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# CERTIFICATE OF COMPLIANCE

## HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

### I. Nonincendive Version (Division 2/Zone 2)

#### **MC2 abcdefghijkCImno. Flow Transmitter Series FCM2000.**

NI/I,II/2/ABCDEFGFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67

I/2/Ex nA/II/C/T6; -40 °C < Ta < +60 °C; Type 4X; IP65/67

DIP/III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67

DIP/III/1,2/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67

DIP/A21/T115 °C ... Tfluid

a = Design: 1.

b = Application: P or W.

c = Material Certificates: 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9 (NACE material certificate (not evaluated by FM)).

d = Tube Material: 1, 2, 3, 4, 5, 6, 7 or 8.

e = Flow Range [kg/h]: C, D, E, F, G, H, I, J, K or L.

f = Process Connection Size: 10, 15, 20, 25, 40, 50, 65, 80, 1H or 1F.

g = Process Connection Type: A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S, T, U, V, W, X or Z.

h = Sensor Housing: 1 or 2.

i = Heating/Cooling: 1 or 2.

j = Calibration: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.

k = Label/Documentation: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.

l = Operating Mode: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.

m = Outputs: A, B, C, D or X.

n = Communication: 0, 1, 2, 3, 4, 5, 6 or 7.

o = Power Supply: G or K.

#### *Special Conditions of Use:*

1. *Model Configuration Drawing No. MDM-50-A0292 details Temperature Classification & Ambient Temperature pairings, as influenced by Process Medium Temperatures.*

### II. Nonincendive Version (Division 2/Zone 2)

**MC2 abcdefghijkClmno. Flow Transmitter Series FCM2000.**

NI/I,II/2/ABCDEFGFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67  
 I/2/Ex nA/IIC/T6; -40 °C < Ta < +60 °C; FNICO; Type 4X; IP65/67  
 DIP/II/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/III/1,2/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/A21/T115 °C ... Tfluid

See Control Drawing For Nonincendive Field Wiring Parameters.

- a = Design: 3.
- b = Application: P or W.
- c = Material Certificates: 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9 (NACE material certificate (not evaluated by FM)).
- d = Tube Material: 1, 2, 3, 4, 5, 6, 7 or 8.
- e = Flow Range [kg/h]: C, D, E, F, G, H, I, J, K or L.
- f = Process Connection Size: 10, 15, 20, 25, 40, 50, 65, 80, 1H or 1F.
- g = Process Connection Type: A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S, T, U, V, W, X or Z.
- h = Sensor Housing: 1 or 2.
- i = Heating/Cooling: 1 or 2.
- j = Calibration: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- k = Label/Documentation: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- l = Operating Mode: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- m = Outputs: A, B, C, D or X.
- n = Communication: 0, 1, 2, 3, 4, 5, 6 or 7.
- o = Power Supply: G or K.

*Special Conditions of Use:*

1. Model Configuration Drawing No. MDM-50-A0292 details Temperature Classification & Ambient Temperature pairings, as influenced by Process Medium Temperatures.

III. Intrinsically Safe, Explosionproof & Nonincendive Version (Division 1 & 2/Zone 1 & 2)

**MC2 abcdefghijkClmno. Flow Transmitter Series FCM2000.**

IS/I,II,III/1/ABCDEFGFG; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67  
 XP/II/1/BCD; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 I/1/Ex d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67  
 I/2/Ex d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67  
 NI/I,II/2/ABCDEFGFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/II/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/III/1,2/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/A21/T115 °C ... Tfluid

See Control Drawing For Entity Parameters.

- a = Design: 6.
- b = Application: P or W.
- c = Material Certificates: 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9 (NACE material certificate (not evaluated by FM)).
- d = Tube Material: 1, 2, 3, 4, 5, 6, 7 or 8.
- e = Flow Range [kg/h]: C, D, E, F, G, H, I, J, K or L.
- f = Process Connection Size: 10, 15, 20, 25, 40, 50, 65, 80, 1H or 1F.
- g = Process Connection Type: A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S, T, U, V, W, X or Z.

- h = Sensor Housing: 1 or 2.
- i = Heating/Cooling: 1 or 2.
- j = Calibration: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- k = Label/Documentation: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- l = Operating Mode: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- m = Outputs: A, B, C, D or X.
- n = Communication: 0, 1, 2, 3, 4, 5, 6 or 7.
- o = Power Supply: G or K.

