Overpressure leak detector

DLR-G

Documentation DLR-G

No.: 604 102
Issue: 09/2014

SGB GMBH
Hofstraße 10
57076 Siegen
Germany

Overview of the design variants

The overpressure leak detectors of the DLR-series are available in different designs which are described in detail by the suffix characters.

DLR-… …. PM

“Manometer“, the leak detector is equipped with a digital pressure display in the housing cover.

“Protected“ construction of the leak detector in a weatherproof housing.

“Numerical value”, for the alarm pressure of the leak detector in *bar*.

The alarm pressures range from 1 bar to 18 *bar*.

“G = gas(bottle)“, a pressure gas bottle is used for pressure generation, normally nitrogen.

“P = Pump“, a pump integrated in the leak detector is used for pressure generation.

”GS = gas (-bottle)”, a static pressure generator must be brought to the site since the leak detector does not have a pump or automatic feed mechanism.

“**P**ressure **L**eak detector **P**ipe”, the leak detector operates with overpressures towards the atmosphere and is designed for application on double-walled pipes.

Content

1	Technical description for the overpressure leak detector DLR-G		14 pages
2	Drawings to the technical description		5 pages
3	Appendix to the technical description		5 pages
	3.1	Appendix A: Double walled pipes/fittings and leak detection medium	1 page
	3.2	Appendix B: Switch and pressure values	2 pages
	3.3	Appendix TD: Technical Data	1 page
	3.4	Appendix DP: Evaluation of the display from the function „Tightness Test“	1 page
4	Dimension and Drilling, Plastic-housing		1 page
5	Dimension and Drilling, Steel-housing, weather protected		1 page
6	Working sheet AB-820 500 pneumatic connections		2 pages
7	EC Declaration of conformity		1 page
8	Certificate of Approval by TÜV Nord		7 pages
9	Warranty		1 page

Table of Contents

		Page
1	Subject	2
2	Operative Range	2
2.1	Requirement for the Interstitial Spaces	2
2.2	Pipes	2
2.3	Fittings	2
2.4	Liquid to be conveyed and leak detection medium	3
3	Functional Description	3
3.1	Switch and pressure values	3
3.2	Normal Operation	3
3.3	Function in case of a leak	4
3.4	Overpressure valve	4
3.5	Description of indicator and operating elements	4
4	Installation Instructions	5
4.1	General Notes	5
4.2	Personal Protective Equipment	6
4.3	Installation of the Leak Detector	6
4.4	Installation of connections (leak detector – interstitial space)	6
4.5	Selection Pressure reducer	7
4.6	Pressure tank and pressure reducer	7
4.7	Pressure tank volume for operating method “S”	7
4.8	Power Specifications	8
4.9	Installation example	8
5	Initial operation / repair	8
5.1	General Notes	8
5.2	Changing the operating method or the pressure level	9
6	Operating Instructions	9
6.1	General Notes	9
6.2	Maintenance	10
6.3	Intended Use	10
6.4	Function Testing	10
6.5	Alarm / Malfunction	13
7	Removal	13
8	Marking	13
9	Abbreviations	14

DRAWINGS:

Installation example operating method “S”	M1 – 073 000
Installation example operating method “S”	M2 – 073 000
Installation example operating method “M”	M3 – 073 000
Installation example operating method “M”	M4 – 073 000
Wiring diagram DLR-G	SL – 853 300

APPENDIX:

A	Pipes and leak detection medium	A-1
B	Switch and pressure values	B-1
TD	Technical Data	TD-1
DP	Evaluation of the display from the function “Tightness Test”	DP-1

1. Subject

Pressure leak detector for double-walled pipes, double-walled fittings, or a combination of both aforementioned components, using pressurized air or inert gas as leak detection medium.

DLR-G .. (the periods are placeholders for alarm pressure in bar)

The leak detector can be operated with a stationary pressure tank (operating method S) as well as a mobile pressure tank (operating method M).

2. Operative Range

2.1. Requirements for the Interstitial Spaces

- Proof of pressure resistance of the interstitial space (see Appendix B, Column: “Test” minimum test pressure of the interstitial space)
- Proof of suitability of the interstitial space (for Germany: Proof of suitability from construction authority).
- Tightness of the interstitial space (see section 6.4.4)
- The number of interstitial spaces to be monitored depends on the total interstitial space volume. According to EN 13160, 10m^3 may not be exceeded. For reasons of control of the tightness of interstitial spaces it is recommended not to exceed 4 m^3.
  For pipes: The pipe length (per pipe duct) to be monitored may not exceed 2500 m and must correspond with the specifications for the approval of the pipe.

2.2. Pipes

- Double-walled pipes made of metal or plastic, in factory or on-site construction.
  For Germany: Additional requirements for double-walled pipes may result from TRbF 50 (formerly: TRbF 131/231 Part 1), the DIBt approval guidelines, or EN 13160.
- Operating method “S” for surface and underground installed double-walled pipes.
- Operating method “M” only for applications without temperature variations of more than ± 10°C (for example: double-walled pipes installed underground or indoors - no hot media).

2.3. Fittings

- Double-walled fittings made of metal or plastic in factory or on-site construction.
  For Germany: With general permit from the construction authority unless part of the pipe permit.
- Operating method “S” for surface and underground installed double-walled fittings.
- Operating method “M” only for applications without temperature variations of more than ± 10°C (for example: double-walled fittings used underground or indoors - no hot media).

2.4. Liquid to be conveyed and leak detection medium

Liquids endangering water including those with flash points below 55°C. Limitations result in accordance with Appendix A from liquid to be conveyed and the leak detection medium that is used.

The conveyed product may not react with the leak detection medium.

The pipe/fitting shall be resistant against the conveyed product. Proof of this will be required by third parties (standards, operators, manufacturer of pipe/fitting).

3. Functional Description

The pressure leak detector DLR-G monitors both walls of the double-walled system for leaks. The monitoring pressure during operation is higher than any pressure on the inner or outer wall, so that leaks will be indicated through falling pressure.

Inert gas, or air from a pressure tank, or an operational network can be used as leak detection media. If air is used, it must be dried to less than 10% relative humidity.

The current pressure is shown on the display in mbar / bar or PSI[1]:

- Values of less than 150 mbar or less than 2.18 PSI will not be displayed.
- Values up to 990 mbar will be displayed in mbar and without decimal.
- Values from 1 bar are displayed in bar, with two, or from 10 bar with one decimal.
- Values in PSI are displayed with one or two decimals.

3.1. Switch and pressure values

A list of switch values is shown in Appendix B.

3.2. Normal Operation

The normal operation condition is achieved during initial operation by building up pressure to the specified pressure through the pressure tank connected to the leak detector (operating method S) or a mobile pressure tank (operating method M).

The existing pressure in the interstitial space is monitored with a pressure sensor in the leak detector. Any minor leaks lead to decreased pressure, which will be equalized during operating method S.

For operating method M, the requirements for the tightness of the interstitial space(s) and the connection(s) must be set very high to assure trouble free operation for one year.

[1] The change of the bar and PSI settings is performed at the factory. This change can also be performed on-site following coordination with the manufacturer.

3.3. Function in case of a leak

If there is a leak in the inner or outer wall, gas will leak from the interstitial space. The pressure falls.

When the switch value “backfeed ON” is reached in operating method S, the backfeed will be activated and the specified pressure will be built up again. If the leakage ratio is greater than the limited backfeed rate, the pressure will continue to fall to alarm pressure.

An optical and audible alarm will be triggered when the alarm pressure is reached, which will open the dry relais contacts.

An additional relay can be used for operating method M to establish dry relais contacts when the specified pressure backfeed “REQUIRED” is not reached.

3.4. Overpressure valve

If the interstitial space has sufficient pressure resistance (comp. Appendix B), an overpressure valve will not be supplied.

If overpressure valves are used, the test pressure of the interstitial space represents the layout basis for the set pressure for the overpressure valve. This means that overpressure valves from higher pressure levels can be used for a certain pressure level (alarm pressure) as well (comp. Appendix B).

The overpressure valve 1 (interstitial space) must be used if a pressure increase exceeding the test pressure (for example: warming) can occur and/or the set pressure on the pressure reducer is higher than the test pressure of the interstitial space.

The overpressure valve 2 (supply) must be used if the set pressure of the overpressure valve integrated in the pressure reducer is higher than the test pressure of the interstitial space.

3.5. Description of indicator and operating elements

3.5.1 Conditions of signal elements (indicator lights)

Signal Lights	Operating Condition	Backfeed active or required	Filling activated	Alarm Condition	Alarm, audible alarm verified	Device malfunction
OPERATION: Green	ON	ON	ON	ON	ON	ON
ALARM: Red	OFF	OFF	OFF BLINKING ON[2]	ON	BLINKING	ON
BACKFEED: Yellow	OFF	ON	BLINKING	ON	ON	OFF

[2] In dependance on pressure and/or audible signal on or off

3.5.2 Operating functions through keys

- Turning off the audible alarm:
  Press “Audible Alarm” key once, audible signal turns off, the red LED blinks. Pressing the key again will turn the audible signal on.
  This function is not available during normal operation and function errors.
- Filling the interstitial space with leak detector medium
  Press “Fill” key and hold down for about 5 seconds until the yellow LED is blinking. The filling process has been activated. When the specified pressure has been reached, the yellow signal light will go out and the filling process is turned off. If the pressure falls due to pressure equalizing processes, the filling process can be reactivated to fill the interstitial space completely.
  Holding this key down for more than 10 seconds will trigger the alarm. The triggered alarm will go off shortly after letting go of the key.
- Testing the optical and audible alarm
  Press the “audible alarm“ key and hold down (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.
- Inquiry for tightness of the monitored system
  Press the “audible alarm” key and hold down, until the red LED ist fast blinking. Release the key and press again. The display shows a value for the tightness. (comp. section 6.4.5) 10 seconds after displaying this value the leak detector will return to normal operation.
  This inquiry can only be performed in operating method “S”. The leak detector must have performed at least 1 automatic backfeed interval in normal operation (i.e. without manual activation of the filling function) to achieve a valid statement.

