA max.
Blue : 0V

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ADJUSTMENT AND DETECTING OBJECTS

Model US–T50 (Through-sound type)

● The through type may not detect an object due to unwanted light reflection on a wall or floor surface.
Adjust the sensitivity or use acoustic materials if there's any structure which may reflect the ultrasonic sound.

floor or wall

floor or wall
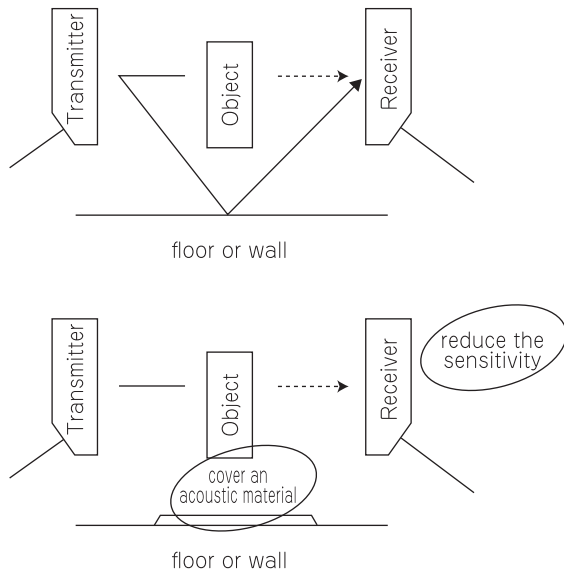
● The sensitivity adjustment volume (ADJ) is on the receiver unit.
● The green LED is a stability indicator. It lights while the ultrasonic sound is stably received. Make sure that the LED lights when there's no object.

Model US–R25 (Reflection type)

● The detection performance of the reflection type depends on the material of the detecting object. The detection distance will decrease for acoustic materials like soft cloth or sponge. The color or transparency of an object has no effects on the detection distance. Depending on the angle of a detecting object the sensor may not detect if the surface of the object is polished like a mirror.
● The potentiometer on the receiver (ADJ) is for distance adjustment, not for sensitivity. The adjustable range is from 60mm to 250mm.
● Do not use the sensor for a range less than 60mm.
Within the range the sensor may not operate.
● The green LED is a stability indicator. It lights while the ultrasonic sound is stably received. Make sure that the LED lights when an object is detected.
● The detection range may vary due to ambient noise. Take noise countermeasure when the sensor is installed in a noisy environment.

PRECAUTIONS

● Avoid to use the sensor in a space where a high frequency sound like metallic sound, sound from air nozzle or glass cutter is generated.
● Do not use the sensor in a space with a rapid temperature change (close to a heat source) or strong air convection (close to a duct of air-conditioner) as air is medium of sound.
● Prevent the ultrasonic portion on the sensor face) from being wet by water. The detection range becomes shorter and the perfomance deteriorates when it's wet with water.
● Avoid turnning the power on and off consectively.
● The sensor needs 10 msec for warming up operation.
● When using a DC power unit with an insulated transformer or a switching regulator, be sure to ground the frame ground (FG) terminal.
● Do not use a same conduit with high voltage or inverter lines for wiring.
● Tighten the attached screw with a torque of 0.6N·m or less to fix the sensor.
● Limit the current of the power supply to 2A.

DIMENSIONS (in mm)

For all models (transmitter/receiver)
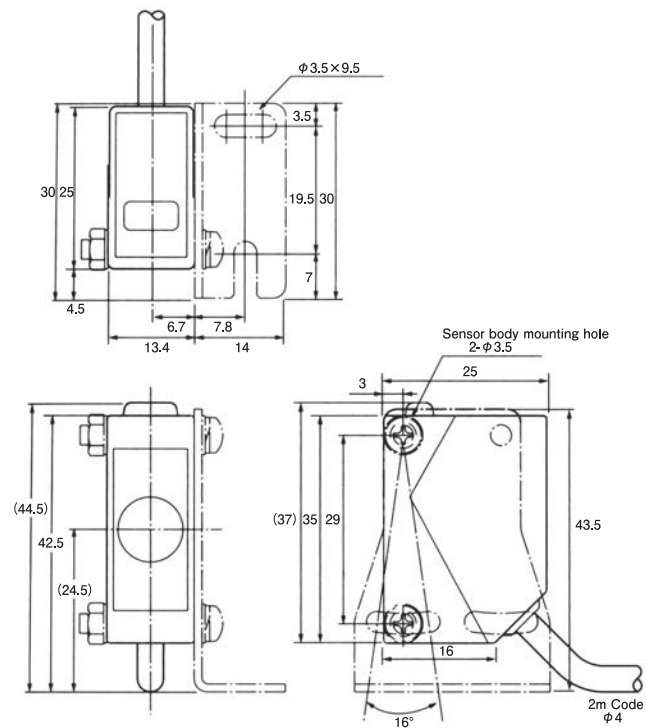
(Dotted lines show the dimensions with the mounting bracket (accessory) attached

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● The guarantee period of this product is one year after the delivery.
● If any defect is found during the guarantee period, Takenaka will repair or replace the defective product.
● This product is an industrial sensor which issues an output upon detecting an object. It does not have any function to prevent accidents, death or injuries.
● Takenaka will not held responsible for any damage or loss incurred due to accidents, faulty installation, abuse, misuse, improper maintenance or acts of God including lightning surge.

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