Documentation

Pressure leak detector DLR-P .. CV

Please read the instructions before commencing any work

Last updated: 04/2023

Item no.: 604442

Contents

1. General

1.1 Information

This manual provides important information for handling the DLR-P .. CV leak detector. The precondition for safe working is compliance with all the specified safety information and instructions for action.

In addition, all the applicable local accident prevention regulations and general safety instructions must be complied with at the operating site of the leak detector.

1.2 Explanation of symbols

Warnings in this manual are indicated by a symbol next to them.

The signal word expresses the level of risk.

DANGER:
An immediately hazardous situation that results in death or serious injuries if not avoided.

WARNING:
A potentially hazardous situation that can result in death or serious injuries if not avoided.

General

CAUTION:
A potentially hazardous situation that can result in minor or slight injuries if not avoided.

Information:
Highlights useful tips, recommendations and information.

1.3 Limitation of liability

All the data and information in this documentation have been compiled taking account of applicable standards and regulations, the current state of technology and our many years of experience.

SGB will not accept liability for:

- non-compliance with this manual,
- improper use,
- deployment of unqualified personnel,
- unauthorized conversions,
- connection to systems not approved by SGB.

1.4 Copyright

1.5 Warranty

We provide 24 months of warranty on the DLR-P .. CV leak detector from the day of installation on-site in accordance with our General Terms and Conditions of Sale and Delivery.

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

The prerequisite for any warranty is the presentation of the function/test report about initial commissioning by trained personnel. Specification of the serial number of the leak detector is required.

The warranty obligation is rendered null and void in the case of
- Inadequate or incorrect installation
- Improper operation
- Changes/repairs 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 department is available to provide you with information.

You can find information about contacts on the World Wide Web at sgb.de/en or on the rating plate of the leak detector.

2. Safety

2.1 Intended Use

WARNING!

Danger from misuse

- For underground, double-walled plastic pipes
- The inner pipe is unpressurised (= filling, intake or ventilation pipe)
- Pressure resistance of the interstitial space at least PN 5
- Earthing/equipotential bonding in accordance with applicable regulations[1].
- Leak tightness of the leak detection system according to section 6.1
- Leak detector must be installed outside Ex-zone.
- Explosive vapor-air mixtures cannot be drawn in through the dry filter.
- Feedthroughs for connection lines into and out of the manhole shaft are sealed gas-tight.
- The leak detector should be (electrically) connected in a way which cannot be switched off.
- Due to the use of air as leak detection medium, the following points must be observed for stored media with flashpoint ≤ 60 °C (Germany ≤ 55°C in accordance with TRGS - technical regulation on hazardous substances - 509 and 751):
  - Explosive vapor-air mixtures must be able to be classified with temperature codes T1 to T3 and in the gas group II A.
- The max. temperature increase during filling may not exceed 40°C
- The area in which the leak detector is installed must be well-ventilated.
- The yearly functional check must be performed according to this documentation including the sequence provided.

Any claims resulting from misuse will not be accepted.

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

2.2 Responsibility of the operating company

WARNING!

Hazard in the case of incomplete documentation

The DLR-P .. CV leak detector is used in the industrial sector. The operating company must therefore comply with statutory occupational health and safety requirements.

In addition to the safety information in this documentation, all the applicable safety, accident prevention and environmental protection regulations must be complied with. In particular:

- Compilation of a hazard analysis and implementation of its results in operating instructions
- Regular checking of whether the operating instructions comply with the current state of regulations
- The content of the operating instructions may also be the reaction to a possible alarm
- Instigation of an annual function test

[1] For Germany: e.g. EN 1127

2.3 Qualification

WARNING!

Danger to people and the environment in the case of insufficient qualification

The personnel must be sufficiently qualified to recognize and avoid possible dangers on their own.

Companies that put leak detectors into operation must be trained by SGB or by an authorized representative.

National regulations must be complied with.

For Germany:

Specialist company qualification for the installation, commissioning and maintenance of leak detection systems.

2.4 Personal protective equipment

Personal safety equipment must be worn during work.

- Wear the necessary protective equipment for the respective work
- Observe and comply with any signs concerning PPE

Entry in the "Safety Book"

"Wear a warning vest"

Wear safety shoes

Wear a protective helmet

Wear gloves - where necessary

Wear protective goggles - where necessary

2.4.1 Personal protective equipment (PPE) on systems where explosion hazards can arise

The parts listed here particularly apply to safety when working on systems where explosion hazards can arise.

If work is carried out in areas with a potentially explosive atmosphere, the following items of equipment are required as an absolute minimum:

- Suitable clothing (risk of a build-up of electrostatic charge)
- Suitable tools (compliant with EN 1127)
- A suitable gas warning device which is calibrated for the existing vapor-air mixture (work should only be performed at a concentration of 50 % below the lower explosion limit)[2]
- Measuring device for determining the oxygen content of the air (Ex/O meter)

2.5 Basic Hazards

DANGER

From electric current

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

Comply with the relevant regulations for electrical installations, where appropriate explosion protection (e.g., EN 60 079-17) and accident protection regulations.

DANGER

From explosive vapor-air mixtures

The absence of gas must be established before carrying out work.

Comply with explosion protection regulations, such as the German BetrSichV (or the Directive 1999/92/EC and the resulting laws in the respective member states) and/or others.

DANGER

When working in shafts

Leak detectors are to be installed outside of manhole shafts. Pneumatic connections are to be set up as usual in the manhole shaft. The shaft must be entered to perform the installation.

Before entry, the appropriate protection measures must be implemented and the absence of gas and sufficient oxygen must be ensured.

[2] Other percentages may be applicable according to national, regional or plant-specific regulations.

3. Technical data of the leak detector

3.1 General Data

Dimensions and drilling template:	see appendix, section 12.1 to 12.2
Weight:	2.7 kg (plastic housing) 5.8 kg (VA housing)
Storage temperature range:	-40°C to +70°C
Operational temperature range:	0°C to +40°C (plastic housing) -40°C to +60°C (VA housing)
Max. height for safe operation:	≤ 2000 m NN
Max. relative humidity for safe operation:	95 %
Buzzer volume:	> 70 dB (A) in 1 m distance
Protection rating of the housing:	IP 30 (plastic housing) IP 66 (VA housing)

3.2 Electrical data

Power supply: optional:	100 to 240 VAC, 50/60 Hz 24 VDC
Power consumption:	50 W
Terminals 5, 6, external signal:	max: 24 VDC; max. 300 mA
Terminals 11…13 (floating): Terminals 17…19 (floating):	DC ≤ 25 W or AC ≤ 50 VA DC ≤ 25 W or AC ≤ 50 VA
Fuse protection: 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

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

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

Volume leak detector incl. pulsation damper:	0,11 liters
Volume manifold 2 … 8:	0,02 … 0,08 liters
Max. operating pressure:	see chap. 3.4, col. PPA

3.4 Switching values

Type DLR-P .. CV	p_{DP} [bar]	p_{AL_ON} [bar]	p_{PO} [bar]	p_{TEST} [bar]
1.1	< 0.1	> 1.1	< 1.45	≥ 5.0
1.5	< 0.5	> 1.5	< 1.9	≥ 5.0
2.0	< 1.0	> 2.0	< 2.4	≥ 5.0
–	Special values agreed between SGB and the customer.			

p_{DP} Max. delivery pressure in the inner pipe

p_{AL_ON} "Alarm ON" switching value – an alarm is triggered at the latest when this value is reached

p_{PO} "Pump OFF“ switching value (= setpoint pressure)

p_{TEST} Minimum test pressure of the interstitial space

Supplement to table:

p_{AL_OFF} "Alarm OFF" switching value – the alarm is cancelled when this value is exceeded. The switching value "Alarm OFF" is approximately 100 mbar higher than the switching value "Alarm ON" (p_{AL_OFF} = p_{AL_ON} + ~100 mbar)

p_{PU_ON} "Pump ON" switching value. The switching value "Pump ON“ is around 100 mbar lower than the switching value "Pump OFF" (p_{PU_ON} = p_{PU_OFF} - ~100 mbar)

3.5 Application area

3.5.1 Requirements for the interstitial space

- Verification of the pressure resistance of the interstitial space (see 3.4, switching values, table, column "p_{TEST}" for the minimum test pressure of the interstitial space)
- Verification of the suitability of the interstitial space (for Germany: building authority certificate of suitability).
- Sufficient passage in the interstitial space for the air leak detection medium.
- Tightness of the interstitial space according to this documentation.
- The number of interstitial spaces to be monitored depends on the overall volume of the interstitial space. According to EN 13160, this must not exceed 10 m^3. In order to make it possible to verify the leak tightness of the interstitial space, we recommend that a value of 4 m^3 is not exceeded.

The length of pipe which is to be monitored (per branch) should not exceed 2500 m or as specified in the approval requirements of the pipeline.

3.5.2 Pipelines

Underground double-walled plastic pipes, which are used as filling, intake or gas recirculation pipes and with a pressure rating in the interstitial space of at least PN 5.

For Germany: More far-reaching requirements may result from the corresponding approvals or from the TRBS, the DIBt approval principles or EN 13160.

3.5.3 Materials conveyed

- Liquids which are hazardous to waters with a flash point > 60°C (Germany: > 55 °C in accordance with TRGS 509 and 751)
- Liquids which are hazardous to waters with a flash point ≤ 60 °C (Germany: > 55 °C in accordance with TRGS 509 and 751). On pipes which are permanently filled with liquid, it must be ensured that the equipment carrying the product (delivery pumps, etc.) is suitable for zone 0, as air is forced into the product in the event of a leak.
- The material being conveyed must not react with the leak detection medium.
- The resistance of the pipeline to the material being conveyed and its vapors must be verified by third parties (e.g., operator, manufacturer of the pipeline/fittings, etc.).

