



FSI-T Series PVC Flow Sensor

Creative Sensor Technology FSI series flow sensors feature proven impeller based technology designed for flow monitoring/flow control applications in irrigation, water conservation and related industries.

The PVC sensor with socket connections is offered for service in PVC piping systems.

Designed by the same team who created the original impeller flow sensor, this sensor is a completely new custom molded design. The sensor features a digital output signal proportional to flow. The electrical characteristics of the output signal duplicate existing impeller flow sensor signals making the FSI series sensor compatible with all manufacturer's control products.

The pulse signal will travel up to 2,000 feet without amplification.

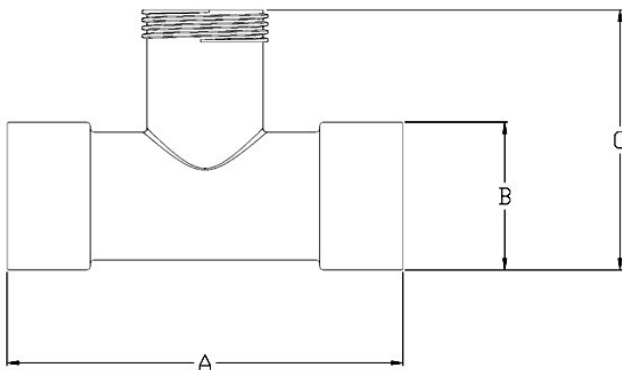
The key elements of this new technology are a proprietary mounting tee, ultra-lightweight impeller and solid state sensing electronics giving the FSI series sensor improved performance.



Applications

- Flow sensing applications in PVC piping systems above and below grade
- Flow sensing input to irrigation control systems
- Flow sensing input to pump monitoring or control systems
- Flow sensing applications for water recycling, water harvesting or water reclamation applications

Flow Sensor Dimensions



SIZE	A LENGTH	B DIAMETER	C HEIGHT
1"	5.625" (143 mm)	1.710" (43 mm)	3.487" (88 mm)
1 1/2"	6.188" (157 mm)	2.310" (58 mm)	4.065" (103 mm)
2"	7.00" (178 mm)	2.875" (73 mm)	4.573" (116 mm)

Allow 3/4" clearance above the branch of the tee to remove flow sensor insert for service.



Specifications

Flow Range

- 0.25 to 15 FPS

Pressure Rating

- 240 PSI Maximum working pressure

Temperature Range

- 32°F to 140° F (0° to 60° C)

Wetted Materials

- Impeller – HDPE (High Density Polyethylene)
- Mounting Tee - Type 1 PVC
- O-ring — BUNA N
- Retaining Nut — Type 1 PVC
- Sensor Insert — Type 1 PVC
- Shaft – Tungsten Carbide

Output Signal

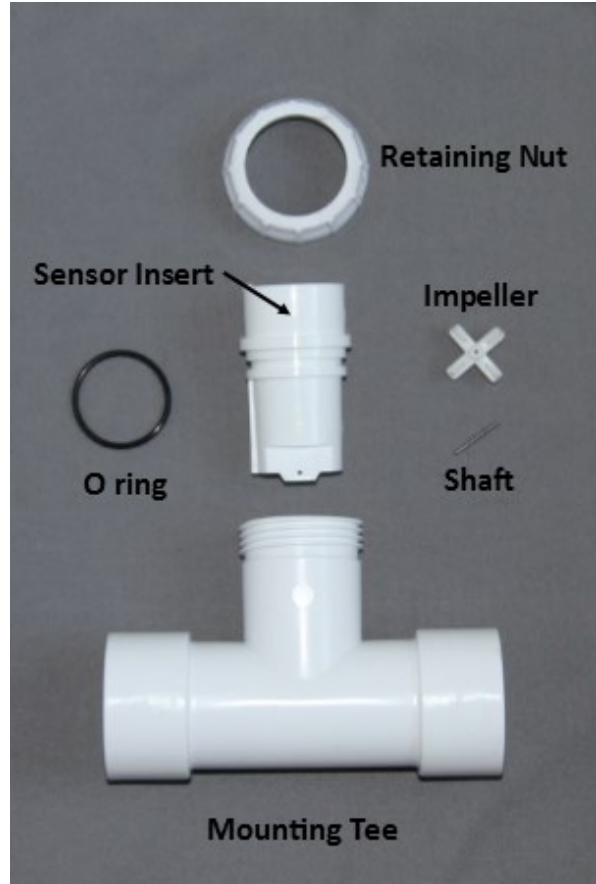
- Frequency Range 0.3 Hz to 200 Hz

Transducer Excitation - all electronics versions except – sensor suffix 009

- Quiescent current 120 uA@8 VDC to 35 VDC max.
- Off State (VHigh) = Supply Voltage - (120 uA X Source Resistance)
- On State (VLow) = Max. 0.85 Volts@50mA (10Ω+0.7VDC)

