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SIGMATAX 2

User manual

11/2021, Edition 4

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Section 1 Specifications

From software version 1.6. Subject to change.

Measurement				
Principle of operation	Samples delivered under pressure, homogenized using ultrasound			
Interval	12 to 20 minutes			
Sample quantity	For up to 2 PHOSPHAX sigma or TOCTAX process photometers			
Tube length	10 m, 20 m, 30 m (393.7 in, 787.4 in, 1181.1 in)			
Suction height	Maximum 7 m (275.6 in) (with tube of length 30 m (1181.1 in): maximum 6 m 236.2 in)			
Environmental conditions				
Ambient temperature	Control unit: +5 °C to +40 °C (+41 °F to +104 °F); 95% relative humidity, non-condensing			
	Connection tube: –20 °C to +40 °C (–4 °F to +104 °F); 95% relative humidity, non-condensing			
	(Without additional insulation; in the event of low external temperatures, correct operation can only be guaranteed with additional insulation. More information available on request)			
Medium temperature	+5 °C to + 30 °C (+41 °F to +86 °F) (probe); 95% relative humidity, non-condensing			
Equipment properties				
Housing protection rating	IP 20			
Outputs	Fault indication contact, potential-free, 24 V, maximum 1 A Service interface: RS 232			
Power connector	230 VAC ±10%; 50 Hz			
Power consumption	Device with system components : 600 VA Recommended fuse: 10 A, time-delay			
	Line	Heater off	Heater on (–20 °C (–4 °F))	
			Continuous operation	At startup
	10 m (393.7 in)	150 VA	250 VA	1300 VA
	20 m (787.4 in)	150 VA	350 VA	2300 VA
	30 m (1181.1 in)	150 VA	470 VA	3000 VA
Inspection interval:	3 months			
Maintenance requirement:	Approximately 0.5 h/week, typically			
Dimensions:	Open loop control unit: W × H × D 366 × 560 × 212 mm (14.4 × 22 × 8.3 in Probe: Ø × L 133 × 404 mm (5.2 × 15.9 in			
Earth (approximate)	Control unit:		12 kg	
	Sampling probe 10 m (393.7 in)		7.5 kg	
	Sampling probe 20 m (787.4 in)		15 kg	
	Sampling probe 30 m (1181.1 in)		22 kg	
	Mounting poles:		10 kg	
Environmental conditions	Indoor use			
Altitude	2000 m			
Overvoltage category	II			
Pollution degree	2			

Section 2 General Information

2.1 Safety information

Please read this entire manual before unpacking, setting up, or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

To prevent damage to or impairment of the device's protection equipment, the device may only be used or installed as described in this manual.

2.1.1 Use of hazard information

⚠DANGER

Indicates a potentially or imminently hazardous situation that, if not avoided, can result in death or serious injury.

⚠WARNING

Indicates a potentially or imminently dangerous situation that, if it is not avoided, can lead to death or to serious injuries.

⚠CAUTION

Indicates a possible dangerous situation that can have minor or moderate injuries as the result.

NOTICE

Indicates a situation that, if it is not avoided, can lead to damage to the device. Information that requires special emphasis.

Note: *Information that supplements points in the main text.*

2.1.2 Precautionary labels

Observe all labels and notices attached to the instrument and/or delivery packaging. Personal injury or damage to the instrument could occur if not observed.

	This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.
	This symbol may be found on an enclosure or barrier within the product and indicates a risk of electric shock and/or death by electrocution.
	Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems after 12 August 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the manufacturer for disposal at no charge to the user. ***Note:*** *You obtain instructions on the correct disposal of all (marked and not marked) electrical products that were supplied or manufactured by Hach-Lange at your relevant Hach-Lange sales office.*
	When carrying or transporting the instrument/instrument components and if the total weight is more than 18 kg, make sure that suitable lifting equipment is used and/or that the instrument/instrument components are carried by 2 people.

2.2 Application areas

Automatic sample removal and homogenization system for supplying the PHOSPHAX S sigma (total phosphorus), TOCTAX (total organic carbon, TOC) and astro TOC (total organic carbon, TOC) process photometers with samples from water containing solid particles with a diameter < 0.5 mm.

NOTICE

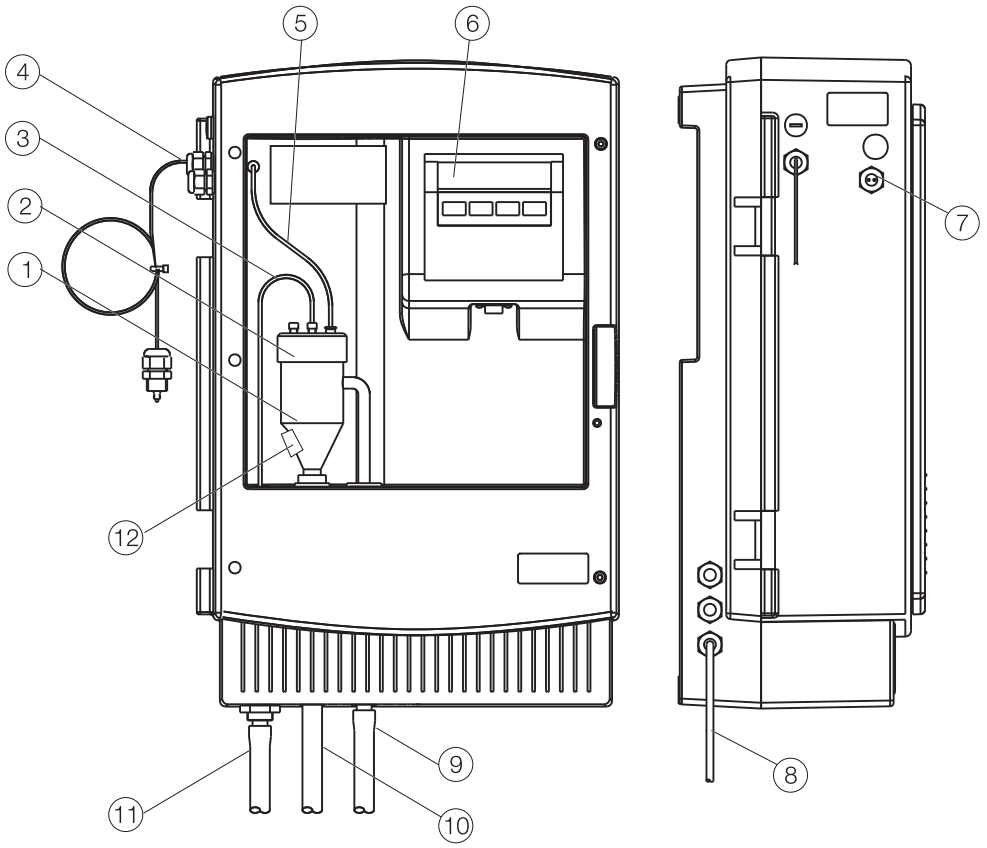
Any use other than use in accordance with requirements defined in the user manual leads to the loss of the warranty claims and can lead to personal injury and property damage, for which the manufacturer assumes no liability.

2.3 Functional description

A sampling probe is immersed in the water and draws only the sample volume required for the analysis without coming into contact with pumps. The sample is conveyed into a small storage vessel in the open loop control unit and is homogenized using an ultrasound generator.

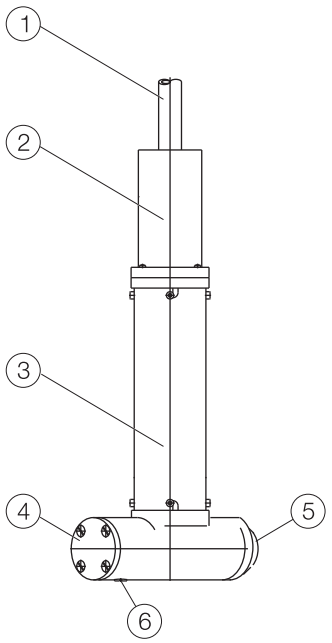
2.4 Instrument design

Figure 1 Control unit



1	Sample storage vessel	**5**	Pressure sensor line	**9**	Overflow drain tube
2	Sample storage vessel lid	**6**	Display with keypad	**10**	Sample storage vessel drain tube
3	Sample tube	**7**	Sample removal for process instruments	**11**	Connection tube from the probe
4	Fiber optic cable for PHOSPHAX sigma or TOCTAX	**8**	Mains connection cable	**12**	Ultrasound transducer

Figure 2 Sampling probe



1	Connection tube	**3**	Sampling vessel	**5**	Air outlet
2	Probe cover	**4**	Valve cover	**6**	Drain valve

⚠ DANGER

Only qualified experts may conduct the tasks described in this section.

⚠ DANGER

Select a suitable attachment point for the instrument.

Plan out the mechanical mount·before positioning poles or drilling holes. Make sure the mount has a sufficient bearing capacity. The dowels must be selected and authorized according to the condition of the wall.

The manufacturer shall accept no liability if the instrument is installed incorrectly.

Plan how to lay cables and tubes and their path in advance. Lay the tubes, data cables and power cables without any bends and so they do not pose a tripping risk.

Do not connect the electrical supply to the mains·until the instrument is completely wired and protected against short circuits.

Sufficiently protect the electrical power supply against short circuits.

For the external power supply, always connect a residual-current circuit breaker·(trip current max.: 30 mA) between the mains and the system.

If the instrument is to be installed outdoors, connect a surge arrester between the mains and the system.

Products intended by the manufacturer for outdoor use offer a higher level of protection against the penetration of liquids and dust. If these products are connected to a mains outlet with a cable and plug·rather than a permanently connected cable, the plug and outlet are much more susceptible to liquid and dust penetration. The operator must sufficiently protect the plug and outlet against liquid and dust penetration in accordance with local safety regulations. If the instrument is to be used outdoors, it must be connected to a suitable outlet with a protection type of at least IP44 (splash protection).

⚠ WARNING

Electrical and fire hazards. Only use the mains cable supplied. Only qualified experts may perform the tasks described in this section of the manual, while adhering to all locally valid safety regulations.

