Quick Installation Guide
Rosemount 8732/8700 Series
Rosemount Magnetic Flowmeter System (Transmitter and Flowtube)

Step 1: Pre-Installation
Step 2: Handling
Step 3: Mounting
Step 4: Installation (Flanged Flowtubes)
Step 4: Installation (Wafer Flowtubes)
Step 4: Installation (Sanitary Flowtubes)
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Step 6: Wiring
Step 7: Basic Configuration
Step 8: Process Leak Protection (Optional)
Step 9: Power up the Transmitter
Step 10: Check Process Connections
Step 11: Confirm Configuration

Start
End

CE

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Quick Installation Guide
00825-0100-4725, Rev BA
July 2003

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IMPORTANT NOTICE
This installation guide provides basic 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 00809-0100-4725) 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 flowtube and transmitter is consistent with the appropriate FM, CSA, or ATEX approval. Do not connect a Rosemount 8732 to a non-Rosemount flowtube that is located in an explosive atmosphere.
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**WARNING**

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

To avoid possible damage to the flowtube 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 flowtube ends are often used for protection.

Correct flange bolt tightening is crucial for proper flowtube 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 flowtube lining and possible flowtube replacement.

**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). The transmitter should be mounted in an upright position.

If the Rosemount 8732 is mounted separately from the flowtube, it is not subject to limitations that might apply to the flowtube.
Figure 1. Rosemount 8732 Dimensional Drawing

- 3/4"-14 NPT Electrical Conduit Connections (2 places)
- 3/4"-14 NPT Flowtube Conduit Connections (2 places)
- LOI Cover

Dimensions:
- 7.49 (190)
- 6.48 (165)
- 4.97 (126)
- 1.88 (47)
- 8.81 (224)
- 4.00 (103)
- 3.07 (78)
- 1.88 (47)
- 8.81 (224)
- 3.07 (78)
- 5.96 (151)

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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 provides easy access for configuration or service.
Both remotely and integrally mounted Rosemount 8732 transmitters require external power and 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 plate to the pipe using the mounting hardware.
2. Attach the Rosemount 8732 to the mounting plate using the mounting screws.
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Identify Options and Configurations
The standard application of the 8732 includes a 4–20 mA output and control of the flowtube coils. Other applications may require one or more of the following configurations or options:

- Multidrop Communications
- Auxiliary Output
- 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 8732 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 8732, consider the following standards and be sure to have the proper power supply, conduit, and other accessories.

Rotate Transmitter Housing
The electronics housing can be rotated on the flowtube 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 flowtube.

STEP 2: HANDLING
Handle all parts carefully to prevent damage. Whenever possible, transport the system to the installation site in the original shipping containers. Teflon®-lined flowtubes 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 Flowtube Support for Handling
STEP 3: MOUNTING

Upstream/Downstream Piping
To ensure specification accuracy over widely varying process conditions, install the flowtube a minimum of five straight pipe diameters upstream and two pipe diameters downstream from the electrode plane (see Figure 3).

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

Flowtube Orientation
The flowtube should be installed in a position that ensures the flowtube 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 degrees of horizontal.
The electrodes in the Rosemount 8705 flowtube 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 flowtube is either vertical or horizontal, as shown in Figure 5. Avoid any mounting orientation that positions the top of the flowtube at 45° from the vertical or horizontal position.
STEP 4: INSTALLATION (FLANGED FLOWTUBE)

Gaskets
The flowtube 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 the grounding ring. All other applications (including flowtubes with lining protectors or a grounding electrode) require only one gasket on each end connection.

Flange Bolts
Suggested torque values by flowtube 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 flowtube is not listed. Tighten flange bolts on the upstream side of the flowtube in the incremental sequence shown in Figure 6 to 20% of the suggested torque values. Repeat the process on the downstream side of the flowtube. For flowtubes 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 flowtube flanges stop.

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 flowtube liner material.