4. Installation Instructions

4.1. General Notes

(1) Only qualified service companies must be used for installation[3].

(2) Comply with relevant regulations for prevention of accidents.

(3) Explosion protection requirements must be satisfied (where necessary), such as laws on the basis of the European Directive 1999/92/EG and/or other applicable codes.

(4) Compliance with the relevant traffic regulations is required when transporting pressure tanks to and from the construction site.

(5) The pressure tank must be protected from falling over at the construction site.

(6) Sufficient ventilation shall be provided if the initial operation or the operation is performed in enclosed spaces. Attach information sign.

(7) Provide a test valve on the end facing away from the leak detector at the end of the pipe(s) or fitting(s).

(8) Before entering inspection chambers, the oxygen content shell be tested and inspection chamber flushed, if necessary.

[3] For Germany: Specialist services per § 19l WHG, which have documented qualifications to install leak detection systems including TRbF 180/280 No. 1.7.

(9) When using metallic connection lines, you must make sure that the mains earth is connected to the same potential as the pipe being monitored.

4.2. Personal Protective Equipment

The parts listed here refer in particular 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 may be expected, the minimum required equipment is as follows:

- Suitable clothing (risk of electrostatic charge).
- Suitable tools (in accordance with EN 1127)
- Suitable gas warning equipment calibrated to the existing vapor-air mixture (work should be performed only at a concentration of 50% below the lower flammable limit)[4].
- Measuring equipment to determine the oxygen content (Ex/O-Meter)

4.3. Installation of the Leak Detector

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

(2) In a dry room, or outdoors in a suitable protection box.

(3) Installation in a protection box: Additional outdoor signal or alarm forwarding via dry relais contacts to a switchboard or similar device.

(4) **NOT in hazardous (classified) areas (danger of explosions)**.

4.4. Installation of connections (leak detector – interstitial space)

(1) The pressure resistance for metal (generally Cu) or plastic pipes, which must match at least the test pressure of the monitoring chamber, also applies for valves/fittings and screw connections. (Note temperature range, especially with use of plastic).

(2) Inside clearance at least 4mm for inert gas as leak detection medium
at least 6 mm for air as leak detection medium

(3) 50 m should not be exceeded significantly, but if: Install pipe with greater inside clearance using transition pieces.

(4) The full cross section must be maintained. Do not push in or bend[5] .

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

(6) Close the protective pipe gas-tight and protect from moisture.[6]

(7) Avoid the buildup of electrostatic charges (e.g., during pulling of lines).

(8) For details regarding connection systems, see worksheet AB-820 500. (See Info)

[4] Other factories' or countries' regulations may give different percentages.

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

[6] For Germany: comp. TRbF 120 / 220

4.5. Selection of the pressure reducer

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

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

4.6. Pressure tank and pressure reducer (function test and initial operation)

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

(2) Install the pressure reducer on the bottle.

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

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

(5) Turn the pressure control valve all the way back.

(6) Open the bottle shut-off valve. (if necessary, check seal between pressure reducer and bottle)

(7) Set the pressure on the pressure reducer according to Appendix B with the pressure control valve on the pressure reducer (adjust after pressure build-up, if necessary).

(8) After completion of the function test with operating method “M” or to change the bottle:
– Close the shut-off valve on the pressure reducer.
– Close the bottle shut-off valve.
– Remove the pressure reducer from the bottle (Attention: Gas will escape until the pressure reducer has no pressure).
– Install protective cover on bottle.

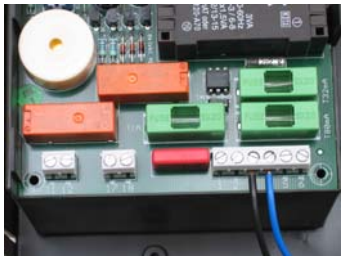
(9) For bottle change, continue with:
– secured setup, then remove protective cover.
– Install pressure reducer. (if necessary, Check seal between pressure reducer and bottle)
– Open bottle shut-off valve.
– Open shut-off valve on the pressure reducer, and, if necessary, adjust pressure with pressure control valve.

4.7. Pressure tank volume for operating method “S”

(1) A pressure tank containing 10 l to 50 l can be used up to a interstitial space volume of 5 m^3.

(2) For more than 5 m^3, a pressure tank containing 50 l must be used.

4.8. Power Specifications



(1) Power supply: According to label.

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

(3) Regulations of power supply companies must be adhered to[7]

Terminal layout: (see also SL-853 300)

1 / 2	Power supply
3 / 4	reserved (with internal magnetic valve)
5 / 6	External signal (in the event of an alarm there will be a line voltage present; is turned off by activating the “audible alarm” key).
11 / 12	Dry relais contacts (opened in case of alarm or loss of power)
17 / 18	For operating method “M" when the pressure “backfeed required” is not reached, these clamps have 12 V. Suitable for connection of a relay (12 V) to forward this message voltage-free.
21 / 22	reserved (with internal sensor)

4.9. Installation example

Installation examples are given in the Appendix.

5. Initial operation / repair

5.1. General Notes

(1) Observe all guidelines from section 4.

(2) Rinsing the interstitial space with inert gas when walls of storage medium are not constructed impermeable[8] .

(3) If a leak detector is operated on a pipe (fitting) that is already in operation, special protective measures must be taken (for example, testing of free gases 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.

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

(5) Ascertain lighting of “Operation” and “Alarm” signal lights and the audible alarm. Turn off the audible alarm, if necessary.
With operating method “S”, the power supply activates the automatic backfeed.

(6) Pressure build-up / filling the interstitial space:
Press the “Fill” key and hold down for about 5 seconds until the yellow signal light is blinking. The magnetic valve will open to quickly fill the interstitial space. When the specified pressure has been reached, the filling process is turned off and the yellow signal light will go out.
With very large interstitial spaces it may be necessary to switch bottles (see section 4.6)

[7] For Germany: including VDE regulations

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

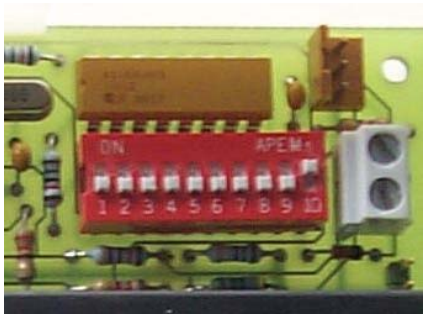
Note: If no pressure buildup is achieved with the pressure tank connected, the leak must be located and corrected (check the settings for the pressure reducer as well, if necessary). ATTENTION: Display on the leak detector begins with 150 mbar pressure.

(7) It may be necessary to press the “Fill” key repeatedly to achieve complete filling of the interstitial space.

(8) Check all connections for leaks with a foaming agent.

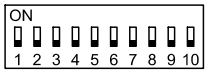
(9) Function test per section 6.4.

5.2. Changing the operating method or the pressure level



(1) Switch settings 1-9 are designed to select the level of pressure. Switch setting 10 is designed to select the operating method.

(2) The operating method “M” or “S” can be set or changed at the construction site by changing the position of switch number 10 on the switchboard.

Switch position 10, regardless of the level of pressure	Operating method “S”	
	Operating method “M”	

(3) Switch settings for the levels of pressure (switches 1 to 9) are shown for each pressure level in Appendix B.

(4) If the switch settings 1-9 are changed at the construction site, it must be assured that the set pressure level does not exceed the set pressure for the overpressure valve.

6. Operating Instructions

6.1. General Notes

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

(2) Explosion protection requirements must be satisfied (where necessary), such as laws on the basis of the European Directive 1999/92/EG and/or other applicable codes.

(3) With operating method “M”, even very small leaks will trigger the alarm.

(4) In the event of an alarm, determine the cause and correct it shortly.

(5) The leak detector must be disconnected from power for any repairs to be performed on the leak detector.

(6) A loss of power is indicated by the “Operating” signal light going off. A loss of power to the relay contacts (if used for alarm transmission) triggers the alarm.
After the power loss, the green signal light lights up again and the dry relais contacts no longer generate an alarm (unless the power loss has caused the pressure to drop below the alarm pressure).

6.2. Maintenance

(1) Maintenance work and function tests must be performed by qualified personnel only[9].

(2) Once a year to ensure functional and operational safety.

(3) Test scope per section 6.4.1.

(4) Compliance with the conditions per sections 4 to 5 must also be tested.

6.3. Intended Use

- Operating method “M”: For double-walled pipes/fittings installed underground or indoors per section 2.2 and 2.3 only.
- Operating method “S”: For double-walled pipes/fittings installed above or underground.
- Feed pressure must be at least 1 bar lower than the minimum alarm pressure.
- Grounding in accordance with valid regulations[10].
- Tightness of the leak detection system per section 6.4.4.
- Leak detector installed outside of the hazardous (classified) area.
- Lead through, into, and out of the dome shaft (or inspection chambers) for connections shall be closed gastight.
- Leak detector (electric) cannot be turned off.
- Use of the leak detection medium air pressure:
  - Air pressure can always be used with transport media with a flash point above 55°C.
  - For transport media with a flash point below 55°C only if their explosive vapor-air mixtures can be assigned to temperature code T1 to T3 and gas group II A or II B and if they have an inner wall that is not permeable for media that can lead to the development of explosive vapor-air mixtures.
- Use of the leak detection medium nitrogen:
  - Conditions from Appendix A must be adhered to

6.4. Function Testing

The functional and operational safety tests must be performed after

- Each initial operation
- In accordance with the time intervals listed in section 6.2[11]
- Each repair

6.4.1 Test Scope

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

(2) Observe the safety instructions for working with the liquid to be conveyed.

[9] For Germany: Technical knowledge of installation and servicing of leak detection systems or supervised by an individual possessing such knowledge in accordance with the valid regulations, if applicable, TRbF 180 No. 1.7 (Knowledge of fire and explosion protection, annual inspection of the specialized company)

[10] For Germany: for example: EN 1127

[11] For Germany: In addition, national laws apply (for example, VAwS)

(3) Check the test valve at the end of the interstitial space pointing away from the leak detector for contamination and clean, if necessary.

