ATEX Installation Instructions for Micro Motion® Model 9701/9703 Transmitters
Note: For hazardous installations in Europe, refer to standard EN 60079-14 if national standards do not apply.

Information affixed to equipment that complies with the Pressure Equipment Directive can be found on the internet at www.micromotion.com/library.

If you require the information given in this manual in a different language, please contact Micro Motion Customer Service.
Model IFT9701/IFT9703 Transmitters
Installation Drawings and Instructions

• For installing the following Micro Motion transmitters:
  - Model IFT9701
  - Model IFT9703

Subject: Equipment type
Transmitter type IFT9701******* and IFT9703*C******
Manufactured and submitted for examination
Micro Motion, Inc.
Address
Boulder, Co. 80301, USA
Standard basis
EN 50014:1997 +A1-A2 General requirements
EN 50018:2000 Flameproof enclosure ”d´
EN 50019:2000 Increased safety ’e´
EN 50020:2002 Intrinsic safety ’i´
Code for type of protection
[EExib] IIB/IIC
EEx de [ib] IIB/IIC T6
1) **Subject and type**

**Transmitter type IFT9701******

The options denoted by * are as follows:

IFT9701 * *** **

- Letter for factory options
- Letter for language
- Approval
  - Y = ATEX intrinsically safe sensor outputs
  - W = ATEX intrinsically safe sensor outputs flameproof transmitter
- Letter for conduit connections
- Display
  - N = No display
  - D = LCD display
- Power rating
  - 3 = 20–30 VDC
  - 6 = 85–250 VAC
- Letter code for mounting

**Transmitter type IFT9703******

The options denoted by * are as follows:

IFT9703 * *C ***

- Letter for factory options
- Letter for language
- Approval
  - W = ATEX intrinsically safe sensor outputs flameproof transmitter
- Letter for conduit connections
- Display
  - N = No display
  - D = LCD display
- Power rating
  - 3 = 20–30 VDC
  - 6 = 85–250 VAC
- Letter code for mounting
2) Description

The transmitter is, in combination with a sensor, used for measurement of mass flow and data transmission. For the transmitter two variations are available:

1. Mounted inside the hazardous area type IFT9701**N*W** and IFT9703*C*N*W**.
2. Mounted outside the hazardous area type IFT9701**(N or D)*Y** and IFT9703*C*(N or D)*Y**.

The electrical components of the transmitter are securely fixed in a light metal housing.

In the variation type IFT9701**N*W** and IFT9703*C*N*W**, the housing consists of a junction box with type of protection "Increased Safety" for the connection of the non intrinsically safe power supply and signal circuits, a compartment with type of protection "Flameproof Enclosure" and a junction box for the connection of the intrinsically safe sensor circuits.

3) Parameters

3.1) Mains circuit (terminals 7 and 8)

for type IFT9701*3***** and IFT9703*C3*****

| Voltage | DC | 20–30 V |
| Max. voltage | Um | DC | 30 V |

for type IFT9701*6***** and IFT9703*C6*****

| Voltage | AC | 85–250 V |
| Max. voltage | Um | AC | 250 V |

3.2) Non intrinsically safe outputs

for type IFT9701****** and IFT9703*C******

mA terminals (terminals 6 and 5)

| Voltage | Um | DC | 20 V |

Frequency output terminals (terminals 2 and 1)

| Max. voltage | Um | DC | 30 V |

3.3) Intrinsically safe circuits type of protection EEx ib IIC / EEx ib IIB

The circuits designed for connecting sensors are classified initially in Group IIC. However, when certain sensors are connected, they can also be assigned to Group IIB.

3.3.1) Drive circuit (terminals 1 and 2)

| Max. voltage | Um | DC | 11,4 V |
| Max. current | Im | | 1,14 A |
| Nominal fuse | | | 250 mA |
| Max. power | Pm | | 1,2 W |
| Internal resistance | Ri | | 10 Ω |
The maximum external inductance $L$ (sensor coil) can be calculated with the following term:

$$L = 2 \times E \times \left(\frac{R_i + R_o}{1,5 \times U_o}\right)^2$$

Whereby $E = 40 \, \mu J$ for group IIC and $E = 160 \, \mu J$ for group IIB and $R_i = 10 \, \Omega$ and $U_o = 11,4 \, V$ will be inserted and $R_o$ is the total resistance (coil resistance + series resistance).

### 3.3.2 Pick-off circuits (terminals 5, 9 and 6, 8)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>$U_{\text{max}}$</th>
<th>DC</th>
<th>15,6</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>$I_{\text{max}}$</td>
<td></td>
<td>10</td>
<td>mA</td>
</tr>
<tr>
<td>Power</td>
<td>$P_{\text{max}}$</td>
<td></td>
<td>40</td>
<td>mW</td>
</tr>
</tbody>
</table>

### 3.3.3 Temperature circuit (terminals 3, 4, 7)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>$U_{\text{max}}$</th>
<th>DC</th>
<th>15,6</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>$I_{\text{max}}$</td>
<td></td>
<td>10</td>
<td>mA</td>
</tr>
<tr>
<td>Power</td>
<td>$P_{\text{max}}$</td>
<td></td>
<td>40</td>
<td>mW</td>
</tr>
</tbody>
</table>

