Data sheet DS/AT200-EN Rev. U

AT200
Magnetostrictive Level Transmitter
K-TEK Products

Measurement made easy

Features

- SIL2 Certified IEC 61508*
- Designed to mount externally to K-TEK KM26 or other Magnetic Level Gauge
- High accuracy: .01% of full scale
- Superior piezo ceramic sensor (Patent # 5,473,245)
- Local indication with LCD display
- Simple calibration
- Never requires recalibration: set it & forget it
- Dual compartment housing with separate field terminal compartment
- Total and/or interface level measurement
- Process temperature range -320° F to 800° F (-196 to 427°C) with options
- Field replaceable electronics module
- Built in RFI / EMI filter
- Digital communication

Options

- Two level indications
- Foundation Fieldbus output
- Glass viewing window
- 316L SS enclosure
- 20 point strapping table

SPECIFICATIONS

Electronic Transmitter

Housing Type	Explosion Proof Powder Coated Cast Aluminum or Stainless Steel Dual Compartment
Electrical Connection	1/2” FNPT or M20
Repeatability	.005% of full scale or 0.015”, whichever is greater
Non-Linearity	.01% of full scale or .035”, whichever is greater
Accuracy	.01% of full scale or 0.050”, whichever is greater
Supply Voltage	13.5 to 36 VDC - Loop Powered ; 9 to 32 VDC - Foundation Fieldbus
Reverse Polarity Protection	Diode in series with loop
Output	Standard 4-20 mA DC Loop HART protocol (standard) Foundation Fieldbus (optional) • ITK 5.1.0 Compliant • 5 AI and 1 PID blocks • 12.5 mA Quiescent Current Draw • LAS Capable
Dampening	Field adjustable by means of pushbuttons. Range: 0.1 to 36 seconds
Burnout	Jumper selectable upscale (21 mA) or downscale (3.6mA)
Temperature	-40 to 170ºF (-40 to 77ºC) ambient
Humidity	0 to 100% R.H., non-condensing

*** Transmitters equipped with 4-20mA/HART module option only**
*** Refer to Ordering Information Section E**

Sensor Tube

Material	316L SS
Process Temp.	-320 to 250ºF (-196 to 121ºC) ; 800ºF (427ºC) with options
Measuring Range	1 to 50 feet (304.8mm to 15.24m) ; 90 degree probes 1 to 25 feet (304.8mm to 7.62m)
Mounting	Stainless steel clamps for KM26 Magnetic Level Gauge chamber (included)

Approvals:

FM Factory Mutual Research Corporation
XP / I / 1 / ABCD / T6; DIP / II, III / 1 / EFG / T6
IS / I / 1 / ABCD / T4 - ELE0001 and ELE1036 [1,2]
NI / I / 2 / ABCD / T4
TYPE 4X

CSA Canadian Standards Association
XP / I / 1 / ABCD / T6; DIP / II, III / 1 / EFG / T6
IS / I / 1 / ABCD / T4 - ELE0001[1]
NI / I / 2 / ABCD / T4
TYPE 4X

ATEX
FP: ITS08ATEX15869X
II 1/2 G/D Ex d IIC T6
Ex tD 20/A21 IP6X T80**°C**
IS: ITS08ATEX15866X [1,2]
II 1/2 GD Ex ia IIC T4 (-40°C ≤ Tamb ≤ 66°C)
Ex iaD 20/21 IP6X T80°C (-40°C ≤ Tamb ≤ 66°C)
Ingress protection: IP66 and IP67

0539
0036

GOST Russia
FP: 1ExdIICT6
IS: 0ExiaIICT6[1]
Ingress protection: IP67
Sanitary Hygienic Certificate

IEC International Electromechanical Commission
IS: **IECEx ITS 08.0032X [1,2]**
Ex ia IIC T4
Ex iaD 20/21 IP6X T80°C
FP: **IECExITS 08.0035**
II 1/2G/D Ex d IIC T6
Ex tD A21 IP6X T80°C

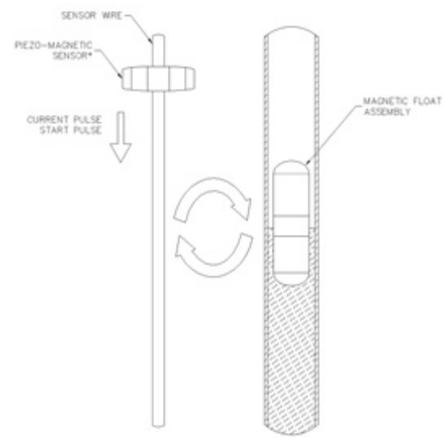
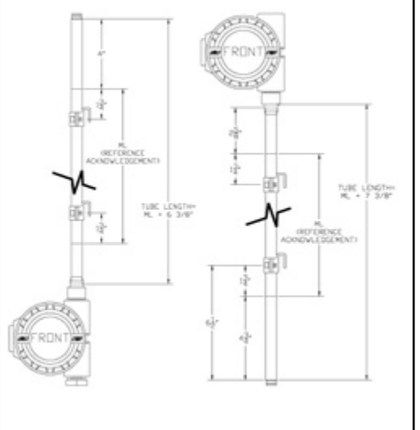
Notes: 1. Excludes RI (secondary analog output) & Honeywell DE options.
2. Fieldbus & FISCO

Safety exida.com Third Party Certified Safety Integrity Level (SIL 2) data (FMEDA analysis) for Safety Instrumented Systems engineering is available.

