

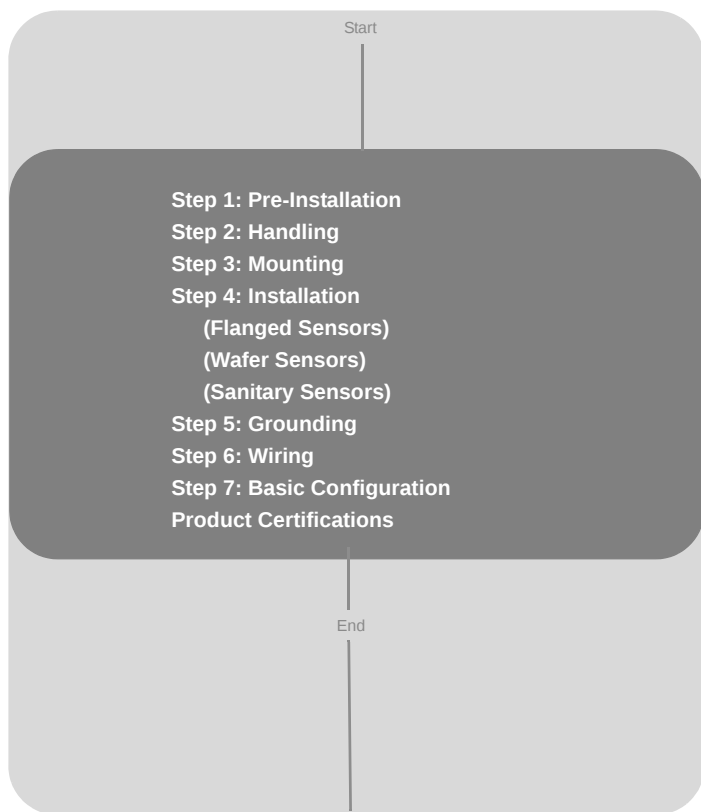
Quick Installation Guide

00825-0100-4664, Rev BB

January 2013

Rosemount 8712 / 8700 Series

Rosemount 8712E Magnetic Flowmeter System (Transmitter and Sensor)



ROSEMOUNT™

www.rosemount.com



EMERSON
Process Management

Rosemount 8712 / 8700 Series

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 IMPORTANT NOTICE

This document provides basic installation guidelines for the Rosemount® 8712. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting, explosion-proof, flame-proof, or intrinsically safe (I.S.) installations. Refer to the Rosemount 8712 reference manual (document number 00809-0100-4664) 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.

Do not connect a Rosemount 8712 to a non-Rosemount sensor that is located in an explosive atmosphere.

 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: PRE-INSTALLATION

Before installing the Rosemount 8712 Magnetic Flowmeter Transmitter, there are several pre-installation steps that should be completed to make the installation process easier:

- Identify the options and configurations that apply to your application
- Set the hardware switches if necessary
- Consider mechanical, electrical, and environmental requirements

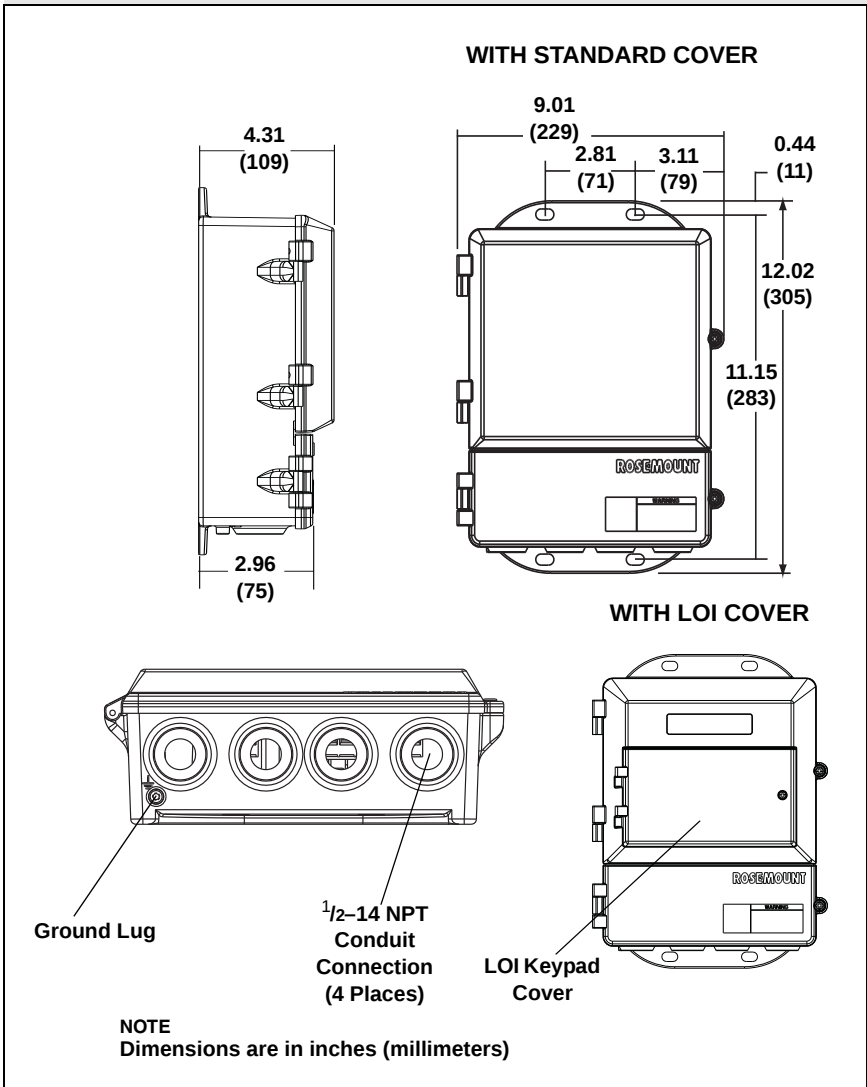
Mechanical Considerations

The mounting site for the Rosemount 8712 transmitter should provide enough room for secure mounting, easy access to conduit ports, full opening of the transmitter covers, and easy readability of the LOI screen (see Figure 1).

