Mess-, Regel- und
Überwachungsgeräte
für Haustechnik,
Industrie und Umweltschutz

Lindenstraße 20
74363 Güglingen

Telefon: +49 7135-102-0
Service: +49 7135-102-211
Telefax: +49 7135-102-147

info@afriso.de
www.afriso.com

Operating instructions

Level switches
Minimelder, Maximelder

Minimelder-R (with relay)
Maximelder-R (with relay)

+ Read instructions before using product!
+ Observe all safety information!
+ Keep instructions for future use!

06.2016 0
854.001.0206

Table of contents

1 This instruction manual 4
1.1 Precautions 4
2 Safety 5
2.1 Intended use 5
2.2 Predictable incorrect application 5
2.3 Safe handling 6
2.4 Staff qualification 6
2.5 Modifications to the product 6
2.6 Usage of spare parts and accessories 6
2.7 Liability information 7
3 Product description 7
3.1 Function 9
3.2 Operating modes 11
3.3 Application examples 11
4 Technical specifications 12
4.1 Approvals, tests and conformities 14
5 Transport and storage 14
6 Mounting and commissioning 15
6.1 Mounting the control unit 15
6.2 Mounting the probe 17
6.3 Electrical connection 18
6.4 Retrofitting an EnOcean® wireless module (optional) 20
6.5 Teaching in the EnOcean® wireless module (optional) 22
7 Operation 22
7.1 Commissioning the product 23
7.2 Function test 23
8 Maintenance 24
8.1 Maintenance times 24
8.2 Maintenance activities 24
9 Suitability for use in flood hazard areas 25
10 Troubleshooting 25
11 Decommissioning, disposal 26
12 General information on EnOcean® wireless 27
12.1 Range of EnOcean® wireless 27
12.2 Additional information on EnOcean® wireless systems 30
12.3 Features of the EnOcean® technology 30

13 Spare parts and accessories 31
14 Warranty 31
15 Copyright 31
16 Customer satisfaction 31
17 Addresses 31

1 This instruction manual

This instruction manual is part of the product.

- ▶ Read this manual before using the product.
- ▶ Keep this manual during the entire service life of the product and always have it readily available for reference.
- ▶ Always hand this manual over to future owners or users of the product.

1.1 Precautions

WARNING TERMType and source of the danger are shown here.

- ▶ Precautions to take in order to avoid the danger are shown here.

There are three different levels of warnings:

Warning term	Meaning
DANGER	Immediately imminent danger! Failure to observe the information will result in death or severe injuries.
WARNING	Possibly imminent danger! Failure to observe the information may result in death or severe injuries.
CAUTION	Dangerous situation! Failure to observe the information may result in minor or severe injuries as well as damage to property.

2 Safety

2.1 Intended use

Minimelder/Maximelder may only be used to signal minimum levels and maximum levels in tanks containing liquids.

Minimelder/Maximelder may only be used for the following liquids:

- Water
- Fuel oil EL, L or M
- Oil/water mixtures

and comparable liquids (not AI,AII !) with equivalent viscosity if these liquids are compatible with the following wetted parts:

- Plastic: polypropylene
- Cable: Oilflex 100, resistant to acids, lye and oils
- O ring: NBR (SH 70)
- Weight/screw connection: Brass

Any use other than the application explicitly permitted in this instruction manual is not permitted.

2.2 Predictable incorrect application

Minimelder/Maximelder must never be used in the following cases:

- Hazardous area (Ex)
  If the product is operated in hazardous areas, sparks may cause deflagrations, fires or explosions.

2.3 Safe handling

This product represents state-of-the-art technology and is made according to the pertinent safety regulations. Each product is subjected to a function and safety test prior to shipping.

- ▶ Operate the product only when it is in perfect condition. Always observe the operating instructions, all pertinent local and national directives and guidelines as well as the applicable safety regulations and directives concerning the prevention of accidents.

WARNING

Severe burns or death caused by mains voltage (AC 230 V, 50 Hz) in the control unit.

- ▶ Do not expose the control unit to water.
- ▶ Disconnect the mains voltage supply before opening the control unit or before performing maintenance and cleaning work and make sure it cannot be switched on.
- ▶ Do not tamper with the control unit in any way whatsoever.

2.4 Staff qualification

The product may only be mounted, commissioned, operated, maintained, decommissioned and disposed of by qualified, specially trained staff.

Electrical work may only be performed by trained electricians and in compliance with all applicable local and national directives.

2.5 Modifications to the product

Changes or modifications made to the product by unauthorised persons may lead to malfunctions and are prohibited for safety reasons.

2.6 Usage of spare parts and accessories

Usage of unsuitable spare parts and accessories may cause damage to the product.

- ▶ Use only genuine spare parts and accessories of the manufacturer (see chapter 13, page 31).

2.7 Liability information

The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe the technical instructions, guidelines and recommendations.

The manufacturer or the sales company shall not be liable for costs or damages incurred by the user or by third parties in the usage or application of this product, in particular in case of improper use of the product, misuse or malfunction of the connection, malfunction of the product or of connected products. The manufacturer or the sales company shall not be liable for damage whatsoever resulting from any use other than the use explicitly permitted in this instruction manual.

