


US series

Long range with analog output
Ultrasonic Sensors

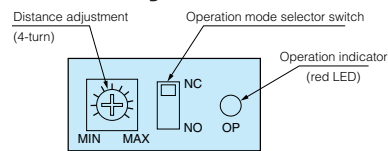


- Ultrasonic sensor embedded with amplifier and comparator
- Hybrid type, which can generate analogue output and comparator output at the same time!
- Easy to aim at the object because of narrow operation area!
- Realizing high resolution (1mm=10mV) with original circuit

Type

Type	Detection distance	Model	Operation mode	Output mode
Reflective	 0.08-1m	US-1AH	Detect ON/ Detect OFF selectable or Proportional output	<ul style="list-style-type: none"> • Analog • Comparator
		US-1AHPN		

Panel layout



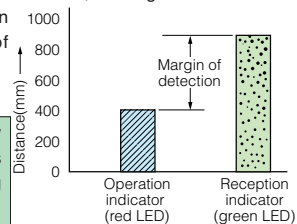
- The distance adjustment is a 4-turn volume. Turning clockwise increases the detecting distance up to about 1 m.
- Set the operation mode selector switch according to the application.
NC: Detect OFF (normally closed)
NO: Detect ON (normally open)
For using the analog output only, the operation above is unnecessary. Use the sensor with the factory setting enabled.

Indicators

The reception indicator (green LED) and operation indicator (red LED) on the panel respectively show different received signal levels as described in the figure.

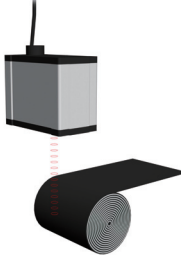
The range of illumination for the operation indicator depends on the distance adjustment setting. The reception indicator is illuminated within the range of distance in which ultrasonic waves are received, although the boundaries may vary depending on the detection object. This indicates a margin of detection.

For detection of object with low ultrasonic reflectance such as rubber, the maximum detecting distance may be reduced.




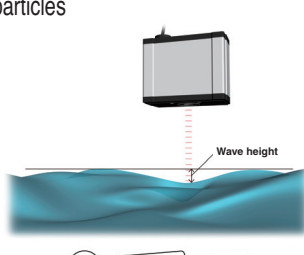
Applications

- Winding thickness control/measurement
- Detection of transparent objects/bottles
- Analog control of level of liquid/fine particles



Ultrasonic wave sensor capable of detecting intense black rubber. Analog voltage output available for analog control.





Wave height controlled in pool equipped with wave generator.

US-1AH

Rating/Performance/Specification

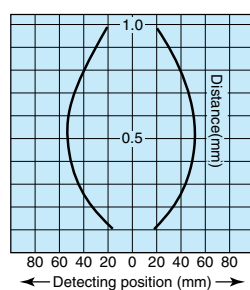
Type		Ultrasonic (analog output)	
Model		US-1AH	US-1AHPN
Detection method		Reflective	
Detecting distance		80-1000 ±10mm With 40x40mm aluminum plate	
Power supply		12-24V DC ±10% / Ripple 10% or less	
Current consumption		50mA or less	
Output mode	Analog output	0.6 - 10V Output impedance: 600 Ω	
	Comparator output	NPN open collector Sink current 100 mA (30 VDC) or less	PNP open collector Source current 100 mA (30 VDC) or less
Operation mode		Detect ON/Detect OFF selectable (with switch)	
Minimum resolution		1mm=10mV	
Linearity		±3% FS (full scale)	
Response time	Analog output:	10V→2V 60ms 2V→10V 50ms	
	Comparator output:	Analog response time + 10 ms	
Hysteresis		3% or less. of detecting distance	
Ultrasonic frequency		186kHz±10kHz	
Indicator		Operation indicator: Red LED (each on front/back) Reception indicator: Green LED (front)	
Volume (VR)		Distance adjustment (4-turn without stopper) provided	
Switch (SW)		Detect ON/Detect OFF selector switch	
Protective feature		Output short circuit protection, protection against reverse connection	
Material		Case: aluminum / Lid: polycarbonate Front panel: acrylic / Back panel: ABS	
Connection		Attached cable (φ6.5mm) 0.3 mm ² 4 cores, 2 m	
Weight		350 g or less	
Accessory		Operation manual	

Environmental Specification

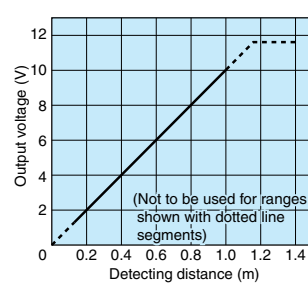
Ambient temperature	-10 - +55 °C (non-freezing)
Ambient humidity	35-85%RH (non-condensing)
Ambient wind speed	1m/s or less
Protective structure	IP51
Vibration	10-55 Hz / 1.5 mm double amplitude / 2 hours each in 3 directions
Shock	500 m/s ² / 2 times each in 3 directions (ultrasonic element excluded)
Dielectric withstanding	500VAC for 1 minute
Insulation resistance	500 VDC, 20 MΩ or higher

Performance Curves (Typical)

• Response Curves: Detecting Position

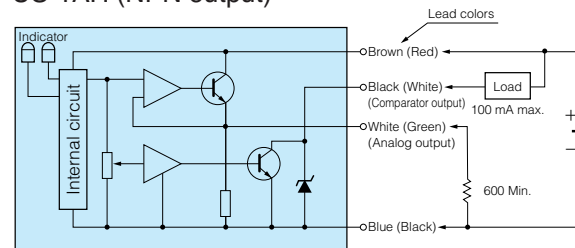


• Output-Distance Curve



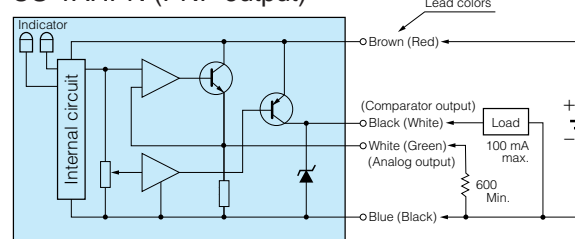
Input/Output Circuit and Connection

US-1AH (NPN output)



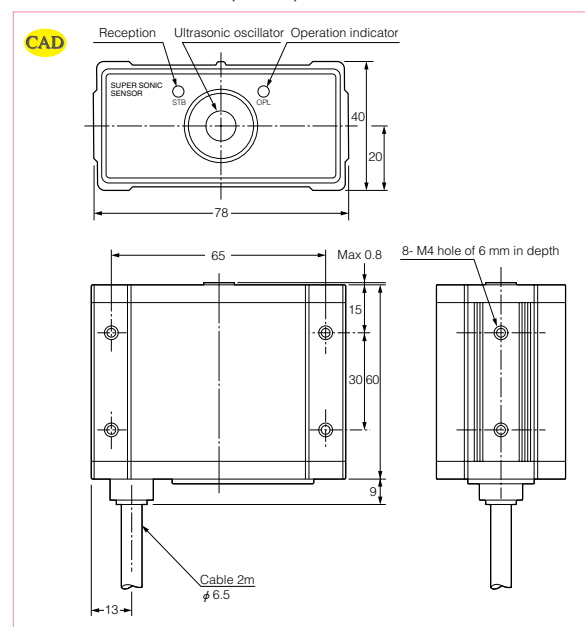
• Insulate unused output lines.

US-1AHPN (PNP output)



• Insulate unused output lines.

Dimensions (in mm)



• Applicable comparator



(ANP Series)