Documentation

Leak Detection Unit LDU14 T.. / P.. (../..)

For tanks and pipes at petrol stations

Please read the instructions before commencing any work

Date 11/2021

Article no.: 603322

Contents

1. General

1.1 Information

This manual provides you with important information for handling the LDU14 .. overpressure leak detector in the models
LDU14 T.. (..) for tanks;
LDU14 P.. (..) for pipes
LDU14 T.. / P..(../..) combined for tanks and pipelines.

(Place holders .. stand for the respective alarm pressure of the leak detector, values in brackets stand for the number of interstitial spaces connected. Examples: LDU14 T330 (6), LDU14 T330 / P1.1 (3/6)).

The precondition for safe working is compliance with all the specified safety information and instructions for action.

In addition, all the applicable local accident protection regulations and general safety instructions must be complied

1.2 Explanation of symbols

In this manual, warning information is indicated by a symbol alongside it.

The signal word expresses the level of risk.

DANGER:
An immediately dangerous situation, which will lead to death or serious injuries if not avoided.

WARNING:
A possibly dangerous situation, which could lead to death or serious injuries if not avoided.

CAUTION:
A possibly dangerous situation, which could lead to minor serious injuries if not avoided.

Information:
Highlights useful tips, recommendations and information.

1.3 Liability waiver

All the data and information in this documentation was compiled using the applicable standards and regulations, the state of the art and our long-term experience into account.

SGB will not accept liability for:

- Non-compliance with this manual
- Improper use
- Use by unqualified personnel
- Unauthorized modifications
- Connection to systems not approved by SGB

1.4 Copyright

1.5 Warranty conditions

We provide a 24-month of warranty for the LDU14 .. leak detector according to our Terms and Conditions, starting from the day of installation.

The warranty period ends 27 months after the date of sale at the latest.

Before a warranty claim can be made, the functional report/test report that details the first commissioning by trained staff must first be submitted. The serial number of the leak detector must also be specified.

The warranty is rendered null and void in the event of:
- faulty or improper installation
- improper operation
- modifications/repairs made without the manufacturer's consent.

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

1.6 Customer service

Our customer service department is available to provide you with information.

A list of contact persons can be found online at sgb.de/en or on the label of the detector unit.

2. Safety

2.1 Proper use

WARNING!

Danger from misuse

- Interstitial spaces can only be joined together if they are **underground**. Only tank interstitial spaces are joined and only pipeline interstitial spaces. Joining tank interstitial spaces to pipe interstitial spaces is not permitted.
- The leak detector LDU14 T330 is only for interstitial spaces of double-walled tanks which are at least 500 mbar resistant to overpressure. The pressure on the base of the tank resulting from liquid pressure and overlay pressure must not exceed 300 mbar.
- The leak detector LDU14 P1.1 is only for double-walled pressureless pipes with interstitial spaces that are at least 5 bar resistant to overpressure.
- The leak detector LDU14 P2.0 is only for double-walled pressureless pipes with interstitial spaces that are at least 5.0 bar resistant to overpressure, with maximum pressure in the inner pipe of 1 bar.
- The leak detector LDU14 P3.5 is only for double-walled pressureless pipes with interstitial spaces that are at least 5.0 bar resistant to overpressure, with maximum pressure in the inner pipe of 2.5 bar.
- Immersion pipes on pressure pipelines should be switched off in the event of alarm on the leak detector LDU14 P.. using the potential-free relay contact.
- In the inner category 2/3, the LDU14 .. meets therefore only connection of the corresponding suitable interstitial spaces (zone I, II or no explosion zone)
- Possible vapours of the stored good are classified in the explosion group II A to II B and temperature class T 1 to T3. Vapours are heavier than air
- Area of application only at petrol stations for fuels according to EN 228:2008 and Ad Blue
- Earthing PA according to applicable regulations (e.g., EN 1127)
- Tightness of the interstitial spaces according to this documentation
- The total volume of the interstitial spaces for tanks or pipelines does not exceed 4,000 litres in each case.
- Assembly only outside the explosive area
- Environmental temperature -10°C to max. +60°C
  with heating -40°C to +60°C
- Seal empty pipes for passing through the pneumatic connection lines in manhole or inspection shafts and the electrical connection lines so that they are gas-tight
- Power connection cannot be switched off

Any claims resulting from improper use will not be accepted.

Pressure fluctuations in the interstitial space should be largely excluded to prevent any possible heating (for example, while filling) exceeding 20°C for tanks and 30°C for pipes.

CAUTION: The device may not be adequately protected if it is not used as specified by the manufacturer.

2.2 Responsibility of the operator

The leak detector LDU14 T / P is used in commercial applications. This means that the operator is subject to the statutory workplace safety obligations.

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

- Compilation of a risk evaluation and implementation of its results in operating instructions
- Checking regularly whether the operating instructions correspond to the current state of regulations
- Creating an alarm plan
- Instigation of an annual function check

2.3 Qualification

WARNING!

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

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

Operating companies putting this leak detector into operation should have attended the appropriate training course provided by SGB or an authorized representative.

National regulations must be observed.

For Germany:

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

2.4 Personal Protective Equipment (PPE)

Personal safety equipment must be worn during work.

- Wear the necessary safety equipment for the appropriate work
- Observe and comply with any signs concerning PSE

Entry in the "Safety Book"

Wear a warning vest

Wear safety shoes

Wear a protective helmet

Wear gloves - where necessary

Wear protective goggles - where necessary

2.5 Basic hazards

DANGER:

From electric current

When working on the electrics of the LDU14 T / P (upper area of the leak detector), switch off the power supply.

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

CAUTION:

Through moved parts

If work is carried out on the pump unit, switch off the power supply. If this unit is opened as part of a functional test, sufficient distance must be kept from the moved parts.

DANGER

Through explosive vapour-air mixtures

Explosive vapour-air mixtures can occur in the lower part of the housing if the empty pipes to the shafts are not properly sealed to be gas-tight.

Explosive vapour-air mixtures can be present in the connecting pipes if there was no overpressure in the leak monitoring system for a time while there was a leak in an inner wall, or if vapours can penetrate the inner wall due to permeation.

Before carrying out work on the leak detector system, check that there is no gas present.

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

DANGER

From working in shafts

Leak detectors are mounted outside the manholes. The pneumatic connections to the interstitial spaces are usually installed in dome shafts or other shafts. Thus, the shaft is to enter for mounting.

Before entering shafts, the relevant safety measures must be taken, and shafts must be free of gas and have sufficient oxygen.

DANGER

In mixing up tubes

Pressure and measuring lines of tanks must not be mixed up with connecting lines to pipes.

3. Technical data of the leak detector unit LDU14

3.1 General data

Dimensions:	Height: 1202 mm, without assembly (flashing light)
	Width: 390 mm
	Depth: 320 mm
Weight LDU14 T330 / P3.5 (12/12):	approx. 48 kg
Storage temperature range:	-40°C to +70°C
Operational temperature range: With heating:	-10°C to +60°C -40°C to +60°C
Max. height for safe operation:	≤ 2000 m above sea level
Max. relative humidity for safe operation:	95 %

3.2 Electrical data

Power supply: optional:	100…240 VAC, 50/60 Hz 24 VDC
Terminals 11 to 13 (floating):	DC ≤ 25 W or AC ≤ 50 VA
Terminals 17 to 19 (floating):	DC ≤ 25 W or AC ≤ 50 VA
Fuse protection[1]:	max. 10 A
Degree of soiling:	PD2

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

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

Volume leak detector	< 0,25 litre for T < 0,25 litre for P
Max. operating pressure	see Chap. 3.4, switching values “Pump Off”

3.4 Switching values

LDU14 T280:	
Alarm ON	> 280 mbar
Pump OFF	< 330 mbar
Opening pressure overpressure valve:	360 ± 10 mbar
Closing pressure overpressure valve:	> Pump “ON”

[1] Note: Acts as a separating point for the device and should be attached as close as possible.

LDU14 T325:	
Alarm ON	> 325 mbar
Pump OFF	< 360 mbar
Opening pressure overpressure valve:	385 ± 10 mbar
Closing pressure overpressure valve:	> Pump “ON”
LDU14 T330:	
Alarm ON	> 330 mbar
Pump OFF	< 410 mbar
Opening pressure overpressure valve:	465 ± 20 mbar
Closing pressure overpressure valve	> Pump "ON"
LDU14 P1.1:	
Alarm ON	> 1.1 bar
Pump OFF	< 1.45 bar
For LDU14 P2.0:	
Alarm ON	> 2.0 bar
Pump OFF	< 2.4 bar
LDU14 P3.5:	
Alarm ON	> 3.5 bar
Pump OFF	< 4.4 bar
Opening pressure overpressure valve[2]:	4.6 +/-0.1 bar
Closing pressure overpressure valve[1]:	> Pump "ON"

Other switching values can be implemented on request.

3.5 Area of use

WARNING!

Please observe provisions according to use

Monitoring suitable double-walled tanks and suitable double-walled pipelines for storing and transporting mineral oil products that are normally used at petrol stations and Ad Blue

[2] This states the opening pressure for the overpressure valve at which the volume flow of the pump is blown off. The triggering pressure (first opening) is lower.