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

Figure 6. Flange Bolt Torquing Sequence

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

<table>
<thead>
<tr>
<th>Size Code</th>
<th>Line Size</th>
<th>Teflon/Tefzel/PFA liners</th>
<th>Polyurethane/Neoprene/Linatex liner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Class 150 (pound-feet)</td>
<td>Class 300 (pound-feet)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class 150 (pound-feet)</td>
<td>Class 300 (pound-feet)</td>
</tr>
<tr>
<td>005</td>
<td>1/2-inch (15 mm)</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>010</td>
<td>1 inch (25 mm)</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>015</td>
<td>1 1/2 inch (40 mm)</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>020</td>
<td>2 inch (50 mm)</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>030</td>
<td>3 inch (80 mm)</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td>040</td>
<td>4 inch (100 mm)</td>
<td>26</td>
<td>50</td>
</tr>
<tr>
<td>060</td>
<td>6 inch (150mm)</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>080</td>
<td>8 inch (200 mm)</td>
<td>60</td>
<td>82</td>
</tr>
<tr>
<td>100</td>
<td>10 inch (250 mm)</td>
<td>55</td>
<td>80</td>
</tr>
<tr>
<td>120</td>
<td>12 inch (300 mm)</td>
<td>65</td>
<td>125</td>
</tr>
<tr>
<td>140</td>
<td>14 inch (350 mm)</td>
<td>85</td>
<td>110</td>
</tr>
<tr>
<td>160</td>
<td>16 inch (400 mm)</td>
<td>85</td>
<td>160</td>
</tr>
<tr>
<td>180</td>
<td>18 inch (450 mm)</td>
<td>120</td>
<td>170</td>
</tr>
<tr>
<td>200</td>
<td>20 inch (500 mm)</td>
<td>110</td>
<td>175</td>
</tr>
<tr>
<td>240</td>
<td>24 inch (600 mm)</td>
<td>165</td>
<td>280</td>
</tr>
<tr>
<td>300</td>
<td>30 inch (750 mm)</td>
<td>195</td>
<td>415</td>
</tr>
<tr>
<td>360</td>
<td>36 inch (900 mm)</td>
<td>280</td>
<td>575</td>
</tr>
</tbody>
</table>
Table 2. Flange Bolt Torque and Bolt Load Specifications for 8705

<table>
<thead>
<tr>
<th>Size Code</th>
<th>Line Size</th>
<th>PN 10 (Newton-meter)</th>
<th>PN 16 (Newton-meter)</th>
<th>PN 25 (Newton-meter)</th>
<th>PN 40 (Newton-meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>005</td>
<td>0.5-inch</td>
<td>10 4400</td>
<td>10 4400</td>
<td>10 4400</td>
<td>10 4400</td>
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<tr>
<td>010</td>
<td>1 inch</td>
<td>20 10100</td>
<td>20 10100</td>
<td>20 10100</td>
<td>20 10100</td>
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<tr>
<td>015</td>
<td>1.5 inch</td>
<td>50 16100</td>
<td>50 16100</td>
<td>50 16100</td>
<td>50 16100</td>
</tr>
<tr>
<td>020</td>
<td>2 inch</td>
<td>60 20100</td>
<td>60 20100</td>
<td>60 20100</td>
<td>60 20100</td>
</tr>
<tr>
<td>030</td>
<td>3 inch</td>
<td>50 16800</td>
<td>50 16800</td>
<td>50 16800</td>
<td>50 16800</td>
</tr>
<tr>
<td>040</td>
<td>4 inch</td>
<td>50 17800</td>
<td>70 19600</td>
<td>70 19600</td>
<td>70 19600</td>
</tr>
<tr>
<td>060</td>
<td>6 inch</td>
<td>90 24700</td>
<td>130 28700</td>
<td>130 28700</td>
<td>130 28700</td>
</tr>
<tr>
<td>080</td>
<td>8 inch</td>
<td>130 35200</td>
<td>130 35200</td>
<td>170 34400</td>
<td>170 34400</td>
</tr>
<tr>
<td>100</td>
<td>10 inch</td>
<td>100 28000</td>
<td>130 29200</td>
<td>100 2500</td>
<td>170 44800</td>
</tr>
<tr>
<td>120</td>
<td>12 inch</td>
<td>120 32800</td>
<td>170 38400</td>
<td>120 2700</td>
<td>190 38600</td>
</tr>
<tr>
<td>140</td>
<td>14 inch</td>
<td>160 43800</td>
<td>220 49500</td>
<td>140 3200</td>
<td>220 47700</td>
</tr>
<tr>
<td>160</td>
<td>16 inch</td>
<td>220 50600</td>
<td>280 56200</td>
<td>160 56200</td>
<td>320 57200</td>
</tr>
<tr>
<td>180</td>
<td>18 inch</td>
<td>190 43200</td>
<td>340 68400</td>
<td>180 51000</td>
<td>340 92900</td>
</tr>
<tr>
<td>200</td>
<td>20 inch</td>
<td>230 51100</td>
<td>380 68900</td>
<td>200 73300</td>
<td>380 73900</td>
</tr>
<tr>
<td>240</td>
<td>24 inch</td>
<td>290 58600</td>
<td>570 93600</td>
<td>240 90100</td>
<td>570 112000</td>
</tr>
</tbody>
</table>
Gaskets

The flowtube 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 the grounding ring. All other applications (including flowtubes with lining protectors or a grounding electrode) require only one gasket on each end connection.
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Alignment and Bolting

1. On 11/2- through 8-inch (40 through 200 mm) line sizes, place centering rings over each end of the flowtube. The smaller line sizes, 0.15- through 1-inch (4 through 25 mm), do not require centering rings. On the 4- and 6-inch PN 10–16, insert the flowtube with rings first and then insert the studs. The slots on this ring scenario are located on the inside of the ring.

