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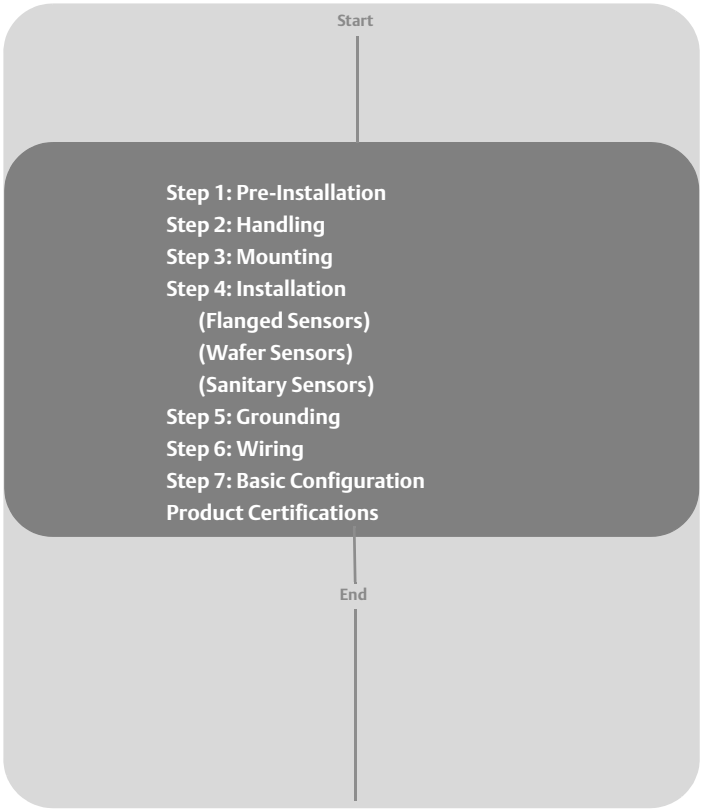
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Quick Installation Guide
00825-0100-4662, Rev CD
June 2013

Rosemount 8732

Rosemount 8732E Magnetic Flowmeter System (Transmitter and Sensor)



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Rosemount 8732

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⚠ IMPORTANT NOTICE

This document provides basic installation guidelines for the Rosemount® 8732. 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 8732 reference manual (document number 00809-0100-4662) 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 8732 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.

⚠ WARNING

Rosemount 8705 Magnetic Flowtube units ordered with non-standard paint options 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.

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STEP 1: PRE-INSTALLATION

Before installing the Rosemount 8732 Magnetic Flowmeter Transmitter, there are several pre-installation steps that should be completed to make the installation process easier:

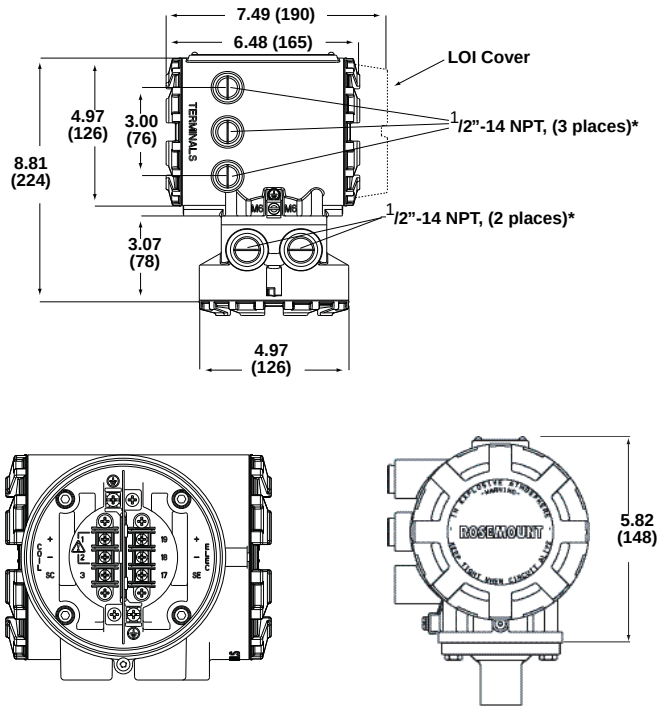
- Identify the options and configurations that apply to your application
- Set the hardware switches if necessary
- Consider mechanical, electrical, and environmental requirements

Mechanical Considerations

The mounting site for the Rosemount 8732 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).

If the Rosemount 8732 is mounted separately from the sensor, it is not subject to limitations that might apply to the sensor.

Figure 1. Rosemount 8732 Dimensional Drawing



NOTE:
* M20 and PG 13.5 connections are available with the use of threaded conduit adapters.

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Environmental Considerations

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

- high-vibration lines with integrally mounted transmitters
- 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.

Both remotely and integrally mounted Rosemount 8732 transmitters require external power so there must be access to a suitable power source.

Installation Procedures

Rosemount 8732 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 bracket to the pipe using the mounting hardware.
2. Attach the Rosemount 8732 to the mounting bracket using the mounting screws.

Identify Options and Configurations

The standard application of the 8732 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:

- HART Multidrop Configuration
- Discrete Output
- Discrete Input
- Pulse Output

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.

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Hardware Jumpers/Switches

The 8732 electronics board is equipped with four user-selectable hardware switches. These switches set the Failure Alarm Mode, Internal/External Analog Power, Internal/External Pulse 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(1):	INTERNAL
Internal/External Pulse Power(1):	EXTERNAL
Transmitter Security:	OFF

(1) For electronics with intrinsically safe (I.S. Output) approvals, analog and pulse power must be provided externally. The electronics do not include these hardware switches.

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.

Electrical Considerations

Before making any electrical connections to the Rosemount 8732, 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.

