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
- Failsafe: Field Selectable: Upscale or Downscale
- Operating Temperature: Electronics –40 to 170ºF (-40 to 77ºC) Ambient
- Humidity: 0-100% R.H. non-condensing
- Electrical Connection: 1/2" FNPT Standard; M20 Optional

Sensor Tube
- Operating Temperature: -40 to 170ºF / -40 to 77ºC Standard
- Max Pressure: 950 psig @ 250ºF Standard
- Measuring Range: 1 to 16 ft. / 0.3 to 4.8 m
- Mounting: Standard 3/4" MNPT compression fitting
- Approvals
  - Factory Mutual Research Corporation:
    XP/I/1/ABCD/T6 Ta=77°C; I/1/AEx d IIC/T6 Ta=77°C; D/II ,III/1 / / EFG/76 Ta=77°C
    IS/I/1/ABCD/T4 Ta=77°C; I/0/AEx ia IIC/T4 Ta=77°C-ELE 0035/NC; Entity
    NI/I/2/ABCD/T4 Ta=77°C; S/II,III/2/FG/75 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: 1ExdIICT6
    Intrinsically Safe: 0ExialICT6
    Ingress protection classification: IP67

AT500 Sample Mud Drilling Application

316L SS Housing
Rugged
3/4" Sch. 40 Sensor Well
Magnetostrictive Sensor
Large Float with Extra Clearance

Sensor Tube
- Material: 316/316L Stainless Steel, 3/4" Sch. 40 Sensor Well
- With 5/8" OD Sensor Tube Standard
- Operating Temperature: -40 to 170ºF / -40 to 77ºC Standard
- Max Pressure: 950 psig @ 250ºF Standard
- Measuring Range: 1 to 16 ft. / 0.3 to 4.8 m
- Mounting: Standard 3/4" MNPT compression fitting
- Approvals
  - Factory Mutual Research Corporation:
    XP/I/1/ABCD/T6 Ta=77°C; I/1/AEx d IIC/T6 Ta=77°C; D/II ,III/1 / / EFG/76 Ta=77°C
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    GOST Russia:
    Flameproof: 1ExdIICT6
    Intrinsically Safe: 0ExialICT6
    Ingress protection classification: IP67
Principle of Operation

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 results in a torsional stress wave being 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.