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.de

Operating instructions

Oil/water alarm unit ÖWU

Without EnOcean® wireless
With EnOcean® wireless

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

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Table of contents

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 WORD

Type and source of the hazard are shown here.

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

There are three different levels of warnings:

Warning word	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

The ÖWU oil/water alarm unit may only be used to monitor for and signal accumulations of oil or water in:

- Drip pans under storage tanks, burners or motors
- Drip pans below devices consuming oil
- Manholes, pipe and cable ducts
- Pump and control stations where oil or water can accumulate due to leaks or backflow.

The ÖWU oil/water alarm unit may only be used for the following liquids:

- Water
- Fuel oil EL, L or M
- Diesel fuel or low-viscosity lubricants group AIII and danger class AIII
- Motor oils, gearbox oils and hydraulic oils
- Vegetable oils and transformer oils

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

2.2 Predictable incorrect application

The ÖWU oil/water alarm unit 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 by accident.
- ▶ 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 30).

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

The ÖWU oil/water alarm unit consists of a control unit and a probe. The control unit and the probe are connected by means of a signal cable. Depending on the order, ÖWU features an optional EnOcean® wireless module. Products without an EnOcean® wireless module can be retrofitted.

Probe

The probe consists of a wall rail, an optical and a conductive sensor. The optical sensor consists of an infrared transmitter and infrared receiver with a small gap in between them. These two parts form a light barrier. If there is air between the transmitter and the receiver, most of the infrared light transmitted by the transmitter is received by the receiver. If the probe is submerged in liquid, only a small portion of the infrared light reaches the receiver and an alarm is generated. The conductive sensor consists of two electrode fastened at a specific distance from each other. If there is water between the two electrodes, the signal for water is triggered.

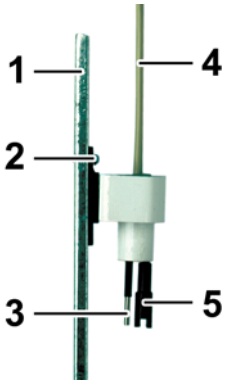
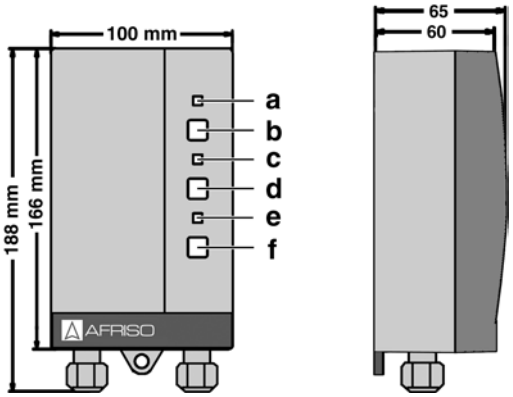


Fig. 1: Probe

1 Rail
2 Fastening screw
3 Conductivity sensor
4 Cable
5 Optical sensor

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 signal processing and conversion of the probe signal into a digital output signal. The output signal is available via two voltage-free relay contacts (2 changeover contacts).



a Green pilot lamp

b Test button

c Red alarm lamp for oil alarm

d Acknowledge button

e Yellow alarm lamp for water alarm

f Button LRNTEL (function only for devices with EnOcean® wireless module)

Fig. 2: Control unit

3.1 Function

ÖWU signals accumulations of water or oil. If the probe is submerged in of these liquids, the control unit detects the change in the probe signal and generates visual and audible alarms and triggers the corresponding output relay.

Probe

The probe detects the different optical and conductive characteristics of air and liquids. It is fastened vertically and with the electrodes pointing down at the lowest point of the area to be monitored. The probe is height-adjustable via a rail. The greater the distance from the floor, the later an accumulation of liquid is detected.

A five-core cable is used for connection to the control unit.

