

- For continuous level measurement of liquids (even if polluted), mash and paste materials in open or closed vessels, sumps, open channels, etc.
- Variants of level meter with adjustment by two buttons, or by magnetic pen
- X version for use in explosive areas
- State indication by two LEDs
- Current output (4 ... 20 mA), voltage output (0 ... 10 V) or RS-485 Modbus output
- Wide choice of electric connection via connectors, cable glands or protective conductor
- When used with horn adapter, can measure difficult media (foam, bulk solids, etc.)



The MSLU Ultrasonic level meters are compact measurement devices containing an ultrasonic transmitter and an electronic module. The transducer generates ultrasonic pulses that travel at the speed of sound toward the target medium. These sound waves are reflected off the surface of the medium and are received by the transducer system. The “time of flight” between the transducer and the surface and then back to the transducer is measured. Based on the time period during which the individual pulses spread towards the level and back, this period is averaged by the electronics (that also performs temperature compensation) and subsequently are converted to an output current 4...20mA, voltage 0...10 V or output RS-485 Modbus.

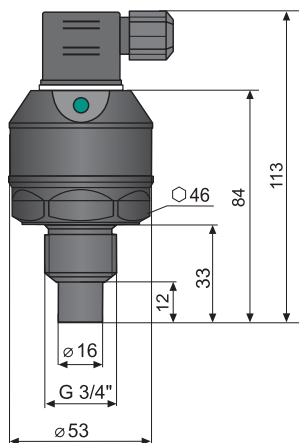
The MSLU ultrasonic level meters are suitable for continuous non-contact level measurement of liquids (water solutions, waste water sewage), mash and paste materials (sediments, resins etc.) in closed or open vessels, sumps, reservoirs and open channels. In the case of bulk-solid materials, the measuring range is reduced, but can be amplified or compensated by using the horn accessory.

All set-up and calibration is done using two buttons positioned in the upper part of the sensor or via a magnetic touch pen. The level meter is equipped with optical state indication (STATE) and with a set-up process (MENU). They are manufactured for either non-explosive areas (N) and explosive areas (X).

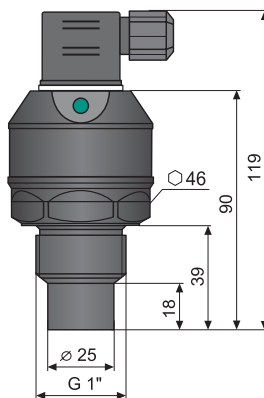
Features and Versions

- | | | |
|-----------|---|---|
| • MSLU-01 | Measuring range from 0.1 m to 1 m,
process connection with thread G ¾". | plastic PVDF transmitter and plastic body (PP+HDPE) |
| • MSLU-02 | Measuring range from 0.2 m to 2 m,
process connection with thread G 1". | plastic PVDF transmitter and plastic body (PP+HDPE) |
| • MSLU-06 | Measuring range from 0.2 m to 6 m,
process connection with thread G 1 ½". | plastic PVDF transmitter and plastic body (PP+HDPE) |
| • MSLU-10 | Measuring range from 0.4 m to 10 m,
process connection with thread G 2 ¼". | plastic PVDF transmitter and plastic body (PP+HDPE), |
| • MSLU-20 | Measuring range from 0.5 m to 20 m,
aluminium alloy flange. | with plastic PVDF transmitter and plastic body (PP+HDPE), |

