Quick Start Guide
00825-0400-4809, Rev FB
June 2016

Rosemount™ 485 Annubar™ Flanged Flo-Tap Assembly

EMERSON™
Process Management

NOTICE

This guide provides basic guidelines for Rosemount 485 Annubar. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, Explosion-proof, Flameproof, or Intrinsically Safe (I.S.) installations. Refer to the Rosemount 485 Annubar Reference Manual for more instruction. This manual is also available electronically on EmersonProcess.com/Rosemount.

If the Rosemount Annubar was ordered assembled to a Rosemount Pressure Transmitter, see the following Quick Start Guides for information on configuration and hazardous locations certifications:

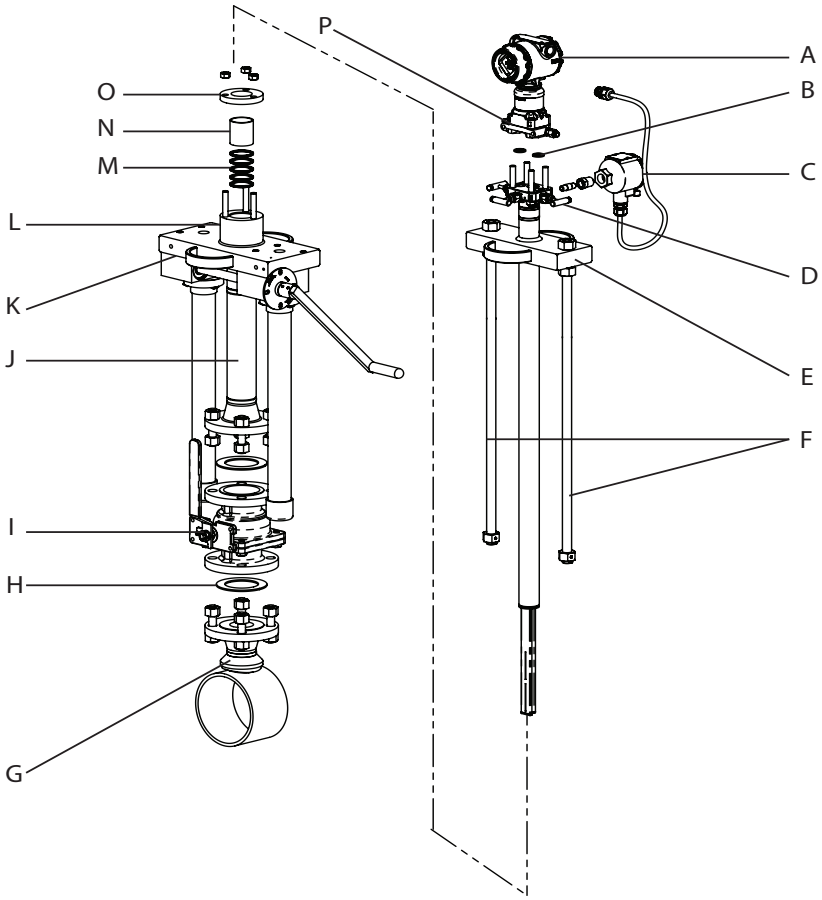
- Rosemount 3051S Series Pressure Transmitter and Rosemount 3051SF Series Flowmeter Quick Start Guide.
- Rosemount 3051S MultiVariable Transmitter and Rosemount 3051SF Series Flowmeter MultiVariable Transmitter Quick Start Guide.
- Rosemount 3051 Pressure Transmitter and Rosemount 3051CF Series Flowmeter Transmitter Quick Start Guide.
- Rosemount 2051 Pressure Transmitter and Rosemount 2051CF Series Flowmeter Transmitter Quick Start Guide.

⚠ 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 Rosemount 485 Annubar Assembly to become hot and could result in burns.

