

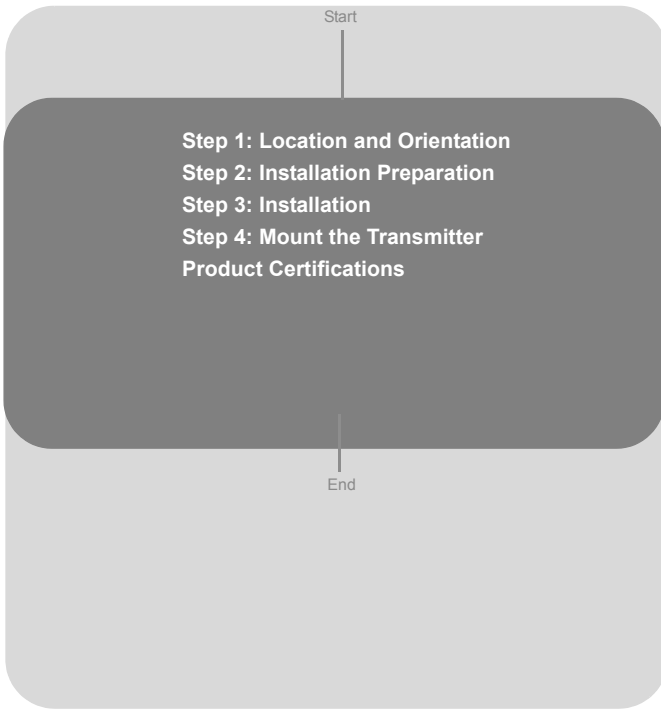
Quick Installation Guide

00825-0100-4031, Rev AA

April 2005

Duct Mount 285 Annubar

Rosemount 285 Annubar[®] Duct Mount



ROSEMOUNT

www.rosemount.com



EMERSON
Process Management

Duct Mount 285 Annubar

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⚠ IMPORTANT NOTICE

This installation guide provides basic guidelines for Rosemount 285 Annubar. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, Explosion-proof, Flame-Proof, or intrinsically safe (I.S.) installations. Refer to the 285 Annubar reference manual (document number 00809-0100-4028) for more instruction. This manual is also available electronically on www.rosemount.com.

⚠ WARNING

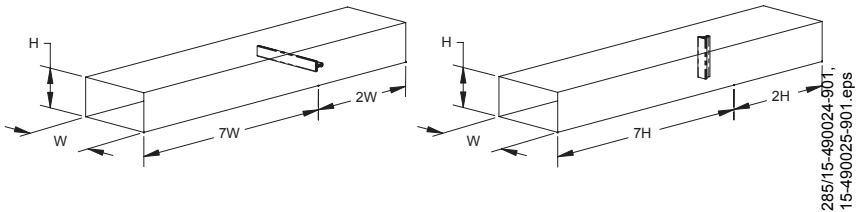
Process leaks may cause harm or result in death. To avoid process leaks, only use gaskets designed to seal with the corresponding flange and o-rings to seal process connections. Flowing medium may cause the 285 Annubar assembly to become hot and could result in burns.

STEP 1: LOCATION AND ORIENTATION

Correct location in the duct is important for accurate measurement. See Table 1 on page 3 for proper installation locations.

Straight-run Installations

The recommended straight-run duct lengths upstream are 7W or 7H; downstream, 2W or 2H. Installation across the longest dimension is preferred.



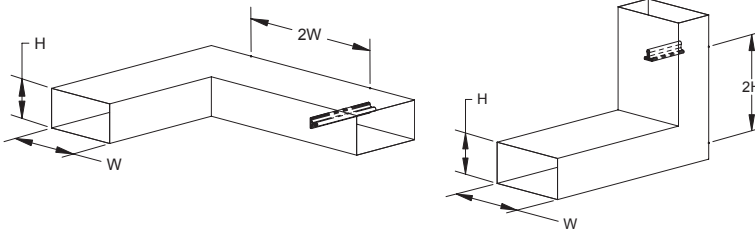
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Elbow Installations

The unit will measure accurately when installed 2 duct widths (height) downstream of a 90° elbow in plane with the elbow.



285/15-490026-901,
 15-490027-901 eps

Special Installations

For unique duct configurations, consult the factory.

