

# US-N300

## Related Information

■ General terms and conditions..... F-3

■ Selection guide .....P.865~

■ General precautions..... P.1595



[panasonic.net/id/pidsx/global](http://panasonic.net/id/pidsx/global)

## Suitable for detecting transparent films or transparent bottles

### Reliable detection of transparent objects

The sensor reliably detects transparent films or transparent objects.



### Only 16 mm 0.630 in thick

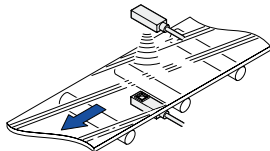
Its 16 mm **0.630 in** thick compact body allows mounting in a narrow space.

### Simple operation mode selection

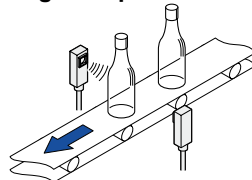
The operation mode can be selected either sound-received-ON or sound-blocked-ON simply by changing the connection of the control input wire.

## APPLICATIONS

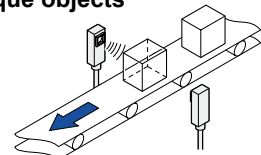
### Detecting transparent film or transparent glass



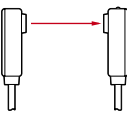

### Detecting transparent bottles



### Detecting transparent and opaque objects



## ORDER GUIDE

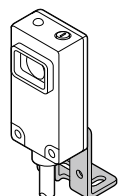
Type	Appearance	Sensing range	Model No. (Note)	Output
Thru-beam			US-N300	NPN transistor universal
			US-N300-C5	

Note: Models whose model name on the product nameplate is followed by "P" are transmitter, while those whose model name is followed by "D" are receiver.

### Accessory

· MS-N30  
(Sensor mounting bracket)

Two M4  
(length 15 mm **0.591 in**)  
screws with washers  
are attached.



Selection  
Guide

Liquid Leak  
Detection

Liquid Level  
Detection

Water  
Detection

Color Mark  
Detection

Wafer  
Detection

Ultrasonic

Small / Slim  
Object Detection

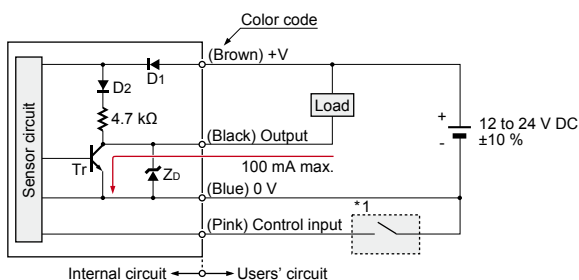
Obstacle  
Detection

US-N300

**SPECIFICATIONS**

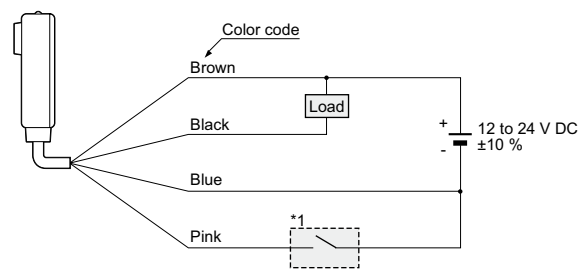
Item	Type	Thru-beam
	Model No.	<b>US-N300</b>
Sensing range		300 mm <b>11.811 in</b>
Sensing object		Transparent, translucent or opaque object: 20 × 20 mm <b>0.787 × 0.787 in</b> or more, Hole: 10 × 10 mm <b>0.394 × 0.394 in</b> or more
Supply voltage		12 to 24 V DC ±10 % Ripple P-P 10 % or less
Current consumption		Transmitter: 35 mA or less, Receiver: 35 mA or less
Output		NPN transistor universal • Maximum sink current: 100 mA • Residual voltage: 1 V or less (at 100 mA sink current)
	Output operation	Selectable either sound-received-ON or sound-blocked-ON by the control input
	Short-circuit protection	Incorporated
Response time		5 ms or less
Operation indicator		Red LED (lights up when the output is ON)
Sensitivity adjuster		Continuously variable adjuster
Transmission frequency		220 kHz approx.
Environmental resistance	Protection	IP62 (IEC)
	Ambient temperature	0 to +50 °C <b>+32 to +122 °F</b> (No dew condensation), Storage: -25 to +70 °C <b>-13 to +158 °F</b>
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
	Voltage withstandability	1,500 V AC for one min. between all supply terminals connected together and enclosure
	Insulation resistance	20 MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure
	Vibration resistance	10 to 55 Hz frequency, 1.5 mm <b>0.059 in</b> double amplitude in X, Y and Z directions for two hours each
	Shock resistance	100 m/s <sup>2</sup> acceleration (10 G approx.) in X, Y and Z directions three times each
Material		Enclosure: Polycarbonate
Cable		0.2 mm <sup>2</sup> 4-core (transmitter: 2-core) cabtyre cable, 2 m <b>6.562 ft</b> long
Cable extension		Extension up to total 100 m <b>328.084 ft</b> is possible, for both transmitter and receiver, with 0.2 mm <sup>2</sup> , or more, cable.
Weight		Transmitter: 80 g approx., Receiver: 85 g approx.
Accessories		<b>MS-N30</b> (Sensor mounting bracket): 1 set for transmitter and receiver, Adjusting screwdriver: 1 pc.

