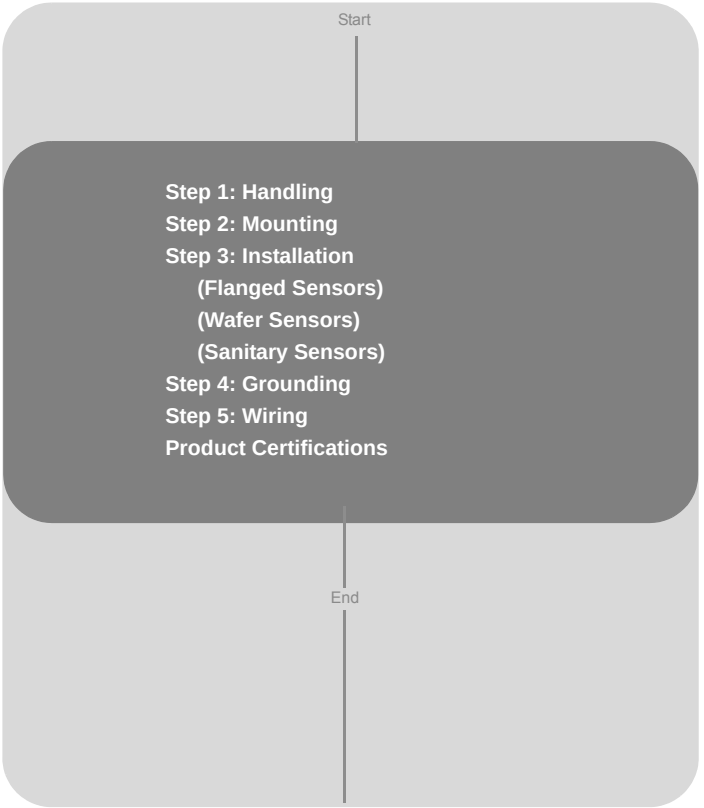
Quick Installation Guide
00825-0100-4727, Rev CB
January 2012

Rosemount 8700 Series
Magnetic Flowmeter Sensors



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⚠ IMPORTANT NOTICE

This document provides basic installation guidelines for the Rosemount® 8700 Series Sensors. 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 8700 reference manual (document number 00809-0100-4727) for more instructions. The manual and this QIG are also available electronically on www.rosemount.com.

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury:

Installation and servicing instructions are for use by qualified personnel only. Do not perform any servicing other than that contained in the operating instructions, unless qualified. Verify that the operating environment of the sensor and transmitter is consistent with the appropriate FM, CSA, ATEX, or IECEx approval.

⚠ WARNING

The sensor liner is vulnerable to handling damage. Never place anything through the sensor for the purpose of lifting or gaining leverage. Liner damage can render the sensor useless.

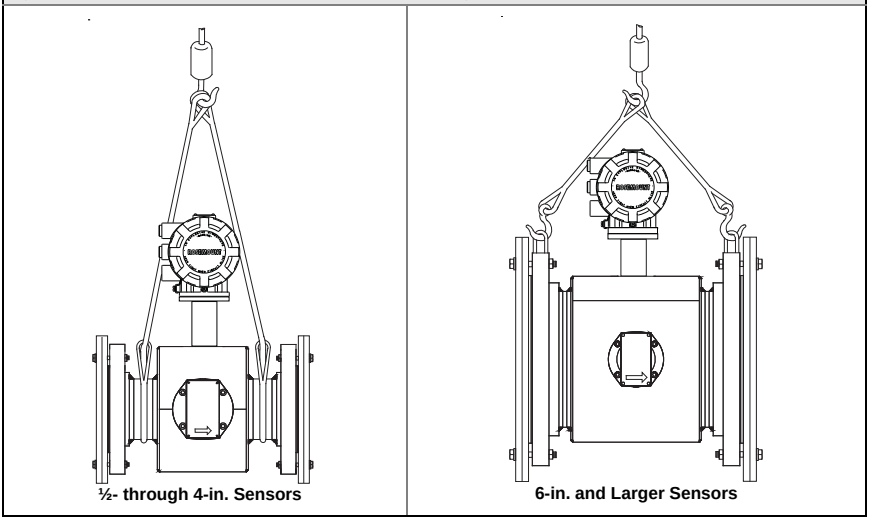
To avoid possible damage to the sensor liner ends, do not use metallic or spiral-wound gaskets. If frequent removal is anticipated, take precautions to protect the liner ends. Short spool pieces attached to the sensor ends are often used for protection.

Correct flange bolt tightening is crucial for proper sensor operation and life. All bolts must be tightened in the proper sequence to the specified torque limits. Failure to observe these instructions could result in severe damage to the sensor lining and possible sensor replacement.

STEP 1: HANDLING

Handle all parts carefully to prevent damage. Whenever possible, transport the system to the installation site in the original shipping containers. PTFE-lined sensors are shipped with end covers that protect it from both mechanical damage and normal unrestrained distortion. Remove the end covers just before installation.

Figure 1. Rosemount 8705 Sensor Support for Handling

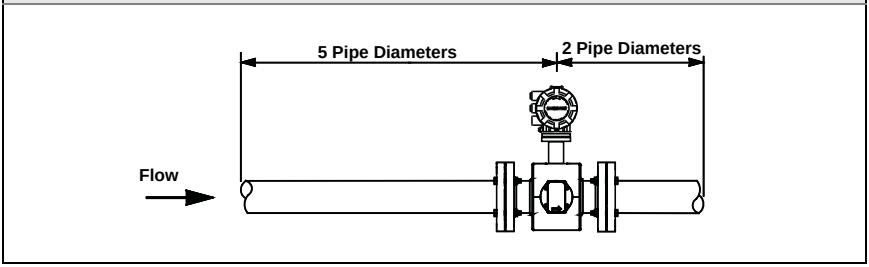


STEP 2: MOUNTING

Upstream/Downstream Piping

To ensure specification accuracy over widely varying process conditions, install the sensor a minimum of five straight pipe diameters upstream and two pipe diameters downstream from the electrode plane (see Figure 2).

Figure 2. Upstream and Downstream Straight Pipe Diameters



Installations with reduced straight runs from zero to five pipe diameters are possible. In reduced straight pipe run installations, performance can shift as much as 2 percent of rate. Reported flow rates will still be highly repeatable.

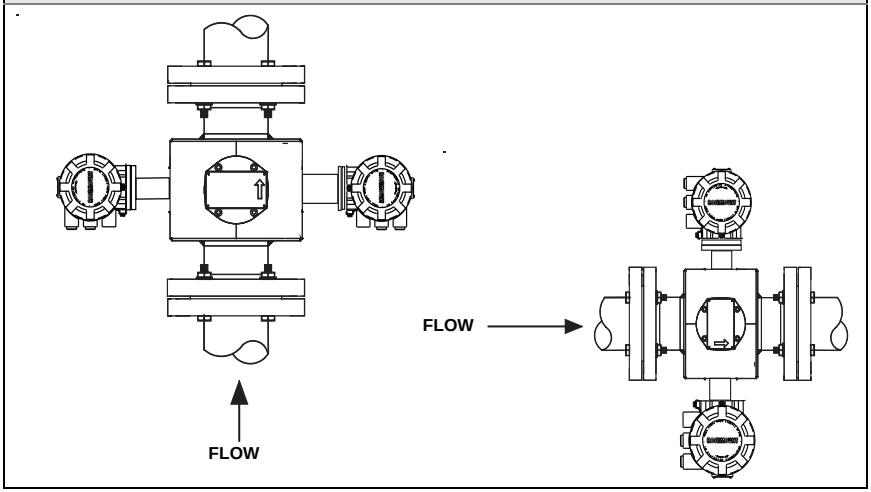
Flow Direction

The sensor should be mounted so the FORWARD end of the flow arrow, shown on the sensor identification tag, points in the direction of flow through the sensor.

Sensor Orientation

The sensor should be installed in a position that ensures it remains full during operation. Vertical installation allows upward process fluid flow and keeps the cross-sectional area full, regardless of flow rate. Horizontal installation should be restricted to low piping sections that are normally full. In these cases, orient the electrode plane to within 45° of horizontal.

