Installation Instructions
P/N MMI-20015054, Rev. AA
May 2009

ATEX Installation Instructions for Micro Motion® ELITE® CMFS Sensors

For ATEX-approved sensor installations

Micro Motion®

EMERSON™
Process Management

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/documentation.

If you require the information given in this manual in a different language, please contact Micro Motion Customer Service.

ELITE Sensors (CMFS-Series)

ATEX Installation Instructions

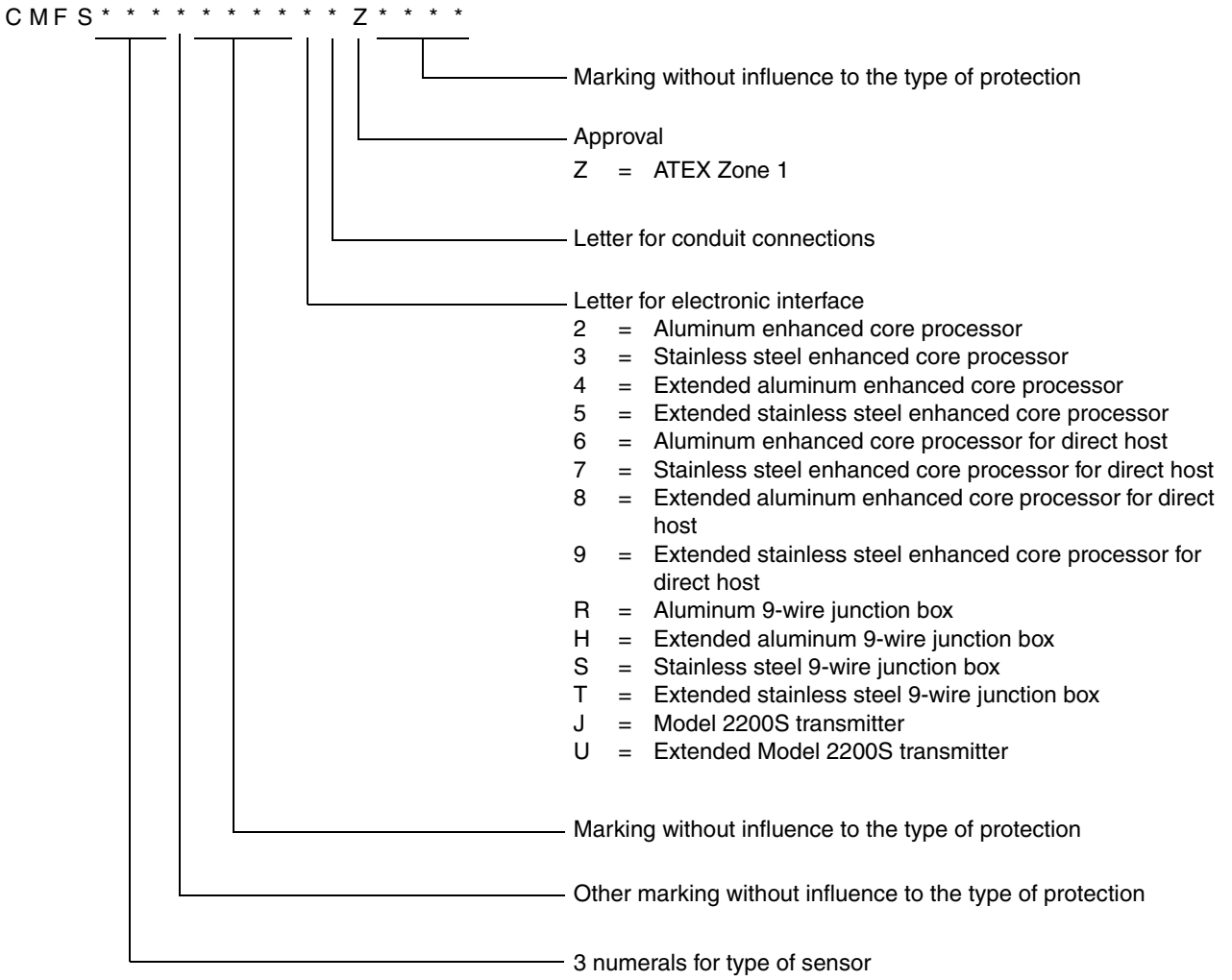
- For installing the following Micro Motion sensors with ATEX Certificate number BVS09 ATEX E 018 X:
  - Model CMFS010
  - Model CMFS015

