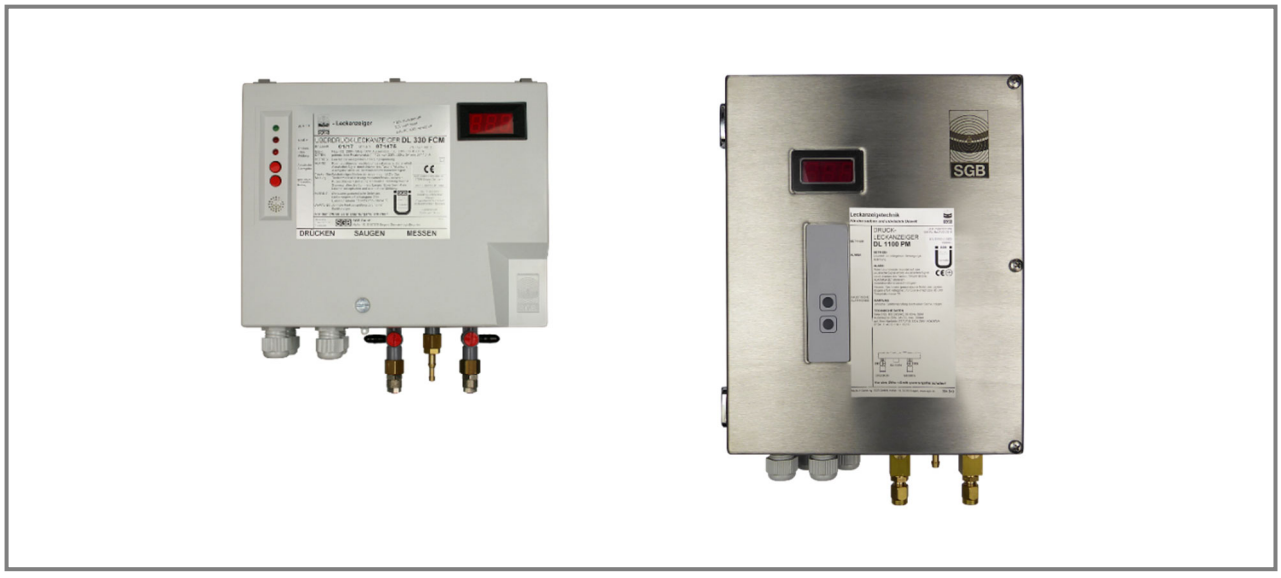
Documentation

Pressure Leak Detector DL ..



Please read instructions prior to commencing any work

As of: 11/2023

Item no.: 603022

Table of Contents

1. General

1.1 Information

These instructions provide important notes on using the DL leak detector. The prerequisite for workplace safety is the adherence to all safety and handling instructions specified in this manual.

Furthermore, any local regulations for prevention of accidents applicable at the site of use of the leak detector 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 situation 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 considering 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 warranty for the DL 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 case of
- inadequate or improper installation
- unintended use
- modifications/repair works without the manufacturer's consent.

Our warranty does not include parts, which may be perished premature due to their consistence or category of usage (e.g. pumps, valves, gaskets, etc.). Furthermore, we are not liable for defects or corrosion damages caused by humid or inappropriate installation environments.

1.6 Customer Service

Our customer service is available for any inquiries.

For information on contacts please refer to our website www.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 pump.
- Connection of interstitial spaces **only in the case of below-ground** interstitial spaces.
- Components that can generate explosive vapors must be contained within double-walled containers, tubs, or surface sealings whose medium-side walls are permeation-tight.

Note/exclusion: If a permeation into the interstitial space that can lead to formation of an explosive atmosphere in 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), the DL leak detector must NOT be used.
The DLG leak detector can be used as an alternative in this case. Please familiarize yourself with this version!

- 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[1].
- The leak detection system is leak-proof according to the table in section 7.3.5 of this documentation.
- Leak detector installed outside of the explosive area.
- Lead-throughs for the pneumatic hoses are sealed gas-tight.
- Leak detector (electric) cannot be turned off.
- The volume of the space monitored by the leak detector must not exceed 10 m^3 (manufacturer's recommendation: 4 m^3).

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 DL 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
- Performing regular checks as to whether the directive is in compliance with the current standards

[1] For example, in accordance with EN 1127

- 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 that put leak detectors into operation 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 HV vest

Wear safety footwear

Wear hard hat

Wear gloves – where necessary

Wear safety goggles – where necessary

2.4.1 Personal protective equipment for systems that may be subject to risk of explosion

The points listed here refer exclusively to safety when working with systems that may be subject to risk of 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[2])
- 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 therefrom) 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 appropriate protective measures should be taken. Ensure no gas is present and that sufficient oxygen is available.

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

3. Technical Data

3.1 General Data

3.1.1 DL 50 to DL 450 and DL 330 P

Dimensions and drilling pattern		see Appendix, section 12.1
Weight		2.3 kg
Storage temperature range		-40°C to +70°C
Operating temperature range		0°C to +40°C
- DL 330 P version		-20°C to +50°C
Max. height[3]		≤ 2000 m above sea level
Max. relative humidity[3]		95 %
Buzzer volume		>70 dB(A) at a distance of 1 m
Housing protection class,	plastic stainless steel	IP 30 IP 66

3.1.2 DL 590 to DL 3000 and DL 50 PM to DL 3000 PM

Dimensions and drilling pattern		see Appendix, section 12.1
Weight		2.7 kg
Storage temperature range		-40°C to +70°C
Operating temperature range		0°C to +40°C
- DL .. PM version		-40°C to +60°C
Max. height[3]		≤ 2000 m above sea level
Max. relative humidity[3]		95 %
Buzzer volume		>70 dB(A) at a distance of 1 m
Housing protection class,	plastic stainless steel	IP 30 IP 66

3.2 Electrical Data

3.2.1 DL 50 to DL 450 and DL 330 P

Power supply	230 V, 50 Hz
Supply tolerance (network)	± 10 %
Input capacity (without external signal)	50 W
Terminals 5, 6, external signal	230 V, 50 Hz, max. 200 VA min. 20 mA
Terminals 11, 12 (potential-free)	max. 230 V, 50 Hz, 3 A min. 6 V/10 mA
External fuse for leak detector **Note:** Acts as a separating point for the device and should be attached as close as possible.	max. 10 A
Overvoltage category	2
Degree of soiling	PD2

[3] For safe operation

3.2.2 DL 590 to DL 3000 and DL 50 PM to DL 3000 PM

Power supply	100 to 240 V, 50/60 Hz
optional:	24 V DC
Input capacity (without external signal)	50 W
Terminals 5, 6, external signal	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
Note: Acts as a separating point for the device and should be attached as close as possible.	
Overvoltage category	2
Degree of soiling	PD2

3.3 Pneumatic Data (Requirements for Measuring Gauge)

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

3.4 Data for applications that fall under the Pressure Equipment Directive (PED) in case of an error

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

Volume	Leak detector DL ..	0,05 liter
	Leak detector DL .. P	0,04 liter
	Manifold 2…8	0,02…0,08 liter
Max. operating pressure		see Chap. 3.5, col. p_{PA}

3.5 Switching Values

Type DL	p_{TS} [mbar]	p_{AE} [mbar]	p_{PA} [mbar]	$P_{ÜDV1}$[4] [mbar]	$p_{PRÜF}$ [mbar]
50	20	> 50	< 100	170 ± 20	≥ 200
100	70	> 100	< 150	220 ± 20	≥ 250
230*	200	> 230	< 310	360 ± 10	≥ 400
280**	250	> 280	< 330	360 ± 10	≥ 400
290	260	> 290	< 350	420 ± 20	≥ 450
325**	300	> 325	< 360	385 ± 10	≥ 400
330	300	> 330	< 410	465 ± 20	≥ 500
400	370	> 400	< 500	565 ± 20	≥ 600
450	420	> 450	< 510	565 ± 20	≥ 600
590	560	> 590	< 700	770 ± 30	≥ 850
750	720	> 750	< 850	940 ± 30	≥ 1000
1000	970	> 1000	< 1400	1590 ± 50	≥ 1750
1100	1070	> 1100	< 1450	1650 ± 70	≥ 1820
1500	1450	> 1500	< 1900	2100 ± 50	≥ 2350
2000	1950	> 2000	< 2400	2650 ± 50	≥ 3000
2300	2250	> 2300	< 2770	3100 ± 100	≥ 3500
2500	2450	> 2500	< 2900	3200 ± 50	≥ 3550
3000	2950	> 3000	< 3400	3750 ± 50	≥ 4150
	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 "Pump OFF" (= operating pressure)

$p_{ÜDV1}$ Opening pressure for overpressure valve 1 (interstitial space)

$p_{PRÜF}$ Minimum test pressure of the interstitial space

* added to the table at a later date

** only for below-ground containers; values were added to the table at a later date

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 "Pump 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 of the pump is diverted. The operating pressure (initial opening) is lower.

3.6 Field of Application

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
- 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, 8 m^3 may not be exceeded. To make it possible 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 DL .. 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 DL .. in accordance with section 3.5.
- Double-walled collecting tubs or surface sealings, whose interstitial space is suitable for connection of a DL .. 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 (air) 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

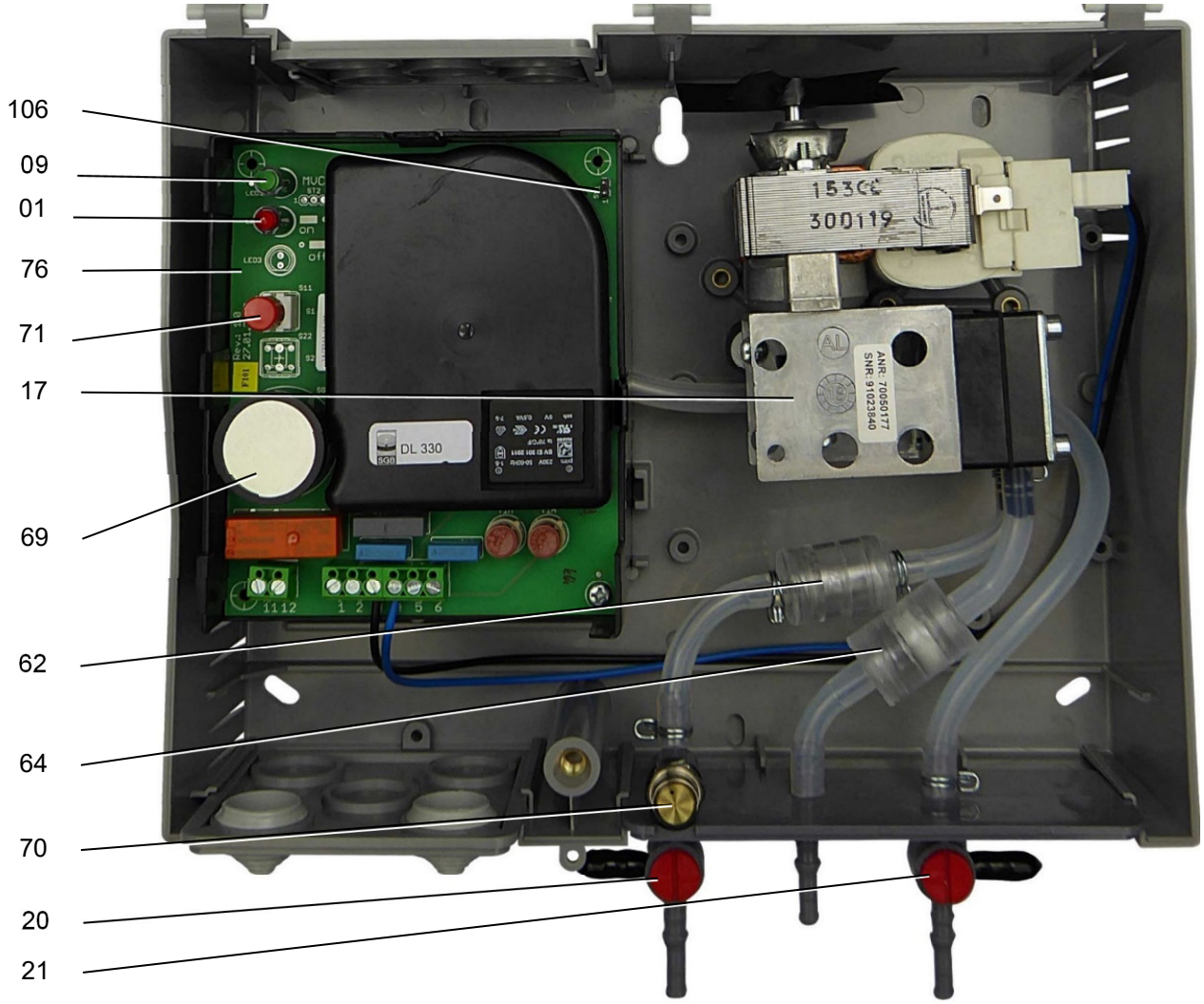
  must be classifiable in gas group II A and II B as well as in temperature code T1 to T3.