*Special Conditions of Use:*

1. Model Configuration Drawing No. MDM-50-A0292 details Temperature Classification & Ambient Temperature pairings, as influenced by Process Medium Temperatures.

IV. Intrinsically Safe, Explosionproof & Nonincendive Version (Division 1 & 2/Zone 1 & 2)

**MC2 abcdefghijkClmno. Flow Transmitter Series FCM2000.**

IS/I,II,III/1/ABCDEFGFG; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67  
 XP/I/1/BCD; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 I/1/Ex d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67  
 I/2/Ex d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67  
 NI/I,II/2/ABCDEFGFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/II/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/III/1,2/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/A21/T115 °C ... Tfluid

See Control Drawing For Entity Parameters.

- a = Design: 7.
- b = Application: D or Q.
- c = Material Certificates: 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9 (NACE material certificate (not evaluated by FM)).
- d = Tube Material: 1, 2, 3, 4, 5, 6, 7 or 8.
- e = Flow Range [kg/h]: C, D, E, F, G, H, I, J, K or L.
- f = Process Connection Size: 10, 15, 20, 25, 40, 50, 65, 80, 1H or 1F.
- g = Process Connection Type: A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S, T, U, V, W, X or Z.
- h = Sensor Housing: 1 or 2.
- i = Heating/Cooling: 1 or 2.
- j = Calibration: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- k = Label/Documentation: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- l = Operating Mode: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- m = Outputs: A, B, C, D or X.
- n = Communication: 0, 1, 2, 3, 4, 5, 6 or 7.
- o = Power Supply: G or K.

*Special Conditions of Use:*

1. Model Configuration Drawing No. MDM-50-A0292 details Temperature Classification & Ambient Temperature pairings, as influenced by Process Medium Temperatures.

V. Nonincendive Version (Division 2/Zone 2)

**ME2 abcdefghC. Flow Transmitter Series FCM2000.**

NI/I,II/2/ABCDEFGFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 I/2/Ex nR [nA]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0291; FNICO; Type 4X; IP65/67  
 I/2/Ex nR/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0291; FNICO; Type 4X; IP65/67  
 DIP/II/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/III/1,2/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/A21/T115 °C ... Tfluid

See Control Drawing For Nonincendive Field Wiring Parameters.

- a = Design: 1.
- b = Application: P or W.
- c = Housing: 3.
- d = Operating Mode: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- e = Outputs: A, B, C, D or X.
- f = Communication: 0, 1, 3, 4, 5, 6 or 7.
- g = Power Supply: G or K.
- h = Label/Documentation: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.

*Special Conditions of Use:*

1. Model Configuration Drawing No. MDM-50-A0292 details Temperature Classification & Ambient Temperature pairings, as influenced by Process Medium Temperatures.

#### VI. Nonincendive Version (Division 2/Zone 2)

**ME2 abcdefghC. Flow Transmitter Series FCM2000.**

NI/I,II/2/ABCDEFGFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67  
 I/2/Ex nR [ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FNICO; Type 4X; IP65/67  
 I/2/Ex nR [ib][nL]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FNICO; Type 4X; IP65/67  
 DIP/II/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/III/1,2/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/A21/T115 °C ... Tfluid

See Control Drawings For Entity & Nonincendive Field Wiring Parameters.

- a = Design: 4 or 5.
- b = Application: P or W.
- c = Housing: 3.
- d = Operating Mode: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- e = Outputs: A, B, C, D or X.
- f = Communication: 0, 1, 3, 4, 5, 6 or 7.
- g = Power Supply: G or K.
- h = Label/Documentation: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.

*Special Conditions of Use:*

1. Model Configuration Drawing No. MDM-50-A0292 details Temperature Classification & Ambient Temperature pairings, as influenced by Process Medium Temperatures.

#### VII. Intrinsically Safe, Explosionproof & Nonincendive Version (Division 1 & 2/Zone 1 & 2)

**ME2 abcdefghC. Flow Transmitter Series FCM2000.**

IS/I,II,III/1/ABCDEFGF; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67  
 XP/II/1/BCD; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 I/1/Ex d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67  
 I/1/Ex d e [ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67  
 I/2/Ex d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67  
 I/2/Ex d e [ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67  
 NI/I,II/2/ABCDEFGF; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/II/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/III/1,2/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/A21/T115 °C ... Tfluid

See Control Drawings For Entity Parameters.