Control unit

The control unit evaluates the electrical signal from the probe on an ongoing basis. The green pilot lamp lights up when the device is ready for operation. If the probe is in air, the control unit signals normal operation: The green pilot lamp is on, the two alarm lamps (red and yellow) are off, the two relays are de-energised.

Oil alarm

☑ The probe is submerged in oil.

↳ The red alarm lamp and the audible alarm are on.

↳ The relay "Oil alarm" energises (Eco mode).

↳ The relay "Oil alarm" de-energised (failsafe mode).

↳ The EnOcean® wireless module sends an alarm message via EnOcean® wireless.

Water alarm

☑ The probe is submerged in water.

↳ The yellow alarm lamp and the audible alarm are on.

↳ The relay "Water alarm" energises (Eco mode).

↳ The relay "Water alarm" de-energised (failsafe mode).

↳ The EnOcean® wireless module sends an alarm message via EnOcean® wireless.

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

No alarm is triggered in case of a power failure. When mains power is available again, the ÖWU immediately resumes operation. If a leak has occurred in the meantime, this is indicated. The green pilot lamp lights up as soon as ÖWU is supplied with mains voltage.

3.2 Operating modes

ÖWU is equipped with two output relays to transmit the alarm signal to additional external equipment. In Eco mode, the two relays are de-energised if no alarm condition is present; if an alarm is present, the corresponding relay is energised. In failsafe mode, the two relays are energised if no alarm condition is present; if an alarm is present, the corresponding relay is de-energised.
ÖWU can be operated with or without additional external equipment. External devices include units for audible and visual alarm signals or remote alarm devices, building control systems, etc.

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.

3.3 Application example

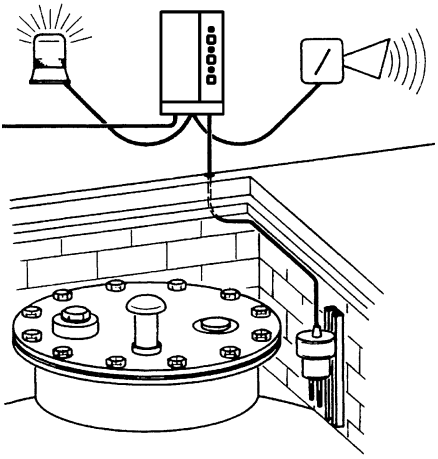


Fig. 3: Standard application

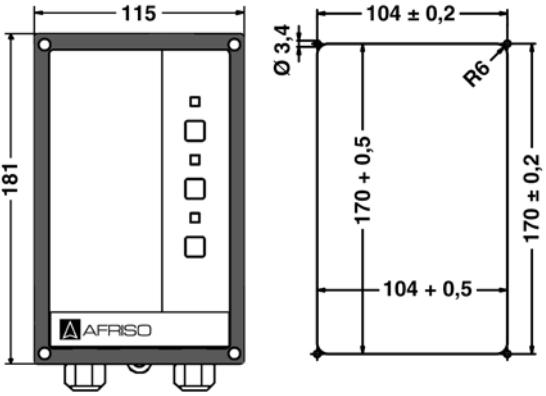


Fig. 4: Control unit with mounting frame for panel mounting; right: control panel cut out

4 Technical specifications

Table 1: Technical specifications probe

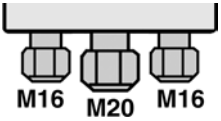
Parameter	Value
General specifications	
Dimensions (W x L x D)	40 x 200 x 50 mm
Weight	0.15 kg
Material probe body	Plastic, ABS
Probe elements	1 conductivity, 1 optical sensor
Connection cable: Standard length Max. length	LiYY 5 x 0.25 mm² 1.5 m 50 m (shielded)
Operating temperature range	
Medium	+5 °C to +50 °C
Storage	-10 °C to +60 °C

