

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: FM17ATEX0062X**

4 **Equipment or protective system: LMT Series Magnetostrictive Level Transmitters
(Type Reference and Name)**

5 **Name of Applicant: ABB Engineering (Shanghai) Ltd**

6 **Address of Applicant: No 4528 KangXin Highway,
KangQiaoTown, Pudong New District, Shanghai 201319.
China**

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:

3062871 dated 4th August 2017

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
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 T6...T4 Ga Ta = -40°C to +85°C
II 1 D Ex ia IIIC T80°C Da Ta = -40°C to +85°C
FISCO Field Device when Option "I" = F1 or P1

Andrew Was
Deputy Certification Manager, FM Approvals Ltd.

Issue date: 2 November 2018

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13 Description of Equipment or Protective System:

The LMT Series of level transmitters are a range of field-mounted, microprocessor-based electronic transmitters utilizing multiple sensor technologies. The transmitters provide measurement of liquid levels and can be configured to provide specific industrial output signals according to 4-20 mA with HART digital communication. The LMT Series consists of three model types: the LMT100 which is insertion-mounted, the LMT200 which is externally mounted on gauge and the LMT300 which is insertion-mounted, sanitary.

The LMT Series level transmitters are comprised of a two compartment enclosure attached to the "front end assembly" which is attached to the probe or sensor. The front end assembly contains a glass-to-metal feedthrough which separates the enclosure from the probe. The LMT Series of level transmitters have an ingress protection rating of IP66.

Three communications options are included, HART, Foundation Fieldbus and Profibus PA.

The transmitters are intended for use in an ambient temperature of -40°C to +85°C. The equipment is rated for a process temperature range of -195°C to +195°C with the insertion-mounted versions rated for a maximum process pressure up to 3000 psi depending on probe.

For Option I = H1

$U_i \leq 30\text{Vdc}$; $C_i \leq 16\text{nF}$; $L_i = 0\text{mH}$ Current and power per tables below.

Input parameters for **L1 DISPLAY OPTION**.

TEMPERATURE CLASS-GAS	TEMPERATURE CLASS-DUST	MINIMUM AMBIENT	MAXIMUM AMBIENT	MAXIMUM INPUT-CURRENT $I_{\text{max}}(\text{mA})$	POWER(W)
T4	T135°C	-40°C	+85°C	100	0.75
T4	T135°C	-40°C	+70°C	160	1
T5	T100°C	-40°C	+40°C	100	1.4
T6	T85°C	-40°C	+40°C	50	0.4

Input parameters for **L2 DISPLAY OPTION**.

TEMPERATURE CLASS-GAS	TEMPERATURE CLASS-DUST	MINIMUM AMBIENT	MAXIMUM AMBIENT	MAXIMUM INPUT-CURRENT $I_{\text{max}}(\text{mA})$	POWER(W)
T4	T135°C	-40°C	+60°C	100	0.75
T4	T135°C	-40°C	+60°C	160	1
T5	T100°C	-40°C	+56°C	100	1.4
T6	T85°C	-40°C	+44°C	50	0.4

For Option I = F1

For linear supplies: $U_i = 24\text{ V}$ $I_i = 250\text{ mA}$ $P_i = 1.2\text{ W}$ $C_i \leq 5\text{ nF}$ $L_i \leq 10\text{ }\mu\text{H}$
For FISCO Supplies: $U_i = 17.5\text{ Vdc}$ $I_i = 380\text{ mA}$ $P_i = 5.32\text{ W}$ $C_i \leq 5\text{ nF}$ $L_i \leq 20\text{ }\mu\text{H}$

For Option I = P1

For linear supplies: $U_i = 24\text{ V}$ $I_i = 250\text{ mA}$ $P_i = 1.2\text{ W}$ $C_i \leq 5\text{ nF}$ $L_i \leq 20\text{ }\mu\text{H}$
For FISCO Supplies: $U_i = 17.5\text{ Vdc}$ $I_i = 380\text{ mA}$ $P_i = 5.32\text{ W}$ $C_i \leq 5\text{ nF}$ $L_i \leq 20\text{ }\mu\text{H}$

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LMT100.a.b.c.d.e.f.g.h.i.j.k.l.m.n - o.p.q.r.s.t.u.v.x // z.aa.bb.cc.dd.ee.ff.gg.hh.ii.jj.