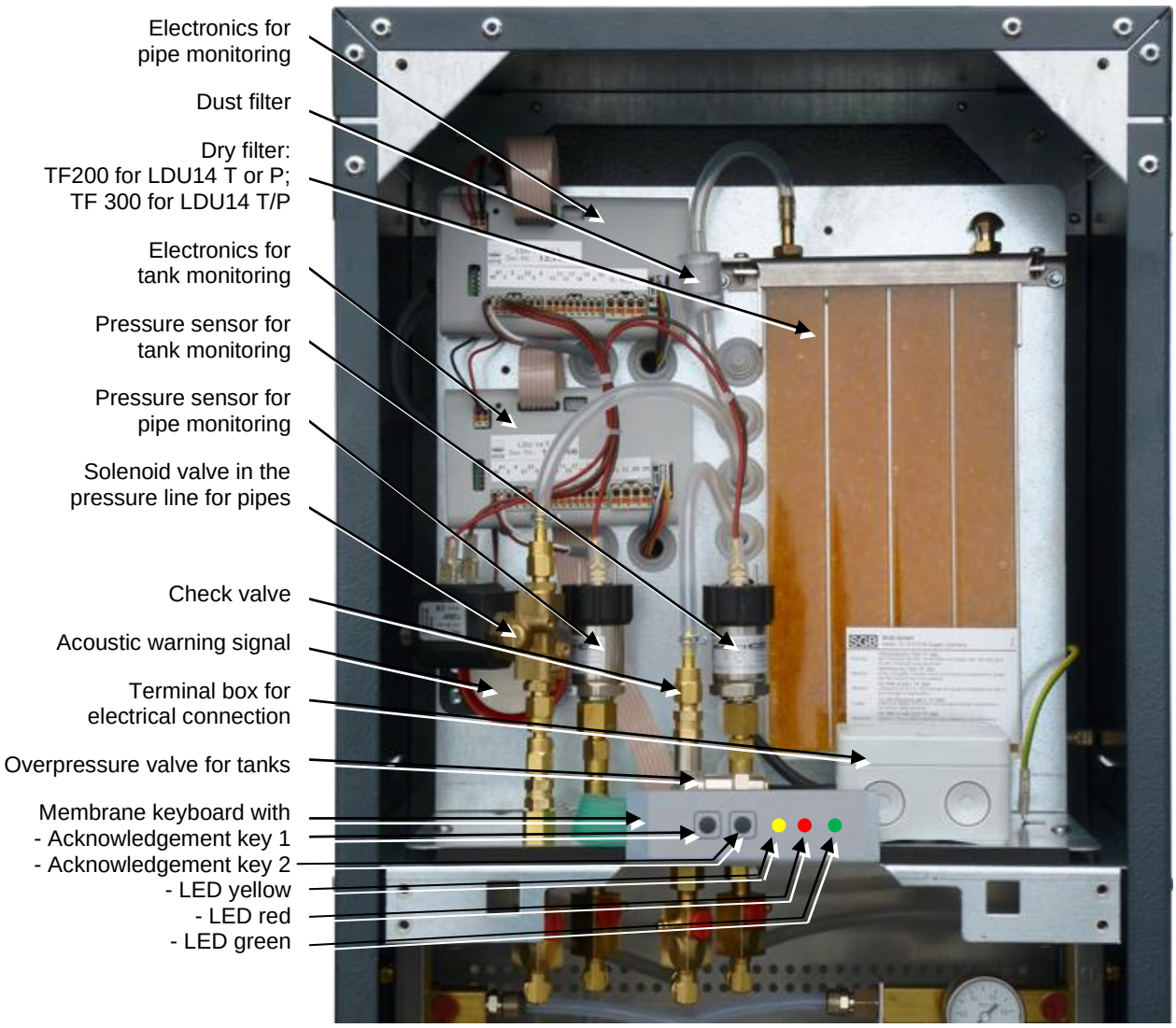
4. Structure and function

4.1 Structure of the system

The LDU14 T / P leak detector has two independent monitoring systems so that tanks and pipes can be monitored completely separately from each other. The electronic controls and overpressure pumps as well as the dry filters are located in the upper part of the housing.

4.1.1 Upper Section Front

The components, which are operated with low voltage, as well as the control, display and operating elements and the terminal box for the electrical connection, are located in the front part of the upper section.



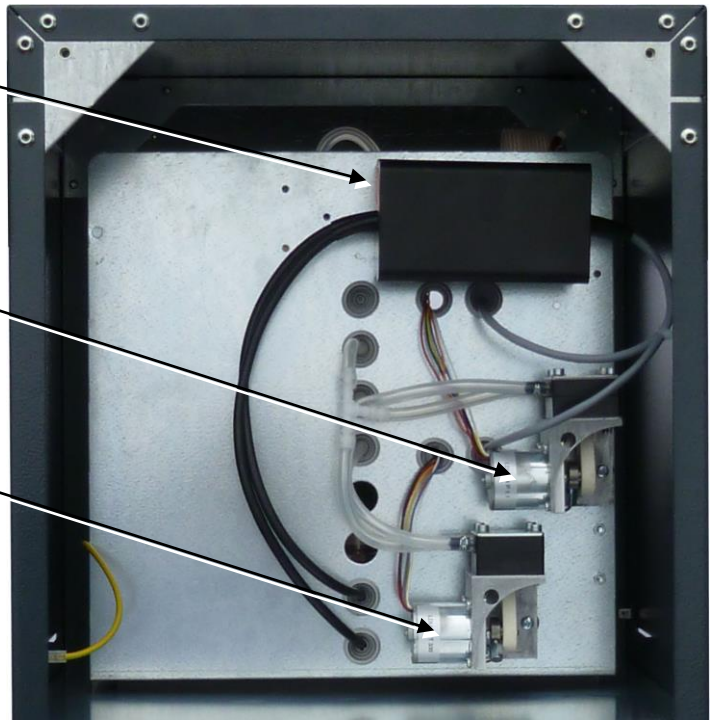
4.1.2 Upper Section Back

The power supply and pumps are located in the upper section in the rear part.

1 power supply unit LDU14 T or LDU14 P or 2 power supply units for LDU14 T/P (on top of each other)

Pump for pipe monitoring

Pump for tank monitoring



The assembly plate with the electronics and pumps can be removed for maintenance purposes at the front and hung in the housing with a hook.

NOTE:

When using the flashing light assembly, first disconnect the plug connections.

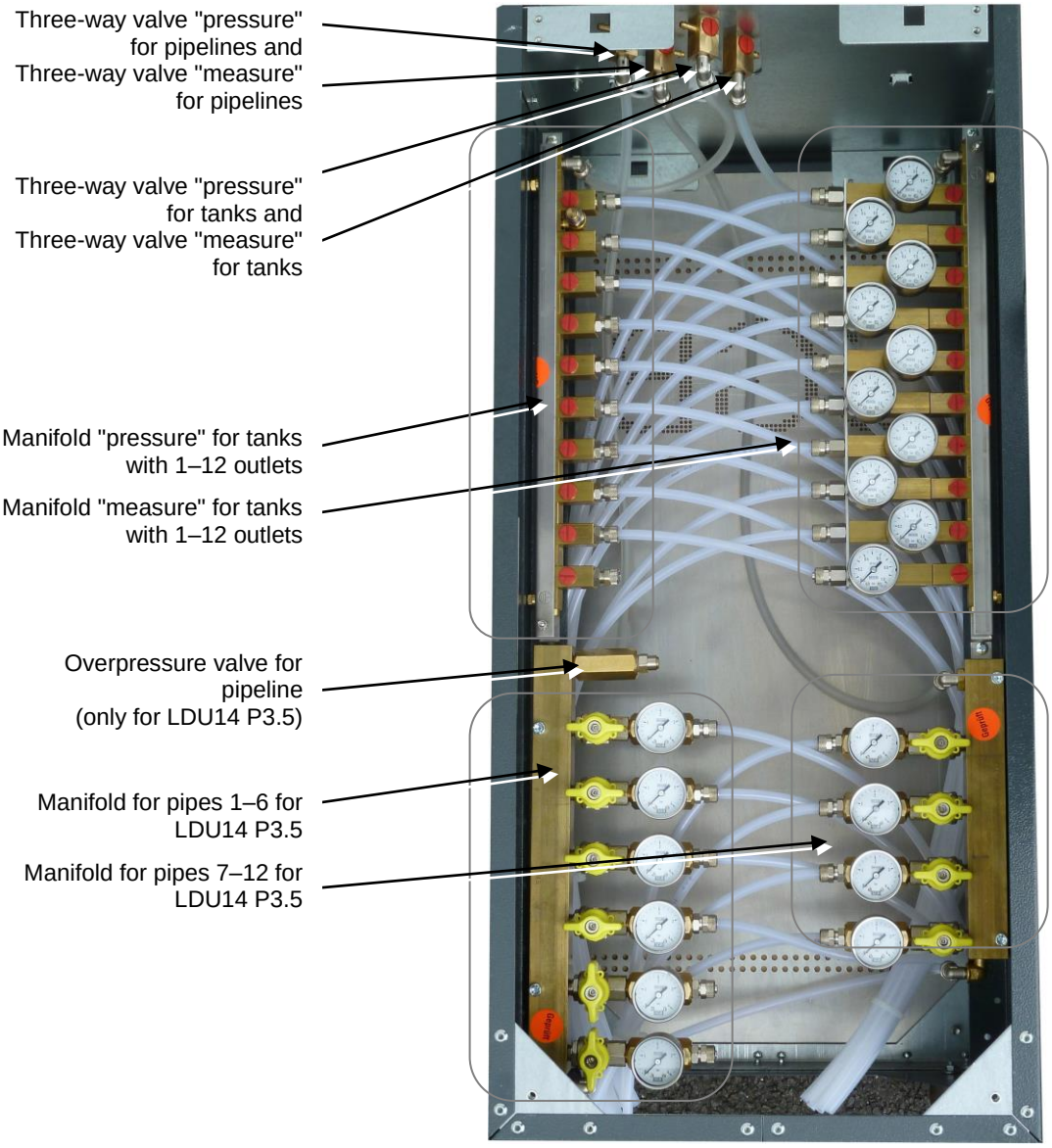
4.1.3 Lower Section

All the manifolds for connecting the interstitial spaces are located in the upper part of the housing.

Three-way valves in the pressure and measuring lines (mounted in the bottom of the upper housing section) are used to connect manometers or test devices for the annual functional tests.

The upper manifolds are for tanks; the pressure connections are on the left and the measuring connections on the right with a manometer in every terminal. The number of outlets can vary from 1 to 12.

The lower manifolds are for pipelines. On the left side, beginning with outlet 1 to 6 and on the right outlet 7 to 12 each with a stop cock and manometer. The number of outlets can vary from 1 to 12. The versions also vary in terms of pressure levels, the one illustrated here is for LDU14 P3.5.



4.2 Normal operation

Pressure monitoring for tanks:

The leak detector LDU14 T280 for tanks generates an operating overpressure of approx. 310 to 320 mbar. If the pressure falls due to a lack of tightness/leaks the alarm is triggered at the latest when the overpressure reaches 280 mbar.

The leak detector LDU14 T330 for tanks generates an operating overpressure of approx. 380 to 420 mbar. If the pressure falls due to a lack of tightness/leaks, the alarm is triggered at the latest when the overpressure reaches 330 mbar.

Pressure monitoring for pipes:

The leak detector LDU14 P1.1 for pipes generates an operating overpressure of approx. 1.4 to 1.6 mbar. If the pressure falls due to a lack of tightness/leaks, the alarm is triggered at the latest when the pressure reaches 1.1 bar.

