Type UD2100 Ultrasonic Doppler Flow Meter

Product description

The type UD2100 ultrasonic doppler flow meter is a permanent clamp-on flow meter for non-invasive flow measurement. It is specifically designed for challenging flow applications with dirty, aerated, abrasive, corrosive and/or caustic media – applications where the most regular flow meters would be compromised.

Typical media in applications of the UD2100 contains: Wastewater, slurries, vicious liquids, sewage, abrasives, sediments and others. This flow meter is recommend for use in fully filled pipes and virtually any media that contains solids or bubbles. The UD2100 can be used on PVC, CPVC, PE, PVDF, PP-H, ABS, PB, HDPE, steel and iron pipes. Processes can be monitored directly by a higherlevel system via 4-20 mA, HART or Modbus output.

Benefits/features

- Large, easy to read graphic display with backlighting
- Easy to install without special tools
- "Clamp-on" design
- Made for difficult applications and dirty media
- Compatible with almost all pipe types and diameters
- Simple quick-start set up procedure
- Compact integral design
- Various options for process communication
- Integrated datalogger

Applications

- Wastewater Treatment
- Mining
- Paper Mills
- Monitoring of manufacturing processes with dirty liquids
- Industrial effluent

Recommended for use with liquids containing suspended solids or bubbles with minimum size of 100 microns and minimum concentration of 75 ppm. Most applications (except potable, distilled, or deionized water) will meet this minimum requirement.

Specifications

General

Measuring method	Ultrasonic doppler measurement	
Flow range	± 0.1 m/s - 12.2 m/s (± 0.1 ft/s - 40 ft/s), bi-directional	
Accuracy	± 2 % of the flow reading at a flow rate > ± 0.3 m/s (11.8 ft/sec). Requires solids or bubbles with minimum size of 100 microns and minimum concentration of 75 ppm	
Repeatability	± 0.5 % of measured value	
Linearity	± 0.5 %	
Response time	1 s	
Selectable flow units	Velocity	m/sec, ft/sec.
	Volume	Liter (L) per sec/min/hour/day US gallons (USG) per sec/min/hour/day Imperial gallons (ISG) per sec/min/hour/day Barrels (bbl) per sec/min/hour/day Cubic meter (m3) per sec/min/hour/day Cubic feet (m3) per sec/min/hour/day
Selectable totalizer units	Liters, m3, US gallons, imperial gallons, barrels, cubic feet	
Menu languages	English, Spanish, French	

Environment

Operating temperature	-20 °C to +60 °C (head unit) -40 °C to +150 °C (sensor)	-4 °F to +140 °F -40 °F to +300 °F
Storage temperature	-10 °C to +60 °C	14 °F to 140 °F
Humidity during operation	Max. 90 % relative humidity at +50 °C (122 °F)	

Suitable pipe types

Pipe materials	UPVC, CPVC, PE, PVDF, PP-H, ABS, PB, HDPE, steel, stainless steel, iron, cast iron, ductile iron, metal, line pipes. Pipes with loose insertion liners and pipes with walls containing air are not supported.	
Pipe diameter (d)	16 - 4500 mm*	½ - 180 inch*

Electronics

Power supply	100 - 240 V AC 50-60 Hz 9-32 V DC
Power consumption	AC: Max. 10 VA DC: Max 10 Watt

Outputs

Analog output

Range	4 – 20 mA or 0-5 VDC
Resolution	0.1 % of measurement range
Load max.	1'000 Ω
Insulation	1'500 V optically isolated
Alarm current	3.5 mA

Pulse output

Pulse sequence	2.25 s minimum time between pulses
Pulse Duration	350 ms
Max. voltage	250 VAC
Max. current	12 A
Insulation	1'000 V

Modbus

Type	Modbus RTU via RS485 or HART

Relays

Type	2x SPDT 5 amp
Programming	Programmable flow alarm and/or proportional pulse

Outputs

Datalogger		
Interface	USB	
Data points	26 million data points	
Format	CSV	

Housing and display

Enclosure		
Material	Polycarbonate	
Dimensions	278 x 188 x 130 mm	10.95 x 7.4 x 5.12 inch
Weight	5 kg	11 lbs
Keyboard	Keypad with 5 buttons	
Protection class	IP 66 / NEMA4X (water and dust tight)	
Display		
Type	White, backlit matrix	
Supported languages	English, Spanish, French	
Sensor		
Material	316SS	
Dimensions	85 x35 x 38 mm	3.375 x 1.375 x 1.5 inch

Shipping information

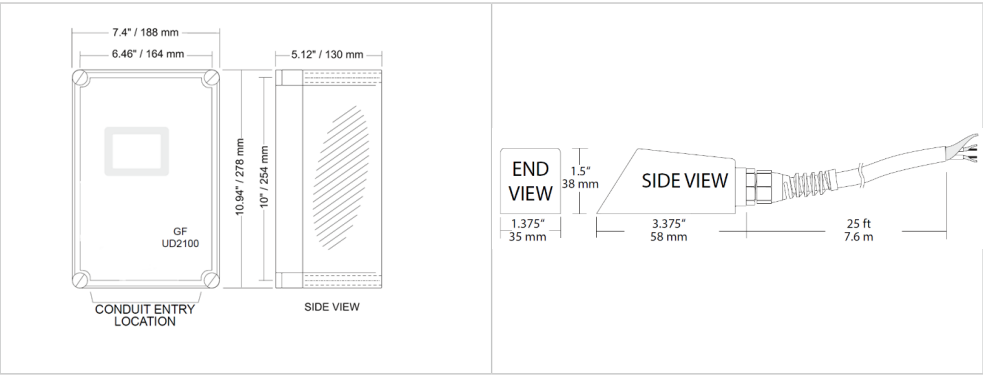
Package dimensions	380 x 290 x 230 mm	15 x 12 x 10 inch
Weight	5.4 kg	12 lbs
Volume weight	5.4 kg	12 lbs

