

- For continuous level measurement of liquids (even if polluted), mash and paste materials in open or closed vessels, sumps, open channels etc.
- Xi version for usage in explosive areas
- Continuous adjustment of min. and max. measuring range
- Easy and quick connecting by connector
- Current (4 ÷ 20 mA) or voltage (0 ÷ 10 V) output
- Options of inverse function (20 ÷ 4 mA and 10 ÷ 0 V)



Ultrasonic level meters ULM® is self contained device, that includes electroacoustics transducer and electronic module. The level meter ULM transmits series of ultrasonic pulses, which propagates towards the liquid surface. Reflected acoustic wave is received back in the ULM transducer and processed in electronic module. The distance calculations are based on time of flight of the acoustic wave to the level and back.

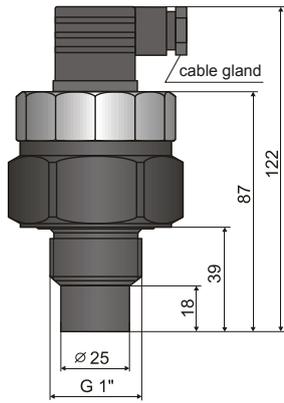
Ultrasonic level meters are for continuous non-contact level measurement of liquid and paste materials. The performance is "N" (normal) usable in non-explosive areas only and "Xi" (explosive proof).

FEATURES OF VARIANTS

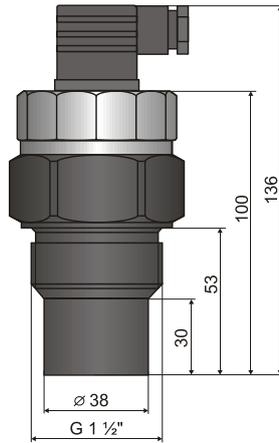
- **ULM-55_-02-_** *measuring range from 0,25 m to 2 m*, plastic PVDF transmitter, mechanical connection with thread G 1", version "N" (for non-explosive areas) or "Xi" (for explosive areas).
- **ULM-55_-06-_** *measuring range from 0,25 m to 6 m*, plastic PVDF transmitter, mechanical connection with thread G 1 ½", version "N" (for non-explosive areas) or "Xi" (for explosive areas).
- **ULM-55N-10-_** *measuring range from 0,5 m to 10 m*, plastic PVDF transmitter and HDPE or aluminium alloy flange, version "N" (for non-explosive areas).
- **ULM-55N-20-_** *measuring range from 0,5 m to 20 m*, plastic PVDF transmitter and alluminium alloy flange, version "N" (for non-explosive areas).

DIMENSION DRAWING

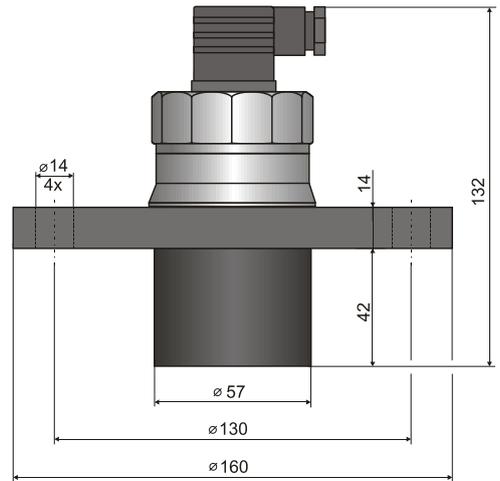
ULM-55_-02



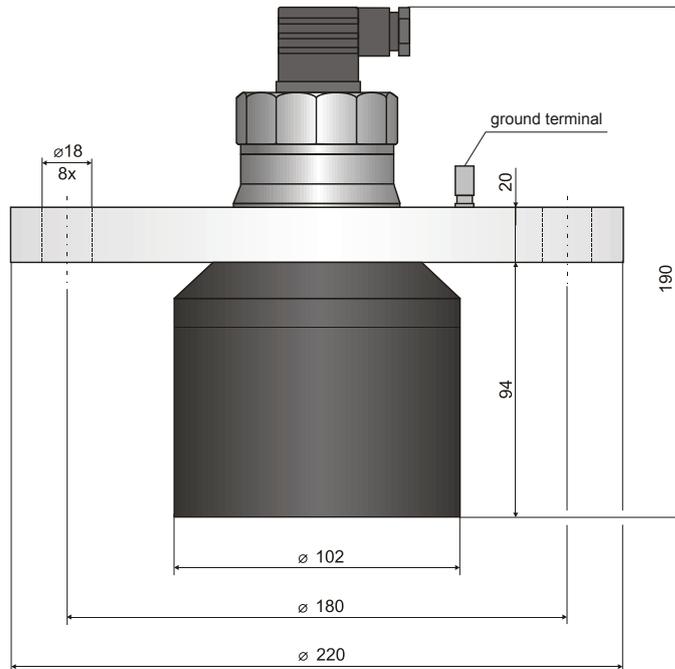
ULM-55_-06



ULM-55N-10



ULM-55N-20



WORKING AREAS (acc. to EN 60079-10 and EN 60079-14)

