

AX-UL-STP-xx-x

Ultrasonic Level Sensor Hart & Relay output



Product Overview

The AX-UL-STP-xx-x is a range of Ultrasonic level sensors designed for level measurement in tanks or sumps and provides a 4-20mA, Hart and two relay outputs to the BMS system or alarm. The unit uses non-intrusive ultrasonic pulse technology so any liquid can be measured. The unit is housed in a IP68 housing and is fixed to the top of the tank. Set-up is by means of push buttons to set up the full/empty levels. There are two standard ranges 6m and 8m. There is the option of an LCD Display and fully functioned programming module.

Features

- Non Intrusive Design
- Easy to set-up
- Mounted on the top of a tank
- Built in temperature compensation

Technical Specification

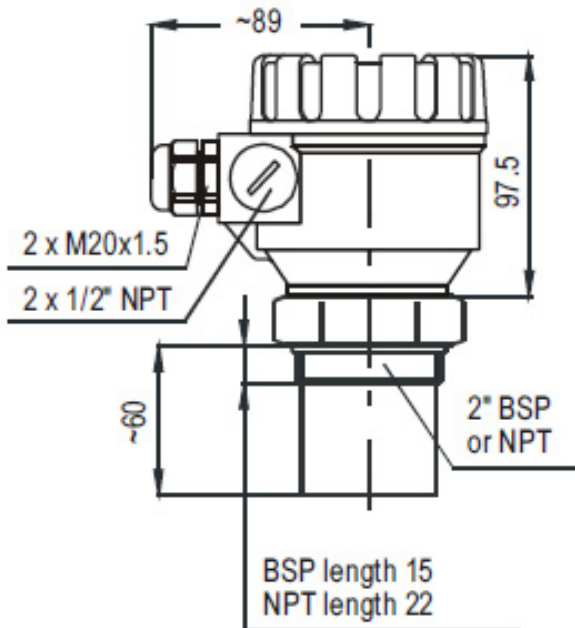
Measuring Range	STP-380	0.25 to 6.0m
	STP-370	0.35 to 8.0m
Process Temperature	-30 to +90 degC	
Power Supply	85 to 255Vac -2VA or 20 to 28Vac/dc -3VA-3W	
Output	4-20mA loop 4- wire transmitter (600 Ohm)	
Digital Communications (-3 or-4)	Hart	
Integral Relays	2 x SPDT (1 at 3A@250Vac, 1 at 1A@30Vdc)	
Operating Pressure	0.3 to 3bar	
Beam Angle	STP-480	5 deg
	STP-470	7deg
Accuracy	0.05% of range +/- 0.2% measured distance	
Resolution	2 to 5m <2mm	
Display (Optional)	SAP-200	LCD Display - fully featured programming configuration and optimisation
Weatherproof Rating	Housing	11 tank shapes, 21 open channels
	Sensor	IP67
Materials	IP68	
Mounting	Polypropylene as standard (PVDF or EPDM option at additional cost)	
Electromagnetic Compatibility	2" BSP (NPT Option)	
Country of Origin	EN61326 Class B	
	EU	

Order Codes

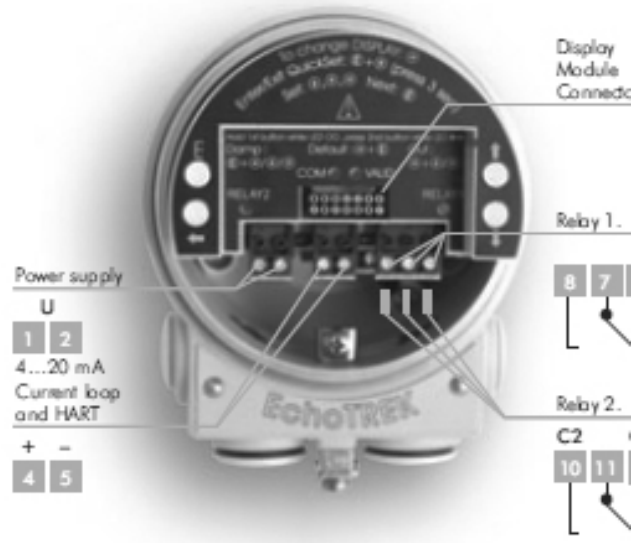
AX-UL-STP480-1	Ultrasonic Level Sensor 0.25 to 6m depth, 4-20mA +2 relay o/p 2" BSP Mtg 85 to255Vac
AX-UL-STP480-2	Ultrasonic Level Sensor 0.25 to 6m depth, 4-20mA +2 relay o/p 2" BSP Mtg 24Vac/dc
AX-UL-STP480-3	Ultrasonic Level Sensor 0.25 to 6m depth, 4-20mA & HART +2 relay o/p 2" BSP Mtg 85 to255Vac
AX-UL-STP480-4	Ultrasonic Level Sensor 0.25 to 6m depth, 4-20mA & HART +2 relay o/p 2" BSP Mtg 24Vac/dc
AX-UL-STP470-1	Ultrasonic Level Sensor 0.35 to 8m depth, 4-20mA +2 relay o/p 2" BSP Mtg 85 to255Vac
AX-UL-STP470-2	Ultrasonic Level Sensor 0.35 to 8m depth, 4-20mA +2 relay o/p 2" BSP Mtg 24Vac/dc
AX-UL-STP470-3	Ultrasonic Level Sensor 0.35 to 8m depth, 4-20mA & HART +2 relay o/p 2" BSP Mtg 85 to255Vac
AX-UL-STP470-4	Ultrasonic Level Sensor 0.35 to 8m depth, 4-20mA & HART +2 relay o/p 2" BSP Mtg 24Vac/dc
add suffix -6	EeX Intrinsically safe version
AX-UL-SAP-200	SAP 200 LCD Display & fully functioned Programming Module