  Attention must be paid to the permeation tightness of the inner wall.

4. Design and Function

4.1 System Design

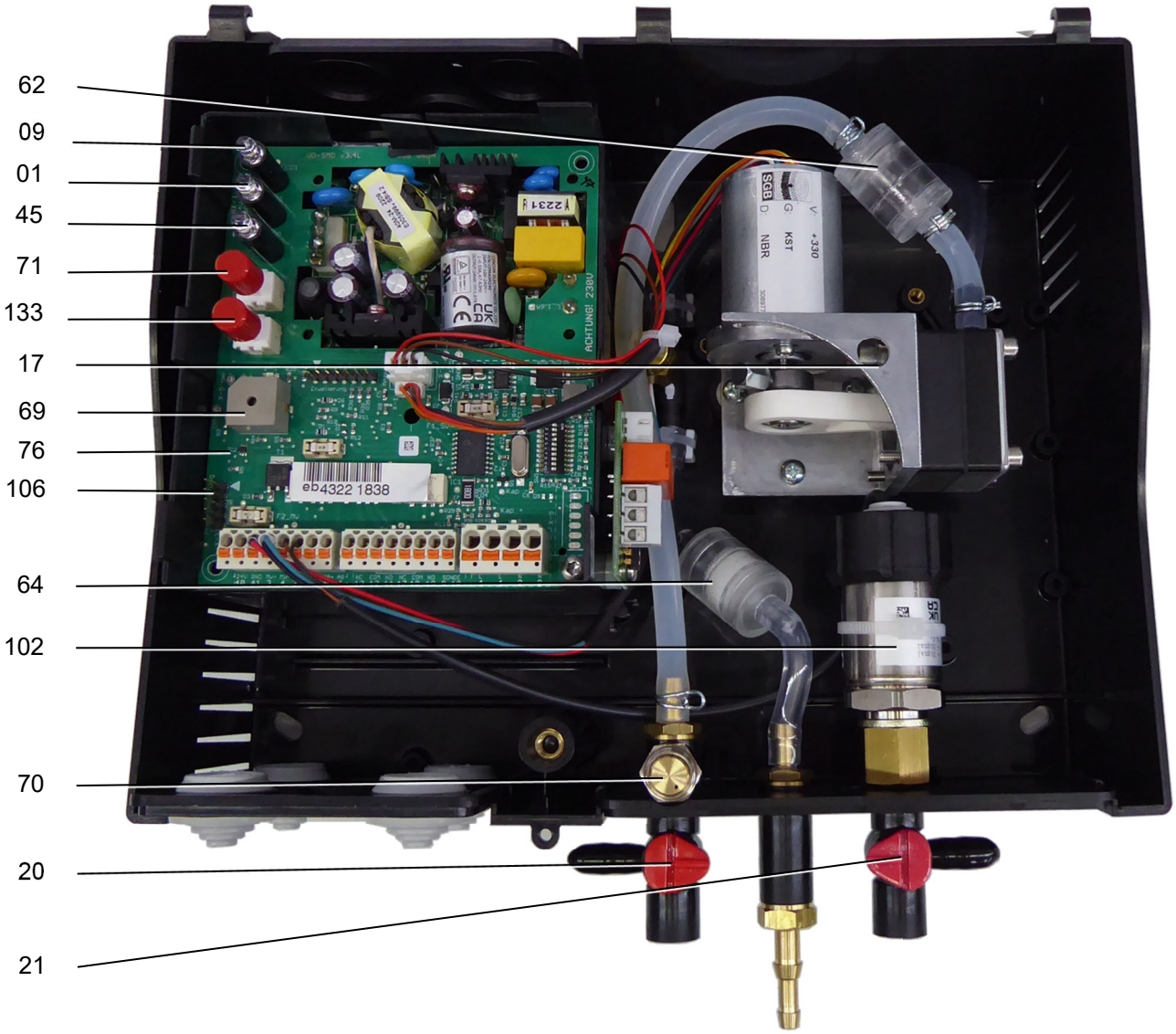
4.1.1 Plastic housing



Interior view with:

01	Signal lamp “alarm”, red
09	Signal lamp "operation", green (white)
17	Overpressure pump
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
62	Check valve
64	Dust filter
69	Buzzer
70	Overpressure valve (interstitial space)
71	"Mute" button
76	Main board
106	Contact for serial data transfer

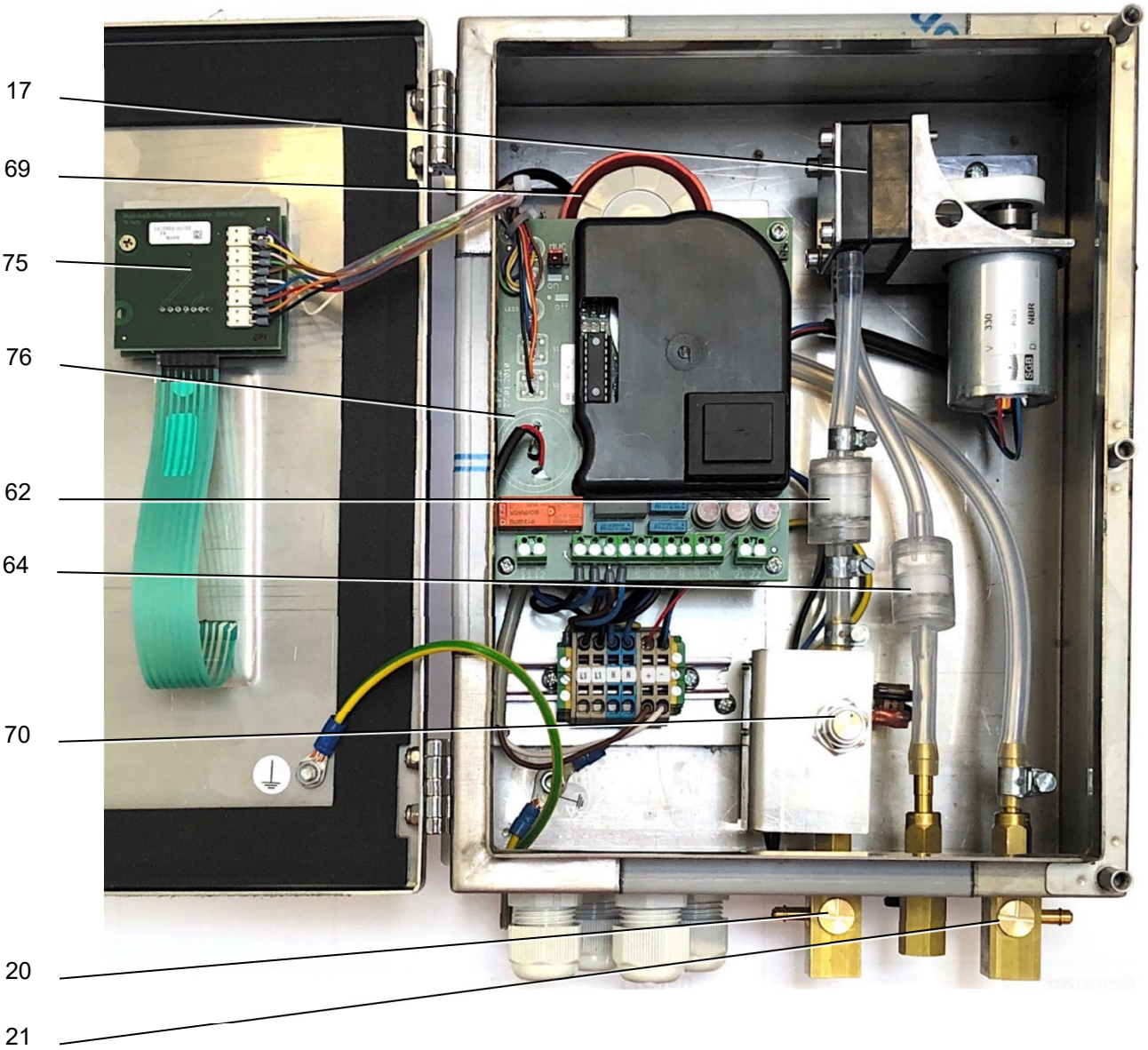
4.1.2 Plastic housing with FC



Interior view with:

01	Signal lamp “alarm”, red
09	Signal lamp "operation", green (white)
17	Overpressure pump
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
45	Signal lamp „Filter control“, yellow
62	Checkk valve
64	Dust filter
69	Buzzer
70	Overpressure valve (on the monitoring room side)
71	Mute button
76	Main board
102	Pressure sensor
106	Contact for serial data transfer
133	Button „acknowledgment dry filter signal“