3.5.4 Additional clarification on explosion protection

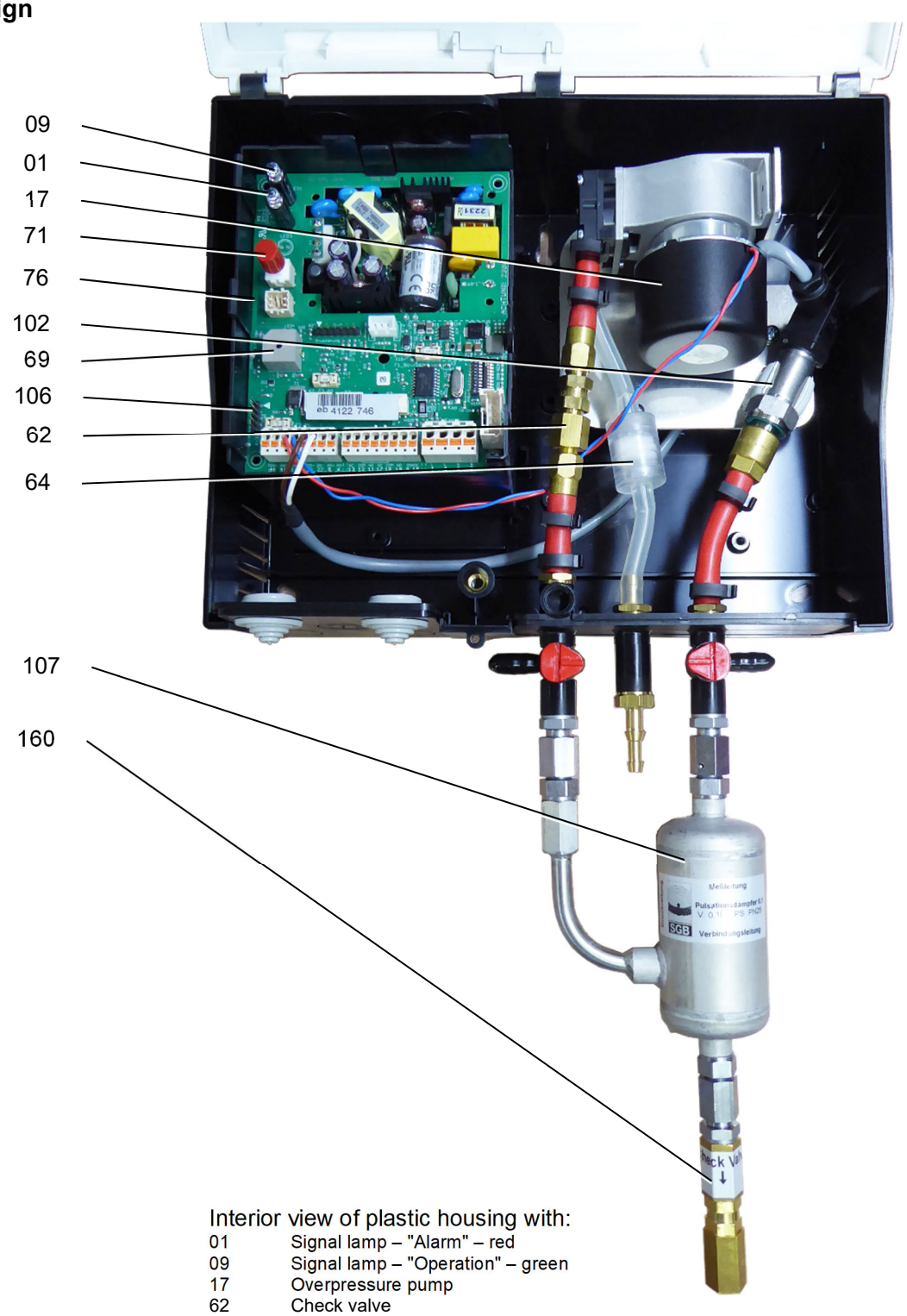
This leak detector is for use on double-walled plastic pipes, in which permeation into the interstitial space cannot be excluded with the consequence of possible zone 0 conditions.

Based on this approach, additional measures are to be implemented:

- Suitable flame barriers (designed to deal with overpressure) at every inlet to the interstitial space.
- Check valve in the connection line, to prevent back-flow of potentially explosive vapor-air mixtures. The check valve (CV) is installed under the leak detector in the pulsation damper.
- An overpressure valve cannot be used; therefore, the test pressure of the interstitial space must be clearly above the operational pressure of the leak detector.

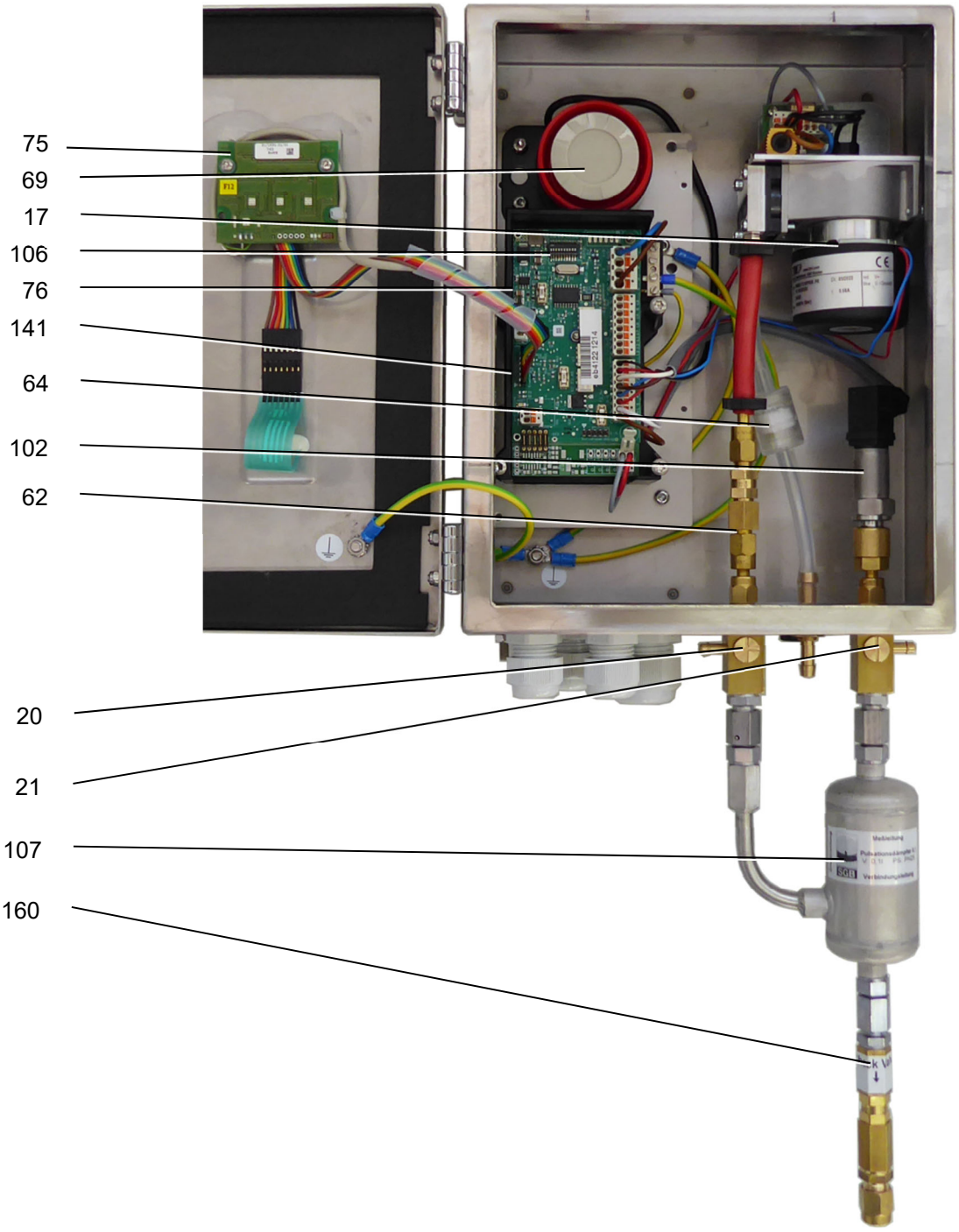
4. Design and function

4.1 Design



Interior view of plastic housing with:

01	Signal lamp – "Alarm" – red
09	Signal lamp – "Operation" – green
17	Overpressure pump
62	Check valve
64	Dust filter
69	Buzzer
71	“Mute” button
76	Main circuit board
102	Pressure sensor
106	Contact for serial data transfer
107	Pulsation damper
160	CV, check valve as isolator



Interior view of stainless steel, weather-proof housing with pulsation damper, 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
75	Display board
76	Main circuit board
102	Pressure sensor
106	Contact for serial data transfer
107	Pulsation damper
141	Keypad connection
160	CV, check valve as isolator

The pressure leak detector DLR-P..CV monitors both walls of the double-walled system for leaks. The monitoring pressure under normal operating conditions is higher than any other pressure applied to the inner or outer wall, so that leaks are indicated through a drop in pressure.

Air is used as a leak detection medium. This is dried via the dry filter in the suction pipe to less than 10% relative humidity. **Used dry filter cartridges must be regenerated or replaced.**

The current pressure is shown in mbar/bar or in PSI on the display screen[3]:

- Values under 150 mbar or 2.18 PSI are not displayed.
- Values up to 990 mbar are displayed in mbar without any decimal places.
- Values over 1 bar are displayed with two decimal places.
- Values in PSI are displayed to one or two decimal place(s).

4.2 Normal operation

The leak detector is connected via the connection line(s) to the interstitial space(s). The overpressure generated by the pump is measured by a pressure sensor and regulated.

When the operating pressure (Pump OFF) is reached the pump is switched off. Due to unavoidable leaks in the leak indication system, the pressure starts to slowly drop again. When the switching pressure "Pump ON" is reached the pump is switched on and the system builds operating pressure back up again.

Depending on the leak tightness and temperature fluctuations of the overall system, the overpressure alternates between the "Feed OFF" and "Feed ON" switching values.

4.3 Function in the event of a leak

If a leak occurs on the inside wall or the outside wall then air will escape from the interstitial space. The pressure will drop until the overpressure pump is switched on in order to restore operating pressure. If the volumetric flow escaping through the leak is greater than the (limited) delivery rate of the pump then the pressure in the system drops and the pump runs in continuous operation.

Any increase in the leak results in further pressure loss until eventually the alarm pressure is reached. At this point the system will generate visual, acoustic and floating alarm outputs.

4.4 Dry filter

A dry filter is needed to dry the drawn-in ambient air enough so that no condensation occurs in the interstitial space.

The minimum requirement for underground interstitial spaces is a TF 200; but larger ones can also be used. The dry filter is designed to

[3] The conversion between bar and PSI is carried out at the manufacturing plant, but this conversion can also be carried out on site upon consultation with the manufacturer.

last for a year provided the equipment is used for its proper intended purpose and no additional temperature fluctuations occur.

	Max. volume (liters) of the interstitial space with			
Type	**TF 200**	**TF 400**	**TF 600**	**TF 1200**
DLR-P 1.1	400	750	1150	2600
DLR-P 1.5	300	650	800	1850
DLR-P 2.0				

Initially the dry filter is an orange color, but this fades to a colorless state (or green) when the filter has been used up. Once the filter cartridge has been used up it should be replaced or regenerated.

4.4.1 Devices with FC (dry filter monitoring)

4.4.1.1 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 red and yellow alarm indicator lights.

