Quick Start Guide
00825-0700-4809, Rev BA
June 2016

Rosemount™ 485 Annubar™ Threaded Assembly

EMERSON™
Process Management

NOTICE

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

If the Rosemount 485 was ordered assembled to a Rosemount Pressure Transmitter, see the following Quick Start Guides for information on configuration and hazardous locations certifications:

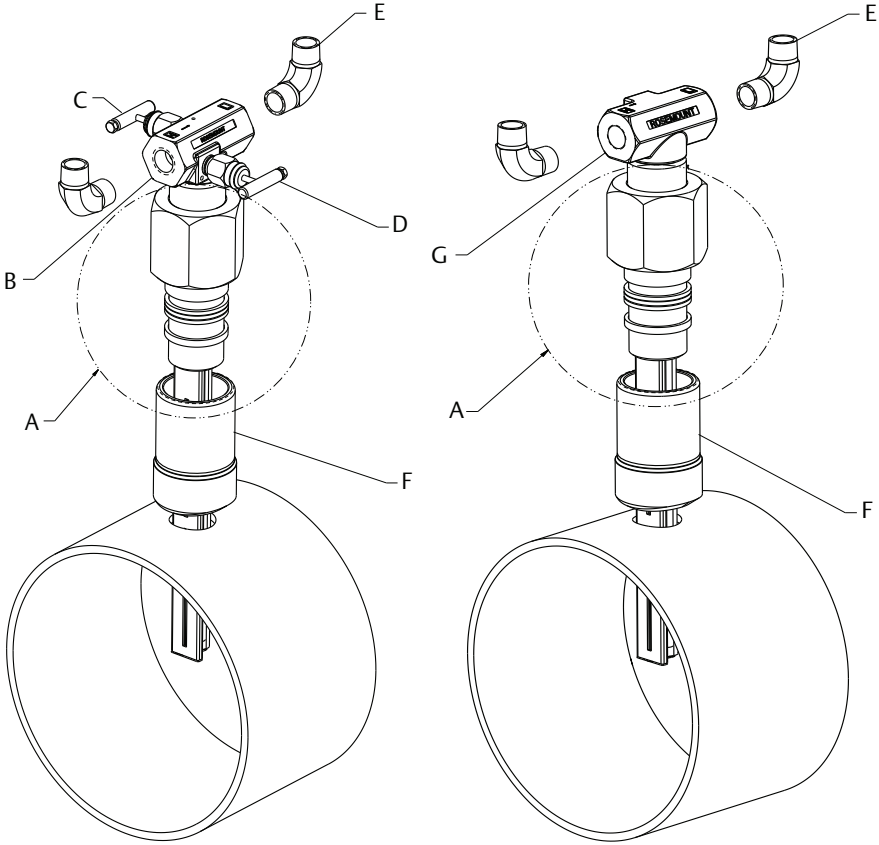
- Rosemount 3051S Series Pressure Transmitter and Rosemount 3051SF Series Flowmeter Quick Start Guide.
- Rosemount 3051S MultiVariable Transmitter and Rosemount 3051SF Series Flowmeter MultiVariable Transmitter Quick Start Guide.
- Rosemount 3051 Pressure Transmitter and Rosemount 3051CF Series Flowmeter 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 packings designed to seal with the recommended torque value 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 Threaded Assembly Exploded View



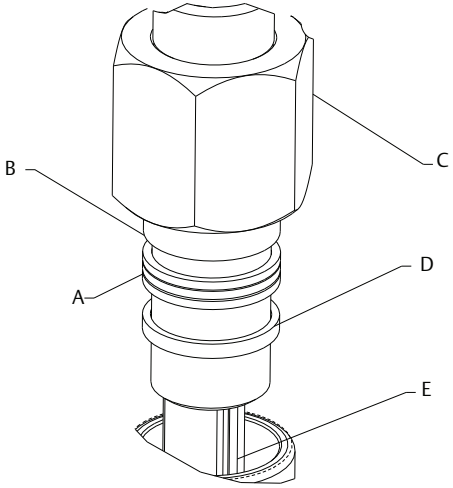
A. See Figure 2 for detail.
B. Remote mount connection with isolation valves
C. Integrated valve low (VL)
D. Integrated valve high (VH)
E. 2× Elbows
F. Threaded weld coupling
G. Remote mount connection

