LECKANZEIGETECHNIK

SGB

Overpressure leak detector

DLR – 2

Z – 65.26 - 304

Documentation DLR - 2

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Contents of the documentation

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DRAWINGS

1. Object

Overpressure leak detector without integrated pressure generator for double-wall pipework using inert gas as the leak detection medium.

2. Type

DLR-2/11 for a nominal pressure of max. 11 bar in the interstitial space.
DLR-2/22 for a nominal pressure of max. 22 bar in the interstitial space.

3. Field of application

3.1. Pipework

Underground double-wall pipework[1], the interstitial space of which is sufficiently resistant to pressure according to the specifications in chapter 3.3.
More extensive demands on the interstitial spaces are revealed in TRbF 131/231 part 1, the approval principles of DIBt or prEN 13160.

3.2. Material to be transported

Liquids hazardous to water[2]

3.3. Pressure resistance of the interstitial space

$$p_{test} = p_{nom} \bullet 1.3$$

with:

p_{test} Testing pressure of the interstitial space
1.3 Safety factor[3]
p_{nom} Nominal pressure = p_{alarm} + (1.5.....5) bar; 4 bar recommended
p_{alarm} p_B + (≥ 1) bar
p_B Maximum operating pressure of the pipework in operation

[1] The pipework can also be laid above ground in tempered rooms, it must be guaranteed that no fluctuations in temperature of more than ±10°C can affect the pipework.

[2] Must not react with the leak detection medium

[3] Safety factors above this value must be taken into consideration if hot liquids are to be transported in the inner pipe.

4. Functional description

The overpressure leak detector DLR-2 monitors both walls of pipework for leaks. The monitoring pressure is so high that leaks in the inner or outer wall are indicated by a fall in pressure.

An inert gas (usually nitrogen from gas bottles[4]) is used as the leak detection medium.

4.1. Switching values of the leak detector

Device type	Max. nom. pressure		p_{Alarm}	p_{Soll}
DLR-2/11	up to 11 bar	pre-adjusted by the manufacturer:	$4.0^{+0.4}/_{-0.0}$	$8.0^{+0.0}/_{-0.4}$
DLR-2/22	up to 22 bar	pre-adjusted by the manufacturer:	$11.0^{+0.4}/_{-0.0}$	$16.0^{+0.0}/_{-0.4}$

4.2. Normal operation

The status of normal operation is achieved during the putting into operation process by building up pressure on top of the nominal pressure, usually by means of a mobile pressure tank.

The pressure in the interstitial space is monitored by a pressure switch in the leak detector. Any leaks lead to a fall in pressure. This means that extremely high demands are made on the airtightness of the interstitial space(s) and the connection pipe(s) in order to guarantee one year of trouble-free operation.

4.3. Air or liquid leak

If there is a leak in the inner or outer pipe, inert gas escapes from the interstitial space. The pressure falls.

If the pressure falls below the alarm pressure the optical and acoustic alarms are triggered.

4.4. Overpressure valve

An overpressure valve has not been provided for in the leak detector, but it can be used if the particular application makes it necessary. (Please contact the manufacturer).

[4] or from a nitrogen supply network within the company (with suitable pressure reducer in place).

4.5. Number of interstitial spaces connected

The number of individual pipes to be monitored depends on the overall volume of interstitial space. According to the specifications in prEN 13160, 10m^3 must not be exceeded. The length of pipework to be monitored (per pipeline) should not exceed 1200 m.

5. Assembly instructions

5.1. Basic instructions

(1) Assembly may only be carried out by a qualified company[5].

(2) Heed relevant accident prevention regulations.

(3) Heed explosion protection measures (if necessary).

(4) Relevant regulations covering the transport of the gas bottle to and from the site must be heeded.

(5) The gas bottle must be secured in an upright position on site.

(6) If the putting into operation process is carried out in a closed room, care must be taken that the room is sufficiently ventilated.

(7) A test valve must be designed on the end of the pipework away from the leak detector.

(8) Before inspection chambers are entered, the nitrogen content must be tested and the inspection chamber flushed if necessary.

5.2. Personal protective equipment

The parts listed here refer exclusively to safety during work on the equipment which could cause an explosion.

If work is being carried out in areas where an explosive atmosphere is very likely, the following pieces of equipment represent the minimum requirement:

- suitable clothing (danger of electrostatic charge)
- suitable tools (according to EN 1127)
- a suitable gas warning device which has been calibrated for the steam-air mixture present (work should only be carried out at a concentration 50% under the lowest explosion limit)[6]

5.3. Assembly of the leak detector

(1) Usually fitted on the wall with dowel plugs and screws.

[5] For Germany: Qualified company according to § 19l WHG, who has proved its qualification for the assembly of leak detector systems incl. TRbF 180 / 280 no. 1.7.

[6] Other percentages could be valid depending on country-specific directives.

(2) In a dry room or in a suitable protective box in the open.

(3) Assembly in the protective box: additional external signal or alarm forwarding via potential-free contacts to a control room or similar.

(4) **NOT to be assembled in potentially explosive areas.**

5.4. Assembly of the connecting pipes (between leak detector and pipework)

(1) Metal (usually copper) or plastic pipes, the pressure resistance of which at least complies with the testing pressure of the interstitial space, this is also valid for fittings and threaded fittings. (Heed temperature range, particularly when using plastic).

(2) At least 4 mm clearance, wall thickness at least 1 mm.

(3) Not longer than 50 m, if this is not possible then the cross-section of the pipe must be enlarged using appropriate transition pieces.

(4) The cross-section must remain intact, indentation and bending[7] are not allowed.

(5) Plastic pipes laid underground or above ground outside must be in a protective outer pipe.

(6) Seal the protective pipe gas-tight.

