# CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM17US0062X**
3. **Equipment:** **FEP63 _ ProcessMaster, and**
   **(Type Reference and Name)** **FEH63_ HygienicMaster Electromagnetic Flowmeters, and**
   **FET63_Transmitters**
4. **Name of Listing Company:** **ABB Automation Products GmbH**
5. **Address of Listing Company:** **Dransfelder Straße 2,**
   **D-37079 Göttingen,**
   **Germany**
6. The examination and test results are recorded in confidential report number:

   3059596 dated 22nd May 2018

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM Class 3600: 2011, FM Class 3610: 2015, FM Class 3611: 2016, FM Class 3615: 2006, FM Class 3616: 2011, FM Class 3810: 2005, ANSI/ISA 60079-0: 2013, ANSI/ISA 60079-1: 2015, ANSI/UL 60079-7: 2017, ANSI/ISA 60079-11: 2014, ANSI/UL 60079-18: 2015, ANSI/ISA 60079-31: 2015, ANSI/NEMA 250: 2008, ANSI/IEC 60529: 2004 and ANSI/ISA 12.27.01: 2011.

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

**Certificate issued by:**

J. E. Marquedant
VP, Manager, Electrical Systems

22 May 2018
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com



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# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

10. Equipment Ratings:

**FE*631F1D (6 and 8) – Integral transmitter & sensor**

Explosionproof for Class I, Division 1, Groups A, B, C and D T6…T1; Dust-ignitionproof for Class II, Division 1, Groups E, F and G T6…T1; Class III, Division 1 T6…T1, Flameproof/increased safety/encapsulated with intrinsically safe outputs for Class I, Zone 1, AEx db eb mb [ia Ga] IIB+$H_2$ T6…T1 Gb, protection by enclosure with intrinsically safe outputs for Zone 21 AEx tb [ia Da] IIIC T80°C…T165°C Db, hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

**FE*632F1A (1 and 2) – Remote sensor**

**FE*632F1U (1 and 2) – Remote sensor**

Explosionproof for Class I, Division 1, Groups A, B, C and D T6…T1; Dust-ignitionproof for Class II, Division 1, Groups E, F and G T6…T3B; Class III, Division 1 T6…T3B, Flameproof/increased safety/encapsulated for Class I, Zone 1, AEx db eb mb IIB+$H_2$ T6…T1 Gb, protection by enclosure/intrinsic safety for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67/68) with an ambient temperature rating of -40°C to +60°C.

**FET631F1W (5 and 7) – Transmitter only**

Explosionproof for Class I, Division 1, Groups B, C and D; Dust-ignitionproof for Class II, Division 1, Groups E, F and G; Class III, Division 1, Flameproof/increased safety/encapsulated with intrinsically safe outputs for Class I, Zone 1, AEx db eb mb IIB + $H_2$ T6 Gb, protection by enclosure for Zone 21 AEx tb IIIC T80°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

**FE*631F2 – Integral transmitter & sensor**

**FEP632F2 – Remote sensor**

**FEH632F2 – Remote sensor**

Nonincendive for Class I Division 2, Groups A, B, C and D T6…T1, Nonincendive for Class II, Division 2, Groups E, F and G, T6…T3B, Class III, Division 1, T6…T3B, Increased safety for Class I, Zone 2 AEx ec IIC T6…T1 Gc, protection by enclosure for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67/69 – sensor only) with an ambient temperature rating of -40°C to +60°C.

**FET631F2– Remote transmitter**

Nonincendive for Class I Division 2, Groups A, B, C and D T6…T1, Nonincendive for Class II, Division 2, Groups E, F and G, T6…T3B, Class III, Division 1, T6…T3B; Increased safety for Class I, Zone 2 AEx ec IIC T6 Gc, protection by enclosure for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

11. The marking of the equipment shall include:

FE*631F1D (6 and 8)
Class I Division 1, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67
Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
Class I, Zone 1, AEx db eb mb [ia Ga] IIB+$H_2$ T6…T1 Gb Ta = -40°C to +60°C; Type 4X, IP65/67
Zone 21, AEx tb [ia Da] IIIC T80°C…T165°C Db

FE*632F1A (1 and 2)
FE*632F1U (1 and 2)
Class I Division 1, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67/68
Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68
Class I, Zone 1, AEx db eb mb IIB+$H_2$ T6…T1 Gb Ta = -40°C to +60°C; Type 4X, IP65/67/68
Zone 21, AEx tb ia IIIC T80°C…T165°C Db

FET631F1W (5 and 7)
Class I Division 1, Groups B, C, D; T6 Ta = -40°C to +60°C; Type 4X, IP65/67
Class II, Division 1, Groups E, F, G, Class III, Division 1; T6 Ta = -40°C to +60°C; Type 4X, IP65/67
Class I, Zone 1, AEx db [ia Ga] IIB + $H_2$ T6 Gb Ta = -40°C to +60°C; Type 4X, IP65/67
Zone 21, AEx tb [ia Da] IIIC T80°C Db

FE*631F2
FEP632F2
FEH632F2
Class I Division 2, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67/68 (sensor only)
Class II, Division 2, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68 (sensor only)
Class I, Zone 2, AEx ec IIC T6…T1 Gc Ta = -40°C to +60°C; Type 4X, IP65/6768 (sensor only)
Zone 21, AEx tb IIIC T80°C…T165°C Db

FET631F2
Class I Division 2, Groups A, B, C, D; T6 Ta = -40°C to +60°C; Type 4X, IP65/67
Class II, Division 2, Groups E, F, G, Class III, Division 1; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 2, AEx ec IIC T6 Gc Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb IIIC T80°C Db

12. **Description of Equipment:**

**General** - The FEP6_ _ ProcessMaster, and FEH6_ _ HygienicMaster are series of electromagnetic flowmeters. The electronics enclosure is a cylindrical enclosure identified as a Type 3, a dual compartment rectangular enclosure identified as the Field Housing or a single compartment a rectangular housing identified as a Type 4.

