

# Leak alarm type LWG 2000

Leakage detection system / alarm device



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## ABOUT THE MANUAL



- This manual is part of the product.
- This manual must be observed and handed over to the operator to ensure that the component operates as intended and to comply with the warranty terms.
- Keep it in a safe place while you are using the product.
- In addition to this manual, please also observe national regulations, laws and installation guidelines.

## SAFETY ADVICE

Your safety and the safety of others are very important to us. We have provided many important safety messages in this assembly and operating manual.

✓ Always read and obey all safety messages.



This is the safety alert symbol.

This symbol alerts you to potential hazards that can kill or hurt you and others. All safety messages will follow the safety alert symbol and either the word "DANGER", "WARNING", or "CAUTION". These words mean:

### **⚠ DANGER**

describes a **personal hazard** with a **high degree of risk**.

→ May result in **death or serious injury**.

### **⚠ WARNING**

describes a **personal hazard** with a **medium degree of risk**.

→ May result in **death or serious injury**.

### **⚠ CAUTION**

describes a **personal hazard** with a **low degree of risk**.

→ May result in **minor or moderate injury**.

**NOTICE** describes **material damage**.

→ Has an **effect** on ongoing operation.



describes a piece of information ✓ describes a call to action

## PRODUCT-RELATED SAFETY ADVICE



### **⚠ DANGER**

**May not be used in potentially explosive areas.**

Can cause an explosion or serious injuries.

- ✓ Must be installed by a specialised company in accordance with local industrial health and safety regulations.
- ✓ Installation outside the defined EX protection zone.



### **⚠ WARNING**

**Escaping, liquid operating media:**

- are hazardous for water
- are inflammable category 3 liquids with a flash point above > 55 °C
- can ignite and cause burning
- can cause injury through people falling or slipping
- ✓ operating media during maintenance work.

## GENERAL PRODUCT INFORMATION

The leak alarm consists of a display unit for optical and acoustic display of a leak in a containment facility and the probe to immerse in the operating medium that is to be recognised. Display unit and probe are connected by a connection cable.

Leaks of water-hazardous liquids or water that is not intended for human consumption or liquids getting into the containment facility are displayed automatically.

**INTENDED USE****The LWG leak alarm meets the following requirements:**

- Leak detector system Class III according to EN 13160-1 as a liquid sensor system in leakage or monitoring rooms according to EN 13160-4;
- The product complies with the essential features of Regulation (EU) 305/2011 for construction products with its mandate M/131 "pipes, tanks and ancillaries not in contact with water intended for human consumption" with the intended use "... in installations for the transport/distribution/storage of gas/fuel intended for the supply of building heating/cooling systems, from the external storage reservoir or the last pressure reduction unit of the network to the inlet of the heating/cooling systems of the building, and in installations for the transport/disposal/storage of water not intended for human consumption".
- Leak detection system for a system to store, fill and handle water-hazardous substances based on the approval principles for overflow safety devices from the German Institute for Civil Engineering (DIBt) with the guidelines in the general building-authority Z-65.40-357
- Fault alarm device according to AwSV and TRwS 780, TRwS 791;
- Construction product and part of systems for the storage, filling and handling of water-endangering materials in Germany according to the sample administrative provision for technical building regulations (MVV TB).
- Leak detection system according to VLAREM for Belgium with the certificate.
- Leak detection system for the monitoring of protective structures in equipment for the storage or the handling of fuel oil and diesel as well as other water-endangering liquids for Switzerland with SVTI certificate KVV no. 321.016.
- Electrical device for household use and similar purposes according to EN 60335-1.

**The LWG 2000 leak alarm fulfils the following requirements of the EN 13160-1:**

- Alarm in case of a leak or system fault.
- Leak display with optical and acoustic alarm.
- If the supply voltage is interrupted, the leak alarm returns to its intended mode when the voltage is restored.
- If INSTALLED correctly, accidental interruption of the supply voltage is prevented.
- Can be tested for a simulated leak.
- Short circuit or interruption in the power supply triggers an alarm.
- Leak display with optical and acoustic alarm can be tested.
- Can be checked to ensure all functions are OK.
- Intended only to monitor one tank or one pipeline.