The manufacturer shall not be liable for misprints.

3 Product description

Minimelder/Maximelder consists of a control unit and a probe. The control unit and the probe are connected by means of a two-wire signal cable.

Minimelder triggers an alarm when the probe is no longer submerged. Maximelder triggers an alarm when the probe is submerged.

Probe

The probe consists of a float switch in which a moving magnet switches a contact. The magnet is embedded in a float. The float moves up when the probe is submerged in a liquid. The factory setting of the magnet in the float causes Minimelder to switch when the probe is no longer submerged and Maximelder to switch when the probe is submerged.

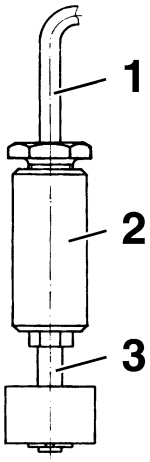


Fig. 1: Probe

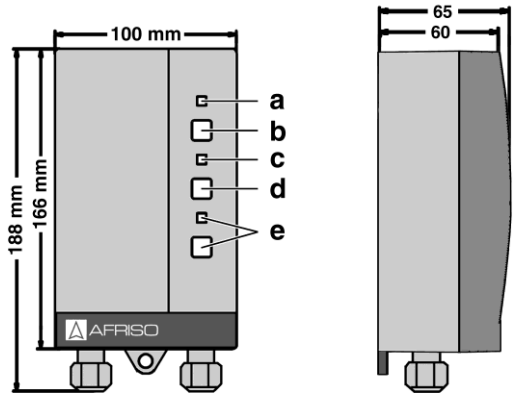
1 Signal cable

2 Brass weight

3 Float switch

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 converting the probe signal into a digital output signal. In the case of Minimelder-R and Maximelder-R, the output signal is available as a voltage-free relay contact (normally open contact).



a Green pilot lamp
b Test button
c Red alarm lamp
d Acknowledge button
e Without function

Fig. 2: Control unit

3.1 Function

When power is supplied, the green pilot lamp indicates that the product is ready for operation. If no alarm is present, you can press the Test button at the control unit to simulate an alarm. The audible alarm can be acknowledged with the Acknowledge button in the case of an alarm. The red alarm lamp remains on as long as the alarm condition persists.

Minimelder

If the probe of Minimelder is not submerged in liquid, the alarm buzzer and the red alarm lamp are activated. If the probe is submerged in liquid, the alarm buzzer and the red alarm lamp are deactivated

Minimelder-R is equipped with a voltage-free relay contact which closes when an alarm is triggered.

Maximelder

If the probe of Maximelder is submerged in liquid, the alarm buzzer and the red alarm lamp are activated. At the same time, the voltage-free relay contact closes. If the probe is not submerged in liquid, the alarm buzzer and the red alarm lamp are deactivated and the relay contact opens.

Maximelder is only available with a relay.

Control unit

The control unit continuously monitors the electrical resistance between the two electrodes of the probe. The green pilot lamp lights up when the device is ready for operation. If the probe resistance is less than 5 kΩ, there is no alarm condition: The red alarm lamp is off, the relay is:

- De-energised (in the operating mode Eco)
- Energised (in the operating mode FailSafe)

If the resistance is greater than 5 kΩ, an alarm condition, i.e. a leak has been detected by the control unit: The red alarm lamp and the audible alarm are on and the relay is:

- Energised (in the operating mode Eco)
- De-energised (in the operating mode FailSafe)

The audible alarm can be muted with the "Acknowledge" button in the case of an alarm.

No alarm is triggered in case of a power failure. When mains power is available again, the product immediately resumes operation. If a leak has occurred in the meantime, this is signalled.

The green pilot lamp lights up as soon as Minimelder-R and Maximelder-R are supplied with mains voltage. The Test button allows you to simulate an alarm condition in order to perform a function check.

Products with EnOcean® wireless module

In the case of an alarm, the wireless module transmits the alarm message via EnOcean® wireless technology in addition to the visual and audible signals.

3.2 Operating modes

Eco:

Minimelder-R and Maximelder-R are equipped with an output relay to transmit the alarm signal to additional external equipment. If no error condition is present, the relay is de-energised; in case of an alarm, the relay is energised.

FailSafe:

Minimelder-R and Maximelder-R are equipped with an output relay to transmit the alarm signal to additional external equipment. If no error condition is present, the relay is energised; in case of an alarm, the relay is de-energised.

Minimelder-R and Maximelder-R can be operated with or without additional external equipment.

- Visual and audible alarms
- Remote alarm equipment
- Building control systems, etc.