NOTICE

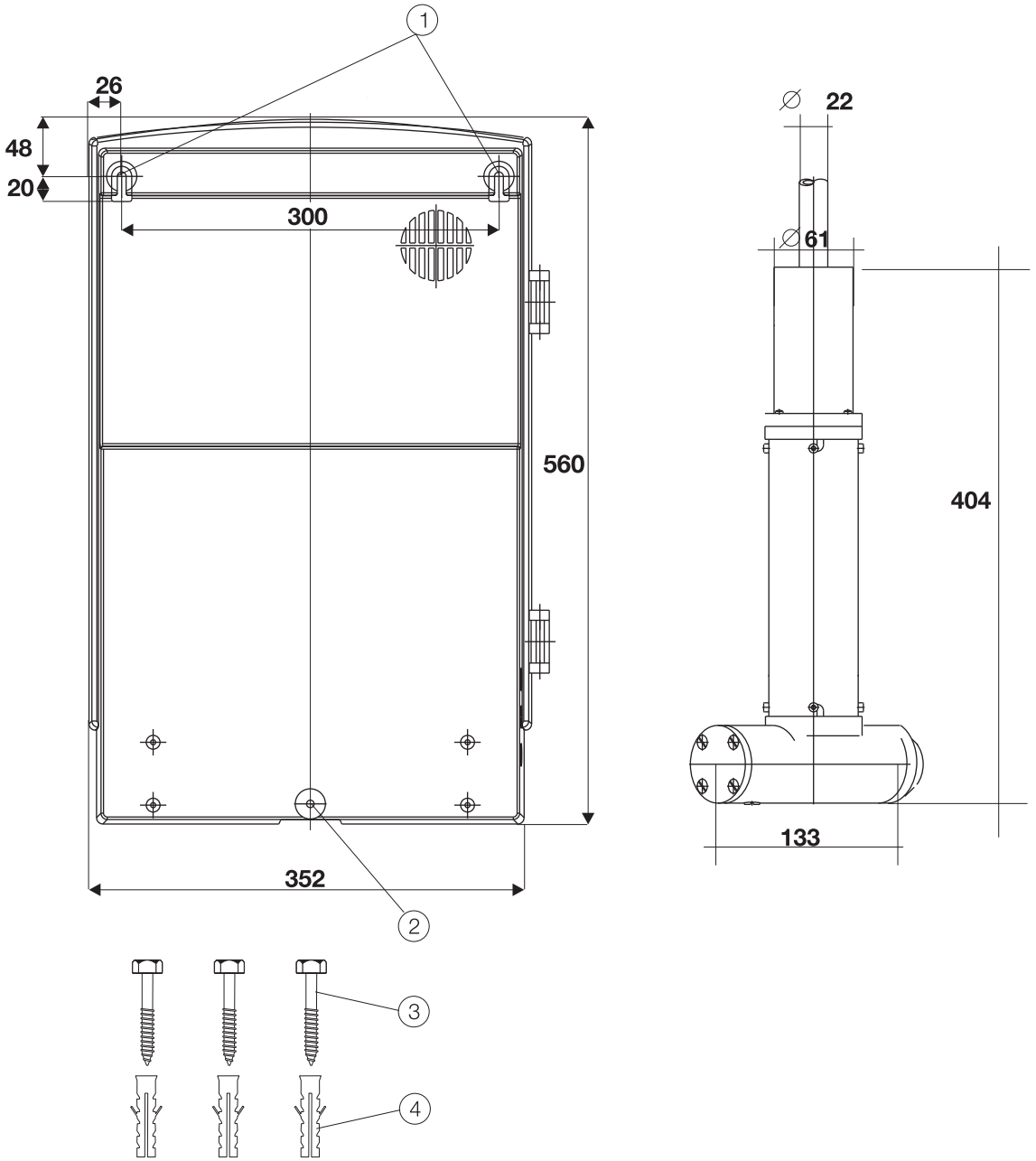
Protect the instrument from extreme temperatures from heaters, direct sunlight and other heat sources.

⚠ CAUTION

Beware of the weight (open loop control unit: approximately 12 kg; sampling probe up to approximately 22 kg) of the instrument and the probe. Do not attempt to carry the instrument and probe without assistance. Use only suitable lifting devices for the transport.

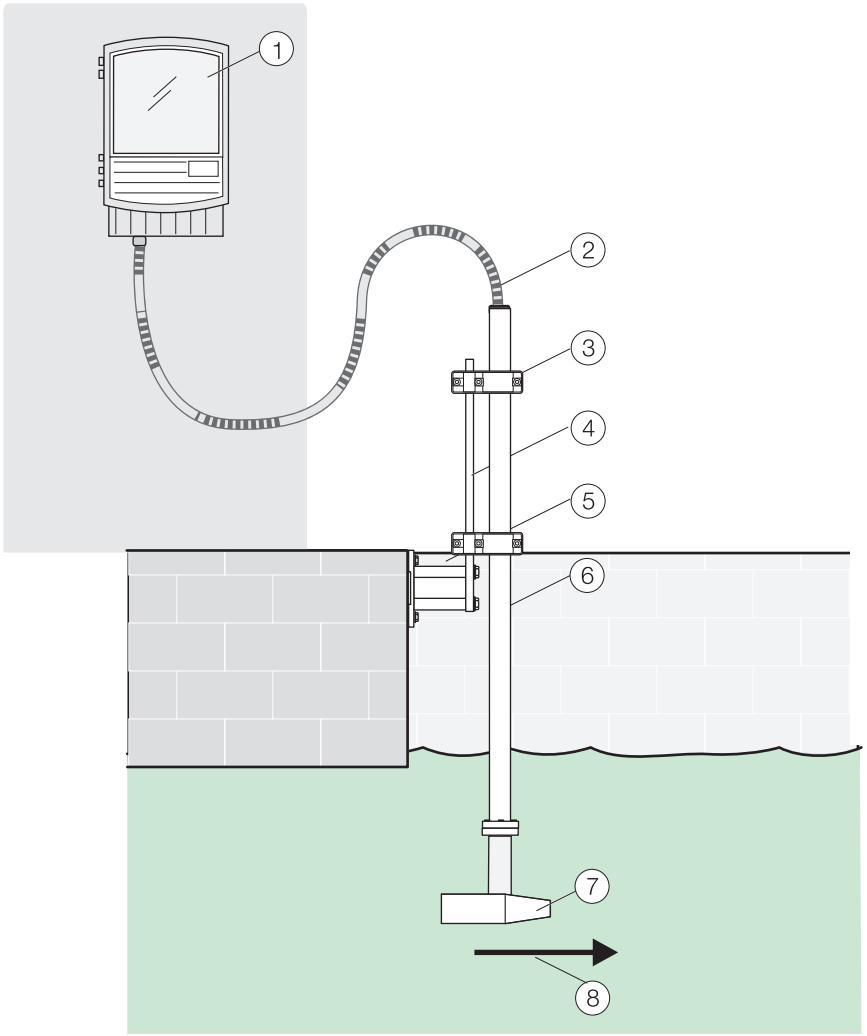
3.1 Mechanical installation

Figure 3 Dimensions (in mm)



1	Suspension points	**3**	Wood screw, 5 x 40 (3×)
2	Fixing point	**4**	Nylon plug, 8 x 40 (3×)

Figure 4 Installation overview

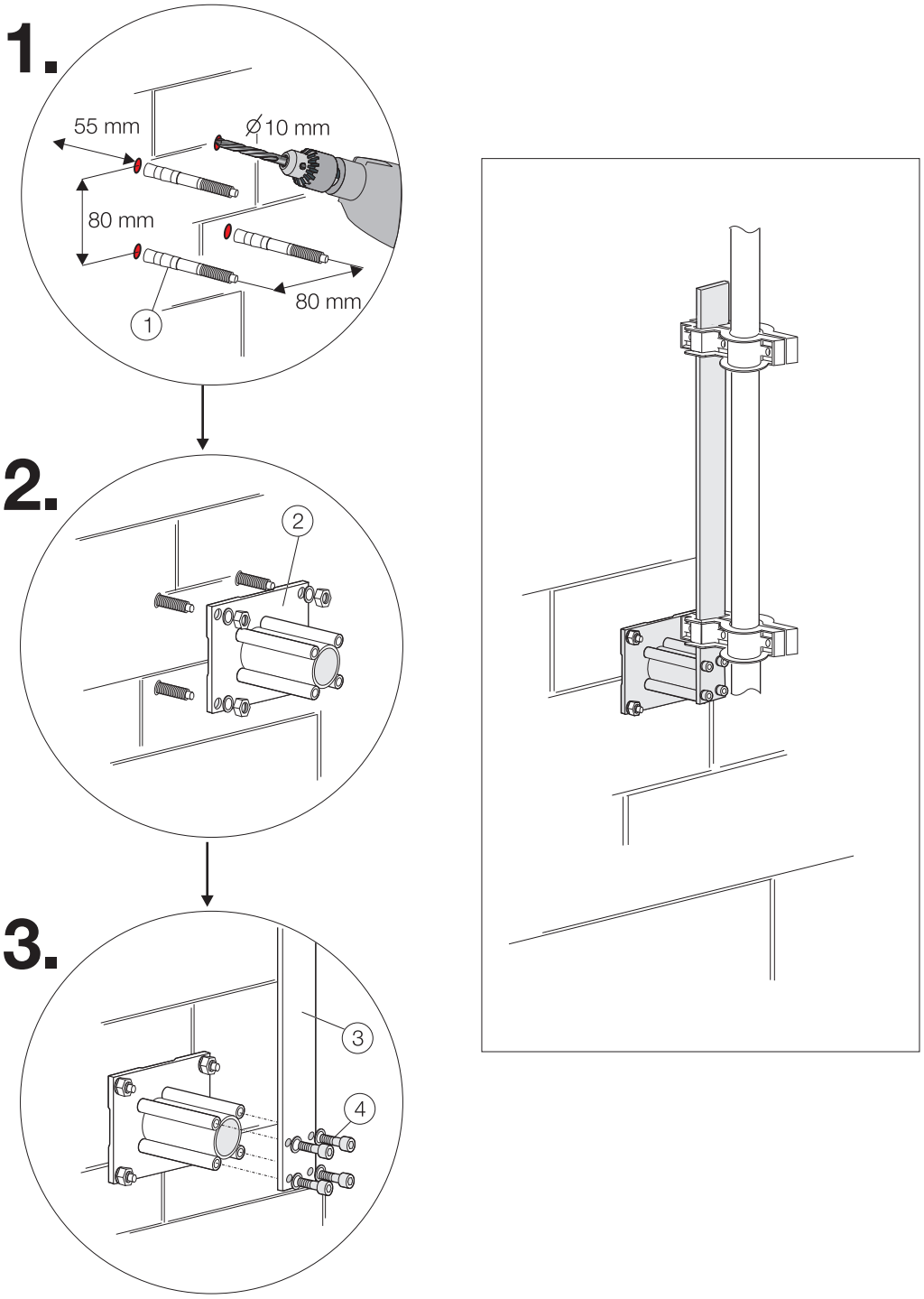


1	SIGMATAX 2 open loop control unit	**4**	Mounting attachment	**7**	SIGMATAX 2 sampling probe
2	Connection tube (10–30 m)	**5**	Base	**8**	Direction of flow
3	Retaining clamp	**6**	Mounting pipe, 2 m (78.7 in)		