Table 2: Technical specifications control unit

Parameter	Value
General specifications	
Dimensions housing (W x H x D)	100 x 188 x 65 mm
Weight	0.5 kg
Emissions	The A-evaluated sound level of the audible alarm is at least 70 dB(A) at a distance of one metre.
Additional connections	2 output relays (changeover contacts)
Operating temperature range	
Ambient	-10 °C to +60 °C
Storage	-10 °C to +60 °C
Supply voltage	
Nominal voltage	AC 100-240 V ± 10 %
Nominal power	Max. 6 VA

Parameter	Value
Breaking capacity output relay	Max. 250 V, 2 A, resistive load
Electrical safety	
Electrical safety	EN 60730-1
Protection class	II (EN 60730-1)
Degree of protection	IP 30 (EN 60529)
Electromagnetic compatibility (EMC)	
Interference	EN 55014-1
Noise immunity	EN 55014-2
EnOcean® wireless	
Frequency	868.3 MHZ
Transmission power	Max. 10 mW
Range	See chapter 11.1, page 26.
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

ÖWU complies with:

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

ÖWU with EnOcean® wireless module also complies with:

- Radio Equipment Directive, RED (2014/53/EU).

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.**

- ▶ Protect the product from shock when storing it.
- ▶ Store the product in a clean and dry environment.
- ▶ Only store the product within the permissible temperature range, see chapter 4, page 11.
- ▶ 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 probe

☑ Do not mount the probe at locations where it is subject to bright external light (below lamps and direct sunlight).
If necessary, protect the probe from direct light by means of partitions.

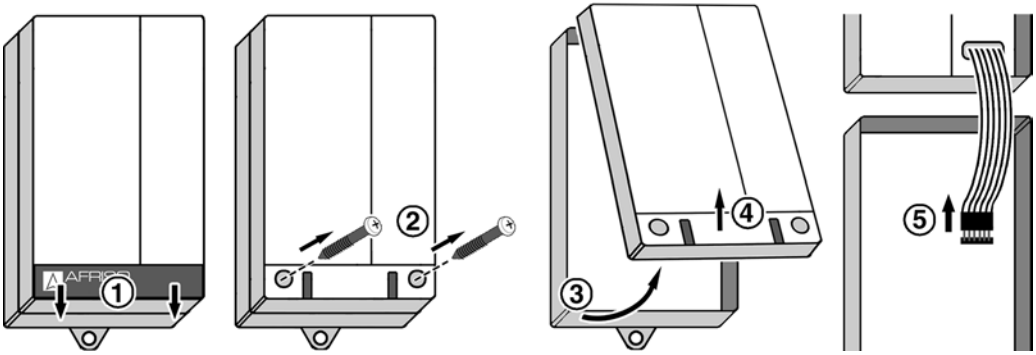
☑ Do not subject the tip of the probe to mechanical load.

1. Fasten the probe vertically and with the electrodes pointing down at the lowest point of the area to be monitored.
2. Fasten the rail to the wall using two screws and adjust the height of the probe to the desired level with the fixing screw.
If even small amounts of water or oil submerge the probe tips, the alarm is triggered early.
The higher the probe, the later the alarm.

