

ADFM[®] Hot Tap Velocity Profiler

Sensor Installation

Instruction Sheet #69-7203-001
Revision A, July 25, 2008

Overview

The Hot Tap measures flow rates in full and pressurized pipes with a diameter of 18 in. (457mm) to 108 in. (2.74m). The Hot Tap sensor is inserted into a two-inch valve and tapping saddle, through the pipe wall.

Tools and Supplies

Installation of the Hot Tap requires the following user-provided tools and supplies:

- Tapping saddle, thread-o-let, or spool piece
- 2" corporation stop or ball valve
- $\frac{9}{64}$ " Allen wrench
- Pipe wrench
- PTFE pipe thread tape
- Optional cable conduit (min. 2" dia.)
- $\frac{1}{4}$ " Hex wrench

Preparation

The standard length of the Hot Tap sensor cable is 50 ft. A custom-length cable can be up to 100 ft. If con-

duit is used, a minimum diameter of 2 in. is required. Minimum bend radius for the cable is 6 in.

Installation

The preferred locations for sensor installation in a horizontal pipe are between the clock positions 1 and 5, and 7 and 11, as shown in Figure 1. Installation at the top and bottom of the pipe should be avoided due to the possibility of trapped air or sedimentation, respectively. The sensor may be installed at any position in a vertical pipe, provided the stream is flowing upward.

For all other variations in position or flow, contact Teledyne Isco for assistance.

Dimensional Requirements

When determining the installation location, consider the minimum clearance required for installation and removal of the sensor from the pipe. The minimum clearance required is found by calculating the dimension C.

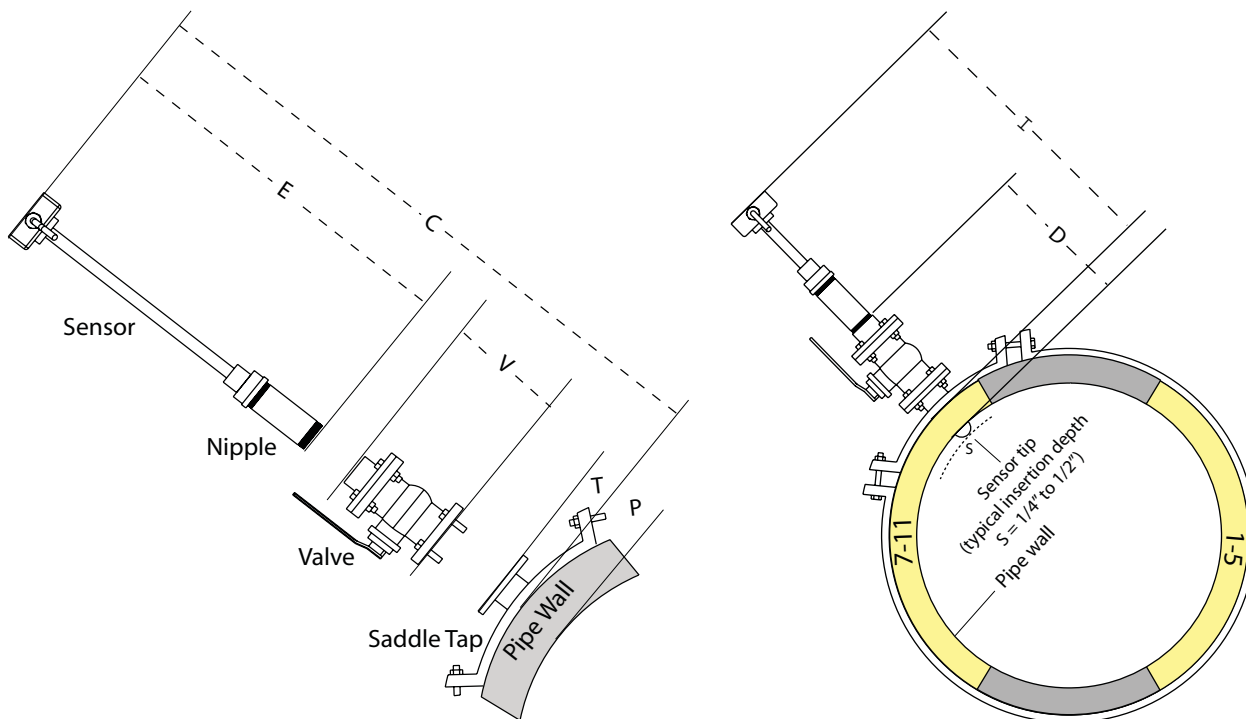


Figure 1: Component measurements and sensor positioning

L	Sensor length (printed on sensor head (standard 28" nom.))	P	Pipe wall thickness
E	Extended sensor length ($L + 2.25$ ")	C	Minimum clearance for sensor removal ($E + V + T$)
V	Valve (user-supplied)	D	Distance from top of valve to inner wall ($V + T + P$)
T	Tapping saddle, thread-o-let, or spool piece (user-supplied)	I	Insertion depth ($L - (S+P)$)
S	Sensor tip insertion depth ($\frac{1}{4}$ " to $\frac{1}{2}$ " nom.)		

For the standard length sensor ($L = 28$ in. nom.), the distance from the top of the valve to the inner pipe wall (D) must not exceed 15 in. in order to have an insertion depth of up to $1\frac{1}{2}$ in. past the inner pipe wall.