The Rosemount 8712 is mounted separately from the sensor, it is not subject to limitations that might apply to the sensor.

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Figure 1. Rosemount 8712 Dimensional Drawing



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Environmental Considerations

To ensure maximum transmitter life, avoid excessive heat and vibration. Typical problem areas include:

- Warm-climate installations in direct sunlight
- Outdoor installations in cold climates

Remote mounted transmitters may be installed in the control room to protect the electronics from the harsh environment and provide easy access for configuration or service.

Remotely mounted Rosemount 8712 transmitters require external power so there must be access to a suitable power source.

Installation Procedures

Rosemount 8712 installation includes both detailed mechanical and electrical installation procedures.

Mount the Transmitter

At a remote site the transmitter may be mounted on a pipe up to two inches in diameter or against a flat surface.

Pipe Mounting

To mount the transmitter on a pipe:

1. Attach the mounting plate to the pipe using the mounting hardware.
2. Attach the 8712 to the mounting plate using the mounting screws.

Identify Options and Configurations

The standard application of the 8712 includes a 4–20 mA output and control of the sensor coils and electrodes. Other applications may require one or more of the following configurations or options:

- Multidrop Communications
- Digital Output
- Digital Input
- Pulse Output

Additional options may apply. Be sure to identify those options and configurations that apply to your situation, and keep a list of them nearby for consideration during the installation and configuration procedures.

Hardware Jumpers/Switches

The 8712 electronics board is equipped with three user-selectable hardware switches. These switches set the Failure Alarm Mode, Internal/External Analog Power, and Transmitter Security. The standard configuration for these switches when shipped from the factory are as follows:

Failure Alarm Mode:	HIGH
Internal/External Analog Power:	INTERNAL
Transmitter Security:	OFF

Changing Hardware Switch Settings

In most cases, it is not necessary to change the setting of the hardware switches. If you need to change the switch settings, complete the steps outlined in the manual.

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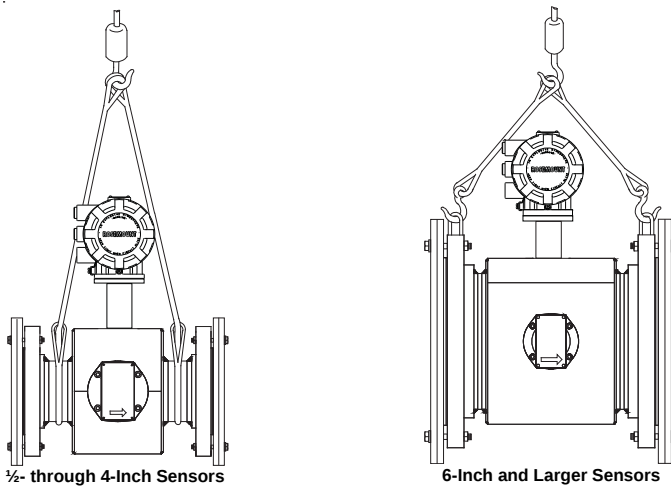
Electrical Considerations

Before making any electrical connections to the Rosemount 8712, consider local and plant electrical standards and be sure to have the proper power supply, conduit, and other accessories necessary to comply with these standards.

STEP 2: 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 2. Rosemount 8705 Sensor Support for Handling

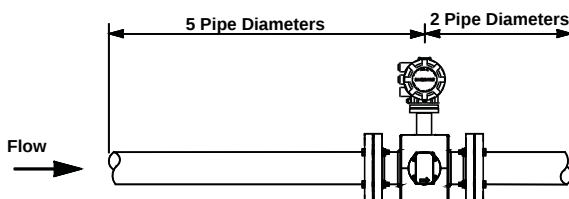


STEP 3: MOUNTING

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 3).

Figure 3. Upstream and Downstream Straight Pipe Diameters



Installations with reduced straight runs from 0 to 5 pipe diameters are possible. In reduced straight pipe run installations, performance will shift to as much as 0.5% of rate. Reported flow rates will still be highly repeatable.

Flow Direction

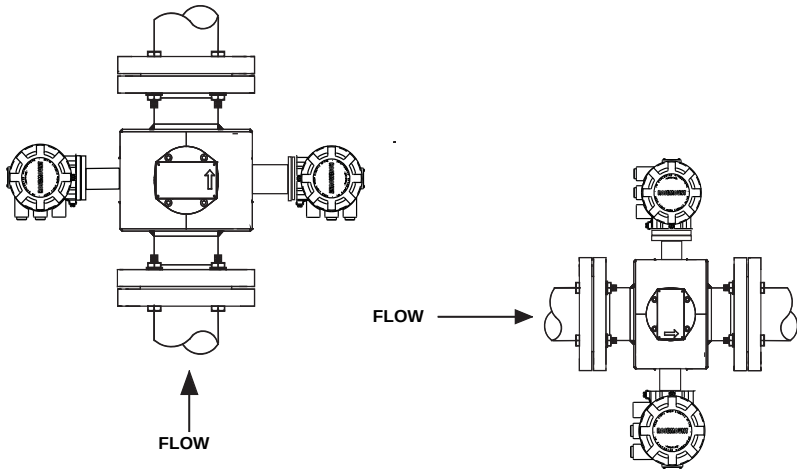
The sensor should be mounted so the FORWARD end of the flow arrow, shown on the sensor identification tag, points in the direction of flow through the sensor.

Sensor Orientation

The sensor should be installed in a position that ensures the sensor 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.