Table 1. Isolation Valves

Name	Description	Position	Purpose
VH	Integrated Isolation Valve High[1]	Letter "H" side of the Remote Mount Connection	Isolates high side or low side pressure from the process
VL	Integrated Isolation Valve Low[2]	Letter "L" side of the Remote Mount Connection	

1. High pressure
2. Low pressure

Figure 2. Rosemount 485 Annubar Threaded Packing Assembly Detail Exploded View(1)



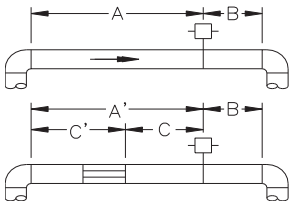
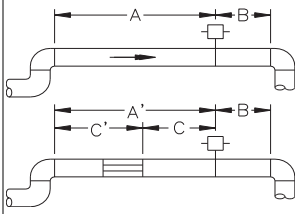
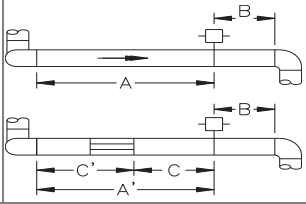
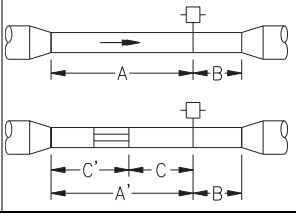
A. 3× Packaging rings
B. Follower
C. Nut
D. Retaining ring
E. Rosemount 485 Annubar Sensor

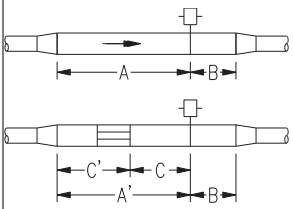
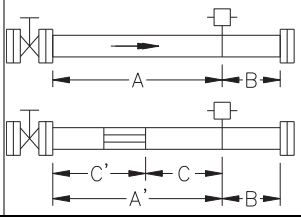
1. *Image scale = 3/2.*

1.0 Location and orientation

Correct orientation and straight run requirements must be met for accurate and repeatable flow measurements. Refer to Table 2 for minimum pipe diameter distances from upstream and downstream disturbances.

Table 2. 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

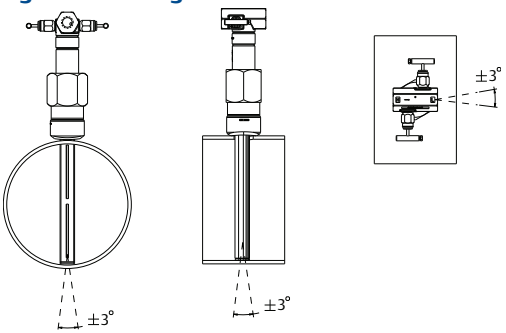
Note

- Consult the factory for instructions regarding use in square or rectangular ducts.
- If proper lengths of straight run are not available, position the mounting such that 80% of the run is upstream and 20% is downstream. This will result in degraded accuracy.
- Use straightening vanes to reduce the required straight run length.
- Row 6 in Table 2 applies to gate, globe, plug, and other throttling valves that are partially opened, as well as control valves.