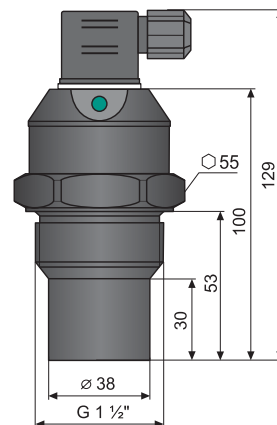
MSLU-01



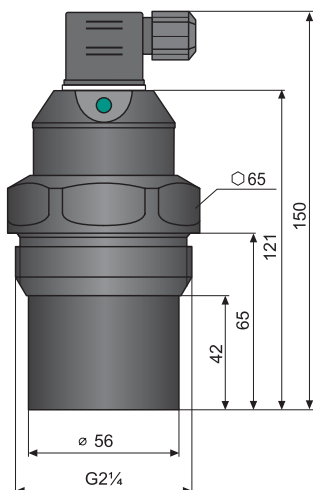
MSLU-02



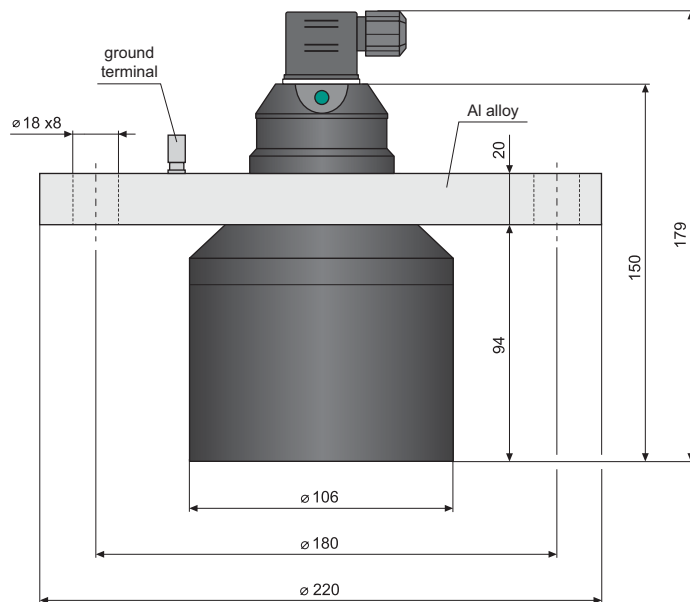
MSLU-06



MSLU-10

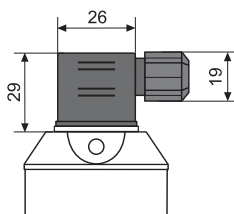


MSLU-20

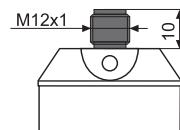


Flange (type 20) DIN 2527, PN10

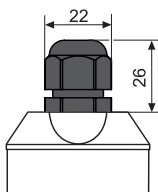
Variant "G" with connector ISO



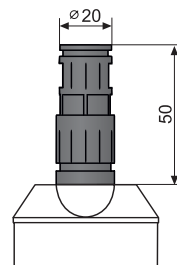
Variant "C" with connector M12



Variant "B" with cable outlet PG11



Variant "H" with outlet for protective conductor






Technical Specifications

Measuring range ¹⁾	MSLU-01	0.1 ... 1 m
	MSLU-02	0.2 ... 2 m
	MSLU-06	0.2 ... 6 m
	MSLU-10	0.4 ... 10 m
	MSLU-20	0.5 ... 20 m
Supply voltage	MSLU-(01/02/06/10/20)-N	18 ... 36 V DC
	MSLU-(01/02/06/10/20)-X	18 ... 30 V DC
Current supply	MSLU-(01/02/06/10/20)-X(N)-C	4 ... 20 mA / max. 22 mA
	MSLU-(01/02/06/10/20)-N-C	Max. 12 mA
	MSLU-(01/02/06/10/20)-N-M	Max. 20 mA
Current output MSLU-(01/02/06/10/20)-C		4 ... 20 mA (limit values 3.9 ... 20.5 mA)
Voltage output MSLU-(01/02/06/10/20)-V		0 ... 10 V (limit values 0 ... 10.2 V)
Modbus output MSLU-(01/02/06/10/20)-M		Modbus RTU protocol
Resolution		< 1 mm
Accuracy (within the total range)	MSLU-01 in area 0.1–0.2 m / 0.2–1.0 m	0.3 % / 0.2 %
	MSLU-02; 06	0.15 %
	MSLU-10; 20	0.2 %
Temperature error		Max. 0.04% / K
Beamwidth (-3 dB)	MSLU-01; 02; 10	10°
	MSLU-06	14°
	MSLU-20	12°
Ambient temperature range	MSLU-01; 02; 06	-30 ... +70°C
	MSLU-10; 20	-30 ... +60°C
Measuring period	MSLU-01; 02	0.5 s
	MSLU-06; 10	1.2 s
	MSLU-20	5.0 s
	MSLU-M (Modbus)	adjustable via Modbus RTU
Averaging (can be modified according to agreement)	MSLU-__	4 measurement
	MSLU-M (Modbus)	adjustable via Modbus RTU
Short time temperature stress resistance		+90°C / 1 h.
Max. operation overpressure (on transmission surface)		0.1 MPa
Max. internal values ²⁾ (for the X version only)		$U_i=30\text{VDC}$; $I_i=132\text{mA}$; $P_i=0.99\text{W}$; $C_i=370\text{nF}$; $L_i=0.9\text{mH}$
Failure indication	echo failure – basic mode	3.75 mA (0 V)
	echo failure – inverse mode	22 mA (10.5 V)
	level in dead zone – basic mode	22 mA (10.5 V)
	level in dead zone – inverse mode	3.75 mA (0 V)
Protection class		IP67
Recommended cable		PVC 2 x 0.75 mm ² (3 x 0.5 mm ²)
Maximal current output load resistance	at U = 24 V DC	$R_{\max} = 270\Omega$
	at U = 22 V DC	$R_{\max} = 180\Omega$
	at U = 20 V DC	$R_{\max} = 90\Omega$
Minimal voltage output load resistance		$R_{\min} > 1\text{k}\Omega$
Delay between supply power rise time and first measurement	MSLU-01; 02; 06	5 s
	MSLU-10; 20	9 s
Process connection	MSLU-01	thread G 3/4"
	MSLU-02	thread G 1" (optional with Horn adapter)
	MSLU-06	thread G 1 1/2" (optional with Horn adapter)
	MSLU-10	thread G 2 1/4" (optional with Horn adapter)
	MSLU-20	aluminium alloy flange
Weight	MSLU-01	0.20 kg
	MSLU-02	0.20 kg
	MSLU-06	0.25 kg
	MSLU-10	0.65 kg
	MSLU-20	2.80 kg

¹⁾ In case the level of bulk-solid materials is measured, the measurement range is reduced.

²⁾ Allowed pressure range in the zone 0: 80 ... 110 kPa.