Contents

Figure 1. Rosemount 485 Annubar Flanged Flo-Tap Assembly Exploded View



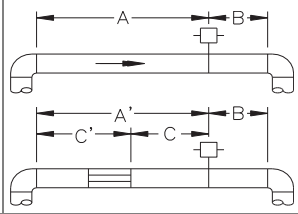
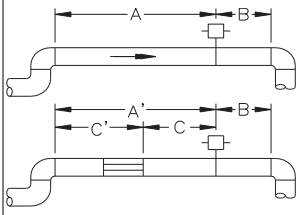
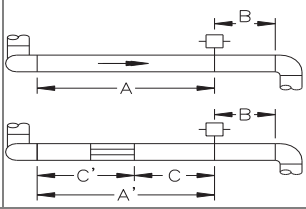
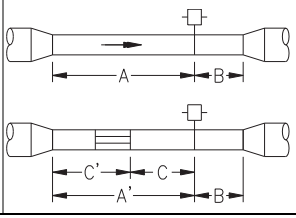
A. Transmitter
B. 2× O-rings
C. Temperature sensor connection housing
D. Direct mount transmitter connection with valves
E. Head plate
F. Drive rods
G. Mounting flange assembly
H. Gasket
I. Isolation valve
J. Cage nipple
K. Support plate
L. Packing gland
M. Packing
N. Follower
O. Compression plate
P. Coplanar flange with drain vents

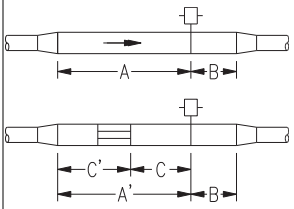
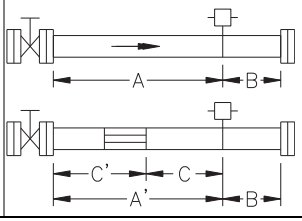
Note
Use an appropriate pipe sealing compound rated for the service temperature on all threaded connections.

1.0 Location and orientation

Correct orientation and straight run requirements must be met for accurate and repeatable flow measurements. Refer to Table 1for minimum pipe diameter distances from upstream disturbances.

Table 1. Straight Run Requirements

	In plane / Out of plane	Upstream pipe diameters					Downstream pipe diameters
		Without straightening vanes		With straightening vanes			
		In plane A	Out of plane A	A'	C	C'	B
1		8 N/A	10 N/A	N/A 8	N/A 4	N/A 4	4 4
2		11 N/A	16 N/A	N/A 8	N/A 4	N/A 4	4 4
3		23 N/A	28 N/A	N/A 8	N/A 4	N/A 4	4 4
4		12 N/A	12 N/A	N/A 8	N/A 4	N/A 4	4 4

5		18 N/A	18 N/A	N/A 8	N/A 4	N/A 4	4 4
6		30 N/A	30 N/A	N/A 8	N/A 4	N/A 4	4 4

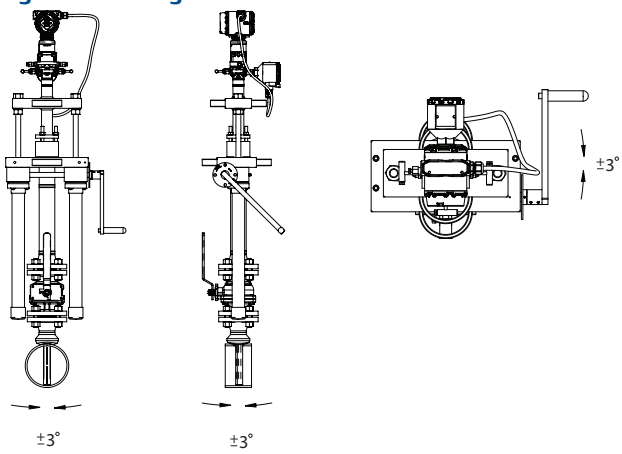
Note

- Consult the factory for instructions regarding use in square or rectangular ducts.
- "In plane A" means the bar is in the same plane as the elbow. "Out of plane A" means the bar is perpendicular to the plane of the elbow.
- If proper lengths of straight run are not available, position the mounting such that 80% of the run is upstream and 20% is downstream.
- Use straightening vanes to reduce the required straight run length.
- Row 6 in Table 1 applies to gate, globe, plug, and other throttling valves that are partially opened, as well as control valves.

