AFRISO EN

Technik für Umweltschutz

Messen. Regeln. Überwachen.

Operating instructions

Hydrostatic level indicator

TankControl 10

CE

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1 About these operating instructions

These operating instructions describe the hydrostatic level indicator TankControl 10 with submersible probe (also referred to as "product" in these operating instructions). These operating instructions are part of the product.

- You may only use the product if you have fully read and understood these operating instructions.
- Verify that these operating instructions are always accessible for any type of work performed on or with the product.
- Pass these operating instructions as well as all other product-related documents on to all owners of the product.
- If you feel that these operating instructions contain errors, inconsistencies, ambiguities or other issues, contact the manufacturer prior to using the product.

The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe these operating instructions or from failure to comply with directives, regulations and standards and any other statutory requirements applicable at the installation site of the product.

2 Information on safety

2.1 Safety messages and hazard categories

These operating instructions contain safety messages to alert you to potential hazards and risks. In addition to the instructions provided in these operating instructions, you must comply with all directives, standards and safety regulations applicable at the installation site of the product. Verify that you are familiar with all directives, standards and safety regulations and ensure compliance with them prior to using the product.

Safety messages in these operating instructions are highlighted with warning symbols and warning words. Depending on the severity of a hazard, the safety messages are classified according to different hazard categories.

DANGER

DANGER indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

NOTICE

NOTICE indicates a hazardous situation, which, if not avoided, can result in equipment damage.

In addition, the following symbols are used in these operating instructions:

This is the general safety alert symbol. It alerts to injury hazards or equipment damage. Comply with all safety instructions in conjunction with this symbol to help avoid possible death, injury or equipment damage.

This symbol alerts to hazardous electrical voltage. If this symbol is used in a safety message, there is a hazard of electric shock.

2.2 Intended use

This product may only be used for measuring the level of the following media:

- Grey water as per EN 12056-1
- Fuel oil EL as per DIN 51603-1 and as per DIN SPEC 51603-6 with 5 - 100 % fatty acid methyl ester (FAME) as per EN 14214
- Diesel fuel as per EN 590 with up to 7 % fatty acid methyl ester (FAME) as per EN 14214
- Biodiesel with up to 100 % fatty acid methyl ester (FAME) as per EN 14214
- Paraffinic fuels (such as HVO/GTL as per DIN/TS 51603-8) proportionately with 0 - 100 %

Any use other than the application explicitly permitted in these operating instructions is not permitted and causes hazards.

Verify that the product is suitable for the application planned by you prior to using the product. In doing so, take into account at least the following:

- All directives, standards and safety regulations applicable at the installation site of the product
- All conditions and data specified for the product
- The conditions of the planned application

In addition, perform a risk assessment in view of the planned application, according to an approved risk assessment method, and implement the appropriate safety measures, based on the results of the risk assessment. Take into account the consequences of installing or integrating the product into a system or a plant.

When using the product, perform all work and all other activities in conjunction with the product in compliance with the conditions specified in the operating instructions and on the nameplate, as well as with all directives, standards and safety regulations applicable at the installation site of the product.

2.3 Predictable incorrect application

The product must never be used in the following cases and for the following purposes:

- Hazardous area
  - If the product is operated in hazardous areas, sparks may cause deflagrations, fires or explosions.
- Use as safety-related equipment
  - The product does not replace the function of a level sensor.
- As overfill prevention system

2.4 Qualification of personnel

Only appropriately trained persons who are familiar with and understand the contents of these operating instructions and all other pertinent product documentation are authorized to mount, commission, maintain and decommission this product.

These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product.

All persons working on and with the product must be fully familiar with all directives, standards and safety regulations that must be observed for performing such work.

2.5 Personal protective equipment

Always wear the required personal protective equipment. When performing work on and with the product, take into account that hazards may be present at the installation site which do not directly result from the product itself.

2.6 Modifications to the product

Only perform work on and with the product which is explicitly described in these operating instructions. Do not make any modifications to the product which are not described in these operating instructions.

3 Transport and storage

The product may be damaged as a result of improper transport or storage.

NOTICE

INCORRECT HANDLING

- Verify compliance with the specified ambient conditions during transport or storage of the product.
- Use the original packaging when transporting the product.
- Store the product in a clean and dry environment.
- Verify that the product is protected against shocks and impact during transport and storage.

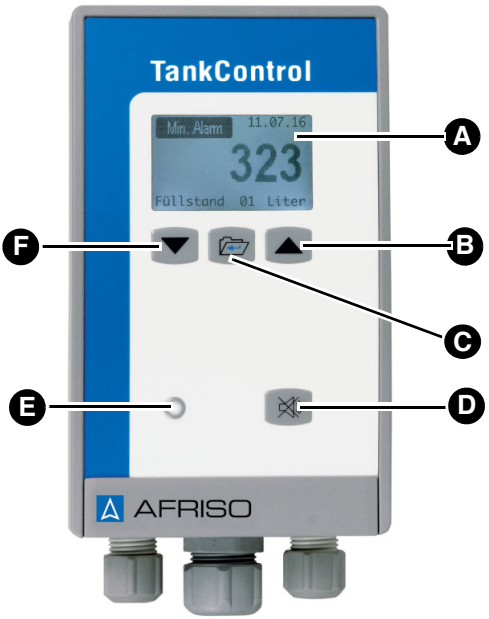
Failure to follow these instructions can result in equipment damage.

4 Product description

The product consists of a control unit and a submersible probe with a pressure sensor.

4.1 Overview control unit

The control unit contains the following elements in an impact-resistant plastic housing: display elements and controls as well as all electronic components for evaluation.



A. Display
B. Arrow up key
C. Menu key
D. Acknowledge key
   - Audible alarm off
E. Red LED
   - Visual alarm
F. Arrow down key

Fig. 1: Control unit

Product description

Pictograms

Symbol	Meaning/function
	**Menu key** This key lets you access the main menu or confirm your selection (save).
	**Acknowledge key** This key lets you acknowledge/mute the audible alarm or access the alarm acknowledgement menu.
	**Visual alarm** In the case of an alarm, the red LED indicates an error/alarm.
	**Arrow up key** Scroll to the top/right with this key.
	**Arrow down key** Scroll to the bottom/left with this key.

4.2 Dimensions

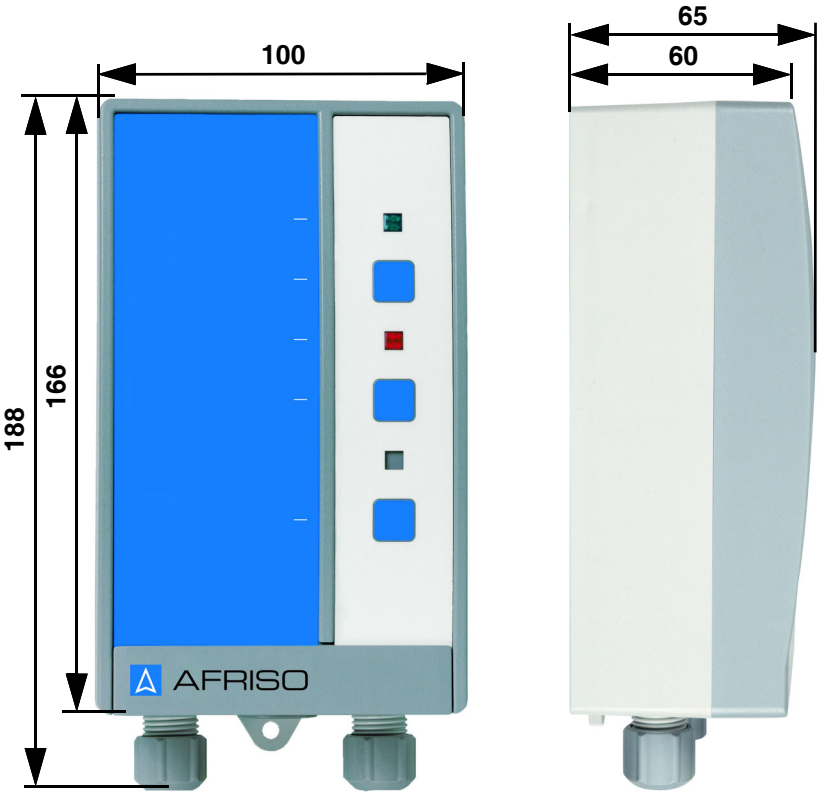
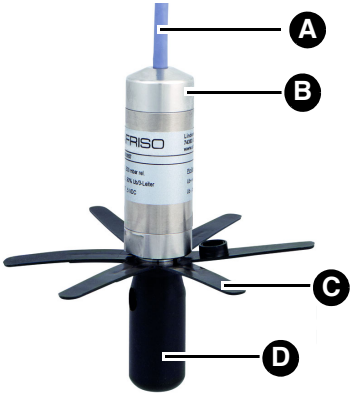