Magnetostrictive Level Transmitters.

a = Approvals A4, B4, C4, D4, E1, G4, J4, K4, M1, M2, or P4.

j = Housing D1, D2, D3 or D4.

k = Display L1 or L2.

l = Output F1, H1 or P1.

Model code option variables "b" through "i" and beyond variable "l" do not affect product safety.

Model code options "o" to "jj" are optional. Model code "x" = AR is not applicable.

LMT200.a.b.c.e.j.k.l - o.p.q.r.s.t.u.v.w.x.y // z.aa.bb.cc.dd.ee.ff.gg.hh.ii.jj.

Magnetostrictive Level Transmitters.

a = Approvals A4, B4, C4, D4, E1, G4, J4, K4, M1, M2, or P4.

j = Housing D1, D2, D3 or D4.

k = Display L1 or L2.

l = Output F1, H1 or P1.

Model code option variables "b" through "i" and beyond variable "l" do not affect product safety.

Model code options "o" to "jj" are optional. Model code "x" = AR is not applicable.

LMT300.a.b.c.d.e.f.g.h.i.j.k.l.m.n - o.p.q.r.s.t.u.v.x // z.aa.bb.cc.dd.ee.ff.gg.hh.ii.jj.

Magnetostrictive Level Transmitters.

a = Approvals A4, B4, C4, D4, E1, G4, J4, K4, M1, M2, or P4.

j = Housing D1, D2, D3 or D4.

k = Display L1 or L2.

l = Output F1, H1 or P1.

Model code option variables "b" through "i" and beyond variable "l" do not affect product safety.

Model code options "o" to "jj" are optional. Model code "x" = AR is not applicable.

14 Specific Conditions of Use:

1. For Category II 1 G installations the LMT main electronics enclosure option j = D1 or D2 contains aluminium and is considered to present a potential risk of ignition by impact or friction. Care shall be taken into account during installation and use to prevent impact or friction.
2. For Category II 1 G and II 1 D installations, parts of the equipment containing light metals (Aluminium, Titanium, Zirconium or Magnesium) shall be protected from impact so that impact or friction sparks cannot occur, taking into account rare malfunction. Measures to prevent impact or friction sparks when using the equipment containing light metals include but are not limited to:
 - Mounting the probe vertically
 - No mechanical agitation shall be used
 - Use of stilling wells to mitigate effect of agitation.
 - Limit rate of change of level to values such that friction sparks cannot occur
3. The user shall take the appropriate mitigation measures in accordance with their own risk assessment to prevent any other conditions capable of producing impact or friction sparks.
4. If additional non-conductive paint/coatings are applied to the process connection, flange or instrument housing (for example to provide additional corrosion resistance) there may exist a risk of electrostatic discharge due to charge build-up on the non-conductive paint/coating layer. The user shall take the appropriate mitigation measures in accordance with their own risk assessment.

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5. When non-metallic sensor well or probe sleeve materials are used there is a risk of ignition from electrostatic discharge due to the flow of non-conductive media (for example in stirring vessels and pipes). The user shall decide on the suitability of the equipment for the particular application.
6. When the manufacturer of the equipment has not identified the type of protection on the label, the user shall, on installation, mark the label with the type of protection used.
7. For Option I = H1 the equipment temperature class rating is according to the following table:

Process Temperature	Ambient Temperature	Temperature Class Ex ia IIC Ga	Temperature Class Ex ia IIIC Da
-196°C to +80°C	-40°C to +57.9°C	T6	T80°C
-196°C to +95°C	-40°C to +67.4°C	T5	N/A
-196°C to +130°C	-40°C to +85°C	T4	N/A
-196°C to +195°C	-40°C to +85°C	T4	N/A

