



# 1 TYPE EXAMINATION CERTIFICATE

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

3 Type Examination Certificate No: FM20ATEX0013X

4 Equipment or protective system: 705-Eclipse Level Transmitter/Eclipse Level Probe.  
(Type Reference and Name)

5 Name of Applicant: Magnetrol International Inc.

6 Address of Applicant: 705 Enterprise Street  
Aurora, IL 60504  
United States of America

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. 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:

PR452813 dated 3<sup>rd</sup> June 2020

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 60079-11:2012 and 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 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:



II 3 G Ex ic IIC T4 Gc -40°C ≤ Ta ≤ +70°C

**Richard Zammitt**  
Certification Manager, FM Approvals Europe Ltd.

Issue date: 04<sup>th</sup> June 2020

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# SCHEDULE

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## 13 Description of Equipment or Protective System:

**General:** Eclipse Level Transmitter/Probe Model 705 Series are used for liquid level detection. The level information is determined by using Time Domain Reflectometry and Micro power Impulse Radar technology (TDR/MIR). Electromagnetic energy pulses are transmitted from the end of the probe which acts as a waveguide. When the transmitted energy down the probe encounters a discontinuity (a change in dielectric due to material level), a reflection is generated. The transmitter receives the reflected energy and determines material level using MIR distance techniques to determine the material level. The transmitter is available with intrinsically safe probe electronics and probe, and as entirely intrinsically safe. For both product configurations, a wiring compartment contains a conformally coated printed circuit terminal board. For all configurations, the electronics compartment contains two conformally coated printed circuit boards and an optional LCD display module. One of the circuit boards is the digital board with keypad and the other is the analog board. A short coaxial cable inside the electronics compartment connects the analog circuitry to probe. The Transmitter is powered from 24V dc at 4-20mA and the operating ambient temperature range is specified at -40°C to 70°C. The Enclosure is rated for IP66.

**Construction:** The Transmitter's enclosure assembly consists of two electronics compartments and an integral probe assembly. The electronics housing is constructed of A360/A413 aluminum alloy or 316 stainless steel and has a total free internal volume of 472 cm<sup>3</sup> with components installed. The wiring compartment houses field wire terminations while the electronics compartment houses the instrument's probe electronics and provides mounting for the integral probe assembly. The enclosure is made of cast aluminum coated with chromate conversion and powder coat with Tiger Drylac Series 49 Polyester TGIC and is rated for outdoor locations, IP66. Each compartment is covered by a screw-on cover, one cover is blind the other has a glass window. The blind cover is used to cover the wiring compartment. The window cover is used to cover the electronics compartment when the instrument includes the LCD display. There are a series of probes available based off of two common configurations. One is a coaxial assembly constructed of stainless steel with a 1 inch diameter outer tube and a 3/4 inch diameter un-insulated solid inner rod. The other configuration is a twin rod or single assembly constructed of stainless steel or hastelloy or monel and consisting of small coaxial section and the remainder dual parallel rods. Both probe configurations have the same process seal construction consisting of Stycast 2651 – 40FR with Catalyst 9. The probe assembly is integral to the transmitter assembly and the maximum length of the attached probe is 240 inches and a process pressure rating of 750 psi.

### Electrical Data:

Intrinsic Safety parameters:

Energy Limitation :  $U_i = 28.4 \text{ V}$ ;  $I_i = 124 \text{ mA}$ ;  $P_i = 0.84 \text{ W}$ ;  $C_i = 3 \text{ nF}$ ;  $L_i = 3 \text{ } \mu\text{H}$ .

FISCO :  $U_i = 17.5 \text{ V}$ ;  $I_i = 380 \text{ mA}$ ;  $P_i = 5.32 \text{ W}$ ;  $C_i = 3 \text{ nF}$ ;  $L_i = 3 \text{ } \mu\text{H}$ .

### Model Code structure and relevant parameters:

**705-5abc-Eef/7gh-ijkl-m. Eclipse Level Transmitter/Eclipse Level Probe.**

a = Digital Output: 1, 2 or 3.

b = Options: 0 or A.

c = Accessories: 0 or A.

e = Housing Material: 1, 2, 3, 4, 5, 6, 7, 8, 9 (refer to drawing 099-6526 for details).

f = Conduit: 0, 1, or 4 (4 only when e = 3 or 9).

g = Measurement: E or M.

h = Configuration / Style: A, B, E, F, G, H, J, L, M, N, Q, R, S, T, 1 (only when i = A), 2, 5, or 7 (only when i = A).

i = Material: A, B, C, D, E, F, G, H, J, K, L, N, P, R, Y, Z, 1 or 4.

j = Process connection size: 1, 2, 3, 4, 5, 6, 9, B, C, D, E, F, T, U.

k = Process connection type: 1, 2, 3, 4, 5, 6, 7, 8, A, B, C, D, E, F, G, K, L, M, N, P, R, S, T, U, V or W (refer to drawing 099-6526 for details).

l = Options: 0, 1, 2, 3, 4, 5, 6, 7, 8, A, or N.

m = Probe Length: 240 inch or 610 cm maximum (in 1 inch or 1 cm increments).