Fig. 2: Dimensions in mm

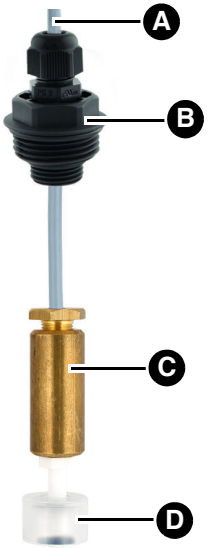
4.3 Overview submersible probe



A. Probe cable with vent hose
B. Pressure sensor
C. Star
D. Spacer

Fig. 3: Submersible probe

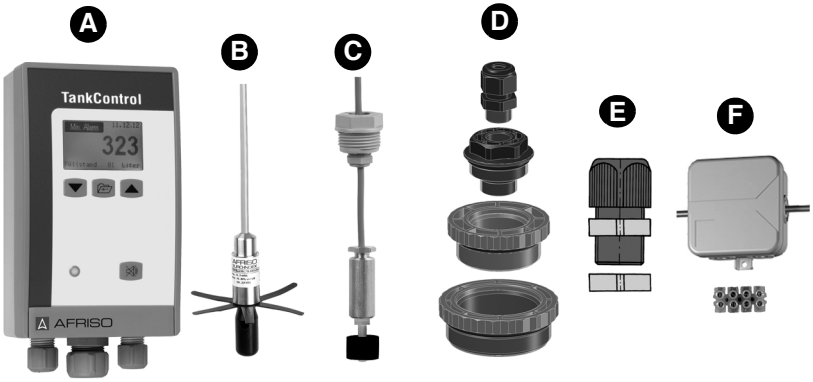
4.4 Overview floating probe (optional)



A. Two-wire probe cable
B. Screw fitting with thread G1
C. Brass weight
D. Float switch

Fig. 4: Floating probe

4.5 Scope of delivery



A. Control unit
B. Submersible probe
C. Optional: Floating probe (ZS)
D. Screw connector kit
   G1½ a x G1 i, G2 a x G1½ i
E. Mounting kit for withdrawal flange at battery tanks
F. Moisture-proof junction box with mounting accessories

Bag of accessories (not shown) with screws and dowels for wall mounting

4.6 Application example(s)

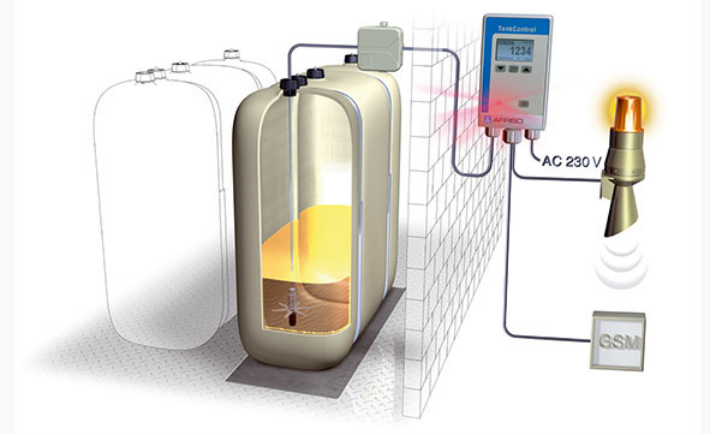


Fig. 5: Level measurement with one submersible probe

Fig. 6: Level measurement with detection of difference at battery tanks

4.7 Function

The submersible probe measures the hydrostatic pressure at the tank bottom and converts it into a voltage signal. The voltage signal is transmitted to the control unit.

The control unit calculates the content of the tank and displays the content in litres, m³, % or liquid level in mm.

A calculation of remaining range can be carried out on the basis of the consumption determination.

When the alarm switching point (for example, minimum or maximum level) is reached, the red LED lights solid and the audible alarm sounds.

In conjunction with an additional submersible probe (ZT), level differences in two tanks (for example, battery tanks) can be detected.

The optional floating probe (ZS) can be used for backflow alarms (for example, in rain water harvesting systems).

Voltage-free changeover contact

The voltage-free changeover contacts switch the alarm for additional equipment (for example, horn, warning light with rotating reflector).

4.8 Approvals, conformities, certifications

The product complies with:

- EMC Directive (2014/30/EU)
- Low Voltage Directive (2014/35/EU)
- RoHS Directive (2011/65/EU)

4.9 Technical specifications

4.9.1 Control unit

Parameter	Value
General specifications	
Dimensions housing (W x H x D)	100 x 188 x 65 mm
Weight	0.5 kg
Length of probe cable	15 m
Material	Plastic ABS
Pollution degree	2
Ambient conditions	
Ambient temperature operation	0 ... 45 °C
Ambient temperature storage	-5 ... 80 °C
Temperature of the medium	-5 ... 70 °C
Electrical data	
Supply voltage	AC 230 V ±10 %, 50/60 Hz
Nominal power	5 VA
Internal battery (integrated)	Lithium battery 3.6 V, Type LS 14500, Li-metal
Protection class (EN 60730-1)	II
Degree of protection (EN 60529)	IP 54
Rated impulse withstand voltage	2500 V
Additional connections	
Relay contacts	2 voltage-free changeover contacts
Breaking capacity relay output	Max. 230 V, 2 A
Relay fuse	T 2 A

4.9.2 Submersible probe

Parameter	Value
General specifications	
Dimensions (Ø x L)	24 x 53 mm
Weight	0.42 kg
Housing	Stainless steel 304
Diaphragm	Stainless steel 316 L
Seals	FKM (Viton)
Spacer	POM, PE
Length of probe cable	6 m
Pressure range	0 ... 400 mbar
Measuring accuracy*	< ± 0.5 %
Temperature error	< ± 0.3 % FSO, 10 K in compensated range 0 ... 70 °C
Ambient conditions	
Temperature of the medium	-5 ... 70 °C
Ambient temperature storage	-5 ... 70 °C
Electrical safety	
Degree of protection (EN 60529)	IP 68

*Accuracy of the complete system with reference to the indication of the liquid level in mm: ±1.5 % FSO, IEC 60770.