3.3 Application examples

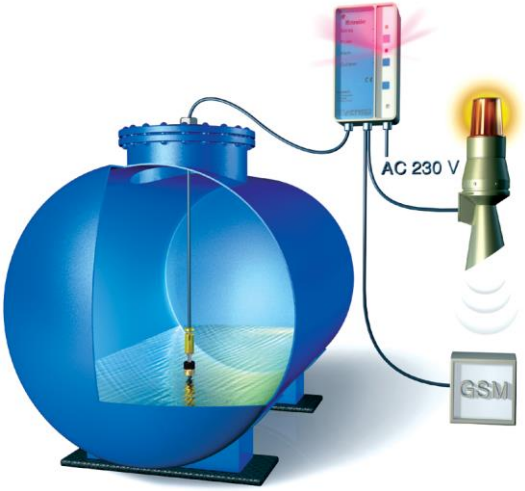


Fig. 3: Standard application Minimelder-R

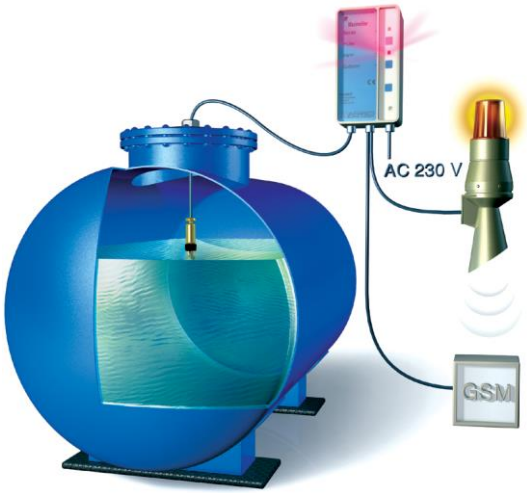


Fig. 4: Standard application Maximelder-R

4 Technical specifications

Table 1: Technical specifications probe

Parameter	Value
General specifications	
Dimensions (Ø x L)	24 x 85 mm
Weight	0.35 kg
Material probe housing	Polypropylene
Material probe weight	Brass
Resistance	Water, oils
Connection cable: Standard length Max. length	Oilflex 2 x 0.5 mm² 5 m 50 m (shielded)
Operating temperature range	
Ambient	-5 °C to +50 °C
Storage	-10 °C to +60 °C
Supply voltage	
Probe voltage	Max. 17 V, AC

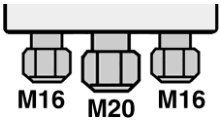
Parameter	Value
Electrical safety	
Degree of protection	IP 68 (EN 60529)

Table 2: Technical specifications control unit

Parameter	Value
General specifications	
Dimensions housing (W x H x D)	100 x 188 x 65 mm
Weight	0.4 kg
Response delay	< 1 second
Additional connections	1 output relay (1 changeover contact)
Breaking capacity output relay	Max. 250 V, 2 A, resistive load
Relay fuse	T 2 A
Emissions	The A-evaluated sound level of the audible alarm is at least 70 dB(A) at a distance of one metre.
Operating temperature range	
Ambient	-5 °C to +50 °C
Supply voltage	
Nominal voltage	AC 230 V ± 10 %, 50/60 Hz
Nominal power	5 VA
Mains fuse	T 100 mA H (1.5 kA)
Electrical safety	
Protection class	II (EN 60730-1)
Degree of protection	IP 30 (EN 60529)
Electromagnetic compatibility (EMC)	
Interference	EN 60730-1:2011
Noise immunity	EN 60730-1:2011
EnOcean® wireless	

Parameter	Value
Frequency	868.3 MHZ
Transmission power	Max. 10 mW
Range	See chapter 12.1, page 27.
EnOcean Equipment Profile (EEP)	A5-30-04
Telecommunications Directive 1999/5/EC	EN 301489-3, EN 300220-1, EN 300220-2, EN 50371

Cable glands at control unit



The centre rubber piece can be replaced with a cable gland M20.

Cable gland	Cable diameter
M16	4.0-8.8 mm
M20	8.0-12.5 mm

4.1 Approvals, tests and conformities

Minimelder/Maximelder complies with the EMC Directive (2014/30/EU), the Low Voltage Directive (2014/35/EU) and the RoHS- Directive (2011/65/EU).

Minimelder/Maximelder with EnOcean® wireless module also complies with the Telecommunication Directive 1999/5/EC.

5 Transport and storage

CAUTION **Damage to the product due to improper transport.**

- ▶ Do not throw or drop the product.
- ▶ Protect the product from wetness, humidity, dirt and dust.

CAUTION **Damage to the product due to improper storage.**

- ▶ Store the product in a clean and dry environment.
- ▶ Only store the product within the permissible temperature range, see chapter 4, page 12.
- ▶ Protect the product from wetness, humidity, dirt and dust.

6 Mounting and commissioning

☑ Do not install the control unit and the probe in hazardous areas (EX areas).

6.1 Mounting the control unit

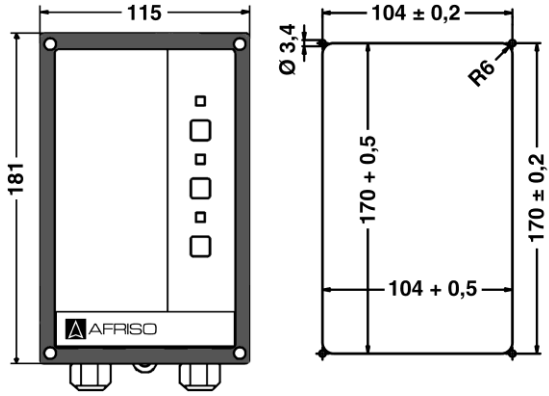


Fig. 5: Control unit with mounting frame for panel mounting; right: control panel cut out

☑ Mount the control unit to an even, rigid and dry wall at eye level.