2. Insert studs for the bottom side of the flowtube between the pipe flanges. Stud specifications are listed in Table 3. Using carbon steel bolts on smaller line sizes, 0.15- through 1-inch (4 through 25 mm), rather than the required stainless steel bolts, will degrade performance.

3. Place the flowtube between the flanges. Make sure that the centering rings are properly placed in the studs. The studs should be aligned with the markings on the rings that correspond to the flange you are using.

4. Insert the remaining studs, washers, and nuts.

5. Tighten to the torque specifications shown in Table 1. Do not overtighten the bolts or the liner may be damaged.

Table 3. Stud Specifications

<table>
<thead>
<tr>
<th>Nominal Flowtube Size</th>
<th>Stud Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15 – 1 inch (4 – 25 mm)</td>
<td>316 SST ASTM A193, Grade B8M Class 1 threaded mounted studs</td>
</tr>
<tr>
<td>11/2 – 8 inch (40 – 200 mm)</td>
<td>CS, ASTM A193, Grade B7, threaded mounting studs</td>
</tr>
</tbody>
</table>
Flange Bolts

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

Table 4.

<table>
<thead>
<tr>
<th>Size Code</th>
<th>Line Size</th>
<th>Pound-feet</th>
<th>Newton-meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>15F</td>
<td>0.15 inch (4 mm)</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>30F</td>
<td>0.30 inch (8 mm)</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>005</td>
<td>1/2-inch (15 mm)</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>010</td>
<td>1 inch (25 mm)</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>015</td>
<td>1 1/2 inch (40 mm)</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>020</td>
<td>2 inch (50 mm)</td>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>030</td>
<td>3 inch (80 mm)</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>040</td>
<td>4 inch (100 mm)</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>060</td>
<td>6 inch (150 mm)</td>
<td>50</td>
<td>77</td>
</tr>
<tr>
<td>080</td>
<td>8 inch (200 mm)</td>
<td>70</td>
<td>61</td>
</tr>
</tbody>
</table>

Figure 7. Gasket Placement with Centering Rings
STEP 4: INSTALLATION (SANITARY FLOWTUBE)

Gaskets
The flowtube 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 flowtubes 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 8. Rosemount 8721 Sanitary Installation

User supplied clamp

User supplied gasket

Note: If ordered, manufacturer supplied clamp and gasket
**STEP 5: GROUNDING**

Use Table 5 to determine which grounding option to follow for proper installation. The flowtube case should always be earth grounded in accordance with national and local electrical codes. Failure to do so may impair the protection provided by the equipment. The Internal Ground Connection (Protective Ground Connection) located inside the junction box is the Internal Ground Connection screw. This screw is identified by the ground symbol.

Table 5. Grounding Installation

<table>
<thead>
<tr>
<th>Type of Pipe</th>
<th>Grounding Options</th>
<th>Grounding Rings</th>
<th>Grounding Electrodes</th>
<th>Lining Protectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductive Unlined Pipe</td>
<td>See Figure 9</td>
<td>Not Required</td>
<td>Not Required</td>
<td>See Figure 10</td>
</tr>
<tr>
<td>Conductive Lined Pipe</td>
<td>Insufficient</td>
<td>See Figure 10</td>
<td>See Figure 9</td>
<td>See Figure 10</td>
</tr>
<tr>
<td>Non-Conductive Pipe</td>
<td>Insufficient</td>
<td>See Figure 11</td>
<td>See Figure 12</td>
<td>See Figure 11</td>
</tr>
</tbody>
</table>

Figure 9. No Grounding Options or Grounding Electrode in Lined Pipe
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Figure 10. Grounding with Grounding Rings or Lining Protectors

Figure 11. Grounding with Grounding Rings or Lining Protectors
STEP 6: WIRING

Conduit Ports and Connections
Both the flowtube and transmitter junction boxes have ports for ¾-inch NPT conduit connections. These connections should be made in accordance with local or 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 two cables, but a dedicated conduit line between each transmitter and flowtube is required. Shielded cable must be used for best results in electrically noisy environments.

