Sanitary magnetostrictive level transmitter
K-TEK Products

Features
- SIL2 Certified IEC 61508*
- High Accuracy: .01% of Full Scale
- Superior Piezo Ceramic Sensor (Patent # 5,473,245)
- Local Indication with LCD Display
- Single & Double Tri-Clamp Installations
- Suitable for CIP & SIP Applications
- 180 Grit Polish Standard
- Never Requires Re-Calibration: Set It & Forget It
- Dual Compartment Housing with Separate Field Terminal Compartment
- Pressure to 1750 psig (120.7 bar)
- Temperature Range: -320 to 450º F (-196 to 232ºC) with options
- Field Replaceable / Upgradable Electronics Module
- Built In RFI / EMI Filter
- Digital Communication

Options
- 240 Grit & Electropolished Finish
- 20 Point Strapping Table
- Temperature Indication
- Foundation Fieldbus
- Honeywell DE Output
- Glass Viewing Window
- 316L Stainless Steel Enclosure
- Flexible Waveguide for Low Headroom Applications
SPECIFICATIONS

Electronic Transmitter

Housing type  
Explosion Proof Powdered Coated Cast Aluminum or Stainless Steel, Dual Compartment

Electrical Connection  
1/2" FNPT or M20

Repeatability  
0.005% of full scale or 0.015", whichever is greater

Non-Linearity  
0.01% of full scale or 0.035", whichever is greater

Accuracy  
0.01% 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)
   - ITK 5.1.0 Compliant
   - 5 AI and 1 PID blocks
   - 12.5 mA Quiescent Current Draw
   - LAS Capable

Honeywell DE (optional)

Damping  
Field adjustable by means of pushbuttons. Range: 0.1 to 36 seconds

Burnout  
Jumper selectable upscale (21 mA) or downscale (3.6 mA)

Temperature  
-40 to 170°F (-40 to 77°C) Ambient

Humidity  
0 to 100% R.H., non-condensing

* Transmitters equipped with single level 4-20mA/HART module option only
* Refer to “Ordering Information” Section G

Sensor Tube

Material  
316L Stainless Steel

Process Temp.  
-320 to 450°F (-196 to 232°C) with options

Max. Press.  
1750 psig @ 450°F (120.7 bar @ 232°C) actual rating will be determined by process connection

Probe Length  
1 to 30 feet (304.8mm to 9.14m)

Mounting  
Tri-Clamp fitting standard; Refer to ordering information for options.

Approvals:

FM Factory Mutual Research Corporation
XP / I / 1 / ABCD / T6; DIP / II, III / 1 / EFG / T6 1
IS / I / 1 / ABCD / T4 - ELE0001 and ELE1036 2,3
NI / I / 2 / ABCD / T4
TYPE 4X

ATEX
FP: IT508ATEX15866X
   II 1/2 G/D Ex d IIC T6
   Ex tD 20/A21 IP6X T80°C
IS: IT508ATEX15866X
   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)

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

GOST Russia
FP: 1ExdIICT6 1
IS: 0ExialIBT6 2
Sanitary Hygienic Certificate

IEC International Electromechanical Commission
IS: IECEx ITS 08.0032X 2,3
   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 Probe SW3 options.
2. Excludes RI (secondary analog output) & Honeywell DE options.
3. Fieldbus & FISCO

Safety exida.com Third Party Certified Safety Integrity Level (SIL 2) data (FMEDA analysis) for Safety Instrumented Systems
PRINCIPLE OF OPERATION:
The AT100S 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.
ORDERING INFORMATION

AT100S/a/b/c/d/e/f/g/h/I/j/k/l:

/a   Probe Material
   S6   316L Stainless Steel Standard

/b   Transmitter Configuration
   L   Standard Local Transmitter
   LW  Standard Local Transmitter with Window Cover
   T   Local Transmitter with Top Access or Readout
   TW  Local Transmitter with Top Access or Readout and Window Cover
   C   Offset Transmitter with Vapor Seal for Service Below Ambient
   CW  Offset Transmitter with Vapor Seal for Service Below Ambient and Window Cover

/c   Transmitter Housing
   A   Standard Dual Compartment Aluminum Housing
   S   Dual Compartment 316L Stainless Steel Housing