Area Classification (according to EN 60079-10 and EN 60079-14)	
MSLU-N	Performance for non-explosive areas
MSLU-01-X-C MSLU-20-X-C MSLU-06-X-C	Explosive proof – suitable for explosive areas (combustible gases or vapours)  II 1/2G Ex ia IIB T5 Ga/Gb with isolating repeater (SIR-420) the whole level meter – zone 1, front head part – zone 0
MSLU-10-X-C	Explosive proof – suitable for explosive areas (combustible gases or vapours)  II 1/2G Ex ia IIA T5 Ga/Gb with isolating repeater (SIR-420) the whole level meter – zone 1, front head part – zone 0
MSLU-20-X-C	Explosive proof – suitable for explosive areas (combustible gases or vapours)  II 2G Ex ia IIA T5 Gb with isolating repeater (SIR-420) the whole level meter – zone 1

Installation

- The device is installed in a vertical position into the upper lid of the tank or reservoir using a lug, a fastening nut or a flange in such a way that the axis of the device is perpendicular to the surface level of the measured liquid (Fig. 1). Tightening of the level meter in the welding flange (or. by the fixing nut) **must be done only by hand** *. The device shall be installed in places with no risk of **mechanical damage to the front of the sensor**.
- The minimum distance from the tank wall when installing into the lid or the ceiling of the tank are listed in Fig. 3. In the case of device installation close to smooth wall of the tank it is not necessary to observe the minimum distance, conversely it is suitable to shorten this distance.
- When installing in an open channel (sump, drain, etc.), install the device onto a console as close as possible to the expected maximum level.
- The reference plane for the measurement is the lower edge of the transducer (Fig.2). In compliance with the measuring principle, no signals **reflected in the area directly below the device** (dead zone) can be evaluated. The dead zone (Fig. 2) determines the minimum distance possible between the device and the highest level. The minimum distances to the medium are listed in the chapter "Technical specifications".
- The device shall be installed so that the surface does not interfere with the dead zone when the tank is filled to the maximum. If the measured surface interferes with the dead zone, the device **will not measure properly**.

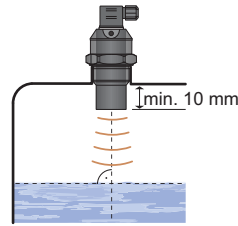


Fig. 1: Correct installation of the sensor, perpendicular to the liquid surface

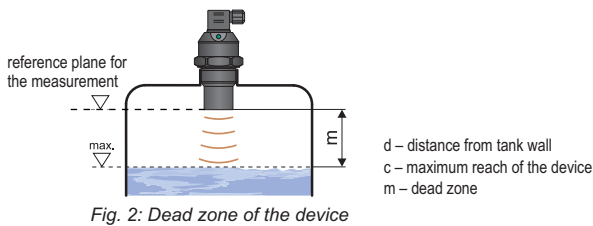


Fig. 2: Dead zone of the device

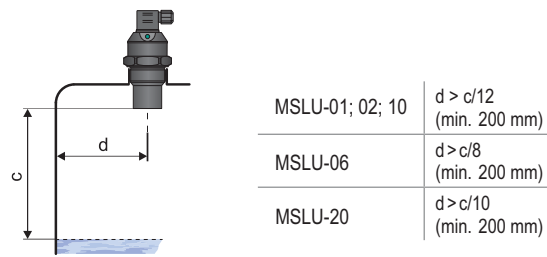


Fig. 3: Distance of the device from the tank wall

- Do not install the device in or above the **filling** point (Fig. 4). The measurement could be affected by the inflowing medium.

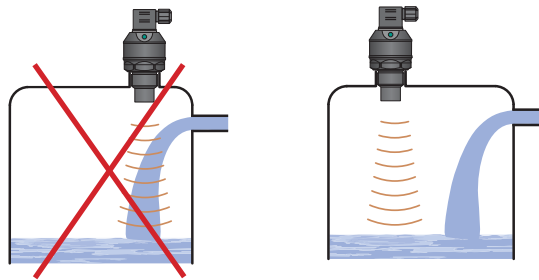



Fig. 4: Installation of the device out of reach of filling circulation

 It is recommended to avoid placing the sensor into a narrow inlet.

- Only if the maximum level in the tank gets into the dead zone, the device shall be mounted into a higher **installation neck**. The tank can be then filled nearly up to the maximum volume. The neck's inner surface shall be even and smooth (without edges and welded joints), the inner edge should be rounded in the spot where the ultrasonic wave leaves the pipe. Choose the largest possible neck diameter, but keep the neck height as low as possible. The recommended dimensions of the inlet neck are listed in Fig. 5.

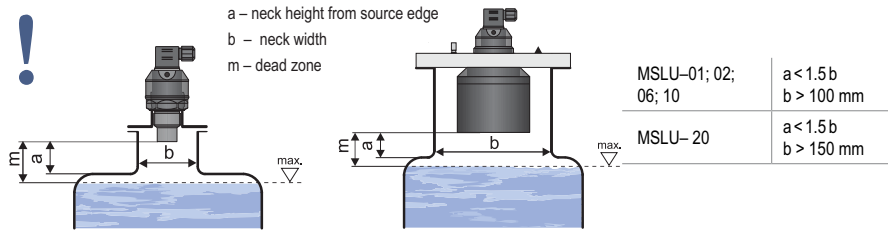


Fig. 5: Installation of the device in the installation neck

- If the level sensor is mounted to bottlenecks and places with barriers, or near uneven walls or the filling area, where the transmission signal could be distorted, we recommend using a guide tube (acoustic horn). The tube must be made from a single material with a smooth inner surface (see image 6 a 7). The minimum tube diameter must have the dimension „h“ according to see to table at image 7. The construction of the guide tube we recommend to consult with the manufacturer.

