

**Installation Instructions**

P/N MMI-20011711, Rev. A

September 2008

**ATEX Installation Instructions  
for Micro Motion<sup>®</sup> MVD<sup>™</sup>  
Direct Connect<sup>™</sup> Meters**



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](http://www.micromotion.com/library).

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Reference nos. EB-3600635 Rev. A and EB-20003369 Rev. B

# MVD™ Direct Connect™ Meters

## ATEX Drawings and Installation Instructions

- For installing the following Micro Motion transmitters and devices:
  - Model 700 core processor
  - Model 800 core processor
  - Direct Connect I.S. barrier



Subject:	Equipment type	<b>Signal Processing Device type 700 and Signal Processing Device type 800</b>	
Manufactured and submitted for examination		<b>Micro Motion, Inc.</b>	
Address		<b>Boulder, Co. 80301, USA</b>	
Basis for examination:		<b>Annex II of Directive 94/9/EC</b>	
Standard basis	Type 700	EN 50014:1997 +A1-A2	General requirements
		EN 50020:1994	Intrinsic safety 'i'
	Type 800	EN 60079-0:2006	General requirements
		EN 60079-11:2007	Intrinsic safety 'i'
Code for type of protection	Type 700	<b>EEx ib IIB/IIC T5</b>	
	Type 800	<b>Ex ib IIB/IIC T5</b>	

**1) Subject and type**

Signal processing device type 700 and type 800

**2) Description**

The signal processing device is used for the connection of sensors to transmitters via a 9 pin energy limited interface.

The electrical components are completely encapsulated in a plastic housing. On the top of the housing are terminals for the connection of the circuits from/to the transmitter and the connection of the sensor is by means of a 9 pin connector at the lower side.

**3) Parameters**

- 3.1) Input circuit (terminals 1–4) for Type 700  
 Input circuit (J1 pins 1–2 and J2 pins 1–2) for Type 800

Voltage	U <sub>i</sub>	DC	17,3	V
Current	i <sub>i</sub>		484	mA
Power	P <sub>i</sub>		2,1	W
Effective internal capacitance	C <sub>i</sub>		2200	pF
Effective internal inductance	L <sub>i</sub>		30	μH

- 3.2) Output (sensor) circuits for type 700

		Drive circuit pins 7–8	Pick-off circuits J4 pins 3–6	Temperature circuit J4 pins 1, 2, and 9			
Voltage	U <sub>o</sub>	10,5 Vdc	17,3 Vdc	17,3 Vdc			
Current	I <sub>o</sub>	2,45 A	6,9 mA	26 mA			
Power	P <sub>o</sub>	2,54 W	30 mW	112 mW			
Internal resistance	R <sub>i</sub>	4,32 Ω					
<b>Group</b>		<b>IIC</b>	<b>IIB</b>	<b>IIC</b>	<b>IIB</b>	<b>IIC</b>	<b>IIB</b>
Max. external inductance	L <sub>o</sub>	5,9 μH	24 μH	742 mH	2,97 H	52,6 mH	210 mH
Max. external capacitance	C <sub>o</sub>	2,41 μF	16,8 μF	353 nF	2,06 μF	353 nF	2,06 μF
Max. inductance/resistance ratio	L <sub>o</sub> /R <sub>o</sub>	5,5 μH/Ω	22 μH/Ω	1,19 mH/Ω	4,75 mH/Ω	0,32 mH/Ω	1,26 mH/Ω