1.1 Misalignment

Rosemount 485 Annubar installation allows for a maximum misalignment of 3°.

Figure 2. Misalignment



1.2 Horizontal orientation

For proper venting and draining, the sensor should be located in the upper half of the pipe for air and gas applications. For liquid and steam applications, the sensor should be located in the bottom half of the pipe. The maximum temperature for a direct mounted transmitter is 500 °F (260 °C). See "Install isolation valve" on page 9 for remote mounted transmitter recommendations.

Figure 3. Gas

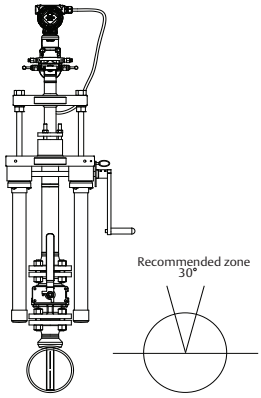
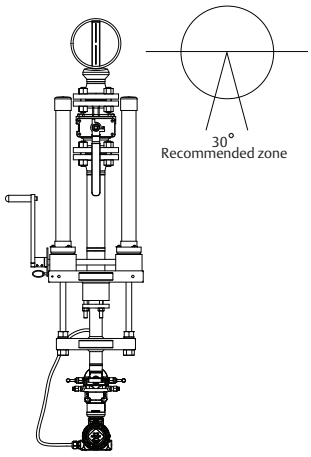


Figure 4. Liquid and Steam



Note

For steam applications with DP readings between 0.75 and 2 inH_2O in horizontal pipes, it is recommended to install the primary element/flowmeter mounting above the pipe.

Note
Due to the weight of the Flo-Tap mounting hardware, external support may be needed for vertical orientation applications and horizontal orientation applications that are installed outside of the recommended zones.

1.3 Vertical orientation

The sensor can be installed in any position around the circumference of the pipe, provided the vents are positioned properly for bleeding or venting. Optimal results for liquid or steam are obtained when flow is up. For steam applications, a 90° spacer will be added to provide water legs to ensure the transmitter stays within temperature limits. The maximum temperature for a direct mounted transmitter is 500 °F (260 °C).

Figure 5. Steam

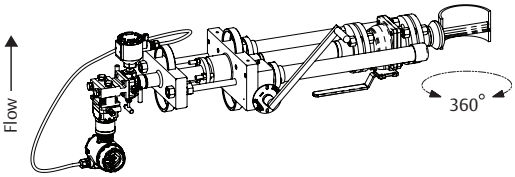


Figure 6. Liquid

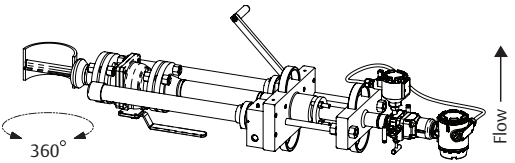
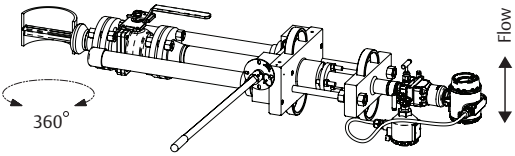


Figure 7. Gas



2.0 Weld mounting hardware

Note
Rosemount-supplied mounting has an integral alignment built into the mounting hardware that assists in the correct drilling of the mounting hole. It also assists in the alignment of the sensor to the mounting hole for insertion.