The FEP6_ _ ProcessMaster, and FEH6_ _ HygienicMaster are both available as integral and remote designs. In the case of the remote version an optional pre-amplifier can be located on the Primary. A high process temperature version is available and uses a 100 mm stand-off between the Primary and the electronics or remote connection facilities.

The sensor is available in two different versions: Process Sensor and Hygienic Sensor. The Process Sensor is available in meter size DN3 to DN2000, the Hygienic Sensor is available in meter size DN3 to DN100. The medium temperature range for the Hygienic Sensor and the medium temperature range for the Process Sensor are -40°C to 130°C for the normal temperature version and -40°C to +180°C for the high temperature version.

Enclosure rating IP65, IP67, or IP68 depending on the option selected.

**Ratings** -
Power Supply (Terminals L and N)

| | |
|---|---|
| $U_{DC}$ = 16.8 to 30 V | Power supply (= $U_{LOW}$); $P_{MAX}$ = ≤ 20 W; C, Ripple < 5 % |
| $U_{AC}$ = 100 V (-15%) to 240 V (+10%) | Power supply (= $U_{HIGH}$); S ≤ 20 W |

See Drawing Number 3KXF000061G0009 for the parameters for the Current Output, Digital Output, and Digital Input connections.

The transmitters are rated for use in an ambient temperature range of -40°C to +60°C. The flowmeters are rated for use in a process temperature range of either -40°C to +130°C or -40°C to +180°C.

**Mode Code options**

***FEH631F2fghijklmnopqrA-t.u.v – Hygienic Integral***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1

j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP631F2fghijklmnopqrA-t.u.v.w – Process Integral – Design Level A***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2, or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D, E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA, SMS

***FEP631F2fghT1jklmnopqrB-t.u.v.SMA – Process Integral – Design Level B***
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety

h = Process Connection Type: 2-digit code – not relevant for safety
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D, E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1 or TK4

***FEH632F2fghijklmnop8Y0A-t.u.v – Hygienic remote sensor***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP632F2fghijklmnop8Y0A-t.u.v.w – Process remote sensor – Design Level A***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety

h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FEP632F1fghT1jklmnop8Y0B-t.u.v.SMA – Process remote sensor – Design Level B***
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67 /68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
21 / AEx ia tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1 or TK4

***FET632F2fopqr - t.u.v – Remote transmitter***
NI / I / 2 / ABCD / T6 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6 Ta = +60°C; Type 4X, IP65/67
NI / III / 1 / T6 Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C Db Ta = +60°C; Type 4X, IP65/67

f = Housing Type/Housing Material/ Cable entry: F1 or F2
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA

u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEH631F1fghijklmnopqrA-t.u.v – Hygienic Integral***
S-XP-IS / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I/ 1 / AEx db eb mb [ia Ga] / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C…T165°C Db, Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Process Connection Type: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2:DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP631F1fghijklmnopqrA-t.u.v.w – Process Integral***
S-XP-IS / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
NI / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I/ 1 / AEx db eb mb [ia Ga] / IIB+H2 / T6…T1 Gb/Ga Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C…T165°C Db/Da, Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: D1, D2, D3, D4, D6 or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Process Connection Type: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C, or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3, Y0

Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2:DR0, DSA, DSN, or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FEH632F1fghijklmnop8Y0A-t.u.v – Hygienic remote sensor***
S-XP / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I/ 1 / AEx db eb mb / IIB+H2 / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP632F1fghijklmnop8Y0A-t.u.v.w – Process remote sensor***
S-XP / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67 /68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I/ 1 / AEx db eb mb / IIB+H2 / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W

Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FET632F1fopqr - t.u.v – Remote transmitter***
XP-IS / I / 1 / BCD / T6 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6 Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6 Ta = +60°C; Type 4X, IP65/67
I / 1 / AEx db [ia Ga] / IIB + H2 / T6 Gb/Ga Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C Db/Da Ta = +60°C; Type 4X, IP65/67

f = Housing Type/Housing Material/ Cable entry: W5 or W7
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

13. **Specific Conditions of Use:**

1. The painted surface of the FE*6, ProcessMaster and HygenicMaster may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TR60079-32-2 Cleaning of the painted surface should only be done with a damp cloth.
2. For installations in flammable dust, the cable entries shall be fitted with an appropriate cable entry device meeting the requirements of IP6x fitted with a gasket or seal between the cable entry device and the wall of the enclosure.
3. For Integral and Remote versions FE*63*F1 or FE*63*F2 Zone 21 having exposed electrodes in the process shall be used in a non-flammable liquid process only.
4. Contact the manufacturer for specific flamepath joint details during repair of flameproof AEx d apparatus.
5. Refer to manufacturer's instructions for ambient temperature, process temperature and temperature classification details.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

| Date | Description |
|---|---|
| 22nd May 2018 | Original Issue. |

# CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM17US0062X**
3. **Equipment:** **FEP63 _ ProcessMaster, and**
   **(Type Reference and Name)** **FEH63_ HygienicMaster Electromagnetic Flowmeters, and**
   **FET63_Transmitters**
4. **Name of Listing Company:** **ABB Automation Products GmbH**
5. **Address of Listing Company:** **Dransfelder Straße 2,**
   **D-37079 Göttingen,**
   **Germany**
6. The examination and test results are recorded in confidential report number:

   3059596 dated 22nd May 2018

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM Class 3600: 2011, FM Class 3610: 2015, FM Class 3611: 2016, FM Class 3615: 2006, FM Class 3616: 2011, FM Class 3810: 2005, ANSI/ISA 60079-0: 2013, ANSI/ISA 60079-1: 2015, ANSI/UL 60079-7: 2017, ANSI/ISA 60079-11: 2014, ANSI/UL 60079-18: 2015, ANSI/ISA 60079-31: 2015, ANSI/NEMA 250: 2008, ANSI/IEC 60529: 2004 and ANSI/ISA 12.27.01: 2011.