Note
 Typical insertion depth is usually between $\frac{1}{4}$ in. and $\frac{1}{2}$ in. However, installations in pipes where buildup of grease or debris is expected, deeper insertion will ensure unimpaired flow readings.

The sensor's exact length is measured in the factory and printed on the electronics box at the top of the shaft (Figure 3). If D exceeds 15 in., a custom length sensor shaft (part #60-5314-677) must be ordered. Contact Tele-dyne Isco for assistance with custom length selection.

Before installation, fully extend the Hot Tap by loosening the lock ring screw (Figure 4) and pulling the sensor all the way back inside the nipple. The sensor's extended length (E) is 2.25 in. greater than the sensor length L . Use Figure 1 and the chart as a guide when calculating distances C and D .

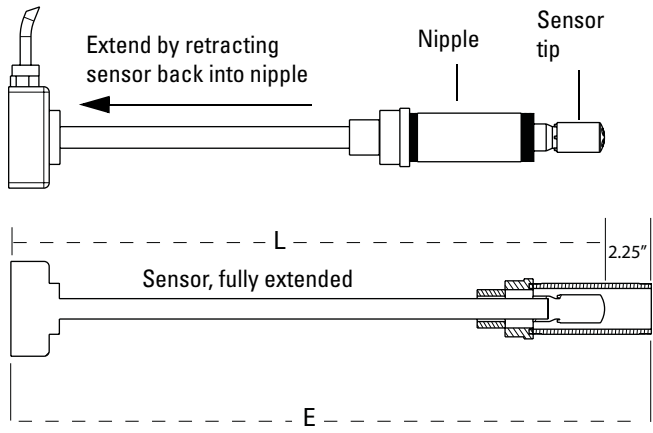


Figure 2: Extending the sensor

Installation Steps

1. With the sensor fully extended, apply pipe thread tape to the nipple threads.
2. Screw the nipple into the valve (Figure 1).
3. Open the valve and push the sensor into the pipe to Dimension I.
4. Align the arrow printed on the Hot Tap's electronics box (Figure 3) with the direction of flow (downstream). (The cable is also attached on the downstream side of the box.)



Figure 3: Sensor length and flowstream alignment

5. Lock the sensor shaft in place by tightening the clamping collar (Figure 4). Note that there are two Allen screws; the screw to be tightened is on the side of the ring, not the top.

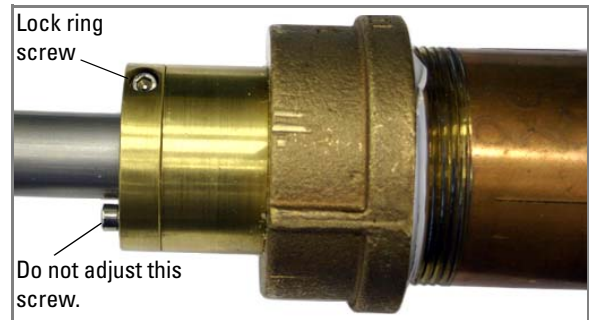


Figure 4: Securing the sensor in place

Second Clamping Collar

A secondary clamping collar (kit #69-7303-012) is included with the Hot Tap sensor. Should the secondary collar become necessary, install it on the shaft directly behind the first collar.

1. Remove the old Allen screw from the top of the original clamping collar.
2. Place one half of the new clamping collar on top of the old one, aligning the holes. Insert the long Allen screw, with spring lock washer, through the new collar clamp and down into the threaded hole of the old collar, and tighten down firmly.

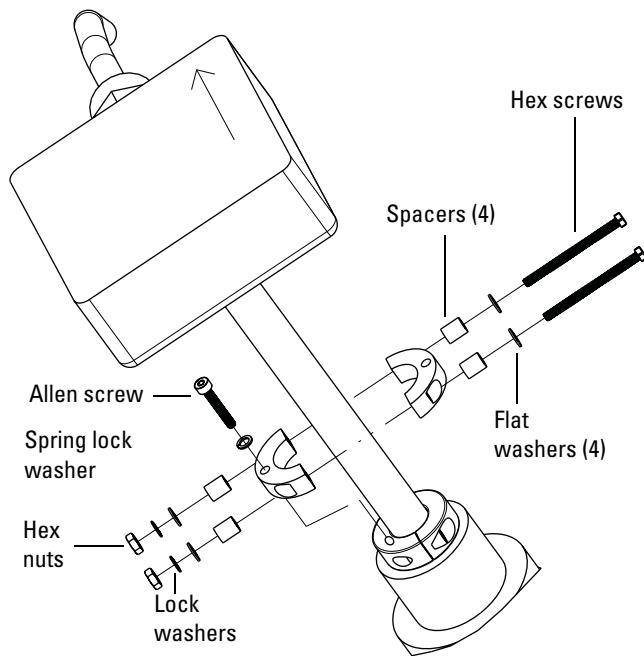


Figure 5: Secondary collar installation

3. Place the other half of the new collar on top of the old one to form the new collar.
4. Insert the two long screws, including washers, spacers, and nuts, as shown in Figure 5. Tighten the screws until the collar is snug against the shaft and cannot rotate.



Figure 6: Hot Tap with secondary collar installed

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