- a = Design: 6, 7 or 8.
- b = Application: D or Q.
- c = Housing: 8.
- d = Operating Mode: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- e = Outputs: A, B, C, D or X.
- f = Communication: 0, 1, 3, 4, 5, 6 or 7.
- g = Power Supply: G or K.
- h = Label/Documentation: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.

*Special Conditions of Use:*

1. Model Configuration Drawing No. MDM-50-A0292 details Temperature Classification & Ambient Temperature pairings, as influenced by Process Medium Temperatures.

### VIII. Intrinsically Safe, Explosionproof & Nonincendive Version (Division 1 & 2/Zone 1 & 2)

#### **MS2 abcdefghijkC. Flow Transmitter Series FCM2000.**

IS/II/1/ABCD; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67  
 I/1/Ex ib/IIC/T5; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67  
 NI/I,II/2/ABCDEFGF; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/II/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/III/1,2/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67  
 DIP/A21/T115 °C ... Tfluid

See Control Drawings For Entity Parameters.

- a = Design: 6.
- b = Application: D or Q.
- c = Material Certificates: 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9 (NACE material certificate (not evaluated by FM)).
- d = Tube Material: 1, 2, 3, 4, 5 or 6.
- e = Flow Range [kg/h]: S, T or U.
- f = Temperature Version: 1, 2 or 3.
- g = Process Connection: A, B, C, D, F, G, H, I, M, N, P, Q, R, U, V, W or Z.
- h = Pressure Rating: A, B, C, D, E, F, G, H, K, L, M, N, P, Q, R, S, T, U, V, W, X or Z.
- i = Heating/Cooling: 1, 2, 3, 4, 5 or 6.
- j = Calibration: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.
- k = Label/Documentation: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z.

*Special Conditions of Use:*

1. *Model Configuration Drawing No. MDM-50-A0292 details Temperature Classification & Ambient Temperature pairings, as influenced by Process Medium Temperatures.*

## Equipment Ratings:

### I. Nonincendive Version (Division 2/Zone 2)

Nonincendive for use in Class I & II, Division 2, Groups A, B, C, D, E, F & G; Nonincendive Ex nA T6...T2 for use in Class I, Zone 2, Group IIC; Dust-Ignitionproof for Class II, Division 1, Groups E, F & G; Dust-Ignitionproof for Class III, Division 1 & 2, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous indoor/outdoor (Type 4X & IP65/67) Locations

### II. Nonincendive Version (Division 2/Zone 2)

Nonincendive for use in Class I & II, Division 2, Groups A, B, C, D, E, F & G, in accordance with manufacturer's Control Drawing No. MDM-10-A0291; Nonincendive Ex nA T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0291; Dust-Ignitionproof for Class II, Division 1, Groups E, F & G; Dust-Ignitionproof for Class III, Division 1 & 2, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous indoor/outdoor (Type 4X & IP65/67) Locations

### III. Intrinsically Safe, Explosionproof & Nonincendive Version (Division 1 & 2/Zone 1 & 2)

Intrinsically Safe for use in Class I, II & III, Division 1, Groups A, B, C, D, E, F & G, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Explosionproof for use in Class I, Division 1, Groups B, C & D; Flameproof Ex d e [ia][ib] T6...T2 for use in Class I, Zone 1, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Flameproof Ex d e [ib][ib] T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Nonincendive for use in Class I & II, Division 2, Groups A, B, C, D, E, F & G; Dust-Ignitionproof for Class II, Division 1, Groups E, F & G; Dust-Ignitionproof for Class III, Division 1 & 2, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous indoor/outdoor (Type 4X & IP65/67) Locations

### IV. Intrinsically Safe, Explosionproof & Nonincendive Version (Division 1 & 2/Zone 1 & 2)

Intrinsically Safe for use in Class I, II & III, Division 1, Groups A, B, C, D, E, F & G, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Explosionproof for use in Class I, Division 1, Groups B, C & D; Flameproof Ex d e [ia][ib] T6...T2 for use in Class I, Zone 1, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Flameproof Ex d e [ia][ib] T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Nonincendive for use in Class I & II, Division 2, Groups A, B, C, D, E, F & G; Dust-Ignitionproof for Class II, Division 1, Groups E, F & G; Dust-Ignitionproof for Class III, Division 1 & 2, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous indoor/outdoor (Type 4X & IP65/67) Locations