**Operating media**

- Waste oil
- Diesel fuel
- FAME
- Water or oil-water mixtures (+1°C to +70°C)
- Water not intended for human consumption
- Aqueous solutions of inorganic, non-oxidising salts with a pH between 6 and 8.
- Other water-hazardous, non-flammable liquids and flammable liquids with a flash point above > 55 °C with proof of function from the manufacturer's tests:

Immerse the probe in the operating medium to be tested. Leave in a heating cabinet at 60 °C for 48 hours. Then carry out the specified FUNCTION TESTS at ambient temperature. A certificate of the test and the result must be issued.



You will find a **list of operating media** with descriptions, the relevant standards and the country in which they are used in the Internet at **[www.gok.de/liste-der-betriebsmedien](http://www.gok.de/liste-der-betriebsmedien)**.



### Place of operation

- Install the display unit at a suitable position on the wall in a dry room that is entered regularly.
- If it is used outdoors, the display unit must be positioned or protected in such a way that no water can enter it. We recommend a protective housing of protection type IP65 according to EN 60529.
- If it is used outdoors, the display unit must be protected against UV radiation.
- If used outdoors, the probe must be positioned so that no surface water, rainwater, dirt or airborne sand can get into the containment facility or the cable connection fitting (part no. 15 379 00).

**NOTICE** The outdoor containment facility should have a roof projecting over the containment facility to 0.6 times its height.

The height is measured from the edge. An external signal generator should then be connected via the potential-free relay contact.

### **NOTICE** Malfunctions caused by flooding!

- The LWG 2000 type leak alarm is not designed for installation in areas prone to flooding or risk areas.
- Following flooding, the LWG 2000 type leak alarm must be replaced!



### INAPPROPRIATE USE

All uses exceeding the concept of intended use:

- e.g. operation with different operating media
- operation with inflammable operating media of categories 1, 2 or 3 with a flash point  $\leq 55^{\circ}\text{C}^{1)}$
- outdoor use without protection type IP65
- changes to the product or parts of the product
- installation in a potentially explosive area
- installation in pressurised tanks and containers

**⚠ DANGER** If the device is not operated properly or it is misused, there may be a risk of injury for the installer and the operator, risks for the device and for other property of the operator, and a risk of a malfunction of the device itself.

### USER QUALIFICATION

INSTALLATION, START-UP, MAINTENANCE and RESTORATION of the product may only be commissioned to such companies constituting specialised companies for this work in the meaning of § 62 of the AwSV. This does not apply if the system is excluded from this obligation to be installed by a specialised company according to national regulations. These will simply be referred to below as "specialised company".

Work on electrical parts may be carried out only by an electrician qualified according to VDE regulations or by an electrician who is qualified according to local regulations.

The specialised company and the operator must observe, comply with and understand all of the following instructions in this assembly and operating manual.

<sup>1)</sup> It is also necessary to comply with the divergent provisions/regulations of the EU member states concerning areas at risk of explosion and the flash point of the operating medium!

Activity	Qualification
storing, transporting, unpacking OPERATION	trained personnel
ASSEMBLY, MAINTENANCE START-UP, SHUT-DOWN, REPLACEMENT, RESTART, RESTORATION, DISPOSAL,	qualified personnel, customer service
ELECTRIC CONNECTION	qualified electrician
TROUBLESHOOTING	qualified personnel, customer service qualified electrician, trained personnel

### FUNCTION DESCRIPTION

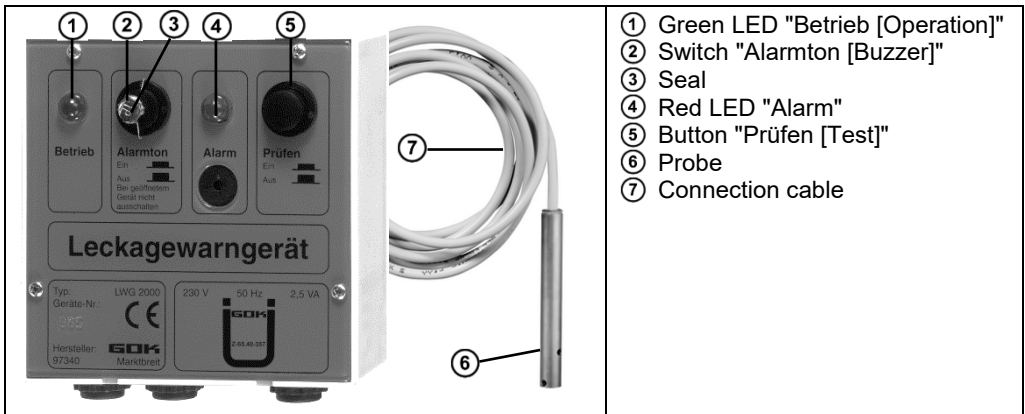
The probe is fitted with a PTC thermistor, which is installed at the lowest point of the containment facility to be monitored.