Conduit Cables
Run the appropriate size cable through the conduit connections in your magnetic flowmeter system. Run the power cable from the power source to the transmitter. Run the coil drive and electrode cables between the flowmeter and transmitter. Prepare the ends of the coil drive and electrode cables as shown in Figure 13. Limit the unshielded wire length to 1-inch on both the electrode and coil drive cables. Excessive lead length or failure to connect cable shields can create electrical noise resulting in unstable meter readings.

Figure 12. Grounding with Grounding Electrodes
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Step 6.1 Transmitter Coil Input
This wiring section covers supplying power to the flowtube coils through the transmitter. The transmitter coil input power sends a pulsed DC frequency to the flowtube.

Wire the transmitter according to local electrical requirements. Ground the transmitter cage via the threaded conduit connection. For ac power applications, connect ac Neutral to terminal N and connect ac Line to terminal L1. For dc power applications, properly connect the positive and negative terminals. Units powered by 15-50 V dc power supply may draw up to 1 amp of current. In addition, follow the supply wire and disconnect requirements below:

Figure 13. Cable Preparation Detail

NOTE Dimensions are in inches (millimeters).
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Supply Wire Requirements
Use 12 to 18 AWG wire rated for the proper temperature application.
For connections in ambient temperatures above 140 °F (60 °C), use a wire rated for 176 °F (80 °C). For ambients greater than 176 °F (80 °C), use a wire rated for 230 °F (110 °C).

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 8732 is (Overvoltage) Category II.
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Overcurrent Protection
The Rosemount 8732 Flowmeter Transmitter requires overcurrent protection of the supply lines. Maximum ratings of overcurrent devices are as follows:

<table>
<thead>
<tr>
<th>Power System</th>
<th>Fuse Rating</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 V ac</td>
<td>250 V; 1 Amp, Quick Acting</td>
<td>Bussman AGCI or Equivalent</td>
</tr>
<tr>
<td>220 V ac</td>
<td>250 V; 0.5 Amp, Quick Acting</td>
<td>Bussman AGCI or Equivalent</td>
</tr>
</tbody>
</table>

Step 6.2 Transmitter Communication Input
Connect 4–20 mA Loop External Power Source
The 4–20 mA output loop signal may be powered internally or externally. The default position of the internal/external analog power jumper is in the internal position. The user-selectable power supply jumper is located on the electronics board.

Internal
The 4–20 mA analog power loop may be powered from the transmitter itself. Resistance in the loop must be 1,000 ohms or less. If a HART Communicator or control system will be used, it must be connected across a minimum of 250 ohms resistance in the loop.

External
HART multidrop installations require a 10–30 V dc external analog power source. If a HART Communicator or control system is to be used, it must be connected across a minimum of 250 ohms resistance in the loop.

To connect external power to the 4–20 mA loop, connect -dc to Terminal 8 and +dc to Terminal 7.

NOTE
To connect any of the other output options (pulse output for totalizing, auxiliary output for switch closure, or positive zero return), consult the comprehensive product manual.
Step 6.3 Transmitter to Flowtube Wiring

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

Remote transmitter installations require equal lengths of signal and coil drive cables. Integrally mounted transmitters are factory wired and do not require interconnecting cables. Lengths from 5 to 1,000 feet (1.5 to 300 meters) may be specified, and will be shipped with the flowtube.

Table 6. Cable Requirements

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Cable (20 AWG) Belden</td>
<td>ft</td>
<td>08712-0061-0001</td>
</tr>
<tr>
<td>8762, Alpha 2411 equivalent</td>
<td>m</td>
<td>08712-0061-0003</td>
</tr>
<tr>
<td>Coil Drive Cable (14 AWG) Belden</td>
<td>ft</td>
<td>08712-0060-0001</td>
</tr>
<tr>
<td>8720, Alpha 2442 equivalent</td>
<td>m</td>
<td>08712-0060-0013</td>
</tr>
<tr>
<td>Combination Signal and Coil Drive Cable</td>
<td>ft</td>
<td>08712-0752-0001</td>
</tr>
<tr>
<td>(18 AWG)(1)</td>
<td>m</td>
<td>08712-0752-0003</td>
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</tbody>
</table>

(1) Combination signal and coil drive cable is not recommended for high-signal magmeter system. For remote mount installations, combination signal and coil drive cable should be limited to less than 100 ft. (30 m).
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Flowtube to Remote Mount Transmitter Connections

Figure 16. Remote Mount Wiring Diagram

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

Flowtube to Integral Mount Transmitter Connections

Figure 17. Integral Mount Wiring Diagram

Do not connect ac power to the flowtube or to terminals 1 and 2 of the transmitter, or replacement of the electronics board will be necessary.
Step 7: Basic Configuration

Once the magnetic flowmeter is installed and power has been supplied, transmitter must be configured through the basic setup. These parameters can be configured through either a local operator interface, a 275 HART Communicator or AMS. 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.

