

# Rosemount™ 8800D Series Vortex Flowmeter



# 1.0 About this guide

This guide provides basic guidelines for the Rosemount 8800D Vortex Flowmeter. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting, Explosion-proof, Flameproof, or Intrinsically Safe (I.S.) installations. Refer to the Rosemount 8800D [Reference Manual](#) for more instruction. The manuals and this guide are also available electronically on [EmersonProcess.com/Rosemount](http://EmersonProcess.com/Rosemount).

## WARNING

***Explosions could result in death or serious injury.***

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Review the approvals section of the Rosemount 8800D reference manual for any restrictions associated with a safe installation.

- Before connecting a handheld communicator in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- Verify the operating atmosphere of the flowmeter is consistent with the appropriate product certifications.

In an Explosion-proof/Flameproof installation, do not remove the flowmeter covers when power is applied to the unit.

***Electrical shock can result in death or serious injury.***

- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

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## 2.0 Installation

### 2.1 Mount the flowmeter

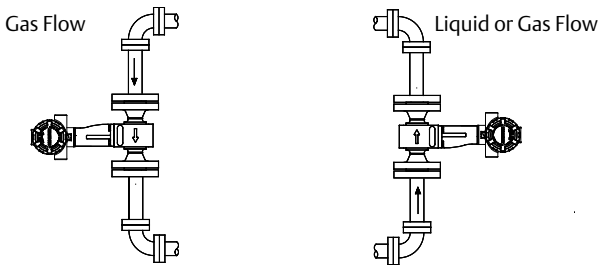
Design process piping so the meter body will remain full, with no entrapped air. The vortex flowmeter can be installed in any orientation without affecting accuracy. However, the following are guidelines for certain installations.

#### Vertical mounting

If the vortex flowmeter will be installed in a vertical orientation:

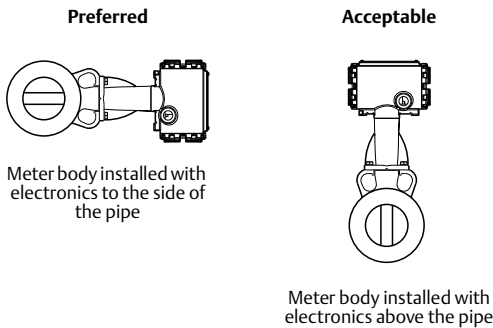
- Install upward or downward flow for gas or steam.
- Install upward flow for liquids.

**Figure 1. Vertical Installation**



#### Horizontal mounting

**Figure 2. Horizontal Installation**



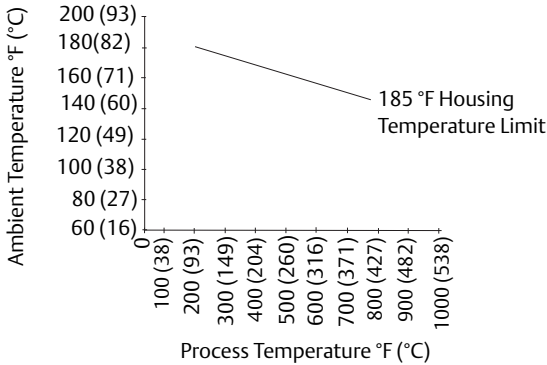
For steam and fluids with small solids content, it is recommended to have the flowmeter installed with the electronics to the side of the pipe. This will minimize potential measurement errors by allowing the condensate or solids to flow under the shedder bar without interrupting the vortex shedding.

## High temperature mounting

The maximum temperature for integral electronics is dependent on the ambient temperature where the flowmeter is installed. The electronics must not exceed 185 °F (85 °C).

Figure 3 shows combinations of ambient and process temperatures needed to maintain a housing temperature of less than 185 °F (85 °C).

**Figure 3. Rosemount 8800D Ambient/Process Temperature Limits<sup>(1)</sup>**



The following orientations are recommended for applications with high process temperatures.

- Install with electronics head beside or below process pipe.
- Insulation around pipe may be necessary to maintain ambient temperature below 185 °F (85 °C).

### Note

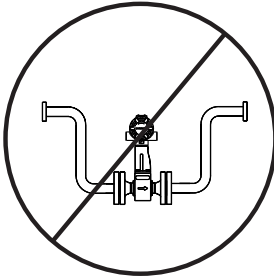
Insulate pipe and meter body only. Do not insulate support tube bracket so heat can be dissipated.

1. The indicated limits are for horizontal pipe and vertical meter position, with meter and pipe insulated with three inches of ceramic fiber.

## Steam installations

Avoid installation shown in [Figure 4](#). Such conditions may cause a water-hammer condition at start-up due to trapped condensation.

**Figure 4. Improper Installation**



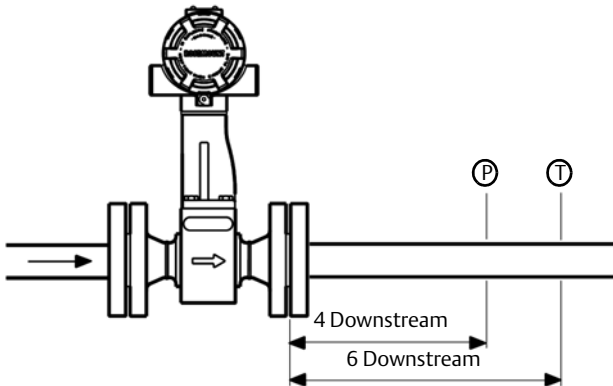
## Upstream/downstream requirements

The Rosemount 8800D Flowmeter may be installed with a minimum of 10 straight pipe diameters (10D) upstream and five straight pipe diameters (5D) downstream by following the K-factor corrections as described in the Rosemount 8800 [Installation Effects Technical Data Sheet](#). No K-factor correction is required if 35 straight pipe diameters upstream (35D) and five straight pipe diameters downstream (5D) are available.

## External pressure/temperature transmitters

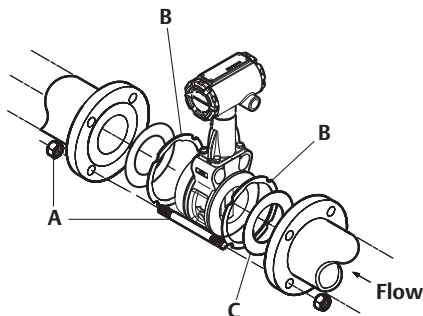
When using pressure and temperature transmitters in conjunction with the 8800D for compensated mass flows, install the transmitters downstream of the Rosemount 8800D Flowmeter as shown in [Figure 5](#).

**Figure 5. Upstream/Downstream Piping**



## Wafer style installation

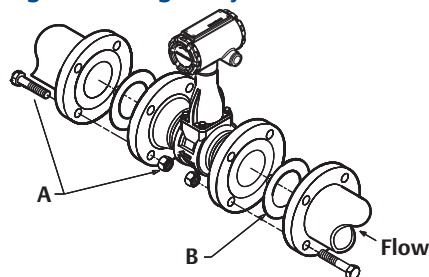
**Figure 6. Wafer Style Installation**



- A. Installation studs and nuts (supplied by customer)
- B. Alignment ring
- C. Gaskets (supplied by customer)

## Flanged-style installation

**Figure 7. Flanged-Style Flowmeter Installation**



- A. Installation bolts and nuts (supplied by customer)
- B. Gaskets (supplied by customer)

### Note

The required bolt load for sealing the gasket joint is affected by several factors, including operating pressure, gasket material, thickness, and condition. A number of factors also affect the actual bolt load resulting from a measured torque, including condition of bolt threads, friction between the nut head and the flange, and parallelism of the flanges. Due to these application-dependent factors, the required torque for each application may be different. Follow the guidelines outlined in the ASME PCC-1 for proper bolt tightening. Make sure the flowmeter is centered between flanges of the same nominal size as the flowmeter.

## Insert integral temperature sensor (MTA option only)

### Installation procedures

#### Note

Step number of procedure corresponds with number in drawing (Figure 1).

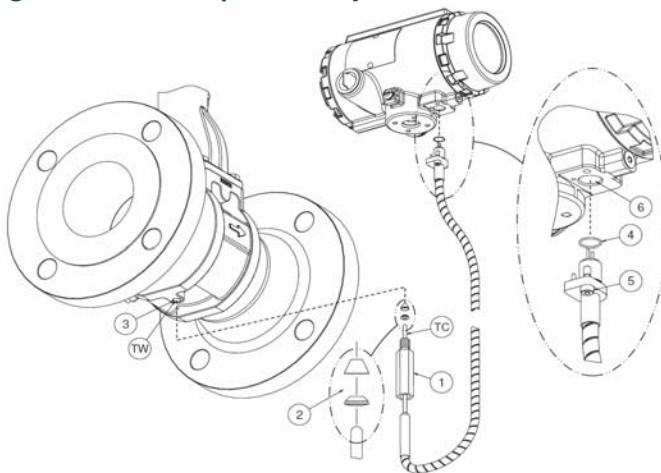
1. Slide the thermocouple bolt (1) over the thermocouple (TC).
2. Place the 2-part ferrule (2) over the end tip of the thermocouple (TC).
3. Insert the thermocouple in to the thermowell hole (TW) on the bottom side of the meter body.
  - a. **Important!** Carefully push the thermocouple in to the thermowell completely. This is critical to get the proper insertion depth. Then thread the thermocouple bolt in to the hole.
  - b. When the thermocouple bolt is hand tight, mark the position of the bolt in relation to the meter body (the mark will help determine rotations). Using a  $\frac{1}{2}$ -in. wrench turn the bolt clockwise  $\frac{3}{4}$  turn to seat the ferrule.