## 3.3) Output (sensor) circuits for type 800

		Drive circuit pins 7–8	Pick-off circuits J4 pins 3–6	Temperature circuit J4 pins 1, 2, and 9			
Voltage	U <sub>o</sub>	10,5 Vdc	17,3 Vdc	17,3 Vdc			
Current	I <sub>o</sub>	2,45 A	18,05 mA	4,61 mA			
Power	P <sub>o</sub>	2,54 W	30 mW	20 mW			
Internal resistance	R <sub>i</sub>	4,32 Ω					
<b>Group</b>		<b>IIC</b>	<b>IIB</b>	<b>IIC</b>	<b>IIB</b>	<b>IIC</b>	<b>IIB</b>
Max. external inductance	L <sub>o</sub>	5,9 μH	24 μH	109 mH	436 mH	1,67 H	6,69 H
Max. external capacitance	C <sub>o</sub>	2,41 μF	16,8 μF	353 nF	2,06 μF	353 nF	2,06 μF
Max. inductance/resistance ratio	L <sub>o</sub> /R <sub>o</sub>	5,5 μH/Ω	22 μH/Ω	1,19 mH/Ω	4,75 mH/Ω	1,78 mH/Ω	7,14 mH/Ω

## 3.4) Ambient temperature range

For type 700 and type 800                      T<sub>a</sub>                      –40 °C up to +60 °C

## 4) Marking

 II 2 G

–40 °C ≤ T<sub>a</sub> ≤ +60 °C

- type	- type of protection
Signal processing device type 700	EEx ib IIB/IIC T5
Signal processing device type 800	Ex ib IIB/IIC T5

## 5) Special conditions for safe use / Installation instructions

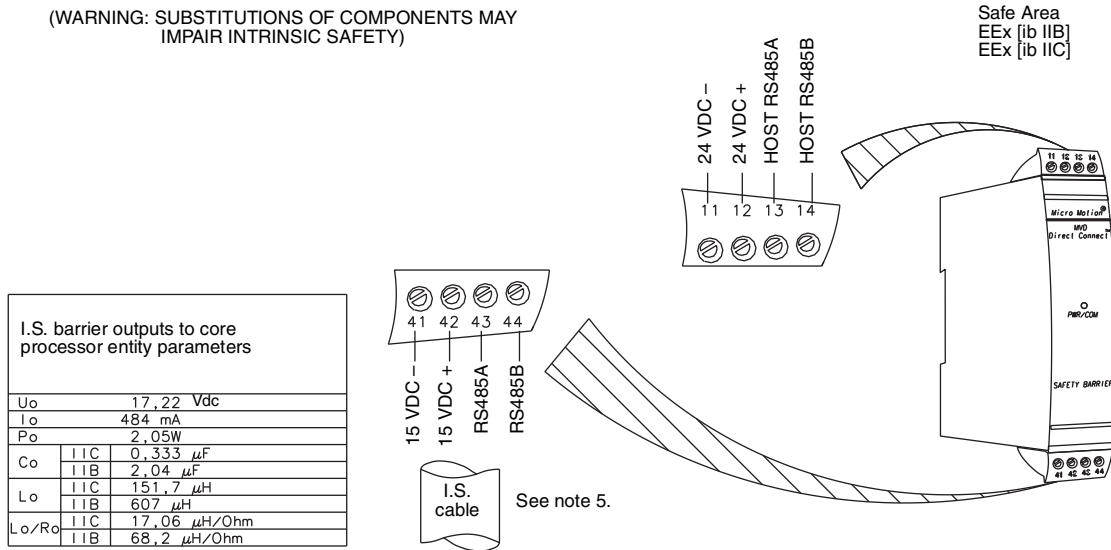
- 5.1) The signal processing device has to be mounted inside an enclosure degrees of protection min. IP 20 in accordance with EN 60529.
- 5.2) The installation of the signal processing device inside an enclosure has to be done in a way that the distance in air between the connection facilities and earthed metal parts is min. 3 mm.

