

CERTIFICATE OF CONFORMITY



- HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
- Certificate No:** FM18US0274X
- Equipment:** KTF Magnetostrictive
(Type Reference and Name) KTR Magnetostrictive
KTC Magnetostrictive
Liquid Level Transmitters
- Name of Listing Company:** Kenco Engineering
- Address of Listing Company:** 10001 E 54th Street
Tulsa, OK 74146 United States
- The examination and test results are recorded in confidential report number:
PR450493 dated 7th May 2019
- 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 3615:2018, FM Class 3810:2018,
ANSI/ISA 60079-0:2013, ANSI/UL 60079-1:2015, ANSI/ISA 60079-26:2017,
ANSI/UL 61010-1:2012, ANSI/IEC 60529:2004
- 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.
- 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.
- Equipment Ratings:
Explosionproof for Class I, Division 1, Groups B, C and D or for A, B, C and D; Flameproof for Class I, Zone 0/1, AEx db IIB+H2 T6...T3 Ga/Gb hazardous (classified) locations, (IP65) with an ambient temperature rating of -40°C to +71°C.

Certificate issued by:



J.E. Marquedant
VP, Manager - Electrical Systems

19 May 2019

Date

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

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11. The marking of the equipment shall include:

Class I Division 1, Groups B, C, D; T6...T3
Class I, Zone 0/1, AEx db IIB+H2 T6...T3 Ga/Gb
Ta = -40°C to +71°C; IP65

Or

Class I Division 1, Groups A, B, C, D; T6...T3
Class I, Zone 0/1, AEx db IIB+H2 T6...T3 Ga/Gb
Ta = -40°C to +71°C; IP65

12. **Description of Equipment:**

General - The KTF, KTR, and KTC Magnetostrictive Liquid Level Transmitters are a continuous multi-functional magnetostrictive transmitter that provides product level, interface level, and temperature to the user via 4 to 20 mA current loops, HART, Modbus, or DDA for use in Hazardous Locations.

The KT Transmitters can be configured with three different enclosure offerings as described below.

Housing Types	Description
D	Cast Aluminum Single Cavity with Display Option
E	Cast Aluminum Dual Cavity with Display Option
L	Stainless Steel Single Cavity with Display Option

The KT Transmitters can be configured with 11 different sensor pipe probe offerings as described below.

Sensor Types	Description
B	Industrial end plug w/stop collar (5/8" OD)
M	Flexible, 7/8"OD tube w/ bottom fixing eye
N	Flexible, 7/8"OD tube w/ bottom fixing weight
P	Flexible, 7/8"OD tube w/ bottom fixing magnet
S	Flexible, 7/8"OD tube w/o bottom fixing hardware
R	Rigid, 1/2" OD
Y	10 mm OD Pipe

Note - For the KTR Magnetostrictive Liquid Level Transmitters Model only, Sensor Types B, can be optionally coated with PTFE

Construction – All the KTF, KTR, and KTC Magnetostrictive Liquid Level Transmitters are configured with a purchased component housing (single or dual compartment type) and custom probe arrangement with stainless steel or Hastelloy float(s). The probe and housing are separated with a potted feedthrough for separating the electronics housing compartment(s) from the probe compartment. The probe(s) offered, depending on product equipment builds, come in Stainless Steel or Hastelloy materials, or PTFE coated probes (KTR Magnetostrictive Liquid Level Transmitters Only) varying in lengths depending on rigid or flexible type arrangement (where Rigid sensor pipe (12 to 300 in),(305 to 7620 mm), and Flexible sensor pipe (62 to 999 in), (1575 to 30000 mm). All of the enclosures offered are available in ¼ inch NPT thread form or Metric Thread form (M20 sized).

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Only for the case for KTC Magnetostrictive Liquid Level Transmitters single cavity housing builds with 90 degree electronic mountings (Model Code d = 3, 4, 5, or 6), the instrument enclosure is fitted with (3) ¾ inch NPT openings; (1) which is populated with the 90 degree electronics mount (90 degree elbow), (1) entry fitted with a blanking plug and the remaining entry can be optionally fitted with (1) ¾ inch male to ½ inch female NPT threaded adapter which is suitable for cable / conduit connection.

Ratings - The KTF, KTR, and KTC Magnetostrictive Liquid Level Transmitters are for use with internal electronics rated 28 Vdc (120mA max), with an Analog 4 to 20mA output or Digital RS485 output. The ambient operating temperature range of the KTF, KTR, and KTC Magnetostrictive Liquid Level Transmitters are -40°C to 71°C. The process temperature range of the KTF, KTR, and KTC Magnetostrictive Liquid Level Transmitters are -40°C to 150°C. The equipment has an ingress protection rating of IP65. The flexible probe has a maximum working pressure rating of 435psi and for the rigid type probe, the maximum working pressure rating is 1000psi.