#### Note

After completing the above step, the ferrule and thermocouple bolt will be permanently installed on the thermocouple.

4. Verify the rubber O-ring is installed on the electronics connection end of the thermocouple.
5. Verify the 2.5 mm hex head screw is installed.
6. Insert the electronics end connector in to the transmitter housing. Tighten the screw with a 2.5 mm hex bit to secure the connection.  
**Important!** Do not over tighten hex screw.

Figure 8. Thermocouple Assembly



## Remote electronics

If you order one of the remote electronics options (options R10, R20, R30, R33, R50, or RXX), the flowmeter assembly ships in two parts:

- The meter body with an adapter installed in the support tube and an interconnecting coaxial cable attached to it.
- The electronics housing installed on a mounting bracket.

If you order the armored remote electronics options, follow the same instructions as for the standard remote cable connection with the exception that the cable may not need to be run through conduit. Armored includes the glands.

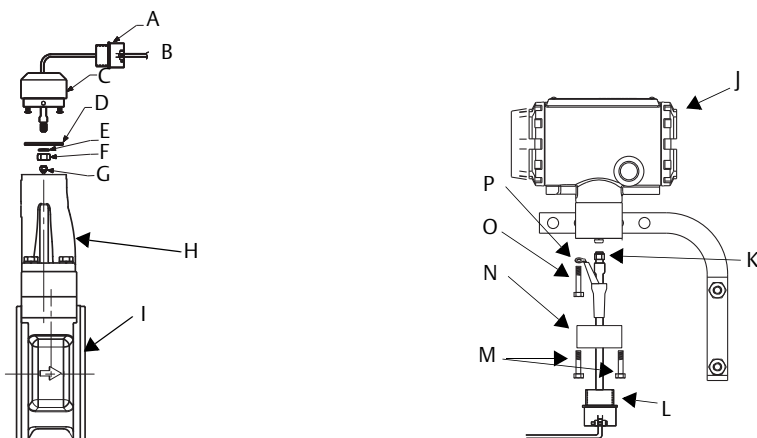
## Mounting

Mount the meter body in the process flow line as described earlier in this section. Mount the bracket and electronics housing in the desired location. The housing can be repositioned on the bracket to facilitate field wiring and conduit routing.

## Cable connections

Refer to [Figure 9](#) and the instructions on [page 9](#) to connect the loose end of the coaxial cable to the electronics housing.

**Figure 9. Remote Electronics Installation**



- A. 1/2 NPT conduit adapter or cable gland (supplied by customer)
- B. Coaxial cable
- C. Meter adapter
- D. Union
- E. Washer
- F. Nut
- G. Sensor cable nut
- H. Support tube

- I. Meter body
- J. Electronics housing
- K. Coaxial cable nut
- L. Conduit adapter (optional-supplied by customer)
- M. Housing adapter screws
- N. Housing adapter
- O. Housing base screw
- P. Ground connection



**Note**

Consult factory for SST installation.

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1. If the coaxial cable will be run in conduit, carefully cut the conduit to the desired length to provide for proper assembly at the housing. A junction box may be placed in the conduit run to provide a space for extra coaxial cable length.

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**Caution**

The coaxial remote cable cannot be field terminated or cut to length. Coil any extra coaxial cable with no less than a 2-in. (51 mm) radius.

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2. Slide the conduit adapter or cable gland over the loose end of the coaxial cable and fasten it to the adapter on the meter body support tube.
3. If using conduit, route the coaxial cable through the conduit.
4. Place a conduit adapter or cable gland over the end of the coaxial cable.
5. Remove the housing adapter from the electronics housing.
6. Slide the housing adapter over the coaxial cable.
7. Remove one of the four housing base screws.
8. Attach and securely tighten the coaxial cable nut to the connection on the electronics housing.
9. Attach the coaxial cable ground wire to the housing via the housing base ground screw.
10. Align the housing adapter with the housing and attach with the provided screws.
11. Tighten the conduit adapter or cable gland to the housing adapter.

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**Caution**

To prevent moisture from entering the coaxial cable connections, install the interconnecting coaxial cable in a single dedicated conduit run or use sealed cable glands at both ends of the cable.

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**Note**

Refer to the reference manual for details for the CPA option.

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## 2.2 Consider housing rotation

The entire electronics housing may be rotated in 90° increments for easy viewing. Use the following steps to change the housing orientation:

1. Loosen the three housing rotation set screws at the base of the electronics housing with a  $\frac{5}{32}$ -in. hex wrench by turning the screws clockwise (inward) until they clear the support tube.
2. Slowly pull the electronics housing out of the support tube.

**Caution**

Do not pull the housing more than 1.5-in. (40 mm) from the top of the support tube until the sensor cable is disconnected. Damage to the sensor may occur if this sensor cable is stressed.

3. Unscrew the sensor cable from the housing with a  $\frac{5}{16}$ -in. open end wrench.
4. Rotate the housing to the desired orientation.
5. Hold in this orientation while screwing sensor cable onto base of the housing.

**Caution**

Do not rotate the housing while the sensor cable is attached to the base of the housing. This will stress the cable and may damage the sensor.

6. Place the electronics housing into the top of the support tube.
7. Use a  $\frac{5}{32}$ -in. hex wrench to turn the three housing rotation screws counter-clockwise (outward) to engage the support tube.

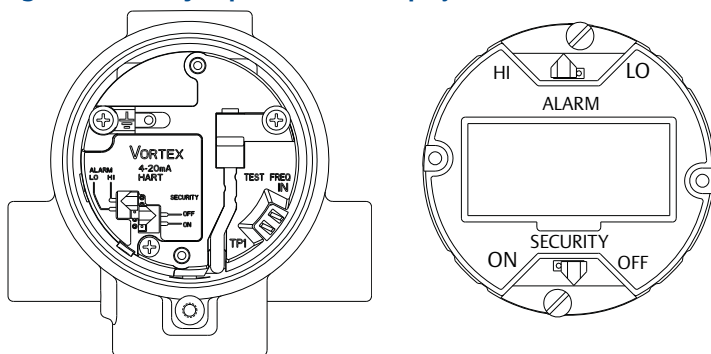
## 2.3 Set jumpers

Adjust jumpers to desired settings.

**HART®**

If alarm and security jumpers are not installed, the flowmeter will operate normally with the default alarm condition alarm “HI” and the security “OFF”.

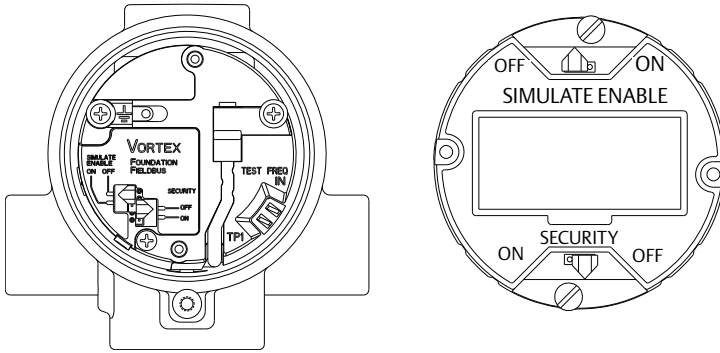
**Figure 10. HART Jumpers and LCD Display**



## FOUNDATION™ Fieldbus

If security and simulate enable jumpers are not installed, the flowmeter will operate normally with the default security “OFF” and simulate enable “OFF”.

**Figure 11. FOUNDATION Fieldbus Jumpers and LCD Display**



## 2.4 Connect wiring and power up

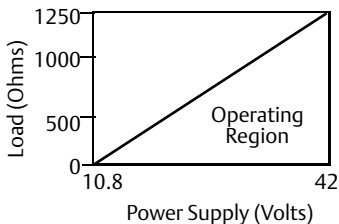
### Power supply

#### HART

The dc power supply should provide power with less than two percent ripple. The total resistance load is the sum of the resistance of the signal leads and the load resistance of the controller, indicator, and related pieces. Note that the resistance of intrinsic safety barriers, if used, must be included.

**Figure 12. Load Limitation**

Maximum Loop Resistance =  $41.7 \text{ (Power Supply Voltage - 10.8)}$



The Field Communicator requires a minimum loop resistance of 250 Ω.

### FOUNDATION Fieldbus

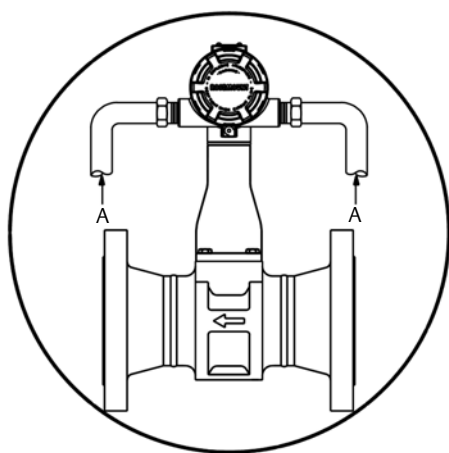
The flowmeter requires 9-32 Vdc at the power terminals. Each fieldbus power supply requires a power conditioner to decouple the power supply output from the fieldbus wiring segment.