### V. Nonincendive Version (Division 2/Zone 2)

Nonincendive for use in Class I & II, Division 2, Groups A, B, C, D, E, F & G; Nonincendive Ex nR [nA] T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0291; Nonincendive Ex nR T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0291; Dust-Ignitionproof for Class II, Division 1, Groups E, F & G; Dust-Ignitionproof

for Class III, Division 1 & 2, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous indoor/outdoor (Type 4X & IP65/67) Locations

#### VI. Nonincendive Version (Division 2/Zone 2)

Nonincendive for use in Class I & II, Division 2, Groups A, B, C, D, E, F & G, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Nonincendive Ex nR [ib] T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Nonincendive Ex nR [ib][nL] T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Dust-Ignitionproof for Class II, Division 1, Groups E, F & G; Dust-Ignitionproof for Class III, Division 1 & 2, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous indoor/outdoor (Type 4X & IP65/67) Locations

#### VII. Intrinsically Safe, Explosionproof & Nonincendive Version (Division 1 & 2/Zone 1 & 2)

Intrinsically Safe for use in Class I, II & III, Division 1, Groups A, B, C, D, E, F & G, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Explosionproof for use in Class I, Division 1, Groups B, C & D; Flameproof Ex d e [ia][ib] T6...T2 for use in Class I, Zone 1, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Flameproof Ex d e [ib] T6...T2 for use in Class I, Zone 1, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Flameproof Ex d e [ia][ib] T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Flameproof Ex d e [ib] T6...T2 for use in Class I, Zone 2, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Nonincendive for use in Class I & II, Division 2, Groups A, B, C, D, E, F & G; Dust-Ignitionproof for Class II, Division 1, Groups E, F & G; Dust-Ignitionproof for Class III, Division 1 & 2, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous indoor/outdoor (Type 4X & IP65/67) Locations

#### VIII. Intrinsically Safe & Nonincendive Version (Division 1 & 2/Zone 1)

Intrinsically Safe for use in Class I, Division 1, Groups A, B, C & D, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Intrinsically Safe Ex ib T5...T2 for use in Class I, Zone 1, Group IIC, in accordance with manufacturer's Control Drawing No. MDM-10-A0281; Nonincendive for use in Class I & II, Division 2, Groups A, B, C, D, E, F & G; Dust-Ignitionproof for Class II, Division 1, Groups E, F & G; Dust-Ignitionproof for Class III, Division 1 & 2, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous indoor/outdoor (Type 4X & IP65/67) Locations

### FM Approved for:

ABB Automation Products GmbH  
Dransfelder Strasse 2  
D-37079 Göttingen  
Germany

This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

C22.2 No. 0.15	2001
C22.2 No. 14	2008
C22.2 No. 25	2000
C22.2 No. 30	1999
C22.2 No. 94	1999
C22.2 No. 142	2004
C22.2 No. 157	2006
C22.2 No. 213	2004
C22.2 No. 61010.1	2004
C22.2 No. 60529	2005
CSA E60079-0	2007
CSA E60079-1	2007
CSA E60079-7	2003
CSA E60079-11	2002
CSA E60079-15	2002
CSA E61241-1	2002
IEC 60079-26	2006
IEC 60079-27	2008
IEC 61241-0	2004