8. For Option I = F1 or P1 the equipment temperature class rating is according to the following table:

Process Temperature	Ambient Temperature	Temperature Class Ex ia IIC Ga	Temperature Class Ex ia IIIC Da
-196°C to +80°C	-40°C to +57.9°C	T6	T80°C
-196°C to +95°C	-40°C to +67.4°C	T5	T100°C
-196°C to +130°C	-40°C to +85°C	T4	T135°C
-196°C to +195°C	-40°C to +85°C	T4	T135°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 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.

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18 Certificate History

Details of the supplements to this certificate are described below:

Date	Description
08 th August 2017	Original Issue.
2 November 2018	<u>Supplement 1:</u> Report Reference: 3062990 dated 23 rd October 2018 Description of the Change: Addition of FF and PA communications options I = F1 and P1.

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Blueprint Report

ABB Engineering (Shanghai) Ltd (135922)

Class No 3615

Original Project I.D. 3048977

Certificate I.D. FM17ATEX0062X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>	<u>Electronic Drawing</u>
3KXL000064U0101	D	Magnetostrictive Front End PCB	RR208054	Yes (pdf)
3KXL000065U0101	E	Magnetostrictive Front End Board	RR208054	Yes (pdf)
3KXL000065U0110	E	Magnetostrictive Front End Board BOM	3062990	Yes (pdf)
3KXL000065U0111	A	Magnetostrictive Front End	3048977	Yes (pdf)
3KXL000102U0107	1	LMT SPECIFICATION NAMEPLATE ARTWORK	3062990	Yes (pdf)
3KXL140000G0022	C	LMT Intrinsic Safety Schematic for HART Variant	3062990	Yes (pdf)
3KXL140000G0101	NC	LMT HOOKUP WITH 'AR' REPEATER INDICATOR OPTION	RR208054	Yes (pdf)
3KXL140000G0109	0	Installation and control drawings for LMT products	3062990	Yes (pdf)
3KXL140000G0209	1	LMT ATEX, IECEX & Other Approvals Certification Plate Artwork	3062990	Yes (pdf)
3KXL140000G0309	1	LMT FM & Other Approvals Certification Plate Artwork	3062990	Yes (pdf)
3KXL140000G0409	1	LMT ATEX, IECEX & FM Certification Plate Artwork	3062990	Yes (pdf)
3KXL140000G0509	0	TRANSMITTER LMT MAGNETOSTRICTIVE	3062990	Yes (pdf)
3KXL140000G0609	1	LMT Specification Nameplate	3062990	Yes (pdf)
3KXL140000G0709	NC	AR OPTION FLAMEPROOF NAMEPLATE FOR USE WITH LMT	RR208054	Yes (pdf)
3KXL140100G0001	B	LMT100 General Assembly and Options	3062990	Yes (pdf)
3KXL140200G0001	B	LMT200 General Assembly and Options	3062990	Yes (pdf)
3KXL140300G0001	C	LMT300 General Assembly and Options	3062990	Yes (pdf)
FAB0003	E	REPEAT INDICATOR (AR) ALUMINUM & STAINLESS STEEL DUAL COMPARTMENT HOUSING	RR208054	Yes (pdf)
HSG2017	G	DUAL COMPARTMENT HOUSING EXPLOSION PROOF / FLAMEPROOF CERTIFICATION	RR208054	Yes (pdf)
LMT-0303-2	NC	LMT Explosive Atmospheres Option Codes	3062990	Yes (pdf)
SM/LMT100/200/300-EN	B	LMT Series Safety manual for magnetostrictive level transmitter	3062871	Yes (pdf)
SM/LMT100/200/300_EX_EN	A	Safety manual for magnetostrictive level transmitter	3062990	Yes (pdf)
SM_LMT100200	D	Safety manual	3062990	Yes (pdf)