CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM17US0243X**
3. **Equipment:** **LMT Series Magnetostrictive Level Transmitters**
   (Type Reference and Name)
4. **Name of Listing Company:** **ABB Engineering (Shanghai) Ltd**
5. **Address of Listing Company:** **No 4528 ,KangXin Highway**
   KangQiaoTown PudongNewDistrict Shanghai 201319
   China
6. The examination and test results are recorded in confidential report number:

   3062871 dated 4th August 2017

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM Class 3600:2011, FM Class 3610:2010, FM Class 3611:2004, FM Class 3615:2006, FM Class 3616:2011, FM Class 3810:2005, ANSI/ISA 60079-0:2013, ANSI/UL 60079-1:2015, ANSI/ISA 60079-11:2012, ANSI/ISA 60079-15:2010, ANSI/ISA 60079-31:2015, ANSI/NEMA 250:1991, ANSI/IEC 60529:2004

8. 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.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

Certificate issued by:

J.E. Marquedant
VP, Manager, Electrical Systems

23 October 2018
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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10. Equipment Ratings:

Explosionproof for Class I, Division 1, Groups A, B, C and D; Dust-ignitionproof for Class II, Division 1, Groups E, F and G; Class III, Division 1; Flameproof for Class I, Zone 1, AEx db IIC T6…T2 Gb; Protection by Enclosure for Zone 21, AEx tb IIIC T85°C…T165°C Db hazardous (classified) locations, indoors and outdoors (Type 4X, IP66) with an ambient temperature rating of -40°C to +85°C.

Intrinisically safe for Class I, II and III Division 1, Groups A, B, C, D, E, F and G T6…T4; Intrinsically safe for Class I, Zone 0 AEx ia IIC T6…T4 Ga; Intrinsically safe for Zone 20, AEx ia IIIC T80°C…T165°C Da when installed per Control Drawing 3KXL140000G0109; Noninicendive for Class I, Division 2 Groups A, B, C and D, Class II, Division 2 Groups F and G; Class III. Type of Protection 'n' for Class I, Zone 2 AEx nC IIC T6…T4 hazardous (classified) locations, indoors and outdoors (Type 4X, IP66) with an ambient temperature rating of -40°C to +85°C.

11. The marking of the equipment shall include:
For a = Approvals M1, or N2.

Class I, Division 1, Groups A, B, C, D; T6…T2 Ta = -40°C to +85°C; Type 4X, IP66

Class II, Division 1, Groups E, F, G, Class III, Division 1; T6…T3B Ta = -40°C to +85°C; Type 4X, IP66

Class I, Zone 1, AEx db IIC T6…T2 Gb Ta = -40°C to +85°C, Type 4X, IP66

Zone 21, AEx tb IIIC T85°C…T165°C Db Ta = -40°C to +85°C, Type 4X, IP66

For a = Approvals M1, N1 or N3.

Class I, II and III, Division 1, Groups A, B, C, D, E, F and G T6…T4 Ta = -40°C to +85°C; Type 4X, IP66

Class I, Zone 0, AEx ia IIC T6…T4 Ga Ta = -40°C to +85°C, Type 4X, IP66

Zone 20, AEx ia IIIC T80°C…T165°C Da Ta = -40°C to +85°C, Type 4X, IP66

Class I, Division 2, Groups A, B, C and D T6…T4 Ta = -40°C to +85°C, Type 4X, IP66

Class II, Division 2, Groups F and G T6…T4 Ta = -40°C to +85°C, Type 4X, IP66

Class III

Class I, Zone 2, AEx nC IIC T6…T4 Ta = -40°C to +85°C, Type 4X, IP66

"FISCO Field Device" when Output I = F1 or P1

12. **Description of Equipment:**

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 feedthru which separates the enclosure from the probe.

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

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The LMT Series level transmitters operate on 10.5 - 42 Vdc. 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 +427°C with the insertion-mounted versions rated for a maximum process pressure up to 3000 psi depending on probe.

The intrinsically safe versions of the LMT operate at a maximum voltage of 30 V per Control Drawing 3KXL140000G0109.

An optional repeat indicator (model code option "o" = AR) is available for explosionproof and dust-ignitionproof applications. The repeat indicator is a 4-20 mA loop powered display which provides a second (repeating) display for the main transmitter. The enclosure and electronics were previously Approved under FM Approvals Project ID 2D2A0.AE as Explosionproof for Class I, Division 1, Groups A, B, C and D and Dust-Ignitionproof for Class II/III, Division 1, Groups E, F and G.