Rotate Transmitter Housing

The electronics housing can be rotated on the sensor in 90° increments by loosening the four mounting bolts on the bottom of the housing and reinstalling the bolts. When the housing is returned to its original position, be sure the surface is clean and there is no gap between the housing and the sensor.

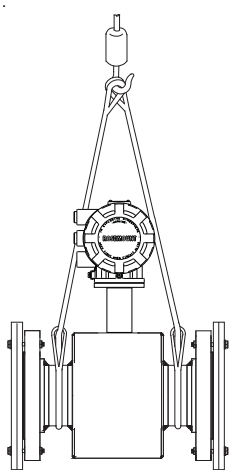
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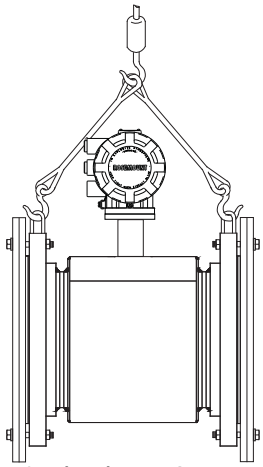
STEP 2: HANDLING

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



½- through 4-Inch Sensors



6-Inch and Larger Sensors

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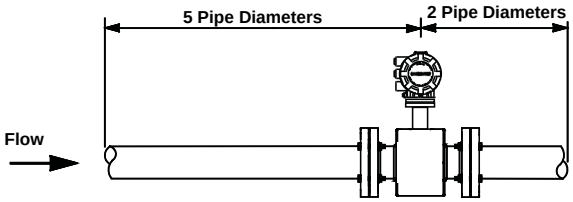
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STEP 3: MOUNTING

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 upstream and downstream straight runs are possible. In reduced straight run installations, absolute performance may shift. 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 tube adaptor points in the direction of flow through the sensor. See Figure 4.

Figure 4. Flow Direction Arrow



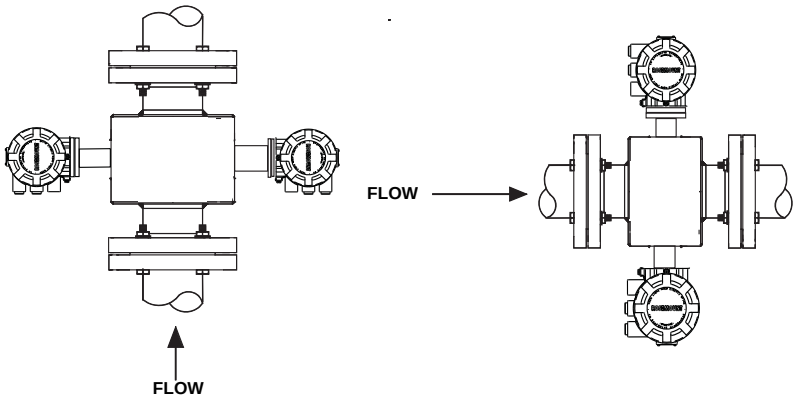
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Sensor Location

The sensor should be installed in a location 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.

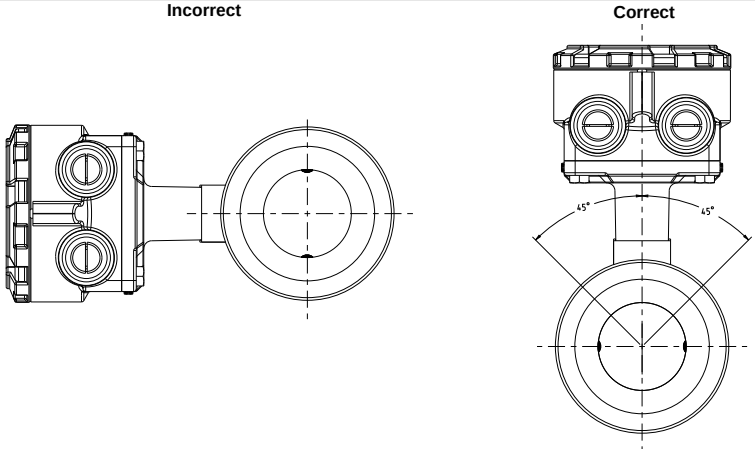
Figure 5. Sensor orientation



Sensor Orientation

The electrodes in the sensor are properly orientated when the two measurement electrodes are in the 3 and 9 o'clock positions or within 45° from the vertical, as shown on the right of Figure 6. Avoid any mounting orientation that positions the top of the sensor at 90° from the vertical position as shown on the left of Figure 6.

Figure 6. Mounting position



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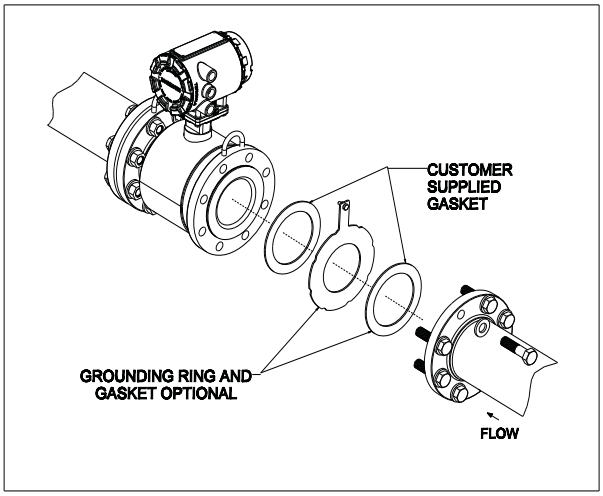
STEP 4: INSTALLATION

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 7. Flanged gasket placement



Flange Bolts

NOTE:
Do not bolt one side at a time. Tighten each side simultaneously. Example:
1. Snug upstream
2. Snug downstream
3. Tighten upstream
4. Tighten downstream

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 flanges and Table 2 for EN 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 8 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.