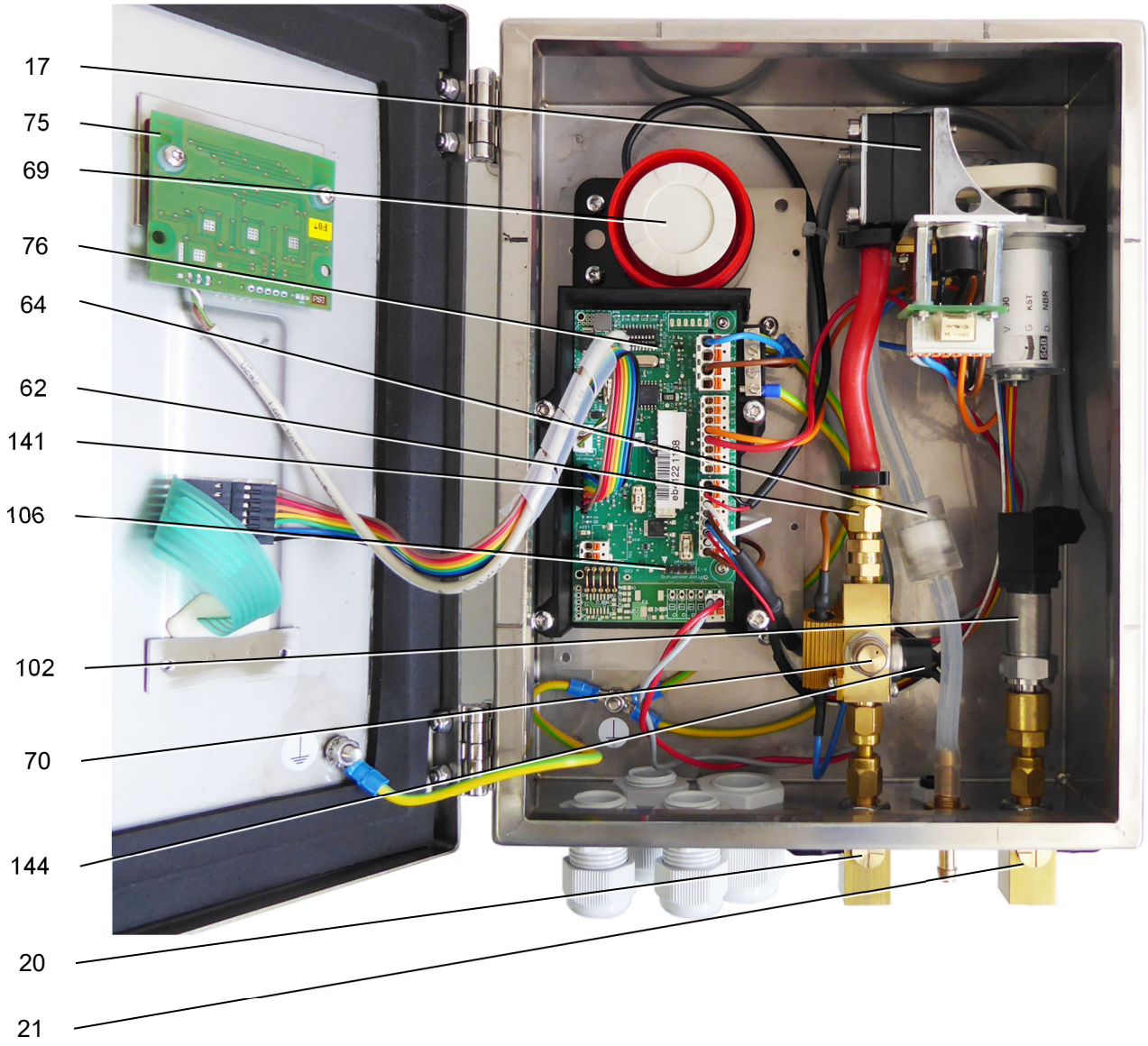
4.1.3 Stainless steel housing for DL 330 P



Interior view with:

17	Overpressure pump
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
62	Check valve
64	Dust filter
69	Buzzer
70	Overpressure valve
75	Display board
76	Main board

4.1.4 Stainless steel housing for DL 50 PM to DL 3000 PM[5]

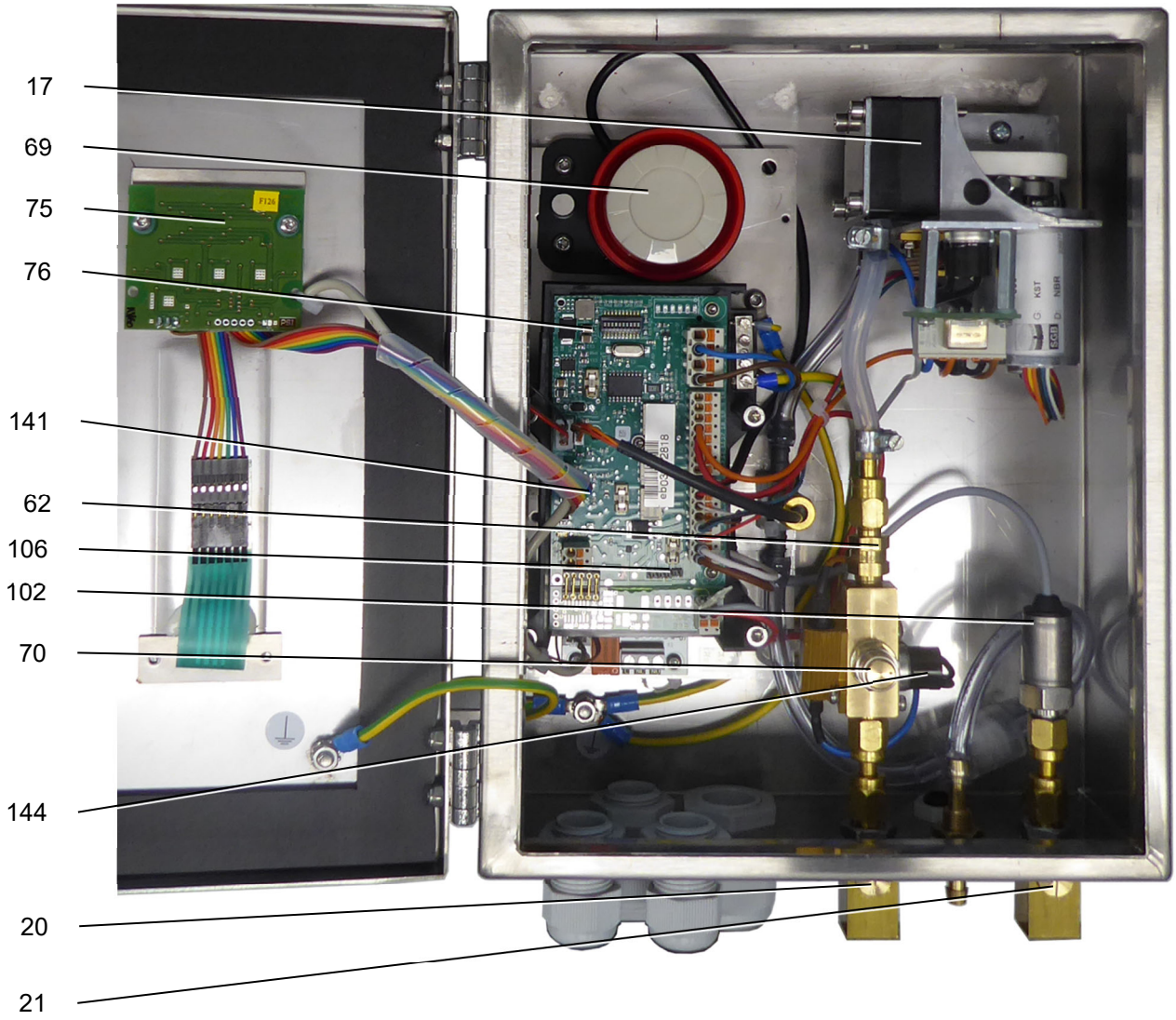


Interior view with:

17	Overpressure pump
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
62	Check valve
64	Dust filter
69	Buzzer
70	Overpressure valve
75	Display board
76	Main board
102	Pressure sensor
106	Contact for serial data transfer
141	Keypad terminal strip
144	Temperature switch, frost protection

[5] Contrary to the above illustration, in the pressure levels DL 50 PM to DL 450 PM a white silicon hose is used as a pressure line.

4.1.5 Stainless steel housing for DL 50 PM to DL 3000 PM with FC[6]



Interior view with:

17	Overpressure pump
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
62	Check valve
64	Dust filter
69	Buzzer
70	Overpressure valve
75	Display board
76	Main board
102	Pressure sensor
106	Contact for serial data transfer
141	Keypad terminal strip
144	Temperature switch, frost protection
164	Humidity sensor

[6] Contrary to the above illustration, in the pressure levels DL 50 PM to DL 450 PM a white silicon hose is used as a pressure line.

The DL .. pressure leak detector monitors both walls of a 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, an integrated pump takes in external air through a dry filter and forwards it to the interstitial space.

The dry filter will dry the external air to a relative humidity of approximately 10 %. Drying is necessary to prevent moisture or condensation accumulation in the interstitial space. Used dry filter fillings must be regenerated or exchanged.

Note for devices with an alarm pressure > 590:

- Values of less than 50 mbar or less than 0.73 PSI will not be displayed.
- Values between 50 and 999 mbar will be displayed in mbar without any decimal places.
- Values from 1 bar are displayed in bar with two decimals and from 10 bar with one decimal.

Values in PSI are displayed with one or two decimals.

4.2 Normal Operating Condition

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 Case 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 the visual and audible alarms.

4.4 Dry Filter

The air supplied to the interstitial space is fed through a dry filter in the suction line. The dry filter dries the air to about 10 % relative humidity to avoid corrosion and condensation accumulation[7] in the interstitial space.

The dry filter is designed for one year as long as it is used as intended and no additional temperature variances occur.

A used dry filter, which is orange in the beginning, will become colorless (or green). Exchange or regenerate used drying material immediately.

- For the FC option (FC = Filter Control/dry filter monitoring), see section 4.4.1 Devices with FC

Dry filter for <u>below-ground</u> containers:

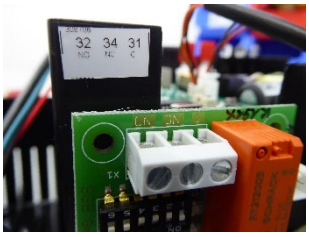
TF 180 (the larger dry filters can also be used)

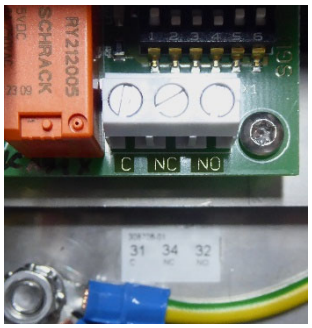
Dry filter for <u>above-ground</u> containers:

Type	Max. volume of the interstitial space with				
	TF 180	**TF 200**	**TF 400**	**TF 600**	**TF 1200**
DL 50	350	750	1400	2100	4800
DL 100					
DL 230					
DL 290	300	600	1100	1600	3700
DL 330					
DL 400	250	520	1000	1500	3500
DL 450					
DL 590	240	500	900	1350	3000
DL 750					
DL 1000	210	400	750	1150	2600
DL 1100					
DL 1500	150	300	550	800	1850
DL 2000					
DL 2300	130	250	400	700	1600
DL 2500					
DL 3000	110	230	350	600	1400

[7] Condensation accumulations in the interstitial space can result in an impermissible rise in pressure.

4.4.1 Devices with FC (dry filter monitoring)





- Function

There is a sensor installed in the pump suction line, between the pump and the dry filter, which measures the moisture in the air that is drawn in.

The increase in relative humidity when the dry material has been used up is detected by the sensor. In the event of insufficient drying capacity, the visual, audible, and potential-free signals will be triggered.

The signal is indicated visually via alternate flashing of
- the two red alarm indicator lights (up to DL 450), or
- the red and yellow alarm indicator lights (DL 590 and above) The potential-free signal is indicated at terminals 31 to 34:
31/32 Contact opens in the event of a signal
31/34 Contact closes in the event of a signal

- Replacing the dry material

When a "Dry filter used up" signal is triggered, the dry material should be replaced within a reasonable time.

The audible signal can be acknowledged by pressing the key briefly. The visual and potential-free signals will continue.

The whole signal can be acknowledged by pressing the "Acknowledge dry filter signal" key for longer (until the bottom LED flashes). When the pump is next activated (or, if this function is performed while the pump is running, after approx. 30 seconds), the signal will be triggered again if the residual moisture is too high.

