CLARK
FSI-S00-000 Saddle Mount Impeller Type Flow Sensor

3" & 4" Pipe Size, Pulse Output

DESCRIPTION

FSI-S00 flow sensors are designed specifically for flow monitoring and control applications in fluidic systems where the materials of construction and performance specifications are suitable.

The flow sensors are designed specifically for irrigation measurement and control applications. The standard two- wire flow sensor output is a digital square wave proportional to flow. The 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 sensor insert mounts in a housing that controls the depth and alignment of the impeller, unlike other insert type sensors that may be mis-aligned or set to the wrong depth. The housing is permanently attached to the PVC saddle therefore no additional mounting hardware is required. They are rated to operate at pressures up to 150 psi.

FEATURES

- **Lower flow measurement** than competitive devices from unique mechanical design
- **Moisture resistant construction** for under-ground installations
- **Simple installation** – drill the pipe and mount the saddle- no need to measure, align or set depth
- **Easy to service** — single large retaining nut holds the sensor insert in the housing.

SPECIFICATIONS

Pipe Sizes
3", 4"
Wetted Materials
Impeller: HDPE (High Density Polyethylene)
Shaft: Tungsten Carbide
O-ring: BUNA N
Tee, Sensor Housing, Retaining Nut: Type 1 PVC
Working Pressure
150 PSI@90ºF
Temperature Range
32ºF to 140º F (0º to 60º C)
Output Signal
Frequency Range: 0.3 Hz to 200 Hz
Output Pulse: 5 msec +/-25%
Transducer Excitation
Quiescent current 600 uA@8 VDC to 35 VDC max.
Quiescent voltage (VHigh)= Supply Voltage - (600uA X Supply Impedance)
On State (VLow)= Max. 1.2 VDC@50mA current limit, (10 Ohm + 0.7VDC)

Accurcy:
±2% F.S.
Velocity Range (See Table 2)
0.25 to 12 FPS
3" Saddle: 6-300 GPM
4" Saddle: 10-480 GPM
Electrical Cable
2 single conductor solid copper U.L. listed #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 cable

DIMENSIONS

Table 1- Dimensions, K Factors						
Model	**Pipe Size**	**Length Inches (mm)**	**Width Inches (mm)**	**H*eight Inches (mm)**	****K Factor (To read flow rate in GPM)**	****Offset**
FSI-S30-001	3"	5.0 (127)	5.5 (140)	6.5 (165)	2.75	1.58
FSI-S40-001	4"	5.0 (127)	5.5 (140)	7.5 (190)	4.53	1.11
*Minimum Clearance Above sensor Required for Removal: 3.75 inches (96 mm) **Frequency = (GPM/K) - Offset or GPM = Frequency x K + Offset						

FLOW SENSOR OPERATING RANGE

FSI-S30/40 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 Qgpm = Vfps X D^2 X 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.

Table 2- Flow			
Model		**FSI-S30-001 3"**	**FSI-40-001 4"**
	Feet Per Second	**GPM**	**GPM**
Minimum Flow	0.25	6	10
	1	25	40
	2	50	80
	3	75	120
	5	125	200
	7	175	280
	10	250	400
	12	300	480

ELECTRICAL

1. Two conductors are required to connect the flow sensor to the monitor or control device.
2. The RED lead from the sensor is the + (Positive) lead and the BLACK lead from the sensor is the - (Negative) lead. Observe polarity when extending these conductors and connect them to the + and - leads or terminals of the FLOW SENSOR INPUT of the monitor or controller. Do not connect flow sensor to Power or Valve circuits!
3. Use a shielded Direct Burial cable with at least one twisted pair of conductors. Multiple pair cable may be used. Use #20 AWG or larger stranded copper wire conductors to extend the distance up to 2,000 feet.
4. Waterproof the splices. The preferred method is the two part epoxy kit, Scotchlok 3570 as manufactured by 3M. Follow all manufacturer's instructions.
5. Make sure that the flow sensor housing is installed in the tee or the retaining nut is on the wire leads before making the splices.
6. Provide a service loop in the cable to allow the flow sensor housing to be removed from the tee and brought above grade for servicing.
7. Avoid making splices in the direct burial cable.

ORDERING INFORMATION

Model	Size
FSI-S30-001	3"
FSI-S40-001	4"