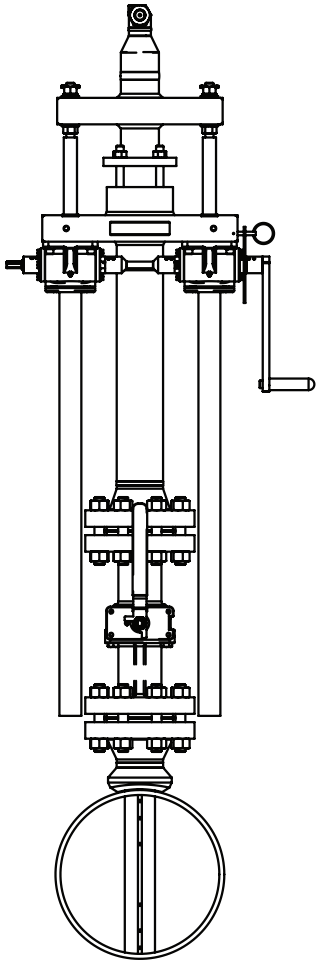
Quick Start Guide
00825-0200-4585, Rev BB
June 2016

Rosemount™ 585 Annubar™ Flanged Flo-Tap Assembly



EMERSON™
Process Management

NOTICE

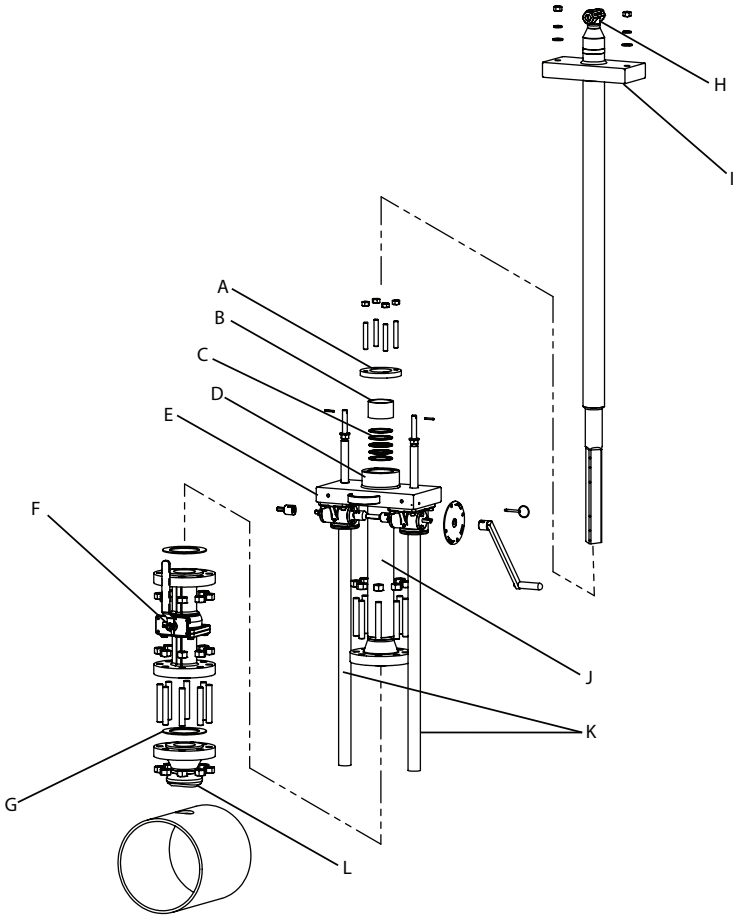
This guide provides basic guidelines for Rosemount 585 Annubar. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, Explosion-proof, Flame-Proof, or intrinsically safe (I.S.) installations. Refer to the Rosemount 585 Annubar Reference Manual (document number 00809-0100-4585) 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 Rosemount 585 Annubar assembly to become hot and could result in burns.

