1 # EC-TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 94/9/EC**

3 **EC-Type Examination Certificate No:** **FM14ATEX0059X**

4 **Equipment or protective system: (Type Reference and Name)** **Jupiter JM4 Magnetostrictive Level Transmitter**

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 9 of Directive 94/9/EC of 23 March 1994, 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:

3051963 dated 30th October 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:

EN 60079-0:2012 + A11:2013, EN 60079-11:2012, EN 60079-31: 2014 and EN 60529:1991+ A 1:2000

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 EC-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. 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 D Ex tb IIIC T85°C…T120°C Db Ta = -15°C to +70°C, IP67

Digitally signed by Mick Gower
DN: cn=Mick Gower, o=FM Approvals, ou, email=mick.gower@fmapprovals.com, c=GB
Date: 2015.11.02 14:57:30 Z

Mick Gower
Certification Manager, FM Approvals Ltd.

Issue date: 02nd November 2015

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

The Jupiter Model JM4 is a continuous level transmitter for liquid level control, utilizing the engineering principle of magnetostriction and the effect of a magnetic field on the magnetostrictive wire as the basis for operation of the instrument. The primary components are the probe assembly, containing the wire and Preamp PC Board assembly, and the electronics assembly containing all other PC Boards. The Jupiter JM4 Transmitter is available as the Model JM4-51 normal mode (Entity input version) or JM4-52 Fieldbus mode (FISCO input version) and only differs in the Digital PC Board and Wiring PC Board.

A low energy pulse which is generated by the Preamp travels the length of the magnetostrictive wire. A return signal is generated from the location where the magnetic field of the MLI float intersects the wire. A timer measures the elapsed time between the generation of the pulse and the return of the mechanical or acoustic signal. This is detected by the acoustic sensor located in the end of the probe. The software is set up to interpret the time-of-flight data and to display and transmit the process variable data resulting from the measurement.

The Jupiter Model JM4 is a level transmitter with Fieldbus digital communication. The Jupiter Model JM4 uses a nominal input voltage of 24VDC and it provides Fieldbus digital communication. With the FISCO concept the input voltage is limited to 17.5V. A digital display and keypad are optional.

The Jupiter Model JM4 is housed in a dual compartment (die-cast aluminum or investment cast 316SS) enclosure with separate wiring and electronics compartments. 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 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.

Model Code Structure and Parameters:

JM4-51ab-cde / 2fg-hij-klm-n-o. Jupiter JM4 Magnetostrictive Level Transmitter / JM4 Probe.

Entity Parameters:
Ui = 28.6V, Ii = 140mA, Pi = 1W, Ci = 4.4nF, Li = 2.7µH
a = Safety Option: 0, 1 or 2.
b = Accessories/Mounting: A, B, C, 0, 1 or 2.
c = Area Classification: A or D. (If c = D, b = A or 0 only)
d = Housing Material: 1 or 2.
e = Conduit Connection: 0, 1, 2 or 3.
f = Measurement System: A or C.
g = Probe Configuration: 1, 2, 8, E, F, H, K, L, M, R, S or T.
h = Process Connection: 00, 01, 11, 22, 41, 42, 43, 44, 45, 46, 47, 53, 54, 55, 56, 57, 63, 64, 65, 66, 67, CA, CB, CC, DA, DB, DD, DE, EA, EB, ED, EE, FA, FB, FD, FE, FF or FG.
i = Material of Construction: A, B, C, D, F, L, P or 1.
j = Probe Options: N or V.
k = Installation Considerations: 0, 1, 2, 3, 4, 5, C, E, F, G, H, J or N.
l = Construction Code: 0, K, L, M or N.
m = Level/Interface Measurement: 1, 2 or 3.
n = Float: 00, 11, 12, 13, 21, 22, 23, 31, 32, 41, 42, 51, 52, 61, 62, 99, AA, AB, AC, BA, BB, CA, CB, DA, DB, DC, FA, FB, FC, MA, MB, NA, NB, PA, PB, QA, QB, RA or RB
o = Probe Length: (3 digit max) in: inches (f = A) or centimeters (f = C).