Electrical Cable

- Standard electronics –001 version is equipped with 2 single conductor solid copper #18 AWG leads with direct burial insulation.
- Lead length 48 inches.
- Wiring may be extended up to 2,000 feet with direct burial, twisted pair shielded



Ordering Information



Description	Size	Part number
Complete flow sensor	1 inch	FSI-T10-001
	1 1/2 inch	FSI-T15-001
	2 inch	FSI-T20-001



Flow sensor insert only		FSI-EA0-001
-------------------------	--	-------------



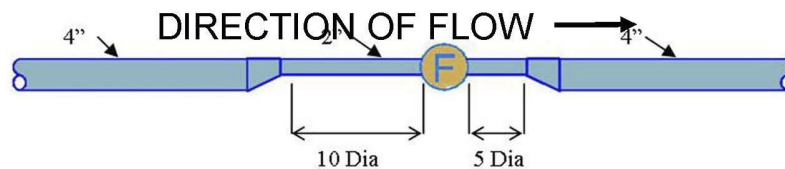
Impeller Repair Kit		FSI-T00-001
---------------------	--	-------------



Flow Sensor Operating Range

CST flow sensors use a rotating impeller to sense the water moving through the closed pipe. The speed of the impeller rotation is proportional to the velocity of the liquid. As the impeller turns, it produces digital pulses. The relationship between velocity and volumetric flow rate is dependent on the size of the pipe and may be calculated using the formula $Q_{gpm} = V_{fps} \times D^2 \times 2.45$ where Q is the flow rate in gpm, V is velocity in fps and D is the inside diameter of the pipe in inches. The pipe must be full for the rotational speed of the impeller to accurately reflect flow.

CST FSI Series flow sensors measure flow over a range from **0.076–4.57m/s**. **Size the flow sensor for the flow rates that need to be measured, not the pipe size.** The most common mistake in selecting a flow sensor is to oversize the unit and not be able to measure low flow. The flow sensor will operate at significantly higher velocities than commonly used for sizing pipe. Note: a 2" flow sensor has an operating range high enough for use with 3 or 4 inch diameter pipelines running at lower velocities. If the system flow rate falls below the minimum shown in these tables, use a smaller diameter flow sensor installed in a "meter run"- a section of pipe containing 10 diameters of straight pipe ahead of the sensor and 5 diameters of straight pipe after the sensor, as shown below.



The table below shows the flow rate of each sensor size within its operating range. The pressure drop through the sensor at maximum flow rates are included for reference.

Flow Sensor Model		FSI-T10	FSI-B15	FSI-T15	FSI-T20	FSI-S30	FSI-S40	FSI-S60
Nominal Pipe Size		1"	1 1/2"	1 1/2"	2	3	4	6
FLOW	M/SEC	LPM	LPM	LPM	LPM	LPM	LPM	LPM
MINIMUM	0.076	3.25		6.80	10.60	22.70	37.85	
	0.15	6.51	10.60	13.60	21.20	45.40	75.70	170.30
	0.3	13.25	20.82	27.41	42.80	90.80	151.40	340.70
	0.61	26.50	41.64	54.90	87.00	181.60	302.80	681.40
	0.91	39.37	62.46	83.28	128.70	272.50	454.20	1022.00
	1.52	64.35	104.10	136.30	215.80	454.20	757.00	1703.00
	2.13	90.85	145.70	193.10	299.00	635.90	1060.00	2385.00
	3.04	132.50	208.20	272.50	427.80	908.50	1514.00	3407.00
	3.65	159.00	249.80	329.30	514.80	1090.00	1817.00	4088.00
MAXIMUM	4.57	196.80	314.20	408.80	643.50			Not avail
								In AUST.
FRICTION LOSS AT MAXIMUM FLOW		1.72KPA	1.24KPA	1.24KPA	1.03KPA	1.03KPA	1.03KPA	1.03KPA

Calculations are made using Type K copper pipe dimensions for FSI-B15 sensor and Class 200 PVC pipe dimensions for all others
 Minimum velocity of FSI-B15 and FSI-S60 sensors is 0.01 M/SEC
 Maximum velocity for all saddle type sensors is 3.65 M/SEC