(4) Check the free passage of air (or nitrogen) in the interstitial space (section 6.4.2).

(5) Check the switch values (section 6.4.3)

(6) Check tightness following initial operation or repair (section 6.4.4)

(7) Check tightness as part of the annual function test (section 6.4.5)

(8) Creating the Operating Conditions (section 6.4.6)

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

6.4.2 Checking the Free Passage of Air in the Interstitial Space

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

(1) Insert a measuring instrument into the test coupling. The current pressure in the interstitial space will be displayed.

(2) Open the test valve for the first connected interstitial space.

(3) Check that the measuring instrument registers a pressure drop.

(4) Close the test valve.

(5) Repeat procedure from section (2) to (4) for each additional test valve for the interstitial space(s) connected to this leak detector.
Caution: with operating method “S", if automatic backfeed is activated during this process, perform the filling process and then continue the test.

(6) With operating method “M”, the pressure that has fallen due to the test must be equalized as follows:

a) Connect the pressure tank per section 4.6

b) Activate “Fill”.

c) Pressure buildup to specified pressure. Check the pressure on the pressure reducer during the filling procedure (test pressure may not be exceeded) and adjust, if necessary.

d) Once the filling process has been completed, close the shut-off valve on the pressure reducer and disconnect the test measuring instrument and the pressure tank.

6.4.3 Testing the switch values

(1) If several interstitial spaces are connected through one distribution system, close all shut-off cocks on the distributor except for the shut-off cock for the interstitial space with which the test is performed.

(2) Insert a manometer into the test coupling.

(3) Open the test valve at the end of the interstitial space included in the test pointing away from the leak detector.

(4) Check the switch values for "Automatic Backfeed" or "Backfeed required" (the yellow signal light is lit up) and for “Alarm ON”. Record the values.

(5) Close the test valve.

(6) Operating method “S”: During the pressure buildup (automatic filling), check the switch values for "Alarm OFF" and "Backfeed OFF" (activate "Fill" if necessary). Record the values.
Operating method “M”: Connect the pressure tank per section 6.4 Activate “Fill”. During the pressure buildup, check the switch values for "Alarm OFF" and "Backfeed (here: Filling) OFF". Record the values. Remove the pressure tank.

(7) The test is considered passed if the specifications per Appendix B have been maintained.

(8) Disconnect the measuring instrument.

(9) Open all shut-off cocks in the connection(s).

6.4.4 Testing the tightness after initial operation and repair[12]

(1) Insert the test measuring instrument into the test coupling.

(2) The test measuring instrument will display the current pressure.

(3) The tightness check is approved for one year of trouble-free operation if the following conditions have been met:
Operating method “S”:
The test time per 100 l interstitial space volume is 8 minutes. 1 mbar pressure loss is permitted within this specified test time. If a pressure loss of 1 mbar cannot be measured, this will result in the multiplication of the pressure loss according to the same multiplication of the test time.
Example:
Interstitial space volume: 1500 l;
Test time (with 1 mbar measurable pressure loss): 1500 / 100 x 8 = 120 minutes
Test time (with 10 mbar measurable pressure loss): 120 x 10 = 1200 minutes (≈ 20 hours)
Operating method “M“:
Determine the difference between the measured values for “Backfeed (Fill) OFF” and “Alarm ON” and convert into mbar (x 1000). Divide the calculated value by 8760. This results in a maximum tolerated pressure loss (per hour) to prevent triggering of an alarm before one year has passed.
If the determined value cannot be measured, this will result in the multiplication of the pressure loss according to the same multiplication of the test time.
Example:
Difference between the above named switch values: 1.75 bar (value measured onsite)
1.75 x 1000 = 1750
1750 / 8760 = 0.2 mbar / h (approved pressure loss)
The measuring instrument onsite shows „only“ one value of 5 mbar. This means the readability is 25 times (5 / 0.2). This extends the test time to 25 hours.

(4) Disconnect the test measuring instrument after the tightness test has been completed.

6.4.5 Testing the tightness as part of the annual function test

(1) Perform an inquiry of tightness (see section 3.5.2).

(2) Evaluate the displayed value (visible on the display for 10 seconds) per Appendix DP. This appendix serves informational purposes only and is not part of the permit.

[12] This section assumes that the specified pressure has been built up in the interstitial space and the pressure has been equalized.

6.4.6 Creating the Operating Conditions

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

(2) If shut-off cocks have been installed in the connections, they must be sealed (if connected to an interstitial space) with lead in an opened position.

(3) Make sure that for operating method “S”, the pressure tank is filled sufficiently.

6.5. Alarm / Malfunction

(1) Red and yellow signal lights light up, the audible signal sounds.

(2) Turn the audible signal off.

(3) Inform the installation company immediately.

(4) Determine the cause for the alarm, correct it, and then perform a function test for the leak detection system per section 6.4.

(5) In the event of a malfunction, only the red signal light will be lit up (yellow is off). Notify the manufacturer.

7. Removal

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

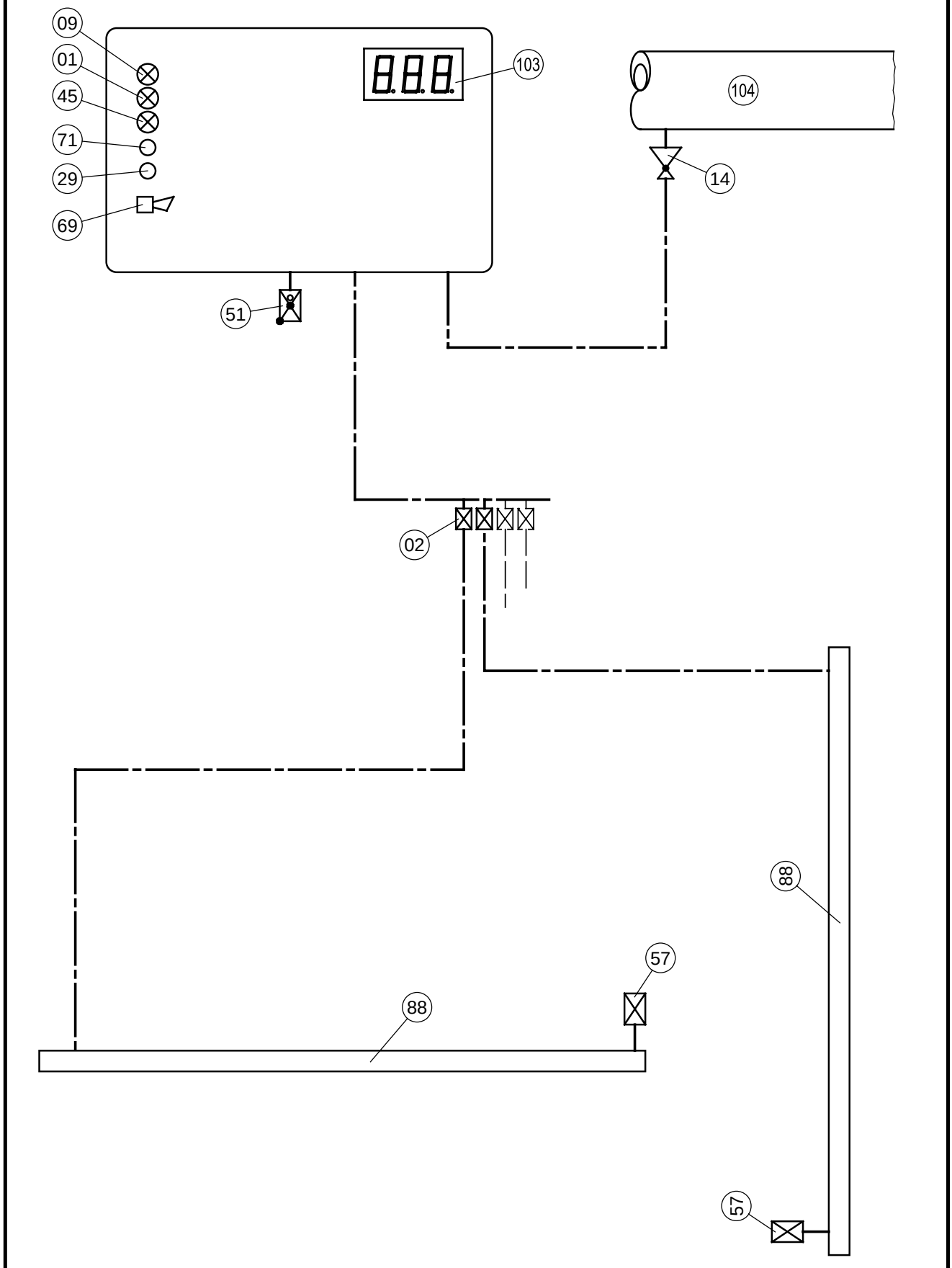
- Follow applicable rules for electrical disconnection.
- Make sure the unit is free of gas before and during removal work.
- Seal any openings gas-tight through which the explosion atmosphere can carry over.
- Do not use spark-producing electrical tools (saws, parting grinders, etc.) for removal. If this is unavoidable, be certain to observe EN 1127.
- Use low-spark tools.
- Avoid the buildup of electrostatic charges (e.g., through friction).
- Properly dispose of contaminated components (possibly through outgassing).