The leak detector LDU14 P2.0 for pipes generates an operating overpressure of approx. 2.3 to 2.4 mbar. If the pressure falls due to a lack of tightness/leaks, the alarm is triggered at the latest when the pressure reaches 2.0 bar

The leak detector P3.5 for pipes generates an operating overpressure of approx. 4.0 to 4.4 mbar. If the pressure falls due to a lack of tightness/leaks, the alarm is triggered at the latest when the pressure reaches 3.5 bar.

Depending on the level of tightness of the monitoring system, the overpressure alternates between the Pump OFF switching value and the Pump ON switching value, with short pump running times and longer down times.

If the pumps come on frequently or also run continuously then this indicates that leaks are present which will require attention within due course.

Current interruptions are indicated by the operation lamp going out. The potential-free relay contacts open.

4.3 Dry filter

The dry filter dries the sucked in air to prevent any possible corrosion and condensation in the interstitial space. The drying material shows the saturation by a colour change from orange to white or clear. The dry filter is designed to last for a year if the equipment complies with its proper intended purpose or with sufficient tightness of the system.

The transport lock of the dry filter must be opened before commissioning the leak detector LDU14!

Sizes of the dry filter:

For LDU14 T and LDU14 P:	**TF 200**
For LDU14 T/P:	**TF 300**

Exchange or regenerate used drying material immediately!

4.3.1 Optional dry filter monitoring FC

- Function

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

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

For LDU14 T or LDU14 P, the visual message for the used dry filter is indicated by the yellow LED on the membrane keyboard on the front.

For the combined versions LDU14 T / P, the visual message for the used dry filter is indicated by the green LED flashing on the membrane keyboard on the front.

- Replacing the dry material

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

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

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

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

- Usage limits

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

1. The pump must run for at least 30 seconds in order to obtain a meaningful measurement. During or after commissioning of the leak detector, the time between pump ON and OFF should be measured to establish whether this minimum run time is achieved.
2. It is not possible to obtain meaningful measurement results at low temperatures (below 5°C). The measurement function is therefore deactivated below 5°C.

4.4 Overpressure valves

4.4.1 Tanks

The overpressure valve protects the interstitial spaces against unacceptably high overpressures. Rises in pressure in the interstitial space caused, for example, by temperature fluctuations lead to a discharge via the overpressure valve. (Never spray overpressure valves with leak detection spray or soapy water. Risk of sticking.)

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

4.4.2 Pipes

Types 1.1 and 2.0 do not feature any overpressure valves, as the pump delivery head is clearly below the test pressure of the pipe.

Type 3.5 has an overpressure valve which protects the interstitial space from unacceptably high pressure.

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

4.5 In the event of a leak

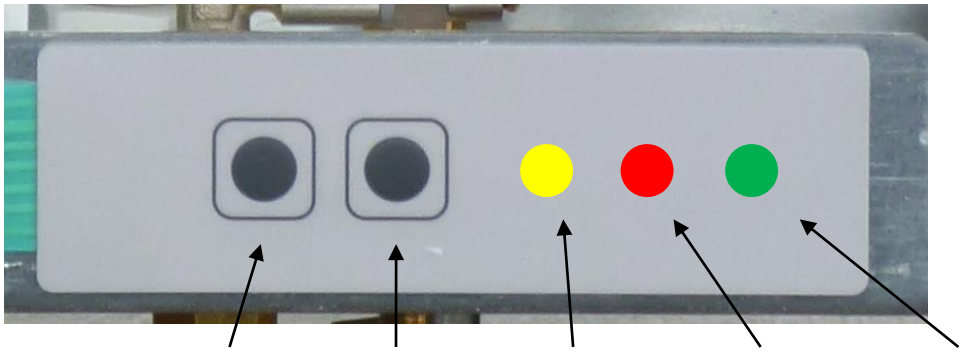
If a lack of tightness / leak occurs in one of the walls, the pressure in the system drops. The overpressure pump concerned switches on in order to restore the operating pressure. If the volume of air flowing out through the leak exceeds the limited conveying quantity of the pump, the pump continues to run.

Increasing leakage rates lead to a further fall in pressure (when the pump is running). When the Alarm ON switching value is reached, a visual and acoustic signal is triggered.

See Chapter 8 for the alarm display.

4.6 Description of the display and control elements

Membrane keyboard with display and control elements



Type LDU14..	Acknowledgement key 2	Acknowledgement key 1	LED yellow	LED red	LED green
T.. or P..	Without function	Acknowledgement of an acoustic leak alarm	Without function	Lights up if there is a **leak alarm** (flashes after acknowledgement)	Operating lamp: lights up if there is power supply
T.. FC or P.. FC with dry filter control FC	Acknowledgement of an acoustic dry filter message	Acknowledgement of an acoustic leak alarm	Lights up if there is a dry filter message	Lights up if there is a **leak alarm** (flashes after acknowledgement)	Operating lamp: lights up if there is power supply
Combined T../P..	Acknowledgement of an acoustic **tank** leak alarm	Acknowledgement of an acoustic **pipe** leak alarm	Lights up if there is a **tank** leak alarm (flashes after acknowledgement)	Lights up if there is a **pipe** leak alarm (flashes after acknowledgement)	Operating lamp: lights up if there is power supply
Combined T../P.. FC with dry filter control FC	Acknowledgement of an acoustic **tank** leak alarm and/or **dry filter message**	Acknowledgement of an acoustic **pipe** leak alarm	Lights up if there is a **tank** leak alarm (flashes after acknowledgement)	Lights up if there is a **pipe** leak alarm (flashes after acknowledgement)	Operating lamp: - lights up if there is power supply - flashes if there is a dry filter message

Switching off the acoustic alarm signal:
Press the respective acknowledgement button once briefly – the acoustic alarm signal switches off and the red or yellow LED flashes. Pressing the button again will switch on the acoustic signal.
This function is not available in normal operation or during malfunctions.

Testing the visual and acoustic alarm signal
Press the acknowledgement button 1 and keep it pressed (approx. 10 seconds) – the alarm signal is triggered until the button is released again.
This test is only possible if the pressure in the system has exceeded the "Alarm OFF" pressure level.

Resetting the dry filter alarm
Press the acknowledgement button 2 and keep it pressed until the dry filter message goes off.

Testing the leak-tightness of the monitored system for the LDU14 T and the LDU14 P models Press the acknowledgement button 1 and keep it pressed until the red LED flashes at high speed, then release the button. A value for the leak-tightness is indicated by the flashing light signal of the red LED. (See section 7.3.1) For this test the leak detector must have performed at least 1 automatic feed interval in normal operation (i.e., without being filled by an assembly pump) in order to obtain a valid result.

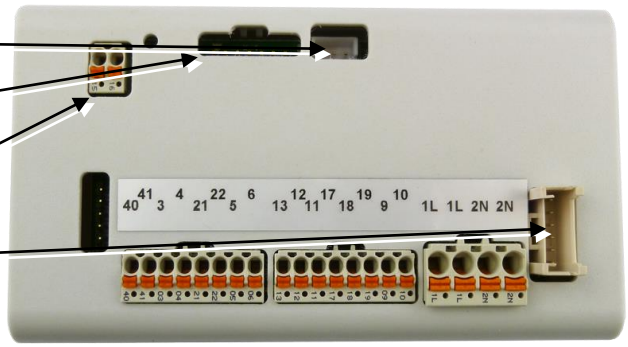
Testing the leak-tightness of the monitored system for the combined versions LDU14 T / P
There should be no dry filter alarm for this test.
Press the acknowledgement button 1 and keep it pressed until the red LED flashes at high speed, then release the button. A value for the leak-tightness is indicated by the flashing light signal of the red LED. (See section 7.3.1)

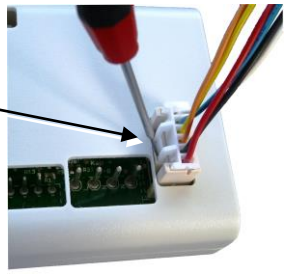
Press the acknowledgement button 2 for tanks and keep it pressed until the yellow LED flashes at high speed, then release the button. A value for the leak-tightness is indicated by the flashing light signal of the yellow LED. (See section 7.3.1)

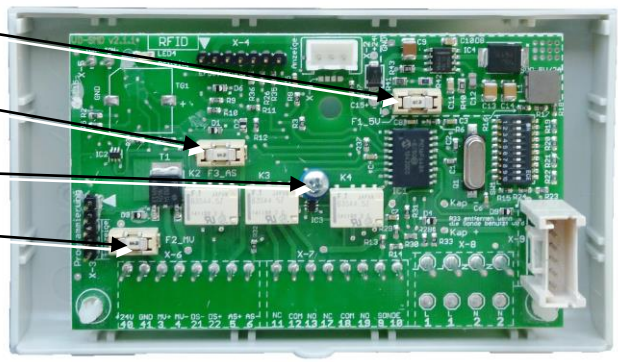
For this test the leak detector must have performed at least 1 automatic feed interval in normal operation (i.e., without being filled by an assembly pump) in order to obtain a valid result.

Electronic controls:

Electronic control boards are available to monitor leaks on both tanks and pipes.



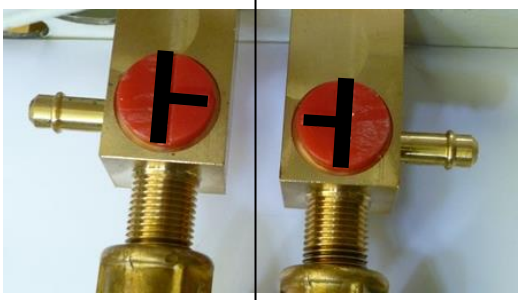




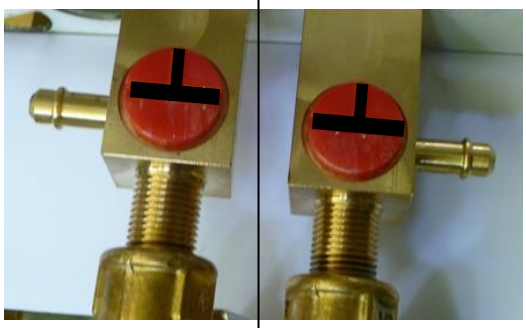
Three-way valves

For the simple operation and functional test, three-way valves for simulating a leak and for connecting measuring devices, pumps or testing devices are located in the pressure line and the measuring line for both tank monitoring and pipe monitoring.
The various positions are listed below.