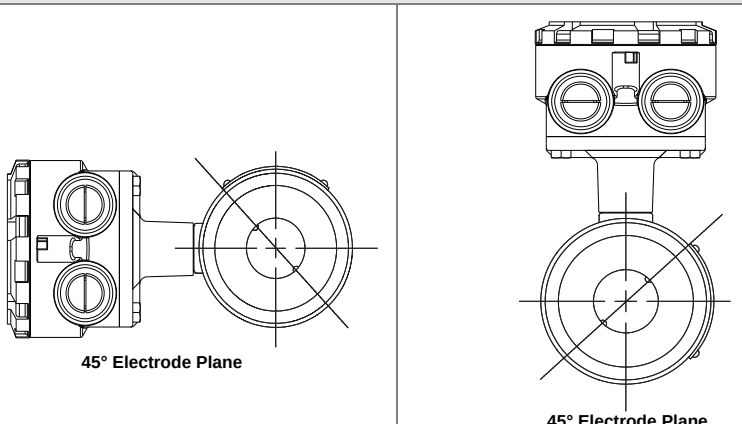
Figure 3. Sensor Orientation



The electrodes in the Rosemount 8705 sensor are properly orientated when the two measurement electrodes are in the 3 and 9 o'clock positions, as shown on the right of Figure 3.

The electrodes in the Rosemount 8711 are properly orientated when the top of the sensor is either vertical or horizontal, as shown in Figure 4. Avoid any mounting orientation that positions the top of the sensor at 45° from the vertical or horizontal position.

Figure 4. Rosemount 8711 Mounting Position



STEP 3: INSTALLATION

Flanged Sensors

Gaskets

The sensor requires a gasket at each of its connections to adjacent devices or piping. The gasket material selected must be compatible with the process fluid and operating conditions. Metallic or spiral-wound gaskets can damage the liner. Gaskets are required on each side of a grounding ring. All other applications (including sensors with lining protectors or a grounding electrode) require only one gasket on each end connection.

Flange Bolts

NOTE

Do not bolt one side at a time. Tighten each side simultaneously. Example:

1. Snug left
2. Snug right
3. Tighten left
4. Tighten right

Do not snug and tighten the upstream side and then snug and tighten the downstream side. Failure to alternate between the upstream and downstream flanges when tightening bolts may result in liner damage.

Suggested torque values by sensor line size and liner type are listed in Table 1 for ASME B16.5 (ANSI) and Table 2 for DIN flanges. Consult the factory if the flange rating of the sensor is not listed. Tighten flange bolts on the upstream side of the sensor in the incremental sequence shown in Figure 5 to 20 percent of the suggested torque values. Repeat the process on the downstream side of the sensor. For sensors with more or less flange bolts, tighten the bolts in a similar crosswise sequence. Repeat this entire tightening sequence at 40, 60, 80, and 100 percent of the suggested torque values or until the leak between the process and sensor flanges stop.

If leakage has not stopped at the suggested torque values, the bolts can be tightened in additional 10 percent increments until the joint stops leaking, or until the measured torque value reaches the maximum torque value of the bolts. Practical consideration for the integrity of the liner often leads the user to distinct torque values to stop leakage due to the unique combinations of flanges, bolts, gaskets, and sensor liner material.

Check for leaks at the flanges after tightening the bolts. Failure to use the correct tightening methods can result in severe damage. Sensors require a second tightening 24 hours after the initial installation. Over time, sensor liner materials may deform under pressure.

Figure 5. Flange Bolt Torquing Sequence

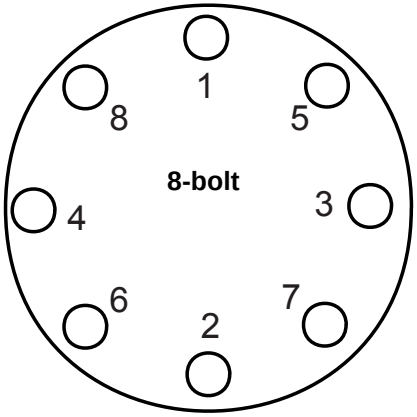


Table 1. Suggested Flange Bolt Torque Values for Rosemount 8705 and 8707 High-Signal Sensors

		PTFE/ETFE/PFA liners			Polyurethane/Neoprene/Lina tex liner	
Size Code	**Line Size**	**Class 150 (pound-feet)**	**Class 300 (pound-feet)**	**Class 600[(1)] (Derated to 1000 psi)**	**Class 150 (pound-feet)**	**Class 300 (pound-feet)**
005	0.5 in. (15 mm)	8	8	8	-	-
010	1 in. (25 mm)	8	12	13	-	-
015	1.5 in. (40 mm)	13	25	29	7	18
020	2 in. (50 mm)	19	17	20	14	11
030	3 in. (80 mm)	34	35	41	23	23
040	4 in. (100 mm)	26	50	68	17	32
060	6 in. (150mm)	45	50	77	30	37
080	8 in. (200 mm)	60	82	121	42	55
100	10 in. (250 mm)	55	80	129	40	70
120	12 in. (300 mm)	65	125	146	55	105
140	14 in. (350 mm)	85	110	194	70	95
160	16 in. (400 mm)	85	160	274	65	140
180	18 in. (450 mm)	120	170	432	95	150
200	20 in. (500 mm)	110	175	444	90	150
240	24 in. (600 mm)	165	280	731	140	250
300	30 in. (750 mm)	195	415	-	165	375
360	36 in. (900 mm)	280	575	-	245	525

(1) Derated available with PTFE lining only.

For sensors with ANSI 600# full rated, 900#, 1500#, and 2500# flanges, the liner is protected from over-compression by the sensor design. Standard flange torque specifications as determined by ANSI and ASME should be followed. No special precaution is required to prevent liner damage caused by over torquing. Bolt tightening procedures laid out in this Quick Installation Guide must still be followed.

To prevent liner damage on any magnetic flowmeter, a flat gasket must be used. For optimum results on meters with high pressure flanges (ANSI 600# or above), it is recommended that a flat full face gasket be used. Under NO circumstances should a spiral wound or flexitallic gasket be used as this will damage the liner sealing surface.

Table 2. Flange Bolt Torque and Bolt Load Specifications for 8705

		PTFE/ETFE liner							
		PN10		PN 16		PN 25		PN 40	
Size Code	Line Size	(Newton-meter)	(Newton)	(Newton-meter)	(Newton)	(Newton-meter)	(Newton)	(Newton-meter)	(Newton)
005	0.5-in. (15 mm)							10	4400
010	1 in. (25 mm)							20	10100
015	1.5 in. (40 mm)							50	16100
020	2 in. (50 mm)							60	20100
030	3 in. (80 mm)							50	16800
040	4 in. (100 mm)			50	17800			70	19600
060	6 in. (150mm)			90	24700			130	28700
080	8 in. (200 mm)	130	35200	90	19700	130	29200	170	34400
100	10 in. (250 mm)	100	28000	130	28300	190	38000	250	44800
120	12 in. (300 mm)	120	32000	170	38400	190	38600	270	47700
140	14 in. (350 mm)	160	43800	220	49500	320	57200	410	68100
160	16 in. (400 mm)	220	50600	280	56200	410	68100	610	92900
180	18 in. (450 mm)	190	43200	340	68400	330	55100	420	64000
200	20 in. (500 mm)	230	51100	380	68900	440	73300	520	73900
240	24 in. (600 mm)	290	58600	570	93600	590	90100	850	112000

Table 2. (continued) Flange Bolt Torque and Bolt Load Specifications for 8705

Size Code	Line Size	Polyurethane, Linatex, and Neoprene Liners							
		PN 10		PN 16		PN 25		PN 40	
		(Newton-meter)	(Newton)	(Newton-meter)	(Newton)	(Newton-meter)	(Newton)	(Newton-meter)	(Newton)
010	1 in. (25 mm)							20	7040
015	1.5 in. (40 mm)							30	10700
020	2 in. (50 mm)							40	13400
030	3 in. (80 mm)							30	11100
040	4 in. (100 mm)			40	11700			50	13200
060	6 in. (150mm)			60	16400			90	19200
080	8 in. (200 mm)	90	23400	60	13100	90	19400	110	22800
100	10 in. (250 mm)	70	18600	80	18800	130	25400	170	29900
120	12 in. (300 mm)	80	21300	110	25500	130	25800	180	31900
140	14 in. (350 mm)	110	29100	150	33000	210	38200	280	45400
160	16 in. (400 mm)	150	33700	190	37400	280	45400	410	62000
180	18 in. (450 mm)	130	28700	230	45600	220	36800	280	42700
200	20 in. (500 mm)	150	34100	260	45900	300	48800	350	49400
240	24 in. (600 mm)	200	39200	380	62400	390	60100	560	74400

Wafer Sensors

Gaskets

The sensor requires a gasket at each of its connections to adjacent devices or piping. The gasket must be a full face gasket to cover the entire sealing surface of the meter, and the material selected must be compatible with the process fluid and operating conditions. Metallic or spiral-wound gaskets can damage the liner. Gaskets are required on each side of a grounding ring.