URV (Upper Range Value)
The upper range value (URV), or analog output range, is preset to 30 ft/s at the factory. The units that appear will be the same as those selected under the units parameter.

LRV (Lower Range Value)
Reset the lower range value (LRV), or analog output zero, to change the size of the range (or span) between the URV and LRV. Under normal circumstances, the LRV should be set to a value near the minimum expected flow rate to maximize resolution. The LRV must be between –30 ft/s to 30 ft/s.

Line Size
The line size (tube size) must be set to match the actual flowtube connected to the transmitter. The size must be specified in inches according to the available sizes listed below.
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Calibration Number
The tube calibration number is a 16-digit number used to identify flowtubes calibrated at the Rosemount factory.

<table>
<thead>
<tr>
<th>Function</th>
<th>HART Fast Keys</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROCESS VARIABLES</td>
<td></td>
</tr>
<tr>
<td>Analog Output Test</td>
<td>1, 1</td>
</tr>
<tr>
<td>Pulse Output Test</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Self Test</td>
<td>1, 2, 1, 2</td>
</tr>
<tr>
<td>D/A Trim and (4-20 mA Output Trim)</td>
<td>1, 2, 4, 1</td>
</tr>
<tr>
<td>Scaled D/A Trim</td>
<td>1, 2, 4, 2</td>
</tr>
<tr>
<td>Electronics Trim</td>
<td>1, 2, 4, 3</td>
</tr>
<tr>
<td>Auto Zero Trim</td>
<td>1, 2, 4, 4</td>
</tr>
<tr>
<td>Universal Auto Trim (8712U Only)</td>
<td>1, 2, 4, 5</td>
</tr>
<tr>
<td>DIAGNOSTICS AND SERVICE</td>
<td></td>
</tr>
<tr>
<td>Analog Output Test</td>
<td></td>
</tr>
<tr>
<td>Pulse Output Test</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Self Test</td>
<td>1, 2, 1, 2</td>
</tr>
<tr>
<td>D/A Trim and (4-20 mA Output Trim)</td>
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<tr>
<td>Scaled D/A Trim</td>
<td>1, 2, 4, 2</td>
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<tr>
<td>Electronics Trim</td>
<td>1, 2, 4, 3</td>
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<tr>
<td>Auto Zero Trim</td>
<td>1, 2, 4, 4</td>
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<tr>
<td>Universal Auto Trim (8712U Only)</td>
<td>1, 2, 4, 5</td>
</tr>
<tr>
<td>BASIC SETUP</td>
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</tr>
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<td>Tag</td>
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<tr>
<td>Flow Rate Units</td>
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<tr>
<td>URV (Upper Range Value)</td>
<td>1, 3, 3</td>
</tr>
<tr>
<td>LRV (Lower Range Value)</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>Line Size</td>
<td>1, 3, 5</td>
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<tr>
<td>Calibration Number</td>
<td>1, 3, 6</td>
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<tr>
<td>Damping</td>
<td>1, 3, 7</td>
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<tr>
<td>DETAILED SETUP</td>
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<tr>
<td>User-Defined Volume Unit</td>
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<tr>
<td>Base Volume Unit</td>
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<td>User-Defined Flow Unit</td>
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<td>Measure Gross Total</td>
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<td>Start Totalizer</td>
<td>1, 1, 4, 4</td>
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<td>Stop Totalizer</td>
<td>1, 1, 4, 5</td>
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<tr>
<td>Reset Totalizer</td>
<td>1, 1, 4, 6</td>
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</table>
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 tree. A list of the LOI functions are listed in Table 7 on page 28. The display can be locked to prevent unintentional configuration changes. Select the Display Lock (DL) in the Display Set Menu. Hold the UP arrow for 15 seconds to deactivate the LOI. Exit by pressing the LEFT arrow three times. DL shows up in the lower left hand corner of the display. To reactivate the LOI, hold the UP arrow for 15 seconds. The DL will disappear from the display.
### Table 7. LOI Functions