Table 1. Minimum straight duct requirements for the 285 Annubar

	Upstream Length	Downstream Length
<p>285/15-490028-901</p>	7W	2W
<p>285/15-490029-901</p>	7W	2W
<p>285/15-490030-901</p>	15W	2W
<p>285/15-490031-901</p>	7W	2W
<p>285/15-490032-901</p>	15W	2W

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STEP 2: INSTALLATION PREPARATION

Operating Limitations

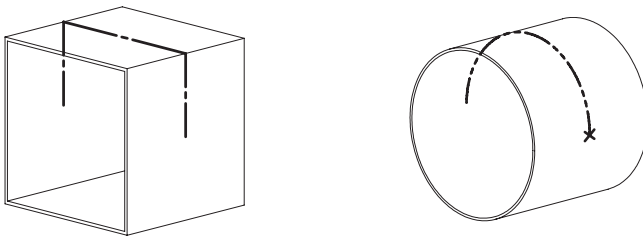
For the Annubar to produce accurate, repeatable flow measurement, the following must be considered. The maximum allowed pressure and temperature limits are:

- Annubar Type D1 (duct mount without compression fitting): 10 psig @ -40°F to 850°F.
- Annubar Type D2 (duct mount with compression fitting): 10 psig @ -40°F to 300°F.

Annubar Installation Preparation

1. Make sure there is enough clearance to insert the Annubar into the duct.
2. Mark the mounting location of the Annubar, locating it along the center line of the rectangular duct, or anywhere on the circumference of a round duct. Mark horizontal and vertical center lines through the mounting location. For duct mount Annubars without compression fitting (threaded stud welded to tip of sensor), extend the center line to the opposite duct wall (or 180° around a circular duct), as shown in Figure 1.

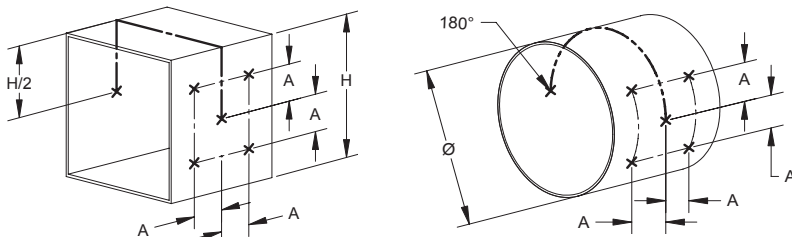
Figure 1.



285/15-490013-903,
15-490033-903

3. Measure and mark the locations of the mount screw holes and the opposite side support hole (for Annubars with threaded stud welded to sensor tip) (see Table 2).

Figure 2.



285/15-490013-901,
15-490034-901.eps

Table 2. Installation dimensions inches (mm)

Annubar Model Number	A
285xxxxxxxxx1x	0.75 (19.05)
285xxxxxxxxx2x	1.31 (33.27)

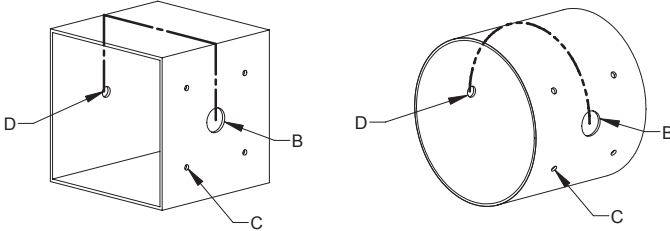
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4. Drill or punch holes B and D (Table 3) and drill or punch holes C (Table 4).

Figure 3.



285/15-490014-901,
 15-490035-901.eps

Table 3. Installation dimensions inches (mm)

Annubar Model Number	B	D
285xxxxxxxD1x1x	0.75 (19.05)	0.38 (9.65)
285xxxxxxxD1x2x	1.31 (33.27)	0.38 (9.65)
285xxxxxxxD2x1x	0.75 (19.05)	not applicable
285xxxxxxxD2x2x	1.31 (33.27)	not applicable

Table 4. Hole drill size for #12 self-tapping screws (C-dimension) inches (mm)

Duct Wall Thickness	Hole Required	
	Hole Size	Drill Size
less than 0.036 (0.91)	0.166 (4.2)	#19
0.048 (1.22)	0.169 (4.3)	#18
0.060 (1.52)	0.177 (4.5)	#16
0.075 (1.91)	0.182 (4.6)	#14
0.105 (2.67)	0.185 (4.7)	#13
0.125 (3.18)	0.196 (5.0)	#9
0.135 (3.43)	0.196 (5.0)	#9
0.164 (4.17)	0.201 (5.1)	#7