If leakage has not stopped at the suggested torque values, the bolts can be tightened in

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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 8. Flange bolt torquing sequence

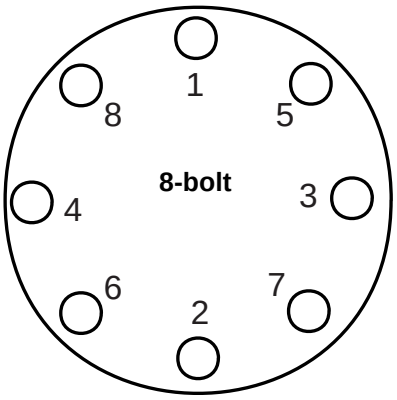


Table 1. Suggested Flange Bolt Torque Values for Rosemount 8705 and 8707 High-Signal Sensors (ASME)

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
025	2.5 inch (65 mm)	22	24	17	16
030	3 inch (80 mm)	34	35	23	23
040	4 inch (100 mm)	26	50	17	32
050	5 inch (125 mm)	36	60	25	35
060	6 inch (150 mm)	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/PFA liner			
		PN10	PN 16	PN 25	PN 40
		(Newton-meter)	(Newton-meter)	(Newton-meter)	(Newton-meter)
005	0.5-inch (15 mm)				10
010	1 inch (25 mm)				20
015	1.5 inch (40 mm)				50
020	2 inch (50 mm)				60
025	2.5 inch (65 mm)				50
030	3 inch (80 mm)				50
040	4 inch (100 mm)		50		70
050	5.0 inch (125 mm)		70		100
060	6 inch (150mm)		90		130
080	8 inch (200 mm)	130	90	130	170
100	10 inch (250 mm)	100	130	190	250
120	12 inch (300 mm)	120	170	190	270
140	14 inch (350 mm)	160	220	320	410
160	16 inch (400 mm)	220	280	410	610
180	18 inch (450 mm)	190	340	330	420
200	20 inch (500 mm)	230	380	440	520
240	24 inch (600 mm)	290	570	590	850

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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-meter)	(Newton-meter)	(Newton-meter)
010	1 inch (25 mm)				20
015	1.5 inch (40 mm)				30
020	2 inch (50 mm)				40
025	2.5 inch (65 mm)				35
030	3 inch (80 mm)				30
040	4 inch (100 mm)		40		50
050	5.0 inch (125 mm)		50		70
060	6 inch (150 mm)		60		90
080	8 inch (200 mm)	90	60	90	110
100	10 inch (250 mm)	70	80	130	170
120	12 inch (300 mm)	80	110	130	180
140	14 inch (350 mm)	110	150	210	280
160	16 inch (400 mm)	150	190	280	410
180	18 inch (450 mm)	130	230	220	280
200	20 inch (500 mm)	150	260	300	350
240	24 inch (600 mm)	200	380	390	560

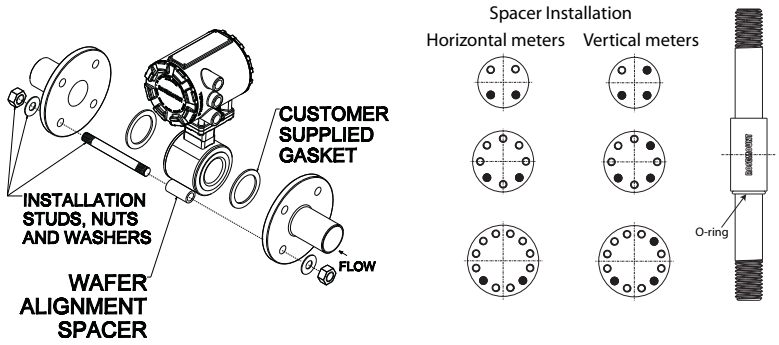
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Wafer Sensors

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 below.

Figure 9. 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 9 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 o-ring over the stud to keep the spacer in place. See Figure 9. 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 over-tighten 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	ASME - 150#
AA20	2	50	ASME - 150#
AA30	3	80	ASME - 150#
AA40	4	100	ASME - 150#
AA60	6	150	ASME - 150#
AA80	8	200	ASME - 150#
AB15	1.5	40	ASME - 300#
AB20	2	50	ASME - 300#
AB30	3	80	ASME - 300#
AB40	4	100	ASME - 300#
AB60	6	150	ASME - 300#
AB80	8	200	ASME - 300#
AB15	1.5	40	ASME - 300#
AB20	2	50	ASME - 300#
AB30	3	80	ASME - 300#
AB40	4	100	ASME - 300#
AB60	6	150	ASME - 300#
AB80	8	200	ASME - 300#
DB40	4	100	EN 1092-1 - PN10/16
DB60	6	150	EN 1092-1 - PN10/16
DB80	8	200	EN 1092-1 - PN10/16
DC80	8	100	EN 1092-1 - PN25
DD15	1.5	150	EN 1092-1 - PN10/16/25/40
DD20	2	50	EN 1092-1 - PN10/16/25/40
DD30	3	80	EN 1092-1 - PN10/16/25/40
DD40	4	100	EN 1092-1 - PN25/40
DD60	6	150	EN 1092-1 - PN25/40
DD80	8	200	EN 1092-1 - 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 8 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

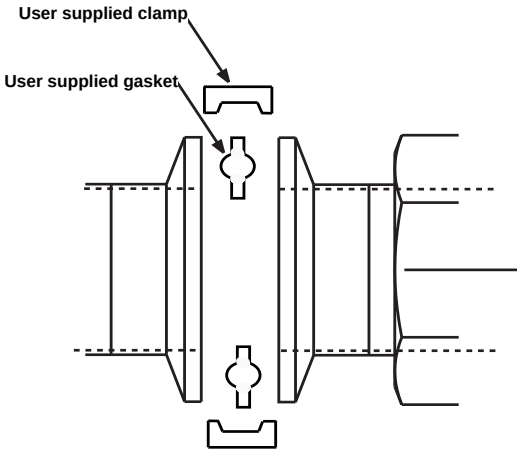
Gaskets

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 10. 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**	**Reference Electrode**	**Lining Protectors**
Conductive Unlined Pipe	See Figure 11(1)	See Figure 11(1)	Not Required See Figure 14	See Figure 12(1)
Conductive Lined Pipe	Insufficient Grounding	See Figure 12	See Figure 11	See Figure 12
Non-Conductive Pipe	Insufficient Grounding	See Figure 13	Not Recommended	See Figure 13

