Documentation

Pressure Leak Detector DLG ..

Please read instructions prior to commencing any work

As of 05/2025

Item no.: 603042

DLG Versions

DLG pressure leak detectors are available in different versions that are described more precisely by the letters attached to them. The levels of availability and the possible combinations depend on the device. Please contact our sales team. Phone +49 0271 48964-0, email sgb@sgb.de

DLG .. P M 8S

Up to 8 leak detection probes can be connected to the leak detector.

"Manometer": The leak detector is equipped with a digital pressure indicator in the housing cover.

"Protected": Leak detector version in a weather-protected housing made of stainless steel.

".." = Numerical value that stands for the alarm pressure of the leak detector. The alarm pressures range from 50 mbar to 3000 mbar.

"Pressure leak detector with gas supply": The leak detector operates with overpressure towards the atmosphere.

Table of Contents

1. General

1.1 Information

These instructions provide important notes on using the DLG leak detector. Workplace safety requires all the safety and handling instructions specified in this manual to be adhered to.

Furthermore, any local regulations for preventing accidents at the site where the leak detector is used and general safety instructions must be complied with.

1.2 Explanation of Symbols

In these instructions, warnings are marked with the adjacent symbol.

The signal word expresses the level of hazard.

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

WARNING:
Potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION:
Potentially hazardous situations which, if not avoided, could result in minor or moderate injury.

INFORMATION:
Highlights useful tips, recommendations, and information.

1.3 Limitation of Liability

All information and instructions in this documentation have been compiled with consideration given to the applicable standards and regulations, the state of the art, and our longstanding experience.

SGB does not assume any liability in the case of:

- Noncompliance with these instructions
- Improper use
- Use by unqualified personnel
- Unauthorized modifications
- Connection to systems not approved by SGB

1.4 Copyright

1.5 Warranty Conditions

We provide a warranty for the DLG leak detector for a period of 24 months from the day of installation on site in accordance with our General Terms & Conditions.

The maximum warranty period is 27 months from our date of sale.

Warranty is subject to submission of the functional/test report on initial commissioning by qualified personnel.
The serial number of the leak detector must be stated.

The obligation of warranty shall cease to exist in the case of
- inadequate or improper installation
- improper use
- modifications/repairs without consent of the manufacturer

No liability is accepted for delivery parts that wear or are consumed prematurely due to their material properties or application (e.g., pumps, valves, seals, etc.). We do not assume responsibility for corrosion damage due to a humid installation site.

1.6 Customer Service

Our customer service is available for any inquiries.

For information on contacts please refer to our website sgb.de/en or the label of the leak detector.

2. Safety

2.1 Intended Use

- Pressure leak detector for double-walled containers, where pressure is maintained via a pressure gas supply.
- Containers monitored with this leak detector may neither be filled with hot media nor warmed up. Doing so despite this prohibition requires coordination with SGB GmbH.
- Only operate the leak protector with pressure reducers tested and approved by SGB. When using other pressure reducers, provide evidence that failure of the pressure reducer will not result in unacceptable pressure increases.
- Install the pressure gas bottle in a way that ensures no risks will be presented if there is an increase in concentration.
- Only intended for use with pressure gas bottles up to a pressure of 200 bar.

- Connection of interstitial spaces **only in the case of below-ground** interstitial spaces[1].
- Double-walled containers, tubs, or surface sealings
- The alarm pressure must be at least 30 mbar higher than any pressure against the interstitial space (from inside and/or outside).
- Grounding (if applicable) in accordance with applicable regulations[2].
- The leak detection system is leak-proof according to the table in section 4.5.5 of this documentation.
- Leak detector installed outside of the explosive area.
- Leadthroughs for the pneumatic connection lines sealed in a gas-tight way.
- Leak detector (electric) cannot be turned off.

Any claims arising from misuse are excluded.

Caution: The protective function of the device may be impaired if it is not used as specified by the manufacturer.

2.2 Obligation of the Operating Company

WARNING!
Danger in case of incomplete documentation

The DLG leak detector is used in a commercial environment. The operating company is therefore subject to statutory occupational safety obligations.

In addition to the safety instructions in this documentation, all applicable safety, accident prevention, and environmental regulations must be adhered to. In particular:

- Compiling a risk assessment and implementing its results in a directive

[1] Not permitted in Belgium in accordance with VLAREM II – one leak detector per interstitial space is prescribed there.
[2] For example, in accordance with EN 1127

- Performing regular checks as to whether the directive is in compliance with the current standards
- The directive includes information on how to react to an alarm that might arise
- Arranging for an annual functional check

2.3 Qualification

WARNING!

Danger to humans and the environment in the case of inadequate qualification

The personnel must be capable of independently recognizing and avoiding potential risks based on their qualifications.

Companies commissioning leak detectors must be trained by SGB or an authorized representative.

National guidelines must be adhered to.

For Germany:
Technical service qualification for mounting, commissioning, and maintenance of leak detection systems.

2.4 Personal Protective Equipment (PPE)

Personal protective equipment must be worn during work.

- Wear the necessary protective equipment for the work in question
- Note and comply with on-site PPE signs

Entry in the "Safety Book"

Wear gloves – where necessary

Wear HV vest

Wear safety goggles – where necessary

Wear safety footwear

Use an oxygen warning device with the leak detection medium nitrogen

Wear hard hat

2.4.1 Personal Protective Equipment for Systems that may be Subject to a Risk of Explosion

The points listed here refer exclusively to safety when working with systems that may be subject to the risk of an explosion.

If work is performed in areas in which an explosive atmosphere must be expected, the minimum required equipment is as follows:

- Suitable clothing (risk of electrostatic charge)
- Suitable tools (in accordance with EN 1127)

- Suitable combustible gas indicator calibrated to the existing vapor-air mixture (work should be performed only at a concentration of 50 % below the lower explosion limit[3])
- Measuring equipment to determine the oxygen content of the air (Ex/O meter)

2.5 Fundamental Hazards

DANGER

From electric current

When working on the leak detector, it must be disconnected from the power supply unless stated otherwise in the documentation.

Comply with relevant regulations regarding electrical installation, explosion protection (e.g., EN 60 079-17), if necessary, and accident prevention.

DANGER

From explosive vapor-air mixtures

Ensure there is no gas present prior to performing work

Comply with explosion regulations, e.g., German Ordinance on Industrial Safety and Health (Betriebssicherheitsverordnung, BetrSichV) (and/or Directive 1999/92/EC and the laws of the respective member states resulting from this) and/or others.

DANGER

From working in chambers

The leak detectors are mounted outside the access chambers. Pneumatic connection is usually performed inside the access chamber. Therefore, the chamber must be entered in order to complete the mounting process.

Before entering, the corresponding protective measures must be taken, and it must be ensured that no gas and sufficient oxygen are present.

[3] Other countries' or companies' regulations may provide different percentages.

3. Technical Data of the Leak Detector

3.1 General Data

Dimensions and drilling pattern		see Appendix, section 12.1
Weight	Plastic	2.2 kg
	Stainless-steel	4.4 kg
Storage temperature range		
	Plastic	-5°C to +50°C
	Stainless-steel	-40°C to +70°C
Operating temperature range		
	Plastic	0°C to +40°C
	Stainless-steel	-40°C to +60°C
Max. height for safe operation		≤ 2000 m above sea level
Max. relative humidity for safe operation		95 %
Buzzer volume		> 70 dB(A) at a distance of 1 m
Housing protection class		
	Plastic	IP 30
	Stainless-steel	IP 54

3.2 Electrical Data

Power supply - Optional	100–240 V, 50/60 Hz 24 V DC
Input capacity (without external signal)	10 W (without heating) 28 W (with heating at 20 °C)
Terminals 5, 6, external signal	max. 24 V DC; max. 300 mA
Terminals 11…13 (potential-free)	DC ≤ 25 W or AC ≤ 50 VA
Terminals 17…19 (potential-free)	DC ≤ 25 W or AC ≤ 50 VA
External fuse for leak detector	max. 10 A
Overvoltage category	2
Degree of soiling	PD2

3.3 Data referring to the Pressure Equipment Directive

Note: The leak detector, installation kits, and manifolds are pressure accessories without a safety function.

Volume leak detector	0,03 liters
Volume manifold 2…8	0,02 liters … 0,08 liters
Max. operating pressure	see 3.5, col. p_{PA}

3.4 Pneumatic Data (Requirements for Measuring Gauge)

Nominal size	min. 100
Class precision	min. 1.6
End scale value	suitable

3.5 Switching Values

Type DLG	p_{TS} [mbar]	p_{AE} [mbar]	p_{PA} [mbar]	$P_{ÜDV1}$[4] [mbar]	$p_{ÜDV2}$ [5] [mbar]	$p_{PRÜF}$ [mbar]	p_{DM} [mbar]
50	20	> 50	< 100	170 ± 20	600 ± 50	≥ 200	200
100	70	> 100	< 150	220 ± 20	650 ± 50	≥ 250	250
230*	200	> 230	< 310	360 ± 10	800 ± 50	≥ 400	400
280*	250	> 280	< 330	360 ± 10	800 ± 50	≥ 400	400
290	260	> 290	< 350	420 ± 20	850 ± 50	≥ 450	450
330	300	> 330	< 410	465 ± 20	900 ± 50	≥ 500	500
400	370	> 400	< 500	565 ± 20	1000 ± 50	≥ 600	600
450	420	> 450	< 510	565 ± 20	1000 ± 50	≥ 600	600
590	560	> 590	< 700	770 ± 30	1250 ± 100	≥ 850	850
750	720	> 750	< 850	940 ± 30	1500 ± 100	≥ 1000	1000
1000	970	> 1000	< 1400	1590 ± 50	2700 ± 100	≥ 1750	1800
1100	1070	> 1100	< 1450	1650 ± 70	2750 ± 100	≥ 1820	1850
1500	1450	> 1500	< 1900	2100 ± 50	3400 ± 100	≥ 2350	2400
2000	1950	> 2000	< 2400	2650 ± 50	4200 ± 100	≥ 2950	3000
2300	2250	> 2300	< 2770	3100 ± 100	4800 ± 200	≥ 3500	3500
2500	2450	> 2500	< 2900	3200 ± 50	5000 ± 100	≥ 3550	3600
3000	2950	> 3000	< 3400	3750 ± 50	6000 ± 100	≥ 4150	4200
_	Special switching values agreed to by SGB and customers						