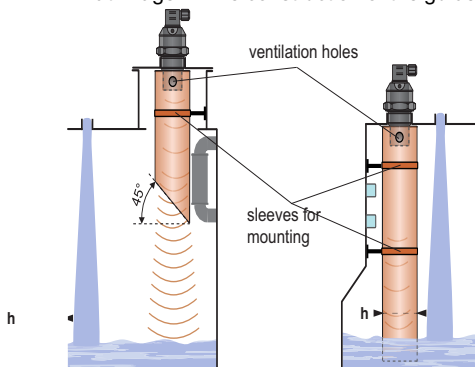


Fig. 6: Short guide tube installation

Fig. 7: Total guide tube installation

MSLU-01	$h \geq 50 \text{ mm}$
MSLU-02	$h \geq 70 \text{ mm}$
MSLU-06	$h \geq 100 \text{ mm}$
MSLU-10	$h \geq 150 \text{ mm}$
MSLU-20	$h \geq 200 \text{ mm}$

- Horn adapter ST-G0,75 (MSLU-01) ST-G1 (MSLU02) ST-G1,5 (MSLU-06) or ST-G2,25 (MSLU-10) for improved reception of the transmitted signal can be used in open channels, sumps, tanks, etc.
- Horn adapter ST increases the directivity of the emitted acoustic waves, improves the reception of weak echoes (unstable surface level, loose materials, foam on the level) and reduces the risk of falsereflections.
- The horn adapter is installed on the device via process connection G3/4" (ST-G0,75) or G1" (ST-G1) or G1½" (ST-G1,5), or G 2 ¼" (ST-G2,25).

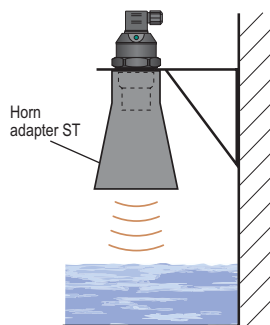


Fig. 8: Horn adapter installation

Installation

- The site for installing the level meter needs to be chosen so that the emitted acoustic signal is not affected by **nearby objects** (reinforcements, supports, brackets, ladders, heating elements, mixers, etc.). These obstacles may result in false rebounds, increasing measurement inaccuracy (Fig. 9).

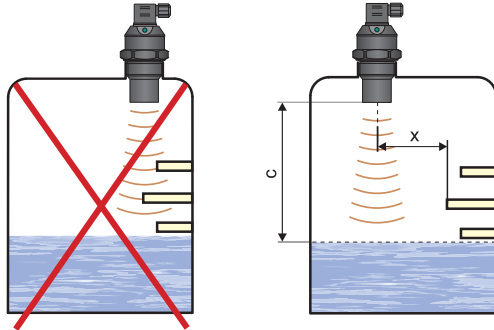


Fig. 9: Minimum distance from close objects in the tank

MSLU-01;02;10	$x > c/12$ (min. 200 mm)
MSLU-06	$x > c/8$ (min. 200 mm)
MSLU-20	$x > c/10$ (min. 200 mm)

x – distance from the edge of the longest object
c – maximum reach of the level meter

- Foam may be produced on the surface of the measured liquid during filling, mixing and other processes. The thick foam significantly absorbs the ultrasound signal and may cause malfunction of the device (Fig. 10). In those cases it is necessary to test the device in advance or contact the manufacturer. In case of a thin layer of foam, it is also possible to use directional horn for improving receipt of the reflected echo.

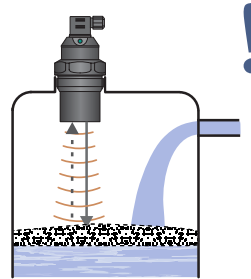


Fig. 10: Thick foam on the surface

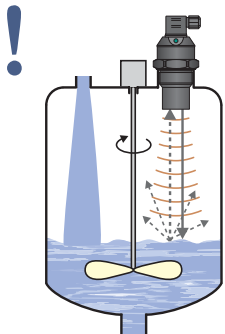


Fig. 11: Moderately stirred surface

- The ultrasonic signal can be scattered or attenuated if the surface is moderately stirred or rippled (due to a mixer, inflow of liquid, etc.). This may result in **reduction of the measurement range** or unreliable operation of the device (Fig. 11). **For a rippled or swirling level, you can use the directional horn to eliminate scattering of the ultrasonic signal.**

- False surface reflections of the ultrasonic signal and unreliable operation of the device might result from the mixer's **rotating blades** that ripple the surface level (Fig. 12).
- The device should not be installed in places with the risk of **false reflections** of the ultrasonic signal from the mixer's blades (Fig. 13).