3.1.1 Install the sampling probe

Installation with rim mounting LZX414.00.00000

Figure 5 Base and mounting attachment



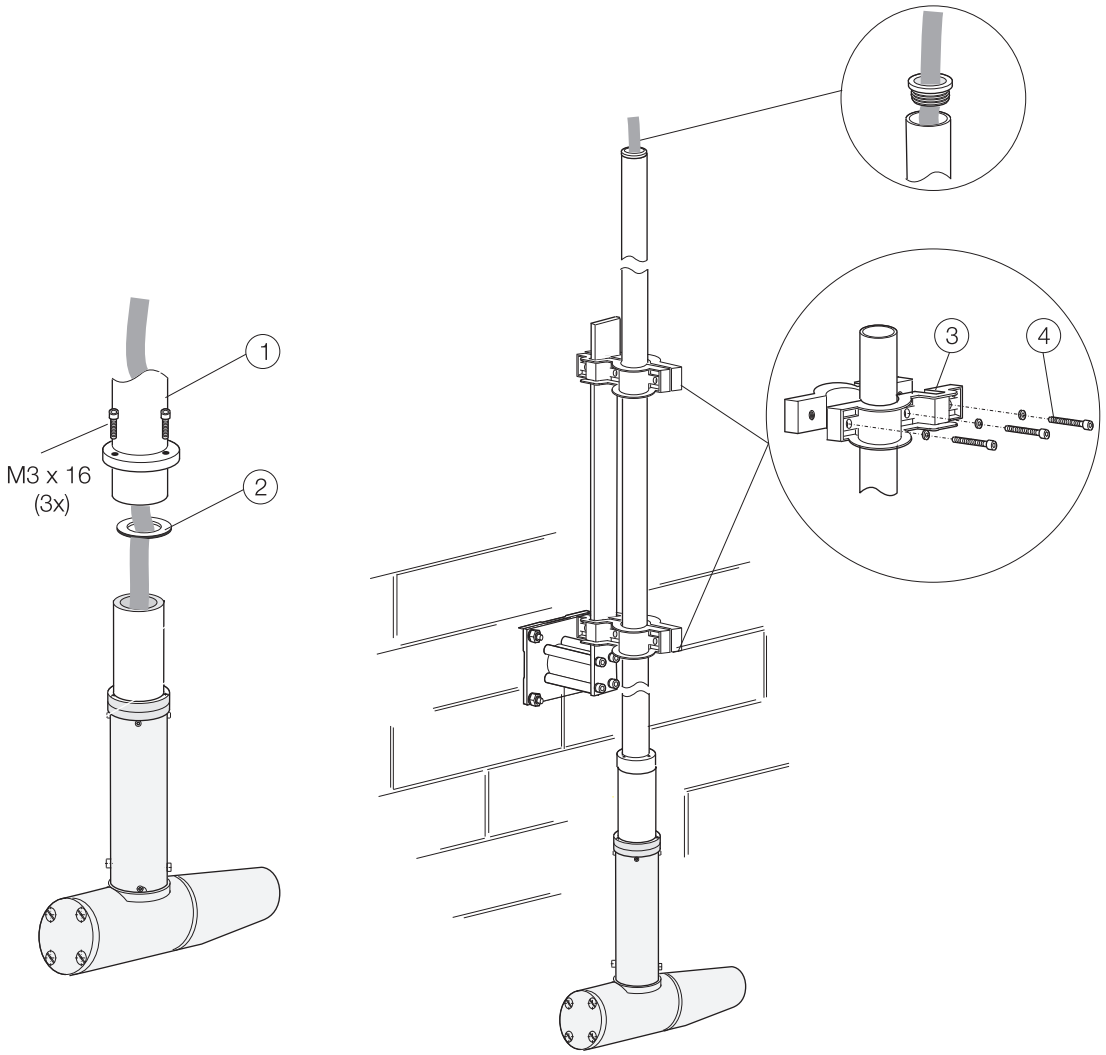
1	Express anchor	**3**	Mounting attachment
2	Base	**4**	Cylinder-head screw, M8 × 40 (4×)

NOTICE

When carrying out an installation variant that deviates from this example, make sure that the connection tube from the sampling probe is guided vertically upward for at least 0.5 m (19.6 in).

Installation using pole mount LZX414.00.00000

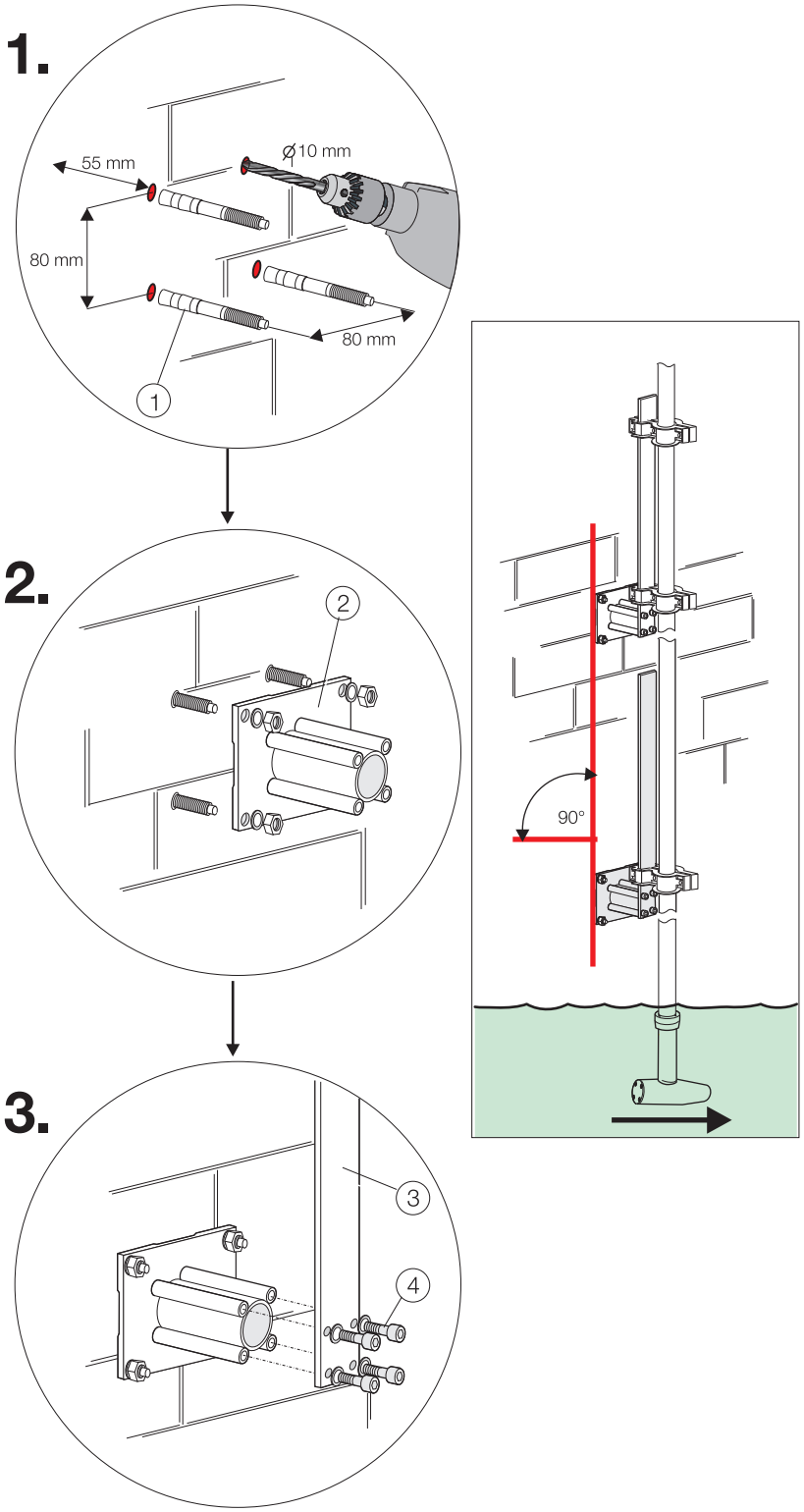
Figure 6 Sampling probe and mounting pipe