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When h = F, j = 2 and k = P: 72 inch or 30 cm maximum (in 1 inch or 1 cm increments).

When h = 5, 1 or 2: 75 ft or 22 m maximum (in 1 foot or 1 metre increments).

When h = 7: 50 ft or 15 m (in 1 foot or 1 metre increments).

## **705-5abc-Eef/7gh-AjkN-m. Eclipse Level Transmitter/Eclipse Level Probe.**

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b = Options: 0 or A.

c = Accessories: 0 or A.

e = Housing Material: 1, 2, 3, 7, 8 or 9. (refer to drawing 099-6526 for details)

f = Conduit: 0, 1 or 4 (4 only when e = 3 or 9).

g = Measurement: E or M.

h = Configuration / Style: D or P.

j = Process connection size: 1, 2, 3, 4, 5, 6, B, C, D, E, F, T.

k = Process connection type: 1, 3, 4, 5, 6, 7, 8, K, L, M, N, T, U, A, B, C, D, E, F, G, H, I, J. (refer to drawing 099-6526 for details)

m = Probe Length: 240 inch or 610 cm maximum (In 1 inch or 1 cm increments).

## **705-5abc-Eef/7EK-ijkA-mn. Eclipse Level Transmitter/Eclipse Level Probe.**

a = Digital Output: 1, 2 or 3.

b = Options: 0 or A.

c = Accessories: 0 or A.

e = Housing Material: 1, 2, 3, 7, 8 or 9. (refer to drawing 099-6526 for details)

f = Conduit: 0, 1 or 4 (4 only when e = 3 or 9).

i = Material: K, L, M.

j = Process connection size: 3 or 4.

k = Process connection type / Configuration: 1, 3, 4, 5, 9. (refer to drawing 099-6526 for details)

m = Temperature Range: 1 or 2.

n = Chamber Type: 1, 2 or 3.

## 14 **Specific Conditions of Use:**

1. Refer to the manufacturer's instructions to reduce the potential of an electrostatic charging hazard on the equipment enclosure.
2. To maintain the T4 temperature code care shall be taken to ensure the "Enclosure Temperature" does not exceed 70°C.

## 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 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.

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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 FM Approvals Europe Ltd. The documents are maintained under project number 3D0A2AX.

18 **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
04 <sup>th</sup> June 2020	Original Issue.

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# Blueprint Report

**Magnetrol International Inc (1000000020)**

**Class No 3610**

**Original Project I.D. 3D0A2AX**

**Certificate I.D. FM20ATEX0013X**

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>
009-9310	N	M16C HART DIGITAL P.C. BOARD	PR452813
009-9316	N	ENHANCED 705 ANALOG P.C. BOARD	PR452813
009-9323	Q	M16C H1 & PA DIGITAL P.C. BOARD	PR452813
009-9327	F	WIRING P.C. BOARD	PR452813
009-9330	N	SANITARY WIRING P.C. BD	PR452813
009-9346	G	WIRING P.C. BOARD	PR452813
030-3601	G	ENHANCED 705 ECLIPSE WIRING BD ASSY	PR452813
030-9145	AK	ENHANCED 705 DIGITAL P.C. BOARD ASSEMBLY	PR452813
030-9149	Y	ENHANCED 705 ANALOG P.C. BOARD ASSEMBLY	PR452813
030-9150	AB	M16C FIELDBUS DIGITAL BOARD ASSEMBLY	PR452813
030-9151	S	SAFETY WIRING BOARD	PR452813
031-2835	V	ENHANCED 705 HART BEZEL ASSEMBLY	PR452813
031-2841	K	ENHANCED 705 H1 & PA FIELDBUS BEZEL ASSEMBLY	PR452813
036-5703	T	ECLIPSE SANITARY BEZEL ASSEMBLY	PR452813
094-1842	C	ENHANCED 705 ECLIPSE WIRING BOARD (HART) SCHEMATIC	PR452813
094-5056	H	WIRING BOARD	PR452813
094-5062	C	HART WIRING BOARD	PR452813
094-6051	R	SCHEMATIC ENHANCED 705 ANALOG P.C. BOARD	PR452813
094-6052	H	ENHANCED 705 DIGITAL P.C. BOARD SCHEMATIC	PR452813
094-6053	S	SCHEMATIC M16C H1 & PA FIELDBUS DIGITAL BOARD	PR452813
099-5055	H	SYSTEM DRAWING MODEL 705-XXXX TRANSMITTER	PR452813
099-6526	P	MODEL 70X 2 WIRE TRANSMITTER EXPLOSIONPROOF / I.S.	PR452813
099-7155	D	MODEL 70X 2 WIRE TRANSMITTER INTRINSICALLY SAFE	PR452813
57-600.24	May 2020	Installation and Operating Manual	PR452813