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

4.4.1.2 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.

4.4.1.3 Usage limits

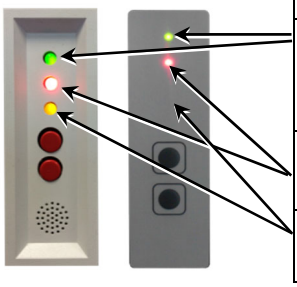
The following usage limits must be observed with regard to the dry filter monitoring system:

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.

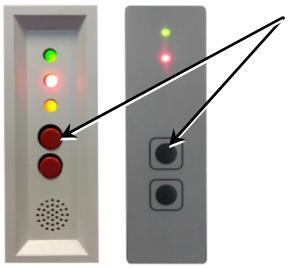
4.5 Display and control elements

4.5.1 Display



Signal lamp	Operating status	Alarm status	Alarm, acoustic alarm signal acknowledged/reset	Device fault
OPERATION: green	ON	ON	ON	ON
ALARM: red	OFF	ON	FLASHING	ON
LED yellow	Without function or in the event that dry filter monitoring is connected, the yellow and red LEDs flash alternately.			

4.5.2 Function: "Switch off audible alarm signal"

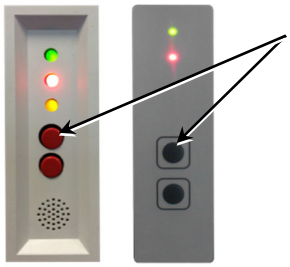


Briefly press the "mute" button once – the audible alarm signal is then switched off and the red LED flashes.

Pressing the button again switches on the audible signal.

This function is not available in normal operation and for malfunctions.

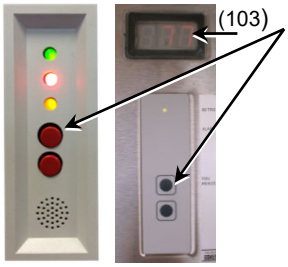
4.5.3 Function: "Test visual and audible alarm signal"



Press the "mute" button and keep it pressed (approx. 10 seconds) – the alarm signal is triggered until the button is released again.

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

4.5.4 Function: "Test leak tightness"



Press the "mute" button and keep it pressed until the signal lamp flashes quickly, then release the button. A value for the leak tightness is indicated on the optional display (103). The same value is shown by the number of flashes of the “Alarm” signal lamp.

This display goes off after 10 seconds and the current underpressure in the system is displayed again.

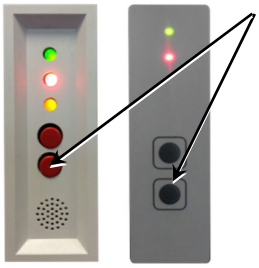
For the “test leak tightness” function the leak detector must have performed at least 1 automatic feed interval in normal operating conditions (i.e. without being filled/evacuated by an assembly pump) in order to obtain a valid result.

It is recommended to perform this test before performing any recurring functional check of a leak detector. This makes it possible to directly assess whether to look for leaks.

Number of flashing signals	Assessment of the leak tightness
0	Very leak tight
1 to 3	Leak tight
4 to 6	Sufficiently leak tight
7 to 8	Maintenance recommended
9 to 10	Maintenance urgently recommended

The smaller the above value, the tighter the system is. The meaningfulness of this value also depends on temperature fluctuations and should therefore be considered as an indicative value.

4.5.5 Acknowledgement of the "Dry filter alarm" (only when the filter control FC is present)



Press "Dry filter message acknowledgement" button briefly so that the audible signal is switched off. The visual display (alternating flashing of the red and yellow LEDs) continues.

For complete reset of the dry filter alarm, press the button and keep pressed until an audible signal sounds.

5. Installation of the system

5.1 General Information

- Before starting work, the documentation must be read and understood. If anything is unclear, please contact the manufacturer.
- The safety instructions in this documentation must be observed.
- Installation and assembly must only be performed by qualified companies
- The relevant accident prevention regulations must be complied with.
- Feedthroughs for pneumatic and electrical connection lines, via which the Ex-atmosphere can spread, must be sealed so that they are gas-tight.
- Comply with explosion protection regulations (if required), such as the German BetrSichV (or the Directive 1999/92/EC and the resulting laws in the respective member states) and/or others.
- If nitrogen is used for the initial pressurization of the interstitial space, corresponding safety precautions are to be taken (e.g. secure canister, use a suitable pressure reducer, ventilation in room and shafts, etc.).
- A test valve should be provided at the end of the pipe(s)/fitting(s) away from the leak detector.
- Before entering inspection chambers, check the oxygen content and, if necessary, flush the inspection chamber.
- When metal connection lines are used, it must be ensured that the mains power supply earth has the same potential as the piping to be monitored.
- Hints for personal protective equipment are listed in chapter 2.4 and 2.4.1.

5.2 Leak detector

(1) Usually wall-mounted with wall plugs and screws.

(2) **NOT in potentially explosive atmospheres**.

(3) Plastic housing: in a dry room
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.

(4) Stainless steel housing: outdoors or in the building

(5) Dimensions of the housings and hole patterns are shown in appendices 12.1 to 12.2.

(6) If several double-walled pipes are connected to a leak detector, a shut-off valve is to be provided for each branch.

5.3 Dry filter

(1) Preferably close to the leak detector.

(2) Installed in such a way that under no circumstances will explosive vapor-air mixtures be drawn in.

(3) Attachment with mounting materials supplied.
TF 180: Vertical with intake opening facing downwards
TF 200, 300, 400, 600, 1200: Vertical with intake opening facing upwards, if possible, near the leak detector

(4) The dry filter and intake connection port of the leak detector should be connected via a PVC hose (or similar).

5.4 Pneumatic connection lines, requirements

- Metal (usually copper) or plastic pipes with a pressure resistance corresponding to at least the test pressure of the interstitial space – also applies for valves and screw connections. Observe the temperature range, particularly when using plastic.
- Make sure that the correct screw connections and matching threads are used.
- Clear width at least 6 mm for air as leak detection medium
- Length should not exceed 50 m, but if it does: use a pipe with a greater clear width together with bridging pieces.
- The full cross section must be maintained. Pinching and kinking[4] are not permitted.
- Bur and clean it prior to the connection of cut pipes (free of sawdust).
- Metal or plastic pipes laid underground and plastic pipes laid overground should be laid inside a protective pipe.
- The protective tube should be sealed gas-tight and protected to prevent liquids from penetrating inside.
- Avoid any build-up of electrostatic charge (e.g., when drawing in lines).
- Pressure and measuring lines are joined under the leak detector by the pulsation damper.
- All conducting parts must be linked to each other. The bleeder resistance must be ≤ $10^6 \Omega$ at the same time.

5.5 Making pneumatic connections

5.5.1 Fitting the connection to the interstitial space, or test valves

(1) As a rule, according to the specifications of the manufacturer of the pipeline/interstitial space.

(2) If Schrader valves are used, the following points are to be observed:
- Unscrew protective cap
- Tighten locknut
- Remove valve insert and tape down close to the connection with a piece of adhesive tape.
- Screw the connection on to the interstitial space or test valve and tighten by hand.
- If necessary, tighten further with suitable pliers.

[4] Commercially available moulded parts (with given bending radii) may need to be used for plastic pipes

5.5.2 Between the leak detector and the interstitial space

(1) Select and lay suitable pipe.

(2) When laying the hose/pipe, check that the hoses are protected against damage when the manhole is inspected.

(3) Observe earthing/potential equalization of metal parts in non-conductive connection lines.

(4) Create the appropriate connection (according to the depictions in the following images)

5.5.2.1 Flange 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

5.5.2.2 Clamping ring screw connection for metal and plastic pipes

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

(2) Insert pipe (with support sleeve) as far as the stop

(3) Tighten nut of screw connection by hand to the resistance; then turn further 1¾ turns with the wrench

(4) Loosen nut

(5) Tighten nut by hand until stop is felt

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

5.5.2.3 Quick screw connection for PA hose

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

(2) Unscrew union nut and push it over the pipe end

(3) Push pipe on nipple as far as the threaded end

(4) Tighten the union nut by hand

(5) Tighten the union nut with a spanner until there is a noticeable increase in force (approx. 1 to 2 turns)

5.6 Electrical cables

Mains power connection:

- 2.5 mm² without wire end ferrule
- 1.5 mm² with wire end ferrule and plastic collar

Floating contacts, external signal and power supply 24 VDC via terminals 40/41:

- 1.5 mm² without wire end ferrule
- 0.75 mm² with wire end ferrule and plastic collar

5.7 Electrical connection

(1) Power supply in the range of 100 to 240 V (terminals 1/2) or direct with 24 V DC at terminals 40/41.

(2) Recommended cable type: NYM 3 x 1,5 mm^2, LiYY 3 x 0,75 mm^2 with wire end ferrules

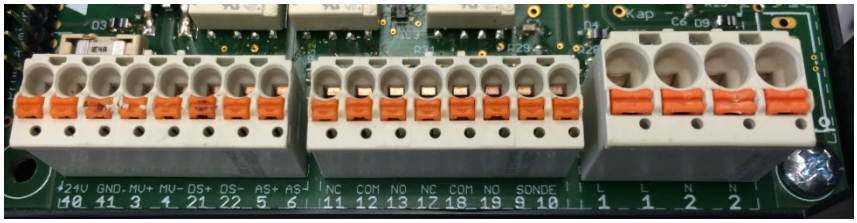
(3) Hard-wired, i.e., no plug-in or switchable connections.

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

(5) Close unused cable glands properly and professionally.

(6) The regulations of the electricity supply companies must be satisfied[5].

(7) Terminal assignment (Also see section 5.8.3/5.8.4 block diagrams):

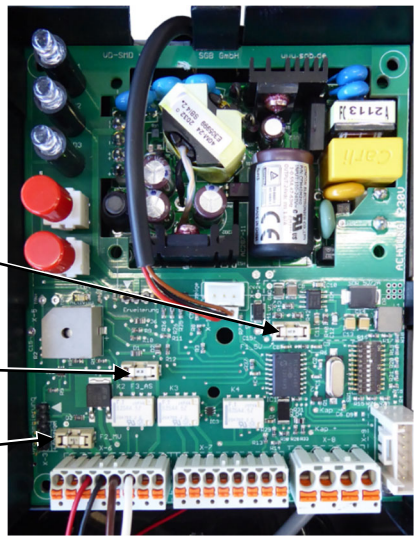


1/2	Network connection (100…240 V AC) **Note:** Both terminals are duplicated!
3/4	Assigned (to internal pump)
5/6	External signal (24 V DC in the event of an alarm - it is switched off by pressing the "Audible alarm" button).
11/12	Potential-free contacts (open in the event of an alarm and in the event of a power failure)
12/13	As above, however closed contacts
17/18/19	Potential-free contacts, while power failure: 17/18 closed 18/19 open Potential-free contacts, while pump running: 17/18 open 18/19 closed
21/22	Assigned (to internal sensor)
40/41	24 V DC as permanent power supply for supplying other components or the power supply is connected here for a device using 24 V DC supply voltage.