Once the dry material has been replaced, the dry filter signal must be acknowledged as described.

- Usage limits

The following usage limits must be observed with regard to the dry filter monitoring system:

1. The pump must run for at least 30 seconds in order to obtain a meaningful measurement. During or after commissioning of the leak detector, the time between pump ON and OFF should be measured to establish whether this minimum run time is achieved.

2. It is not possible to obtain meaningful measurement results at low temperatures (below 5°C). The measurement function is therefore deactivated below 5°C.

4.5 Overpressure Valve

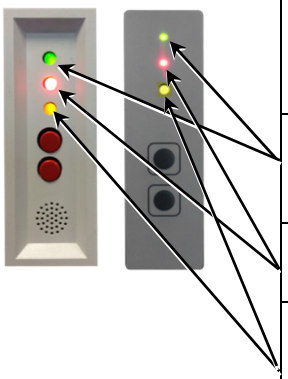
The overpressure valve installed in the pressure line is designed for the protection of the interstitial space against impermissibly high overpressures (exceeding of the test pressure). Impermissibly high overpressures can occur due to:

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

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

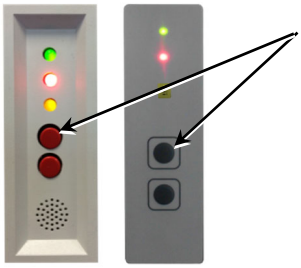
4.6 Displays and Controls

4.6.1 Display



Indicator light	Operating condition	Alarm condition	Alarm, audible alarm acknowledged	Probe alarm	Probe alarm, acknowledged	Malfunction
OPERATION: green	ON	ON	ON	ON	ON	ON
ALARM: red	OFF	ON	FLASHING	OFF	OFF	ON
LED: yellow (red for DL 50 to 450)				ON	FLASHING	OFF
	Not used or, with FC dry filter monitoring, the yellow and red LEDs flash alternately					

4.6.2 "Turn off audible alarm signal" function

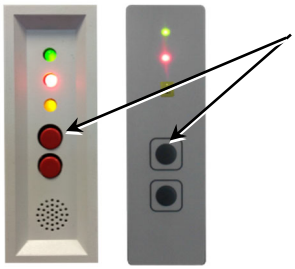


Briefly press "Mute" button once; audible signal turns off, and the red LED flashes.

Pressing the button again will turn the audible signal on.

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

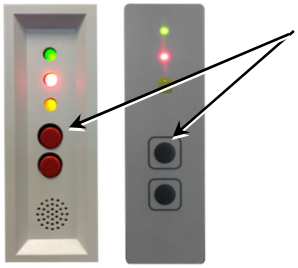
4.6.3 "Testing the visual and audible alarm signal" function



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.

4.6.4 "Tightness inquiry" function



Press and hold the "Mute" button until the signal lamp "Alarm" starts flashing rapidly, then release it. A value for the tightness is indicated as follows:

a) Without display: The signal lamp "Alarm" will flash between 0 and 10 times, or

b) With display (M): The numerical value will be displayed digitally.

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

For the "Tightness inquiry" function, the leak detector must have performed at least 1 automatic refilling interval in normal operating

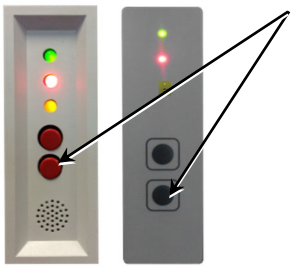
conditions (i.e., without external filling/evacuation, e.g., by an installation pump) to achieve a valid statement.

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.

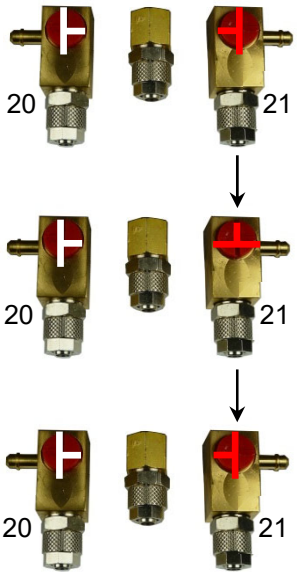
4.6.5 "Acknowledge dry filter signal" function (only if FC filter monitoring is present)



Briefly press the "Acknowledge dry filter signal" key to shut off the audible signal. The visual signal (alternate flashing of the red and yellow LEDs) continues.

To reset the dry filter signal completely, press and hold the key until an audible signal sounds.

4.6.6 Zero-point adjustment[8]



Turn three-way valve 21 90° clockwise from the operating position. The alarm is triggered and the pump runs.

Press and hold the "Mute" button until the signal lamp “Alarm” starts flashing rapidly (approx. 5 seconds), then release the button and press and release it again.

The zero-point adjustment is confirmed with a visual and audible signal (3x).

Return three-way valve 21 to the operating position.

A repetition of the zero-point adjustment is not possible until the operating pressure has been built up.

[8] Function only available for DL 50 to DL 450

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.
- Comply with the safety instructions in this documentation.
- Only qualified service companies may be used for installation[9].
- Comply with relevant regulations for prevention of accidents.
- 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.
- Before entering inspection chambers, the oxygen content must be tested and the inspection 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 tank to be monitored.
- Follow the instructions regarding personal protective equipment (PPE) in sections 2.4 and 2.4.1.

5.2 Leak Detector

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

(2) In a dry room, or outdoors in a suitable protective box.
Devices with a plastic 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) If mounted in a protective box: additional external signal or alarm forwarding via potential-free contacts to a switchboard or similar device.

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

(5) The distance between the leak detector and the interstitial space should be kept to a minimum.

(6) For housing dimensions and drilling patterns, see section 12.1.

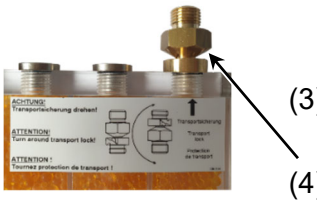
(7) Prior to closing the housing lid, make sure that the function of the overpressure valve is not impeded.

5.3 Dry Filter

(1) Near the leak detector, if possible. If the leak detector is installed in the protective box, the dry filter can be installed in the protection box or outdoors.

(2) Fastening with the installation material provided.
TF 180: Vertical with suction opening pointing down

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



TF 200, 300, 400, 600, 1200: Vertical with suction opening pointing up, beneath the leak detector if possible

(3) Connect the dry filter and the suction port of the leak detector via a PVC hose (or similar).

(4) Turn over the transport lock for the dry filter (ventilation cap).

5.4 Requirements for Pneumatic Connection Lines (Between Leak Detector and Tank)

(1) Metal (generally Cu) or plastic pipes with a pressure resistance at least corresponding to the test pressure in the interstitial space. Also applies to fittings and screwed connections. Note temperature range, especially when using plastic.

(2) Make sure that the correct screw connections and matching threads are used.

(3) Inside clearance: min. 6 mm

(4) A distance of 50 m should not be significantly exceeded, but if this happens: Install pipe/tube with greater inside clearance using appropriate transition pieces.

(5) Color coding:
Measuring line: red
Pressure line: white (or clear)

(6) The full cross section must be maintained. Do not push in or bend[10].

(7) Install metal or plastic pipes that are installed underground or overground exposed on the surface in protective pipes.

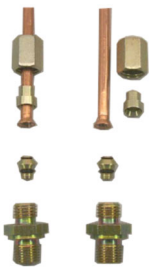
(8) Before connecting cut pipes, deburr and clean them (free of chips).

(9) Seal the protective pipe gas-tight and protect from moisture.

(10) Avoid the buildup of electrostatic charges (e.g., while inserting and pulling lines).

5.5 Completing Pneumatic Connections

5.5.1 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

[10] If necessary, install commercially available fittings for plastic pipes (specified bending radii).

5.5.2 Clamping ring screw connection for metal and plastic pipes

(1) Insert support sleeve 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 tighten a further 1 ¾ turns with a wrench

(4) Loosen nut

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

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

5.5.3 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)

5.6 Electrical Cables DL 590 and higher pressure ratings as well as PM versions

Power connection:

- 2.5 mm^2 without ferrule

- 1.5 mm^2 with ferrule and plastic collar

Voltage-free contacts, external signal, and power supply 24 VDC via terminals 40/41:

- 1.5 mm^2 without ferrule

- 0.75 mm^2 with ferrule and plastic collar

5.7 Electrical Connection

(1) Power supply: according to label imprint

(2) Supply line: at least 1.0 mm^2, e.g., NYM 3 x 0.75 mm^2, and max. 2.5 mm^2

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

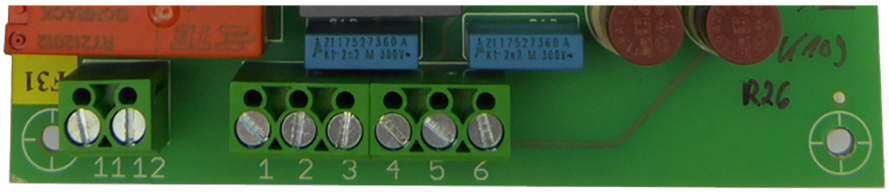
(4) Devices with plastic housing may only be connected with a fixed cable.

(5) Close unused cable glands properly and professionally.

(6) Regulations of power supply companies must be adhered to.[11]

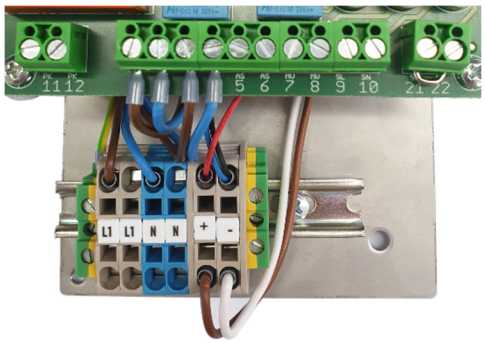
[11] For Germany: also VDE regulations

Terminal layout for DL 50 to DL 450



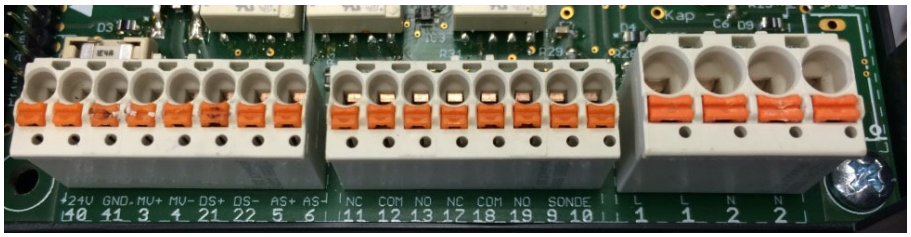
1/2 230 V AC power connection
3/4 Occupied (with internal pump)
5/6 External signal (in the event of an alarm there will be a line voltage present; turned off by activating the "Mute" button).
11/12 Potential-free contacts (opened in case of alarm or loss of power)

Terminal layout for DL 330 P



1/2 230 V AC power connection
3/4 Occupied (with internal pump)
5/6 External signal (in the event of an alarm there will be a line voltage present; turned off by activating the „Mute“ button)
11/12 Potential-free contacts (opened in case of alarm or loss of power)

Terminal layout for DL 590 to DL 3000 and DL 50 PM to DL 3000 PM



1/2 100–240 V AC power connection
40/41 24 V DC power connection
3/4 Occupied (with internal pump)
5/6 External signal (24 V DC in case of alarm, can be turned off by activating the "Sound off" key)
11/12 Potential-free contacts (opened in case of alarm or loss of power)
12/13 Potential-free contacts (closed in case of alarm or loss of power)
17/18 Potential-free contacts (opened in the event of active refilling)
18/19 Potential-free contacts (closed in the event of active refilling)
21/22 Occupied with internal sensor

