Underpressure leak detector

VL-H2

Z – 65.22 - 119

Documentation VL-H2

Art. no.: 600 502
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SICHERUNGS**G**ERÄTE**B**AU GMBH
Hofstraße 10
57076 Siegen

Table of Contents
for Documentation on
Vacuum Leak Detector VL - H2

TECHNICAL SPECIFICATION OF LEAK DETECTOR TYPE VL-H 2... FORMING PART OF A LEAK DETECTING UNIT

1) Object

A leak detector designed for negative pressure alarm at >230 mbar for type VL-H 2B and/or >325 mbar for type VL-H 2B as part of a leak detection system designed to indicate leaks in the control area of double skin tanks for storing flammable liquids.

2) Type

Negative pressure Leak Detectors types VL-H 2 A and VL-H 2 B.

3) Application

3.1 Non-pressurised tanks
- to DIN 6608, DIN 6616 form A, DIN 6619, DIN 6623 and DIN 6624 and equiavalent steel tanks, or equivalent plastic tanks provided these tanks are of a double skin construction without leak indicating liquid in the control area, or furnished with an approved leakproof lining according to DIN 6608 part 2 and/or analogous application of DIN 6608 part 2.

3.2 Non-pressurized tanks
- to DIN 6608 part 2 whose control area still may be partly filled with leak indicating liquid and that are installed underground at a depth of at least 30cms below ground level.

3.3 Non-pressurized tanks
- to DIN 6618 part 2 and part 4.

3.4 Non-pressurized tanks
- to DIN 6625 furnished with an approved leakproof lining.

3.5 Non-pressurized tanks
- of a cylindrical, rectangular or spherical shape and of reinforced concrete or equivalent approved tanks of other materials having an approved leakproof lining and/or of a double skin construction.

With tanks having a control area as specified under 3.1; 3.2; 3.4 and 3.5 above in which the suction pipe does not reach down to the tank bottom

° Leak Detector type VL-H 2A may be applied only, if the tank overall height does not exceed 2.0 metres and
° Leak Detector type VL-H 2B may be applied only, if the tank overall height does not exceed 2.9 metres.

3.6 *Product Stored*

Flammable liquids of danger classification AIII according to the Ordinance for Flammable Liquids (VbF).

4) Functional Characteristics

(1) *A leak in the tank walls below or above the level of the stored liquid and the ground water, as well as leaks in the piping connecting the leak detector to the control area and leaks in the leak detector itself will all automatically trigger a visual and an acoustic alarm following a rise in pressure in tanks with control areas that are fitted with a VL-H 2... Leak Detector.*

(2) *The vacuum pump in the leak detector generates a negative pressure (below atmospheric pressure and the tank's internal pressure by a predetermined quantity) in the control area.*

(3) *The leak detector pump side is connected to the control area through the suction pipe (evacuating pipe) and the vertically installed float valve. The gauge pipe connects the control area to the instrument side (vide drg #2563).*

(4) *Vacuum switch D (connected to the control area by gauge pipe lm) measures and controls the negative pressure created by vacuum pump Rp.*

Microswitch M2 (in the vacuum switch) will de-energize the vacuum pump when the service vacuum (pump switch setting "OFF") is reached. A rise in pressure will cause the said microswitch to reenergize the vacuum pump (pump switch setting "ON"). During normal operation, the negative pressure will be floating between these two control values with the vacuum pump performing brief work cycles and idling in the mean time depending on the general impermeability of the system.

(5) *In the event that the pressure rises to the pump switch setting "ON" level due to air entering through a leak in the control area walls or any components, or tubes, or fitting connected to the control area, the alarm will be triggered by switch M1 in vacuum switch D. The alarm is both visual (red signal light A) and acoustic (buzzer Su). The acoustic signal can be switched off on switch T (that is plumbed during normal operation). Additional terminals on terminal block K allow for connecting external alarm signals (apart from the buzzer).*

(6) *In the event that pressure drops to the alarm switch setting "OFF" (e.g. at system start-up or during a performance test), the alarm must be cancelled by applying switch M1 in the vacuum pressure switch.*

7) In the event of a leak allowing **liquid** to enter the control area, the pressure will rise and so cause the vacuum switch to energize the vacuum pump. The vacuum pump evacuates the liquid and - as soon as it reaches the float valve - this safety device will respond and close the suction pipe (evacuating pipe) to the control area. No more liquid is drawn off after the float valve has responded, the negative pressure is not re-established and - with the negative pressure de-creasing on account of the continuing flow of liquid into the control area - switch M1 in vacuum switch D will trigger the alarm.

8) The leak detector is rated for connecting up to a 220 volt 50 Hz power supply. The green light ("working") lights up when the power supply is connected up.

9) The vacuum switch settings made in the factory for operating the leak detector are shown on table 1 below.

Table 1 - vacuum switch settings:

	VL-H 2 A	VL-H 2 B
Pump "OFF" (negative pressure mbar)	330 - 360	420 - 450
Pump "ON" (negative pressure mbar)	270 - 320	370 - 410
Alarm "ON" (negative pressure mbar)	255 - 275	340 - 360
Alarm "OFF"(negatibe pressure mbar)	285 - 320	375 - 415
A l a r m at/or before	230 mbar	325 mbar

5) Leak Detector Design Features

5.1 Configuration

The leak detector consists of vacuum pump Rp, the control system with vacuum switch D, the switch elements with the alarm units and the unions for connecting the suction and exhaust pipes and the equipment required for performance testing (venting device and test cock).

A float valve Fl (safety device) is installed in the suction pipe as near as possible to the tank.

All components required for the leak detector functioning are listed in the parts list and shown on drawings #1576 and #2563.

6) Instructions for Installation

6.1 General Notes

(1) The leak detector unit and the VL-H 2... Leak Detector shall be installed by authorized specialists (meeting the requirements of sec. 19(1) WHG) who can prove they are qualified to install leak detector units in accordance with TRbF 503 (Technical Directions for Flammable Liquids).

(2) The provisions contained in the Instructions for the Installation of Leakproof Linings shall be adhered to.

6.2 Installation of the Leak Detector

(1) The leak detector should be installed in an enclosed and dry location that is not accessible to unauthorizted persons. **The leak detector may not be installed in hazardous locations.** For avoiding thermal impact, the leak detector may not be mounted in the vicinity of a source of heat.

(2) The leak detector is designed for wall mounting with screws and plugs. The screw heads to be covered by plastic caps covering the screw holes. In the existence of severe vibrations, it is recommended to mount the units on rubber-metal connections. When selecting the place for mounting the leak detector, bear in mind that the distance between the control area and the leak detector should be as short as possible.

(3) When installing the leak detector outdoors or in areas that qualify as humid areas (pursuant to VDE Regulations) the leak detector should be accommodated in a weatherproof protective casing with a transparent cover (to DIN 40050 IP 55). In this case, an additional external signal (horn) must be mounted in a suitable place.

6.3 *Electric Power Supply*

The leak detector is rated for a 220 volt 50 Hz AC power supply. A permanently installed supply point is required, plug-and-socket or coupler connections being disallowed - correct earthing must be ensured.

The Public Utilities' and VDE Rules and Regulations to be adhered to.

An additional external acoustic signal to be brought up to the relevant terminals in the leak detector. The external signal power draw may not exceed 50 VA.

6.4 *Installation of Connecting Piping*

(1) Vacuum-proof, water-repellent synthetic hosing that is resistant to the stored product (e.g. PVC hosing such as GUTASYN, ACODUR or equivalent), or rigid pipes (e.g. commercial copper pipes) may be used for connecting the leak detector to the control area.

The piping must have the following ***dimensions*** *and be* ***colour-coded*** *as follows:*

Synthetic hosing	*Colour Coding*	*Dimensions*
Evacuating pipe	*clear and/or white*	*8 x 2 mm*
Gauge pipe	*red*	*8 x 2 mm*
Exhaust pipe	*green*	*8 x 2 mm*

Rigid piping		
Evacuating pipe	*white rings at each end*	*6 x 1 mm*
Gauge pipe	*red " " " "*	*6 x 1 mm*
Exhaust pipe	*green " " " "*	*6 x 1 mm*

Care must be taken to ensure that the full cross-section is maintained over the entire length of the pipe.
No squeezing or kinking is allowed.

(2) If synthetic piping is installed, underground, protective conduits must be used. Suitable heat insulation or lagging must be provided, or the endangered sections of the piping installed in metal conduits to ensure there is no danger from heat effects on the piping. If metal piping is used, then synthetic adapters must be used for insulating the unions to the tank.

(3) The **gauging** and **evacuating** pipes must be installed at a **steady incline** from the connecting piece to the leak detector. Should this not be possible, then install a **separator for the condensate** at the **lowest points** of each pipe. This separator to be accessible for inspection.

(4) Connect the **exhaust pipe** to the **tank venting device.** Install condensate separators at the low points in the exhaust pipe also, if necessary.

(5) The **evacuating pipe** is connected to the leak detector at one end and to the float valve (installed vertically in the piping) at the other end.

(6) The **gauge pipe** is connected to the leak detector at one end and to the relevant connecting piece on the tank at the other end.

(7) All connecting pieces for connecting the pipes to the leak detector are identified accordingly.

(8) Metal adaptors must be used for making the connections to the NW 4mm connecting pieces, in the case of rigid piping.

6.5 Additional Instructions for installing Leak Detectors on above.ground tanks.

Apart from the above points 6.2 to 6.4, the following instructions must be observed in the case of underground tanks that are covered with less than 30cms soil and with tanks installed in the open:

(1) All connecting pipes (evacuting, gauge and exhaust pipes) between the tank and Leak Detector VL-H must be installed at a steady 4 perc. incline and be provided with a condensate drainage pot at their lowest point.

