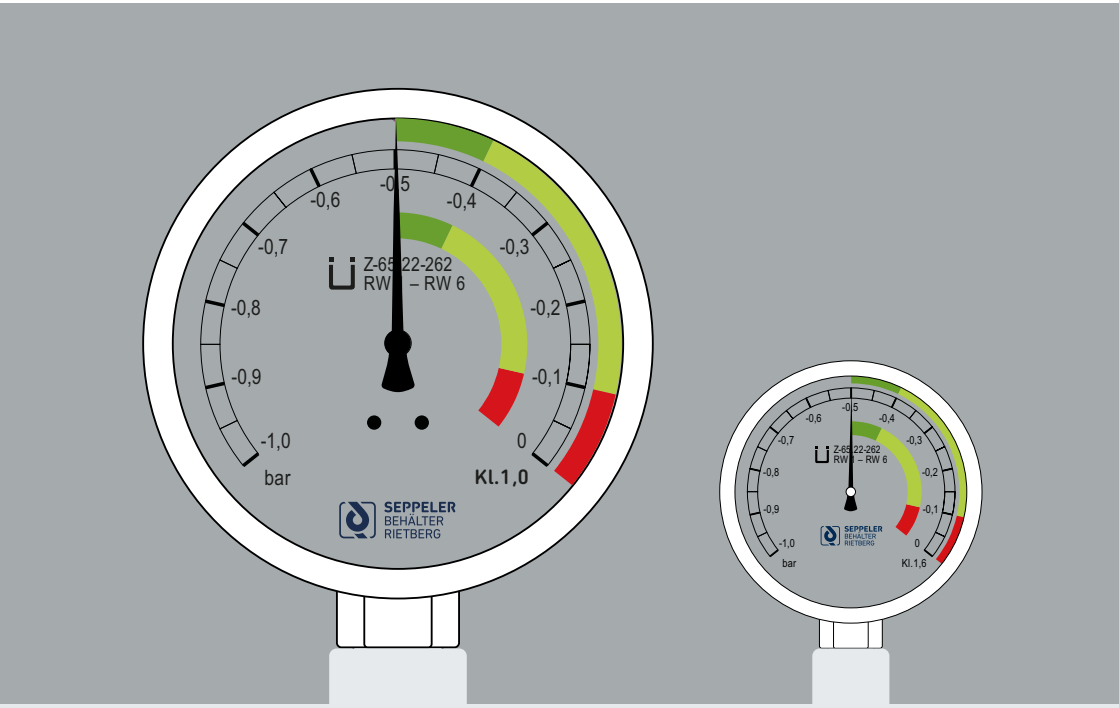
SEPPELER
RIETBERGBEHÄLTER

TECHNICAL DESCRIPTION
VACUUM-LEAKAGE MONITORING SYSTEM

RW 1 RW 2 RW 3 RW 4 RW 5 RW 6



SEPPELER – WE MAKE IT WORK.

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APPROVALS AND
REPLACEMENT PARTS LISTS

https://www.seppeler.de/rietberg-behaelter/service/produktdokumentationen

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1 GENERAL DESCRIPTION

This chapter contains information on this technical description as well as general safety information when handling the vacuum-leakage monitoring system.
In the following, the vacuum-leakage monitoring system is also referred to as a leakage indicator.

1.1 INFORMATION ON THE TECHNICAL DESCRIPTION

This technical description is a central component of the leakage indicator user documentation. Take note of all information, data and requirements contained within the technical description. The technical description will help you to operate the leakage indicator safely and with a high degree of availability.
Technical changes of the specifications and illustrations in the technical description which serve to improve the leakage indicator are reserved.

1.2 USING THE TECHNICAL DESCRIPTION

This technical description serves to allow you to familiarise yourself with the leakage indicator and to use it according to its proper fields of application.
The technical description is to be complemented based on existing national accident prevention and environmental protection regulations.
The technical description must always be available at the site of the leakage indicator and in a readable form.
The technical description must be read and applied by every person charged with working with/on the leakage indicator, for example: Operation, including setting up, removing faults, care, disposal of operating and auxiliary materials, servicing (maintenance, inspection).