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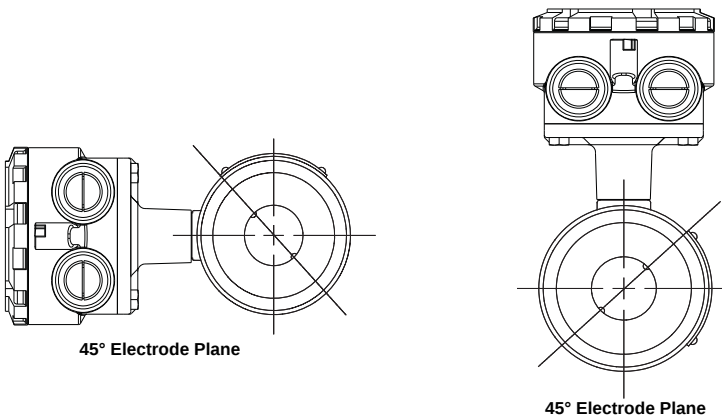
Figure 4. Sensor Orientation



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 4.

The electrodes in the Rosemount 8711 are properly orientated when the top of the sensor is either vertical or horizontal, as shown in Figure 5. Avoid any mounting orientation that positions the top of the sensor at 45° from the vertical or horizontal position.

Figure 5. Rosemount 8711 Mounting Position



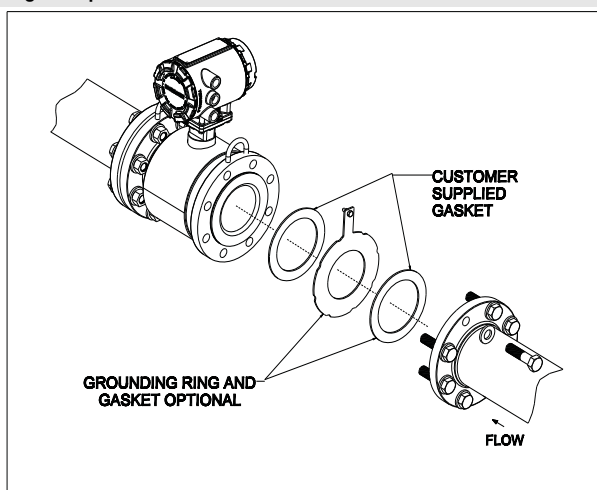
STEP 4: INSTALLATION

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.

Figure 6. Flanged gasket placement



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 7, to 20% 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% of the suggested torque values or until the leak between the process and sensor flanges stop.

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If leakage has not stopped at the suggested torque values, the bolts can be tightened in additional 10% 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 7. Flange Bolt Torquing Sequence

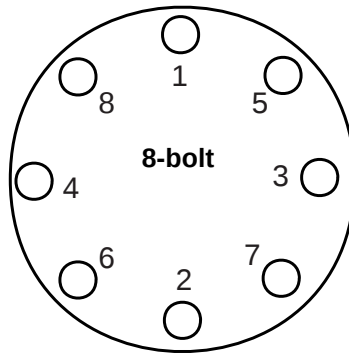


Table 1. Suggested Flange Bolt Torque Values for Rosemount 8705 and 8707 High-Signal Sensors

Size Code	Line Size	PTFE/ETFE/PFA liners		Polyurethane/Neoprene/Linatex/Adiprene liner	
		Class 150 (pound-feet)	Class 300 (pound-feet)	Class 150 (pound-feet)	Class 300 (pound-feet)
005	0.5 inch (15 mm)	8	8	-	-
010	1 inch (25 mm)	8	12	-	-
015	1.5 inch (40 mm)	13	25	7	18
020	2 inch (50 mm)	19	17	14	11
030	3 inch (80 mm)	34	35	23	23
040	4 inch (100 mm)	26	50	17	32
060	6 inch (150mm)	45	50	30	37
080	8 inch (200 mm)	60	82	42	55
100	10 inch (250 mm)	55	80	40	70
120	12 inch (300 mm)	65	125	55	105
140	14 inch (350 mm)	85	110	70	95
160	16 inch (400 mm)	85	160	65	140
180	18 inch (450 mm)	120	170	95	150
200	20 inch (500 mm)	110	175	90	150
240	24 inch (600 mm)	165	280	140	250
300	30 inch (750 mm)	195	415	165	375
360	36 inch (900 mm)	280	575	245	525

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Table 2. Flange Bolt Torque and Bolt Load Specifications for 8705(EN 1092-1)

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

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Table 2. (continued) Flange Bolt Torque and Bolt Load Specifications for 8705 (EN 1092-1)

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

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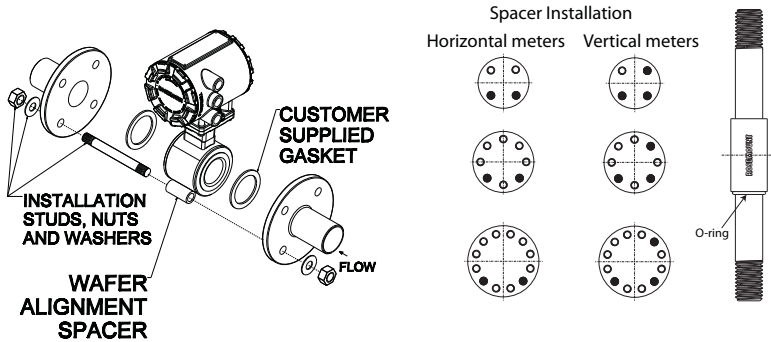
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Wafer Sensors

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. See Figure 8 below.