(2) The connecting piping ID must be at least 6mms and the wall thickness 2mms. Synthetich connecting piping must be installed in rigid and weather-proof conduits.

(3) 4/6mm adaptors are supplied for connecting the NW 6mm hosing to the NW 4mm connecting pieces on the leak detector.

(4) If rigid connecting piping is used it must be of an 8 x 1mm dimension and installed in compliance with the above points.

6.6 *Additional Mounting Instructions for double skin tanks whose control area is still filled with leak indicating liquid:*

(1) In the case of double skin steel tanks that are still filled with leak indicating liquid, the leak detector system can only function properly if an air cushion exists in the tank control area peak for ensuring **free passage between the tank filler neck and gaugeing connection..**

(2) Towards providing for a proper connection, the filler neck and gauging fitting must be modified by means of reducing sleeves and/or hose nozzles installed directly on the tank. For maintaining the vacuum, care must be taken to ensure that the connections are leak-proof.

(3) A vacuum pump of min. 1.5m³/h capacity including a 10 Litres glass bottle to be connected by means of a min 6mm ID PVC hose to the tank suction fitting. Now, with the gauging connection open, remove the leak indicating liquid from the control area by means of the vacuum generated in the glass bottle till no more liquid is sucked up (the column in the PVC hose breaks off). The free passage between the suction and gauging connecting pieces is so established.

(4) Now connect a vacuum measuring instrument to the tank gauging connection and continue the emptying process at 0.5 bar negative pressure till no more leak indicating liquid is sucked up. Make sure not to exceed the 0.5 bar negative pressure.

(5) For using Leak Detector VL-H 2.., at least the following quantities of leak indicating liquid must be evacuated from the control areas:

Tank size (m^3)	Volume of liquid to be removed
1 to 5 m^3	5.0 litres
7 to 13 m^3	10.0 litres
16 to 30 m^3	15.0 litres
40 to 60 m^3	30.0 litres
60 to 100 m^3	35.0 litres

(6) If necessary, the evacuating process described under (3) above must be repeated several times at intervals up until the said minimum quantity is reached.

(7) After the minimum quantity of leak indicating liquid has been removed, connect the leak detector as specified in sections 6.2 to 6.4 and start it up without using an installation pump. Finally, test the complete system as specified in section 8.3.

7) Starting up the Leak Detector

7.1 Starting up the leak detector on double skin tanks

(1) Make a vacuum-tight connection of the gauging and suction pipes to the double skin tank control area fittings. Connect a high-capacity installation pump to the other end of the suction pipe (directly ahead of the leak detector) and a measuring instrument of min. 1.6 accuracy classification and with 600 mbar full scale to the other end of the gauging pipe.

(2) Now evacuate the control area and the connecting pipes to a negative pressure value of approx. 500 mbar.

(3) The vacuum reading on the measuring instrument may not drop noticeably within 30 minutes of pressure compensation.

(4) After successfull completion of the test, remove the installation pump and gauging instrument. In doing so, reduce **the service vacuum (pump setting "OFF") as indicated on table 1.**

(5) Now connect the gauging and suction pipes to the leak detector and vaccum-seal both connections. Then connect the leak detector to the power supply.

(6) The performance test in accordanc with section 8.3 must now follow.

(7) On completiom of this work and after starting up the system, seal the alarm switch (acoustic signal "OFF") with lead.

7.2 Starting up the leak detector on tanks having a leak-proof lining

(1) The leak-proof lining to be installed in conformity with the original equipment manufacturer's Instructions for Installation.

(2) Apply a high-capacity installation vacuum pump for producing an approx. 0.6 to 0.7 bar vacuum in the control area. Connect the installation pump to the tank's suction fitting. Connect a vacuum gauging instrument of min 1.6 accuracy classification and max 1.0 bar full scale to the gauging connection. Check the test vacuum on this instrument.

(3) The vacuum reading on the measuring instrument may not drop noticeably within 30 minutes of pressure compensation.

(4) Now continue with steps (4) to (7) of section 7.1.

8. Operating Instructions

8.1 General Notes

(1) With a vacuum-sealed and leak-tight installation of the leak detector system (control area, connecting piping and leak detector) it may be safely assumed that the leak detector will operate inside the control range only when the vacuum deteriorates on account of unavoidable minimal leaks and then requires readjustment to its upper control value (operating vacuum).

(2) If the vacuum pump starts up repeatedly, or runs constantly, this may indicate leaks which require repair.

(3) A larger leak, or a fault will cause the **alarm** to be sounded. This leak must then be repaired immediately.

(4) The leak detector may not be opened unless it has been cut out of circuit beforehand.

8.2 Maintenance

(1) The VL-H 2... Leak Detector must be inspected annually by an authorized expert to ensure that it is operating correctly and safety. The inspection to be carried out in accordance with section 8.3.

(2) Checks must be carried out to ensure that the conditions listed under section 6) are still maintained.

8.3 Performance Test of Leak Detector and Leak Indicator Display Unit

Operating and safety tests for the leak indicator are to be performed -

- after each start-up;

- in accordance with section 8.2 at the time intervals indicated

and

- after each elimination of a malfunction.

The performance test to be carried out using the three-way cock built into the gauge pipe underneath the leak detector unit with the test fitting in conjunction with the venting device built into the suction pipe also underneath the leak detector unit.

Ventilation *of the control area must be carried out* ***slowly*** *via the control area ventilating device for avoiding gauging errors.*

Each performance test hence automatically includes checking the gauge and suction pipes for free flow between the control area and the leak detector.

The performance test must include, but is not limited, to the following inspections:

(1) The leak detector system vacuum sealing and leak-proofness (control area with connecting pipes and leak detector) must be checked by attaching a gauge of minimum 1.6 accuracy classification and 600 mbar full scale to the test fittings with the test cock in test position "B".

(2) With the test cock in the test position "B", ***slowly*** *ventilate the pneumatic system such that the vacuum switch settings can be measured by the ensuing rise in pressure.*

This check simultaneously serves for controlling the free flow in the gauge and suction pipes.

(3) The optical and acoustic signal must be tested. The alarm must occur ***latest*** *when the* ***vacuum values specified in chapter 4 of table 1 are reached.***

(4) With the issue of the alarm confirmed and the ventilating device reclosed, the complete leak detector system can be tested at increasing vacuum (pressure drop) up to pump switch setting "OFF".

(5) The leak detector vacuum sealing is tested in test position "B" with the gauge attached and the leak detector gauge and suction pipes by-passed.

(6) Check the vacuum pump lift with the test cock in position "A". With free suction flow, the pump lift must be min 500 mbar.

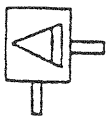
The negative pressure switch to be vented via the test fitting and the gauge connected to the ventilating device for this test.

(7) Test position "C" serves for checking the connecting pipes and control area for leaks.

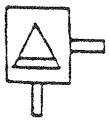
(8) Performance and safety of all necessary and specified fittings and system components (e.g. float valve, condensate trap) must be checked.

(9) After completion of all test work, replace test cock in the "working" position, remove the gauge and seal the alarm switch with lead.

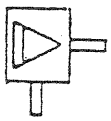
(10) Record the test in a written report.



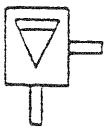
Working position: Ventilating system and test cock closed.



Test position A: Testing vacuum pump lift.



Test position B: Testing the complete system, ventilation via ventilating system.



Test position C: Testing the control area and connecting piping for leaks.

8.4 Alarm Status

(1) In the event of an emergency, the red light A lights up and the acoustic signal Su is sounded.

(2) Remove leaded seal on alarm switch T, switch of acoustic alarm and inform the installation company immediately.

(3) The authorized expert must ascertain the cause of the alarm, eliminate this cause and then engage on a performance test as specified in section 8.3.

Item Position	Component Gegenstand	Material Werkstoff/Bezeichnung	O.E.M. Hersteller
A	Alarmlampe Signal light	Glimmlampe 220 V Glow lamp	
B	Betriebslampe "Working" light	Glimmlampe 220 V Glow lamp	Pistor + Krönert, geeignete suitable
T	Alarmschalter Emergency switch	Kippschalter 1620 - 0401 Toggle switch	Marquardt, geeignete suitable
D	Unterdruckschalter Vacuum switch	PU-H 300/1,4000/1	Sicherungsgerätebau GmbH
M 1	Alarmschalter in D ~~Emergency switch~~	Mikroschalter microswitch	
M 2	Pumpenschalter in D Pump switch	"	Marquardt, geeignete suitable
Rp	Regel-Vakuumpumpe Vacuum control pump	A 15	Piot + Tirouflet
Rp	wahlweise " optional	7009 V	ASF
Rp	" "	Typ 1239	W. Sauer
Rp	" "	Typ 2039	W. Sauer
Su	Summer Buzzer	E 2772, BVO 1	Eichhoff-Werke, geeignete
G	Gerätegehäuse Equipment housing	Polystyrol, schlagfest Wandstärke min. 2 mm Polystyrene, shock-proof, 2mm wall thickness	Kunststoffwerke Dieter, geeignete
K	Steckschraubklemmleiste Screw & plug-in terminal block	Weco 424, 4 pol	Weco, geeignete suitable
Rsp	RUckschlagsperre m. Filter Nonreturn valve with filter	Zeichnung 2568 Drg #2568	Sicherungsgerätebau GmbH
Ph	PrUfhahn Test cock	Messing, vierkant Brass, square	Burger Industriewerke, geeignete suitable
Bv	BelUftungsvorrichtung Ventilating device	Messing Brass	Burger Industriewerke, geeignete suitable
Fl	FlUssigkeitssicherung Float valve	Nr. 68055	Oventrop
ls	Saugleitung Suction pipe	PVC-glasklar transparent	
lm	MeBleitung Gauge pipe	PVC-rot red	geeignete suitable
la	Auspuffleitung Exhaust pipe	PVC-grün green	

Zum Prüfungsschein

Geprüft

Hamburg, 15. MRZ. 1979

Technischer Überwachungs-Verein Norddeutschland e.V.
Prüfstelle für Leckanzeigegeräte

PTB Nr. III B/S 1.50 8

5. SEP. 1979

Physikalisch-Technische Bundesanstalt

gehörig

Sicherungsgerätebau GmbH
5900 Siegen

	Datum	Name
Gezeichnet	15.9.78	
Geprüft		
Normgepr.		

