

The Data Industrial SDI Series flow sensor offers accurate liquid flow measurement in closed pipe systems in an easy to install economical package. Impeller sensors offer a quick response to changes in flow rate and are well suited to flow control and batch type applications in addition to flow monitoring. The new four-bladed impeller design is rugged, non-fouling and does not typically require custom calibration. Coupled with the proprietary patented digital detection circuit, the sensor measures flows from under 0.3 ft/sec to over 20 ft/sec regardless of the conductivity or turbidity of the liquid. The standard frequency output produces a low impedance square wave signal proportional to flow rate that may be transmitted up to 2000 feet without amplification. Models are available to measure flow in one or both directions.

Hot Tap Sensors

Hot tap sensors feature an isolation valve and mounting hardware to install or remove the sensor from a pipeline that would be difficult to shut down or drain. In a true "hot tap" installation the sensor is mounted in the pipe under pressure by attaching a service saddle or weld-on fitting to the pipe and mounting the isolating valve to the threaded connection. A hole is then cut in the wall of the pipe through the valve using a commercial tapping machine with a 1" size cutter. Once the hole is cut, the tapping machine is removed and the valve is shut. Then the sensor assembly is mounted to the isolation valve and extended into the pipeline to measure flow. Even in new construction a hot tap sensor may be appropriate for service considerations.

The Data Industrial hot tap sensor is constructed of 316 Stainless Steel and is rated for service to 1000 psi and 180° F. The sensor installs in a 1" NPT tap for both wet and dry installations. The small stem diameter allows the sensor to be inserted into the pressurized pipeline by hand without the need for an installation tool. The mounting hardware holds the sensor firmly in place at the correct depth and alignment.

Output Configurations

Standard Frequency-

Sensor output is a pulse proportional to flow. The signal is similar to all 200 Series Data Industrial flow sensors and will interface with all existing Data Industrial transmitters and monitors. The power supply to the sensor and the output signal from the sensor is carried on the same two wires. Wire connections are made at screw terminals on removable headers inside the NEMA 4X housing.

Analog Output-

The sensor is also available with a two-wire loop powered 4-20 mA output. The analog output is produced by an on-board micro-controller for precise, drift-free signals. The unit is programmed from a computer using Windows® based software and a connection cable. Units may be pre-programmed at the factory or field programmed. All information is stored in non-volatile memory in the flow sensor.

Scaled Pulse Output-

The scaled pulse is produced by an on-board micro-controller for precise, accurate outputs. This option may be programmed to produce an isolated solid state contact closure scaled to any number of engineering units of measure. Sensors may be pre-programmed at the factory or field programmed using a Data Industrial connection cable and a Windows® based software program. All information is stored in non-volatile memory in the flow sensor. This is a four-wire option.



Bi-directional Flow- Analog Output-

This option provides a programmable 4-20 mA signal proportional to flow rate and a contact closure to indicate the direction of flow. All programming is accomplished as previously mentioned. The user can program the unit for pipe size, flow scale and the direction of flow. This is a six-wire option.

Bi-directional Flow- Scaled Pulse Output-

This option provides the user with a choice of outputs. In one case the sensor provides an output scaled to the required number of engineering units on one set of terminals and a contact closure to indicate the direction of flow on another. The other choice provides two isolated scaled pulse outputs, one for each direction. Programming the output choice, pipe size, output scale and direction of flow by the user are also accomplished by using a PC with Data Industrial software and connection cable. This option also requires six wires.

Display Options-

All models except the standard frequency output version may also be equipped with a display. Integrated into the NEMA 4X housing, the 8 digit LCD may be programmed to show rate of flow, flow total or toggle between the two. Bi-directional models also show flow direction.