As well as the technical description and the accident prevention regulations applicable in the country and at the site of use, the recognised specialist rules for safe and proper working must also be observed.

1.3 LAYOUT OF THE TECHNICAL DESCRIPTION

Safety information is indicated with the appropriate symbol and bold text.

Enumerations
Enumerations of properties in an arbitrary, non-sequential manner are indicated with a point.
Example:
› Feature A
› Feature B
  › Sub-feature of feature B

Sequences
Working stages which must be carried out in the prescribed sequence are numbered and the result of the working stage is depicted in cursive.
Example:
1. Stage 1
   Result of stage 1
2. Stage 2
   2.1 Partial stage of stage 2

1.4 OBLIGATIONS OF THE OPERATING COMPANY

The operating company undertakes to only allow persons to work on the leakage indicator if they:
› Are instructed in the fundamental requirements of safety at work and accident prevention and in the use of the leakage indicator.
› Have read and understood the safety information and warnings in this

technical description.
- Have been trained or instructed and their responsibilities for operating, setting up, maintaining and repairing the system have been clearly set out.
- Are regularly instructed on complications, hazards and other special rules of conduct.

The operating company undertakes to:
- Observe and instruct the generally accepted legal and other binding regulations on accident prevention, environmental protection and handling hazardous substances, in addition to this technical description.
- Determine the responsibility of the user to allow the user to refuse to follow the unsafe instructions of third parties.
- Check the safety-conscious work of the personnel at regular intervals.
- Observe the applicable legal requirements and regulations at the site of the leakage indicator.

1.5 REQUIREMENTS FOR THE PERSONNEL

Before beginning the work, all persons who are tasked with working on the leakage indicator undertake to:
- Observe the fundamental requirements of safety at work and accident prevention.
- Read the safety and warning information in this technical description.
- Apply or use personal/work-related protective equipment and tools during work which serve to ensure safety at work if this is deemed necessary for safety reasons.
- Adhere to the competence specifications.

When it comes to installing, maintaining and repairing the leakage indicator, the operating company may only contract companies which are specialised in these activities in terms of section 3 AwSV, and which have knowledge of fire and explosion protection, if these activities are to be carried out on containers for liquids with a flashpoint ≤ 55 °C. Once the leakage indicator has been assembled, an inspection to ensure proper installation and good working order must be carried out by a qualified professional from the specialist company. A certificate for the setting of the leakage indicator and its good working order must be issued and passed to the operating company.
The activities do not need to be carried out by specialist companies if they are

exceptions to the obligation to engage a specialist company in accordance with national regulations, or if the manufacturer of the leakage indicator carries out the activities using their own qualified professionals. The safety at work requirements remain unaffected.
Use by unauthorised personnel is not permitted.

1.6 INFORMATION ON TRAINING

Only use trained or instructed personnel. Clearly set out the responsibilities of the personnel for the operation, setting up, maintaining and repairing the system. Personnel being trained, introduced to or instructed in using the system, as well as personnel working as part of a general apprenticeship, may only be allowed to work on the leakage indicator under the constant supervision of an experienced person.
The following knowledge and skills must be taught to the users:

- Accident prevention regulations.
- Measures to take in an emergency.
- Safety information for use.
- Tests and visual checks.
- Explanations of the technical description for the operating personnel.

1.7 HAZARDS WHEN OPERATING THE LEAKAGE INDICATOR

The leakage indicator is built according to the most recent state of technology and the recognised safety regulations. However, damage to the leakage indicator tank or other material assets, or damage to the environment may occur if not used properly.
Only operate the leakage indicator in a technically flawless state and according to the instructions on proper use. Remove faults which could have an impact on safety or have them removed immediately.