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JM4-52ab-cde / 2fg-hij-klm-n-o. Jupiter JM4 Magnetostrictive Level Transmitter / JM4 Probe.
FISCO Parameters:
Ui = 17.5V, Ii = 380mA, Pi = 5.32W, Ci = 440pF, Li = 2.7µH
a = Safety Option: 0, 1 or 2.
b = Accessories/Mounting: A, B, C, 0, 1 or 2.
c = Area Classification: A or D. (If c = D, b = A or 0 only)
d = Housing Material: 1 or 2.
e = Conduit Connection: 0, 1, 2 or 3.
f = Measurement System: A or C.
g = Probe Configuration: 1, 2, 8, E, F, H, K, L, M, R, S or T.
h = Process Connection: 00, 01, 11, 22, 41, 42, 43, 44, 45, 46, 47, 53, 54, 55, 56, 57, 63, 64, 65, 66, 67, CA, CB, CC, DA, DB, DD, DE, EA, EB, ED, EE, FA, FB, FD, FE, FF or FG.
i = Material of Construction: A, B, C, D, F, L, P or 1.
j = Probe Options: N or V.
k = Installation Considerations: 0, 1, 2, 3, 4, 5, C, E, F, G, H, J or N.
l = Construction Code: 0, K, L, M or N.
m = Level/Interface Measurement: 1, 2 or 3.
n = Float: 00, 11, 12, 13, 21, 22, 23, 31, 32, 41, 42, 51, 52, 61, 62, 99, AA, AB, AC, BA, BB, CA, CB, DA, DB, DC, FA, FB, FC, MA, MB, NA, NB, PA, PB, QA, QB, RA or RB
o = Probe Length: (3 digit max) in: inches (f = A) or centimeters (f = C).

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 and use to prevent impact or friction.
2. To maintain the T4 temperature code care shall be taken to ensure the “Enclosure Temperature” does not exceed 70ºC
3. The risk of electrostatic discharge shall be minimized at installation, following the direction given in the instruction.
4. For Installation with ambient temperature of 70ºC, refer to the manufacturer’s instructions for guidance on proper selection of conductors.
5. Provisions shall be made to provide transient overvoltage protection to a level not to exceed 119Vdc.
6. When equipment is used in explosive dust atmospheres, the end user shall take precautions so that the thermal effects of the process temperature shall limit the equipment enclosure and probe surface temperatures to not exceed the required installation location temperature and shall be between T85C and T120C.

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 EC-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.

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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
02nd November 2015	Original Issue.

Magnetrol International Inc (1000000020)

Class No 3610

Original Project I.D. 3051963

Certificate I.D. FM14ATEX0059X

Drawing No.	Revision Level	Drawing Title	Last Report	Electronic Drawing
009-9362	C	Fabrication Digital Board, Model 706	3051963	Yes (pdf)
009-9365	B	Fabrication Display Board, Model 706	3051963	Yes (pdf)
009-9368	A	Fabrication Digital Board, Model 706	3051963	Yes (pdf)
009-9369	A	Fabrication Wiring Board Model 706	3051963	Yes (pdf)
009-9375	B	Foundation Fieldbus Fabrication Wiring Board	3051963	Yes (pdf)
009-9378	A	Fabrication Board, Juniper JM4 Analog	3051963	Yes (pdf)
009-9379	A	Fabrication Board, Juniper JM4 Preamp	3051963	Yes (pdf)
094-6067	L	Eclipse 4X Digital Board	3051963	Yes (pdf)
094-6070	B	Display Board Eclipse 706	3051963	Yes (pdf)
094-6072	D	Digital Board Foundation Fieldbus	3051963	Yes (pdf)
094-6073	D	Wiring Board Eclipse 706	3051963	Yes (pdf)
094-6075	C	Foundation Fieldbus Wiring Board Eclipse 706	3051963	Yes (pdf)
094-6076-001	B	Schematic Jupiter 4X Analog Board	3051963	Yes (pdf)
094-6077-001	B	Schematic Jupiter 4X Preamp Board	3051963	Yes (pdf)
094-6082-001	C	Schematic Jupiter 4X Wiring Board	3051963	Yes (pdf)
099-5074	A	System Drawing Jupiter JM4 Transmitter	3051963	Yes (pdf)
099-6553	V	Jupiter JM4 Agency Drawing	3051963	Yes (pdf)
ORI-46-650	2	Jupiter JM4 Installation and Operation Manual	3051963	Yes (pdf)