In correct operation, the PTC thermistor is surrounded by air and is heated constantly with a probe heating circuit. When the temperature changes, the PTC thermistor changes its electrical resistance as soon as liquid comes into contact with the PTC thermistor as the result of a leak. This causes the display unit to trigger an alarm.

The alarm is reset only when the leak is eliminated. The display unit switches back to monitoring mode:

- green LED "Betrieb [Operation]"
- The device that is connected via the potential-free relay contact can be restarted.

### DESIGN



The display unit is intended to be attached to a wall and contains the power supply, the display and operating elements and all the components to evaluate the signal from the connected probe.

The alarm on the display unit is:

- displayed optically via the red LED "Alarm" and
- acoustically via a buzzer.

The display unit also has a potential-free relay contact to connect an external power supply, e.g. a burner pump, motor, warning light, acoustic signal generator.

### ASSEMBLY

Before assembly, check that the product is complete and has not suffered any damage during transport.

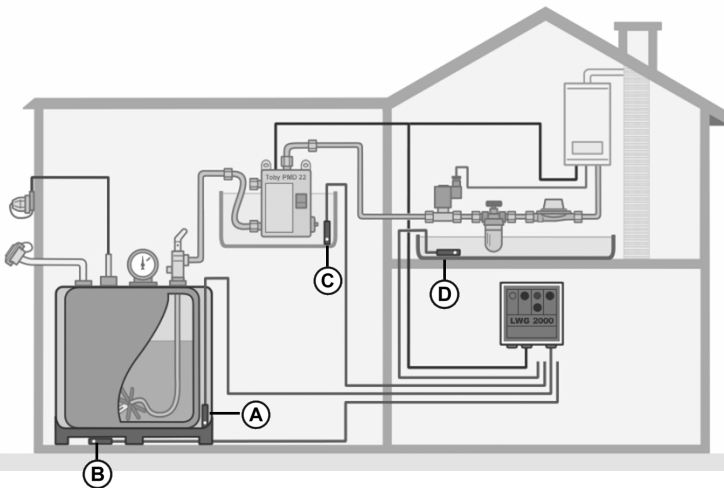
**ASSEMBLY must be carried out by a specialised company.**

See USER QUALIFICATION!

The specialised company and the operator must observe, comply with and understand all of the following instructions in this assembly and operating manual. For the system to function as intended, it must be installed professionally in compliance with the technical rules applicable to the planning, construction and operation of the entire system.

**Example of application - LWG 2000 leak alarm with four possible installation situations for a probe.**

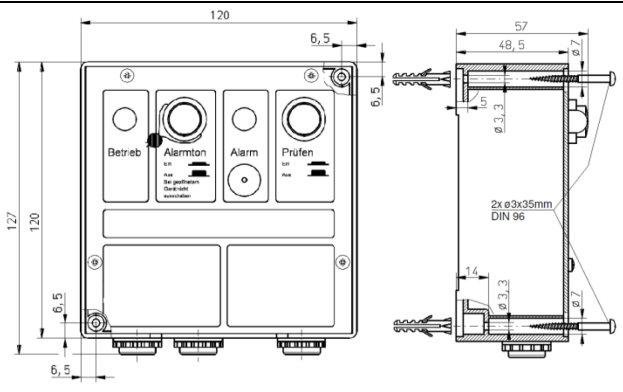
Only one probe (A) (here in the example) can be connected to each LWG 2000.



- (A) Probe in tank with integrated containment basin (connected).
- (B) Probe on the floor of the installation room to monitor flooding and/or to monitor the containment facility for leaking fuel in a hidden area.
- (C) Probe in the containment basin of an oil pump.
- (D) Probe in the containment basin of a consuming device to monitor the pressure line.

