IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx FMG 14.0018X**

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Issue No: 19

Certificate history:

Issue 18 (2024-03-22)
Issue 17 (2024-01-19)
Issue 16 (2023-08-24)
Issue 15 (2023-05-04)
Issue 14 (2022-11-08)
Issue 13 (2022-08-03)
Issue 12 (2022-02-22)
Issue 11 (2021-12-06)
Issue 10 (2021-06-16)
Issue 9 (2021-04-26)

Status: **Current**

Date of Issue: 2025-02-13

Applicant: **AMETEK Magnetrol USA, LLC**
705 Enterprise Street
Aurora, IL 60504
United States of America

Equipment: **Guided Wave Radar Transmitter Eclipse 706**

Optional accessory:

Type of Protection: **Type "i", Type "e", Type "d" and Type "t"**

Marking: Refer to the **Marking Section** of the Annex.

Approved for issue on behalf of the IECEx Certification Body: **J. E. Marquedant**

Position: **VP, Manager - Electrical Systems**

Signature:
(for printed version)

Date:
(for printed version)

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Certificate issued by:

FM Approvals LLC
One Technology Way
Norwood MA 02062
United States of America

FM Approvals
Member of the FM Global Group

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Manufacturer: **AMETEK Magnetrol USA, LLC**
705 Enterprise Street
Aurora, IL 60504
United States of America

Manufacturing locations:

Magnetrol International NV-
Protection types Ex i, Ex db and Ex tb only
Heikensstraat 6
9240 Zele
Belgium

Orion Instruments Inc.
2105 Oak Villa Boulevard
Baton Rouge, Louisiana 70815
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Edition:7.0	Explosive atmospheres - Part 0: Equipment - General requirements
IEC 60079-1:2014 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11:2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26:2006 Edition:2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 60079-31:2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
IEC 60079-7:2017 Edition:5.1	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

US/FMG/ExTR14.0017/00
US/FMG/ExTR14.0017/01
US/FMG/ExTR14.0017/02
US/FMG/ExTR14.0017/03
US/FMG/ExTR14.0017/04
US/FMG/ExTR14.0017/05
US/FMG/ExTR14.0017/06
US/FMG/ExTR14.0017/07
US/FMG/ExTR14.0017/08
US/FMG/ExTR14.0017/09
US/FMG/ExTR14.0017/10
US/FMG/ExTR14.0017/11
US/FMG/ExTR14.0017/12
US/FMG/ExTR14.0017/13
US/FMG/ExTR14.0017/14
US/FMG/ExTR14.0017/15
US/FMG/ExTR14.0017/16
US/FMG/ExTR14.0017/17
US/FMG/ExTR14.0017/18
US/FMG/ExTR14.0017/19

Quality Assessment Reports:

CA/CSA/QAR06.0004/18
CA/CSA/QAR10.0005/07
NL/DEK/QAR11.0031/08

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Refer to **Equipment** Section of Annex.

SPECIFIC CONDITIONS OF USE: YES as shown below:
Refer to **Specific Conditions of Use** in the Annex

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Date of issue: 2025-02-13 Issue No: 19

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

1) Minor Update to Wiring Board
2) Addition of new sanitary enclosure
3) Addition of two new models (706-51ab-c3e / 7fg-hijk-lmn-op-q Eclipse Level Transmitter / Eclipse Level Probe and 706-51ab-c3e Eclipse Level Transmitter with Model 705 adapter) for use with new sanitary enclosure

Annex:

Annex to IECEx FMG 14.0018X.pdf

Annex to IECEx FMG 14.0018X.17

Marking:

706-51 ab-cde / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.
706-51ab-cde. Eclipse Level Transmitter with Model 705 adapter
Ex ia IIC T4 Ga Ta = -40ºC to +70ºC; Entity; IP66/67
Ex db/ia [ia IIC Ga] IIB + H2 T6 … T1 Gb/Ga Ta = -40ºC to +70ºC; IP66/67
Ex ia/tb [ia Da] IIIC T85ºC … T450ºC Db Ta = -15ºC to +70ºC; IP66/67
Ex ia IIIC T85°C…T450°C Da Ta = -15ºC to +70ºC; IP66/67
Ex ec [ia Ga] IIC T4 Gc Ta = -15ºC to +70ºC

706-51 ab-c3e / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.
706-51ab-c3e. Eclipse Level Transmitter with Model 705 adapter
Ex ia IIC T4 Ga Ta = -40ºC to +70ºC; Entity; IP66/67
Ex ic IIC T4 Gc Ta = -40ºC to +70ºC; Entity; IP66/67
Ex ia IIIC T85°C…T450°C Da Ta = -15ºC to +70ºC; IP66/67