Figure 8. Wafer gasket placement



Alignment

1. On 1.5 through 8-inch (40 through 200 mm) line sizes. Rosemount strongly recommends installing the alignment spacers provided to insure proper centering of the wafer sensor between the process flanges. Sensor sizes of 0.15, 0.30, 0.5 and 1 in. (4 through 25 mm), do not require alignment spacers.
2. Insert studs for the bottom side of the sensor between the pipe flanges and center the alignment spacer in the middle of the stud. See Figure 8 for the bolt hole locations recommended for the spacers provided. Stud specifications are listed in Table 3.
3. Place the sensor between the flanges. Make sure that the alignment spacers are properly centered on the studs. For vertical flow installations slide the oring over the stud to keep the spacer in place. See Figure 8. To ensure the spacers match the flange size and class rating for the process flanges see Table 4.
4. Insert the remaining studs, washers, and nuts.
5. Tighten to the torque specifications shown in Table 5. Do not overtighten the bolts or the liner may be damaged.

Table 3. Stud Specifications

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

NOTE

Sensor sizes of 0.15, 0.30, and 0.5 in. mount between AMSE 1/2-inch flanges. Using carbon steel bolts on sensor sizes of 0.15, 0.30, 0.5 and 1 in. (15 and 25 mm), rather than the required stainless steel bolts, will degrade the flow sensor measurement.

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Table 4. Rosemount Alignment Spacer Table

Rosemount Alignment Spacer Table			
Dash No.	Line Size		Flange Rating
	(in)	(mm)	
0A15	1.5	40	JIS 10K-20K
0A20	2	50	JIS 10K-20K
0A30	3	80	JIS 10K
0B15	1.5	40	JIS 40K
AA15	1.5	40	ANSI - 150#
AA20	2	50	ANSI - 150#
AA30	3	80	ANSI - 150#
AA40	4	100	ANSI - 150#
AA60	6	150	ANSI - 150#
AA80	8	200	ANSI - 150#
AB15	1.5	40	ANSI - 300#
AB20	2	50	ANSI - 300#
AB30	3	80	ANSI - 300#
AB40	4	100	ANSI - 300#
AB60	6	150	ANSI - 300#
AB80	8	200	ANSI - 300#
AB15	1.5	40	ANSI - 300#
AB20	2	50	ANSI - 300#
AB30	3	80	ANSI - 300#
AB40	4	100	ANSI - 300#
AB60	6	150	ANSI - 300#
AB80	8	200	ANSI - 300#
DB40	4	100	DIN - PN10/16
DB60	6	150	DIN - PN10/16
DB80	8	200	DIN - PN10/16
DC80	8	100	DIN - PN25
DD15	1.5	150	DIN - PN10/16/25/40
DD20	2	50	DIN - PN10/16/25/40
DD30	3	80	DIN - PN10/16/25/40
DD40	4	100	DIN - PN25/40
DD60	6	150	DIN - PN25/40
DD80	8	200	DIN - PN40
RA80	8	200	AS40871-PN16
RC20	2	50	AS40871-PN21/35
RC30	3	80	AS40871-PN21/35
RC40	4	100	AS40871-PN21/35
RC60	6	150	AS40871-PN21/35
RC80	8	200	AS40871-PN21/35

To order an Alignment Spacer Kit (qty 3 spacers) use p/n 08711-3211-xxxx along with the Dash No. above.

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Flange Bolts

Wafer sensors require threaded studs. See Figure 7 for torque 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 5. Rosemount 8711 Torque Specifications

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

Sanitary Sensors

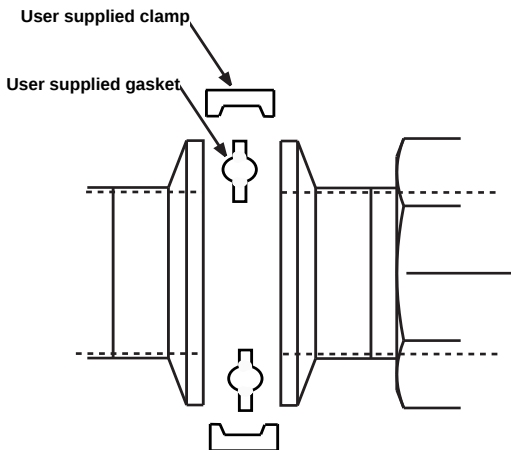
Gaskets

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 9. Rosemount 8721 Sanitary Installation



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STEP 5: GROUNDING

Use Table 6 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 6. Process Grounding Installation

Process Grounding Options				
Type of Pipe	Grounding Straps	Grounding Rings	Grounding Electrode	Lining Protectors
Conductive Unlined Pipe	See Figure 10	Not Required	Not Required	See Figure 11
Conductive Lined Pipe	Insufficient Grounding	See Figure 11	See Figure 10	See Figure 11
Non-Conductive Pipe	Insufficient Grounding	See Figure 12	See Figure 13	See Figure 12

Figure 10. Grounding Straps or Grounding Electrode in Lined Pipe

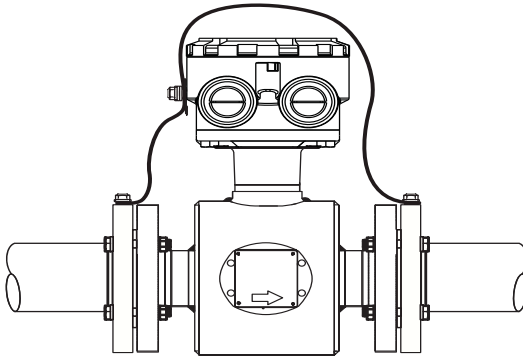
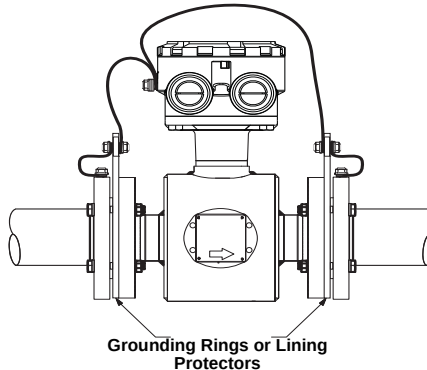


Figure 11. Grounding with Grounding Rings or Lining Protectors



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Figure 12. Grounding with Grounding Rings or Lining Protectors