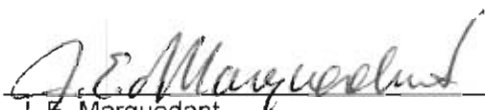
Original Project ID: 3036514

Approval Granted: July 28, 2009

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
090923	November 5, 2009		

FM Approvals LLC

  
 J. E. Marquedant  
 Group Manager, Electrical

5 November 2009  
 Date



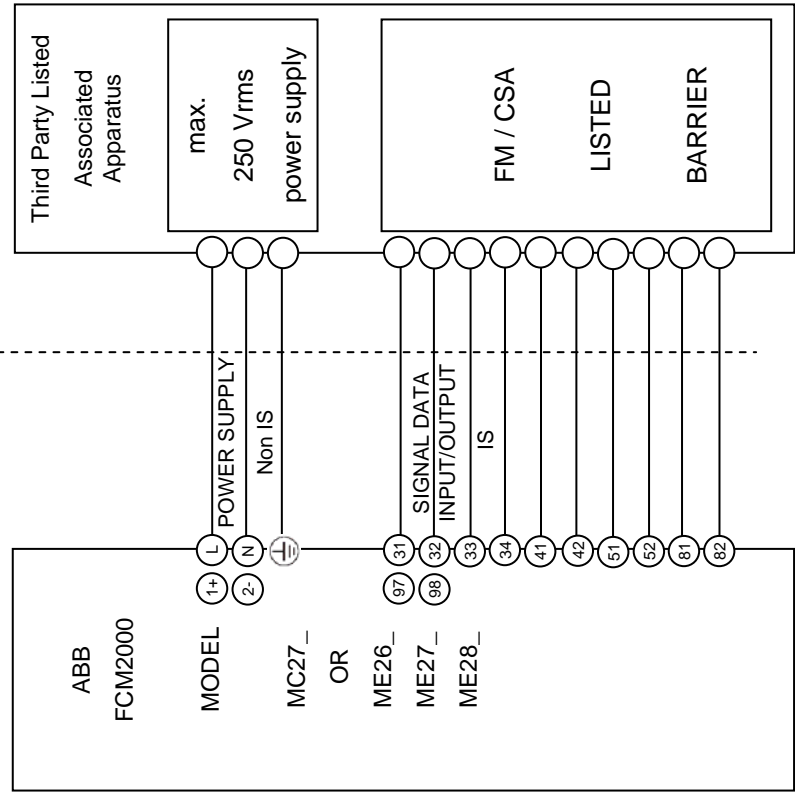
**HAZARDOUS LOCATION**

Class I, Div.1, Groups B,C,D  
Class I, Zone 1, Group IIB

**Notes:**

1. THE INTRINSIC SAFETY ENTITY CONCEPT ALLOWS THE INTERCONNECTION OF TWO FM AND/OR CSA APPROVED INTRINSICALLY SAFE DEVICES WITH ENTITY PARAMETERS NOT SPECIALLY EXAMINED IN COMBINATION AS A SYSTEM WHEN:  
 $U_o$  OR  $V_{oc}$  OR  $V_t < V_{MAX}$ ,  $I_o$  OR  $I_{oc}$  OR  $I_t < I_{MAX}$ ;  
 $Ca$  OR  $Co > Ci + C_{cable}$ ;  $La$  OR  $Lo > Li + L_{cable}$ ;  $P_o < P_i$ .
2. DUST-TIGHT CONDUIT SEALMUST BE USED WHEN INSTALLED IN CLASS II AND III ENVIROMENTS.
3. CONTROL EQUIPMENT CONNECTED TO THE ASSOCIATED APPARATUS MUST NOZ USE OR GENERATE MORE THAN 250 Vrms OR Vdc WITH RESPECT TO EARTH.
4. INSTALLATION FOR U.S. AND CANADIAN APPROVED EQUIPMENT SHOULD BE IN ACCORDANCE WITH ANSI/ISA RP12.6 „INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED) LOCATIONS“, THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) SECTIONS 504, 505 AND THE CANADIAN ELECTRICAL CODE (C22.1-02).
5. THE CONFIGURATION OF ASSOCIATED APPARATUS MUST BE FM AND/OR CSA APPROVED UNDER ENTITY CONCEPT.
6. ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.
7. THE ASSOCIATED APPARATUS MUST BE INSTALLED IN ACCORDANCE WITH BARRIER MANUFACTURE'S INSTALLATION DIAGRAM
8. SELECTED ASSOCIATED APPARATUS MUST BE THIRD PARTY LISTED AS PROVIDING INTRINSICALLY SAFE CIRCUITS FOR THE APPLICATION. IT MUST MEET THE REQUIREMENTS ON PAGE TWO OF THIS INSTALLATION DIAGRAM:

**NONHAZARDOUS LOCATION**



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For Model	MS2	Projection method 1	General Tolerances: Work piece edges:	Tolerancing: Surface:
		<b>ABB</b>		
		ABB Automation Products GmbH		Installation diagram
		Date		FCM2000_MC2_/ME2_ Input/Output Signals
		16-02-07		
		IBB_Kre		
02-15.08.07	8691 IBB_Kre			MDM-10-A0281
Rev. Date	Number	Name	Material	Ref. ERM