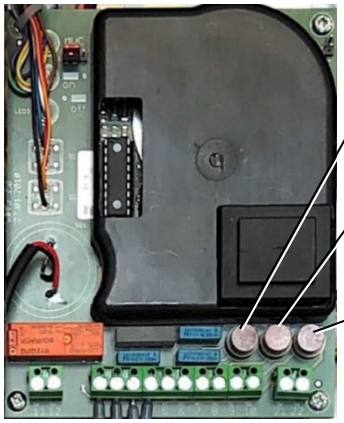
5.7.1 Location of fuses and their values

5.7.1.1 Plastic housing

Fuse 1 A for external signal (5-6)

Fuse 1 A for pump (3-4)

5.7.1.2 Stainless steel housing DL 330 P

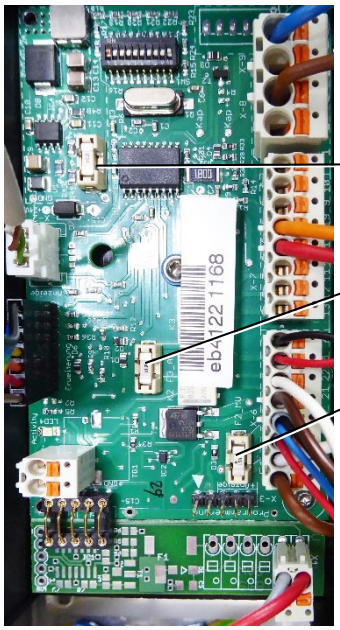


Fuse 1 A for external signal (5-6)

Fuse 250 mA: here without function

Fuse 1 A for pump (3-4)

5.7.1.3 Stainless steel housing DL 50 PM to DL 3000 PM



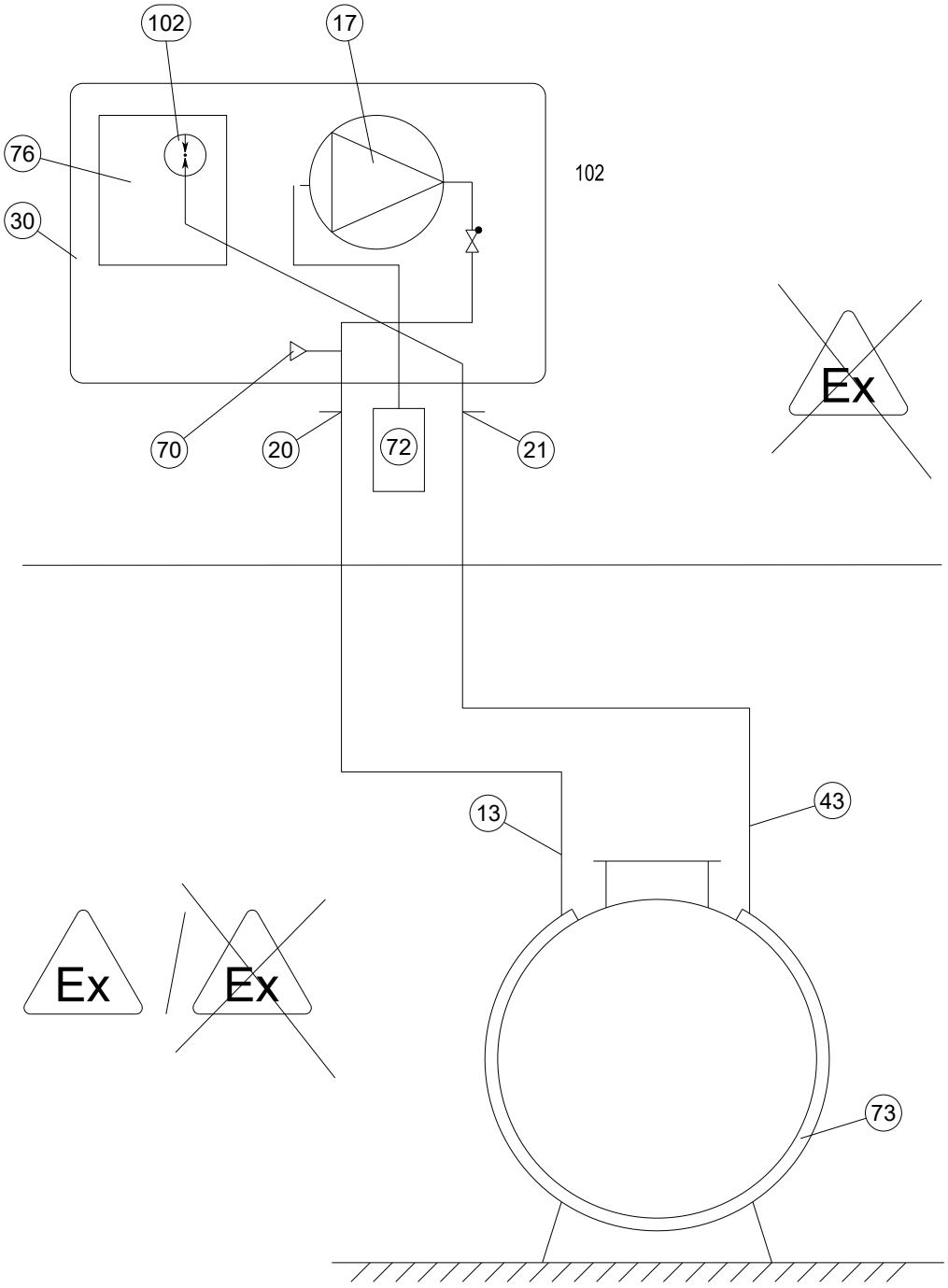
Fuse 2 A for 24-V power supply circuit board

Fuse 1 A for external signal

Fuse 2 A for pump

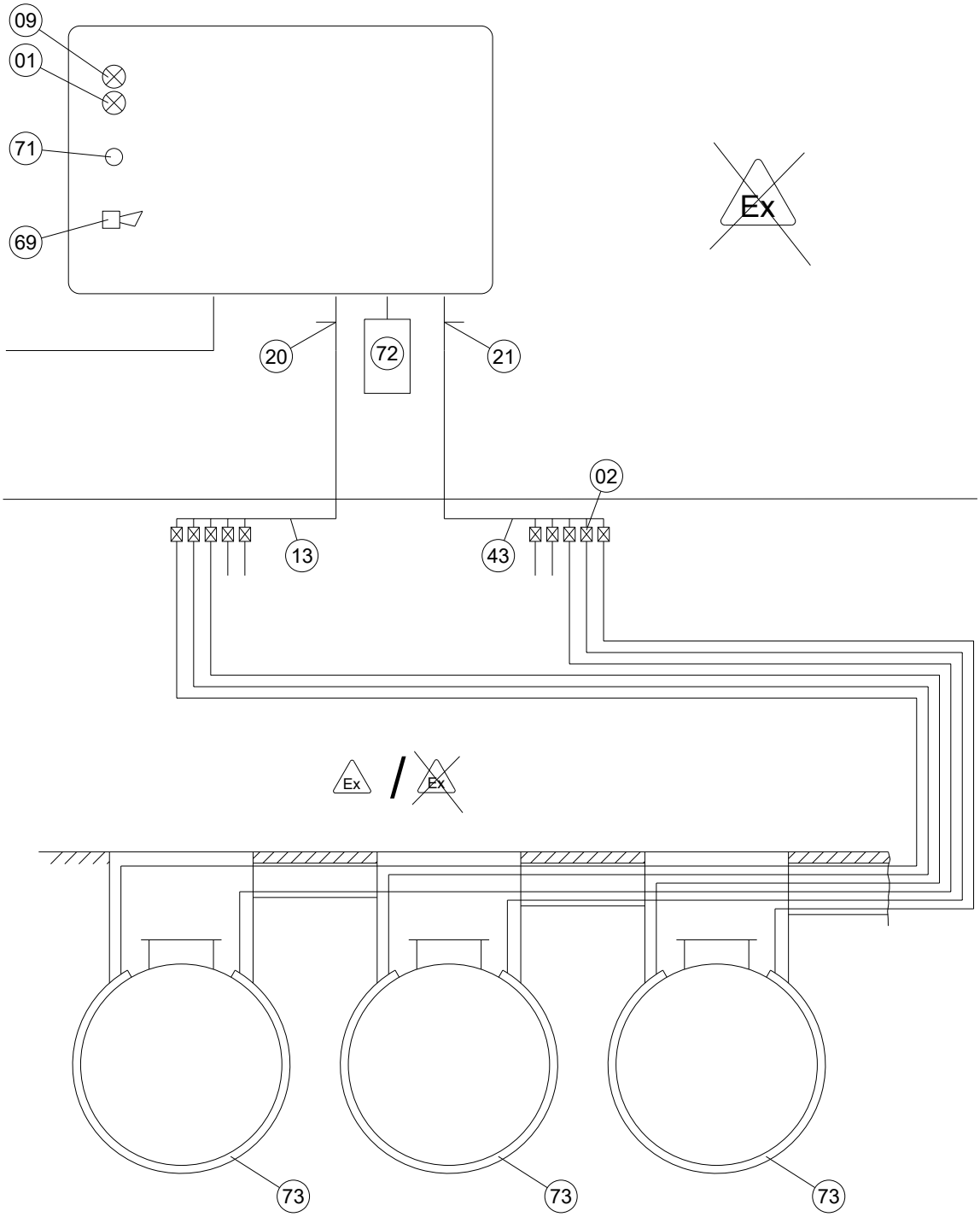
5.8 Installation Examples and Block Diagrams