☑ The control unit must be accessible and visible at all times.

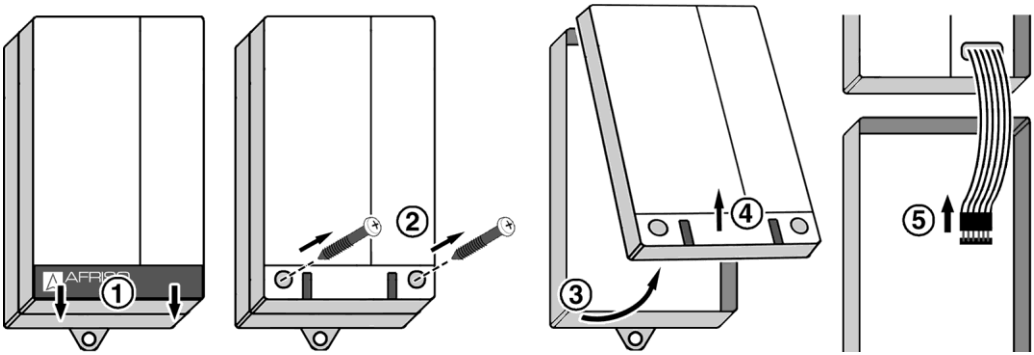
☑ The control unit must not be exposed to water or splash water.

☑ The control unit must not be installed in damp rooms.

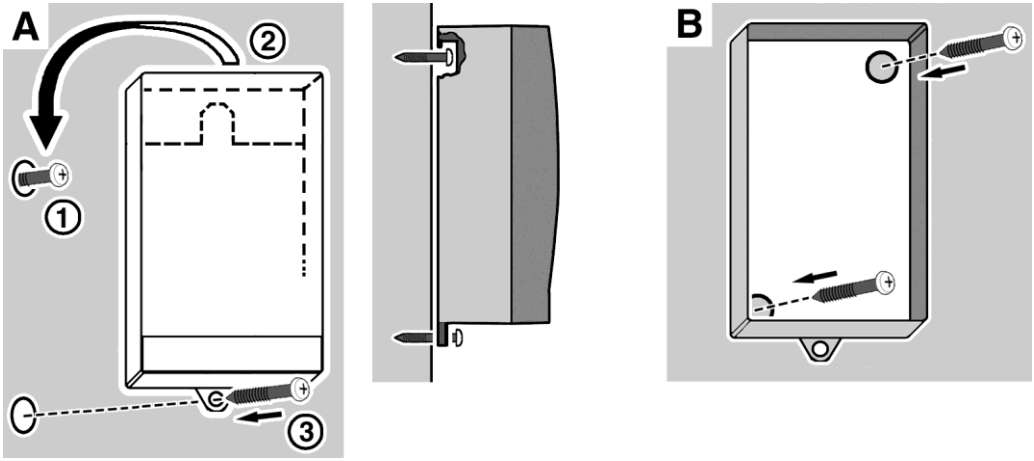
☑ The permissible ambient temperature at the control unit must not be exceeded, see table 2, page 13.

☑ Protect the control unit from direct atmospheric influences if it is installed outdoors.

1. Open the control unit.



2. Mount the control unit to the wall (**A** or **B**).



A **1** Mount the screw to the wall.

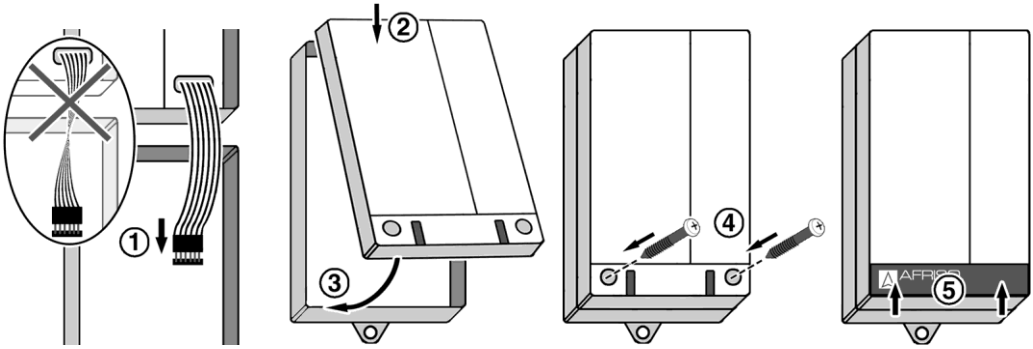
2 Fit the control unit.

3 Fixate the control unit by screwing the bottom lug to the wall.

B Drill the fixing holes in the bottom part with a Ø 5 mm drill.