SGB Sicherungsgerätebau GmbH
5900 Siegen 21 - Weidenau

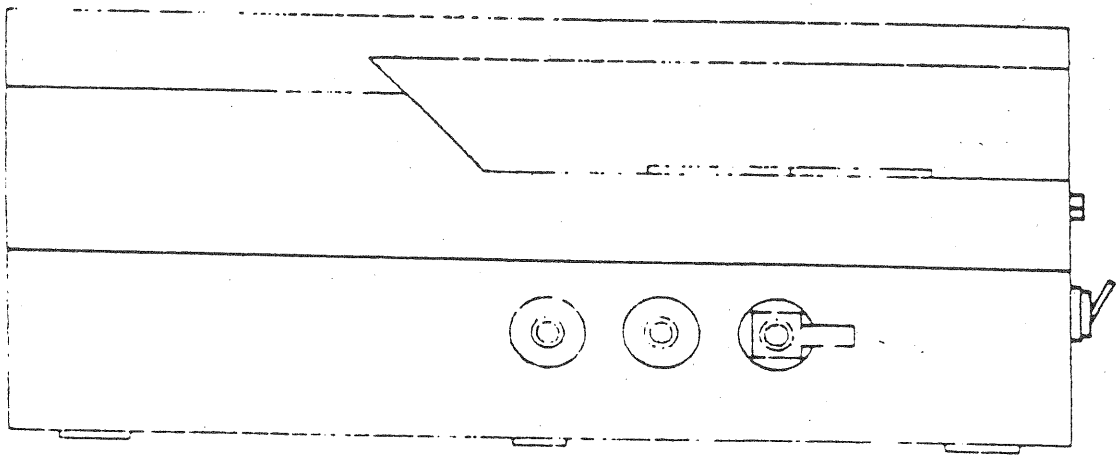
Maßstab

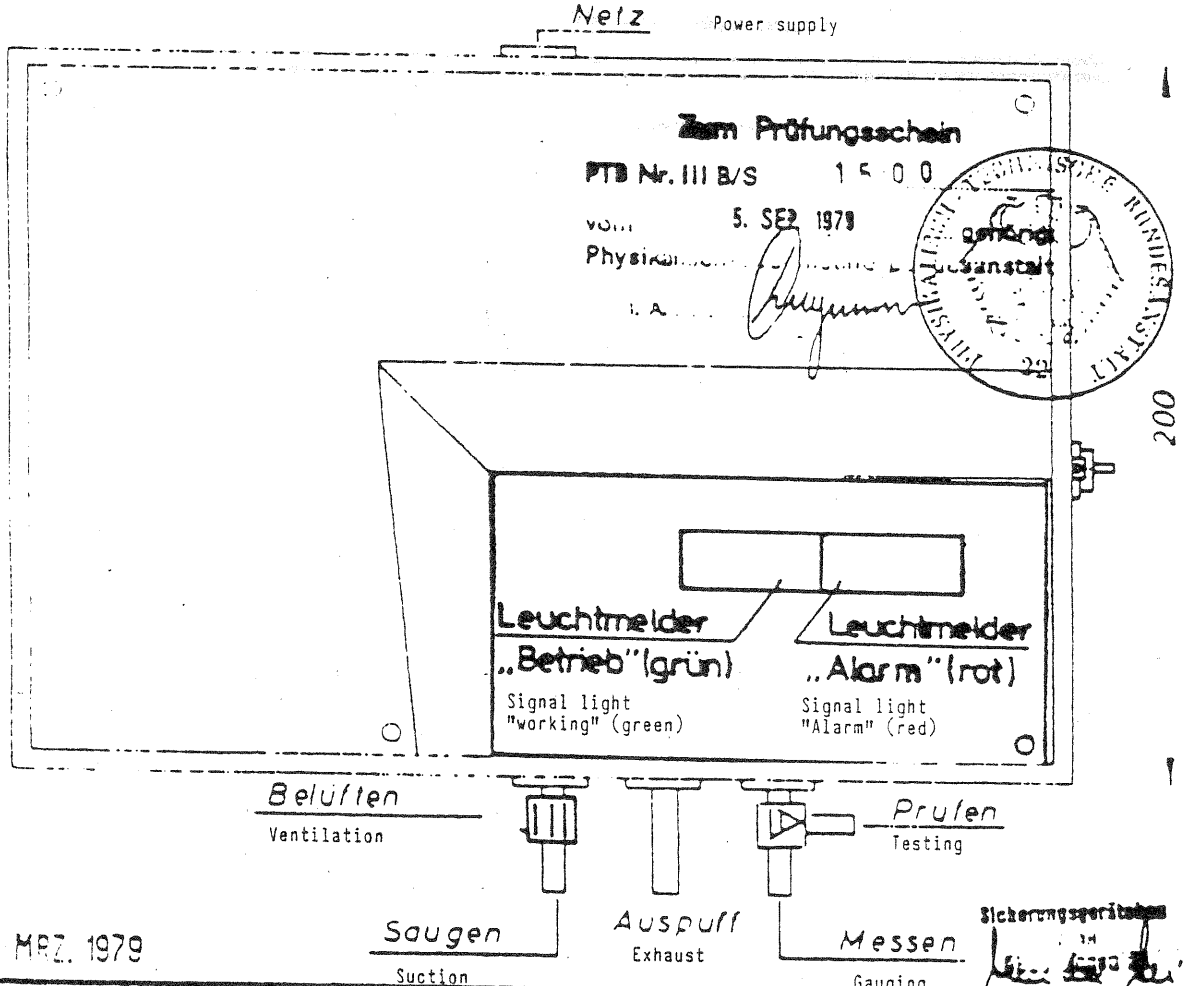
Stückliste List of parts
Vakuum-Leckanzeiger VL - H 2...
Vacuum Leak Detector VL-H 2...

H - 010

Ersatz für

Ersetzt durch





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TÜV 7

15. MRZ. 1979

Sicherungsgerätebau

	Datum	Name
Gezeichnet	2 9 FEB	
Geprüft		
Normgepr.		