Alignment and Bolting

1. On 1.5 - through 8-in. (40 through 200 mm) line sizes, place centering rings over each end of the sensor. The smaller line sizes, 0.15- through 1-in. (4 through 25 mm), do not require centering rings. On the 4- and 6-in. PN 10–16, insert the sensor with rings first and then insert the studs. The slots on this ring scenario are located on the inside of the ring.
2. Insert studs for the bottom side of the sensor between the pipe flanges. Stud specifications are listed in Table 3.

NOTE

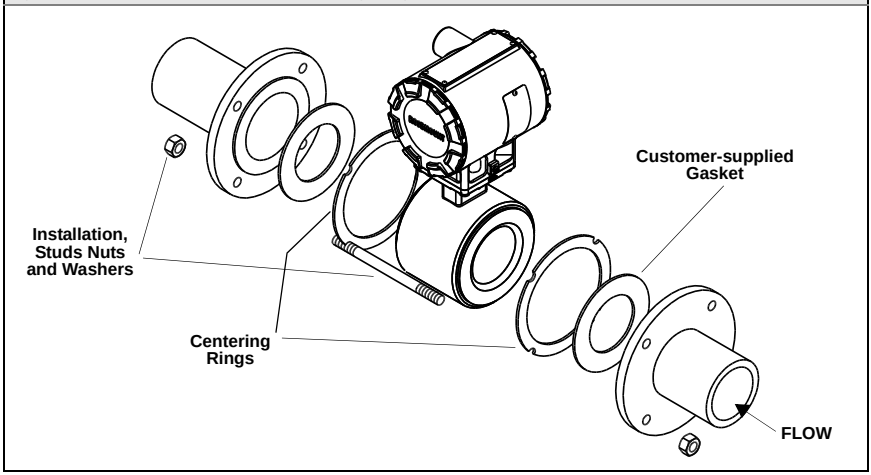
Using carbon steel bolts on smaller line sizes, 0.15- through 1-in. (4 through 25 mm), rather than the required stainless steel bolts, will degrade performance.

Table 3. Stud Specifications

Nominal Sensor Size	Stud Specifications
0.15 – 1 in. (4 – 25 mm)	316 SST ASTM A193, Grade B8M Class 1 threaded mounted studs
1.5 – 8 in. (40 – 200 mm)	CS, ASTM A193, Grade B7, threaded mounting studs

3. Place the sensor between the flanges. Make sure that the centering rings are properly placed in the studs. The studs should be aligned with the markings on the rings that correspond to the flange you are using.
4. Insert the remaining studs, washers, and nuts.
5. Tighten to the torque specifications shown in Table 4. Do not overtighten the bolts or the liner may be damaged.

Figure 6. Gasket Placement with Centering Rings



Flange Bolts

Tighten flange bolts in crosswise sequence. Always check for leaks at the flanges after tightening the flange bolts. All sensors require a second torquing 24 hours after initial flange bolt tightening.

Table 4. Rosemount 8711 Torque Specifications

Size Code	Line Size	Pound-feet	Newton-meter
15F	0.15 in. (4 mm)	5	7
30F	0.30 in. (8 mm)	5	7
005	0.5 in. (15 mm)	5	7
010	1 in. (25 mm)	10	14
015	1.5 in. (40 mm)	15	20
020	2 in. (50 mm)	25	34
030	3 in. (80 mm)	40	54
040	4 in. (100 mm)	30	41
060	6 in. (150 mm)	50	68
080	8 in. (200 mm)	70	95

Sanitary Sensors

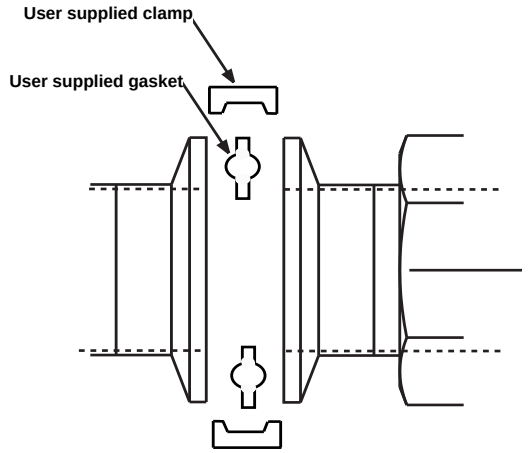
Gaskets

The sensor requires a gasket at each of its connections to adjacent devices or piping. The gasket material selected must be compatible with the process fluid and operating conditions. Gaskets are supplied between the IDF fitting and the process connection fitting, such as a Tri-Clamp fitting, on all Rosemount 8721 Sanitary sensors except when the process connection fittings are not supplied and the only connection type is an IDF fitting.

Alignment and Bolting

Standard plant practices should be followed when installing a magmeter with sanitary fittings. Unique torque values and bolting techniques are not required.

Figure 7. Rosemount 8721 Sanitary Installation



STEP 4: GROUNDING

Use Table 5 to determine which process grounding option to follow for proper installation. The sensor case should be earth grounded in accordance with national and local electrical codes. Failure to do so may impair the protection provided by the equipment.

Table 5. Process Grounding Installation

Process Grounding Options				
Type of Pipe	**Grounding Straps**	**Grounding Rings**	**Grounding Electrode**	**Lining Protectors**
Conductive Unlined Pipe	See Figure 8	Not Required	Not Required	See Figure 9
Conductive Lined Pipe	Insufficient Grounding	See Figure 9	See Figure 8	See Figure 9
Non-Conductive Pipe	Insufficient Grounding	See Figure 10	See Figure 11	See Figure 10

Figure 8. Grounding Straps or Grounding Electrode in Lined Pipe

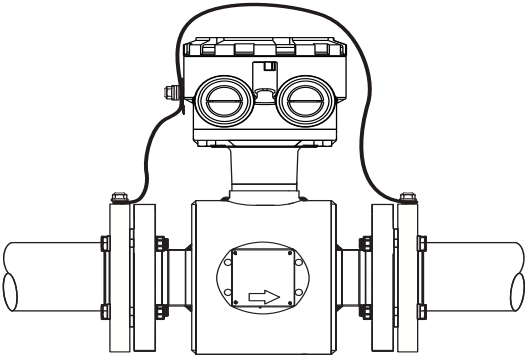


Figure 9. Grounding with Grounding Rings or Lining Protectors

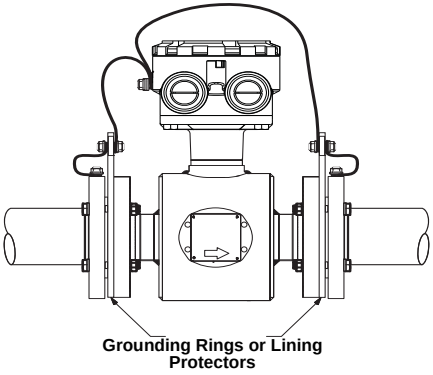


Figure 10. Grounding with Grounding Rings or Lining Protectors

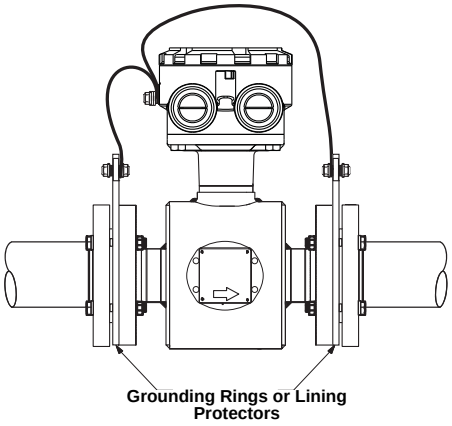
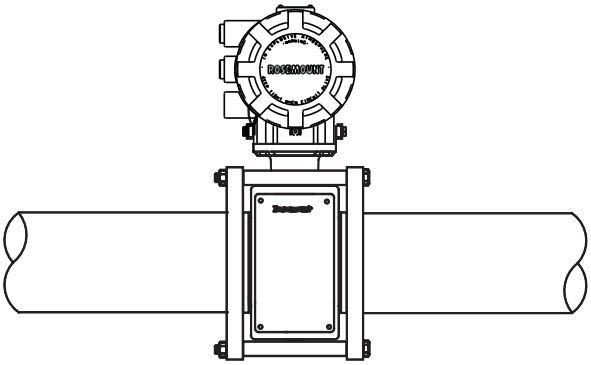