1.1 Misalignment

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

Figure 3. Misalignment

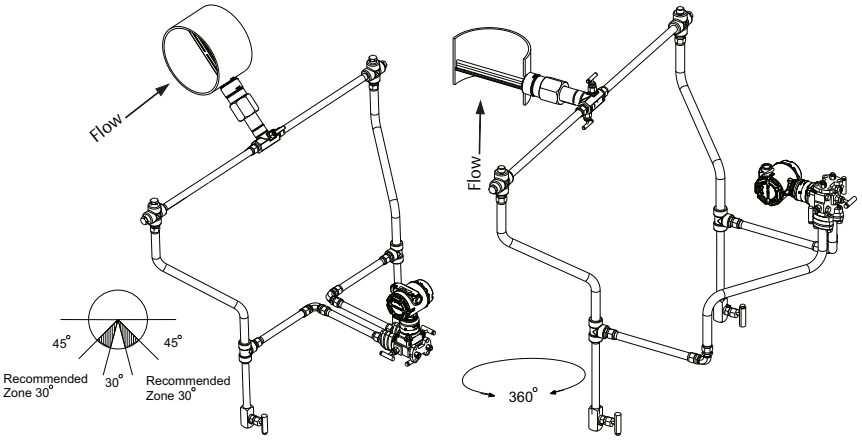


1.2 Flowmeter orientation

Figure 4. Flowmeter Orientation for Liquid

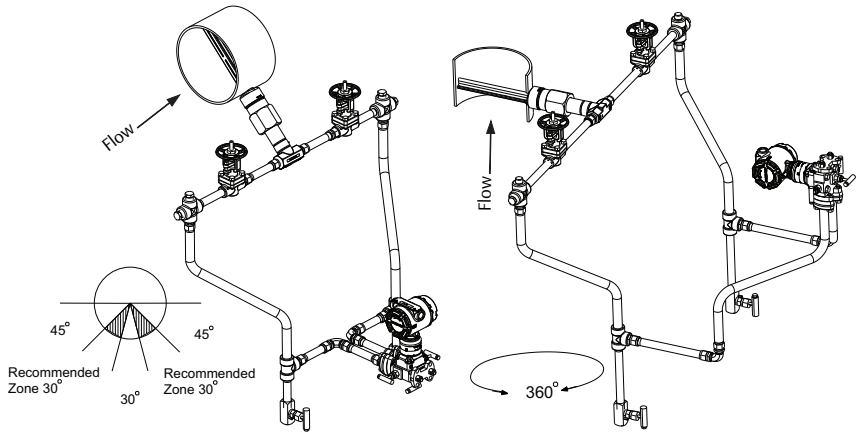
Remote mount; for low temperature (<450 °F/232 °C)

Horizontal liquid **Vertical liquid[1]**



Remote mount; for high temperature (<600 °F/315 °C)

Horizontal liquid **Vertical liquid[1]**

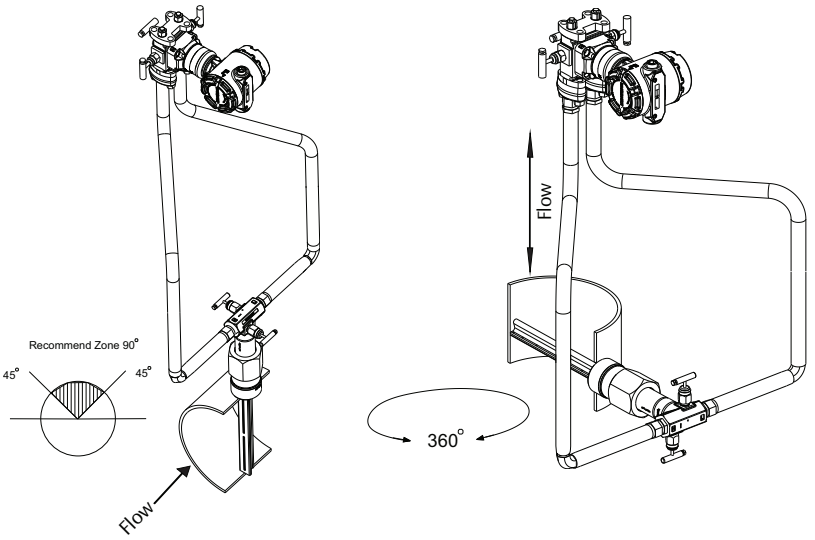


1. Downward flow is not recommended.

Figure 5. Flowmeter Orientation for Gas

Remote mount; for low temperature (<450 °F/232 °C)

Horizontal gas **Vertical gas**



Remote mount; for high temperature (<600 °F/315 °C)

