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UNITSWIRE-SAVING
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SENSORSSTATIC
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MARKERS

PLC

HUMAN MACHINE
INTERFACESENERGY
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MACHINE VISION
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Related Information

■ General terms and conditions..... F-3
■ General precautions..... P.1595

■ Selection guideP.865~


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

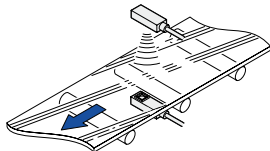
Its 16 mm 0.630 in thick compact body allows mounting in a narrow space.

Simple operation mode selection

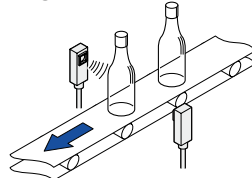
The operation mode can be selected either sound-received-ON or sound-blocked-ON simply by changing the connection of the control input wire.

APPLICATIONS

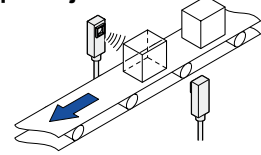
Detecting transparent film or transparent glass



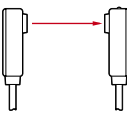
Detecting transparent bottles



Detecting transparent and opaque objects



ORDER GUIDE

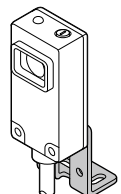
Type	Appearance	Sensing range	Model No. (Note)	Output
Thru-beam			US-N300	NPN transistor universal
			US-N300-C5	

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.



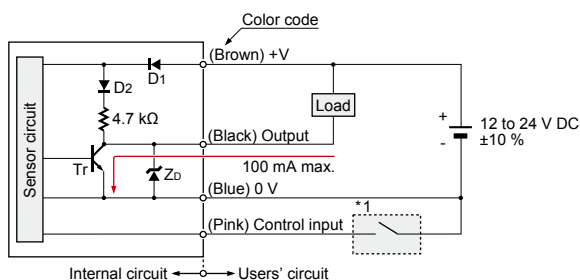
SPECIFICATIONS

Type	Thru-beam
Item	Model No. US-N300
Sensing range	300 mm 11.811 in
Sensing object	Transparent, translucent or opaque object: 20 × 20 mm 0.787 × 0.787 in or more, Hole: 10 × 10 mm 0.394 × 0.394 in 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.
Protection	IP62 (IEC)
Ambient temperature	0 to +50 °C +32 to +122 °F (No dew condensation), Storage: -25 to +70 °C -13 to +158 °F
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 0.059 in double amplitude in X, Y and Z directions for two hours each
Shock resistance	100 m/s ² acceleration (10 G approx.) in X, Y and Z directions three times each
Material	Enclosure: Polycarbonate
Cable	0.2 mm ² 4-core (transmitter: 2-core) cabtyre cable, 2 m 6.562 ft long
Cable extension	Extension up to total 100 m 328.084 ft is possible, for both transmitter and receiver, with 0.2 mm ² , or more, cable.
Weight	Transmitter: 80 g approx., Receiver: 85 g approx.
Accessories	MS-N30 (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

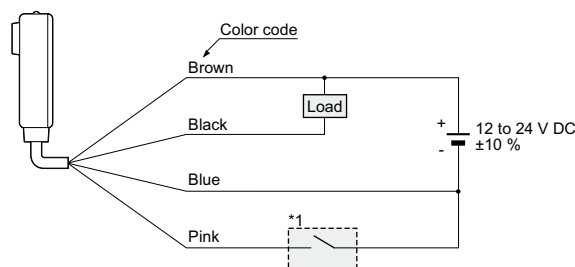
I/O circuit diagram



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

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Liquid Leak
Detection

Liquid Level
Detection

Water
Detection

Color Mark
Detection

Wafer
Detection

Ultrasonic

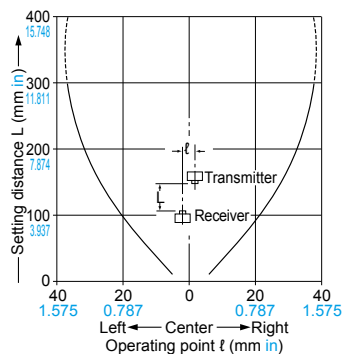
Small / Sim.
Object Detection

Obstacle
Detection

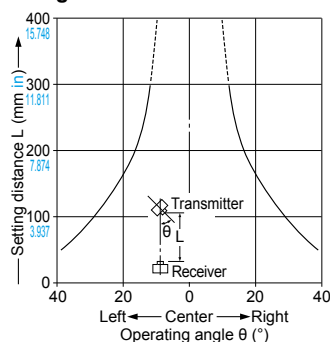
US-N300

SENSING CHARACTERISTICS (TYPICAL)