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

**Certificate issued by:**

J.E. Marquedant

J.E. Marquedant
VP, Manager, Electrical Systems

6 July 2018
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com



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T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

10. Equipment Ratings:

**FE*631F1D (6 and 8) – Integral transmitter & sensor**

Explosionproof for Class I, Division 1, Groups A, B, C and D T6…T1; Dust-ignitionproof for Class II, Division 1, Groups E, F and G T6…T3B; Class III, Division 1 T6…T3B, Flameproof/increased safety/encapsulated with intrinsically safe outputs for Class I, Zone 1, AEx db eb mb [ia Ga] IIB+$H_2$ T6…T1 Gb, protection by enclosure with intrinsically safe outputs for Zone 21 AEx tb [ia Da] IIIC T80°C…T165°C Db, hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

**FE*632F1A (1 and 2) – Remote sensor**

**FE*632F1U (1 and 2) – Remote sensor**

Explosionproof for Class I, Division 1, Groups A, B, C and D T6…T1; Dust-ignitionproof for Class II, Division 1, Groups E, F and G T6…T3B; Class III, Division 1 T6…T3B, Flameproof/increased safety/encapsulated for Class I, Zone 1, AEx db eb mb IIB+$H_2$ T6…T1 Gb, protection by enclosure/intrinsic safety for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67/68) with an ambient temperature rating of -40°C to +60°C.

**FET632F1W (1 to 5 and 7) – Transmitter only**

Explosionproof for Class I, Division 1, Groups B, C and D, T6; Dust-ignitionproof for Class II, Division 1, Groups E, F and G, T6; Class III, Division 1, T6; Flameproof/increased safety/encapsulated with intrinsically safe outputs for Class I, Zone 1, AEx db [ia Ga] IIB + $H_2$ T6 Gb, protection by enclosure for Zone 21 AEx tb [ia Da] IIIC T80°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

**FE*631F2 – Integral transmitter & sensor**

**FEP632F2 – Remote sensor**

**FEH632F2 – Remote sensor**

Nonincendive for Class I Division 2, Groups A, B, C and D T6…T1, Nonincendive for Class II, Division 2, Groups E, F and G, T6…T3B, Class III, Division 1, T6…T3B, Increased safety for Class I, Zone 2 AEx ec IIC T6…T1 Gc, protection by enclosure for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67/68 – sensor only) with an ambient temperature rating of -40°C to +60°C.

**FET632F2– Remote transmitter**

Nonincendive for Class I Division 2, Groups A, B, C and D T6, Nonincendive for Class II, Division 2, Groups E, F and G, T6, Class III, Division 1, T6; Increased safety for Class I, Zone 2 AEx ec IIC T6 Gc, protection by enclosure for Zone 21 AEx tb IIIC T80°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

11. The marking of the equipment shall include:

**FE*631F1D (6 and 8)**

Class I Division 1, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 1, AEx db eb mb [ia Ga] IIB+$H_2$ T6…T1 Gb Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb [ia Da] IIIC T80°C…T165°C Db

**FE*632F1A (1 and 2)**

**FE*632F1U (1 and 2)**

Class I Division 1, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67/68

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68

Class I, Zone 1, AEx db eb mb IIB+$H_2$ T6…T1 Gb Ta = -40°C to +60°C; Type 4X, IP65/67/68

Zone 21, AEx tb IIIC T80°C…T165°C Db

**FET631F2W (1 to 5 and 7)**

Class I Division 1, Groups B, C, D; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 1, AEx db [ia Ga] IIB + $H_2$ T6 Gb Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb [ia Da] IIIC T80°C Db

**FE*631F2**

**FEP632F2**

**FEH632F2**

Class I Division 2, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67/68 (sensor only)

Class II, Division 2, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68 (sensor only)

Class I, Zone 2, AEx ec IIC T6…T1 Gc Ta = -40°C to +60°C; Type 4X, IP65/6768 (sensor only)

Zone 21, AEx tb IIIC T80°C…T165°C Db

**FET632F2**

Class I Division 2, Groups A, B, C, D; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 2, Groups E, F, G, Class III, Division 1; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 2, AEx ec IIC T6 Gc Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb IIIC T80°C Db

12. **Description of Equipment:**

**General** - The FEP6_ _ ProcessMaster, and FEH6_ _ HygienicMaster are series of electromagnetic flowmeters. The electronics enclosure is a cylindrical enclosure identified as a dual compartment Type 3 or a single compartment a rectangular housing identified as a Type 4.

The FEP6_ _ ProcessMaster, and FEH6_ _ HygienicMaster are both available as integral and remote designs. In the case of the remote version an optional pre-amplifier can be located on the Primary. A high process temperature version is available and uses a 40mm or 100 mm stand-offs between the Primary and the electronics or remote connection facilities.

The sensor is available in two different versions: Process Sensor and Hygienic Sensor. The Process Sensor is available in meter size DN3 to DN2000, the Hygienic Sensor is available in meter size DN3 to DN100. The medium temperature range for the Hygienic Sensor and the medium temperature range for the Process Sensor are -40°C to 130°C for the normal temperature version and -40°C to +180°C for the high temperature version. The medium temperature range for sensors identified as Design Level B is -40 °C to 100 °C.

Enclosure rating IP65, IP67, or IP68 depending on the option selected.

**Ratings** -
Power Supply (Terminals L and N)

| | |
|---|---|
| $U_{DC}$ = 16.8 to 30 V | Power supply (= $U_{LOW}$); $P_{MAX}$ = ≤ 20 W; C, Ripple < 5 % |
| $U_{AC}$ = 100 V (-15%) to 240 V (+10%) | Power supply (= $U_{HIGH}$); S ≤ 20 W |

See Drawing Number 3KXF000061G0009 for the parameters for the Current Output, Digital Output, and Digital Input connections.