/d   Probe Type
   5/8” OD Rigid Probes specify end of probe design:
   CP  Clean in Place with Float Retaining Clip
   DN  Drain in Place, No Through Hole, No Float Retainer
   DP  Drain in Place Sensor with Non-Removable Float
   3A  3A Sensor with Non-Removable Float
   SW1 1/2” OD Rigid Probe for Insertion into 5/8” OD x 0.049” Wall Sensor Well
        Note: Order sanitary sensor well separately (ACS-0002-1)
   SW3 1/2” OD Flexible SS Braided Probe for insertion into 5/8” OD x 0.49” wall Sensor Well
        Notes: 1. Max 300°F (149°C) @ 1 hour Clean.
               2. 15 ft. (4.5m) maximum probe length.
               3. Available with /S6 probe material only.
               4. Not suitable for explosion proof service.
               5. Probe is not hermetically sealed. For use in conditioned (non-condensing) indoor locations only.
               6. Only available with H0 process temperature option.
               7. Order sanitary sensor well separately (ACS-0002-1)

/e   Probe Finish
   X   None, use this selection with /SW1 & /SW3 probe types.
   1F  Standard 180 Grit Mechanical Finish (Suitable for 3A Service)
   2F  240 Grit Mechanical Finish
   EP  240 Grit Mechanical and Electro-polished Finish
       Note: Certificates of RA and Passivation available upon request

/f   Process Temperature Options
   H0  170°F (77°C) Maximum; Top of transmitter is 8” (200mm) above tank nozzle
       Note: Max 300°F (149°C) @ 1 hour Clean; Performance not guaranteed during 1 hr. cleaning cycle
   H1  250°F (121°C) Maximum; Top of transmitter is 16” (406mm) above tank nozzle
       Note: Max 300°F (149°C) @ 1 hour Clean; Performance not guaranteed during 1 hr. cleaning cycle
   H2  450°F (232°C) Maximum; Top of transmitter is 26” (660mm) above tank nozzle

/g   Electronic Module
   Hart Protocol:
   M4A  One level, LCD indicator and SIL 2 rated 4-20 mA Output
   M4B  Two Levels, LCD Indicator and SIL 2 rated 4-20 mA Output
   M4AS One Level, LCD Indicator and SIL 2 rated 4-20 mA Output and 20 point Strapping Table
   M4BS Two Levels, LCD Indicator, HART Protocol, one SIL 2 rated 4-20 mA Output and 20 point strapping table
ORDERING INFORMATION (continued)

/g Electronic Module

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

Honeywell DE Protocol:
M4AD  One Level & LCD Indicator
M4BD  Two Levels & LCD Indicator
M5A  One Level, One temperature point, LCD indicator, and Communications
M5B  Two Levels, One temperature point, LCD indicator, and Communications

/h Second Analog Output (Not SIL rated)
X  Not available
RI  Second electronic module with 1 ea. Analog output and LCD indication

Notes:  1.  Only available with M5A modules
        2.  Only for use with HART Protocol equipped electronics modules
        3.  The RI100 is only approved as an Explosion Proof device
        4.  Analog output field selectable to level or temperature
        5.  Housing type will be same as primary transmitter housing (/c above)

/i Approvals¹,²
FM  Factory Mutual
CSA  Canadian Standards Association
CEX  ATEX Flameproof
CEI  ATEX I.S.
IEI  International Electromechanical Commission I.S.
IEX  International Electromechanical Commission Flameproof
GR  GOST Russia

Notes:  1.  All Explosion Proof Approvals exclude Probe SW3.
        2.  All Intrinsically Safe Approvals exclude RI (secondary analog output) & Honeywell DE options.

/j Process Connection
Tnn  Tri-Clamp: welded to the sensor

Notes:  1.  Specify “nn” as follows:  10 = 1”, 15 = 1.5”, 20 = 2.0”, 25 = 2.5” up to 6”
        2.  Tri-clamp size and type will determine the maximum probe pressure rating

CF  Adjustable 1/2” to 5/8” compression fitting
For use with SW1 and SW3 sensor well

WP  Flange or plug welded to the sensor tube
Specify type, material and rating from SLG-0001-1 Flange Designation Chart

/k Float Type
X  None; Use this selection with /SW1, & /SW3 probe types
Fnn  Selection from Standard Float Chart (SLG-0003-1) or specify /FXX for custom float

/l Insertion Length
L  Specify inserted length from top of tank nozzle in inches or millimeters or meters
Consult factory for transmitter measuring length.  There is an unusable range of 2.5 inches minimum at the bottom of the
sensing tube (which can be reduced depending upon float dimensions).  The unusable range at the top is affected by the
float dimensions.

NOTE:  Consult factory for special application requirements.

Available Accessories:
M20 ISO FITTING:  M20 Female Electrical Connection (MM - Brass or MMS - Stainless Steel)
FINISH CERT:  Certificate of RA and Passivation (specify required RA finish for electro-polished probes only)

For fastest response to inquiries provide a completed AT100 Application Data Sheet or the Serial Number of an existing AT100.
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