

- For continuous level measurement of liquids (even if polluted), mash and paste materials in open or closed vessels, sumps, open channels, etc.
- Configuration and adjustment of measuring range by two buttons
- State indication by two LEDs
- 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.

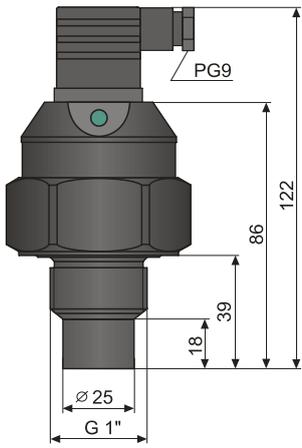
The level meters are suited to level measurement of various liquid materials, sewerage waters, mash and paste materials, suspensions etc. All the setting is done by means of two buttons, located in the upper part of the sensor. Level meters are equipped with optimal state indication "STATE" and the setting process "MENU". The level meters outputs can be current or voltage.

FEATURES OF VARIANTS

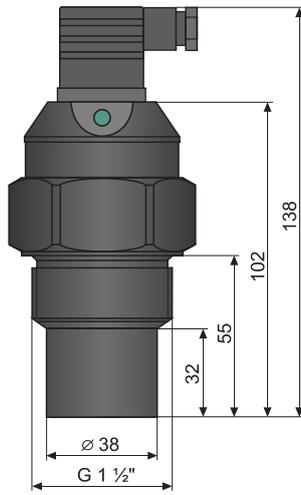
- **ULM-53N-02** *measuring range from 0,25m to 2m*, plastic PVDF transmitter and plastic body (PP+HDPE), process connection with thread G 1".
- **ULM-53N-06** *measuring range from 0,25m to 6m*, plastic PVDF transmitter and plastic body (PP+HDPE), process connection with thread G 1 ½".
- **ULM-53N-10** *measuring range from 0,5m to 10m*, plastic PVDF transmitter and plastic body (PP+HDPE), aluminium alloy or HDPE flange.
- **ULM-53N-20** *measuring range from 0,5m to 20m*, with plastic PVDF transmitter and plastic body (PP+HDPE), aluminium alloy flange.

