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# 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: FM14ATEX0068X

4 Equipment or protective system: LPT Tank SLAYER®  
(Type Reference and Name) LPR RefineME®  
LPC CHAMBERED  
LPS SoClean®  
LPL LevelLimit  
Level Plus Transmitters

5 Name of Applicant: MTS Systems Corp Sensors Division

6 Address of Applicant: 3001 Sheldon Drive  
Cary NC 27513  
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 26<sup>th</sup> 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:

3051777 dated 29<sup>th</sup> January 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 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 1/2 G Ex ia IIC T4 Ga/Gb Ta = -50 to +71°C



**Richard Zammitt**  
Certification Manager, FM Approvals Europe Ltd.

Issue date: 21<sup>st</sup> April 2020

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# SCHEDULE



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## 13 Description of Equipment or Protective System:

The LP Series transmitters are used for the continuous measurement of liquid product level or its interface with other liquids and their temperatures in containers (tanks) using magnetostrictive technology. Magnetostrictive transmitters precisely sense the position of an external float by applying an interrogation pulse to a waveguide medium. This current pulse causes a magnetic field to instantly surround the waveguide. The magnet installed within the float also creates a magnetic field which is used in turn to calculate the precise location of the float.

The LP Series transmitters are offered with a number of different options including housing, lengths, mounting and connection options, but electronically the LP Series transmitters includes only two versions, the Level Plus Digital Level Transmitter and Level Plus Analog Level Transmitter. The Level Plus Digital Level Transmitter has digital outputs and converts the readings into digitally coded signals for transmission over asynchronous interfaces. The digital output is designed to work in single master-multiple slave bus system using an RS 485/EIA 485 physical layer interface.

The Level Plus Analog Level Transmitter with analog interface is a loop powered 4-20mA transmitter and converts the measurements into analog currents with the ability to communicate over a HART interface. The analog output contains up to two 4-20 mA current loops, where the device is self-powered from Loop 1. Loop 2 is galvanically isolated from Loop 1.

The enclosures have an ingress protection rating of IP65.

### ***LPabcdehijEl3nop - Level Plus Digital Level Transmitters. (Tank Slayer, RefineME, SoClean, Chambered)***

Energy Limitation Parameters:

Supply:  $U_i = 28\text{ V}$ ,  $I_i = 100\text{ mA}$ ,  $C_i = 0$ ,  $L_i = 0$ ,  $P_i = 700\text{ mW}$

Rx/Tx-:  $U_i = 8.6\text{ V}$ ,  $I_i = 10\text{ mA}$ ,  $C_i = 0$ ,  $L_i = 0$ ,  $P_i = 21.5\text{ mW}$

Rx/Tx+:  $U_i = 8.6\text{ V}$ ,  $I_i = 10\text{ mA}$ ,  $C_i = 0$ ,  $L_i = 0$ ,  $P_i = 21.5\text{ mW}$

a = Unit: T, R, C or S

b = Output: M, D or U

c = Housing Type: A, B, C, D, E, L or Y

d = Electronics mounting: 1, 2, 3, 4, 5, 6, 7 or 8

e = Sensor Pipe: B, C, D, E, F, M, N, P, S, R, Y or X

f = Material of Construction: 1, 2, 3, A or 9

g = Process Connection Type: 1, 2, 4, 5, 6, 7, 8, A, B, C, D or X

h = Process Connection Size: A, B, C, D, E, F, G, H, J or X

i = Number of DT's: 0, 1, 5, K, M, P or X

j = DT Placement: F, C, B, E, K or X

n = Units of Measure: F, M or U

o = Length: (numeric)

p = Special: S, E, R or F

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## **LPabcdehijEl3nop. - Level Plus Analog Level Transmitters. (Tank Slayer, RefineME, SoClean, Chambered)**

Energy Limitation Parameters:

Loop 1:  $U_i = 28\text{ V}$ ,  $I_i = 120\text{ mA}$ ,  $C_i = 0$ ,  $L_i = 5\text{ }\mu\text{H}$ ,  $P_i = 840\text{ mW}$

Loop 2:  $U_i = 28\text{ V}$ ,  $I_i = 120\text{ mA}$ ,  $C_i = 0$ ,  $L_i = 5\text{ }\mu\text{H}$ ,  $P_i = 840\text{ mW}$

a = Unit: T, R, C or S

b = Output: 1, 2, 3, 4, 5, 6 or 7

c = Housing Type: A, B, C, D, E, L or Y

d = Electronics mounting: 1, 2, 3, 4, 5, 6, 7 or 8

e = Sensor Pipe: B, C, D, E, F, M, N, P, S, R, Y or X

f = Material of Construction: 1, 2, 3, A or 9

g = Process Connection Type: 1, 2, 4, 5, 6, 7, 8, A, B, C, D or X

h = Process Connection Size: A, B, C, D, E, F, G, H, J or X

i = Number of DT's: 0, 1, 5, K, M, P or X

j = DT Placement: F, C, B, E, K or X

n = Units of Measure: F, M or U

o = Length: (numeric)

p = Special: S, E, R or F

## **LPLbcdehijkl. Level Plus Digital Level Transmitter (LevelLimit)**

Energy Limitation Parameters:

Supply:  $U_i = 28\text{ V}$ ,  $I_i = 100\text{ mA}$ ,  $C_i = 0\text{ }\mu\text{F}$ ,  $L_i = 0\text{ mH}$ ,  $P_i = 700\text{ mW}$