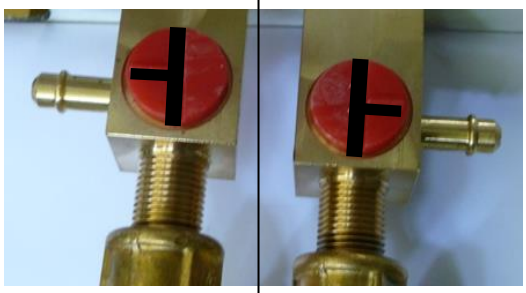
"Pressure" "Measure"



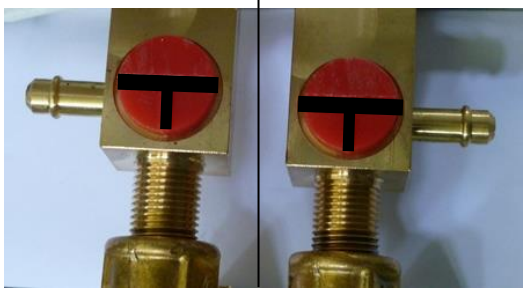
Position I
Operation position



Position II

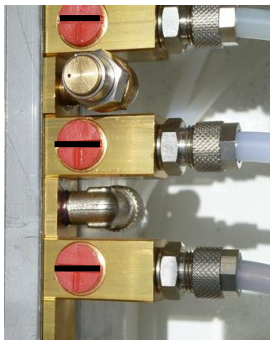


Position III

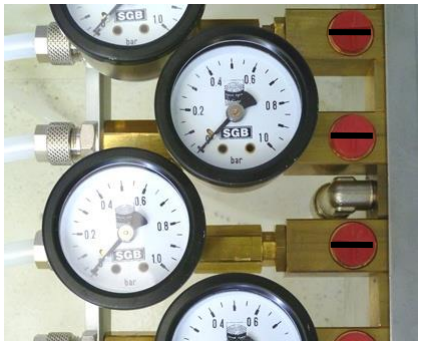


Position IV

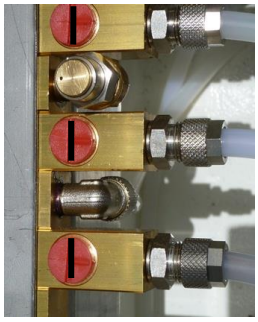
Manifolds for the connection of tanks and pipelines
How the various manifolds are arranged in the LDU14 is illustrated on page 12. The positions of the valves are listed below:



Manifold tank "Pressure" with overpressure valve and opened valves



Manifold tank "Measure" with opened valves



Manifold tank "Pressure" with closed valves

Manifold tank "Measure" with closed valves

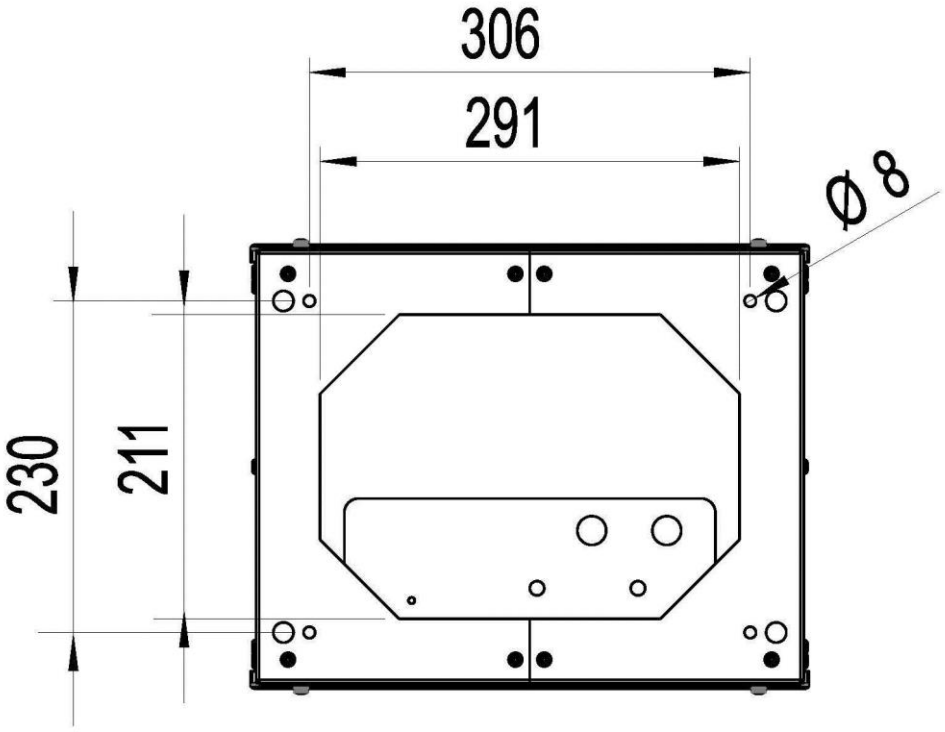
5. Installation of the system

5.1 General notes

- Before starting work, the documentation must be read and understood. If anything is unclear, please contact the manufacturer.
- The safety information in this documentation must be observed.
- Lead-throughs for pneumatic and electrical connection lines, through which an explosive atmosphere can spread, should be sealed so that they are gas-tight.

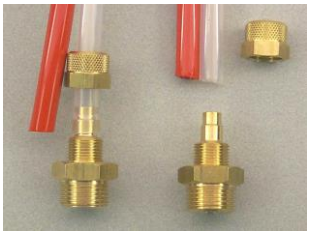
5.2 Housing LDU14

- **NOT in areas with an explosion hazard**
- The housing is mounted to a suitable stand at a convenient place outdoors as near as possible to the tanks and pipes. Natural ventilation must be present. From the middle of the stand, empty pipes should be laid to run the pneumatic connection cables to the respective shafts for connecting the interstitial spaces. A further empty pipe is provided for the electrical cabling.
- Dimensional drawing of the floor of the housing:



5.3 Pneumatic connection cables

- Polyamide or nylon 8/6 x 1 mm
- Resistance to the stored or conveyed product
- At least PN 6 over the complete temperature range.
- The full cross-section must be retained (do not bend).
- 50 m between the interstitial space and the LDU14 should not be significantly exceeded.
- For tanks we recommend marking the measuring line red
- In the protective pipe
- Seal the protective pipes so that they are gas-tight to prevent any explosive atmospheres from penetrating into the leak detector through the protective pipes.



Quick release screw connection for polyamide pipes:

1. Cut the pipe to length at a right angle
2. Unfasten the union nut and push it over the pipe
3. Push the pipe onto the nipple up to the start of the thread
4. Tighten the union nut by hand
5. Re-tighten the union nut with a screwdriver until there is a noticeable increase in force (approx. 1 to 2 turns)

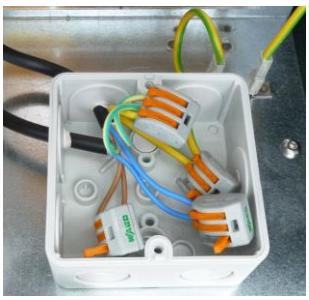
5.4 Electrical connection

Seal the protective pipes for electrical lines so that they are gas-tight to prevent any explosive atmospheres from penetrating through the protective pipes into the housing of the LDU14 and into buildings.

When using armoured cables, appropriate cable glands must be used to insert them into the upper part of the housing.

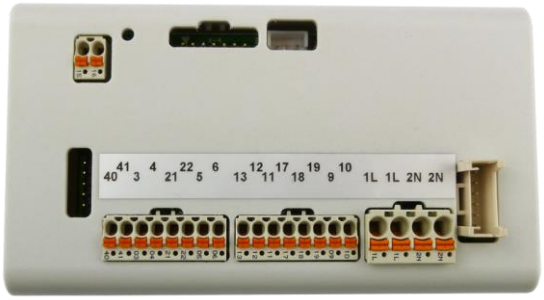
To integrate the leak detector into the potential equalisation, use the marked earth bolt in the lower part of the housing.

5.4.1 230-volt power supply



- Supply line: at least 3 x 1.0 mm^2
- Electrical connection occurs in the terminal box.
  Open the orange spring clip to connect (press clip upwards).
  Plug the wire (10 mm stripped) into the terminal.
  Close spring clip by pressing it down.

5.4.2 Potential-free relay contacts for alarm transmission



Potential-free relay contacts should be opened in the event of an alarm and in the event of a power failure.

Versions LDU14 T.. or LDU14 P..:
Potential-free contact on the terminals 11/12 (opens in the event of an alarm and in the event of a power failure)

Combined version LDU14 T../P..
On the electronics for both pipe and tank monitoring, the potential-free contacts are available in each on the terminals 11/12 (the pipe monitoring and/or the tank monitoring opens in the event of an alarm and in the event of a power failure).