The following abbreviations are used in the table:

p_{TS} Maximum pressure on the tank floor, incl. overburden pressure
p_{AE} Switching value "Alarm ON"; the alarm will be triggered at this pressure level at the latest
p_{PA} Switching value "Refilling OFF" (= operating pressure)
$p_{ÜDV1}$ Opening pressure for overpressure valve 1 (interstitial space)
$p_{ÜDV2}$ Opening pressure for overpressure valve 2 (supply)
$p_{PRÜF}$ Minimum test pressure of the interstitial space
p_{DM} Set pressure on the pressure reducer
* Subsequently added to the table

Supplement to the table:

p_{AA} Switching value "Alarm OFF"; the alarm will be deactivated if this value is exceeded
The switching value "Alarm OFF" is approx. 15 mbar higher than the switching value "Alarm ON" for pressure levels < 1000 and approx. 100 mbar higher for pressure levels > 1000
(p_{AA} = p_{AE} + ~15 mbar (pressure levels < 1000) ~ 100 mbar (pressure levels > 1000))

p_{PE} Switching value "Refilling ON"
The switching value "Refilling ON" is approx. 15 mbar lower than the switching value "Refilling OFF" for pressure levels < 1000 and approx. 100 mbar lower for pressure levels > 1000.
(p_{PE} = p_{PA} - ~15 mbar (pressure levels < 1000) ~ 100 mbar (pressure levels > 1000))

[4] The table lists the opening pressure for overpressure protection at which the volume flow is diverted during active refilling. The operating pressure (initial opening) is lower.

[5] The overpressure valve ÜDV2 can be omitted if the test pressure of the interstitial space is higher than the operating pressure of the overpressure valve integrated in the pressure reducer. The integrated valve must be capable of blowing off the faulty operation of the pressure reducer without exceeding the test pressure in the interstitial space.

3.6 Field of Application

Note on use with containers with permeation: The DLG leak detector with an inert leak detection medium (pressure gas bottle or operational network) can also be used on containers where permeation into the interstitial space occurs due to the stored material and the material composition of the inside container walls (e.g., in the case of double-walled GRP tanks), potentially leading to formation of an explosive atmosphere in the interstitial space during operation.

3.6.1 Interstitial space requirements

- Proof of pressure resistance of the interstitial space (see section 3.5 Switching Values, column "$p_{PRÜF}$" minimum test pressure of the interstitial space)
- Proof of suitability of the interstitial space (for Germany: proof of usability from construction authority).
- Sufficient passage in the interstitial space for the leak detection medium (nitrogen)
- Tightness of the interstitial space according to this documentation.
- The number of interstitial spaces of below-ground containers to be monitored depends on the total interstitial space volume. According to EN 13160, 10 m^3 may not be exceeded. To be able to test the tightness of the interstitial space, it is recommended not to exceed 4 m^3.

3.6.2 Containers/interstitial spaces

- Below-ground and above-ground double-walled steel or plastic containers, without leak detection liquid in the interstitial space, in factory or on-site production design, whose interstitial space is suitable for connection of a DLG .. in accordance with section 3.5.
- Below-ground and above-ground single-walled steel or plastic containers with pressure-resistant leak protection lining or leak protecting jacket, whose interstitial space is suitable for connection of a DLG .. in accordance with section 3.5.
- Double-walled collecting tubs or surface sealings, whose interstitial space is suitable for connection of a DLG .. in accordance with section 3.5.

3.6.3 Stored material

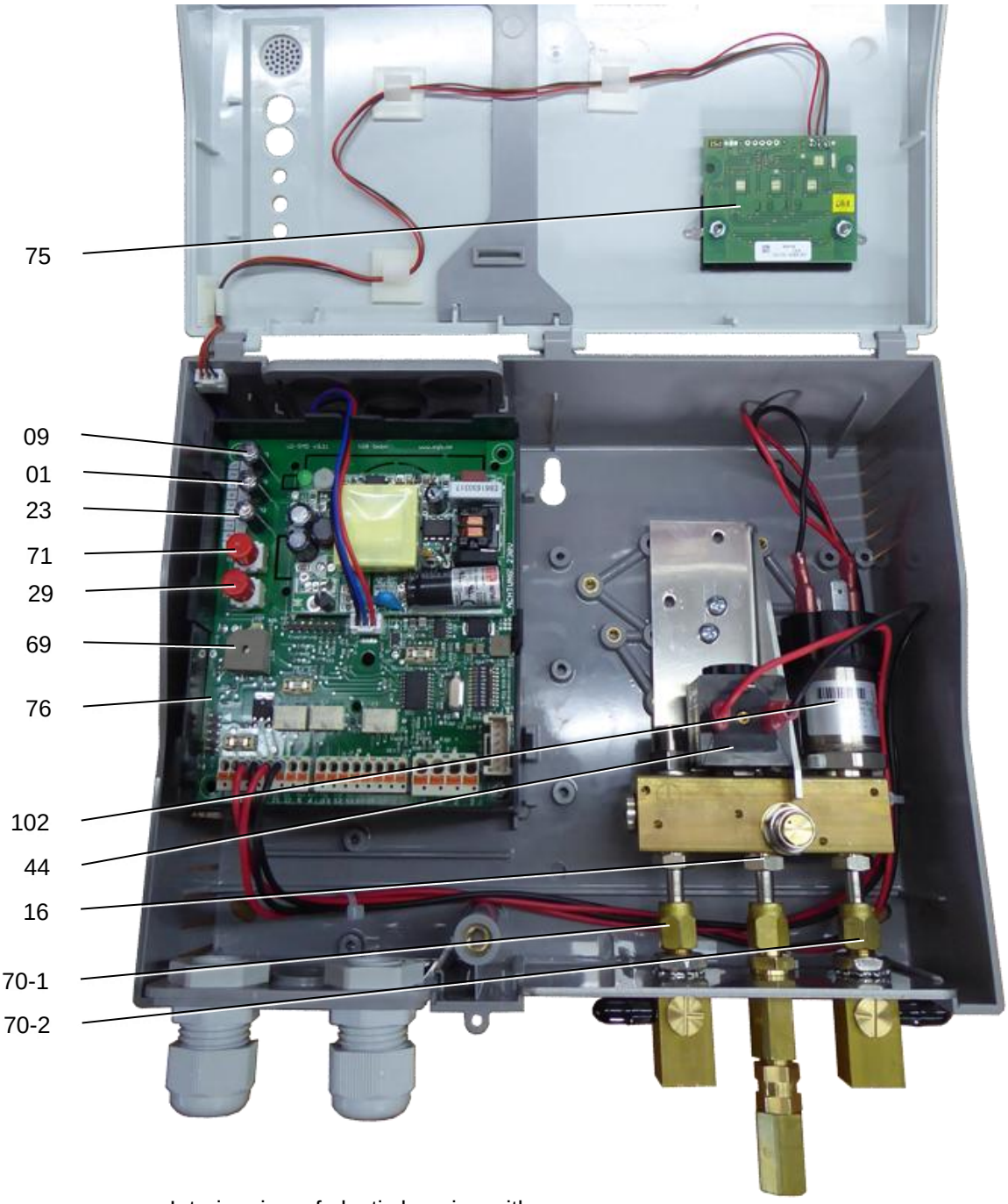
Water-hazardous liquids, with consideration given to the following points:

- The leak detection medium (gas) must not react with the stored material.
- Vapor-air mixtures, arising from
  - the stored liquid,
  - the stored liquid combined with air/humidity or condensation,
  - the stored liquid combined with components (materials) with which the liquid comes into contact

must be classifiable in gas group II A and II B as well as in temperature code T1 to T3.

