# Thru-beam Type Ultrasonic Sensor

Related Information

FIBER SENSORS

LASER SENSORS

PHOTOELECTRIC SENSORS

MICRO PHOTOELECTRIC SENSORS

AREA SENSORS

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS INDUCTIVE PROXIMITY **SENSORS** 

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

ENERGY MANAGEMENT SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide Liquid Leak Detection

Liquid Level Detection Water Detection

Color Mark Detection Wafer Detection

Small / Slim Object Detection Obstacle Detection

US-N300

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

■ General precautions...... P.1595

■ Selection guide ......P.865~

Effective September 22, 2023 Panasonic will discontinue the US-N300 Thrubeam Ultrasonic Sensor

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

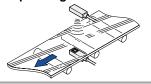
Its 16 mm 0.630 in thick compact body allows mounting in a narrow space.

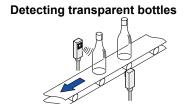
# Simple operation mode selection

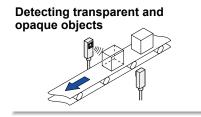
The operation mode can be selected either soundreceived-ON or sound-blocked-ON simply by changing the connection of the control input wire.

# **APPLICATIONS**

Detecting transparent film or transparent glass







# **ORDER GUIDE**

Туре		Appearance	Sensing range	Model No. (Note)	Output
Thru-beam	2 m 6.562 ft cable length		300 mm 11.811 in	US-N300	NPN transistor universal
Thru-I	5 m 16.404 ft cable length			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.

Ramco Innovations

www.ramcoi.com

Phone 800-280-6933

(Sensor mounting bracket)

Accessory MS-N30

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



nsales@ramcoi.com

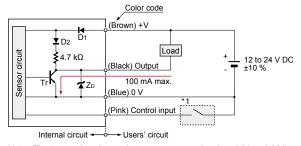
# **SPECIFICATIONS**

	Туре	Thru-beam	
Iten	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.	
Environmental resistance	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 M $\Omega$ , 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 <sup>2</sup> acceleration (10 G approx.) in X, Y and Z directions three times each	
Material		Enclosure: Polycarbonate	
Cable		0.2 mm² 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 mm², 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

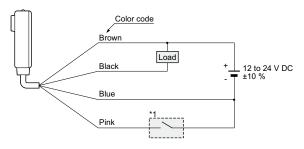
## I/O circuit diagram



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 Z0: Surge absorption zener diode Tr : NPN output transistor

## Wiring diagram



\*1

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

or or or or ...

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

PHOTO-ELECTRIC SENSORS MICRO PHOTO-

AREA SENSORS

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

PROXIMITY SENSORS

SENSORS
SENSOR
OPTIONS

SIMPLE WIRE-SAVING

WIRE-SAVING SYSTEMS

SYSTEMS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES ENERGY

SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide Liquid Leak Detection Liquid Level Detection Water Detection

Color Mark Detection Wafer Detection

Small / Slim Object Detection Obstacle Detection

US-N300

Ramco Innovations

FIBER

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS SAFETY LIGHT CURTAINS / SAFETY COMPONENTS PRESSURE / FLOW SENSORS

PARTICULAR USE SENSORS

SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

MEASURE-MENT SENSORS STATIC

STATIC CONTROL DEVICES LASER MARKERS

PLC HUMAN MACHINE

MACHINE INTERFACES

ENERGY MANAGEMENT SOLUTIONS

FA COMPONENTS

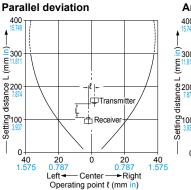
MACHINE VISION SYSTEMS UV CURING SYSTEMS

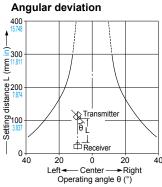
Selection Guide Liquid Leak Detection Liquid Level Detection Water Detection Color Mark Detection Wafer User Detection

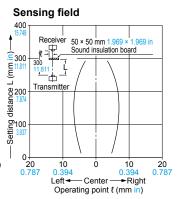
US-N300

Small / Slim Object Detection

# SENSING CHARACTERISTICS (TYPICAL)







# PRECAUTIONS FOR PROPER USE

Refer to p.1595 for general precautions.