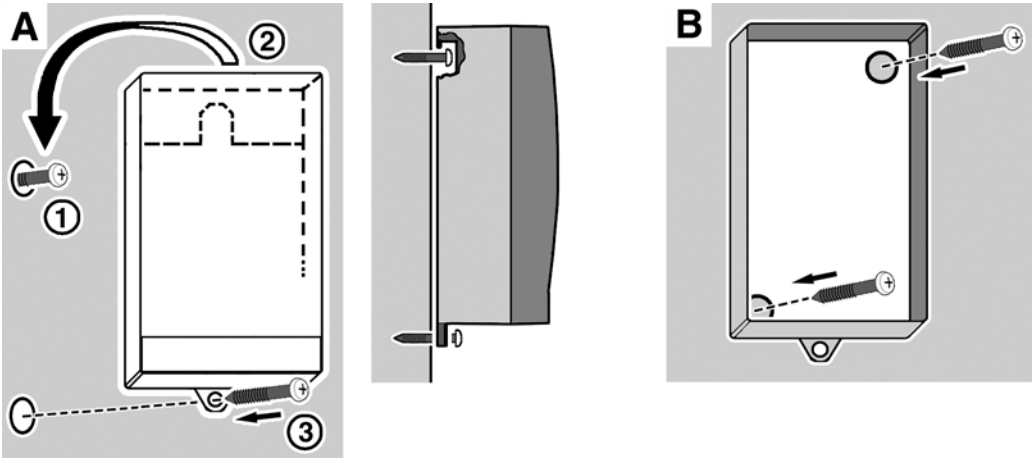
6.2 Mounting the control unit

- ☑ 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 11.
- ☑ 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.

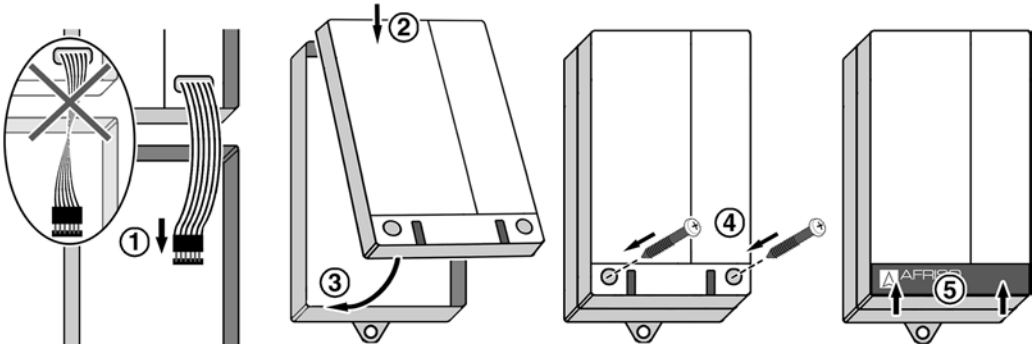
2 Fit the control unit.

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.

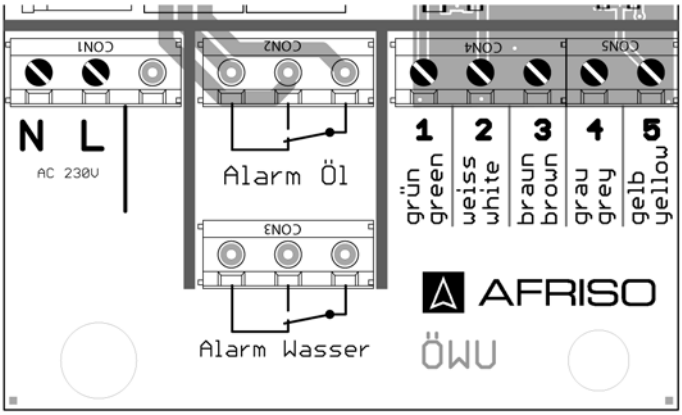
Mount the bottom part to the wall with the screws shipped with the unit.

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



6.3 Electrical connection

☑ Mains voltage is interrupted and cannot be switched on.



1 Green
2 White
3 Brown
4 Grey
5 Yellow

Fig. 5: Electrical connection

Power supply

Connect ÖWU 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 cable gland at the left into the control unit.
2. The phase must be connected to terminal **L**, the neutral conductor to terminal **N**.

Probe

- ▶ Route the cable through the right cable gland and connect it to the terminal block at the right with the numbers **1** to **5** (identical colours).
- ▶ Do not route the probe cable next to mains cables; danger of interference.
- ▶ Protect the probe cable from damage; use a metal pipe, if required.

Output

The output signal of the ÖWU is available via two voltage-free relay contacts (2 changeover contacts). The maximum contact rating is 250 V, 2 A, resistive load.

For connection, use the unused cable gland at the control unit between power and probe cable. Route the cable through the centre rubber piece or cable gland into the control unit and connect it.