Werkstoff: Material:
Polystyrol min. 2mm
min. 2mm polystyrene

SGB Sicherungsgerätebau GmbH
593 Hüttental-Weidenau

Maßstab 1 : 2

Vacuum Leak Detector VL-H 2 External View

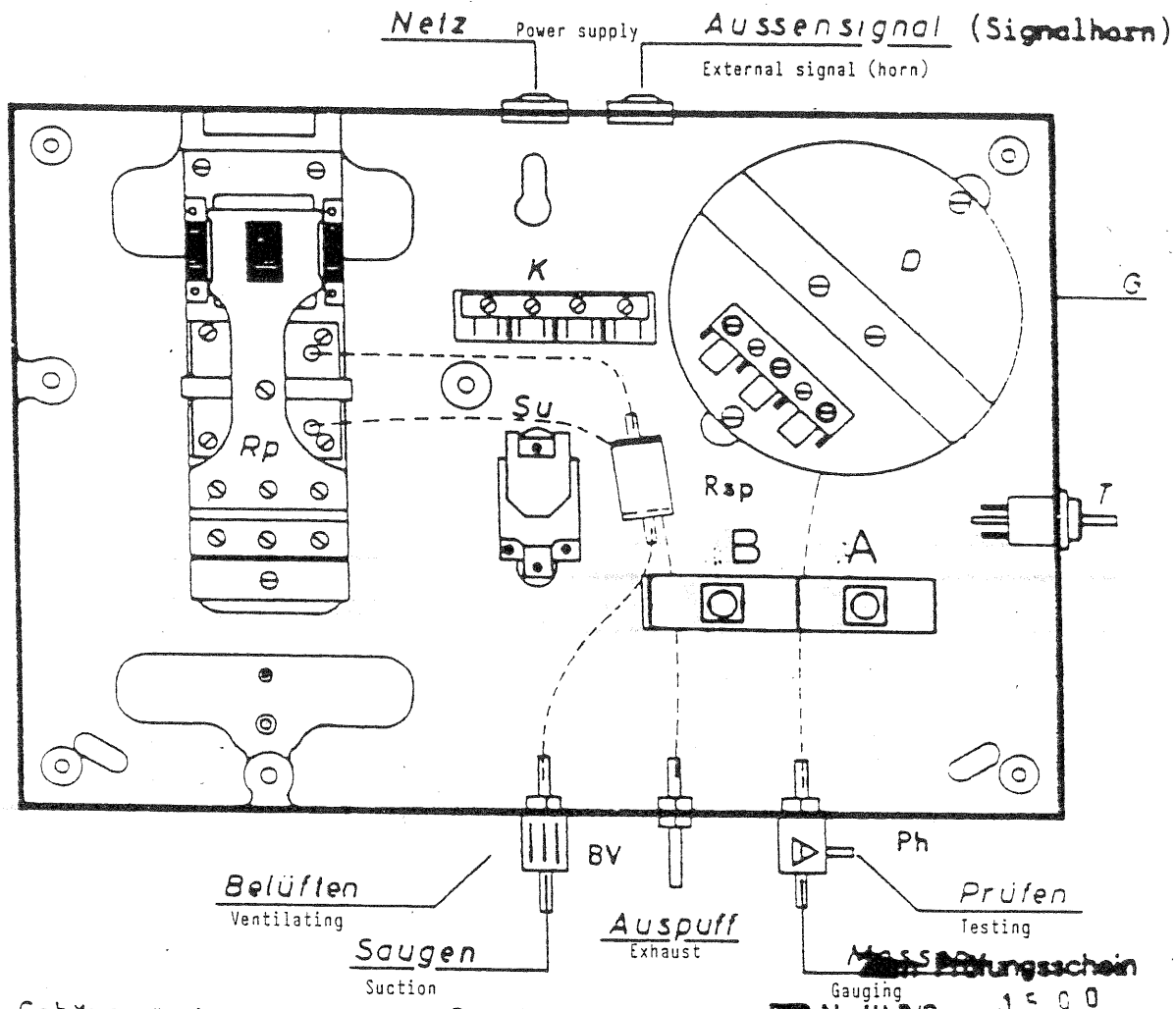
Aussenansicht

Vakuum - Leckanzeiger VL-H2

1579

Ausführung 2

Ersetzt durch



G = Gehäuse Housing

T = Alarmschalter Alarm switch

BV = Belüftungsvorrichtung Ventilating system

Ph = Prüfhahn Test cock

Rp = Regelpumpe Control pump

K = Klemmleiste Terminal block

Su = Summer Buzzer

Rsp = Rückschlagsperre Nonreturn valve

D = Unterdruckschalter Vacuum switch

A = Alarmlampe Alarm light

B = Betriebslampe "Working" light

------ = Verschlauchung (messen = rot, saugen = glasklar, Auspuff = grün)
hosing:
gauging = red; suction = transparent; exhaust = green

Prüfungsschein Nr. III B/S 1500

vom 5. SEP. 1979 gehörig

Physikal... ...esanstalt

17. JULI 1979

Sicherungsgerätebau GmbH 5909 Siegen 21

	Datum	Name
Gezeichnet	17.9.79	Kf.
Geprüft		
Normgepr.		

Werkstoff: Material:
Polystyrol Polystyrene

SGB Sicherungsgerätebau GmbH
593 Hüttental-Weidenau

Maßstab 1:2

Vacuum Leak Detector VL-H2 Key plan

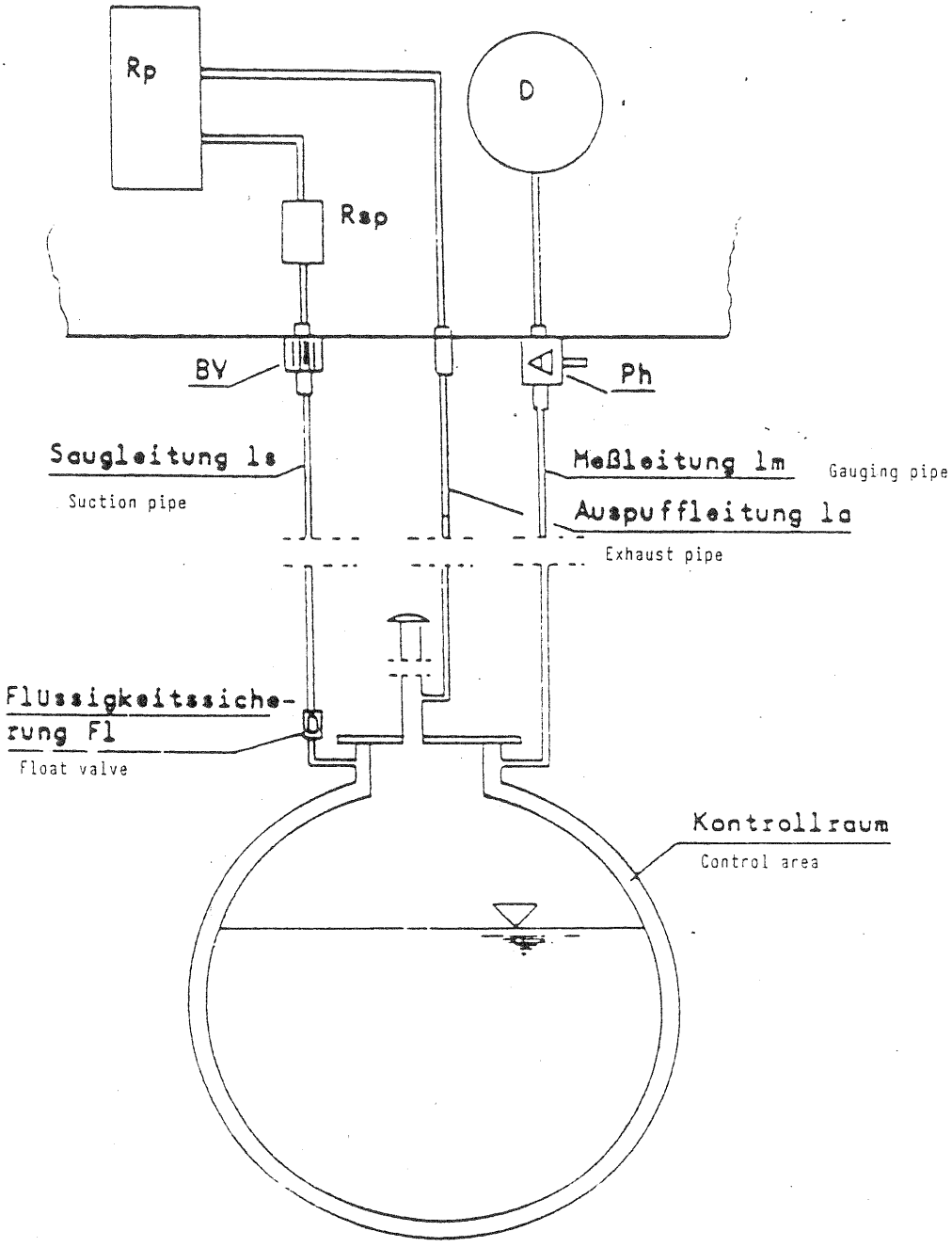
Schematische Innenansicht

Vakuum-Leckanzeiger VL-H2

1576

Ersatz für

Ersetzt durch



Auspuffleitung grundsätzlich zur Tankentlüftung führen!
Exhaust pipe must be brought up to the tank venting system!!

Zum Prüfungsschein
PTB Nr. III B/S 1500
vom 5. SEP. 1979 gehörig
Physikalisch-Technische Bundesanstalt

15. MRZ. 1979

Sicherungsgerätebau GmbH 5900 Siegen 21

	Datum	Name
Gezeichnet	15.9.78	
Geprüft -		
Normgepr.		

SGB Sicherungsgerätebau
GmbH
5900 Siegen 21 - Weidenau

Maßstab
o.M.