4.9.3 Floating probe

Parameter	Value
General specifications	
Dimensions (Ø x L)	24 x 85 mm
Weight	0.35 kg
Connection cable	Ölflex 2 x 0.5 mm²
Length of probe cable	5 ... 50 m (shielded)
Material probe body	Polypropylene
Housing	Brass
Ambient conditions	
Ambient temperature operation	-5 ... 50 °C
Ambient temperature storage	-5 ... 55 °C
Electrical safety	
Degree of protection (EN 60529)	IP 68

5 Mounting

NOTICE

INOPERABLE PRODUCT

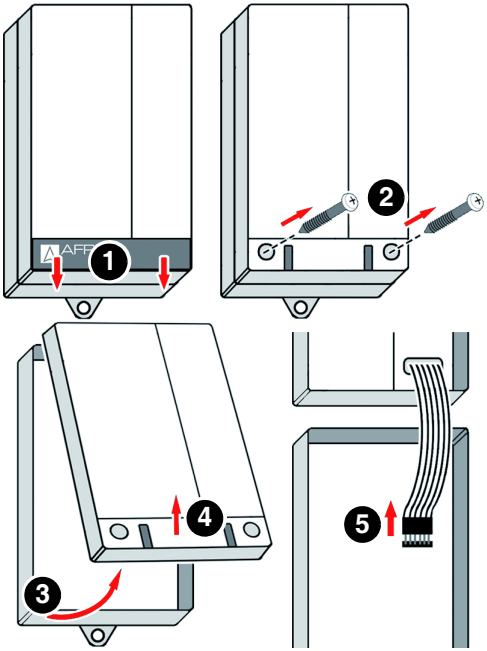
- Verify that the transparent hose of the pressure sensor is not closed or bent.

Failure to follow these instructions can result in equipment damage.

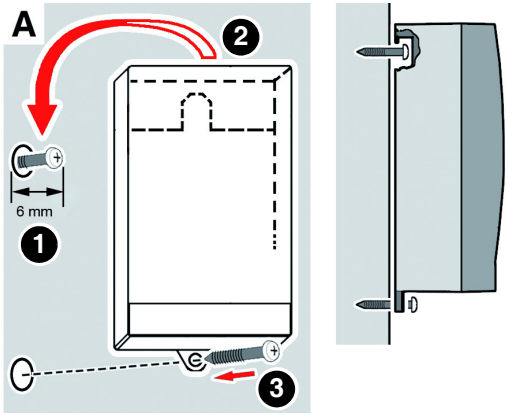
5.1 Mounting the control unit

- ⇨ Select a mounting position where the audible alarm signal can always be heard, even in the case of ambient noise. If audibility cannot be ensured, you must install an additional alarm unit at a suitable location.
- ⇨ Verify that the control unit is mounted to an even, rigid and dry wall at eye level.
- ⇨ Verify that the control unit is accessible and easy to oversee at all times.
- ⇨ Verify that the control unit is protected against water and splash water.
- ⇨ Verify that the control unit is protected from direct sunlight.
- ⇨ Verify that the the moisture-proof junction box is closed in such a way that it is water-tight.
- ⇨ Verify that the moisture-proof junction box is closed in such a way that it is **not** air-tight.

Mounting



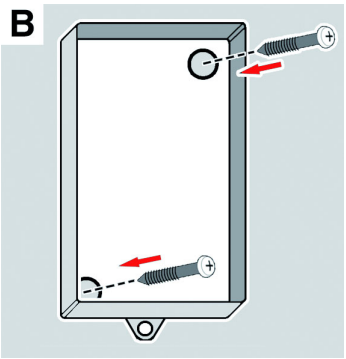
1. OPen the control unit.



2. Mount the housing to the wall using mounting type A or B. Use the housing as a drilling template.

Mounting type A

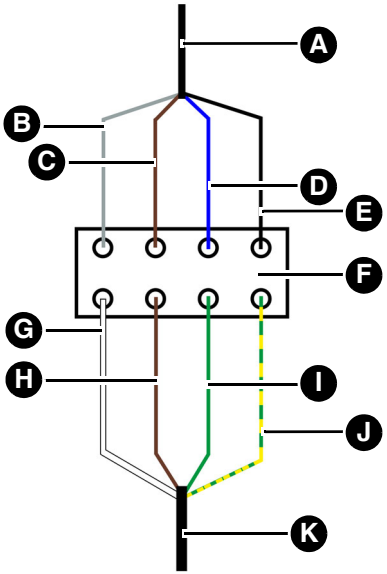
1. Mount the screw to the wall.
2. Fit the control unit.
3. Fasten the control unit by screwing the bottom lug to the wall.



Mounting type B

1. Drill two fixing holes with a Ø 5 mm into the base.
2. Mount the control unit to the wall with the enclosed screws.

3. Mount the moisture-proof junction box to the wall.
4. Route the cable of the the control unit into the moisture-proof junction box.
5. Mount the submersible probe (see "Mounting the submersible probe").
6. Route the cable of the submersible probe to the moisture-proof junction box.
7. Connect the cables using the terminal strip.



A. Cable from control unit
B. Grey (Vcc)
C. Brown (AGND)
D. Blue (signal)
E. Black (shield)
F. Terminal strip
G. White (UB+)
H. Brown (UB-)
I. Green (S+)
J. Green/yellow (shield)
K. Cable from submersible probe

Fig. 7: Connection terminal strip

8. Close the moisture-proof junction box.
9. Connect the supply voltage to the control unit (see "Electrical connection").

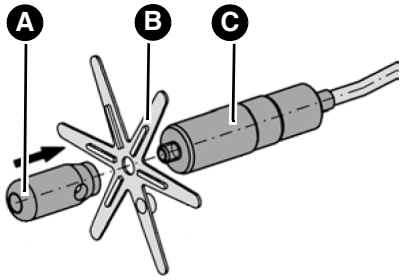
5.2 Mounting the submersible probe

NOTICE

INCORRECT MEASUREMENT RESULTS

- Verify that the submersible probe does not reach possible sludge accumulation at the bottom.

Failure to follow these instructions can result in equipment damage.

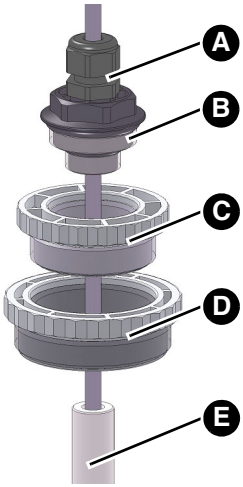


A. Spacer
B. Star
C. Pressure sensor

Fig. 8: Mounting the submersible probe

1. Plug the star onto the pressure sensor.
   - Verify that the ribs at the star fit.
2. Screw the spacer with the star onto the pressure sensor.

3. Select the threaded adapter (screw connector kit) suitable for the tank connection.



A) Cable gland for holding the measuring line
B) Connection thread (G½ and G1)
C) Threaded adapter (G1 to G1½)
D) Threaded adapter (G1½ to G2)
E) Bottom part

Fig. 9: Cable gland kit

4. Push the threaded adapter onto the cable.
   - Note the correct direction of the threaded adapter.
5. Perform zero calibration (see "Zero calibration of the submersible probe").
6. Push the submersible probe into the tank from the top.
7. Lower the submersible probe to the bottom of the tank.
8. At the cable gland, adjust the cable length of the probe cable in such a way that the spacer reaches the tank bottom.
   - Any volume of liquid below the the submersible probe is not detected by the submersible probe.
9. Tighten the threaded adapter so that the probe cable can no longer be moved
10. Determine the actual level (see "Displaying the level").

5.3 Mounting additional submersible probe (optional)

Mount the first submersible probe in the first tank and the second submersible probe in the last tank. Establish the electrical connection of the second submersible probe (see "Connecting an additional submersible probe (optional)").

5.4 Mounting the floating probe (optional)

The floating probe is mounted in such a way that it is suspended in the tank. The height at which the float switch of the floating probe is mounted corresponds to the alarm switching point.