## Conduit installation

Prevent condensation in any conduit from flowing into the housing by mounting the flowmeter at a high point in the conduit run. If the flowmeter is mounted at a low point in the conduit run, the terminal compartment could fill with fluid.

If the conduit originates above the flowmeter, route conduit below the flowmeter before entry. In some cases a drain seal may need to be installed.

**Figure 13. Proper Conduit Installation with Rosemount 8800D**



A. Conduit Line

Use the following steps to wire the flowmeter:

1. Remove the housing cover on the side marked FIELD TERMINALS.
2. Connect the positive lead to the "+" terminal and the negative lead to the "-" terminal as shown in [Figure 14](#) for HART installations and [Figure 15](#) for FOUNDATION fieldbus installations.

### Note

FOUNDATION Fieldbus terminals are not polarity sensitive.

3. For HART installations utilizing the pulse output, connect the positive lead to the "+" terminal of the pulse output and the negative lead to the "-" terminal of the pulse output as shown in [Figure 14](#). A separate 5 to 30 Vdc power supply is required for the pulse output. Maximum switching current for the pulse output is 120 mA.

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**Caution**

Do not connect the powered signal wiring to the test terminals. Power could damage the test diode in the test connection. Twisted pairs are required to minimize noise pick up in the 4 - 20 mA signal and digital communication signal. For high EMI/RFI environments, shielded signal wire is required and preferred in all other installations. Use 24 AWG or larger wire and do not exceed 5,000 feet (1,500 meters). For FOUNDATION fieldbus use wire specifically designed for fieldbus installations for maximum performance. For ambient temperatures above 140 °F (60 °C) use wire rated to 176 °F (90 °C).

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Figure 14 shows wiring connections necessary to power a Rosemount 8800D and enable communications with a hand-held Field Communicator.

Figure 15 shows wiring connections necessary to power the 8800D with FOUNDATION fieldbus.

4. Plug and seal unused conduit connections. Use pipe sealing tape or paste on threads to ensure a moisture-tight seal. Housing conduit entries marked with M20 will require M-20 x 1.5 blanking plug thread. Unmarked conduit entries will require a 1/2-14 NPT blanking plug thread.

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**Note**

Straight threads require a minimum of three (3) wraps of tape to obtain a tight seal.

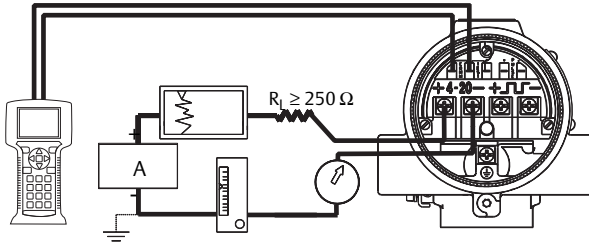
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5. If applicable, install wiring with a drip loop. Arrange the drip loop so the bottom is lower than the conduit connections and the flowmeter housing.

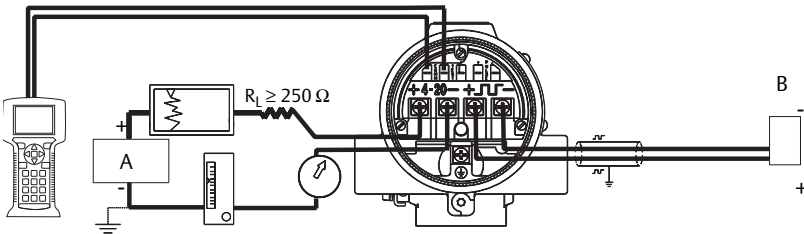
Rosemount 8800D Vortex units ordered with painted meter body may be subject to electrostatic discharge. To avoid electrostatic charge build-up, do not rub the meter body with a dry cloth or clean with solvents.

**Figure 14. Flowmeter Wiring for HART Protocol**

**4-20 mA Wiring**



**4-20 mA and Pulse Wiring with Electronic Totalizer/Counter**

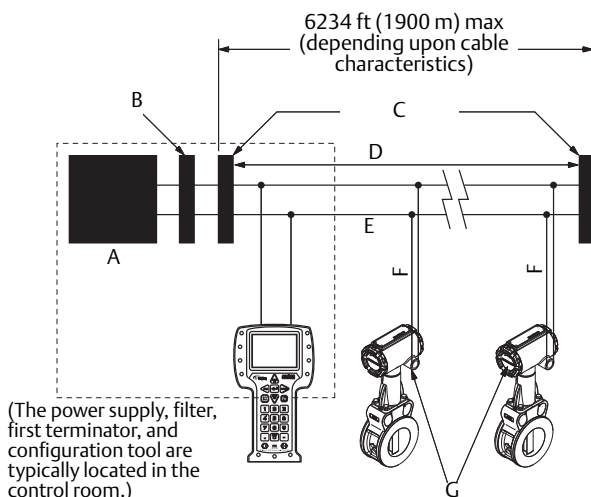


A. Power Supply

B. Power Supply with Counter

**Note**

Installation of the transient protection terminal block does not provide transient protection unless the Rosemount 8800D case is properly grounded.

**Figure 15. Flowmeter Field Wiring for FOUNDATION Fieldbus Protocol**

- A. Power Supply
- B. Integrated Power Conditioner and Filter
- C. Terminators
- D. Fieldbus Segment
- E. (Trunk)
- F. (Spur)
- G. Devices 1 through 16<sup>(1)</sup>

### Cover jam screw

For transmitter housings shipped with a cover jam screw, the screw should be properly installed once the transmitter has been wired and powered up. The cover jam screw is intended to disallow the removal of the transmitter cover in flameproof environments without the use of tooling. Follow these steps to install the cover jam screw:

1. Verify the cover jam screw is completely threaded into the housing.
2. Install the transmitter housing cover and verify the cover is tight against the housing.
3. Using an M4 hex wrench, loosen the jam screw until it contacts the transmitter cover.
4. Turn the jam screw an additional  $\frac{1}{2}$  turn counterclockwise to secure the cover.

### Note

Application of excessive torque may strip the threads.

5. Verify the cover cannot be removed.

1. Intrinsically safe installations may allow fewer devices per I.S. barrier.

## 2.5 Verify configuration

Before operating the Rosemount 8800D in an installation, you should review the configuration data to ensure it reflects the current application. In most cases, all of these variables are pre-configured at the factory. Configuration may be required if your 8800D is not configured or if the configuration variables need revision.

Rosemount recommends the following variables are reviewed before startup:

**Table 1. Configuration Variables to Consider**

HART configuration	FOUNDATION fieldbus configuration
<ul style="list-style-type: none"> <li>• Tag</li> <li>• Transmitter Mode</li> <li>• Process Fluid</li> <li>• Reference K-Factor</li> <li>• Flange Type</li> <li>• Mating Pipe ID</li> <li>• PV Units</li> <li>• PV Damping</li> <li>• Process Temperature Damping</li> <li>• Fixed Process Temperature</li> <li>• Auto Adjust Filter</li> <li>• LCD Display Configuration (for units with a display only)</li> <li>• Density Ratio (for Standard or Normal flow units only)</li> <li>• Process Density and Density Units (for mass flow units only)</li> <li>• Variable Mapping</li> <li>• Range Values</li> <li>• Pulse Output Configuration (for units with a pulse output only)</li> </ul>	<ul style="list-style-type: none"> <li>• Tag</li> <li>• Transmitter Mode</li> <li>• Process Fluid</li> <li>• Reference K-Factor</li> <li>• Flange Type</li> <li>• Mating Pipe ID</li> <li>• PV Units (configured in the AI block)</li> <li>• Flow Damping</li> <li>• Process Temperature Damping</li> <li>• Fixed Process Temperature</li> <li>• Auto Adjust Filter</li> <li>• LCD Display Configuration (for units with a display only)</li> <li>• Density Ratio (for Standard or Normal flow units only)</li> <li>• Process Density and Density Units (for mass flow units only)</li> </ul>



