

Rosemount™ Annubar™ Flow Meter Remote Mount Transmitter Installation Options

1.0 Introduction

Rosemount Annubar primary elements and flow meters may be specified in direct or remote mounted transmitter configurations.

Remote mounting may be necessary when:

- The process temperature exceeds the limitations of a direct mount transmitter.
- It is necessary to position the transmitter at a different location.

This document serves as a guide for installing a remote mounted transmitter.

Note

Not all components shown in this document may be provided by the factory. Please contact your Emerson representative if you require additional information or assistance.

Table 1-1. Components

Label	Components	Purpose
1	Transmitter	Reads differential pressure
2	Manifold	Isolates and equalizes transmitter
3	Primary isolation valve	Isolates the primary element from the impulse piping system
4	Drain/vent valve	Drains (for gas service) or vents (for liquid/steam service) the DP transmitter chambers
5,6, 7 (See image for specific components)	Blowdown valve	Allows pipeline pressure to blow and clear sediment from impulse piping
	Vent valve	Allows venting of collected gases from impulse piping in liquid applications
	Drain valve	Allows draining of collected condensate from impulse piping in gas applications
	Vent chamber	Collects gases in liquid applications
	Condensate chamber	Collects condensate in gas applications

2.0 Impulse piping

Impulse piping connects a remote mounted transmitter to the Rosemount Annubar primary element. Temperatures in excess of 250 °F (121 °C) at the transmitter will damage electronic components;

impulse piping allows process fluid temperatures to decrease to a point where the transmitter is no longer vulnerable.

The following restrictions and recommendations apply to impulse piping location:

- Piping used to connect the Rosemount Annubar primary element and transmitter must be rated for continuous operation at the pipeline-designed pressure and temperature.
- Impulse piping that runs horizontally must slope at least 1-in. per foot (83 mm/m).
 - With the Rosemount Annubar primary element mounted below the pipe, impulse piping must slope downwards (toward the transmitter) for liquid and steam applications.
 - With the Rosemount Annubar primary element mounted above the pipe, impulse piping must slope up (toward the transmitter) for gas applications.
- For applications where the pipeline temperature is below 250 °F (121 °C), the impulse piping should be as short as possible to minimize flow temperature changes. Insulation may be required.
- For applications where pipeline temperature is above 250 °F (121 °C), the impulse piping should have a minimum length of 1-ft. (0.30 m) for every 100 °F (38 °C) over 250 °F (121 °C), which is the maximum operating transmitter temperature. Impulse piping must be uninsulated to reduce fluid temperature. All threaded connections should be checked after the system comes up to temperature, because connections may be loosened by the expansion and contraction caused by temperature changes.
- A minimum of 1/2-in. (12 mm) outer diameter (OD) stainless steel tubing with a wall thickness of at least 0.035-in. is recommended.
- Outdoor installations for liquid, saturated gas, or steam service may require insulation and heat tracing to prevent freezing.
- For installations where the transmitter is more than 6-ft. (1.8 m) from the Rosemount Annubar primary element, the high and low impulse piping must be run together to maintain equal temperature. They must be supported to prevent sagging and vibration.
- Threaded pipe fittings are not recommended because they create voids where air can become entrapped and increase potential for leakage.
- Run impulse piping in protected areas or against walls or ceilings. If the impulse piping is run across the floor, ensure that it is protected with coverings or kick plates. Do not locate the impulse piping near high temperature piping or equipment.
- Use an appropriate pipe sealing compound rated for the service temperature on all threaded connections. When making threaded connections between stainless steel fittings, Loctite® PST® Sealant is recommended.
- Impulse tube material must be compatible with process fluid.