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 N2
b = Probe wetted material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
c = Probe style and probe type Y0, R1, R2, R3, R4, R5, C1, C2, C3, C4, H1, H2, J1, J2, J4, J5, T1, S5, W1, W2, W4, W5, W6, W8, W9 or Z9.
d = Probe end connection Y0, A1, C1, C2, C3, C4, C5, C6 or Z9.
e = Process connection style Y0, P1, P2, P3 or P4.
f = Process connection type YY, AF, AJ, AR, CG, CN, CR, CV, DG, DR, DT, EG, ER, FB, FC, FN, GT, JG, JR, MD, NT, RG, RR, SA, SB, SC, SD, SE, SF, SG, SH, SJ, SK, SV, SL, SM, SN, SP, S1, SR, SS, S2, SU, UG, UR or ZZ.
g = Process connection size Y, A, B, C, D, E, F, G, H, J, K, M, N, P, R or Z.
h = Process connection pressure rating Y, A, B, C, D, E, F, G, H, J, K, M, N, P or Z.
i = Process connection material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
j = Housing D1, D2, D3 or D4.
k = Display L0, L1, L2, L3, L4 or L8.
l = Output Y0, F1, H1 or P1.
m = Float 1 option 00Y, 00R, 99Z, 210, 231, 232, 233, 241, 251, 252, 253, 254, 255, 261, 262, 263, 271, 272, 273, 274, 275, 281, 282, 283, 291, 401, 402, 461, 462, 463, 471, 472, 473, 481, 01B, 02B, 05B, 06B, 07B, 08B, 09D, 10D, 11D, 12E, 12F, 14G, 15B, 17B, 17D, 18B, 19E, 19F, 20D, 22D, 29B, 30B, 31B, 41B, 45T, 50B, 50M, 51B, 52P, 53G, 53P, 54G, 55G, 56F, 58B, 59E, 60T or 61T.
n = Float 2 option 00Y, 00R or 99Z.

Model code options beyond variable "n" do not affect product safety. Model code options "o" to "jj" are optional.

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 N2.
b = Probe wetted material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
c = Probe style and probe type Y0, R1, R2, R3, C1, C2, C3, C4 or Z9.
e = Process connection style Y0, B1, B2, T1 or T2.

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j = Housing D1, D2, D3 or D4.
k = Display L0, L1, L2, L3, L4 or L8.
l = Output Y0 or H1.
Model code options beyond variable "l" do not affect product safety. Model code options "o" to "jj" are optional.

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 N2.
b = Probe wetted material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
c = Probe style and probe type Y0, S1, S2, S3, S4 or Z9.
d = Probe end connection Y0, S1, S2, S3, S4 or Z9.
e = Process connection style Y0, P1, P2 or P4.
f = Process connection type YY, CG, CN, CR, CV, SA, SB, SC, SD, SE, SF, SG, SH, SJ, SK, SV, SL, SM, SN, SP, S1, SR, SS, S2, SU or ZZ.
g = Process connection size Y, C, D, E, F, G, H, J, K, M, N or Z.
h = Process connection pressure rating A, B, C, D or E.
i = Process connection material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
j = Housing D1, D2, D3 or D4.
k = Display L0, L1, L2, L3, L4 or L8.
l = Output Y0, F1, H1 or P1.
m = Float 1 option 00Y, 00R, 99Z, 210, 231, 232, 233, 241, 251, 252, 253, 254, 255, 261, 262, 263, 271, 272, 273, 274, 275, 281, 282, 283, 291, 401, 402, 461, 462, 463, 471, 472, 473, 481, 01B, 02B, 05B, 06B, 07B, 08B, 09D, 10D, 11D, 12E, 12F, 14G, 15B, 17B, 17D, 18B, 19E, 19F, 20D, 22D, 29B, 30B, 31B, 41B, 45T, 50B, 50M, 51B, 52P, 53G, 53P, 54G, 55G, 56F, 58B, 59E, 60T or 61T.
n = Float 2 option 00Y, 00R or 99Z.

Model code options beyond variable "n" do not affect product safety. Model code options "o" to "jj" are optional.

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 M1, N1 or N3.
b = Probe wetted material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
c = Probe style and probe type Y0, R1, R2, R3, R4, R5, C1, C2, C3, C4, H1, H2, J1, J2, J4, J5, T1, S5, W1, W2, W3, W4, W5, W6, W7, W8, W9 or Z9.
d = Probe end connection Y0, A1, C1, C2, C3, C4, C5, C6 or Z9.
e = Process connection style Y0, P1, P2, P3 or P4.
f = Process connection type YY, AF, AJ, AR, CG, CN, CR, CV, DG, DR, DT, EG, ER, FB, FC, FN, GT, JG, JR, MD, NT, RG, RR, SA, SB, SC, SD, SE, SF, SG, SH, SJ, SK, SV, SL, SM, SN, SP, S1, SR, SS, S2, SU, UG, UR or ZZ.
g = Process connection size Y, A, B, C, D, E, F, G, H, J, K, M, N, P, R or Z.
h = Process connection pressure rating Y, A, B, C, D, E, F, G, H, J, K, M, N, P or Z.
i = Process connection material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
j = Housing D1, D2, D3 or D4.
k = Display L1 or L2.
l = Output Y0, F1, H1 or P1..