<table>
<thead>
<tr>
<th>Primary Menu</th>
<th>Secondary Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Set</td>
<td>Display Lock</td>
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<tr>
<td></td>
<td>Flowrate Display</td>
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<td></td>
<td>Totalize Display</td>
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<td></td>
<td>End of List</td>
</tr>
<tr>
<td>Basic Set Up</td>
<td>Units</td>
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<tr>
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<td>Tube Size</td>
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<td>Tube Cal. No.</td>
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<tr>
<td></td>
<td>URV, LRV</td>
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<tr>
<td></td>
<td>Damping</td>
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<tr>
<td>Detailed Set Up</td>
<td>LoFlow Cutoff</td>
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<tr>
<td></td>
<td>Dig Out Config</td>
</tr>
<tr>
<td></td>
<td>Special Units</td>
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<tr>
<td></td>
<td>Coil Frequency</td>
</tr>
<tr>
<td></td>
<td>Signal Processing</td>
</tr>
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<td></td>
<td>Empty Pipe</td>
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<tr>
<td>XMTR Test</td>
<td>XMTR Test</td>
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<tr>
<td></td>
<td>Loop Test</td>
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<td></td>
<td>Pulse Test</td>
</tr>
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<td></td>
<td>End of List</td>
</tr>
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<td>XMTR Trim</td>
<td>4-20 Trim</td>
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<td>Auto Zero</td>
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<td></td>
<td>Gain Trim</td>
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</tr>
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<td>Device Info</td>
<td>Error Messages</td>
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<tr>
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<td>XMTR Tag</td>
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<td>Software Rev</td>
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<td>Flowtube Tag</td>
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<td>Electrode Type</td>
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<tr>
<td></td>
<td>Electrode Mtrl</td>
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<td>Flange Type</td>
</tr>
<tr>
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<td>Flange Mtrl</td>
</tr>
<tr>
<td></td>
<td>End of List</td>
</tr>
</tbody>
</table>
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Product Certificates
Approved Manufacturing Locations
Rosemount Inc. — Chanhassen, Minnesota, USA
Fisher-Rosemount Tecnologias de Flujo, S.A. de C.V. —
Chihuahua, Chihuahua, Mexico

European Directive Information
The EC declaration of conformity for all applicable European directives
for this product can be found on our website at www.rosemount.com.
A hard copy may be obtained by contacting our local sales office.

ATEX Directive
Rosemount Inc. complies with the ATEX Directive.
Flame-Proof enclosure Ex d protection type in
accordance with EN50 018
• Transmitters with Flame-Proof enclosure type protection shall only be opened when power is removed.
• Closing of entries in the device must be carried out using the appropriate EEx d metal cable gland or metal blanking plug.
• Do not exceed the energy level, which is stated on the approval label.

Type n protection type in accordance with EN50 021
• 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.
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European Pressure Equipment Directive (PED) (97/23/EC)

Model 8705 Magnetic Flowmeter flowtubes in line size and flange combinations:
- Line Size: 1 1/2 inch / Flange Type ANSI 600, ANSI 900
- Line Size: 2 inch / Flange Type ANSI 300, ANSI 600, ANSI 900
- Line Size: 3 inch / Flange Type PN40, ANSI 300, ANSI 600, ANSI 900
- Line Size: 4 inch / Flange Type PN 40, ANSI 300, ANSI 600, ANSI 900
- Line Size: 6 inch / all Flange Types
- Line Size: 8 inch / PN16, PN25, PN40, ANSI 150, ANSI300, ANSI 600, ANSI900
- Line Size: 10, 12, 14, 16, 18, 20, 24, 30, 36 inch / all Flange Types
  - QS Certificate of Assessment - EC No. PED-H-20
  - Module H Conformity Assessment

Model 8711 Magnetic Flowmeter Flowtubes
- Line Sizes: 1.5, 2, 3, 4, 6, and 8 inch
  - QS Certificate of Assessment - EC No. PED-H-20
  - Module H Conformity Assessment

All other Model 8705/8711 Flowtubes — Sound Engineering Practice

Flowtubes that are SEP or Category I with Explosion-Proof protection are outside the scope of PED and cannot be marked for compliance with PED.

Mandatory CE-marking for flowtubes in accordance with Article 15 of the PED can be found on the flowtube body (CE 0434).

Flowtube categories I – IV, use module H for conformity assessment procedures.
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Electro Magnetic Compatibility (EMC) (89/336/EEC)
Installed signal wiring should not be run together and should not be in
the same cable tray as AC power wiring.
Device must be properly grounded or earthed according to local
electric codes.
To improve protection against signal interference, shielded cable is
recommended, see “Connect Wiring and Power Up” on page 16 for
more information.