### Mounting the display unit

- ✓ Remove the display unit from the packaging.
- ✓ Check for completeness, damage and labelling.
- ✓ Unscrew 4 screws on the front of the display unit.
- ✓ Remove the front of the display unit.
- ✓ Drill 2 mounting holes Ø 5 mm.
- ✓ Mount the display unit with the 2 enclosed S5 anchors and wood screws 3 x 35 DIN 96.



### ELECTRIC CONNECTION



#### **⚠ GEFAHR** Danger to life due to electric shock!

Electric shock from touching live parts.

- ✓ Before opening the housing, ensure that the equipment is free of all voltage.
- ✓ Only place under tension after ending all work.

**NOTICE** The housing of the display unit is suitable for wall mounting and is connected to the 230 V mains supply. Under normal circumstances, the display unit must be operated with the housing cover closed. It is installed and started up by a qualified technician while the unit is open.

### Safety precautions for electrical components

#### **⚠ CAUTION**

The functions and operating safety of the device are guaranteed only under the climatic conditions that are specified in TECHNICAL DATA. If the device is transported from a cold to a warm environment, condensation may cause the device to malfunction or may even destroy the device. Because of this, you must ensure that the device has acclimatised to the ambient temperature before using it.

#### **⚠ CAUTION**

If you have any doubts that the device can be operated safely, do not operate it. Your safety may be adversely affected by the device, if for example:

- it is obviously damaged
  - it no longer works as specified
  - it has been stored in unsuitable conditions for some time,
- ✓ if in doubt, send the device to the manufacturer for repair or maintenance

### Electrical power connection of the display unit

A1	Light "Operation"
A2	Button "Alarm sound"
A3	Light "Alarm"
A4	Alarm buzzer
A5	Button "Test"
A6	Nipple for cable lead-through
A	Terminal for "power supply"
B	Terminal for additional "alarm"
C	Terminal for probe „Fühler“

**⚠ DANGER**

**Electrical potential!**

⚡ Electric shock risk.

✓ Switch off the power supply and make sure that it cannot be switched on again inadvertently.

✓ Via terminal "Power" „A“.

✓ AC voltage 230 V/ 50 Hz.

✓ Use only a fixed connection, not a plug or switch.

✓ Insert the cable through the nipple.

✓ Connect the cable according to the terminal block designation.

### Probe installation - standard method

- Install the probe so that it hangs loosely in the containment facility.
  - The weight of the sleeve ensures that the probe hangs vertically.
- Fix the probe in place with the enclosed installation set (part no. 15 073 97).
  - If the probe is installed horizontally it cannot be removed unintentionally.

### Probe installation - general

Install the probe at the lowest point of the containment facility. If the probe is installed vertically, there must be a gap of at least 5 mm between the base of the containment facility and the bottom of the probe.

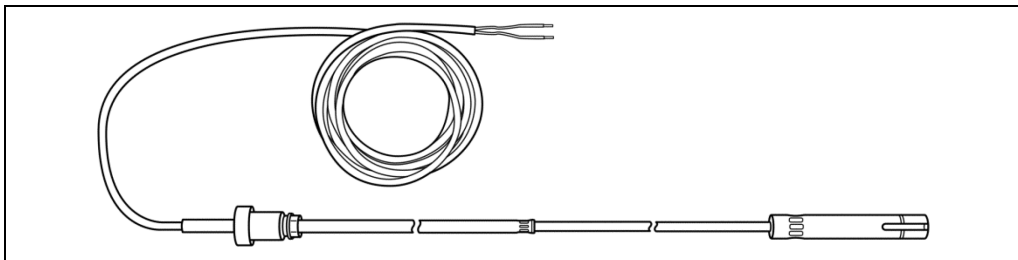
Distance between lowest point of the base of the containment facility and the bottom of the probe:

- generally, at least 5 mm and maximum 25 mm.
- in tanks with integrated containment facility (containment basin), maximum 50 mm.

**Special case:** In case of liquid level monitoring, install the probe in the position where the message is to be triggered.



## Probe - tank installation



## Probe installation - tank installation

**NOTICE**

Connection line (E) for connection to the display unit.  
The probe (I) must not be shortened.