8. Marking

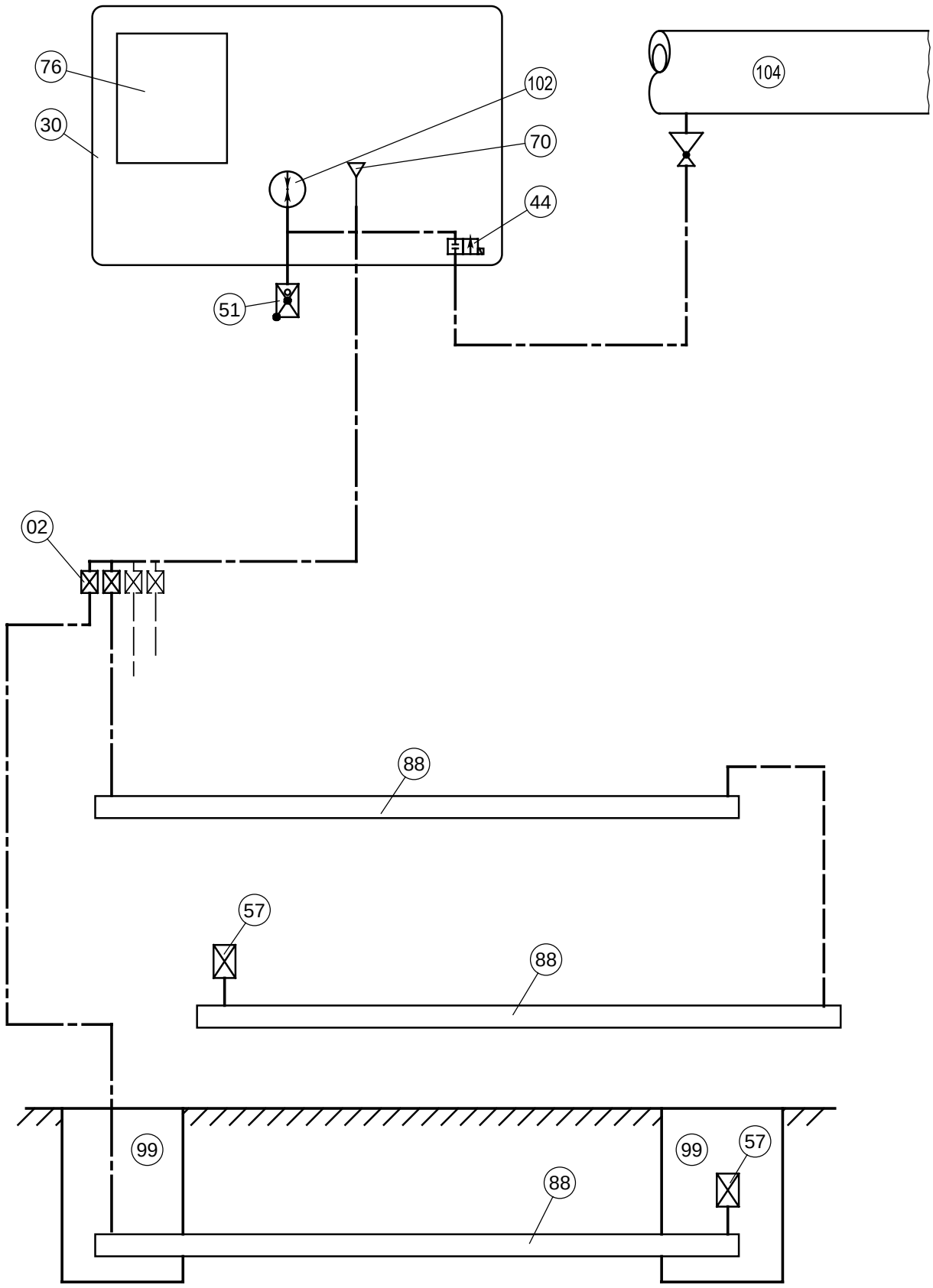
- Electrical data
- Serial number
- Type ID
- Date of manufacture (month/year)
- Manufacturer ID
- Statutorily specified symbols
- The connection(s) can be connected to areas that require devices of category 3 (group II (G)) (T1 to T3; IIA to IIB).

9. Abbreviations

01 ”Alarm” signal light, red
02 Shut-off cock
06 Connecting coupling “Fill”
05 Shut-off valve (on the pressure reducer)
09 ”Operating” signal light, green
14 Pressure reducer
19 Pressure tank
24.1 Fine-wire fuse “Exterior Signal” T1 A
24.2 Fine-wire fuse “Transformer” T32 mA
24.3 Fine-wire fuse “Magnetic valve” T80 mA
25 Bottle stop valve
29 Key “Fill”
30 Housing
44 Magnetic valve
45 Signal light “Backfeed”
51 Test coupling
57 Test valve
59 Relay
69 Buzzer
70 Overpressure valve
71 “Audible alarm” key
76 Main circuit board
77 Pressure control valve
88 Double-walled pipe / double-walled fittings or combination of both
99 Inspection chamber
102 Pressure sensor
103 Display
104 Operational network (e.g. air / nitrogen)
105 Control unit
106 Contacts for serial data transmission