706-52 ab-cde / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.
706-52ab-cde. Eclipse Level Transmitter with Model 705 adapter.
Ex ia IIC T4 Ga Ta = -40ºC to +70ºC; FISCO; IP66/67
Ex db/ia [ia IIC Ga] IIB + H2 T6 … T1 Gb/Ga Ta = -40ºC to +70ºC; IP66/67
Ex ia/tb [ia Da] IIIC T85ºC … T450ºC Db Ta = -15ºC to +70ºC; IP66/67
Ex ia IIIC T85°C…T450°C Da Ta = -15ºC to +70ºC; IP66/67
Ex ec [ia Ga] IIC T4 Gc Ta = -15ºC to +70ºC
Ex ic IIC T4 Gc Ta = -15ºC to +70ºC

706-53 ab-cde / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.
706-53ab-cde. Eclipse Level Transmitter with Model 705 adapter.
Ex ia IIC T4 Ga Ta = -40ºC to +70ºC; Entity; IP66/67
Ex db/ia [ia IIC Ga] IIB + H2 T6 … T1 Gb/Ga Ta = -40ºC to +70ºC; Entity; IP66/67
Ex ia/tb [ia Da] IIIC T85ºC … T450ºC Db Ta = -15ºC to +70ºC; Entity; IP66/67
Ex ia IIIC T85°C…T450°C Da Ta = -15ºC to +70ºC; IP66/67
Ex ec [ia Ga] IIC T4 Gc Ta = -15ºC to +70ºC

Equipment:

Guided Wave Radar Transmitter Eclipse 706

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 Foundation 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, Foundation Fieldbus Communication as the Model 706-52 and as PROFIBUS as the Model 706-53.

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 enclosure has an ingress protection rating of IP66/67.

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.

Two models are for use specifically with a sanitary enclosure rated IP66/67 only for protection type Intrinsic Safety. These are:

- 706-51ab-c3e / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe
- 706-51ab-c3e. Eclipse Level Transmitter with Model 705 adapter

Model Code structure and relevant parameters:

706-51 ab-cde / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.
Energy Limitation Parameters:
Ui = 28.4V, Ii = 120mA, Pi = 0.84W, Ci = 4.4nF, Li = 2.7µH

a = Safety Option 1, or 2.
b = Accessories/mounting A, B, C, 0, 1 or 2.
c = Classification A, B, C 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, H, J, L, M, N, P, S, T, 1, 2, 3, 4, 5, 6, or 7.
h = Process connection size: 1, 2, 3, 4, 5, 6, 9, B, C, D, E, F, S, T or V.
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, P, R, S, T, U, V or Y.
j = Construction codes: 0, K, L, M, N or P.
k = Flange option: 0, 1, 2 or 3.
l = Material of construction: A, B, C, E, F, G, H, L, P, R or S.
m = Spacer material 0, 1, 2, 3, 4 or 5.
n = O-ring/seal material 0, 2, 8, A, B, D or N.
o = Probe size/flushing connection 0, 1, 2, A or B.
p = Special option 0, 1, 2, 3, 4, 5 or 6.
q = Insertion length (3 digits max) in:
inches (English units f = A)
(Metric units f = C)

706-51 ab-cde. Eclipse Level Transmitter with Model 705 adapter
Energy Limitation Parameters:
Ui = 28.4V, Ii = 120mA, Pi = 0.84W, Ci = 4.4nF, Li = 2.7µH

a = Safety option 1 or 2.
b = Accessories/mounting A, B, C, 0, 1 or 2.
c = Classification 1, 2, 3, A, B, C or D.
d = Housing 1, 2, A or B.
e = Conduit connection 0, 1, 2 or 3.

706-51 ab-c3e / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.
Energy Limitation Parameters:
Ui = 28.4V, Ii = 120mA, Pi = 0.84W, Ci = 4.4nF, Li = 2.7µH

a = Safety Option 1, or 2.
b = Accessories/mounting A, B, C, 0, 1 or 2.
c = Classification A, B, C or D.
e = Conduit connection 0, 1, 2 or 3.
f = Measurement system A or C.
g = Configuration/Style: D, F, G, H, J, L, M, N, P, S, T, 1, 2, 3, 4, 5, 6, or 7.
h = Process connection size: 1, 2, 3, 4, 5, 6, 9, B, C, D, E, F, S, T or V.
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, P, R, S, T, U, V or Y.
j = Construction codes: 0, K, L, M, N or P.
k = Flange option: 0, 1, 2 or 3.
l = Material of construction: A, B, C, E, F, G, H, L, P, R or S.
m = Spacer material 0, 1, 2, 3, 4 or 5.
n = O-ring/seal material 0, 2, 8, A, B, D or N.
o = Probe size/flushing connection 0, 1, 2, A or B.
p = Special option 0, 1, 2, 3, 4, 5 or 6.
q = Insertion length (3 digits max) in:

inches (English units f = A)
(Metric units f = C)

706-51 ab-c3e. Eclipse Level Transmitter with Model 705 adapter
Energy Limitation Parameters:
Ui = 28.4V, Ii = 120mA, Pi = 0.84W, Ci = 4.4nF, Li = 2.7µH

a = Safety option 1 or 2.
b = Accessories/mounting A, B, C, 0, 1 or 2.
c = Classification 1, 2, 3, A, B, C or D.
e = Conduit connection 0, 1, 2 or 3.

