

CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM18US0256X
3. **Equipment:** Level Plus Digital/Analog Level Transmitters
(Type Reference and Name)
4. **Name of Listing Company:** MTS Systems Corp Sensors Division
5. **Address of Listing Company:** 3001 Sheldon Dr
Cary NC 27513
USA
6. The examination and test results are recorded in confidential report number:

3051777 dated 29th January 2015
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

FM Class 3600:2018, FM Class 3610:2018, FM Class 3810:2018,
ANSI/ISA 60079-0:2013, ANSI/ISA 60079-11:2014, 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.
10. **Equipment Ratings:**

Intrinsically Safe for Class I, Division 1, Groups A, B, C and D; Flameproof for Class I, Zone 0, AEx ia IIC T4 hazardous (classified) locations, IP65 with an ambient temperature rating of -50°C to +71°C.

Certificate issued by:


J.E. Marquedant
VP, Manager - Electrical Systems

30 March 2020
Date

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

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FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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11. The marking of the equipment shall include:
Intrinsically safe Class I Division 1, Groups A, B, C, D; T4 Ta = -50°C to +71°C; IP65
Class I, Zone 0, AEx ia IIC T4 Ta = -50°C to +71°C, IP65

12. **Description of Equipment:**

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 Loop1. Loop2 is galvanically isolated from Loop 1.

The LevelLimit is the Level Plus Digital Level Transmitter with the addition of HI level overfill protection through a Digital I/O output. The overfill protection is in the same mechanical package but electrically isolated from the digital level transmitter.

Level Plus Digital Level Transmitters. (Tank Slayer, RefineME, SoClean, Chambered)

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

LPabcdefghijklmnp.

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

k = Notified Body: F

l = Protection Method: I

m = Gas Group: A, B, C, D, 3 or 4

n = Units of Measure: F, M or U

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o = Length: (numeric)
p = Special: S, E, R or F

Level Plus Digital Level Transmitter (LevelLimit)

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

LPLbcdefghijkl.

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

Level Plus Analog Level Transmitters. (Tank Slayer, RefineME, SoClean, Chambered)

Entity Parameters:

Loop 1: $U_i = 28\text{ V}$, $I_i = 120\text{ mA}$, $C_i = 0\text{ }\mu\text{F}$, $L_i = 5\text{ uH}$, $P_i = 840\text{ mW}$
Loop 2: $U_i = 28\text{ V}$, $I_i = 120\text{ mA}$, $C_i = 0\text{ }\mu\text{F}$, $L_i = 5\text{ uH}$, $P_i = 840\text{ mW}$

LPabcdefghijklmnop.

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
k = Notified Body: F
l = Protection Method: I
m = Gas Group: A, B, C, D, 3 or 4
n = Units of Measure: F, M or U
o = Length: (numeric)
p = Special: S, E, R or F

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Level Plus Analog Level Transmitter (LevelLimit)

Entity Parameters:

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

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

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

LPLbcdefghijkl.

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

c = Process Connection Size; A, B, G or X

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

e = DT Placement; C, F or X

f = Notified Body; F

g = Protection Method; I

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

i = Unit of Measure; M or U

j = Length; any 5 numerical digits

k = Special; E, F, R or S

l = HI Switch Position; any 5 numerical digits

13. 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 °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°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.

14. Test and Assessment Procedure and Conditions:

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

15. Schedule Drawings

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

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16. Certificate History

Details of the supplements to this certificate are described below:

| Date | Description |
|---------------------------------|---|
| 29 th January 2015 | Original Issue. |
| 24 th September 2018 | Supplement 1: Report Reference – RR215509 dated 24 th September 2018. Description of the Change: Add options U, E and K. Minor documentation updates. Updated certificate to new format |
| 25 th February 2020 | Supplement 2: Report Reference – PR451357 dated 25 th February 2020. Description of the Change: Addition of LevelLimit model. Updated standards. |
| 30 th March 2020 | Supplement 3: Report Reference – RR222232 dated 30 th March 2020. Description of the Change: Addition of the words “or titanium” to Specific Conditions of use: |

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