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C **+73.4 °F**.

**I/O CIRCUIT AND WIRING DIAGRAMS****I/O circuit diagram**

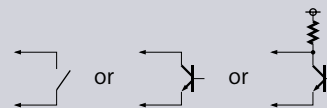
Note: The transmitter has only two power supply wires (+V and 0 V).

Symbols... D1: Reverse supply polarity protection diode  
D2: Reverse current protection diode  
ZD: Surge absorption zener diode  
Tr: NPN output transistor

**Wiring diagram**

\*1

Non-voltage contact, NPN open-collector transistor or NPN non-contact transistor



• Control input  
Low (-0.5 to +1.5 V, or connected to 0 V): Sound-received-ON  
High (6 V to supply voltage, or open): Sound-blocked-ON

FIBER SENSORS

LASER SENSORS

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MICRO PHOTO-ELECTRIC SENSORS

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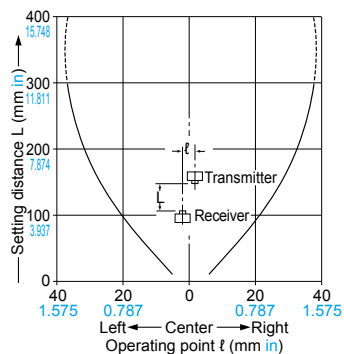
Small / Sim Object Detection

