



IRU-2000/3000

Ultrasonic Level Sensors

- 1 to 25 ft. (0.3 to 7.62 m) detection range for 2000 series
- 1.25 to 35 ft. (0.38 to 10.67 m) detection range for 3000 series
- Easy to install
- Internal temperature compensation
- Programmable response time
- Maintenance free
- Programmable filtering

■ Description

The IRU 2000/3000 series sensors use ultrasonic technology to provide a non-contact method of determining distance or level measurements. This versatility makes the IRU series ideal for a variety of applications. The color, translucency, dielectric constant, specific gravity or viscosity of the target does not affect an ultrasonic sensor. Ultrasonic sensors function extremely well in harsh environments, are reliable, and require little or no maintenance.

■ Operational Description

Ultrasonic sensing is very similar to radar. The sensor transmits ultrasonic sound waves. If the sound waves meet a solid or reflective object, such as a liquid, they are reflected back and detected by the sensor. The time of flight is measured, and since the speed of sound is a well-known variable, the distance to the object can be calculated.

Until recently, the many variables in the speed of sound created inaccurate readings. With the advent of microprocessor technology, these variables can now be factored into the equation and eliminated. One such variable is ambient temperature. The IRU series incorporates internal temperature compensation to adjust for changes in ambient temperature. The IRU series also incorporates programmable filtering options to account for other variables, such as waves on a liquid, or tank irregularities. The distance to the object is converted into an analog output signal that is user adjustable.

■ Applications

The IRU series was designed for a wide range of applications, including presence/absence detection, proximity detection, and level control.



■ Specifications

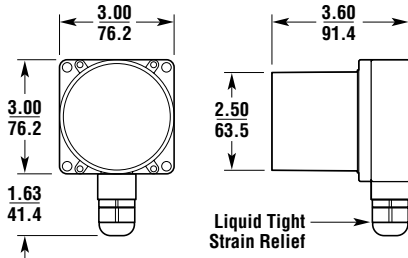
Model	IRU-200x	IRU-212x/222x/233x	IRU-313x/323x
Operating Range	1 to 25 ft. (0.3 to 7.6 m)	1 to 25 ft. (0.3 to 7.6 m)	1.25 to 35 ft. (0.38 to 10.67 m)
Available Outputs	(1) solid state relay 4-20 mA with (2) NPN trips Isolated 4-20 mA RS-485 with (1) NPN trip	4-20 mA with (2) NPN trips Isolated 4-20 mA RS-485 with (1) NPN trip	4-20 mA with (2) NPN trips Isolated 4-20 mA
Supply Voltage	24 VDC*	24 VDC*	24 VDC*
Total Current Draw	80 mA @ 24 VDC	80 mA @ 24 VDC	80 mA @ 24 VDC
Maximum Rated Power	2.5 W	2.5 W	2.5 W
Housing	ABS with UV inhibitor	PVC	PVC
Mounting	Surface mount, (4) screws	2 and 3 NPT 2 in. Teflon® faced flange 3 in. sanitary 3A flange	3 NPT 3 in. Teflon® faced flange
Transducer Type	Ceramic	Ceramic	Ceramic
Ratings	NEMA 4X	NEMA 4X	NEMA 4X
Approvals	Models 2002, 2003 & 2005: CSA C/US General Purpose Rating	Models 2125 & 2225: Class 1, Div. 2, Groups A,B,C,D All Models: CSA C/US General Purpose Rating	Models 3135 & 3235: Class 1, Div. 2, Groups A,B,C,D All Models: CSA C/US General Purpose Rating
Response Time	Programmable (20 ms minimum)	Programmable (20 ms minimum)	Programmable (20 ms minimum)
Sample Rate	Programmable (1-22 Hz)	Programmable (1-22 Hz)	Programmable (1-22 Hz)
Resolution	0.1 in. (2.5 mm)	0.1 in. (2.5 mm)	0.1 in. (2.5 mm)
Accuracy (with no temperature gradient)	±0.25% of detected range	±0.25% of detected range	±0.25% of detected range
Adjustments	RS-232 with RST module; potentiometer adjustments available on select models	RS-232 with RST module	RS-232 with RST module
Operating Temperature	-40 to 140°F (-40 to 60°C)	-40 to 140°F (-40 to 60°C)	-40 to 140°F (-40 to 60°C)
Temperature Compensation	Internal	Internal	Internal
Beam Pattern	9° off axis	9° off axis	9° off axis
Connections	IRU-2002 & 2003: (6) pin terminal strip IRU-2004 & 2005: (6) conductor cable (6 ft. (1.8 m) standard length)	(6) conductor cable (6 ft. (1.8 m) standard length)	(6) conductor cable (6 ft. (1.8 m) standard length)
Frequency	69 kHz	69 kHz	43 kHz

* The sensor will operate from 12-28 VDC, but the sensor performance will be diminished if the voltage is less than 24 VDC. A minimum of 14 VDC is required to program the sensor using the RST module.

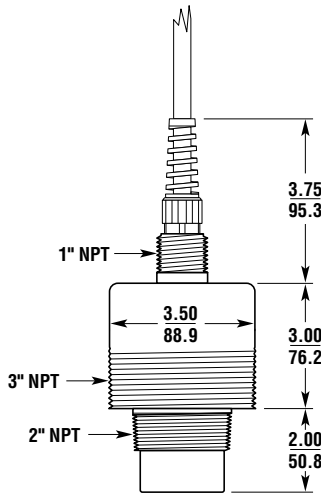
Specifications are subject to change without notice.