(1) *Ground Rings/Lining Protectors are not required for process reference. Ground Straps per Figure 12 would be sufficient.*

Figure 11. Grounding Straps in Conductive Lines Pipe or Reference Electrode in Lined Pipe

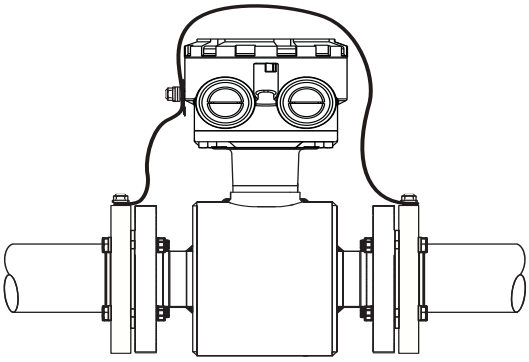
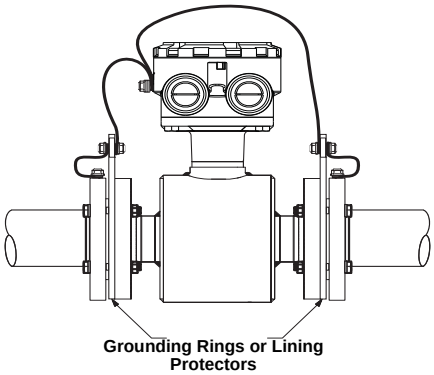


Figure 12. Grounding with Grounding Rings or Lining Protectors in Conductive Pipe



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Figure 13. Grounding with Grounding Rings or Lining Protectors in Non-Conductive Pipe

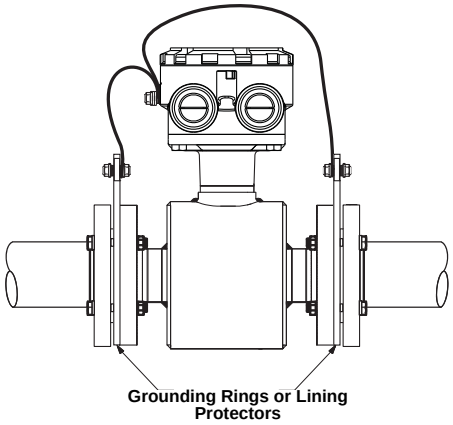
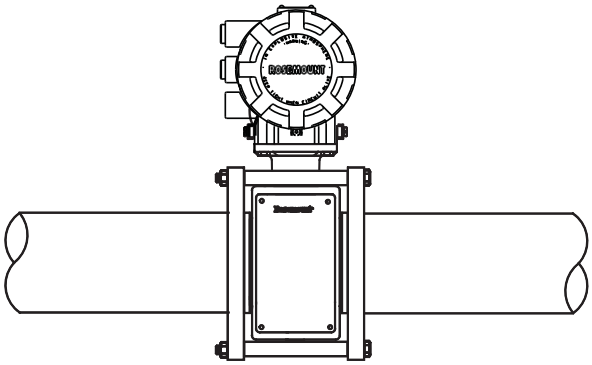


Figure 14. Grounding with Reference Electrode in Conductive Unlined Pipe



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STEP 6: WIRING

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.

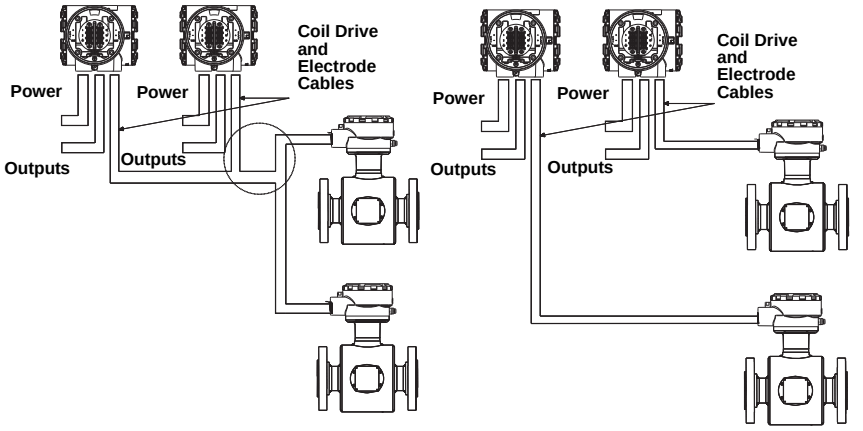
Conduit Ports and Connections

Both the sensor and transmitter junction boxes have ports for 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 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 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 electrode cable is needed between the sensor and the remote transmitter. See Figure 15. 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 15. Conduit preparation



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STEP 6 CONTINUED...

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 flowmeter sensor and transmitter.

- Electrode cables 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 according to national and 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.