Horizontal gas **Vertical gas**

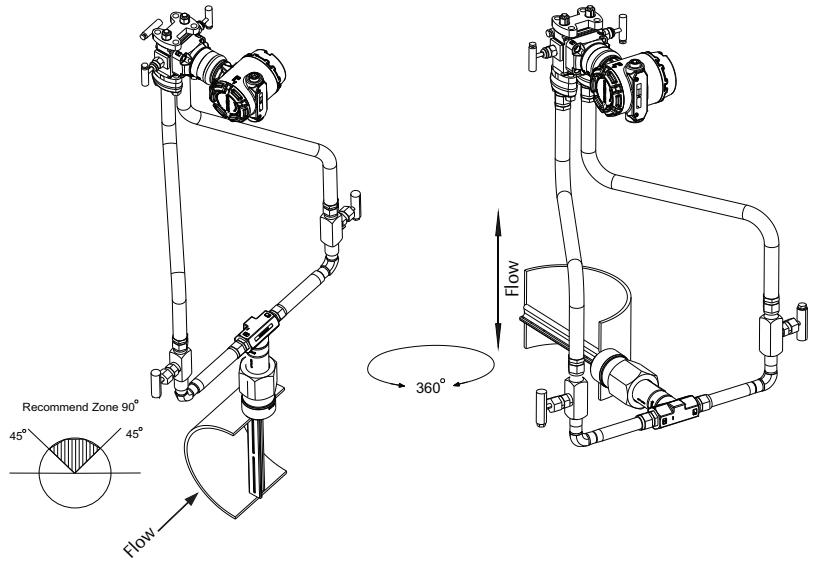
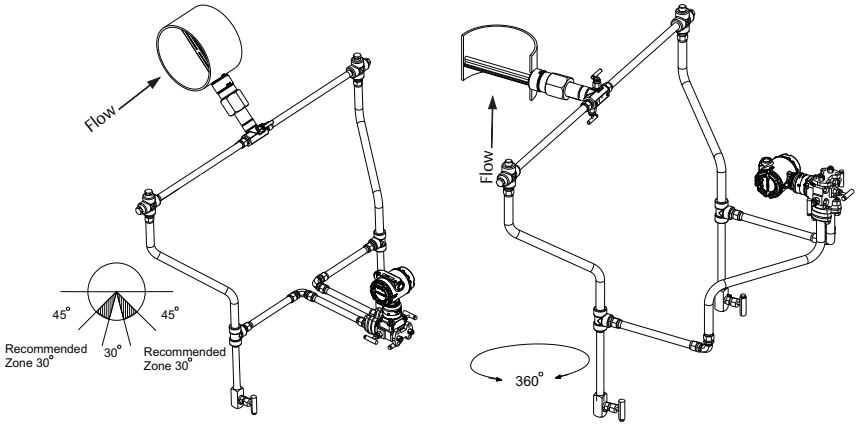


Figure 6. Flowmeter Orientation for Steam

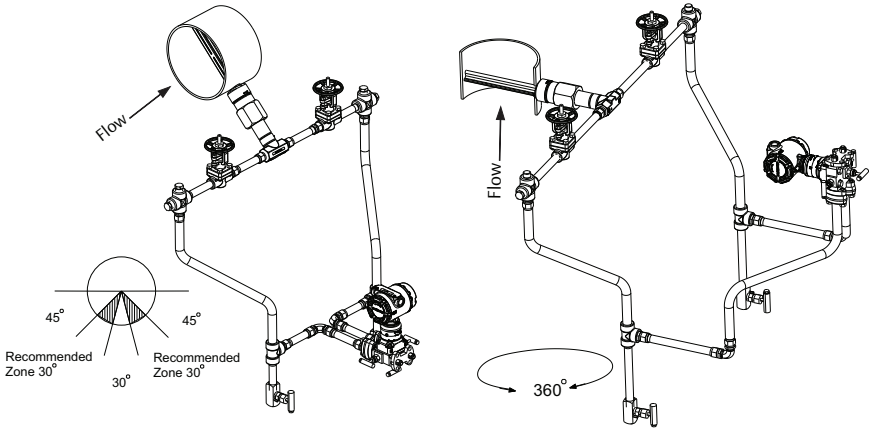
Remote mount; for low temperature (<450 °F/232 °C)

Horizontal steam **Vertical steam[1]**



Remote mount; for high temperature (<600 °F/315 °C)