Subject: Equipment type	**Sensor type CMFS*** **********	
Manufactured and submitted for examination	**Micro Motion, Inc.**	
Address	**Boulder, Co. 80301, USA**	
Basis for examination:	**Annex II of Directive 94/9/EC**	
Standard basis	EN 60079-0:2006	General requirements
	EN 60079-11:2007	Intrinsic safety ´i´
	EN 61241-0:2006 and EN 61241-1:2004	Dust evaluation ´tD A´
Code for type of protection	**II 2G Ex ib IIC T1–T4/T5/T6** **II 2D Ex tD A21 IP65 T***	
EC Type Examination Certificate	**BVS 09 ATEX E 018 X**	

1) Subject and type

Sensor type CMFS*** **********

Instead of the asterisks (*), letters and numerals will be inserted which indicate the following modifications:



2) Description

The flow sensor, in combination with a transmitter, is used for flow measurement. The flow sensor, which consists of magnetically excited oscillating tubes, contains as electrical components coils, resistors, temperature sensors and terminals and connectors.

- When used with an integral mounted junction box, the sensor is given the denomination CMFS********(S or T)****** for a SS enclosure and CMFS********(R or H)****** for an aluminum enclosure. See Section 3.1.

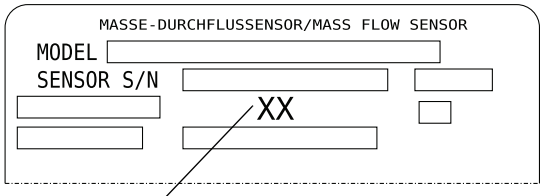
- When used with a type 800 integral mounted enhanced signal processing device, the sensor is given the denomination CMFS*** *****(3, 5, 7 or 9)****** for a stainless steel enclosure and CMFS*** *****(2, 4, 6 or 8)****** for an aluminum enclosure. See Section 3.2.

- When used with an integral type 2200S********* transmitter, the sensor is given the denomination CMFS*** *****(J or U)******. See Section 3.3.

- By mounting the sensor directly to a 2200S transmitter, the use of the unit will be modified according to the following table:

	CMFS010*****(J,U)*Z**** CMFS015*****(J,U)*Z****
Transmitter type 2200S***1*Z****	Ex ib IIC T1–T4 Ex ibD 21 T70°C

Modifications to the design which have impact on the electrical parameters are indicated by a Construction Identification Code (CIC). This code consists out of two digits, starting with an A and followed by a sequence number; for example A4. The CIC can be found on the approval label, see picture below:



Construction Identification Code (CIC) (Approximate location)

3) Parameters

3.1) **Type CMFS********(R, H, S, or T)********
Sensor with junction box

3.1.1) Drive circuit
Connections 1 (red) and 2 (brown)

Voltage	Ui	DC	11,4	V
Current	Ii		2,45	A
Power	Pi		2,54	W
Effective internal capacitance			Negligible	

Sensor type			Inductance (mH)	Coil Resistance (Ω)	Series Resistor (Ω)	Minimum Ambient/Fluid Temp (°C)
CMFS010*****(R,H,S,T)*Z****		IIC	1,25	0	945,1	–240
CMFS015*****(R,H,S,T)*Z****		IIC	1,25	0	945,1	–240