### 3.4 Ambient temperature range

- IFT9701******: $T_a$ from $-40 \, ^\circ C$ to $+55 \, ^\circ C$
- IFT9703*C******: $T_a$ from $-40 \, ^\circ C$ to $+55 \, ^\circ C$
4) Marking

\[ \textbf{Ex} \quad \text{II 2 G or II (2) G} \]

\[-40 ^{\circ}\text{C} \leq Ta \leq +55 ^{\circ}\text{C} \]

<table>
<thead>
<tr>
<th>- type</th>
<th>- type of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFT9701**(N or W)**</td>
<td>EEx de [ib] IIB/IIIC T6</td>
</tr>
<tr>
<td>IFT9701**(N or D)<em>Y</em>*</td>
<td>[EEx ib] IIB/IIIC</td>
</tr>
<tr>
<td>IFT9703<em>C</em>N*W**</td>
<td>EEx de [ib] IIB/IIIC T6</td>
</tr>
<tr>
<td>IFT9703<em>C</em>(N or D)<em>Y</em>*</td>
<td>[EEx ib] IIB/IIIC</td>
</tr>
</tbody>
</table>

5) Special conditions for safe use / Installation instructions for IFT9701 or IFT9703.

5.1) For the application of the transmitter in an ambient temperature of less than -20°C suitable cable and cable entries or conduit entries certified for this condition shall be used.

5.2) For installation outside the hazardous area, it is allowed to use cable entry fittings that are not increased safety EEx e.

5.3) To achieve potential equalization, the conductor for the transmitter grounding terminal must be connected to the appropriate grounding terminal inside the hazardous area using a potential equalizing line.

5.4) The non-intrinsically safe end of the transmitter must only be connected to devices where there are no voltages higher than 250V.

5.5) For types IFT9701**(N*W** and IFT9703*C*N*W**

Warning — Do not open EEx d within 2 minutes after power is disconnected.
Model IFT9701 to CMF (except CMF400), H (except H300) and F (except F300) sensors with junction box

**IFT9701 IN HAZARDOUS AREA OR SAFE AREA TO SENSOR IN HAZARDOUS LOCATION**

To achieve potential equalization, the conductor for the transmitter grounding terminal must be connected to the appropriate grounding terminal inside the hazardous area using a potential equalizing line.

**Non-I.S. parameters**

- **Voc**: 20 V
- **Isc**: 5 mA
- **Co**: 0.75 µF
- **Lo**: 100 nH

**CAUTION:** To maintain intrinsic safety, the intrinsically safe wiring must be separated from all other wiring and the IFT9701 transmitter and sensor must be properly grounded.

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**MODELS**

<table>
<thead>
<tr>
<th>Models</th>
<th>CMF (except F300 and F300A)</th>
<th>H (except H300)</th>
</tr>
</thead>
</table>

Supplied as intrinsically safe

**Electronics:** IFT9701
**Sensor:** CMF, F, H

EB-20001039 Rev. E
Model IFT9701 to D (except D600) and DL sensors with junction box

IFT9701 IN HAZARDOUS AREA OR SAFE AREA TO SENSOR IN HAZARDOUS LOCATION

Equipment ground

External equipment ground

To achieve potential equalization, the conductor for the transmitter grounding terminal must be connected to the appropriate grounding terminal inside the hazardous area using a potential equalizing line.

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Model IFT9701

(IFIT9701 with increased safety (EExe) cable glands)

For installation in Hazardous Area EEx de[ib] IIB/IIC T6

For installation outside the hazardous area, it is allowed to use cable entry fittings that are not increased safety EExe.

Refer to sensor tag for complete hazardous area classification.

Non-I.S. parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{oc}$</td>
<td>20 V</td>
</tr>
<tr>
<td>$I_{sc}$</td>
<td>5 mA</td>
</tr>
<tr>
<td>$C_0$</td>
<td>0.75 $\mu$F</td>
</tr>
<tr>
<td>$L_0$</td>
<td>100 mH</td>
</tr>
<tr>
<td>$V_{max}$</td>
<td>30 V</td>
</tr>
<tr>
<td>$I_{max}$</td>
<td>128 mA</td>
</tr>
<tr>
<td>$C_1$</td>
<td>D</td>
</tr>
<tr>
<td>$L_1$</td>
<td>D</td>
</tr>
</tbody>
</table>

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Model IFT9701

(IFIT9701 with industrial cable glands)

For installation in Safe Area [EEx lb] IIB/IIC

For installation in Hazardous Area EEx ib IIB/IIC

Refer to sensor tag for complete hazardous area classification.

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Hazardous Area EEx ib IIB/IIC

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CAUTION:

To maintain intrinsic safety, the intrinsically safe wiring must be separated from all other wiring and the IFT9701 transmitter and sensor must be properly grounded.

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MODELS

D, DL

Supplied as intrinsically safe

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Electronics: IFT9701

Sensor: D, DL

EB-20000370 Rev. B
To achieve potential equalization, the conductor for the transmitter grounding terminal must be connected to the appropriate grounding terminal inside the hazardous area using a potential equalizing line.

**CAUTION:**
To maintain intrinsic safety, the intrinsically safe wiring must be separated from all other wiring and the IFT9701 transmitter and sensor must be properly grounded.

**WARNING:** Do not open EEx d within 2 minutes after power is disconnected.

Refer to sensor tag for complete hazardous area classification.