**Table 2. Fast Keys for Rosemount 8800D Device Revision 1 DD Revision 2 and Device Revision 2 DD Revision 1**

Function	HART Fast Keys	Function	HART Fast Keys
Alarm Jumpers	1, 4, 2, 1, 3	Meter Body Number	1, 4, 1, 5
Analog Output	1, 4, 2, 1	Minimum Span	1, 3, 8, 3
Auto Adjust Filter	1, 4, 3, 1, 4	Num Req Preams	1, 4, 2, 3, 2
Base Time Unit	1, 1, 4, 1, 3, 2	Poll Address	1, 4, 2, 3, 1
Base Volume Unit	1, 1, 4, 1, 3, 1	Process Fluid Type	1, 3, 2, 2
Burst Mode	1, 4, 2, 3, 4	Process Variables	1, 1
Burst Option	1, 4, 2, 3, 5	Pulse Output	1, 4, 2, 2, 1
Burst Variable 1	1, 4, 2, 3, 6, 1	Pulse Output Test	1, 4, 2, 2, 2
Burst Variable 2	1, 4, 2, 3, 6, 2	PV Damping	1, 3, 9
Burst Variable 3	1, 4, 2, 3, 6, 3	PV Mapping	1, 3, 6, 1
Burst Variable 4	1, 4, 2, 3, 6, 4	PV Percent Range	1, 1, 2
Burst Xmtr Variables	1, 4, 2, 3, 6	QV Mapping	1, 3, 6, 4
Conversion Number	1, 1, 4, 1, 3, 4	Range Values	1, 3, 8
D/A Trim	1, 2, 5	Review	1, 5
Date	1, 4, 4, 5	Revision Numbers	1, 4, 4, 7
Descriptor	1, 4, 4, 3	Scaled D/A Trim	1, 2, 6
Density Ratio	1, 3, 2, 4, 1, 1	Self Test	1, 2, 1, 5
Device ID	1, 4, 4, 7, 6	Signal to Trigger Ratio	1, 4, 3, 2, 2
Electronics Temp	1, 1, 4, 7, 1	STD/ Nor Flow Units	1, 1, 4, 1, 2
Electronics Temp Units	1, 1, 4, 7, 2	Special Units	1, 1, 4, 1, 3
Filter Restore	1, 4, 3, 3	Status	1, 2, 1, 1
Final Assembly Number	1, 4, 4, 7, 5	SV Mapping	1, 3, 6, 2
Fixed Process Density	1, 3, 2, 4, 2	Tag	1, 3, 1
Fixed Process Temperature	1, 3, 2, 3	Total	1, 1, 4, 4, 1
Flange Type	1, 3, 4	Totalizer Control	1, 1, 4, 4
Flow Simulation	1, 2, 4	Transmitter Mode	1, 3, 2, 1
Installation Effects	1, 4, 1, 6	TV Mapping	1, 3, 6, 3
K-factor (Reference)	1, 3, 3	Trigger Level	1, 4, 3, 2, 5
Local Display	1, 4, 2, 4	URV	1, 3, 8, 1
Loop Test	1, 2, 2	User Defined Units	1, 1, 4, 1, 3, 3
Low Flow Cutoff	1, 4, 3, 2, 3	USL	1, 3, 8, 4
Low Pass Filter	1, 4, 3, 2, 4	Shedding Frequency	1, 1, 4, 6
LRV	1, 3, 8, 2	Variable Mapping	1, 3, 6
LSL	1, 3, 8, 5	Velocity Flow	1, 1, 4, 3
Manufacturer	1, 4, 4, 1	Velocity Flow Base	1, 1, 4, 3, 3
Mass Flow	1, 1, 4, 2, 1	Volumetric Flow	1, 1, 4, 1
Mass Flow Units	1, 1, 4, 2, 2	Wetted Material	1, 4, 1, 4
Mating Pipe ID (Inside Diameter)	1, 3, 5	Write Protect	1, 4, 4, 6
Message	1, 4, 4, 4		

**Note**

For detailed configuration information see the Rosemount 8800D Vortex Flowmeter manual (00809-0100-4004).

**Table 3. Fast Keys for Rosemount 8800D Device Revision 2 DD Revision 3**

Function	HART Fast Keys
Alarm Direction	1, 3, 1, 3, 2
Analog Output	3, 4, 3, 1
Analog Trim	3, 4, 3, 6
Base Time Unit	2, 2, 2, 3, 2
Base Volume Unit	2, 2, 2, 3, 1
Burst Mode	2, 2, 7, 2
Burst Option	2, 2, 7, 3
Burst Slot 0	2, 2, 7, 4, 1
Burst Slot 1	2, 2, 7, 4, 2
Burst Slot 2	2, 2, 7, 4, 3
Burst Slot 3	2, 2, 7, 4, 4
Burst Variable Mapping	2, 2, 7, 4, 5
Compensated K-Factor	2, 2, 1, 2, 2
Conversion Number	2, 2, 2, 3, 4
Date	2, 2, 8, 2, 1
Descriptor	2, 2, 8, 2, 2
Density Ratio	2, 2, 3, 3, 2
Device ID	2, 2, 8, 1, 5
Display	2, 1, 1, 2
Electronics Temp	3, 2, 5, 4
Electronics Temp Units	2, 2, 2, 2, 5
Final Assembly Number	2, 2, 8, 1, 4
Fixed Process Density	2, 2, 1, 1, 5
Fixed Process Temperature	2, 2, 1, 1, 4
Flange Type	2, 2, 1, 4, 2
Flow Simulation	3, 5, 1
4 <sup>th</sup> Variable	2, 2, 2, 1, 4
Installation Effects	2, 2, 1, 1, 7
Lower Range Value	2, 2, 4, 1, 4
Lower Sensor Limit	2, 2, 4, 1, 5, 2
Loop Test	3, 5, 2, 6
Low Flow Cutoff	2, 1, 4, 3
Low-pass Corner Frequency	2, 1, 4, 4
Manufacturer	2, 2, 8, 1, 2
Mass Flow	3, 2, 3, 6
Mass Flow Units	2, 2, 2, 2, 4
Mating Pipe ID (Inside Diameter)	2, 2, 1, 1, 6
Message	2, 2, 8, 2, 3
Meter Body Number	2, 2, 1, 4, 5
Minimum Span	2, 2, 4, 1, 6
Optimize DSP	2, 1, 1, 3

Function	HART Fast Keys
Percent of Range	3, 4, 3, 2
Polling Address	2, 2, 7, 1
Primary Variable Damping	2, 1, 4, 1
Primary Variable	2, 2, 2, 1, 1
Process Density Units	2, 2, 2, 2, 6
Process Fluid Type	2, 2, 1, 1, 2
Process Temp Units	2, 2, 3, 1, 2
Process Variables	3, 2, 1
Pulse Output	3, 2, 4, 4
Pulse Output Test	3, 5, 3, 4
Recall Factory Calibration	3, 4, 3, 8
Reference K-Factor	2, 2, 1, 2, 1
Reset Transmitter	3, 4, 1, 2
Restore Default Filters	2, 1, 4, 6
Revision Numbers	2, 2, 8, 3
Scaled Analog Trim	3, 4, 3, 7
2nd Variable	2, 2, 2, 1, 2
Self Test	3, 4, 1, 1
Set Variable Mapping	2, 2, 2, 1, 5
Shedding Frequency	3, 2, 4, 2
Signal Strength	3, 2, 5, 2
Special Flow Unit	2, 2, 2, 3, 5
Special Volume Unit	2, 2, 2, 3, 3
Status	1, 1, 1
Tag	2, 2, 8, 1, 1
3rd Variable	2, 2, 2, 1, 3
Total	1, 3, 6, 1
Totalizer Configuration	1, 3, 6, 3
Totalizer Control	1, 3, 6, 2
Transmitter Mode	2, 2, 1, 1, 1
Trigger Level	2, 1, 4, 5
Upper Range Value	2, 2, 4, 1, 3
Upper Sensor Limit	2, 2, 4, 1, 5, 1
Velocity Flow	3, 2, 3, 4
Velocity Flow Units	2, 2, 2, 2, 2
Velocity Measurement Base	2, 2, 2, 2, 3
Volume Flow	3, 2, 3, 2
Volume Flow Units	2, 2, 2, 2, 1
Wetted Material	2, 2, 1, 4, 1
Write Protect	2, 2, 8, 1, 6

**Table 4. Fast Keys for Rosemount 8800D HART 7 Device Revision 2 (DD Revision 1)/  
HART 5 Device Revision 3 (DD Revision 1)**