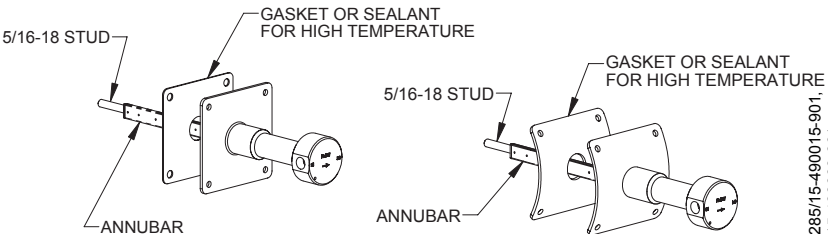
5. Deburr all holes.

STEP 3: INSTALLATION

Duct-Mount without Compression Fitting (Annubar type D1)

1. Place the gasket over the end of the probe and push it up against the mounting flange. Alternatively, a high-temperature gasket sealant may be used.
2. Insert the end of the Annubar through the mounting hole, and push it through the duct until the threaded stud protrudes through the hole on the opposite side of the duct.

Figure 4.

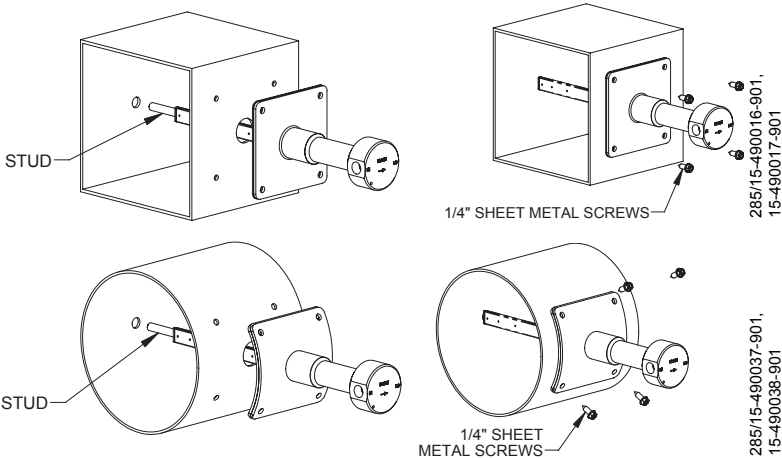


285/15-490015-901,
 15-490036-901

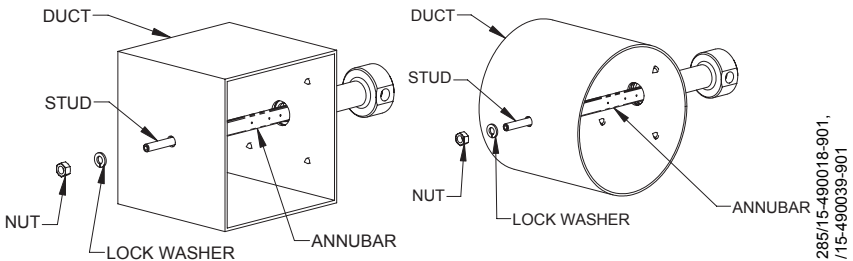
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3. Push the flange and gasket flush against the duct wall; align the flow arrow in the direction of flow and fasten the flange to the duct using the #12 sheet metal screws provided.

Figure 5.



4. On the opposite side of the duct, place the $\frac{5}{16}$ -in. lock washer over the stud, screw on the $\frac{5}{16}$ -in. nut, and tighten. Depending on the pressure in the duct, it may be necessary to add some high temperature gasket sealant where the stud protrudes through the duct wall.



Duct Mount With Compression Fitting (Annubar type D2)

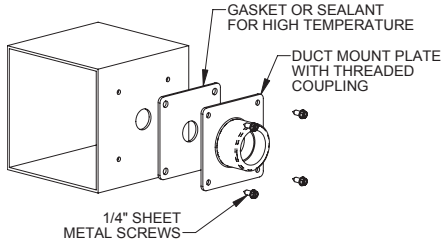
1. Place gasket against the mounting flange. Alternatively, a high-temperature gasket sealant may be used.
2. Push the flange and gasket flush against the duct wall, and fasten the flange to the duct using the #12 sheet metal screws provided.