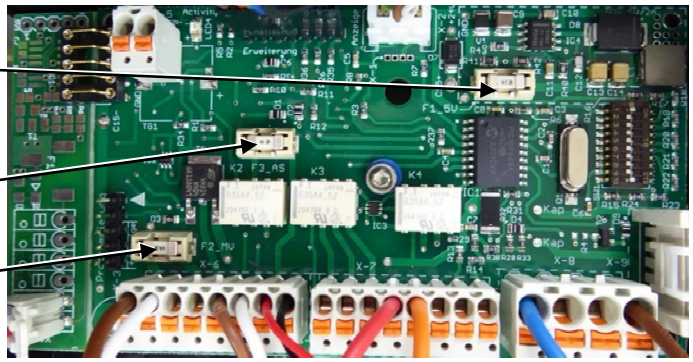
[5] For Germany: also, VDE regulations

5.7.1 Location of fuses and their values

5.7.1.1 Plastic housing

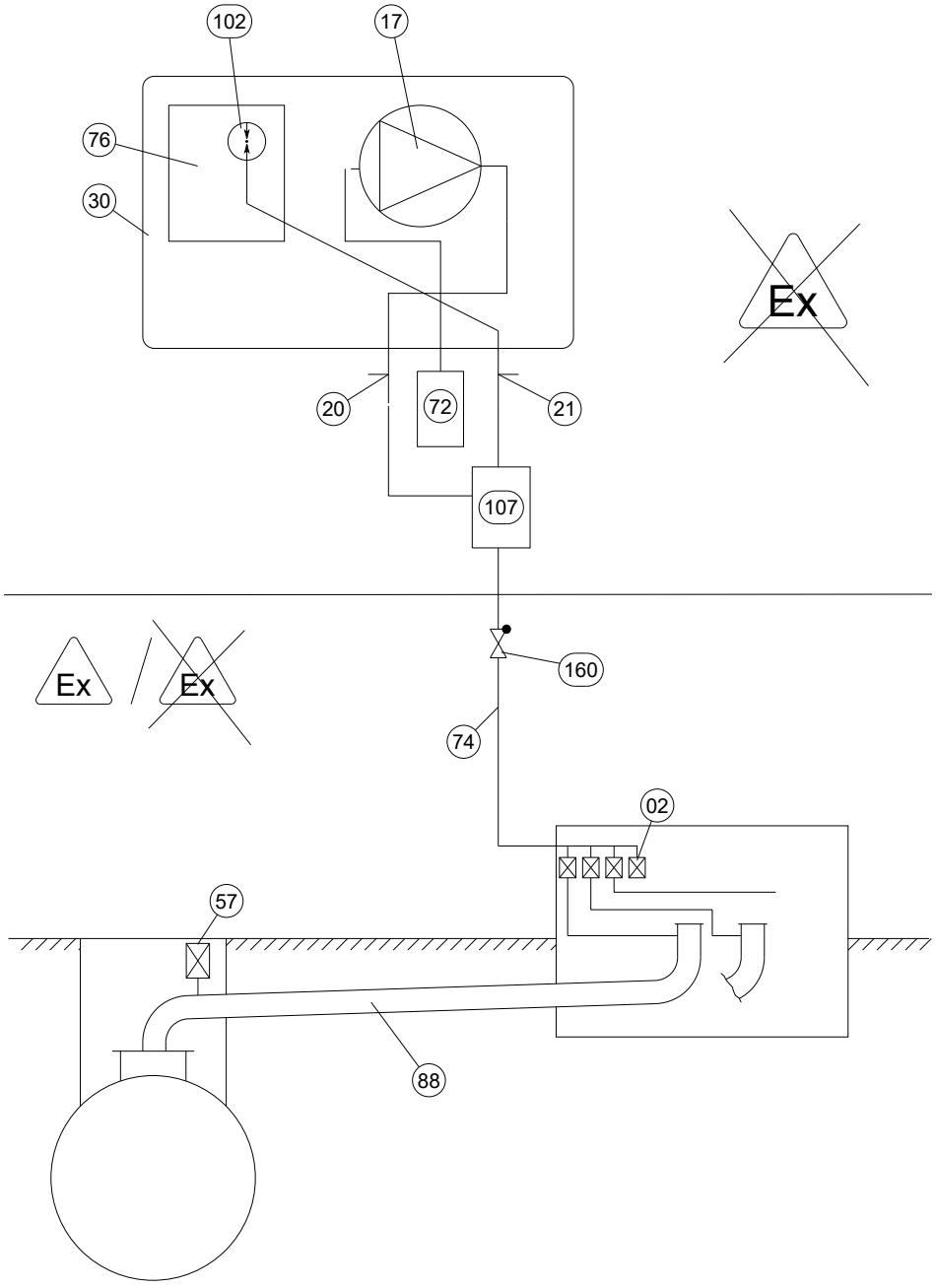


5.7.1.2 Stainless-steel housing



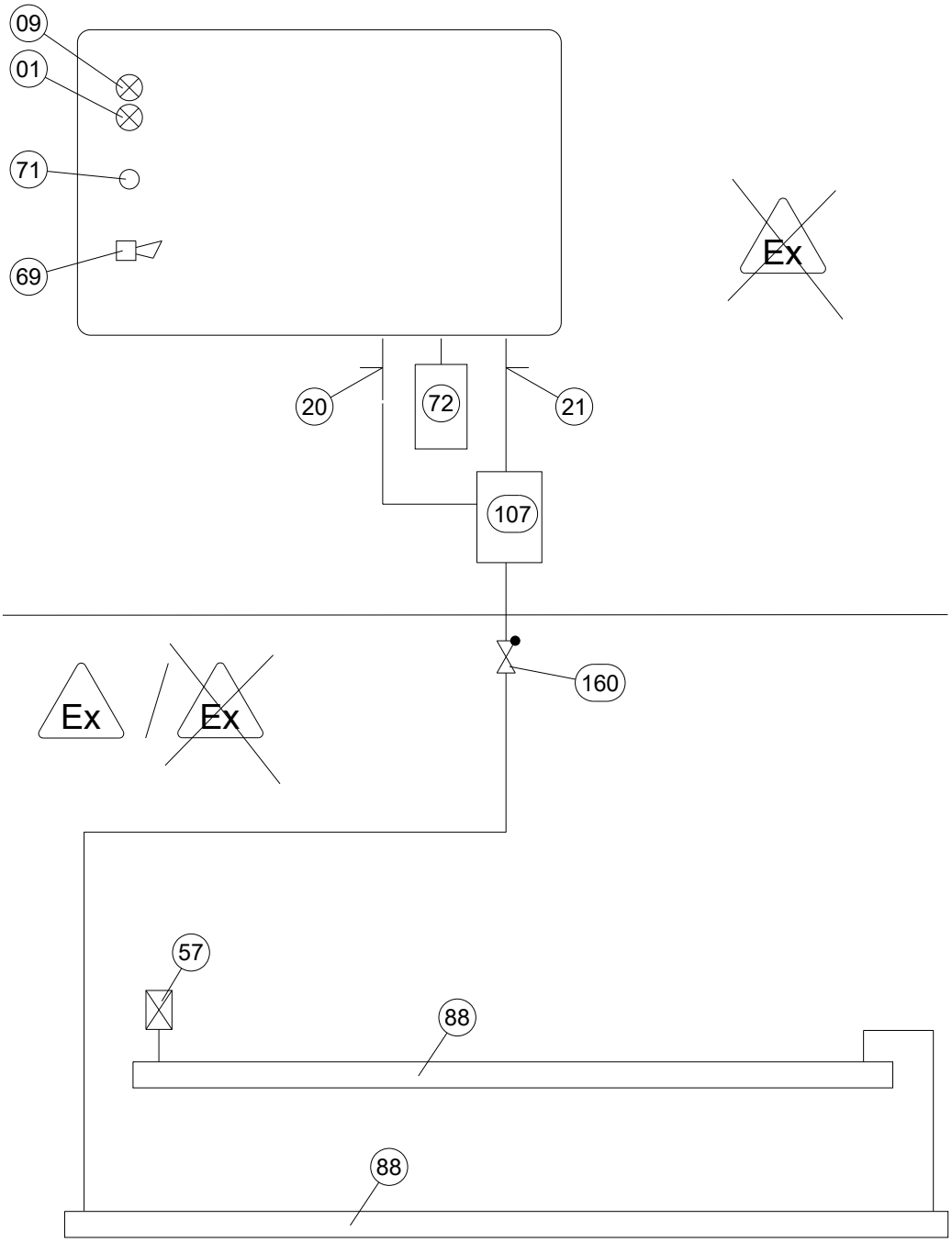
5.8 Installation examples

5.8.1 Leak detector DLR-P .. CV, pipes connected in parallel



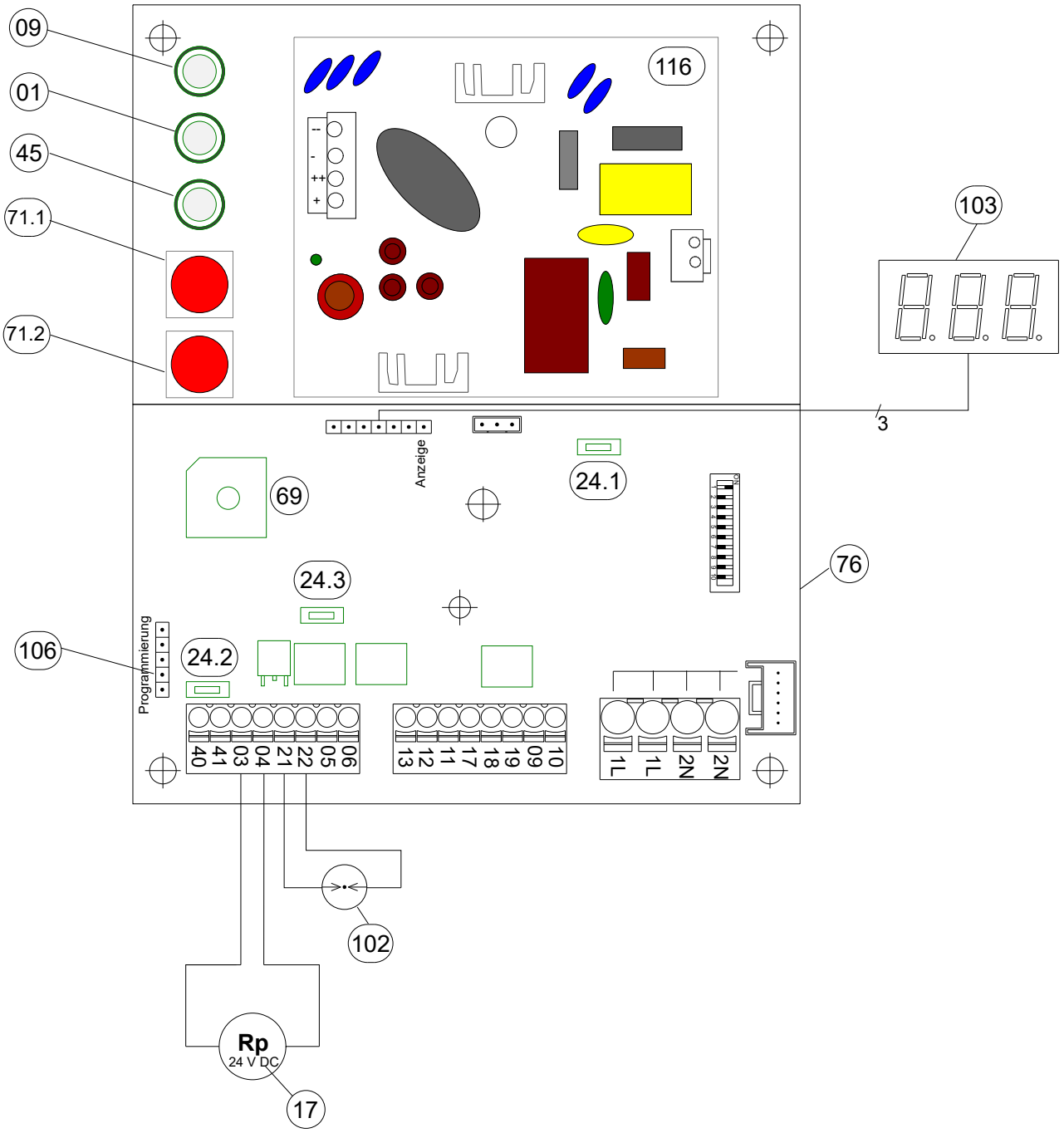
02	Stop valve
17	Overpressure pump
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
30	Housing
57	Test valve
61	Check valve
72	Dry filter
74	Connection line
76	PCB
88	Double-walled pipe
102	Pressure sensor
107	Pulsation damper
160	CV, check valve as isolator

5.8.2 Leak detector DLR-P .. CV, pipes connected in parallel



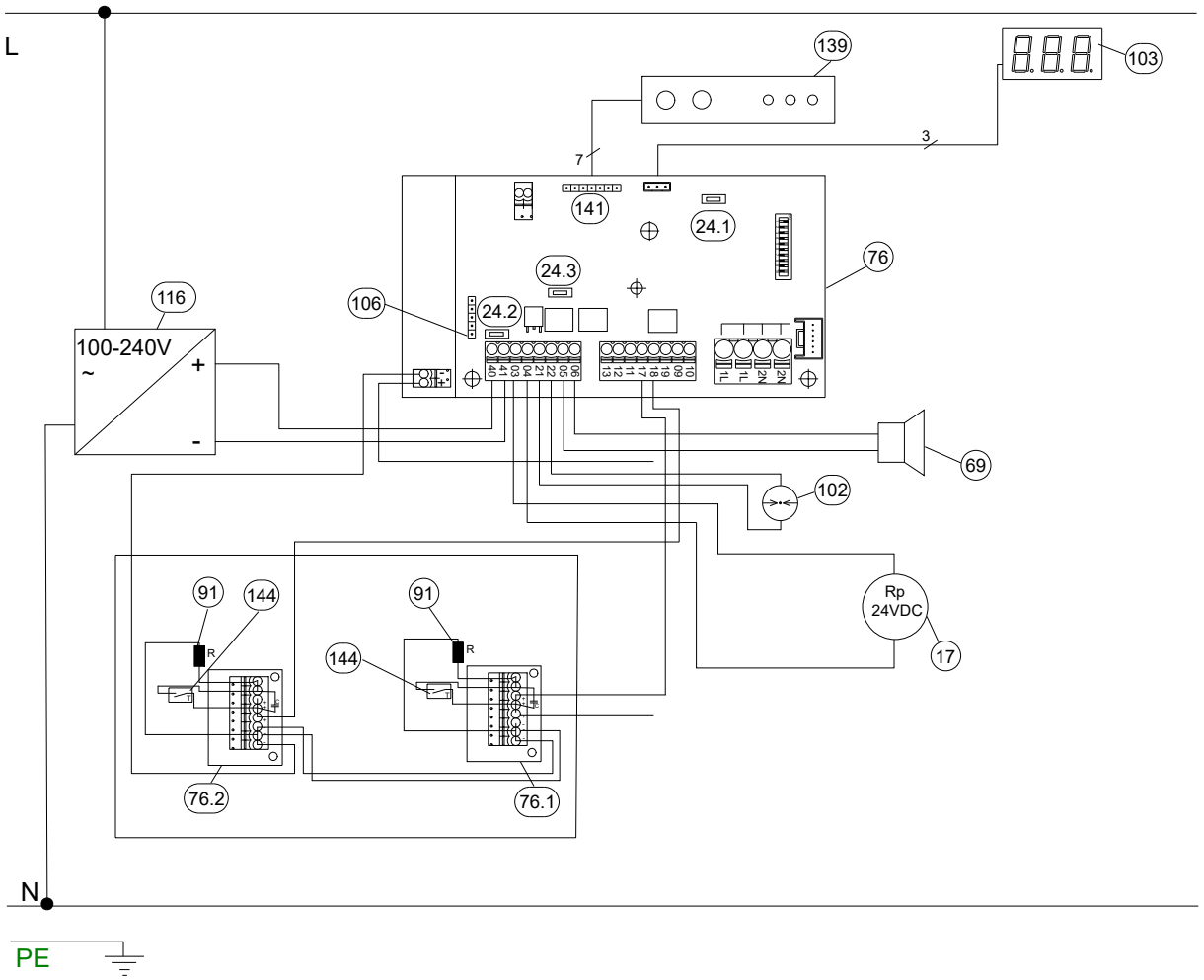
01	Signal lamp – "Alarm" – red
09	Signal lamp – "Operation" – green
20	Three-way valve in the pressure line
21	Three-way valve in the measuring line
57	Test valve
61	Check valve
69	Buzzer
71	“Mute” button
72	Dry filter
88	Double-walled pipe
99	Control shaft
107	Pulsation damper
160	CV, check valve as isolator

5.8.3 Block diagram, plastic housing



01	Signal lamp – "Alarm" – red
09	Signal lamp – "Operation" – green
17	Overpressure pump
24.1	Fuse – "power supply", 2 A
24.2	Fuse – "pump", 1.5 A
24.3	Fuse – "external signal", 1 A
45	Signal lamp – "dry filter monitoring", yellow
69	Buzzer
71.1	“Mute” button
71.2	Button – “dry filter monitoring alarm”
76	Main circuit board
102	Pressure sensor
103	Display
105	Control unit
106	Contact for serial data transfer
116	Power supply 24 V DC

5.8.4 Block diagram, VA housing



17	Overpressure pump
24.1	Fuse – "power supply", 2 A
24.2	Fuse – "pump", 1.5 A
24.3	Fuse – "external signal", 1 A
69	Buzzer
76	Main circuit board
76.1	Heater circuit board “overpressure valve”
76.2	Heater circuit board “pump”
91	Heater resistor
102	Pressure sensor
103	Display
106	Contact for serial data transfer
116	Power supply 24 V DC
141	Keypad connection strip
144	Thermostat for heater resistor

6. Commissioning

(1) Do not perform the start-up until the points from section 5 "Commissioning" have been fulfilled.

