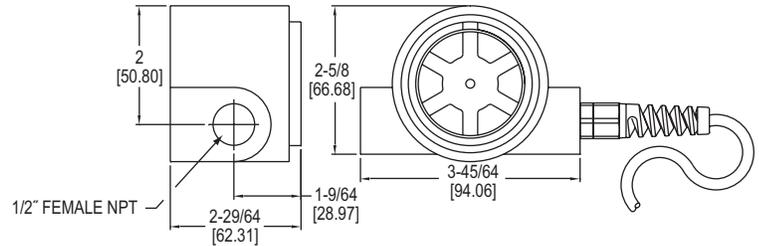




## Series SF Sight Flow Transmitter

### Specifications - Installation and Operating Instructions



**Series SF Sight Flow Transmitter** integrates tangential turbine technology with hermetically sealed circuitry to provide accurate flow measurement and control in the harshest environments. The 2-wire loop-powered design transmits a 4 to 20 mA signal proportional to flow rate. Models can accurately measure flow in both directions and can be mounted in any orientation. Series SF Transmitters are ideal for measuring flow rates in cooling and lubrication circuits, HVAC systems, aggressive chemical metering, and batching systems.

#### MECHANICAL INSTALLATION

The Series SF Sight Flow Transmitter has a 1/2 NPT(F) plumbing connections. It is recommended to use a paste type pipe sealant on the threads. Teflon tape sealant can also be used as long as it is applied so the tape does not enter the flow stream (pieces of tape can wrap around the turbine and impeded rotation).

The recommended mounting orientation would be any plane that will place the axis of the turbine vertical or horizontal with respect to ground. The unit will operate satisfactory with the axis at other angles, but side loading of the bearing surfaces will lead to premature wear of the rotating parts.

For the best flow measurement results, place the inlet (references to "inlet" and "outlet" refer to unidirectional systems) of the flow sensor at least 10 straight pipe diameters downstream from any fitting, valve, elbow, reducer, etc. that causes nonstable flow conditions. Ideally, 5 straight pipe diameters should be placed at the outlet of the sensor. If the sensor must be placed closer to a source of nonstable flow than the recommended distances, some instability of the output signal may result. The average signal will be accurate.

Place the sensor in such a position that the round access cover can be removed for cleaning and turbine servicing. A union placed near the sensor is recommended to allow easy removal.

#### ELECTRICAL INSTALLATION

The Series SF Sight Flow Transmitter is a two-wire loop-powered device desined to transmit a 4 to 20 mA signal proportional to flow rate. The noise-immune current transmission from the sensor can be routed with low cost two conductor twisted-pair cable. The current operates on 12-35VDC and requires a source capable of supplying at least 20 mA of current. The circuit has built-in polarity protection and over-current limiting to protect both the sensor and what the sensor is connected to.

#### SPECIFICATIONS

**Flow Range:** 0.5 to 15 GPM (2 to 60 LPM).

**Accuracy:**  $\pm 2\%$  FS.

**Temperature Range:** 20 to 225°F (-7 to 107°C).

**Maximum Pressure:** 500 psig (34 bar) Model SF10, 200 psig (14 bar) Model SF11.

**Repeatability:** 0.5% Full Scale.

**Supply Voltage:** 12 to 35 VDC.

**Output:** 4 to 20 mA.

**Loop Resistance:** 1150 $\Omega$  max.

**Response Time:** 2 seconds to 90% (step change in flow rate).

**Wetted Parts:** 316 SS shaft and case, Iglide® bearings, Buna-N seal and acetal copolymer, (polycarbonate cover on Model SF11).

**Connections:** 2" NPT(F).

**Wire Leads:** 22 AWG 9' (2.7m).

#### MODEL CHART

Model	Cover Material
SF10	316 stainless steel
SF11	Clear polycarbonate

To connect the sensor:

1. Connect the red wire from the sensor to the positive 12-35VDC power supply output.
2. Connect the black wire from the sensor to the positive side of the loop load (resistor, chart recorder, data acquisition board, meter, etc.). This connection may be labeled "4-20mA Input" on some devices.
3. If applicable, connect the negative side of the loop load to the negative side of the power supply.
4. Apply power to the system.
5. If everything is operating correctly, the green LED on the sensor will dimly illuminate and 4 mA will be flowing in the loop. If fluid is flowing through the sensor, the current will be higher than 4 mA.

#### Troubleshooting

If the LED does not illuminate:

- Check wiring terminations for good connections.
- Check wiring polarity.
- Verify correct supply voltage.
- Insure the load impedance is within allowable limits.
- Apply the DC supply voltage directly across the sensor wires. If the LED does illuminate, the load is either: too great of impedance or an open circuit. If the LED does not illuminate, the sensor's lead wires or circuit are defective.

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## SERVICE and MAINTENANCE

The Series SF Flow Transmitter is designed to provide years of low maintenance service in industrial environments. As with all mechanical rotating devices, the bearing surfaces will wear with use. The life of the parts will depend on factors such as cleanliness of fluid, media, mounting orientation, temperature, fluid velocity and frequency of operation. The sensor was designed with simple field replacement of the rotating parts.

### To inspect or replace the rotating components:

1. Relieve pressure in the piping system.
2. Remove the retainer ring that secures the turbine access cover.
3. Remove the access cover with pliers, taking care not to damage the o-ring seal.
4. Pull out turbine assembly and shaft.

5. Inspect the shaft for things that may have wrapped around it.
6. Inspect the turbine bearing surface for wear and elongation. Replace as necessary.
7. Clean any rust off of the magnets that may have accumulated.
8. Reassemble the unit by placing the turbine into the body cavity with the two magnet pockets facing inward. Place the shaft into the turbine hole and guide it into the retaining hole in the body cavity. Lubricate the o-ring with glycerine or other lubricant and press it into the pocket of the body. Replace the retaining ring securely before applying pressure to the system.

### Circuit Recalibration:

1. Place a milliamp meter into the current loop.
2. Turn off the flow going through the sensor. Adjust the OFFSET control for a reading of 4 mA on the milliamp meter.
3. Adjust the flow rate through the sensor to full flow rate. Adjust the SPAN control for a reading of 20mA on the milliamp meter. The zero and span adjustment are not interactive and should require additional adjustments.