706-52 ab-cde / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe.
Energy Limitation Parameters:
Ui = 28.4V, Ii = 120mA, Pi = 0.84W, Ci = 4.4nF, Li = 2.7µH
FISCO Parameters:
Ui = 17.5V, Ii = 380mA, Pi = 5.32W, Ci = 0.5nF, Li = 2.7µH

a = Safety option 0.
b = Accessories/Mounting: A, B, C, 0, 1 or 2.
c = Classification: 0, 1, A, B, C 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, H, J, L, M, N, P, S, T, 1, 2, 3, 4, 5, 6, or 7.
h = Process connection size: 1, 2, 3, 4, 5, 6, 9, B, C, D, E, F, S, T or V.
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, P, R, S, T, U, V or Y.
j = Construction codes: 0, K, L, M, N or P.
k = Flange option: 0, 1, 2 or 3.
l = Material of construction: A, B, C, E, F, G, H, L, P, R or S.
m = Spacer Material: 0, 1, 2, 3, 4 or 5.
n = O-ring / seal material: 0, 2, 8, A, B, D or N.
o = Probe size/Flushing Connection: 0, 1, 2, A or B.
p = Special Option: 0, 1, 2, 3, 4, 5 or 6.
q = Probe Length:

inches (English units f = A)
(Metric units f = C)

706-52 ab-cde. Eclipse Level Transmitter with Model 705 adapter.
Energy Limitation Parameters:
Ui = 28.4V, Ii = 120mA, Pi = 0.84W, Ci = 4.4nF, Li = 2.7µH
FISCO Parameters:
Ui = 17.5V, Ii = 380mA, Pi = 5.32W, Ci = 0.5nF, Li = 2.7µH

a = Safety option 0.
b = Accessories/Mounting: A, B, C, 0, 1 or 2.
c = Classification: A, B, C, D, 1 or 2.
d = Housing Material: A, B, 1 or 2.
e = Conduit: 0, 1, 2 or 3.

706-53 ab-cde / 7fg-hijk-lmn-op-q. Eclipse Level Transmitter / Eclipse Level Probe
Energy Limitation Parameters:
Ui = 17.5V Ii = 380mA, Pi = 5.32W, Ci = 0.5nF, Li = 2.7µH

a = Safety option 0.
b = Accessories/Mounting: A, B, C, 0, 1 or 2.
c = Classification: A, B, C 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, H, J, L, M, N, P, S, T, 1, 2, 3, 4, 5, 6, or 7.
h = Process connection size: 1, 2, 3, 4, 5, 6, 9, B, C, D, E, F, S, T or V.
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, P, R, S, T, U, V or Y.
j = Construction codes: 0, K, L, M, N or P.
k = Flange option: 0, 1, 2 or 3.
l = Material of construction: A, B, C, E, F, G, H, L, P, R or S.

m = Spacer Material: 0, 1, 2, 3, 4 or 5.
n = O-ring / seal material: 0, 2, 8, A, B, D or N.
o = Probe size/Flushing Connection: 0, 1, 2, A or B.
p = Special Option: 0, 1, 2, 3, 4, 5 or 6.
q = Probe Length:
inches (English units f = A)
(Metric units f = C)

706-53 ab-cde. Eclipse Level Transmitter with Model 705 adapter.
Energy Limitation Parameters:
Ui = 17.5V, Ii = 380mA, Pi = 5.32W, Ci = 0.5nF, Li = 2.7µH

a = Safety option 0.
b = Accessories/Mounting: A, B, C, 0, 1 or 2.
c = Classification: A, B, C, D, 1 or 2.
d = Housing Material: A, B, 1 or 2
e = Conduit: 0, 1, 2 or 3.

Specific Conditions of Use:

706-53.1 The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation.

706-53.2 To maintain the T6...T1 temperature code, care shall be taken to ensure the "Enclosure Temperature" does not exceed 70ºC.

706-53.3 The risk of electrostatic discharge shall be minimized at installation, following the directions given in the instructions.

706-53.4 Contact the original manufacturer for information in the dimensions of the flameproof joints

706-53.5 For installation with ambient temperature of 70ºC, refer to the manufacturer's instruction for guidance on proper selection of conductors.

706-53.6 Provisions shall be made to provide transient overvoltage protection to a level not to exceed 119 Vdc.

706-53.7 Flameproof joints are not intended to be repaired.

706-53.8 Temperature codes for the ratings Ex db/ia [ia IIC] IIB + H_2 and Ex ia/tb [ia] III C 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

The model 706 Transmitter with adapter shall be used only with FM Approved Model 705 probe assemblies per installation instructions in the product manual.