1.8 PROPER USE

This leakage indicator without its own negative pressure generator serves to monitor double-walled containers used for storing water-polluting liquids. The leakage indicator consists of a control block with pressure gauge connected to the container. Any leakage in the walls of the interstitial space of a container is detected through the increase in pressure and visually displayed. Different uses or uses which go beyond this count as misuse and are not in accordance with the proper use requirements. The company Seppeler Rietbergwerke GmbH & Co. KG is not liable for any damage arising from this.
Proper use also includes:

- Observing all instructions and regulations in the technical description and all accompanying documents.
- Adhering to prescribed time limits for inspections and maintenance work and time limits listed in the technical description including its accompanying documents.

1.9 MISUSE

The following in particular count as misuse:

- Unauthorised changes. The operating company may not make any changes, extensions and renovations to leakage indicator which may affect its safety without permission from Seppeler Rietbergwerke GmbH & Co. KG. This applies in particular to the installation and setting of the leakage indicator. Changes to the leakage indicator may void the approval.
- The operation, maintenance and repair of the leakage indicator by unauthorised and/or uninstructed persons.
- The use of liquids in the leakage indicator.
- Operating a damaged leakage indicator.
- Using spare parts which are not original. Spare parts used must meet the technical requirements given by Seppeler Rietbergwerke GmbH & Co. KG.
- Operating the leakage indicator outside of the given parameters / operating data.

1.10 CLAIMS AND LIABILITY

Generally, our "general terms and conditions of sale and delivery" apply. These are available to the operating company of the leakage indicator upon signing the contract at the latest.
The liability of Seppeler Rietbergwerke GmbH & Co. KG is 1 year from the date of delivery.

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If the disruption within the warranty period arose from inappropriate handling, or arose after the warranty period ended, the service costs are at the expense of the owner.
Defect and liability claims for damage to persons or property are excluded if they arose from one or several of the following causes:

- Improper use.
- Damage due to inappropriate handling.
- Inappropriate assembly, commissioning, operation and maintenance.
- Operating the storage facility with a defective leakage indicator.
- Not observing the information in the technical description regarding assembly, commissioning, operation, maintenance and setting up.
- Unauthorised structural changes.
- Repair work which is carried out in an improper manner.
- Catastrophic events due to the influence of external forces and force majeure.
- Vandalism.

2 SAFETY SYMBOLS

DANGER

"DANGER" indicates an immediate threat of danger which will lead to severe physical injuries or death.

WARNING

"WARNING" indicates a potentially dangerous situation which could lead to severe physical injuries or death.

CAUTION

"CAUTION" indicates a potentially dangerous situation which could lead to minor physical injuries.

INFORMATION

"INFORMATION" indicates a potentially dangerous situation which could lead to damage to property or the environment.
This signal word is also used for application information and other useful information.

3 TECHNICAL DATA

3.1 GENERAL DATA

Name:	Vacuum-leakage monitoring system RW 1 – RW 6
Environmental temperatures:	-20 °C to +60 °C (glycerine) -40 °C to +60 °C (silicone oil)
Relative humidity:	max. 90%
Monitoring principle:	Permanent off-grid vacuum-leakage monitoring at both walls
Permissible media/storage goods:	Water-polluting liquids without solid particle separation and with a kinematic viscosity of ≤ 5000 mm^2/s.
Approval:	General type approval no. Z-65.22-262
Connection valve:	Schrader valve NPT 1/8" x 1/4" SAE

3.2 PRESSURE GAUGE

Model:	EN 837-1
Dial scale:	0 to -1.0 bar (1/10 subdivision of the display)
Diameter range [mm], pressure gauge:	Ø 50 to Ø 75 for containers ≤ 1000 l Ø 100 to Ø 200 for containers >1000 l
Pressure gauge housing:	CrNi-steel, blank
Inspection glass:	Plastic, clear
Pressure gauge process connection:	NG 50: External thread G ¼ B, SW 14 NG 100: External thread G ½ B, SW 22
Filling liquid:	Glycerine Silicone oil
Accuracy class:	NG 50, 63: 1.6; NG 100: 1.0