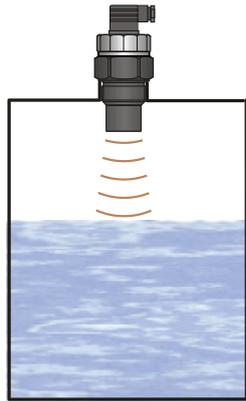
| | |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ULM-55N-_-_- | performance for non-explosive areas |
| ULM-55Xi-_-_- | explosive proof - suitable for explosive areas (combustible dusts, gases or vapours) Ⓜ II 1/2 GEx ia IIB T5 with isolating repeater (IRU-420), housing zone 1, part with active surface zone 0 |

TECHNICAL SPECIFICATION

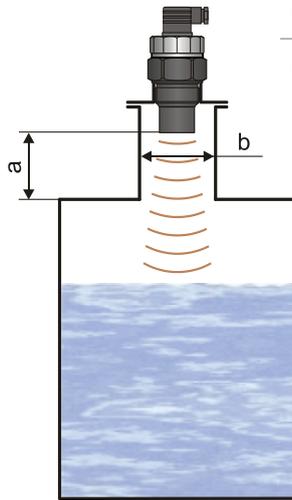
| | | | |
|-----------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------|
| Measuring range / Dead zone | ULM-55N-02-__ | 0,25 ÷ 2 m / 0,25m | |
| | ULM-55N-06-__ | 0,25 ÷ 6 m / 0,25m | |
| | ULM-55N-10-__ | 0,5 ÷ 10 m / 0,5 m | |
| | ULM-55N-20-__ | 0,5 ÷ 20 m / 0,5 m | |
| | ULM-55Xi-02-I ULM-55Xi-06-I | 0,25 ÷ 2 m / 0,25m 0,35 ÷ 6 m / 0,35m | |
| Maximum adjustable range | ULM-55Xi-02-I | 0,5 ÷ 2 m | |
| | ULM-55Xi-06-I | 0,8 ÷ 6 m | |
| Supply voltage | ULM-55N-__-I | 12 ÷ 36 V DC | |
| | ULM-55N-__-U | 16 ÷ 36 V DC | |
| | ULM-55Xi-__-I | 12 ÷ 30 V DC | |
| | ULM-55N-20-U,I | 18 ÷ 36 V DC | |
| Current output ULM-55-__-I Voltage output ULM-55N-__-U | | 4 ÷ 20 mA (real margins 3,9 ÷ 20,5 mA) 0 ÷ 10 V (real margins 0 ÷ 10,2 V) | |
| Failure indication (N / Xi version) | echo failure – normal mode | 3,75 mA resp. 0 V | < 3,8 mA |
| | echo failure – inverse mode | 22 mA resp. 10,5 V | — |
| | level in dead zone – normal mode | 22 mA resp. 10,5 V | > 21 mA |
| | level in dead zone – inverse mode | 3,75 mA resp. 0 V | — |
| Resolution | | < 1 mm | |
| Basic accuracy (from full measured scale) | | 0,2 % (ULM-55N-02 - 0,3%) | |
| Temperature error | | max. 0,04% / K | |
| Beamwidth (-3 dB) | ULM-55-02-__ | 10° | |
| | ULM-55-06-__ | 14° | |
| | ULM-55N-10-__ | 10° | |
| | ULM-55N-20-__ | 12° | |
| Ambient temperature range | ULM-55-02-__ | -30 to +70°C | |
| | ULM-55-06-__ | -30 to +70°C | |
| | ULM-55N-10-__ | -30 to +60°C | |
| | ULM-55N-20-__ | -30 to +60°C | |
| Short time temperature stress resistance | | +90°C / 1 hour | |
| Max. operation pressure (on transmission surface) | | 0,1 MPa | |
| Expansion tech. specif. (for Xi version) | max. internal values | U _i = 30 V DC; I _i = 132 mA; P _i = 0,99 W; C _i = 370 nF; L _i = 0,9 mH | |
| | allowed temperature range in zone 0 | -20°C to +60°C | |
| | allowed pressure range in zone 0 | 80 to 110 kPa | |
| Protection class | housing | IP67 | |
| | connector type GDM 2009 (3009) | IP65 | |
| | connector type GAN-DADE7A (DAEE7A) | IP67 (optional) | |
| Recommended cable | | PVC 2 x 0,75 mm ² (3 x 0,5 mm ²) | |
| Max. load (serial) resistivity for current output (U = 24 V DC) | | R _{max} = 600 Ω | |
| Max. load (serial) resistivity for voltage output | | R > 1 kΩ | |
| Weight | ULM-55-02-__ | 0,35 kg | |
| | ULM-55-06-__ | 0,41 kg | |
| | ULM-55N-10-__ | 0,78 kg | |
| | ULM-55N-20-__ | 2,95 kg | |

