

Sanitary Magnetostrictive Level Transmitter

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 450° F (-196 to 232°C) 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) Foundation Fieldbus (optional) <ul style="list-style-type: none"> • 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



SPECIFICATIONS

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 / T6¹
 IS / I / 1 / ABCD / T4 - ELE0001 and ELE1036^{2,3}
 NI / I / 2 / ABCD / T4
 TYPE 4X



CSA Canadian Standards Association
 XP / I / 1 / ABCD / T6; DIP / II, III / 1 / EFG / T6¹
 IS / I / 1 / ABCD / T4 - ELE0001²
 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
 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)



GOST Russia
 FP: 1ExdIIC T6¹
 IS: 0ExiaIIB T6²
 Ingress protection: IP67
 Sanitary Hygienic Certificate

Ingress protection: IP66 and IP67



IEC International Electromechanical Commission
 IS: IECEX ITS 08.0032X^{2,3}
 Ex ia IIC T4
 Ex iaD 20/21 IP6X T80°C
 FP: IECEX ITS 08.0035
 II 1/2G/D Ex d IIC T6

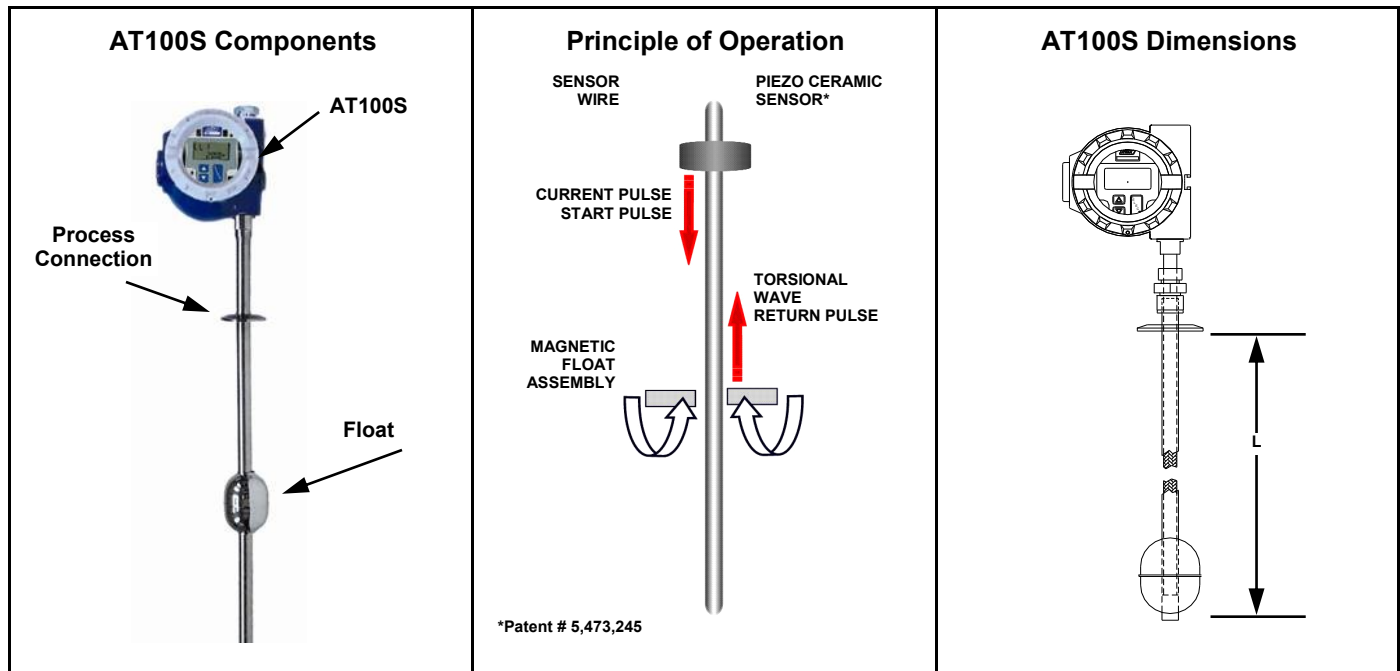
- Notes:**
1. Excludes Probe SW3 options.
 2. Excludes RI (secondary analog output) & Honeywell DE options.
 3. Fieldbus & FISCO

IEC61508 CERTIFIED

Safety 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/l/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

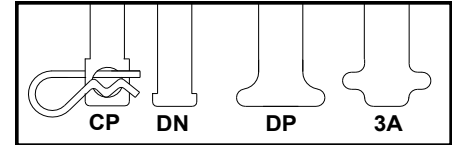
5/8" OD Rigid Probes specify end of probe design:

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 Approvals^{1,2}

- FM** Factory Mutual
- CSA** Canadian Standards Association
- CEX** ATEX Flameproof
- CEI** ATEX I.S.
- IEI** International Electromechanical Commission I.L. APPROVED
- 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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