3.0 Location for the transmitter on Rosemount Annubar flow meters

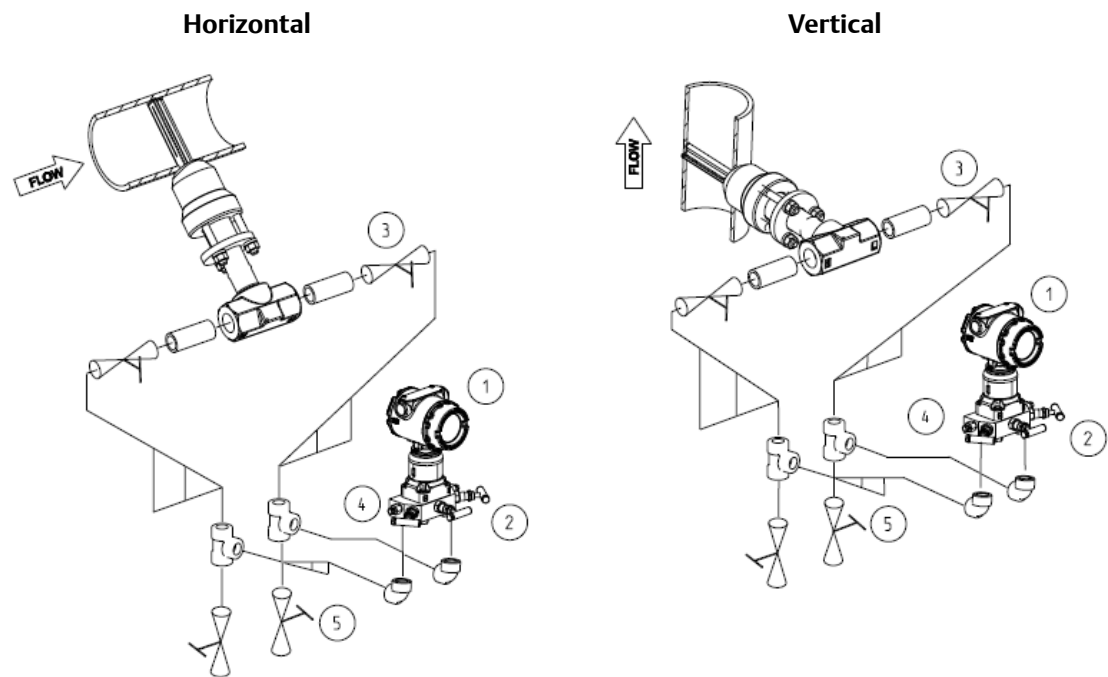
The location for the transmitter on Rosemount Annubar flow meters depends upon the service to be used.

3.1 Recommended location for liquid service up to 250 °F (121 °C)

The transmitter may be installed in one of two ways, depending on the space limitations of the installation site. To help you determine which installation variation to use, refer to [Figure 3-1](#).

The recommended installation mounts the transmitter below the primary element to ensure that air will not be introduced into the impulse piping or the transmitter. To determine the recommended transmitter location for use in either a horizontal or vertical pipe, refer to [Figure 3-1](#). Vertical down flow in liquid applications is not recommended.

Figure 3-1. Liquid Service Locations



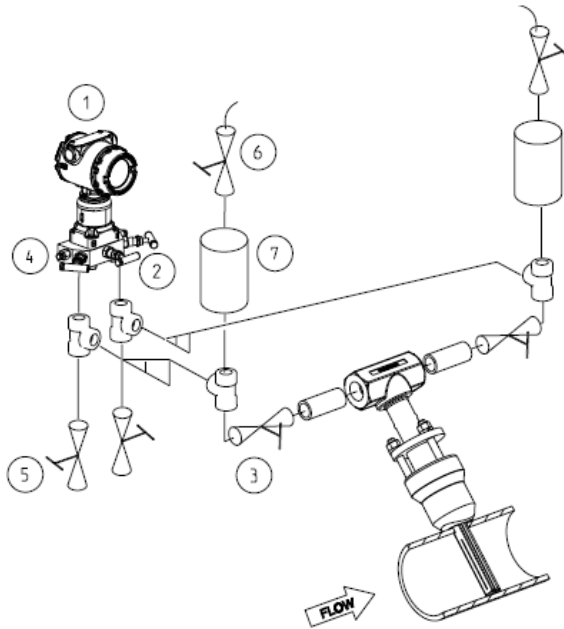
1. Transmitter
2. Manifold
3. Primary isolation valve
4. Vent valve
5. Blowdown valve

Alternate location

When it is impractical to mount the transmitter below the pipeline, mount the transmitter above the pipeline using the arrangement shown in [Figure 3-1a](#). The alternate installation requires periodic maintenance to ensure that air is vented from the piping and chambers.

The alternate location can be used with horizontal pipes only, as shown in [Figure 3-1a](#).