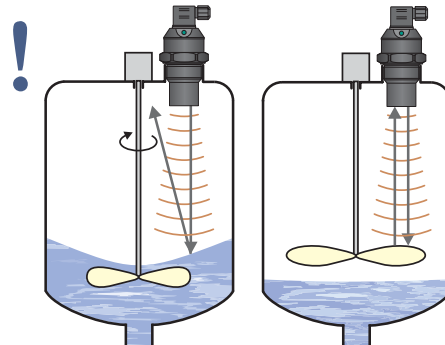


Fig. 12: Strongly stirred surface Fig. 13: False reflection from mixer blades

- In case the level of bulk solids is measured, the measurement range is reduced due to absorption of acoustic waves by a bulk medium. Shortening of the measuring range occurs by up to 50% depending on the grain size. We therefore recommend selecting a level meter with higher range than the maximum distance to the medium. It is also appropriate to use a directional horn (see image 14), which reduces the shortening of the measuring range, because it better concentrates acoustic energy while preserving the same beam angle, and improves the sensitivity when receiving the reflected echo. We recommend to consult the use with the manufacturer.

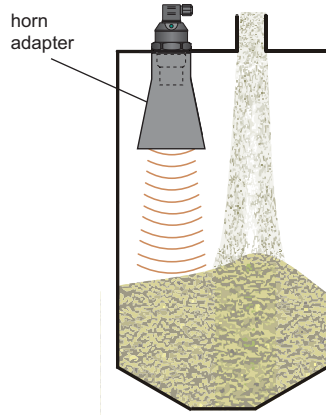


Fig. 14: Level meter installation in silo or hopper

- The measuring device **shall not be installed** in places with direct sunlight and shall be protected against weather conditions. **Direct sunlight affects the built-in temperature compensation!**
- If installation in places with direct sunlight is inevitable, it is necessary to mount a **shielding cover** above the device (Fig. 15).

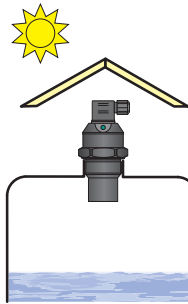


Fig. 15: Shielding cover against direct sunlight

- It is advisable to keep cable under the **cable gland** (sagging down) as shown in Fig. 16 to prevent penetration of moisture. Rain and condensing water can be therefore drained away freely.
- The cable gland as well as the connector shall be **tightened sufficiently** to prevent penetration of moisture.

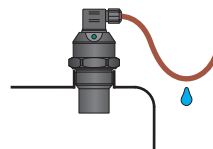


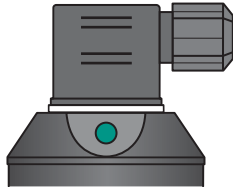
Fig. 16: Protection against penetration of moisture



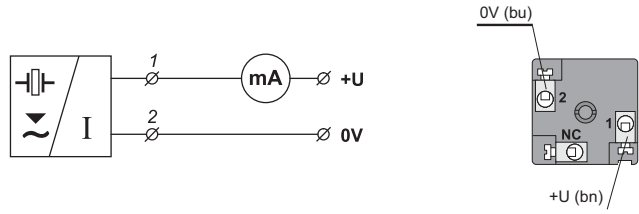
In the case of use for an aggressive medium is necessary to prove the chemical compatibility of used materials of the sensor . The guarantee ceases when the product is chemically damaged.

Connection through ISO connector

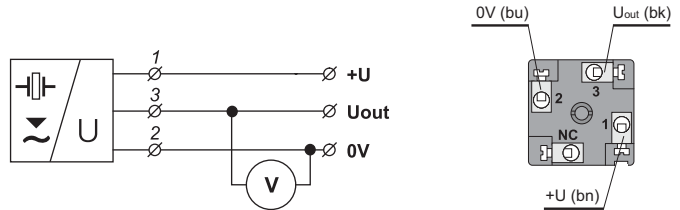
The MSLU level meter with a G type cable gland are connected to processing (display) units by means of a cable with an outer diameter of 6 to 8 mm (recommended wire cross-section 0.5 to 0.75 mm²), via a detachable ISO connector with inner screw terminals, which is part of the delivery. The connection diagram and the inner view of the connector are shown in Figures on the right. Non-detachable connector IP67 with PVC cable 5 m long can be supplied as an extra option.



View of the connector ISO



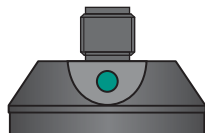
Connection diagram of the MSLU level meter (variant -C) and inside view of the connector



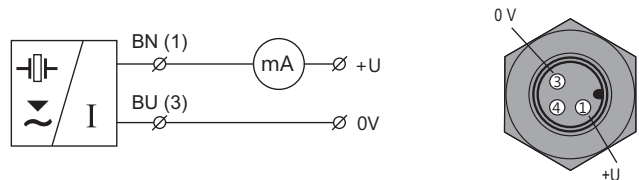
Connection diagram of the MSLU level meter (variant -V) and inside view of the connector

Connection through M12 connector

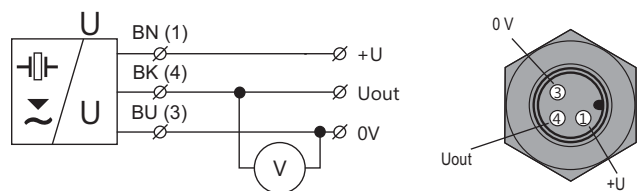
The MSLU level meter with a M type cable gland are connected to processing (display) units by means of a cable with an outer diameter of 4 to 6 mm (recommended wire cross-section 0.5 to 0.75 mm²), via a connector socket with a moulded cable (2 or 5 m long) or via a detachable connector socket without a cable (see accessories). In this case connect the cable to the inner socket pins under figures on the right.