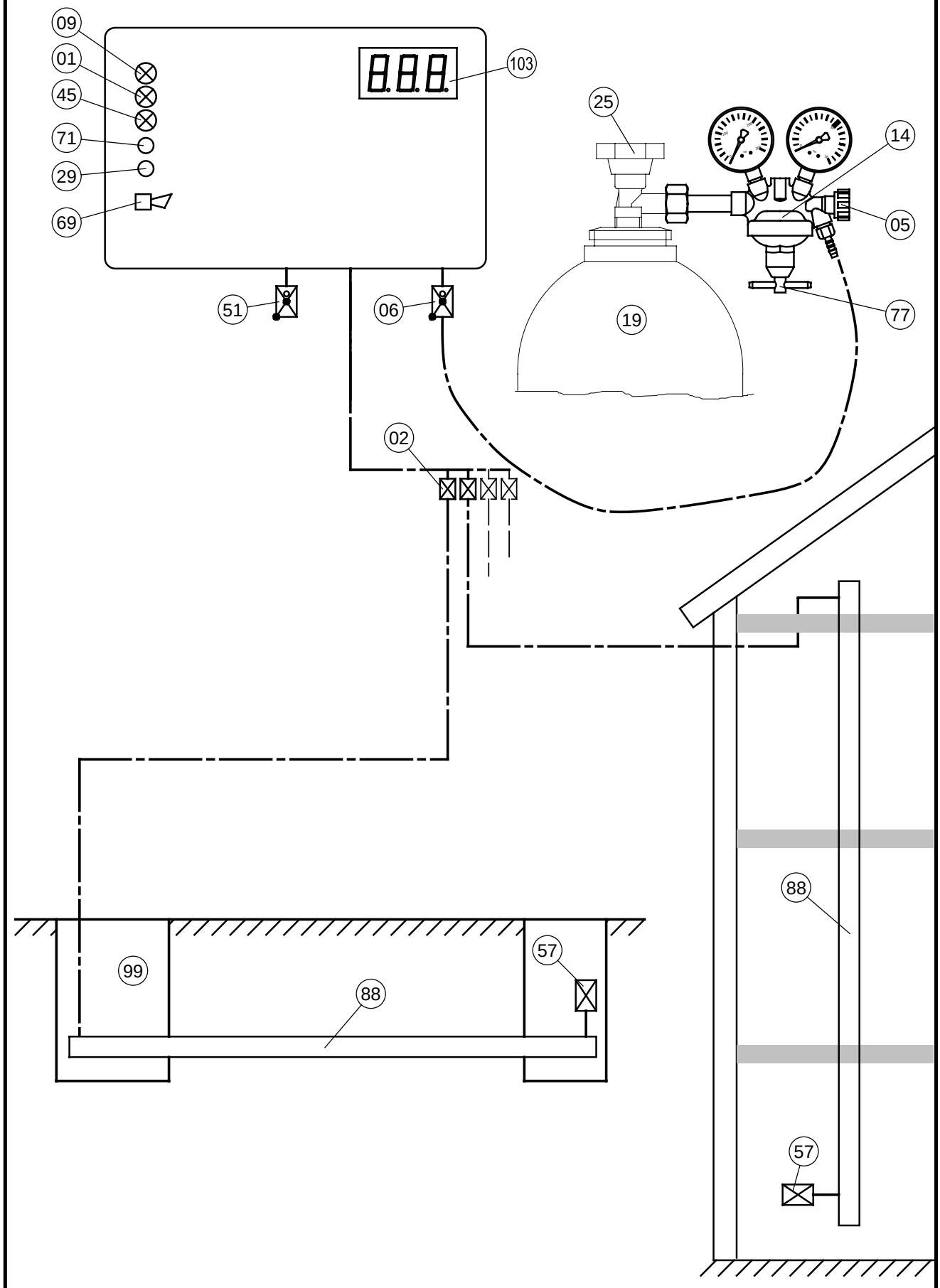
14-01-2002	SGB	M1 - 073 000



14-01-2002

SGB

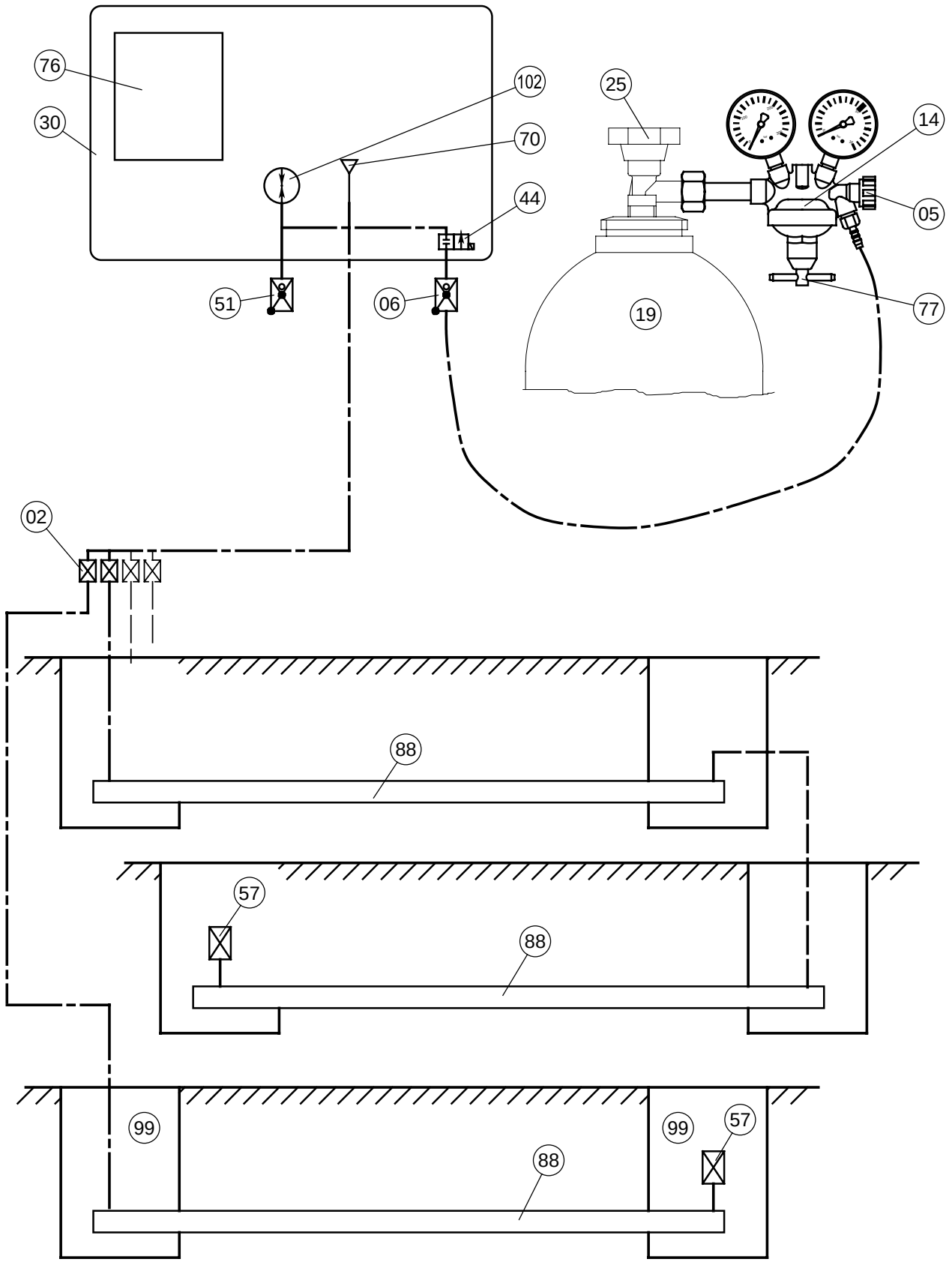
M2 - 073 000



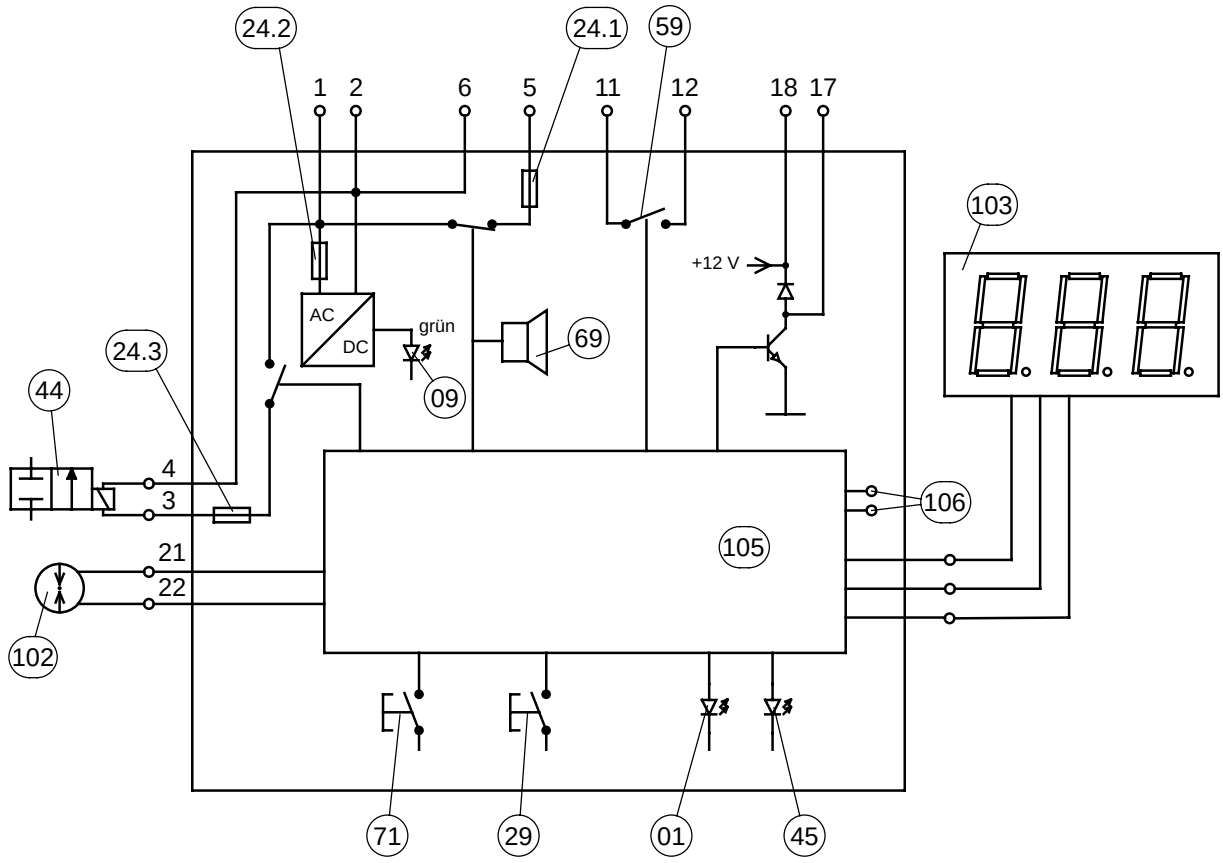
14-01-2002

SGB

M3 - 073 000



14-01-2002	SGB	M4 - 073 000


24.2
24.1
59
1
2
6
5
11
12
18
17
103
+12 V
AC
DC
grün
69
24.3
09
44
4
3
106
105
21
22
102
71
29
01
45

A Double-walled pipes / fittings and leak detection medium

For conveying products with a flash point of >55°C, air and inert gas can be used as long as the leak detection medium is compatible with the product.

The following statements apply only to applications to transport liquids with flash points of less than 55°C.

The following statements are based on a risk evaluation according to the directive 94/9/EEC (explosion directive). The risk evaluation was performed based on the table in Appendix B (informative) for EN 13160.

If the evaluation of the device categories has different results due to operational regulations or for any other reasons, the use of the leak detector must be checked separately.

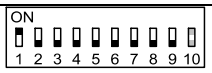
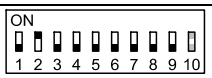
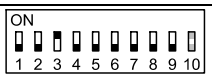
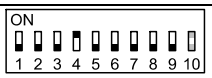
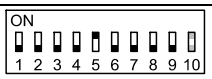
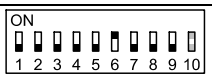
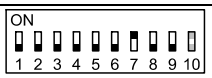
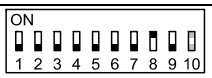
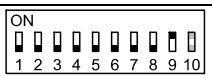
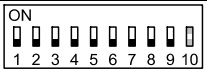
Walls of storage medium	Overpressure valve for interstitial space	Operating method	Suggested leak detection medium or use of the leak detector prohibited
Permeable: (e.g. interior wall made of plastic)	Exists	S	Inert gas
		M	Use prohibited
	Does not exist	S	Inert gas
		M	Use prohibited[1]
Not permeable: (e.g. double-walled steel pipe)	Exists	S	Inert gas / air pressure [2]
		M	Inert gas
	Does not exist	S	Inert gas / air pressure[2]
		M	Inert gas

[1] The leak detector with inert gas can only be used for this application if the operator assesses the interstitial space to be a zone 2.

[2] The use of air pressure does not present any problems with interstitial spaces for pipes / fittings with a medium transporting area, that is not permanently filled with products (e.g. filling lines).
When air pressure is used for interstitial spaces of pipes / fittings with a medium transporting area that is permanently filled with product, it must be assured that the product conveying equipment (e.g. pumps) is suitable for zone 0, because in the event of a leak, air will be pressed into the product transporting system.
If the pressure supply is performed using a pressure gas bottle, it is necessary to equip the pressure gas bottle with residual pressure monitoring. In case of a notification (fall below the set residual pressure) the pressure gas bottle is to be refilled or replaced with a full one.

B Switch and pressure values

If possible, leak detectors that are operated with operating method M should be operated without overpressure valves.

Type DLR-G	p_B [bar]	p_{AE} [bar]	p_{PA} [bar]	Position of the dip switch	$P_{ÜDV1}$ [1] [bar]	$p_{ÜDV2}$ [2] [bar]	$p_{PRÜF}$ [bar]	p_{DM} [bar]
1	Unpressurized	> 1	< 2		2,8 ± 0,15	6,5 ± 0,2	> 3,4	2,5
2	< 1	> 2	< 3		3,8 ± 0,2	7,5 ± 0,2	> 4,5	3,5
3	< 2	> 3	< 4		4,8 ± 0,2	8,5 ± 0,2	> 5,6	4,5
4	< 3	> 4	< 5		5,8 ± 0,2	9,5 ± 0,2	> 6,7	5,5
5	< 4	> 5	< 6		6,8 ± 0,2	10,5 ± 0,2	> 7,8	6,5
6	< 5	> 6	< 7		7,8 ± 0,2	11,5 ± 0,2	> 8,9	7,5
7	< 6	> 7	< 8		8,8 ± 0,2	12,5 ± 0,2	> 10	8,5
8	< 7	> 8	< 9		9,8 ± 0,2	13,5 ± 0,2	> 11,1	9,5
9	< 8	> 9	< 10		10,8 ± 0,2	14,5 ± 0,2	> 12,2	10,5
–	Special switch values agreed to by SGB and customers				Special switch values agreed to by SGB and customers			