Vacuum Leak Detector VL - H 2 Pneumatic circuit diagram

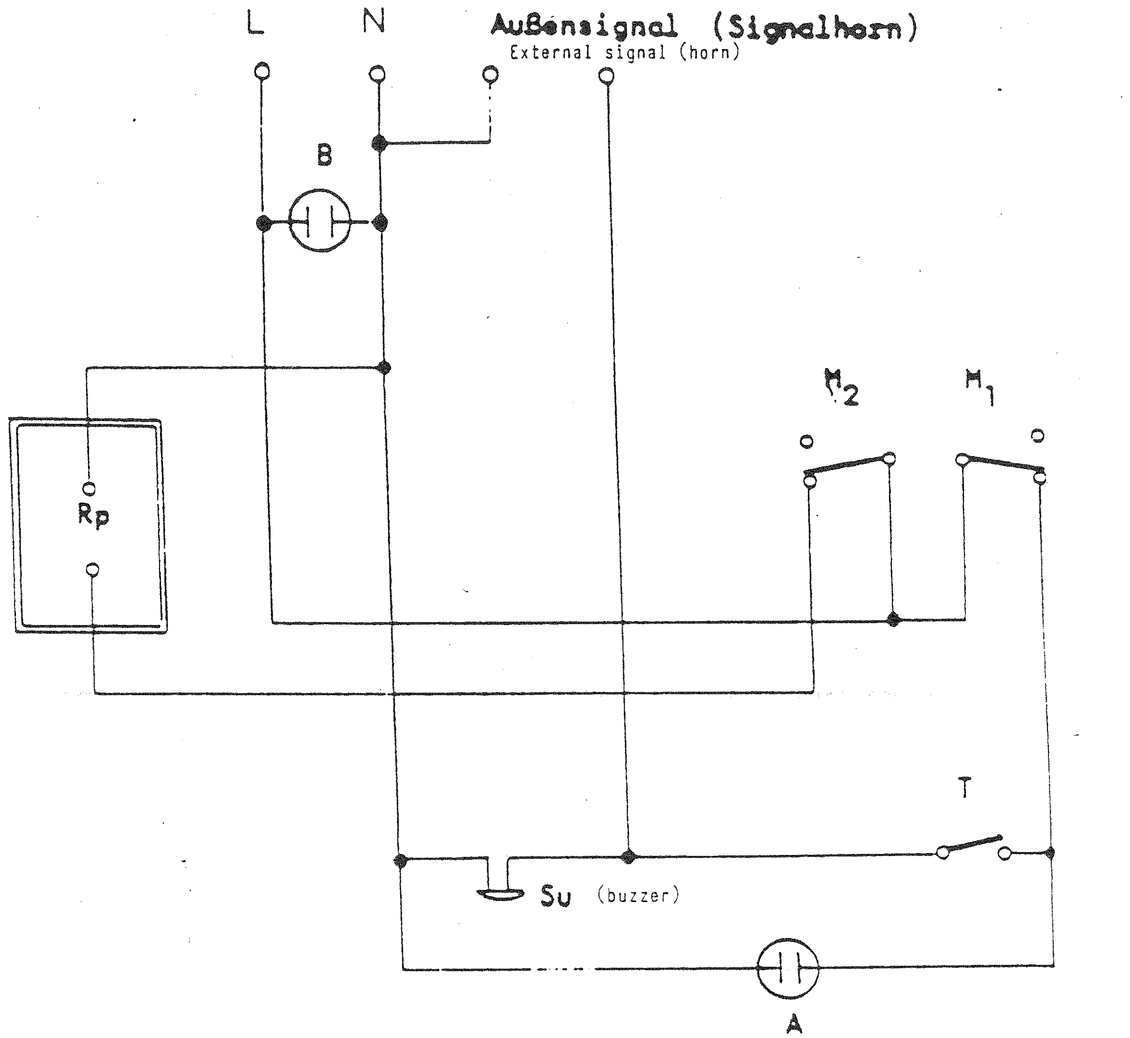
Vakuum-Leckanzeiger VL - H 2

Pneumatisches Schaltbild

2563

Ersatz für

Ersetzt durch



Zum Prüfungsschein
PTB Nr. III B/S 1500
5. SEP. 1979
gehörig
...sanstalt

TÜV
15. MRZ. 1979

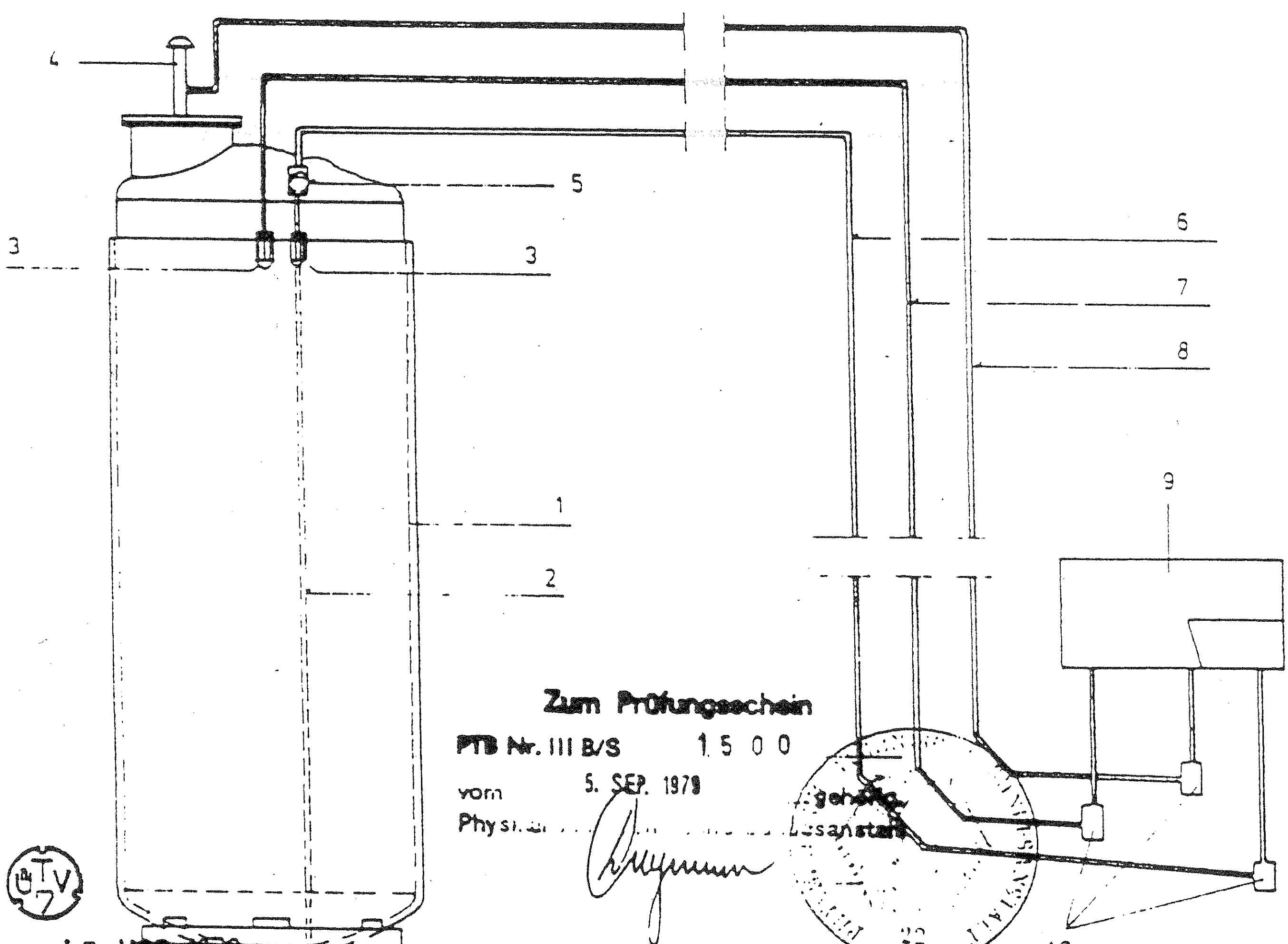
	Datum	Name		SGB Sicherungsgerätebau GmbH 5900 Siegen 21 - Weidenau
Gezeichnet	15.9.78			
Geprüft				
Normgepr				

Maßstab		
o.M.	Vacuum Leak Detector VL-H 2 Electric circuit diagram Vakuum-Leckanzeiger VL - H 2 Elektrisches Schaltbild	2564
		Ersatz für
		Ersetzt durch

1	**Kontrollraum** CONTROL AREA
2	Leckfuhlerrohr / Leak Detector tube — Material lt. Herstellerangabe / Material as per OEM's specification
3	Elektrische Trennstucke, handelsublich — Commercial ellectric isolating units
4	Entluftung entspr. DIN 4755 — Ventilation conforms to DIN 4755
5	Flussigkeitssicherung Fabr. Oventrop Nr 68055 — Float valve
6	Saugleitung, I.W. 6 mm — Suction pipe, 6mm ID
7	Messleitung, I.W. 6mm — Gauge pipe, 6mm ID
8	Auspuffleitung, I.W. 6mm — Exhaust pipe, 6mm ID
9	Leckanzeiger VL-H 2 — Leak Indicator VL-H2
10	Kondensatgefaße Fabr. Oventrop Nr. 16812351 — Condensate trap OEM Oventrop

Saug-, Meß- und Auspuffleitung in Schutzrohren verlegen (she. Montageanweisung Abschnitt 4.3 und 4.4).

Install suction, gauging and exhaust piping in protective conduits
(vide Instructions for Installation - section 4.3 & 4.4)



	Datum	Name		
Gezeichnet	11.14.75	[illegible]	Sicherungsgerätebau GmbH 5900 Siegen 21	SGB *Sicherungsgerätebau* GmbH 5900 Siegen 21 - Weidenau
Geprüft				
Normgepr				

Maßstab	VERTICAL DOUBLE SKIN STORAGE TANK - Leak Detector Installation drg. Steh. doppelwandige Lagerbehälter Montageskizze für Leckanzeiger VL - H 2	2565
		Ersatz für
		Ersatz durch

Supplement E-2 on Technical Description of Underpressure Leak Detector VL H2

1. Subject

1.1. Based on the test certificate from the Technical Physical Federal Institute *PTB No. III B/S 1500* dated 5 September 1979 with first supplement dated 11 January 1982, second supplement dated 10 July 1987 and third supplement dated 18 April 1988, on 13 September 1979, the Ministry for Labor, Health and Social Security for the State of North Rhine Westphalia has hereby granted legal commercial component approval 08/PTB No. III B/S 1500 for the underpressure leak detector, type VL H2 as part of a leak indicator device with first supplement from the central point for safety engineering for the State of North Rhine Westphalia dated 26 February 1982, second supplement dated 28 July 1987 and third supplement dated 30 May 1988.

This refers to the use of the leak detector on tanks for storage of minerals or products classified in hazard class A III.

Supplement E-1 dated 27 January 1997 is a part of this 2nd supplement.

1.2. The underpressure leak detector, type VL H2 with alarm underpressure > 230 or 325 mbar may be used for monitoring double walled tanks in which *non-combustible water polluting liquids are stored.*

2. Type Designation

Underpressure leak detector VL H2/A, VL H2/B and VL H2/A-VA, VL H2/B-VA

3. Range of Application

The range of application is supplemented by the following new version:

3.1. Pressureless Operated, Double Walled Tanks with/and Institial Space(s) without Leak Detection Liquid Filling

3.1.1 Tanks according to DIN 6608, DIN 6616, Shape A, DIN 6619, DIN 6623 and DIN 6624

Density of substance stored [kg/dm^3]	Max. tank height of diameter [m]		
	VL-H2/A	VL-H2/B	
0.8	2.55	3.76	Above ground tanks only
0.9	2.27	3.34	
1.0	2.04	3.01	Above and underground tanks
1.1	1.86	2.74	
1.2	1.70	2.51	
1.3	1.57	2.32	
1.4	1.46	2.15	
1.5	1.36	2.01	
1.6	1.28	1.88	
1.7	1.20	1.77	
1.8	1.13	1.67	
1.9	1.07	1.58	

3.1.2 Tanks according to DIN 6618-2

Diameter [mm]	Height [mm]	Max. density of substance stored [kg/dm^3]	
		VL-H2/A	VL-H2/B
1600	≤ 6 960	1.9	1.9
2000	≤ 8 540	1.9	1.9
2500	≤ 8 800	1.9	1.9
2900	≤ 9 585	1.9	1.9
	≤ 12 750	1.35	1.7
	≤ 15 950	1.04	1.3

3.1.3 Constructionally approved tanks (approved for general construction), whose interstitial space is suitable for connection of the underpressure leak detector VL-H2.

3.1.4 Tanks with interstitial spaces for which test certificates from the testing point for leak detection equipment from TÜV-Nord e.V., Hamburg are present, which indicate that the interstitial space is suitable for connection of the underpressure leak detector VL-H2.