■ Dimensions — in./mm

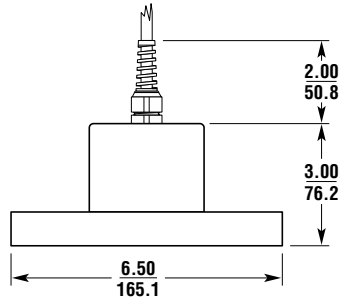
IRU-200x



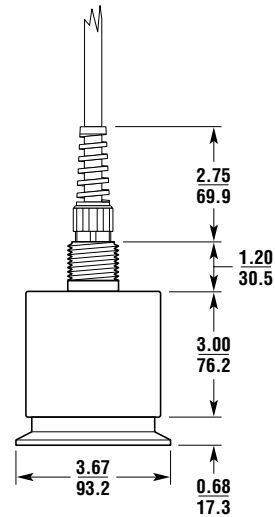
IRU-212x



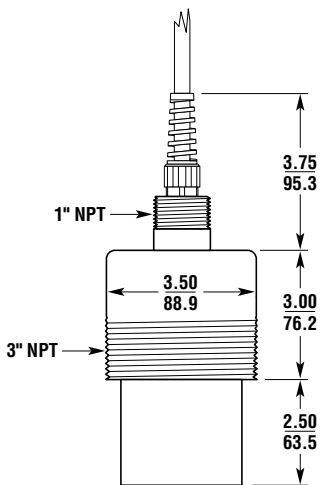
IRU-222x



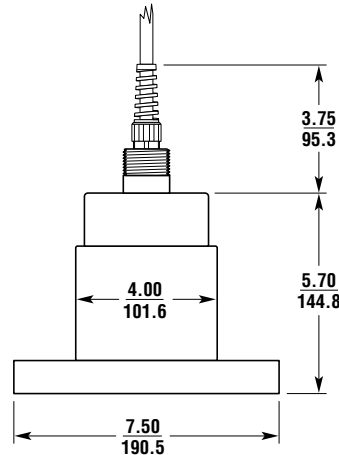
IRU-233x




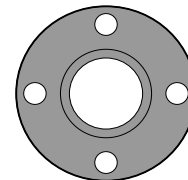
IRU-313x



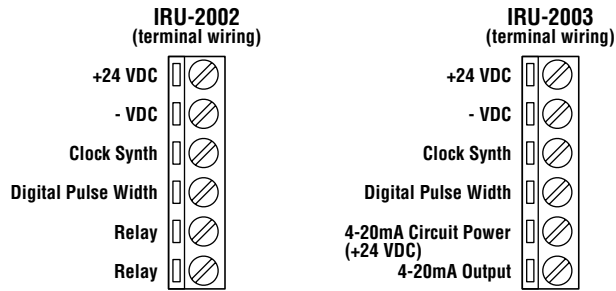
IRU-323x



 For information on ultrasonic sensing accessories, see www.apgsensors.com



■ **Wiring**



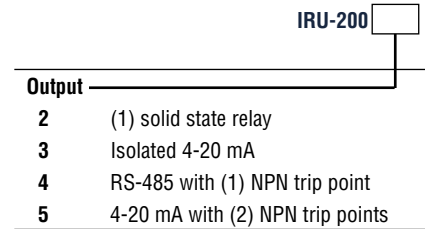
	IRU-2004	IRU-2005
Red	+24 VDC	+24 VDC
Black	-VDC	-VDC
Green	Clock	Clock
White	NPN trip	NPN 2
Blue	T(+) or (B)	NPN 1
Orange	T(-) or (A)	4-20 mA

	IRU-2123/2223/2333	IRU-2124/2224/2334	IRU-2125/2225/2335
Red	+24 VDC	+24 VDC	+24 VDC
Black	-VDC	-VDC	-VDC
Green	Clock sync	Clock sync	Clock sync
White	Digital pulse width	NPN trip	NPN trip 2
Blue	4-20 mA	T(+) or (B)	NPN trip 1
Orange	4-20 mA circuit power (+ 24 VDC)	T(-) or (A)	4-20 mA output

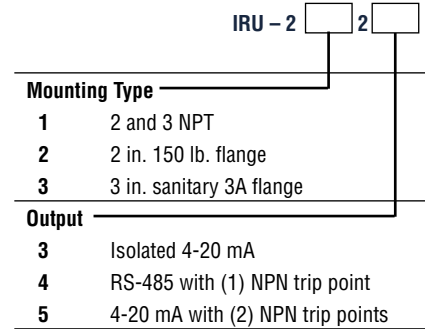
	IRU-3123/3233	IRU-2135/3235
Red	+24 VDC	+24 VDC
Black	-VDC	-VDC
Green	Clock sync	Clock sync
White	Digital pulse width	NPN trip 2
Blue	4-20 mA output	NPN trip 1
Orange	4-20 mA circuit power (+ 24 VDC)	4-20 mA output

■ **Ordering Information**

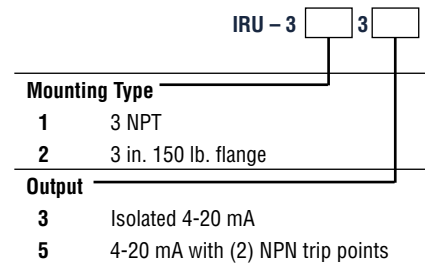
IRU-200x Series




IRU-212x/222x/233x Series



IRU-313x/323x Series



 For information on RST-2001A (serial interface) and RST-3001 (USB interface) Programming Modules, see www.apgsensors.com

 For information on ultrasonic sensing accessories, see www.apgsensors.com