(2) If a leak detector is put into operation on a pipe (or fitting) which is already in operation, then special protection measures need to be taken (e.g., checking that the leak detector and/or interstitial space is free of gas). Further measures may be required depending upon the local conditions and should be assessed by qualified personnel.

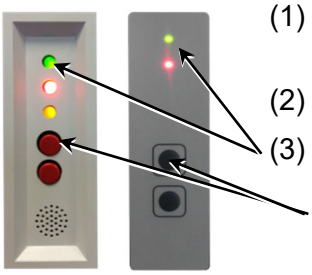
6.1 Leak tightness test

The leak tightness of the interstitial space must be established before commissioning.

In the case of larger interstitial spaces, the pressure build-up should be performed using an external pump (use dry filter!) or a nitrogen canister (use suitable pressure reducer!).

The test is basically considered as passed if the overpressure does not drop by more than one mbar within a test time (in minutes) of the interstitial space volume divided by 10.
Example: Interstitial space volume = 800 liters
resulting in: 800/10 = 80
resulting in: 80 minutes of testing for max. 1 mbar pressure loss.

6.2 Commissioning the leak detector

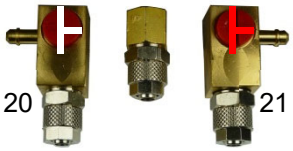


(1) The leak tightness of the interstitial space is required before commissioning.

(2) Apply supply voltage.

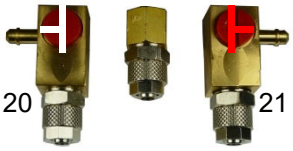
(3) Check that the signal lamps for "Operation" and "Alarm" light and that the audible alarm signal sounds. Switch off audible alarm if necessary.

The pump starts immediately and builds up the overpressure in the monitored system (insofar as the interstitial space has not previously been pressurized)



(4) Connect test measuring gauge to the spout of the three-way valve 21 to rotate the cock by 180°.

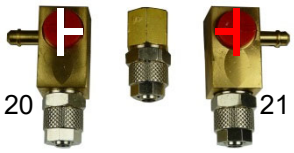
(5) The pressure build-up can be monitored via the connected measuring instrument.



(6) If the pressure builds up too slowly, an installation pump with dry filters can be connected to the spout of the three-way valve 20 (or nitrogen canister with suitable pressure reducer).

Rotate cock by 180° and switch on the installation pump.

Note: If no pressure is built up with the assembly pump (or pressure gas canister) connected, then the leak should be located and rectified (if required check that the delivery rate of the assembly pump and the settings of the pressure reducer are correct).



(7) Check all connection points with a foaming agent for leak tightness.