3.1.5 Others (e.g. interstitial spaces of catch tubs, flat seals), for which test certificates from the testing point for leak detecting equipment at TÜV-Nord e.V., Hamburg are present, indicating that the interstitial space is suitable for connection of the underpressure leak detector VL-H2.

3.1.6 Other Tanks and Interstitial Spaces According to Chapters 3.1, 3.2, 3.4, 3.5

On tanks, on which the suction line in the interstitial space does not reach to the bottom of the tank, the conditions specified in Chapter 3.1.1 must be maintained.

3.2. Substance Stored

3.2.1 Leak Detectors VL-H2/.. and VL-H2/..-VA

- Water polluting liquids with flash point between 55°C and 100°C (hazard class AIII)
- Water pollutant liquids according to substance list in Appendix 1
- Water polluting liquids with flash point greater than >100°C such as:
  non-combustible (fresh): Motor oils, hydraulic oils, lubricating oils, drilling oils, spindle oils
- Similar water polluting liquids comparable with those specified previously in terms of their corrosion characteristics and whose cinematic viscosity does not exceed 5 000 mm^2/s at 0°C.

3.2.2 ONLY Leak Detector VL H2/..-VA

- Liquids with a flash point ≥ 55°C, contained in the positive list in DIN 6601 under substance No. 1.4301, 1.4306 and 1.4541 and proven to be ready for use (+).
- Liquids comparable to those specified previously in terms of their corrosion characteristics.

4. Conditions of Use

- No. 6.4 of the installation instructions is supplemented to include the following sentence in Para. (5):

  (5) The liquid stop valve must be sufficiently resistant to the substance stored.

- No. 6.5 of the installation instructions is supplemented to include the following sentence:

  (5) If the substance stored is heated in tanks set up outdoors and above ground, the first 20% of the measuring line (starting from the tank) may also require heating.

- All other versions, descriptions, drawings and conditions of the construction approval 08/PTB No. III B/S 1500 remain unaffected.

A.1 Ensuring reliable triggering of alarms on tanks/containers with a suction line to the lowest point

(1) The calculation for ensuring reliable triggering of alarms can be omitted for the tanks/ containers listed in supplement E-2 (with the table showing tank height against density).

(2) In order to ensure reliable triggering of alarms, the volume of the interstitial space must be reduced by entering fluids by V = 17% (VL-H2/A) or V = 18.5% (VL-H2/B).

(3) In the event of a leak, the interstitial space can be filled to the height h_1 above the lowest point of the container/tank as a result of the alarm pressure (alarm ON).

$$h_1 = \frac{p_{AE}}{g \cdot \rho}$$

Whereby:

h1 height in m

p_{AE} alarm pressure (VL-H2/A): 23 000 Pa
p_{AE} alarm pressure (VL-H2/B): 32 500 Pa

ρ density in kg/m^3

G constant of gravitation: 9.81 m/s^2

(4) The volume of the interstitial space V_1 at fill height h_1 should be determined through calculation (alternatively, the capacity should be gauged by litres). The geometry of the tank should be taken into account here.

(5) Triggering of the alarm is taken to be assured if the following condition is met:

$$V < \frac{V_1}{V_0} \cdot 100\%$$

Whereby:

V volume to be displaced in %

V_1 volume of the interstitial space from the lowest point of the interstitial space to the height h_1 in m^3

V_0 total interstitial space volume in m^3

A.2 Ensuring reliable triggering of alarms on tanks/containers without a suction line to the lowest point

(1) The table in section 3.1.1 of supplement E-2 should be applied to tanks/containers without a suction line to the lowest point.

Appendix I

Substance List

Serial No.	Ident. No. DIN 6601	Substance description
1.		Adipic acid
2.		Aluminum chloride
3.		Drilling oils
4.		Boric acid
5.	3167	Brake fluid, hydraulic, flash point > 100°C
6.		Calcium hydroxide
7.		Calcium nitrate
8.		Diethylene glycol TR
9.		Diphenyl
10.		Ferrous (II) chloride, saturated solution 38,4 %
11.		Ferrous (III) chloride
12.		Ferrous (III) chloride sulfate solution
13.		Ferrous (II) sulfate, saturated solution 21 %
14.		Ferric (III) sulfate
15.		Ethylene glycol TR
16.	3192	Extracts, food flavorings, in alcohol solution, 55°C < flash point < 100°C
17.	3077	Formaldehyde, aqueous solution, with 37 % formaldehyde, methanol content 10 - 15 %, flash point > 61°C
18.	3076	Formaldehyde, aqueous solution with < 5 % formaldehyde, flash point > 100°C
19.	445	Formaldehyde, aqueous solution with > 5 % formaldehyde, methanol content < 15 %, flash point > 55°C
20.		Anti-freeze agent , (glysantine)
21.	3393	Gas oil, flash point > 100°C
22.		Glycerin (propane triol) TR
23.		Urea, dissolved, containing ammonia

Serial No.	Ident. No. DIN 6601	Material description
24.		Urea –formaldehyde solutions
25.	3085	Resin in hydrocarbons, without alcohol, flash point > 100°C
26.		Hexamine, aqueous solution
27.		Hydraulic oils
28.		Calium chloride < saturated solution
29.		Calium iodide < saturated solution
30.		Calium nitrate (saltpeter) < saturated solution
31.		Calium sulfate < saturated solution
32.	3124	Hydrocarbons and mixtures, flash point > 100°C
33.		Linseed oil
34.		Magnesium nitrate < saturated solution
35.		Magnesium sulfate < saturated solution
36.	574	Methylene glycol
37.		Sodium acetate < saturated solution
38.		Sodium aluminate
39.		Sodium chloride < saturated solution
40.		Sodium fluoride < saturated solution
41.		Sodium hydrogen carbonate < saturated solution
42.		Sodium nitrate < saturated solution
43.		Sodium sulfate < saturated solution
44.		Sodium sulfite < saturated solution
45.		Sodium thiosulfate < saturated solution
46.	963	Sodium chloride, aqueous solution
47.		Vegetable oils, e.g. olive oil
48.		Recinoleic oil
49.		Brine

Serial No.	Ident. No. DIN 6601	Material description
50.	3224	Shale oil, flash point > 100°C
51.		Lubricating oils (fresh oils)
52.		Soap solution
53.		Spindle oils
54.	3183	Coal tar distillates, flash point > 100°C
55.	3268	Coal tar naphtha, flash point > 100°C
56.		Stearic acids TR
57.	3167	Tars, liquid, flash point > 100°C
58.	3230	White spirit, flash point > 100°C
59.		Animal fats and oils
60.	3227	Tinctures, medical, in alcohol solution, 55°C < flash point < 100°C
61.		Water, distilled
62.		Wheat germ oil
63.		Tartaric acid < saturated solution

 WgfS-Nbr-Datenbank *13 February 1991*

Technical data

1. External electrical data

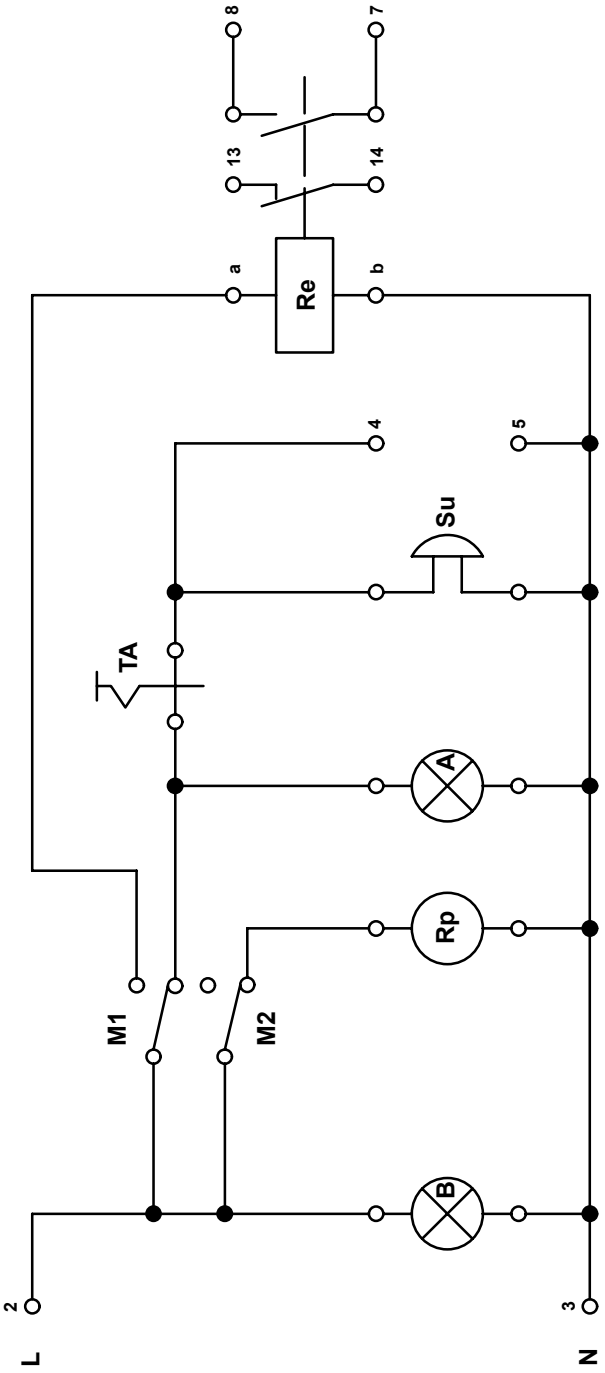
Electrical supply (without external signal)		230V~ - 50 Hz - 50 W
Switch contact load, terminal strip, terminals AS		230V~ - 50 Hz - max. 2 A
Switch contact load, potential free contacts	max:	230V~ - 50 Hz - 8 A
	min:	5 V / 5 mA
Class of overvoltage		2
Max. fusing		10 A

2. Pneumatic data (leak detector trip values)

	Alarm ON mbar	**Alarm OFF mbar**	**Pump ON mbar**	**Pump OFF mbar**
VL-H2/A	230 – 275	285 – 320	270 – 320	330 – 360
VL-H2/B	325 – 360	375 – 415	370 – 410	420 – 450

3. Pneumatic data (requirements concerning the test measuring instrument)

Nominal size	min. 100 mm
Accuracy class	min. 1.6
Scale end value	-600 mbar and -1000 mbar



A = Red signal lamp (alarm)
B = Green signal lamp (operation)
M1 = Microswitch 1 (Alarm)
M2 = Microswitch 2 (pump)
Re = Relay
Rp = Underpressure pump

Su = Buzzer
TA = Alarm switch
2, 3 = Mains connection
4, 5 = External signal
7, 8 = Potential-free contacts
13, 14 = Potential-free contacts

Nr.	Änderung	Datum	Name
1	Bez. Mikroschalter	05.10.98	Borheier
1	Klemmenbezeichnung	26.02.98	Borheier

Bearb. 12.01.98 Borheier
Gepr.

