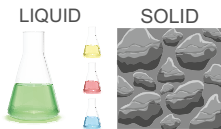


Ultrasonic Level Meters

LULT50



OVERVIEW

Operation

The LULT50 ultrasonic level sensor are compact measurement devices containing an ultrasonic transmitter and an electronic module. Using an transmitter, level sensor transmit the series of ultrasonic pulses that spread towards the level surface. The transmitter receives reflected acoustic waves that are subsequently processed in the electronic module. Based on the period during which the individual pulses spread towards the level and back, this period is averaged by the electronics that performs temperature compensation and subsequently a conversion to an output. The output of the ULS sensor consists of a PNP transistor with an open collector or a two-state current switch 4 mA / 20 mA.

Application

- Tanks, Closed vessels, waste water, sludge, suspensions
- Pipes, open channels
- Sumps, drains, adhesives, resins
- Chemical industry

Features

- Variants of level sensor with adjustment by two buttons, or by magnetic pen
- State indication by two LEDs
- Wide choice of electric connection via connectors, cable glands or protective conductor
- Reception of reflected ultrasonic signal from level can be improved using horn adapter
- For limit level measurement of liquids (even if polluted), mash and paste materials

OPERATING DATA

| | |
|----------------------------|---|
| Ambient Temperature | -30...+70°C |
| Storage Temperature | -40...+70°C |
| Operating Pressure | -1...4 Bar |
| Enclosure | IP67 / IP68 |
| Accuracy | 0,2% for sensor 01 0,15% for sensor 02,06 0,2% for sensor 10,20 |
| Resolution | <1 mm |
| Temperature Error | Max. 0,04%/K |
| Beam Width | 10° for sensor 01,02,10 14° for sensor 06 12° for sensor 20 |
| Measuring Period | 0,6 s for sensor 01,02 1,0 s for sensor 06 1,8 s for sensor 10 5,0 s for sensor 20 |
| Recommended Cable | PVC 2x0,75 mm ² (3x0,5 mm ²) |

MEASURING RANGES

| | |
|--------------|---|
| Range | 0,1...1 m for sensor 01 0,2...2 m for sensor 02 0,2...6 m for sensor 06 0,4...10 m for sensor 10 0,5...20 m for sensor 20 |
|--------------|---|