(7) Avoid electrostatic charge (e.g. when introducing and pulling through pipes).

5.5. Selection of pressure reducing device

(1) The pressure reducing device must have an integrated safety valve.

(2) The setting range of the pressure reducing device to be used must be chosen in such a way that it is suitable for the application case concerned.

(3) The maximum pressure which can be set on the pressure reducing device should not exceed the testing pressure of the interstitial space (SGB recommendation).

5.6. Gas bottle and pressure reducing device (functional test and putting into operation)

(1) Following the secure upright installation of the gas bottle, remove the protective hood.

(2) Mount the pressure reducing device on the bottle.

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

(4) Turn back the pressure regulating valve as far as possible.

(5) Open the bottle shut-off valve.

(6) Set the nominal pressure on the pressure reducing device using the pressure regulating valve (readjust during pressure build-up if necessary).

[7] If necessary, customary fittings (set bending radii) must be used for the plastic pipes

(7) After completion of the functional test or when changing the bottle:
– Close the shut-off valve on the pressure reducing device.
– Separate the pressure reducing device from the interstitial space (testing device).
– Close the bottle shut-off valve.
– Open the shut-off valve on the pressure reducing device (pressure reducing device becomes pressure-less)
– Dismount the pressure reducing valve from the bottle.
– Replace the protective hood on the bottle.

5.7. Electrical connection

(1) Voltage supply according to information on type plate.

(2) Firmly laid, i.e. no plug or switch connections.

(3) The regulations of the electrical supply company must be heeded[8].

(4) Terminal connection: see Technical Data sheet.

5.8. Assembly examples

Assembly examples are given in the appendix.

6. Putting into operation / service

6.1. Basic instructions

(1) Assembly according to chapter 5, instructions given in that chapter must also be heeded here.

(2) The interstitial space must be flushed with inert gas if the wall coming into contact with the stored medium is not impermeable.[9]

(3) Should a leak detector be put into operation on a pipe which is already in operation, special protective measures must be taken (e.g. check there is no gas in the leak detector and / or interstitial space). Further measures can depend on local conditions and must be evaluated by the operating staff.

(4) Once the pneumatic connection has been made, make the electrical connection.

(5) Make sure the "in operation" and "alarm" lamps are lit up and the acoustic alarm is working. Then switch the "acoustic alarm" switch off.

(6) If the factory settings cannot be taken over, proceed with chapter 6.2

(7) Build up the pressure using the device according to drawing P-115 520

[8] For Germany: also VDE regulations

[9] For Germany: heed additional requirements in the case of such double-wall pipework.

Note: should the pressure not build up despite the gas bottle being connected, the leak must be located and eliminated (if necessary check the pressure reducing device for the correct setting).

(8) It must be ensured that the testing pressure of the interstitial space is not exceeded during the whole pressure build-up process.

(9) Functional test according to chapter 7.4.

6.2. Setting other switching values (deviation from factory settings)

(1) Determine the maximum operating pressure of the pipework (feed pressure).

(2) Calculate latest alarm triggering according to chapter 3.3.

(3) Calculate nominal pressure according to chapter 3.3

(4) Is the testing pressure of the interstitial space greater by factor 1.3 than the nominal pressure by calculated under item (3) above?
If yes, proceed with item (5)
If no: check whether the nominal pressure from item (3) can be reduced, if not, then either increase the testing pressure or reduce the feed pressure in the inner pipe and proceed with item (2).

(5) Note the new values in the housing cover and proceed with setting as follows:

(6) Unscrew the safety pin on the pressure switch.

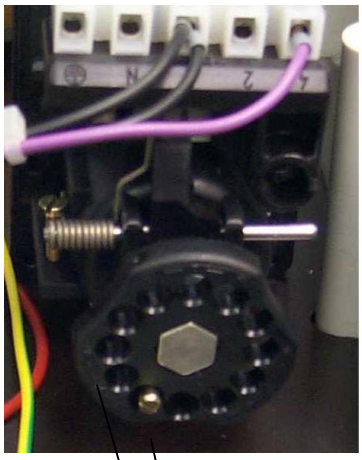
(7) Close both shut-off cocks of the testing device. Insert the test pressure gauge into test coupling 51, connect pressure tank to coupling 6.1, connect the measuring gauge to coupling 6.2 (cf. P-115 520 no. II)

(8) Set the pressure regulation valve on the pressure reducing device to nominal pressure.

(9) Open the shut-off valve on the pressure reducing device.

(10) Open shut-off cock 2.2.

(11) Build up pressure to alarm pressures, check the pressure on the pressure reducing device during the filling process (testing pressure must not be exceeded) and readjust if necessary.
Shut-off cock 2.2 must be closed when the alarm pressure has been reached.



(12) Has the alarm been stopped?
If yes: continue with item (13)
If no: unscrew the setting screw on the pressure switch until the alarm has been stopped, continue with item (13).

(13) Carefully tighten the setting screw on the pressure switch until the alarm is triggered.

(14) Open shut-off cock 2.2.

(15) Build up pressure until the alarm is stopped.

(16) Closs shut-off cock 2.2, open shut-off cock 2.1.

(17) Wait for alarm to be triggered, note and record the value and close shut-off cock 2.1

(18) If the "alarm ON" pressure value does not correspond to the value determined under item (5), the pressure switch can be readjusted, otherwise continue with item (19):
Tightening the screw leads to higher pressure values, loosening to lower pressure values:
DLR-2/11: 1 rotation ~ 550 mbar
DLR-2/22: 1 rotation ~ 750 mbar

(19) Insert the safety pin in the pressure switch.

(20) Open shut-off cock 2.2.

(21) Wait for "alarm OFF" switching value.

(22) Close shut-off cock 2.2.

(23) Carry out functional test according to chapter 7.4.