5.8.1 DL connected to an aboveground container (M1–060 000)



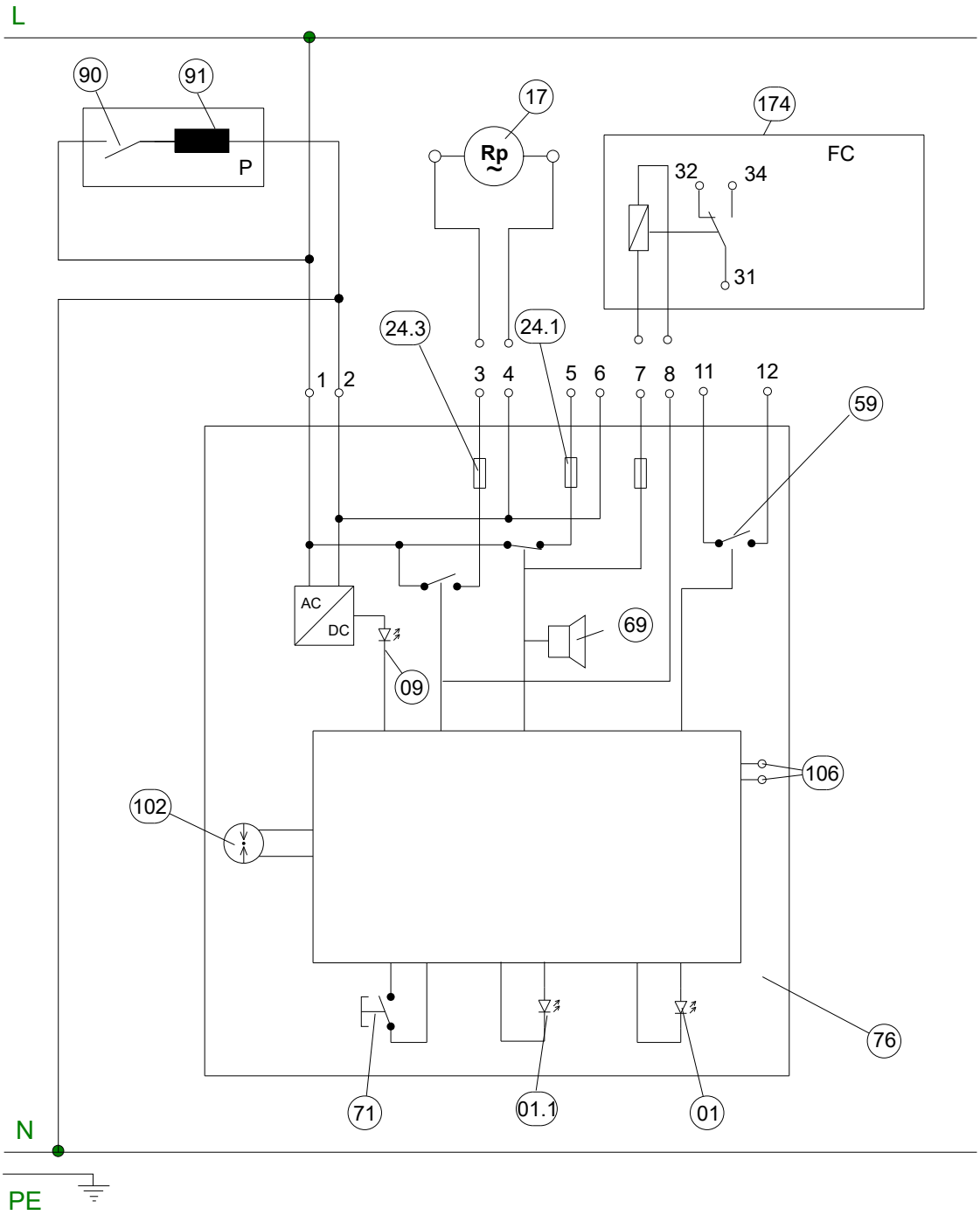
13	Pressure line
17	Overpressure pump
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
30	Housing
43	Measuring line
70	Overpressure valve
72	Dry filter
73	Interstitial space
76	Main board
102	Pressure sensor

5.8.2 DL connected to multiple below-ground containers via a manifold (M2–060 000)



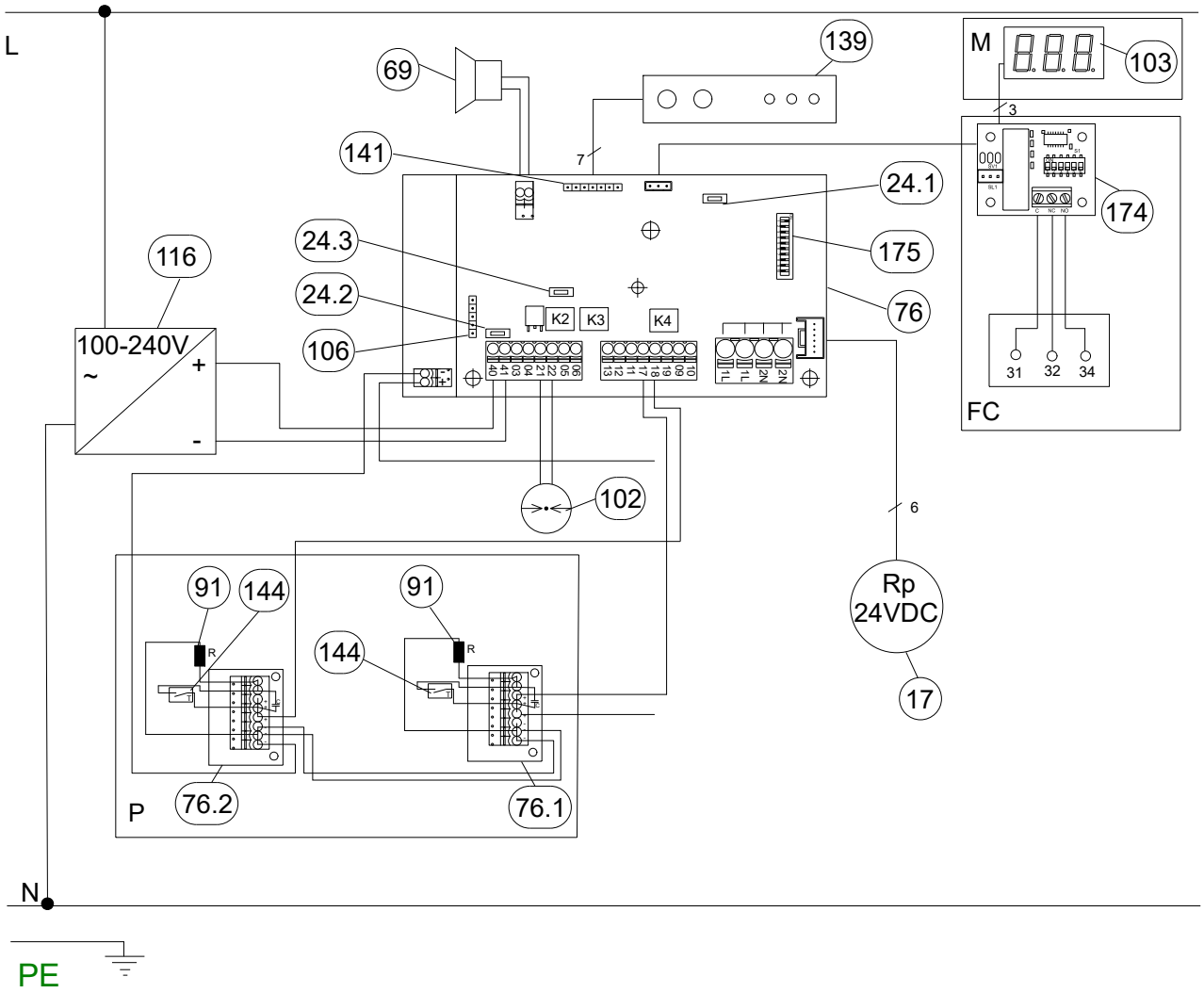
01	Signal lamp "Alarm", red
02	Shut-off valve
09	Signal lamp "Operation", green
13	Pressure line
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
43	Measuring line
69	Buzzer
71	"Mute" button
72	Dry filter
73	Interstitial space

5.8.3 Block diagram, DL 50 to DL 450 (P, M, and FC are options)



01	Signal lamp "Alarm", red
09	Signal lamp "Operation", green
17	Overpressure pump
24.1	"Power supply" fuse, 2 A
24.3	"External signal" fuse, 1 A
59	Relay
69	Buzzer
71	"Mute" button
76	Main board
102	Pressure sensor
105	Control unit
106	Contact for serial data transfer
174	Circuit board for signal forwarding

5.8.4 Block diagram, DL 590 to DL 3000 (P, M, and FC are options)



01	Signal lamp "Alarm", red
09	Signal lamp "Operation", green
17	Overpressure pump
24.1	"Power supply" fuse, 2 A
24.2	"Solenoid valve" fuse, 1.5 A
24.3	"External signal" fuse, 1 A
45	"Refilling" indicator light, yellow
59.2	Relay
59.3	Relay
59.4	Relay
69	Buzzer
71.1	"Mute" button
71.2	"Dry filter monitoring alarm" key
76	Main board
76.1	"Overpressure valve" heating board
76.2	"Pump" heating board
91	Heating resistor
102	Pressure sensor
103	Display
106	Contact for serial data transfer
116	24 V DC power supply unit
139	Keypad
144	Temperature switch, frost protection
174	Circuit board for signal forwarding

6. Commissioning

(1) Only perform commissioning once the steps in section 5 "Mounting" have been completed.

(2) If a leak detector is placed into operation on a container that is already filled, special protective measures must be taken (for example, testing for the presence of 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.

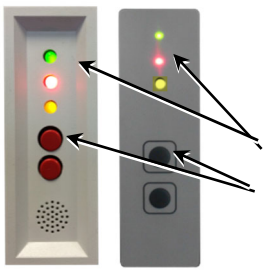
6.1 Tightness Test

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 an external pump (use dry filter!) or a nitrogen cylinder (use 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.

6.2 Commissioning the Leak Detector



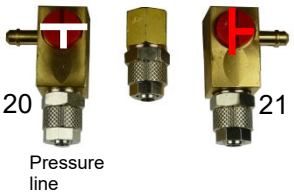
(1) Tightness of the interstitial space prior to commissioning is assumed.

(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.

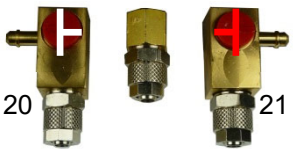
(4) Turn three-way valve 21 180°.
Connect the measuring gauge.

(5) Apply the operating pressure to the leak detection system according to the "Switching values" table, section 3.4, page 11. (Use the installation pump with sufficiently dimensioned dry filter (!))



(6) Pressure can be built up with the installation pump directly via the pressure line or via three-way valve 20. In this case, turn the valve 90° clockwise.

ⓘ **Note:** If no pressure build-up is achieved with the installation pump connected, the leak must be located and corrected (check the performance of the installation pump as well if necessary).



(7) When the operating pressure of the leak detector has been reached (pump in the leak detector will turn off), reconnect the pressure line. Return both three-way valves to the operating position. Remove the measuring gauge.

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

7. Functional Check and Maintenance

7.1 General Information

(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 pump 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 potential-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 potential-free contacts no longer generate an alarm (unless the power loss has caused the pressure to drop below the alarm pressure).

(6) At regular intervals, the operating company must
a) check the function of the signal lamp "Operation"
b) check consumption of the dry filter. Used material – color change from orange to colorless/green, or from dark blue to pink – needs to be exchanged or regenerated.

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

7.2 Maintenance

- Maintenance work and functional checks must be performed by trained personnel only[12]
- Once a year to ensure functional and operational safety
- Test scope according to section 7.3 "Functional check"
- 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.

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[13]
- Each time a malfunction has been corrected

[12] For Germany: Technical knowledge regarding installation service leak detection systems or under the supervision of a responsible expert in accordance with currently valid regulations.
[13] For Germany, national regulations must also be observed (e.g., AwSV).

7.3.1 Test scope

(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) Regenerating or replacing the filter filling

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

(5) Testing the switching values (section 7.3.3)

(6) Checking the overpressure valve (section 7.3.4)

(7) Tightness test following commissioning or correction of malfunctions (section 7.3.5)

(8) Tightness inquiry at the beginning of the annually recurring functional check (section 7.3.6)

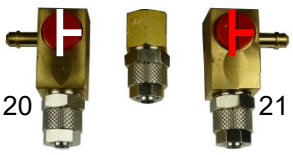
(9) Achieving the operating conditions (section 7.3.7)

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

7.3.2 Checking the free passage of air in the interstitial space

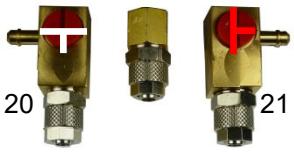
Checking the free passage of air ensures that an interstitial space is connected to the leak detector and that the interstitial space has sufficient passage to cause an air leak to trigger an alarm.

If several interstitial spaces are connected, each interstitial space must be checked for free 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°.

