FM Approvals
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Member of the FM Global Group

CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

I. Nonincendive Version (Division 2/Zone 2)

MC2 abcdefghijkClmno. Flow Transmitter Series FCM2000.
NI/I,II,III/2/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67
I/2/AEx nA/IIC/T6; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/II,III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/21/AEx tD/T115 °C ... Tfluid

See Control Drawing For Nonincendive Field Wiring Parameters.

a = Design: 1.
b = Application: O or V.
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,III/2/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67
I/2/AEx nA nR [nA]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0291; FNICO; Type 4X; IP65/67
I/2/AEx nA nR/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0291; FNICO; Type 4X; IP65/67
I/2/AEx nA/IIC/T6; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/II,III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/21/AEx tD/T115 °C ... Tfluid

See Control Drawing For Nonincendive Field Wiring Parameters.

a = Design: 3.
b = Application: O or V.
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/ABCDEFG; -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/AEx d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67
I/2/AEx d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67
NI/I,II,III/2/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67
I/2/AEx nA/IIC/T6; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/II,III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/21/AEx tD/T115 °C ... Tfluid

See Control Drawings For Entity & Nonincendive Field Wiring Parameters.

a = Design: 6.
b = Application: C or Y.
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/ABCDEFG; -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/AEx d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67
I/2/AEx d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67
NI/I,II,III/2/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67
DIP/II,III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/21/AEx tD/T115 °C ... Tfluid

See Control Drawings For Entity & Nonincendive Field Wiring Parameters.

a = Design: 7.
b = Application: C or Y.
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,III/2/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67
I/2/AEx nR [nA]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0291; FNICO; Type 4X; IP65/67

I/2/AEx nR/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0291; FNICO; Type 4X; IP65/67
DIP/II,III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/21/AEx tD/T115 °C ... Tfluid

See Control Drawing For Nonincendive Field Wiring Parameters.

a = Design: 1.
b = Application: O or V.
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,III/2/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67
I/2/AEx nR [ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FNICO; Type 4X; IP65/67
I/2/AEx nR [ib][nA]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FNICO; Type 4X; IP65/67
DIP/II,III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/21/AEx tD/T115 °C ... Tfluid

See Control Drawings For Entity & Nonincendive Field Wiring Parameters.

a = Design: 4 or 5.
b = Application: O or V.
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/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67
XP/I/1/ABCD; -40 °C < Ta < +60 °C; Type 4X; IP65/67
I/1/AEx d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67
I/1/AEx d e [ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67

I/2/AEx d e [ia][ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; FISCO; Type 4X; IP65/67
I/2/AEx d e [ib]/IIC/T6; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67
NI/I,II,III/2/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67
DIP/II,III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/21/AEx tD/T115 °C ... Tfluid

See Control Drawings For Entity & Nonincendive Field Wiring Parameters.

a = Design: 6, 7 or 8.
b = Application: C or Y.
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 & Nonincendive Version (Division 1 & 2/Zone 1)

MS2 abcdefghijkC. Flow Transmitter Series FCM2000.
IS/I/1/ABCD; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67
I/1/AEx ib/IIC/T5; -40 °C < Ta < +60 °C; MDM-10-A0281; Type 4X; IP65/67
NI/I,II,III/2/ABCDEFG; -40 °C < Ta < +60 °C; MDM-10-A0291; Type 4X; IP65/67
DIP/II,III/1/EFG; -40 °C < Ta < +60 °C; Type 4X; IP65/67
DIP/21/AEx tD/T115 °C ... Tfluid

See Control Drawings For Entity & Nonincendive Field Wiring Parameters.

a = Design: 6.
b = Application: C or Y.
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 & III, Division 2, Groups A, B, C, D, E, F & G, in accordance with manufacturer's Control Drawing No. MDM-10-A0291; Nonincendive AEx nA T6...T2 for use in Class I, Zone 2, Group IIC; Dust-Ignitionproof for Class II & III, Division 1, Groups E, F & G; Dust Ignition Protected type "tD" for use in Class I, Zone 21 Hazardous (Classified) indoor/outdoor (Type 4X & IP65/67) Locations

II. Nonincendive Version (Division 2/Zone 2)

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

V. Nonincendive Version (Division 2/Zone 2)

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

VI. Nonincendive Version (Division 2/Zone 2)

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

FM Approved for:

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

FM Approvals

Member of the FM Global Group

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

Class 3600	1998
Class 3610	2007
Class 3611	2004
Class 3615	2006
Class 3616	DRAFT
Class 3810	2005
ANSI/ISA-12.00.01	2005
ANSI/ISA-12.00.03	2008
ANSI/ISA-12.02.01	2002
ANSI/ISA-12.10.02	2006
ANSI/ISA-12.10.03	2006
ANSI/ISA-12.12.02	2009
ANSI/ISA-12.16.01	2002
ANSI/ISA-12.22.01	2005
ANSI/ISA-82.02.01	2004
ANSI/IEC 60529	2004
ANSI/NEMA 250	2003

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

Notes:

1. THE INTRINSIC SAFETY ENTITY CONCEPT ALLOUS THE INTERCONNESTION OF TWO FM AND/OR CSA APPROVED INTRINSICALLY SAFE DEVICES WITH ENTITY PARAMETERS NOT SPECICALLY EXAMINED IN COMBINATION AS A SYSTEM WHEN:
   Uo OR Voc OR Vt < V MAX, Io OR Ioc OR It < I MAX;
   Ca OR Co > Ci + Ccable; La OR Lo > Li + Lcable; Po < Pi.

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.

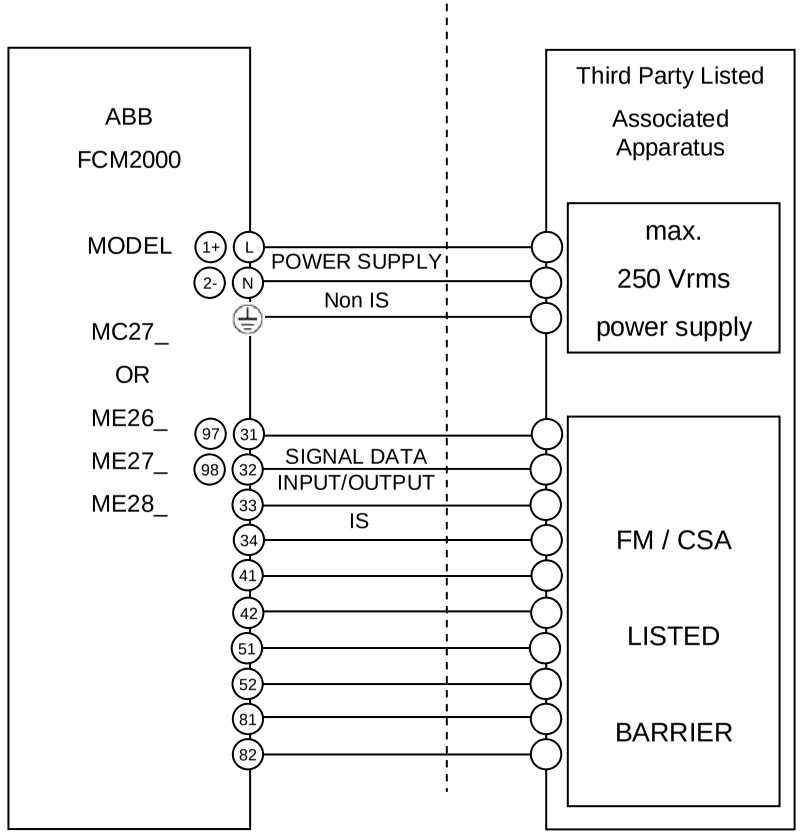
4. INSTALLATION FOR U.S. AND CANADIAN APPROVED EQUIPMENT SHOULD BE IN ACCORDANCE WITH ANSI/ISA RP12.6 „INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED) LOCATIONS“, THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) SECTIONS 504, 505 AND THE CANADIAN ELECTRICAL CODE (C22.1-02).

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:



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For Model	Projection method 1	General tolerances:	Tolerancing:
MS2	ABB Automation Products GmbH	Work piece edges:	Surface:
	Date / Name: 16.02.07 IBB_Kre	Installation diagram FCM2000_MC2_/ ME2_ Input/Output Signals	
02 15.08.07 8691 IBB_Kre	Replaces:	MDM-10-A0281	
Rev. Date Number Name		Material / Ref. B/M	

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

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

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

Dieses ist eine zertifizierte Zeichnung
Änderungen nur mit Zustimmung der Prüfstelle
THIS IS A CERTIFIED DRAWING
REVISIONS ONLY WITH APPROVAL OF THE NOTIFIED BODY

For Model MS2

Projection method 1

ABB Automation Products GmbH

Rev.	Date	Number	Name
02	15.08.07	8691	IBB_Kre

Replaces:

Date 16.02.07 Name IBB_Kre

checked per Std. drawn by checked

General tolerances: Tolerancing:

Work piece edges: Surface:

Installation diagram

FCM2000_MC2_/ ME2_ Input/Output Signals

MDM-10-A0281

Material Ref. B/M

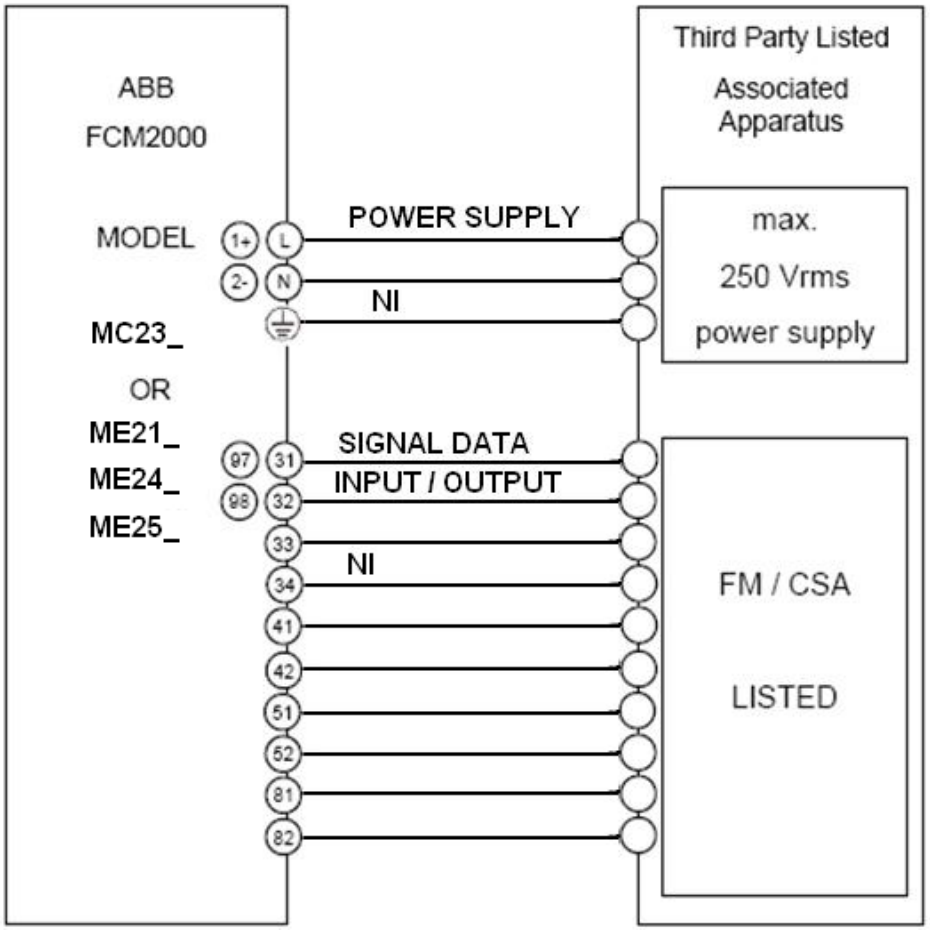
Notes:

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



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Fieldbus PA/FF ME21, 24, 25 MC 23	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]
Current 1 passive Terminal 97/98	60	500	7000	0	0	170	60	500	7000	0	0	170

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

Document No.:

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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 … +50°C	-40°C … +60°C	-40°C … +40°C	-40°C … +50°C	-40°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 … +60°C	-40°C … +50°C	-40°C … +60°C
	20 - 150	T2	200°C	200°C	---
		T3	185°C	180°C	180°C
		T4	120°C	115°C	115°C
		T5	85°C	80°C	75°C
		T6	70°C	65°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.

$T_{surface}$ = T 115°C.... $T_{(fluid)}$ Model MC2_

$T_{surface}$ = T 115°C 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 ≤ 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 ≤ 70°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°C, because:
at T5 for small components <10cm² the maximum surface temperature could be 150°C. So 150°C maximum – 70°C over-temperature PT1000= 80°C fluid.

T4: = 125°C, because:
at T4 for small components <10cm² the maximum surface temperature could be 200°C. Because of T4 maximum temperature is 135°C we decided 125°C (10°C buffer) for the fluid. This is with less influence of small components.

T3: = 180°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.

Model MS2_ : Temperature Class vs. Ambient and Fluid Temperature

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.

$T_{surface}$ = T 115°C.... $T_{(fluid)}$ Model MS2_

$T_{surface}$ = T 115°C Model ME2_
(limited by temperature fuse on power supply board)