3.3 VARIANTS

Type	Design and type of container
RW 1	Cubic transport and storage container
RW 2	Upright cylindrical storage container
RW 3	Horizontal cylindrical storage container
RW 4	Upright cylindrical transport container
RW 5	Horizontal cylindrical transport container
RW 6	Upright and horizontal cylindrical transport container (Operating pressure ≥ 3.0 bar and operating temperature > 50 °C)

4 STRUCTURE AND FUNCTION

4.1 STRUCTURE

The leakage indicator consists of a low-pressure Bourdon tube pressure gauge which corresponds to accuracy class 1.0 or 1.6 in accordance with EN 837-1 and which is filled with glycerine, as well as a control block with a valve for connecting to a mobile evacuation pump or a test fitting. The pressure gauge display panel has a measurement range of -1.0 bar to 0 bar and a diameter of Ø 50 to bis Ø 75 mm for container volumes ≤ 1000 l and a diameter of Ø 100 to Ø 200 mm for container volumes > 1000 l.
Alternatively, a filling of silicone oil may be used.

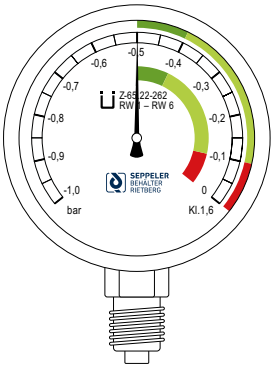

Fig. 4-1: Breakdown of the display panel

Pos.	Name	Function
Adjustment range	-0.4 to -0.5	Dark green
Working range	-0.1 to -0.4	Light green
Alarm range	±0 to -0.1	Red

The leakage indicator is affixed to the container so that the display range of the pressure gauge is visible and the connection is easily accessible for a mobile negative pressure generator or test fitting. The gap at the container walls is designed to be an interstitial space.
At the lowest point of the interstitial space, there is a control sleeve to check the functional reliability and operational safety of the leakage indicator. If a defect occurs, it also allows the draining of water-polluting liquids which must be collected and properly disposed of.
The leakage indicator may be affixed to containers with the following heights regardless of the density of the liquid stored:

Density of the liquid stored	Container height/diameter
≤ 1.6 g/cm3	Up to 2.9 m
≤ 1.7 g/cm3	Up to 2.6 m
≤ 1.8 g/cm3	Up to 2.5 m
≤ 1.9 g/cm3	Up to 2.4 m

4.2 FUNCTION

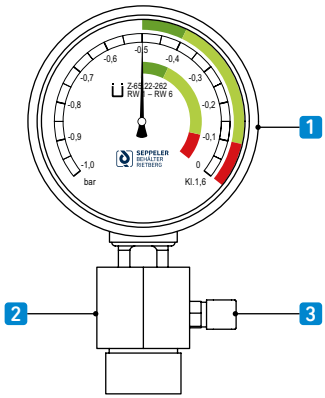

Fig. 4-2: Vacuum-leakage monitoring system:
1 Pressure gauge
2 Control block
3 Connection valve

The leakage indicator works on a negative pressure basis without a negative pressure generator permanently connected to the interstitial space. With the aid of an external evacuation pump which is connected to the control block,

negative pressure of -0.4 to -0.5 bar is generated within the interstitial space. After the negative pressure generator is removed, the light green working range (-0.4 to -0.1 bar) in the interstitial space must be maintained for at least 1 year. Any leakage in the walls of the interstitial space is detected when the negative pressure drops to -0.1 bar and is displayed by the red field of the pressure gauge dial.

The pressure can also be picked up by a pressure transducer on the pressure gauge. The pressure transducer serves to convert the pressure from the physical size into an electrical signal which can be further processed by the operating company accordingly. The operating instructions of the third-party manufacturer must be followed.

5 ASSEMBLY, LEAK TEST AND COMMISSIONING

5.1 ASSEMBLY

The leakage indicator and its related attachment parts have already been completely mounted onto the gas-tight interstitial space of the above-ground double-walled container by the container manufacturer. The leakage indicator is affixed to the container so that the display range of the pressure gauge is visible and the connection for an evacuation pump or test fitting is easily accessible. Each leakage indicator is subjected to a leak test with helium.