IEC61508 CERTIFIED

PRINCIPLE OF OPERATION:

The AT200 is based upon the magnetostrictive principle. The sensing tube contains a wire which is pulsed at fixed time intervals creating a magnetic field around the wire. The interaction of the magnetic field around the wire and the magnetic float causes a torsional stress wave to be induced in the wire. This torsion propagates along the wire at a known velocity, from the position of the magnetic float and toward both ends of the wire. A patented piezo ceramic sensing element placed in the transmitter assembly converts the received mechanical torsion into an electrical return pulse. The microprocessor-based electronics measures the elapsed time between the start and return pulses and converts it into a position measurement which is proportional to the level of the float.

AT200 Components	Principle of Operation	AT200 Dimensions
		

ORDERING INFORMATION
AT200/a/b/c/d/e/f/g/h:

/a Mounting
- **B** Bottom Connected Electronic Housing
- **BW** Bottom Connected Electronic Housing with Window Cover
- **T** Top Connected Electronic Housing
- **TW** Top Connected Electronic Housing with Window Cover

/b Transmitter Configuration
- **L** Standard Local Transmitter Housing
  Notes:
  1. For Process Temperature up to:
     A. 200ºF (93ºC)
     B. 500ºF (260ºC) with insulation pad or chamber insulation
- **L9** Transmitter Housing Mounted to Extended Sensing Tube with 90º, 3” Radius Bend
  Notes: 1. For High Process Temperature up to:
     A. 800ºF (427ºC) with chamber insulation (H2 required above 500ºF)
     B. For Limited Space Applications:
        a. L9 without insulation suitable to 300ºF
        b. L9 with insulation pad or chamber insulation suitable to 500ºF
  2. For Ambient Temperature above freezing and Process Temperature above ambient
  3. Order insulation pad or KM26 chamber insulation separately
  4. 25 ft. (7.6m) maximum measuring length
  5. LCD Indicators will be visible at 90º from horizontal
- **C** Offset Transmitter Housing with Vapor Seal for service below ambient. (Use with IW probe type.)
  Notes:
  1. If ambient temperature is below 32ºF, the L9C option is required.
  2. Process Temperature from -320ºF to 200ºF (-196ºC to 93ºC)
- **L9C** Offset Transmitter Housing with Vapor Seal Mounted to Extended Sensing Tube with 90º, 3” Radius Bend, for service below ambient freezing
  Notes: 1. Temperature considerations are the same as for L9, but suitable for freezing ambient.
  2. Temperatures to –40ºF/C ambient and Process from –320ºF to 200ºF (-190ºC to 93ºC)

/c Transmitter Housing Type
- **A** Dual Compartment Aluminum Housing (Standard)
- **S** Dual Compartment Stainless Steel Housing

/d Probe Type
- **R1** Standard 5/8” OD Probe
- **H2** High Temperature Sensing Tube Option for process temperature above 500ºF (260ºC)
  (Requires KM26 chamber insulation and L9 option above 500˚F)
- **IW** Insulation Well to allow the insertion and removal of the probe when mounted to a cryogenic insulated level gauge
  (This is the preferred configuration for cryogenic service when there is no flange on top of the KM26).

/e Electronic Module
- **X** None

HART Protocol:
- **M4A** One Level, LCD Indicator & SIL 2 rated 4-20 mA Output
- **M4B** Two Levels, LCD Indicator & SIL 2 rated 4-20 mA Output
- **M4AS** One Level, LCD Indicator & SIL 2 rated 4-20 mA Output & 20 point Strapping Table
- **M4BS** Two Levels, LCD Indicator & SIL 2 rated 4-20 mA Output & 20 point Strapping Table
- **M5A** One Level, One temperature point, LCD indicator, and Communications
- **M5B** Two Levels, One temperature point, LCD indicator, and Communications

Foundation Fieldbus Protocol:
- **M4AF** One Level & LCD Indicator
- **M4BF** Two Levels & LCD Indicator
- **M4AFS** One Level & LCD Indicator & 20 point Strapping Table
- **M4BFS** One Level & LCD Indicator & 20 point Strapping Table

ORDERING INFORMATION (continued)
AT200/a/b/c/d/e/f/g/h:

/f Second Analog Output (Not SIL Rated)
- **X** None
- **RI** Second Electronic Module with One Analog Output and LCD Indicator
  Notes: 1. Only for use with HART Protocol equipped electronics modules
  2. The RI100 is only approved as an Explosion Proof device (FM and CSA) and Flameproof (ATEX, IEC, GK, GR)
  3. Analog output field selectable to any of the two levels
  4. Housing type will be same as primary transmitter housing (/c above)

/g Approval
- **FM** Factory Mutual
- **CSA** Canadian Standard Association
- **CEX** ATEX Flameproof
- **CEI** ATEX I.S.
- **IEI** International Electromechanical Commission I.S.
- **IEX** International Electromechanical Commission Flameproof
- **GR** GOST Russia

Note: Intrinsically Safe Approvals exclude RI (secondary analog output) & Honeywell DE options.

/h Measuring Length
- **ML** Specify the measuring length in inches or mm

Available Accessories:

VI-TRANSMITTER: Vibration Isolators for use on extreme vibration applications (compressor skids, etc.)

M20 ISO FITTING: M20 Female Electrical Connection (Brass or Stainless Steel)
- MM Brass
- MMS Stainless Steel

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