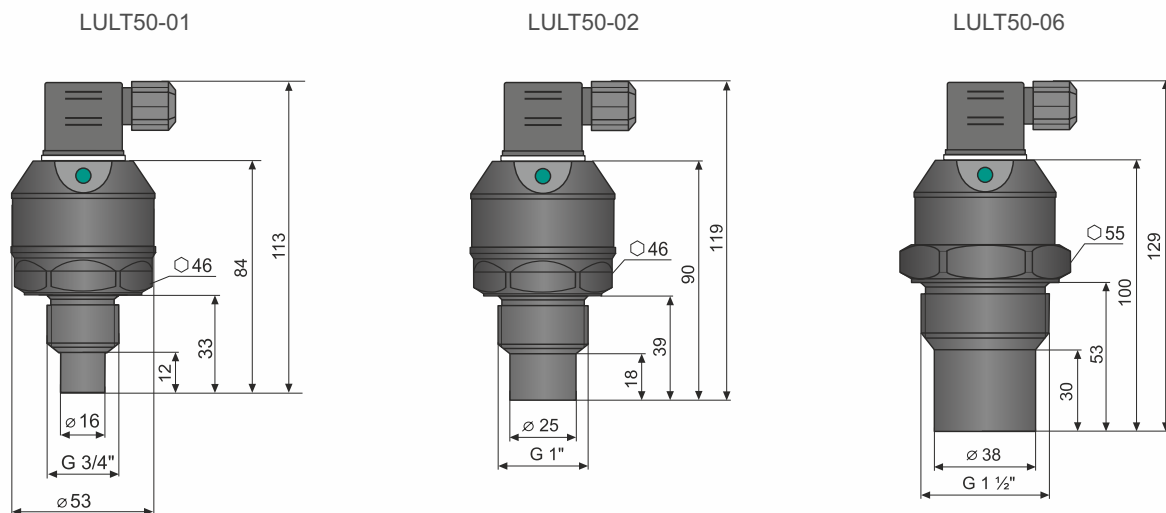
MATERIALS

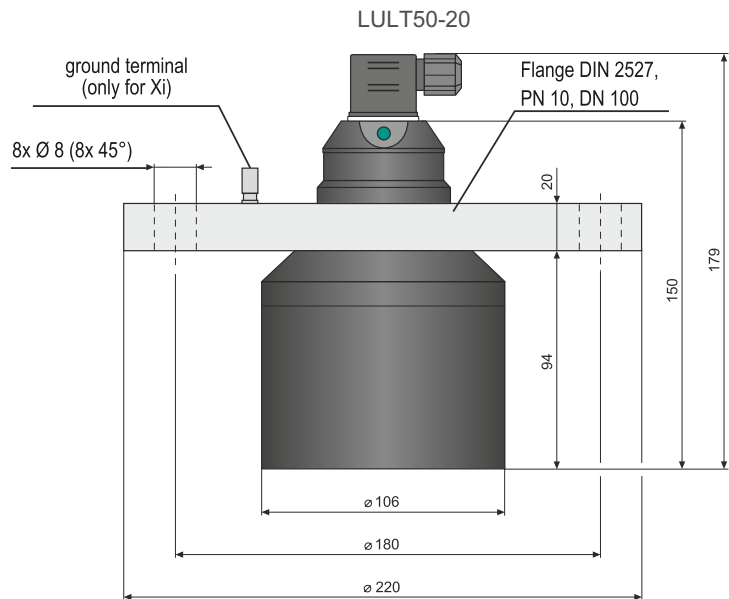
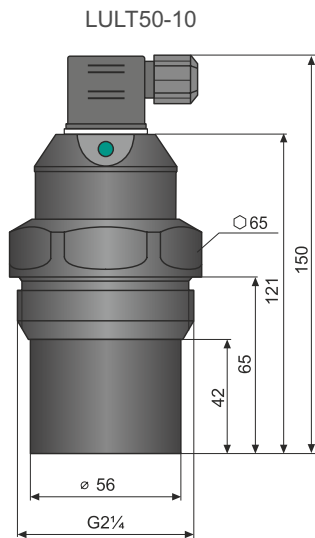
| | |
|-------------------|----------------|
| Housing | PP |
| Transducer | PVDF |
| Flange | Aluminum alloy |

CONNECTION

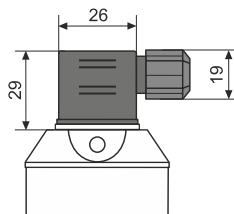
| | |
|----------------|--|
| Thread | G 3/4" for sensor 01 G 1" for sensor 02 G 1 1/2" for sensor 10 G 2 1/4" for sensor 20 |
| Flanged | DN100 PN10 Flange for sensor 20 |

TECHNICAL DRAWINGS AND DIMENSIONS

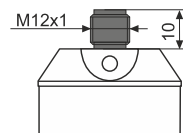




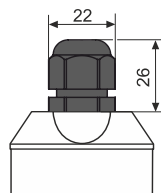
Variant "G" with connector ISO



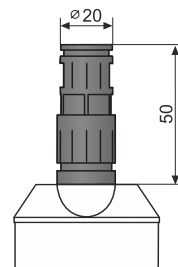
Variant "C" with connector M12



Variant "B" with standard cable gland



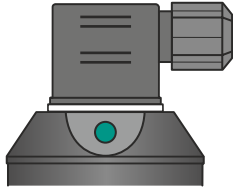
Variant "H" with outlet for protective conductor



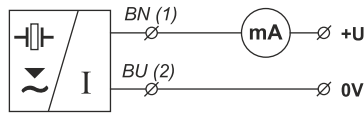
ELECTRICAL DATA

| | |
|---------------------------------------|---|
| Power Supply | 12...36 V DC |
| Current | 4-20 mA |
| Max. Internal Values | $U_i = 30$ VDC, $I_i = 132$ mA, $P_i = 0,99$ W, $C_i = 370$ nF, $L_i = 0,9$ mH |
| Failure Indication | 3,75 mA / 0 V for Echo failure-basic mode 22 mA / 10,5 V for Echo failure-inverse mode 22 mA / 10,5 V for Level in dead zone- basic mode 3,75 / 0 V for Level in dead zone- inverse mode |
| Maximum Current Output Resist. | $R_{max} = 270 \Omega$ for 24 VDC |

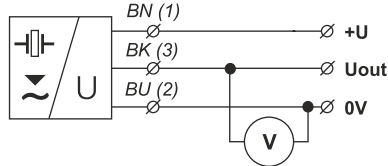
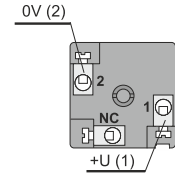
WIRING



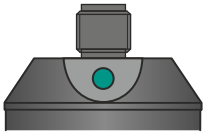
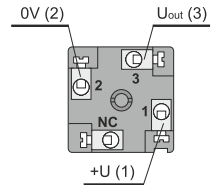
View of the connector ISO



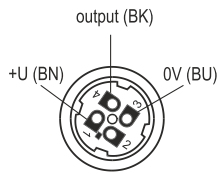
Connection diagram of the LULT50 level meter (variant -I) and inside view of the connector



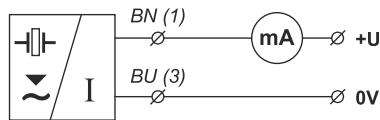
Connection diagram of the LULT50 level meter (variant -U) and inside view of the connector



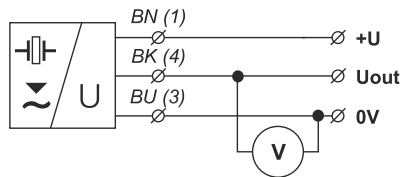
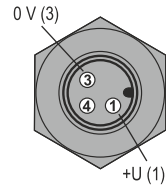
View of the connector M12