Figure 3-1a. Alternate Liquid Service Location



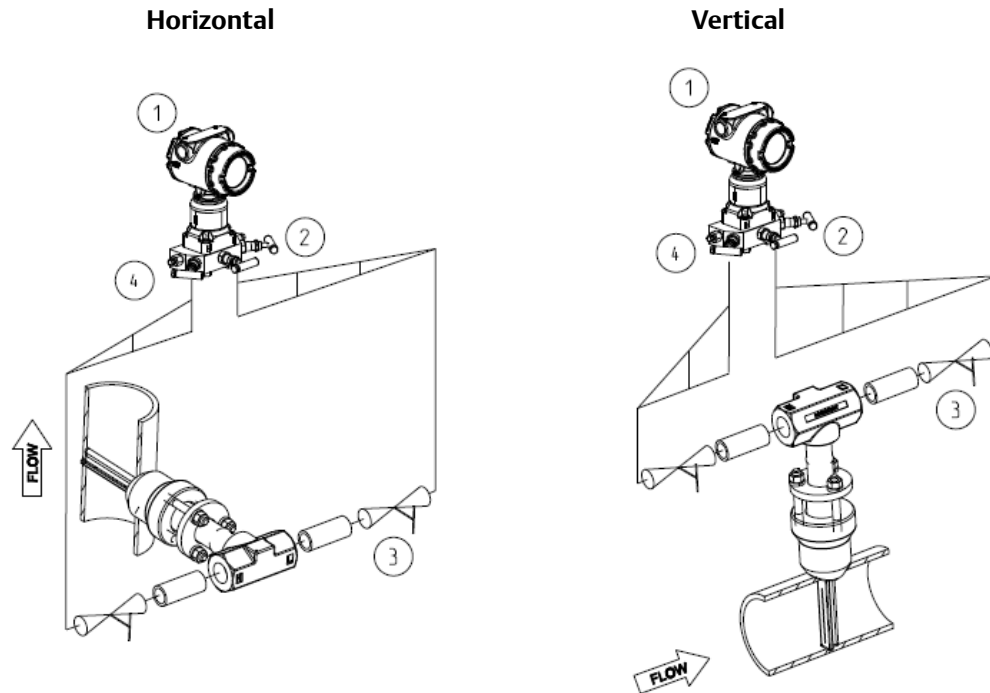
1. Transmitter
2. Manifold
3. Primary isolation valve
4. Vent valve
5. Blowdown valve
6. Vent valve
7. Vent chamber

3.2 Recommended location for gas service

The transmitter may be installed in one of two ways, depending on the space limitations of the installation site. To help you determine which installation variation to use, refer to [Figure 3-2](#).

The recommended installation mounts the Rosemount Annubar primary element through the top half of the pipe (for horizontal process piping), and the transmitter above the process piping to prevent condensable liquids from collecting in the impulse piping and transmitter. To determine the recommended transmitter location for use in either a horizontal or vertical pipe, refer to [Figure 3-2](#).