7. Operating instructions

7.1. General instructions

(1) If the leak detector system has been assembled tightly and correctly then it can be assumed that the leak detector is working without any problems.

(2) Even slight leaks cause the alarm to be triggered.

(3) In case the alarm is triggered, establish the cause quickly and eliminate the problem.

(4) The operator must visually check at regular intervals that the "in operation" lamp is working.

(5) The leak detector must be disconnected from the mains for any repair work.

(6) Current interruptions are indicated by the "in operation" lamp going out. The alarm is triggered via the potential-free relay contacts (if these are used for forwarding the alarm).

7.2. Maintenance

(1) Maintenance work and functional tests may only be carried out by qualified persons[10].

(2) The equipment must be checked once every year for functional and operational safety.

(3) Check the test valve at the end of the pipework away from the leak detector for airtightness and cleanliness.

(4) Pressure build-up in the interstitial space to nominal pressure.

(5) The extent of the annual tests is described in chapter 7.4.

(6) It must also be ensured that the conditions described in chapter 5 are being observed.

[10] For Germany: person having qualified knowledge in the area of assembly and service of leak detection systems or under the responsibility of a qualified person, according to current regulations.

7.3. Use for intended purpose

- Underground double-wall pipework.
- Feed pressure in the inner tank must be at least 1 bar lower than the minimum alarm pressure.
- Pipework must be grounded according to valid regulations[11]
- Leak detector system must be airtight according to the specifications in chapter 7.4.4.
- Leak detector must be assembled outside the potentially explosive area.
- Ducts for the connecting pipe(s) must be sealed airtight.
- Leak detector (electric) must not be connected so that it can switch off.

7.4. Functional test

Test of the functional and operating safety must be carried out after

- every start up
- stipulations of chapter 7.2 in the time intervals given there[12]
- every case of trouble-shooting

7.4.1 Extent of the test

(1) If necessary, discuss the tasks to be carried out with the person responsible on-spot.

(2) Heed the safety instructions regarding contact with the stored goods present.

(3) Check the through connections of the interstitial space (chapter 7.4.2)

(4) Test the switching values (chapter 7.4.3)

(5) Check air-tightness (chapter 7.4.4)

(6) Create operating conditions (chapter 7.4.5)

(7) A qualified person must fill out a test report confirming function and operational safety.

7.4.2 Checking the through of the interstitial space

If several interstitial spaces are connected, each individual interstitial space (strand) must be checked for through connections.

(1) Close both shut-off cocks. Insert test pressure gauge in coupling 51, connect testing device to coupling 6.2 (cf. P-115 520 no. I). The measuring gauge now indicates the current pressure in the interstitial space.

(2) Open the test valve of the first pipework connected.

(3) Determine drop in pressure on the measuring gauge.

(4) Close the test valve.

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

[12] For Germany: regional-specific legal regulations must also be taken into account (e.g. VAwS)

(5) Repeat the procedure from items (2) to (4) for each further test valve of the pipe(s) connected to this leak detector.

(6) Connect the pressure tank to coupling 6.1.

(7) Set the pressure regulating valve to nominal pressure.

(8) Open the shut-off valve on the pressure reducing device.

(9) Open shut-off cock 2.2.

(10) Pressure build-up up to nominal pressure; during the filling process, check the pressure on the pressure reducing device (testing pressure must not be exceeded) and readjust if necessary.

(11) When nominal pressure has been reached, close shut-off cock 2.2.

(12) Close the shut-off valve on the pressure reducing valve, remove the testing device from the coupling, remove the test pressure gauge and the pressure tank from the testing device.

7.4.3 Testing the switching values

(1) Close both shut-off cocks of the testing device. Insert the test pressure gauge into coupling 51, connect the testing device to coupling 6.2 (cf. P-115 520)

(2) Set the pressure regulating valve to nominal pressure.

(3) Open the shut-off valve on the pressure reducing device.

(4) Open shut-off cock 2.1 until the alarm is triggered (optically and acoustically), note the value.

(5) Close shut-off cock 2.1.

(6) Compare the value measured with the specification. The test is considered passed if the measured value for "alarm ON" is greater/equal to the one specified[13].

(7) Open shut-off cock 2.2.

(8) Pressure build-up up to nominal pressure, during the filling process, check the pressure on the pressure reducing device (testing pressure must not be exceeded) and readjust if necessary.

(9) When nominal pressure has been reached, close shut-off cock 2.2.

(10) Repeat items (7) to (9) several times if necessary until all possible pressure compensation processes have been completed.

(11) Close the shut-off valve on the pressure reducing device, remove the testing device from the coupling, remove the test pressure gauge and the pressure tank from the testing device.

7.4.4 Testing the air-tightness[14]

[13] If the pressure switch has to be readjusted, proceed according to chapter 6.2.

(1) Insert the test pressure gauge in test coupling 51, connect the testing device to coupling 6.2 (cf. P-115 520 no. I).

(2) The current pressure is indicated on the test pressure gauge.

(3) Any deviations in pressure must be assessed as follows:

(4) Determine the difference between nominal pressure and the value "alarm ON" and convert to mbar (x 1000).

(5) Divide the resulting value of item (4) by 365. The result of this calculation is the maximum value tolerated (per 24 h) in order not to have the alarm triggered within a period of one year.

(6) Further division by 24 indicates the permissible drop in pressure per hour.

(7) If the pressure value calculated in item (6) can no longer be measured with the measuring gauge, this value can be multiplied by 3, for example, which is then the specification for the air-tightness test in mbar per 3 hours. If necessary, much longer test times must be used.

(8) The above-mentioned values should be reached in order to guarantee one year of trouble-free operation.

(9) Once the air-tightness test has been completed, remove the testing device from the connection, remove the test pressure gauge from the testing device.

