1. EU-TYPE EXAMINATION CERTIFICATE

2. **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU**

3. **EU-Type Examination Certificate No:** **FM23ATEX0017X**

4. **Equipment or protective system: (Type Reference and Name)** **E4 Modulevel - Liquid Level Displacer Transmitter and E4T Modulevel Transmitter**

5. **Name of Applicant:** **AMETEK Magnetrol USA LLC**

6. **Address of Applicant** **705 Enterprise St, Aurora, Illinois 60504, USA**

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8. FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

   The examination and test results are recorded in confidential report number:

   PR464645 dated 12th July 2023

9. Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

   EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015, EN 60529:1991+A1:2000+A2:2013

10. 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.

11. This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12. The marking of the equipment or protective system shall include:

    Epsilon Ex can be located in Annex.

Certificate issued by: Martin Crowe

Certification Manager, FM Approvals Europe Ltd.

Date:28 August 2023

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13. **Description of Equipment or Protective System:**

General - The E4 Modulevel Liquid Level Displacer Transmitter and E4T Modulevel Transmitter consist of a liquid level sensor that operates by means of a displacement device in contact with a process liquid. The buoyancy of which causes a metal rod to rise or fall within a cylindrical LVDT sensor. The sensor ascertains the height position of the rod within the assembly and electronically converts this information into an analog 4-20 mA signal or a digital serial communications signal (Hart or Fieldbus) for use by other parts of an industrial monitoring and control system.

Three fundamental versions offered by the manufacturer are the Integral and Remote assemblies: The "Integral" version incorporates all the sensing, monitoring, and communications circuits in one Flameproof assembly which is mounted vertically atop a vessel or chamber containing process fluid. This version utilizes an Flameproof enclosure that is provided with two threaded covers, an "E Tube adapter that threads onto the process connection, a cylindrical LVDT sensor housing, and an adapter connecting these parts Field installed wiring is accomplished in the area under the upper threaded cover, and the electronic assemblies are housed under the lower cover, having a glass viewing area. The enclosures are provided with either a M20-1.5 or ½ -14" NPT conduit entries are provided on the sides of the enclosure base for the field-installed wiring. The "Remote" version physically separates the sensing function from the monitoring and communications functions. This version employs an "E-Tube adapter" that threads onto the process connection, a cylindrical LVDT sensor housing, and a cylindrical junction box having a threaded cover, joined with an adapter making them one Flameproof assembly. A second remotely mounted Flameproof assembly consisting of a cylindrical junction box joined by a mounting bracket assembly to a larger housing that has two threaded covers. These two assemblies are wired together between the junction boxes at installation to function as one piece of equipment. The E4T Transmitter is the transmitter only without the process assembly.

Field installed wiring is accomplished in the area under the upper threaded cover of the electronics housing, and the electronic assemblies are housed under the other cover, having a glass viewing area. M20-1.5 or ½ -14" NPT conduit entries are provided for the field-installed wiring. Wiring interconnecting the two halves of the remote version is accomplished from the bottom junction box on the electronics assembly to the junction box on the sensor assembly.

The E4 Modulevel Liquid Level Displacer Transmitter consists of the following:

- an aluminium alloy or stainless-steel housing. Two covers of which one is provided with a window are screwed to this housing.
- an adaptor screwed on the base of the housing.
- a cover screwed on the adaptor, inside a linear variable differential transformer is fitted (LVDT). This one detects and converts the movement of the level of the liquid into 4-20 mA signal or digital output (Hart, Fieldbus, Profibus).
- an E-Tube Adapter that is constructed from either Stainless Steel, Hastelloy or Monel. Two screws that are used to secure the E-tube Adapter partition wall between Zone 0 (EPL Ga) and Zone 1 (EPL Gb).

The E4T Modulevel Transmitter consists of the following:

- an aluminium alloy or stainless-steel housing. Two covers of which one is provided with a window are screwed to this housing.

Each housing shall be equipped with suitably certified cable entries. The unused threaded holes shall be plugged with certified threaded plugs.

Operation Temperature Ranges:

The ambient operating temperature range of the E4 Modulevel Liquid Level Displacer Transmitter is -40°C to 70°C. Process temperature range is -20°C to 445°C.