DIMENSION DRAWINGS

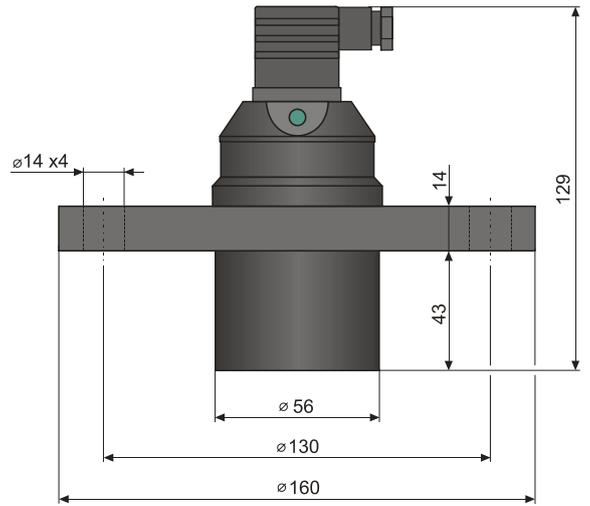
ULM-53N-02



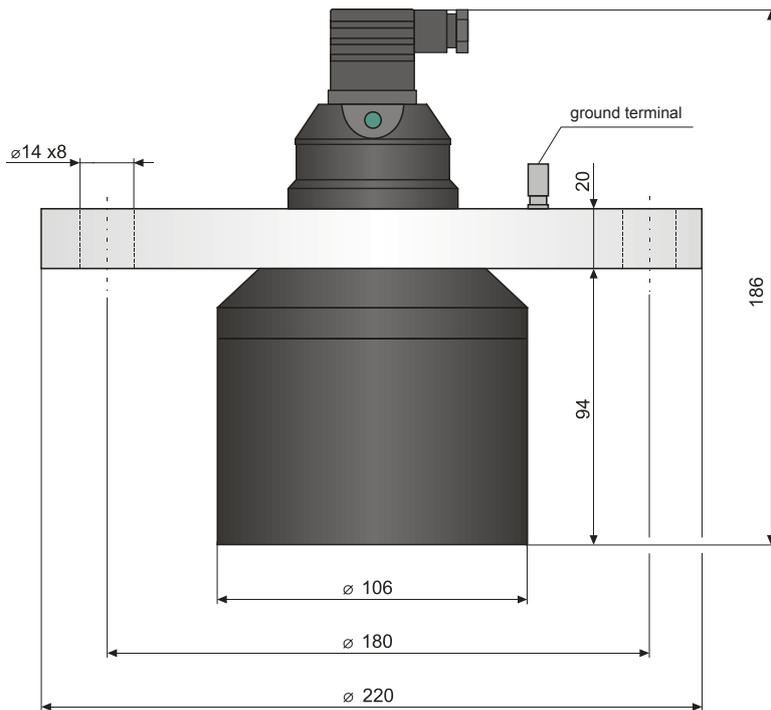
ULM-53N-06



ULM-53N-10



ULM-53N-20



TECHNICAL SPECIFICATION

Measuring range / Min. level distance	ULM-53N-02	0,25 ÷ 2 m / 0,25 m
	ULM-53N-06	0,25 ÷ 6 m / 0,25 m
	ULM-53N-10	0,5 ÷ 10 m / 0,5 m
	ULM-53N-20	0,5 ÷ 20 m / 0,5 m
Supply voltage		18 ÷ 36 V
Current output ULM-53N-__-I Voltage output ULM-53N-__-U		4 ÷ 20 mA (real margins 3,9 ÷ 20,5 mA) 0 ÷ 10 V (real margins 0 ÷ 10,2 V)
Failure indication	echo failure – normal mode	3,75 mA resp. 0 V
	echo failure – inverse mode	22 mA resp. 10,5 V
	level in dead zone – normal mode	22 mA resp. 10,5 V
	level in dead zone – inverse mode	3,75 mA resp. 0 V
Resolution		< 1 mm
Basic accuracy (from full measured scale)		0,2 % (ULM-53N-02 - 0,3%)
Temperature error		max. 0,04% / K
Beamwidth (-3 dB)	ULM-53N-02	10°
	ULM-53N-06	14°
	ULM-53N-10	10°
	ULM-53N-20	12°
Measuring period	ULM-53N-02	1,0 s
	ULM-53N-06	1,4 s
	ULM-53N-10, 20	2,0 s
Averaging		8 measuring
Ambient temperature range	ULM-53N-02	-30 to +70°C
	ULM-53N-06	-30 to +70°C
	ULM-53N-10	-30 to +60°C
	ULM-53N-20	-30 to +60°C
Short time temperature stress resistance		+90°C / 1 h
Max. operation pressure (on transmission surface)		0,1 MPa
Protection class	housing	IP 67
	connector type GDM 2009 (3009)	IP 65
	connector type GAN-DADE7A DAEE7A)	IP 67 (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-53N-02	0,30 kg
	ULM-53N-06	0,35 kg
	ULM-53N-10	0,70 kg
	ULM-53N-20	2,80 kg

INSTALLATION

Level meter is installed into the upper lid of the tank (vessel), using a fixing nut or a flange.

If installed in an open channel (sumps, reservoirs, etc.), install the level meter as closest as you can to the maximum level expected.

The front of the level meter must run in parallel to the measured level.

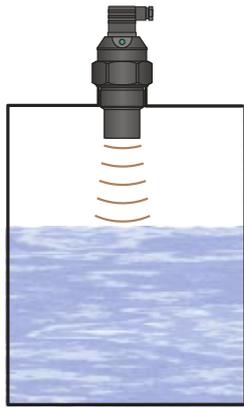
Emitted acoustic signal must not be affected by near objects (stiffeners, ladders, mixers, unevenness, etc.), stream of filling, air flow, etc.

Foam on the level absorbs the acoustic wave reflection which might cause malfunction of the level meter. If possible select the location where the foaming is as low as possible.

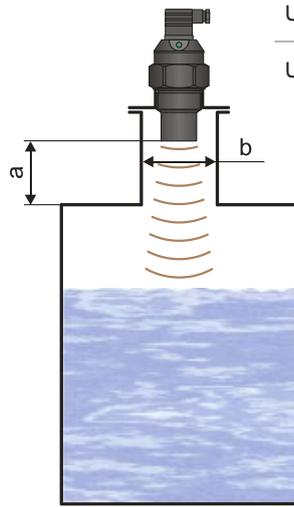
Protect the level meter against direct sunlight.

In the case of uncertainty we recommend to consult the application with the producer.

MOUNTING RECOMMENDATION

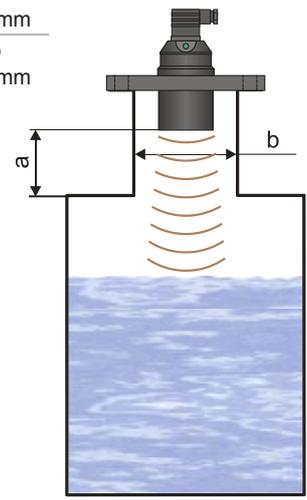


Recommended installation in the tank

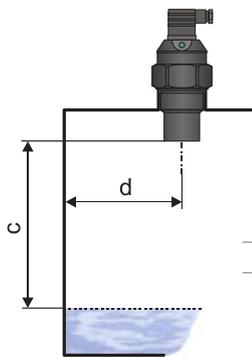


ULM-53N-02,06	$a < 3b$ $b > 100 \text{ mm}$
ULM-53N-10, 20	$a < 1,5b$ $b > 100 \text{ mm}$