Figure 11. Grounding with Grounding Electrode



STEP 5: WIRING

Conduit Ports and Connections

Both the sensor and transmitter junction boxes have ports for 1/2-in. NPT conduit connections with optional CM20 or PG 13.5 connections available. These connections should be made in accordance with national, local, and plant electrical codes. Unused ports should be sealed with metal plugs. Proper electrical installation is necessary to prevent errors due to electrical noise and interference. Separate conduits are not necessary for the coil drive and electrode cables, but a dedicated conduit line between each transmitter and sensor is required. Shielded cable must be used for best results in electrically noisy environments. When preparing all wire connections, remove only the insulation required to fit the wire completely under the terminal connection. Removal of excessive insulation may result in an unwanted electrical short to the transmitter housing or other wire connections.

For flanged and sanitary sensors installed into an application requiring IP68 protection, sealed cable glands, conduit, and conduit plugs that meet IP68 ratings are required.

Conduit Cables

Run the appropriate size cable through the conduit connections in your magnetic flowmeter system. Run the power cable from the power source to the transmitter. Run the coil drive and electrode cables between the sensor and transmitter. Prepare the ends of the coil drive and electrode cables as shown in Figure 12. Limit the unshielded wire length to 1-in. on both the electrode and coil drive cables. Excessive lead length or failure to connect cable shields can create electrical noise resulting in unstable meter readings.

- Installed signal wiring should not be run together and should not be in the same cable tray as AC or DC power wiring.
- Device must be properly grounded or earthed according to local electric codes.
- Rosemount combination cable model number 08712-0752-0001 (ft) or 08712-0752-0003 (m) is required to be used to meet EMC requirements.

Supply Wire Requirements

Use 12 to 18 AWG wire rated for the proper temperature of the application. For connections in ambient temperatures above 140 °F (60 °C), use a wire rated for 176 °F (80 °C). For ambients greater than 176 °F (80 °C), use a wire rated for 230 °F (110 °C). For DC powered transmitters with extended power cable lengths, verify that there is a minimum of 12 Vdc at the terminals of the transmitter.

Disconnects

Connect the device through an external disconnect or circuit breaker. Clearly label the disconnect or circuit breaker and locate it near the transmitter and per local electrical control.

Transmitter to Sensor Wiring

A single dedicated conduit run for the coil drive and electrode cables is needed between a sensor and a remote transmitter. Bundled cables in a single conduit are likely to create interference and noise problems in your system. Use one set of cables per conduit run.

Figure 12. Cable Preparation Detail

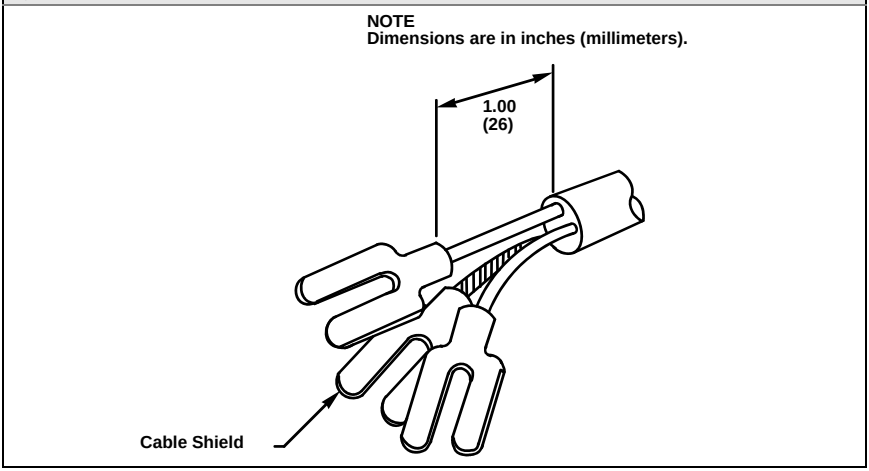


Figure 13. Conduit Preparation

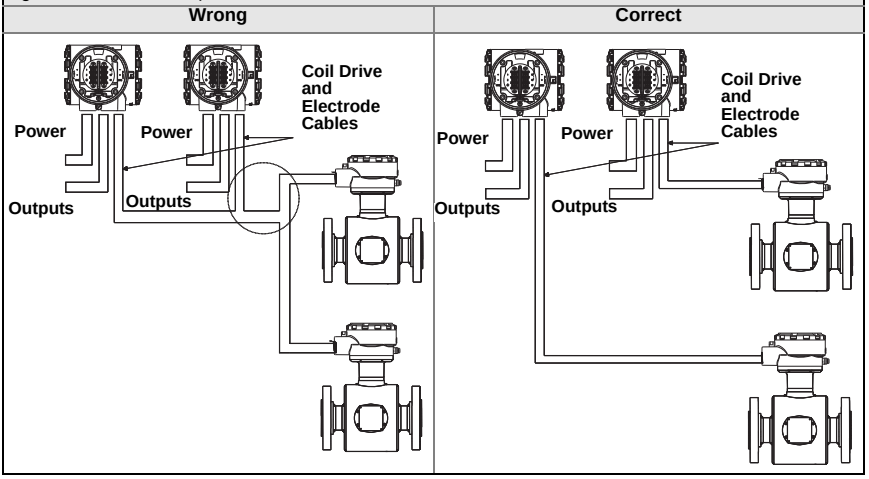


Table 6. Cable Requirements

Description	Length	Part Number
Signal Cable (20 AWG) Belden 8762, Alpha 2411 equivalent	ft m	08712-0061-0001 08712-0061-0003
Coil Drive Cable (14 AWG) Belden 8720, Alpha 2442 equivalent	ft m	08712-0060-0001 08712-0060-0013
Combination Signal and Coil Drive Cable (18 AWG)(1)	ft m	08712-0752-0001 08712-0752-0003

(1) For remote mount installations, combination signal and coil drive cable should be limited to less than 330 ft. (100 m)

Remote transmitter installations require equal lengths of signal and coil drive cables. Integrally mounted transmitters are factory wired and do not require interconnecting cables.

Lengths from 5 to 1,000 feet (1.5 to 300 meters) may be specified, and will be shipped with the sensor.

When connecting the remote cables, be sure to connect the signal cables (20 AWG) to terminals 17, 18, and 19. The coil drive cable (14 AWG) should be used to connect terminals 1, 2, and ground. Table 7 below shows the required wiring connections. Figure 14 shows the terminal block connections at the sensor and transmitter.