Figure 3-2. Gas Service Locations

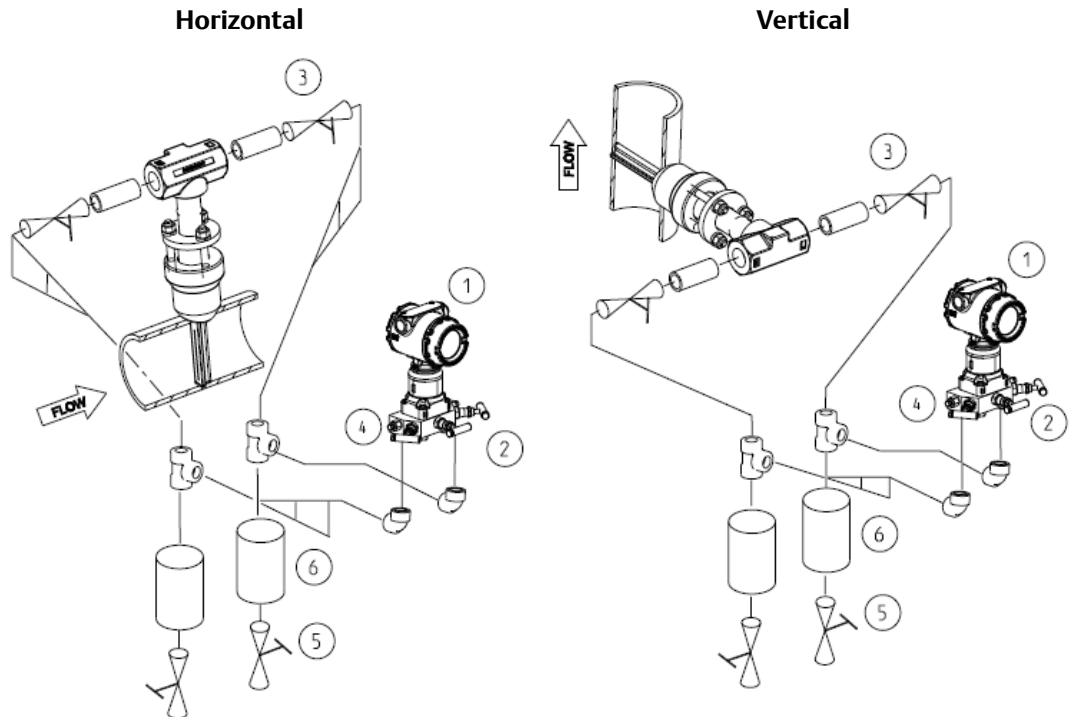


1. Transmitter
2. Manifold
3. Primary isolation valve
4. Drain valve

Alternate location

When it is impractical to mount the transmitter above the process piping, the transmitter can be mounted below the process piping as shown in [Figure 3-2a](#). This alternate installation requires periodic maintenance to ensure that condensate from saturated gas applications is drained from the piping and chambers. To determine the alternate location for use in either a horizontal or vertical pipe, refer to [Figure 3-2a](#).

Figure 3-2a. Alternate Gas Service Locations



- 1. Transmitter
- 2. Manifold
- 3. Primary isolation valve
- 4. Drain/vent valve
- 5. Drain valve
- 6. Condensate chamber

3.3 Recommended location for steam or liquid service above 250 °F (121 °C)

For steam service (at any temperature) or liquid service at temperatures above 250 °F (121 °C), the transmitter must be installed below the process piping.

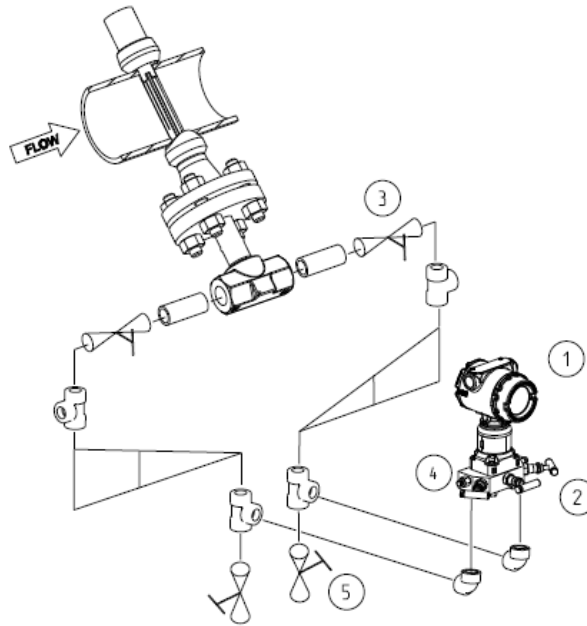
Note

Steam (or hot water) must not enter the transmitter. Fill the system of impulse piping and Rosemount Annubar transmitter with cool water before pressurizing the system.

Horizontal pipes

For horizontal steam process piping, the Rosemount Annubar primary element is mounted through the bottom half of the piping, as shown in Figure 3-3. Route impulse piping down to the transmitter. Prior to exposing the instrument connections to live steam, fill the system with cool water through the two tee fittings.

Figure 3-3. Horizontal Steam Process Piping

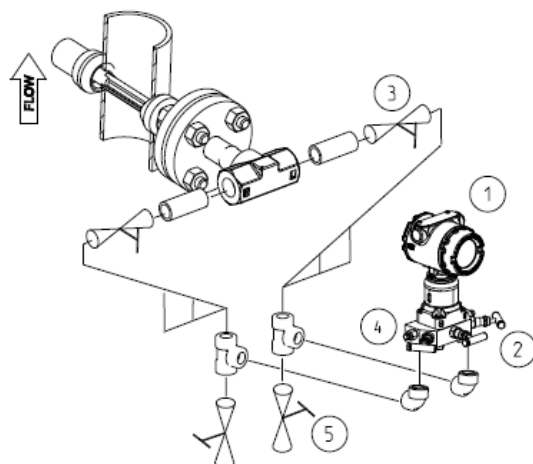


1. Transmitter
2. Manifold
3. Primary isolation valve
4. Vent valve
5. Blowdown valve

Vertical pipes

Steam service in a vertical pipe uses a Rosemount Annubar primary element constructed specifically for vertical pipelines; it must be mounted through the side of the pipe, as shown in Figure 3-4. Vertical flow down in steam or liquid applications is not recommended. Two ½–14 NPT cross fittings are used to fill the system with water. **Insulate the impulse piping from the pipe to and including the PH and PL instrument valves. Do not insulate the NPT cross fittings.**

Figure 3-4. Vertical Steam Process Piping



1. Transmitter
2. Manifold
3. Primary isolation valve
4. Vent valve
5. Blowdown valve

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