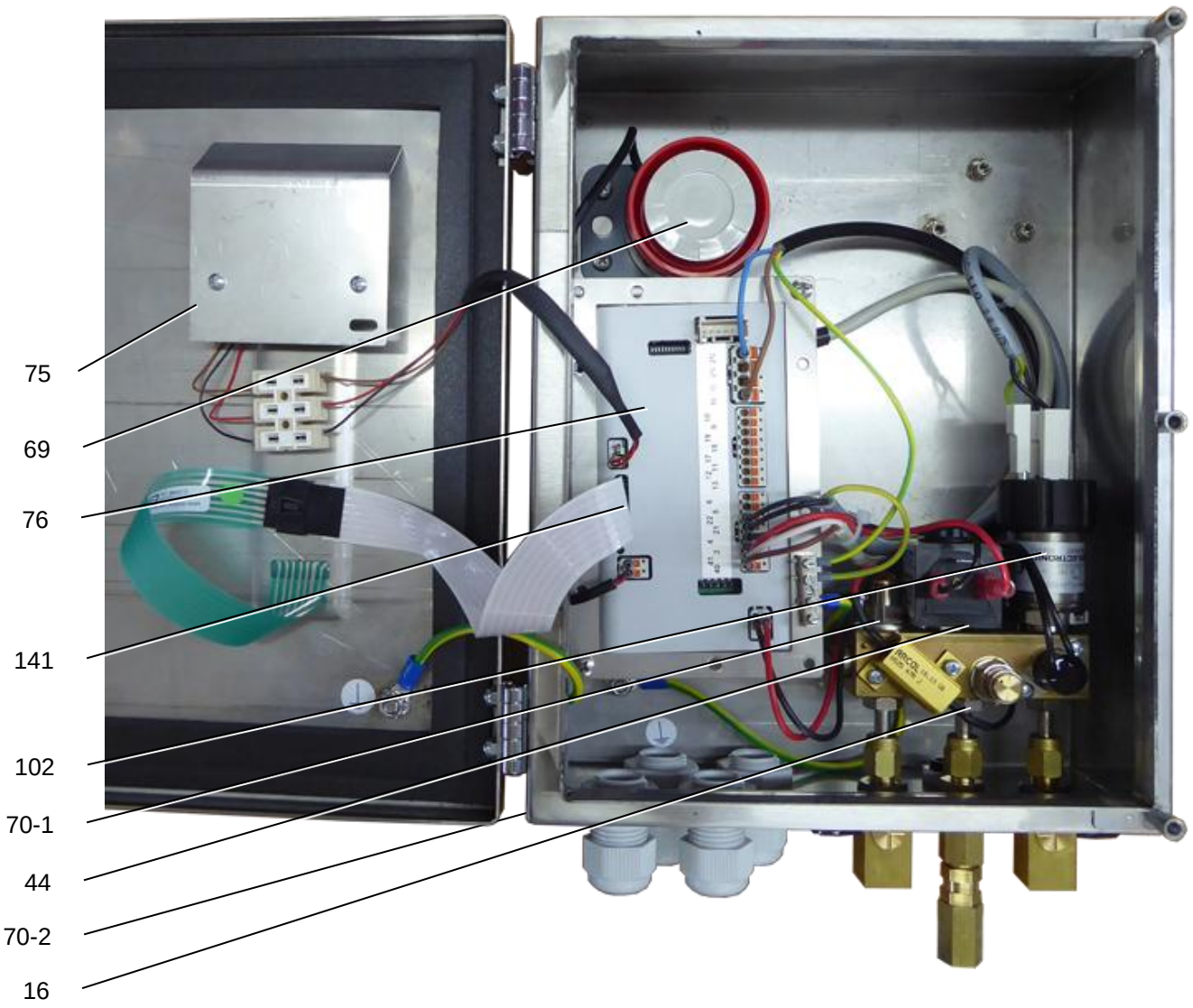
4. Design and Function

4.1 Design



Interior view of plastic housing with:

01	"Alarm" indicator light, red
09	"Operation" indicator light, green
16	Throttle
23	"Filling" or "Refilling" indicator light, yellow
29	"Commissioning" key (filling)
44	Solenoid valve
69	Buzzer
70-1	Overpressure valve (interstitial space)
70-2	Overpressure valve (supply)
71	"Mute" button
75	Display board
76	Main board
102	Pressure sensor



Interior view of stainless-steel housing, weather-protected, with:

16	Throttle
44	Solenoid valve
69	Buzzer
70-1	Overpressure valve (interstitial space)
70-2	Overpressure valve (supply)
75	Display board
76	Main board
102	Pressure sensor
141	Keypad terminal strip

The DLG pressure leak detector monitors both walls of the double-walled system (container) for leaks. The monitoring pressure is so high that leaks are displayed below or above the liquid level (stored material and groundwater) due to pressure drops.

To build pressure, compressed gas (inert gas) is forwarded to the interstitial spaces. A display is integrated into the housing cover of the leak detector, showing the operating pressure in the interstitial space.

- Values of less than 20 mbar or less than 0.29 PSI will not be displayed.
- Values between 20 and 999 mbar will be displayed in mbar without any decimal places.
- Values from 1 bar are displayed in bar with two decimals.
- Values in PSI are displayed with one or two decimal(s).

4.2 Normal Operating Conditions

The pressure leak detector is connected with the interstitial space(s) via the pressure and measuring lines. The overpressure generated by the pressure generator is measured and controlled by a pressure sensor.

When the operating pressure is reached (Refilling OFF), the pressure generator shuts off. The pressure drops off slowly due to unavoidable leaks in the leak detector system. When the "Refilling ON" switching value is reached, the pressure generator will be turned on and the operating pressure will be built up again.

Under normal operating conditions, the leak detector will move between these two pressure values, with short run times and longer idle times, depending on the degree of impermeability and temperature variations of the overall system.

4.3 Function in the Event of Leaks

If a leak occurs below or above the liquid level or groundwater, leak detection medium seeps out of the interstitial space. The pressure will fall until the pressure generator is turned on to reestablish the operating pressure. If the volume flow exiting the leak is larger than the refilling output, the pressure in the system will fall even though the pressure generator is activated.

An enlargement of the leak will lead to a further drop in pressure until the alarm pressure is reached. This triggers visual and audible alarms.

4.4 Overpressure valves

The pressure leak detector normally has two overpressure valves installed. The first is used on the supply side, the second on the interstitial space side to protect the leak detector/interstitial space from excessive supply pressure on the part of the pressure reducer.

Note: A throttle is inserted in the connection for the pressure reducer in order to reduce the volume flow in case of failure of the pressure reducer.

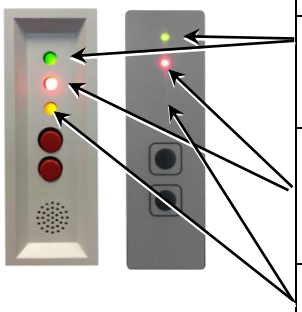
The pressure relief valve on the interstitial space side can also protect the interstitial space from impermissibly high pressures. Impermissibly high overpressures can occur due to:

- Temperature increase resulting from environmental influences (e.g., sunlight)
- Temperature increase resulting from hot filling (contact necessarily the manufacturer)

The installer/operator must determine whether any further measures are to be taken in consideration of the interstitial space volume.

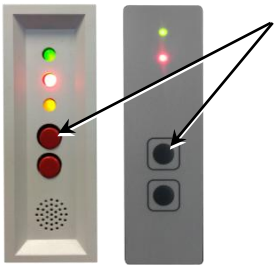
4.5 Displays and Controls

4.5.1 Display



Indicator lights	Operating condition	Refilling activated or required	Filling activated	Alarm state	Alarm, audible alarm acknowledged	Malfunction
OPERATION: green	ON	ON	ON	ON	ON	ON
ALARM: red	OFF	OFF	OFF FLASHING ON[6]	ON	FLASHING	ON
REFILLING: yellow	OFF	ON	FLASHING	ON	ON	OFF

4.5.2 "Turn off audible alarm signal" function

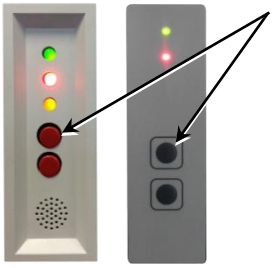


Briefly press "mute" button once; audible signal turns off, and the red LED flashes.

Pressing the key again will turn the audible signal on.

This function is not available during normal operating conditions and malfunctions.

4.5.3 Function "Testing the optical and audible alarm signal"

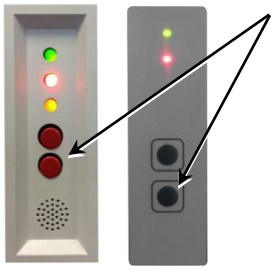


Press and hold the "mute" button (for about 10 seconds). The alarm will be triggered until the key is released.

This inquiry is only possible if the pressure in the system has exceeded the "Alarm OFF" pressure.

[6] Depending on pressure and/or acoustic signal on or off

4.5.4 "Filling" function



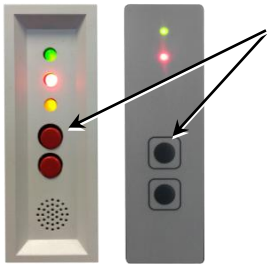
Press and hold the "Filling" key for about 5 seconds until the yellow LED starts flashing. The filling process has been activated.

When the operating pressure has been reached, the yellow indicator light will go out and the filling process is turned off.

In the event of a pressure drop due to pressure compensation processes, the filling process can be reactivated to fill the interstitial space completely.

Holding this key down for more than 10 seconds will trigger the alarm. The alarm triggered will go off shortly after letting go of the key.

4.5.5 "Tightness inquiry" function



Press and hold the "Mute" button until the "Alarm" indicator light starts flashing rapidly, then release it. A value for the tightness is indicated
a) by the "Alarm" indicator light lighting up in the case of versions with plastic housing, or
b) on the display in the case of the version with stainless steel housing.

This display disappears after 10 seconds and the current pressure in the system is displayed again.

For this inquiry, the leak detector must have performed at least 1 automatic refilling interval in normal operating conditions (i.e., without external filling) to achieve a valid statement.

This inquiry is recommended before performing a regular functional check of a leak detector. In this way, it is possible to estimate immediately whether it is necessary to look for leaks.

Number of flash signals	**Assessment of tightness**
0	Very tight
1 to 3	Tight
4 to 6	Sufficiently tight
7 to 8	Maintenance recommended
9 to 10	Maintenance urgently recommended

The smaller the above value, the tighter the system. The significance of this value also depends on temperature fluctuations and should thus be considered a reference point.

5. Mounting the System

5.1 Basic Instructions

- Prior to commencing work, the documentation must be read and understood. In case of ambiguities, please ask the manufacturer.
- Before connecting cut tubes, deburr and clean them (free of chips).
- Comply with the safety instructions in this documentation.
- Follow the instructions regarding personal protective equipment (PPE) in sections 2.4 and 2.4.1.
- Only qualified service companies may be used for installation[7]
- Comply with relevant regulations for prevention of accidents.
- Leadthroughs for pneumatic connection lines through which the explosive atmosphere can carry over must be sealed gas-tight.
- Comply with explosion regulations (if required), e.g., BetrSichV (and/or directive 1999/92/EC and the laws of the respective member states resulting therefrom) and/or others.
- Compliance with the relevant traffic regulations is required when transporting pressure gas bottles to and from the construction site.
- The pressure gas bottle must be protected from falling over at the construction site.
- If nitrogen is used, sufficient ventilation must be provided if commissioning/operation is performed in enclosed spaces. Attach information sign.
- Before entering access and inspection chambers, the oxygen content must be tested and the chamber flushed if necessary.
- If metallic connection lines are used, it must be ensured that the power supply grounding is at the same potential as the container to be monitored.