Table 7. Remote Wiring Connections Using Individual Coil and Signal Cable

Transmitter Terminal	Sensor Terminal	Wire Gauge	Wire Color
1	1	14	White
2	2	14	Black
3 or Ground	3 or Ground	14	Shield
17	17	20	Shield
18	18	20	Black
19	19	20	White

Sensor to Remote Mount Transmitter Connections

Figure 14. 8732 Remote Mount Wiring Diagram

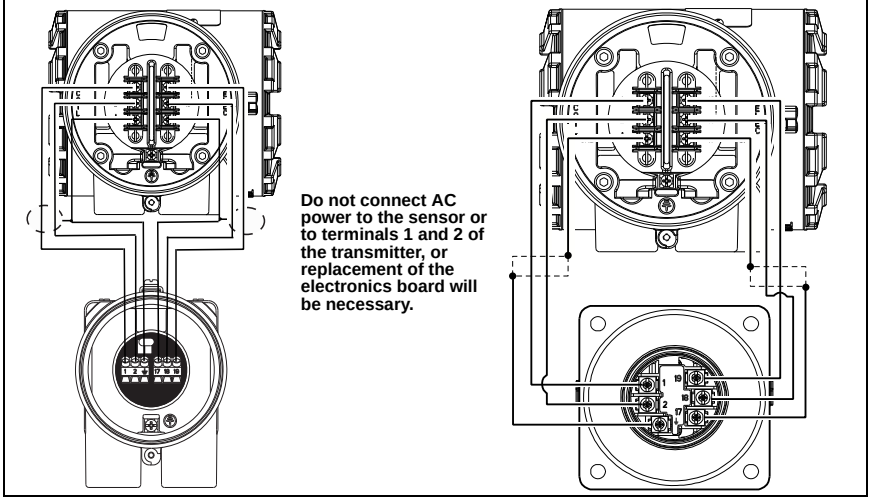
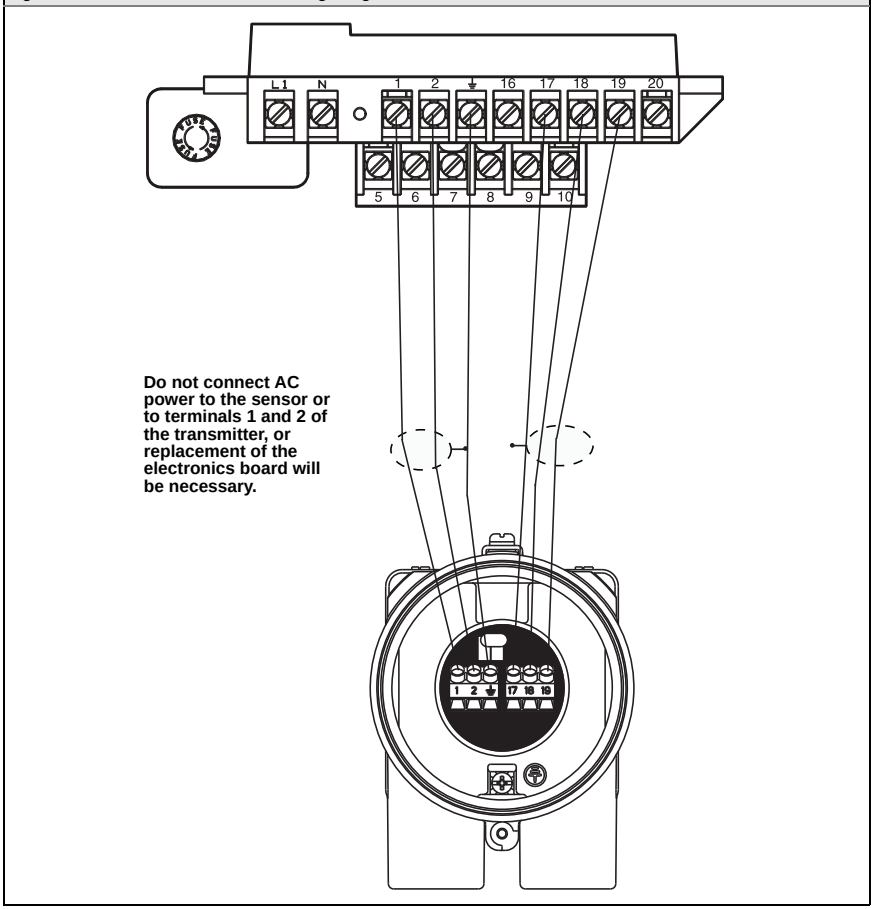
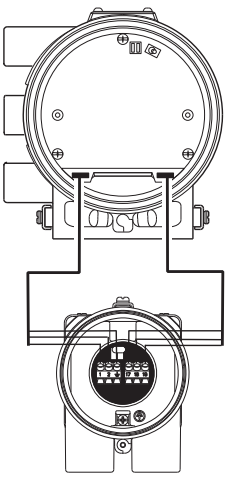


Figure 15. 8712 Remote Mount Wiring Diagram

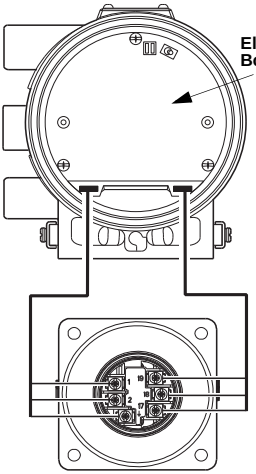


Sensor to Integral Mount Transmitter Connections

Figure 16. 8732 Integral Mount Wiring Diagram



Do not connect AC power to the sensor or to terminals 1 and 2 of the transmitter, or replacement of the electronics board will be necessary.



NOTE

Interconnecting cables for integral mount transmitters are wired at the factory. Do not use cable other than that supplied by Emerson Process Management, Rosemount, Inc.

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Eden Prairie, Minnesota, USA

Fisher-Rosemount Technologias de Flujo, S.A. de C.V. — Chihuahua Mexico

Emerson Process Management Flow — Ede, The Netherlands

Asia Flow Technologies Center — Nanjing, China

European Directive Information

The EC Declaration of Conformity can be found on page 27. The most recent revision can be found at www.rosemount.com.

Type n protection type in accordance with EN50021

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

Complies with Essential Health and Safety Requirements:

EN 61241-0: 2006
EN 61241-1: 2004

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

Rosemount 8705 and 8707 Magnetic Flowmeter sensors in line size and flange combinations:

Line Size: $1^1/_2$ in. - 24 in. with all DIN flanges and ANSI 150 and ANSI 300 flanges. Also available with ANSI 600 flanges in limited line sizes.

Line Size: 30 in. - 36 in. with AWWA 125 flanges

QS Certificate of Assessment - EC No. 59552-2009-CE-HOU-DNV
Module H Conformity Assessment

Rosemount 8711 Magnetic Flowmeter Sensors
Line Sizes: 1.5, 2, 3, 4, 6, and 8 in.

QS Certificate of Assessment - EC No. 59552-2009-CE-HOU-DNV
Module H Conformity Assessment

Rosemount 8721 Sanitary Magmeter Sensors in line sizes of $1^1/_2$ in. and larger:

Module H Conformity Assessment

All other Rosemount 8705/8707/8711/8721

Sensors —
in line sizes of 1 in. and less:
Sound Engineering Practice

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

Mandatory CE-marking for sensors in accordance with Article 15 of the PED can be found on the sensor body (CE0575).

Sensor category I is assessed for conformity per module A procedures.

Sensor categories II – III, use module H for conformity assessment procedures.

Other important guidelines

Only use new, original parts.

To prevent the process medium escaping, do not unscrew or remove process flange bolts, adapter bolts or bleed screws during operation.

Maintenance shall only be done by qualified personnel.

CE Marking

Compliance with all applicable European Union Directives.
(Note: CE Marking is not available on Rosemount 8712H).

Sensor Approval Information

	Rosemount 8705 Sensor		Rosemount 8707 Sensor		Rosemount 8711 Sensor		Rosemount 8721 Sensors
Approval Codes	For Non Flammable Fluids	For Flammable Fluids	For Non Flammable Fluids	For Flammable Fluids	For Non Flammable Fluids	For Flammable Fluids	For Non Flammable Fluids
NA	•						•
N0	•		•		•		
ND	•		•	•	•	•	•
N1	•	•			•	•	
N5	•	•	•	•	•	•	
N7	•	•			•	•	
ND	•				•	•	
NF	•				•	•	
E1	•	•			•	•	
E2	•	•			•	•	
E3	•	•			•	•	
E5(1)	•	•			•	•	
E8	•	•			•	•	
E9	•	•			•	•	
EB	•	•			•	•	
EK	•	•			•	•	
EM	•	•			•	•	
EP	•	•			•	•	
KD	•	•			•	•	

(1) Available in line sizes up to 8 in. (200 mm) only.