Mount the bottom part to the wall with the screws shipped with the unit.

3. Connect the unit electrically, see chapter 6.3, page 18.
4. Close the control unit.



6.2 Mounting the probe

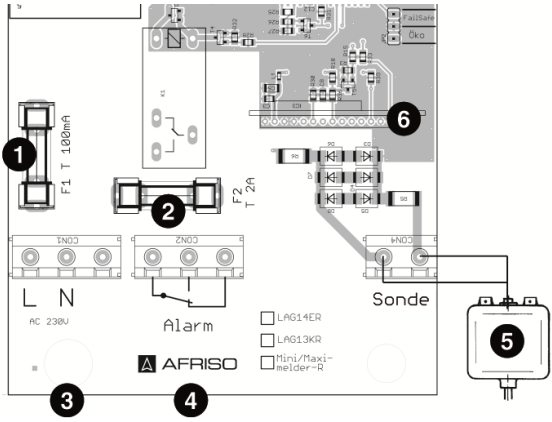
- ▶ Mount the probe in such a way that it is suspended at the height/level of the required switching point.
- ▶ The probe can be fastened by means of the enclosed G 1" screw connector. The probe weight ensures that the probe is suspended vertically in the liquid.

6.3 Electrical connection

☑ Mains voltage is interrupted and cannot be switched on.

Observe the VDE regulations, the pertinent regulations concerning the prevention of accidents, the operating instructions for the leak detector and the container (tank) as well as all other applicable national and local regulations.

Connect the control unit directly to the 230 V supply mains without a switch and without a plug.



1 Mains fuse F1

2 Relay fuse F2

3 Mains voltage

4 Relay for additional alarm

5 Probe

6 Female connector for EnOcean® wireless module

Fig. 6: Electrical connection

Power supply

Connect Minimelder/Maximelder to mains by means of a permanently installed cable such as NYM-J 3 x 1.5 mm².

1. Route the mains cable through the right cable gland into the control unit.
2. The phase must be connected to terminal L1, the neutral conductor to terminal N.
3. Use a separate fuse as per EN 60127-2 for the cable to the control unit (nominal rating 10 A, breaking capacity at least 1.5 kA).

Probe

- ▶ If the control unit and the container to be monitored are mounted next to each other, the signal cable can be directly connected to the control unit.
- ▶ Standard shielded cable 2 x 0.5 mm² can be used to extend the probe cable. The maximum length of the extension cable is 50 m.
- ▶ Do not route the probe cable next to mains cables; danger of interference.

- ▶ Protect the signal cable from damage; use a metal pipe, if required.
- ▶ Route the signal cable from the probe through the left cable gland into the control unit and connect it to the 2-pole terminal with the designation "Probe" in the control unit. You do not have to ensure a specific polarity.

Output

The output signal of Minimelder-R and Maximelder-R leak detector is made available via a voltage-free relay contact (normally open contact). If no error condition is present, the relay is de-energised; in case of an alarm, the relay is energised. The relay contact is fused with a T 2 A fuse (slow-blow).

Minimelder is not equipped with an output relay.

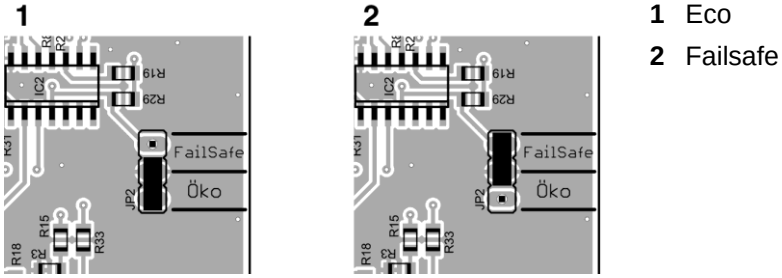
CAUTION

Electrical systems may be considerably impacted and the switching contact may be destroyed by voltage peaks when inductive consumers are switched off.

- ▶ Use commercially available standard RC combinations such as 0.1 µF/100 Ohm for inductive consumers.

Setting the operating mode Eco/failsafe

- ▶ Set the jumper as required:



1 Eco

2 Failsafe

Fig. 7: Jumper

Table 3: Operating mode

Operating mode	Normal operation	Alarm condition
Eco	Relay de-energised.	Relay energises
Failsafe	Relay energised	Relay de-energises

6.4 Retrofitting an EnOcean® wireless module (optional)

☑ Disconnect Minimelder-R/Maximelder-R from mains voltage.