SGB

Werkstoff | Maßstab

Bezeichnung

Stromlaufplan VL- H2

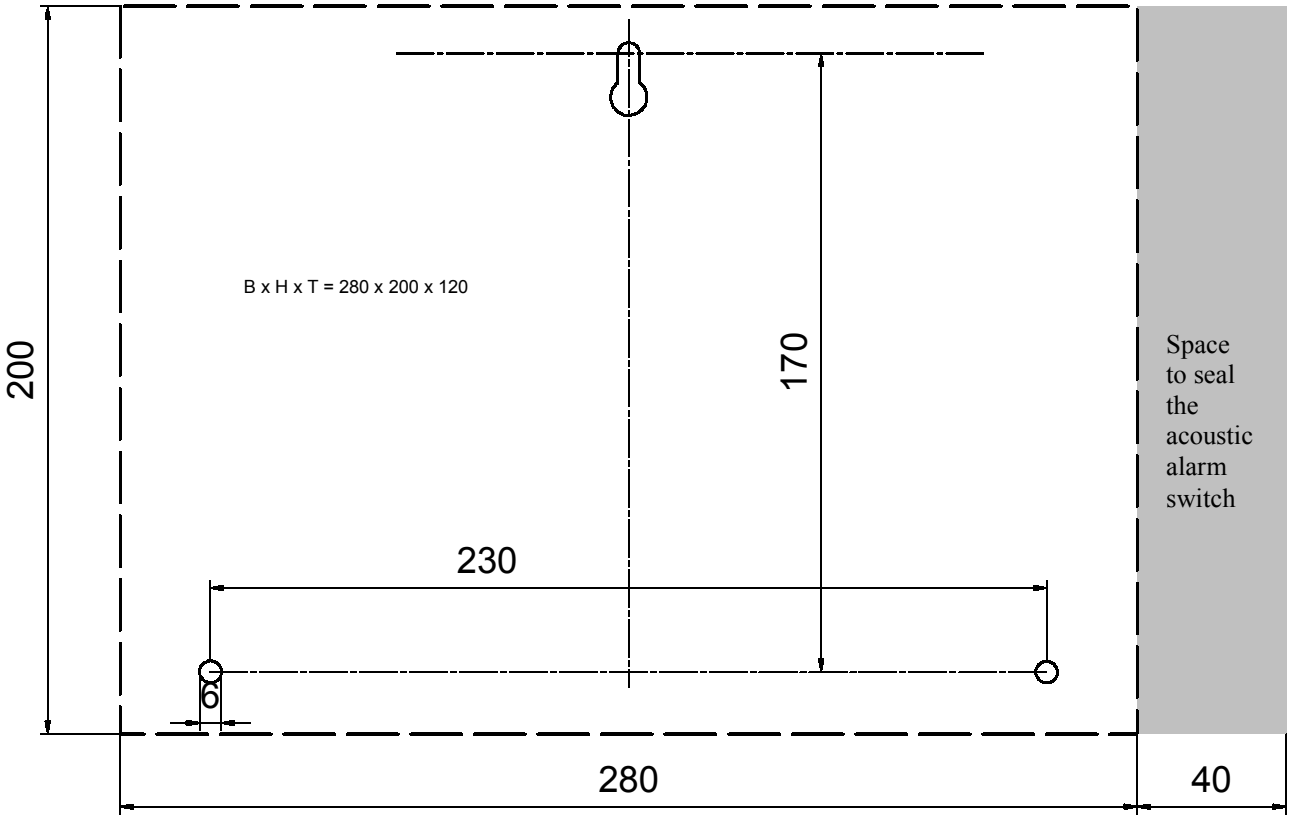
mit Relais in sicherheitsgerichteter Verdrahtung

Zeichnungsnummer

SL - 850 200

Blatt

Bl.



28-04-2003

SGB

Dimension / Measurement

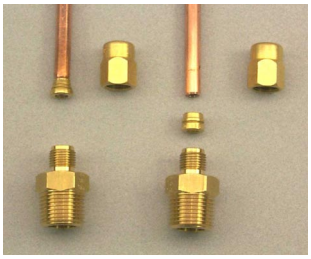
Work Sheet: AB-820 500

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

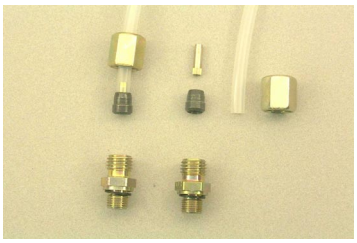
2 Clamping ring threaded fitting for plastic and metal pipes



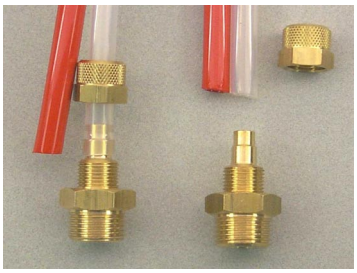
1. Insert the support sleeve into the end of the pipe
2. Insert the pipe with support sleeve as far as it will go
3. Tighten the thread until strong resistance can be clearly felt
4. Lightly loosen the nut
5. Tighten the nut until resistance can be felt (nut must exactly match the thread of the basic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

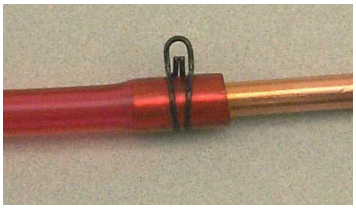
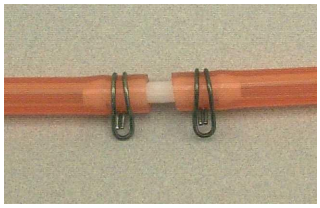
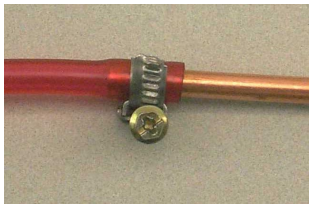


1. Make a right-angled cut in the PA pipe
2. Loosen the union nut and push it over the end of the pipe
3. Push the pipe onto the nipple up to where the thread begins
4. Tighten the union nut by hand
5. Further tighten the union nut using a wrench until clearly increased force is needed (approx. 1 to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

NOT suitable for PE-pipes

Pneumatic connections

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

10829 Berlin, march 17, 2004
Kolonnenstraße 30 L
Tel.: 030 78730-364
Fax: 030 78730-320
Ref.: III 14-1.65.22-64/02

Allgemeine bauaufsichtliche Zulassung (National technical approval)

Approval no.: Z-65.22-119

Applicant: Sicherungsgerätebau GmbH
Hofstraße 10
57076 Siegen

Subject of approval: Underpressure Leak Detector VL-H2

Valid until: June 30, 2007

Allgemeine bauaufsichtliche Zulassung (National technical approval) is hereby granted to the above subject of approval.*

This *allgemeine bauaufsichtliche Zulassung* (National technical approval) comprises six pages and five pages appendices.

* This *Allgemeine bauaufsichtliche Zulassung* (National technical approval) replaces the *Allgemeine bauaufsichtliche Zulassung* (National technical approval) Z-65.22-119 dated June 2 1997, in the revised and expanded version dated June 21 2002.

II. SPECIAL TERMS

1 Subject of approval and application scope

1.1 The subject of this *Allgemeine bauaufsichtliche Zulassung* (National technical approval) are leak detectors with an integrated underpressure generator in accordance with the underpressure system of type VL-H2 in the versions VL-H2/A and VL-H2/A-VA with an alarm underpressure > 230 mbar as well as in the versions VL-H2/B and VL-H2/B-VA with an alarm underpressure > 325 mbar.

1.2 The leak detectors are approved for connection to suitable interstitial spaces of tanks and surface sealing systems for installations for storing, filling and transferring water-hazardous liquids with a flash point above 55°C (refer to Appendix 1 for the design and layout of the leak detectors).

1.3 Suitable interstitial spaces in the sense of section 1.2 are:

- the interstitial spaces of double-walled tanks according to *Bauregelliste* (Construction Products List) A part 1, no. 15.2 (DIN 6608-2), no. 15.3 (DIN 6616), no. 15.5 (DIN 6618-2), no. 15.8 (DIN 6619-2), no. 15.10 (DIN 6623-2) and no. 15.12 (DIN 6624-2) which are operated with operating pressures of zero or less than 0.5 bar,
- the interstitial spaces of double-walled tanks which have been granted the *Allgemeine bauaufsichtliche Zulassung* (National technical approval) and are operated with operating pressures of zero or less than 0.5 bar.
- the interstitial spaces of single-walled tanks which are equipped with leak detection lining which has been granted the *Allgemeine bauaufsichtliche Zulassung* (National technical approval) and are operated with operating pressures of zero or less than 0.5 bar.
- the interstitial spaces of surface sealing systems which have been granted the *Allgemeine bauaufsichtliche Zulassung* (National technical approval).
- interstitial spaces for which it is ensured that an alarm is triggered for the density of the liquid being stored at the alarm underpressures specified in section 1.1.