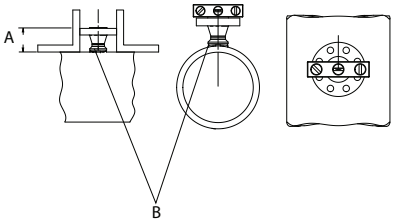
1. At the pre-determined position, place the flanged assembly on the pipe, gap 1/16-in. (1.6 mm), and measure the distance from the outer diameter of the pipe to the face of the flange. Compare this to Table 2 and adjust the gap as necessary.

Table 2. Flange Sizes and Outer Diameter to Flange (ODF) per Sensor Size

Sensor size	Flange size	ODF (in. [mm])	Flange size	ODF (in. [mm])
1	1 1/2-in. 150#	3.88 (98,5)	DN40 PN16	3.09 (78,6)
1	1 1/2-in. 300#	4.13 (104,9)	DN40 PN40	3.21 (81,6)
1	1 1/2-in. 600#	4.44 (112,7)	DN40 PN100	3.88 (98,6)
1	1 1/2-in. 900#	4.94 (125,4)	N/A	N/A
1	1 1/2-in. 1500#	4.94 (125,4)	N/A	N/A
1	1 1/2-in. 2500#	6.76 (171,6)	N/A	N/A
2	2.0-in. 150#	4.13 (104,8)	DN50 PN16	3.40 (86,3)
2	2.0-in. 300#	4.38 (111,2)	DN50 PN40	3.51 (89,3)
2	2.0-in. 600#	4.76 (120,8)	DN50 PN100	4.30 (109,3)
2	2.0-in. 900#	5.88 (149,2)	N/A	N/A
2	2.0-in. 1500#	5.88 (149,2)	N/A	N/A
2	3.0-in. 2500#	9.87 (250,7)	N/A	N/A
3	3.0-in. 150#	4.63 (117,5)	DN80 PN16	3.84 (97,6)
3	3.0-in. 300#	5.00 (126,9)	DN80 PN40	4.16 (105,6)
3	3.0-in. 600#	5.38 (136,6)	DN80 PN100	4.95 (125,6)
3	4.0-in. 900#	8.19 (208,0)	N/A	N/A
3	4.0-in. 1500#	8.56 (217,5)	N/A	N/A
3	4.0-in. 2500#	11.19 (284,2)	N/A	N/A

2. Place four 1/4-in. (6 mm) tack welds at 90° increments. Check alignment of the mounting both parallel and perpendicular to the axis of flow (see Figure 8). If alignment of the mounting is within tolerances, finish weld per local codes. If outside of specified tolerance, make adjustments prior to making the finish weld.

Figure 8. Alignment



A. ODF
B. Tack welds

3. To avoid serious burns, allow the mounting hardware to cool before continuing.

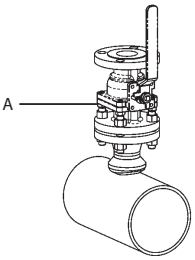
3.0 Install isolation valve

1. Position the isolation valve onto the mounting flange. Ensure the valve stem is positioned so that when the Flo-Tap is installed, the insertion rods will straddle the pipe and the valve handle will be centered between the rods (see Figure 9).

Note
Interference will occur if the valve is located inline with the rods.

2. Fasten the isolation valve to the mounting using gasket, bolts, and nuts.

Figure 9. Isolation Valve Orientation



A. Isolation valve

4.0 Mount drilling machine and drill hole

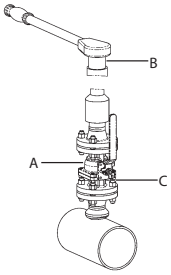
Drilling machine is not provided with assembly.