5.2 LEAK TEST

5.2.1 TEST BASED ON THE OVERPRESSURE PRINCIPLE

An almost absolute vacuum is generated in the interstitial space by way of an evacuation pump. Subsequently, the interstitial space is flooded with helium until the overpressure of 0.1 to 0.2 bar required to search for leakages has been generated in the test space. The leakage detector probe moves along the welded seams of the interstitial space. If the welded seams have leakages in places (micropores, lack of fusion), these leakages are identified by the leakage detector and reported.

5.2.2 TEST BASED ON THE NEGATIVE PRESSURE PRINCIPLE

An consistent, almost absolute vacuum is generated in the interstitial space by way of an evacuation pump. The evacuated test space is connected via a leak detection device. The welded seams of the interstitial space are impinged with helium. If there are leakages in the welded seams, helium is pulled into the interstitial space, detected by the leakage detector and the alarm is triggered.

5.3 COMMISSIONING

Once the leak test has been completed successfully, the leakage indicator is mounted by the manufacturer in an operational state, and a negative pressure of 0.4 to 0.5 bar is set so that no further measures are required for commissioning the leakage indicator.

6 OPERATION

The leakage indicator may only be used in accordance with its conditions for proper use (see chapter 1.8 "Proper use").
The leakage indicator operates in the following modes:

› Monitoring the leak tightness of the container walls.

The operating, setting up, maintenance and troubleshooting work can be sorted into these operating modes.

Basic checks before and during operation.

Each time before filling or removing liquids, check the leakage indicator for visible defects (visual check). Before beginning work, the time periods for checks and maintenance work in accordance with chapter 7 "Maintenance and care" must be complied with.
During operation, the operator must always be observant for irregularities around the container. The following signs indicate irregularities:

› Unusual smell.
› Stains from operating materials on the container or on the ground.
› Leaks.

At the first sign of the characteristics mentioned above, shut down the container immediately. Inform the maintenance personnel immediately for a precise assessment of its technical condition. The maintenance personnel must decide whether operation can continue without further restrictions on the functionality. If downtime is expected due to the damage established, repair measures must be introduced without delay.

7 MAINTENANCE AND CARE

To ensure flawless, proper use of the leakage indicator, the care and maintenance tasks discussed in this chapter are necessary. Regular care and maintenance extend the life cycle of the tank and increase its performance.
The maintenance work must be carried out regularly for the safe operation of the leakage indicator, and the intervals between each service must be adhered to. Not adhering to these can lead to damage and the increased risk of accidents.
Only use materials, operating or auxiliary agents recommended by the manufacturer.

7.1 MAINTENANCE TABLE

Component	Work to be carried out	Interval
Pressure gauge	Checking and recording the pressure on the pressure gauge. If an alarm is triggered in the red area, the system must be shut down and the damaged container must be drained, if necessary.	Regularly At least once per week
Pressure gauge	Checking the pressure gauge display for dirt and readability.	Regularly At least once per week

7.2 RECURRING TESTS ON THE LEAKAGE INDICATOR

At least once per year, the functional reliability and operational safety of the leakage indicator must be inspected by a qualified professional from a specialist company in accordance with section 3 of the Ordinance on Installations for the Handling of Substances Hazardous to Water dated 31 March 2010 (Federal law gazette I p. 377), or from the manufacturer or operating company, in the case that there is no obligation to engage a specialist company. During this inspection, the interstitial space must be ventilated via the test socket at the lowest point of the container / at the sump tray or suction piece, and the pressure gauge display must be checked.

Any water-polluting liquid located in the interstitial space must be collected and properly disposed of. The inspection must be logged. Once the function of the interstitial space and the pressure gauge has been confirmed, the leakage indicator should be recommissioned and the interstitial space evacuated via the valve on the control block (see chap. 8.4.4 Generating negative pressure in the interstitial space).