Fieldbus PA/FF	Ex i / IS FISCO						Ex i / IS					
	V MAX [V]	I MAX [mA]	Pi [mW]	Ci [nF]	Ci pa [nF]	Li [mH]	V MAX [V]	I MAX [mA]	Pi [mW]	Ci [nF]	Ci pa [nF]	Li [mH]
<b>ME26,27,28 MC27</b>	60	380	5320	0	0	170	60	380	5320	0	0	170
<b>Current1</b> Fieldbus	60	380	5320	0	0	170	60	380	5320	0	0	170
<b>Terminal</b> 97/98												

HART active	Ex i / IS						V MAXo [V]	I MAXo [mA]	Po [mW]	Co [nF]	Co pa [nF]	Lo [mH]
	V MAX [V]	I MAX [mA]	Pi [mW]	Ci [nF]	Ci pa [nF]	Li [mH]						
<b>ME26,27,28 MC27</b>	20	100	500	217	0	3,8						
<b>Current1</b> active Terminal 31/32	V MAX [V]	I MAX [mA]	Pi [mW]	Ci [nF]	Ci pa [nF]	Li [mH]	60	100	500	2,4	2,4	0,17
<b>Current2</b> passiv Terminal 33/34	30	100	760	2,4	2,4	0,17	30	100	760	2,4	2,4	0,17
<b>Contact Output</b> Terminal 41/42	15	30	115	2,4	2,4	0,17	15	30	115	2,4	2,4	0,17
<b>Contact Input</b> Terminal 81/82	30	250	1100	2,4	2,4	0,17	30	250	1100	2,4	2,4	0,17
<b>Pulse Output</b> Terminal 51/52	15	30	115	2,4	2,4	0,17	15	30	115	2,4	2,4	0,17

HART passive	Ex i / IS						U MAX [V]	I MAX [mA]	Pi [mW]	Ci [nF]	Ci pa [nF]	Li [mH]
	U MAX [V]	I MAX [mA]	Pi [mW]	Ci [nF]	Ci pa [nF]	Li [mH]						
<b>ME26,27,28 MC27</b>	60	300	2000	0,47	0,47	0,17						
<b>Current1</b> passiv Terminal 31/32	60	300	2000	0,47	0,47	0,17	60	300	2000	0,47	0,47	0,17
<b>Current2</b> passiv Terminal 33/34	60	300	2000	0,47	0,47	0,17	60	300	2000	0,47	0,47	0,17
<b>Contact Output</b> Terminal 41/42	60	300	2000	0,47	0,47	0,17	60	300	2000	0,47	0,47	0,17
<b>Contact Input</b> Terminal 81/82	60	300	2000	0,47	0,47	0,17	60	300	2000	0,47	0,47	0,17
<b>Pulse Output</b> Terminal 51/52	60	300	2000	0,47	0,47	0,17	60	300	2000	0,47	0,47	0,17