1. Suspend the floating probe into the tank at the cable.
2. Fasten the cable of the floating probe with the enclosed G1 screw fitting at the height/level of the required alarm switching point.

5.5 Electrical connection

DANGER

ELECTRIC SHOCK

- Verify that the degree of protection against electric shock (protection class, double insulation) is not reduced by the type of electrical installation.
- Verify that the product is connected by means of a permanently installed cable connection (for example, NYM-J 2x1.5 mm²).

Failure to follow these instructions will result in death or serious injury.

DANGER

ELECTRIC SHOCK CAUSED BY LIVE PARTS

- Disconnect the mains voltage supply before performing the work and ensure that it cannot be switched on.
- Verify that no hazards can be caused by electrically conductive objects or media.

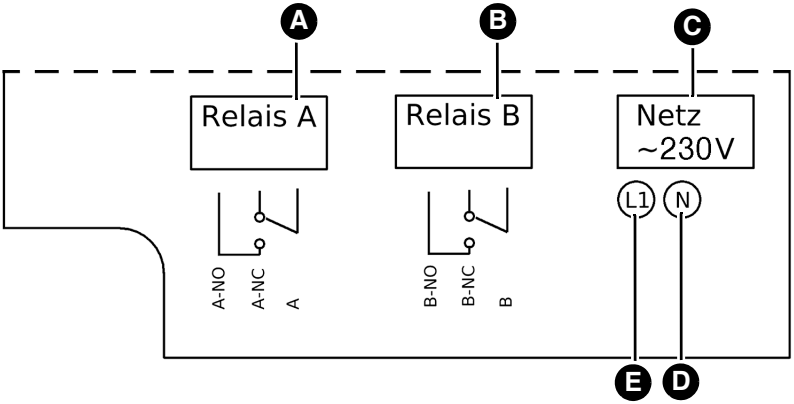
Failure to follow these instructions will result in death or serious injury.

NOTICE

ELECTROSTATIC DISCHARGE

- Always earth yourself before touching electronic components.

Failure to follow these instructions can result in equipment damage.



A. Probe 1
B. Probe 2 or floating probe
C. Supply voltage
D. Neutral conductor
E. Terminal L1

Fig. 10: Wiring diagram

NO	Relay - Normally Open	Not connected to terminal A at connection relay A or not connected to terminal B at connection relay B.
NC	Relay - Normally Closed	Connected to terminal A at connection relay A or connected to terminal B at connection relay B.

5.5.1 Power supply control unit

- Verify that the power supply to the control unit is separately fused (10 A maximum).

1. Route the mains cable through the right cable gland into the control unit.
2. Connect the phase to terminal L1 (F).
3. Connect the neutral conductor (E).

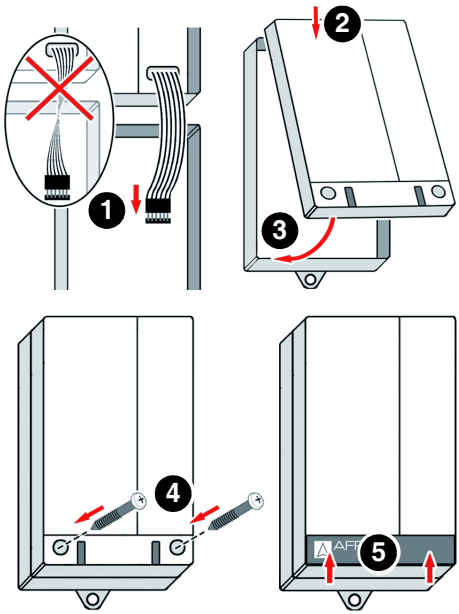


Fig. 11: Connecting the control unit

4. Grease the seal with the enclosed grease.
5. Close the control unit.
   - Verify that the lower part of the housing and the upper part of the housing are correctly mounted.

6. Switch on the on-site power supply.

5.5.2 Connecting an additional submersible probe (optional)

1. Route the probe cable through the centre cable gland into the control unit.
2. Connect the probe cable to "Sensor2" as follows:
   - yellow/green to terminal "Shield"
   - green to terminal "Signal"
   - brown to terminal "AGND"
   - white to terminal "Vcc"
3. Enable the additional probe in the software of the control unit (see "Setting the password").

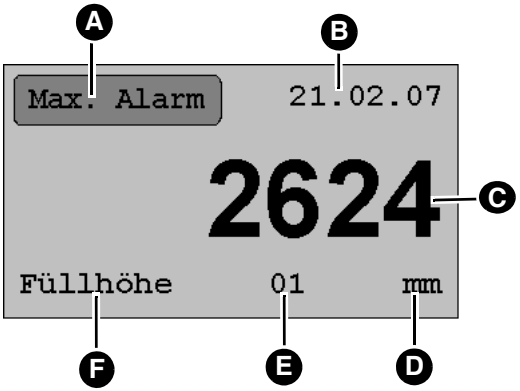
5.5.3 Connecting the floating probe (optional)

1. Route the probe cable through the centre cable gland into the control unit.
2. Connect the probe cable to "Sensor2" as follows:
   - Terminal "Signal"
   - Terminal "AGND"
3. Enable the probe in the software of the control unit (see "Setting the password").

6 Commissioning

⇨ Verify that the product has been properly mounted and electrically connected.

6.1 Commissioning the product



A. State indication:
- Max. alarm
- Sensor?
- Min. alarm
- Diff. Alarm
- Schw. alarm

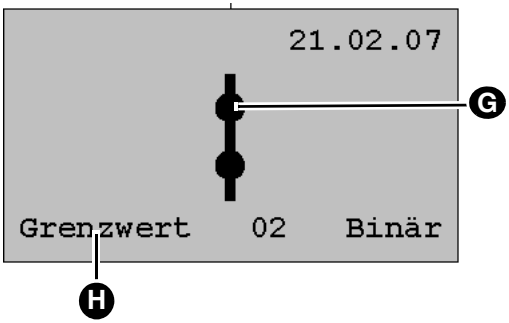
B. Date
- DD/MM/year

C. Measured value

D. Unit

E. Number of probe:
- 01
- 02

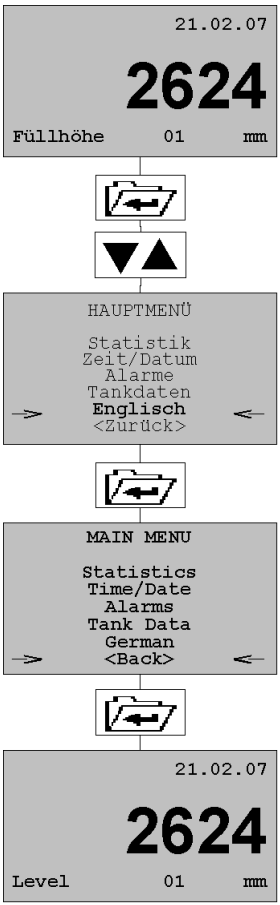
F. Measured variable:
- Liquid level
- Level