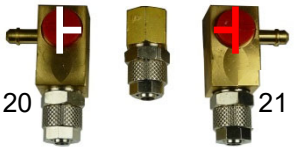


(3) Turn three-way valve 20 90° clockwise so that the pressure line and interstitial space(s) are ventilated.

(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).



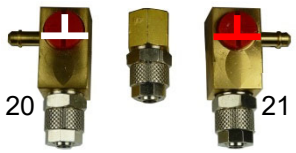
(7) Perform procedure in (5) to (7) with each additional container.

(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

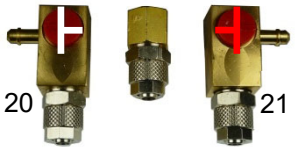


(1) Connect the testing device to the free connections on three-way valves 20 and 21. Connect the measuring gauge to the testing device.

(2) Turn three-way valve 20 90°counterclockwise and three-way valve 21 90° clockwise.

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

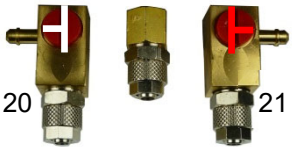
(4) Vent using the needle valve; determine "Pump ON" and "Alarm ON" switching values (visual and audible); record values.



(5) Close the needle valve and determine "Alarm OFF" and "Pump 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.

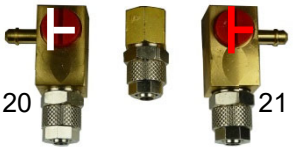
7.3.3.2 Without testing device



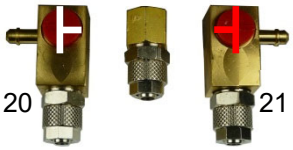
(1) If several containers are connected via a manifold system, close all shut-off valves on the manifold except for the shut-off valves for the container with the smallest interstitial space volume.

(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 "Pump 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 "Pump OFF" switching values. Record the values.

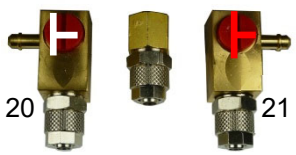


(5) Turn three-way valve 21 to the operating position. Remove the measuring gauge.

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

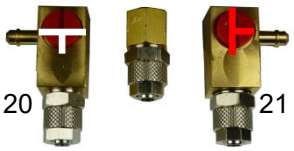
7.3.4 Testing the overpressure valve

7.3.4.1 Without testing device (tanks and pipelines if available)

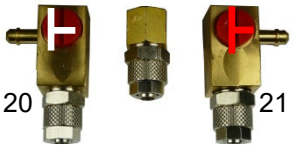


(1) If several interstitial spaces are each connected via a manifold in the pressure and measuring line with a shut-off device, close all shut-off valves on the manifolds except for that of the smallest interstitial space.

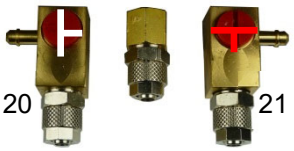
Attach the measuring gauge to the connection on three-way valve 21 and turn the valve 180°.



(2) Turn three-way valve 20 by 90° (CW) so that the pressure line, interstitial space, and the measuring line are ventilated.

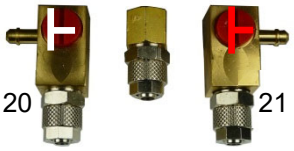


(3) Continue ventilating until the pump switches on, then turn three-way valve 20 by 90° (CCW).

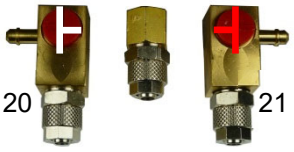


(4) Turn three-way valve 21 by 90° (CW). The pressure sensor is removed from the system and now overpressure is created until the overpressure valve is opened.

(5) Determine the opening pressure and record the value (pressure does not increase further)
ATTENTION: Do not use leak detection spray on the overpressure valve (danger of electric shock and the function of the overpressure valve is no longer given due to the “washing” or coagulation of the seal).



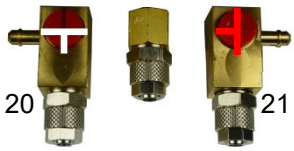
(6) Determine the closing pressure by turning three-way valve 21 by 90° (CCW). This engages the pressure sensor; the pump switches off. The overpressure will drop to the closing pressure of the overpressure valve.



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

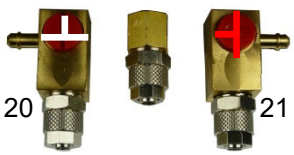
(8) Open all shut-off valves on the manifold with a connected container or pipe.

7.3.4.2 <u>With</u> testing device (pipelines and tanks)



(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 except for that of the smallest interstitial space.

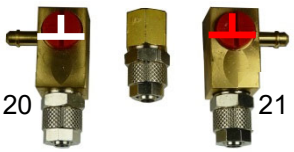
Turn three-way valve 20 by 90° (CW) so that the pressure line and the interstitial space with the measuring line are ventilated.



(2) Continue ventilating until the pump switches on, then turn three-way valve 20 by 180°.

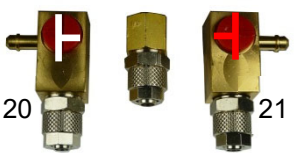
(3) Connect the testing device (white hose of the testing device to three-way valve 20 and the red hose to three-way valve 21.)

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



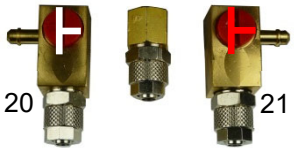
(5) Now the pressure is measured in the testing device until the overpressure valve opens (no more pressure increase). Record the value.

(6) Turn three-way valve 21 by 90° (CW), the pump switches off immediately and the closing pressure can be determined (pressure does not drop further). Record the value.



(7) Return both three-way valves to the operating position. Remove the testing device and 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) Connect the measuring gauge to three-way valve 21. Turn three-way valve 21 180°.

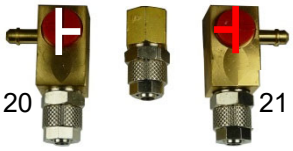
Once the pressure has equalized, start the tightness test.

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

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

The test is positive if the values in the following table are met:

Interstitial space volume in liters	**Max. 1 mbar (0.015 psi) pressure drop in**
250	22 minutes
500	45 minutes
1000	1.50 hours
1500	2.25 hours
2000	3.00 hours
2500	3.75 hours
3000	4.50 hours
3500	5.25 hours
4000	6.00 hours



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

7.3.6 Tightness inquiry at the beginning of the annually recurring functional check

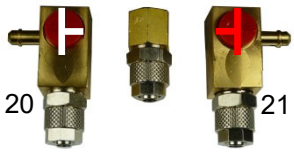
For the "Tightness inquiry" function, the leak detector must have performed at least 1 automatic refilling interval in normal operating conditions (i.e., without external filling/evacuation, e.g., by an installation pump) to achieve a valid statement. This means that point 7.3.6 does not apply to the initial commissioning.

(1) Perform a tightness inquiry (see section 4.6.4).

(2) Evaluate the displayed value (visible on the display for 10 seconds) according to section 4.6.4.

[14] Prerequisite: The operating pressure has been built up in the interstitial space and pressure equalization has occurred.

7.3.7 Achieving the operating conditions



(1) Seal the housing of the leak detector.

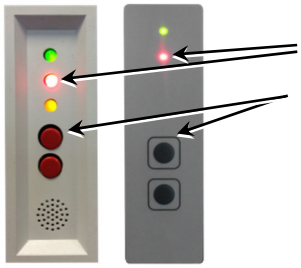
(2) Check that the three-way valves are in the correct position (operating position).

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

(4) Exchange dry filter or restore original unused condition.

8. Alarm/Malfunction

8.1 Alarm



(1) The red signal lamp 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

In case of a malfunction, only the red signal lamp 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 shop.sgb.de/en

10. Accessories

See shop.sgb.de/en

11. Disassembly

11.1 Disassembly

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

- Make sure the unit is free of gas before and during removal.
- 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. If this is unavoidable, be certain to observe EN 1127.
- Avoid electrostatic charges (e.g., from rubbing of plastic parts or wearing of unsuitable work clothing).
- Properly dispose of contaminated components (danger of gas release).

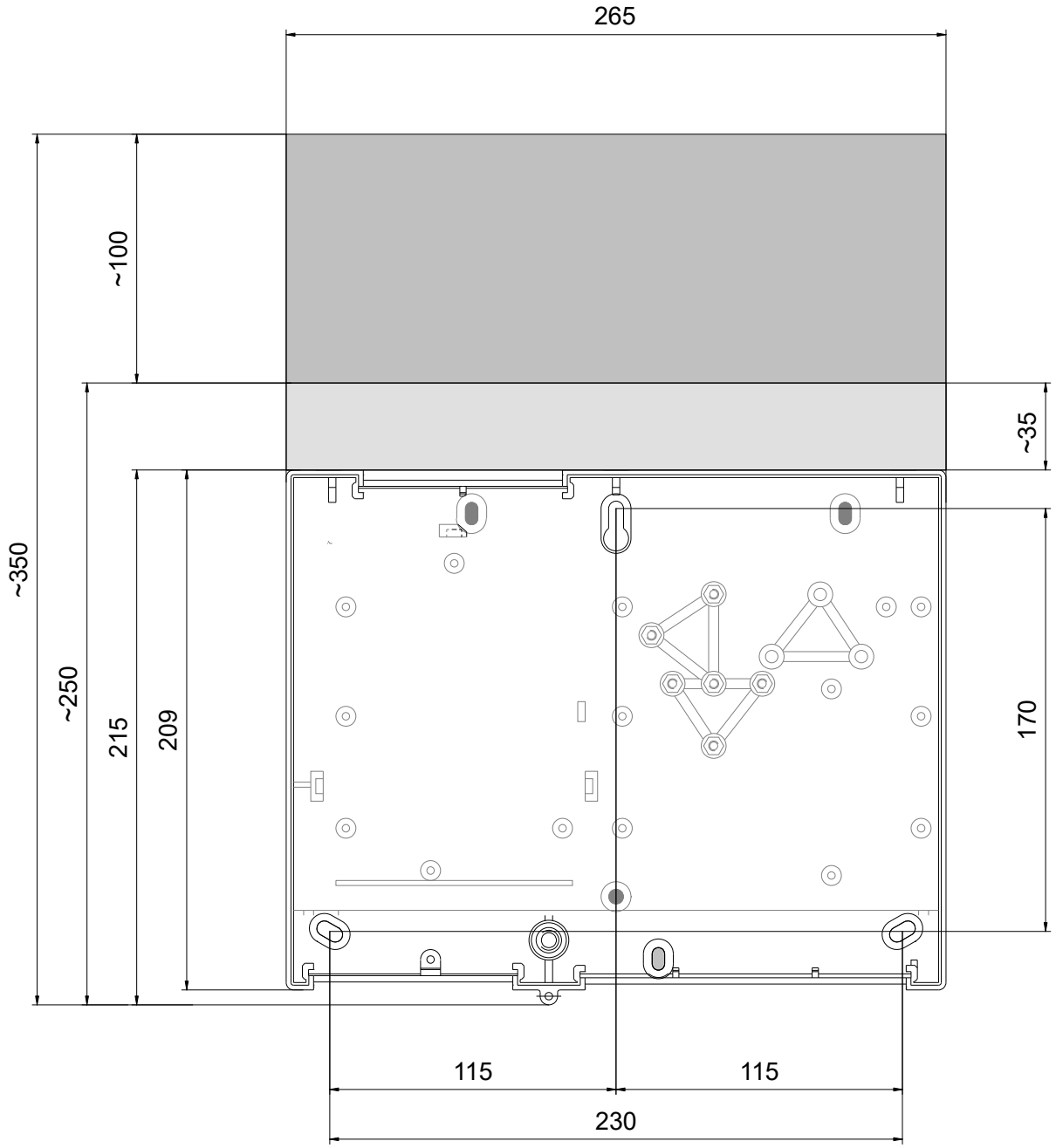
11.2 Disposal

Properly dispose of contaminated components (possibility of gas release). Properly dispose of electronic components.