1	Mounting pipe, 2 m (78.7 in)	**3**	Retaining clamp
2	EPDM flat seal	**4**	Cylinder-head screw, M5 × 20 (3×)

3.1.2 Second mounting point and extension pipe

Figure 7 Second mounting point LZX456

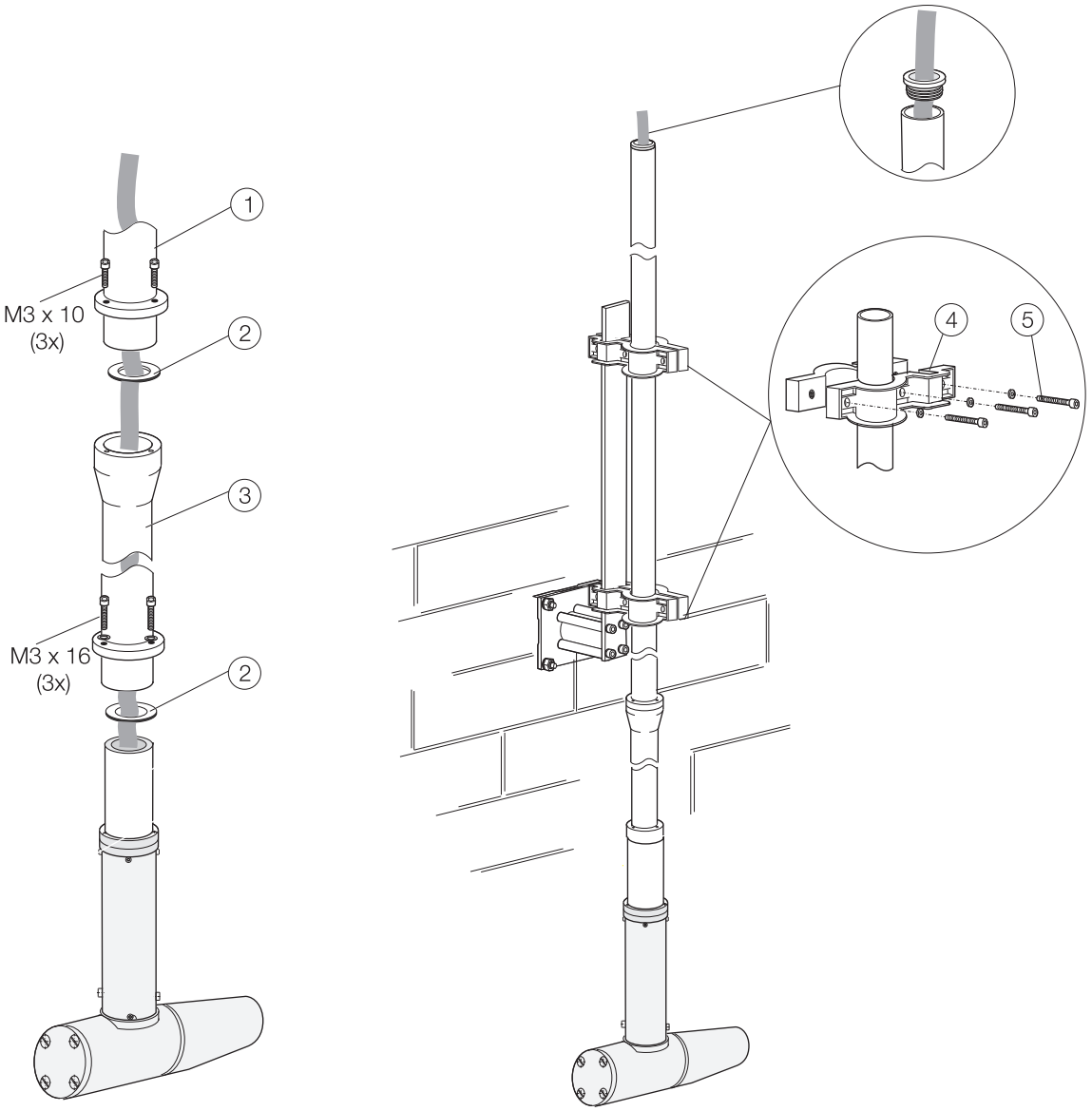


1	Mounting pipe, 2 m (78.7 in)	**3**	Retaining clamp
2	EPDM flat seal	**4**	Cylinder-head screw, M5 × 20 (3×)

NOTICE

When carrying out an installation variant that deviates from this example, make sure that the connection tube from the sampling probe is guided vertically upward for at least 0.5 m (19.6 in).

Figure 8 Installation with extension pipe.



1	Mounting pipe, 2 m (78.7 in)	**4**	Retaining clamp
2	EPDM flat seal	**5**	Cylinder-head screw, M5 × 20 (3×)
3	Extension pipe		

3.1.3 Install the open loop control unit

NOTICE

Install the open loop control unit in a dry location out of direct sunlight.

Make sure that an area of 5 cm is kept free around the entire instrument to enable air to circulate (distance from the wall of the building, cable channel etc.).

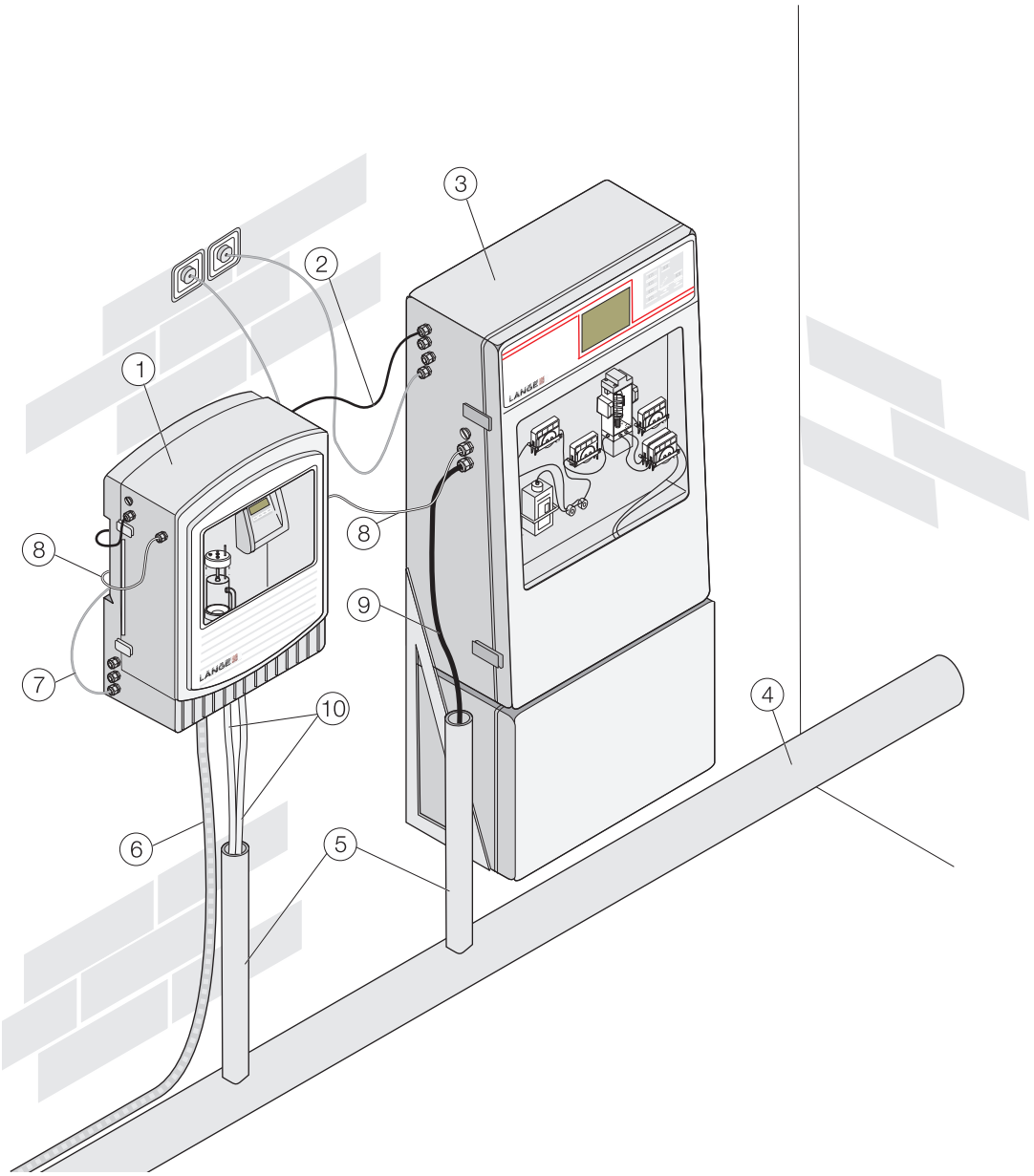
NOTICE

The Teflon sample lines must be laid without sharp bends. Shortening or extending the lines will lead to problems when the samples are transported.

Each process instrument must have a separate drain tube!

The individual device drains may only be combined in a larger drain pipe with regular water throughput.

Figure 9 Open loop control unit and process instrument



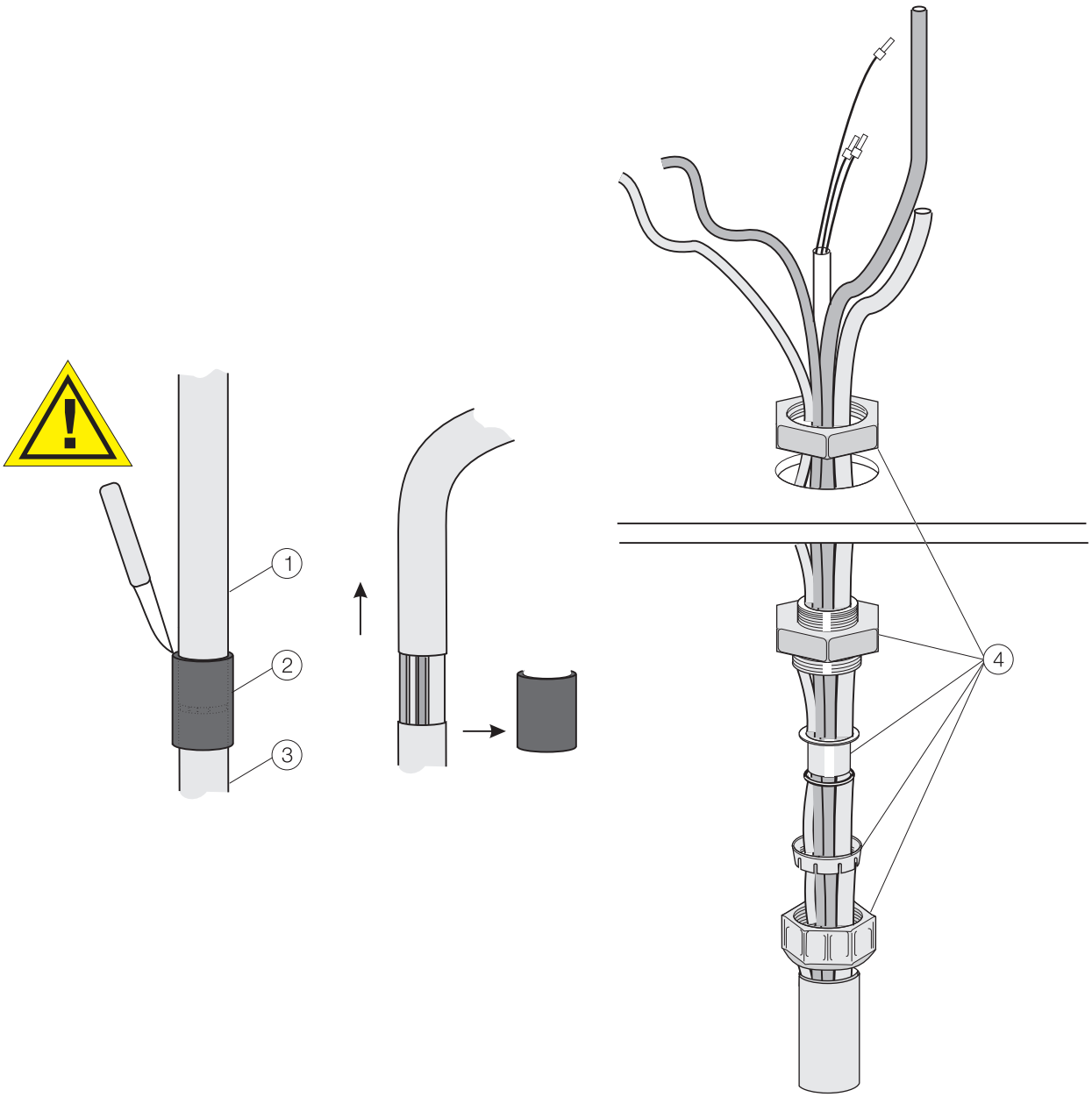
1	SIGMATAX 2 open loop control unit	**5**	Separate drain pipe for process instrument	**9**	Drain tube for process instrument
2	Fiber optic cable to the process instruments	**6**	SIGMATAX 2 connection tube	**10**	SIGMATAX 2 drain tubes
3	PHOSPHAX sigma or TOCTAX	**7**	SIGMATAX 2 mains connection cable		
4	Shared drain pipe	**8**	Teflon sample line		