Obstacle Detection

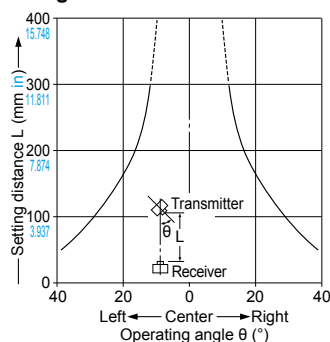
**US-N300**

## SENSING CHARACTERISTICS (TYPICAL)

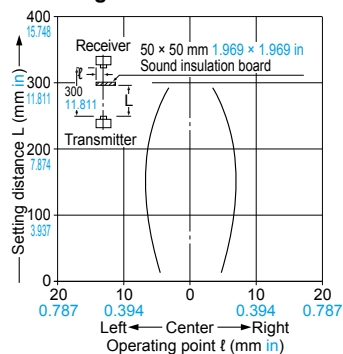
### Parallel deviation



### Angular deviation



### Sensing field



## PRECAUTIONS FOR PROPER USE

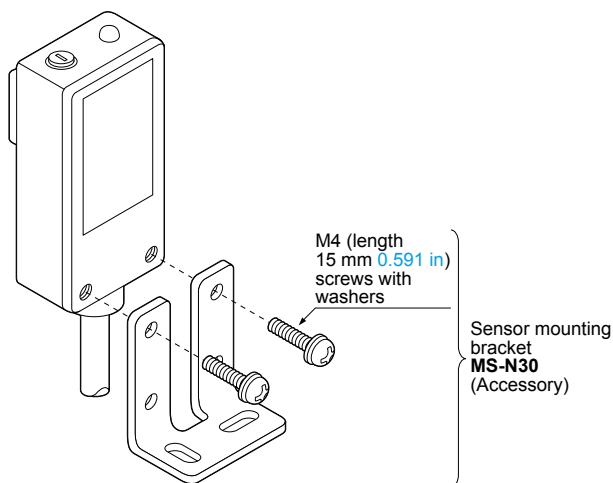
Refer to p.1595 for general precautions.



- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

### Mounting

- The tightening torque should be 0.49 N·m or less.



### Sensitivity adjustment

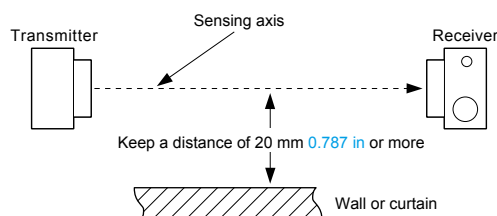
- Normally, use the sensor at the maximum sensitivity. However, if the sensing is not proper due to surrounding objects (reflection from surrounding objects, etc.), adjust the sensitivity.

### Influence of surrounding objects

#### Influence of an object parallel to the sensing axis

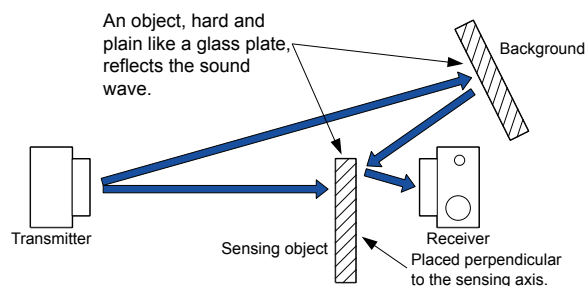
- If there is a wall or a curtain near the sensing axis, the sound reflection may cause the operation to be unstable.

#### <Countermeasure>



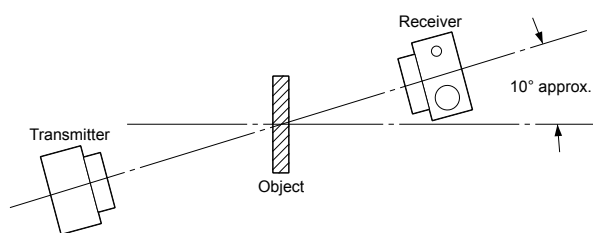
### Influence of background objects

- If sensor heads are installed as shown in the figure below, the operation may become unstable by the reflected sound wave.



#### <Countermeasure>

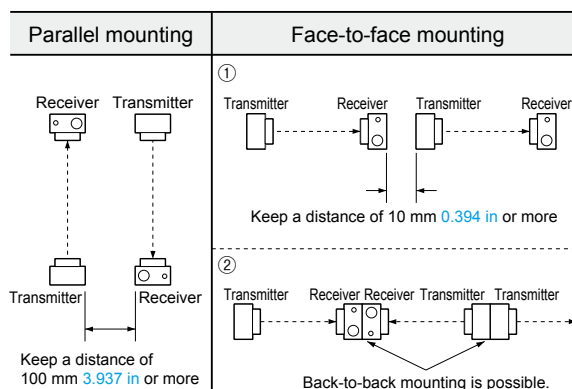
The receiver should be placed away from the object and at an angle to it as shown below.



### Mutual interference

- When two or more sensors are mounted close together, the sensors may not enter the "sound-blocked state" due to mutual interference.

#### <Countermeasure>



**PRECAUTIONS FOR PROPER USE**

Refer to p.1595 for general precautions.

**Traveling speed and minimum sensing object width**

- Minimum sensing object width is  $20 \times 20 \text{ mm}$   $0.787 \times 0.787 \text{ in}$  in the stationary condition.  
The minimum sensing width of a traveling object is related to the traveling speed and the sensor response time by the following formula.

$$W = VT + A \text{ (m)}$$

W : Minimum sensing object width (m)

V : Traveling speed of the object (m/sec.)