1. Determine the sensor size based on the sensor width (see Table 3).

Table 3. Sensor Size/Hole Diameter Chart

Sensor size	Sensor width	Hole diameter	
1	0.590-in. (14,99 mm)	3/4-in. (19 mm)	+1/32-in (0,8 mm) – 0.00
2	1.060-in. (26,92 mm)	1 5/16-in. (34 mm)	+1/16-in. (1,6 mm) – 0.00
3	1.935-in. (49,15 mm)	2 1/2-in. (64 mm)	+1/16-in. (1,6 mm) – 0.00

2. Mount the drilling machine to the isolation valve.



A. Isolation valve is fully open when inserting drill
B. Pressure drilling machine
C. Isolation valve is fully closed after withdrawing drill

3. Open the valve fully.
4. Drill the hole into the pipe wall in accordance with the instructions provided by the drilling machine manufacturer (use Table 3 to select the proper drill bit for the sensor being used).
5. Retract the drill fully beyond the valve.

5.0 Remove drilling machine

1. Verify the drill has been retracted past the valve.
2. Close the isolation valve to isolate the process.
3. Bleed drilling machine pressure and remove.
4. Check isolation valve and mounting for leakage.

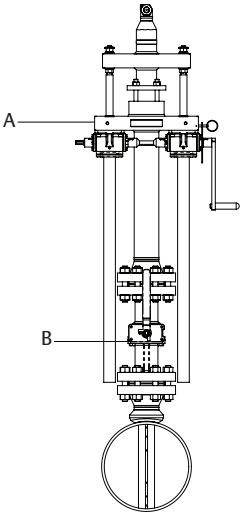
6.0 Mount the Rosemount Annubar Assembly

1. Align the flow arrow on the head with the direction of flow.
2. Use the supplied gaskets and flange bolts to fasten the Flo-Tap assembly to the isolation valve.
3. Tighten the nuts in a cross pattern to compress the gasket evenly.
4. Ensure the vent valves are closed before proceeding.
5. Open and close the isolation valve to pressurize the Rosemount 485 Sensor and identify any leak points in the installation. Use extreme caution if the flowing medium is steam or caustic.
6. Check the entire installation for leakage. Tighten as required to stop any connection from leaking.
7. Repeat step 5 and 6 until there is no leakage.

Note

Rosemount 485 Annubar have the potential to carry a large amount of weight at a great distance from the piping, necessitating external support. The support plate has threaded holes to assist in supporting the Rosemount 485 Annubar.

Figure 10. Install Flo-Tap Assembly



A. Support plate
B. Isolation valve

7.0 Insert the Rosemount Annubar Sensor

7.1 Standard drive (M)

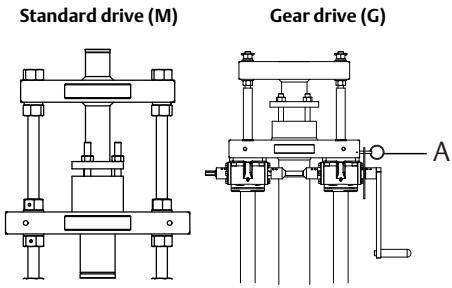
1. Open the isolation valve fully.
2. Rotate the drive nuts clockwise (as viewed from the top). The nuts must be tightened alternately, about two turns at a time, to prevent binding caused by unequal loading.
3. Continue this procedure until the tip of the sensor firmly contacts the opposite side of the pipe.
   a. The orange stripes are visual indication of when the sensor is approaching the opposite side wall.
   b. As the orange strip approaches the support plate, place a finger above the packing gland while cranking. When movement stops, the sensor is in contact with the opposite side wall.
   c. Turn the handle an additional 1/4 to 1/2 turn to secure the sensor.

7.2 Gear drive (G)

1. Open the isolation valve fully.
2. Rotate the crank clockwise. If a power drill with an adapter is used, do not exceed 200 rpm.
   a. Continue rotating the crank until the sensor firmly contacts the opposite side of the pipe. The orange stripes are visual indication of when the sensor is approaching the opposite side wall.
   b. As the orange stripes approach the support plate, remove the power drill and continue cranking manually. Place a finger above the packing gland while cranking. When movement stops, the sensor is in contact with the opposite side wall.
   c. Turn the handle an additional 1/4 to 1/2 turn to secure the sensor.
3. Secure the drive by inserting the drive lock pin as shown in Figure 11.