7.4.5 Establishing the operating condition

(1) Seal the housing, "acoustic alarm" switch and test valve(s) at the end of the pipework away from the leak detector.

(2) If there are shut-off cocks being used in the connecting pipes these must be sealed open (provided they are connected to interstitial space).

7.5. Alarm

(1) In case of alarm the red signal lamp 1 lights up and the acoustic signal 69 sounds.

(2) Remove the lead on the "acoustic alarm" switch, turn off the acoustic alarm and inform a qualified company immediately.

(3) The expert from the qualified company or the operator must establish why the alarm was triggered, eliminate the problem and then check that the leak detection system is functioning correctly as described in section 7.4.

8. Dismantling

Special attention must be paid to the following points when dismantling equipment which could be potentially explosive:

[14] In this chapter it is assumed that the nominal pressure is built up in the interstitial space and pressure compensation has taken place.

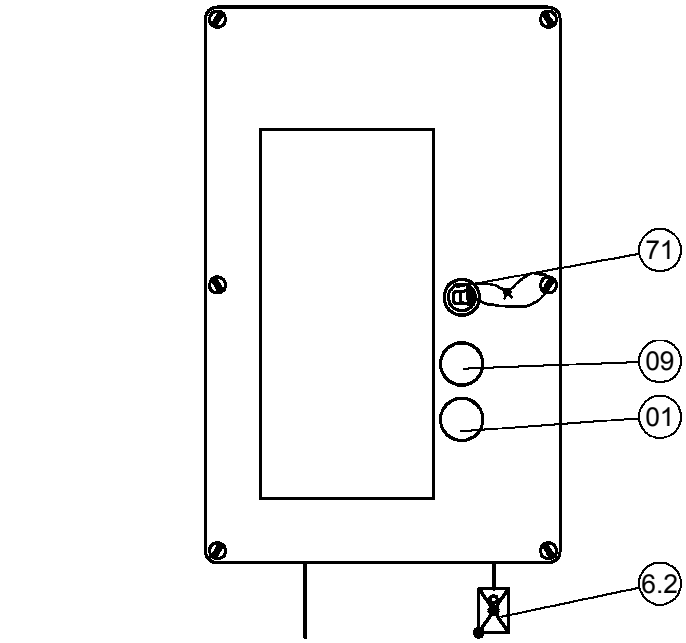
- Check there is no gas around before and during work.
- Close openings through which an explosive atmosphere can escape absolutely gastight.
- Do not carry out dismantling work with tools which cause sparks (saw, parting-off grinder…). If it should be unavoidable, pay particular attention to EN 1127.
- Avoid electrostatic charge (e.g. cause by rubbing).
- Dispose of contaminated components (possible gas evolution) properly.

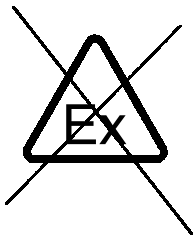
9. Marking

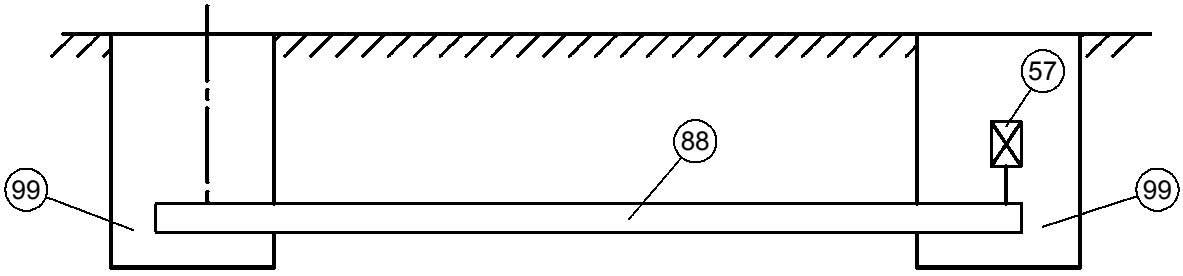
- Electrical data
- Serial number
- Type description
- Date of manufacture (month / year)
- Manufacturer's mark
- Statutory marks
- Connecting pipe(s) can be connected to areas requiring category 3 (Group II (G)) devices.

10. Abbreviations

01	Signal lamp "alarm", red
2.1	Shut-off cock, vent
2.2	Shut-off cock, press
09	Signal lamp "in operation", green
6.1	Coupling, testing device
6.2	Coupling, leak detector
51	Test coupling
55	Overpressure switch, alarm
57	Test valve
59	Relay
69	Buzzer
71	"Acoustic alarm" switch
88	Double-wall pipework (underground)
71	"Acoustic alarm" switch
73	Interstitial space
99	Inspection chamber