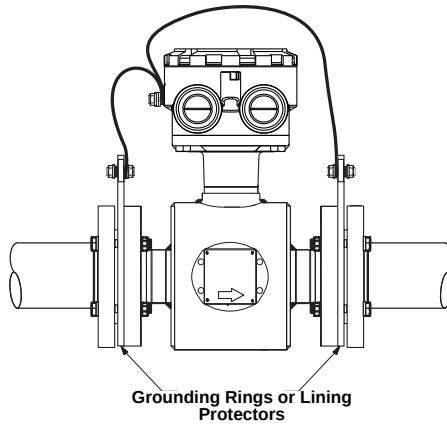
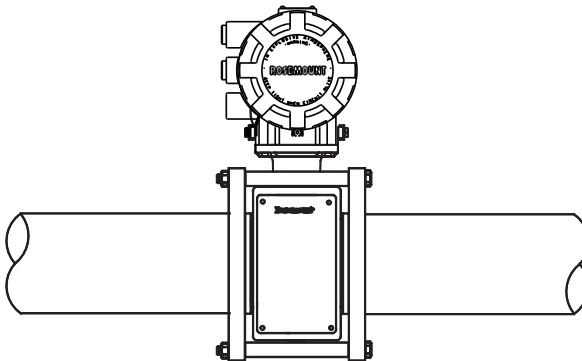


Figure 13. Grounding with Grounding Electrode



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STEP 6: WIRING**Conduit Ports and Connections**

This wiring section covers the connection between the transmitter and sensor, the 4-20 mA loop, and supplying power to the transmitter. Follow the conduit information, cable requirements, and disconnect requirements in the sections below.

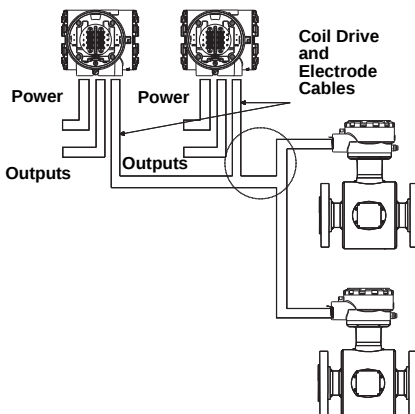
Conduit Ports and Connections

Both the sensor and transmitter junction boxes have ports for $\frac{1}{2}$ -inch 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 signal 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 sensors installed into an application requiring IP68 protection, sealed cable glands, conduit, and conduit plugs that meet IP68 ratings are required.

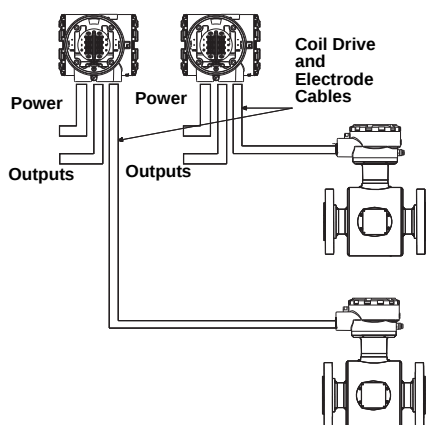
Conduit Requirements

A single dedicated conduit run for the coil drive and signal cable is needed between the sensor and the remote transmitter. See Figure 14. Bundled cables in a single conduit are likely to create interference and noise problems in the system. Use one set of cables per conduit run.

Figure 14. Conduit Preparation
Wrong



Correct



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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 signal cables between the flowmeter sensor and transmitter.

- 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 part number 08732-0753-1003 (ft) or 08732-0753-2004 (m) is required to be used to meet EMC requirements.

Transmitter to Sensor Wiring

The transmitter can be integral to the sensor or remotely mounted following the wiring instructions.

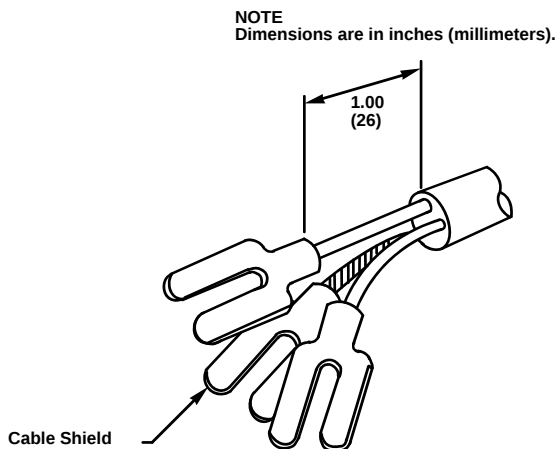
Remote Mount Cable Requirements and Preparation

For installations using the individual coil drive and signal cable, lengths should be limited to less than 1,000 feet (300 meters). Equal length cable is required for each. See Table 7.

For installations using the combination coil drive and signal cable, lengths should be limited to less than 330 feet (100 meters). See Table 7.

Prepare the ends of the coil drive and signal cables as shown in Figure 15. Limit the unshielded wire length to 1-inch on both the coil drive and signal cables. Any unsheathed wire should be wrapped with proper insulation. Excessive lead length or failure to connect cable shields can create electrical noise resulting in unstable meter readings.

Figure 15. Cable Preparation Detail



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STEP 6 CONTINUED...

To order cable specify length as quantity desired.

25 feet = Qty (25) 08732-0753-1003

Table 7. Cable Requirements

Description	Length	Part Number
Coil Drive Cable (14 AWG) Belden 8720, Alpha 2442 or equivalent	ft m	08712-0060-0001 08712-0060-2013
Signal Cable (20 AWG) Belden 8762, Alpha 2411 or equivalent	ft m	08712-0061-0001 08712-0061-2003
Combination Cable Coil Drive Cable (18 AWG) and Signal Cable (20 AWG)	ft m	08732-0753-1003 08732-0753-2004

⚠ WARNING

Potential Shock Hazard Across Terminals 1 & 2 (40 Vac).