3.1.4 Prepare the connection tube

DANGER

The pipe trace heater in the connection tube is operated at 230 V. If any damage occurs to the tube casing, the entire system must be taken out of operation immediately.

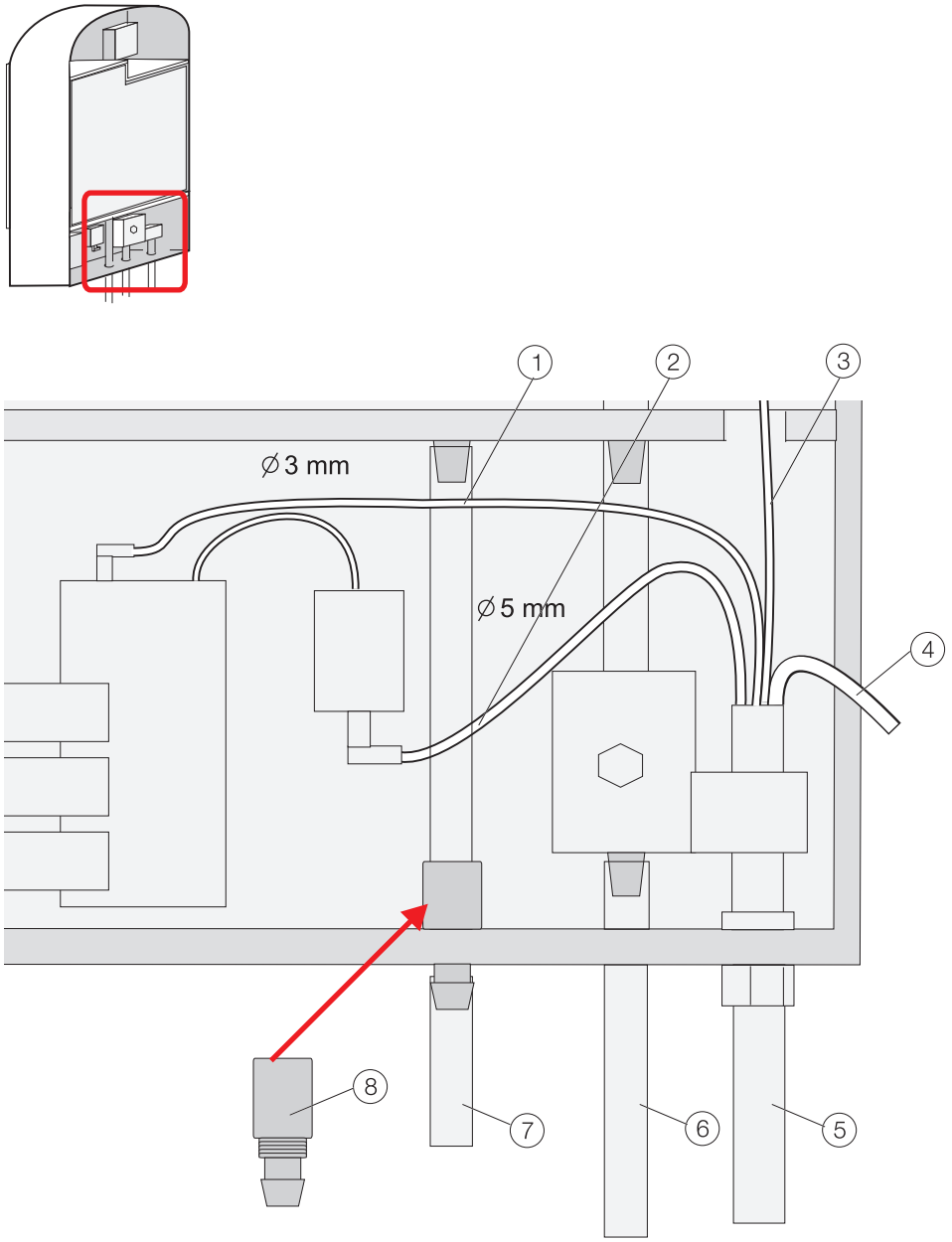
Figure 10 Connection tube



1	Protective tube	**3**	Connection tube
2	Heat-shrink tube	**4**	PG 16 screw connection

3.1.5 Connect the connection tube

Figure 11 Connections for connection tube and drain tubes



1	Air hose (drain valve), Ø 3 mm (0.11 in)	**4**	Electrical connection cable for the pipe trace heater	**7**	Overflow drain tube
2	Air hose, Ø 5 mm (0.19 in)	**5**	Connection tube from the sampling probe	**8**	Drain fitting
3	Sample tube	**6**	Drain tube for storage vessel		

3.2 Electrical installation

NOTICE

Protect the instrument from extreme temperatures from heaters, direct sunlight and other heat sources.

⚠WARNING

Electrical and fire hazards. Use only the supplied power cable.

Only qualified experts may perform the tasks described in this section of the manual, while adhering to all locally valid safety regulations.

NOTICE

Use only earthed sockets for the connection of this device to the power supply.

If you are not sure if the sockets are earthed, have this checked by a qualified electrician.

The power plug serves in addition to the power supply to isolate the device quickly from the mains where necessary.

The entire measurement system has two power plugs (measurement device and open loop control unit).

During the disconnection from the power source it must be made sure that the correct power plug is pulled (for example by labeling the sockets).

This is recommended for long-term storage and can prevent potential dangers in the event of a fault.

Therefore make sure that the sockets to which the device is connected are easy to reach by each user at all times.

NOTICE

Pull out power plug before the opening of the device.

3.2.1 Connect the pipe trace heater and fault indication contact

⚠WARNING

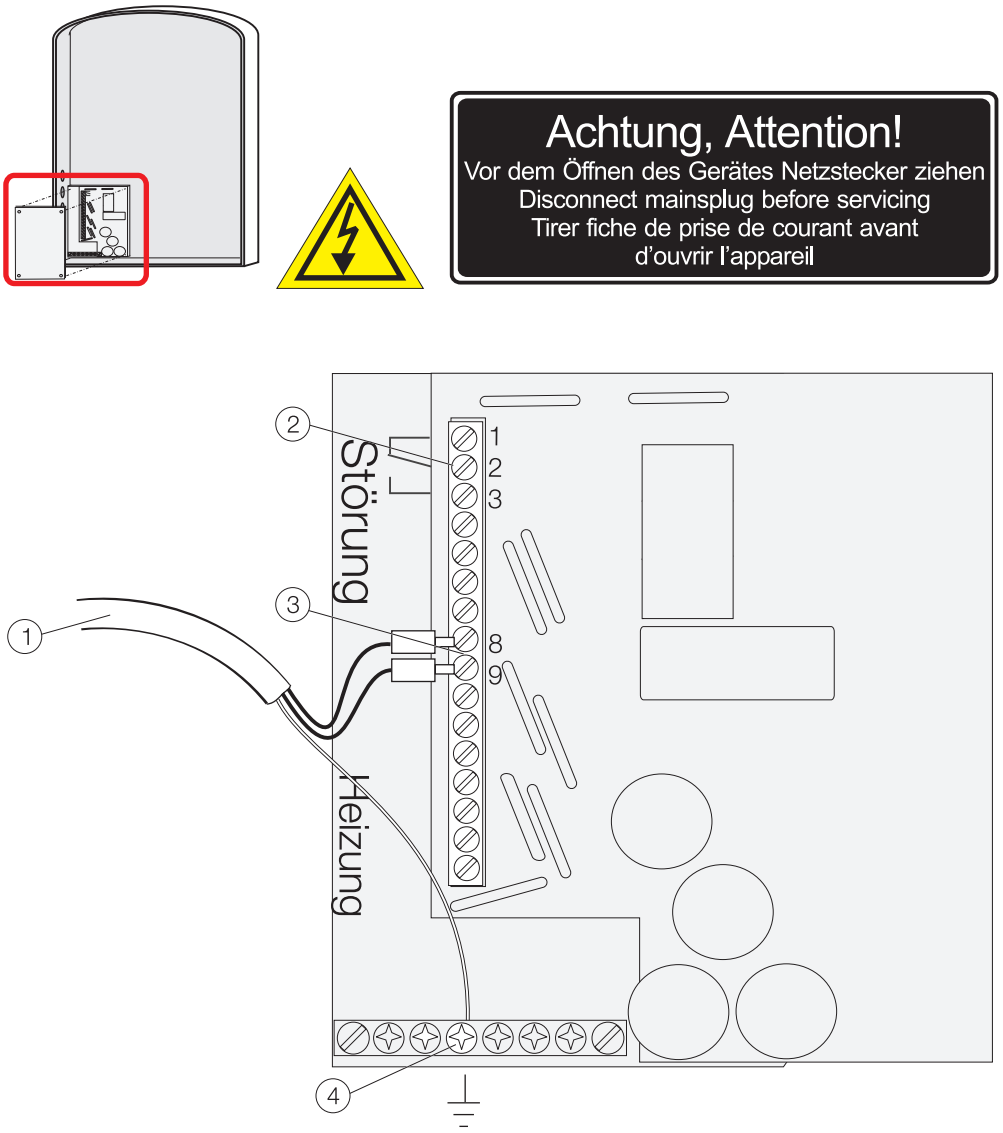
The electrical connection for the pipe trace heater must be carried out by a specialist electrician.