Note
Do not place finger above packing gland for high temperature applications.

Figure 11. Insert the Sensor



A. Drive lock pin

8.0 Mount the Transmitter

8.1 Transmitter mounting, direct mount head with valves

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

1. Place PTFE O-rings into grooves on the Rosemount Annubar head.
2. Align the high side of the transmitter to the high side of the sensor (“Hi” is stamped on the side of the head) and install.
3. Tighten the nuts in a cross pattern to 384 in-lb (43 N-m).

8.2 Transmitter mounting with remote mount head

Temperatures in excess of 250 °F (121 °C) at the sensor module diaphragms will damage the transmitter. Remote mounted transmitters are connected to the sensor by means of impulse piping, which allows process temperatures to decrease to a point where the transmitter is 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 transmitter) for liquid and steam applications.
   - Slope upward (toward the transmitter) for gas applications.
2. Outdoor installations for liquid, saturated gas, or steam may require insulation and heat tracing to prevent freezing.
3. 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 transmitter.

Figure 12. Valve Identification for 5-Valve and 3-Valve Manifolds

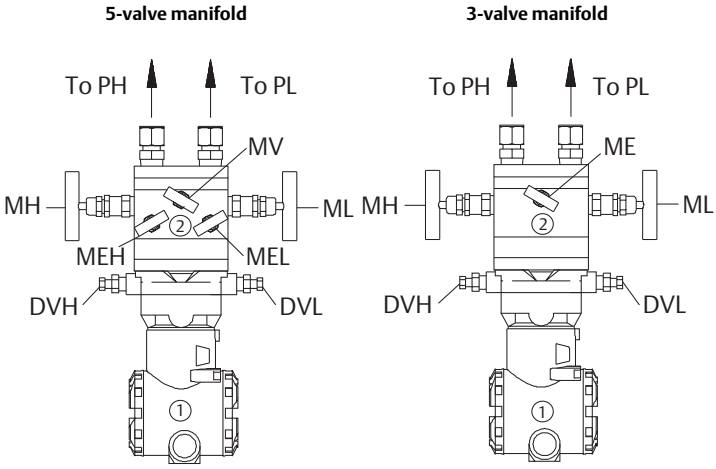


Table 4. Description of Impulse Valves and Components

Name	Description	Purpose
Components		
1	Transmitter	Reads Differential Pressure
2	Manifold	Isolates and equalizes transmitter
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 transmitter 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

8.3 Recommended installations

Gas service

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

Figure 13. Horizontal Gas

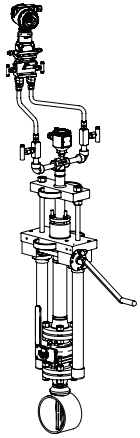
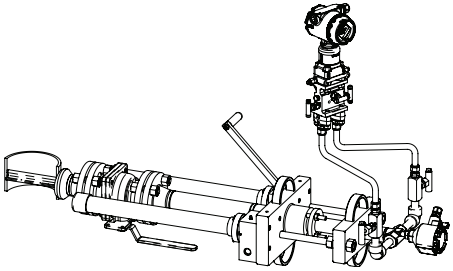


Figure 14. Vertical Gas



Steam and liquid service

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

Figure 15. Horizontal Steam and Liquid

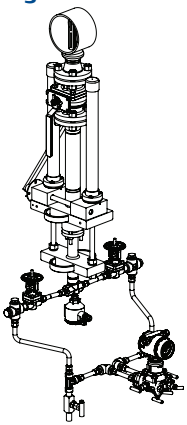
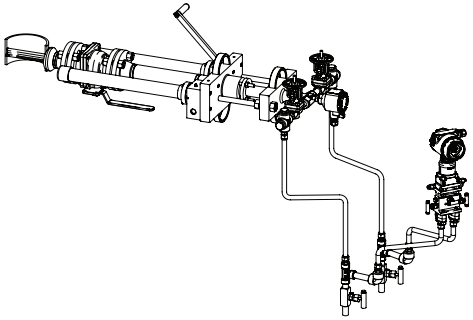


