Baseline's BL-BFS150 is a brass tee-type, impeller flow sensor that provides accurate digital output signals proportional to the velocity of the liquid flowing through the pipe. The BL-BFS150 has female NPT connections and is intended for service in metallic piping systems at points of connection or on pump assemblies.

Installation Overview

1. Choose the proper location and orientation.

2. Install the sensor in the pipe.

3. Make the electrical connections.

4. Program the controller.

Operation Notes

- Make sure the flow sensor is assembled and the retaining nut is tightened (hand tight) before pressurizing the system.

- Fill the pipeline and eliminate all trapped air.

- The flow sensor should begin transmitting flow immediately; however, it may take up to a minute for the flow readings to display in the appropriate screens on the BaseStation controllers.

- Always wait for flow to stabilize before setting control limits. Stabilization may take several minutes in large piping systems.

Choosing the Proper Location and Orientation

Because an impeller sensor measures the velocity of the liquid and converts it to a flow measurement based on area, proper flow measurement depends on the condition of the pipe interior and the sensor's location in the piping system. The pipeline must be full, free from trapped air, floating debris, and built-up sediment.

- The mounting tee should be installed with a minimum of 10 diameters of straight pipe (15 inches for 1½ inch pipe), upstream and a minimum of 5 diameters of straight pipe (7½ inches for 1½ inch pipe) downstream to eliminate irregular flow profiles caused by valves, fittings or pipe bends.

- Always install with the flow arrow on the mounting tee pointed downstream.

- Allow 3¾" clearance to remove the flow sensor housing from the tee for service. The tee is usually installed with the housing up in the vertical or 12 o'clock position. However, if necessary, it may be installed with sensor housing at an angle from vertical to provide clearance.

- Flow sensors may be installed inside a building, outside above grade or underground. If installed above grade, provide adequate security to prevent damage or disassembly. If installed below grade, provide access for service.

- Flow sensors are most typically installed below grade in a horizontal section of pipe with the sensor housing up. Do not direct bury the flow sensor. Provide a meter pit or valve box of adequate size and drainage to service the sensor. Provide a service loop in the wire connections to allow the sensor housing to be brought above grade.

- Flow sensors may be installed on vertical sections of pipe providing that the piping is full and does not contain trapped air. A vertical pipe with rising flow is preferred over falling flow. The sensor housing may be oriented in any direction radially around the pipe.
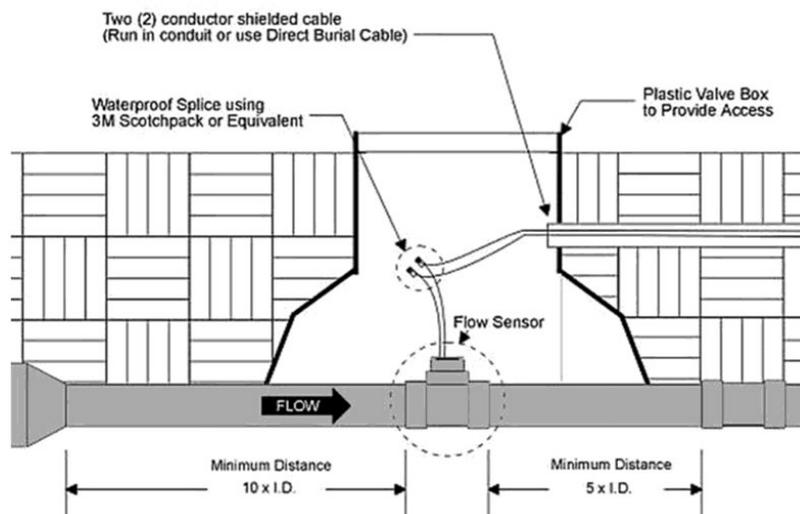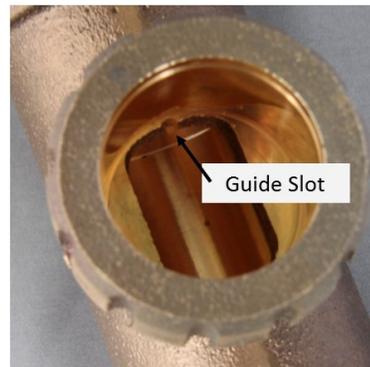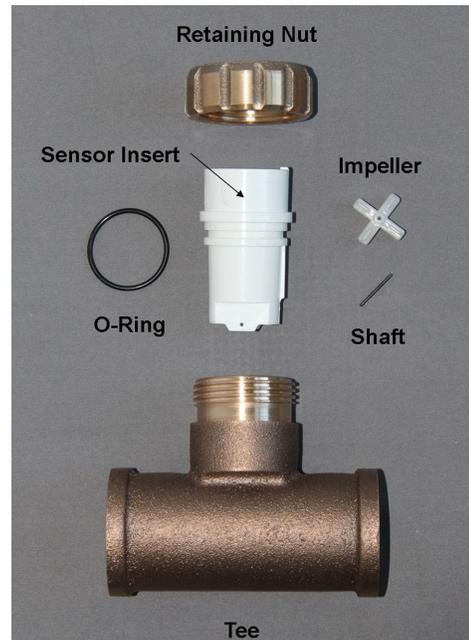
Installing the Sensor in the Pipe