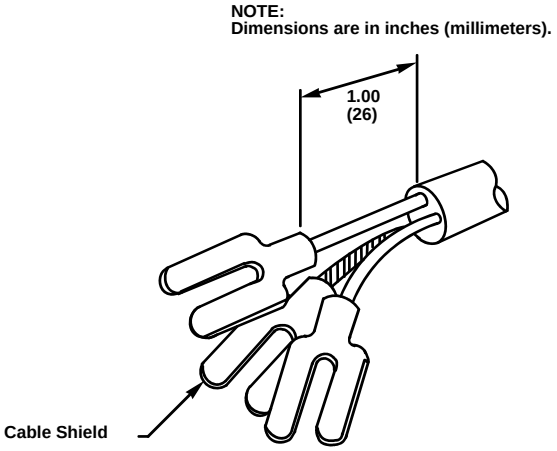
Remote Mount Cable Requirements and Preparation

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

Prepare the ends of the coil drive and electrode cables as shown in Figure 16. Limit the unshielded wire length to 1-inch on both the coil drive and electrode 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 16. 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
Electrode 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 Electrode 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 electrode refer to Table 8. If using the combination coil drive and electrode cable refer to Table 9. See Figure 17 for transmitter specific wiring diagram.

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

Table 8. Individual coil and electrode 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 electrode cable

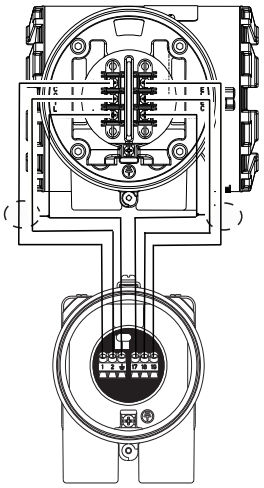
Transmitter Terminal	Sensor Terminal	Wire Gauge	Wire Color
1	1	18	Red
2	2	18	Green
3 or Ground	3 or Ground	18	Shield
17	17	20	Shield
18	18	20	Black
19	19	20	White

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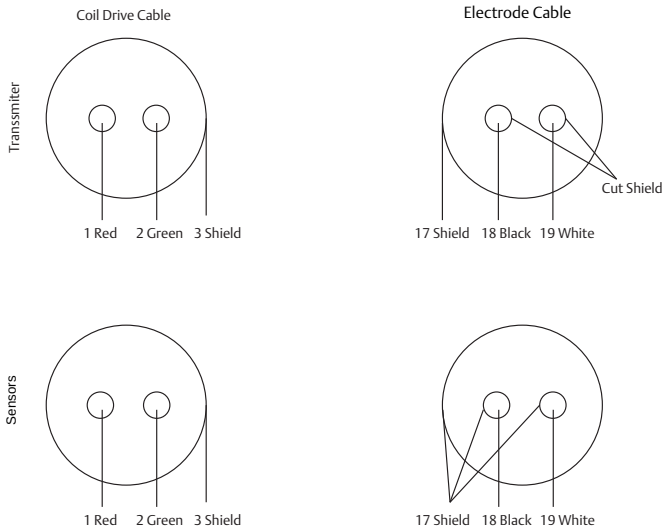
STEP 6 CONTINUED...

Figure 17. Remote mount wiring diagrams



NOTE:
When using the Rosemount supplied combination cable, the electrode cables 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 18.

Figure 18. Combination coil and electrode cable wiring diagram



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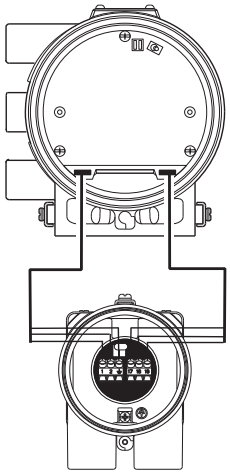
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STEP 6 CONTINUED...

Integral Mount Transmitters

The interconnecting wire harness for an integral mount transmitter is installed at the factory. See Figure 19. Do not use cable other than that supplied by Emerson Process Management, Rosemount, Inc.

Figure 19. 8732EST integral mount wiring diagram



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Connecting 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.

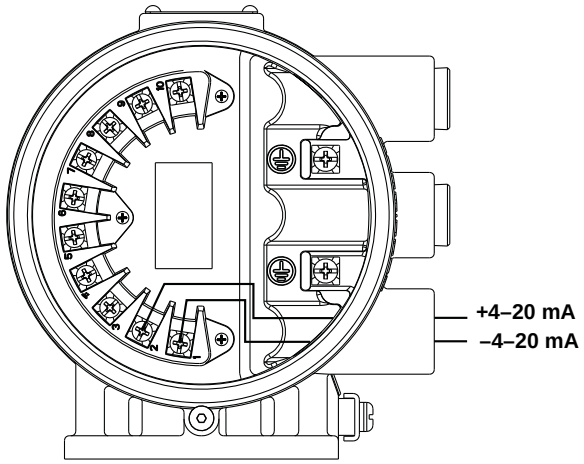
Powering the 4-20mA Output

For transmitters with non-I.S. Output, the 4–20 mA output signal may be powered internally or externally. The default position of this switch is in the internal position and is located on the front of the electronics board.

8732E terminal connections

Connect negative (-)DC to Terminal 1 and positive (+)DC to Terminal 2. See Figure 20.

Figure 20. 8732E 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.

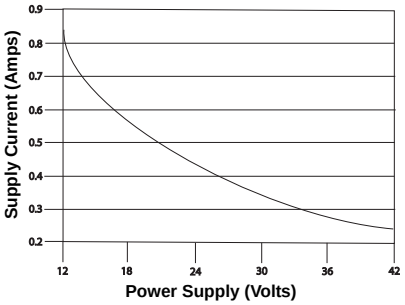
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Powering the Transmitter

The 8732E transmitter is designed to be powered by 90-250 Vac, 50–60 Hz or 12–42 Vdc. Before connecting power to the Rosemount 8732E, 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 21.

Figure 21. DC Power supply current requirements



I = Supply current requirement (Amps)
V = Power supply voltage (Volts)

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 8732E is (Overvoltage) Category II.