Function	Fast Key	Function	Fast Key
Analog Output	3, 4, 3, 1	Polling Address	2, 2, <sup>-(1)</sup> , 2, 1
Analog Trim	3, 4, 3, 7	Primary Variable	2, 2, 2, 1
Base Mass Unit (MF)	2, 2, 2, 8, 1	Process Fluid Type	2, 2, 1, 1, 3
Base Process Density	2, 2, 3, 2, 1	Process Variables	3, 2, 3
Base Time Unit (CVF)	2, 2, 2, 9, 4	Pulse Output	3, 2, 5, 3
Base Time Unit (MF)	2, 2, 2, 8, 4	Pulse Output Test	3, 5, 3, 4
Base Time Unit (VF)	2, 2, 2, 7, 4	Reference K-Factor	2, 2, 1, 2, 1
Base Volume Unit (CVF)	2, 2, 2, 9, 1	Reset Transmitter	3, 4, 4, 1, 2
Base Volume Unit (VF)	2, 2, 2, 7, 1	Restore Default Filters	2, 1, 4, 6
Compensated K-Factor	2, 2, 1, 2, 2	Restore Factory Calibration	3, 4, 3, 9
Conversion Factor (CVF)	2, 2, 2, 9, 2	Revision Numbers	2, 2, <sup>-(1)</sup> , 2
Conversion Factor (MF)	2, 2, 2, 8, 2	Scaled Analog Trim	3, 4, 3, 8
Conversion Factor (VF)	2, 2, 2, 7, 2	Second Variable	2, 2, 2, 2
Date	2, 2, <sup>-(1)</sup> , 1, 5	Self Test	3, 4, 4, 1, 1
Corrected Volumetric Flow	3, 2, 1	Set Damping	2, 1, 4, 1
Corrected Volumetric Flow Units	2, 2, 2, 6, 2	Set Low Flow Cutoff	2, 1, 4, 3
Density Ratio	2, 2, 3, 4	Set Low-pass Corner Frequency	2, 1, 4, 4
Descriptor	2, 2, <sup>-(1)</sup> , 1, 6	Set Trigger Level	2, 1, 4, 5
Device ID	2, 2, <sup>-(1)</sup> , 1	Shedding Frequency	3, 2, 5, 1
Device Status	1, 1	Signal Strength	3, 4, 2, 1, 4
Display	2, 1, 1, 2	Special Flow Unit (CVF)	2, 2, 2, 9, 5
Electronics Temp	3, 2, 6	Special Flow Unit (MF)	2, 2, 2, 8, 5
Electronics Temp Units	2, 2, 2, 6, 7	Special Flow Unit (VF)	2, 2, 2, 7, 5
Final Assembly Number	2, 2, 1, 4, 3	Special Volume Unit	2, 2, 2, 7, 3
Fixed Process Density	2, 2, 1, 1, 5	Tag	2, 2, <sup>-(1)</sup> , 1, 1
Fixed Process Temperature	2, 2, 1, 1, 4	Third Variable	2, 2, 2, 3
Flange Type	2, 2, 1, 4, 2	Total	2, 2, 4, 3, 1
Flow Simulation	3, 5, 1, 2, 1	Totalizer Configuration	2, 2, 4, 3, 3
Fourth Variable	2, 2, 2, 4	Totalizer Control	2, 2, 4, 3, 2
Loop Test	3, 5, 2, 7	Transmitter Mode	2, 2, 1, 1, 1
Lower Range Value	2, 2, 4, 1, 4	Upper Range Value	2, 2, 4, 1, 3
Lower Sensor Limit	2, 2, 4, 1, 6	Upper Sensor Limit	2, 2, 4, 1, 5
Mass Flow	3, 2, 1	Variable Mapping	2, 2, 2, 5
Mass Flow Units	2, 2, 2, 6, 5	Velocity Flow	3, 2, 1
Message	2, 2, <sup>-(1)</sup> , 1, 7	Velocity Flow Units	2, 2, 2, 6, 3
Meter Factor	2, 2, 1, 1, 7	Velocity Measurement Base	2, 2, 2, 6, 4
Minimum Span	2, 2, 4, 1, 7	Volume Flow	3, 2, 1
Optimize DSP	2, 1, 1, 3	Volume Flow Units	2, 2, 2, 6, 1
Percent of Range	3, 4, 3, 2	Wetted Material	2, 2, 1, 4, 1
Pipe Inside Diameter	2, 2, 1, 1, 6	Write Protect	2, 2, <sup>-(1)</sup> , 4, 1

1. These items are in a list format without numeric labels. To access these features, you must scroll to this option in the HART Communicator.

## 3.0 Product Certifications

### 3.1 Approved Manufacturing Locations

Emerson Process Management— Eden Prairie, Minnesota, USA

Emerson Process Management BV - Ede, The Netherlands

Emerson Process Management Flow Technologies Co., Ltd - Nanjing, Jiangsu Province, P.R. China

SC Emerson SRL - Cluj, Romania

### 3.2 Flameproof enclosure Ex d protection type in accordance with IEC 60079-1, EN 60079-1



- Transmitters with Flameproof enclosure type protection shall only be opened when power is removed.



- Closing of entries in the device must be carried out using the appropriate Ex d cable gland or blanking plug. Unless otherwise marked on housing, the standard conduit entry thread forms are 1/2-14 NPT.

#### Type n protection type in accordance with IEC 60079-15, EN60079-15



Closing of entries in the device must be carried out using the appropriate Ex e or Ex n cable gland and metal blanking plug or any appropriate ATEX or IECEx approved cable gland and blanking plug with IP66 rating certified by an EU approved certification body.

### 3.3 European Directive Information

The CE Declaration of Conformity for all applicable European directives for this product can be found on our website at [EmersonProcess.com/Rosemount](http://EmersonProcess.com/Rosemount). A hard copy may be obtained by contacting our local sales office.

### 3.4 ATEX Directive

Emerson Process Management complies with the ATEX Directive.

### 3.5 European Pressure Equipment Directive (PED)

#### Rosemount 8800D Vortex Flowmeter Line Size 40 mm to 300 mm

Certificate Number 4741-2014-CE-HOU-DNV  
c 0575

Module H Conformity Assessment

Mandatory CE-marking for flowmeters in accordance with Article 15 of the PED can be found on the flowtube body.

Flowmeter categories I – III use module H for conformity assessment procedures.

## Rosemount 8800D Vortex Flowmeter Line Size 15 mm and 25 mm

### Sound Engineering Practice (SEP)

Flowmeters that are SEP are outside the scope of PED and cannot be marked for compliance with PED.

## 4.0 Hazardous Location Certifications

### 4.1 North American Certifications

#### Factory Mutual (FM)

- E5** Explosion proof-Intrinsically Safe for Class I, Division 1, Groups B, C, and D;  
Dust-ignition proof for Class II/III, Division 1, Groups E, F, and G;  
Temperature Code T6 ( $-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$ )  
Factory Sealed  
Enclosure Type 4X, IP66
- I5** Intrinsically safe for use in Class I, II, III Division 1, Groups A, B, C, D, E, F, and G;  
Non-incendive for Class I, Division 2, Groups A, B, C, and D  
NIFW (Non-incendive Field Wiring) when installed per Rosemount Drawing 08800-0116  
Temperature Code T4 ( $-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$ ) 4-20 mA HART  
Temperature Code T4 ( $-50^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$ ) Fieldbus  
Enclosure Type 4X, IP66
- IE** FISCO for Class I, II, III, Division 1, Groups A, B, C, D, E, F and G;  
FNICO for Class I Division 2, Groups A, B, C, and D  
when installed per Rosemount control drawing 08800-0116  
Temperature Code T4 ( $-50^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$ )  
Enclosure Type 4X, IP66

#### Combined Factory Mutual (FM) Certifications

- K5** E5 and I5 Combination

#### *Special Conditions for Safe Use (X):*

1. When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V insulation test. This must be taken into account upon installation.
2. The Model 8800D Vortex Flowmeter when ordered with aluminum electronics housing is considered to constitute a potential risk of ignition by impact or friction. Care should be taken into account during installation and use to prevent impact or friction.

#### Canadian Standards Association (CSA)

- E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D;  
Dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G  
Class I, Zone 1, Ex d[ia] IIC  
Temperature Code T6 ( $-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$ )  
Factory Sealed  
Single Seal  
Enclosure Type 4X
- I6** Intrinsically safe for use in Class I, II, III Division 1, Groups A, B, C, D, E, F, G;  
Non-incendive for Class I, Division 2, Groups A, B, C and D  
Temperature Code T4 ( $-50^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$ ) 4-20 mA HART  
Temperature Code T4 ( $-50^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$ ) Fieldbus  
Single Seal  
Enclosure Type 4X

- IF** FISCO for Class I, Division 1, Groups A, B, C, and D  
 FNICO for Class I Division 2, Groups A, B, C, and D  
 Temperature Code T4 ( $-50^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$ )  
 When installed per Rosemount drawing 08800-0112  
 Enclosure Type 4X

### Combined Canadian Certifications (CSA)

**K6** E6 and I6 Combination

### Combined North America Certifications (FM and CSA)

**KB** E5, I5, E6, and I6 Combination

## 4.2 European Certifications

### ATEX Intrinsic Safety

EN 60079-0: 2012

EN 60079-11: 2012

**I1** Certification No. Baseefa05ATEX0084X

ATEX Marking

Ⓔ II 1 G Ex ia IIC T4 Ga ( $-60^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$ ) 4-20 mA HART

Ⓔ II 1 G Ex ia IIC T4 Ga ( $-60^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$ ) Fieldbus

**CE** 0575

4-20 mA HART entity parameters	Fieldbus entity parameters	FISCO input parameters
$U_i = 30 \text{ VDC}$	$U_i = 30 \text{ VDC}$	$U_i = 17.5 \text{ VDC}$
$I_i^{(1)} = 185 \text{ mA}$	$I_i^{(1)} = 300 \text{ mA}$	$I_i^{(1)} = 380 \text{ mA}$
$P_i^{(1)} = 1.0 \text{ W}$	$P_i^{(1)} = 1.3 \text{ W}$	$P_i^{(1)} = 5.32 \text{ W}$
$C_i = 0 \mu\text{F}$	$C_i = 0 \mu\text{F}$	$C_i = 0 \mu\text{F}$
$L_i = 0.97 \text{ mH}$	$L_i < 10 \mu\text{H}$	$L_i < 10 \mu\text{H}$

1.Total for transmitter.

### ATEX FISCO

**IA** Certification No. Baseefa05ATEX0084X

ATEX Marking

Ⓔ II 1 G Ex ia IIC T4 Ga ( $-60^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$ )

**CE** 0575

#### Special Conditions for Safe Use (X):

- When fitted with 90V transient suppressors (T1 option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.
- The enclosure may be made from aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion when located in Zone 0 environment. The polyurethane paint finish may constitute an electrostatic hazard and must only be cleaned with a damp cloth.
- When the equipment is installed, particular precautions must be taken to ensure taking into account the effect of process fluid temperature, that the ambient temperature of the electrical housing of the equipment meets the marked protection type temperature range.