T : Sensor response time = 0.005 (sec.)

A : Minimum sensing object width in the stationary condition = 0.02  $0.066 \text{ (m ft)}$ Example: If  $V = 10 \text{ m}$   $32.808 \text{ ft/sec.}$ 

$$W = 10 \times 0.005 \times 0.016 + 0.02 \times 0.066$$

$$= 0.07 \text{ m } 0.230 \text{ ft}$$

$$= 70 \text{ mm } 2.756 \text{ in}$$

**Others**

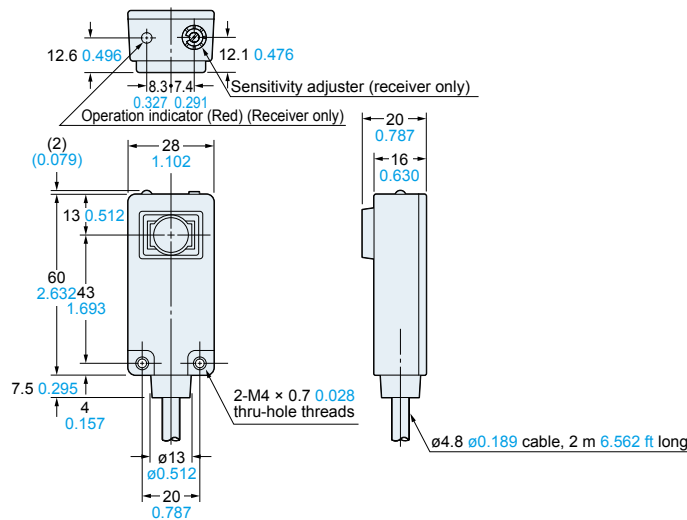
- Do not use during the initial transient time (50 ms) after the power supply is switched on.
- The ultrasonic sound propagates through the air. If the sensor is used at a place where air blows or the temperature suddenly changes (near a door, an air conditioner, etc.) the operation may become unstable. Avoid using **US-N300** at such places.
- Take care that the sensor may malfunction due to an intense extraneous sound, such as, metal impact sound.
- Do not expose the transmitting element or the receiving element to moisture or dust. It may affect the sensing operation.

**DIMENSIONS (Unit: mm in)**

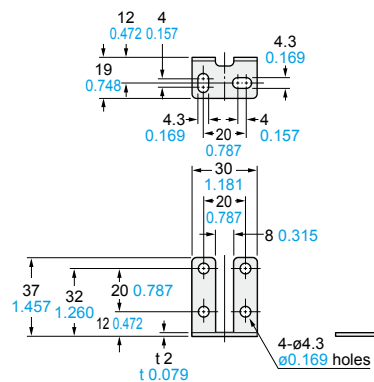
The CAD data can be downloaded from our website.

**US-N300**

Sensor

**MS-N30**

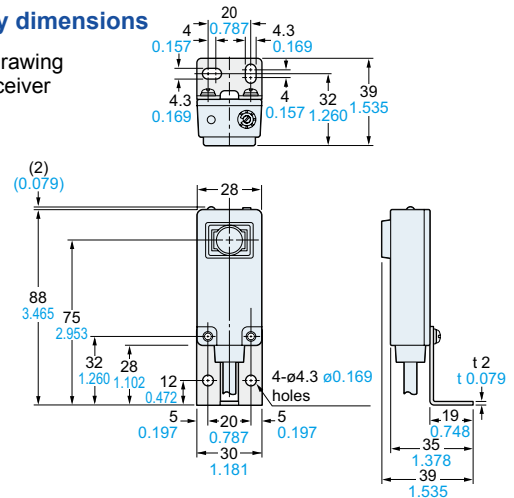
Sensor mounting bracket (Accessory)



Material: Cold rolled carbon steel (SPCC)

Two M4 (length 15 mm  $0.591 \text{ in}$ ) screws with washers are attached.**Assembly dimensions**

Mounting drawing with the receiver



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