# Direct Connect I.S. barrier installation drawings

**Figure 1: I.S. barrier to direct host**

COMBINE THIS DRAWING WITH ONE OF FIGURE 2, 3, 4, OR 5

(WARNING: SUBSTITUTIONS OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY)



5. Maximum cable length determined by entity parameters and maximum cable inductance.

Reference no. EB-20003018 Rev. A

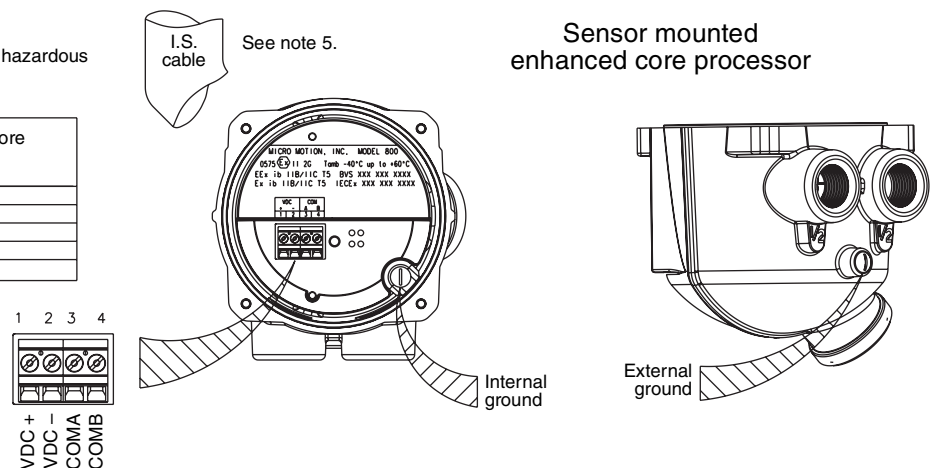
**Figure 2: CMF sensor with enhanced core processor**

COMBINE THIS DRAWING WITH FIGURE 1

Hazardous Area  
EEx ib IIC / IIB

Refer to sensor tag for complete hazardous area classification.

U <sub>i</sub>	17,3 Vdc
I <sub>i</sub>	484 mA
P <sub>i</sub>	2,1W
C <sub>i</sub>	2200pF
L <sub>i</sub>	30μH



5. Maximum cable length determined by entity parameters and maximum cable inductance.

Reference no. EB-20003018 Rev. A

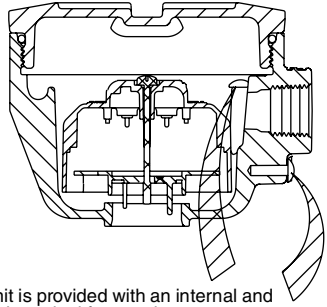
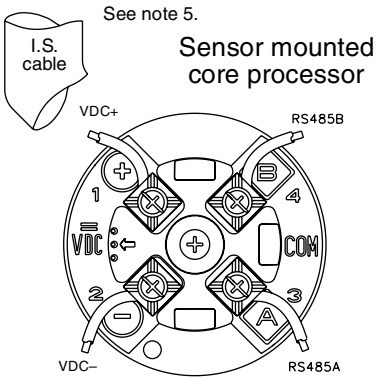
**Figure 3: CMF, D (except D600), DL, F, H, R, CNG and T sensors with core processor**

COMBINE THIS DRAWING WITH FIGURE 1

Hazardous Area  
EEx ib IIC / IIB

Refer to sensor tag for complete hazardous area classification.

4-wire I.S. and non-incendive core processor entity parameters	
U <sub>i</sub>	17,3 Vdc
I <sub>i</sub>	484 mA
P <sub>i</sub>	2,1W
C <sub>i</sub>	2200pF
L <sub>i</sub>	30μH



This unit is provided with an internal and external terminal for supplementary bonding connection. This terminal is for use where local codes or authorities permit or require such connection.

5. Maximum cable length determined by entity parameters and maximum cable inductance.

Reference no. EB-3600800 Rev. B

**Figure 4: D600 with core processor**

COMBINE THIS DRAWING WITH FIGURE 1

Hazardous Area  
EEx de [ib] IIB T4

Refer to sensor and booster amplifier tags for complete hazardous area classification.

