

# AT500MD

## Specialty Level Instrument

### Drilling mud pit liquid level transmitter for direct insertion K-TEK Products



#### Features

- High Resolution 4-20 mA DC Output - No Signal Conditioner Required
- No Potentiometric I.S. Isolator Required
- Unaffected by Steam
- Simple Mounting and Installation
- Rugged Design - 3/4" Schedule 40 316L SS Sensor Well Allows Servicing of Transmitter Without Removing Well & Float
- All 316LSS construction
- Zero & Span Setpoints Adjust Digitally - Calibrates Without Opening Enclosure
- No O-Rings or Seals in Sensor Tube
- Fully Potted Electronics
- Greater Degree of Interchangeability in the Field With Respect to Length & Measurement Span
- Level Measurement Almost Infinitely Adjustable Span Over Sensor Tube
- No Internal Moving Parts - Never requires recalibration

## SPECIFICATIONS

### Electronic Transmitter:

Repeatability:	.01% of full scale or 0.030", whichever is greater
Non-linearity:	.02% of full scale or .07", whichever is greater
Accuracy:	.02% of full scale or .10", whichever is greater
Loop Supply Voltage:	13.5 to 36 VDC
Housing Type:	Explosion proof 316L SS with 1/2" FNPT Electrical Connection
Polarity Protection:	Diode in series with loop
Output:	Standard 4-20 mA DC Calibration via magnet Field Selectable: Upscale or Downscale
Failsafe:	Electronics -40 to 170°F (-40 to 77°C) Ambient
Operating Temperature:	Electronics -40 to 170°F (-40 to 77°C) Ambient
Humidity:	0-100% R.H. non-condensing
Electrical Connection	1/2" FNPT Standard; M20 Optional

### Sensor Tube

Material:	316/316L Stainless Steel, 3/4" Sch. 40 Sensor Well With 5/8" OD Sensor Tube <b>Standard</b>
Operating Temperature:	-40 to 170°F / -40 to 77°C <b>Standard</b> Up to 250°F / 121°C with 10" extension (H1)
Max Pressure:	950 psig @ 250°F <b>Standard</b> 65.5 bar @ 121°C <b>Standard</b>
Measuring Range:	1 to 16 ft. / 0.3 to 4.8 m
Mounting:	Standard 3/4" MNPT compression fitting (refer to ordering information for options)

### Approvals



**Factory Mutual Research Corporation:**  
XP/II/1/ABCD/T6 Ta=77°C; I/1/AEx d IIC/T6 Ta=77°C;  
DIP / II ,III / 1 / EFG / T6 Ta=77°C  
IS/II/1/ABCD/T4 Ta=77°C; I/O/AEx ia IIC/T4 Ta=77°C-ELE 0035/NC; Entity;  
NI/II/2/ABCD/T4 Ta=77°C; S/II,III/2/FG/T5 Ta=77°C; NEMA 4X



#### CSA International:

##### Hazardous Locations

Class I, Div. 1, Grps A,B,C,D; Class II, Div. 1, Grps E,F,G; Class III;  
Class I, Zone 1, Ex d, IIC T6:



##### Intrinsically Safe Entity - For Hazardous Locations:

Class I, Div. 1, Grps A,B,C,D, Temp. Code T4;  
Class I, Zone 0, Ex ia IIC T4 when installed per drawing ELE0035,  
Max. operating temp. 77°C, Encl. Type 4X.



#### ATEX:

Flameproof: EX II 1/2 GD T85C EEx d IIC T6  
Intrinsically Safe: EX II 1 GD T85C EEX ia IIC T6



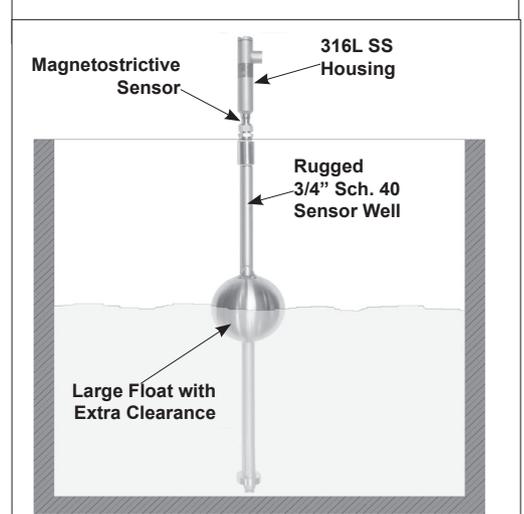
#### GOST Russia:

**Flameproof: 1ExdIIC T6**

**Intrinsically Safe: 0ExiaIIC T6**

**Ingress protection classification: IP67**

## AT500 Sample Mud Drilling Application



**ORDERING INFORMATION**

Standard QuikShip Models

Order Number Complete Model Number

AT500MD1 AT500/S6/L/S/SW2/H0/F5/FM/CF/F51B/15.5"