Overcurrent Protection

The Rosemount 8732E flowmeter 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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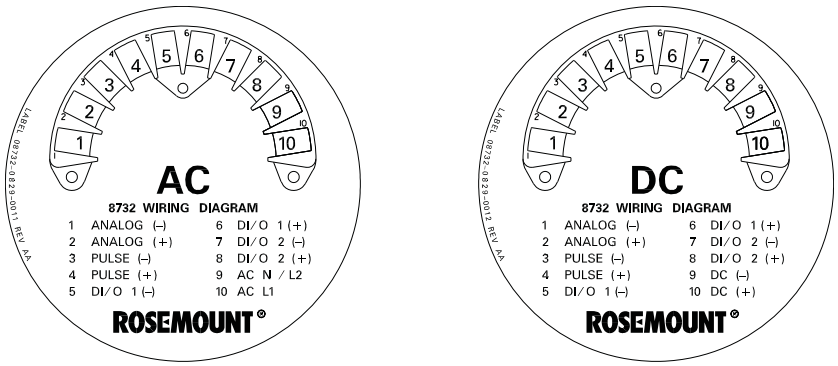
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STEP 6 CONTINUED...

8732E Power Supply

For AC power applications (90-250 VAC, 50-60 Hz) connect AC Neutral to terminal 9 (AC N/L2) and connect AC Line to terminal 10 (AC/L1). For DC power applications connect negative to terminal 9 (DC -) and positive to terminal 10 (DC +). Units powered by 12-42 V DC power supply may draw up to 1 amp of current. See Figure 22 for terminal block connections.

Figure 22. 8732E Transmitter power connections



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. Follow these steps to install the cover jam screw:

1. Verify that the cover jam screw is completely threaded into the housing.
2. Install the transmitter housing cover and verify that 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 $^{1}/_{2}$ turn counterclockwise to secure the cover. (Note: Application of excessive torque may strip the threads.)
5. Verify that the cover cannot be removed.

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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 27. 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 Units (PV)

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 generated at the Rosemount factory during flow calibration and is unique to each sensor.

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Table 11. Handheld fast keys (HART Handheld communicator)

Function	HART Fast Keys
Process Variables	**1, 1**
Primary Variable (PV)	1, 1, 1
PV Percent of Range	1, 1, 2
PV Analog Output (AO)	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 Upper Range Value (URV)	1,3,4
PV Lower Range Value (LRV)	1,3,5
Calibration Number	1,3,6
PV Damping	1,3,7
Review	**1,5**

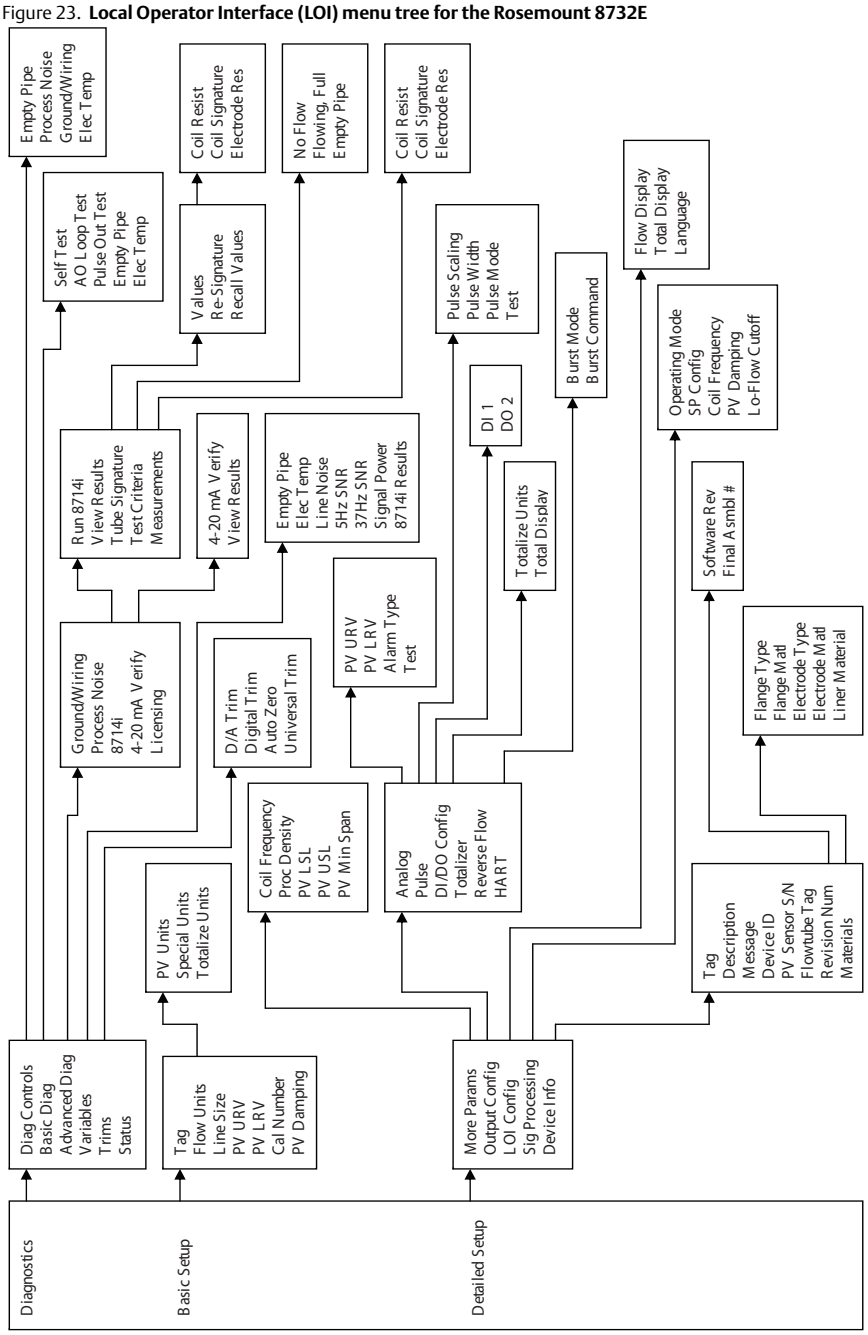
Local Operator Interface

To activate the optional Local Operator Interface (LOI), press the DOWN arrow two times. Use the UP, DOWN, LEFT, and RIGHT arrows to navigate the menu structure. A map of the LOI menu structure is shown on page 28. The display can be locked to prevent unintentional configuration changes. The display lock can be activated through a HART communication device, or by holding the UP arrow for 10 seconds. When the display lock is activated, DL will appear in the lower right hand corner of the display. To deactivate the display lock (DL), hold the UP arrow for 10 seconds. Once deactivated, the DL will no longer appear in the lower right hand corner of the display.