4-wire I.S. and non-incendive core processor entity parameters	
U <sub>i</sub>	17,3 Vdc
I <sub>i</sub>	484 mA
P <sub>i</sub>	2,1W
C <sub>i</sub>	2200pF
L <sub>i</sub>	30μH

Installation method	Fitting required	Per EN60079-14
Conduit	EEx d IIB Conduit Seal	
Cable	EEx d IIB Cable Gland	
Conduit or Cable Increased Safety	EEx e	

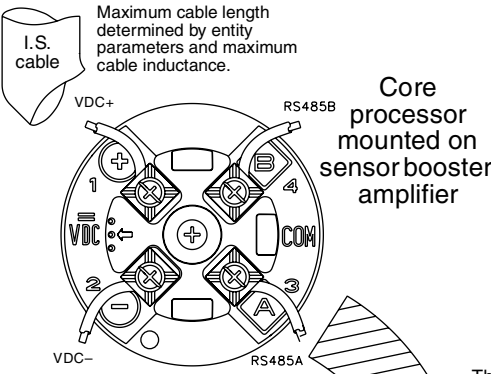
Conduit Seal Required within 18" of enclosure. To be sealed after wiring. (customer supplied)

1/2"-14 NPT or M20 x 1,5 adapter supplied as ordered

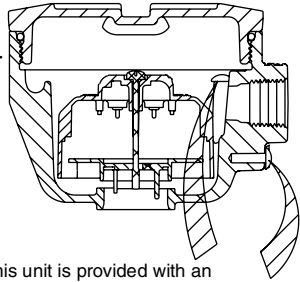
85-265 VAC | N/L2 | L/L1 | 50-60 HZ

Explosion-Proof housing

To achieve potential equalization the ground terminal must be connected to the appropriate ground terminal within the hazardous area using a potential equalizing line.



For remote mount booster amplifier wiring see drawing EB-1005122

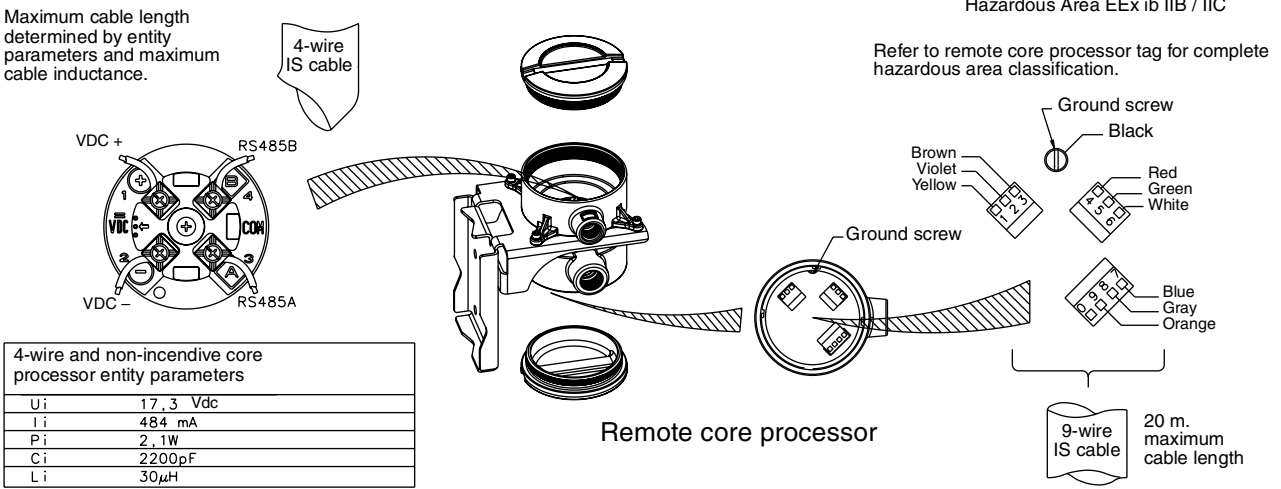


This unit is provided with an internal and external terminal for supplementary bonding connection. This terminal is for use where local codes or authorities permit or require such connection.