Rx/Tx-:  $U_i = 8.6\text{ V}$ ,  $I_i = 10\text{ mA}$ ,  $C_i = 0\text{ }\mu\text{F}$ ,  $L_i = 0\text{ mH}$ ,  $P_i = 21.5\text{ mW}$

Rx/Tx+:  $U_i = 8.6\text{ V}$ ,  $I_i = 10\text{ mA}$ ,  $C_i = 0\text{ }\mu\text{F}$ ,  $L_i = 0\text{ mH}$ ,  $P_i = 21.5\text{ mW}$

Switch:  $U_i = 28\text{ Vdc}$ ,  $I_i = 5\text{ mA}$ ,  $P_i = 140\text{ mW}$ ,  $L_i = 7.59\text{ mH}$ ,  $C_i = 0\text{ }\mu\text{F}$

b = Sensor Pipe; B, M, N, P or S

c = Process Connection Size; G or X

d = Number of Digital Thermometers; 0, 1, 5, K or M

e = DT Placement; C, F or X

f = Notified Body; E

g = Protection Method; I

h = GAS Group; 3, 4, A, B, C or D

i = Unit of Measure; M or U

j = Length; any 5 numerical digits

k = Special; S, E, R or F

l = HI Switch Position; any 5 numerical digits

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## **LPLbcdefghijkl. Level Plus Analog Level Transmitter (LevelLimit)**

Energy Limitation Parameters:

Loop 1:  $U_i = 28\text{Vdc}$ ,  $I_i = 120\text{mA}$ ,  $C_i = 0\mu\text{F}$ ,  $L_i = 5\mu\text{H}$ ,  $P_i = 840\text{mW}$

Loop 2:  $U_i = 28\text{Vdc}$ ,  $I_i = 120\text{mA}$ ,  $C_i = 0\mu\text{F}$ ,  $L_i = 5\mu\text{H}$ ,  $P_i = 840\text{mW}$

Switch:  $U_i = 28\text{Vdc}$ ,  $I_i = 5\text{mA}$ ,  $C_i = 0\mu\text{F}$ ,  $L_i = 7.59\text{mH}$ ,  $P_i = 140\text{mW}$

- b = Sensor Pipe; B, M, N, P or S
- c = Process Connection Size; G or X
- d = Number of Digital Thermometers; 0, 1, 5, K or M
- e = DT Placement; C, F or X
- f = Notified Body; E
- g = Protection Method; I
- h = GAS Group; 3, 4, A, B, C or D
- i = Unit of Measure; M or U
- j = Length; any 5 numerical digits
- k = Special; S, E, R or F
- l = HI Switch Position; any 5 numerical digits

### 14 **Specific Conditions of Use:**

1. The apparatus enclosure contains aluminum or titanium and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction. ( When installed in a Ga Approval)
2. The maximum permitted ambient temperature of the Level Plus Digital/Analog Level Transmitter is  $71^\circ\text{C}$ . To avoid the effects of process temperature and other thermal effects care shall be taken to ensure the surrounding ambient and the ambient inside the transmitter housing does not exceed  $71^\circ\text{C}$
3. Some models contain non-metallic enclosure parts, to prevent the risk of electrostatic sparking the non-metallic surface should only be cleaned with a damp cloth.

### 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.

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## 18 Certificate History

Details of the supplements to this certificate are described below:

Date	Description
17 <sup>th</sup> February 2015	Original Issue.
22 <sup>nd</sup> June 2015	<u>Supplement 1:</u> Report Reference - RR201245 dated 15 <sup>th</sup> June 2015. Description of the Change: Minor drawing revisions.
04 <sup>th</sup> February 2016	<u>Supplement 2:</u> Report Reference - RR203284 dated 02 <sup>nd</sup> February 2016. Description of the Change: Minor changes to parts and documentation
01 <sup>st</sup> December 2016	<u>Supplement 3:</u> Report Reference - RR207287 dated 30 <sup>th</sup> November 2016. Description of the Change: Minor documentation updates.
23 <sup>rd</sup> March 2017	<u>Supplement 4:</u> Report Reference - RR208630 dated 20 <sup>th</sup> March 2017. Description of the Change: Minor documentation updates.
25 <sup>th</sup> October 2018	<u>Supplement 5:</u> Report Reference – RR215509 dated 24 <sup>th</sup> September 2018. Description of the Change: Add options U, E and K. Minor documentation updates. Added full model code.
18 <sup>th</sup> October 2019	<u>Supplement 6:</u> Report Reference: – RR219750 Dated 16 <sup>th</sup> October 2019. Description of the Change: Minor drawing modifications. Certificate transferred from FM Approvals Ltd., notified body no. 1725, to FM Approvals Europe Ltd., notified body no. 2809. Update to include latest amendment to EN60529.
25 <sup>th</sup> February 2020	<u>Supplement 7:</u> Report Reference – PR451357 dated 25 <sup>th</sup> February 2020. Description of the Change: Addition of LevelLimit model.
31 <sup>st</sup> March 2020	<u>Supplement 8:</u> Report Reference – RR222232 dated 30 <sup>th</sup> March 2020. Description of the Change: Addition of the words “or titanium” to Specific Conditions of use, fix minor typos on certificate.
21 <sup>st</sup> April 2020	<u>Supplement 9:</u> Report Reference – RR223250 dated 20 <sup>th</sup> April 2020. Description of the Change: Minor design changes and drawing changes not affecting compliance.

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