NOTICE

If the mains plug·of the power connection cable·is removed and replaced by hard wiring, then in immediate proximity of the display unit a suitable double-pole one-way circuit breaker with clear labeling for the power supply must be installed.

All connected signal connection lines must be shielded.

Figure 12 Terminal assignment



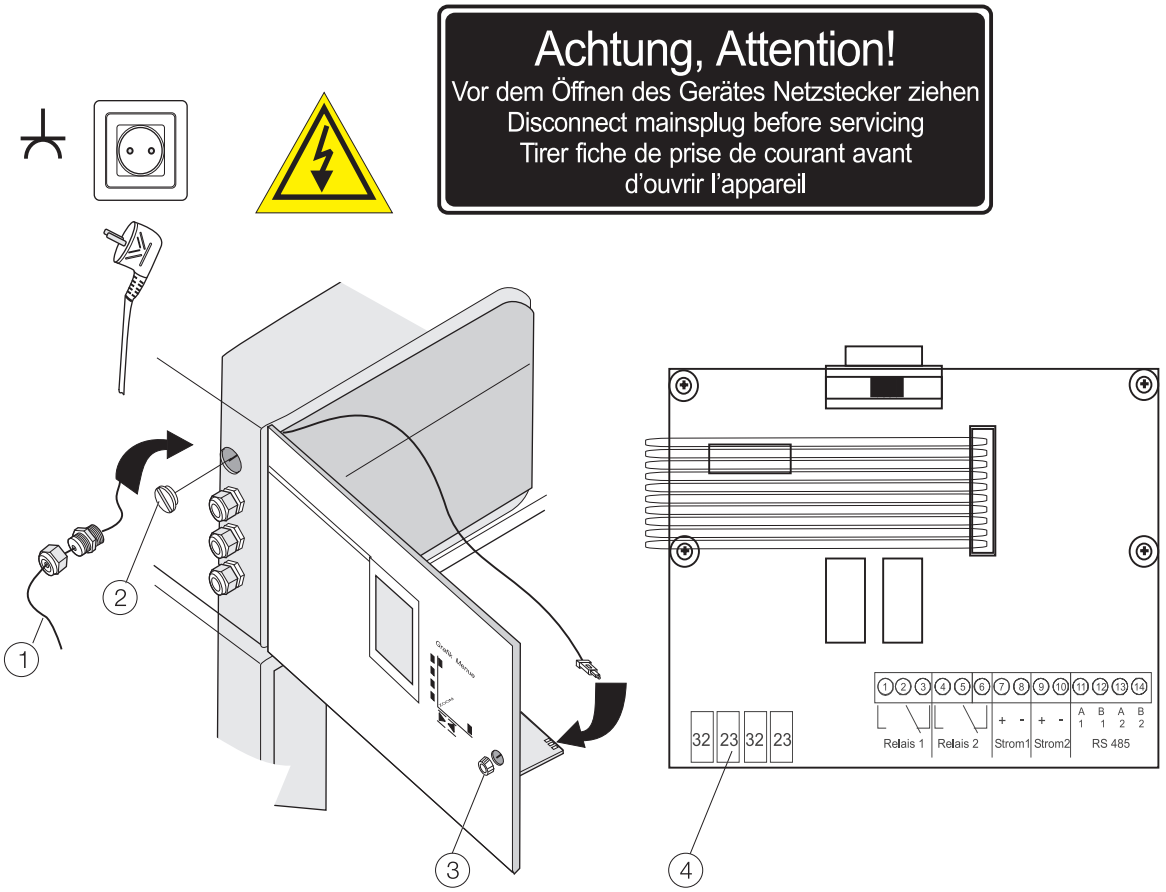
1	Connection cable for pipe trace heater	**3**	Connection terminals for heater (N, L = terminals 8 + 9 from the top)
2	Fault indication contact (circuit diagram shows contact during a fault indication) Open 1/2, closed 2/3	**4**	Connection terminal for earth conductor

NOTICE

Route the signal lines (1, 2, 3) separated from the power cable.

3.2.2 Connect the fiber optic cable

Figure 13 Fiber optic cable connection



1	Fiber optic cable for SIGMATAX 2 with PG screw connection	**3**	Knurled-head screw for opening the front panel
2	Blind plug for fiber optic cable PG screw connection (PHOSPHAX sigma or TOCTAX)	**4**	Fiber optic cable connection

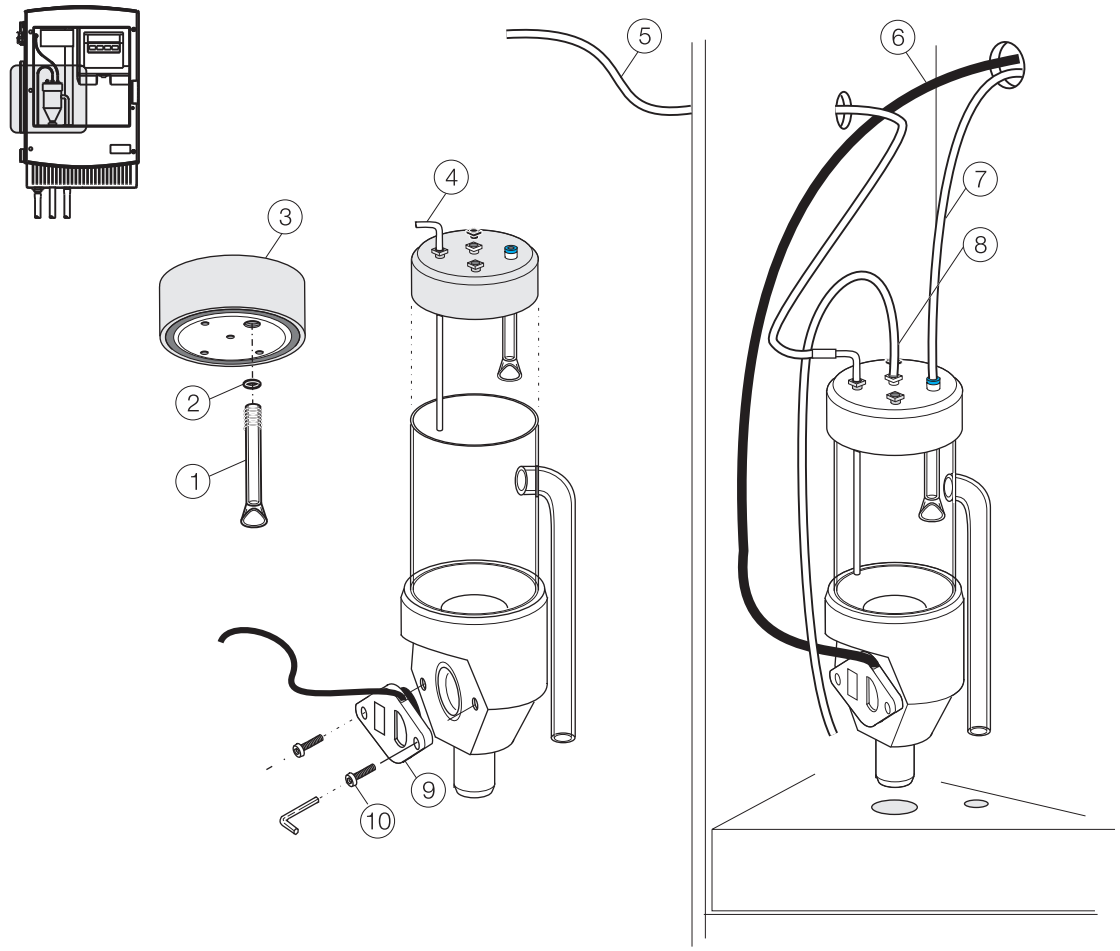
3.3 Internal tubing

1. Carefully screw the level indicator tube (1) and O-ring (2) into the cover (3) from below.
2. Connect the sampling line (5) to the sampling pipe (4). Then insert the sampling pipe all the way into the cover through opening 3 or 4.

   Note: *Fragile glass components*

3. Lubricate the rubber seal of the ultrasound transducer (9) with Baysilone paste.
4. Attach the ultrasound transducer (9) to the sample storage vessel using the two cross-head screws (10). Install the ultrasound transducer in line with the illustration (cable "upward").
5. Connect the pressure sensor line (7) and insert the sample delivery line (8) 1 cm (0.39 in) through the central opening in the cover.