Dimensions

STP-480 / 470



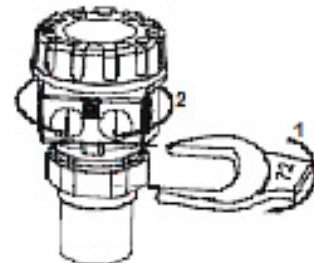
Top Cover including Display Module



Installation

Installation of the (BSP or NPT) threaded models

- Screw the unit in to its place. Use open wrench for tightening; max torque is 20Nm
- After tightening the enclosure can be rotated to the proper position. (Safety bolt prevents rotation more than 350°)
- The unit may be damaged by electrostatic discharge (EDS) via its terminal, thus apply the precautions commonly used to avoid electrostatic discharge e.g. by touching a properly grounded point before removing the cover of the enclosure.
- Ensure that the power supply is turned off at the source.
- With removal of the cover of the housing and taking out the display module (if any), the screw terminals can be accessed. Suggested cable core cross section: 0.5 ... 1.5 mm². Arrange grounding by the inner or outer grounding screw first.
- Switch on the unit and make necessary programming.
- After programming ensure proper sealing and closing of the cover.



Note: If mounting the unit directly to the tank (without our mounting flange) ensure the mounting is non-metallic as a metallic one is likely to resonate and affect the performance of the ultrasonic units.

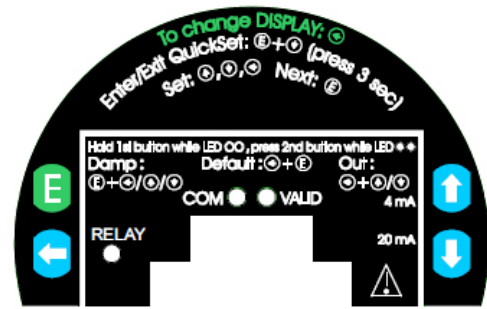
Programming without SAP Display Module

Programming is only possible if the EchoTREK is in Level Measuring Mode and receives valid echo i.e. "VALID" LED is lit!

The following can be programmed without display module

- Assignment of the 4 mA to a required e.g. min. level / max. distance
- Assignment of the 20 mA to a required e.g. max. level / min. distance
- Error indication by the current output (Hold, 3.6 mA or 22 mA)
- Damping (10, 30 or 60 sec)
- Reset to the factory default

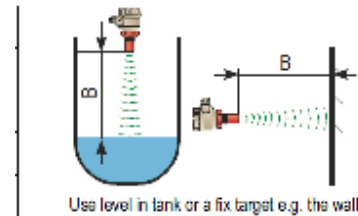
Note: Current output can also be assigned in inverted mode:
4 mA = 100% (Full), 20 mA = 0% (Empty)



Procedure of programming: press button in the relevant sequence and check the state of the LED-s. Symbols for the states of the LED-s:
○ = LED is off, ● = LED is blinking, ●● = LED is on, ●○ = LEDs are blinking alternatively, ⊗ = Dont care

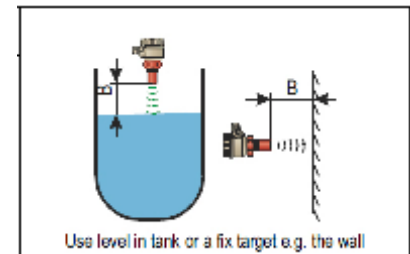
Minimum level (0%, empty tank) assignment to 4 mA

Action	Led state following the action
1) Check for a valid ECHO	⊗● = Valid ECHO, transmitter programmable
2) Press NEXT [Right Arrow] button steadily	○○ = EchoTREK in programming mode
3) Press UP [Up Arrow] button steadily	●● = 4 mA assigned to the distance (see picture)
4) Release buttons	○○ = Programming completed



Maximum level (100%, full tank) assignment to 20 mA

Action	Led state following the action
1) Check for a valid ECHO	⊗○ = Valid ECHO, transmitter programmable
2) Press NEXT [Right Arrow] button steadily	○○ = EchoTREK in programming mode
3) Press DOWN [Down Arrow] button steadily	●● = 20 mA as signed to the distance (see picture)
4) Release buttons	○○ = Programming completed



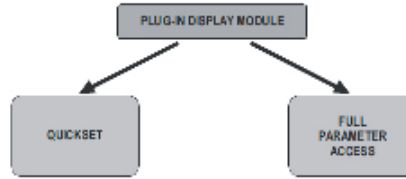
"Error state" indication by the analogue signal (Check for a valid echo as above)

As a result of this setting the value of the analogue output will be 3.8 mA; 22 mA or according last value (hold) until the error is ceased.