Standards/approvals

CE, conforms to RoHS		
Security	BS EN 61010-1:2020	
EMV	BS EN 61326-1:2013	BS EN 61326-2-3:2013
Environment	BS EN 60068-1:2015	
	BS EN 60068-2-1:2008	BS EN 60068-2-2:2008

* Note: Pipe size is dependant on pipe material and inner pipe diameter

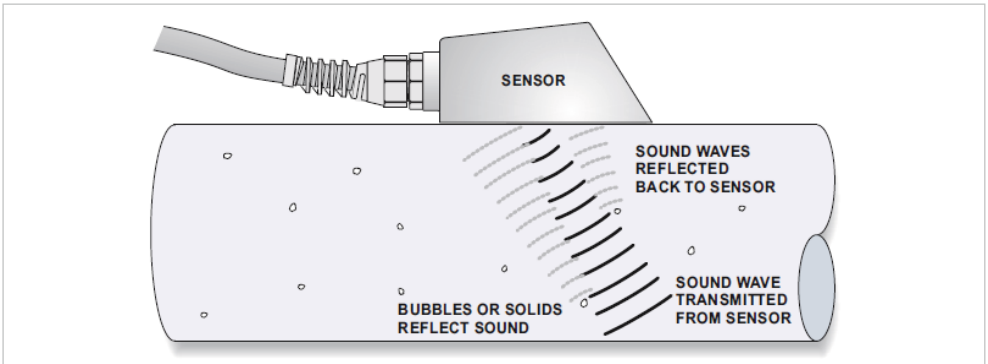
Dimensions



Packaging content

1 Type UD2100 head-unit
2 Type UD2100 Doppler Sensor incl. cable
3 S/steel hose-clip
4 S/steel sensor pipe clamp
5 Super Lube® coupling grease (12 g)
6 Cable ties
7 GF calibration certificate
8 Enclosure mounting hardware
9 USB-Stick incl. product documentation &factory calibration certificate

Function



The UD2100 ultrasonic doppler sensor continuously emits high frequency (ultrasonic) sound pulses through the pipe wall into the flowing liquid.

The ultrasonic sound pulses get reflected back from the particles or gas bubbles in the media. At zero flow the reflected frequency is the same as the emitted frequency. If the liquid is flowing the reflected frequency is different from the emitted (through the doppler effect.

This frequency shift is measured continuously by the UD2100 and used to precisely measure the velocity of the media.

Ordering Information

Config. Code	Code	Description
UD2100-A1-A1-A1-A1-A	159 300 320	UD2100 | 100-240 VAC | 4-20 mA, Pulse | 7.6 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-A1-A1-A1-B1-A	159 300 321	UD2100 | 100-240 VAC | 4-20 mA, Pulse | 15 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-A1-A1-A1-C1-A	159 300 322	UD2100 | 100-240 VAC | 4-20 mA, Pulse | 30 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-A1-A1-A1-A2-A	159 300 323	UD2100 | 100-240 VAC | Modbus, 4-20 mA, Pulse | 7.6 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-A1-A1-A1-B2-A	159 300 324	UD2100 | 100-240 VAC | Modbus, 4-20 mA, Pulse | 15 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-A1-A1-A1-C2-A	159 300 325	UD2100 | 100-240 VAC | Modbus, 4-20 mA, Pulse | 30 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-B1-A1-A1-A1-A	159 300 326	UD2100 | 9-32 VDC | 4-20 mA, Pulse | 7.6 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-B1-A1-A1-B1-A	159 300 327	UD2100 | 9-32 VDC | 4-20 mA, Pulse | 15 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-B1-A1-A1-C1-A	159 300 328	UD2100 | 9-32 VDC | 4-20 mA, Pulse | 30 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-B1-A1-A1-A2-A	159 300 329	UD2100 | 9-32 VDC | Modbus, 4-20 mA, Pulse | 7.6 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-B1-A1-A1-B2-A	159 300 330	UD2100 | 9-32 VDC | Modbus, 4-20 mA, Pulse | 15 m cable | NEMA4X/IP66 | -20-60 °C
UD2100-B1-A1-A1-C2-A	159 300 331	UD2100 | 9-32 VDC | Modbus, 4-20 mA, Pulse | 30 m cable | NEMA4X/IP66 | -20-60 °C

Accessories and replacement parts

Code	Description
159 300 340	Standard clamp-on Sensor with 25 ft / 7.6 m shielded coaxial pair
159 300 341	Standard clamp-on Sensor with 50 ft / 15 m length cable
159 300 342	Standard clamp-on Sensor with 100 ft / 30 m length cable
159 300 343	Sensor cable Junction Box
159 300 344	Sensor Mounting Kit with Couplant and SS clamps for pipes up to 32" (80 cm)
159 300 345	Enclosure Sunscreen (iridite aluminum)
159 300 038	Super Lube® Grease 85 g
159 300 346	Extra sensor cable 20 ft / 6 m length
159 300 347	Extra sensor cable 35 ft / 10 m length
159 300 348	Extra sensor cable 175 ft / 50 m length
	Extra sensor cable custom length (up to 500 ft / 152 m, RG174U shielded coaxial pair)

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