Low Voltage Directive (93/68/EEC)
All Models 8732
EN 61010-1: 1995

Other important guidelines
Only use new, original parts.
To prevent the process medium escaping, do not unscrew or remove
process flange bolts, adapter bolts or bleed screws during operation.
Maintenance shall only be done by qualified personnel.

Hazardous Location Certifications
Equivalent Hazardous Location Certifications for flowtube and
transmitter must match in integrally-mounted magnetic flowmeter
systems. Remote-mounted systems do not require matched
hazardous location certification option codes.
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Transmitter Approval Information

North American Certification

Factory Mutual (FM)

N0   Division 2 Approval
Class I, Division 2, Groups A, B, C, D
Temp Code – T5 at 60°C
Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
Temp Code – T6 at 60°C
Enclosure Type 4X

N5   Division 2 Approval for flowtubes with IS electrodes only
Class I, Division 2, Groups A, B, C, D
Temp Codes – T5 at 60°C
Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
Temp Code – T6 at 60°C
Enclosure Type 4X

E5   Explosion-Proof Approval
Explosion-Proof for Class I, Division 1, Groups C, D
Temp Code – T6 at 60°C
Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
Temp Code – T6 at 60°C
Class I, Division 2, Groups A, B, C, D
Temp Codes – T5 at 60°C,
Enclosure Type 4X

Canadian Standards Association (CSA)

N0   Suitable for Class I, Division 2, Groups A, B, C, D
Temp Code T5 at 60°C
Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
Enclosure Type 4X
European Certifications

ED  ATEX Flame-Proof
Certificate No: KEMA03ATEX2052X  II 2G
Ex e II B T6 (Ta = -20°C to +65°C)
V<sub>max</sub> = 250 V AC or 50 V DC

SPECIAL CONDITIONS FOR SAFE USE (X):
If the Model 8732 Flow Transmitter is used integrally with the Model 8705 or 8711 Flowtubes, it shall be assured that the mechanical contact areas of the Flowtube and Flow Transmitter comply with the requirements for flat joints according to standard EN 50018, clause 5.2.

The relation between ambient temperature, process temperature, and temperature class is to be taken from the table under (15 - description) above.

The electrical data is to be taken from the summary under (15 - electrical data) above. (See Table 9)

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.
Flowtube Approval Information

Table 8. Flowtube Option Codes

<table>
<thead>
<tr>
<th>Approval Codes</th>
<th>For Non-flammable Fluids</th>
<th>For Flammable Fluids</th>
<th>For Non-flammable Fluids</th>
<th>For Flammable Fluids</th>
<th>For Non-flammable Fluids</th>
<th>For Flammable Fluids</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
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<td>E5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
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<td>CD1(2)</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>KD1(2)</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

(1) CE Marking is standard on Model 8705 and 8711. No hazardous location certifications are available on the Model 5707M.

(2) Refer to Table 9 on page 38 for relation between ambient temperature, process temperature, and temperature class.

Factory Mutual (FM)

N0 Division 2 Approval for Non-Flammable Fluids (All Flowtubes)
- Class I, Division 2, Groups A, B, C, D
- Temp Code – T5 (8705/8711 at 60°C)
- Temp Code – T3C (8707 at 60°C)
- Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
- Temp Code – T6 (8705/8711 at 60°C)
- Temp Code – T5 (8707 at 60°C)
- Enclosure Type 4X

N5 Division 2 Approval for Flammable Fluids (All Flowtubes)
- Class I, Division 2, Groups A, B, C, D
- Temp Code – T5 (8705/8711 at 60°C)
- Temp Code – T3C (8707 at 60°C)
- Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
- Temp Code – T6 (8705/8711 at 60°C)
- Temp Code – T5 (8707 at 60°C)
- Enclosure Type 4X
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E5  Explosion-Proof (8711 Only)
   Explosion-Proof for Class I, Division 1, Groups C, D
   Temp Code – T6 at 60°C
   Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
   Temp Code – T6 at 60°C
   Class I, Division 2, Groups A, B, C, D
   Temp Code – T5 at 60°C
   Enclosure Type 4X

Canadian Standards Association (CSA)
N0  Suitable for Class I, Division 2, Groups A, B, C, D
   Temp Code – T5 (8705/8711 at 60°C)
   Temp Code – T3C (8707 at 60°C)
   Dust-Ignition proof Class II/III, Division 1, Groups E, F, G
   Enclosure Type 4X

European Certifications
N1  Pending - ATEX Non-Sparking/Non-incendive (8705/8711 Only)
   Certificate No: KEMA02ATEX1302X  II 3G
   EEx nA [L] IIC T3... T6

SPECIAL CONDITIONS FOR SAFE USE (X):
To Be Determined
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CD ATEX Increased Safety (Zone 1)
with IS Electrodes (8711 only)
Certificate No: KEMA03ATEX2052X ☞ II 1/2G
EEx e ia IIC T3... T6 (Ta = -20 to +65°) (See Table 9)
☞ 0575

SPECIAL CONDITIONS FOR SAFE USE (X):
If the Model 8732 Flow Transmitter is used integrally with the Model 8705 or 8711 Flowtubes, it shall be assured that the mechanical contact areas of the Flowtube and Flow Transmitter comply with the requirements for flat joints according to standard EN 50018, clause 5.2.