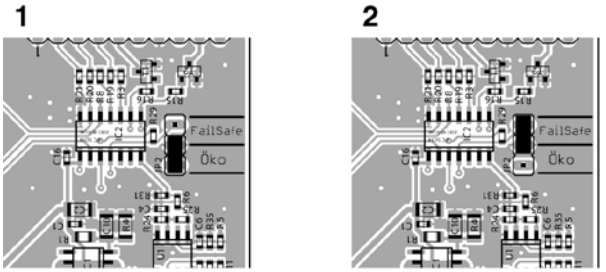
CAUTION

Electrical systems may be 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. 6: Jumper

Table 3: Operating mode

Operating mode	Normal operation	Oil alarm	Water alarm
Eco	Both relays de-energised	Relay "Oil alarm" energises	Relay "Water alarm" energises
Failsafe	Both relays energised	Relay "Oil alarm" de-energises	Relay "Water alarm" de-energises

6.4 Retrofitting an EnOcean® wireless module (optional)

☑ Disconnect ÖWU from mains voltage.

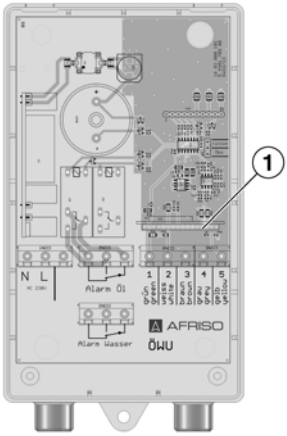
1. Open the cover of the control unit (see chapter 6.2, page 16).

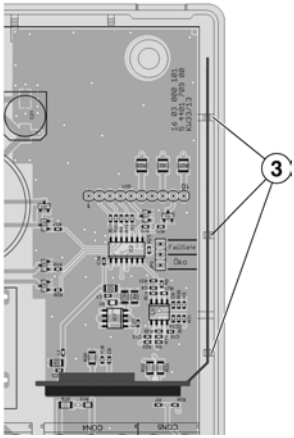
CAUTION

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.



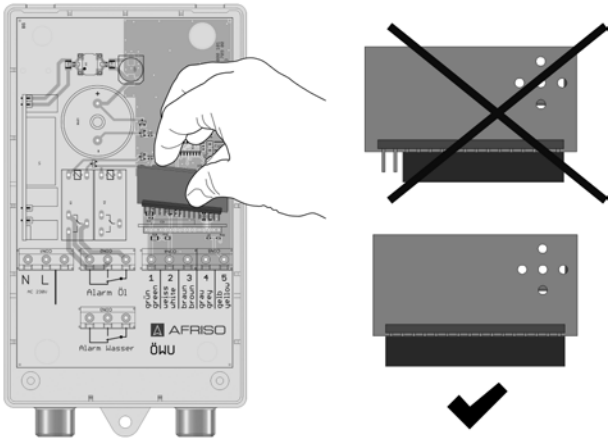


1 Female connector for EnOcean® wireless module

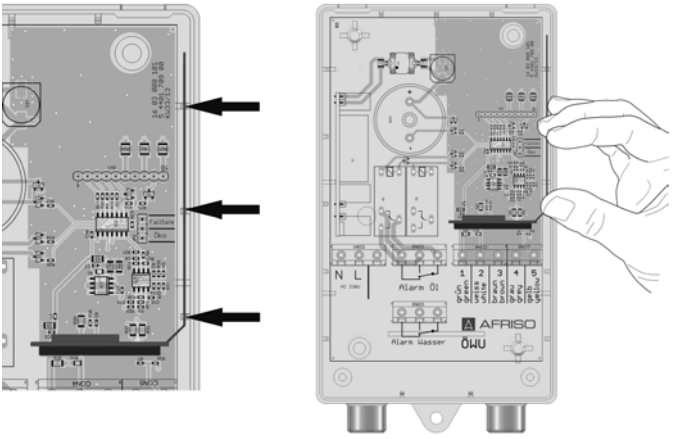
2 Position antenna

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 6.2, page 16).