- Install the probe (I) at the lowest point of the containment facility.
- Fix the probe in place with the enclosed installation set.
- The probe should not move once it has been installed.
- Installation diameter on the tank: 22 to 30 mm
- Adjust the correct length of the probe by moving the tube (H) in the probe receiving part (F).
- Lock in place with the setscrew. (G)
- It must not be possible to move the probe after installation.

**NOTICE**

The probe (I) must not lie on the base of the tank.

### **⚠ DANGER** Danger to life from electrocution

Electric shock from touching live parts.

- ✓ Disconnect the power supply before opening the housing.
- ✓ Switch off the power supply and make sure that it cannot be switched on again inadvertently.
- ✓ Switch the power supply on again only when work is finished.

**NOTICE** The product is to be integrated in the framework of the measures for lightning and overvoltage protection at the location of the operator.

## Electrical installation

### Connection cable between the display unit and the probe

Cable cross section	2 x 0.5mm <sup>2</sup>
Design	Wet room NYM or YR, in soil NYY or similar
Maximum length	100m implement cross section of cable as 2 x 1.5mm <sup>2</sup>
Connection	Display unit: Terminals <b>4</b> and <b>5</b> "Fühler [Probe]"
	Probe cable: on the display unit or extension via cable extension fitting accessory (part no. 15 379 00).

### Connection of potential-free relay contact on display unit

Maximum switched voltage	250V AC 50Hz	230V	110V	60V	24V
Type of current	AC (alternating current)	DC (direct current)			

Max. switched voltage in A	1.0	0.1	0.2	0.6	4
Maximum contact rating	250VA	23W	22W	36W	96W

**If a device is connected to the display unit, the display unit should have an additional preliminary fuse**

Connection in the display unit	Terminals <b>1 + 3</b>	closed in case of "alarm"
	Terminals <b>2 + 3</b>	open in case of "alarm"

#### **NOTICE**

When the terminals have been connected, replace the top of the housing.

### **START-UP**

The product is ready for use.

- When the supply voltage is connected, the red LED "Alarm" must be lit. The buzzer also sounds.

#### **NOTICE**

If the red LED "Alarm" does not light up or the buzzer does not buzz after voltage has been connected, the LWG 2000 leak alarm is defective.

- After about 20 seconds, the red LED "Alarm" goes off and the buzzer stops.
- The green LED "Betrieb [Operation]" must be lit.
- The display unit is now in monitoring mode.

### **OPERATION**

#### **Intended operation**

The green LED "Betrieb [Operation]" of the display unit must be lit constantly.

#### **Alarms**

An alarm can be triggered by the following events:

- Liquid accumulating in the containment facility.
- Line interruption or short circuit in the probe circuit.

An alarm is displayed in case of the following events:

- The red LED "Alarm" is lit,
- The buzzer sounds,
- The device connected to the potential-free relay contact switches off.

The cause of the leak must be found and fixed without delay.

The manufacturer has sealed the "Alarmton [Buzzer]". When the seal is removed and the button pressed, the acoustic alarm is switched off.

The red LED "Alarm" remains lit.

When the leak has been repaired, the display unit switches back to monitoring mode (green LED "Betrieb [Operation]" is lit).

A new seal has to be fitted to the "Alarmton [Buzzer]" switch.

When the top of the display unit housing is open, the "Alarmton [Buzzer]" must not be switched to **Off**.

#### **NOTICE**

Special case: Liquid level monitoring of substances that are not hazardous to water: After the 1st alarm, a new seal is not required.

## FUNCTION CHECK

Press and hold the "Prüfen [Test]" button to check the alarm function in monitoring mode.  
Display red LED "Alarm" and buzzer.  
When you release the button, the alarm goes off.

### Function test 1

Check the alarm function in monitoring mode within the scope of START-UP and MAINTENANCE. This check includes simulating a leak.

- Press and hold the "Prüfen [Test]" button.
- Alarm: as described in OPERATION.
- When you release the button, the alarm goes off.

### Function test 2

Check the alarm function also by simulating a leak within the scope of START-UP and MAINTENANCE.