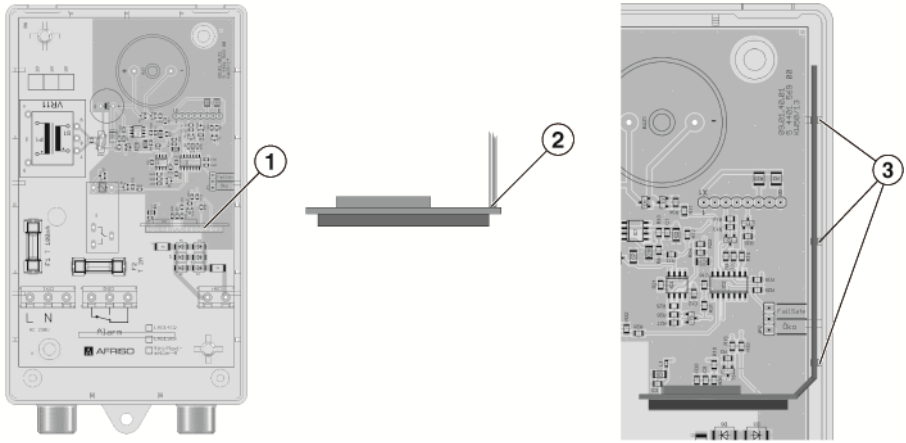
1. Open the cover of the control unit (see chapter 6.1, page 15).

CAUTION

Damage to the electronic components due to electrostatic discharge

Take precautions when handling components that can be damaged by electrostatic discharge.

- ▶ Always earth yourself before touching electronic components.
- ▶ Do not touch the EnOcean® wireless module to plug it in; use the anti-electrostatic film to plug the wireless module for the timer module into the slot.

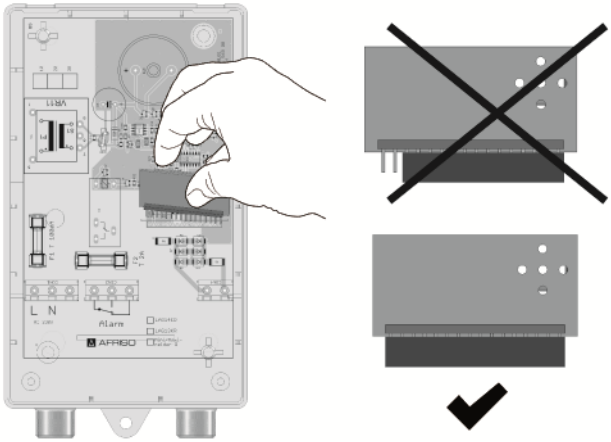


1 Female connector for EnOcean® wireless module

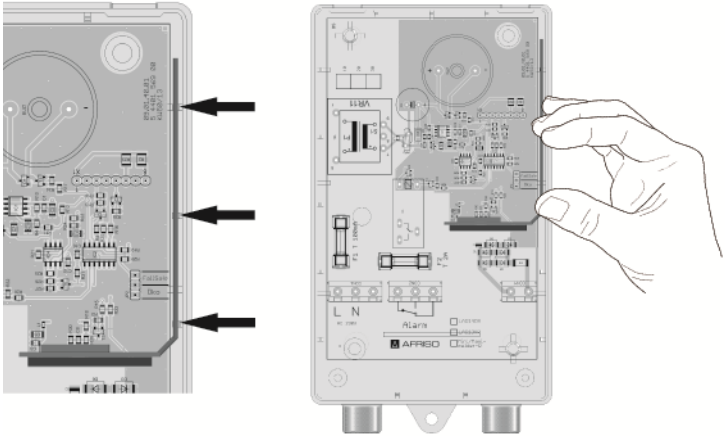
2 Position antenna

3 Housing opening (for fastening the antenna)

2. Connect the EnOcean® wireless module to the female connector.
   When connecting the wireless module, ensure the following:
   - The position of the antenna must be at the right side (close to the housing wall).
   - All pins must be inserted into the female connector.
   - Do not bend the pins.



3. Push the antenna of the EnOcean® wireless module into the three housing openings of the control unit.



4. Close the cover of the control unit (see chapter 6.1, page 15).

6.5 Teaching in the EnOcean® wireless module (optional)

☑ Minimelder-R/Maximelder-R is close to the EnOcean® centre.

1. Set the EnOcean® centre to the Learn mode (LRNMOD).
2. Briefly press lowest button of Minimelder-R/Maximelder-R.

↳ Minimelder-R/Maximelder-R sends a Learn telegram (LRNTEL).

↳ Minimelder-R/Maximelder-R is connected to the EnOcean® centre.

7 Operation

Minimelder/Maximelder monitors the level in containers. Minimelder triggers an alarm if the level falls below a minimum level. Maximelder triggers an alarm if the level exceeds a maximum level. The operation of Minimelder/Maximelder is limited to its regular monitoring:

- The green pilot lamp is on.
- The red alarm lamp is not on.
- The audible alarm is off.

7.1 Commissioning the product

- ☑ The control unit and the probe have been installed as per chapter 6, page 15.
- ☑ The unit has been connected electrically as per chapter 6.3, page 18.
- ☑ The probe has been connected to the control unit.
- ☑ Output relay has been wired (if required).
- ☑ The unit has been connected to mains.
- ☑ The flat cable has been connected to the printed circuit board.
- ☑ The control unit has been closed.

If all prerequisites are met, the product is ready for operation.

1. Switch on the power supply via the on-site mains fuse.

↳ The green pilot lamp lights up.

2. Perform a function test, see chapter 7.2, page 23.

7.2 Function test

▶ Perform a function test at least once per year.