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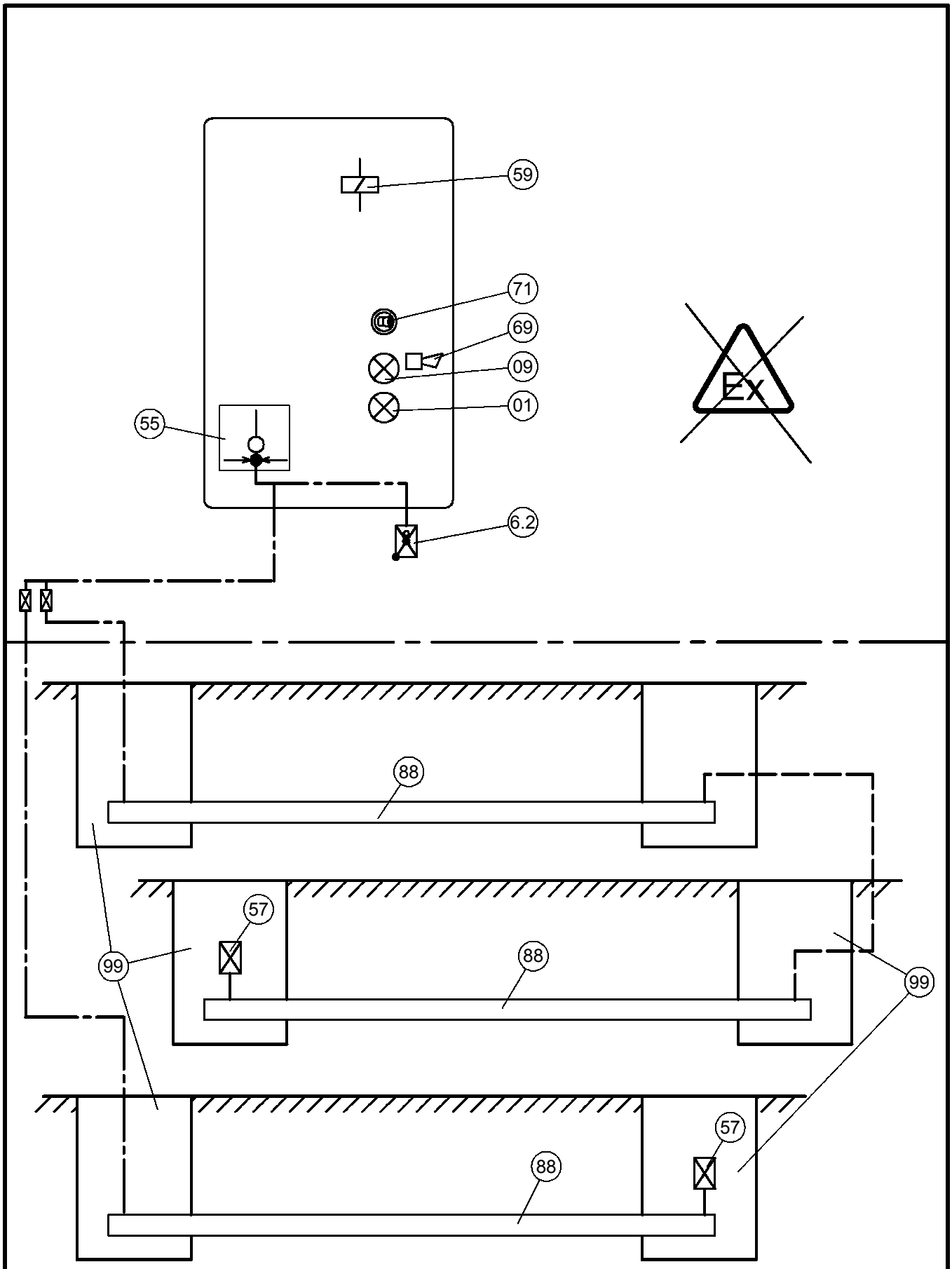
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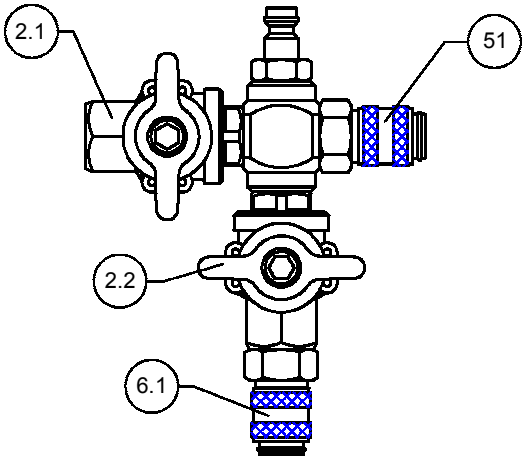

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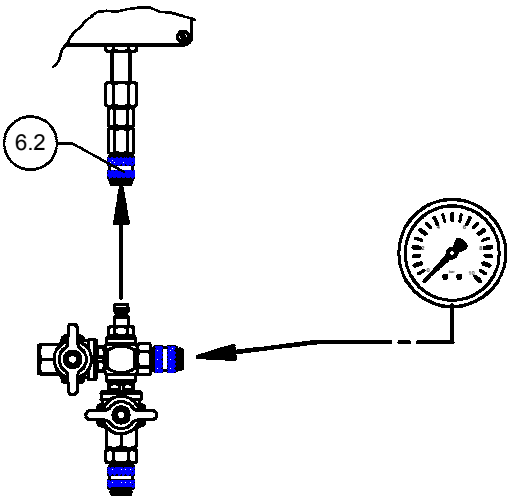

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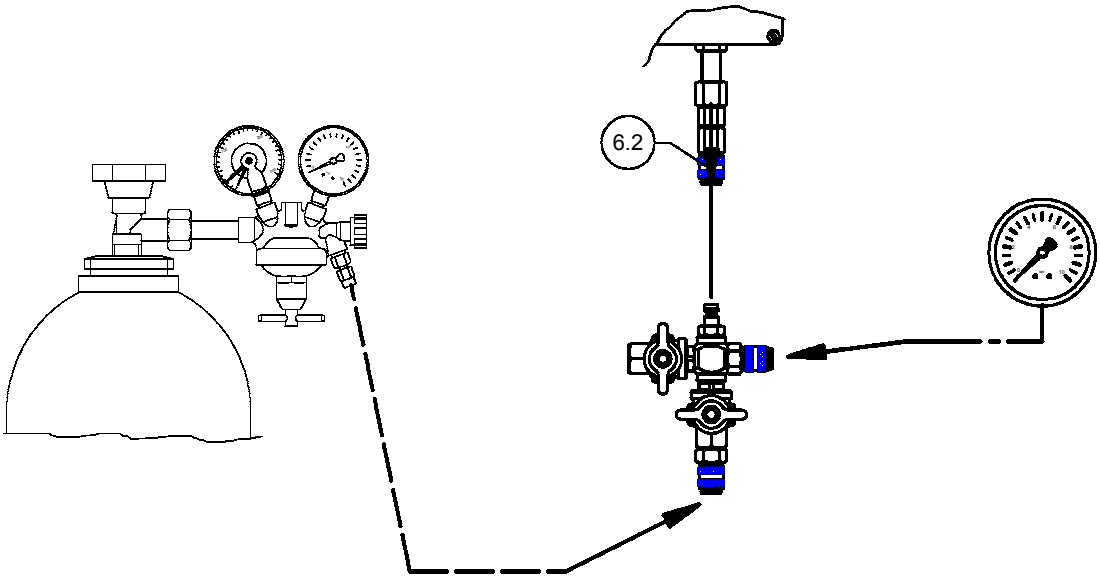