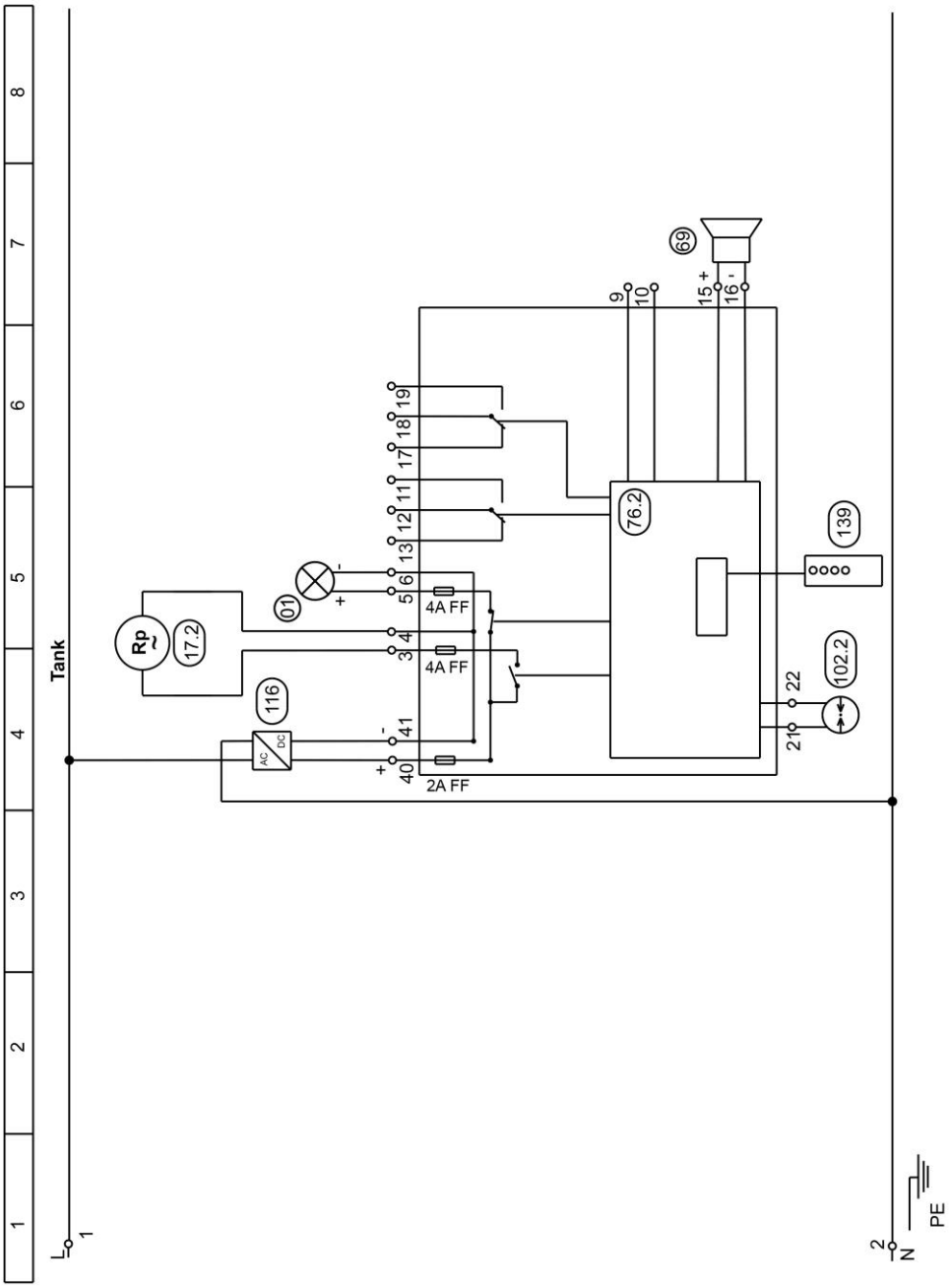
(The contacts 12/13 can be used in each case as a "closer" in the event of an alarm.)

5.4.3 Terminal diagram

Terminal 1 (L) / 2 (N):	not connected
Terminal 3 (+) / 4 (-):	occupied (depending on equipment of LDU14)
Terminal 5 (+) / 6 (-):	external signal, voltage supply (24 V DC) in case of alarm, is switched off using „audible alarm signal“ button
Terminal 9 / 10:	not connected
Terminal 11 / 12/ 13:	dry relay contacts, 11/12 open in case of alarm and power failure, 12/13 closed in case of alarm and power failure
Terminal 15 (+) / 16 (-):	external signal, voltage supply (5 V) in case of alarm, is switched off using „audible alarm signal“ button
Terminal 17 / 18 / 19:	dry relay contacts at pump standstill or in currentless condition: 17/18 closed 18/19 open; dry relay contacts at pump running: 17/18 open 18/19 closed
Terminal 21 (+) / 22 (-):	occupied (pressure sensor)
Terminal 40 (+) / 41 (-):	voltage supply circuit board; 24 V DC

5.4.4. Circuit diagrams

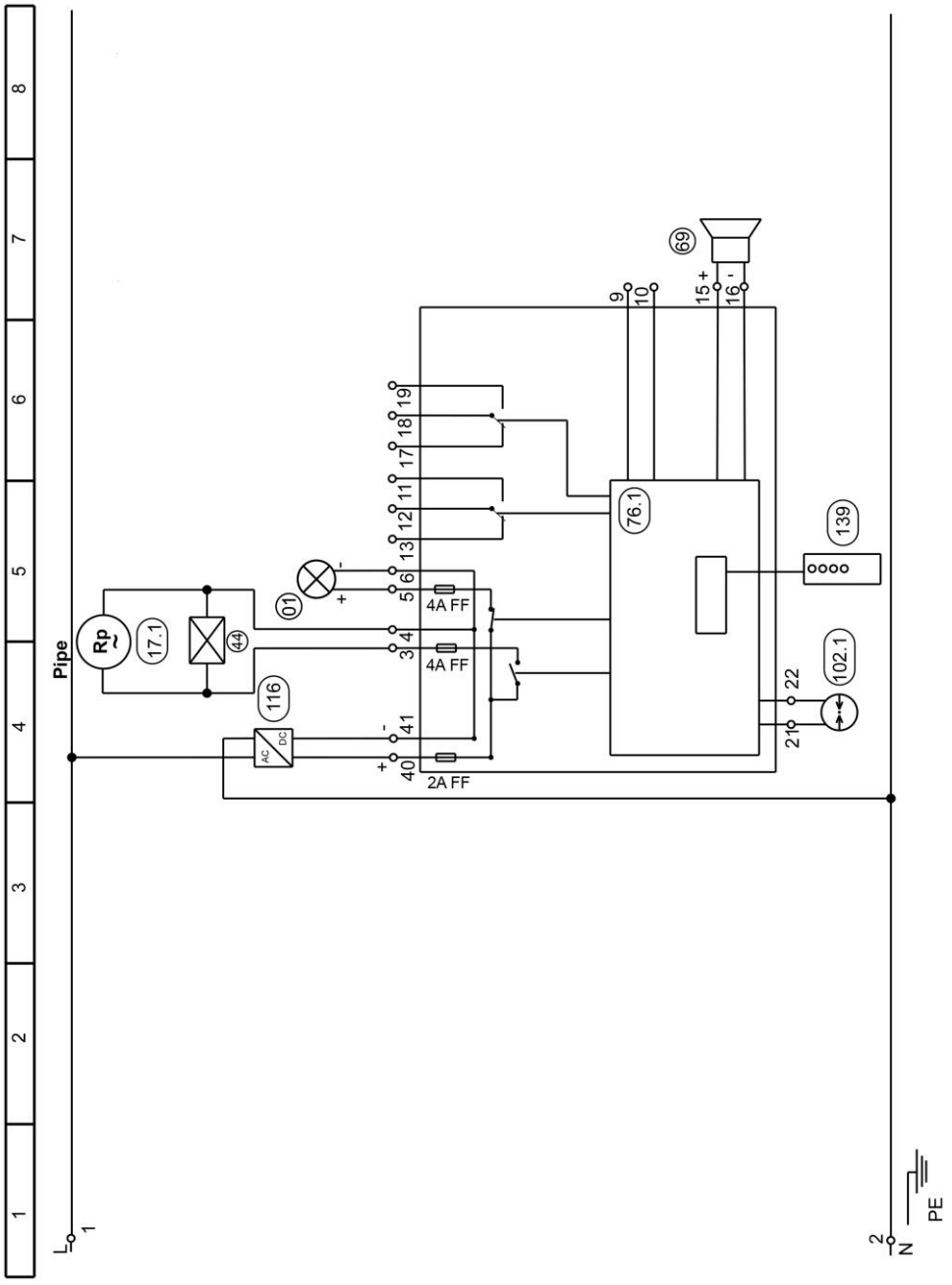
Circuit plan LDU14 T..



Used index

01	Flash light horn (optional)
17.2	Overpressure pump tank (T)
69	Acoustic signal
76.2	PCB (T)
102.2	Pressure sensor (T)
116	24 V DC power supply
139	Membrane keyboard

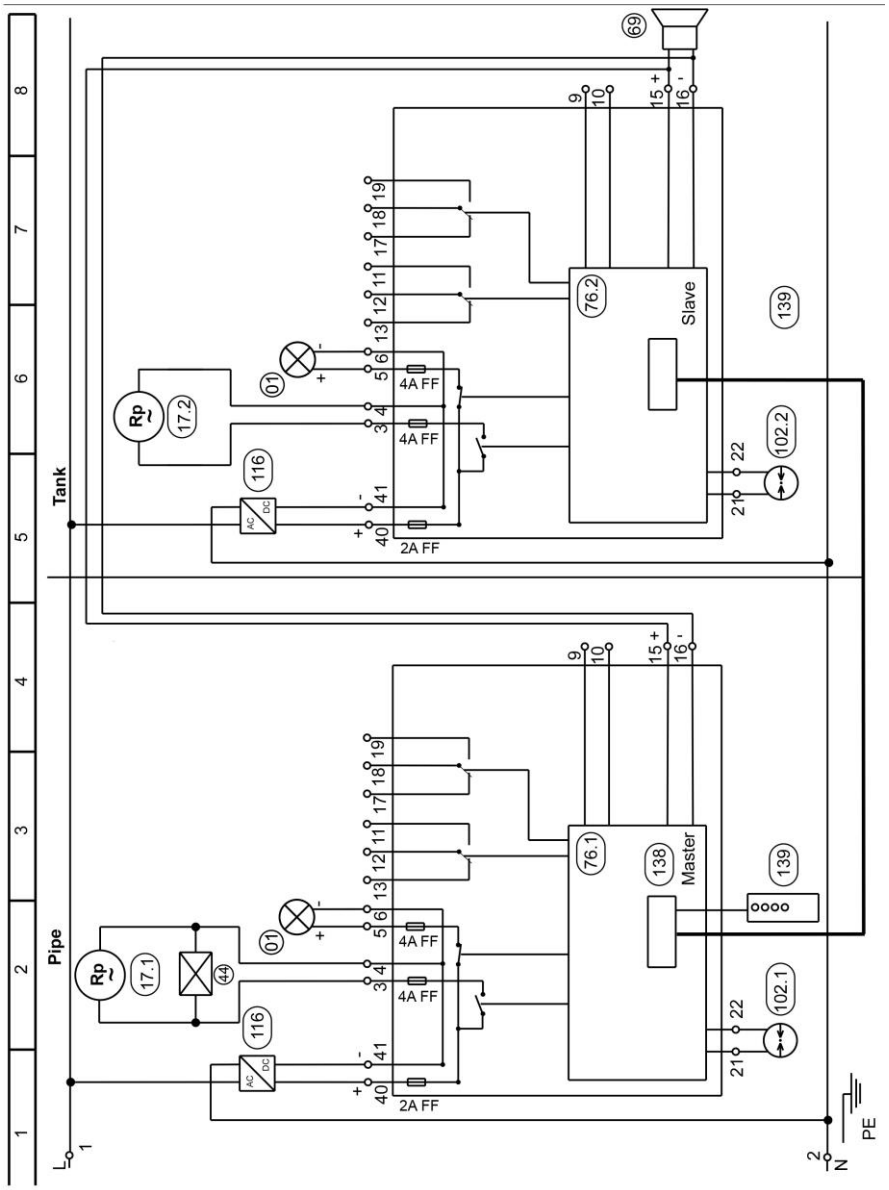
Circuit plan LDU14 P..