12. Appendix

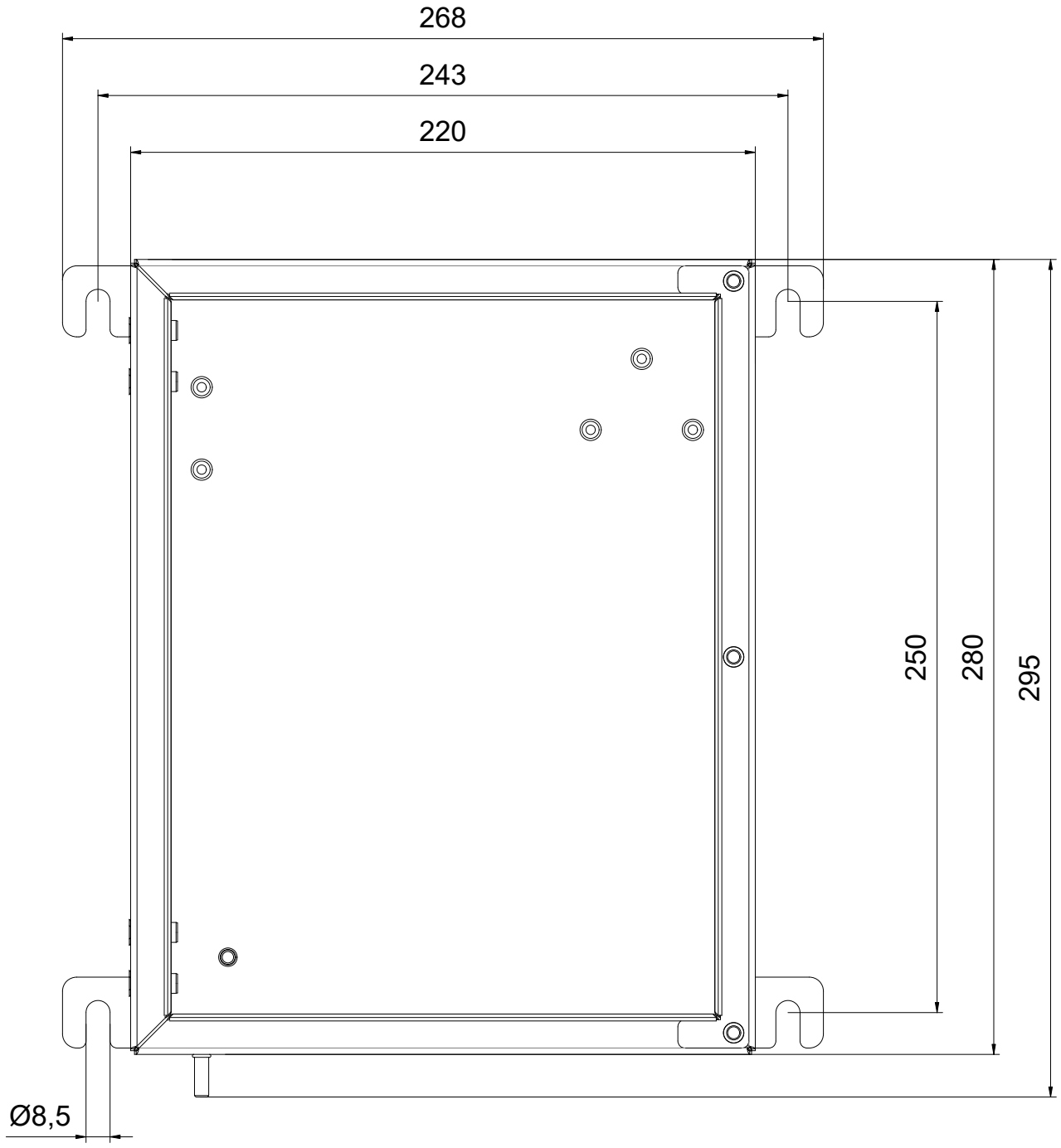
12.1 Dimensions and Drilling Patterns

12.1.1 Plastic housing



Depth = 110 mm

12.1.2 Stainless steel housing, "P" version



Depth = 120 mm

12.2 Version 8S "Leak Detection Probes for Monitoring Access and Monitoring Chambers"

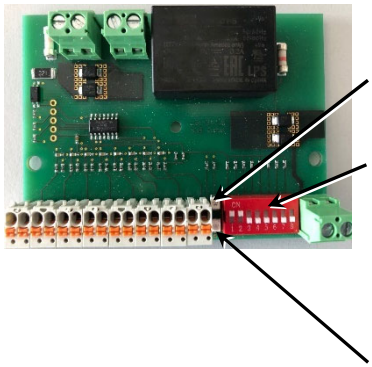
12.2.1 Object

With the 8S version of the DL leak detector, it is possible to connect up to 8 leak detection probes.

The probes have an explosion-proof design and can therefore be mounted in Zone 1 (e.g., in the access chamber). The sensor cable is 1 m long and must be extended in a suitable terminal box. The extension should not be more than 250 m.

The probe will respond to an increase in liquid in the access chamber.

12.2.2 Design and function



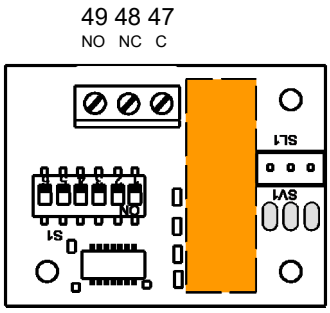
(1) The PCB can only be operated in conjunction with a leak detector and is installed at the manufacturer's factory.

(2) Once the leak detector has been switched on, a green LED lights up to indicate normal operating conditions.

(3) Each connected sensor must be activated via the relevant DIP switch.

If a channel is activated but there is no sensor connected, an alarm will be indicated. If, on the other hand, a sensor is connected and the channel is **not activated**, **nothing** will be indicated!

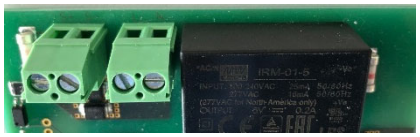
(4) If an alarm or a malfunction (short circuit, cable break, channel activated and no sensor connected) is detected on one of the probe channels (1 to 8), the red LED will light up.



(5) At the same time, the "probe alarm" will be triggered on the leak detector (see also section 4.6) and the potential-free contacts switch

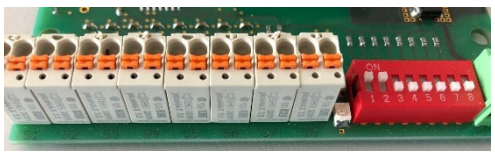
47	C	(common)
48	NC	(normally closed)
49	NO	(normally open)
47/48	Normal operation: opened; probe alarm: closed	
47/49	Normal operation: closed; probe alarm: opened	

(6) Electrical connection (already completed by the manufacturer)



S+/S-	Connection for probe contact on main board
L/N	Power connection

(7) Electrical connection of the probes and the potential equalization



S1 to S8	Connection of the leak detection probes (by the customer)
PA	Potential equalization, must be connected

12.3 EU Declaration of Conformity

We,

SGB GmbH

Hofstr. 10

57076 Siegen, Germany,

hereby declare in sole responsibility that the leak detector

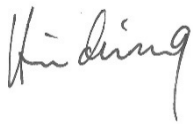
DL ..

is in conformity with the essential requirements of the EU directives/regulations/UK statutory requirements 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 SI 2016 No. 1091	EN 61000-6-3:2012 EN 61000-6-2:2006 EN 61000-3-2:2015 EN 61000-3-3:2014
2014/35/EU Low Voltage Directive SI 1989 No. 728	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 potentially explosive atmospheres SI 2016 No. 1107	The pneumatic components of the leak detector may be connected to spaces (interstitial spaces of containers) that require category 3 devices (DL and DLG). 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: 02/2023

12.4 Declaration of Performance (DoP)

Number: **006 EU-BauPVO 2014**

1. Unique identification code of the product type:

   Pressure leak detector type DL ..

2. Use:

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

3. Manufacturer:

   SGB GmbH, Hofstraße 10, 57076 Siegen, Germany
   Tel.: +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 case 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

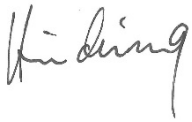
7. Declared performance:

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 ... +40°C	

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

   Dipl.-Ing. M. Hücking, Technical Director

   Siegen, 02/2023

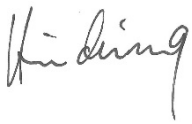


12.5 Declaration of Compliance of the Manufacturer (ÜHP)

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, 02/2023



12.6 TÜV-Nord Certifications

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

Tel: +49(0)40 8557-0
Fax: +49(0)40 8557-2295

hamburg@tuev-nord.de
www.tuev-nord.de

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

Page 1 of 1

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

Grosse Bahnstrasse 31, D-22525 Hamburg
Phone: 040 8557-0
Fax: 040 8557-2295
hamburg@tuev-nord.de
www.tuev-nord.de

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

Page 1 of 1

As of 02/2020
STPÜZ-QMM-321-032-02

BA51 05/07 gbe

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

TÜV NORD Systems GmbH & Co. KG
Accredited test laboratory
Accreditation no.: D-PL-11074-04
Test center identifier: HHA02

Test report no.:	**8117607335**
Manufacturer:	SGB GmbH Hofstr. 10 57076 Siegen
Test object:	Float switch type CPTL07 (serial no.: 0719002) as category 1 leak detection probe in accordance with EN 13160:2016 Part 4 connected to a leak detector type DL 330 + L in accordance with EN 13160:2016 Part 2
Test date:	November 2019
Test basis:	EN 13160 -4:2016
Test location:	TÜV NORD Systems GmbH & Co. KG test laboratory
Test results:	As a category 1 leak detection probe in accordance with EN 13160:2016 Part 4, the float switch type CPTL07 meets the requirements with regard to reusability, software, and temperature resistance (sections 4.1.4, 4.1.5, 4.2.1 of EN 13160-4:2016). The documentation requirements set out in EN 13160-4 section 5.1.1 are fulfilled.
Note:	The float switch is only to be used in conjunction with a suitable alarm device in accordance with 13160 Part 1. Suitable evidence of the resistance of the float switch is to be provided, e.g. with the aid of the resistance list in EN 12285-1, Annex B. If the float switch comes into contact with the medium, it must be taken out of operation and checked to ensure its integrity before being used again.

The tests only refer to the test object.

The test report may only be published in its full form. The publication of shortened versions or excerpts requires prior written consent from the test laboratory.

This test report comprises 6 pages. Total number of pages: 6

Head of Test Laboratory
Head of Test Laboratory

Hamburg, 2019-12-09

Legal notice

SGB GmbH
Hofstr. 10
57076 Siegen
Germany

T +49 271 48964-0
E sgb@sgb.de
W www.sgb.de