## ATEX Type n Certification

EN 60079-0: 2012

EN 60079-11: 2012

EN 60079-15: 2010

**N1** Certification No. Baseefa05ATEX0085X

ATEX Marking

⊕ II 3 G Ex nA ic IIC T5 Gc (-50 °C ≤ Ta ≤ 70 °C) 4-20 mA HART

⊕ II 3 G Ex nA ic IIC T5 Gc (-50 °C ≤ Ta ≤ 60 °C) Fieldbus

Maximum Working Voltage = 42 VDC 4-20 mA HART

Maximum Working Voltage = 32 VDC Fieldbus

### Special Conditions for Safe Use (X):

1. When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.
2. The enclosure may be made from aluminum alloy with a protective polyurethane paint finish. The polyurethane paint finish may constitute an electrostatic hazard and must only be cleaned with a damp cloth.
3. When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of process fluid temperature, that the ambient temperature of the electrical housing of the equipment meets the marked protection type temperature range.

## ATEX Flameproof Certification

EN 60079-0: 2009

EN 60079-1: 2007

EN 60079-11: 2012

EN 60079-26: 2007

**E1** Certificate: KEMA99ATEX3852X

Integral Flowmeter marked:

⊕ II 1/2 G Ex d [ia] IIC T6 Ga/Gb (-50 °C ≤ Ta ≤ 70 °C)

Remote Transmitter marked:

⊕ II 2(1) G Ex d [ia Ga] IIC T6 Gb (-50 °C ≤ Ta ≤ 70 °C)

with meter body marked:

⊕ II 1 G Ex ia IIC T6 Ga (-50 °C ≤ Ta ≤ 70 °C)

42 VDC Max 4-20 mA HART

32 VDC Max Fieldbus

U<sub>m</sub> = 250V

### Installation instructions:

1. The cable and conduit entry devices shall be of a certified flameproof type Ex d, suitable for the conditions of use and correctly installed.
2. Unused apertures shall be closed with suitable blanking elements.
3. When the ambient temperature at the cable or conduit entries exceed 60 °C, cables suitable for at least 90 °C shall be used.
4. Remote mounted sensor; in type of protection EX ia IIC, only to be connected to the associated Model 8800D Vortex Flowmeter electronics. the maximum allowable length of the interconnecting cable is 152 m (500 ft).

**Special Conditions for Safe Use (X):**

1. For information regarding the dimensions of the flameproof joints, the manufacturer shall be contacted.
2. The Flowmeter shall be provided with special fasteners of property class A2-70 or A4-70.
3. Units marked with "Warning: Electrostatic Charging Hazard" may use non-conductive paint thicker than 0.2 mm. Precaution shall be taken to avoid ignition due to electrostatic charge on the enclosure.

**Combined ATEX Certifications****K1** E1, I1, and N1 Combination**4.3 International IECEx Certifications****Intrinsic Safety**

IEC 60079-0: 2011

IEC 60079-11: 2011

**I7** Certificate No. IECEx BAS05.0028XEx ia IIC T4 Ga (-60 °C ≤ T<sub>a</sub> ≤ 70 °C) 4-20 mA HARTEx ia IIC T4 Ga (-60 °C ≤ T<sub>a</sub> ≤ 60 °C) Fieldbus

4-20 mA HART entity parameters	Fieldbus entity parameters	FISCO input parameters
U <sub>i</sub> = 30 VDC	U <sub>i</sub> = 30 VDC	U <sub>i</sub> = 17.5 VDC
I <sub>i</sub> <sup>(1)</sup> = 185 mA	I <sub>i</sub> <sup>(1)</sup> = 300 mA	I <sub>i</sub> <sup>(1)</sup> = 380 mA
P <sub>i</sub> <sup>(1)</sup> = 1.0 W	P <sub>i</sub> <sup>(1)</sup> = 1.3 W	P <sub>i</sub> <sup>(1)</sup> = 5.32 W
C <sub>i</sub> = 0 μF	C <sub>i</sub> = 0 μF	C <sub>i</sub> = 0 μF
L <sub>i</sub> = 0.97mH	L <sub>i</sub> < 10 μH	L <sub>i</sub> < 10 μH

1. Total for transmitter.

**FISCO****IG** Certificate: IECEx BAS 05.0028XEx ia IIC T4 Ga (-60 °C ≤ T<sub>a</sub> ≤ 60 °C)**Special Conditions for Safe Use (X):**

1. When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.
2. The enclosure may be made from aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion when located in Zone 0 environment. The polyurethane paint finish may constitute an electrostatic hazard and must only be cleaned with a damp cloth.
3. When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of process fluid temperature, that the ambient temperature of the electrical housing of the equipment meets the marked protection type temperature range.

**Type n Certification**

IEC 60079-0: 2011

IEC 60079-11: 2011

IEC 60079-15: 2010



**N7** Certificate No. IECEx BAS05.0029X  
 Ex nA ic IIC T5 Gc (-50 °C ≤ Ta ≤ 70 °C) 4-20 mA HART  
 Ex nA ic IIC T5 Gc (-50 °C ≤ Ta ≤ 60 °C) Fieldbus  
 Maximum Working Voltage = 42 VDC 4-20 mA HART  
 Maximum Working Voltage = 32 VDC Fieldbus

***Special Conditions for Safe Use (X):***

1. When fitted with 90V transient suppressors (T1 Option), the equipment is not capable of passing the 500V isolation test. This must be taken into account upon installation.
2. The enclosure may be made from aluminum alloy with a protective polyurethane paint finish. The polyurethane paint finish may constitute an electrostatic hazard and must only be cleaned with a damp cloth.
3. When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of process fluid temperature, that the ambient temperature of the electrical housing of the equipment meets the marked protection type temperature range.

## Flameproof Certification

IEC 60079-0: 2007-10

IEC 60079-1: 2007-04

IEC 60079-11: 2011

IEC 60079-26: 2006

**E7** Certificate: IECEx KEM05.0017X  
 Integral Flowmeter marked:  
 Ex d [ia] IIC T6 Ga/Gb (-50 °C ≤ Ta ≤ 70 °C)  
 Remote Transmitter marked:  
 Ex d [ia Ga] IIC T6 Gb (-50 °C ≤ Ta ≤ 70 °C)  
 with meter body marked:  
 Ex ia IIC T6 Ga (-50 °C ≤ Ta ≤ 70 °C)  
 42 VDC Max 4-20 mA HART  
 32 VDC Max Fieldbus  
 U<sub>m</sub> = 250V

## Installation instructions:

1. The cable and conduit entry devices shall be of a certified flameproof type Ex d, suitable for the conditions of use and correctly installed.
2. Unused apertures shall be closed with suitable blanking elements.
3. When the ambient temperature at the cable or conduit entries exceed 60 °C, cables suitable for at least 90 °C shall be used.
4. The remote mounted sensor may only be connected to the transmitter with the associated cable, supplied by the manufacturer.

***Special Conditions for Safe Use (X):***

1. For information regarding the dimensions of the flameproof joints, the manufacturer shall be contacted.
2. The Flowmeter shall be provided with special fasteners of property class A2-70 or A4-70.
3. Units marked with "Warning: Electrostatic Charging Hazard" may use non-conductive paint thicker than 0.2 mm. Precaution shall be taken to avoid ignition due to electrostatic charge on the enclosure.

## Combined IECEx Certifications

**K7** Combination of E7, I7, and N7

## 4.4 Chinese Certifications (NEPSI)

### Flameproof Certification

GB3836.1 – 2010

GB3836.2 – 2010

GB3836.4 – 2010

GB3836.20 – 2010

**E3** Certification No. GYJ12.1493X

Ex ia / d IIC T6 Ga/Gb (Integral Transmitter)

Ex d [ia Ga] IIC T6 Gb (Remote Transmitter)

Ex ia IIC T6 Ga (Remote Sensor)

Ambient temperature range:  $-50\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$

Process temperature range:  $-202\text{ }^{\circ}\text{C}$  to  $+427\text{ }^{\circ}\text{C}$

Power Supply: 42 Vdc Max 4-20 mA HART

Power Supply: 32 Vdc Max Fieldbus

$U_m = 250\text{V}$

#### **Special Conditions for Safe Use (X):**

1. The maximum allowable length of the interconnecting cable between transmitter and sensor is 152 m. The cable shall also be provided by Rosemount Inc., or by Emerson Process Management Flow Technologies Co., Ltd.
2. Suitable heat-resisting cables rated at least  $+80\text{ }^{\circ}\text{C}$  shall be used when the temperature around the cable entry exceeds  $+60\text{ }^{\circ}\text{C}$ .
3. Dimensions of flameproof joints are other than the relevant minimum or maximum specified in Table 3 of GB3836.2-2010. Contact manufacturer for details.
4. The Flowmeter is provided with special fasteners of property class A2-70 or A4-70.
5. Any friction should be prevented in order to avoid the risk of electrostatic charge on the enclosure due to non-conductive paint.
6. The earthing terminal should be connected to the ground reliably at site.
7. Do not open when energized.
8. The cable entry holes have to be connected by means of suitable entry device or stopping plugs with type of protection of Ex d IIC Gb the cable entry device and stopping plugs are approved in accordance with GB3836.1-2010 and GB3836.2-2010, and which are covered by a separate examination certificate, any unused entry hole is to be fitted with type of protection of Ex d IIC Gb flameproof stopping plug.
9. Users are forbidden to change the configuration to ensure the explosion protection performance of the equipment. Any faults shall be settled with experts from the manufacturer.
10. Precautions shall be taken to ensure that the electronic parts are within permissible ambient temperature considering the effect of the allowed fluid temperature.
11. During installation, operation and maintenance, users shall comply with the relevant requirements of the product instruction manual, GB3836.13-1997 "Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres", GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous areas (other than mines)", GB3836.16-2006 "Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)", and GB50257-1996 "Code for construction and acceptance of electrical device for explosion atmospheres and fire hazard electrical equipment installation engineering".