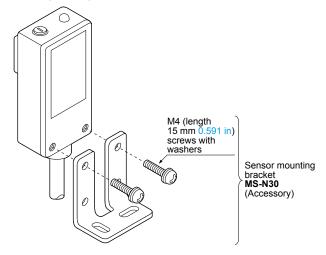


 Never use this product as a sensing device for personnel protection.

 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

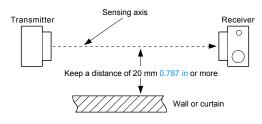
 Normally, use the sensor at the maximum sensitivity. However, if the sensing is not proper due to surrounding objects (reflection from surrounding objects, etc.), adjust the sensitivity.

# Influence of surrounding objects

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

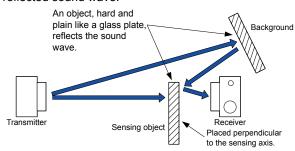
• If there is a wall or a curtain near the sensing axis, the sound reflection may cause the operation to be unstable.

#### <Countermeasure>



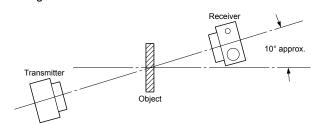
## Influence of background objects

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



#### <Countermeasure>

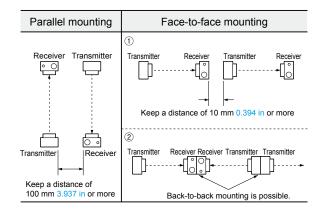
The receiver should be placed away from the object and at an angle to it as shown below.



# **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>



# 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 (m)

W: Minimum sensing object width (m) V: Traveling speed of the object (m/sec.) T : Sensor response time = 0.005 (sec.)

: Minimum sensing object width in the stationary condition  $= 0.02 \ 0.066 \ (m \ ft)$ 

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

 $W = 1032.808 \times 0.0050.016 + 0.020.066$ 

= 0.07 m 0.230 ft = 70 mm 2.756 in

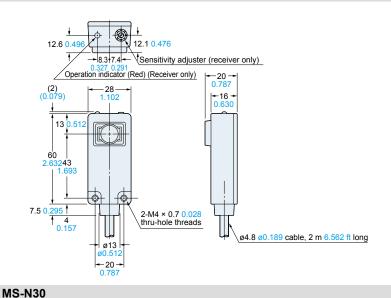
#### **Others**

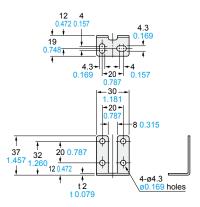
- Do not use during the initial transient time (50 ms) after the power supply is switched on.
- The ultrasonic sound propagates through the air. If the sensor is used at a place where air blows or the temperature suddenly changes (near a door, an air conditioner, etc.) the operation may become unstable. 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.

The CAD data can be downloaded from our website.

# DIMENSIONS (Unit: mm in)

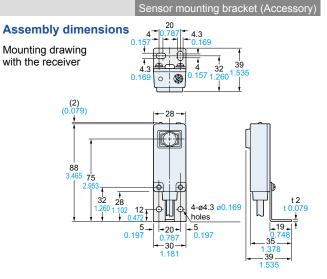
US-N300





Material: Cold rolled carbon steel (SPCC)

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



LASER SENSORS

PHOTO-ELECTRIC SENSORS MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

SENSOR OPTIONS

MEASURE-MENT SENSORS

CONTROL

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

FA COMPONENTS

MACHINE VISION SYSTEMS

Liquid Level Detection Water Detection

Wafer Detection

Small / Slim Object Detection Obstacle Detection