3.1.2) Pick-off circuit coil
Terminals 5/9 (green/white) and 6/8 (blue/grey)

Voltage	Ui	DC	30	V
Current	Ii		101	mA
Power	Pi		750	mW
Effective internal capacitance			Negligible	

Sensor type			Inductance (mH)	Coil Resistance (Ω)	Series Resistor (Ω)	Minimum Ambient/Fluid Temp (°C)
CMFS010*****(R,H,S,T)*Z****		IIC	1,25	0	0	–240
CMFS015*****(R,H,S,T)*Z****		IIC	1,25	0	0	–240

3.1.3) Temperature circuit
Terminals 3 (orange), 4 (yellow), and 7 (violet)

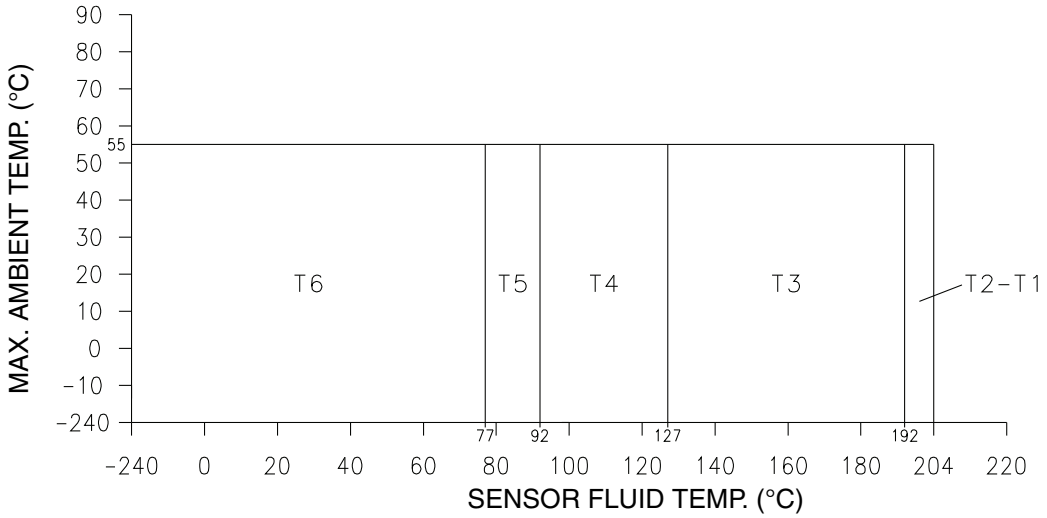
Voltage	Ui	DC	30	V
Current	Ii		101	mA
Power	Pi		750	mW
Effective internal capacitance	Ci		Negligible	
Effective internal inductance	Li		Negligible	

3.1.4) Temperature class/maximum surface temperature T

The classification into a temperature class/determination of the maximum surface temperature T depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and is shown in the following graphs.

3.1.4.1)

Sensor type	CMFS010*****(R,H,S,T)*Z****	IIC
	CMFS015*****(R,H,S,T)*Z****	IIC



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

Note 2: The maximum surface temperature T for dust is as follows: T6: T 80°C, T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 207°C.

Note 3: The minimum ambient and process fluid temerature allowed for dust is –40°C.

Ambient temperature range	Ta	–240 °C to +55 °C

The use of the sensor at higher ambient temperatures is possible, provided that the ambient temperature does not exceed the maximum temperature of the medium taking into account the temperature classification and the maximum operating temperature of the sensor.