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Figure 23. **Local Operator Interface (LOI) menu tree for the Rosemount 8732E**



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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 Technology Center — Nanjing, China

EUROPEAN DIRECTIVE INFORMATION

The EC declaration of conformity can be found on page 36. 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.

CE *CE Marking*
Complies with EN 61326-1: 2006

For Rosemount 8732E transmitters:

Complies with Essential Health and Safety Requirements:
EN 60079-0: 2006
EN 60079-1: 2007
EN 60079-7: 2007
EN 60079-11: 2007
EN 60079-26: 2004
EN 60079-27: 2006
EN 50281-1-1: 1998 + A1

International Certificates

Rosemount Inc. complies with the following IEC Requirements.

C-Tick Marking

For Rosemount 8732E transmitters:

IEC 60079-0: 2004
IEC 60079-1: 2007-04
IEC 60079-11: 2006
IEC 60079-26: 2004
IEC 60079-7: 2006-07
IEC 61241-0: 2004
IEC 61241-1: 2004

NOTE:
For the 8732E transmitters with a local operator interface (LOI), the lower ambient temperature limit is -20 °C.

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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 60 °C: -50 °C ≤ Ta ≤ +60 °C)
Dust-ignition proof Class II/III, Division 1
Groups E, F, and G (T5 at 60 °C)
Hazardous Locations; Enclosure Type 4X

N5 Non-incendive for Class I, Division 2,
Groups A, B, C, and D flammable fluids
(T4 at 60 °C: -50 °C ≤ Ta ≤ +60 °C)
Dust-ignition proof Class II/III, Division 1
Groups E, F, and G (T5 at 60 °C)
Hazardous Locations; Enclosure Type 4X
Requires sensors with N5 Approval

E5 Explosion proof for Class I, Division 1
Groups C and D (T6 at 60 °C)
Dust-ignition proof Class II/III, Division 1
Groups E, F, and G (T5 at 60 °C),
Non-incendive for Class I, Division 2
Groups A, B, C, and D flammable fluids
(T4 at 60 °C: -50 °C ≤ Ta ≤ +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
(T4 at 60 °C: -50 °C ≤ Ta ≤ +60 °C)
Dust-ignition proof Class II/III, Division 1
Groups E, F, and G (T4 at 60 °C)
Hazardous Locations; Enclosure Type 4X

European Certifications

E1 ATEX Flameproof
Certificate No: KEMA 07ATEX0073 X
⟨Ex⟩ II 2G Ex de IIC T6 or
⟨Ex⟩ II 2G Ex de [ia] IIC T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC
CE 0575

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ED ATEX Flameproof

Certificate No: KEMA 07ATEX0073 X
Ex II 2G Ex de IIB T6 or
Ex II 2G Ex de [ia] IIB T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC
CE 0575

ND ATEX Dust

Certificate No: KEMA 07ATEX0073 X
Ex II 1D Ex tD A20 IP66 T100 °C or
with I.S. outputs
Ex II G [Ex ia] IIC
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC
IP 66
CE 0575

Special Conditions for Safe Use (KEMA 07ATEX0073X):

Contact Rosemount Inc. for information on the dimensions of the flameproof joints. The property class of the security screws which attach the flowtube or junction box to the transmitter is SST A2-70.

Installation Instructions:

The cable and conduit entry devices and blanking elements shall be of a certified flameproof type, suitable for the conditions of use and correctly installed. With the use of conduit, a certified stopping box shall be provided immediately to the entrance of the enclosure.

N1 ATEX Type n

Certificate No: Baseefa 07ATEX0203X
Ex II 3G Ex nA nL IIC T4
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °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 6.8.1 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.

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International Certifications

IECEx

E7 IECEx Flameproof
Certificate No: KEM 07.0038X
Ex IIC or Ex de [ia] IIC T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

EF IECEx Flameproof
Certificate No: KEM 07.0038X
Ex de IIB or Ex de [ia] IIB T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

NF IECEx Dust
Certificate No: KEM 07.0038X
Ex tD A20 IP66 T 100 °C
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

Special Conditions for Safe Use (KEM 07.0038X):
Contact Rosemount Inc. for information on the dimensions of the flameproof joints. The property class of the security screws which attach the flowtube or junction box to the transmitter is SST A2-70.

Installation Instructions:
The cable and conduit entry devices and blanking elements shall be of a certified flameproof or increased safety type, suitable for the conditions of use and correctly installed. With the use of conduit, a certified stopping box shall be provided immediately to the entrance of the enclosure.

N7 IECEx Type n
Certificate No: IECEx BAS 07.0062X
Ex nA nL IIC T4
with FISCO / FNICO output
Ex nA nL [ia] IIC T4
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 42 V DC

Special Conditions for Safe Use (x):
The apparatus is not capable of withstanding the 500V electrical strength test required by Clause 6.8.1 of IEC 60079-15: 2005. This must be taken into account when installing the apparatus.