North American Certifications

Factory Mutual (FM)

N0 Non-incendive for Class I, Division 2, Groups A, B, C, and D non-flammable fluids (8705/8711 T5 at 60 °C; 8707 T3C at 60 °C), and Dust-ignition proof Class II/III, Division 1, Groups E, F, and G (8705/8711 T6 at 60 °C; 8707 T3C at 60 °C) Hazardous locations; Enclosure Type 4X

N0 8721 Hygienic Sensor
Factory Mutual (FM) Ordinary Location;
CE Marking; 3-A Symbol Authorization #1222;
EHEDG Type EL

N5 Non-incendive for Class I, Division 2, Groups A, B, C, and D; with intrinsically safe electrodes for use on flammable fluids (8705/8711 T5 at 60 °C; 8707 T3C at 60 °C), and Dust-ignition proof Class II/III, Division 1, Groups E, F, and G (8705/8711 T6 at 60 °C; 8707 T3C at 60 °C) Hazardous locations; Enclosure Type 4X

E5 Explosion proof for Class I, Division 1, Groups C and D (8705/8711 T6 at 60 °C), and Dust-ignition proof Class II/III, Division 1, Groups E, F, and G (8705/8711 T6 at 60 °C), and non-incendive for Class I, Division 2, Groups A, B, C, and D flammable fluids (8705/8711 T5 at 60 °C) Hazardous locations; Enclosure Type 4X

Canadian Standards Association (CSA)

N0 Non-incendive for Class I, Division 2, Groups A, B, C, and D non-flammable fluids (8705/8711 T5 at 60 °C; 8707 T3C at 60 °C), and Dust-ignition proof Class II/III, Division 1, Groups E, F, and G (8705/8711 T6 at 60 °C; 8707 T3C at 60 °C) Hazardous locations; Enclosure Type 4X

N0 8721 Hygienic Sensor
Canadian Standards Association (CSA) Ordinary Location;
CE Marking; 3-A Symbol Authorization #1222;
EHEDG Type EL

European Certifications

ND ATEX Dust Certificate No.: KEMA 06ATEX0006
⟨Ex⟩ II 1D Ex tD A20 IP6x T105°C (-50 ≤ T_{amb} ≤ 65 °C)
CE 0575

Installation Instructions

The cable and conduit entry devices and blanking elements shall be of a certified IP6x type, suitable for the conditions of use and correctly installed. At maximum ambient temperatures or at process temperatures above 60 °C heat resistant cables with a temperature rating of at least 90 °C shall be used.

The surface temperature of 105 °C is based on a maximum ambient temperature of 65 °C. When the process temperature is higher than the maximum ambient temperature (up to a maximum of 180 °C), the surface temperature will be the process temperature plus 40 °K.

N1 ATEX Non-Sparking/Non-incendive
Certificate No: KEMA02ATEX1302X
⟨Ex⟩ II 3G EEx nA [L] IIC T3... T6
Ambient Temperature Limits -20 to 65 °C

SPECIAL CONDITIONS FOR SAFE USE (X):

The relation between ambient temperature, process temperature, and temperature class is to be taken from Table 10 on page 24. The electrical data is to be taken from Table 11.

KD, E1

ATEX Zone 1 Increased Safety with IS Electrodes
Certificate No. KEMA 03ATEX2052X
⟨Ex⟩ II 1/2G EEx e ia IIC T3...T6
Ambient Temperature Limits -20 to 65 °C (See Table 9)
CE 0575
V_{max} = 40 V

SPECIAL CONDITIONS FOR SAFE USE (X):

The relation between ambient temperature, process temperature and temperature class is to be taken from Table 10 on page 24. The electrical data is to be taken from Table 11.

Installation Instructions

At ambient temperatures above 50 °C, heat resistant cables with a temperature rating of at least 90 °C shall be used.
A fuse with a rating of maximum 0,7 A according to IEC 60127-1 shall be included in the coil excitation circuit if the sensors are used with other flow transmitters.

International Certifications

N7 IECEx Type 'n'

Certificate Number: IECEx DEK 11.0094X

Ex nA nL IIC T3...T5 Gc IP66

Ambient Temperature Limits (-50 °C ≤ T_a ≤ +60 °C) (see Table 11 on page 26 for relationship between process temperature and temperature code.)

SPECIAL CONDITIONS FOR SAFE USE (X):

The relation between ambient temperature, process temperature, temperature class, orientation of the junction box and flowtube mounting is to be taken from Table 11. The equipment shall only be used with a flow transmitter that uses a current-control coil excitation circuit that complies with the Electrical Data in Table 12. When used with an integrally mounted transmitter, exceeding of the temperature limits of the transmitter by the influence of ambient and process temperature shall be prevented.

Installation Instructions

At an ambient temperature greater than 140 °F/60 °C, and a process temperature above or equal to 140 °F/60 °C, the flowmeter must be used with heat-resistant cables with a temperature rating of at least 194 °F/90 °C. At a process temperature greater than 100 °C, the flowmeter shall be used with heat-resistant cables with a temperature rating of at least 212 °F/100 °C. Cable entry devices and blanking elements shall be of an Ex e or Ex n certified type, with a minimum rating of IP54.

NF IECEx Dust

Certificate Number: IECEx KEM 09.0078

Ex tD A20 IP6x T105°C (-50 ≤ T_{amb} ≤ 65 °C)

Installation Instructions:

The cable and conduit entry devices and blanking elements shall be of a certified IP6x type, suitable for the conditions of use and correctly installed. At maximum ambient temperatures or at process temperatures above 60 °C heat resistant cables with a temperature rating of at least 90 °C shall be used.

The surface temperature of 105 °C is based on a maximum ambient temperature of 65 °C. When the process temperature is higher than the maximum ambient temperature (up to a maximum of 180 °C), the surface temperature will be the process temperature plus 40 °K.

NEPSI - China

E3, EP

NEPSI Increased Safety with IS Electrodes
Certificate No. GYJ071360X
Ex e ia IIC T3...T6 (-20 °C ≤ Ta ≤ +65 °C) (see Table 9 on page 23)

InMetro - Brazil

E2, EB

NCC Increased Safety with IS Electrodes
Certificate No. NCC 5038/08
BR-Ex e ia IIC T3...T6 (-20 °C ≤ Ta ≤ +65 °C) (see Table 9 on page 23)

KOSHA - Korea

E9, EK

KOSHA Increased Safety with IS Electrodes
Certificate No. 2005-2232-QIX
Ex e ia IIC T3 T6 (-20 °C ≤ Ta ≤ +65 °C) (see Table 9 on page 23)

Table 8. Electrical Data

Rosemount 8705 and 8711 Sensors	
Coil excitation circuit:	40 V, 0,5 A, 20 W maximum
Electrode circuit:	in type of explosion protection intrinsic safety EEx ia IIC, U_i = 5 V, I_i = 0.2 mA, P_i = 1 mW, U_m = 250 V

Table 9. Relation between ambient temperature, process temperature, and temperature class(1)

Meter Size (Inches)	Maximum Ambient Temperature	Maximum Process Temperature	Temperature Class
1/2	149 °F (65 °C)	239 °F (115 °C)	T3
1	149 °F (65 °C)	248 °F (120 °C)	T3
1	95 °F (35 °C)	95 °F (35 °C)	T4
1 1/2	149°F (65 °C)	257 °F (125 °C)	T3
1 1/2	122 °F (50 °C)	140 °F (60 °C)	T4
2	149 °F (65 °C)	257 °F (125 °C)	T3
2	149 °F (65 °C)	167 °F (75 °C)	T4
2	104 °F (40 °C)	104 °F (40 °C)	T5
3 - 4	149 °F (65 °C)	266 °F (130 °C)	T3
3 - 4	149 °F (65 °C)	194 °F (90 °C)	T4
3 - 4	131 °F (55 °C)	131 °F (55 °C)	T5
3 - 4	104 °F (40 °C)	104 °F (40 °C)	T6
6	149 °F (65 °C)	275 °F(135 °C)	T3
6	149 °F (65 °C)	230 °F (110 °C)	T4
6	149 °F (65 °C)	167 °F (75 °C)	T5
6	140 °F (60 °C)	140 °F (60 °C)	T6
8-60	149 °F (65 °C)	284 °F (140 °C)	T3
8-60	149 °F (65 °C)	239 °F (115 °C)	T4
8-60	149 °F (65 °C)	176 °F (80 °C)	T5
8-60	149 °F (65 °C)	149 °F (65 °C)	T6

(1) This table is applicable for E1 and KD approval codes only.