The transmitters are rated for use in an ambient temperature range of -40°C to +60°C. The flowmeters are rated for use in a process temperature range of either -40°C to +130°C or -40°C to +180°C.

**Mode Code options**

***FEH631F2fghijklmnopqrA-t.u.v – Hygienic Integral***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety

k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP631F2fghijklmnopqrA-t.u.v.w – Process Integral – Design Level A***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2, or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D, E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA, SMS

***FEP631F2fghT1jklmnopqrB-t.u.v.SMA – Process Integral – Design Level B***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, or D4

g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D, E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1 or TK4

***FEH632F2fghijklmnop8Y0A-t.u.v – Hygienic remote sensor***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP632F2fghijklmnop8Y0A-t.u.v.w – Process remote sensor – Design Level A***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2

g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FEP632F2fghT1jklmnop8Y0B-t.u.v.SMA – Process remote sensor – Design Level B***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67 /68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
21 / AEx ia tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1 or TK4

***FET632F2fopqr - t.u.v – Remote transmitter***
NI / I / 2 / ABCD / T6 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6 Ta = +60°C; Type 4X, IP65/67
NI / III / 1 / T6 Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C Db Ta = +60°C; Type 4X, IP65/67

f = Housing Type/Housing Material/ Cable entry: F1 or F2
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2

r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEH631F1fghijklmnopqrA-t.u.v – Hygienic Integral***
S-XP-IS / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I/ 1 / AEx db eb mb [ia Ga] / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C…T165°C Db, Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner Material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2:DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP631F1fghijklmnopqrA-t.u.v.w – Process Integral***
S-XP-IS / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
NI / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I/ 1 / AEx db eb mb [ia Ga] / IIB+H2 / T6…T1 Gba Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C…T165°C Db, Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: D1, D2, D3, D4, D6 or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner Material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70 or 91

p = Power supply: A, D, C, or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3, Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2:DR0, DSA, DSN, or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FEH632F1fghijklmnop8Y0A-t.u.v – Hygienic remote sensor***
S-XP / I / 1 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I/ 1 / AEx db eb mb / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP632F1fghijklmnop8Y0A-t.u.v.w – Process remote sensor***
S-XP / I / 1 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67 /68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I/ 1 / AEx db eb mb / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3

n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FET632F1fopqr - t.u.v – Remote transmitter***
XP-IS / I / 1 / BCD / T6 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6 Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6 Ta = +60°C; Type 4X, IP65/67
I / 1 / AEx db [ia Ga] / IIB + H2 / T6 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C Db Ta = +60°C; Type 4X, IP65/67

f = Housing Type/Housing Material/ Cable entry: W1, W2, W3, W4, W5 or W7
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

13. **Specific Conditions of Use:**

1. The painted surface of the FE*6, ProcessMaster and HygenicMaster may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TR60079-32-2 Cleaning of the painted surface should only be done with a damp cloth.
2. For installations in flammable dust, the cable entries shall be fitted with an appropriate cable entry device meeting the requirements of IP6x fitted with a gasket or seal between the cable entry device and the wall of the enclosure.
3. For Integral and Remote versions FE*63*F1 or FE*63*F2 Zone 21 having exposed electrodes in the process shall be used in a non-flammable liquid process only.
4. Contact the manufacturer for specific flamepath joint details during repair of flameproof AEx d apparatus.
5. Refer to manufacturer's instructions for ambient temperature, process temperature and temperature classification details.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

| Date | Description |
|---|---|
| 22nd May 2018 | Original Issue. |
| 6th July 2018 | Supplement 1:<br>Report Reference: RR214851 dated 6th July 2018.<br>Description of the Change: Editorial corrections to the certificate. |

# CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM17US0062X**
3. **Equipment:** **FEP63 _ ProcessMaster, and**
   **(Type Reference and Name)** **FEH63_ HygienicMaster Electromagnetic Flowmeters, and**
   **FET63_Transmitters**
4. **Name of Listing Company:** **ABB Automation Products GmbH**
5. **Address of Listing Company:** **Dransfelder Straße 2,**
   **D-37079 Göttingen,**
   **Germany**
6. The examination and test results are recorded in confidential report number:

   3059596 dated 22nd May 2018

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM Class 3600: 2011, FM Class 3610: 2015, FM Class 3611: 2016, FM Class 3615: 2006, FM Class 3616: 2011, FM Class 3810: 2005, ANSI/ISA 60079-0: 2013, ANSI/ISA 60079-1: 2015, ANSI/UL 60079-7: 2017, ANSI/ISA 60079-11: 2014, ANSI/UL 60079-18: 2015, ANSI/ISA 60079-31: 2015, ANSI/NEMA 250: 2008, ANSI/IEC 60529: 2004 and ANSI/ISA 12.27.01: 2011.

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

**Certificate issued by:**

J.E. Marquedant
VP, Manager, Electrical Systems

24 August 2018
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com



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T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

10. Equipment Ratings:

**FE*631F1D (6 and 8) – Integral transmitter & sensor**

Explosionproof for Class I, Division 1, Groups A, B, C and D T6…T1; Dust-ignitionproof for Class II, Division 1, Groups E, F and G T6…T3B; Class III, Division 1 T6…T3B, Flameproof/increased safety/encapsulated with intrinsically safe outputs for Class I, Zone 1, AEx db eb mb [ia Ga] IIB+$H_2$ T6…T1 Gb, protection by enclosure with intrinsically safe outputs for Zone 21 AEx tb [ia Da] IIIC T80°C…T165°C Db, hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

**FE*632F1A (1 and 2) – Remote sensor**

**FE*632F1U (1 and 2) – Remote sensor**

Explosionproof for Class I, Division 1, Groups A, B, C and D T6…T1; Dust-ignitionproof for Class II, Division 1, Groups E, F and G T6…T3B; Class III, Division 1 T6…T3B, Flameproof/increased safety/encapsulated for Class I, Zone 1, AEx db eb mb IIB+$H_2$ T6…T1 Gb, protection by enclosure/intrinsic safety for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67/68) with an ambient temperature rating of -40°C to +60°C.

