

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: FM14ATEX0059X**

4 **Equipment or protective system: Jupiter JM4 Magnetostrictive Level Transmitter
(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, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of the 26th 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:

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 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015,
EN 60079-31:2014 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 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

II 1/2 G Ex db IIB+H₂ T6...T1 Ga/Gb Ta = -40°C to +70°C

II 2 D Ex tb IIIC T85°C...T120°C Db Ta = -15°C to +70°C

**Damien Mc Ardle
Certification Manager, FM Approvals Europe Ltd.**

Issue date: 19th December 2019

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SCHEDULE

to EU-Type Examination Certificate No. FM14ATEX0059X

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.

The enclosure has an ingress protection rating of IP67.

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: F, G, 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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Member of the FM Global Group

to EU-Type Examination Certificate No. FM14ATEX0059X

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 70°C*
- 3. The risk of electrostatic discharge shall be minimized at installation, following the direction given in the instruction.*
- 4. 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 85°C and 120°C.*
- 5. For Installation with ambient temperature of 70°C, refer to the manufacturer's instructions 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. For the Ex db rated Jupiter JM4, consult the manufacturer for dimensional information on the flameproof joints for repair.*
- 8. All Unused device openings must be closed using a suitably certified plug.*
- 9. Temperature codes for the ratings Ex db IIB+H₂, are defined by the following table:*

Maximum Process Temperature(PT)	Temperature Class
<i>From 0 °C to 70 °C</i>	<i>T6</i>
<i>From 71 °C to 90 °C</i>	<i>T5</i>
<i>From 91 °C to 125 °C</i>	<i>T4</i>
<i>From 126 °C to 190 °C</i>	<i>T3</i>
<i>From 191 °C to 290 °C</i>	<i>T2</i>
<i>From 291 °C to 440 °C</i>	<i>T1</i>

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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 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
02 nd November 2015	Original Issue.
24 th August 2016	Supplement 1: Report Reference: Project ID 3058192 dated 10 th August 2016. Description of change: Update standards, update ratings, update documentation and update certificate to EU format.
06 th December 2016	Supplement 2: Report Reference: Revision Report RR206919 dated 05 th December 2016 Description of change: Minor product revisions and updating of associated documentation.
04 th January 2019	Supplement 3: Report Reference: Project ID 3063537 dated 21 st December 2018. Description of change: Addition of Ga to rating II 1/2 G Ex db IIB +H2 T6...T1 Ga/Gb and addition of EN 60079-26 standard and associated documentation.
19 th March 2019	Supplement 4: Description of the Change: Certificate transferred from FM Approvals Ltd., notified body no. 1725, to FM Approvals Europe Ltd., notified body no. 2809.
19 th December 2019	Supplement 5: Report Reference: PR452105 dated 18 th December 2019. Description of the Change: Documentation update due to the addition of epoxy material options used in the construction for the feed-through assembly for US Division rating only.

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Blueprint Report

Magnetrol International Inc (1000000020)

Class No 3610

Original Project I.D. 3051963

Certificate I.D. FM14ATEX0059X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>
005-8081	H	Jupiter JM4 Nameplates	PR452105
005-8084	G	Jupiter JM4 Nameplates	PR452105
009-9362	C	Fabrication Digital Board, Model 706	3051963
009-9365	B	Fabrication Display Board, Model 706	3051963
009-9368	A	Fabrication Digital Board, Model 706	3051963
009-9369	B	Fabrication Wiring Board Model 706	RR206919
009-9375	B	Foundation Fieldbus Fabrication Wiring Board	3051963
009-9378	A	Fabrication Board, Juniper JM4 Analog	3051963
009-9379	A	Fabrication Board, Juniper JM4 Preamp	3051963
094-6067	L	Eclipse 4X Digital Board	3051963
094-6070	B	Display Board Eclipse 706	3051963
094-6072	D	Digital Board Foundation Fieldbus	3051963
094-6073	D	Wiring Board Eclipse 706	3051963
094-6075	E	Foundation Fieldbus Wiring Board Eclipse 706	RR206919
094-6076-001	C	Schematic Jupiter 4X Analog Board	RR206919
094-6077-001	B	Schematic Jupiter 4X Preamp Board	3051963
094-6082-001	C	Schematic Jupiter 4X Wiring Board	3051963
099-5074	C	System Drawing Jupiter JM4 Transmitter	RR206919
099-6553	AA2	Jupiter JM4 Agency Drawing	PR452105
ORI.650.2	Dec-18	Jupiter JM4 Installation and Operating Manual	3063537