Electrical data (Not for Intrinsically Safe):
The E4 and E4T Modulevel Transmitters operate at 9-32Vdc.
For energy limitation parameters, refer to Annex.

See Annex

14. **Specific Conditions of Use:**

    See Annex

15. **Essential Health and Safety Requirements:**

    The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

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

    This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

    Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

    This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

17. **Schedule Drawings**

    A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

18. **Certificate History**

    Details of the supplements to this certificate are described below:

Date	Description
18 July 2023	Original Issue.
28 August 2023	Supplement 1: Report Reference: RR238055 dated 24 August 2023. Description of the Change(s): Addition of E4T Transmitter assembly.

ANNEX

E4 Modulevel-5ab1-cde-fg-hij. Liquid Level Displacer Transmitter

Markings:

II 1 G Ex ia IIC T4 Ga -40°C ≤ Ta ≤ 70°C

Description of Equipment:

Energy Limitation Parameters:
Ui = 28.6V, Ii = 140mA, Pi = 1W Ci = 4.4nF Li = 2.7µH

a = Signal Output: 1 or 2.
b = Accessories: 0, 1, 2, A, B or C.
c = Housing Conduit Connection: 0, 1, 2, 3, A, B, C or D.
d = Process Temperature: Non-Steam Probe: A, B, D, G, H, J Steam Probe: A, C, E, F
e = Specific Gravity: 0, 1, 2 or 9.
fg = Process Connection - Head Flange: 53, 54, 55, 56, 57, 58, 5K, 5L, 5M, 5N, 63, 64, 65, 66, 67, 68, 6K, 6L, 6M, 6N, 73, 74, 75, 76, 77, 78, 7K, 7L, 7M, 7N, ED, EE, EF, EG, EH, EW, EZ, FD, FE, FF, FG, FW, FZ, GA, GB, GD, GE, GW or GZ.
h = Construction Codes: O, K, L, M or N.
i = Material of Construction: A, B or R.
j = Level Range – Displacer Length: A, B, C, D, E, F, G, H or I.

Specific Conditions of Use:

1. Some of the enclosures contains aluminum and are considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
2. Refer to the manufacturer's instructions to reduce the potential of an electrostatic charging hazard on the equipment enclosure.
3. The installer must ensure the process temperature does not increase the ambient temperature above +70°C.

E4 Modulevel-5ab3-cde-fg-hij. Liquid Level Displacer Transmitter

Markings:

II 2 G Ex db IIC T6…T1 Ga/Gb -40°C ≤ Ta ≤ 70°C

Description of Equipment:

a = Signal Output: 1 or 2.
b = Accessories: 0, 1, 2, A, B or C.
c = Housing Conduit Connection: 0, 1, 2, 3, A, B, C or D.
d = Process Temperature: Non-Steam Probe: A, B, D, G, H, J Steam Probe: A, C, E, F
e = Specific Gravity: 0, 1, 2 or 9.

fg = Process Connection - Head Flange: 53, 54, 55, 56, 57, 58, 5K, 5L, 5M, 5N, 63, 64, 65, 66, 67, 68, 6K, 6L, 6M, 6N, 73, 74, 75, 76, 77, 78, 7K, 7L, 7M, 7N, ED, EE, EF, EG, EH, EW, EZ, FD, FE, FF, FG, FW, FZ, GA, GB, GD, GE, GW or GZ.
h = Construction Codes: O, K, L, M or N.
i = Material of Construction: A, B or R.
j = Level Range – Displacer Length: A, B, C, D, E, F, G, H or I.

