Condensate Pot for Steam Flow Measurements

TIPS AND TYPICAL INSTALLATIONS

The concept of using impulse tubes (sensing lines) is basically the same whether working with steam flow instruments or liquid flow instruments. However, additional problems are introduced when measuring steam. The difference in density between the flowing fluid (steam) and the liquid (condensate) in the sensing line demands the use of a condensing chamber to obtain accurate, reliable steam flow measurements. Remember: The connection tubing from the flow measurement device (typically a flow orifice) to the condensate chamber is now full of steam, while the tubing from the condensate chambers to the measurement instrument (differential transmitter) is full of condensate.

CONDENSING CHAMBER

In Figure 1, note how the chamber maintains equal heads of the liquid on the two sides of the measuring instruments and provides a large surface area (top of the liquid) to sense and send any changes to the transmitter. The chamber allows a larger surface area for radiant losses to ensure a proper condensate level for the sensing lines. Without the chamber, the condensate can evaporate at times and provide different liquid levels that affect flow measurements. See Figure 2 for a typical installation.

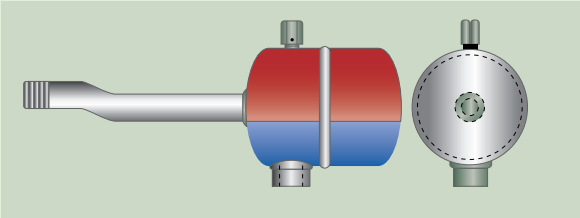

Figure 1: Condensing Chamber (Condensate Pot)

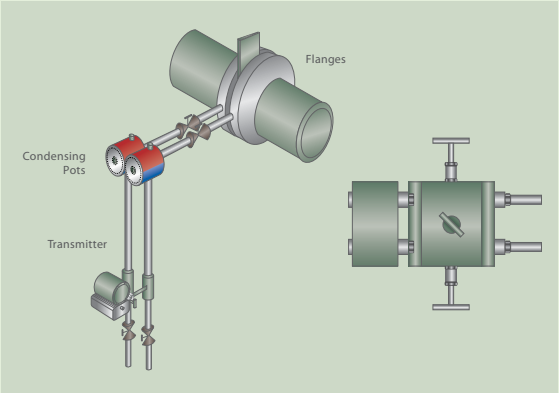

Figure 2: Typical Installation

INSTALLATION TIPS

1. Use stainless steel tubing for the connection to the flanges or steam line.
2. Place the pot nearer the steam line or flange connection points.
3. Keep both the condenser and condensate chamber at the same level as the upper connection point. (An unequal level will cause significant error due to false reads.)
4. If the flow device (in the steam line) is installed in a vertical pipe, align the lower connection point to the steam pipe with the upper connection point.

Figure 3: Flow Metering with Condensate Chambers

5. For flow measurements, keep the instruments below the condensate chamber.
6. Install tubing and valves to allow the sensing lines to be blown down every year. This will ensure that no plugging has occurred (plugging affects readings.)
7. Use the manual air vent on top of the condensate chamber for venting air at commissioning. (The chamber has to be rated for the maximum pressure and temperature that will occur in the steam line.)