Reference no. EB-1005181 Rev. B

**Figure 5: Remote core processor with remote transmitter**

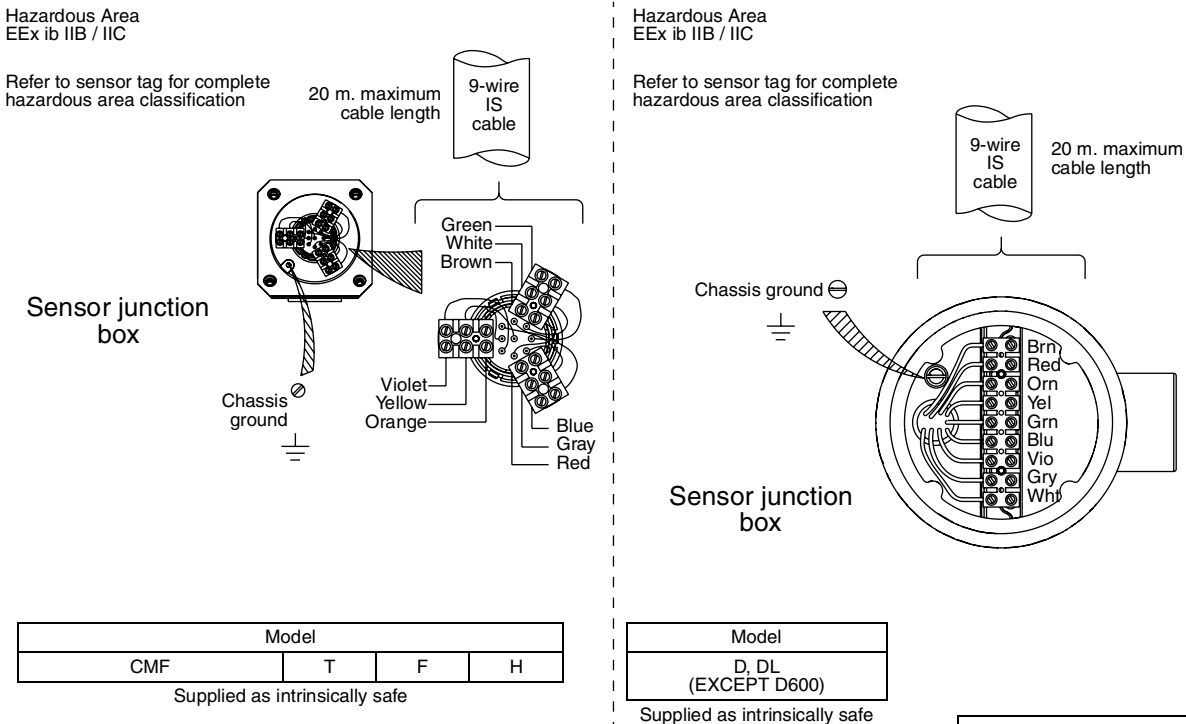
COMBINE THIS DRAWING WITH FIGURE 1 AND ALSO WITH ONE OF FIGURE 6, 7, OR 8



Reference no. EB-20001049 Rev. C

**Figure 6: CMF, D (except D600), DL, F, H, and T sensor with junction box**

COMBINE THIS DRAWING WITH FIGURES 1 AND 5



Reference no. EB-20006378 Rev. A



**Figure 7: D600 with junction box**

COMBINE THIS DRAWING WITH FIGURES 1 AND 5

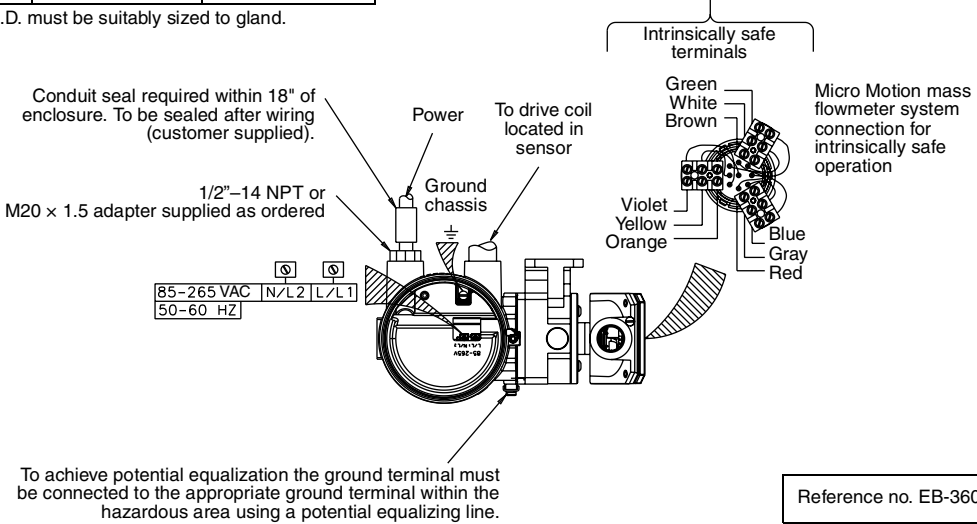
Hazardous Area  
EExde [ib] IIB

For remote mount booster amplifier wiring refer to EB-3007062.

**CAUTION:**  
To maintain intrinsic safety, the intrinsically safe wiring must be installed according to EN 60079-14. Transmitter and sensor must be properly grounded.

Installation method	Fitting required	Per EN60079-14
Conduit	EEx d IIB conduit seal	
Cable	EEx d IIB cable gland	
Conduit or cable increased safety	EEx e	

Cable O.D. must be suitably sized to gland.



To achieve potential equalization the ground terminal must be connected to the appropriate ground terminal within the hazardous area using a potential equalizing line.

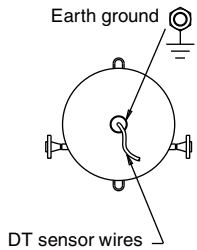
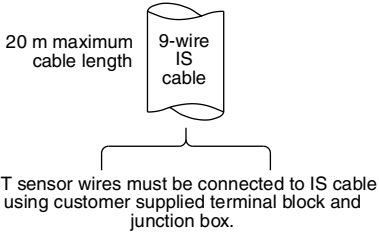
Reference no. EB-3600808 Rev. C

**Figure 8: DT with junction box**

COMBINE THIS DRAWING WITH FIGURES 1 AND 5

Hazardous Area  
EEx ib IIB

Special conditions for safe use:  