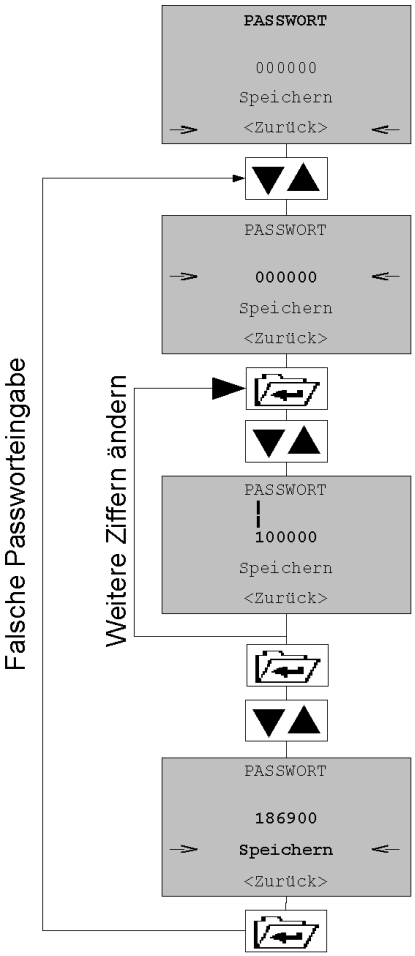
G. Changeover contact

H. Alarm

6.2 Adjusting the language



6.3 Setting the password

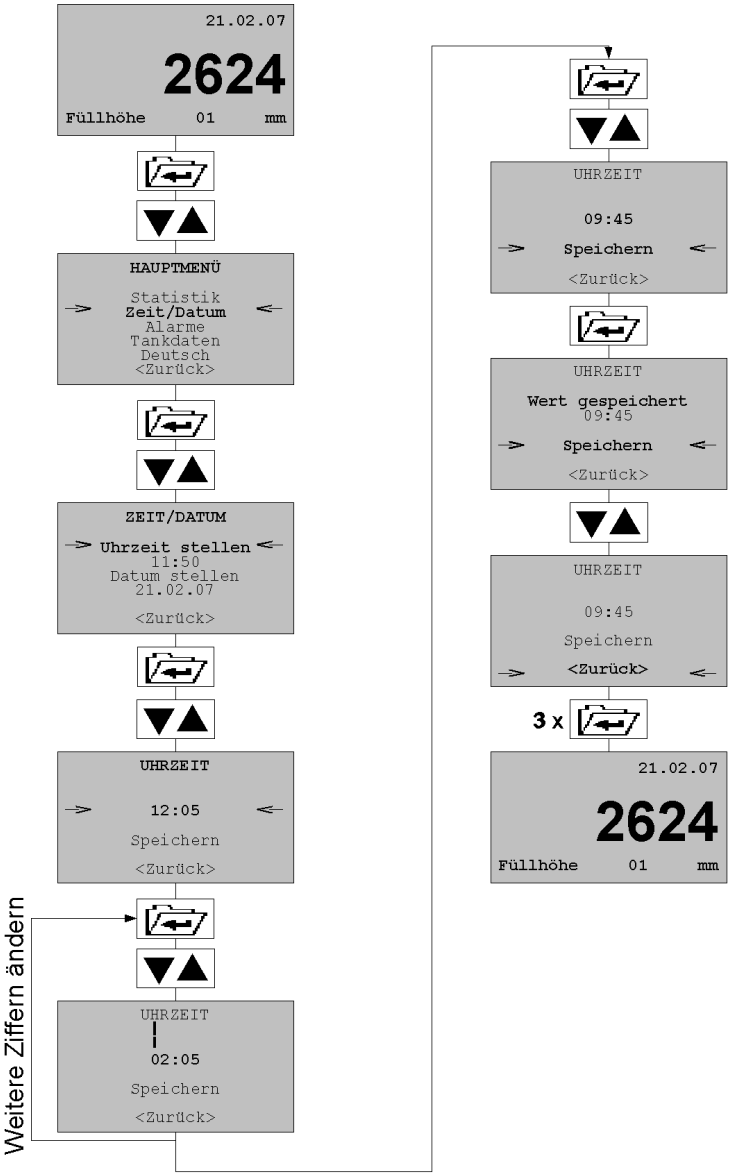


See chapter "Passwords" for possible passwords.

6.3.1 Passwords

Releasing settings:	186900
Additional submersible probe (ZT):	726452
Additional floating probes (ZS):	234585
Deactivating the additional probe:	426458
Resetting the device to the factory settings:	153462

6.4 Setting date and time



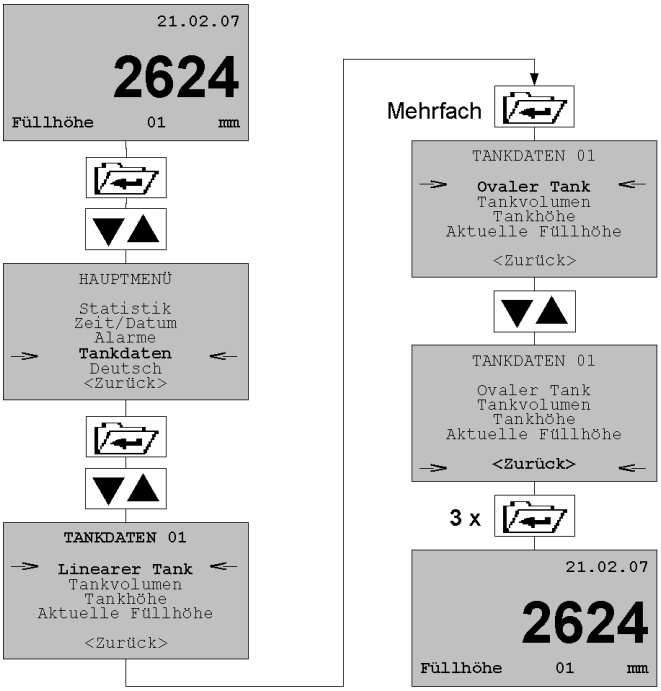
6.5 Setting the tank data

If you use a floating probe, you do not have to set tank data.

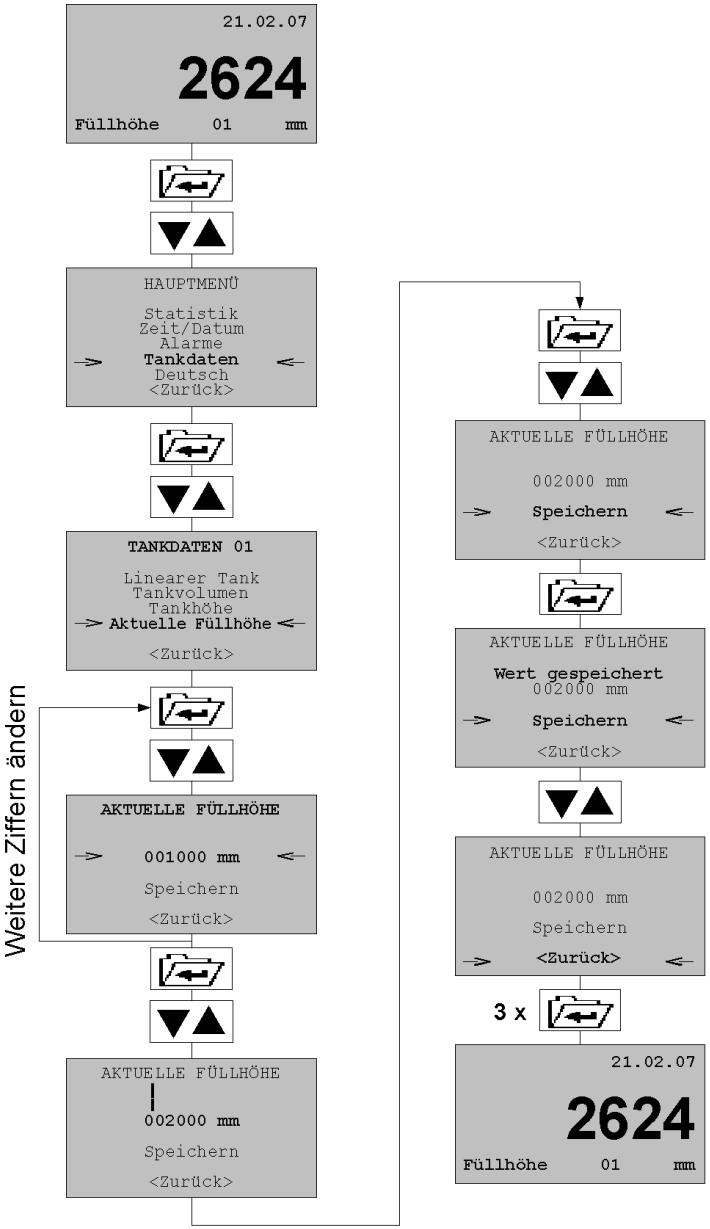
6.5.1 Selecting the tank shape

You can select one of the following tank shapes:

- Plastic battery tank
- Linear tank
- Cylindrical tank
- Spherical tank
- Cylindrical horizontal tank
- Plastic tank with recess
- Hemispherical tank

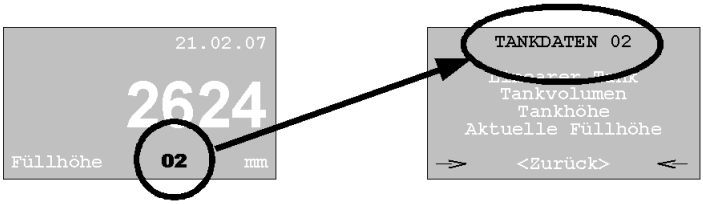


6.5.2 Setting the tank volume, tank height and liquid level



6.5.3 Setting the liquid level for submersible probe 2

1. Display the menu "**Tankdaten 02**".



2. Proceed as described in chapter "Setting the tank volume, tank height and liquid level".

6.6 Zero calibration of the submersible probe

⇨ Verify that the submersible probe is in air.

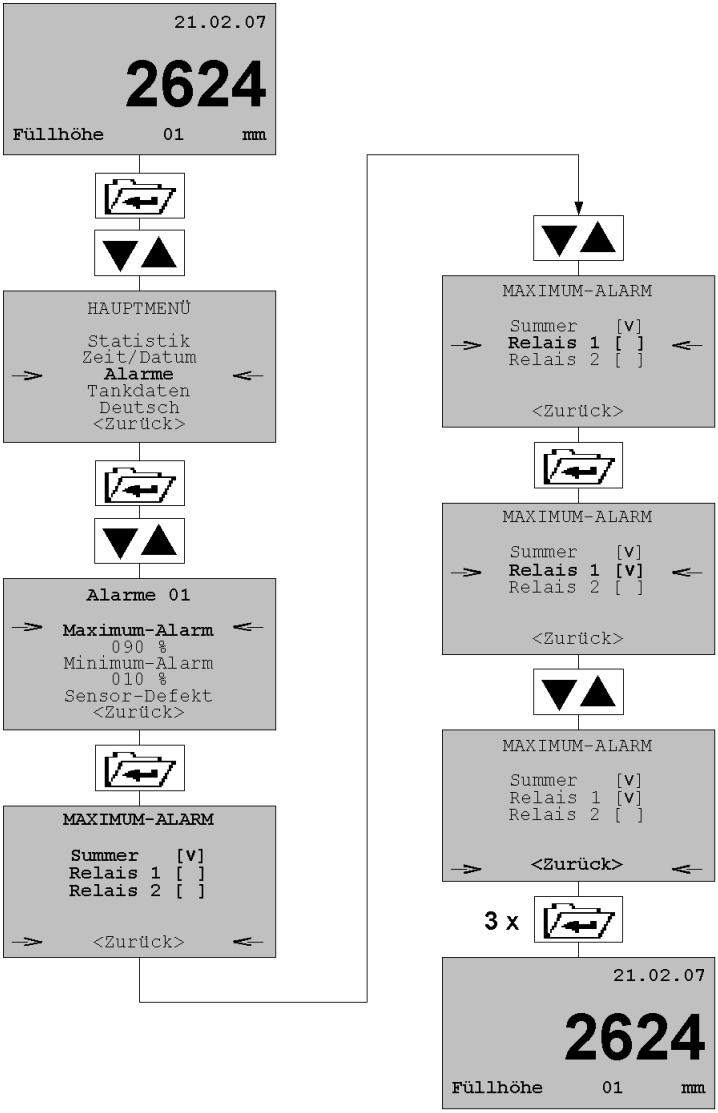
⇨ Verify that the submersible probe is connected to the control unit.

⇨ Verify that mains voltage is connected and switched on.

1. Set the value "Current level" to the value "000000 mm²“ (see "Setting the tank volume, tank height and liquid level").
2. The zero point of the submersible probe has been saved.

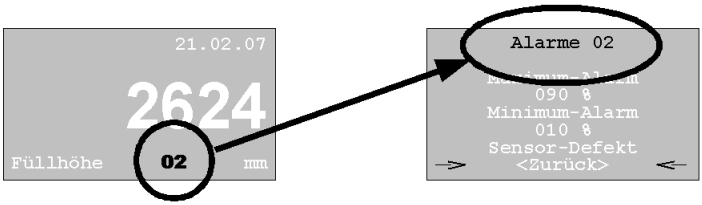
6.7 Adjusting the alarm

6.7.1 Setting the buzzer and changeover contact for submersible probe 1



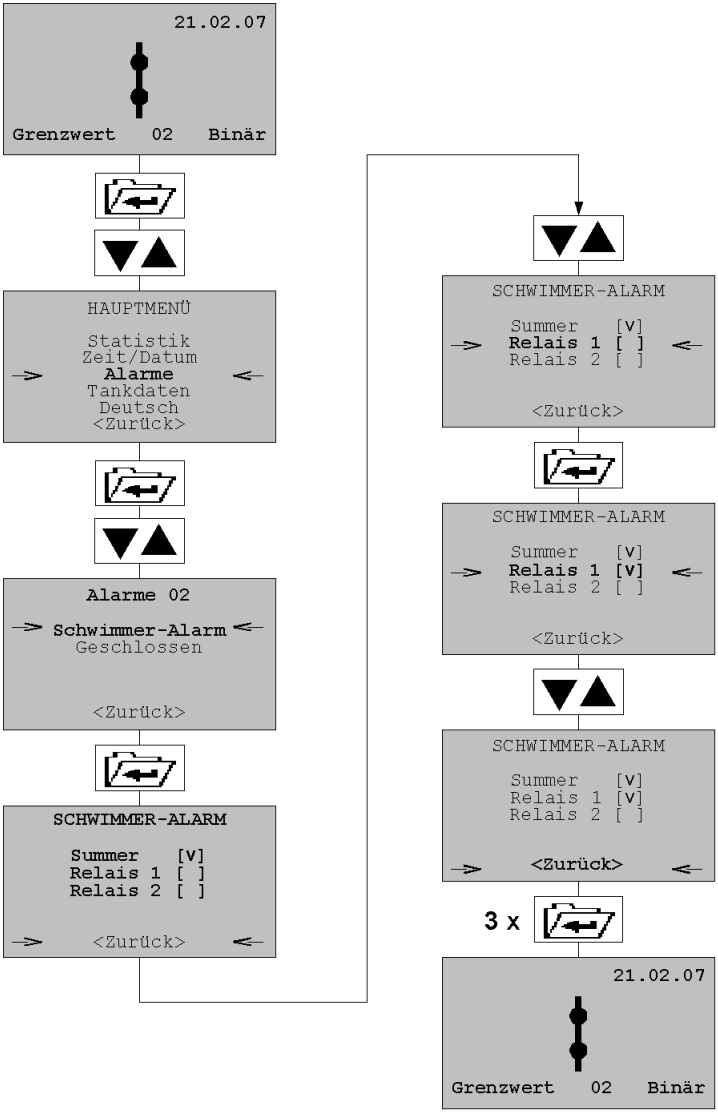
6.7.2 Setting the buzzer and changeover contact for submersible probe 2