6.5 Commissioning the product

- ☑ The probe and control unit have been installed as per chapter 6, page 15.
- ☑ Probe has been positioned.
- ☑ 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 housing has been closed with screws.

If all prerequisites are met, the device 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 test and a function test, see chapter 6.6, page 22 and chapter 6.7, page 23.

6.6 Test

Verify compliance with all regulations and directives applicable at the installation site when commissioning and repairing ÖWU.

- ▶ Verify that the probe fixed at the desired level above the collecting system.
- ▶ Verify that the probe is not subjected to external light.
- ▶ Verify that the liquids properly wet the probe and that the optical absorption properties of the probe are sufficient for generating alarms.
- ▶ Verify that the liquids are reliably detected at all temperatures that may occur.
- ▶ Perform a function test, see chapter 6.7, page 23.

6.7 Function test

At the probe

1. Submerge the probe in water / oil.

↳ When the probe is submerged in oil, the red alarm lamp must immediately light up.
When the probe is submerged in water, the yellow alarm lamp must immediately light up.

↳ In both cases, the audible alarm must sound.

2. Remove the probe from the liquid.

↳ The corresponding alarm lamp and the audible alarm must go out.

At the control unit

▶ Press the Test button.

↳ Both alarm lamps must light up.

↳ The audible alarm must sound.

↳ Both relays are energised.

7 Teaching in the EnOcean® wireless module (optional)

☑ ÖWU is close to the EnOcean® centre.

1. Set the EnOcean® centre to the Learn mode (LRNMOD).
2. Briefly press lowest button of ÖWU.

↳ ÖWU sends a Learn telegram (LRNTEL).

↳ ÖWU is connected to the EnOcean® centre.

8 Operation

ÖWU monitors rooms/drip pans and signals accumulations of water or oil. If the probe is submerged in oil or water, the device generates an alarm. The operation of the ÖWU is limited to its regular monitoring:

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

9 Maintenance

Oil/water alarm units are safety equipment; if damaged, they may only be repaired by the manufacturer.

9.1 Maintenance times

Table 4: Maintenance times

When	Activity
At regular intervals	▶ Verify that ÖWU and its environment are always clean, accessible and easy to oversee
At least once per year	▶ Perform a visual inspection of the probe and its connection cable to the control unit; check for damage, pollution and corrosion (clean or replace, if necessary) ▶ Perform a function test, see chapter 6.7, page 23

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
	Flat cable not connected to printed circuit board	▶ Connect the flat cable to the printed circuit board
Red alarm lamp is on	Alarm: Probe submerged in oil	▶ Remove cause of alarm
	Probe not connected	▶ Connect probe
Yellow alarm lamp is on	Alarm: Probe submerged in water	▶ Remove cause of alarm
	Short circuit in probe (electrodes 1 and 2)	▶ Check probe
Red or yellow alarm lamp is always on, even if the probe is not submerged in liquid	Short circuit in the probe	▶ Check probe
	Line interruption in the probe	▶ Check cable from control unit to probe
Pressing the Test button has no effect	Control unit defective	▶ Replace control unit
Red or yellow alarm lamp is not on, even if the probe is submerged in liquid.	Probe not connected	▶ Check wiring
	Probe defective	▶ Replace probe
Other malfunctions	–	▶ Send the product to the manufacturer

11 General information on EnOcean® wireless

11.1 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 with EnOcean®.

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.

11.2 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

11.3 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.

12 Decommissioning, disposal

1. Switch off the supply voltage.
2. Dismount ÖWU (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.

13 Spare parts and accessories

Part	Part no.
ÖWU without EnOcean® wireless	40028
Wall mounting rail probe ÖWU	55051
Mounting frame for control unit	43521
Sealing kit (IP54) with cable gland M20	43416
EnOcean® wireless module TCM 320	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.de.