- Remove the probe - if necessary, also the containment facility.
- Immerse the probe in water.
- Alarm: as described in OPERATION.
- Then rub the probe dry and (re-)install it in the containment facility.

### Function test 3

During MAINTENANCE, check the alarm function by simulating a short circuit.

#### **DANGER**

#### **Danger to life from electrocution**

Electric shock from touching live parts.

- Disconnect the supply voltage.
- Remove the top from the display unit housing.
- Bridge the "Fühler [Probe]" terminal.
- Switch the supply voltage on.
- Alarm: as described in OPERATION.
- Disconnect the supply voltage again.
- Remove the bridge from the "Fühler [Probe]" terminal.
- Screw the top of the display unit on again.
- START-UP

### Function test 4

During MAINTENANCE, check the alarm function by simulating an interruption.

#### **DANGER**

#### **Danger to life from electrocution**

Electric shock from touching live parts.

- Disconnect the supply voltage.
- Remove the top from the display unit housing.
- On a probe 4/5 terminal, loosen the connection cable between the display unit and the probe.
- Switch the supply voltage on.
- Alarm: as described in OPERATION.
- Disconnect the supply voltage again.
- Loosen the connection cable between the display unit and the probe and re-connect the probe 4/5 terminal „Fühler“:
- Screw the top of the display unit on again.
- START-UP

### TROUBLESHOOTING

#### Fault signals during operation

Fault signal	Action
Red LED <b>Alarm</b> and/or green LED <b>Betrieb (Operation)</b> do not light up when you connect the system.	Send device to the manufacturer to be checked.
Buzzer does not sound when the system is connected.	Send device to the manufacturer to be checked.
Red LED <b>Alarm</b> is lit, buzzer sounds.	The probe has responded on the display unit. → Empty containment facility. → Clean containment facility and probe. → Check connected devices in the containment facility for leaks.
Green LED <b>Betrieb (Operation)</b> is not continuously lit.	Send device to the manufacturer to be checked.
Red LED <b>Alarm</b> is not lit but buzzer sounds.	Send device to the manufacturer to be checked.
Buzzer does not sound but red LED <b>Alarm</b> is lit.	Send device to the manufacturer to be checked.
Continuous alarm but no liquid on the probe.	Probe cable is defective. → Check for interruption or short circuit. Strong air flow on the probe. → Take suitable measures to protect probe from draughts.

### MAINTENANCE

Check the functions of the leak detection system regularly, but at least once per year. Check according to FUNCTION CHECK.

It is the operator's responsibility to determine the type and frequency of the checks.

### RESTORATION

If the actions described in TROUBLESHOOTING do not lead to a proper restart and if there is no dimensioning problem, the product must be sent to the manufacturer to be checked. Our warranty does not apply in cases of unauthorised interference.

If you have a constant error message or an alarm without the probe being wet, check the connection line between the signal part and the probe for an interruption or short circuit and reinstall if necessary.

### DISPOSAL



**To protect the environment, our electrical and electronic appliances may not be disposed of along with household waste.**

At the end of its lifespan, each end user is obligated to pass old appliances to a district or area collection point, separate from household waste. This ensures that old appliances are disposed of properly and negative effects on the environment are avoided. Our registration number for the electrical old appliances register (EAR) is: WEEE-Reg.-No. DE 78472800.

**TECHNICAL DATA**

<b>Display unit</b>	
electrical device acc. EN 60335-1	<ul style="list-style-type: none"><li>• over-voltage category III</li><li>• contamination degree 2</li><li>• protection class type I</li></ul>
Supply voltage	230V AC 50 to 60 Hz
Power consumption	2.5VA
Sound level of buzzer	≥ 70dB(A)
Dimensions H/W/D in mm	120 x 120 x 50
Voltage tolerance	+10%
Housing	Polyester
Ambient temperature	-20°C to +60°C
Type of protection	IP30 acc. to EN 60529

<b>Probe</b>	
Voltage	12 V DC
Material	Stainless steel 1.4301
Probe length	2m, 5m, 20m
Tank installation Probe length	maximum 1.4m
Length of probe cable	3.6m
Storage medium temperature	-20°C to +60°C
Ambient temperature	-20°C to +60°C

**TECHNICAL CHANGES**

All the information contained in this assembly and operating manual is the result of product testing and corresponds to the level of knowledge at the time of testing and the relevant legislation and standards at the time of issue. We reserve the right to make technical changes without prior notice. Errors and omissions excepted. All figures are for illustration purposes only and may differ from actual designs.