Contents

Figure 1. Rosemount 585 Annubar Flanged Flo-Tap Assembly Exploded View



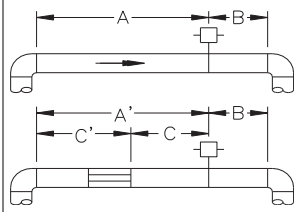
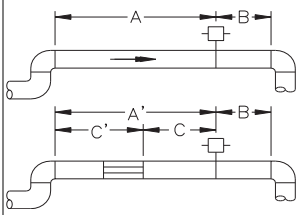
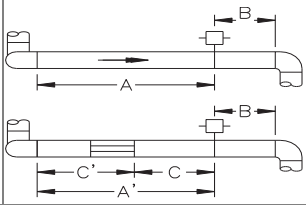
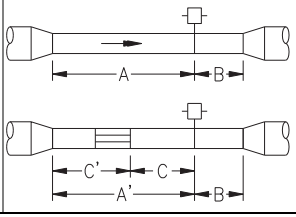
A. Compression plate
B. Follower
C. Packing
D. Packing gland
E. Support plate
F. Isolation valve
G. Gasket
H. Remote mount process connection
I. Head plate
J. Cage nipple
K. Drive rods
L. Mounting flange assembly

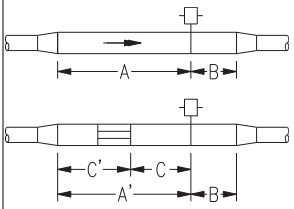
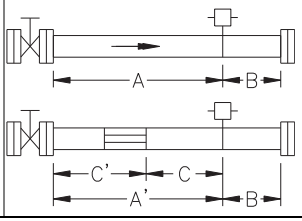
Note
Use an appropriate pipe sealing compound rated for the service temperature on all threaded connections.

1.0 Location and orientation

Correct orientation and straight run requirements must be met for accurate and repeatable flow measurements. Refer to Table 1 for 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

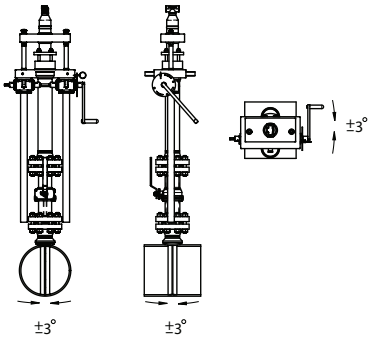
Note

- 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 585 installation allows for a maximum misalignment of 3°.

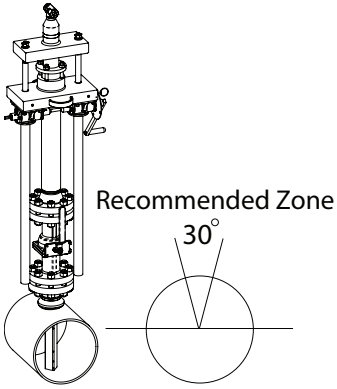
Figure 2. Misalignment



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 applications, the sensor should be located in the bottom half of the pipe. For steam applications, the sensor can be located on either the top or the bottom of the pipe depending on the temperature of the steam. See "Steam on top service" on page 17 for more information.

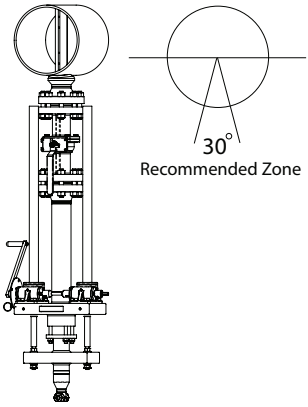
Figure 3. Gas and Steam on Top



Note

Top mounting for steam applications is an appropriate mounting option in many cases. Consult Rosemount Customer Central for instructions regarding Steam on Top mounting.

Figure 4. Liquid and Steam



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 direct mount steam applications, a 90° spacer will be added to provide water legs to ensure the transmitter stays within temperature limits.

Figure 5. Steam and Liquid

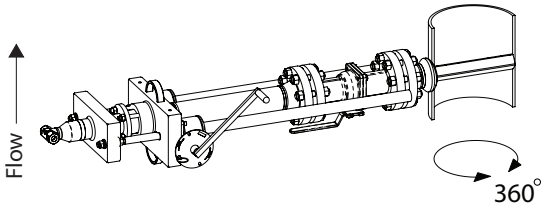
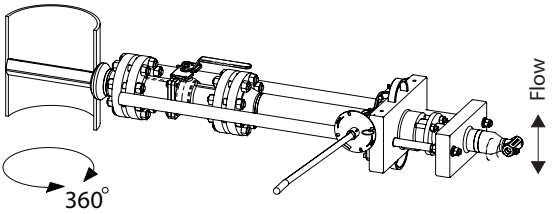


Figure 6. Gas



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.