Used index

01	Flash light horn (optional)
17.1	Overpressure pump pipe (P)
44	Solenoid valve
69	Acoustic signal
76.1	PCB (P)
102.1	Pressure sensor (P)
116	24 V DC power supply
139	Membrane keyboard

Circuit plan LDU14 T.. /P..



Used index

01	Flash light horn (optional)
17.1	Overpressure pump pipe (P)
17.2	Overpressure pump tank (T)
44	Solenoid valve
69	Acoustic signal
76.1	PCB (P)
76.2	PCB (T)
102.1	Pressure sensor (P)
102.2	Pressure sensor (T)
116	24 V DC power supply
138	Connecting module for the combined versions LDU14 T../P..
139	Membrane keyboard

6. Start-up

Only by qualified staff. (By SGB or trained staff of our recognised distributors).

If a leak detector is put into operation on tanks which have already been filled, then special protection measures need to be taken (e.g., checking that the leak detector and/or the interstitial space is free of gas). Further measures may depend on the local conditions and should be assessed by the personnel involved on the basis of a risk assessment

6.1 Tightness test for interstitial spaces

Before starting up the LDU14, check the tightness of the interstitial spaces.

The overpressure build up should be carried out by an external pump with an upstream dry filter or with nitrogen.

NOTE: The permissible overpressures in the respective interstitial space must not be exceeded in any case during the build-up of pressure.

The test is generally considered to have been passed, if the pressure does not fall by more than 1 mbar during a testing period in minutes (calculated from the interstitial space volume in litres, divided by 10).
e.g.: Monitoring room volume: 800 litres
results in a testing time with 800/10 = 80 minutes
results in: 80 minutes of testing for max. 1 mbar pressure loss.

6.2 Initial commissioning steps

First produce the pneumatic connections, then create the power supply of the leak detector LDU14 ..

Check that the operating lamp lights up on the membrane keyboard.

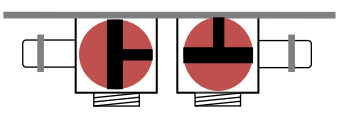
Provided the pressure in the respective interstitial spaces is below the respective alarm pressure, the "Alarm" signal lamp and the acoustic alarm signal are activated to the respective electronic controls.

The acoustic signal can be turned off by pressing the acknowledgement key(s).

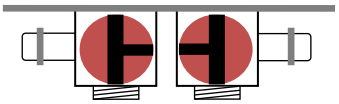
The pumps of the respective systems work provided the pressure in each case is still below the operating pressure.

6.3 First response of the overpressure valves

The overpressure valves for the LDU14 T and LDU14 P 3.5 should be made to open by correspondingly increasing the pressure during start-up. During this time the interstitial spaces are not put under overpressure.



1. Close all the outlets in the manifolds (see page 21).
2. Adjust the three-way valve "pressure" and "measure" as shown

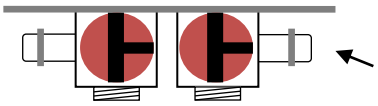


3. Follow the pressure increase until a discharge of the overpressure valve can be heard.
4. Adjust the three-way valves "pressure" and "measure" as shown.
5. Open the shut-off cocks in the manifolds for the interstitial spaces connected.

This procedure should be carried out, provided it is available, for the tank monitoring system and the pipe monitoring system.

IMPORTANT NOTE: Spraying the overpressure valve with leak detection spray, soapy water, or the like can impair the overpressure valves in their function and must be avoided!

6.4 Pressure build-up to operating pressure

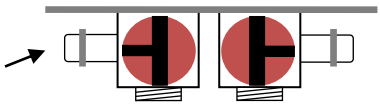


Connect the measuring gauge to the three-way valve "measure" of the respective system, bring the three-way valve "measure" into the position illustrated.

Open all the shut-off cocks in the manifolds for the interstitial spaces connected. Close valves without connected interstitial spaces.

The overpressure build-up (for proven tightness test) can be carried out with the pump of the leak detector. If the integrated pump is used, check the condition of the dry filter and, if necessary, replace the dry material.

For larger interstitial spaces (from 100 litres), the use of an installation pump with an upstream dry filter or the use of a nitrogen cylinder is recommended to save time.



To connect an external pressure source, turn the three-way valve "pressure" to the position illustrated.

Build up the pressure moderately. Do not exceed the opening pressure of the overpressure valve. Do not exceed the test pressure of the interstitial spaces. When filling using a nitrogen cylinder, the pressure should be adjusted on the pressure reducer to a pressure below the test pressure of the interstitial space.

When the operating pressure of the respective leak detector is reached the respective pump switches off.

7. Function check and maintenance

7.1 General

Testing of the functional and operational safety and reliability should be performed

- after every commissioning
- in accordance with the intervals laid out in section 6.2
- whenever a fault has been rectified

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

7.2 Maintenance

- Once annually to determine functional safety
- Scope of check according to 7.3

7.3 Functional tests

The function check must contain the following content:

- Agreement of work with the responsible operative officer
- Observe the safety information on handling the materials being stored
- Testing the leak-tightness of the monitoring systems
- Continuity test of the interstitial spaces
- Testing the switching values
- Testing the overpressure valves
- Testing the delivery head of the overpressure pumps
- Leak test
- Setting up the equipment ready for operation
- Completion of a test report for the tank lead detector LDU14 T.. and the pipeline leak detector LDU14P.. with confirmation of the functional and operation safety. The series numbers are noted on the respective PCBs. (Test reports are available for downloading on the SGB website)
- IMPORTANT NOTE: During maintenance or a functional test both covers should not be opened, only one at a time.
- Before starting work inside the housing, the presence of gas should be measured and checked.

7.3.1 Testing the leak-tightness of the tank monitoring system and the pipeline monitoring system

This function can be used to request an orientation value for the leak-tightness of the monitored system.

For this test the leak detector must have performed at least 1 automatic feed interval in normal operation in order to obtain a valid result.

This test is only possible if the switch value "Alarm OFF" has been exceeded. It can be repeated several times in succession.

This test makes sense **only before** performing a recurrent functional test of a leak detector. This makes it possible to directly estimate whether to look for leaks.

Testing the leak-tightness of the monitored system
Press the respective acknowledgement button and keep it pressed until the "Alarm" signal lamp flashes at high speed, then release the button. A value for the leak-tightness is indicated by the flashing light signal of the yellow LED. (see page 18 "Testing for leak-tightness...")

After pressing the button, this is confirmed by the sound of a brief acoustic signal. The leak-tightness is then shown by the flashing of the alarm LED 0 to 10 times as follows:

Number of flashes	Evaluation of the tightness
0	Very tight
1 to 3	Tight
4 to 6	Sufficiently tight
7 to 8	Maintenance recommended
9 to 10	Maintenance urgently recommended

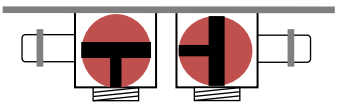
The smaller the above value, the tighter the system is. The larger the value, the less tight the system is and as a consequence, the pumps run frequently and continuously, which can lead to premature failures due to wear. The meaningfulness of this value naturally also depends on temperature fluctuations and should therefore be considered as an indicative value.

7.3.2 Check the free passage of air (gas) for the interstitial spaces of tanks

If several interstitial spaces are connected then each interstitial space should be tested individually for free passage of air (gas):

7.3.2.1 Check the free passage of air (gas) for the tank interstitial spaces

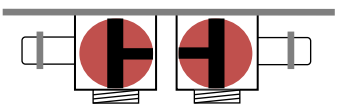
(1) Close all stop cocks in the distribution.



(2) Set three-way valve "pressure" to position "IV" for ventilating the respective interstitial space.

(3) Open the shut-off cock of the first tank in the pressure-side manifold, check the pressure drop of the respective tank on the assigned measuring gauge and close the shut-off cock again. If there is no pressure loss, locate and rectify the cause.

(4) Repeat the procedure for all the other tanks.



(5) Set the three-way valve "pressure" to position “I”

(6) Open all shut-off cocks on the manifolds with connected tanks.

7.3.2.2 Check the free passage of air (gas) for the pipeline interstitial spaces

(1) Close all the shut-off cocks in the distribution for pipes.

(2) Open the test valves successively at the end of the connected pipelines, check the discharge of air and the complete pressure drop except for atmosphere pressure (0 bar) on the assigned manometer in the manifold.

Note: under certain circumstances, explosive vapours can be discharged from the test valves.
Continue with the next pipe section until all pipe sections have been checked for free passage and ventilation.

(3) Open all shut-off cocks on the manifolds with connected pipes.

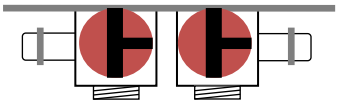
7.3.3 Testing the switching values

The switching values of the leak detector must be checked. This can be carried out with the smallest of the interstitial spaces connected or to save even more time with a suitable SGB test device.

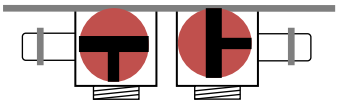
7.3.3.1 Testing the switching values without the aid of a test device

Perform the following procedure for both the tank leak detector and for the pipeline leak detector:

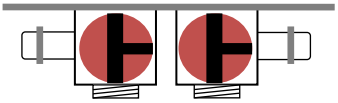
For tanks: If several tanks are connected via a distributor, close all of the shut-off valves on the distributor apart from the cock for the tank with the smallest interstitial space volume.
For pipelines: close all shut-off cocks except for the smallest of the interstitial spaces.



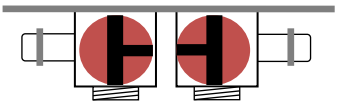
(1) Connect a test measuring gauge to the three-way valve "Measure", position “III”.



(2) Vent via the three-way valve "Pressure", position “IV”, determine the switching values for "Pump ON" and "Alarm ON" (with visual and acoustic alarms), write down the values.