## I. S. Certification

GB3836.1 – 2010

GB3836.4 – 2010

GB3836.20 – 2010

GB12476.1 – 2000

**I3** Certification No. GYJ12.1106X

Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ + 70 °C) 4-20 mA HART

Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ + 60 °C) Fieldbus

4-20 mA HART entity parameters	Fieldbus entity parameters	FISCO input parameters
$U_i = 30 \text{ VDC}$	$U_i = 30 \text{ VDC}$	$U_i = 17.5 \text{ VDC}$
$I_i^{(1)} = 185 \text{ mA}$	$I_i^{(1)} = 300 \text{ mA}$	$I_i^{(1)} = 380 \text{ mA}$
$P_i^{(1)} = 1.0 \text{ W}$	$P_i^{(1)} = 1.3 \text{ W}$	$P_i^{(1)} = 5.32 \text{ W}$
$C_i = 0 \mu\text{F}$	$C_i = 0 \mu\text{F}$	$C_i = 0 \mu\text{F}$
$L_i = 0.97\text{mH}$	$L_i < 10 \mu\text{H}$	$L_i < 10 \mu\text{H}$

1.Total for transmitter.

## FISCO

**IH** Certification No. GYJ12.1106X

Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C)

### **Special Conditions for Safe Use (X):**

1. The maximum allowable length of the interconnecting cable between transmitter and sensor is 152 m. The cable shall also be provided by manufacturer.
2. When transient protection terminal block applied to this product, during installation, users shall comply with Clause 12.2.4 in GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous areas (other than mines)."
3. Suitable heat-resisting cables rated at least +80 °C shall be used when the temperature around the cable entry exceeds +60 °C.
4. Only be connected to the certified associated apparatus, the Vortex Flowmeter could be used in the explosive atmosphere. The connection should be complied with the requirements of the manual of the associated apparatus and the Vortex Flowmeter.
5. The enclosure should be taken to protect it from impact.
6. Any friction should be prevented in order to avoid the risk of electrostatic charge on the enclosure due to non-conductive paint.
7. The cable with shield is suitable for connection, and the shield should be connected to earth.
8. The enclosure shall be kept from the dust, but the dust shall not be blown by compressed air.
9. The cable entry holes have to be connected by means of suitable cable entry, the way of being installed shall be ensure that the equipment satisfies degree of protection IP66 according to GB4208-2008.
10. Users are forbidden to change the configuration to ensure the explosion protection performance of the equipment. Any faults shall be settled with experts from the manufacturer.
11. Precautions shall be taken to ensure that the electronic parts are within permissible ambient temperature considering the effect of the allowed fluid temperature.

12. During installation, operation and maintenance, users shall comply with the relevant requirements of the product instruction manual, GB3836.13- 1997 “Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”, GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous areas (other than mines)”, GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”, and GB50257-1996 “Code for construction and acceptance of electrical device for explosion atmospheres and fire hazard electrical equipment installation engineering”.

## Type n Certification

GB3836.1 – 2010

GB3836.4 – 2010

GB3836.8 – 2003

**N3** Certification No. GYJ12.1107X

Ex nA ic IIC T5 Gc (- 50 °C ≤ T<sub>a</sub> ≤ +70 °C) 4-20 mA HART

Ex nA ic IIC T5 Gc (- 50 °C ≤ T<sub>a</sub> ≤ +60 °C) Fieldbus

### *Special Conditions for Safe Use (X):*

1. The maximum allowable length of the interconnecting cable between transmitter and sensor is 152 m. The cable shall also be provided by the manufacturer.
2. Suitable heat-resisting cables rated at least +80 °C shall be used when the temperature around the cable entry exceeds +60 °C.
3. When transient protection terminal block (The Other Option is T1) applied to this product, during installation, users shall comply with Clause 12.2.4 in GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous areas (other than mines).”
4. Any friction should be prevented in order to avoid the risk of electrostatic charge on the enclosure due to non-conductive paint.
5. Do not open when energized.
6. The cable entry holes have to be connected by means of suitable cable entry, the way of being installed shall be ensure that the equipment satisfies degree of protection IP54 according to GB4208-2008.
7. Users are forbidden to change the configuration to ensure the explosion protection performance of the equipment. Any faults shall be settled with experts from the manufacturer.
8. Precautions shall be taken to ensure that the electronic parts are within permissible ambient temperature considering the effect of the allowed fluid temperature.
9. During installation, operation and maintenance, users shall comply with the relevant requirements of the product instruction manual, GB3836.13- 1997 “Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”, GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous areas (other than mines)”, GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”, and GB50257-1996 “Code for construction and acceptance of electrical device for explosion atmospheres and fire hazard electrical equipment installation engineering”.

## Combined Chinese Certifications (NEPSI)

**K3** Combination of E3, I3, and N3

## 4.5 Brazilian Certifications (INMETRO)

### I. S. Certification

ABNT NBR IEC 60079-0: 2013

ABNT NBR IEC 60079-11: 2009

ABNT NBR IEC 60079-26: 2008 and 2009 correction

ABNT NBR IEC 60079-27: 2010

**I2** Certification Number: NCC 11.0699 X

Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +70 °C) 4-20 mA HART

Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C) Fieldbus

**IB** Certification Number: NCC 11.0699 X

Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C)

#### **Special Conditions for Safe Use (X):**

1. When fitted with 90V transient suppressors, the equipment is not capable of passing the 500V insulation test. This must be taken into account upon installation.
2. The enclosure may be made from aluminum alloy with a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion when located in Zone 0. The polyurethane paint finish may constitute an electrostatic hazard and must only be cleaned with a damp cloth.
3. When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of process fluid temperature, that the ambient temperature of the electrical housing of the equipment meets the marked protection type temperature range.

### Flameproof Certification

ABNT NBR IEC 60079-0: 2013

ABNT NBR IEC 60079-1: 2009 and 2011 correction

ABNT NBR IEC 60079-11: 2009

ABNT NBR IEC 60079-26: 2008 and 2009 correction

**E2** Certification Number: NCC 11.0622 X

Ex d [ia] IIC T6 Ga/Gb (Integral Transmitter)

Ex d [ia Ga] IIC T6 Gb (Remote Transmitter)

Ex ia IIC T6 Ga (Remote Sensor)

Ambient temperature range: -50 °C ≤ Ta ≤ +70 °C

Process temperature range: -202 °C to +427 °C

Power Supply: 42 Vdc Max 4-20 mA HART

Power Supply: 32 Vdc Max Fieldbus

Transmitter Um = 250 V

### Remote mounted sensor

In type of protection Ex ia IIC, only to be connected to the associated Model 8800D Vortex Flowmeter electronics. The maximum length of the interconnecting cable is 152 m (500 ft).

#### **Special Conditions for Safe Use (X):**

1. For information regarding the dimensions of the flameproof joints, the manufacturer shall be contacted.
2. The Flowmeter is provided with special fasteners of property class A2-70 of A4-70.
3. Units marked with "Warning: Electrostatic Charging Hazard" may use non-conductive paint thicker than 0.2 mm. Precautions shall be taken to avoid ignition due to electrostatic charge of the enclosure.

## Combined Brazilian Certifications (INMETRO)

**K2** Combination of E2 and I2

### 4.6 EurAsian Conformity (EAC)

This section addresses compliance with the requirements of technical regulations of the Customs Union.