a - neck height
b - neck width



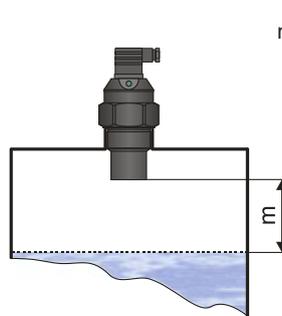
Possible installation through the neck



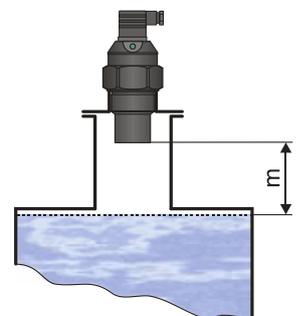
c - measuring range
d - min. distance from tank wall (min. 200 mm)

ULM-53N-02,10	$d > 1/12 c$
ULM-53N-06	$d > 1/8 c$
ULM-53N-20	$d > 1/10 c$

Installation distance from the tank wall



m - dead zone

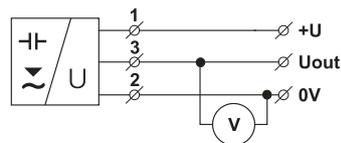
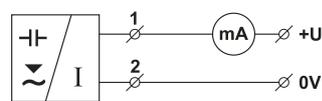


Maximum level distance from ULM

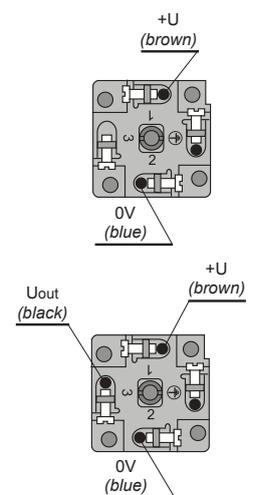
ELECTRICAL CONNECTION

The ultrasonic level meter is designed to be connected to supply unit or to controller through two or three-wire cable with outer diameter $6 \div 8 \text{ mm}$ (recommended cross section of cores 0,5 m to 0,75 mm²) 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 5 m long cable.

Note: In case of strong electromagnetic interferences (EMI), parallel cable ducting with power lines, or when cable length exceeds 30m we recommended to use shielded cable.



Connection scheme



The inside of the connector socket

LEVEL METERS SETTING

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 20mA or 10V limit and increasing the output current or voltage). Values are confirmed by simultaneous pressing of both buttons for about 1sec. The setting process is indicated by yellow "MENU" LED indicator.

For detailed information please read at the instructions manual



Full view of ultrasonic level meter

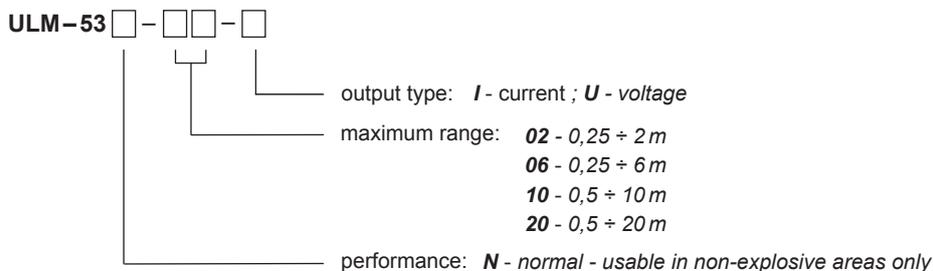
STATUS AND FAILURE SIGNALIZATION

LED indicators	colour	function
"STATE"	green	Slow blinks (1–2s, depends on the measuring interval) – reception of reflected signal (echo) from the measured level. Correct function. Fast blinks – the measured value is in "dead zone" of the level meter, or the ultrasonic transmitter is polluted. Dark – the level meter is not able to receive echo. FUNCTION FAILURE!
"MENU"	yellow	Slow blinks – signalization setting limit 4 mA Fast blinks – signalization setting limit 20mA

RANGE OF APPLICATION

For continuous non-contact level measurement of liquids (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-53N-02-I ULM-53N-10-U
 ULM-53N-06-U ULM-53N-20-I

ACCESSORIES

standard – included in the level meter price

- 1x of seal (only for ULM-53N-02 and 06)
- 1x connector socket

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-53N-02)
- stainless steel fixing nut UM-G1 1/2 (for ULM-53N-06)

version 04/2009

ULM-53-dat-5.5



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