1. Display the menu "**Alarme 02**".

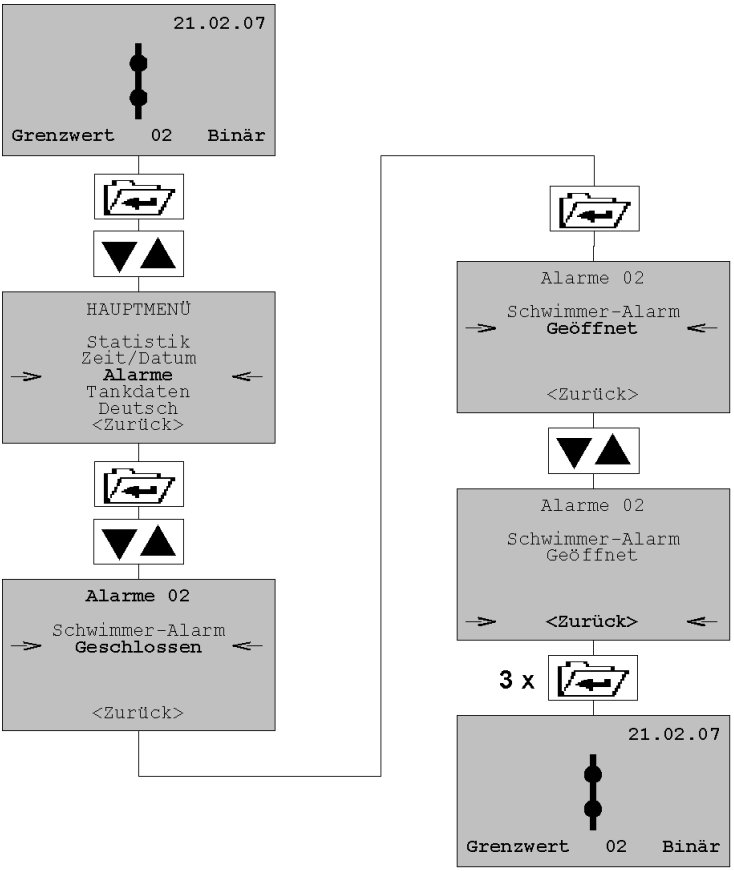


2. Proceed as described in chapter "Setting the buzzer and changeover contact for submersible probe 1".

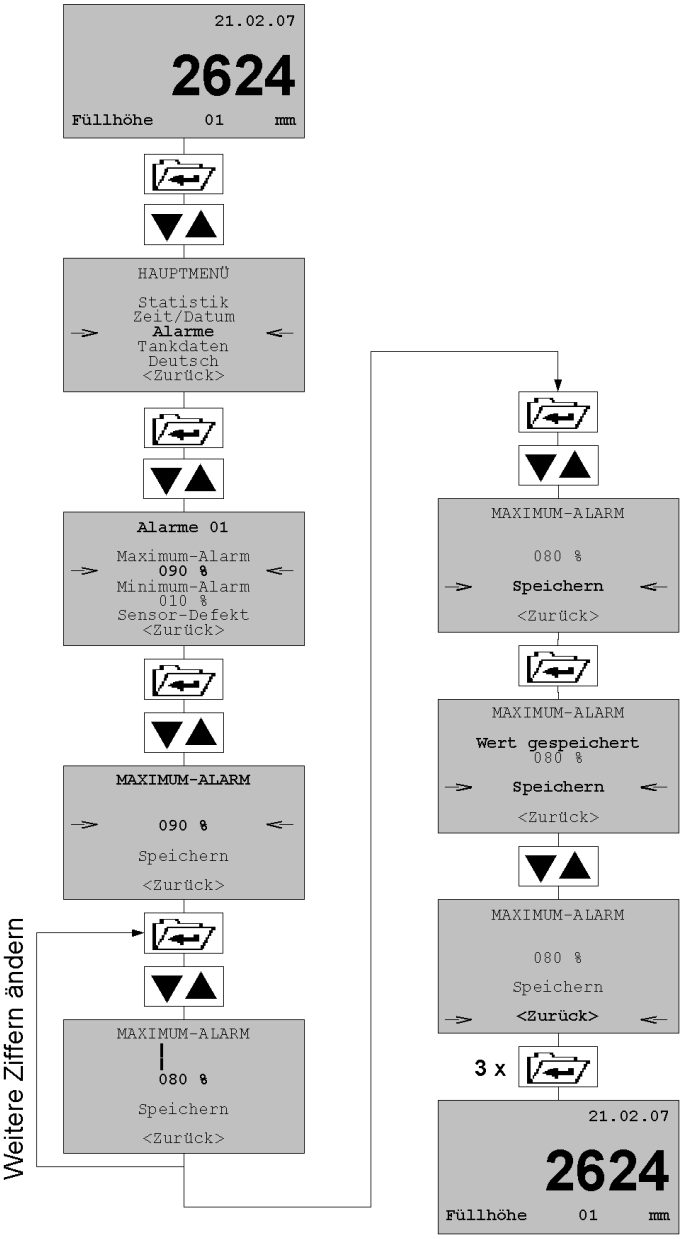
6.7.3 Setting the buzzer and the changeover contact for the floating probe



6.7.4 Setting the alarm switching point for the floating probe



6.7.5 Setting the alarm switching point for submersible probe 1

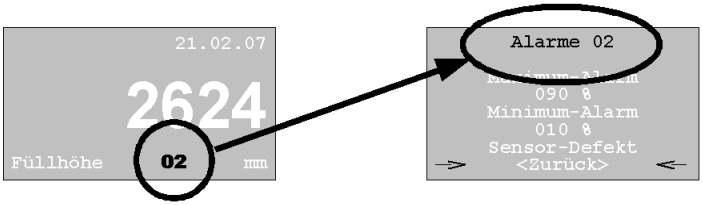


6.7.6 Setting the alarm switching point for differential alarm

The percentage relates to the tolerated difference between the two liquid levels.

- If the difference is exceeded, an alarm is triggered

1. Display the menu "**Alarme 02**"



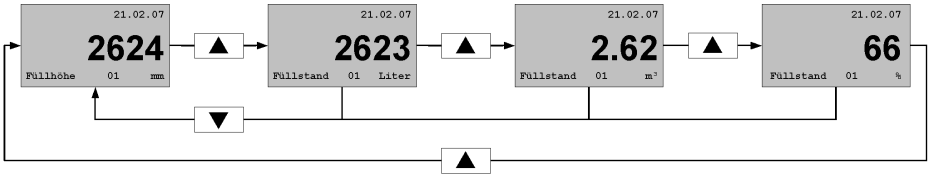
2. Proceed as described in chapter "Setting the alarm switching point for the floating probe".

7 Operation

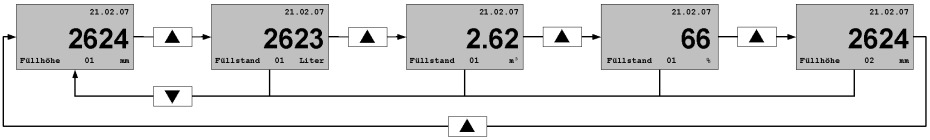
The display backlight is switched off 5 minutes after the last time a key was pressed.