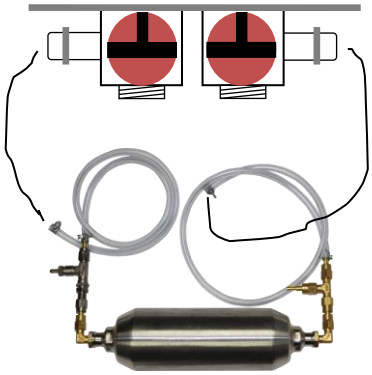
(3) Set the three-way valve to position “I” and determine the switching values for "Alarm OFF" and "Pump OFF", write the values down.



(4) Set the three-way valve "measure" to position I and disconnect the test measuring instrument.

(5) Open all shut-off cocks on the manifolds with a connected interstitial space.

7.3.3.2 Testing the switching values with the aid of a test device



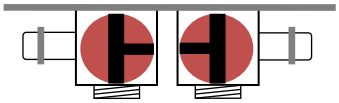
(1) Connect the appropriate pressure-resistant SGB test device (Art. no.: 115395) to the free support of the three-way valve "press" and "measure". Set both valves to position "II".

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

(3) Close the needle valve (test device) – pressure is then built up on top of the operating pressure.

(4) Vent via the needle valve, determine the switching values for "Pump ON" and "Alarm ON" (visual and acoustic), write the values down.

(5) Close the needle valve and check the switching values for "Alarm OFF" and "Pump OFF", write the values down. (If necessary open the needle valve slightly so that there is a slow pressure increase)



(6) Set the three-way valve to "pressure" and "measure" in position "I". Disconnect the test device.

7.3.4 Testing the overpressure valves

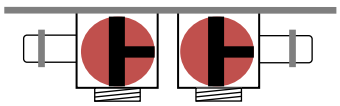
The overpressure valves must be checked. This can be carried out with the smallest of the connected interstitial spaces or to save even more time with a suitable SGB test device.

7.3.4.1 Testing the overpressure values without a test device

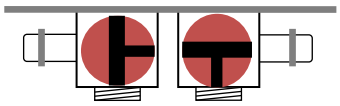
Perform the following procedure for both the tank leak detector and for the pipeline leak detector if an overpressure valve has been provided:

For tanks: If several tanks are connected via a distributor, close all of the shut-off valves on the distributor apart from the valve for the tank with the smallest interstitial space volume.

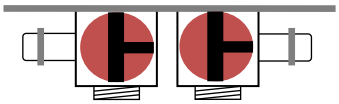
For pipelines: Close all shut-off cocks except for the smallest of the interstitial spaces.



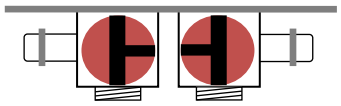
(1) Set the three-way valve "measure" briefly to position III until the pump starts running, then



(2) Set the three-way valve "measure" to position IV and connect the measuring device. The pump now increases the pressure up to the opening of the overpressure valve being measured. As soon as the pressure stops increasing, the overpressure valve has opened. Record the opening pressure. NOTE: at the same time do not exceed the test pressure of the interstitial space.



(3) Set the three-way valve "measure" to position III. The pump switches off. Follow the pressure loss on the measuring gauge. The pressure drop must come to a halt before the switching value pump ON is reached. Record the closing pressure of the valve.



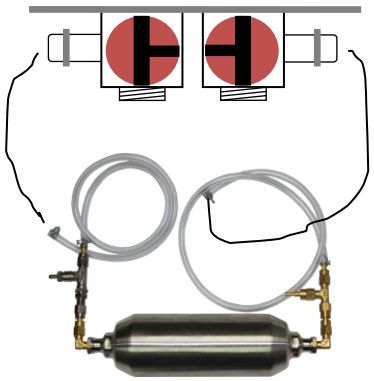
(4) Set the three-way valve "measure" to position I and disconnect the measuring device.

(5) Open all shut-off valves on the manifolds with a connected interstitial space.

7.3.4.2 Testing the overpressure valves with a test device

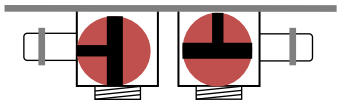
Perform the following procedure for both the tank leak detector and for the pipeline leak detector:

1) Close all shut-off cocks on the manifold.

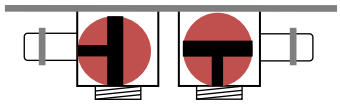


2) Connect the appropriate pressure-resistant SGB test device (Art. no.: 115395) to the free support of the three-way valve "press" and "measure". Open the needle valve on the test device.

3) Connect the measuring gauge to the test device

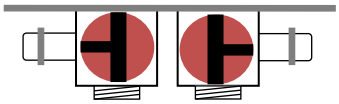


4) Set "measure" valve to position "II". Set "pressure" valve to position III. (The pump runs).

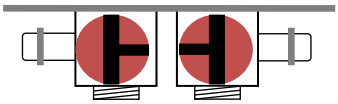


5) Set "measure" valve to position IV. (Pressure sensor is disconnected; the pump will not be switched off)

6) Close the needle valve of the test device, the pressure rises to reach the opening pressure of the overpressure valve, record the pressure value.



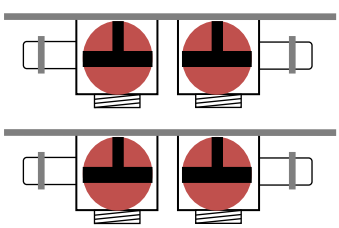
7) Set the three-way valve "measure" to position II. The pump switches off. Follow the pressure loss on the measuring gauge. The pressure drop must come to a halt before the switching value pump ON is reached. Record the closing pressure of the valve.



8) Set the three-way valve to "pressure" and "measure" in position "I". Disconnect the test device.

9) Open all shut-off valves on the manifolds with connected interstitial spaces.

7.3.5 Testing the delivery head of the overpressure pumps



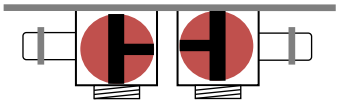
1) Set the three-way valve to "measure" and "press" in position II. The pump starts running.

2) Connect the measuring device to the three-way valve "press" and read the delivery pressure of the pump. The following pressure values should at least be reached:

Delivery pressure for pump LDU14 T280	> 0.4 bar
Delivery pressure for pump LDU14 T330	> 0.5 bar
Delivery pressure for pump LDU14 P1.1	> 1.7 bar
Delivery pressure for pump LDU14 P2.0	> 2.8 bar
Delivery pressure for pump LDU14 P3.5	> 4.7 bar

Note: At all T-models as well as the model P3.5 the opening pressure of the overpressure valve will be reached before. If the blow-off is detected, this test is reckoned as passed

Change the pumps if these values are not reached.

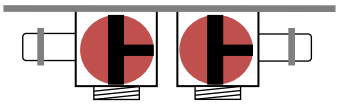


3) Set the three-way valve "measure" and "pressure" to position I.

7.3.6 Leak test

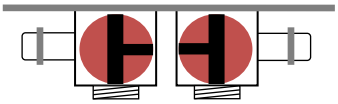
Perform the following procedure for both the tank leak detector and for the pipeline leak detector:

(1) Check that all shut-off valves with connected tanks or connected pipelines are opened.



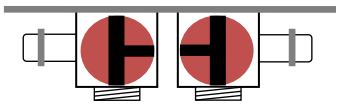
(2) Connect a test measuring gauge to the three-way valve "measure", position “III”.

(3) Start with the leak test once the pressure has been equalised. The test time (in minutes) is calculated by dividing the interstitial spaces in litres by 10.
The test is considered positive when the pressure does not fall by more than 1 mbar within the test time.
e.g.: Monitoring room volume: 800 litres
resulting in: 800/10 = 80
resulting in: 80 minutes of testing for max. 1 mbar pressure loss.



(4) Set the three-way valve 21 to position "I" and disconnect the test measuring gauge

7.3.7 Setting up the equipment ready for operation



(1) Three-way valves must be in the "operation" position.

(2) The shut-off valves for each connected interstitial space must be set to their "open" position.

(3) Seal the housing

8. Fault (Alarm)

8.1 Alarm description

An alarm of one of the leak detector systems in the LDU14 is indicated visually and acoustically. An acoustic signal sounds. The potential-free relay contact opens. Visually a flashing lamp lights up on the top part of the housing.

For LDU14 T.. or LDU14 P the red LED lights up. The acoustic signal can be switched off with the acknowledgement button 1.

For LDU14 T../P.. the red LED lights up for the pipeline alarm, the yellow LED for the tank alarm.

The acoustic alarm for the pipeline can be switched off using the acknowledgement button 1, the acoustic alarm for tanks using the acknowledgement button 2.

The optional flashing lamp on the upper side of the housing goes off when acknowledging the acoustic alarm.

The alarm message on the potential-free relay contacts remains until the alarm status ends by removing the cause of the alarm.

Notify the installation company to find and eliminate the error.

A function check must be carried out after repair work.

9. Spare parts

See spare parts sheets in the internet at shop.sgb.de/en

10. Identification

- Electrical data
- Serial no.
- Type designation
- Date of manufacture (month / year)
- Manufacturer’s code
- Legally required symbols/marks

11. Disassembly and disposal

11.1 Disassembly

Check that no gas is present before and during the work.

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

Do not use tools capable of generating sparks (saw, cutting grinder...) for dismantling. If this remains unavoidable, comply with EN 1127, and the area must not have a potentially explosive atmosphere.

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

11.2 Disposal

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

Dispose of electronic components appropriately.