### LIST OF ACCESSORIES

Product name	Order no.
Leak alarm, type LWG 2000 with display unit, standard 2 m probe and installation set	15 073 00
Display unit for leak alarm type LWG 2000	15 073 01
Tank probe for installation in tanks with integrated containment facility (basin), probe length can be adjusted between 960 and 1400mm, connection cable 5 m	15 073 90
probe without installation set, probe length 2m	15 073 98
probe without installation set, probe length 5m	15 073 92
probe without installation set, probe length 20m	15 073 19
Installation set to mount the probe	15 073 97
Cable connection fitting, complete IP54, to extend 2-wire network or signal cables to 4mm <sup>2</sup>	15 379 00
Spare seal	15 513 60

### DECLARATION OF CONFORMITY

You will find the manufacturer's **declaration of conformity** for this product on the website: <https://www.gok.de/konformitaetserklaerungen>



### DECLARATION OF COMPLIANCE

You will find the manufacturer's **declaration of compliance** for this product on the website:  
[www.gok.de/uebereinstimmungserklaerungen](http://www.gok.de/uebereinstimmungserklaerungen)



### DECLARATION OF PERFORMANCE

You will find the manufacturer's **declaration of performance** for this product on the website: [www.gok.de/leistungserklaerungen](http://www.gok.de/leistungserklaerungen).



### WARRANTY

We guarantee that the product will function as intended and will not leak during the legally specified period. The scope of our warranty is based on Section 8 of our terms and conditions of delivery and payment.



### CONTAINMENT FACILITY

#### NOTICE

Containment facilities are safety facilities to contain liquids that are harmful to water that leak from system components. These especially include: containment chambers, containment basins, inspection pits, protection tubes, leakage areas, and monitoring areas.

Containment facilities must be designed in accordance with the applicable regulations and rules of the EU member states.

**NOTES**

### INSTALLATION CERTIFICATE FROM SPECIALISED COMPANY



- To be kept by system operator.
- Important for any warranty claims.

I hereby confirm that the following safety device was installed correctly:

☐ **Leak alarm, Type LWG 2000**

in accordance with the applicable assembly and operation manual. After INSTALLATION, the safety device was started up and subjected to a FUNCTION TEST. Upon start-up, the safety device operated properly. The operator was informed about the operation, care and maintenance of the leak alarm in accordance with the assembly and operating manual. The assembly and operating manual along with a copy of the general building-authority approval was handed to the operator and is in the possession of the operator.

Specialised company is

- ☐ Specialised company according to water law  
☐ (Electrical installation) company

Operating medium or stored material ►

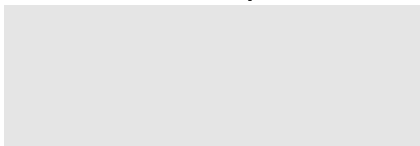
- ☐ Waste oil                      ☐ Diesel fuel  
☐ FAME                              ☐ Aqueous urea solution  
☐ Fuel oil                          ☐ Bio fuel oil  
☐ Industrial oil  
☐ Water or oil-water mixtures  
☐ Other water-hazardous, non-flammable liquids <sup>1) + 2)</sup>

<sup>1)</sup> More detailed description of the operating medium



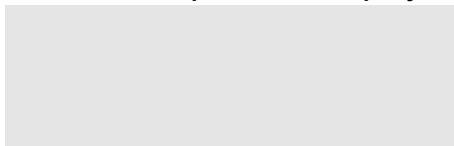
<sup>2)</sup> Proof of function from the manufacturer's tests: Immerse the probe in the operating medium to be tested. Leave in a heating cabinet at + 60 °C for 48 hours. Then carry out the specified FUNCTION TESTS at ambient temperature. A certificate of the test and the result must be issued.

#### Address of operator



Place, date

#### Address of specialised company



Specialised company(stamp, signature)

### Recurring FUNCTION TEST

The safety device(s) was (were) subjected to a recurring FUNCTION TEST and worked correctly at that time.

Place, date

Specialised company(stamp, signature)