(8) After reaching the operating pressure of the leak detector (pump in the leak detector switches off), the three-way valve 20 must be rotated by 180° and the pump must be switched off and removed.

(9) Rotate three-way valve 21 by 180° and remove pressure measuring gauge.

(10) Perform function test according to section 7.3.

7. Function test and maintenance

7.1 General

(1) It can be assumed that the system will work correctly without any problems if the leak detection system is installed correctly without leaks.

(2) If the pump switches on frequently or runs continuously, this indicates that leaks are present that must be rectified within a reasonable time.

(3) If an alarm is triggered, locate and eliminate the cause quickly.

(4) Disconnect the supply voltage to the leak detector whenever performing maintenance and repair work on it.

(5) Interruptions in the power supply are indicated by the "Operation" signal lamp going out. The alarm signal must be relayed by the floating relay contacts.

This relaying is necessary to be able to detect and react to power failures. Steam must be safely prevented from leaking from the interstitial space back into the leak detector.

After the interruption in the power supply, the green signal lamp lights again, the alarm signal via the floating contacts is removed (unless the pressure has dropped below the alarm pressure during the power failure).

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

7.2 Maintenance

7.2.1 Performed by the operator

- Perform regular checks to ensure that operational lamps are working
- Check the dry filter regularly (recommended every 2 months - used up material undergoes a color change from orange to colorless or dark green and/or from dark blue to pink) and if necessary, replace it or have it replaced.

7.2.2 By qualified people[6]

- Once a year to ensure functional and operational reliability and safety.
- Test scope according to section 7.3.
- It must also be checked whether the conditions in sections 5 and 6 are satisfied.
- Comply with explosion protection regulations (if required), such as the German BetrSichV (or the Directive 1999/92/EC and the resulting laws in the respective member states) and/or others.

[6] For Germany: specialist company according to water legislation with expertise in leak detection systems
For Europe: authorisation by the manufacturer

7.3 Function test

Checking of the functional and operational safety and reliability must be performed:

- after every start-up
- in accordance with the intervals laid out in section 7.2[7]
- whenever a fault has been rectified.

7.3.1 Scope of testing

Depending on the type or layout of the pipes, 2 people may be needed to carry out a functional check.

(1) The work to be performed should be discussed with the person responsible on site.

(2) Observe the safety information regarding handling of the materials being conveyed.

(3) Check for leaks on the test valve at the end of the interstitial space away from the leak detector, and check that it is free of dirt – clean as required.

(4) Continuity test of the interstitial space for each connected branch (section 7.3.2)

(5) Check the leak tightness of the check valve (section 7.3.3)

(6) Testing the switching values with the aid of a test device (section 7.3.4)

(7) Tightness test after commissioning or fault clearance (section 7.3.5)

(8) Tightness inquiry as part of the annual functional check (section 7.3.6)

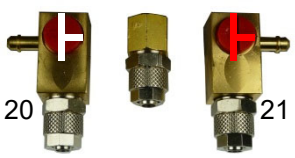
(9) Setting up the equipment ready for operation (section 7.3.7) including regeneration or replacement of the filter cartridge

(10) Completion of a test report by the qualified person, with confirmation of functional and operational safety and reliability.

7.3.2 Continuity test of the interstitial space

The continuity test checks that the interstitial space connected to the leak detector has sufficient continuity for any air leak to cause an alarm.

If several interstitial spaces are connected in parallel, each interstitial space must be tested individually for continuity.



(1) Connect test measuring instrument to the spout of the three-way valve 21 and rotate the tap by 180°.

(2) If several interstitial spaces are connected via a distributor with a shut-off device then all of the shut-off cocks of the distributor should be closed.

[7] For Germany: regional regulations must also be observed (e.g. AwSV - Ordinance on Installations for the Handling of Substances Hazardous to Water)

(3) Open all test valves at the end away from the leak detector and leave open.

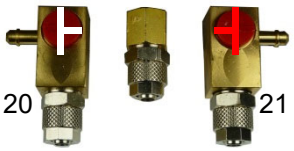
(4) Open the shut-off device in the distributor of the interstitial space which is to be tested; the pressure on the measuring gauge will drop.

IMPORTANT NOTE: Maintenance work and functional tests should only be performed by qualified persons.

(5) Close previously opened shut-off device in the distributor; the leak detector will gradually build up the operational pressure again.

(6) Repeat steps (4) and (5) for every other pipe.

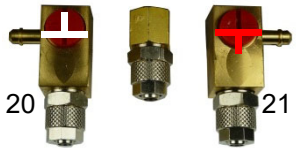
(7) Close the test valves opened under (3) and wait for the pressure to build up.



(8) Restore operating position of the three-way valves and remove measuring gauge.

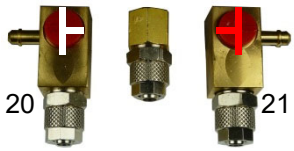
7.3.3 Check valve “160” tightness test

(1) Turn three-way valve 20 anticlockwise by 90°, the overpressure pump discharges to the outside.



(2) Turn three-way valve 21 counterclockwise by 90°, wait for the pressure to drop to atmospheric pressure level and then connect the measuring gauge to the spout.

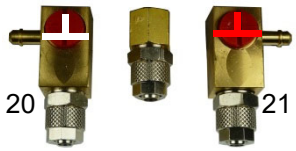
(3) The pressure may not increase by more than 1 mbar in a minute. Otherwise the check valve (160) is to be replaced.



(4) Restore operating position of the three-way valves and remove measuring gauge.

7.3.4 Testing the switching values **with** the aid of a test device (see section 12.3)

(1) Connect a test device to the free connection port on the three-way valves 20 and 21 (insert hose clips if necessary).



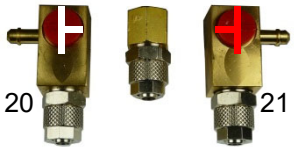
(2) Rotate three-way valve 20 anticlockwise by 90° and valve 21 clockwise by 90°.

(3) Connect the measuring gauge to the test device.

(4) Close the needle valve in the test device, this builds up the operating pressure in the test vessel.

(5) Vent using the needle valve (test device), determine the switching values for "Pump ON" and "Alarm ON" (visual and audible), write down the values.

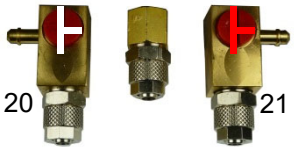
(6) Close the needle valve and check the switching values for "Alarm OFF" and "Pump OFF", write down the values. (if necessary open the needle valve slightly so that the pressure increases slowly).



(7) The test is considered to have been passed if the measured switching values are within the specified tolerance.

(8) Restore operating position of the three-way valves and remove test measuring instrument.

7.3.5 Leak tightness check after start-up and fault clearance[8]



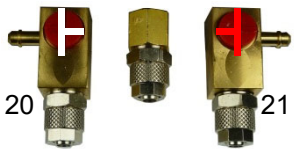
(1) The requirements for system tightness are defined in section 6.1.

Determine the testing time for each connected interstitial space (and/or the whole monitored system - calculate it or use the prepared SGB GmbH test reports).

(2) Connect measuring gauge to the spout of the three-way valve 21 and rotate the valve by 180°.

(3) Read off the start pressure and time and write them down. Let the test time elapse and determine the pressure drop.

(4) The test is considered as passed when the pressure does not fall by more than 1 mbar within the test time.
Test time and permitted pressure drop can be lengthened or increased proportionally.



(5) After performing the test turn the valve back again and remove the measuring gauge.

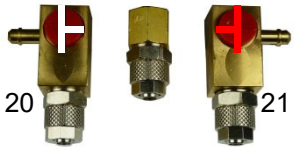
7.3.6 Tightness inquiry as part of the annual functional check

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. This inquiry serves informational purposes only and is not part of the permit.

7.3.7 Setting up the equipment ready for operation



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

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

(3) If stop cocks are used in the connecting lines, seal them (if an interstitial space is connected) in their open position.

(4) Replace dry filter or establish not used up condition.

[8] Requirement: The setpoint pressure in the interstitial space has been built up and pressure equalisation has taken place.

8. Alarm (fault)

When monitoring pressure lines, use the potential-free contacts of the leak detector to switch off the feed pumps.

8.1 Alarm

(1) The red signal lamp comes on and an acoustic signal sounds.

(2) Switch off the acoustic signal.

8.2 Fault

(1) In the case of a fault, only the red signal lamp lights (yellow is off); at the same time, the audible signal cannot be acknowledged.

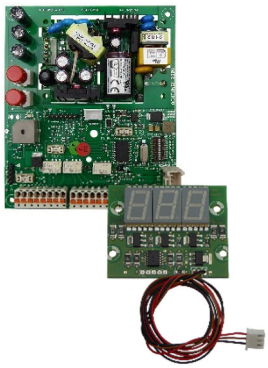
8.3 Behavior

(1) Notify installation company immediately and provide the display from the previous section.

(2) Determine and rectify the cause for the alarm, then perform a functional check of the leak detection system as described in section 7.3.

9. Spare parts

Spare parts can be found on our shop site shop.sgb.de, e.g.



PCBs:

331670-02 VD SMD L PCB with 522380 for DLR-P devices (For implementation in plastic housing)

331661 VD SMD PCB without LED, without transformer without dry filter monitoring unit, incorporated in housing (For implementation in VA housing)

331725 Display PCB for electronic leak detector VL, VLR, DL, DLG, DLR-G, DLR-P

Pumps:

202200KKSV Overpressure pump 24 VDC for DLR-P .. CV

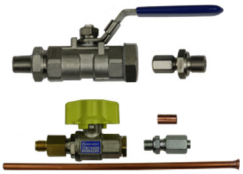
Filters:

340010 Dust filter, material PA

Pressure sensors:

344504 4 bar sensor

10. Accessories

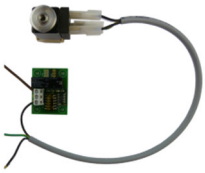


You can find accessories on our website shop.sgb.de and e.g.,

- Mounting kits

- Electrical separators

- Manifolds



- Pressure limiting device

- Dry filter/dry material for refilling

- P version, stainless-steel housing

11. Disassembly and disposal

11.1 Disassembly

Check for absence of gas and sufficient oxygen content of the air before and during the work

Seal any openings gas-tight which could otherwise allow the spread of an explosive atmosphere.

If possible, do not use tools capable of generating sparks (saw, angle grinder, etc.) for disassembly. If this remains unavoidable, comply with EN 1127, and the area must not have a potentially explosive atmosphere.

Avoid any build-up of electrostatic charge (e.g., due to friction).