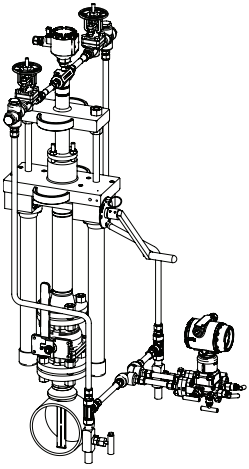
Figure 16. Vertical Steam and Liquid



Top mounting for steam service

This orientation can be used for any steam temperature. However, it is required for installations above 600 °F (315 °C). For remote mount installations the impulse piping should slope up slightly from the instrument connections on the Rosemount Annubar to the cross fittings allowing condensate to drain back into the pipe. From the cross fittings, the impulse piping should be routed downward to the transmitter and the drain legs. The transmitter should be located below the instrument connections of the Rosemount Annubar. Depending on the environmental conditions, it may be necessary to insulate the mounting hardware.

Figure 17. Horizontal Top Mounting for Steams



9.0 Retracting the Rosemount Annubar Assembly

9.1 Gear drive (G)

1. Remove the drive lock pin.
2. Rotate the crank counter-clockwise. If a power drill with an adapter is used, do not exceed 200 rpm.
3. Retract until the rod end nuts are against the gear box mechanism.

10.0 Product certifications

10.1 Approved Manufacturing Locations

Rosemount Inc. – Shakopee, Minnesota USA

Rosemount DP Flow Design and Operations – Boulder, Colorado USA

Emerson Process Management GmbH & Co. OHG – Wessling, Germany

Emerson Process Management Asia Pacific Private Limited – Singapore

Emerson Beijing Instrument Co., Ltd – Beijing, China

10.2 European Directive Information

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

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

Rosemount 485 Annubar — Refer to EC declaration of conformity for conformity assessment

Pressure Transmitter — See appropriate Pressure Transmitter QSG

10.3 Hazardous Locations Certifications

For information regarding the transmitter product certification, see the appropriate transmitter QSG:

- Rosemount 3051S Series Pressure Transmitter and Rosemount 3051SF Series Flowmeter Quick Start Guide.
- Rosemount 3051S MultiVariable Transmitter and Rosemount 3051SF Series Flowmeter MultiVariable Transmitter Quick Start Guide.
- Rosemount 3051 Pressure Transmitter and Rosemount 3051CF Series Flowmeter Transmitter Quick Start Guide.
- Rosemount 2051 Pressure Transmitter and Rosemount 2051CF Series Flowmeter Transmitter Quick Start Guide.

Figure 18. Rosemount Primary Element Declaration of Conformity

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EU Declaration of Conformity

No: DSI 1000 Rev. L

CE

We,

Rosemount, Inc.
8200 Market Boulevard
Chanhassen, MN 55317-9685
USA

declare under our sole responsibility that the products,

Rosemount Primary Elements: 405x, 485, 585, 1195, 1495, 1595
Rosemount DP Flowmeters: 2051CFx, 3051CFx, 3051SFx

manufactured by,

Rosemount / Dieterich Standard, Inc.
5601 North 71st Street
Boulder, CO 80301
USA

to which this declaration relates, is in conformity with the provisions of the European Union Directives as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule.