Specific Conditions of Use:

1. The flamepaths of the equipment are not intended to be repaired. Consult the manufacturer if repair of the flamepath joints is necessary.
2. Refer to the manufacturer's instructions to reduce the potential of an electrostatic charging hazard on the equipment enclosure.
3. For installation with ambient temperature of +70ºC, refer to the manufacturer's instruction for guidance on proper selection of conductors.
4. Partition wall material shall not be subject to environmental conditions which might adversely affect the partition wall integrity.
5. Some of the enclosures contains aluminum and are considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
6. The installer must ensure the process temperature does not increase the ambient temperature above +70°C.
7. Temperature class for the process temperatures is defined by the following table:

Temperature Class Value	T-Max (Process)	Temperature Class Value	T-Max (Process)
T6	+80°C	T3	+195°C
T5	+95°C	T2	+295°C
T4	+130°C	T1	+445°C

E4T-5ab1-cde. Modulevel Transmitter

Markings:

II 1 G Ex ia IIC T4 Ga -40°C ≤ Ta ≤ 70°C

Description of Equipment:

Intrinsically safe Energy Limitation Parameters:

- Ui = 28.6 V, Ii = 140 mA, Pi = 1.0 W Ci = 4.4 nF, Li = 2.7µH

a = Signal Output: 1 or 2.
b = Accessories: 0, 1, 2, A, B or C.
c = Housing Conduit Connection: 0, 1, 2, 3, A, B, C or D.
d = Process Temperature: Non-Steam Probe: A, B, D, G, H, J Steam Probe: A, C, E, F
e = Specific Gravity: 0, 1, 2 or 9.

Specific Conditions of Use:

1. Some of the enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
2. Clean with a damp cloth only to avoid build-up of electrostatic charge
3. The installer must ensure the process temperature does not increase the ambient temperature above +70°C
4. Model E4T Modulevel Transmitter can only be retrofitted onto EZ, ES, E3 or E4 Models marked with ATEX Hazardous Locations certification.

E4T-5ab3-cde. Modulevel Transmitter

Markings:

II 2 G Ex db IIC T6...T1 Ga/Gb -40°C ≤ Ta ≤ 70°C

Description of Equipment:

a = Signal Output: 1 or 2.
b = Accessories: 0, 1, 2, A, B or C.
c = Housing Conduit Connection: 0, 1, 2, 3, A, B, C or D.
d = Process Temperature: Non-Steam Probe: A, B, D, G, H, J Steam Probe: A, C, E, F
e = Specific Gravity: 0, 1, 2 or 9.

Specific Conditions of Use:

1. The flamepaths of the equipment are not intended to be repaired. Consult the manufacturer if repair of the flamepath joints is necessary.
2. Refer to the manufacturer's instructions to reduce the potential of an electrostatic charging hazard on the equipment enclosure.
3. For installation with ambient temperature of +70ºC, refer to the manufacturer's instruction for guidance on proper selection of conductors.
4. Some of the enclosures contains aluminum and are considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
5. The installer must ensure the process temperature does not increase the ambient temperature above +70°C.
6. Model E4T Modulevel Transmitter can only be retrofitted onto EZ, ES, E3 or E4 Models marked with ATEX Hazardous Locations certification.
7. Temperature class for the process temperatures is defined by the following table:

Temperature Class Value	T-Max (Process)	Temperature Class Value	T-Max (Process)
T6	+80°C	T3	+195°C
T5	+95°C	T2	+295°C
T4	+130°C	T1	+445°C

Blueprint Report

AMETEK Magnetrol USA LLC (1000000020)

Class No 3615

Original Project I.D. 464645

Certificate I.D. FM23ATEX0017X

Drawing No.	Revision Level	Drawing Title	Last Report
48-636	July 2023	E4 Modulevel Installation and Operating Manual	RR238055
009-9823	A	ANALOG FABRICATION BOARD, E4 MODULEVEL	PR464645
030-9162	N	Display P.C. Board Assembly	PR464645
030-9177	N	Model R86 Hart Digital Board	PR464645
030-9180	H	R86, Hart "IS" Wiring Board	PR464645
030-9823	A	E4 MODULEVEL BOARD ASSEMBLY	PR464645
031-2850	J	Display Module Assembly	PR464645
094-6070	E	Display Board "Eclipse 706"	PR464645
094-6087	J	R86, Pulsar 2x 26GHZ Hart Digital Schematic	PR464645
094-6089	G	Schematic Pulsar Model R86 Wiring PC Board	PR464645
094-9823	A	ANALOG P.C. BOARD SCHEMATIC, E4 MODULEVEL	PR464645
099-5085	A	System Drawing E4 Modulevel	PR464645
099-6591	B	E4 Modulevel Agency Drawing	RR238055