5.2 Leak Detector

(1) Generally mounted on walls with plugs and screws.

(2) In a dry room (plastic housing) or outdoors (stainless-steel housing). To allow the ventilation slots to work properly, make sure there is a side clearance of at least 2 cm from other objects and walls.

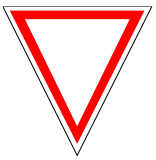
(3) **NOT in potentially explosive areas**.

(4) Dimensions of housings and drilling patterns are illustrated in the Appendix.

(5) Prior to closing the housing lid, make sure that the function of the overpressure valve is not impeded.

[7] For Germany: Specialist service companies as per German water legislation that also have basic knowledge in the area of fire and explosion protection.

5.3 Selecting the Pressure Reducer



(1) The pressure reducer must have an integrated overpressure valve.

(2) The range of settings for the pressure reducer to be used must be selected in correspondence with the application or the pressure to be set. (See section 3.5)

(3) The system pressure range of the pressure reducer must match the bottle. In this case, 200 bar maximum.

5.4 Pressure Gas Bottle and Pressure Reducer

See note in section 6.1

5.5 Requirements for Pneumatic Connection Lines (Between Leak Detector and Container)

- Pressure resistance of the metal (generally Cu) or plastic pipes must at least correspond with the test pressure in the interstitial space. Also applies to fittings and screwed connections. Note temperature range, especially when using plastic!
- Inside clearance min. 4 mm.
- A distance of 50 m should not be significantly exceeded, but if this happens: Install pipe with greater inside clearance using transition pieces.
- Color coding: Measuring line: red; Pressure line: white (or clear)
- The full cross section must be maintained. Do not push in or bend[8].
- Install metal or plastic pipes that are installed underground or overground exposed on the surface in protective pipes.
- Seal the protective pipe gas-tight and protect from moisture.
- Avoid the buildup of electrostatic charges (e.g., while inserting and pulling lines).
- Make sure that the correct screw connections and matching threads are used.

5.6 Completing Pneumatic Connections

5.6.1 Between pressure reducer and leak detector

(1) Select suitable pipe to connect the pressure reducer to the leak detector. Recommendation: Use the Flex tube (SGB item no.: 260721)

(2) Connect the pipe to the pressure reducer (the image shows connection via the Flex tube mentioned above).

(3) Connect the pipe to the leak detector.

[8] If necessary, install commercial fittings for plastic pipes (specified bending radii)

5.6.2 Between leak detector and interstitial space

(1) Select and install suitable pipe.

(2) During installation of the tube/pipe, ensure again that the tubes are protected against damage when the access chamber is entered.

(3) Complete the relevant connection (according to the illustrations in the following images)

5.6.2.1 Flanged screw connection (for flanged pipes)

(1) Lubricate O-rings

(2) Insert spacer ring loosely into the screw socket

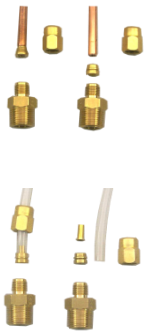
(3) Slide union nut and pressure ring over the pipe

(4) Hand-tighten union nut

(5) Tighten union nut until need for increased force is clearly noticeable

(6) Final assembly: Tighten by another ¼ turn

5.6.2.2 Clamping ring screw connection for metal and plastic pipes



(1) Insert support sleeve (only plastic pipes) into end of the pipe

(2) Insert pipe (with support sleeve) all the way to the stop

(3) Tighten the screw connection by hand until resistance becomes noticeable, then

(4) then tighten a further 1 ¾ turns with a wrench

(5) Loosen nut

(6) Tighten the nut by hand up to a noticeable stop

(7) Final assembly of the screw connection by tightening a ¼ turn

5.6.2.3 Quick screw connections for PA tubing

(1) Cut PA pipe to length at a right angle

(2) Unfasten union nut and slide over the end of the pipe

(3) Slide pipe onto nipple up to the beginning of the thread

(4) Hand-tighten union nut

(5) Wrench-tighten union nut until need for increased force is noticeable (approx. 1 to 2 turns)

5.7 Electrical Cables

Terminals for mains connection (L/N):

0,2…2,5 mm^2 for solid and fine-stranded conductors

0,25…1,5 mm^2 for fine-stranded conductors with ferrule with plastic collar

0,2…2,5 mm^2 for fine-stranded conductors with ferrule without plastic collar

For all other terminals such as potential-free contacts, external signal and 24 VDC power supply (terminals 40/41):

0,2…1,5 mm² for solid and fine-stranded conductors

0,25…0,75 mm² for fine-stranded conductors with ferrule with plastic collar

0,25…1,5 mm² for fine-stranded conductors with ferrule without plastic collar

Mains connection supply cable, if NYM cable is used:

- 0,5…2,5 mm² (recommended 1,5 mm²)

Potential-free contacts, external signal and 24 VDC power supply via terminals 40/41 if NYM cable is used:

- 0.2...1.5 mm² (recommended 0.75 mm²)

Note:
Electrical cables must be sufficiently resistant to environmental influences (e.g. vapor, UV radiation ...).

5.8 Electrical Connection

(1) Power supply: according to label imprint.

(2) Fixed wiring, i.e., no plug or switch connections

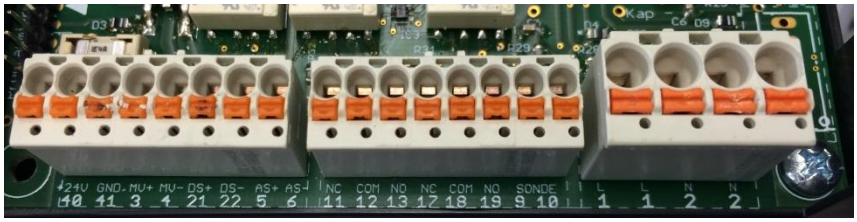
(3) When laying the cables, make sure that the pressure relief valve is not blocked by the cable.

(4) Devices with plastic housing may only be connected with a fixed cable.

(5) Close unused cable glands properly and professionally.

(6) Regulations of power supply companies must be adhered to[9]

(7) Terminal layout (see section 5.9.3):



1/2 Power connection (100–240 V AC)
CAUTION: both terminals exist in duplicate!

3/4 Occupied (with internal solenoid valve)

5/6 External signal (in the event of an alarm 24 V DC is present; turned off by activating the "Sound off" key).

11/12 Potential-free contacts (opened in the event of an alarm or loss of power)

12/13 Potential-free contacts (closed in the event of an alarm or loss of power)

17/18 Potential-free contacts (opened in the event of active refilling)

[9] For Germany: also, VDE regulations

18/19	Potential-free contacts (closed in the event of active refilling)
21/22	Occupied (with internal sensor)
40/41	24 V DC as permanent power supply to power other assemblies or, for a device with a supply voltage of 24 V DC, the power supply is connected here.