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m = Float 1 option 00Y, 00R, 99Z, 210, 231, 232, 233, 241, 251, 252, 253, 254, 255, 261, 262, 263, 271, 272, 273, 274, 275, 281, 282, 283, 291, 401, 402, 461, 462, 463, 471, 472, 473, 481, 01B, 02B, 05B, 06B, 07B, 08B, 09D, 10D, 11D, 12E, 12F, 14G, 15B, 17B, 17D, 18B, 19E, 19F, 20D, 22D, 29B, 30B, 31B, 41B, 45T, 50B, 50M, 51B, 52P, 53G, 53P, 54G, 55G, 56F, 58B, 59E, 60T or 61T.
n = Float 2 option 00Y, 00R or 99Z.

Model code options beyond variable "n" 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 M1, N1 or N3.
b = Probe wetted material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
c = Probe style and probe type Y0, R1, R2, R3, C1, C2, C3, C4 or Z9.
e = Process connection style Y0, B1, B2, T1 or T2.
j = Housing D1, D2, D3 or D4.
k = Display L1 of L2.
l = Output Y0, F1, H1 or P1.

Model code options 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 M1, N1 or N3.
b = Probe wetted material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
c = Probe style and probe type Y0, S1, S2, S3, S4 or Z9.
d = Probe end connection Y0, S1, S2, S3, S4 or Z9.
e = Process connection style Y0, P1, P2 or P4.
f = Process connection type YY, CG, CN, CR, CV, SA, SB, SC, SD, SE, SF, SG, SH, SJ, SK, SV, SL, SM, SN, SP, S1, SR, SS, S2, SU or ZZ.
g = Process connection size Y, C, D, E, F, G, H, J, K, M, N or Z.
h = Process connection pressure rating A, B, C, D or E.
i = Process connection material Y0, A2, A3, A4, A5, A6, C1, C9, D1, D2, D3, D4, H1, H2, H3, H4, L1, M4, N1, N2, N3, N4, P1, P2, P3, P4, P5, P6, P7, P8, S1, S2, S3, S4, S5, S6, S7, S9, T2, T5, U9 or Z9.
j = Housing D1, D2, D3 or D4.
k = Display L0, L1, L2, L3, L4 or L8.
l = Output Y0, F1, H1 or P1.
m = Float 1 option 00Y, 00R, 99Z, 210, 231, 232, 233, 241, 251, 252, 253, 254, 255, 261, 262, 263, 271, 272, 273, 274, 275, 281, 282, 283, 291, 401, 402, 461, 462, 463, 471, 472, 473, 481, 01B, 02B, 05B, 06B, 07B, 08B, 09D, 10D, 11D, 12E, 12F, 14G, 15B, 17B, 17D, 18B, 19E, 19F, 20D, 22D, 29B, 30B, 31B, 41B, 45T, 50B, 50M, 51B, 52P, 53G, 53P, 54G, 55G, 56F, 58B, 59E, 60T or 61T.
n = Float 2 option 00Y, 00R or 99Z.

Model code options beyond variable "n" do not affect product safety. Model code options "o" to "jj" are optional. Model code "x" = AR is not applicable.

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13. **Specific Conditions of Use:**

1. For Ex d and XP installation - The flameproof joints of the equipment are not intended to be repaired. Consult the manufacturer if repair of the flameproof joints is necessary.
2. For Division 1 and Zone 0 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.
3. For Zone 0 or Zone 20 installations, parts of the equipment containing light metals (Aluminum, 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
4. 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.
5. 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.
6. 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.
7. 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.
8. The equipment temperature class rating is according to the following table:

Process Temperature	Ambient Temperature	Temperature Class			
		DIV 1, ZN 1	DIV 1, ZN 21	Div 1, Zn 0	Div 1, ZN 20
		XP, “db”	DIP, “tb”	IS, “ia”	IS, “ia”
-196°C to +80°C	-40°C to +57.9°C	T6, T6	T6, T85°C	T6	T6, T85°C
-196°C to +95°C	-40°C to +67.4°C	T5, T5	T5, T100°C	T5	T5, T100°C
-196°C to +130°C	-40°C to +85°C	T4, T4	T4, T135°C	T4	T4, T135°C
-196°C to +195°C	-40°C to +85°C	T4, T4	T4, T135°C	T4	T4, T135°C
-196°C to +295°C	-40°C to +85°C	T3B, T3	T3B, T165°C	N/A	N/A, T165°C
-196°C to +420°C	-40°C to +85°C	T2, T2	N/A, N/A	N/A	N/A, N/A

9. On installation as Type nC apparatus the LMT shall be provided with supply transient protection external to the apparatus such that the voltage at the supply terminals of the LMT does not exceed 140% of the voltage rating of the equipment.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

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15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
4th August 2017	Original Issue.
23rd October 2018	Supplement 1: Report Reference: 3062990 dated 23rd October 2018 Description of the Change: Addition of FF and PA communications options l = F1 and P1.

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