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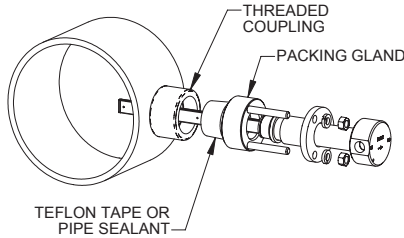
Figure 6.



285/15-490022-901

3. Remove the packing gland from the Annubar, and thread it into the threaded coupling, using teflon tape or pipe sealant.

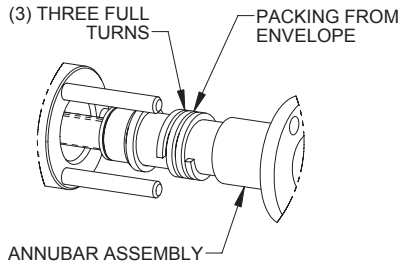
Figure 7.



285/15-490040-901

4. Remove the packing from the envelope and wrap it around the Annubar three full turns. Insert the Annubar into the mounting until the packing is completely contained within the gland, and the tip of the Annubar is contacting the opposite side of the duct wall. Place the lock washers over the studs on the packing gland and hand tighten the nuts.

Figure 8.



285/15-490041-901

5. Align the flow arrow on the Annubar with the flow direction in the duct and tighten the nuts on the packing.

NOTE

Do not over tighten the packing, as this can lead to deforming the opposite wall of the duct.

6. Observe the opposite side of the duct and ensure that the ducting has not deformed.

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STEP 4: MOUNT THE TRANSMITTER

Transmitter Mounting, Direct Mount Head with Valves

It is not necessary to retract the Annubar when direct mounting a transmitter with valves.

1. Place Teflon[®] (PTFE) O-rings into grooves on the face of head.
2. Align the high side of the transmitter to the high side of the sensor ("H" is stamped on the side of the head) and install.
3. Tighten the nuts in a cross pattern to 400 in•lb (45 N•m).

Transmitter Mounting, Direct Mount Head without Valves

1. Place Teflon (PTFE) O-rings into grooves on the face of head.
2. Orient the equalizer valve(s) so they are easily accessible. Install a manifold with the smooth face mating to the face of the head. Tighten in cross pattern to a torque of 400 in•lb (45 N•m).
3. Place Teflon (PTFE) O-rings into grooves on the face of the manifold.
4. Align the high side of the transmitter to the high side of the sensor ("H" is stamped on the side of the head) and install.
5. Tighten the nuts in a cross pattern to 400 in•lb (45 N•m).

Transmitter Mounting with Remote Mount Head

Temperatures in excess of 250 °F (121 °C) at the electronics will damage the transmitter.

Remote mounted electronics are connected to the sensor by means of impulse piping, which allows service flow temperatures to decrease to a point where the electronics are no longer vulnerable.

Different impulse piping arrangements are used depending on the process fluid and must be rated for continuous operation at the pipeline design pressure and temperature. A minimum of 1/2 in. (12 mm) outer diameter stainless steel tubing with a wall thickness of at least 0.035 in. (1 mm) is recommended. Threaded pipe fittings are not recommended because they create voids where air can become entrapped and create leakage points.

The following restrictions and recommendations apply to impulse piping location:

1. Impulse piping that runs horizontally must slope at least one inch per foot (83 mm/m).
 - Slope downward (toward the electronics) for liquid and steam applications
 - Slope upward (toward the electronics) for gas applications.
2. For applications with temperature below 250 °F (121 °C), impulse piping should be as short as possible to minimize temperature changes. Insulation may be required.
3. For applications above 250 °F (121 °C), impulse piping should have a minimum length of one foot (0.3048 m) for every 100 °F (38°C) temperature increase over 250 °F (121 °C). Impulse piping must be non-insulated to reduce fluid temperature. Any threaded connections should be checked after the system reaches the intended temperature because connections may come loose with contraction and expansion caused by temperature change.
4. Outdoor installations for liquid, saturated gas, or steam may require insulation and heat tracing to prevent freezing.
5. When impulse piping is longer than six feet (1.8 m) the high and low impulse lines must be positioned together to maintain equal temperature. They must be supported to prevent sagging and vibration.