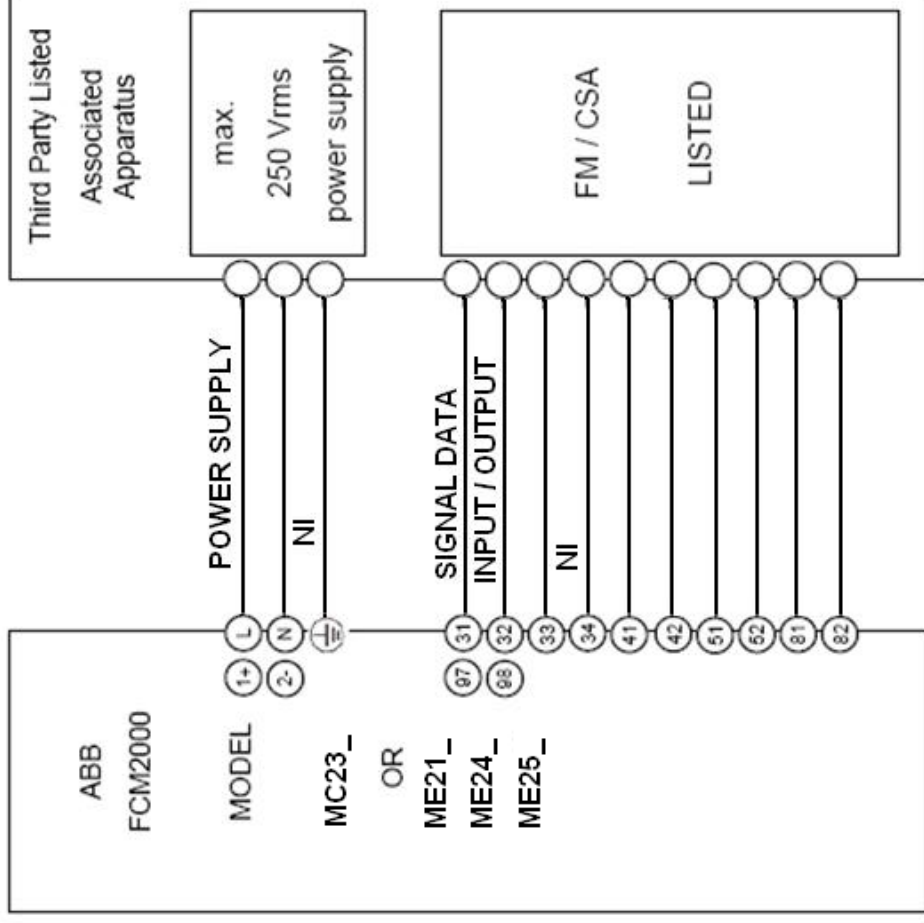
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For Model	MS2	Projection method 1	General Tolerances: Work piece edges:	Tolerancing: Surface:
		ABB Automation Products GmbH	Installation diagram	
Checked		Name	FCM2000_MC2_/ME2_ Input/Output Signals	
Drawn		Date	MIDM-10-A0281	
Checked per STD		IBB_Kre	REF. EPH	
16.02.07				
02.15.08.07	8691	IBB_Kre		
Rev.	Date	Number	Name	REPLACES:

Notes:

1. CONTROL EQUIPMENT CONNECTED TO THE ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN 250 Vrms OR Vdc WITH RESPECT TO EARTH.
2. INSTALLATION FOR U.S. AND CANADIAN APPROVED EQUIPMENT SHOULD BE IN ACCORDANCE WITH ANSI/ISA 82.02.1-1999 SAFETY STANDARD FOR ELECTRICAL AND ELECTRONIC TEST, MEASURING, CONTROLLING AND RELATED EQUIPMENT -GENERAL REQUIREMENTS-
3. THE CONFIGURATION ASSOCIATED APPARATUS MUST BE FM AND/OR CSA APPROVED UNDER ENTITY CONCEPT.
4. ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT



	Ex n FNICO						EX nL NI					
	V MAX [V]	I MAX [mA]	Pi [mW]	Ci [nF]	Ci pa [nH]	Li [nH]	V MAX [V]	I MAX [mA]	Pi [mW]	Ci [nF]	Ci pa [nH]	Li [nH]
Fieldbus PA/FF ME21, 24, 25 MC 23	60	500	7000	0	0	170	60	500	7000	0	0	170
<b>Current 1</b> passive Terminal 97/98												

	Ex n NI	
	V MAX [V]	I MAX [mA]
HART Communication ME21, 24, 25 MC 23		
<b>Current 1</b> Terminal 31/32	30	30
<b>Current 2</b> passive Terminal 33/34	30	30
<b>Contact Output</b> Terminal 41/42	30	65
<b>Contact Input</b> Terminal 81/82	30	10
<b>Pulse Output</b> Terminal 51/52	30	65

Document No.:

**MDM-10-A0291 Rev.01**

Page 3/3

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## Temperature Class and surface temperature

### Fieldhousing ME21:

The maximum temperature of the fieldhousing by an ambient temperature of -40...+60°C is less than +80°C, so the Temperature Class of the fieldhousing is T6. The surface temperature is T115°C.

### Primary MC2\_compact and ME2\_remote\_:

The maximum temperature of the primaries by an ambient temperature of -40 ...+60°C for Zone1 / DIV1 and Zone2 / DIV2 are shown in following table.