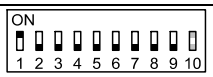
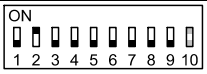
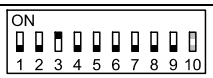
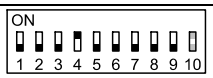
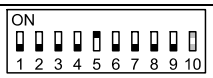
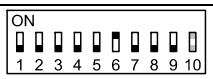
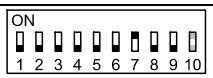
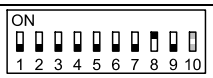
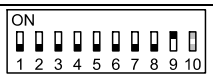
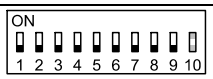
The following abbreviations are used in the table:

p_B Maximum operating pressure in the inner pipe (transportation pressure + dynamic pressure + pressure due to geodetic height differences)
p_{AE} Switch value “Alarm ON”; the alarm will be triggered at this pressure level
p_{AA} Switch value “Alarm OFF”; alarm will be deactivated if this value is exceeded ($p_{AA} = p_{AE}$ + ~250 mbar)
p_{PA} Switch value “Backfeed OFF” (=specified pressure)
p_{PE} Switch value “Backfeed ON” ($p_{PE} = p_{PA}$ - ~250 mbar)
$p_{ÜDV1}$ Specified pressure to activate overpressure valve 1 (interstitial space)
$p_{ÜDV2}$ Specified pressure to activate overpressure valve 2 (supply)
$p_{PRÜF}$ Minimum test pressure of interstitial space
p_{DM} Set pressure on the pressure reducer

[1] The overpressure valve ÜDV1 can be omitted, if it can be assured that the pressure in the interstitial space will not exceed the test pressure (e.g. through warming) and that the set pressure on the pressure reducer is lower than the test pressure of the interstitial space.
If pressure valves ÜDV1 from higher pressure levels are used, sufficient pressure resistance of the interstitial space shall be guaranteed.

[2] The overpressure valve ÜDV2 can be omitted if the test pressure of the interstitial space is higher than the specified pressure of the overpressure valve integrated in the pressure reducer.

[3] Switch settings 1 to 9 are designed to select the level of pressure. Switch setting 10 is designed to select the operating method.

Type DLR-G	p_B [bar]	p_{AE} [bar]	p_{PA} [bar]	Position of the dip switch	$P_{ÜDV1}$[4] [bar]	$p_{ÜDV2}$[5] [bar]	$P_{PRÜF}$ [bar]	p_{DM} [bar]
10	< 9	> 10	< 12		13,5 ± 0,3	17 ± 0,3	> 15,4	13
11	< 10	> 11	< 13		14,5 ± 0,3	18 ± 0,3	> 16,5	14
12	< 11	> 12	< 14		15,5 ± 0,3	19 ± 0,3	> 17,6	15
13	< 12	> 13	< 15		16,5 ± 0,3	20 ± 0,3	> 18,7	16
14	< 13	> 14	< 16		17,5 ± 0,3	21 ± 0,3	> 19,8	17
15	< 14	> 15	< 17		18,5 ± 0,3	22 ± 0,3	> 20,9	18
16	< 15	> 16	< 18		19,5 ± 0,3	23 ± 0,3	> 22	19
17	< 16	> 17	< 19		20,5 ± 0,3	24 ± 0,3	> 23,1	20
18	< 17	> 18	< 20		21,5 ± 0,3	25 ± 0,3	> 24,2	21
–	Special switch values agreed to by SGB and customers				Special switch values agreed to by SGB and customers			

The following abbreviations are used in the table:

p_B Maximum operating pressure in the inner pipe (transportation pressure + dynamic pressure + pressure due to geodetic height differences)
p_{AE} Switch value “Alarm ON”; the alarm will be triggered at this pressure level
p_{AA} Switch value “Alarm OFF”; alarm will be deactivated if this value is exceeded ($p_{AA} = p_{AE}$ + ~500 mbar)
p_{PA} Switch value “Backfeed OFF” (=specified pressure)
p_{PE} Switch value “Backfeed ON” ($p_{PE} = p_{PA}$ - ~500 mbar)
$p_{ÜDV1}$ Specified pressure to activate overpressure valve 1 (interstitial space)
$p_{ÜDV2}$ Specified pressure to activate overpressure valve 2 (supply)
$p_{PRÜF}$ Minimum test pressure of interstitial space
p_{DM} Set pressure on the pressure reducer

[4] The overpressure valve ÜDV1 can be omitted, if it can be assured that the pressure in the interstitial space will not exceed the test pressure (e.g. through warming) and that the set pressure on the pressure reducer is lower than the test pressure of the interstitial space.
If overpressure valves ÜDV1 from higher pressure levels are used, sufficient pressure resistance of the interstitial space must be guaranteed.

[5] The overpressure valve ÜDV2 can be omitted if the test pressure of the interstitial space is higher than the specified pressure of the pressure valve integrated in the pressure reducer.

Technical Data

1. Electrical data

Input capacity (without external signal)		230 V – 50 Hz – 20 W
Switching contact load, terminals AS		230 V – 50 Hz – 1 A
Switch contact load, dry relais contacts,	max:	230 V – 50 Hz – 2 A
	min:	10 V – 10 mA
External fuse protection of the leak detector	max.	10 A
Overvoltage category		2

2. Pneumatic Data (Requirements for the Test Measuring Instrument)

Nominal size	at least 100
Class precision	at least 1,6
End scale value	suitable depending on pressure level

Evaluation of the display from the function “Tightness Test”

The Tightness test as part of the annual function test is described in section 6.4.5. As long as the value shown on the display does NOT exceed the following nominal values, it can be assumed that the system is so tight that the pressure tank being used (200 bar filling) will last for one year:

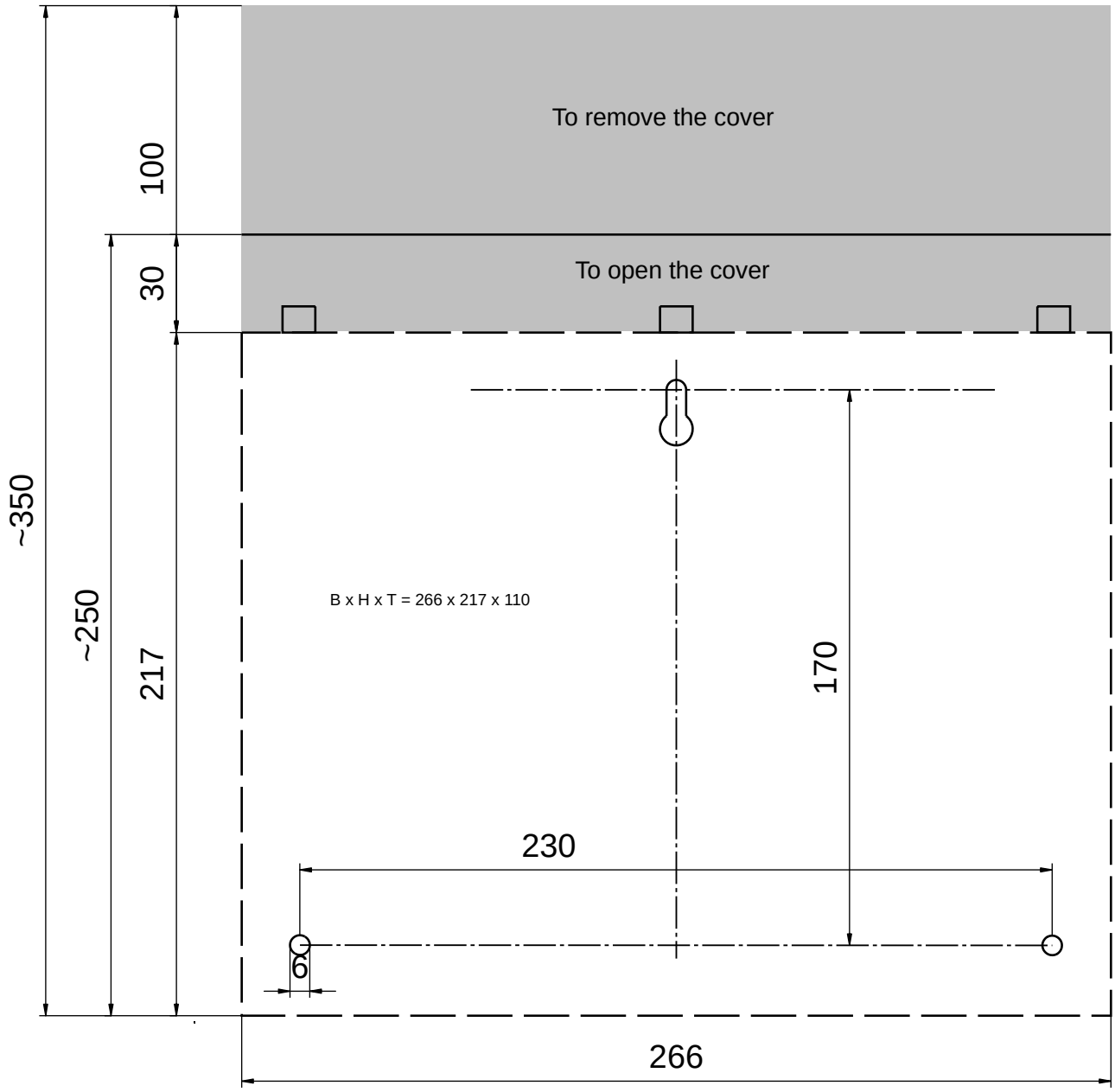
- 50 l pressure tank: Display from 0 to 7
- 10 l pressure tank: Display 0 or 1

The smaller the above value the tighter the system. The expression of these values depends on a number of factors including the setting for the supply pressure on the pressure reducer.

The above statement is therefore meant to be a guideline (nominal value) and cannot provide a final statement regarding the “actual” tightness of the system.