Action	Led state following the action
1) Press [Up Arrow] button steadily	○○ = EchoTREK in programming mode
2) Press any of the DOWN [Down Arrow], ENTER [Enter], NEXT [Right Arrow] buttons steadily	●● = - hold last value ●● = - 3.6 mA ●● = - 22 mA
3) Release buttons	○○ = Programming completed

Programming with SAP200 Display Module

The SAP 200 supports 2 separately accessible programming modes representing 2 layers of programming complexity, dependant on user choice



QUICKSET (5.2.4)

Recommended as a simple and fast way to set up the EchoTREK by 6 basic parameters for the following basic settings, marked by abbreviations easy to remember

- Engineering unit for the display (Metric or US)
- Maximum measuring distance (H)
- Assignment of min level to 4 mA
- Assignment of max level to 20 mA
- Error indication by the current output
- Damping time

Full Parameter Access (5.2.5)

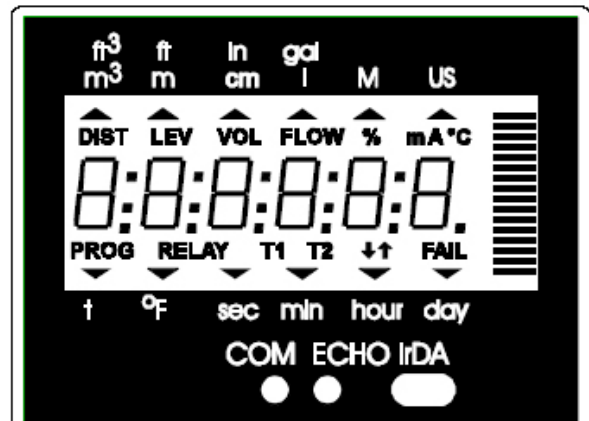
All features of the EchoTREK such as:

- Measurement configuration
- Outputs
- Measurement optimisation
- 11 pre-programmed tank shapes for volume calculation
- 21 pre-programmed formula for flow metering
- 32-point linearisation

5.2.1 SAP-200 Display Module

Symbols used on the LCD:

- DIST – Distance (measuring) mode
- LEV – Level (measuring) mode
- VOL – Volume (measuring) mode
- FLOW – Open channel (flow metering) mode
- PROG - Programming mode (device under programming)
- RELAY – 'C2' circuit of the relay is closed
- T1 - TOT1 volume flow totaliser (resetable aggregate)
- T2 - TOT2 volume flow totaliser (aggregate)
- FAIL - Measurement / device error
- ↑ ↓ - Level changing direction
- Bargraph assigned to the current output or echo strength



Symbols used on the frame:

- **M** – Metric system
- **US** – US calculation system

LEDs lit

- **COM** – digital (Hart) communication
- **VALID** – presence of valid echo

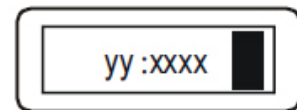
IrDA – Infrared communication port for logger readout, diagnostics and software upgrade.

5.2.2 Steps of the SAP-200 Display Module

Programming will be performed by the pressing and releasing the relevant one or two keys (simultaneously).

Single key pressing

- ENTER** (Ⓔ) to select parameter address and go to parameter value
to save parameter value and return to parameter address
- NEXT** (⬅) to move the blinking (sign of change) of the digit to the left
- UP** (⬆) to increase value of the blinking digit
- DOWN** (⬇) to decrease value of the blinking digit



Double key pressing

Press the two keys simultaneously for desired programming step.

- yy parameter address (P01, P02...P99)
- xxxx parameter value (dcba)
- bargraph

SAP-200 indications

Depending on the measurement one of the below symbols will lit and the process value displayed (see P01 chapter 6.1). Engineering units will be indicated directly (°C, °F and mA) and by the lit arrow showing towards them on the frame

- **DIST** distance
- **LEV** level
- **VOL** volume
- **FLOW** flow
- **T1/T2** totalised values
- **FAIL** (blinking) Error code displayed

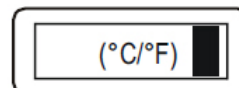
For paging readouts **NEXT** (⬅) key should be pressed.

The following process values can be displayed

- Volume / Flow – if programmed so
- Level – if programmed so
- Distance – if programmed so
- Warning indications – FAIL blinking

Display screens can be scrolled by pressing key **NEXT** (⬅). To return to the screen of the selected measurement mode key **ENTER** (Ⓔ) should be pressed (see P01 chapter 6.1)

Temperature can be displayed by pressing **UP** (⬆).



Current output value can be displayed by pressing **DOWN** (⬇).