The relation between ambient temperature, process temperature and temperature class is to be taken from the table under (15 - description) above.

The electrical data is to be taken from the summary under (15 - electrical data) above.

INSTALLATION INSTRUCTIONS:
At ambient temperatures above 50°C, the flowmeter shall be used with heat resistant cables with a temperature rating of at least 90°C.
A fuse with a rating of maximum 0,7 A according to IEC 127 shall be included in the coil excitation circuit if the flowtubes are used with other flow transmitters (e.g. Model 8712).
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KD  ATEX Increased Safety (Zone 1)
   with IS Electrodes (8705 only)
Certificate No. KEMA 03ATEX2052X  Ex ia IIC T3... T6 (Ta = -20 to 65°C) (See Table 9)

SPECIAL CONDITIONS FOR SAFE USE (X):
If the Model 8732 Flow Transmitter is used integrally with the Model 8705 or 8711 Flowtubes, it shall be assured that the mechanical contact areas of the Flowtube and Flow Transmitter comply with the requirements for flat joints according to standard EN 50018, clause 5.2.

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Table 9. Relation between ambient temperature, process temperature, and temperature class\(^{(1)}\)

<table>
<thead>
<tr>
<th>Meter Size (Inches)</th>
<th>Maximum Ambient Temperature</th>
<th>Maximum Process Temperature</th>
<th>Temperature Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\frac{1}{2})</td>
<td>149°F (65°C)</td>
<td>239°F (115°C)</td>
<td>T3</td>
</tr>
<tr>
<td>1</td>
<td>149°F (65°C)</td>
<td>248°F (120°C)</td>
<td>T3</td>
</tr>
<tr>
<td>1</td>
<td>95°F (35°C)</td>
<td>95°F (35°C)</td>
<td>T4</td>
</tr>
<tr>
<td>1(\frac{1}{2})</td>
<td>149°F (65°C)</td>
<td>257°F (125°C)</td>
<td>T3</td>
</tr>
<tr>
<td>1(\frac{1}{2})</td>
<td>140°F (60°C)</td>
<td>140°F (60°C)</td>
<td>T4</td>
</tr>
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<td>2</td>
<td>149°F (65°C)</td>
<td>257°F (125°C)</td>
<td>T3</td>
</tr>
<tr>
<td>2</td>
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<td>167°F (75°C)</td>
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</tr>
<tr>
<td>2</td>
<td>104°F (40°C)</td>
<td>104°F (40°C)</td>
<td>T5</td>
</tr>
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<td>3 - 4</td>
<td>149°F (65°C)</td>
<td>266°F (130°C)</td>
<td>T3</td>
</tr>
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<td>3 - 4</td>
<td>104°F (40°C)</td>
<td>104°F (40°C)</td>
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<td>149°F (65°C)</td>
<td>275°F (135°C)</td>
<td>T3</td>
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<td>6</td>
<td>149°F (65°C)</td>
<td>230°F (110°C)</td>
<td>T4</td>
</tr>
<tr>
<td>6</td>
<td>149°F (65°C)</td>
<td>167°F (75°C)</td>
<td>T5</td>
</tr>
<tr>
<td>6</td>
<td>140°F (60°C)</td>
<td>140°F (60°C)</td>
<td>T6</td>
</tr>
<tr>
<td>8 - 36</td>
<td>149°F (65°C)</td>
<td>284°F (140°C)</td>
<td>T3</td>
</tr>
<tr>
<td>8 - 36</td>
<td>149°F (65°C)</td>
<td>239°F (115°C)</td>
<td>T4</td>
</tr>
<tr>
<td>8 - 36</td>
<td>149°F (65°C)</td>
<td>176°F (80°C)</td>
<td>T5</td>
</tr>
<tr>
<td>8 - 36</td>
<td>149°F (65°C)</td>
<td>149°F (65°C)</td>
<td>T6</td>
</tr>
</tbody>
</table>

\(^{(1)}\) This table is applicable for L\(\text{U}\) and K\(\text{U}\) option codes only.