

# 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:** FM14ATEX0041X

4 **Equipment or protective system:** 706 Eclipse Guided Wave Level Transmitter  
(Type Reference and Name)

5 **Name of Applicant:** Magnetrol International Inc.

6 **Address of Applicant:** 705 Enterprise Street  
Aurora, IL 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 Ltd, notified body number 1725 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:

3051920 dated 6<sup>th</sup> April 2015

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:

EN60079-0:2012 +A11:2013, EN60079-1:2007, EN60079-11:2012, EN60079-31:2014,  
EN60529:1991 +A1:2000

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:



II 1 G Ex ia IIC T4 Ga Ta = -40°C to +70°C, IP67  
II 2/1 G Ex d/ia [ia IIC Ga] IIB + H2 T6 ...T1 Gb/Ga Ta = -40°C to +70°C, IP67  
II 1/2 D Ex ia/tb [ia Da] IIIC T85°C ...T450°C Da/Db Ta = -15°C to +70°C, IP67



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**Mick Gower**  
Certification Manager, FM Approvals Ltd.

Issue date: 06<sup>th</sup> December 2016

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# SCHEDULE

to EU-Type Examination Certificate No. FM14ATEX0041X

## 13 Description of Equipment or Protective System:

The Model 706 is an Eclipse Wave Radar Level Transmitter, for liquid and bulk solids level control, utilizing guided wave radar (GWR) technology. Guided Wave Radar functions according to the principal of Time Domain Reflectometry (TDR). A pulse of electromagnetic energy travels down the probe and is reflected by the liquid (or bulk solid) surface. The time of pulse travel, down the probe and back to the electronics unit, is used to determine the distance to the process surface. That distance is used to compute process level, and control the transmitter output.

The Model 706 is an advanced two-wire transmitter. It uses a nominal input voltage of 24VDC and it provides an analog 4-20mA signal with HART or Fieldbus digital communication. With the FISCO and FNICO concepts, the input voltage is limited to 17.5 V. A digital display and keypad are optional. The Model 706 is available with HART Communication as the Model 706-51 and with Fieldbus Communication as the Model 706-52.

The Model 706 is housed in a dual compartment (die-cast aluminum or investment cast 316SS) enclosure with separate wiring and electronics compartments. The Model 706 housing is a new design that has been designed for approval as explosion-proof.

The wiring compartment at the top of the transmitter isolates the power/signal conductors from the electronics compartment beneath it by way of an environmentally sealed feed-through. A quick disconnect probe coupling eases installation and allows probes to be installed without concern for their orientation to the transmitter head. Probe mounting can be provided integrally, directly to the electronics housing, or can be remotely mounted up to 12 feet from the electronics housing

### **706-51ab-cde / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.**

#### **Entity Parameters:**

$U_i = 28.4V$ ,  $I_i = 120mA$ ,  $P_i = 0.84W$ ,  $C_i = 4.4nF$ ,  $L_i = 2.7\mu H$

*a* = Safety Option 1 or 2.

*b* = Accessories/mounting A, B, C, 0, 1 or 2.

*c* = Classification 3, A, or D.

*d* = Housing 1 or 2.

*e* = Conduit connection 0, 1, 2 or 3.

*f* = Measurement system A or C.

*g* = Configuration/style D, F, G, J, K, L, M, N, P, S, T, V, Y, Z, 1, 2, 3, 4, 5, 6 or 7.

*h* = Process connection size 1, 2, 3, 4, 5, 6, B, C, D, E or F.

*i* = Process connection type 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, J, K, L, M, N, T or U

(*h* = 1 or 2 with *f* = D, J or S; *h* = 9 with *f* = K).

*j* = Construction codes 0, K, L, M, N or P.

*k* = Flange option 0, 1 or 2.

*l* = Material of construction A, B, C, F, P, Q, R, S or T (*k* = F only with *f* = F).

*m* = Spacer material 0, 1, 2, 3, 4 or 5 (*l* = 3 only with *f* = D).

*n* = O-ring/seal material 0, 2, 8, A, B, D or N (*m* = B only with *f* = G or T).

*o* = Probe size/flushing connection 0, 1 or 2.

*p* = Special option 0, 1 or 2.

*q* = Insertion length (3 digits max) in:

- inches (English units *e* = A, rigid probes *f* = D, F, G, J, K, L, M, N, P, S, T, V, Y, Z).
- feet (English units *e* = A, flexible probes *f* = 1, 2, 3, 4, 5, 6 or 7).
- centimeters (metric units *e* = C, rigid probes *f* = D, F, G, J, K, L, M, N, P, S, T, V, Y, Z).
- meters (metric units *e* = C, flexible probes *f* = 1, 2, 3, 4, 5, 6 or 7).