Specifications

Wetted Materials:

Sensor stem, mounting adapter, and isolation valve:

- 316 Stainless steel

Sensor Tip:

- GF polyphenylene sulfide (PPS)

O-rings, bearings, shaft:

- see ordering matrix

Operating temperature: Electronics:

- 150°F (65°C)

Operating Temperature: LCD:

- 150°F (65°C)

Maximum Pressure Rating:

- 1000 psi (68.9 bar) @ 70°F (21°C)*
 - 900 psi (62 bar) @ 100°F (37.8°C)*
 - 670 psi (46.1 bar) @ 140°F (60°C)*
 - 225 psi (15.5 bar) @ 180°F (82°C)*
- * Non-Shock

Optimum Design Flow Range:

- 1 to 20 ft/sec
- extended flow range < 0.3 to 20 fps

Pressure Drop:

- 0.5 psi or less @ 10 ft/sec for all pipe sizes 1.5" dia and up.

Accuracy:

- Standard: to +/- 1% of rate over optimum flow range
- Custom wet calibration : On request

Straight Pipe Requirement:

- install sensor in straight pipe section with a minimum distance of 10 diameters upstream and 5 diameters downstream to any bend, transition, or obstruction.

Repeatability:

+/- 0.5%

Enclosure:

- Polypropylene with Viton® sealed acrylic cover. Meets NEMA 4X specifications

Wire Connections:

- all wire connections are made to screw type terminals within the electronics housing, 1/2" conduit thread connection

Programming:

- all programmable models utilize Data Industrial A301 connector cable and SDI Series software

Display: (optional)

- 8 character, 3/8" LCD
- STN (Super twisted Nematic) display
- annunciators for: rate, total, input, output flow direction for Bi-directional models

Accessories:

- ASDI Programming Kit contains software and A301 programming cable
- A1027 Hot Tap Adapter Nipple

SDI Hot Tap Ordering Matrix

	SDI	0	H1	N	0	0	-	0	2	0	0
Material											
Stainless Steel		0									
Type											
Hot Tap for Pipe 1½" - 10" *			H1								
Hot Tap for Pipe 12" - 36" *			H2								
Hot Tap for Pipe 36" and UP *			H3								
Electronic Housing											
NEMA 4X				N							
Output											
Standard Frequency Pulse										0	
Analog 4-20mA										1	
Scaled Pulse										2	
Bi-Directional 4-20mA + Direction										5	
Bi-Directional Scaled Pulse										6	
Display											
No Display										0	
LCD Option (not available with output option 0)										1	
O-Ring											
Viton®										0	
Shaft											
Tungsten Carbide											2
Impeller											
Stainless Steel											0
Bearing											
Torlon®											0

* Pipe Sizes for reference only - Depending on pipe material, tapping saddle, or existing hardware longer sensor length may be required - Contact Factory.

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Torlon® is a registered trademark of Amoco Performance Products

Windows® is a registered trademark of Microsoft Corporation

Power Specifications

	uni-directional			bi-directional	
	raw pulse option 0	analog loop option 1	scaled pulse option 2	analog loop option 5	scaled pulse option 6
Number of wire connections	2	2	4	6	6
Pulse Units					
Operating Voltage	8-35 VDC	N/A	12-30 VAC 12-35 VDC	12-30 VAC 12-35 VDC	12-30 VAC 12-35 VDC
Oversvoltage protection	30 VAC ±40 VDC	±40 VDC	30 VAC ±40 VDC	30 VAC ±40 VDC	30 VAC ±40 VDC
Quiescent Current Draw @12VDC or 24VAC	330uA TYP	Software controlled current of 3.5-20.5mA	< 2mA	< 5.0 mA	< 5.0 mA
Short Circuit Current	50mA TYP	N/A	> 100 mA	for direction > 100 mA	> 100 mA
Output Frequency	800 Hz max	N/A	scaled by customer	N/A	scaled by customer
Output Pulse Width	5 mS below 100 Hz	N/A	adjustable 50mS to 5.0 second in 50 mS increments	N/A	adjustable 50mS to 5.0 second in 50 mS increments
Output Isolation	N/A	N/A	Opto-Isolated	Opto-Isolated	Opto-Isolated
Analog Units					
Operating Voltage	N/A	8-35 VDC	N/A	8-35 VDC	N/A
Output Response Time	N/A	varies with programmable filter	N/A	varies with programmable filter	N/A