

Differential Pressure Flow Sensors**Municipal Water Distribution
Industry: Water and Waste**

Verabar® flow sensors are frequently used in many municipal water applications. These applications can be among the most difficult. Factors such as buried lines, different pipe materials (steel, concrete, fiberglass, cast iron, etc.) and seasonal flow rate variations all combine to make municipal water flow measurement a challenge.

Application:

The City of Tallahassee, through Raytheon Engineers, requested assistance on engineering and specifying flow measurement for a large main water supply line. The line had an internal diameter (ID) of 84", was constructed of fiberglass and was buried. The only access into the 84" pipe was through a 24" branch line capped off with a blind flange.

Problem:

- 1) The high flow rate (130,000 GPM) in the large line meant that opposite end support was required (for added structural strength). Because the line was buried, it was impossible to attach an end support fitting externally on the pipe.
- 2) Mounting the sensor through a 24" hole in the pipe creates a tremendous flow disturbance and potentially washes out the signal of the Verabar® sensing ports located close to the pipe wall.
- 3) Mounting the sensor to the top of the pipe in liquid applications is not recommended. Entrained air will migrate upward and collect at the DP transmitter, potentially causing an erratic signal.

Solution:

- 1) Veris designed a special sensor with an internal support plate and an opposite end support boot.
- 2) Veris elected not to drill the sensing ports located closest to the large 24" disturbance in the pipe. Because this large sensor already has 12 sensing ports in the flow stream to average the velocity, eliminating one set of sensing ports did not have a great effect on the accuracy.
- 3) Air traps were installed at the top of the instrument lines. The tubing sloped downward to the DP transmitter (see Figure B).

Result:

The Verabar® has been in service for over three years and is providing accurate, repeatable and maintenance free flow measurement.

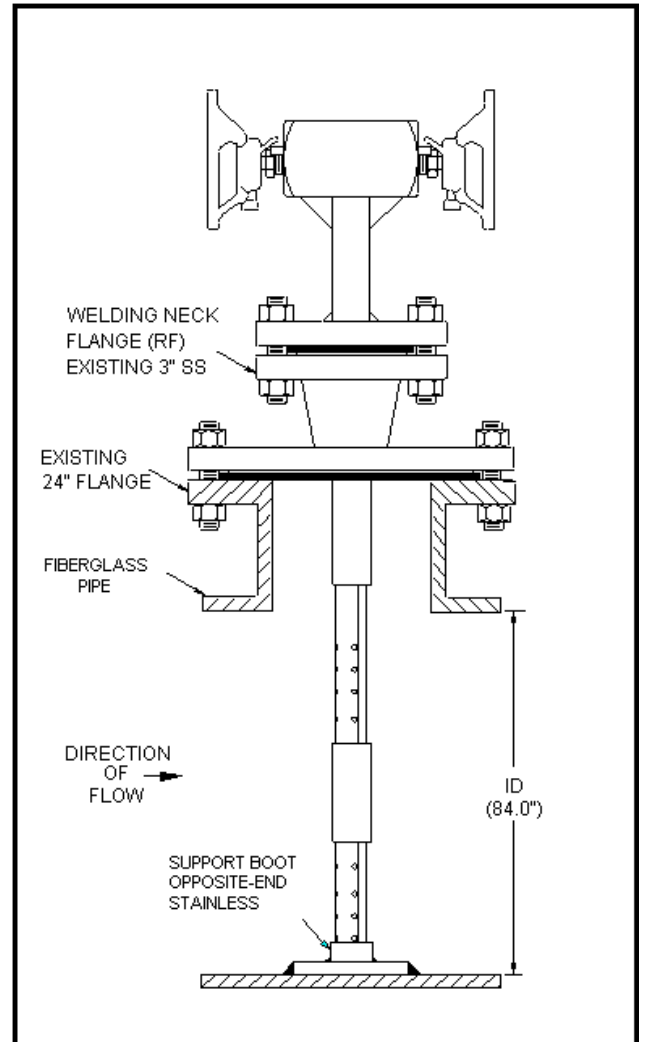


Figure A. End support assembly was fiber-glassed into the pipe internally

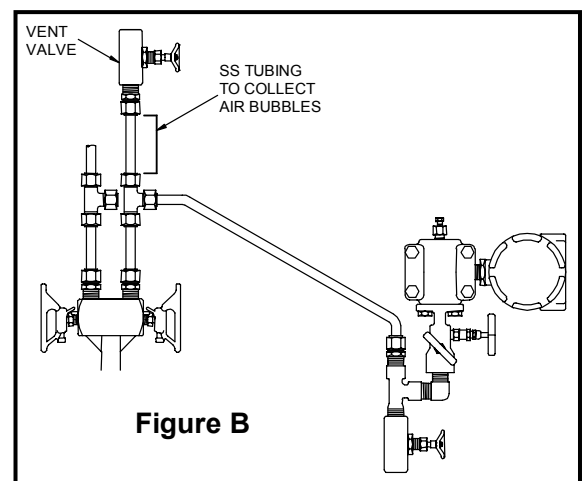


Figure B