Horizontal steam **Vertical steam[1]**

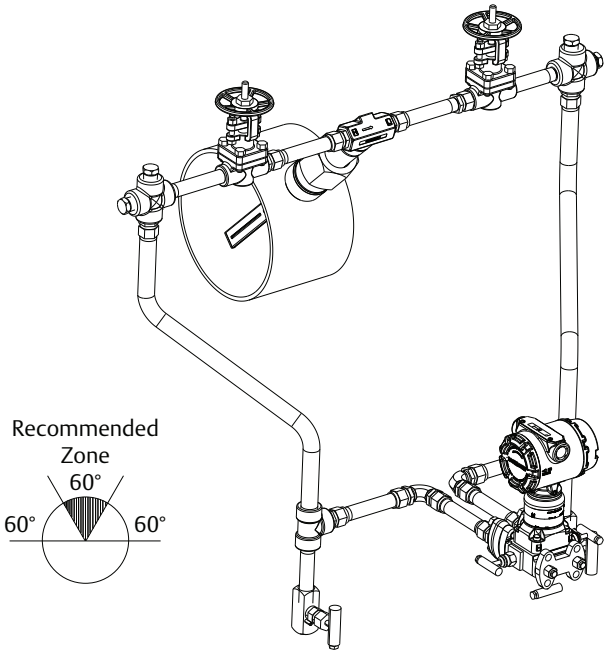


1. Downward flow is not recommended.

1.3 Top mounting the flowmeter for steam

Top mounting for steam applications is an alternate mounting option in some cases. Consult Rosemount Customer Central for instructions regarding steam on top mounting. Top mounting in steam is an alternative mounting method for steam installations that can be used if there are space restrictions or other concerns. This installation method is intended for applications that run with limited interruptions or shutdowns. Also, top mounting can reduce or eliminate the need for heat tracing in outdoor applications that do not experience shutdowns during cold weather.

Figure 7. Remote Mount; Horizontal Top Mounting for Steam



This orientation can be used for any steam temperature. 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 primary element. Depending on the environmental conditions, it may be necessary to insulate the mounting hardware.

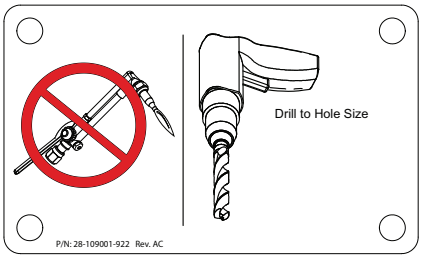
2.0 Drill sensor holes

1. Determine the sensor size based on the probe 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

2. Depressurize and drain the pipe.
3. Select the location to drill the hole.
4. Determine the diameter of the hole to be drilled according to the specifications in Table 3. Drill the mounting hole into the pipe with a hole saw or drill. DO NOT TORCH CUT THE HOLE.



⚠ WARNING

When drilling the mounting hole, Emerson™ Process Management recommends the use of a magnetic drill or pipe clamping fixture to safely drill the hole. Use appropriate personal protective equipment and procedures when drilling and welding.

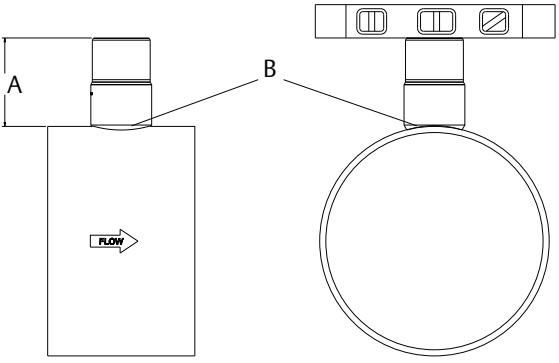
3.0 Prepare for welding

1. Clean off the coating on the bottom of the weld coupling to get the best weld penetration effect.
2. For specific process fluid, the anti-rust oil inside the weld coupling may need to be rinsed thoroughly before welding. If you are not sure about your process fluid, contact an Emerson Process Management representative.

4.0 Weld the mounting hardware

1. Center the threaded body over the mounting hole, gap 1/16-in. (1,6 mm), and place four 1/4-in. (6 mm) tack welds at 90° increments.
2. Check alignment of the threaded body both parallel and perpendicular to the axis of flow (see Figure 8). If alignment of mounting is within tolerances defined in Figure 3, finish weld per local codes. If alignment is outside of specified tolerance, make adjustments prior to finish weld.