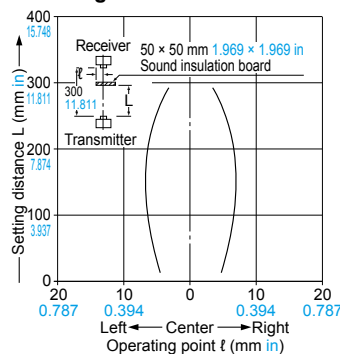
Parallel deviation



Angular deviation



Sensing field



PRECAUTIONS FOR PROPER USE

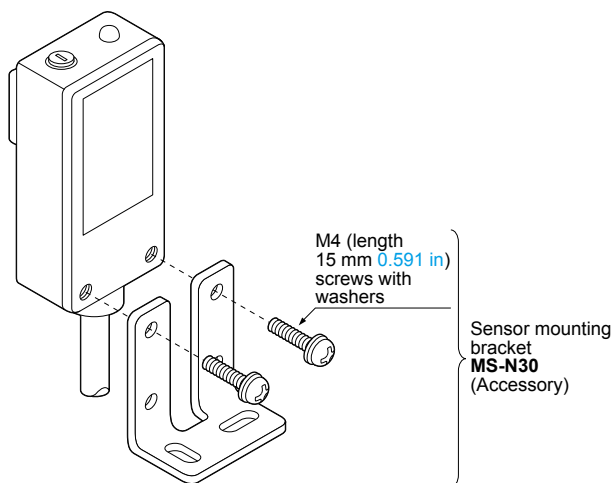
Refer to p.1595 for general precautions.



- 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.

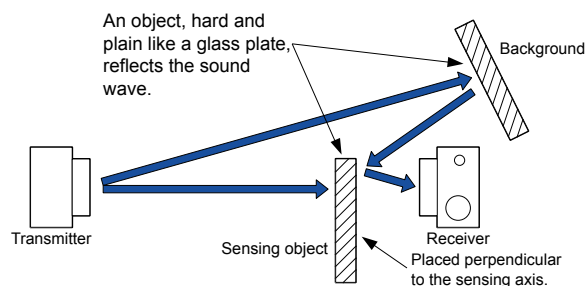
Mounting

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



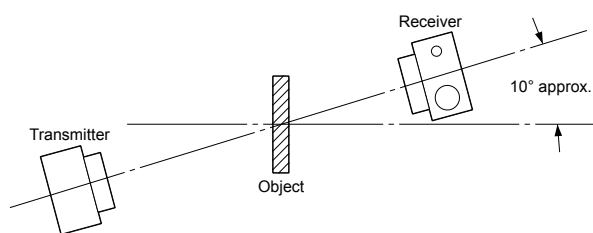
Influence of background objects

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



<Countermeasure>

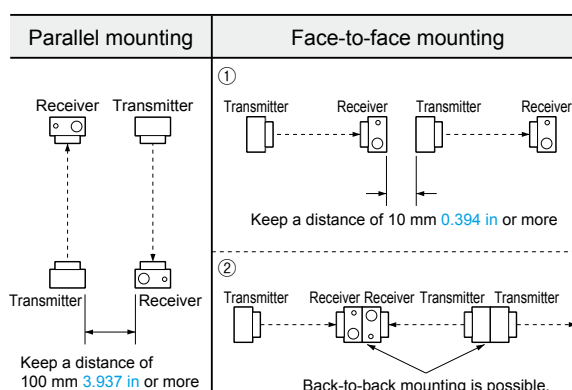
The receiver should be placed away from the object and at an angle to it as shown below.