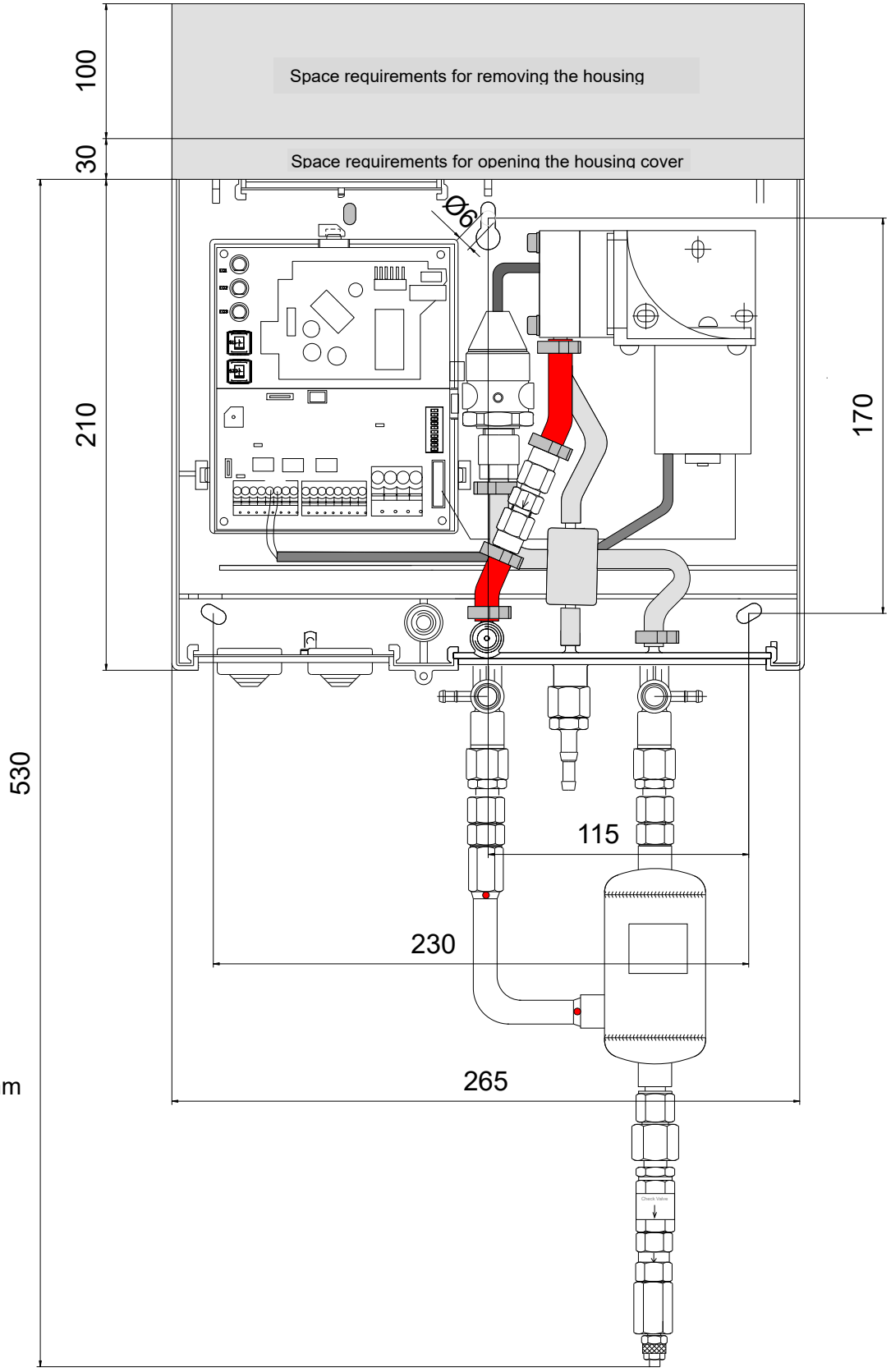
11.2 Disposal

Contaminated components (potential outgassing) must be disposed of appropriately.

Dispose of electronic components appropriately.

