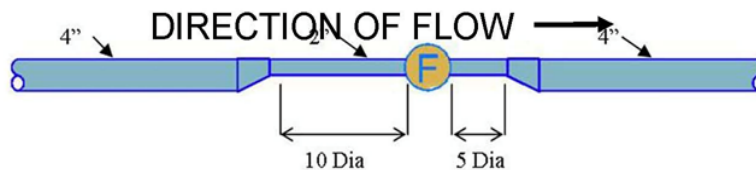




Flow Sensor Operating Range

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 0.076-4.57 M/Sec. **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
Nominal Pipe Size		1" (25mm)	1 1/2" (40mm)	1 1/2" (40mm)	2" (50mm)	3" (80mm)	4" (100mm)
	M/SEC	LPM	LPM	LPM	LPM	LPM	LPM
MINIMUM FLOW	0.076	3.255		6.8	10.6	22.7	37.9
	0.15	6.511	10.6	13.6	21.2	45.4	75.7
	0.3	13.25	20.82	27.4	42.8	90.8	151.4
	0.61	26.5	41.64	54.9	87.1	181.7	302.8
	0.91	39.37	62.45	83.3	128.7	272.5	454.2
	1.52	64.35	104.1	136.3	215.7	454.2	757
	2.13	90.85	145.7	193	299	635.9	1059.8
	3.04	132.5	208.2	272.5	427.7	908.4	1514
	3.65	159	249.8	329.3	514.8	1090	1816.8
MAXIMUM FLOW	4.57	196.8	314.2	408.8	643.5		
FRICION LOSS AT MAXIMUM FLOW		1.72 KPA	1.24 KPA	1.24 KPA	1.03 KPA	1.03 KPA	1.03 KPA

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 0.5 FPS
 Maximum velocity for all saddle type sensors is 12 FPS