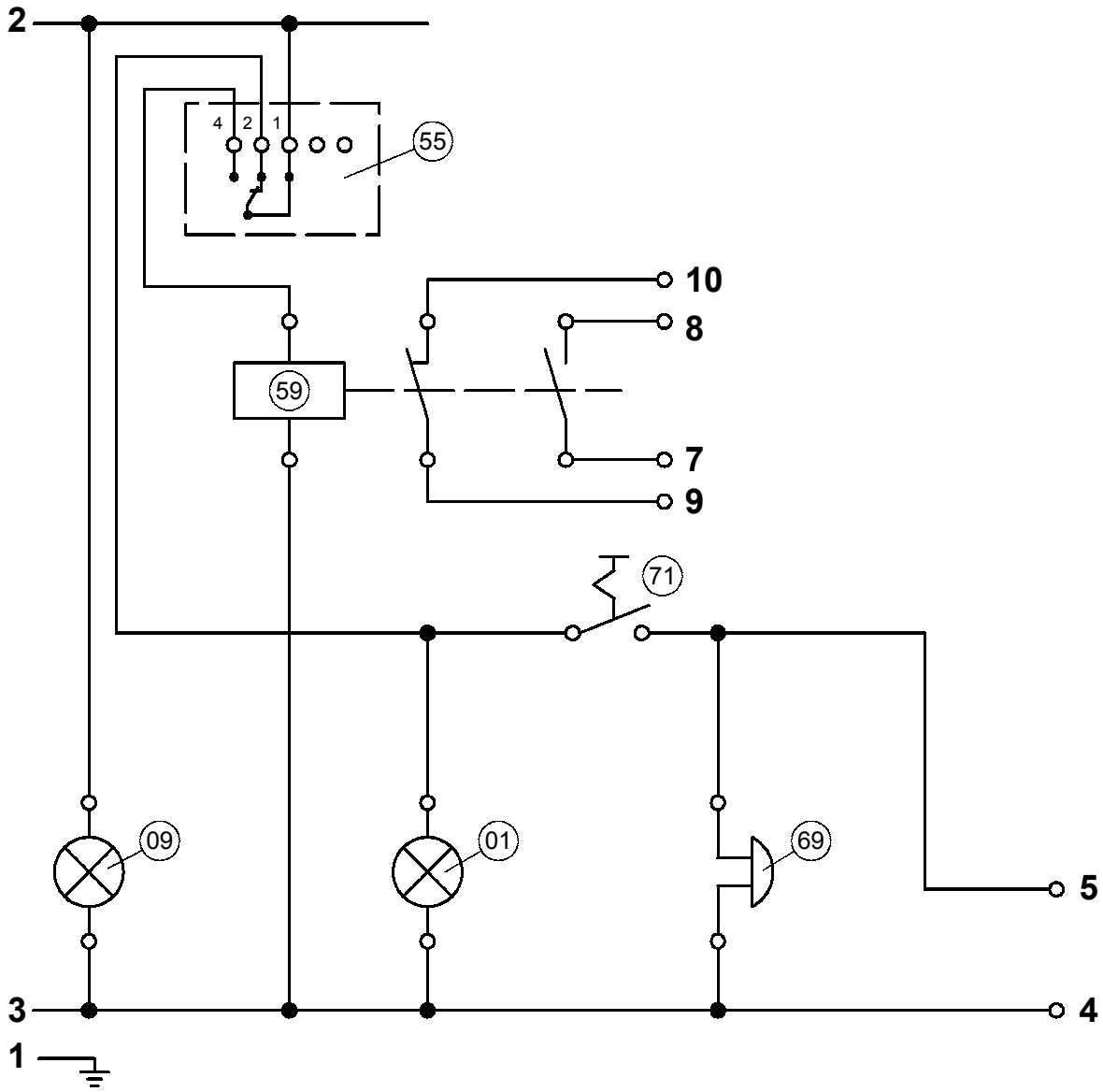
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Technical data

1. Electrical data (voltage version: see type plate!)

Electrical supply (without external signal)		230 V – 50 Hz – 10 W 115 V – 60 Hz – 10 W 24 V (=) - 10 W 12 V (=) - 10 W
Switch contact load, terminal strips AS		max. 50 VA
Switch contact load, potential-free contacts	max.: min.:	230 V – 50 Hz – 8 A 5 V – 5 mA
External fuse of the leak detector		max. 10 A
Overvoltage category		2

1.1. Terminal assignment ~

1	Ground
2	Phase
3	Neutral
4 & 5	External signal (voltage in case of alarm)
7 & 8	Potential-free contacts, contact open in case of alarm (and power failure)

1.2. Terminal assignment =

2	Plus +
3	Minus -
4 &. 5	External signal (voltage in case of alarm)
7 & 8	Potential-free contacts, contact open in case of alarm (and power failure)