At the probe

▶ Remove the probe of Minimelder from the liquid.
Submerge the probe of Maximelder into a liquid.

↳ The red alarm lamp must immediately light up and the audible alarm must sound.

↳ The alarm signals must switch off automatically if no alarm condition is present.

At the control unit

▶ Press the Test button.

↳ The red alarm lamp must light up and the audible alarm must sound.

8 Maintenance

Minimelder-R/Maximelder-R are safety equipment; if damaged, they may only be repaired by the manufacturer.

8.1 Maintenance times

Table 4: Maintenance times

When	Activity
Annually	▶ Perform a function test, see chapter 7.2, page 23.
At regular intervals	▶ Verify that Minimelder/Maximelder and their environment are always clean, accessible and easy to oversee.

8.2 Maintenance activities

Tampering with or modifications to the product will incur considerable safety risks.

Repair work that can be performed on site may only be performed by trained electricians and only if the device is not live.

Replacing the mains fuse F1

☑ Mains voltage is interrupted and cannot be switched on.

1. Remove the upper part of the housing.
2. Remove the transparent cover from the fuse.
3. Replace fuse F1.
4. Snap the transparent cover onto the fuse.
5. Connect the flat cable to the connector.
6. Refit the upper housing part and screw it to the base.
7. Switch on the mains voltage.

Replacing the relay fuse F2

☑ Mains voltage is interrupted and cannot be switched on.

1. Remove the upper part of the housing.
2. Remove the transparent cover from the fuse.
3. Replace fuse F2.
4. Snap the transparent cover onto the fuse.
5. Connect the flat cable to the connector.
6. Refit the upper housing part and screw it to the base.
7. Switch on the mains voltage.

9 Suitability for use in flood hazard areas

Minimelder-R/Maximelder-R can withstand floods up to a maximum water column of 10 m and a pressure of 1 bar. The products do not have to be replaced after a flood.

10 Troubleshooting

Repairs may only be performed by specially trained, qualified staff.

Table 5: Troubleshooting

Problem	Possible reason	Repair
Green pilot lamp is not on	Mains voltage is interrupted	▶ Supply mains voltage
	Mains fuse defective	▶ Replace the mains fuse
	Flat cable not connected to printed circuit board	▶ Connect the flat cable to the printed circuit board
Red alarm lamp is on	Probe not connected	▶ Connect probe
	Alarm: Minimelder probe not submerged	▶ Remove cause of alarm
	Alarm: Maximelder probe submerged	▶ Remove cause of alarm
	Signal cable interrupted	▶ Check signal cable

Problem	Possible reason	Repair
Red alarm lamp is always on, even if the Minimelder(-R) probe is submerged in liquid or the Maximelder-R probe is not submerged in liquid	Interruption in the signal cable, the probe or the control unit	▶ Check signal cable, probe and control unit
Pressing the Test button has no effect	Control unit defective	▶ Replace control unit
Other malfunctions	–	▶ Send the product to the manufacturer

11 Decommissioning, disposal

1. Switch off the supply voltage.
2. Dismount the product (see chapter 6, page 15, reverse sequence of steps).

3. To protect the environment, this product must **not** be disposed of together with the normal household waste. Dispose of the product according to according to local directives and guidelines.

This product consists of materials that can be reused by recycling firms. The electronic inserts can be easily separated and the device consists of recyclable materials.

If you do not have the opportunity to dispose of the used device in accordance with environmental regulations, please contact us for possibilities to return it.

12 General information on EnOcean® wireless

12.1 Range of EnOcean® wireless

Ranges between transmitters and receivers

Compared to wired systems, EnOcean wireless systems offer a high degree of flexibility as well as simplicity of installation. The following installation information is intended to allow for easy commissioning. Visit www.enocean.com for details on range planning.

Radio signals are electromagnetic waves. The field strength at the receiver decreases with increasing distance from the transmitter, i.e. the range is limited. Materials in the direction of propagation also reduce the range compared to line-of-sight links:

Table 6: Range reduction EnOcean® wireless system 868.3 MHz

Material	Range reduction
Wood, plaster, uncoated glass, without metal	0 – 10 %
Bricks, pressboards	5 – 35 %
Ferro concrete	10 – 90 %
Metal, aluminium lining	See "Shielding"

The geometric shape of a room determines the radio range since the propagation is not in the form of a beam but requires a certain volume of space (ellipsoid with transmitter and receiver at the focal points). Narrow corridors with solid walls are bad for propagation.

External antennas typically have a better radio performance than antennas from in-wall, flush-mounted receivers. The type of antenna installation and distance from ceilings, floors and walls all play a role.

People and obstacles in a room may reduce the range.

Some reserve must therefore be included when planning range to achieve reliable operation of the wireless system even in unfavourable conditions.

A robust and reliable installation in buildings is achieved by sufficient range reserve.