- TR CU 020/2011—Electromagnetic compatibility of technical means
- TR CU 032/2013—On the safety of equipment operating under excessive pressure
- TR CU 012/2011—About the safety of equipment for use in potentially explosive atmospheres

GOST R IEC 60079-0-2011, GOST R IEC 60079-1-2011, GOST R IEC 60079-11-2010, GOST R IEC 60079-15-2010, GOST 31610.26-2002/IEC 60079-26:2006

**E8** Type of protection flameproof enclosure «d» with intrinsically safe flow sensor

Ex marking of the integral installation:

Ga/Gb Ex d [ia] IIC T6 X (-50°C ≤ Ta ≤ 70°C)

Ex marking of the remote installation:

electronics module:

1Ex d [ia Ga] IIC T6 Gb X (-50°C ≤ Ta ≤ 70°C)

flow sensor:

0Ex ia IIC T6 Ga X (-50°C ≤ Ta ≤ 70°C)

Electrical parameters:

Maximum DC supply voltage (with output signal 4-20 mA HART/pulse) 42 V;

Maximum DC supply voltage (with output signal Foundation Fieldbus and FISCO) 32 V

#### **Special conditions for safe use (X):**

1. For flowmeters with Ex marking 0Ex ia IIC T6 Ga X, Ga / Gb Ex d [ia] IIC T6 X and transmitter with Ex marking 1Ex d [ia Ga] IIC T6 Gb X cabling in explosive area must be conducted according to requirements of IEC 60079-14-2011. Sheath cables must be designed for a maximum ambient temperature;
2. Remote installation should be made only with special coaxial cable provided by the manufacturer of flowmeters;
3. When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of process fluid temperature, that the ambient temperature of the electrical housing of the equipment meets the marked protection type temperature range;
4. Precautions shall be taken to avoid ignition due to electrostatic charge on the enclosure

**I8, G8** Type of protection "intrinsically safe circuit" level «ia»

Ex marking:

0Ex ia IIC T4 Ga X

Ambient temperature range:

(I8) Flowmeters with pulse output signals, 4-20 mA /HART (-60°C ≤ Ta ≤ 70°C)

Flowmeters with output Fieldbus (I8) and FISCO (G8) (-60°C ≤ Ta ≤ 60°C)

## Input intrinsically safe parameters

Intrinsically safe parameters	Output signal		
	4-20mA/HART Pulse	FOUNDATION Fieldbus	FISCO
U <sub>i</sub> , <sup>(1)</sup> V	30	30	17.5
I <sub>i</sub> , <sup>(1)</sup> mA	185	300	380
P <sub>i</sub> , <sup>(1)</sup> W	1	1.3	5.32
L <sub>i</sub> , uH	970	20	10
C <sub>i</sub> , nF	0	0	0

1. Applicable values U<sub>i</sub>, I<sub>i</sub> are limited by the maximum input power P<sub>i</sub>. It is not allowed to apply max values of U<sub>i</sub>, I<sub>i</sub> at the same time.

### Special conditions for safe use (X):

1. Power supply of flowmeters with Ex marking 0Ex ia IIC T4 Ga X must be implemented through intrinsically safe barriers having certificate of conformity for appropriate subgroups of electrical equipment.
2. Inductance and capacitance of intrinsically safe circuits of flowmeters with Ex marking 0Ex ia IIC T4 Ga X, with given parameters connecting cables must not exceed maximum values shown on the intrinsically safe barrier from the side of explosive zone.
3. When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of process fluid temperature, that the ambient temperature of the electrical housing of the equipment meets the marked protection type temperature range.
4. When fitted with the 90V transient suppressors, the equipment is not capable of passing the 500V insulation test. This must be taken into account upon installation.
5. The enclosure may be made from aluminium alloy with a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion when located in Zone 0.

### N8 Type of protection «n» and "intrinsically safe" level «ic»

Ex marking:

2Ex nA ic IIC T5 Gc X (-50°C ≤ T<sub>a</sub> ≤ 70°C)

Electrical parameters:

The maximum DC voltage (with output 4-20 mA HART/pulse) 42V;

Maximum supply DC voltage (with output signal Foundation Fieldbus and FISCO) 32V

### Special conditions for safe use (X):

1. When the equipment is installed, particular precautions must be taken to ensure, taking into account the effect of process fluid temperature, that the ambient temperature of the electrical housing of the equipment meets the marked protection type temperature range.
2. When fitted with the 90V transient suppressors, the equipment is not capable of passing the 500V insulation test. This must be taken into account upon installation.
3. Precautions shall be taken to avoid ignition due to electrostatic charge on the enclosure.

### K8 Combination of E8, I8, N8

Figure 16. Rosemount 8800D Declaration of Conformity

 <b>EMERSON</b> Process Management	 <b>ROSEMOUNT</b>	
 <b>EC/EU Declaration of Conformity</b> <b>No: RFD 1029 Rev. R</b> <hr style="border: 0.5px solid black;"/>		
<p>We,</p> <p style="margin-left: 40px;"><b>Emerson Process Management</b> <b>Rosemount Flow</b> <b>12001 Technology Drive</b> <b>Eden Prairie, MN 55344</b> <b>USA</b></p>		
<p>declare under our sole responsibility that the product(s),</p> <p style="text-align: center;"><b>Rosemount Model 8800D Vortex Flowmeters</b></p>		
<p>to which this declaration relates, is in conformity with the provisions of the European Community/Union Legislation, including the latest amendments, as shown in the attached schedule.</p>		
<p>Assumption of conformity is based on the application of harmonized or applicable technical standards and, when applicable or required, a European Community/Union Legislation notified body certification, as shown in the attached schedule.</p>		
<div style="display: flex; align-items: center; justify-content: center;"><div style="margin-left: 10px;"><hr style="border: 0.5px solid black;"/> (signature)</div></div>		
<div style="display: flex; align-items: center; justify-content: center;"><div style="width: 100px; border-bottom: 1px solid black; margin-bottom: 5px;"></div><div style="text-align: left; margin-left: 5px;"><b>12 April 2016</b> (date of issue)</div></div>	<div style="display: flex; align-items: center; justify-content: center;"><div style="width: 100px; border-bottom: 1px solid black; margin-bottom: 5px;"></div><div style="text-align: left; margin-left: 5px;"><b>Mark Fleigle</b> (name - printed)</div></div> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"><div style="width: 100px; border-bottom: 1px solid black; margin-bottom: 5px;"></div><div style="text-align: left; margin-left: 5px;"><b>Vice President Technology and New Products</b> (function name - printed)</div></div>	
<div style="display: flex; justify-content: space-between;"><span>FILE ID: 8800D CE Marking</span><span>Page 1 of 3</span><span>RFD1029.docx</span></div>		




**ROSEMOUNT**


### Schedule

#### EC/EU Declaration of Conformity RFD 1029 Rev. R

**EMC Directive (2004/108/EC) until 19 April 2016 and (2014/30/EU) as of 20 April 2016**

**All Models**

EN 61326-1: 2013

**PED Directive (97/23/EC) until 18 July 2016 and (2014/68/EU) as of 19 July 2016**

**Model 8800D Vortex Flowmeter with option 'PD', in Line Sizes 1.5"- 12"**

Equipment without the 'PD' option is NOT PED compliant and cannot be used in the EEA without further assessment unless the installation is exempt under Article 1, paragraph 3 of the PED Directive (97/23/EC) or (2014/68/EU).

QS Certificate of Assessment - EC No. 4741-2014-CE-HOU-DNV  
Module H Conformity Assessment  
ASME B31.3: 2010

**Model 8800D Vortex Flowmeter with option 'PD', in Line Sizes .5"- 1"**

Sound Engineering Practice  
ASME B31.3: 2010

**ATEX Directive (94/9/EC) until 19 April 2016 and (2014/34/EU) as of 20 April 2016**

**Model 8800D Vortex Flowmeter**

**Baseefa05ATEX0084 X – Intrinsic Safety Certificate**

Equipment Group II, Category 1 G (Ex ia IIC T4 Ga)  
EN 60079-0: 2012  
EN 60079-11: 2012

**Baseefa05ATEX0085 X – Type n Certificate**

Equipment Group II, Category 3 G (Ex nA ic IIC T5 Gc)  
EN 60079-0: 2012  
EN 60079-11: 2012  
EN 60079-15: 2010


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### Schedule

#### EC/EU Declaration of Conformity RFD 1029 Rev. R

#### ATEX Directive (94/9/EC) and (2014/34/EU) continued

**KEMA99ATEX3852X – Flameproof with Intrinsically Safe Connection(s) Certificate**  
 Equipment Group II, Category 1/2 G (Ex d [ia] IIC T6 Ga/Gb) – Integral Transmitter  
 Equipment Group II, Category 2(1) G (Ex d [ia Ga] IIC T6 Gb) – Remote Transmitter  
 Equipment Group II, Category 1 G (Ex ia IIC T6 Ga) – Remote Sensor  
 EN 60079-0: 2009  
 EN 60079-1: 2007  
 EN 60079-11: 2012  
 EN 60079-26: 2007

#### PED Notified Body

**DNV GL**  
 [Notified Body Number: 0575]  
 Veritasveien 1, N-1322  
 Hovik, Norway

**OR DNV Nemko Presafe AS**  
 [Notified Body number: 2460]  
 P.O. Box 73, Blindern  
 0314 Oslo, Norway

#### ATEX Notified Bodies

**DEKRA Certification B.V.** [Notified Body Number: 0344]  
 Meander 1051, 6825 MJ Arnhem  
 P.O. Box 5185, 6802 ED Arnhem  
 The Netherlands

**SGS Baseefa Limited** [Notified Body Number: 1180]  
 Rockhead Business Park, Staden Lane  
 Buxton, Derbyshire SK17 9RZ  
 United Kingdom

#### ATEX Notified Body for Quality Assurance

**DNV GL** [Notified Body Number: 0575]  
 Veritasveien 1, N-1322  
 Hovik, Norway

Or

**DNV Nemko Presafe AS** [Notified Body number: 2460]  
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## Quick Start Guide

00825-0100-4004, Rev FB  
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