INSTALLATION

Ultrasonic level meter ULM is designed for vertical mounting on top wall of vessel or sump by means of fixing nut or a flange. The axis of the ULM should be perpendicular to measured surface (level). The mounting place for ULM is necessary to choose properly to avoid the fault reflection from near objects (crossbars, propellers, ladders), from in flow of fluid, etc. In the case of uncertainty we recommend to consult the application with the producer. Metallic parts of ULM housing are not necessary to ground.

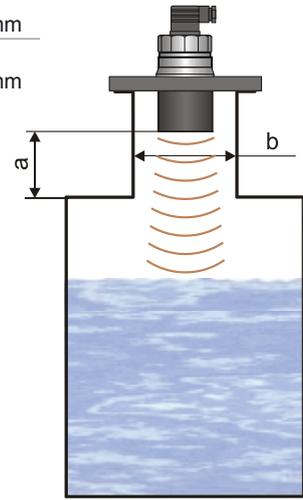


Recommended installation
in the tank

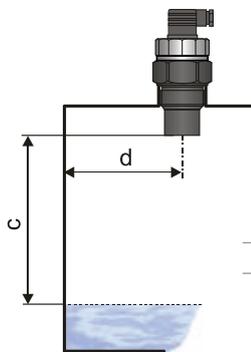


| | |
|---------------|------------------------------------|
| ULM-55-02,06 | $a < 3b$ $b > 100 \text{ mm}$ |
| ULM-55-10, 20 | $a < 1,5b$ $b > 100 \text{ mm}$ |

a - neck height
b - neck width



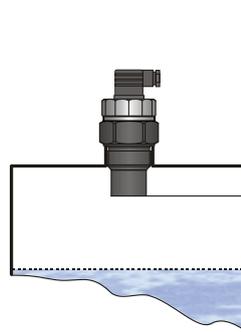
Possible installation through the neck



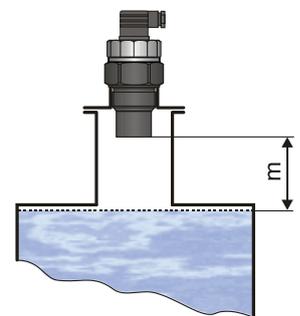
c - measuring range
d - min. distance from tank wall
(min. 200 mm)

| | |
|--------------|--------------|
| ULM-55-02,10 | $d > 1/12 c$ |
| ULM-55-06 | $d > 1/8 c$ |
| ULM-55-20 | $d > 1/10 c$ |

Installation distance from the tank wall



m - dead zone



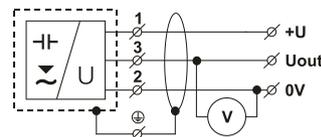
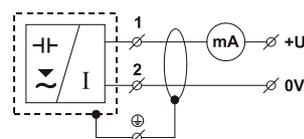
Maximum level distance from ULM

ELECTRICAL CONNECTION

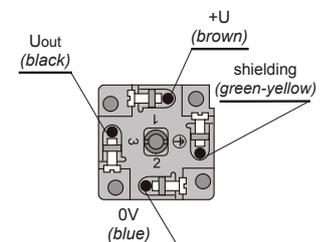
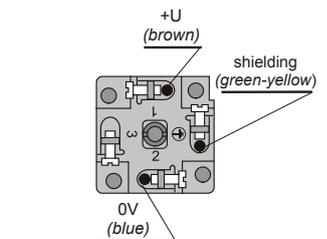
The Ultrasonic level meter is designed to be connected to supply unit or to controller through two-wire cable with outer diameter $6 \div 8 \text{ mm}$ (recommended cross section of cores $0,5 \text{ m to } 0,75 \text{ mm}^2$) by means of connector GDM (DIN 43650) which is included in delivery. The scheme and the inside of the connector are on pictures. As an option accessory is possible to deliver waterproof (IP 67) connector GAN-DAEE 7A with PVC 5m long cable.

Note: In case of strong electromagnetic interferences (EMI), parallel cable ducting with power lines, or when cable length exceeds 30 m is advised to:

– ground the metallic body of level meter using the terminal marked \oplus inside the connector (types 02, 06, 10) or using the screw terminal placed on flange (type 20).