8 TROUBLESHOOTING

8.1 SAFETY INFORMATION

DANGER

Danger due to the formation of explosive atmospheres in the interstitial space!
If flammable liquids (flashpoint < 55 °C) have been stored and liquid or gas has penetrated the interstitial space from the vapour chamber via a leakage in the inner tank wall, an explosive atmosphere in the interstitial space must be assumed. For drying, ventilation and assembly work, only devices and tools which are approved for work in explosive environments may be used.

INFORMATION

Repair work may only be carried out by the manufacturer or by a specialist company authorised by the manufacturer in accordance with section 62 AwSV.

8.2 FAULTS DURING OPERATION

In the case of faults during operation, stop the mobile tank and inform the maintenance personnel.
In the case of faults in the controls and/or electrics, call a professional who can determine and remove the fault using the circuit diagrams.

8.3 FAULT TABLE

Fault	Cause	Remedy
Leakage indicator pointer in alarm range	Leakage in the interstitial space	Shut down the container and inform the maintenance personnel
	Pressure gauge defective	Shut down the container and inform the maintenance personnel
	Connections not tight	Shut down the container and inform the maintenance personnel

8.4 REPAIR

To ensure the flawless, proper use of the leakage indicator, repair work is necessary or cannot be avoided.
The use of original replacement parts and wearing parts, as well as authorised accessories, serves to ensure operational safety of the leakage indicator and protects personnel and the environment from unpredictable hazards.

8.4.1 DRAINING LIQUID FROM THE INTERSTITIAL SPACE

If the leakage indicator is not displaying negative pressure, i.e. the pressure gauge pointer is in the alarm range and shows between -0.1 and 0 bar and no visible damage can be seen on the exterior tank coat, the operator must check whether liquid has penetrated the interstitial space in the inner container due to leakages.

Working stages:

1. Place a suitable receptacle under the test socket at the base of the container.
2. Loosen the locking screw at the test socket.
3. If liquid drains out, ventilate the interstitial space.
   - 3.1 Unscrew the protective cap on the vacuum valve.
   - 3.2 Connect the flushing device to the vacuum valve (connection thread = 7/16-20 UNF) and flush the interstitial space with an inert gas such as nitrogen.
4. Connect the flushing line to the connection bracket (internal thread G ¼). The inlet pressure (overpressure in the flushing line) must not exceed the maximum permitted test pressure. If the inlet pressure is higher, an unpermitted level of overpressure is generated in the interstitial space. A suitable pressure reducer must be used.
5. Flush the interstitial space until no more liquid drains from the test socket and the interstitial space is dry.
6. After the flushing process:
   - 6.1 Remove the collection receptacle from under the test socket and dispose of the collected liquid appropriately.
   - 6.2 Determine the cause for the drop in vacuum and arrange the corresponding repair measures.
7. After the repair:
   - 7.1 Clean the threads of the test socket and locking screw using a brass wire brush.
   - 7.2 Moisten the locking screw with a liquid sealant (e.g. WEICONLOCK low strength).
   - 7.3 Screw the locking screw into the test socket and tighten.
   - 7.4 The leak-tightness of the leakage indicator (interstitial space with leakage indicator) must be checked and proven (see chap. 5.1 Assembly).

7.5 In the interstitial space, generate a negative pressure of 0.4 to 0.5 bar (see chap. 8.4.4 Generating negative pressure in the interstitial space).

8.4.2 REPLACING THE PRESSURE GAUGE

INFORMATION

The pressure gauge has been stuck in place by the manufacturer using WEICONLOCK / low strength.
When using liquid sealants, you must be aware of the hardening time. For WEICONLOCK / low strength, the hardening time is approx. 30 minutes.

Working stages:

1. Remove the pressure gauge.
2. Clean the threads using a brass wire brush. The threads must be clean and free from grease.
3. Fit the new pressure gauge. To do this, use WEICONLOCK / low strength as a sealant. The scale must be visible.
4. In the interstitial space, generate a negative pressure of 0.4-0.5 bar (see chap. 8.4.4 Generating negative pressure in the interstitial space.