5.8.1 Location of fuses and their values

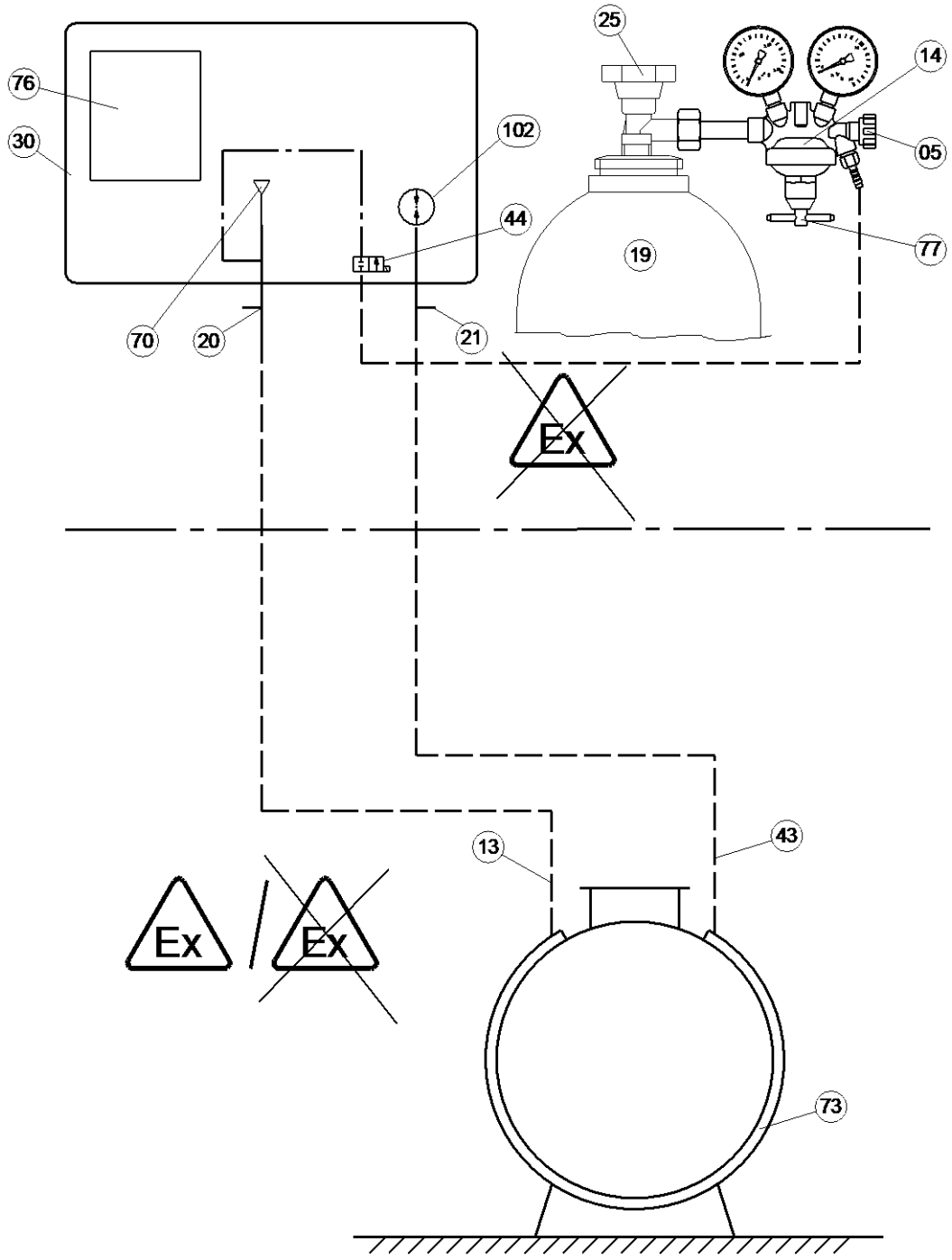
5.8.1.1 Plastic housing

5.8.1.2 Stainless steel housing

Will follow shortly

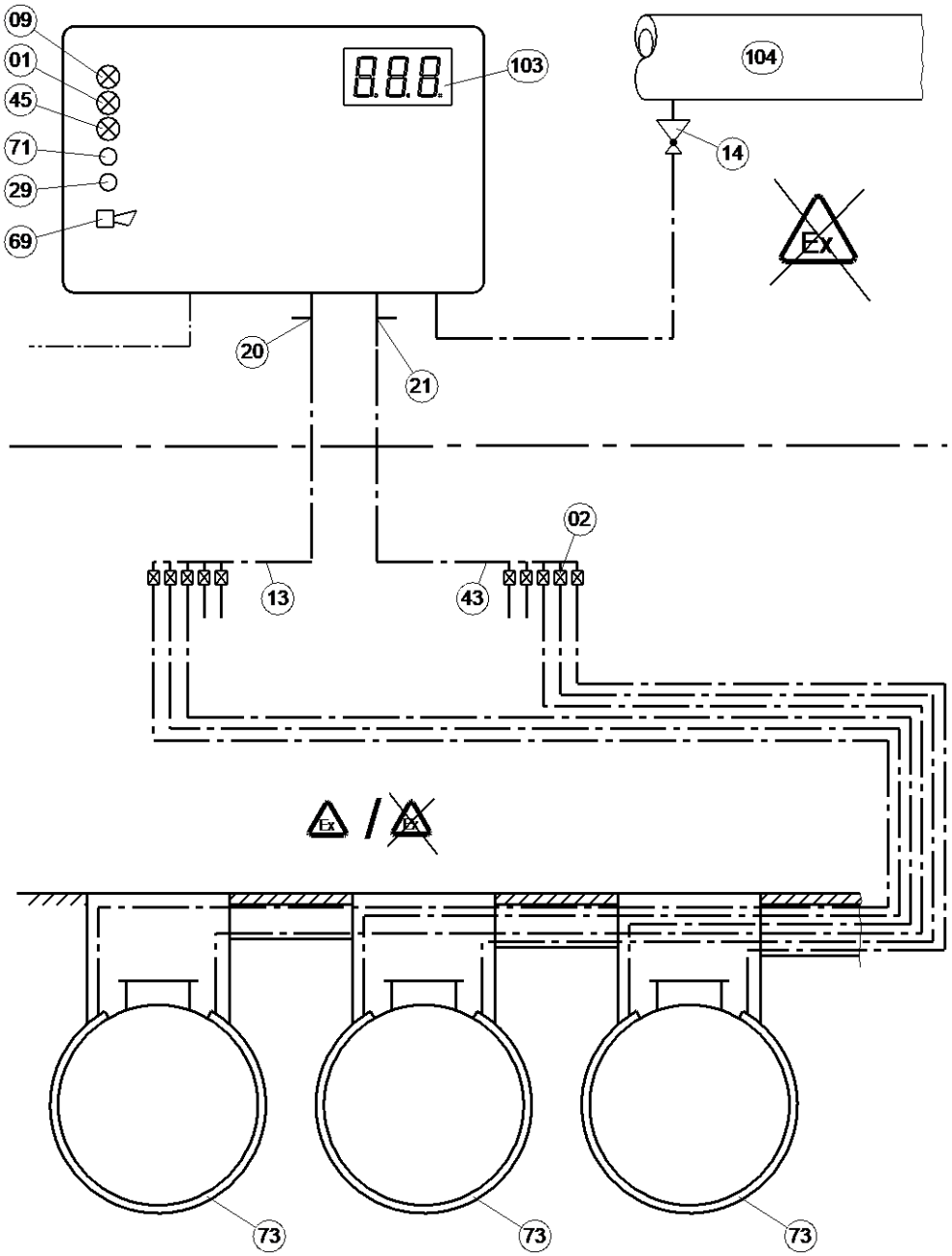
5.9 Installation Examples

5.9.1 Leak detector supplied by bottle; an aboveground container is monitored



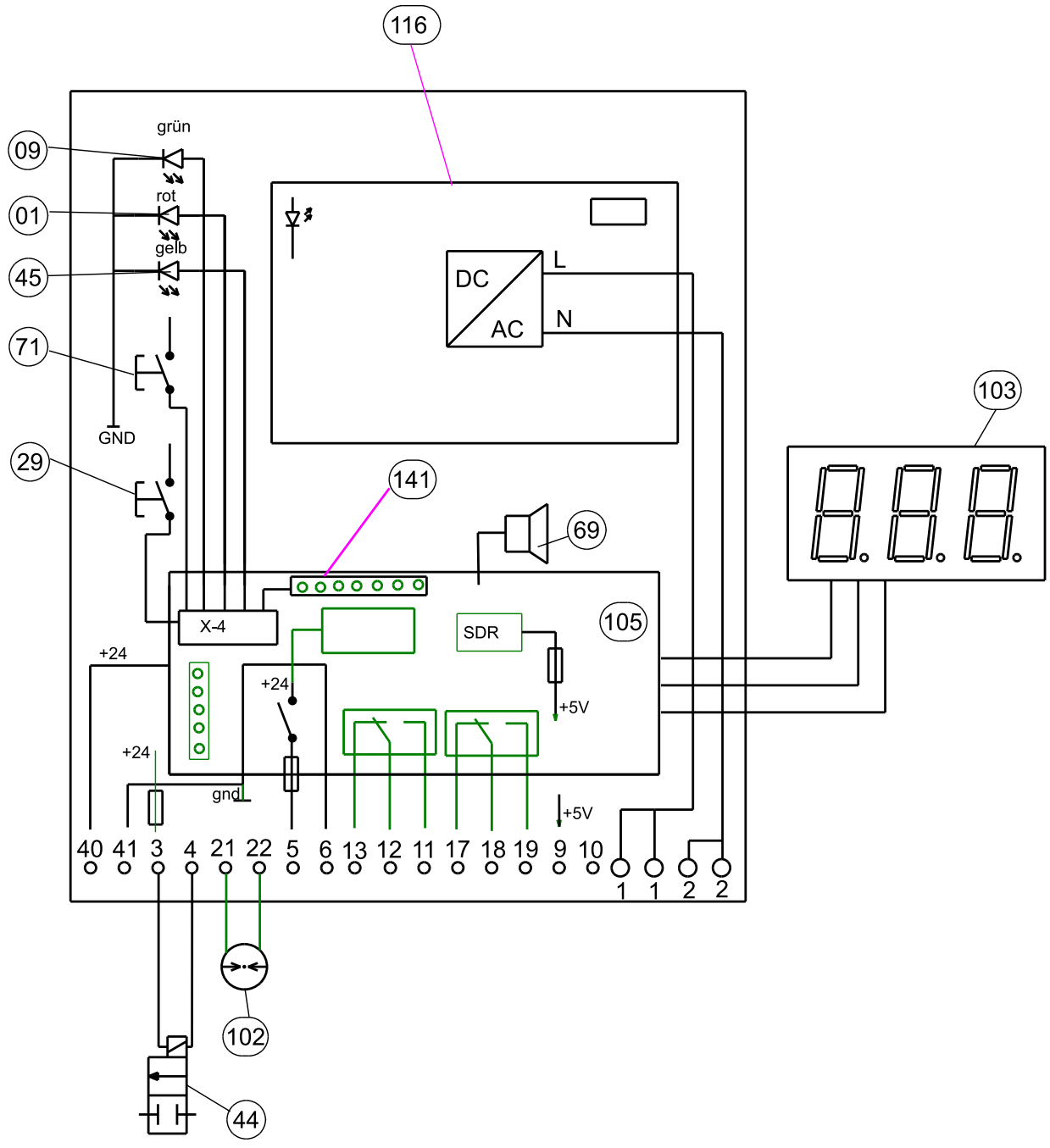
05	Shut-off valve	43	Measuring line
13	Pressure line	44	Solenoid valve
14	Pressure reducer	70	Overpressure valve
19	Pressure cylinder	73	Interstitial space
20	Three-way valve in the pressure line	76	Main board
21	Three-way valve in the measuring line	77	Pressure regulator
25	Cylinder shut-off valve	102	Pressure sensor
30	Housing		

5.9.2 Leak detector supplied by nitrogen system; several underground containers are monitored.



01	"Alarm" indicator light, red	43	Measuring line
02	Shut-off cock	45	"Refilling" indicator light, yellow
09	"Operation" indicator light, green (white)	69	Buzzer
13	Pressure line	71	Mute" button
14	Pressure reducer	73	Interstitial space
20	Three-way valve in the pressure line	103	Display
21	Three-way valve in the measuring line	104	Plant pressure supply system (e.g., air/nitrogen)
29	"Filling" key		

5.9.3 Block diagram



01	"Alarm" indicator light, red	76	Main board
09	"Operation" indicator light, green	102	Pressure sensor
29	"Filling" key	103	Display
44	Solenoid valve	105	Control unit
45	"Refilling" indicator light, yellow	116	Power supply unit 24 V DC
69	Buzzer	141	Keypad terminal strip
71	"Mute" button		

6. Commissioning

(1) Only perform commissioning once the steps in section 5 "Mounting" are fulfilled.