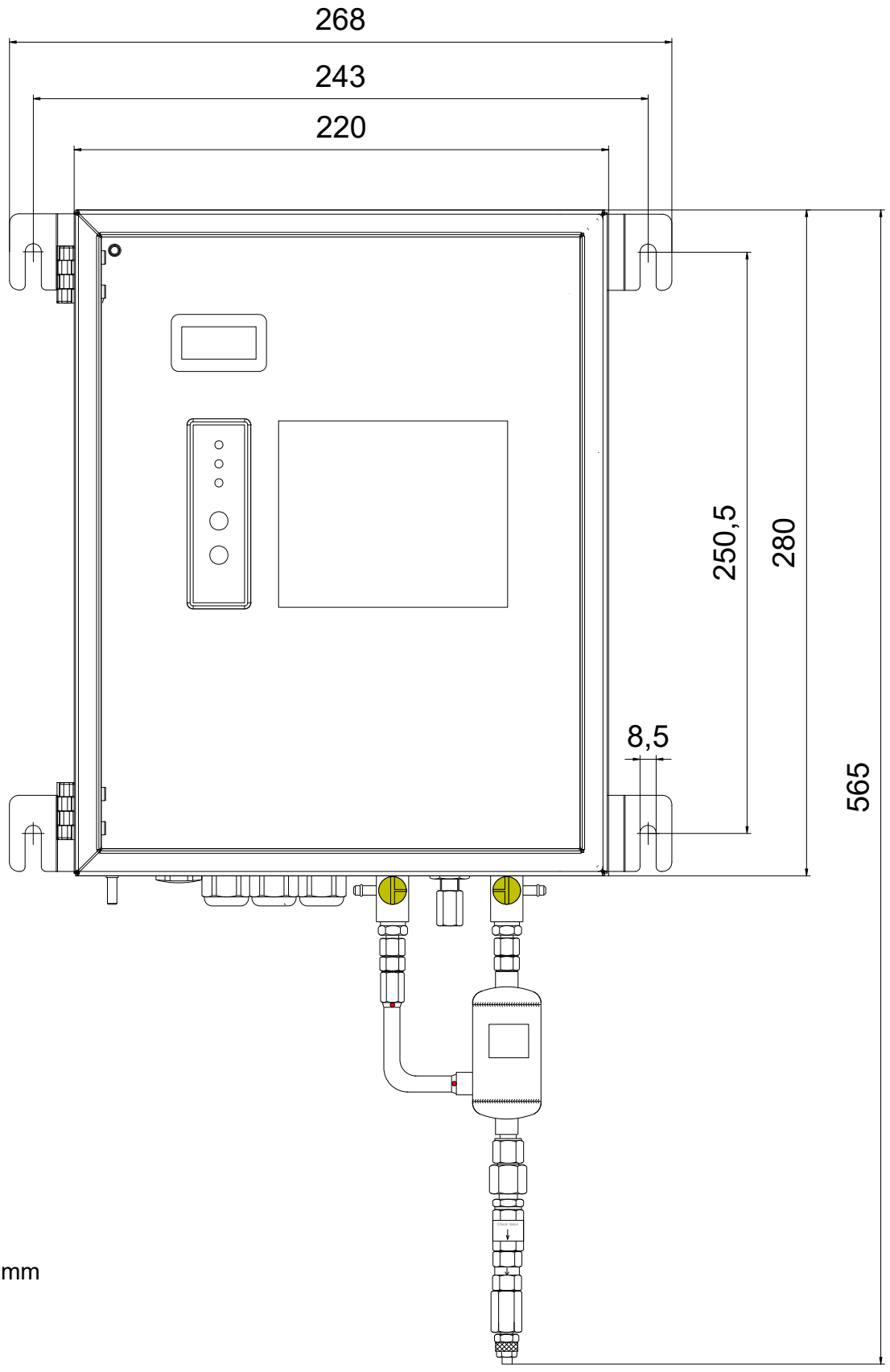
12. Appendix

12.1 Dimensions and drilling pattern, plastic housing



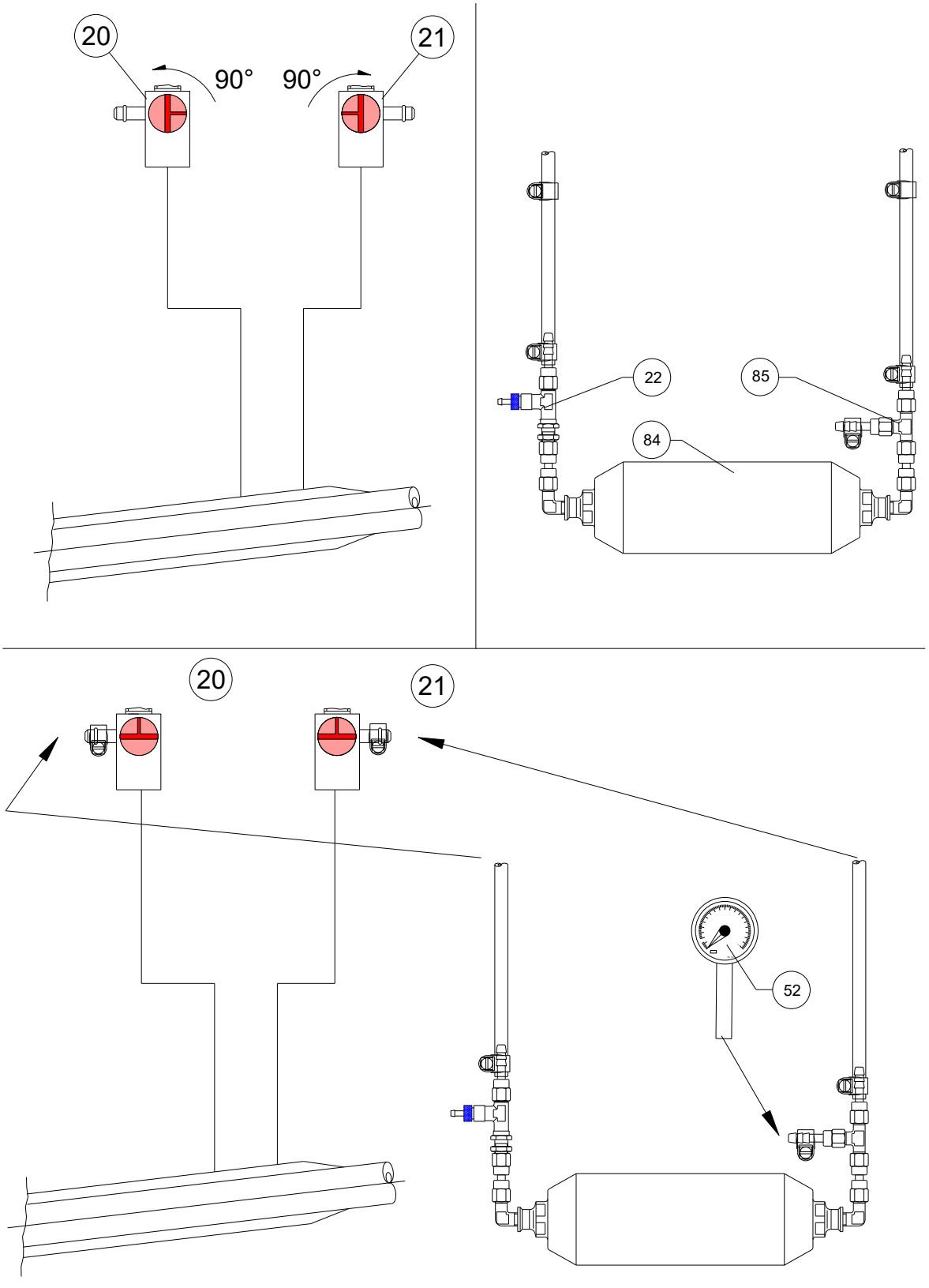
Depth = 110 mm

12.2 Dimensions and drilling pattern, stainless-steel housing for outdoor installation

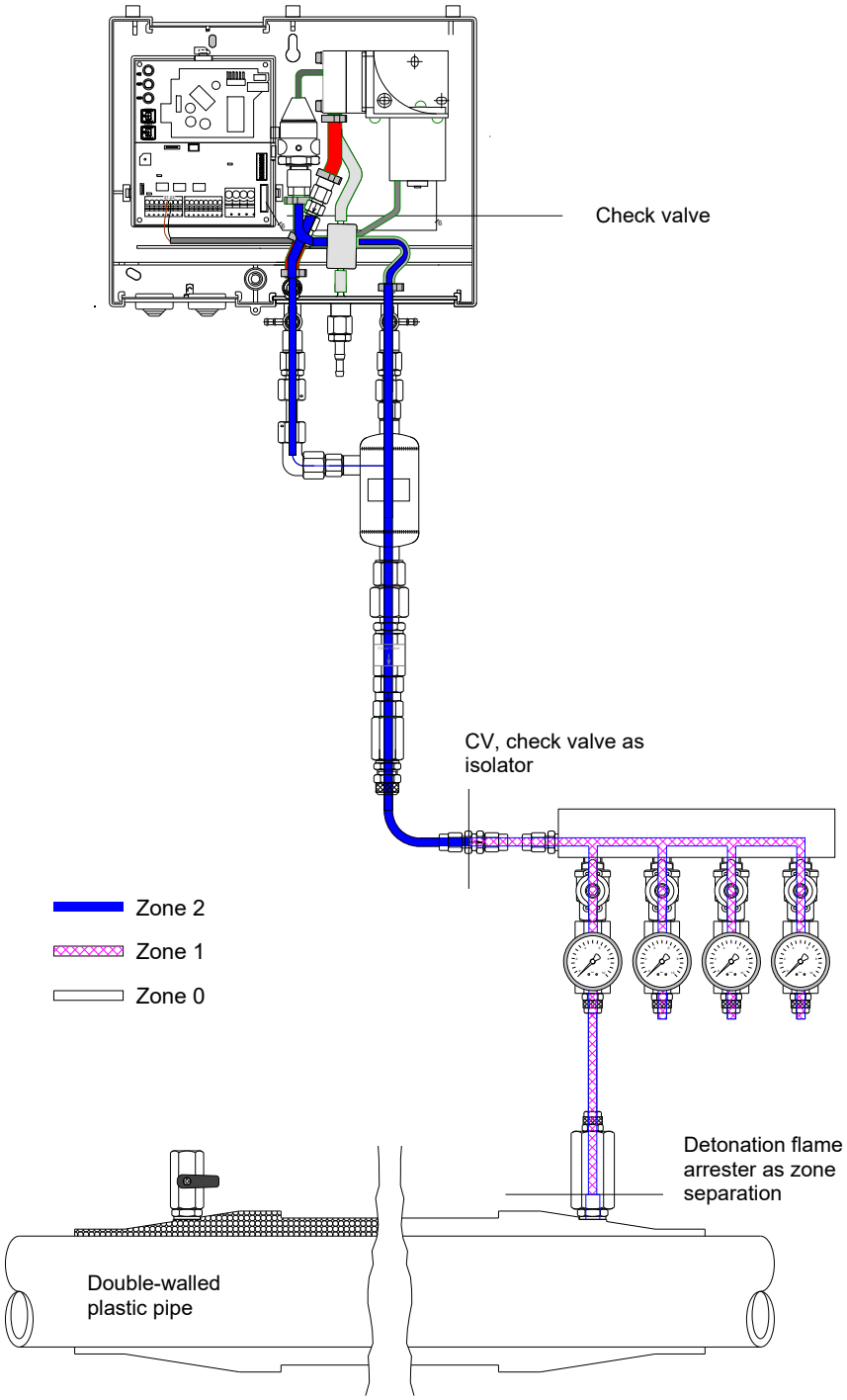


Depth = 120 mm

12.3 Test device



12.4 Overview of the ex-zone arrangement (Z-078 092R)



12.5 Declaration of EU conformity

We,

SGB GmbH

Hofstr. 10

57076 Siegen, Germany,

hereby declare in sole responsibility that the leak detectors

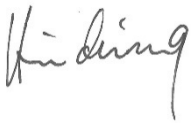
DLR-P .. CV

Are in conformity with the essential requirements of the EU directives / regulations / UK statutory requirements listed below.

This declaration shall lose its validity if the device is modified or used for another purpose without our agreement.

Number / short title	Satisfied regulations
2014/30/EU EMC Directive SI 2016 No. 1091	EN 61000-6-3:2007 / 2011 EN 61000-6-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013
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 in Potentially Explosive Atmospheres SI 2016 No. 1107	The leak detector with its pneumatic parts may be connected to spaces (interstitial spaces of tanks/pipelines/fittings) which are required for category 1 devices, taking into account the requirements in this documentation. The following documents have been used: EN 1127-1:2019 EN 80079-36:2016 TÜV SÜD ignition hazard analysis: The ignition hazard analysis did not result in any additional hazards

Compliance is declared by:



Last updated: February 2023

ppa. Martin Hücking
(Technical Director)

12.6 Declaration of performance

Number: ***008 EU-BauPVO 2017***

1. Unique identification code of the product type:

   Pressure leak detector type DLR-P .. CV

2. Intended purpose:

   Class I pressure leak detector for monitoring double-walled pipes

3. Manufacturer:

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

4. Authorized person:

   n/a

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

   System 3

6. In the case of the declaration of performance concerning a construction product that 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
   Code number of the notified test laboratory: 0045

7. Declared performance:

Key characteristics	**Performance**	**Harmonized standard**
Electrical function	Corresponds to documentation	EN 13160-2: 2003
Operation signal lamp/alarm	Green/red	
Leak test	< 1 Pa l/s	
Pressure switching values, depending on the type	Satisfied	
Ensuring reliable triggering of alarms	System requirement (present, if field of application observed)	

8. Signed for and in the name of the manufacturer by

   Dipl.-Ing. M. Hücking, Technical Director

   Siegen, 03/2023

12.7 Manufacturer's declaration of conformity

SGB
MVV TB
Anhang C 2.15.15
TÜV-NORD

Compliance with the "Muster-Verwaltungsvorschrift Technische Baubestimmungen" (sample administrative regulation technical building regulations) is hereby declared.

Dipl.-Ing. M. Hücking, Technical Director

Siegen, 03/2023

12.8 Certifications TÜV Nord

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

TÜV NORD Systems GmbH & Co. KG
PÜZ – Center for containers, pipes and equipment for plants with materials hazardous to water

Identification no.: 0045

Große Bahnstraße 31·22525 Hamburg
Phone: 040 8557-0
Fax: 040 8557-2295
hamburg@tuev-nord.de
www.tuev-nord.de

Certification

Subject of the test: Client:	**Pressure leak detector - Type DLR-P..**
Manufacturer:	SGB GmbH Hofstraße 10 D-57076 Siegen
Test type:	SGB GmbH
Test period:	Initial test of a Type DLR-P.. pressure leak detector with leak indicating unit to DIN EN 13160-1:2003/EN 13160-1:2010 and DIN EN 13160-2:2003 as a Class 1 leak monitoring system
Test location:	06/2016 to 08/2017
Test results:	PÜZ Prüflabor TÜV NORD Systems GmbH & Co. KG
	The DLR-P.. pressure leak detector complies with Class 1 as defined in DIN EN 13160-1:2003/EN 13160-1:2010 as an overpressure system and fulfills the requirements according to DIN EN 13160-2:2003 for use on equipment for storing fuels used to supply heating systems in buildings. The specifications in the technical description "Documentation DLR-P" dated 07/2014 apply in relation to the field of application and installation

For details on testing please refer to the test report PÜZ 8112235824-1 dated 25 August 2017.

Hamburg, 25 August 2017 Head of the Testing Laboratory

J. Straube

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Version as of 0112013
STPÜZ -QMM-321-032-02

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

TÜV NORD Systems GmbH & Co. KG
PÜZ – Center for containers, pipes and equipment for plants with materials hazardous to water

Identifier: HHA02

Große Bahnstraße 31·22525 Hamburg
Phone: 040 8557-0
Fax: 040 8557-2295
hamburg@tuev-nord.de
www.tuev-nord.de

Certification

Subject of the test:	**Pressure leak detector - Type DLR-P..**
Client:	SGB GmbH Hofstraße 10 D-57076 Siegen
Manufacturer:	SGB GmbH
Test type:	Initial test of a Type DLR-P.. pressure leak detector with leak indicating unit to DIN EN 13160-1:2003/EN 13160-1:2010 and DIN EN 13160-2:2003 and BRL A, Part 1, Annex 15.23 as Class 1 leak monitoring system
Test period:	06/2017 until 08/2017
Test location:	PÜZ Prüflabor TÜV NORD Systems GmbH & Co. KG
Test results:	**The DLR-P.. pressure leak detector complies with Class 1 as defined in DIN EN 13160-1:2003/EN 13160-1:2010 as an overpressure system and fulfills the requirements according to DIN EN 13160-2:2003 and/or BRL A, Part 1, No. 15.43 with Annex 15.23. The specifications in the technical description "Documentation DLR-P" dated 07/2014 apply in relation to the field of application and installation**

For details on testing, please refer to the test report PÜZ 8112235824-1 dated 25 August 2017.

Hamburg, 25 August .2017 Head of the Testing Laboratory

*Use on equipment employed for storing fuels used to supply heating systems in buildings is excluded

As of 01/2013
STPÜZ-QMM-321-032-02

Company details

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