**FET632F1W (1 to 5 and 7) – Transmitter only**

Explosionproof for Class I, Division 1, Groups B, C and D, T6; Dust-ignitionproof for Class II, Division 1, Groups E, F and G, T6; Class III, Division 1, T6; Flameproof/increased safety/encapsulated with intrinsically safe outputs for Class I, Zone 1, AEx db [ia Ga] IIB + $H_2$ T6 Gb, protection by enclosure for Zone 21 AEx tb [ia Da] IIIC T80°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

**FE*631F2 – Integral transmitter & sensor**

**FEP632F2 – Remote sensor**

**FEH632F2 – Remote sensor**

Nonincendive for Class I Division 2, Groups A, B, C and D T6…T1, Nonincendive for Class II, Division 2, Groups E, F and G, T6…T3B, Class III, Division 1, T6…T3B, Increased safety for Class I, Zone 2 AEx ec IIC T6…T1 Gc, protection by enclosure for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67/68 – sensor only) with an ambient temperature rating of -40°C to +60°C.

**FET632F2– Remote transmitter**

Nonincendive for Class I Division 2, Groups A, B, C and D T6, Nonincendive for Class II, Division 2, Groups E, F and G, T6, Class III, Division 1, T6; Increased safety for Class I, Zone 2 AEx ec IIC T6 Gc, protection by enclosure for Zone 21 AEx tb IIIC T80°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

11. The marking of the equipment shall include:

**FE*631F1D (6 and 8)**

Class I Division 1, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 1, AEx db eb mb [ia Ga] IIB+$H_2$ T6…T1 Gb Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb [ia Da] IIIC T80°C…T165°C Db

**FE*632F1A (1 and 2)**

**FE*632F1U (1 and 2)**

Class I Division 1, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67/68

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68

Class I, Zone 1, AEx db eb mb IIB+$H_2$ T6…T1 Gb Ta = -40°C to +60°C; Type 4X, IP65/67/68

Zone 21, AEx tb IIIC T80°C…T165°C Db

**FET631F2W (1 to 5 and 7)**

Class I Division 1, Groups B, C, D; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 1, AEx db [ia Ga] IIB + $H_2$ T6 Gb Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb [ia Da] IIIC T80°C Db

**FE*631F2**

**FEP632F2**

**FEH632F2**

Class I Division 2, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67/68 (sensor only)

Class II, Division 2, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68 (sensor only)

Class I, Zone 2, AEx ec IIC T6…T1 Gc Ta = -40°C to +60°C; Type 4X, IP65/6768 (sensor only)

Zone 21, AEx tb IIIC T80°C…T165°C Db

**FET632F2**

Class I Division 2, Groups A, B, C, D; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 2, Groups E, F, G, Class III, Division 1; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 2, AEx ec IIC T6 Gc Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb IIIC T80°C Db

12. **Description of Equipment:**

**General** - The FEP6_ _ ProcessMaster, and FEH6_ _ HygienicMaster are series of electromagnetic flowmeters. The electronics enclosure is a cylindrical enclosure identified as a dual compartment Type 3 or a single compartment a rectangular housing identified as a Type 4.

The FEP6_ _ ProcessMaster, and FEH6_ _ HygienicMaster are both available as integral and remote designs. In the case of the remote version an optional pre-amplifier can be located on the Primary. A high process temperature version is available and uses a 40mm or 100 mm stand-offs between the Primary and the electronics or remote connection facilities.

The sensor is available in two different versions: Process Sensor and Hygienic Sensor. The Process Sensor is available in meter size DN3 to DN2000, the Hygienic Sensor is available in meter size DN3 to DN100. The medium temperature range for the Hygienic Sensor and the medium temperature range for the Process Sensor are -40°C to 130°C for the normal temperature version and -40°C to +180°C for the high temperature version. The medium temperature range for sensors identified as Design Level B is -40 °C to 100 °C.

Enclosure rating IP65, IP67, or IP68 depending on the option selected.

**Ratings** -
Power Supply (Terminals L and N)

| | |
|---|---|
| $U_{DC}$ = 16.8 to 30 V | Power supply (= $U_{LOW}$); $P_{MAX}$ = ≤ 20 W; C, Ripple < 5 % |
| $U_{AC}$ = 100 V (-15%) to 240 V (+10%) | Power supply (= $U_{HIGH}$); S ≤ 20 W |

See Drawing Number 3KXF000061G0009 for the parameters for the Current Output, Digital Output, and Digital Input connections.

The transmitters are rated for use in an ambient temperature range of -40°C to +60°C. The flowmeters are rated for use in a process temperature range of either -40°C to +130°C or -40°C to +180°C.