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>



Sensitivity adjustment

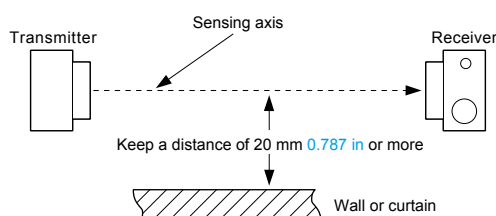
- Normally, use the sensor at the maximum sensitivity. However, if the sensing is not proper due to surrounding objects (reflection from surrounding objects, etc.), adjust the sensitivity.

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>



PRECAUTIONS FOR PROPER USE

Refer to p.1595 for general precautions.

Traveling speed and minimum sensing object width

- Minimum sensing object width is 20 × 20 mm **0.787 × 0.787 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 (m ft)**

Example: If V = 10 m **32.808 ft/sec.**

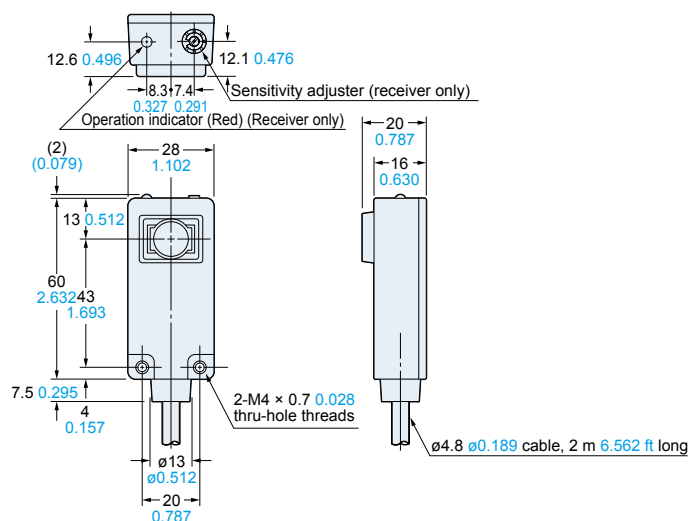
$$\begin{aligned} W &= 10 \times 0.005 \times 0.016 + 0.02 \times 0.066 \\ &= 0.07 \text{ m } \mathbf{0.230 \text{ ft}} \\ &= 70 \text{ mm } \mathbf{2.756 \text{ in}} \end{aligned}$$

DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

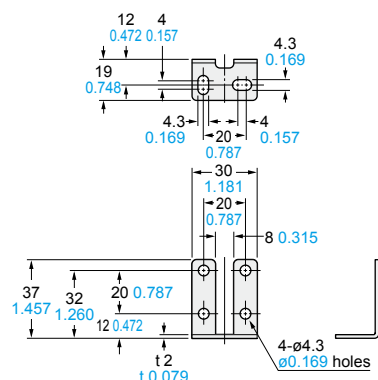
US-N300

Sensor



MS-N30

Sensor mounting bracket (Accessory)

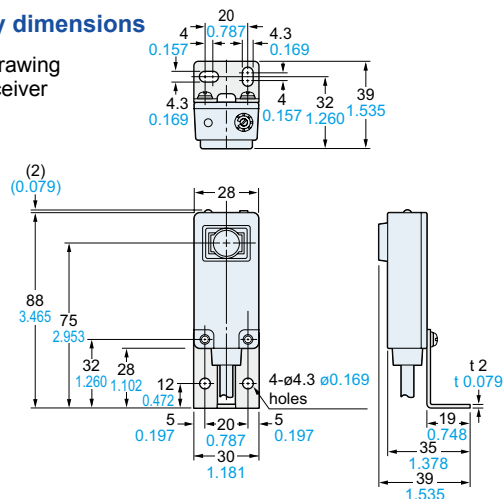


Material: Cold rolled carbon steel (SPCC)

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

Assembly dimensions

Mounting drawing with the receiver



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UV CURING SYSTEMS

Selection Guide

Liquid Leak Detection

Liquid Level Detection

Water Detection

Color Mark Detection

Wafer Detection

Ultrasonic

Small / Sim Object Detection

Obstacle Detection

US-N300