2. Pneumatic data (requirements concerning the test measuring gauge)

Nominal size	min. 100
Accuracy class	min. 1.6
Scale end value	adapted to pressure stage

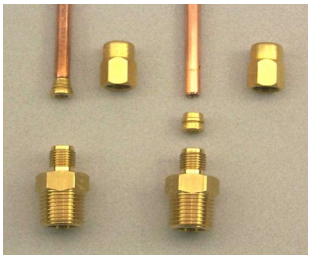
Work Sheet: AB-820 500

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

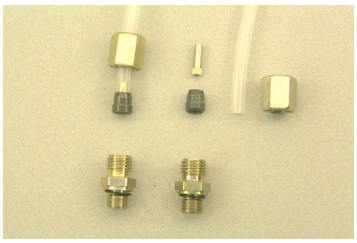
2 Clamping ring threaded fitting for plastic and metal pipes



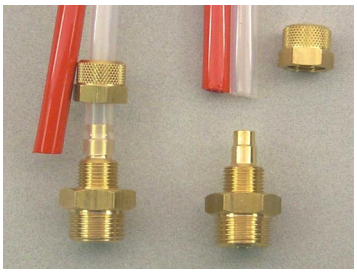
1. Insert the support sleeve into the end of the pipe
2. Insert the pipe with support sleeve as far as it will go
3. Tighten the thread until strong resistance can be clearly felt
4. Lightly loosen the nut
5. Tighten the nut until resistance can be felt (nut must exactly match the thread of the basic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



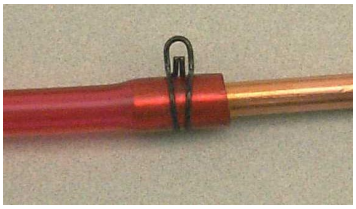
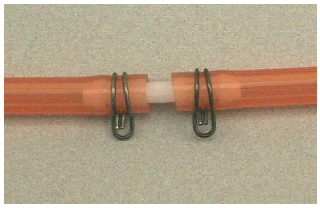
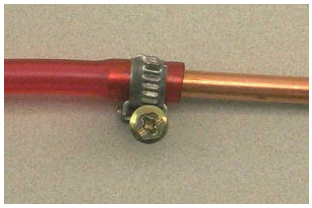
4 Quick-action fitting for PA- and PUR-tubes



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.

DEUTSCHES INSTITUT FÜR BAUTECHNIK

Anstalt des öffentlichen Rechts

(German Institute for Constructional Engineering)

10829 Berlin, June 26, 2001
Kolonnenstraße 30 L
Telephone: (030) 78730-315
Fax: (030) 78730-320
Ref.: III 15-1.65.26-45/01

General Approval of the Building Inspection Authorities

Approval no.: Z-65.26-304

Applicant: Sicherungsgerätebau GmbH
Hofstr. 10
D-57076 Siegen

Subject of approval: Leak detector types "DLR-2/11" and "DLR-2/22" forming part of a leak detector device for double-wall pipework in equipment used for the storage, filling and transfer of liquids hazardous to water, functioning according to the overpressure system with inert gas

Validity: June 30, 2006

The Building Inspection Authorities herewith issue general approval for the a/m device. The present approval comprises five pages and two appendices.

I. SPECIAL PROVISIONS

1 Subject of approval and field of application

1.1 The subject of this general approval is an overpressure leak detector of the type designation "DLR-2/11." or "DLR-2/22". It works with inert gas, e.g. nitrogen, without a firmly installed pressure tank and comprises a pressure absorber for controlling the alarm signal, display and warning units as well as one connection each for the connecting pipe to the interstitial space of the double-wall pipework and for feeding inert gas including a test pressure gauge. Leaks in the walls of the interstitial space are registered by means of falls in pressure and then indicated optically and acoustically (for the design of the leak display units see Appendix 1).

1.2 The leak detector "DLR-2/." may be connected the interstitial space of double-wall pipework laid underground or overground in tempered rooms. The overall monitoring volume of all the double-wall pipework connected must not exceed 10 m³ and the length of the pipework to be monitored should not exceed 1200 m. The leak detector may only be connected to interstitial spaces of double-wall pipework which is suitable for the storage of liquids hazardous to water. These are interstitial spaces of double-wall pipework with proof of suitability awarded by the Building Inspection Authorities.

1.3 This present general approval only serves to prove the functional safety of the subject of approval in the sense of paragraph 1.1.

1.4 The general approval is granted regardless of testing or approval reservations of other legal areas (e.g. 1st Directive to the device safety law - low-voltage guideline -, Law governing electromagnetic compatibility of devices - EMVG guideline, 11th Directive to the device safety law - explosion protection directive -).

1.5 This general approval of the building authorities means that the determination of suitability and type approval of the subject of approval in terms of water regulations according to § 19 of the Water Resources Law is not applicable.

2 Regulations applicable to the subject of approval

2.1 Composition

2.1.1 The subject of approval consists of the overpressure leak detector of the type "DLR-2/11" and the type "DLR-2/22" including the parts listed in paragraph 1.1.

2.1.2 The proof of functional safety of the subject of approval in the meaning of paragraph 1.1 is assured by the "Zulassungsgrundsätzen für doppelwandige Rohrleitungen (ZG-LAGR)" *("Principles for Approval for Leak Detection Devices for Double-wall Pipework"*) issued by the German Institute for Constructional Engineering in August 1994.

2.2 Manufacture and marking

2.2.1 Manufacture

The leak detector shall be manufactured only in the applicant’s manufacturing shops. Its design, dimensions and materials shall be in accordance with the specifications described in appendix 2 of the present general approval.