**Mode Code options**

***FEH631F2fghijklmnopqrA-t.u.v – Hygienic Integral***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety

k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP631F2fghijklmnopqrA-t.u.v.w – Process Integral – Design Level A***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2, or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D, E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA, SMS

***FEP631F2fghT1jklmnopqrB-t.u.v.SMA – Process Integral – Design Level B***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, or D4

g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D, E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1 or TK4

***FEH632F2fghijklmnop8Y0A-t.u.v – Hygienic remote sensor***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP632F2fghijklmnop8Y0A-t.u.v.w – Process remote sensor – Design Level A***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2

g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FEP632F2fghT1jklmnop8Y0B-t.u.v.SMA – Process remote sensor – Design Level B***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67 /68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
21 / AEx ia tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1 or TK4

***FET632F2fopqr - t.u.v – Remote transmitter***
NI / I / 2 / ABCD / T6 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6 Ta = +60°C; Type 4X, IP65/67
NI / III / 1 / T6 Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C Db Ta = +60°C; Type 4X, IP65/67

f = Housing Type/Housing Material/ Cable entry: F1 or F2
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2

r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEH631F1fghijklmnopqrA-t.u.v – Hygienic Integral***
S-XP-IS / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I/ 1 / AEx db eb mb [ia Ga] / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C…T165°C Db, Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner Material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2:DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP631F1fghijklmnopqrA-t.u.v.w – Process Integral***
S-XP-IS / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
NI / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I/ 1 / AEx db eb mb [ia Ga] / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C…T165°C Db, Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: D1, D2, D3, D4, D6 or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner Material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70 or 91

p = Power supply: A, D, C, or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3, Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2:DR0, DSA, DSN, or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FEH632F1fghijklmnop8Y0A-t.u.v – Hygienic remote sensor***
S-XP / I / 1 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I/ 1 / AEx db eb mb / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP632F1fghijklmnop8Y0A-t.u.v.w – Process remote sensor***
S-XP / I / 1 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67 /68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I/ 1 / AEx db eb mb / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3

n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FET632F1fopqr - t.u.v – Remote transmitter***
XP-IS / I / 1 / BCD / T6 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6 Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6 Ta = +60°C; Type 4X, IP65/67
I / 1 / AEx db [ia Ga] / IIB + H2 / T6 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C Db Ta = +60°C; Type 4X, IP65/67

f = Housing Type/Housing Material/ Cable entry: W1, W2, W3, W4, W5 or W7
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

13. **Specific Conditions of Use:**

1. The painted surface of the FE*6, ProcessMaster and HygenicMaster may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TR60079-32-2 Cleaning of the painted surface should only be done with a damp cloth.
2. For installations in flammable dust, the cable entries shall be fitted with an appropriate cable entry device meeting the requirements of IP6x fitted with a gasket or seal between the cable entry device and the wall of the enclosure.
3. For Integral and Remote versions FE*63*F1 or FE*63*F2 Zone 21 having exposed electrodes in the process shall be used in a non-flammable liquid process only.
4. Contact the manufacturer for specific flamepath joint details during repair of flameproof AEx d apparatus.
5. Refer to manufacturer's instructions for ambient temperature, process temperature and temperature classification details.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

| Date | Description |
|---|---|
| 22nd May 2018 | Original Issue. |
| 6th July 2018 | Supplement 1:<br>Report Reference: RR214851 dated 6th July 2018.<br>Description of the Change: Editorial corrections to the certificate. |
| 24th August 2018 | Supplement 2:<br>Report Reference: RR215360 dated 24th August 2018.<br>Description of the Change: Editorial corrections to the certificate. |

# CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM17US0062X**
3. **Equipment:** **FEP63 _ ProcessMaster, and**
   **(Type Reference and Name)** **FEH63_ HygienicMaster Electromagnetic Flowmeters, and**
   **FET63_Transmitters**
4. **Name of Listing Company:** **ABB Automation Products GmbH**
5. **Address of Listing Company:** **Dransfelder Straße 2,**
   **D-37079 Göttingen,**
   **Germany**
6. The examination and test results are recorded in confidential report number:

   3059596 dated 22nd May 2018

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM Class 3600: 2018, FM Class 3610: 2018, FM Class 3611: 2018, FM Class 3615: 2018, FM Class 3616: 2011, FM Class 3810: 2018, ANSI/ISA 60079-0: 2013, ANSI/ISA 60079-1: 2015, ANSI/UL 60079-7: 2017, ANSI/ISA 60079-11: 2014, ANSI/UL 60079-18: 2015, ANSI/ISA 60079-31: 2015, ANSI/NEMA 250: 2008, ANSI/IEC 60529: 2004 and ANSI/ISA 12.27.01: 2011.

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

**Certificate issued by:**

J.E. Marquedant
VP, Manager, Electrical Systems

2 January 2019
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com



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# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

10. Equipment Ratings:

**FE*631F1D (6 and 8) – Integral transmitter & sensor**

Explosionproof for Class I, Division 1, Groups A, B, C and D T6…T1; Dust-ignitionproof for Class II, Division 1, Groups E, F and G T6…T3B; Class III, Division 1 T6…T3B, Flameproof/increased safety/encapsulated with intrinsically safe outputs for Class I, Zone 1, AEx db eb mb [ia Ga] IIB+$H_2$ T6…T1 Gb, protection by enclosure with intrinsically safe outputs for Zone 21 AEx tb [ia Da] IIIC T80°C…T165°C Db, hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

**FE*632F1A (1 and 2) – Remote sensor**

**FE*632F1U (1 and 2) – Remote sensor**

Explosionproof for Class I, Division 1, Groups A, B, C and D T6…T1; Dust-ignitionproof for Class II, Division 1, Groups E, F and G T6…T3B; Class III, Division 1 T6…T3B, Flameproof/increased safety/encapsulated for Class I, Zone 1, AEx db eb mb IIB+$H_2$ T6…T1 Gb, protection by enclosure/intrinsic safety for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67/68) with an ambient temperature rating of -40°C to +60°C.

**FET632F1W (1 to 5 and 7) – Transmitter only**

Explosionproof for Class I, Division 1, Groups B, C and D, T6; Dust-ignitionproof for Class II, Division 1, Groups E, F and G, T6; Class III, Division 1, T6; Flameproof/increased safety/encapsulated with intrinsically safe outputs for Class I, Zone 1, AEx db [ia Ga] IIB + $H_2$ T6 Gb, protection by enclosure for Zone 21 AEx tb [ia Da] IIIC T80°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

**FE*631F2 – Integral transmitter & sensor**

**FEP632F2 – Remote sensor**

**FEH632F2 – Remote sensor**

Nonincendive for Class I Division 2, Groups A, B, C and D T6…T1, Nonincendive for Class II, Division 2, Groups E, F and G, T6…T3B, Class III, Division 1, T6…T3B, Increased safety for Class I, Zone 2 AEx ec IIC T6…T1 Gc, protection by enclosure for Zone 21 AEx tb IIIC T80°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67/68 – sensor only) with an ambient temperature rating of -40°C to +60°C.