For the sensor types DT065, DT100, and DT150 the following applies: The minimum medium temperature is +32 °C.



DT sensor wire terminations to IS cable	
DT sensor wire #	IS cable color
1	Brown
2	Red
3	Orange
4	Yellow
5	Green
6	Blue
7	Violet
8	Gray
9	White

Micro Motion mass flowmeter system connection for intrinsically safe operation

**CAUTION:**  
To maintain intrinsic safety, the intrinsically safe wiring must be installed according to EN-60079-14. Transmitter and sensor must be properly grounded.

Models: DT65, DT100, DT150  
Supplied as intrinsically safe

Reference no. EB-20002030 Rev. B

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**Micro Motion Inc. USA**  
Worldwide Headquarters  
7070 Winchester Circle  
Boulder, Colorado 80301  
T +1 303-527-5200  
+1 800-522-6277  
F +1 303-530-8459

**Micro Motion Europe**  
Emerson Process Management  
Neonstraat 1  
6718 WX Ede  
The Netherlands  
T +31 (0) 318 495 555  
F +31 (0) 318 495 556

**Micro Motion United Kingdom**  
Emerson Process Management Limited  
Horsfield Way  
Bredbury Industrial Estate  
Stockport SK6 2SU U.K.  
T +44 0870 240 1978  
F +44 0800 966 181

**Micro Motion Asia**  
Emerson Process Management  
1 Pandan Crescent  
Singapore 128461  
Republic of Singapore  
T +65 6777-8211  
F +65 6770-8003

**Micro Motion Japan**  
Emerson Process Management  
1-2-5, Higashi Shinagawa  
Shinagawa-ku  
Tokyo 140-0002 Japan  
T +81 3 5769-6803  
F +81 3 5769-6844