(2) Flush the interstitial space with inert gas if walls of storage medium are not impermeable.[10]

(3) If a leak detector is operated on a container that is already in operation, special protective measures must be taken (for example, checking that there is no gas in the leak detector and/or the interstitial space). Additional measures may be necessary depending on the local conditions and must be assessed by qualified personnel.

6.1 Commissioning/Functional Check for the Pressure Gas Bottle

(1) Remove the protective cover after the pressure gas bottle has been securely set up.

(2) Install the pressure reducer on the bottle.

(3) Close shut-off valve on the pressure reducer.

(4) Install the connection line between the leak detector and the pressure reducer.

(5) Turn the pressure regulator all the way back.

(6) Open the cylinder shut-off valve (if necessary, test tightness between pressure reducer and bottle).

(7) Set the pressure on the pressure reducer (see section 3.5) using the pressure regulator on the pressure reducer (adjust during pressure build-up, if necessary).

(8) To change the bottle:

- Close the shut-off valve on the pressure reducer.
- Close the cylinder shut-off valve.
- Remove the pressure reducer from the bottle (Caution: Gas will escape until the pressure reducer has no pressure).
- Install a protective cover on the bottle.
- Set up the new bottle securely, then remove the protective cover.
- Install the pressure reducer (if necessary, test tightness between pressure reducer and bottle).
- Open the cylinder shut-off valve.
- Open the shut-off valve on the pressure reducer, readjust the pressure using the pressure regulator if necessary.

[10] For Germany: Additional DIBT requirements must be considered for such double-walled pipes.

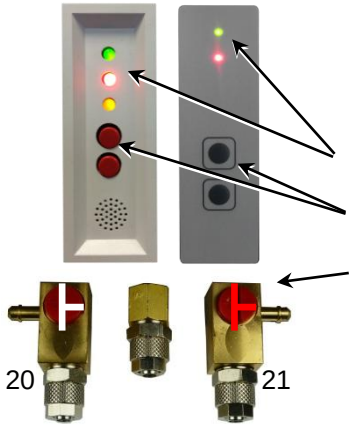
6.2 Tightness test

Prior to commissioning, ensure the leak-tightness of the interstitial space.

In the case of larger interstitial spaces, the pressure build-up should be achieved with the aid of a nitrogen cylinder (use a suitable pressure reducer!).

The test is generally considered to be passed if the overpressure does not drop by more than 1 mbar within a test period (in minutes) calculated from the interstitial space volume divided by 10.
Example: Interstitial space volume = 800 liters
Thus: 800/10 = 80
Thus: Test for 80 minutes for max. 1 mbar pressure drop.

6.3 Commissioning the Leak Detector



(1) Tightness of the interstitial space prior to commissioning is assumed.

(2) After completion of the pneumatic connection, connect the power.

(3) Ascertain lighting of "Operation" and "Alarm" indicator lights and sounding of the audible alarm.
Press "Sound off" key.

(4) Turn three-way valve 21 180°. Connect the measuring gauge.

(5) Press and hold the "Filling" key for about 5 seconds until the yellow indicator light starts flashing. The solenoid valve will open to quickly fill the interstitial space. When the operating pressure has been reached, the filling process is turned off and the yellow indicator light will go out. With very large interstitial spaces it may be necessary to switch bottles.

Note: If no pressure build-up is achieved with the pressure gas bottle connected, the leak must be located and corrected (check the settings for the pressure reducer as well, if necessary). CAUTION: Display on the leak detector (display) begins with a pressure from 20 mbar.

(6) The filling process can/should be reactivated, if necessary, in order to fill the interstitial space completely.

(7) When the operating pressure of the leak detector has been reached (pressure generator in the leak detector will turn off), reconnect the pressure line and/or put both valves in position "I". Remove the pressure measuring instrument.

(8) Perform a functional check according to section 7.3.

7. Functional Check and Maintenance

7.1 General

(1) If the leak detection system has been properly installed and is free of leaks, trouble-free operation can be assumed.

(2) Frequent switching on or continuous running of the pressure generator indicates leaks, which should be corrected within a reasonable time.

(3) In the event of an alarm, determine the cause and fix it quickly.

(4) The leak detector must be disconnected from the power when performing any repairs.

(5) A loss of power is indicated by the "Operation" indicator light going off. Alarm signals are triggered via the voltage-free relay contacts (if used for alarm transmission) if contacts 11 and 12 were used. After the power loss, the green indicator light lights up again and the voltage-free contacts no longer generate an alarm (unless the power loss has caused the pressure to drop below the alarm pressure).

(6) The operator must check the function of the "Operation" indicator light at regular intervals.

(7) Use a dry cloth to clean the leak detector.

7.2 Maintenance

- Maintenance work and functional checks must be performed by trained personnel only[11].
- Once a year to ensure functional and operational safety.
- Test scope according to Section 7.3.
- Compliance with the conditions in sections 5 and 6 must also be tested.
- Comply with explosion regulations (if required), e.g., BetrSichV (and/or directive 1999/92/EC and the laws of the respective member states resulting therefrom) and/or others.
- The operator must check the filling level of the pressure gas bottle regularly. If the pressure in the bottle is only slightly above the set pressure on the pressure reducer, it must be filled again or replaced.

[11] For Germany: Technical service according to water legislation with expertise in leak detection systems
For Europe: Authorization by the manufacturer

7.3 Functional Check

The functional and operational safety check must be performed:

- After each commissioning
- In accordance with the time intervals listed in section 7.2[12]
- Each time a malfunction has been corrected

CAUTION: During the functional check nitrogen is usually released. If this must be done in a chamber or similar, it is mandatory to permanently check the oxygen content.

7.3.1 Scope of test

(1) Coordinate the work to be performed with those responsible for operation on site, if necessary

(2) Observe the safety instructions for working with the stored material.

(3) Checking the free passage of air in the interstitial space (section 7.3.2)

(4) Testing the switching values (section 7.3.3)

(5) Checking the overpressure valve (section 7.3.4)

(6) Tightness test following commissioning or correction of malfunctions (section 7.3.4)

(7) Tightness test as part of the annual functional check (section 7.3.5)

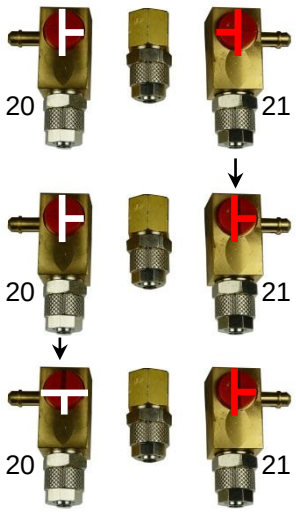
(8) Creating the operating condition (section 7.3.6)

(9) A qualified person must complete a test report, confirming functional and operational safety.

7.3.2 Checking free passage in the interstitial space

Checking the free passage of air ensures that an interstitial space is connected to the leak detector and that the interstitial space has sufficient passage to cause an air leak to trigger an alarm.

If several interstitial spaces are connected in parallel, each one of them must be checked for passage.



(1) If several interstitial spaces are each connected via a manifold in the pressure and measuring line with a shut-off device, close all shut-off valves on the manifolds.

(2) Attach the measuring gauge to the connection on three-way valve 21 and turn valve 180°.

(3) Turn three-way valve 20 90° clockwise so that the pressure line and interstitial space(s) are ventilated.

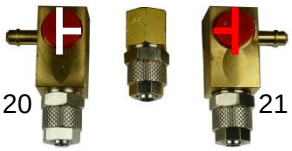
[12] For Germany: In addition, national laws apply (e.g., AwSV)

(4) Open shut-off valves of the first (following) container (measuring and pressure line in pairs).

(5) Check whether the measuring gauge registers a pressure drop. If no pressure drop occurs, locate and correct the cause.

(6) Close the shut-off valves opened in (4).

(7) Perform procedure in (5) to (7) with each additional container.

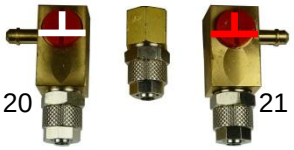


(8) Return three-way valves 20 and 21 to the operating position. Remove the measuring gauge.

(9) Open all shut-off valves on the manifolds with a connected container.

7.3.3 Testing the switching values

7.3.3.1 With testing device



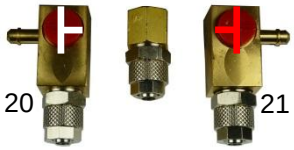
(1) Connect the testing device to the free connections on three-way valves 20 and 21. Turn three-way valve 20 90°counterclockwise and three-way valve 21 90° clockwise.

(2) Connect the measuring gauge to the testing device.

(3) Close needle valve (testing device); pressure is built up to operating pressure.

(4) Vent using the needle valve; determine "Refilling ON" and "Alarm ON" switching values (visual and audible); record values.

(5) Close the needle valve and determine "Alarm OFF" and "Refilling OFF" switching values. Record the values. Open the needle valve a little, if necessary, so that the pressure rises slowly.



(6) Return three-way valves 20 and 21 to the operating position. Remove the testing device.

7.3.3.2 Without testing device

(1) If several containers are connected via a manifold system, close all shut-off valves on the manifold except for the shut-off cocks for the container with the smallest interstitial space volume.