**FET632F2– Remote transmitter**

Nonincendive for Class I Division 2, Groups A, B, C and D T6, Nonincendive for Class II, Division 2, Groups E, F and G, T6, Class III, Division 1, T6; Increased safety for Class I, Zone 2 AEx ec IIC T6 Gc, protection by enclosure for Zone 21 AEx tb IIIC T80°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP65/67) with an ambient temperature rating of -40°C to +60°C.

# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

11. The marking of the equipment shall include:

**FE*631F1D (6 and 8)**

Class I Division 1, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 1, AEx db eb mb [ia Ga] IIB+$H_2$ T6…T1 Gb Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb [ia Da] IIIC T80°C…T165°C Db

**FE*632F1A (1 and 2)**

**FE*632F1U (1 and 2)**

Class I Division 1, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67/68

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68

Class I, Zone 1, AEx db eb mb IIB+$H_2$ T6…T1 Gb Ta = -40°C to +60°C; Type 4X, IP65/67/68

Zone 21, AEx tb IIIC T80°C…T165°C Db

**FET631F2W (1 to 5 and 7)**

Class I Division 1, Groups B, C, D; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 1, AEx db [ia Ga] IIB + $H_2$ T6 Gb Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb [ia Da] IIIC T80°C Db

**FE*631F2**

**FEP632F2**

**FEH632F2**

Class I Division 2, Groups A, B, C, D; T6…T1 Ta = -40°C to +60°C; Type 4X, IP65/67/68 (sensor only)

Class II, Division 2, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68 (sensor only)

Class I, Zone 2, AEx ec IIC T6…T1 Gc Ta = -40°C to +60°C; Type 4X, IP65/6768 (sensor only)

Zone 21, AEx tb IIIC T80°C…T165°C Db

**FET632F2**

Class I Division 2, Groups A, B, C, D; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class II, Division 2, Groups E, F, G, Class III, Division 1; T6 Ta = -40°C to +60°C; Type 4X, IP65/67

Class I, Zone 2, AEx ec IIC T6 Gc Ta = -40°C to +60°C; Type 4X, IP65/67

Zone 21, AEx tb IIIC T80°C Db

12. **Description of Equipment:**

**General** - The FEP6_ _ ProcessMaster, and FEH6_ _ HygienicMaster are series of electromagnetic flowmeters. The electronics enclosure is a cylindrical enclosure identified as a dual compartment Type 3 or a single compartment a rectangular housing identified as a Type 4.

The FEP6_ _ ProcessMaster, and FEH6_ _ HygienicMaster are both available as integral and remote designs. In the case of the remote version an optional pre-amplifier can be located on the Primary. A high process temperature version is available and uses a 40mm or 100 mm stand-offs between the Primary and the electronics or remote connection facilities.

The sensor is available in two different versions: Process Sensor and Hygienic Sensor. The Process Sensor is available in meter size DN3 to DN2000, the Hygienic Sensor is available in meter size DN3 to DN100. The medium temperature range for the Hygienic Sensor and the medium temperature range for the Process Sensor are -40°C to 130°C for the normal temperature version and -40°C to +180°C for the high temperature version. The medium temperature range for sensors identified as Design Level B is -40 °C to 100 °C.

Enclosure rating IP65, IP67, or IP68 depending on the option selected.

**Ratings** -
Power Supply (Terminals L and N)

| | |
|---|---|
| $U_{DC}$ = 16.8 to 30 V | Power supply (= $U_{LOW}$); $P_{MAX}$ = ≤ 20 W; C, Ripple < 5 % |
| $U_{AC}$ = 100 V (-15%) to 240 V (+10%) | Power supply (= $U_{HIGH}$); S ≤ 20 W |

See Drawing Number 3KXF000061G0009 for the parameters for the Current Output, Digital Output, and Digital Input connections.

The transmitters are rated for use in an ambient temperature range of -40°C to +60°C. The flowmeters are rated for use in a process temperature range of either -40°C to +130°C or -40°C to +180°C.

**Mode Code options**

***FEH631F2fghijklmnopqrA-t.u.v – Hygienic Integral***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety

k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G8, M5, D1 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN.DRM, DRD or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP631F2fghijklmnopqrA-t.u.v.w – Process Integral – Design Level A***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2, or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D, E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M5, D1 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN, DRM, DRD or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA, SMS

***FEP631F2fghT1jklmnopqrB-t.u.v.SMA – Process Integral – Design Level B***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: S1, S2, D1, D2, D3, or D4

g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D, E
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2
r = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M5, D1 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN, DRM, DRD or DSG
v = Temperature range of installation/Ambient temperature range: TK1 or TK4

***FEH632F2fghijklmnop8Y0A-t.u.v – Hygienic remote sensor***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP632F2fghijklmnop8Y0A-t.u.v.w – Process remote sensor – Design Level A***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I / 2 / AEx ec / IIC / T6…T1 Gc Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db Ta = +60°C; Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2

g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FEP632F2fghT1jklmnop8Y0B-t.u.v.SMA – Process remote sensor – Design Level B***
NI / I / 2 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6…T3B Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67 /68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
21 / AEx ia tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1 or TK4