View of the connector M12



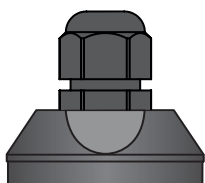
Connection diagram of the MSLU level meter (variant -C) and inside view of the connector



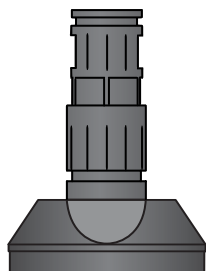
Connection diagram of the MSLU level meter (variant -V) and inside view of the connector

Connection via PG 11 gland or gland for protective hoses

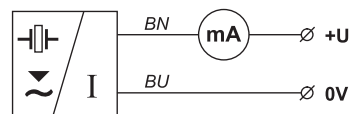
The MSLU level meter or MSLU sensor with a B or H type cable gland are connected to processing (display) units by means of a fixed PVC cable 5 m long. PG 11 (B) or plastic bushings with a thread for protective hoses (H) can be used as a cable gland. Connection diagrams are shown in Figures on the right.



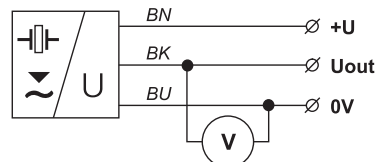
View of the cable gland PG11



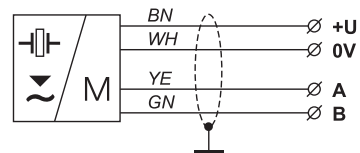
View of the cable gland for protective hose



Connection diagram of the MSLU level meter (variant -C) and inside view of the connector



Connection diagram of the MSLU level meter (variant -V) and inside view of the connector



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

legend:
 BK – black WH – white
 BU – blue YE – yellow
 BN – brown GN – green



Wiring operations shall only be carried out without voltage!

Taking into account the potential occurrence of electrostatic discharge on non-conducting parts of the level meter, it is necessary to ground the flange of level meters MSLU-20-X-F, located in an explosive atmosphere, using a ground terminal!



It is also necessary to design and take measurements to reduce the effects of static electricity to a safe level in the wiring.

Installation in explosive atmospheres needs to be carried out in compliance with ČSN EN 60079-14 (Electrical installations for explosive gaseous atmospheres – Part 14: Electrical installations in dangerous areas other than mining) and possibly also in compliance with other standards relating to the area and country concerned.



The supply source should be preferably designed as a stabilized source of safe voltage 18 V to 36 V DC (max. 30 V DC for version X), which is part of the downstream processing or display system.

In case of strong ambient electromagnetic disturbance, parallel run of the input cable with the power line or its length exceeding 30 m, we recommend using a shielded cable.

Set-up Elements

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 10 V 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.

For detailed information please read the instruction manual.

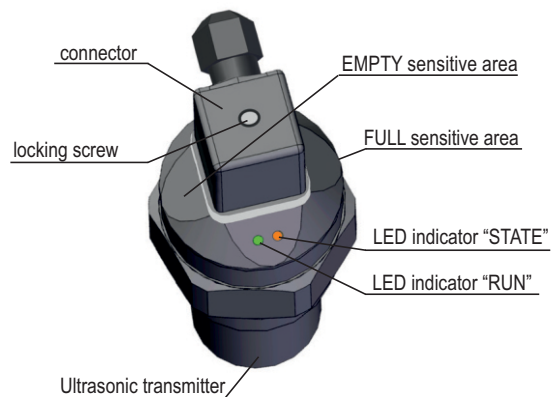


Key parts of the measuring device (version with buttons)

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 20 mA or 10 V 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.

For detailed information please read the instruction manual.



Key parts of the measuring device (version with Hall probes)

Status Indication

LED indicator	Color	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 meter or the ultrasound transducer is dirty</p> <p>off – the level meter is not capable of receiving the echo. Incorrect installation or malfunction</p>
"STATE"	orange	<p>MSLU</p> <p>slow flashing – 4 mA (0 V) threshold setting indication</p> <p>fast flashing – 20 mA (10 V) threshold setting indication</p> <p>3 short flashes – setting confirmation</p> <p>MSLU variant "M" with Modbus communication</p> <p>fast flashing – communication under way on line RS-485</p>

Set-up Elements

The level meter works most often in its default mode for level measurement (Fig. 33) and only rarely in the inverse mode (Fig. 34).

The manual device shall be set up after installation using the DOWN and UP buttons (for version "T") or by applying the magnetic pen onto sensitive flat areas (for version "M"). The set-up process is indicated by the STATE indicator lamp.

The L version level meter does not have any setting controls and indication LEDs. Pre-defined ranges are factory set (applicable to current and voltage outputs).

The level meter variant with a Modbus type output is set by means of two-way communication via the RS-485 industrial bus with the Modbus RTU protocol. A list of applicable registers is given in a separate appendix. To set up the level meter and collect measured data.

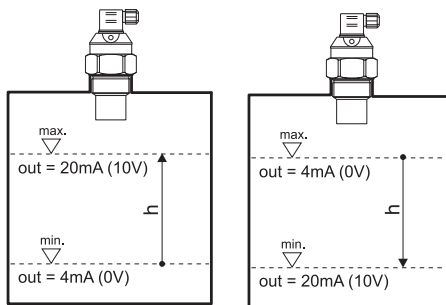


Fig. 33: Default mode (level measurement)

Fig. 34: Inverse mode

Setting procedure for Level Meter

Connect the level meter to the supply source. Check the output value - current or voltage - using the measuring device or a connected instrument.