(2) Attach the measuring gauge to the connection on three-way valve 21.
Turn both three-way valves 180°.

(3) Vent through three-way valve 20; determine "Refilling ON" and "Alarm ON" switching values (with visual and audible alarm) and record values.

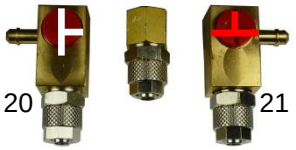
(4) Turn three-way valve 20 to the operating position.
Determine "Alarm OFF" and "Refilling OFF" switching values.
Record the values.

(5) Turn three-way valve 21 to the operating position.
Remove the measuring gauge.

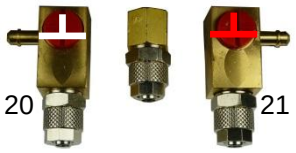
(6) Open all shut-off valves on the manifold with a connected container.

7.3.4 Checking the overpressure valve

For this test, the operating pressure of the leak detector must be built up.

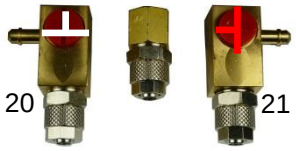


(1) Turn three-way valve 21 90° clockwise.
The pressure sensor is vented.
The refilling function switches on and the alarm is triggered.

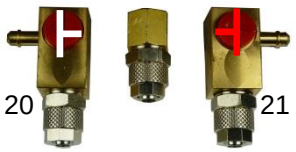


(2) Turn three-way valve 20 90° counterclockwise. Attach the measuring gauge to the connection on three-way valve 20.

(3) Determine the opening pressure of the overpressure valve (no further pressure increase), and record the value. If the opening pressure of the overpressure valve exceeds the test pressure of the container, it must be replaced or readjusted.

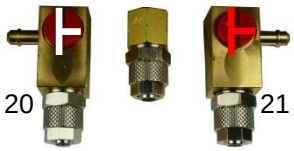


(4) Turn three-way valve 21 to the operating position.
The refilling function switches off.
Determine the closing pressure of the overpressure valve (no additional pressure drop[13]).
Record the value.



(5) Return three-way valve 20 to the operating position.
Remove the measuring gauge.

7.3.5 Tightness test following commissioning or correction of malfunctions[14]



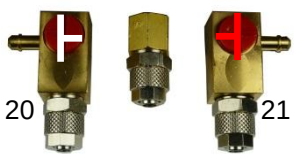
(1) Check that all shut-off valves with connected containers are opened.

(2) Turn three-way valve 21 180°.
Connect the measuring gauge to three-way valve 21.

(3) Once the pressure has equalized, start the tightness test.

(4) Read off and record starting pressure and time. Wait for test time to elapse and determine pressure drop.

(5) The test is considered to be passed if the pressure does not drop by more than 1 mbar in the test time. See also section 6.2.
The test time and allowed pressure drop can be extended or increased proportionally.



(6) Once the test has been completed, return three-way valve 21 to the operating position. Remove the measuring gauge.

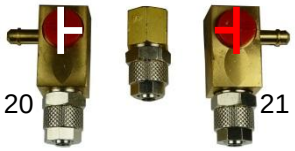
[13] If the refilling function switches on before the closing pressure is reached, determine the cause and repair it.
[14] Prerequisite: The operating pressure has been built up in the interstitial space and pressure equalization has occurred.

7.3.6 Tightness test as part of the annual functional check

(1) Perform a tightness inquiry (see section 4.5.4).

(2) Evaluate the displayed value (visible on the display for 10 seconds) according to section 4.5.4.

7.3.7 Achieving the operating conditions



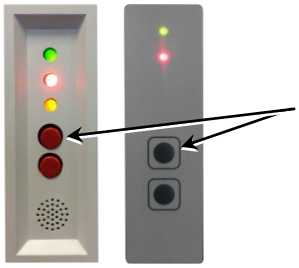
(1) Seal the housing of the leak detector and the test valve(s) at the end of the interstitial space opposite the leak detector.

(2) Check that the three-way valves are in the correct position (operating position).

(3) If shut-off cocks have been installed in the connection lines, they must be sealed in an opened position (if connected to an interstitial space).

8. Alarm (Malfunction)

8.1 Alarm



(1) The red indicator light lights up (yellow also lights up), the audible signal sounds.

(2) Turn the audible signal off.

(3) Inform the installation company immediately.

(4) Determine the cause for the alarm, fix it, and then perform a functional check for the leak detection system according to section 7.3.

8.2 Malfunction

(1) In case of a malfunction, only the red indicator light will light up (yellow is off), and at the same time the audible signal cannot be acknowledged.

8.3 How to Behave

(1) Inform the installation company immediately and state the display from the preceding paragraph.

(2) Determine the cause for the alarm, fix it, and then perform a functional check for the leak detection system according to section 7.3.

9. Spare Parts

See our SGB web shop at: shop.sgb.de

10. Accessories

In the SGB online shop www.shop.sgb.de you will find suitable accessories like e.g.:

Tube between pressure reducer and leak detector
Stainless steel corrugated tube, PN80, shaft length 80 mm, DN6, 1.2 m steel tube between pressure reducer and leak detector

Art. No. 260721

11. Disassembly and Disposal

11.1 Disassembly

For the disassembling of systems which can cause an explosion risk, the following points must be observed in particular:

- Prior to and during work, make sure the unit is free of gas and the breathing air contains sufficient oxygen levels.
- Seal any openings through which an explosive atmosphere can carry over so they are gas tight.
- Avoid using spark-producing tools (saws, parting grinders, etc.) for disassembly whenever possible. Should this be unavoidable, however, comply with EN 1127 or the area must be free of explosive atmosphere.
- Avoid the build-up of electrostatic charges (e.g., through friction).

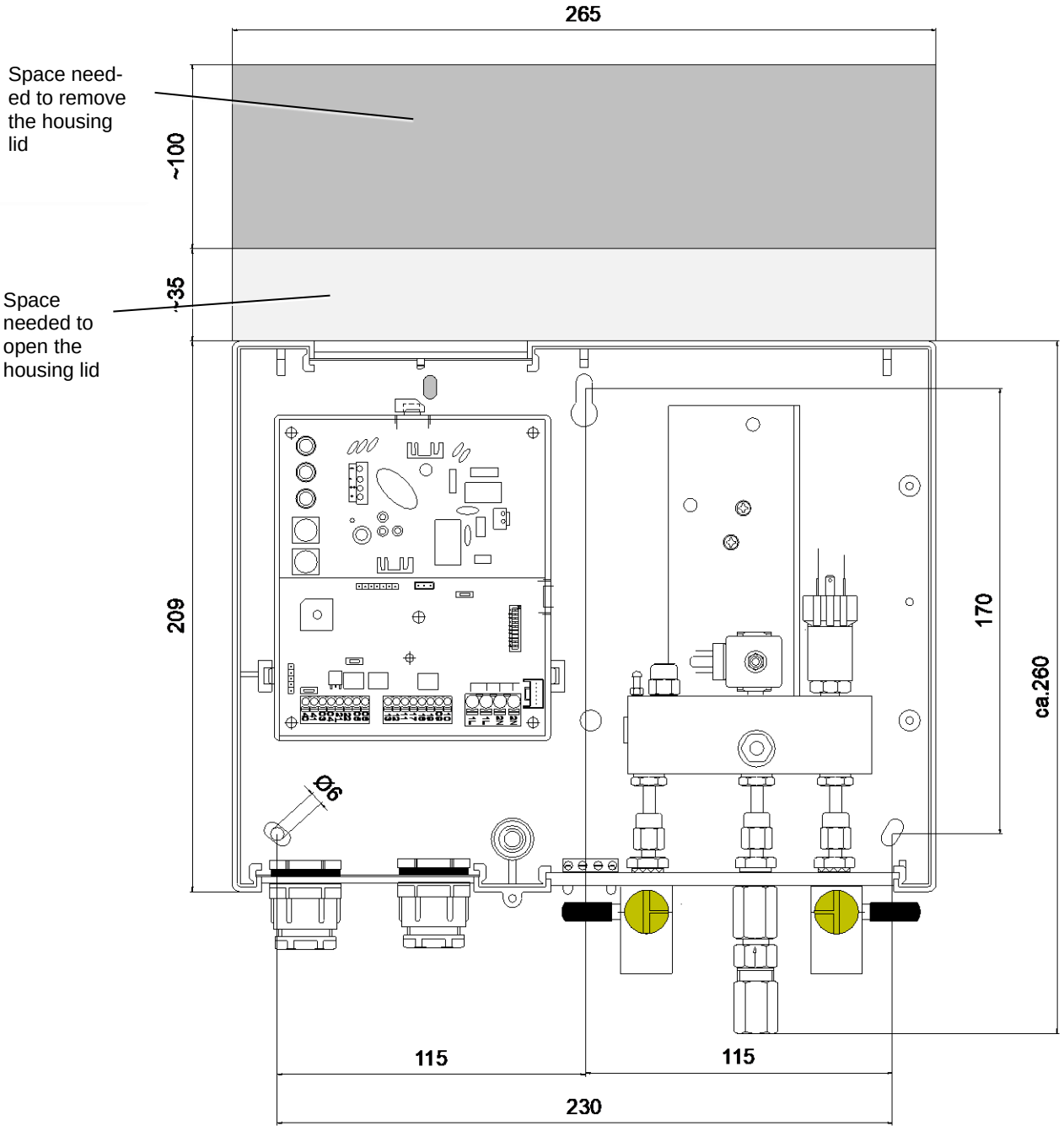
11.2 Disposal

Properly dispose of components that have been contaminated (possibly through outgassing).

Properly dispose of electronic components.