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# SCHEDULE

to EU-Type Examination Certificate No. FM14ATEX0041X

## **706-52ab-cde / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.**

FISCO Parameters:

U<sub>i</sub> = 17.5V, I<sub>i</sub> = 380mA, P<sub>i</sub> = 5.32W, C<sub>i</sub> = 0.5nF, L<sub>i</sub> = 2.7μH

a = Safety option 1 or 2.

b = Accessories/Mounting: A, B, C, 0, 1 or 2.

c = Classification: 3, A, or D.

d = Housing Material: 1 or 2.

e = Conduit: 0, 1, 2 or 3.

f = Measurement: A or C.

g = Configuration/Style: D, F, G, J, K, L, M, N, P, S, T, V, Y, Z, 1, 2, 3, 4, 5, 6, or 7.

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

i = Process connection type: 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, J, K, L, M, N, T or U (h = 1 or 2 only with f = F, J, 1, 2, 5 or 7; h = 1, 2, 3, 4, A or B only with f = D, P, S, T or V; h = 5, 6, 7, 8, K, L, M or N only with f = D, J or S; h = 9 only with K).

j = Construction codes: 0, K, L, M, N or P.

k = Flange option: 0, 1, or 2.

l = Material of construction: A, B, C, F, P, Q, R or S (k = F only with f = F).

m = Spacer Material: 0, 1, 2, 3, 4 or 5 (l = 3 only with f = D).

n = O-ring / seal material: 0, 2, 8, A, B, D or N (m = B only with f = G or T).

o = Probe size/Flushing Connection: 0, 1 or 2.

p = Special Option: 0, 1, or 2.

q = Probe Length:

- inches (English units e = A, rigid probes f = D, F, G, J, K, L, M, N, P, S, T, V, Y, Z)
- feet (English units e = A, flexible probes f = 1, 2, 3, 4, 5, 6 or 7)
- centimeters (metric units e = C rigid probes f = D, F, G, J, K, L, M, N, P, S, T, V, Y, Z).
- meters (metric units e = C flexible probes f = 1, 2, 3, 4, 5, 6 or 7)

### 14 Specific Conditions of Use:

1. The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation.
2. To maintain the T6...T1 temperature code care shall be taken to ensure the "Enclosure Temperature" does not exceed 75°C.
3. The risk of electrostatic discharge shall be minimized at installation, following the directions given in the instructions.
4. Contact the original manufacturer for information in the dimensions of the flameproof joints.
5. For installation with ambient temperature of 70°C, refer to the manufacturer's instruction for guidance on proper selection of conductors.
6. Provisions shall be made to provide transient overvoltage protection to a level not to exceed 119Vdc.
7. Temperature codes for the ratings Ex d/ia [ia IIC] IIB+H<sub>2</sub> and Ex ia/tb [ia] IIIC are defined by the following table:

Process temperature(PT)	Temperature Code-TCG (GAS)	Temperature Code-TCD (Dust)
Up to 75°C	T6	TCD= PT+10K=85°C
From 75°C to 90°C	T5	TCD= PT+10K=100°C
From 90°C to 120°C	T4	TCD= PT+15K=135°C
From 125°C to 185°C	T3	TCD= PT+15K=200°C
From 185°C to 285°C	T2	TCD= PT+15K=300°C
From 285°C to 435°C	T1	TCD= PT+15K=450°C

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**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 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 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
04 <sup>th</sup> June 2015	Original Issue.
19 <sup>th</sup> October 2016	<u>Supplement 1:</u> Report Reference: RR205631 dated 17 <sup>th</sup> October 2016 Description of the Change: Model number breakdown.
03 <sup>rd</sup> November 2016	<u>Supplement 1 issue 2</u> Reason for re-issue – correction of certificate number on schedule pages, typographical error, no technical changes to original issue.
06 <sup>th</sup> December 2016	<u>Supplement 2:</u> Report Reference: – RR206918 dated 5 <sup>th</sup> December 2016. Description of the Change: Minor product revisions and updating of associated documentation.

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# Blueprint Report

**Magnetrol International Inc (1000000020)**

**Class No 3610**

**Original Project I.D. 3051920**

**Certificate I.D. FM14ATEX0041X**

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>	<u>Electronic Drawing</u>
094-6067	L	Eclipse 4X Digital Board	RR206918	Yes (pdf)
094-6068	H	Analog Board Eclipse 706	3051920	Yes (pdf)
094-6070	B	Display Board Eclipse 706	3051920	Yes (pdf)
094-6072	D	Digital Board Foundation Fieldbus	RR206918	Yes (pdf)
094-6073	D	Wiring Board Eclipse 706	RR206918	Yes (pdf)
094-6075	E	Foundation Fieldbus Wiring Board Eclipse 706	RR206918	Yes (pdf)
099-5072	J	System Drawing Model 706 Transmitter	3051920	Yes (pdf)
099-6546	Y	Model 706 2 Wire Transmitter Explosion Proof / IS	RR205631	Yes (pdf)
099-6547	N	Model 706 2 Wire Transmitter I.S.	RR205631	Yes (pdf)
099-6550	P	Foundation Fieldbus Model 706	3051920	Yes (pdf)
57-606	3	Installation and Operating Manual for Eclipse Model 706	3051920	Yes (pdf)