***FET632F2fopqr - t.u.v – Remote transmitter***
NI / I / 2 / ABCD / T6 Ta = +60°C; Type 4X, IP65/67
NI / II / 2 / EFG / T6 Ta = +60°C; Type 4X, IP65/67
NI / III / 1 / T6 Ta = +60°C; Type 4X, IP65/67
I / 2 / AEx ec / IIC / T6 Gc Ta = +60°C; Type 4X, IP65/67
21 / AEx tb / IIIC / T80°C Db Ta = +60°C; Type 4X, IP65/67

f = Housing Type/Housing Material/ Cable entry: F1 or F2
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 0, 1 or 2

r = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M5, D1 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN, DRM, DRD or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEH631F1fghijklmnopqrA-t.u.v – Hygienic Integral***
S-XP-IS / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I/ 1 / AEx db eb mb [ia Ga] / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C…T165°C Db, Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: D1, D2, D3, D4, D6, or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner Material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M5, D1 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2:DR0, DSA, DSN, DRM, DRD or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP631F1fghijklmnopqrA-t.u.v.w – Process Integral***
S-XP-IS / I / 1 / BCD / T6…T1 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67
NI / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67
I/ 1 / AEx db eb mb [ia Ga] / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C…T165°C Db, Type 4X, IP65/67
Single Seal

f = Housing Type/Housing Material/ Cable entry: D1, D2, D3, D4, D6 or D8
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner Material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2, or 3
n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70 or 91

p = Power supply: A, D, C, or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3, , G4, G5, G6, G7, G8, G9, M5, D1 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2:DR0, DSA, DSN, DRM, DRD or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FEH632F1fghijklmnop8Y0A-t.u.v – Hygienic remote sensor***
S-XP / I / 1 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67/68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I/ 1 / AEx db eb mb / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: T1 or P1
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0 or 2
n = Grounding accessories: A, B or C
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

***FEP632F1fghijklmnop8Y0A-t.u.v.w – Process remote sensor***
S-XP / I / 1 / ABCD / T6…T1 Ta = +60°C; Type 4X, IP65/67/68
DIP / II / 1 / EFG / T6…T3B Ta = -40°C to +60°C; Type 4X, IP65/67 /68
DIP / III / 1 / T6…T3B Ta = +60°C; Type 4X, IP65/67/68
I/ 1 / AEx db eb mb / IIB+H2 / T6…T1 Gb Ta = +60°C; Type 4X, IP65/67/68
21 / AEx tb / IIIC / T80°C…T165°C Db, Type 4X, IP65/67/68
Single Seal

f = Housing Type/Housing Material/ Cable entry: A1, A2, U1, or U2
g = Meter Size: 4-digit code – not relevant for safety
h = Process Connection Type: 2-digit code – not relevant for safety
i = Liner material: R2, R3, R4, E1, T1, T3, T2, P1, C1, E2 or P2
j = Process connection material: Single digit – not relevant for safety
k = Electrode design: 1, or 5
l = Measuring electrode material: Single digit code – not relevant for safety
m = Grounding electrode/Full pipe detection: 0, 1, 2 or 3

n = Grounding accessories: A, B, C, D or E
o = Protection class transmitter/protection class sensor: 70, 76, 77 or 91
p = Power supply: Y or W
Additional Codes
t = Option card 1: DR0
u = Option card 2: DR0
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK
w = Sensor housing material: SMA or SMS

***FET632F1fopqr - t.u.v – Remote transmitter***
XP-IS / I / 1 / BCD / T6 Ta = +60°C; Type 4X, IP65/67
DIP / II / 1 / EFG / T6 Ta = +60°C; Type 4X, IP65/67
DIP / III / 1 / T6 Ta = +60°C; Type 4X, IP65/67
I / 1 / AEx db [ia Ga] / IIB + H2 / T6 Gb Ta = +60°C; Type 4X, IP65/67
21 / AEx tb [ia Da] / IIIC / T80°C Db Ta = +60°C; Type 4X, IP65/67

f = Housing Type/Housing Material/ Cable entry: W1, W2, W3, W4, W5 or W7
o = Protection class transmitter/protection class sensor: 70 or 91
p = Power supply: A, D, C or E
q = Display: 1 or 2
r = Outputs: G0, G1, G2, G3, G4, G5, G6, G7, G8, G9, M5, D1 or Y0
Additional Codes
t = Option card 1: DR0, DRN, DRG, DRT or DRA
u = Option card 2: DR0, DSA, DSN, DRM, DRD or DSG
v = Temperature range of installation/Ambient temperature range: TK1, TK4, TKH or TKK

13. **Specific Conditions of Use:**

1. The painted surface of the FE*6, ProcessMaster and HygenicMaster may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust, or oil. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TR60079-32-2 Cleaning of the painted surface should only be done with a damp cloth.
2. For installations in flammable dust, the cable entries shall be fitted with an appropriate cable entry device meeting the requirements of IP6x fitted with a gasket or seal between the cable entry device and the wall of the enclosure.
3. For Integral and Remote versions FE*63*F1 or FE*63*F2 Zone 21 having exposed electrodes in the process shall be used in a non-flammable liquid process only.
4. Contact the manufacturer for specific flamepath joint details during repair of flameproof AEx d apparatus.
5. Refer to manufacturer's instructions for ambient temperature, process temperature and temperature classification details.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

# SCHEDULE

US Certificate Of Conformity No: FM17US0062X

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

| Date | Description |
|---|---|
| 22nd May 2018 | Original Issue. |
| 6th July 2018 | Supplement 1:<br>Report Reference: RR214851 dated 6th July 2018.<br>Description of the Change: Editorial corrections to the certificate. |
| 24th August 2018 | Supplement 2:<br>Report Reference: RR215360 dated 24th August 2018.<br>Description of the Change: Editorial corrections to the certificate. |
| 2nd January 2019 | Supplement 3:<br>Report Reference: RR215454 dated 2nd January 2019.<br>Description of the Change: Addition of Modbus option card. Modifications to PWBs. |