Figure 14 Sample storage vessel



1	Level indicator pipe	**5**	Sample tube	**9**	Ultrasound transducer
2	O-ring	**6**	Connection cable for ultrasound transducer	**10**	Cross-head screw, M4 × 16 (2×)
3	Sample storage vessel cover with O-ring compression fittings	**7**	Pressure sensor line		
4	Small sample pipe	**8**	Sample tube		

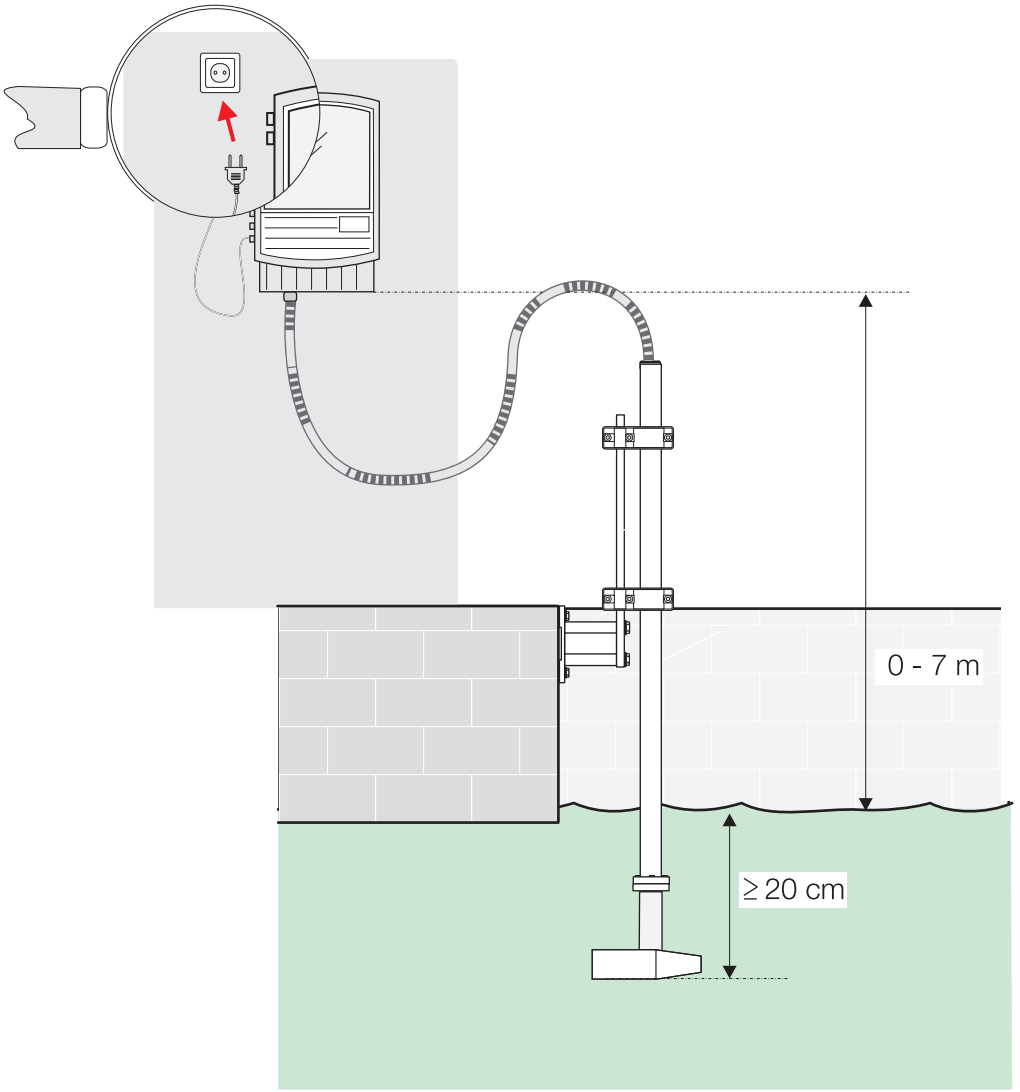
After the sampling probe and control unit have been fully installed and all lines have been connected (connection tube, sampling and drain tubes, fiber optic cables), the mains plug can be plugged in.

If there is a risk of freezing, switch on the pipe trace heater!

⚠WARNING

The pipe trace heater in the connection tube is operated at 230 V. If any damage occurs to the tube casing, the entire system must be taken out of operation immediately.

Figure 15 Plug in the power plug

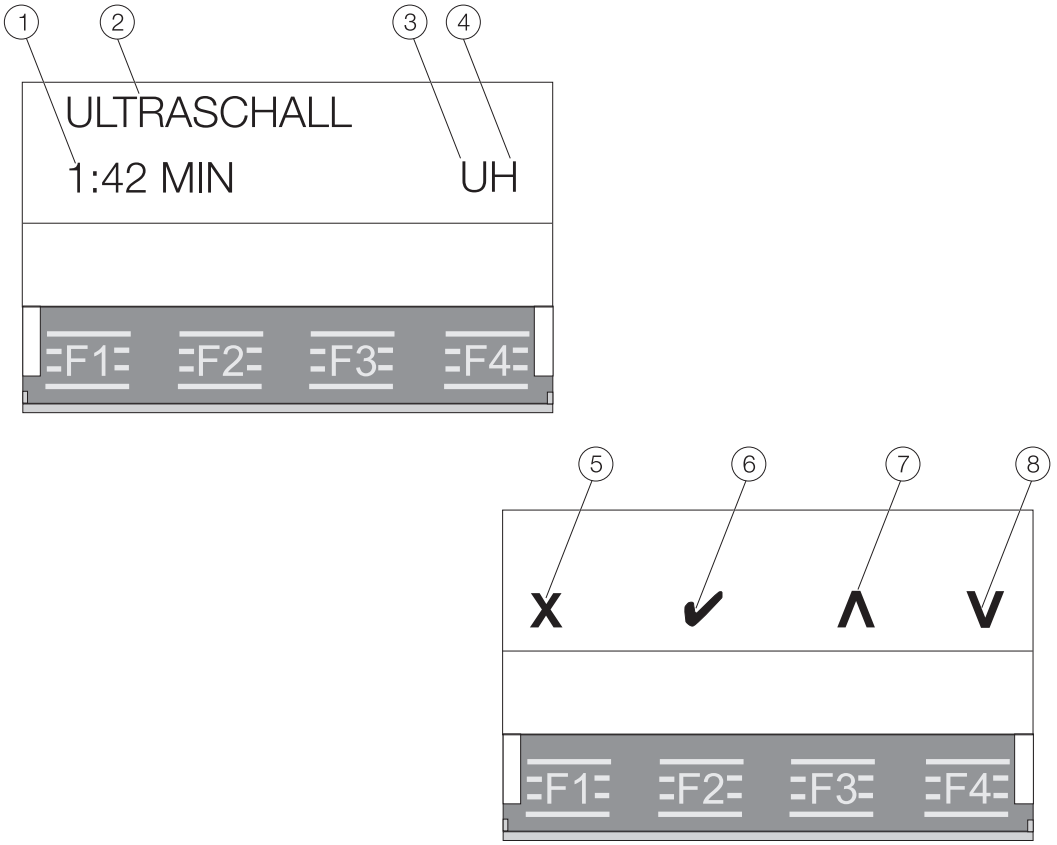


5.1 Operation

All instrument functions are controlled by the software. The instrument is operated via menus using four keys that are located below the display. From operational mode, you can access the first menu level by pressing the function keys, F1 to F4, for 3 seconds.

The functions of the keys in the individual menus may vary, and are therefore shown (abbreviated clearly) in the second row of the display (softkey function).

Figure 16 Display and keypad



1	Time remaining for current process	**4**	Operational status of heater ("H" visible = heater active)	**7**	Go back to previous menu item
2	Current status message	**5**	Cancel	**8**	Go to next menu item
3	Operational status of ultrasound ("U" visible = ultrasound active)	**6**	Setting change		

5.2 Menu overview

Menu level 1	Menu level 2	Menu level 3	Description
+SETTINGS for parameterizing the instrument	Language		Option to select the language for the menus
	HEATER		Self-adjusting pipe trace heater — turn on if there is a risk of freezing!
	Interval		Time interval (6–60 minutes) between 2 samples. An interval > 12 minutes is only necessary for longer analysis periods
	Probe type		Length of connection tube (10–30 m (393.7–1181.1 in)
	Contrast		Reading angle (0–30) of the display; temperature dependent
	press. indic.		Pressure display on the screen; can be switched off
	Version		Instrument type and program version
+OUTPUT TEST for testing connected data cables	error indication		Switches on the potential-free fault indication contact for 2 seconds **The fault indication contact is only held in the previous position for as long as the user activates it for testing purposes.**
	fiber optic 1		Blanks fiber optic cable 1 for 1 second
	fiber optic 2		Blanks fiber optic cable 2 for 1 second
OF output 2 +SERVICEMENU for maintenance tasks and functional tests	+INSPECTION: SIGMATAX switches to service mode	clean.samp. tube	Cleans the sample tube (assisted by the program)
		cleaning probe	Cleans the sampling probe (assisted by the program)
		blowing probe	Automatically cleans the sampling probe with air
		blowing valve	Automatically cleans the drain valve with air
	+FUNCTIONSTEST SIGMATAX switches to service mode	compressor	Activates compressor for 30 seconds
		probe valve	Automatically open and close the probe valve
		ultrasonic	Takes a new sample and activates ultrasound for 30 seconds
		drain valve	Automatically opens and closes the drain valve
	+ERROR STATUS	filling error	Counter for filling errors that have occurred
		delivery error	Counter for delivery errors that have occurred
		error reset	Reset the counters to "0"

5.3 Important instrument settings

5.3.1 Switch on the heater

1. Press one of the function keys, F1 to F4, for 3 seconds.
2. Open the +SETTINGS menu by pressing F2.
3. Press F4 to scroll to the [heating] menu item
4. Select this menu item by pressing F2.
5. Switch the heater on or off by pressing F3 or F4.
6. Confirm by pressing F2 and exit this menu level by pressing F1.

5.3.2 Set the processing interval

1. Press one of the function keys, F1 to F4, for 3 seconds.
2. Open the +SETTINGS menu by pressing F2.
3. Press F4 twice to scroll to the [interval] menu item.
4. Select this menu item by pressing F2.
5. Set the desired interval by pressing F3 and F4.
6. Confirm by pressing F2 and exit this menu level by pressing F1.

5.3.3 Set the display contrast

1. Press one of the function keys, F1 to F4, for 3 seconds.
2. Open the +SETTINGS menu by pressing F2.
3. Press F4 four times to scroll to the [contrast] menu item.
4. Select this menu item by pressing F2.
5. Set the desired contrast by pressing F3 and F4.
6. Confirm by pressing F2 and exit this menu level by pressing F1.

5.3.4 Switch on the pressure display

1. Press one of the function keys, F1 to F4, for 3 seconds.
2. Open the +SETTINGS menu by pressing F2.
3. Press F4 five times to scroll to the [press indic.] menu item.
4. Select this menu item by pressing F2.
5. Switch the pressure indicator on or off by pressing F3 or F4.
6. Confirm by pressing F2 and exit this menu level by pressing F1.