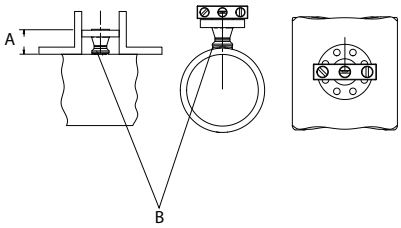
Table 2. Flange Sizes and Outer Diameter to Flange (ODF) per Sensor Size

Sensor size	Flange type	Pressure class	Flange size/rating/type	ODF in. (mm)(1)
44	A	1	3.0-in. 150# RF	4.63 (117)
44		3	3.0-in. 300# RF	5.00 (127)
44		6	3.0-in. 600# RF	5.38 (137)
44	R	1	4.0-in. 150# RTJ	4.82 (122)
44		3	4.0-in. 300# RTJ	5.25 (133)
44		6	4.0-in. 600# RTJ	5.44 (138)

1. Tolerances for the ODF dimension above a 10-in. (254 mm) line size is ±0.060-in. (1,5 mm). Below 10-in. (254 mm) line size is ±0.030-in. (0,8 mm).

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 7). 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.
3. To avoid serious burns, allow the mounting hardware to cool before continuing.

Figure 7. Alignment

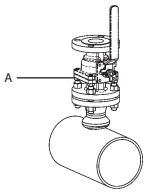


A. ODF
B. Tack welds

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 8).

Figure 8. Isolation Valve Orientation



A. Isolation valve

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

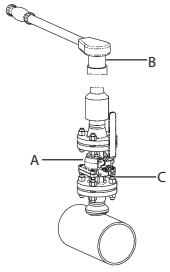
2. Fasten the isolation valve to the mounting using gasket, bolts, and nuts.

4.0 Mount drilling machine and drill hole

Drilling machine is not provided with assembly.

1. Mount the drilling machine to the isolation valve.
2. Open the valve fully.
3. Drill the hole into the pipe wall in accordance with the instructions provided by the drilling machine manufacturer. Drill to 2.5-in. (64 mm). Drill hole has a tolerance of $+^{1}/_{16}$ /–0-in. (1,6 /–0 mm).
4. Retract the drill fully beyond the valve.

Figure 9. Drilling Assembly



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

5.0 Remove drilling machine

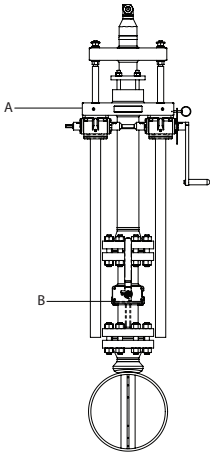
1. Verify the drill has been retracted past the valve.
2. Close the isolation valve to isolate the process.
3. Bleed drilling machine pressure and remove.
4. Check isolation valve and mounting for leakage.

6.0 Mount the Rosemount Annubar Sensor

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 585 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. Repeat steps 5 and 6 until there is no leakage.

Note
Rosemount 585 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 585.

Figure 10. Install Flo-Tap Assembly



A. Support plate
B. Isolation valve

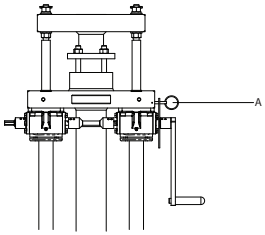
7.0 Insert the Rosemount Annubar Sensor

1. Open the isolation valve fully.
2. Rotate the crank clockwise. If a power drill with an adapter is used, do not exceed 200 revolutions per minute.
3. Continue rotating the crank until 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 stripes approach the support plate, remove the power drill and continue cranking manually. Place a finger above the packing gland while cranking. Vibration and movement will occur. When vibration and movements stop, the sensor is in contact with the opposite side wall.

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

   c. Turn the handle an additional 1/4 to 1/2 turn to secure the sensor.

Figure 11. Insert the Sensor



A. Drive lock pin

8.0 Mount the transmitter

8.1 Transmitter mounting, direct mount head without valves

1. Place 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 384 in-lb (43 N-m).
3. Place 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 (“Hi” is stamped on the side of the head) and install.
5. Tighten the nuts in a cross pattern to 384 in-lb (43 N-m).
6. If the DV option is selected, double instrument valves will be provided. Repeat Steps 1-4 to install the redundant transmitter.