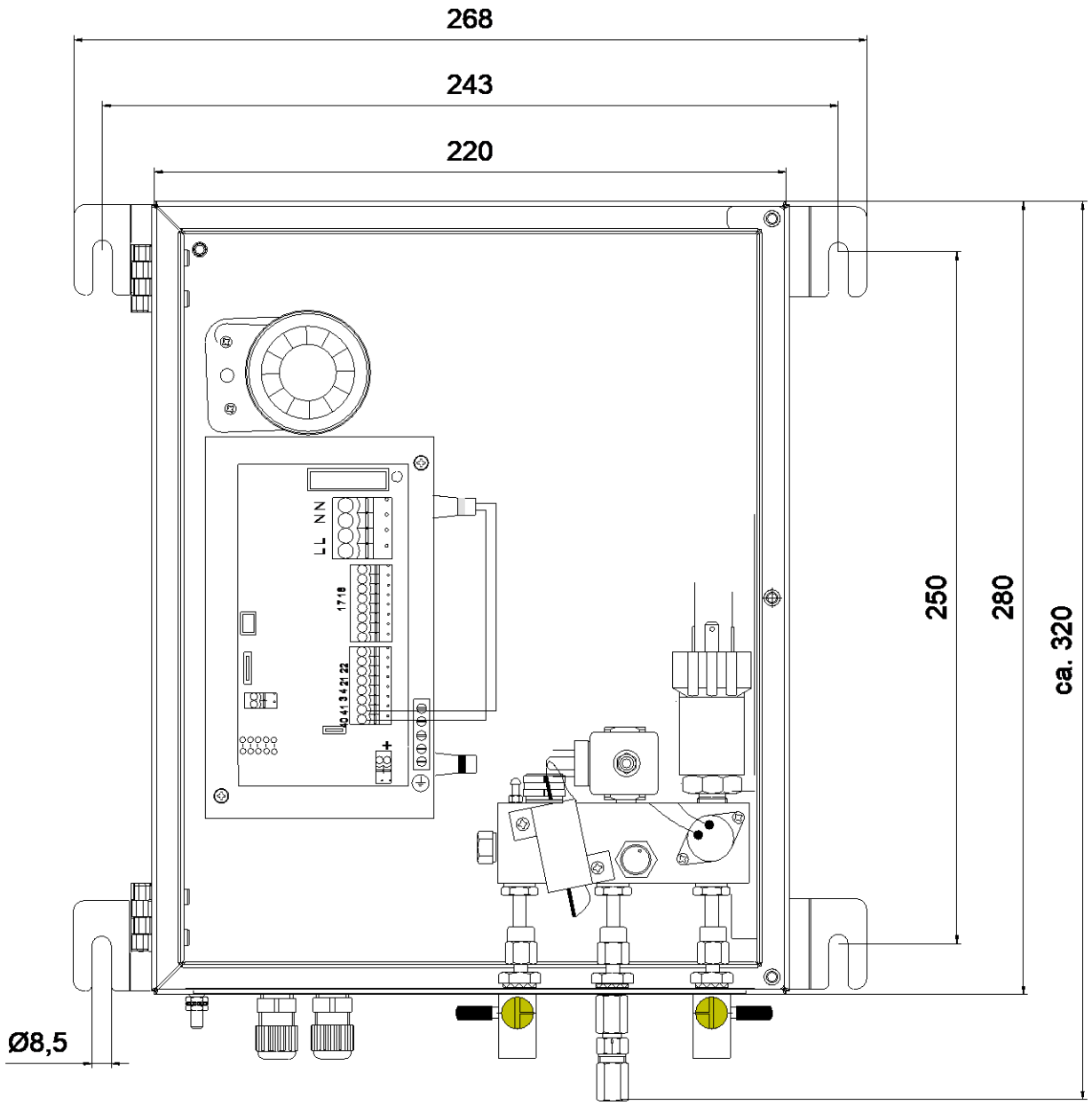
12. Appendix

12.1 Dimensions and Drilling Pattern, Plastic Housing



Depth = 110 mm

12.2 Dimensions and Drilling Pattern, Stainless Steel Housing



Depth = 120 mm

12.3 EU Declaration of Conformity

We,

SGB GmbH

Hofstrasse 10

57076 Siegen, Germany,

hereby declare in sole responsibility that the leak detector

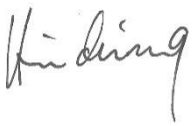
DLG ..

is in conformity with the essential requirements of the EU directives listed below.

If the device is modified or used in a way that was not agreed with us, this declaration shall lose its validity.

Number/short title	Satisfied regulations
2014/30/EU EMC Directive	EN 61000-6-3:2017; A1:2011 EN 61000-6-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/EU Low-voltage Directive	EN 60335-1:2012; A11:2014; A13:2017; A1:2019; A2:2019; A14:2019; A15:2020 EN 61010-1:2010; A1:2019 EN 60730-1:2011
2014/34/EU Equipment for EX Areas	The pneumatic components of the leak detector may be connected to spaces (interstitial spaces of containers) that require category 3 devices. The following documents have been consulted: EN 1127-1: 2019 The ignition hazard assessment did not result in any additional hazards.

Conformity is declared by:



ppa. Martin Hücking
(Technical Director)

As of 01/2025

12.4 Declaration of Performance

Number: **006 EU-BauPVO 2014**

1. Unique identification code of the product type:

   Pressure leak detector type DLG ..

2. Use:

   Class I pressure leak detector for monitoring double-walled, underground or above-ground, pressurized or non-pressurized tanks

3. Manufacturer:

   SGB GmbH, Hofstraße 10, 57076 Siegen, Germany
   Phone: +49 271 48964-0, e-mail: sgb@sgb.de

4. Authorized representative:

   n/a

5. System for assessment and verification of constancy of performance:

   System 3

6. In the event of a declaration of performance for a construction product which is covered by a harmonized standard:

   Harmonized standard: EN 13160-1-2: 2003
   Notified body: TÜV Nord Systems GmbH & Co.KG, CC Tankanlagen, Große Bahnstraße 31, 22525 Hamburg, Germany
   Identification number of the notified testing laboratory: 0045

7. Declared performance:

Essential characteristics	Performance	Harmonized standard
Pressure switch points	Passed	EN 13160-2: 2003
Reliability	10,000 cycles	
Pressure test	Passed	
Volume flow rate test in the alarm switch point	Passed	
Function and tightness of the leak detection system	Passed	
Temperature resistance	0°C to +40°C	

8. Signed for and on behalf of the manufacturer by:

   Dipl.-Ing. M. Hücking, Technical Director

   Siegen, 01/2025

12.5 Declaration of Compliance of the Manufacturer (ÜHP)

SGB
MVV TB
Anhang C 2.15.15
TÜV-NORD

Compliance of the leak detector with the Specimen Administrative Provision of the Technical Building Regulations is hereby declared.

Dipl.-Ing. M. Hücking, Technical Director

Siegen, 01/2025

12.6 Certifications TÜV Nord

Note:
By TÜV not certified translation of the German original version

TÜV NORD Systems GmbH & Co.

PÜZ (testing, supervision and certification) — centre for containers, pipelines and pieces of equipment for systems with substances hazardous to water

Identification number : 0045

Große Bahnstraße 31, 22525 Hamburg

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Certification

Subject of test:	**Overpressure leak detector type DL../DLG..**
Client:	SGB GmbH Hofstraße 10 57076 Siegen
Manufacturer:	SGB GmbH
Type of test:	Initial examination of an overpressure leak detector type DL../DLG.. with leak indicator equipment and leak detector according to DIN EN 13160-1:2003/EN 13160-1:2010 and DIN EN 13160-2:2003 and BRL A, part 1, appendix 15.23 as a class I leak monitoring system
Testing period:	03/2015 to 09/2015
Testing location:	PÜZ testing lab TÜV NORD Systems GmbH & Co. KG
Test results:	**The overpressure leak detector DL../DLG.. corresponds with class I for leak monitoring systems according to DIN EN 13160-1:2003/EN 13160-1:2010 and fulfils the requirements of DIN EN 13160-2:2003 and BRL A, part 1, no. 15.43 with appendix 15.23. Regarding the area of application and installation, the specifications of the technical description "Document 603 000" as of 06/2014 apply**

Details of the test can be found in the test report PÜZ 8112235330 dated 03.09.2015.

Hamburg, 04.09.2015 Test laboratory supervisor

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Dated 01/2013
STPÜZ-QMM-321-032-02

Note:
By TÜV not certified translation of the German original version

TÜV NORD Systems GmbH & Co. KG
Manufacturer Certification Competence Center

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Certificate no. 8117744963-1

Subject of the test:	**Overpressure leak detector type DL.. / DLG..**
Client:	SGB GmbH Hofstrasse 10 57076 Siegen
Manufacturer:	SGB GmbH
Test type:	Type testing of an overpressure leak detector with alarm device, type DL../DLG.. in accordance with EN 13160-2:2016. Classification of the leak detection system as per classifications in accordance with EN 13160-1:2016.
Test object	Leak detector with alarm device, type DL 330, device no. 1911430121
Test period:	02/2020
Test location:	Accredited test laboratory at TÜV NORD Systems GmbH & Co. KG
Test results:	**In the type test, the overpressure leak detector of type DL 330 met the essential characteristics of Table ZA.1 of EN 13160-2:2016 and corresponds to leak detection system class I in accordance with EN 13160-1:2016. The specifications in the technical description "Documentation 603 000" dated 11/2019 apply in relation to the field of application and installation.**

Note: The certificate is only valid in combination with the test report of TÜV NORD test laboratory PB 8117744963-1 dated February 19, 2020. Production inspection is not required in accordance with EN 13160-2:2016.

Hamburg, 2/21/2020

TÜV NORD Systems GmbH & Co. GK
Manufacturer Certification Competence Center

J. Straube

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As of 02/2020
STPÜZ-QMM-321-032-02

BA 51 05/07 gbe

Legal notice

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