3.2) **Type CMFS********(2–9)*Z******** **
Sensor with core processor

3.2.1) Input circuits
Terminals 1–4

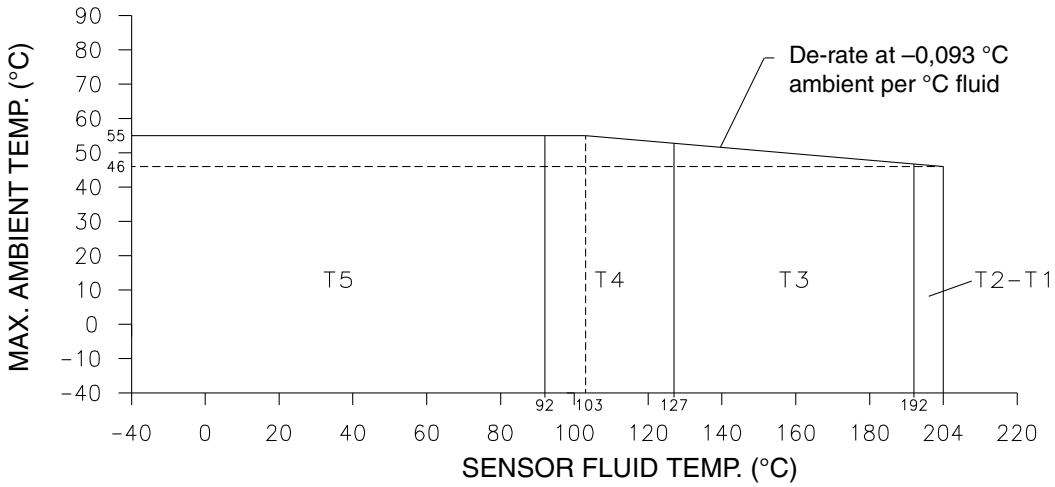
Voltage	Ui	DC	17,3	V
Current	Ii		484	mA
Power	Pi		2,1	W
Effective internal capacitance	Ci		2200	pF
Effective internal inductance	Li		30	µH

3.2.2) Temperature class/maximum surface temperature T

The classification into a temperature class/determination of the maximum surface temperature T depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and is shown in the following graphs.

3.2.2.1)

			
Sensor type	CMFS010*****(2, 3, 4, 5, 6, 7, 8, 9)*Z****	IIC	With integral core processor
	CMFS015*****(2, 3, 4, 5, 6, 7, 8, 9)*Z****	IIC	



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.
Note 2: The maximum surface temperature for dust is as follows: T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 207°C.
Note 3: The minimum ambient and process fluid temerature allowed for dust is –40°C.

Ambient temperature range	Ta	–40°C to + 55°C

3.3) **Type CMFS********(J or U)********
Sensor with integral 2200S transmitter

3.3.1) Input circuits
Terminals 1 and 2

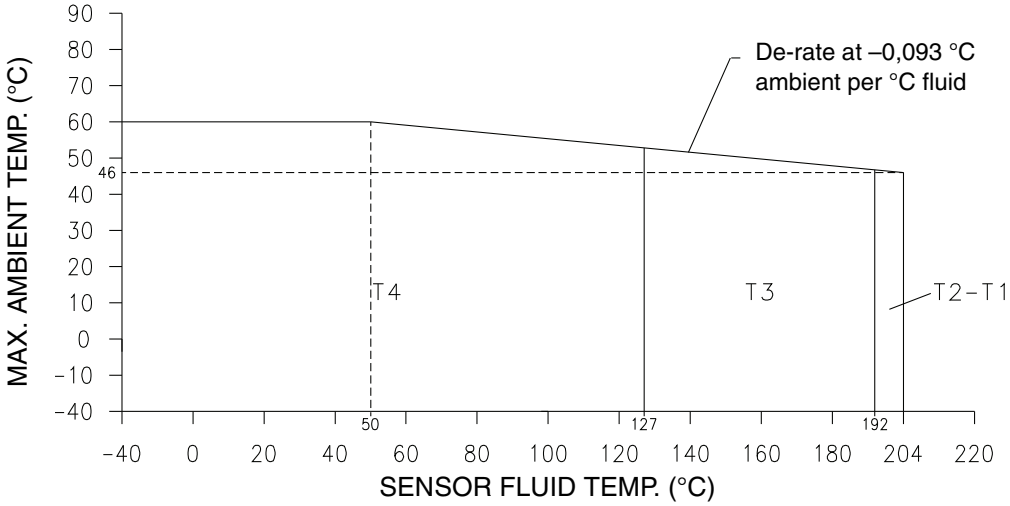
Voltage	Ui	DC	28	V
Current	Ii		120	mA
Power	Pi		0,84	W
Effective internal capacitance	Ci		2200	pF
Effective internal inductance	Li		30	µH