Model MC2_ , ME_2 : Temperature Class vs. Ambient and Fluid Temperature									
Model	Size DN	Temperature Class	Ambient Temperature Zone1/ Div1 MC26 /27			Ambient Temperature Zone2/ Div2 MC21 /23			
			-40°C	-40°C	-40°C	-40°C	-40°C	-40°C	
			...	...	...	...	...	...	
			+40°C	+50°C	+60°C	+40°C	+50°C	+60°C	
MC2_	DN 20 - 150	T2	200°C	200°C	200°C	200°C	200°C	---	
		T3	185°C	180°C	180°C	180°C	180°C	180°C	
		T4	125°C	120°C	120°C	115°C	115°C	115°C	
		T5	85°C	85°C	75°C	80°C	80°C	75°C	
		T6	65°C	65°C	60°C	60°C	60°C	60°C	
ME2_	Size DN	Temperature Class	Ambient Temperature Zone1 / Div1 ME26			Ambient Temperature Zone2 / Div2 ME21			
			-40°C			-40°C			
			...			...			
				+60°C			+60°C		
	20 - 150	T2		200°C			200°C		
		T3		185°C			180°C		
		T4		120°C			115°C		
		T5		85°C			80°C		
		T6		70°C			65°C		
	Size DN	Temperature Class	Ambient Temperature Zone1 / Div1 ME24/ ME25/ ME27/ ME28						
			-20°C						
			...						
							+50°C		
	1,5, 3, 6	T2		-					
		T3		180°C					
T4			125°C						
T5			80°C						
T6			-						

The surface temperature for Zone1 / DIV1 is depending on the fluid temperature.

$$T_{\text{surface}} = T_{115^\circ\text{C}} \dots T_{(\text{fluid})} \quad \text{Model MC2}_$$

$$T_{\text{surface}} = T_{115^\circ\text{C}} \quad \text{Model ME2}_$$

(limited by temperature fuse on power supply board)

This is also valid for insulated tubes or tubes with external heatings even if the heating temperature is  $\leq$  fluid temperature.

The thermal insulation of the tube and the flowmeter can be made if necessary by the customer.

The insulation may take place up to the 100mm around the primary housing.

The technical data are not changed thereby.

**Primary MS2\_:**

The maximum temperature of the primaries by an ambient temperature of -20 ...+50°C for Zone1 / DIV1 and Zone2 / DIV2 is shown in following tables.

**Zone 1/ DIV1:**

The over-temperature of PT-1000 on meter single-tube is  $\leq 70^\circ\text{C}$ . That has an influence on the temperature classes. Acc. IEC60079-11 it is possible to increase the maximum surface temperature for small components. With this possibility the correlation between ambient-, fluid temperature and temperature class against the existing UL-approval is given to:

- T6: = left, because:  
the over-temperature is higher than the existing UL-Approval
- T5: = unchanged  $80^\circ\text{C}$ , because:  
at T5 for small components  $<10\text{cm}^2$  the maximum surface temperature could be  $150^\circ\text{C}$ . So  $150^\circ\text{C}$  maximum –  $70^\circ\text{C}$  over-temperature PT1000=  $80^\circ\text{C}$  fluid.
- T4: =  $125^\circ\text{C}$ , because:  
at T4 for small components  $<10\text{cm}^2$  the maximum surface temperature could be  $200^\circ\text{C}$ . Because of T4 maximum temperature is  $135^\circ\text{C}$  we decided  $125^\circ\text{C}$  ( $10^\circ\text{C}$  buffer) for the fluid. This is with less influence of small components.
- T3: =  $180^\circ\text{C}$ , because:  
There is no logical reason why it should be possible to install the flowmeter in T4 areas but not in T3, even if IEC60079-11 does not note something about small components for T3.  
So we use the same maximum as in the existing UL-Approval.

<b>Model MS2_ : Temperature Class vs. Ambient and Fluid Temperature</b>			
Model	Size DN	Temperature Class	Ambient Temperature
			-20°C ... +50°C
Primary MS2_ Zone1/ DIV1	DN1,5 DN3 DN6	T3	180°C
		T4	125°C
		T5	80°C
		T6	---

The surface temperature for Zone1 / DIV1 is depending on the fluid temperature.

$$T_{\text{surface}} = T_{115^\circ\text{C}} \dots T_{(\text{fluid})} \quad \text{Model MS2}_-$$

$$T_{\text{surface}} = T_{115^\circ\text{C}} \quad \text{Model ME2}_-$$

(limited by temperature fuse on power supply board)