Connection scheme

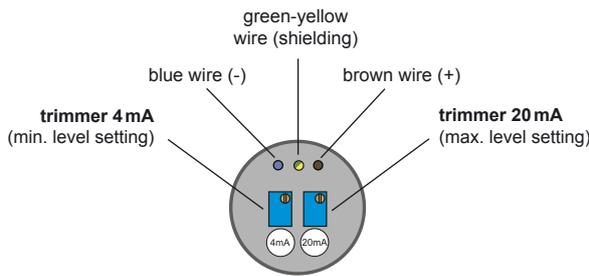


The inside of the connector
socket

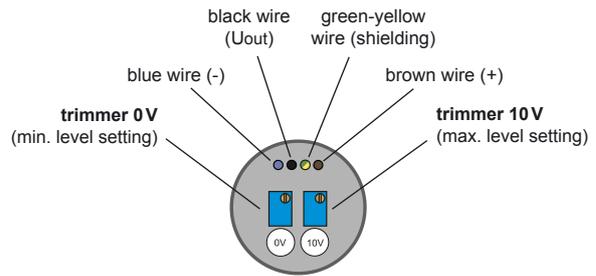
– use the shielded cable – the shielding is connected to terminal \oplus inside the connector and the other end of the cable shielding (in distribution cabinet) is not connected. When it is not possible to connect the shielding in connector, let the "sensor end" disconnected and ground the end in distribution cabinet.

ADJUSTMENT ELEMENTS

All adjustment elements (two trimmers) are placed under the cover nut. For detailed information please read at the instructions manual.



Adjusting elements for ULM-55_--I

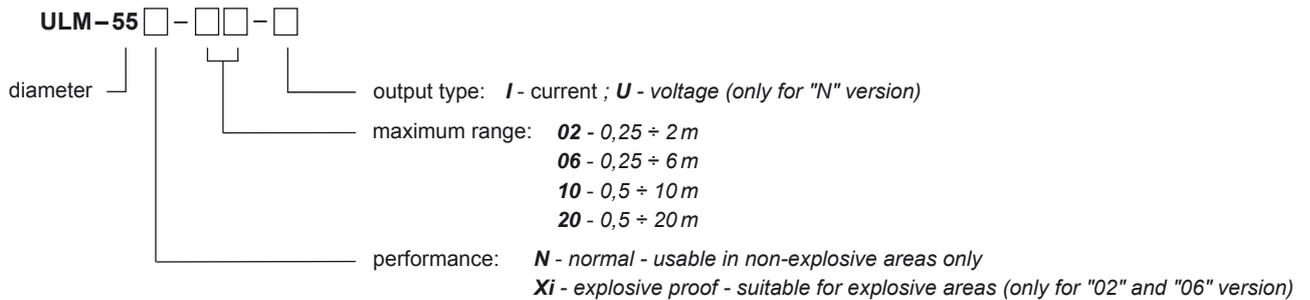


Adjusting elements for ULM-55_--U

RANGE OF APPLICATION

For continuous non-contact level measurement of liquids (water, water solutions, sewerage water, etc.), mash and paste materials (sediments, sticks, resins etc.) in closed or open vessels, sumps, reservoirs and open channels.

ORDER CODE



CORRECT SPECIFICATION EXAMPLES

ULM-55N-02-I
 ULM-55N-06-U

ULM-55N-10-U
 ULM-55N-20-I

ULM-55Xi-02-I
 ULM-55Xi-06-I

ACCESSORIES

standard – included in the level meter price

- 1x of seal (asbestos free) (only for "02, 06" version)
- 1x connector socket
- 1x screwdriver for adjustment

optional (see datasheet "accessories")

- connector socket (IP 67) type GAN-DADE 7A with 5 m cable (for current version output)
- connector socket (IP 67) type GAN-DAEE 7A with 5 m cable (for voltage version output)
- stainless steel fixing nut UM-G1 (for ULM-55_-02)
- stainless steel fixing nut UM-G1 1/2 (for ULM-55_-06)

SAFETY, PROTECTION, COMPATIBILITY AND EXPLOSION PROOF

Level meter ULM-55 is equipped with protection against reverse polarity, output current overload, short circuit and short time over voltages.

Electromagnetic compatibility is provided by conformity with standards: EN 55022/B, EN 61326/Z1, EN 61000-4-2, 4-3, 4-4, 4-5 and 4-6. Explosion proof of ULM-55Xi is examined by FTZÚ-AO 210 Ostrava - Radvanice certificate No.: FTZÚ 02 ATEX 0263.

version 03/2009