KTFbcdefghijklmnop, Magnetostrictive Liquid Level Transmitters

b = Output: 1, 2, 5, 7, M, D
c = Housing Type: *D, *E, L (*available for Gas Groups A, B, C, D)
d = Electronics Mounting: 1
e = Flexible Sensor Housing: M, N, P, S
f = Wetted Materials: 1
g = Mounting Connection Type: 1, 2, 6, 7, 8, X
h = Mounting Connection Size: B, D, E, F, G, H, J, X
i = Digital Thermometer Quantity: 0, 1, 5, K, M,
j = Digital Thermometer Placement: F, C, X
k = Notified Body: F
l = Protection Method: F
m = Gas Group: **A, B, C, D, 4 (**only when Housing Type D or E is selected)
n = Unit of Measure: M, U
o = Length: (XXX.XX in), (XXXXX mm), Flexible sensor pipe (62 to 866 in), (1575 to 21996 mm).
p = Special: S (Standard Product), E (Engineering Special (not affecting agency controlled parts or features), R (Reverse Measurement)

KTRbcdefghijklmnop, Magnetostrictive Liquid Level Transmitters

b = Output: 1, 2, 5, 7, M, D
c = Housing Type: *D, *E, L (*available for Gas Groups A, B, C, D)
d = Electronics Mounting: 1
e = Sensor Pipe: B
f = Wetted Materials: 1, 3, A
g = Mounting Connection Type: 1, 2, 6, 7, 8, X
h = Mounting Connection Size: A, D, E, F, G, H, J, X
i = Digital Thermometer Quantity: 0, 1, 5, K, M
j = Digital Thermometer Placement: F, C, X
k = Notified Body: F
l = Protection Method: F
m = Gas Group: **A, B, C, D, 4 (**only when Housing Type D or E is selected)
n = Unit of Measure: M, U
o = Length: (XXX.XX in), (XXXXX mm), Rigid sensor pipe (12 to 300 in), (305 to 7620 mm)
p = Special: S (Standard Product), E (Engineering Special (not affecting agency controlled parts or features), R (Reverse Measurement), F (Flexible Sensing Element with Rigid Pipe)

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KTCbcdefghijklmnop, Magnetostrictive Liquid Level Transmitters

- b = Output: 3, 6, D, M
- c = Housing Type: *D, *E, L (*available for Gas Groups A, B, C, D)
- d = Electronics Mounting: 7, 8
- e = Sensor Housing: B,
- f = Sensor Housing Materials: 1
- g = Mounting Connection Type: X (None)
- h = Mounting Connection Size: X (None)
- i = Digital Thermometer Quantity: 0,
- j = Digital Thermometer Placement: X
- k = Notified Body: F
- l = Protection Method: F
- m = Gas Group: **A, B, C, D, 4 (**only when Housing Type D or E is selected)
- n = Unit of Measure: M, U
- o = Length: (XXX.XX in), (XXXXX mm), Rigid sensor pipe (12 to 300 in), (305 to 7620 mm)
- p = Special: S (Standard Product), E (Engineering Special (not affecting agency controlled parts or features), R (Reverse Measurement)

13. **Specific Conditions of Use:**

*For KTF Transmitters –
Specific Conditions of Use:*

1. *Warning: The equipment contains non-metallic enclosure and process parts. To prevent the risk of electrostatic sparking, the non-metallic surface should only be cleaned with a damp cloth. Painted surface of the equipment may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust or oil. Cleaning of the painted surface should only be done with a damp cloth.*
2. *Cables shall be rated > 5°C above maximum ambient temperature.*
3. *To maintain the ingress protection rating of IP65, Teflon tape (3 wraps) or pipe dope shall be used. Refer to Installation Instructions.*
4. *The equipment can be installed in the boundary wall between a Zone 0 area and the less hazardous area, Zone 1. In this configuration, the process connection is installed in a Zone 0 area, while the transmitter housing is installed in a Zone 1 area. Refer to installation instructions.*
5. *Flexible gauges have a minimum bend diameter of 381mm (15 inches).*
6. *Flamepaths not for repair.*
7. *The applicable temperature class, process temperature range and ambient temperature range of the equipment is as follows;*
 - T3 with Process Temperature Range of -40°C to 150°C*
 - T4 with Process Temperature Range of -40°C to 135°C*
 - T5 with Process Temperature Range of -40°C to 100°C*
 - T6 with Process Temperature Range of -40°C to 85°C*
 - 40°C ≤ Ta ≤ 71°C*
8. *When mounting on a MLG (magnetic level gauge) make sure the electronic head and pressure barrier have a minimum spacing of 5 inches. See Installation Manual for detail.*

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For KTR, KTC Transmitters –

Specific Conditions of Use:

1. *Warning: The equipment contains non-metallic enclosure and process parts. To prevent the risk of electrostatic sparking, the non-metallic surface should only be cleaned with a damp cloth. Painted surface of the equipment may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust or oil. Cleaning of the painted surface should only be done with a damp cloth.*
2. *Cables shall be rated > 5°C above maximum ambient temperature.*
3. *To maintain the ingress protection rating of IP65, Teflon tape (3 wraps) or pipe dope shall be used. Refer to Installation Instructions.*
4. *The equipment can be installed in the boundary wall between a Zone 0 area and the less hazardous area, Zone 1. In this configuration, the process connection is installed in a Zone 0 area, while the transmitter housing is installed in a Zone 1 area. Refer to installation instructions.*
5. *Flamepaths not for repair.*
6. *The applicable temperature class, process temperature range and ambient temperature range of the equipment is as follows;*
 - T3 with Process Temperature Range of -40°C to 150°C*
 - T4 with Process Temperature Range of -40°C to 135°C*
 - T5 with Process Temperature Range of -40°C to 100°C*
 - T6 with Process Temperature Range of -40°C to 85°C*
 - 40°C ≤ Ta ≤ 71°C*
7. *When mounting on a MLG (magnetic level gauge) make sure the electronic head and pressure barrier have a minimum spacing of 5 inches. See Installation Manual for detail.*

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.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
19 th May 2019	Original Issue.

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