Wiring the Transmitter to the Sensor

When using individual cables for coil drive and signal refer to Table 8. If using the combination coil drive and signal cable, refer to Table 9. See Figure 16 for transmitter specific wiring diagram.

1. Connect the coil drive cable using terminals **1**, **2**, and **3** (ground).
2. Connect the signal cable using terminals **17**, **18**, and **19**.

Table 8. Individual Coil and Signal Cables

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

Table 9. Combination Coil and Signal Cable

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

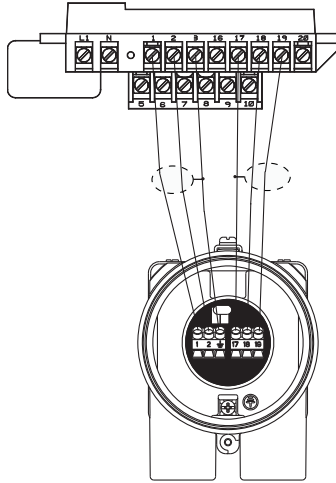
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STEP 6 CONTINUED...

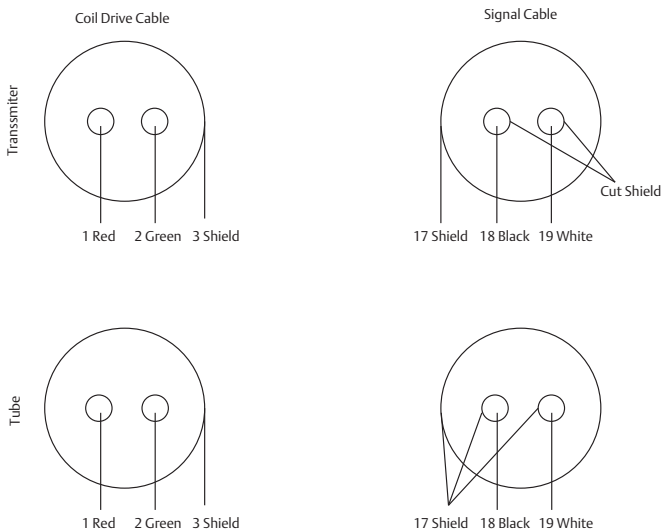
Figure 16. Remote Mount Wiring Diagrams



NOTE

When using the Rosemount supplied combination cable, the signal wires for terminals 18 and 19 contain an additional shield wire. These two shield wires should be tied with the main shield wire at terminal 17 at the sensor terminal block and cut back to the insulation in the transmitter junction box. See Figure 17.

Figure 17. Combination Coil and Signal Cable Wiring Diagram



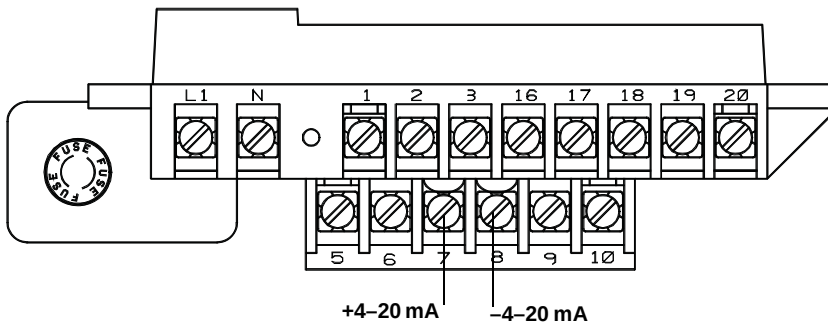
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STEP 6 CONTINUED...**Connect the 4–20 mA Analog Signal****Cabling considerations**

If possible, use individually shielded twisted pair cable, either in single pair or multi-pair varieties. Unshielded cables may be used for short distances, provided ambient noise and cross-talk will not adversely impact communication. The minimum conductor size is 0.51 mm diameter (#24 AWG) for cable runs less than 1,500 meters (@ 5,000 ft.) and 0.81 mm diameter (#20 AWG) for longer distances. Resistance in the loop must be 1000 ohms or less. The 4–20 mA analog output loop signal may be powered internally or externally. The default position of the internal/external analog power switch is in the internal position. The user-selectable power supply switch is located on the electronics board.

8712E - connect negative (-)DC to Terminal 8 and positive (+)DC to Terminal 7. See Figure 18.

Figure 18. 8712E Analog Signal Wiring Diagram

**Internal Power Source**

The 4–20 mA analog signal loop is powered from the transmitter itself.

External Power Source

The 4–20 mA analog signal loop is powered from an external power source. HART multidrop installations require a 10–30 V DC external analog power source.

NOTE:

If a HART Field Communicator or control system will be used, it must be connected across a minimum of 250 ohms resistance in the loop.

To connect any of the other output options (pulse output and/or digital input/output), consult the comprehensive product manual.

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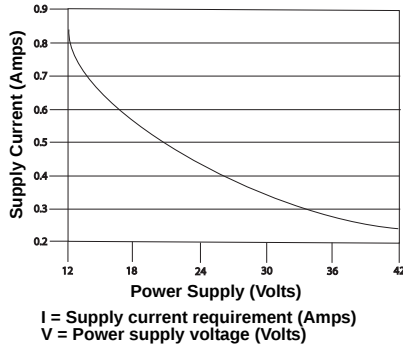
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Powering the Transmitter

The 8712E transmitter is designed to be powered by 90-250 Vac, 50–60 Hz or 12–42 Vdc. Before connecting power to the Rosemount 8712E consider the following standards and be sure to have the proper power supply, conduit, and other accessories. Wire the transmitter according to national, local and plant electrical requirements for the supply voltage. See Figure 19.