7.1 Displaying the level

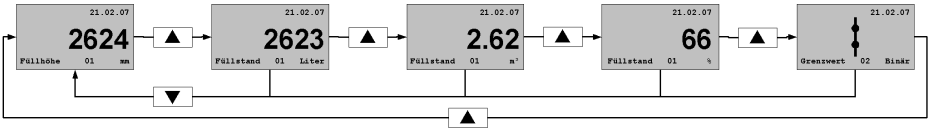
7.1.1 With one submersible probe



7.1.2 With two submersible probes

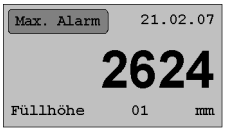


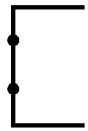
7.1.3 With floating probe



7.2 Alarm

The voltage-free changeover contact switches in the case of an alarm.



\+  \+  \+ 

Alarm message on screen

LED is on

Audible alarm (if set)

Relay is energised (if set)

1. Press the Acknowledge key to mute the audible alarm.
   - The alarm acknowledgement menu is displayed.

2. Acknowledging the relay

[ ] Relay is **not** energised and does not need to be acknowledged.

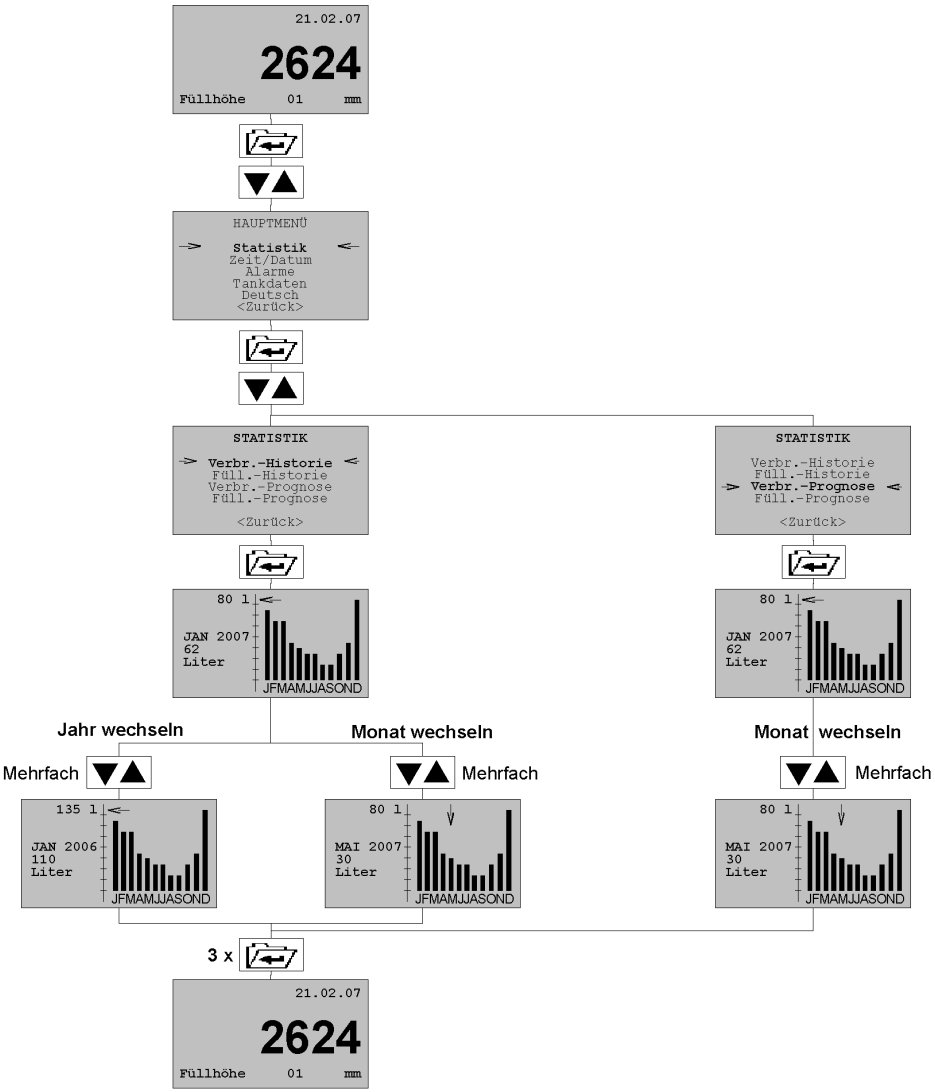
[x] Relay is energised and can be acknowledged.

[v] Relay has been acknowledged.

7.3 Statistics

With the statistics function, the consumption and the level can be displayed as a history or as a forecast.

- The statistics is refreshed every first day of the month.



7.3.1 History

The history shows the consumption within a year in litres (last 5 calendar years maximum).

⇨Verify that you are in the menu January.

1. Press the arrow up or arrow down keys to choose between the consumption data of the past years.

7.3.2 Forecast

The forecast is calculated based on the saved consumption and level data of the last 12 months. It shows the expected consumption for the coming period (up to a maximum of 12 months) in litres.

- The forecast function is not available until one year after commissioning.
- If the forecast function is activated during the first year, the system displays the date as of which the forecast is available (DD.MM.YY).

8 Maintenance

The product is maintenance-free.

8.1 Use in flood hazard areas

The floating probe is suitable for use in flood hazard areas; it is watertight up to 10 mH_2O (1 bar pressure).

9 Troubleshooting

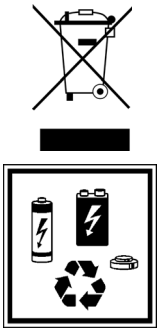
Any malfunctions that cannot be removed by means of the measures described in this chapter may only be repaired by the manufacturer.

Problem	Possible reason	Repair
Display does not show anything	No mains voltage	Apply mains voltage
	Mains fuse defective	Replace the mains fuse
Red LED is on	Alarm condition	Remove the cause of the alarm
	Line interruption in the probe cable	Check the probe cable
Incorrect level indication	Incorrect tank data entered	Enter the tank data again
Other malfunctions	-	Contact the AFRISO service hotline

10 Decommissioning, disposal

Dispose of the product in compliance with all applicable directives, standards and safety regulations.

Electronic components must not be disposed of together with the normal household waste.



1. Disconnect the product from the supply voltage.
2. Dismount the product (see "Mounting", reverse sequence of steps).
3. Dispose of the product.

Information on the PCB

The battery is permanently installed on the PCB and cannot be removed.

10.1 Information on handling of batteries

DANGER

EXPLOSION, FIRE OR TOXIC SUBSTANCES

Incorrect handling of lithium batteries can cause hazards.

- Observe the information on handling lithium batteries in this chapter.

Failure to follow these instructions will result in death or serious injury.

- Do not subject batteries to mechanical stress.
- Never throw batteries into fire.
- Comply with the specified ambient conditions (see "Technical specifications").
- Do not use damaged, deformed or hot batteries.

11 Returning the device

Get in touch with us before returning your product (service@afriso.de).

12 Warranty

See our terms and conditions at www.afriso.com or your purchase contract for information on warranty.

13 Spare parts and accessories

NOTICE

UNSUITABLE PARTS

- Only use genuine spare parts and accessories provided by the manufacturer.

Failure to follow these instructions can result in equipment damage.

Product

Product designation	Part no.	Figure
TankControl 10	52151	

Spare parts and accessories

Spare parts and accessories

Product designation	Part no.	Figure
Additional probe for differential level measurement TankControl 10	52152	
Submersible probe DIT 10/TankControl 10 >SP<	52153	
Floating probe (ZS)	16703	
Junction box	31824	
Cable gland kit	52125	
Additional alarm unit ZAG 01	40633	
Warning light with rotating reflector	61015	
Horn KH 1	61011	
Combined alarm light and horn	61020	
Horn HPW 2	61012	