Table 10. Relation between the maximum ambient temperature, the maximum process temperature, and the temperature class(1)

Maximum Ambient Temperature	Maximum process temperature °F (°C) per temperature class			
	T3	T4	T5	T6
0.5 in. sensor size				
149 °F (65 °C)	296 °F (147 °C)	138 °F (59 °C)	53 °F (12 °C)	17 °F (-8 °C)
140 °F (60 °C)	309 °F (154 °C)	150 °F (66 °C)	66 °F (19 °C)	28 °F (-2 °C)
131 °F (55 °C)	321 °F (161 °C)	163 °F (73 °C)	78 °F (26°C)	41 °F (5 °C)
122 °F (50 °C)	334 °F (168 °C)	176 °F (80 °C)	89 °F (32 °C)	53 °F (12 °C)
113 °F (45 °C)	347 °F (175 °C)	189 °F (87 °C)	102 °F (39 °C)	66 °F (19 °C)
104 °F (40 °C)	350 °F (177 °C)	199 °F (93 °C)	114 °F (46 °C)	78 °F (26 °C)
95 °F (35 °C)	350 °F (177 °C)	212 °F (100 °C)	127 °F (53 °C)	89 °F (32 °C)
86 °F (30 °C)	350 °F (177 °C)	224 °F (107 °C)	138 °F (59 °C)	102 °F (39 °C)
77 °F (25 °C)	350 °F (177 °C)	237 °F (114 °C)	150 °F (66 °C)	114 °F (46 °C)
68 °F (20 °C)	350 °F (177 °C)	248 °F (120 °C)	163 °F (73 °C)	127 °F (53 °C)
1.0 in. sensor size				
149 °F (65°C)	318 °F (159 °C)	158 °F (70 °C)	71 °F (22 °C)	34 °F (1 °C)
140 °F (60°C)	330 °F (166 °C)	170 °F (77 °C)	84 °F (29 °C)	46 °F (8 °C)
131°F (55 °C)	343 °F (173 °C)	183 °F (84 °C)	96 °F (36 °C)	59 °F (15 °C)
122 °F (50 °C)	350 °F (177 °C)	196 °F (91 °C)	109 °F (43 °C)	72 °F (22 °C)
113 °F (45 °C)	350 °F (177 °C)	206 °F (97 °C)	122 °F (50 °C)	84 °F (29 °C)
104 °F (40 °C)	350 °F (177 °C)	219 °F (104 °C)	134 °F (57 °C)	96 °F (36 °C)
95 °F (35 °C)	350 °F (177 °C)	231 °F (111 °C)	145 °F (63 °C)	109 °F (43 °C)
86 °F (30 °C)	350 °F (177 °C)	244 °F (118 °C)	158 °F (70 °C)	122 °F (50 °C)
77 °F (25 °C)	350 °F (177 °C)	257 °F (125 °C)	170 °F (77°C)	134 °F (57 °C)
68 °F (20 °C)	350 °F (177 °C)	269 °F (132 °C)	183 °F (84 °C)	145 °F (63 °C)
1.5 in. sensor size				
149 °F (65 °C)	296 °F (147 °C)	159 °F (71°C)	87 °F (31 °C)	55 °F (13 °C)
140 °F (60 °C)	307 °F (153 °C)	170 °F (77°C)	96 °F (36 °C)	66 °F (19 °C)
131 °F (55 °C)	318 °F (159 °C)	181 °F (83°C)	107 °F (42 °C)	77 °F (25 °C)
122 °F (50 °C)	329 °F (165 °C)	192 °F (89 °C)	118 °F (48 °C)	87 °F (31 °C)
113 °F (45 °C)	339 °F (171 °C)	203 °F (95 °C)	129 °F (54 °C)	96 °F (36 °C)
104 °F (40 °C)	350 °F (177 °C)	213 °F (101 °C)	140 °F (60 °C)	107 °F (42 °C)
95 °F (35 °C)	350 °F (177 °C)	222 °F (106 °C)	150 °F (66 °C)	118 °F (48 °C)
86 °F (30 °C)	350 °F (177 °C)	233 °F (112 °C)	159 °F (71 °C)	129 °F (54 °C)
77 °F (25 °C)	350 °F (177 °C)	244 °F (118 °C)	170 °F (77 °C)	140 °F (60 °C)
68 °F (20 °C)	350 °F (177 °C)	255 °F (124 °C)	181 °F (83 °C)	150 °F (66 °C)

Continued on Next Page

Table 10. Relation between the maximum ambient temperature, the maximum process temperature, and the temperature class(1)

Maximum Ambient Temperature	Maximum process temperature °F (°C) per temperature class			
	T3	T4	T5	T6
2.0 in. sensor size				
149 °F (65 °C)	289 °F (143 °C)	163 °F (73 °C)	95 °F (35 °C)	66 °F (19 °C)
140 °F (60 °C)	300 °F (149 °C)	172 °F (78 °C)	104 °F (40 °C)	75 °F (24 °C)
131 °F (55 °C)	309 °F (154 °C)	183 °F (84 °C)	114 °F (46 °C)	84 °F (29 °C)
122 °F (50 °C)	318 °F (159 °C)	192 °F (89 °C)	123 °F (51 °C)	95 °F (35 °C)
113 °F (45 °C)	329 °F (165 °C)	201 °F (94 °C)	134 °F (57 °C)	104 °F (40 °C)
104 °F (40 °C)	338 °F (170 °C)	212 °F (100 °C)	143 °F (62 °C)	114 °F (46 °C)
95 °F (35 °C)	348 °F (176 °C)	221 °F (105 °C)	152 °F (67 °C)	123 °F (51 °C)
86 °F (30 °C)	350 °F (177 °C)	231 °F (111 °C)	163 °F (73 °C)	134 °F (57 °C)
77 °F (25 °C)	350 °F (177 °C)	240 °F (116 °C)	172 °F (78 °C)	143 °F (62 °C)
68 °F (20 °C)	350 °F (177 °C)	251 °F (122 °C)	183 °F (84 °C)	152 °F (67 °C)
3 to 60 in. sensor size				
149 °F (65 °C)	350 °F (177 °C)	210 °F (99 °C)	116 °F (47 °C)	75 °F (24 °C)
140 °F (60 °C)	350 °F (177 °C)	222 °F (106 °C)	129 °F (54 °C)	89 °F (32 °C)
131 °F (55 °C)	350 °F (177 °C)	237 °F (114 °C)	143 °F (62 °C)	102 °F (39 °C)
122 °F (50 °C)	350 °F (177 °C)	249 °F (121 °C)	156 °F (69 °C)	116 °F (47 °C)
113 °F (45 °C)	350 °F (177 °C)	264 °F (129 °C)	170 °F (77 °C)	129 °F (54 °C)
104 °F (40 °C)	350 °F (177 °C)	266 °F (130 °C)	183 °F (84 °C)	143 °F (62 °C)
95 °F (35 °C)	350 °F (177 °C)	266 °F (130 °C)	197 °F (92 °C)	156 °F (69 °C)
86 °F (30 °C)	350 °F (177 °C)	266 °F (130 °C)	203 °F (95 °C)	170 °F (77 °C)
77 °F (25 °C)	350 °F (177 °C)	266 °F (130 °C)	203 °F (95 °C)	176 °F (80 °C)
68 °F (20 °C)	350 °F (177 °C)	266 °F (130 °C)	203 °F (95 °C)	176 °F (80 °C)

(1) This table is applicable for N1 option codes only.