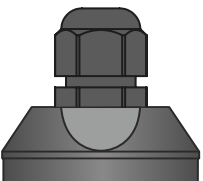
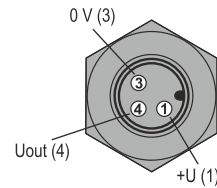
Inside view of the connector socket



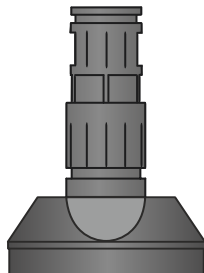
Connection diagram of the LULT50 level meter (variant -I) and inside view of the connector



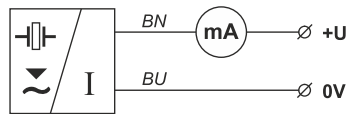
Connection diagram of the LULT50 level meter (variant -U) and inside view of the connector



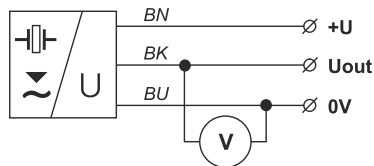
View of the cable gland PG11



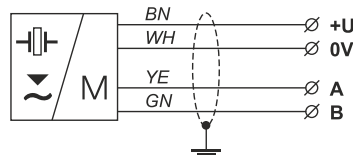
View of the cable gland for protective hose



Connection diagram of the LULT50 level meter (variant -I) and inside view of the connector



Connection diagram of the LULT50 level meter (variant -U) and inside view of the connector



Connection diagram of the level meter with an RS-485 output (variant -M)

Legend:

- BK** – black
- BN** – brown
- BU** – blue
- WH** – white
- YE** – yellow
- GN** – green

FUNCTION

Device type with setting using buttons

The measuring range is setup by means of two buttons "DOWN" and "UP". The "DOWN" button is used to enter to the setting mode (setting the 4 mA or 0V limit) and to decrease the output current or voltage. The "UP" button as an opposite function (setting the 20 mA or 10V limit and increasing the output current or voltage). Values are confirmed by simultaneous pressing of both buttons for about 1 sec. The setting process is indicated by yellow "STATE" LED indicator.



Key parts of the measuring device
(version "T" with buttons)

Device type with setting using a magnetic pen

The measuring range is setup by touching of the magnetic pen to sensitive spots "EMPTY" and "FULL" . The "EMPTY" spot is used to enter to the setting mode (setting the 4 mA or 0 V limit) and to decrease the output current or voltage. The "FULL" spot as an opposite function (setting the 20mA or 10V limit and increasing the output current or voltage). Values are confirmed by touching of the magnetic pen to the sensitive spot for about 3 sec. The setting process is indicated by yellow "STATE" LED indicator.



Key parts of the measuring device
(version "M" with magnetic pen setting)

| LED indicator | Colour | Function |
|---------------|--------|--|
| "RUN" | green | <p>short flashing (repeated depending on the measurement interval approx. 1 ... 2 s) - correct function, receipt of signal (echo) reflected from the measured surface</p> <p>fast flashing – the measured surface is in the dead zone of the level sensor or the ultrasound transducer is dirty</p> <p>off – the level sensor is not capable of receiving the echo. Incorrect installation or malfunction</p> |
| "STATE" | orange | <p>Output status indication</p> <ul style="list-style-type: none"> • off – sensor output is disconnected (OFF) • on – sensor output is connected (ON) <p>Indication setting</p> <ul style="list-style-type: none"> • slow flashing – setting indication for the disconnected status • fast flashing – setting indication for the connected status • 3 short flashes – setting confirmation |

ORDERING

| | | | | | |
|-----------------------|----|---|---|----|------------------------------------|
| LULT50 | | | | | Ultrasonic Level Sensor |
| Sensor | 01 | | | | 0,1...1 m, G 3/4" thread |
| | 02 | | | | 0,2...2 m, G 1" thread |
| | 06 | | | | 0,2...6 m, G 1 1/2" thread |
| | 10 | | | | 0,4...10 m, G 2 1/4" thread |
| | 20 | | | | 0,5...20 m, DN100 PN10 Flanged |
| Output | | I | | | 4-20 mA |
| | | M | | | Modbus RTU (RS-485) |
| | | U | | | 0-10 VDC |
| Electrical Connection | | | G | | Connector ISO |
| | | | C | | M12 Connector |
| | | | B | | Standard cable gland |
| | | | H | | Cable gland for protective hose |
| Set-up | | | | T | Setting using buttons |
| | | | | M | Setting using a magnetic pen (MP8) |
| | | | | L | No setting controls and LED |
| Hazardous Area | | | | N | None |
| | | | | Xi | Ex ia IIB T5 Ga/Gb |
| Cable | | | | XX | Please specify as unit is meter |