12. Appendix

12.1 LDU14 models

For tanks only:

042100	LDU14 T330 (1) 100-240VAC, painted steel box, dry filter
042200	LDU14 T330 (2) 100-240VAC, painted steel box, dry filter
042300	LDU14 T330 (3) 100-240VAC, painted steel box, dry filter
042400	LDU14 T330 (4) 100-240VAC, painted steel box, dry filter
042500	LDU14 T330 (5) 100-240VAC, painted steel box, dry filter
042600	LDU14 T330 (6) 100-240VAC, painted steel box, dry filter
042700	LDU14 T330 (7) 100-240VAC, painted steel box, dry filter
042800	LDU14 T330 (8) 100-240VAC, painted steel box, dry filter
042900	LDU14 T330 (9) 100-240VAC, painted steel box, dry filter
043000	LDU14 T330 (10) 100-240VAC, painted steel box, dry filter
043100	LDU14 T330 (11) 100-240VAC, painted steel box, dry filter
043200	LDU14 T330 (12) 100-240VAC, painted steel box, dry filter
043800	LDU14 T330 (18) 100-240VAC, painted steel box, dry filter

For unpressurized pipes like fill, suction and vent pipes:

042001	LDU14 P1.1 (1) 100-240VAC, painted steel box, dry filter
042002	LDU14 P1.1 (2) 100-240VAC, painted steel box, dry filter
042003	LDU14 P1.1 (3) 100-240VAC, painted steel box, dry filter
042004	LDU14 P1.1 (4) 100-240VAC, painted steel box, dry filter
042005	LDU14 P1.1 (5) 100-240VAC, painted steel box, dry filter
042006	LDU14 P1.1 (6) 100-240VAC, painted steel box, dry filter
042007	LDU14 P1.1 (7) 100-240VAC, painted steel box, dry filter
042008	LDU14 P1.1 (8) 100-240VAC, painted steel box, dry filter
042009	LDU14 P1.1 (9) 100-240VAC, painted steel box, dry filter
042010	LDU14 P1.1 (10) 100-240VAC, painted steel box, dry filter
042011	LDU14 P1.1 (11) 100-240VAC, painted steel box, dry filter
042012	LDU14 P1.1 (12) 100-240VAC, painted steel box, dry filter
042013	LDU14 P1.1 (13) 100-240VAC, painted steel box, dry filter
042018	LDU14 P1.1 (18) 100-240VAC, painted steel box, dry filter
042024	LDU14 P1.1 (24) 100-240VAC, painted steel box, dry filter

For pressurised pipes:

042041	LDU14 P3.5 (1) 100-240VAC, painted steel box, dry filter
042042	LDU14 P3.5 (2) 100-240VAC, painted steel box, dry filter
042043	LDU14 P3.5 (3) 100-240VAC, painted steel box, dry filter
042044	LDU14 P3.5 (4) 100-240VAC, painted steel box, dry filter
042045	LDU14 P3.5 (5) 100-240VAC, painted steel box, dry filter
042046	LDU14 P3.5 (6) 100-240VAC, painted steel box, dry filter
042047	LDU14 P3.5 (7) 100-240VAC, painted steel box, dry filter
042048	LDU14 P3.5 (8) 100-240VAC, painted steel box, dry filter
042049	LDU14 P3.5 (9) 100-240VAC, painted steel box, dry filter
042050	LDU14 P3.5 (10) 100-240VAC, painted steel box, dry filter
042051	LDU14 P3.5 (11) 100-240VAC, painted steel box, dry filter
042052	LDU14 P3.5 (12) 100-240VAC, painted steel box, dry filter

Combined solutions:

042306	LDU14 T330 / P1.1 (3/6) 100-240VAC, steel box, dry filter
042606	LDU14 T330 / P1.1 (6/6) 100-240VAC, steel box, dry filter
042808	LDU14 T330 / P1.1 (8/8) 100-240VAC, steel box, dry filter
043006	LDU14 T330 / P1.1 (10/6) 100-240VAC, steel box, dry filter
043212	LDU14 T330 / P1.1 (12/12) 100-240VAC, steel box, dry filter

Other variations available. Please click on shop.sgb.de/en.

12.2 Declaration of Conformity

We,

SGB GmbH
Hofstr. 10
57076 Siegen, Germany,

hereby declare in sole responsibility that the leak detector

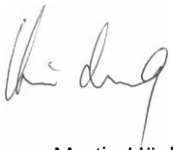
LDU14 ..

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

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

Number / short title	Satisfied regulations
2014/30/EU EMC directive	EN 61000-6-3:2007 / A1:2011 EN 61000-6-2:2006 EN 61000-3-2:2014 EN 61000-3-3:2013
2014/35/EU Low Voltage Directive	EN 60335-1:2012 / A11:2014 / A13:2017 / A1:2019 / A2:2019 / A14:2019 EN 61010-1:2010 / A1:2019 EN 60730-1:2011
2014/34/EU 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 2 devices. The following documents were used: EN 1127-1:2019 The ignition hazard analysis did not result in any additional hazards.

Compliance is declared by



ppa. Martin Hücking
(Technical Director)

Last updated: February 2021

12.3 Declaration of Performance (DoP)

Number: **011 EU-BauPVO 2018**

1. Unique identification code of the product type:

   LDU14 Leak Detection Unit Txx/Pyy

2. Usage purpose:

   Class I pressure leak detector for the monitoring of double-walled tanks and pipelines

3. Manufacturer:

   SGB GmbH; Hofstraße 10; 57076 Siegen; Germany
   Tel.: +49 271 48964-0; E-Mail: sgb@sgb.de

4. Authorized representative:

   n.A.

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

   System 3

6. In the case of the declaration of performance concerning a construction product that is covered by a harmonized standard:

   Harmonized standard: EN 13160-1-2:2003

   Notified body: TÜV Nord Systems GmbH & Co.KG, CC Tankanlagen, Große Bahnstraße 31, 22525 Hamburg, Germany

   Code number of the notified test laboratory: 0045

7. Declared performance:

Key characteristics	**Performance**	**Harmonized standard**
Elektrical function	As per documentation	EN 13160-2: 2003
Operation / alarm signal lamp	Green / Red	
Leak test	< 1 Pa l/s	
Pressure switching values, depending on model	Compliant	
Ensuring alarm output	System requirement (present, if application range observed)	

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

   Dipl.-Ing. M. Hücking, Technischer Leiter

   Siegen, 02/2021

12.4 Manufacturer's declaration of compliance (MDC)

SGB
MVV TB
Anhang C 2.15.15
TÜV-NORD

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

Dipl.-Ing. M. Hücking, Technischer Leiter

Siegen, 02/2021

12.5 Certifications TÜV Nord

TÜV NORD

BESTÄTIGUNG

Confirmation

Document-No.: 8115395528

Zeichen *Order no.* --	**Auftragsdatum** *Date of order* **28.11.2017**	**Aktenzeichen** *File reference* **8115395528**	**Prüfbericht-Nr.** *Test report no.* **8112235824-2**

Herstellers
Manufacturer
SGB GmbH
Hofstraße 10
57076 Siegen

Fertigungsstätte
Place of manufacture
wie oben

Anforderungen
Requirements
DIN EN 13160-1:2003
Typprüfung (System 3) BauPVO

Geprüft nach
Approval acc. to
Tabelle ZA.1 im Anhang ZA im Zusammenhang mit Abschnitt C.2 im Anhang C der EN 13160-1:2003

Beschreibung des Produktes
Description of product
Leckdetektor Typ LDU-14 P und T für Überdrucksysteme Klasse I

Verwendung
use
Leckdetektor für doppelwandige unterirdische Rohrleitungen und Behälter für Anlagen zur Lagerung von wassergefährdenden Flüssigkeiten, die zum Beheizen und Kühlen und Transport (von Brennstoffen) benutzt werden

Ergebnis der Erstprüfung
Result of typtest
Hiermit wird bescheinigt, dass das oben genannte Bauprodukt entsprechend der durchgeführten Typprüfung die Anforderungen der EN 113160-1:2003 im Zusammenhang mit der EN 13160-2:2003 erfüllt. Details zur Prüfung sind im Prüfbericht Nr. 8112235824-2 ersichtlich.

Gültigkeit des Zertifikates bis
certificate valid until
01.2023

Hamburg, 19.01.2018

TÜV Nord Systems GmbH & Co. KG
Große Bahnstraße 31
D-22525 Hamburg
Germany

Tel. +49-(0) 40 8557 2102
Fax +49-(0) 40 8557 19010775
e-mail: jstraube@tuev-nord.de

notified body TÜV NORD 0045

J. Straube
Leiter Prüflabor
Laboratory Head
TÜV NORD Systems GmbH & Co. KG

BA 51 05.07 gbe

Sicherungskopie von Bestätigung-Typprüfung_EN 13160-2_2017.docx

TÜV NORD

ÜBEREINSTIMMUNGSNACHWEIS ÜHP

Nr. PÜZ-07-8115395528

Hiermit wird gemäß § 24, Abs.2, Nr. 2 der BauO für das Land Nordrhein-Westfalen bestätigt, dass das

Bauprodukt	**Leckdetektor Typ LDU 14 P und T für Überdrucksysteme**
des Herstellers	SGB GmbH Hofstraße 10 57076 Siegen
Fertigungsstätte	SGB GmbH, Hofstraße 10, 57076 Siegen

nach den Ergebnissen der von der

Prüfstelle
für Bauprodukte nach Landesbauordnung
der TÜV NORD Systems GmbH & Co. KG

durchgeführten Erstprüfung den Bestimmungen der

Anlage C 2.15.15, Abschnitt C 2

der Verwaltungsvorschrift Technische Baubestimmungen entspricht.

Der Hersteller ist somit berechtigt, das Bauprodukt sowie die Begleitdokumentation mit dem Übereinstimmungszeichen (Ü-Zeichen) gemäß der Übereinstimmungszeichen-Verordnung zu kennzeichnen. *

Hinweis: Für die werkseigene Produktionskontrolle gilt der Anhang ZA, Tabelle ZA.1 und Tabelle ZA.3 der DIN EN 13160-1. Eine regelmäßige Fremdüberwachung ist nicht bestimmt. Details zur Prüfung sind im Prüfbericht Nr. 8112235824-1 vom 10.01.2018 ersichtlich.

* Ausgenommen sind Leckdetektoren für Einrichtungen zur Lagerung von Brennstoffen, die für die Versorgung von Heizsystemen in Gebäuden bestimmt sind

Hamburg, den 19.01.2018

TÜV NORD Systems GmbH & Co. KG PÜZ für Bauprodukte

J. Straube
Leiter der Prüfstelle
- Bauprodukte nach Landesbauordnung -
der TÜV NORD Systems GmbH & Co. KG
Kennziffer: HHA02

Gültigkeitsvermerk:
Gültig bis 01/2023

TÜV NORD Systems GmbH & Co. KG
Große Bahnstraße 31
D-22525 Hamburg
Germany
Tel. +49-(0) 40-8557-2368
Fax +49-(0) 40-8557-2710
e-mail technikzentrum@tuev-nord.de

Company details

SGB GmbH
Hofstr. 10
57076 Siegen
Germany

Telephone +49 271 48964-0
E-mail sgb@sgb.de
Web www.sgb.de