Table 11. The relation between ambient temperature, process temperature, temperature class, orientation of the junction box and flowtube mounting(1)

Line Size Inch (mm)	Maximum Ambient Temperature °F (°C)	Maximum Process Temperature °F (°C)	Temperature Code (T-Code)	Junction Box Orientation	Transmitter Mounting(2)
2 (50)	140 °F (60 °C)	140 °F (60 °C)	T5	Any	Integral or Remote
2 (50)	140 °F (60 °C)	212 °F (100 °C)	T4	Any	Remote Only
2 (50)	140 °F (60 °C)	300 °F (150 °C)	T3	Side or Down	Remote Only
3 (80)	140 °F (60 °C)	140 °F (60 °C)	T5	Any	Integral or Remote
3 (80)	140 °F (60 °C)	212 °F (100 °C)	T4	Any	Remote Only
3 (80)	140 °F (60 °C)	300 °F (150 °C)	T3	Side or Down	Remote Only
4 (100)	140 °F (60 °C)	140 °F (60 °C)	T5	Any	Integral or Remote
4 (100)	140 °F (60 °C)	230 °F (110 °C)	T4	Any	Remote Only
4 (100)	140 °F (60 °C)	320 °F (160 °C)	T3	Side or Down	Remote Only
6 (150)	140 °F (60 °C)	140 °F (60 °C)	T5	Any	Integral or Remote
6 (150)	140 °F (60 °C)	240 °F (115 °C)	T4	Any	Remote Only
6 (150)	140 °F (60 °C)	330 °F (165 °C)	T3	Side or Down	Remote Only
8 (200) -36 (900)	140 °F (60 °C)	140 °F (60 °C)	T5	Any	Integral or Remote
8 (200) -36 (900)	140 °F (60 °C)	250 °F (120 °C)	T4	Any	Remote Only
8 (200) -36 (900)	140 °F (60 °C)	340 °F (170 °C)	T3	Side or Down	Remote Only

(1) This table is applicable for N7 option code only.

(2) Other combinations of process temperature and ambient temperature can be used with integral mounting, but it must be assured that the temperature of the mounting flange and other components comprising the electronics housing of the transmitter do not go outside the ambient temperature limits of the transmitter.

Table 12. Electrical Data(1)

Coil Circuit Parameters:	Um = 40V max, Imax = 500 mA,Pmax = 20 W
Electrode Circuit Parameters:	Ui = 5 V, Uo= 5 V, Io= 200 µA, Po= 1 mW

(1) This table is applicable for N7 option code only.

Rosemount 8705 Declaration of Conformity

EMERSON. Process Management

ROSEMOUNT

CE

EC Declaration of Conformity

No: RFD 1006 Rev. H

We,

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344-3695
USA

declare under our sole responsibility that the product(s),

Model 8705 Magnetic Flowmeters

manufactured by,

Rosemount Inc. **12001 Technology Drive** **Eden Prairie, MN 55344-3695** **USA**	*and*	**Fisher-Rosemount Flow Technologies** **Ave. Miguel de Cervantes 111** **Chihuahua, CHIH 31109** **Mexico**

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

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

(signature)

June 9, 2011
(date of issue)

Mark Fleigle
(name - printed)

Vice President Technology and New Products
(function name - printed)

FILE ID: 8705 CE Marking

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EMERSON. Process Management

ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RFD 1006 Rev. H

EMC Directive (2004/108/EC)

All Models
EN 61326-1: 2006

PED Directive (97/23/EC)

Model 8705 Magnetic Flowmeter with Option "PD", in Line Sizes 1.5"- 36"

QS Certificate of Assessment - EC No. 59552-2009-CE-HOU-DNV
Module H Conformity Assessment
ASME B31.3: 2008

Model 8705 with Option "PD", in Line Sizes .5" – 1.0"

Sound Engineering Practice
ASME B31.3: 2008

ATEX Directive (94/9/EC)

Model 8705 Magnetic Flowmeter

KEMA 02ATEX1302 X – Type n Certificate
Equipment Group II, Category 3 G (EEx nA [L] IIC T3… T6)
EN 50021: 1999

KEMA 03ATEX2052 X – Increased Safety with Intrinsically Safe Electrodes
Equipment Group II, Category 1/2 G (EEx e ia IIC T3… T6)
EN 50019: 2000
EN 50020: 2002

KEMA 06ATEX0006 – Dust Certificate
Equipment Group II, Category 1 D (Ex tD A20 IP6x T105°C)
EN 61241-0: 2006
EN 61241-1: 2004

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EMERSON. Process Management

ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RFD 1006 Rev. H

PED Notified Body

Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
Hovik, Norway

ATEX Notified Bodies for EC Type Examination Certificate

KEMA [Notified Body Number: 0344]
Utrechtseweg 310, 6812 AR Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
Postbank 6794687

ATEX Notified Body for Quality Assurance

Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
Hovik, Norway

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Rosemount 8711 Declaration of Conformity

EMERSON. Process Management

ROSEMOUNT

CE

EC Declaration of Conformity

No: RFD 1007 Rev. G

We,

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344-3695
USA

declare under our sole responsibility that the product(s),

Model 8711 Magnetic Flowmeters

manufactured by,

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344-3695
USA

and

Fisher-Rosemount Flow Technologies
Ave. Miguel de Cervantes 111
Chihuahua, CHIH 31109
Mexico

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

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

(signature)

June 9, 2011
(date of issue)

Mark Fleigle
(name - printed)

Vice President Technology and New Products
(function name - printed)

F FILE ID: 8711 CE Marking

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EMERSON. Process Management

ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RFD 1007 Rev. G

EMC Directive (2004/108/EC)

All Models
EN 61326-1: 2006

PED Directive (97/23/EC)

Model 8711 Magnetic Flowmeter with Option "PD", in Line Sizes 1.5"- 8"

QS Certificate of Assessment - EC No. 59552-2009-CE-HOU-DNV
Module H Conformity Assessment
ASME B31.3: 2008

Model 8711 with Option "PD", in Line Sizes .15" – 1.0"

Sound Engineering Practice
ASME B31.3: 2008

ATEX Directive (94/9/EC)

Model 8711 Magnetic Flowmeter

KEMA 02ATEX1302 X – Type n Certificate
Equipment Group II, Category 3 G (EEx nA [L] IIC T3… T6)
EN 50021: 1999

KEMA 03ATEX2052 X – Increased Safety with Intrinsically Safe Electrodes
Equipment Group II, Category 1/2 G (EEx e ia IIC T3… T6)
EN 50019: 2000
EN 50020: 2002

KEMA 06ATEX0006 – Dust Certificate
Equipment Group II, Category 1 D (Ex tD A20 IP6x T105°C)
EN 61241-0: 2006
EN 61241-1: 2004

EMERSON. Process Management

ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RFD 1007 Rev. G

PED Notified Body

Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
Hovik, Norway

ATEX Notified Bodies for EC Type Examination Certificate

KEMA [Notified Body Number: 0344]
Utrechtseweg 310, 6812 AR Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
Postbank 6794687

ATEX Notified Body for Quality Assurance

Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
Hovik, Norway

FILE ID: 8711 CE Marking Page 3 of 3 8711_RFD1007_G.docx

Rosemount 8721 Declaration of Conformity

EMERSON. Process Management

ROSEMOUNT

CE

EC Declaration of Conformity

No: RFD 1051 Rev. D

We,

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344-3695
USA

declare under our sole responsibility that the product(s),

Model 8721 Sanitary Magnetic Flowmeters

manufactured by,

Rosemount Inc. **12001 Technology Drive** **Eden Prairie, MN 55344-3695** **USA**	*and*	**Fisher-Rosemount Flow Technologies** **Ave. Miguel de Cervantes 111** **Chihuahua, CHIH 31109** **Mexico**

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

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

(signature)

June 9, 2011
(date of issue)

Mark Fleigle
(name - printed)

Vice President Technology and New Products
(function name - printed)

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EMERSON. Process Management

ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RFD 1051 Rev. D

EMC Directive (2004/108/EC)

All Models
EN 61326-1: 2006

PED Directive (97/23/EC)

Model 8721 Magnetic Flowmeter, line sizes greater than 1"(25mm):

QS Certificate of Assessment - EC No. 59552-2009-CE-HOU-DNV
Module A Conformity Assessment
Category I Equipment
ASME B31.3: 2008

Model 8721 Magnetic Flowmeter, in line sizes less than 1" (25mm):

Sound Engineering Practice
ASME B31.3: 2008

PED Notified Body

Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
Hovik, Norway

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