AT500MD2 AT500/S6/L/S/SW2/H0/F5/FM/CF/F51B/63.5"

AT500MD3 AT500/S6/L/S/SW2/H0/F5/FM/CF/F51B/147.5"

**AT500/a/b/c/d/e/f/g/h/l/j:**

**/a Probe Material**

S6 316L Stainless Steel **Standard**

**/b Transmitter configuration**

L Local Transmitter **Standard**

**/c Transmitter Housing**

S 316L Stainless Steel Housing **Standard**

**/d Probe Type**

SW2 Rigid Probe 5/8 in. O.D. in 3/4" Schedule 40 316L SS Sensor Well  
(16 ft./ 9.1m maximum probe length)

**/e Process Temperature Options**

H0 170°F / 77°C Maximum **Standard**

H1 250°F / 121°C. Maximum (Top of transmitter is 17 in. / 43 cm above tank nozzle)

**/f Electrical Connection**

F5 1/2 in. FNPT **Standard**

M2 M20 Connection

RF RFI Filter with 1/2 in. MNPT connection and flying leads

**/g Approvals**

X **None Standard**

FM Factory Mutual and CSA Canadian Standard Association

CEI ATEX Intrinsically Safe

CEX ATEX Flameproof

GR GOST Russia



**/h Process Connection**

CF 3/4 in. MNPT x adjustable compression fitting **Standard**

FL Flange with 3/4 in. NPT tap shipped loose; Specify from chart Flange Selection chart (SLG-0001-1).

**/i Float Type**

F51B 6" O.D. x 5.8" H; 1.78" I.D., 0.50 min. Specific Gravity; 400 PSIG Maximum

FXX Custom Float - Consult Factory

**/j Length**

L

Standard lengths:

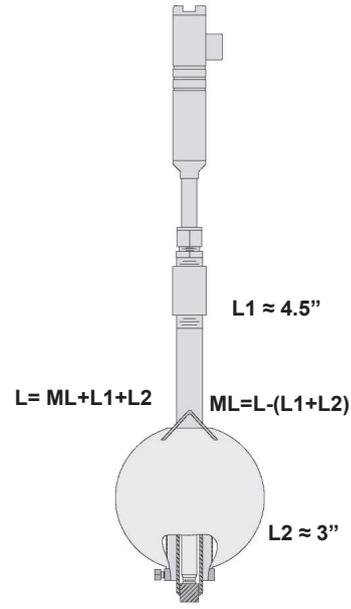
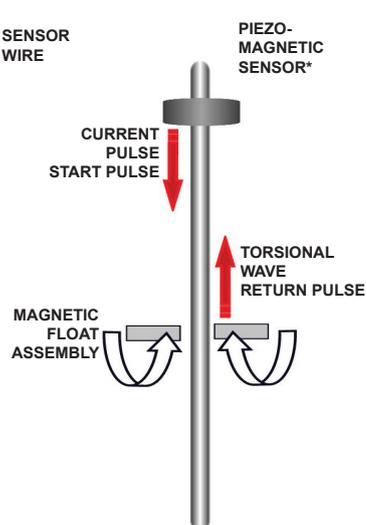
15.5 in. / 394 mm                      27.5 in. / 698 mm                      39.5 in. / 1003 mm

51.5 in. / 1308 mm                      63.5 in. / 1613 mm                      75.5 in. / 1918 mm

87.5 in. / 2222 mm                      99.5 in. / 2527 mm                      111.5 in. / 2832 mm

123.5 in. / 3137 mm                      135.5 in. / 3442 mm                      147.5 in. / 3746 mm

Custom Lengths to 16 ft. / 4876 mm specified in inches or millimeters

<p><b>DIMENSIONS</b></p>  <p><math>L_1 \approx 4.5"</math></p> <p><math>L_2 \approx 3"</math></p> <p><math>L = ML + L_1 + L_2</math></p> <p><math>ML = L - (L_1 + L_2)</math></p>	<p><b>Principle of Operation</b></p> <p>The AT500 is based upon the magnetostrictive principle. The sensing tube contains a wire which is pulsed at fixed time intervals. The interaction of the current pulse with the magnetic field created by 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-magnetic 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 4-20 mA output which is proportional to the level being measured.</p>	<p><b>Principle of Operation Diagram</b></p>  <p>SENSOR WIRE</p> <p>PIEZO-MAGNETIC SENSOR*</p> <p>CURRENT PULSE START PULSE</p> <p>TORSIONAL WAVE RETURN PULSE</p> <p>MAGNETIC FLOAT ASSEMBLY</p> <p>*Patented</p>
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