2.2.2 Marking

The manufacturer shall place the conformity mark on the leak detector, on the packing of the leak detector or on the delivery note. The conformity mark shall be in accordance with the relevant codes of the different states. Such marking is only valid if the conditions as per paragraph 2.3 have been complied with. In addition, the leak detector shall be marked with the following data:

Type designation
Approval number.

2.3 Certificate of conformity

2.3.1 General

Conformity of the leak detector with the provisions of the present general approval must be confirmed by the manufacturer's declaration of conformity, issued on the basis of in-house production inspection and testing and initial testing of the leak detector by an authorised technical control board.

2.3.2 In-house production inspection

The manufacturer shall implement and carry out in-house production inspection. In the course of such in-house inspection, every leak detector or its components shall be checked. By means of such individual checks the manufacturer shall ensure that materials, dimensions, tolerances and design correspond to the approved sample, and that the leak detector is reliable.

The results of in-house inspection shall be recorded and evaluated. The records should contain the following details as a minimum:

- designation of the leak detector
- type of in-house inspection or testing
- date of manufacture, inspection and testing of the leak detector
- results of inspection and testing
- signature of the person responsible for in-house inspection and testing.

The records shall be kept on file for at least 5 years. Upon request , they shall be presented to the German Institute for Constructional Engineering and the Building Inspection Authorities.

In the event of inadequate test results, the manufacturer shall immediately take appropriate remedial action. Leak detectors that do not meet the requirements shall be separated so as to avoid confusion with satisfactory units. After repair - if possible and necessary from a technical point of view - the leak detector shall be re-tested.

2.3.3 Initial testing of the leak detector by an authorised technical control board.

Initial testing shall comprise the functional checks as defined in the approval principles for leak detectors on tanks. If the general approval of the Building Inspection Authorities includes checking of samples from current production, initial testing as described herein is not necessary.

3 Conditions relating to the design

3.1 Care must be taken that the subject of approval and the interstitial space are sufficiently resistant to the liquids to be stored and that the liquids hazardous to water do not react with the inert gas.

3.2 The necessary monitoring pressures for the leak detectors type "DLR-2" will be set individually by the manufacturer depending on the permissible operating overpressure of the double-wall pipework.

4. Conditions relating to the construction of leak detectors

4.1 (1) Leak detectors should be installed in accordance with paragraph 5 of the technical specification[1] and commissioned in accordance with paragraph 6 of this technical specification. Installation, maintenance, repair and cleaning of the leak detectors shall only be carried out by specialist companies as per § 19 l of the Water Resources Law.

(2) Carrying out of the activities listed in (1) above by specialist companies is not required if such work is exempted from these rules, or if such work is carried out by in-house experts from the manufacturer of the subject of approval. This does not affect labour-protection regulations.

4.2 The leak detector must be installed in a room closed on all sides, it must not be installed and operated in a potentially explosive area. If it is not operated in a dry room it must be installed in a suitable switch box or switch cabinet which complies with at least protection type IP 54.

5. Provisions concerning use, maintenance and regular checks

The leak detector must be operated and maintained according to paragraphs 6 and 7 of the technical specification[1]. The technical specification[1] should be part of the manufacturer's supply.

By order

Strasdas

Authenticated

Official seal

Deutsches Institut für Bautechnik

German Institute for Constructional Engineering

[1] Technical specification "Overpressure leak detector DLR-2" of the applicant issued on Mai 15, 2001, tested by the TÜV Nord e.V.

DECLARATION OF CONFORMITY

This declaration applies for

PRESSURE LEAK DETECTORS
DLR-8, D-FFL 10, DLR-S, DLR-2, DLV-WKK

from the Company Sicherungsgerätebau GmbH
Hofstraße 10
D- 57076 Siegen

With this declaration, SGB confirms that the leak detectors specified above fulfill the protection requirements established in

EC Directive 89/336/EEC for alignment of the legal regulations of the member states regarding electro-magnetic compatibility and in the German law on electromagnetic compatibility (EMC) dated 9 November 1992 (§ 4 Para. 1).

This declaration applies for appliances produced according to the documentation (technical description, drawing(s) – which are constituents of this declaration.

The following declarations were used for evaluation of the products in terms of its electromagnetic compatibility:

- EN 50 082-1: 1992
- EN 55 014: 1993
- EN 61 000-3-2: 1995
- EN 61 000-3-3: 1995

EC Directive 73/23/EEC for alignment of the legal regulations of the member states regarding electrical operating equipment for use within certain voltage limits and defined in the 1st Code on the Equipment Protection Law dated 11 June 1979.

This declaration applies for appliances produced according to the documentation (technical description, drawing(s) – which are constituents of this declaration.

The following declarations were used for evaluation of the products in terms of use within certain voltage limits:

- EN 60 335-1:1988
- EN 61 010-1:1993 (IEC 1010-1:1990 + A1:1992, modified)

EC Directive 94/9 EEC for alignment of the legal regulations of the member states for equipment and protective systems for intended use in explosion hazard areas or in the 2nd Code on the Equipment Protection Law dated 12 December 1996.

The leak detector may be connected with its pneumatic components to monitoring chambers of tanks requiring equipment regarding category 3. This declaration applies for appliances produced according to the documentation in accordance with internal QM documentation (technical description with drawings) – which are constituents of this declaration.

Evaluation of the product was accomplished. The following documents were used for this purpose:

- EN 1127-1:1997
- EN 13463-1:2001
- EN 13160-1:2003

The ignition hazard analysis / risk evaluation indicated no further hazards.

Siegen, 4 July 2003

Martin Hücking, Development, Explosion protection representative

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

Sicherungsgerätebau GmbH
Hofstraße 10 - D - 57076 Siegen
☎ +49 / 271 / 48964 - 0
Fax: +49 / 271 / 48964 - 6