(signature)

Vice President of Global Quality
(function)

Kelly Klein
(name)

19 Apr 2016
(date of issue)

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DSI 1000.docx

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EU Declaration of Conformity

No: DSI 1000 Rev. L

CE

PED Directive (97/23/EC) ***This directive is valid until 18 July 2016***
PED Directive (2014/68/EU) ***This directive is valid from 19 July 2016***

Summary of Classifications		
Model/Range	PED Category	
	Group 1 Fluid	Group 2 Fluid
Rosemount 585 - 150#-900# All Lines	SEP	SEP
Rosemount 585 - 1500# & 2500# All Lines	III	SEP
Rosemount 405C, 405A, x051xFC	SEP	SEP
Rosemount 1195, x051xFP with 150#, 1-1/2" Flange	I	SEP
Rosemount 1195, x051xFP with 300# or 600#, 1" or 1-1/2" Flange	II	I
Rosemount 1195, x051xFP with 1" or 1-1/2" Threaded & Welded Connection	II	I
Rosemount 485/x051SxFA: 1500# & 2500# All Line Sizes, Flanged	III	SEP
Rosemount 485/x051xFA: Sensor Size 2, 150#, 6"to 24" Line Sizes, FloTap	I	SEP
Rosemount 485/x051xFA: Sensor Size 2, 300#, 6"to 24" Line Sizes, FloTap	II	I
Rosemount 485/x051xFA: Sensor Size 2, 600#, 6"to 16" Line Sizes, FloTap	II	I
Rosemount 485/x051xFA: Sensor Size 2, 600#, 18"to 24" Line Sizes, FloTap	III	II
Rosemount 485/x051xFA: Sensor Size 3, 150#, 12"to 44" Line Sizes, FloTap	II	I
Rosemount 485/x051xFA: Sensor Size 3, 150#, 46"to 72" Line Sizes, FloTap	III	II
Rosemount 485/x051xFA: Sensor Size 3, 300#, 12" to 72" Line Sizes, FloTap	III	II
Rosemount 485/x051xFA: Sensor Size 3, 600#, 12"to 36" Line Sizes, FloTap	III	II
Rosemount 485/x051xFA: Sensor Size 3, 600#, 48" to 72" Line Sizes, FloTap	IV*	III
All other Rosemount Primary Elements and DP Flowmeters	SEP	SEP

Certificate of Assessment – CE-0041-H-RMT-001-13-USA

IV* *Category IV Flo Tap requires a B1 Certificate for design examination and H1 Certificate for special surveillance*

EMERSON. Process Management

EU Declaration of Conformity

No: DSI 1000 Rev. L

CE

Pressure Equipment Directive Notified Body:

Bureau Veritas UK Limited [Notified Body Number: 0041]
Parklands, Wilmslow Road, Didsbury
Manchester M20 2RE
United Kingdom

表格 1B: 含有 China RoHS 管控物质超过最大浓度限值的部件型号列表 Rosemount 485
Table 1B: List of Rosemount 485 Parts with China RoHS Concentration above MCVs

部件名称 Part Name	有害物质 / Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr +6)	多溴联苯 Polybrominated biphenyls (PBB)	多溴联苯醚 Polybrominated diphenyl ethers (PBDE)
铝制温度传感器外壳组件 Aluminum RTD Housing Assembly	O	O	O	X	O	O

本表格系依据 SJ/T11364 的规定而制作.
This table is proposed in accordance with the provision of SJ/T11364
O: 意为该部件的所有均质材料中该有害物质的含量均低于 GB/T 26572 所规定的限量要求.
O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.
X: 意为在该部件所使用的所有均质材料里，至少有一类均质材料中该有害物质的含量高于 GB/T 26572 所规定的限量要求.
X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

上述申明仅适用于选择铝制外壳组件的产品。其他所有差压流量一次元件的组件所含有的 China RoHS 管控物质浓度均低于 GB/T 26572 所规定的限量要求。关于差压流量计变送器组件的管控物质浓度的申明，请参看变送器的快速安装指南。
The disclosure above applies to units supplied with aluminum connection heads. No other components supplied with DP Flow primary elements contain any restricted substances. Please consult the transmitter Quick Start Guide (QIG) for disclosure information on transmitter components.

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Quick Start Guide
00825-0400-4809, Rev FB
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