Setting using buttons (version "T")

Basic mode (Level measurement)

Setting of lower limit 4 mA (0 V)

1. Drain the tank to the lower measured surface level.
2. Press the DOWN button for at least 2 s to activate the setting mode (the STATE indicator LED flashes slowly). Keep the DOWN button pressed for at least additional 3 s to set the value to 4 mA (0 V) directly. In that case you can skip step 3.
3. Press the DOWN and UP buttons to accurately set any value in individual increments (hold the relevant button to increase the adjustment step gradually).
4. Press both buttons simultaneously for at least 1 s to confirm the set values. The STATE indicator LED briefly flashes three times.
5. Any other setting is possible 2 s after both buttons are released.

Setting of upper limit 20 mA (10 V)

1. Fill the tank up to the upper measured surface level.
2. Press the UP button for at least 2 s to activate the setting mode (the STATE indicator LED flashes quickly). Keep the UP button pressed for at least additional 3 s to set the value to 20 mA (10 V) directly. In that case you can skip step 3.
3. Press the DOWN and UP buttons to accurately set any value in individual increments (hold the relevant button to increase the adjustment step gradually).
4. Press both buttons simultaneously for at least 1 s to confirm the set values. The STATE indicator LED briefly flashes three times.
5. Any other setting is possible 2 s after both buttons are released.

Inverse mode

In the inverse mode, set the lower limit of 4 mA (0 V) when the tank is filled up to the upper measured surface level and the upper limit of 20 mA (10 V) when the tank is drained to the lower measured surface level see Fig. 32.

Set-up Elements

Factory default settings

1. Disconnect the level meter from supply voltage (e.g. by disconnecting the connector).
2. Press the DOWN and UP buttons at the same time while supply voltage is disconnected.
3. Connect supply voltage while keeping the DOWN and UP buttons pressed.
4. Wait approx. 4 s for 3 short flashes of the orange STATE indicator LED. After that, release both buttons.
5. Now the level meter is restored into factory default settings.

Setting using a magnetic pen (version "M")

Basic mode (Level measurement)

Setting of lower limit 4 mA (0 V)

1. Drain the tank to the lower measured surface level.
2. Set the level meter output to the value of 4 mA (0 V) by applying the magnetic pen to the EMP-TY sensitive area for at least 2 s. The STATE indicator LED flashes slowly. Hold the magnetic pen on the flat area for at least additional 3 s to confirm the set value and store it in the internal memory of the level meter. The STATE indicator LED briefly flashes three times.
3. Any other setting is possible 2 s after the magnetic pen is removed from the sensitive area.

Setting of upper limit 20 mA (10 V)

1. Fill the tank up to the upper measured surface level.
2. Set the level meter output to the value of 20 mA (10 V) by applying the magnetic pen to the FULL sensitive area for at least 2 s. The STATE indicator LED flashes slowly. Hold the magnetic pen on the flat area for at least additional 3 s to confirm the set value and store it in the internal memory of the level meter. The STATE indicator LED briefly flashes three times.
3. Any other setting is possible 2 s after the magnetic pen is removed from the sensitive area.

Factory default settings

1. Disconnect the level meter from supply voltage (e.g. by disconnecting the connector).
2. While there is no supply voltage, apply the magnetic pen on one of the sensitive areas.
3. Connect supply voltage and keep the magnetic pen in position.
4. Wait approx. 4 s for 3 short flashes of the orange STATE indicator LED. You can remove the magnetic pen.
5. Now the level meter is restored into factory default settings.

Inverse mode

In the inverse mode, set the lower limit of 4 mA (0 V) when the tank is filled up to the upper measured surface level and the upper limit of 20 mA (10 V) when the tank is drained to the lower measured surface level

Range of Application

Thanks to the proximity principle employed, the devices are suitable for continuous or limit measurement of the level of liquids, waste water, sludge, suspensions, adhesives, resins in various open and closed vessels, sumps, open channels and drains. Applicability for measuring the surface level of loose materials is limited, the range of measurement is shorter there.

Accessories

standard

(included in device price)

- 1x seal (for MSLU– 01; 02; 06; 10)
- 1x connector (for versions with an ISO connector)
- 1x magnetic pen (for device type adjusted with a magnetic pen)

optional

(for a extra charge)

- stainless steel or plastic fastening nuts G ¾", G1", G1 ½" and G2 ¼
- stainless steel or plastic lugs G ¾", G1", G1 ½" and G2 ¼
- horn adapter ST-G0,75, ST-G1 (thread G1"), ST-G1,5 and ST-G2,25

Materials		
sensor part	Opções	standard material
Housing	all	plastic PP
Ultrasonic transducer	all	plastic PVDF
Flange	MSLU-20	aluminum with surface finish (powder coating)
Cable gland	all	plastic PA

Protection, Safety, Compatibility and Explosion Proof design

The MSLU level meter is equipped with protection against reverse polarity of the supply voltage and against short voltage surges and with protection against current overload at the output.

Protection against dangerous contact is provided by low safe voltage under EN 33 2000-4-41.