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6. Impulse lines should be positioned in protected areas or against walls or ceilings. Use appropriate pipe sealing compound rated for the service temperature on all threaded connections. Do not place the impulse piping near high temperature piping or equipment.

An instrument manifold is recommended for all installations. Manifolds allow an operator to equalize the pressures prior to zeroing and isolates the process fluid from the electronics.

Figure 9. Valve Identification for 5-valve and 3-Valve Manifolds

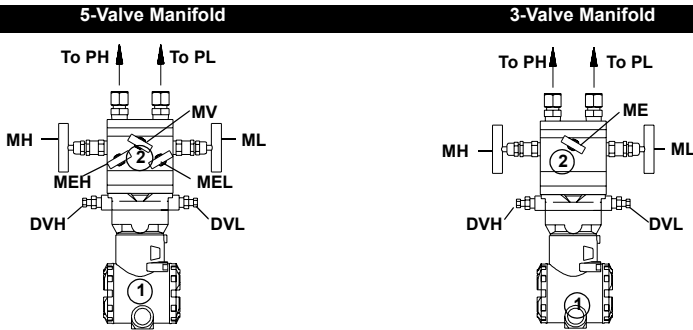


Table 5. Description of Impulse Valves and Components

Name	Description	Purpose
Components		
1	Electronics	Reads Differential Pressure
2	Manifold	Isolates and equalizes electronics
Manifold and Impulse Valves		
PH	Primary Sensor ⁽¹⁾	High and low side pressure process connections.
PL	Primary Sensor ⁽²⁾	
DVH	Drain/Vent Valve ⁽¹⁾	Drains (for gas service) or vents (for liquid or steam service) the DP electronics chambers
DVL	Drain/Vent Valve ⁽²⁾	
MH	Manifold ⁽¹⁾	Isolates high side or low side pressure from the process
ML	Manifold ⁽²⁾	
MEH	Manifold Equalizer ⁽¹⁾	Allows high and low pressure side access to the vent valve, or for isolating the process fluid
MEL	Manifold Equalizer ⁽²⁾	
ME	Manifold Equalizer	Allows high and low side pressure to equalize
MV	Manifold Vent Valve	Vents process fluid

(1) High Pressure

(2) Low Pressure

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STEP 4 CONTINUED...

Recommended Installations

Gas Service

Secure the electronics above the sensor to prevent condensable liquids from collecting in the impulse piping and the DP cell.

Liquid Service (up to 250 °F (121 °C))

Secure the electronics below the sensor to ensure that air will not be introduced into the impulse piping or the electronics.

Figure 10. Gas

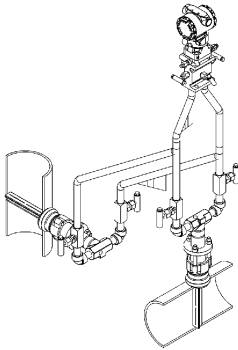
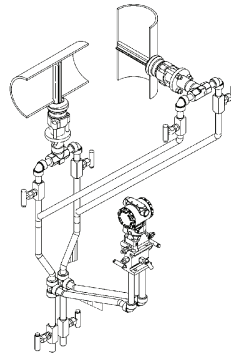


Figure 11. Liquid



Steam or Liquid Service (above 250 °F (121 °C))

Mount the electronics below the process piping, adjust 10 to 15 degree above direct vertical down. Route the impulse piping down to the electronics and fill the system with cool water through the two tee fittings.

Figure 12. Horizontal Line

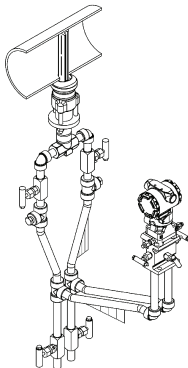
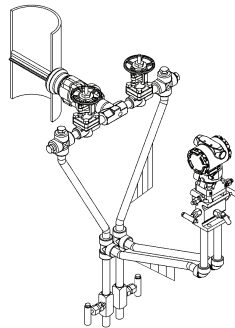


Figure 13. Vertical Line



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PRODUCT CERTIFICATIONS

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

European Pressure Equipment Directive (PED) (97/23/EC)

Rosemount 285 Annubar — Refer to EC declaration of conformity for conformity assessment

Pressure Transmitter — See appropriate Pressure Transmitter QIG

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