Figure 19. DC Power Supply Current 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 ambient temperatures greater than 176 °F (80 °C), use a wire rated for 230 °F (110 °C). For DC powered transmitters with extended cable lengths, verify that there is a minimum of 12 V DC 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.

Installation Category

The installation category for the 8712E is (Overvoltage) Category II.

Overcurrent Protection

The Rosemount 8712E transmitter requires overcurrent protection of the supply lines. Maximum ratings of overcurrent devices are shown in Table 10.

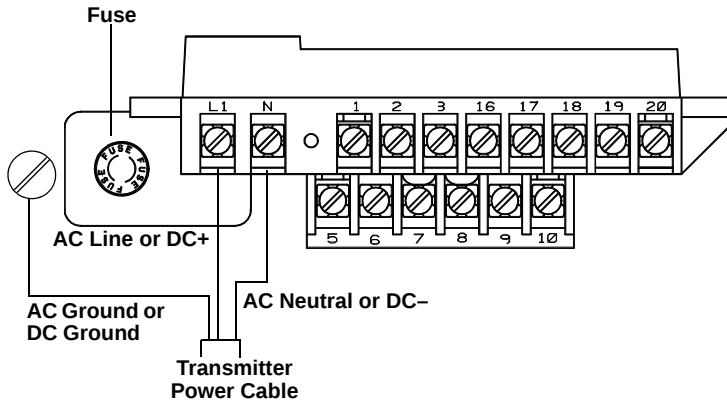
Table 10. Overcurrent Limits

Power System	Fuse Rating	Manufacturer
95-250 V AC	2 Amp, Quick Acting	Bussman AGC2 or Equivalent
12-42 V DC	3 Amp, Quick Acting	Bussman AGC3 or Equivalent

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8712E Power Supply

For AC power applications (90-250 VAC, 50-60 Hz) connect AC Neutral to terminal N and connect AC Line to terminal L1. For DC power applications, connect negative to terminal N (DC -) and positive to terminal L1 (DC +). Ground the transmitter cage via the grounding stud located on the bottom of the transmitter housing. Units powered by 12-42 V DC powersupply may draw up to 1 amp of current. See Figure 20 for terminal block connections.

Figure 20. 8712E Transmitter Power Connections

Step 7: Basic Configuration

Once the magnetic flowmeter is installed and power has been supplied, the transmitter must be configured through the basic setup. These parameters can be configured through either a local operator interface or a HART communication device. A table of all the parameters are on page 26. Descriptions of the more advanced functions are included in the comprehensive product manual.

Basic Setup

Tag

Tag is the quickest and shortest way of identifying and distinguishing between transmitters. Transmitters can be tagged according to the requirements of your application. The tag may be up to eight characters long.

Flow Rate Units

The *flow rate units* variable specifies the format in which the flow rate will be displayed. Units should be selected to meet your particular metering needs.

Line Size

The *line size* (sensor size) must be set to match the actual sensor connected to the transmitter. The size must be specified in inches.

URV (Upper Range Value)

The *upper range value* (URV) sets the 20 mA point for the analog output. This value is typically set to full-scale flow. The units that appear will be the same as those selected under the units parameter. The URV may be set between -39.3 ft/s to 39.3 ft/s (-12 m/s to 12 m/s). There must be at least 1 ft/s (0.3 m/s) span between the URV and LRV.

LRV (Lower Range Value)

The *lower range value* (LRV) sets the 4 mA point for the analog output. This value is typically set to zero flow. The units that appear will be the same as those selected under the units parameter. The LRV may be set between -39.3 ft/s to 39.3 ft/s (-12 m/s to 12 m/s). There must be at least 1 ft/s (0.3 m/s) span between the URV and LRV.

Calibration Number

The sensor *calibration number* is a 16-digit number used to identify sensors calibrated at the Rosemount factory.

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Table 11. Field Communicator Fast Key Sequence

Function	Fast Keys
Process Variables (PV)	1,1
Primary Variable Value	1,1,1
Primary Variable%	1,1,2
PV Loop Current	1,1,3
Totalizer Set-Up	1,1,4
Totalizer Units	1,1,4,1
Gross Total	1,1,4,2
Net Total	1,1,4,3
Reverse Total	1,1,4,4
Start Totalizer	1,1,4,5
Stop Totalizer	1,1,4,6
Reset Totalizer	1,1,4,7
Pulse Output	1,1,5
Basic Setup	1,3
Tag	1,3,1
Flow Units	1,3,2
PV Units	1,3,2,1
Special Units	1,3,2,2
Volume Unit	1,3,2,2,1
Base Volume Unit	1,3,2,2,2
Conversion Number	1,3,2,2,3
Base Time Unit	1,3,2,2,4
Flow Rate Unit	1,3,2,2,5
Line Size	1,3,3
PV URV	1,3,4
PV LRV	1,3,5
Calibration Number	1,3,6
PV Damping	1,3,7
Review	1,5

Local Operator Interface

The optional Local Operator Interface (LOI) provides an operator communications center for the 8712E. By using the LOI, the operator can access any transmitter function for changing configuration parameter settings, checking totalized values, or other functions. The LOI is integral to the transmitter housing.

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PRODUCT CERTIFICATIONS

Approved Manufacturing Locations

Rosemount Inc. — Eden Prairie, Minnesota, USA

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

Emerson Process Management Flow — Ede, The Netherlands

Asia Flow Technology Center — Nanjing, China

European Directive Information

The EC declaration of conformity can be found on page 31. The most recent revision can be found at www.rosemount.com.

Type n protection type in accordance with EN 50021



- Closing of entries in the device must be carried out using the appropriate EExe or EExn 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.