The brass flow sensor mounting tee features female NPT threads for connection to metallic piping systems. Use thread sealant and best industry practices to ensure that the sensor is installed in the correct position with strong permanent joints.

1. Disassemble the flow sensor before joining the tee to the piping system. To remove the flow sensor insert from the tee, turn the retaining nut counter-clockwise to loosen it, and then pull the housing straight out of the tee. **Do not pull on the wire leads!**

2. Use threaded pipe nipples or cut and thread the existing pipe. Remove all chips, filings, or cuttings from the pipe before installing the sensor tee. For copper pipe, use soldered male thread adapters.

3. Install the sensor tee with the arrow pointed in the direction of flow. Tighten both joints with a wrench leaving the area over the branch of the tee clear to install the sensor insert.

4. Reinstall the flow sensor insert in the tee. Make sure the insert and tee are clean and free from dirt or debris. Position the arrow on the top of the housing in the downstream direction. This aligns the guide key on the housing with the slot inside the tee. Push straight in so that the key enters the slot until the o-ring seals the opening.

5. Slide the retaining nut over the wire leads and turn clockwise by hand to tighten.

Do not use sealant or Teflon tape on the retaining nut threads!

Retaining Nut
Sensor Insert
Impeller
O-Ring
Shaft
Tee

Key
Arrow

Guide Slot

Making the Electrical Connections

1. Power off the two-wire when installing devices. Leave 24 to 36 inches of slack on the two-wire to allow the BFS brass flow sensor insert to be removed from the tee and brought above grade for servicing.

2. Connect the red and black wire from the BFS flow sensor to the corresponding red and black wires on the two-wire. It is critical that polarity is maintained. Do not connect the flow sensor to power or valve circuits!

3. Use wire nuts for your initial connections. After you verify communications between the BaseStation and the PFS flow sensor, replace the wire nuts with 3M™ DBR/Y-6 or equivalent moisture-resistant connectors for all two-wire path connections.

Programming the Controller

BaseStation 1000

In the BaseStation 1000 User Manual, refer to Setting Up Flow biCoders. If you want the BFS flow sensor to be associated with a water source, refer to Assigning a Flow Sensor to a Water Source.

BL-BFS150 Calibration Table

K-Value	Offset
0.762	0.126

BaseStation 3200

In the BaseStation 3200 User Manual, refer to Searching for and Assigning Flow Meters. If you want the BFS flow sensor to be associated with a water source, refer to Assigning Devices to Water Sources.

Note
The BaseStation controllers do not use the Offset value.