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 service flow 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:

- Impulse piping that runs horizontally must slope at least one inch per foot (83mm/m).
  - Slope downward (toward the transmitter) for liquid and steam applications
  - Slope upward (toward the transmitter) for gas applications.
- 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.
- For applications above 250 °F (121 °C), impulse piping should have a minimum length of 1 ft. (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.
- Outdoor installations for liquid, saturated gas, or steam may require insulation and heat tracing to prevent freezing.
- When impulse piping is longer than 6 ft. (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.
- 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 transmitter.

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

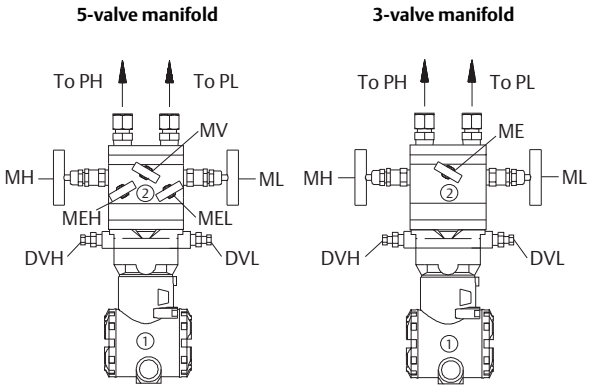


Table 3. Description of Impulse Valves and Components

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. Vertical Line

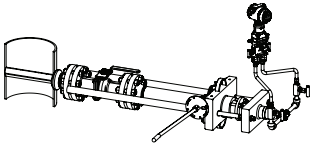
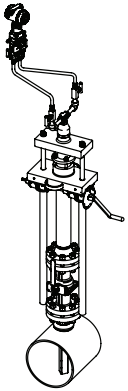


Figure 14. Horizontal Line



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. Vertical Line

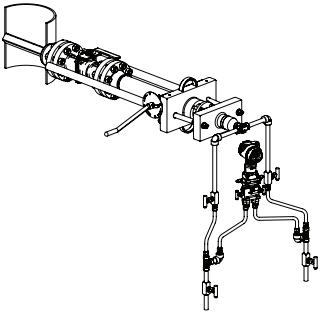
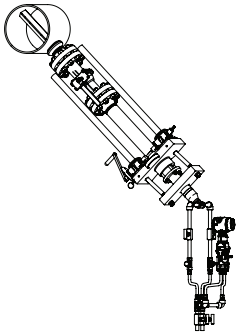


Figure 16. Horizontal Line



Steam service

Mount the transmitter below the process piping. Route the impulse piping down to the transmitter and fill the system with cool water through the two tee fittings.

Figure 17. Vertical Line

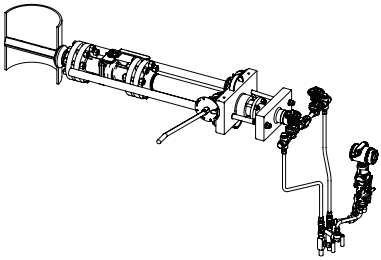
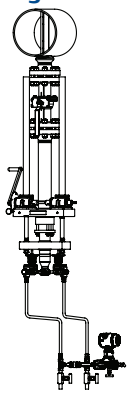


Figure 18. Horizontal Line



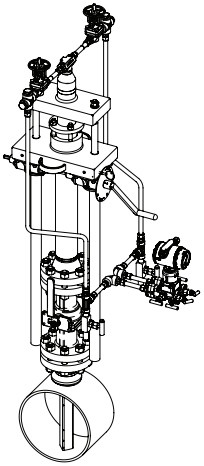
Steam on top service

For remote mount installations the impulse piping should slope up slightly from the instrument connections on the Rosemount 585 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 585. Depending on the environmental conditions, it may be necessary to insulate the mounting hardware.

Table 4. Steam on Top Temperature Limits

Transmitter connection platform	Maximum temperature
Remote mount	850 °F (455 °C)
Direct mount	400 °F (205 °C)

Figure 19. Horizontal Line



Note
Top mounting for steam applications is an appropriate mounting option in many cases. Consult Rosemount Customer Central for instructions regarding Steam on Top mounting.

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 585 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 20. Rosemount 585 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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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 585
Table 1B: List of Rosemount 585 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.

00825-0200-4585

Quick Start Guide
00825-0200-4585, Rev BB
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