The following values mean:

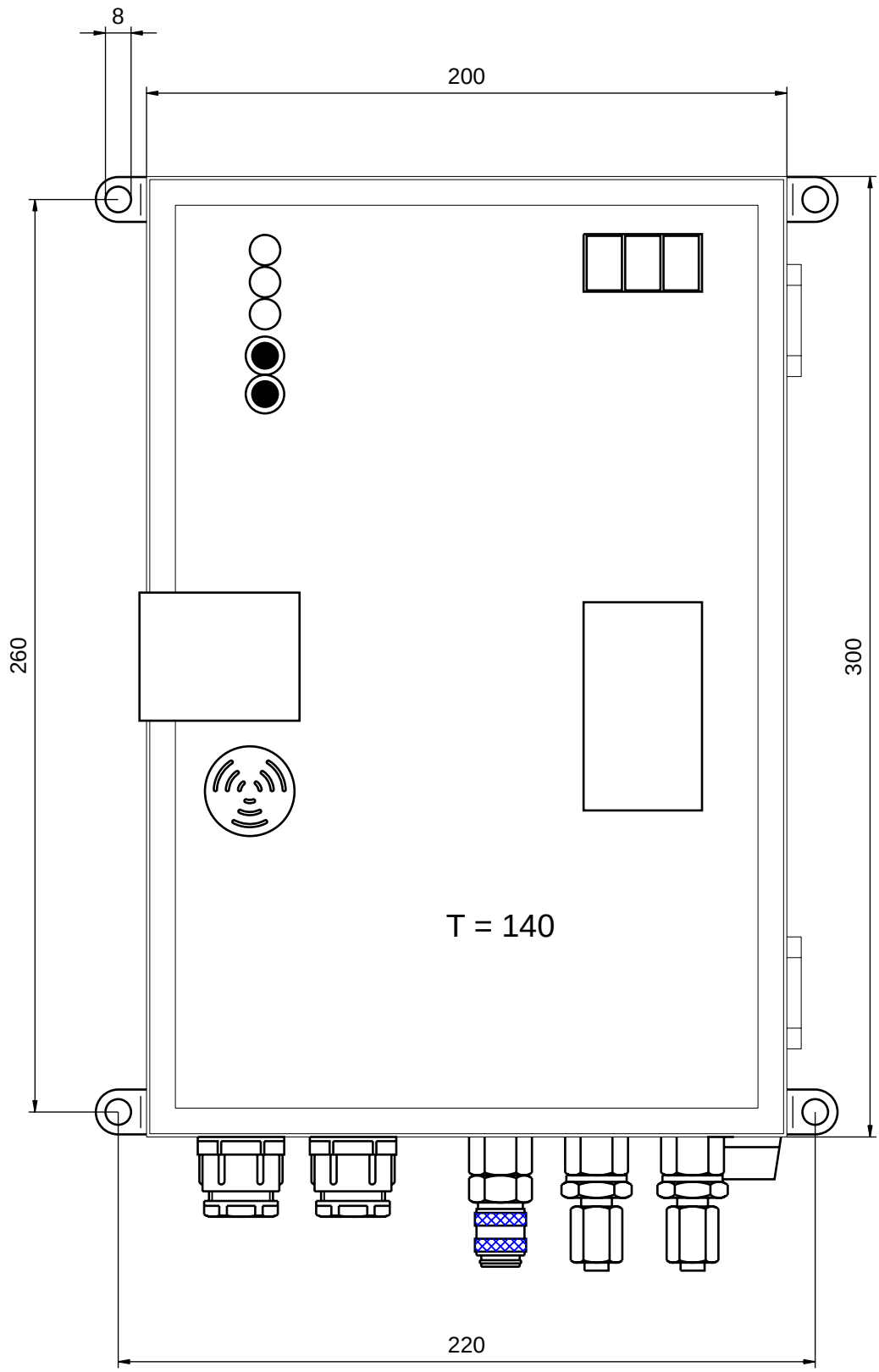
- 50 l pressure tank: Display from 8 to 14 Pressure tank will probably need to be changed before the year has passed.
- 10 l pressure tank: Display from 2 to 14 Pressure tank will probably need to be changed before the year has passed.
- Display from 15 Inquiry not possible (generally set to operating method "M")



18-11-2003

SGB

Dimension / Drilling



28-06-2005

SGB

Dimension/Drilling

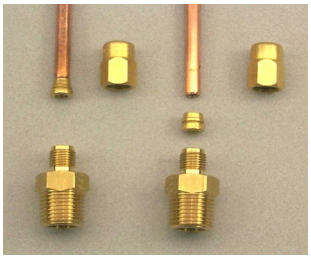
Work Sheet: AB-820 500

Pneumatic connections

1 Flare type fitting for flare type pipes

1. Lubricate the O-rings
2. Place the intermediate ring loosely in the threaded connection piece
3. Push the union nut and the thrust collar over the pipe
4. Tighten the union nut manually
5. Tighten the union nut until clearly increased force is needed
6. Finished assembly: turn by a further ¼ of a revolution

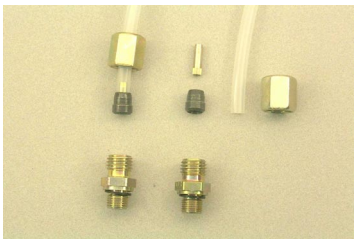
2 Clamping ring threaded fitting for plastic and metal pipes



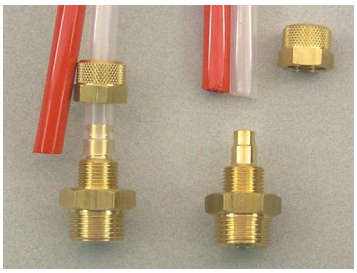
1. Insert the support sleeve into the end of the pipe
2. Insert the pipe with support sleeve as far as it will go
3. Tighten the thread until strong resistance can be clearly felt
4. Lightly loosen the nut
5. Tighten the nut until resistance can be felt (nut must exactly match the thread of the basic body)

3 Olive threaded fitting for plastic and metal pipes

1. Insert the reinforcing sleeve into the end of the pipe
2. Knock in the reinforcing sleeve
3. Push the union nut and the olive over the end of the pipe
4. Screw the union nut by hand until you feel a stop
5. Press the pipe against the stop in the inner cone
6. Tighten the union nut by approx. 1.5 revolutions (pipe must not turn)
7. Loosen the union nut: check whether the pipe visibly projects from under the cutting ring (it doesn't matter if the clamping ring can be turned)
8. Retighten the union nut using normal force



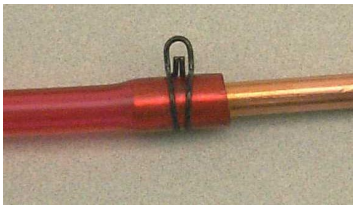
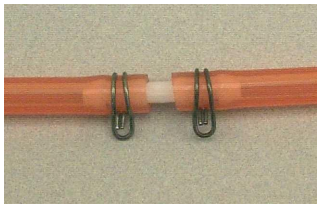
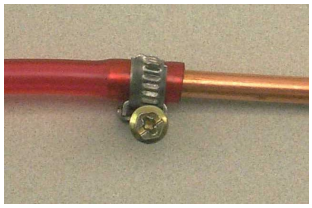
4 Quick-action fitting for PA- and PUR-tubes



1. Make a right-angled cut in the PA pipe
2. Loosen the union nut and push it over the end of the pipe
3. Push the pipe onto the nipple up to where the thread begins
4. Tighten the union nut by hand
5. Further tighten the union nut using a wrench until clearly increased force is needed (approx. 1 to 2 revolutions)

NOT suitable for PE-pipes

5 Tube connections (socket 4 and 6 mm for EXCESS PRESSURE)

1. Push wire or screw clip over the tube
2. Push the tube onto the Cu pipe or the tube socket (if necessary heat or dampen PVC tube), tube must fit tightly all the way round
3. Wire clip: clamp tightly using pliers and push onto the joint
   Screw clip: push the clip over the joint and tighten it using a screwdriver, care must be taken that the clip is a smooth tight fit.

6 Tube connections (socket 4 and 6 mm for VACUUM)

For vacuum applications where there is no excess pressure on the connection lines even in the case of a leakage proceed as in item 5, but without clips.

For vacuum applications where excess pressure could arise in the case of a leakage, proceed as in Item 5.

EC DECLARATION OF CONFORMITY

We,

SGB GmbH
Hofstraße 10
57076 Siegen, Germany

hereby declare in sole responsibility that the leak detectors

DLG ..; DLR-G ..

comply with the essential requirements of the EC directives listed below.

This declaration shall lose its validity if the device is modified without consulting us.

Number / short title	**Satisfied regulations**
2004/108/EC EMC Directive	EN 61 000-6-3: 2007 EN 61 000-6-2: 2005 EN 61 000-3-2: 2006 + A1: 2008 + A2: 2009 EN 61 000-3-3: 2008
2006/95/EC Low Voltage Directive	EN 60 335-1: 2012 EN 61 010-1: 2010 EN 60 730-1: 2011
89/106/EEC Construction Products Directive 93/68/EEC	EN 13 160-1-2: 2003 Approved body: TÜV-Nord, Hamburg
94/9 EEC Equipment in Potentially Explosive Atmospheres	The leak detector with its pneumatic parts may be connected to spaces (interstitial spaces of tanks / pipelines / fittings) which are required for category 3 devices and also, under specific conditions, to spaces which are required for category 1 device. The following documents were used: EN 1127-1: 2011 EN 13 160-1-2: 2003 EN 13463-1: 2009 The ignition hazard analysis did not result in any additional hazards.

Compliance is declared by

ppa. Martin Hücking
(Technical Director)

A p p r o v a l C e r t i f i c a t e

for the design of a leak detector
as part of a leak indication device

Client:

SGB
Sicherungsgerätebau GmbH
Hofstraße 10
57076 Siegen

Dipl.-Ing.
TÜV NORD GmbH.
Große Bahnstraße 31, 22525 Hamburg
Tel.: 040/85572102
Az.:0111 BM 21610
Date: 01. February 2006

1 Subject

Overpressure leak detector as part of a leak detection system for connection to interstitial spaces of double walled pipes.

2 Manufacturer

SGB Sicherungsgerätebau GmbH
Hof Strasse 10 57076 Siegen

3 Information about the leak detector

3.1 Type

DLR-....