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INMETRO - Brazil

E2 INMETRO Flameproof

Certificate No: NCC 12.1177 X
Ex de IIC T6 Gb IP66
Ex de [ia IIC Ga] IIC T6 Gb IP66
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

EB INMETRO Flameproof

Certificate No: NCC 12.1177 X
Ex de IIB T6 Gb IP66 or
Ex de [ia IIC Ga] IIB T6 Gb IP66
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

Special conditions for safe use:

If the equipment needs maintenance, the company Emerson Process Management Brazil should be contacted for information about flameproof seals.

The integral assembly of the 8732E flow transmitter with 8711 or 8705 sensor is allowed only for processes where the maximum ambient temperature is 60 °C. For processes where the ambient temperature is above 60 °C, the assembly of the 8732E flow transmitter must be remote.

Technical characteristics:

Electrical Supply:
250 V, 1 A, 40 VA or 42 V, 1 A, 20 W (maximum)
Transmitter Version Ex de:
Circuit 4-20mA output: 30 V, 30 mA, 900 mW (maximum)
Transmitter with intrinsically safe active circuits (Ex de [ia] version):
Circuit with 4-20 mA output - protection type Ex ia IIC:
Uo = 23.1 V, Io = 179.8 mA, Po = 1.03 W, Co = 137 nF, Lo = 600 µH
Pulse Circuit - protection type Ex ia IIC:
Uo = 23.1 V, Io = 12.7 mA, Po = 73.1 mW, Co = 135.6 nF, Lo = 198 mH
Transmitter with intrinsically safe passive circuits (Ex de [ia] version):
Circuit with 4-20 mA output - protection type Ex ia IIC, only for connection to a certified intrinsically safe circuit:
Ui = 30 V, Ii = 300 mA, Pi = 1W, Ci = 924 pF, Li = 0 µH
Uo = 13.2 V, Co = 1 µF
Pulse Circuit - protection type Ex ia IIC, only for connection to a certified intrinsically safe circuit:
Ui = 30 V, Ii = 100 mA, Pi = 1W, Ci = 4.4 nF, Li = 1.3 mH
Uo = 13.02 V, Io = 2.08 mA, Po = 6.7 mW, Co = 1 µF, Lo = 1 H
From the safety point of view, circuits should be considered to be connected to ground.
The intrinsically safe 4-20 mA output and pulse circuits, are not galvanically isolated from each other.

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NEPSI - China

E3 NEPSI Flameproof
Certificate No: GYJ071438X
Ex de IIC T6 or Ex de [ia] IIC T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

EP NEPSI Flameproof
Certificate No: GYJ071438X
Ex de IIB T6 or Ex de [ia] IIB T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

KOSHA - Korea

E9 KOSHA Flameproof
Certificate No: 2008-2094-Q1X
Ex de IIC or Ex de [ia] IIC T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

EK KOSHA Flameproof
Certificate No: 2008-2094-Q1X
Ex de IIB or Ex de [ia] IIB T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
V_{max} = 250 V AC or 42 V DC

GOST - Russia

E8 GOST Flameproof
Ex de IIC T6 or Ex de [ia] IIC T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
IP67

EM GOST Flameproof
Ex de IIB T6 or Ex de [ia] IIB T6
without LOI (-50 °C ≤ Ta ≤ +60 °C)
with LOI (-20 °C ≤ Ta ≤ +60 °C)
IP67

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Sensor Approval Information

Table 12. Sensor option codes(1)

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	•	•			•	•	
E2	•	•			•	•	
E3	•	•			•	•	
E5(2)	•	•			•	•	
E8	•	•			•	•	
E9	•	•			•	•	
EB	•	•			•	•	
EK	•	•			•	•	
EM	•	•			•	•	
EP	•	•			•	•	
KD	•	•			•	•	

(1) CE Marking is standard on Rosemount 8705, 8711, and 8721. No hazardous location certifications are available on the Rosemount 570TM.

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

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Figure 24. Declaration of conformity

EMERSON. Process Management

ROSEMOUNT

CE

EC Declaration of Conformity

No: RFD 1068 Rev. E

We,

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

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

Model 8732E Magnetic Flowmeter Transmitter

manufactured by,

Rosemount Inc.		
12001 Technology Drive	*and*	**8200 Market Boulevard**
Eden Prairie, MN 55344-3695		**Chanhassen, MN 55317-9687**
USA		**USA**

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)

January 21, 2010
(date of issue)

Mark J 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 1068 Rev. E

EMC Directive (2004/108/EC)

All Models
EN 61326-1: 2006

LVD Directive (2006/95/EC)

All Models
EN 61010-1: 2001

ATEX Directive (94/9/EC)

Model 8732E Magnetic Flowmeter Transmitter

KEMA 07ATEX0073 X – Flameproof, with Increased Safety Terminal(s), Intrinsically Safe Output(s), Dust

Equipment Group II, Category 2 G:
Ex d IIB/IIC T6
Ex de IIB/IIC T6
Ex e IIB/IIC (Junctionbox)

Equipment Group II, Category 2 (1) G:
Ex de [ia] IIB/IIC T6 (Transmitter)

Equipment Group II, Category (1) G
[Ex ia] IIC

Equipment Group II, Category 1 D:
Ex tD A20 IP66 T100 ºC

EN 60079-0: 2006	EN 60079-26: 2004
EN 60079-1: 2007	EN 60079-27: 2006
EN 60079-7: 2007	EN 61241-0: 2006
EN 60079-11: 2007	EN 61241-1: 2004

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EMERSON. Process Management

ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RFD 1068 Rev. E

BASEEF07ATEX0203X – Type n, Intrinsically Safe Output

Equipment Group II, Category 3 G
Ex nA nL IIC T4

Equipment Group II, Category 3(1) G
Ex nA nL [ia] IIC T4

EN 60079-0: 2006
EN 60079-15: 2005
EN 60079-11: 2007

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

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

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