

Thru-beam Type Ultrasonic Sensor US-N300

MJEC-USN3J No.0055-77V

Thank you very much for purchasing Panasonic products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.



- 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.

1 SPECIFICATIONS

Type		Thru-beam	
Item	Model No. (Note)	US-N300	US-N300-P
Sensing range		300mm	
Supply voltage		12 to 24V DC±10% Ripple P-P 10% or less	
Current consumption		Transmitter: 35mA or less, Receiver: 35mA or less	
Output		NPN transistor universal • Maximum sink current: 100mA • Residual voltage: 1V or less (at 100mA sink)	PNP transistor universal • Maximum source current: 100mA • Residual voltage: 1V or less (at 100mA source)
	Output operation	Selectable either sound-received-ON or sound-blocked-ON by the control input	
	Short-circuit protection	Incorporated	
Response time		5ms or less	
Operation indicator		Red LED (lights up when the output is ON)	
Sensitivity adjuster		Continuously variable adjuster	
Transmission		220kHz approx.	
Protection		IP62 (IEC)	
Ambient temperature		0 to +50°C (No dew condensation) Storage: -25 to +70°C	
Ambient humidity		35 to 85% RH, Storage: 35 to 85% RH	
Material		Enclosure: Polycarbonate	
Cable		0.2mm ² 4-core (transmitter: 2-core) cabtyre cable, 2m long	
Weight		Transmitter: 80g approx., Receiver: 85g approx.	
Accessories		MS-N30 (Sensor mounting bracket): 1 set for transmitter and receiver, Adjusting screwdriver: 1 pc.	

Note: The model No. with suffix 'P' shown on the label affixed to the product is the transmitter, 'D' shown on the label is the receiver.
Transmitter: **US-N300P**, Receiver: **US-N300D**
The model No. with suffix '-C5' stands for the 5m cable length type.
Model No.: **US-N300-C5**

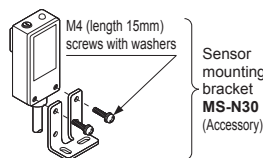
2 CAUTIONS

- 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.
- Make sure that the power supply is off while wiring.

- Take care that wrong wiring will damage the sensor.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Extension up to total 100m (both transmitter and receiver), or less, is possible with 0.3mm², or more, cable.
- Make sure that stress by forcible bend or pulling is not applied directly to the sensor cable joint.
- This sensor is suitable for indoor use only.
- Do not expose the transmitting element or the receiving element to moisture or dust. It may affect the sensing operation.

3 MOUNTING

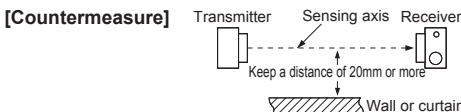
- The tightening torque should be 0.49N·m or less.



4 INFLUENCE OF SURROUNDING OBJECTS

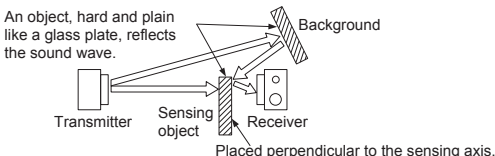
Influence of an object parallel to the sensing axis

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



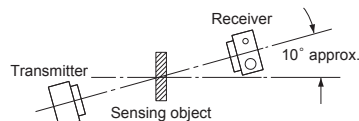
Influence of background objects

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



[Countermeasure]

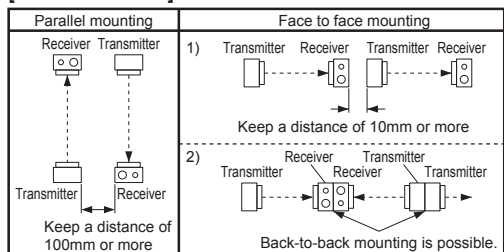
The receiver should be placed away from the object and at an angle to it as shown below.



5 MUTUAL INTERFERENCE

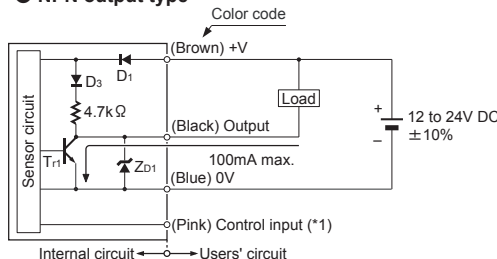
- When two or more sensors, are mounted close together, the sensors may not enter the 'sound-blocked state' due to mutual interference.

[Countermeasure]

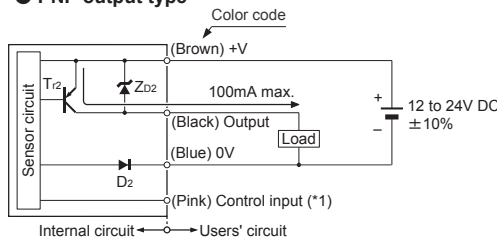


6 I/O CIRCUIT DIAGRAMS

● NPN output type



● PNP output type



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

*1: Selecting output operation by connecting control wire as shown below.

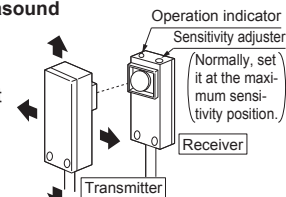
Connection	Operation
Connected to +V, or	Sound-blocked ON
Connected to 0V	Sound-received ON

Symbols ... D₁, D₂: Reverse supply polarity protection diode
D₃: Reverse current protection diode
Z_{D1}, Z_{D2}: Surge absorption zener diode
T₁: NPN output transistor
T₂: PNP output transistor

7 ADJUSTMENTS

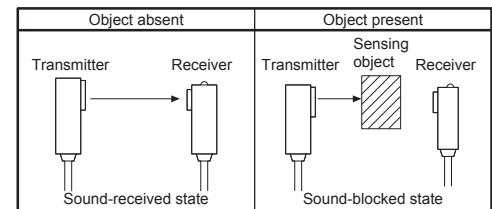
● How to align ultrasound

- ① After wiring, place the transmitter and the receiver face to face along a straight line and check the operation state.
- ② Move the transmitter and the receiver in the up, down, left and right (angular) directions, in order to determine the operation range in the state that the sensitivity adjuster is fully turned to the maximum sensitivity position (turned fully clockwise). Then, set them at the center of the range.

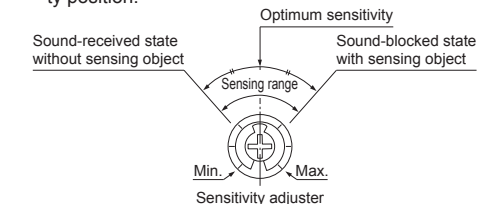


● Sensitivity adjustment

- 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 as follows.



- ① Set the adjuster to Min. Then, without any sensing object, turn the adjuster gradually clockwise, while seeing the operation indicator, to determine the point where the sensor enters the 'sound-received state'.
- ② With a sensing object between the sensor heads, turn the adjuster further clockwise until the sensor enters the 'sound-received state' again. Then, turn the adjuster back a little to determine the point where the sensor just enters the 'sound-blocked state'.
- ③ Set the adjuster at the center of the two points described in ① and ②, which is the optimum sensitivity position.



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