3.3.2) Temperature class/maximum surface temperature T

The classification into a temperature class/determination of the maximum surface temperature T depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and is shown in the following graphs.

3.3.2.1)

			
Sensor type	CMFS010*****(J or U)*Z****	IIC	With integral 2200S transmitter
	CMFS015*****(J or U)*Z****	IIC	



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.
Note 2: The maximum surface temperature for dust is as follows: T4:T 130°C, T3:T 195°C, T2 to T1:T 207°C.
Note 3: The minimum ambient and process fluid temerature allowed for dust is –40°C.

Ambient temperature range Ta –40°C to +60°C

4) Marking

The marking of the equipment shall include the following:

II 2G with additional marking required by the standards mentioned in the following tables.
II 2D Ex tD A21 IP65 T* °C

* *Maximum surface temperature T for dust see temperature graphs and manufacturer's instructions. Minimum ambient and process temperature for dust is –40°C.*

Type	Type of protection gas
CMFS010*****[1)]*Z****	Ex ib IIC T1–T6
CMFS015*****[1)]*Z****	Ex ib IIC T1–T6

Type	Type of protection gas
CMFS010*****[2)]*Z****	Ex ib IIC T1–T5
CMFS015*****[2)]*Z****	Ex ib IIC T1–T5

Minimum ambient/fluid temperature (gas) for sensors with junction box connected to non-MVD transmitters (e.g., RFT9739):

Type	Type of protection gas	Min. ambient/fluid temp. gas
CMFS010*****[1)]*Z****	Ex ib IIC T1–T6	–240 °C
CMFS015*****[1)]*Z****	Ex ib IIC T1–T6	–240 °C

Minimum ambient/fluid temperature (gas) for sensors with junction box connected to MVD transmitters (e.g., 2000-series):

Type	Type of protection gas	Min. ambient/fluid temp. gas
CMFS010*****[1)]*Z****	Ex ib IIC T1–T6	–240 °C
CMFS015*****[1)]*Z****	Ex ib IIC T1–T6	–240 °C

Notes:
1) At this location the letter R, H, S, or T will be inserted.
2) At this location the numeral 2, 3, 4, 5, 6, 7, 8, or 9 will be inserted.

5) Special conditions for safe use / Installation instructions

5.1) By mounting the sensor type CMFS********(J or U)****** directly to the transmitter 22**S********** the use of the unit will be modified according to the following table:

	CMFS010*****(J,U)*Z**** CMFS015*****(J,U)*Z****
Transmitter type 2200S***1*Z****	Ex ib IIC T1–T4 Ex ibD 21 T70°C

5.2) When the application requires that IIC certified sensors are going to be used at lower fluid temperatures than indicated in the EC Type Examination Certificate, these sensors can be modified by adding an infallible series resistor in the drive coil circuitry done by the manufacturer or his representative. In this case, the modified sensor can be marked with IIC and must be marked with an identification code (so-called ETO number). Furthermore the manufacturer or his representative must issue a Manufacturing Declaration which shows how the calculations have been done, what resistor value is to be added and what the identification code is.

Cable glands and adapters

ATEX Installation Instructions

1) ATEX certification requirement

All sensor and transmitter cable glands and adapters are required to be ATEX certified. Refer to the specific manufacturer's website for installation instructions.

For the latest Micro Motion product specifications, view the PRODUCTS section of our web site at www.micromotion.com

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