CE CE Marking

Complies with EN 61326-1: 2006

Complies with Essential Health and Safety Requirements:

EN 60079-15: 2003

International Certificates

C-Tick Marking

Rosemount Inc. complies with the following IEC Requirements:

IEC 60079-0: 2004

IEC 60079-15: 2005-03

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM)

- N0** Non-incendive for Class I, Division 2
Groups A, B, C, and D non-flammable fluids
(T4 at 40 °C)
Dust-ignition proof Class II/III, Division 1
Groups E, F, and G
(T4 at 40 °C)
Hazardous Locations; Enclosure Type 4X, IP66

- N5** Non-incendive for Class I, Division 2,
Groups A, B, C, and D flammable fluids
(T4 at 40 °C)
Dust-ignition proof Class II/III, Division 1
Groups E, F, and G
(T4 at 40 °C)
Hazardous Locations; Enclosure Type 4X, IP66
Requires sensors with N5 Approval

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Canadian Standards Association (CSA)

- N0** Non-incendive for Class I, Division 2
Groups A, B, C, and D non-flammable fluids
(T4 at 40 °C)
Dust-ignition proof Class II/III, Division 1
Groups E, F, and G
(T4 at 40 °C)
Hazardous Locations; Enclosure Type 4X

European Certifications

- N1 ATEX Type n**
Certificate No: Baseefa 05ATEX0170X
 II 3G EEx nA nL IIC T4 (-40 °C ≤ Ta ≤ +60 °C)
V_{max} = 42 V DC
IP 66
CE 0575

Special Conditions for Safe Use (x)

The apparatus is not capable of withstanding the 500V electrical strength test required by Clause 8.1of EN 60079-15: 2003. This must be taken into account when installing the apparatus.

International Certifications

IECEX

- N7 IECEX Type n**
Certificate No: IECEX BAS 07.0036X
Ex nA nL IIC T4 (Ta = -40 °C to + 60 °C)
V_{max} = 42 V DC

Special Conditions for Safe Use (x)

The apparatus is not capable of withstanding the 500V electrical strength required by Clause 6.8.1of IEC 60079-15: 2005. This must be taken into account when installing the apparatus.

InMetro - Brazil

- N2** Non-incendive, Type n
Certificate No: NCC 11.0198X
Ex nA ic IIC T4 Gc (-40 °C ≤ Ta ≤ +60 °C)
V_{max} = 42 V DC

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Sensor Approval Information

Approval Codes	Rosemount 8705 Sensor		Rosemount 8707 Sensor		Rosemount 8711 Sensor		Rosemount 8721 Sensors
	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	•	•			•	•	
NF	•				•	•	
E1	•	•			•	•	
E5 ⁽¹⁾	•	•			•	•	
KD ⁽²⁾	•	•			•	•	

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

(2) Refer to Table 13 on page 30 for relation between ambient temperature, process temperature, and temperature class.

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Table 12. Electrical Data

Rosemount 8705 and 8711 Sensors	
Coil excitation circuit:	40 V DC (pulsed), 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 13. Relation between ambient temperature, process temperature, and temperature class⁽¹⁾

Meter Size (Inches)	Maximum Ambient Temperature	Maximum Process Temperature	Temperature Class
1/2	115 °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)	148 °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 - 36	149 °F (65 °C)	266 °F (130 °C)	T3
3 - 36	149 °F (65 °C)	194 °F (90 °C)	T4
3 - 36	131 °F (55 °C)	131 °F (55 °C)	T5
3 - 36	104 °F (40 °C)	104 °F (40 °C)	T6
6	115 °F (65 °C)	275 °F (135 °C)	T3
6	115 °F (65 °C)	230 °F (110 °C)	T4
6	115 °F (65 °C)	167 °F (75 °C)	T5
6	140 °F (60 °C)	140 °F (60 °C)	T6
8-60	115 °F (65 °C)	284 °F (140 °C)	T3
8-60	115 °F (65 °C)	239 °F (115 °C)	T4
8-60	115 °F (65 °C)	176 °F (80 °C)	T5
8-60	115 °F (65 °C)	145 °F (65 °C)	T6

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

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Figure 21. Declaration of Conformity

					
EC Declaration of Conformity No: RMD 1031 Rev. E					
We, Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344-3695 USA declare under our sole responsibility that the product(s), Model 8712D and Model 8712E Magnetic Flowmeter Transmitters manufactured by, <table><tr><td>Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344-3695 USA</td><td align="center"><i>and</i></td><td>8200 Market Boulevard Chanhassen, MN 55317-9687 USA</td></tr></table> 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 the harmonized standards and, when applicable or required, a European Community notified body certification, as shown in the attached schedule.  _____ (signature) February 09, 2009 _____ (date of issue) Mark Fleig _____ (name - printed) Vice President Technology and New Products _____ (function name - printed) FILE ID: 8712 CE Marking Page 1 of 2 8712_RMD1031E.DOC			Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344-3695 USA	<i>and</i>	8200 Market Boulevard Chanhassen, MN 55317-9687 USA
Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344-3695 USA	<i>and</i>	8200 Market Boulevard Chanhassen, MN 55317-9687 USA			

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ROSEMOUNT



Schedule

EC Declaration of Conformity RMD 1031 Rev. E

LVD Directive (2006/95/EC)

All Models

EN 61010-1: 2001

EMC Directive (2004/108/EC)

All Models

EN 61326-1: 2006

ATEX Directive (94/9/EC)

Model 8712D with Power Supply Option "03" and option code "N1"

Model 8712E with Power Supply Option "2" and option code "N1"

Baseefa05ATEX0170X – Type n Certificate

Equipment Group II, Category 3 G (EEx nA nL IIC T4)

EN 60079-15: 2003

ATEX Notified Bodies for EC Type Examination Certificate

Baseefa [Notified Body Number: 1180]

Rockhead Business Park, Staden Lane

Buxton, Derbyshire SK17 9RZ

United Kingdom

ATEX Notified Body for Quality Assurance

Det Norske Veritas (DNV) [Notified Body Number: 0575]

Veritasveien 1, N-1322

Hovik, Norway