Electromagnetic compatibility complies with EN 55011/B, EN 61326-1 and EN 61000-4-2 to 6.

The explosion-proof design of types MSLU-X is provided in conformity to the standards: EN 60079-0 : 2007; EN 60079-11 : 2007 and EN 60079-26 : 2007.

A declaration of conformity has been issued for this device in accordance with Act No. 22/1997 Coll., as amended. The supplied electrical device conforms to the applicable government regulations concerning safety and electromagnetic compatibility.

Special conditions for the safe use of variants MSLUXi

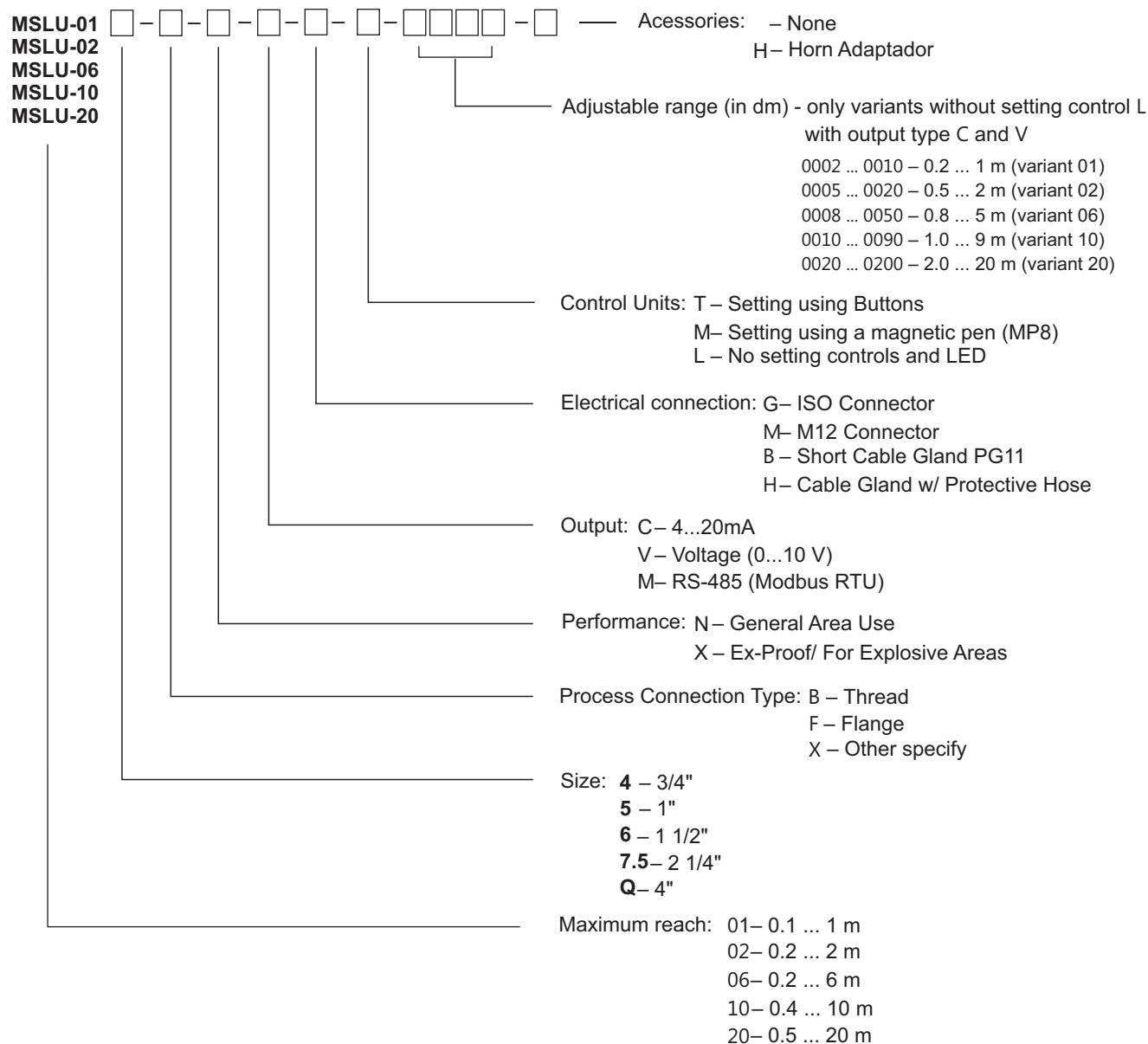
The device is designed for connection to isolating repeater SIR-420. When another approved supply unit whose output parameters meet the above-mentioned output parameters is used, it is necessary to provide galvanic separation or, if a supply unit without galvanic separation (Zener barriers) is used, it is necessary provide potential equalization between the sensor and the grounding point of the barrier.

For application in zone 0, the present explosive atmosphere, comprising a mixture of air with gases, vapour or mists, shall comply with: $0.8 \text{ bar} \leq p \leq 1.1 \text{ bar}$.

It is necessary to ground the flange in variants MSLU20 -X-Q using a ground terminal located on the flange.

The device shall be installed in a way to prevent mechanical damage to the sensor face.

Order Code



Cable (cable length in m) - only for variants with connection type B and H

Correct Specification Examples

MSLU-01-4-B-N-C-G-T

MSLU-02-5-B-X-V-C-T-H