STATUS	**U**	**O**
Open the probe	0 to minimum –0.5 bar	–
Close the probe	0 to minimum 1.3 bar	–
Deliver the sample	> 1.6 bar	10–16
Empty the probe	0.1–0.5 bar	–

5.3.5 Access service mode

1. Press one of the function keys, F1 to F4, for 3 seconds.
2. Press F4 twice to scroll to the [+SERVICEMENU] menu.
3. Press F2 to open this menu.
4. When the [+INSPECTION] or [+FUNCTION TEST] menus are selected, the system automatically switches to service mode.

Service mode means that:

- The instrument is no longer in operational mode
- The sampling probe and sample storage vessel are empty
- The system is depressurized
- The sampling probe is closed
- The fault indication contact remains in the last valid position
- The instrument will not switch back automatically to operational mode

Section 6 Maintenance

The manufacturer recommends that an inspection contract be concluded. This contract extends the warranty period to 5 years and makes sure that all inspection and maintenance tasks are carried out by qualified experts.

Maintenance tasks for users are limited to regular visual inspections and, if necessary, cleaning procedures.

Maintenance schedule	**DOC273.72.04008.MRZ03**
Type of device: ◦ 10 m ◦ 20 m ◦ 30 m	Instrument number:
Commissioning on:	by:

Annually:
Seal membrane on relief valve

Every 1.5 years:
Replace compressor

Every 3 months:
Clean supply lines and sampling probe (interior)

Test pressure

Every 6 months:
Replace valve piston with seal kit

Heat if there is a risk of freezing!

Weekly:
Clean sample storage vessel

Visually inspect sample quality

Every 1–4 weeks:
Check/clean sampling probe

Clean sample tube (semi-automatic)

6.1 Maintenance tasks

6.1.1 After 1–4 weeks (as necessary)

⚠DANGER

Potential dangers with contact with chemical/biological substances.

Working with chemical samples, standards and reagents is linked with dangers.

Make yourself familiar with the necessary safety procedures and the correct handling of the chemicals before the work and read and follow all relevant safety data sheets.

⚠WARNING

Before handling these substances observe all danger notes and safety information printed on the containers of the original solutions and in the safety data sheet.

Dispose of all consumed solutions in accordance with the national regulations and laws.

Select the type of protective equipment suitable to the concentration and quantity of the dangerous material being used.

Clean the sample tube

1. In the [+SERVICEMENU] menu, open the [+INSPECTION] submenu and the [clean.samp. tube]menu item.
2. The individual steps are specified here and carried out with the support of the program (see table).

Display text	**Description/action**
clean. samp. tube	Begin the cleaning tasks supported by the program for the sample tube; start by pressing F4
clean. samp. tube	Confirmation prompt; confirm by pressing F4
cleaning glass inserted?	Replace the sample storage vessel with the cleaning vessel, which contains chlorine bleach (sodium hypochlorite), and confirm by pressing F4.
sample tube advanced?	Feed the sample tube through to the base of the cleaning vessel and confirm by pressing F4.
opening probe cleaning emptying probe cleaning affecting tube xx sec please wait xx sec	The cleaning solution is automatically sucked in for 60 seconds. In the meantime, the sample storage vessel can be cleaned using a paper towel and, if necessary, a little window cleaning solution or diluted hydrochloric acid.
sample glass inserted?	Insert the sample storage vessel again and confirm by pressing F4
sample tube retracted	Retract the sample tube and confirm by pressing F4
from cleaning to Test/maint Operation	At this point, it is possible to choose whether SIGMATAX calls up the [+SERVICEMENU] menu and remains in SERVICE mode, or whether it switches to operational mode.
opening probe cleaning emptying probe cleaning filling probe cleaning closing probe cleaning deliv. sample cleaning emptying sample tube cleaning	The program runs through an automatic rinsing function to remove the residual cleaning solution by repeatedly filling and emptying the system.
[+SERVICEMENU] or **operation**	Status after rinsing is complete

6.1.2 1×/month (or as necessary)

⚠ DANGER

Potential dangers with contact with chemical/biological substances.

Working with chemical samples, standards and reagents is linked with dangers.

Make yourself familiar with the necessary safety procedures and the correct handling of the chemicals before the work and read and follow all relevant safety data sheets.

⚠ WARNING

Before handling these substances observe all danger notes and safety information printed on the containers of the original solutions and in the safety data sheet.

Dispose of all consumed solutions in accordance with the national regulations and laws.

Select the type of protective equipment suitable to the concentration and quantity of the dangerous material being used.

Clean the sampling probe

1. In the [+SERVICEMENU] menu, open the [+INSPECTION] submenu and the [cleaning probe] menu item.
2. The individual steps are specified here and carried out with the support of the program (see table).

Display text	**Description/action**
cleaning probe	Begin the cleaning tasks supported by the program for the sampling probe; start by pressing F4
cleaning probe	Confirmation prompt; confirm by pressing F4
probe in clean.solution?	Immerse the sampling probe in a bucket containing cleaning solution (rinsing agent) and confirm by pressing F4
pressure comp. opening probe cleaning emptying probe cleaning filling probe cleaning closing probe cleaning	The sampling probe is automatically filled with cleaning solution.
was probe shaken?	You can assist the cleaning process mechanically. To do this, simply shake the probe and confirm by pressing F4
opening probe cleaning emptying probe cleaning closing probe cleaning	The sampling probe empties automatically and rinses the removed solids out into the bucket with the cleaning solution.
probe back in basin?	Immerse the sampling probe again at the sampling location and confirm by pressing F4
from cleaning to Test/maint Operation	At this point, it is possible to choose whether SIGMATAX calls up the [+SERVICEMENU] menu and remains in SERVICE mode, or whether it switches to operational mode.
opening probe cleaning emptying probe cleaning filling probe cleaning closing probe cleaning	The program runs through an automatic rinsing function, filling and emptying the system to remove the residual cleaning solution.
[+SERVICEMENU] or **operation**	Status after rinsing is completed

Section 7 Troubleshooting

As soon as a fault leads to an interruption in operation, SIGMATAX 2 immediately switches to service mode. Corresponding error messages are shown both on the SIGMATAX 2 display and on the displays of the connected process photometers.

Service mode means that:

- The instrument is no longer in operational mode
- The sampling probe and sample storage vessel are empty
- The system is depressurized
- The sampling probe is closed
- The fault indication contact is held in the last valid position
- The instrument will not return automatically to operational mode

Error message	Possible cause	Measures
delivery error	Sample line clogged	Select [clean.samp. tube]and carry out a full clean; if necessary, blow air through the sample line using the compressor. Inspect the upper level indication sensor. Check the compressor in the [+FUNCTIONTEST] menu
filling error	Probe valve clogged	Remove probe, extract blockages and inspect the probe valve and drain valve.
Sensor error	Internal electrical cause	Call customer service.

Section 8 Replacement parts and accessories

8.1 Product contents

Description	Cat. No
Control unit	LXV215
10 m (393.7 in) connection tube + sampling probe	LXV231
20 m (787.4 in) connection tube + sampling probe	LXV232
30 m (1181.1 in) connection tube + sampling probe	LXV282
Storage vessel	LZX394
Drain fitting	LZX389
Maintenance schedule	HDF 167
Cleaning vessel	LZX397
2× drain tube 2 m (78.7 in)	LZX278
Screw set	LZX355
Lid for sample storage vessel with level indicator pipe	
Sampling pipe	
PG 16 screw connection	
Works test certificate	
User manual	

8.2 Further accessories

Description	Cat. No
Pole mount for the probe	LZX414.00.00000
User manual	BDA361
Second mounting point (for vibrations)	LZX456

8.3 Replacement and wear parts

Description	Cat. No
230 V membrane compressor (for approximately 1,5 years)	LZX376
Sample storage vessel	LZX394
Valve piston	LZX267
Wear part set for probe valve (for approximately 6 months)	LZX306
Complete drain valve	LZX266
Complete air filter	LZX300
Air filter without fittings (for approximately 12 months)	LZX299
Sample storage vessel lid	LZX381
Accessory set for lid of sample container vessel	LZX385
Maintenance schedule	HDF167
Sampling nozzle (inside the probe)	LZX271
Filter for air outlet	LZX295
Level indicator pipe with O-ring	LZX386
Complete probe valve	LZX269
Straight sampling pipe	LZX305
Bent sampling pipe	LZX293
Sampling vessel (probe body)	LZX294
Sample tubes 1.5 m (59 in) and 2 m (78.7 in)	LZX275
Cleaning vessel	LZX397

8.3 Replacement and wear parts

Description	Cat. No
Probe line 10 m (393.7 in)	LZX393
Probe line 20 m (787.4 in)	LZX398
Probe line 30 m (1181.1 in)	LZX411
Bottom overflow fitting	LZX388
Complete ultrasound transducer	LZX284

Section 9 Warranty and liability

The manufacturer warrants that the product supplied is free of material and manufacturing defects and undertakes the obligation to repair or replace any defective parts at zero cost.

The warranty period for instruments is 24 months. If a service contract is taken out within 6 months of purchase, the warranty period is extended to 60 months.

With the exclusion of the further claims, the supplier is liable for defects including the lack of assured properties as follows: all those parts that, within the warranty period calculated from the day of the transfer of risk, can be demonstrated to have become unusable or that can only be used with significant limitations due to a situation present prior to the transfer of risk, in particular due to incorrect design, poor materials or inadequate finish will be improved or replaced, at the supplier's discretion. The identification of such defects must be notified to the supplier in writing without delay, however at the latest 7 days after the identification of the fault. If the customer fails to notify the supplier, the product is considered approved despite the defect. Further liability for any direct or indirect damages is not accepted.

If instrument-specific maintenance and servicing work defined by the supplier is to be performed within the warranty period by the customer (maintenance) or by the supplier (servicing) and these requirements are not met, claims for damages due to the failure to comply with the requirements are rendered void.

Any further claims, in particular claims for consequential damages cannot be made.

Consumables and damage caused by improper handling, poor installation or incorrect use are excluded from this clause.

The manufacturer process instruments are of proven reliability in many applications and are therefore often used in automatic control loops to provide the most economical possible operation of the related process.

To avoid or limit consequential damage, it is therefore recommended to design the control loop such that a malfunction in an instrument results in an automatic change over to the backup control system; this is the safest operating state for the environment and the process.

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