Recommendations from real-life scenarios:

Table 7: Range EnOcean® wireless system 868.3 MHz

Range	Conditions
> 30 m	Under excellent conditions: Large unobstructed room, optimum antenna design and good antenna position
> 20 m (planning reliability)	With furniture and persons in the room, through 5 plasterboard walls or through two 2 brick walls/autoclaved aerated concrete walls: For transmitters and receivers with good antenna design and good antenna position.
> 10 m (planning reliability)	With furniture and persons in the room, through 5 plasterboard walls or through two 2 brick walls/autoclaved aerated concrete walls: For receivers installed in walls or corners of a room. Or small receiver with internal antenna. Also together with switch/wired antenna on/near metal. Or narrow corridor.
Depending on reinforcement and antenna design	Vertical through 1 to 2 ceilings

The values stated for transmission range are approximate values only.

Shielding

So-called radio shadows form behind metal surfaces, e.g. behind metal partition walls and metal ceilings, behind metal foil of heat insulation and solid reinforcements in concrete walls. Single thin metal strips have very little influence, for example the profiles in a plasterboard wall.

It has been observed that radio communication also works with metal room dividers. This occurs by reflections: metal and concrete walls reflect radio waves and they travel to neighbouring corridors or rooms through openings, e.g. in a wooden door or glass partition. However, the range may be considerably reduced, depending on the location. An additional repeater at a suitable location can offer alternative radio paths.

Main factors that reduce radio range:

- Metal partition walls or hollow walls filled with insulation wool backed by metal foil
- Suspended ceilings with panels made of metal or carbon fibre
- Steel furniture or glass with metal coating
- Installation of pushbutton on a metal wall (typical range loss: 30%)
- Use of metal pushbutton frames (typical range loss: 30%)
- Transmitters that emit high frequency signals

Firewalls, lift shafts, staircases and building service areas should be regarded as shielding.

Shielding can be avoided by repositioning the transmitter or receiver antenna away from the radio shadow or by using a repeater.

Penetration angle

The angle at which a transmitted signal hits the wall plays a key role. If possible, signals should penetrate walls perpendicularly. Wall niches must be avoided.

Antenna installation

The receiving antenna or a receiver with an integrated antenna should not be installed on the same side of the wall as the transmitter. It is better to install the antenna on the adjacent or opposite wall. Antennas should be at a distance of > 10 cm from the corner of the room, if possible.

The ideal installation location for the receiving antenna is a central position in the room.

A magnetic antenna must be placed on a metal surface as large as possible to create an adequate counter pole. It can be easily placed on a ventilation pipe, for example.

Distance of receivers from other sources of interference

The distance of the receivers from other transmitters (such as GSM / DECT / Wireless LAN) and high-frequency sources of interference(computers, audio and video equipment) should be > 50 cm.

Transmitters, on the other hand, can be installed without any problem next to other transmitters and interference sources.

Use of repeaters

In the case of poor reception, it may be helpful to use a repeater.

It receives the radio signal and passes it on which can almost double the range. Repeaters which can be switched to a 2-level function allow for cascading two repeaters.

Field strength meter

A field strength meter helps to find the best position for transmitter and receiver.

In addition, it can be used to check interfered connections between devices already installed and even identify an interfering transmitter.

Installation in residential buildings

In residential buildings, there is usually no need to cover long radio distances. If necessary, a central wireless repeater can be installed for signal amplification.

Installation in commercial buildings

To cover large premises, central radio gateways to the automation bus (TCP/IP, EIB/KNX, LON, etc.) are usually used. Planning with a range radius of 10-12 m offers sufficient reliability, even in view of the changes to the environmental conditions that usually occur later on.

12.2 Additional information on EnOcean® wireless systems

Additional information on planning, installation and operation of EnOcean® wireless systems can be found at:

www.enocean.com/de

- Wireless standard
- Wireless technology
- AN001
- AN102
- AN103

12.3 Features of the EnOcean® technology

Visit www.afriso.de/afrisolab for a brochure on the EnOcean® technology.

Visit AFRISO's YouTube channel for additional videos on AFRISO products.

13 Spare parts and accessories

Part	Part no.
Minimelder-R (with relay)	16701
Maximelder-R (with relay)	16702
Probe for Minimelder	16703
Probe for Maximelder	16704
Cable extension fitting KVA	40041
Mounting frame for control unit	43521
IP54 kit with cable gland M20	43416
RC combination 0.1 µF/100 Ohm	618.001.5100
Mains fuse T 100 mA H (1.5 kA)	960.127.0100
Relay fuse T 2 A	960.127.2000
EnOcean® wireless module	78082

14 Warranty

The manufacturer's warranty for this product is 24 months after the date of purchase. This warranty shall be good in all countries in which this product is sold by the manufacturer or its authorised dealers.

15 Copyright

The manufacturer retains the copyright to these operating instructions. These operating instructions may not be reprinted, translated, copied in part or in whole without prior written consent.

We reserve the right to technical modifications with reference to the specifications and illustrations in this manual.

16 Customer satisfaction

Customer satisfaction is our prime objective. Please get in touch with us if you have any questions, suggestions or problems concerning your product.

17 Addresses

The addresses of our worldwide representations and offices can be found on the Internet at www.afriso.com.