3.2 Area of use

Double walled pipes and double walled fittings, the interstitial spaces of which are sufficiently resistant to pressure and are verifiably suitable for connection of an overpressure leak detector.

3.3 Design

The overpressure leak detector DLR-... essentially comprises a pressure recorder and a leak detection device. Air or an inert gas can be used as the leak detection medium, whereby the conditions laid out in section 6.3 of the technical description must be complied with.

On this leak detector, controlling and signal processing are performed by an electronic circuit. The alarm switching pressure can be adjusted in 1 bar increments up to a maximum of 18 bar using the micro selector switch on the PCB. Special switching values which can be agreed with the manufacturer of the leak detector are also possible. The leak detector can be operated with both air and inert gas as the leak detection medium, with two possible operating modes:

Mode S - The necessary operating overpressure in the interstitial space is created through a process of pressure-controlled refilling from a stationary pressure accumulator which is connected to the interstitial space.

Mode M - The necessary operating overpressure in the interstitial space is provided by connecting a mobile pressure accumulator before starting up the leak detector.

The operating modes S and M should be selected via a micro selector switch located in the unit before the leak detector is started up. The current interstitial space pressure is indicated via a digital display which is integrated in the front panel. If the operating overpressure in the interstitial space drops to the selected alarm switching value then visual and acoustic alarms are automatically triggered.

Overpressure leak detector DLR-P..

With this variant of the device, the pressure in the interstitial space is generated by means of an integrated pump, as a result of which only dried ambient air is used as the leak detection medium. According to the technical description provided by the manufacturer, the lowest monitoring pressure is 1.45 bar and the highest interstitial space pressure is 3.4 bar. According to details provided by the manufacturer, special switching values are also possible.

Overpressure leak detector DLR-GS..

With this variant of the device, the overpressure in the interstitial space can only be generated by means of an externally connected pressure gas accumulator, whereby compressed air or inert gas can be used as the leak detection medium. Two types of the leak detector DLR-GS.. are manufactured. These two types differ in terms of the maximum operating pressure of the interstitial space. The DLR-GS 11 is designed for a maximum operating overpressure of 11 bar, while leak detector DLR- GS 22 is designed for a maximum operating pressure of 22 bar in the interstitial space. The alarm switching values are freely adjustable via an adjusting screw on the pressure switch and should be set beforehand in accordance with the operating instructions.

All variants of the device are equipped with a test connection which allows an external measuring device to be connected. Overpressure protection devices for protection of the devices and the interstitial spaces against violations of upper pressure limits are not a fixed part of the leak detector. Depending on the requirements, they can be connected in the device or externally to the interstitial space.

Details about the design of the leak detector DLR-.. can be found in the technical description provided by Sicherungsgerätebau GmbH dated 26 February 2002, and details about the design of the variant DLR-P.. can be found in the technical description dated 21 December 2005.

4 Test basis

4.1 Approval principles for leak detection systems for pipes (ZG-LAGR),
4.2 Building and testing principles for leak detection devices for pipes (TRbF 502),
4.3 Leak detection systems EN 13160.

5 Test documents/test specimens

5.1 Technical description of the overpressure leak detector DLR-.. dated 26.02.2002,
5.2 Prototype design of the leak detector, type DLR-G 3,
5.3 Test certificate for overpressure leak detector, type DLR-2, dated 21.06.95,
5.4 Technical description of overpressure leak detector DLR-P.. dated 21.12.2005

6 Tests

Design variant DLR-G 3 of the prototype design of the leak detector was tested for compliance with the requirements in EN 13160:2003 and in accordance with the approval principles for leak detection devices for containers and pipes. It was tested in conjunction with the technical description / design drawings and the current flow diagrams, as well as the installation and operating instructions and the software documentation.

The following individual tests were performed:

1. Testing of the electrical equipment (excluding explosion protection aspects)
2. Functional testing and switching operations at various threshold temperatures
3. Testing of the visual and acoustic alarm devices,
4. Pressure and leak testing of the fixtures

Operating mode S with an operating overpressure of 4.1 bar was chosen for the test.

7 Test results

Leak detector DLR-... complies with the requirements defined in EN 13160 and in the approval principles and building/test principles. The components of the sample device comply with the technical description and the drawings. The functional tests performed on the sample device of the leak detector of type DLV-G 3 have shown that the device can withstand the stresses and strains

and remains operational. The components of the electronic circuitry integrated in the device remain operational even under the temperature loads.

The outcome of mechanical function tests and software tests was positive. Undefined measured values, faulty calibration and failure of the system clock pulse all cause an alarm to be triggered. The leak detector of type DLR-... can comply with the requirements made of it in terms of monitoring the overpressure generated in the interstitial space and in terms of automatically generating an alarm when the alarm pressure threshold is reached.

The outcome of the alarm device tests was also positive. After 24 hours of continuous operation, the acoustic alarm device generated a noise level > 70 dB(A) at a distance of 1 m with the control cabinet closed. The visual alarm device was deemed to be adequate.

According to information supplied by the manufacturer, the pressure measuring sensor is pressure-resistant up to an overpressure of 30 bar, so no impairment of functionality is anticipated in higher pressure ranges.

The electrical installation in the fittings box is compliant with DIN VDE regulations. External forwarding of an alarm is ensured via the switching of a potential-free relay, whereby the device is protected against the circuit of the external alarm and through an interconnected additional fuse.

The leak detector with the type designation DLR-P... has the same design as the leak detector DL-... and, during the course of the approval process for obtaining General Building Authority Approval (*allgemeine bauaufsichtliche Zulassung* for Germany), it was already subjected to a suitability test. The leak detector DL.. has been granted General Building Authority Approval (*allgemeine bauaufsichtliche Zulassung* for Germany) for monitoring of double walled containers (approval no. Z.65.23-409). From the point of view of the testing body, there are no objections to the use of the leak detector for monitoring of double walled pipes within the constraints of the application parameters according to 3.1 and in accordance with the technical description for the leak detector DLR-P.. dated 21.12.2005. The leak detector is pressure resistant up to a pressure of 30 bar.

The leak detector with the type designation DLR-GS has the same design as the leak detector of type DLR-2, as a result of which its suitability has already been verified in the approval process. The leak detector DLR-2 has already been granted General Building Authority Approval (*allgemeine bauaufsichtliche Zulassung* for Germany) under the approval no. Z-65.26-304.

8 Assessment

The leak detector of type DLR-... has been approved as suitable as part of a leak indication device operating on the basis of overpressure, and it complies with the requirements of EN 13160 and the approval principles for leak detection devices for pipes and TRbF 502, provided the following conditions are met:

1. The leak detector variants, comprising the signal part and a pressure measuring device, are to be manufactured, adjusted and operated in accordance with the technical description dated 26.02.2002, or for the variant of type DLR-P.. in accordance with the technical description dated 21.12.2005.

2. The relevant detector type must only be used in the interstitial spaces specified in the "Area of use" section in the technical description. The alarm switching pressure of the leak detector should be adjusted in accordance with the technical descriptions, whereby the value must be at least 1 bar above the operating pressure of the pipe to be monitored.

3. The information provided by the manufacturer in the operating instructions must be observed in relation to establishing and maintaining the operating pressure of the leak detector. Every leak detector should be operated in such a way that the maximum permitted operating pressure of the interstitial space in the pipe and the components of the leak detector is not exceeded. In general, the only pressure reducers which should be used are those where the maximum adjustment range on the pressure reduction valve does not exceed the test pressure of the interstitial space. Otherwise, overpressure protection devices should be provided which prevent the maximum permitted operating pressure of the interstitial space from being exceeded.

4. If the leak detector is connected to interstitial spaces of overground pipes or pipes with flammable liquids (flash point < 55 °C), then fixed connecting lines should be provided which comply at least with pressure level PN 10. Before being taken into operation, the connecting pipes should be subjected to a pressure test at a pressure of at least 1.1x the operating pressure of the leak detector (no less than 5 bar).

5. The supply pressure for the pressure accumulator indicated in the technical description must be met, as otherwise the feed quantity of the leak detection medium will deviate from the value permitted according to the approval principles.

6. Every leak detector is to be permanently and legibly marked with at least the following information:

Manufacturer’s name or manufacturer’s symbol/logo,

Year of manufacture,
Production no.,
Approval cert. no.,
Type designation,
Rated operating data.

7. Every leak detector is to be subjected to a routine check prior to delivery. In terms of production monitoring, the requirements in EN 13160-1, Annex C, of TRbF 502 and/or ZG-LAGR no. 7 are to be observed.

8. Installation and operating instructions and a copy of the approval certificate must be enclosed with every leak detector.

9. For operation of the leak detector without a pressure controlled feed (operating mode M), a pressure accumulator should be permanently connected to the leak detector if a pressure increase up to the alarm switching point occurs within a year in the interstitial space due to leaks which cannot be located, e.g. gas pores. The operating mode should be changed on the device in accordance with the adjustment information in the technical description.

9 Note

Compliance with requirements relating to explosion protection, electromagnetic compatibility and the low voltage directive are not covered by the scope of these tests.

Straube
Specialist expert of
TÜV NORD GmbH & Co. KG
Testing body for leak detection devices

Warranty

Dear customer,

You have purchased a high-quality leak detector from our company.

All of our leak detectors undergo a 100% quality control examination.

The type plate with the serial number is only affixed after all test criteria have been complied with.

The **warranty period** for our leak detectors is **24 months**, beginning on the date of installation on site.

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

Our warranty will be effective only if the customer submits to us the functional report or test report on initial putting into service, prepared by a recognised company specialised in water and water protection systems, including the serial number of the leak detector.

Our warranty shall not apply in the event of faulty or improper installation or improper operation, or if modifications or repairs are carried out without the manufacturer's consent.

In case of malfunction, please contact your local specialist company:

Stamp of the specialist company

Yours sincerely

SGB GmbH
Hofstr. 10
57076 Siegen, Germany
Phone +49 271 48964-0
fax: +49 271 48964-6
e-mail sgb@sgb.de
www.sgb.de