8.4.3 REPLACING THE VACUUM VALVE

INFORMATION

The vacuum valve has been stuck in place by the manufacturer using WEICONLOCK / low strength.
When using liquid sealants, you must be aware of the hardening time. For WEICONLOCK / low strength, the hardening time is approx. 30 minutes.

Working stages:

1. Unscrew the protective cap from the vacuum valve.
2. Remove the vacuum valve.
3. Clean the threads using a brass wire brush. The threads must be clean and free from grease.
4. Fit the new vacuum valve. To do this, use WEICONLOCK / low strength as a sealant.
5. In the interstitial space, generate a negative pressure of 0.4 to 0.5 bar (see chap. 8.4.4 Generating negative pressure in the interstitial space).

8.4.4 GENERATING NEGATIVE PRESSURE IN THE INTERSTITIAL SPACE

If the negative pressure in the interstitial space needs to be built back up as a result of repair work, functional inspections or even manipulation, take the following measures:

Working stages:

1. Unscrew the protective cap from the vacuum valve.
2. Screw adapter 1/4" SAE onto the vacuum valve to connect a hose.
3. Connect the evacuation pump hose.
4. Start the evacuation pump and leave it switched on until the preset pressure of -0.4 to -0.5 bar is reached.
5. Stop the evacuation pump, loosen the hose connection and remove adapter 1/4" SAE from the vacuum valve.
6. Screw the protective cap onto the vacuum valve.

INFORMATION

If the negative pressure constantly remains in the preset range for half an hour, the leak-tightness of the leakage indicator is proven.

9 DISASSEMBLY AND DISPOSAL

9.1 SAFETY INFORMATION

DANGER

Danger due to explosive atmosphere!

- Only specialist personnel may be tasked with disassembling the leakage indicator.
- Keep unauthorised persons away from the work.
- Before decommissioning or disposal, dispose of any liquids appropriately.
- Before starting disassembly, check the disassembly area for possible sources of ignition and remove these.
- If necessary, ensure that there is a lot of space around the disassembly area.
- Keep away from sources of ignition.
- Smoking, open light and fire are forbidden.
- Only use explosion-protected tools.
- Recycle attachment parts in the appropriate manner.
- Dispose of cleaning materials and unusable fuel appropriately.
- Observe the information in the safety data sheet about the fuel used.
- When introducing media to rinse the container, explosive vapour-air mixtures may be displaced. Assume an explosive atmosphere in an area of 2 m. Fire, open lights and smoking are forbidden. Keep away from sources of ignition.

WARNING

Danger of injury due to improper disassembly work!

› Only specialist personnel may be tasked with disassembling the leakage indicator.
› Keep unauthorised persons away from the work.
› Use personal protective equipment.

INFORMATION

Environmental pollution!

› The parts of the leakage indicator must be disposed of properly in accordance with the local regulations.
› Operating materials must be properly disposed of in accordance with the local regulations.

9.2 DISASSEMBLY AND DISPOSAL

The leakage indicator must be disassembled properly for disposal and recycled appropriately in individual parts.
Observe the following points before disposal:

› Before beginning disassembly, collect and dispose of any liquids.
› If necessary, ensure that there is a lot of space around the disassembly area.

10 REPLACEMENT PARTS LIST

Pos.	Quanti-ty	Description	Art. no.
1	1	Pressure gauge for containers ≤ 1000 l	37251
2	1	Pressure gauge for containers > 1000 l	37648
3	1	Screw fitting G ¼" x G ¼" x G ⅛"	44574
4	1	Screw fitting G 1" x G ¼" x G ⅛"	87917
5	1	Screw fitting G 1" x G ½" x G ⅛"	89069
6	1	Vacuum valve for leakage indicator NPT ⅛	37006
7	1	Special adapter for vacuum valve	39312
8	1	Evacuation pump including 2.4 m connection hose and special adapter for vacuum valve	89673

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