Figure 8. Alignment



A. Lower Mounting Height LMH(1) B. Tack welds

1. LMH values are as follows:
   Sensor size 1 — 2.89-in.(73 mm)
   Sensor size 2 — 3.92-in.(100 mm)

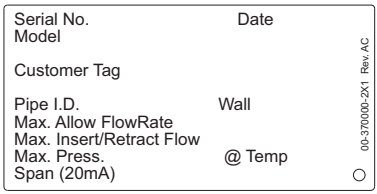
3. To avoid serious burns, allow the mounting hardware to cool before continuing.
4. For flat duct surfaces, the bottom of the weld coupling needs to be ground for mounting. The welding height remains the same as LMH value for respective sensor size.

5.0 Insert the Rosemount Annubar Sensor

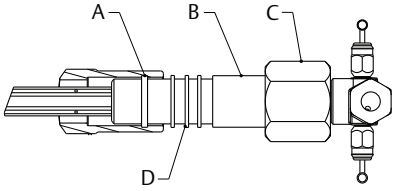
Note
Refer to "Rosemount 485 Annubar Threaded Assembly Exploded View" on page 3 for component descriptions.

1. To ensure the primary element contacts the opposite side pipe wall, mark the tip of the sensor with a marker.
2. Insert the flowmeter into the threaded body until the sensor tip contacts the pipe wall, twisting the primary element back and forth.

3. Verify the sensor tip made contact with the opposite side pipe wall by removing the primary element and ensuring that some of the marker has been rubbed off. If the tip did not touch the wall, verify the measured pipe ID and wall match the tagging information and re-insert.

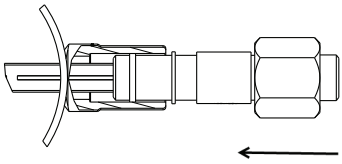


4. Align the flow arrow on the head with the direction of flow. Re-insert the primary element into the threaded weld coupling and install the first packing ring on the sensor between the retaining ring and the follower. Take care not to damage the split packing rings.
5. Install packing rings.

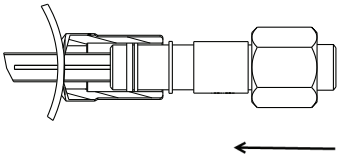


A. Retaining ring
C. Nut
B. Follower
D. 3× Packing rings

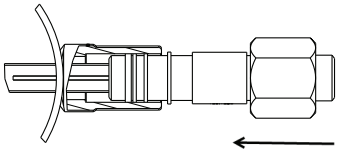
a. Install the first packing ring underneath the follower.
b. Use the follower to compress the first packing ring against the retaining ring.



c. Install the second packing ring underneath the follower. Alternate packing ring splits by 120° to each other.
d. Use the follower to compress the second packing ring against the first packing ring.



e. Install the third packing ring underneath the follower.
f. Use the follower to compress the third packing ring.



6. Tighten the nut to the specified torque.

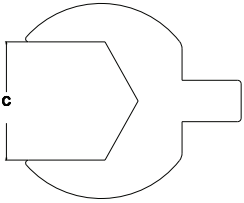
Table 4. Torque Requirements

Sensor size	Open spanner specification C	Recommended torque	Maximum torque
1	M50	444.4 in-lb (50 N-m)	531 in-lb (60 N-m)
2	M65	708 in-lb (80 N-m)	1416 in-lb (160 N-m)

a. Inspect the unit for leakage.
b. If any leaks exist, tighten the nut in 1/4 turn increments until there is no leakage.

Note
Do not exceed the maximum torque listed in Table 4.

Figure 9. Torque Wrench(1)



1. See Table 4 for "Open spanner specification C".

Note
The threaded sealing mechanism will generate significant force at the point where the sensor contacts the opposite pipe wall. Caution needs to be exercised on thin-walled piping (ANSI Sch 10 and lower) to avoid damage to the pipe.

6.0 Product certifications

6.1 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

6.2 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

6.3 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 10. Rosemount 485 Declaration of Conformity

EMERSON. Process Management

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)

Page 1 of 3 DSI 1000.docx

EMERSON. Process Management

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 多溴联苯醚 (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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June 2016

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