1.4 This *Allgemeine bauaufsichtliche Zulassung* (National technical approval) provides evidence of the functional safety/reliability of the subject of approval in the sense of section 1.1.

1.5 The *Allgemeine bauaufsichtliche Zulassung* (National technical approval) is granted without prejudice to the rights of other legal areas to assert testing or approval procedures (e.g. 1st amendment of the German *Gerätesicherheitsgesetz* (Equipment Safety Act), Low Voltage Directive, EMC Directive for Equipment).

1.6 Due to this *Allgemeine bauaufsichtliche Zulassung* (National technical approval), the verification of suitability in accordance with the water laws and the building type approval in accordance with § 19 h of the German *Wasserhaushaltsgesetz*1 (Water Resources Act, WHG) are not required for the subject of the approval.

2 Definitions for the building product

2.1 Properties and composition

2.1.1 A leak at the walls of the interstitial space is indicated visually and acoustically as a result of a pressure increase to the alarm threshold.

2.1.2 The leak detector can be used for connection to interstitial spaces which have internal walls which, in unpressurised storage situations, can be subjected to a static pressure

1 German *Wasserhaushaltsgesetz (*Water Resources Act, WHG) dated November 19 1996

from the liquid being stored corresponding to the definitions in section 3.1. An additional excess pressure in the inside of the tank of < 0.5 bar is permissible.

The connecting lines of the leak detector must reach up above the maximum filling height of the liquids being stored.

2.1.3 The subject of approval comprises the leak detector of type VL-H2 (in the versions VL-H2/A, VL-H2/A-VA, VL-H2/B, VL-H2/B-VA) with the display and control elements, the underpressure pump, the pressure switch and the electrical components for processing the output signal.

2.1.4 Proof of the functional reliability and safety of the subject of approval in the sense of section 1.1 has been provided in accordance with the "*Zulassungsgrundsätze für Leckanzeigegeräte für Behälter* (Approval Principles for Leak Detectors for Tanks, ZG-LAGB)" of the *Deutsches Institut für Bautechnik*, dated August 1994.

2.2 Manufacturing and identification

2.2.1 Manufacturing

The leak detectors must only be manufactured in the applicant's production plants. They must conform to the documents named in Appendix 3 of this *Allgemeine bauaufsichtliche Zulassung* (National technical approval) with regard to design, dimensions and materials.

2.2.2 Identification

The leak detector and/or its packaging or its delivery note must be labelled with the mark of conformance (German "*Ü*" character) in accordance with the conformance directives of the *Länder*. This mark must only be applied if the requirements laid out in section 2.3 are satisfied. In addition, the leak detector shall also be labelled with the following information:

Type designation

Approval number.

2.3 Proof of conformance

2.3.1 General

The confirmation of the conformance of the leak detectors to the definitions of this *Allgemeine bauaufsichtliche Zulassung* (National technical approval) must be performed for every manufacturing plant by submitting the manufacturer's declaration of conformity on the basis of the works-internal production checks and by having an initial test of the leak detector carried out by a suitably certified testing body.

2.3.2 Works-internal production checks

Works-internal production checks shall be set up and performed in the manufacturing plant.

Within the framework of the works-internal production checks, a routine check test shall be performed on every leak detector. By means of the routine check test, the manufacturer shall ensure that the materials, dimensions, fit of components and design conform to the tested prototype and that the leak detectors are functionally reliable and safe.

The results of the works-internal production checks are to be documented and assessed. Such documentation must include as a minimum the following information:

- Designation of the leak detector
- Type of check or test
- Date of manufacture and date of testing for the leak detector
- Results of the checks or tests
- Signature of the person responsible for the works-internal production checks

This documentation shall be retained for at least five years. It is to be submitted to the *Deutsches Institut für Bautechnik* and the highest construction supervision authorities on request.

If the outcome of the tests is unsatisfactory then the manufacturer shall immediately take the measures required to rectify the problem. Leak detectors which do not meet the requirements must be handled in such a way that it is not possible for them to be mixed up with leak detectors which have demonstrated conformance to the requirements. Once the problem has been rectified the affected test shall be repeated immediately, in as far as this is technically possible and required to demonstrate that the problem has been rectified.

2.3.3 Initial test of the leak detectors by a certified testing body

Within the framework of the initial test, the functional tests listed in the *Zulassungsgrundsätze für Leckanzeigegeräte für Behälter* (Approval Principles for Leak Detectors for Tanks) shall be performed. If the conformance tests on which the *Allgemeine bauaufsichtliche Zulassung* (National technical approval) is based were carried out on samples taken from on-going production then these tests shall replace the initial test.

3 Terms and definitions for the design of the leak detectors

3.1 (1) The applicational limits required for the leak detector to ensure reliable triggering of alarms for double-walled steel tanks according to *Bauregelliste* (Construction Products List) A part 1, no. 15.2 (DIN 6608-2), no. 15.3 (DIN 6616), no. 15.8 (DIN 6619-2), no. 15.10 (DIN 6623-2) and no. 15.12 (DIN 6624-2) are to be taken from the details in the table in section 3.1.1 of supplement E-2 for the technical description dated 16.03.2004 depending on the density of the liquid being stored.

(2) The applicational limits required for the leak detector to ensure reliable triggering of alarms for double-walled steel tanks according to *Bauregelliste* (Construction Products List) A part 1, no. 15.5 (DIN 6618-2) are to be taken from the details in the table in section 3.1.2 of supplement E-2 for the technical description dated 16.03.2004.

(3) For the remaining application areas of the leak detector according to section 1, it must be demonstrated in accordance with Appendix A[2] of supplement E-2 of the technical description that the alarms are triggered reliably.

3.2 A minimum density of 1.0 kg/dm^3 should always be assumed in cases where the underpressure leak detectors are used on tanks which are stored below ground.

3.3 The liquids being stored must neither have a tendency to viscousness nor solid deposits.

3.4 In the selection of the leak detection equipment, it must be taken into account that the leak detector and the interstitial space need to be sufficiently resistant to the liquids being stored.

Liquids which may be stored include water-hazardous liquids with a flash point

- between 55°C and 100°C, such as mineral oil products,
- higher than 100°C, such as unused (fresh) engine oils, hydraulic oils, lubricating oils, drilling oils and spindle oils, as well as other similar, water-hazardous liquids which are comparable to the above in terms of their corrosive properties and have a kinematic viscosity which does not exceed 5,000 mm^2/s at 0 °C,
- liquids in accordance with the list of materials in Appendix 2,
- as well as other liquids which are comparable to the above liquids in terms of their corrosive properties (these do not require special proof of permanence).

The leak detector versions VL-H2/A-VA and VL-H2/B-VA are also allowed to be used with liquids with a flash point higher than 55°C which are identified as suitable for use with the materials 1.4301, 1.4306 and 1.4541 in the list of positive liquids (Table 2) in standard

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2 Appendix A dated 16.03.2004 for supplement E-2 of the technical description of the underpressure leak detector VL-H2 dated 16.03.2004

DIN 6601[3], as well as with similar non-combustible, water-hazardous liquids which are comparable in terms of their corrosive properties to those listed.

4 Terms and definitions for implementation

4.1 The leak detectors must be installed in accordance with section 6 of the technical description[4] and commissioned in accordance with section 7 of the same technical description.

The conditions for use listed under section 4 of supplement E-2 of the technical description dated 16.03.2004 are also to be noted as additional installation instructions.

The installation, servicing, repairs and cleaning of the leak detectors must only be assigned to firms certified as qualified in this respect in accordance with § 19l of the *Wasserhaushaltsgesetz (*Water Resources Act, WHG), unless these activities are, in accordance with the regulations according to the law of the *Land*, no longer subject to the requirement that they must be performed by a certified firm (*Fachbetriebspflicht*), or the manufacturer of the leak detectors performs the above work himself with qualified personnel.

4.2 In cases where the liquid is stored out in the open in tanks above ground and is heated, 20% of the measurement line (on the interstitial space side) between the interstitial space and the leak detector must be heated if this line is not routed in a way which protects it against frost.

4.3 The leak detectors must not be installed in a potentionally explosive atmosphere.

4.4 The leak detectors must only be mounted in frost-free locations or in weather-proof protection boxes according to DIN 40 050[5] IP 55. If the leak detector is installed in a protection box then an additional external acoustic alarm should be installed, or the alarm signal should be forwarded via the potential-free contact.

5 Terms and definitions for use, upkeep, maintenance and recurring checks

The leak detection systems with leakage detectors must be operated and maintained in accordance with section 8 of the technical description[4]. The technical description[4] should also be supplied by the manufacturer.

For and on behalf of
Strasdas Certified

3 DIN 6601: Resistance of tank materials made of steel to liquids (list of positive liquids) - October 1991 edition

4 The applicant's technical description dated 17.11.1986 for the leak detector type: VL-H2... and the supplements dated 27.01.1997 and E-2 dated 16.03.2004 for the leak detector versions VL-H2/A, VL-H2/B, VL-H2/A-VA and VL-H2/B-VA were checked by the *TÜV Nord e.V.*

5 DIN 40 050-10: Protection systems; Protection against accidental contact, foreign bodies and water, small transformers up to 16 kVA

DECLARATION OF CONFORMITY

This declaration applies for

UNDERPRESSURE LEAK DETECTORS ***VL-H2, VL-H5, VL-N3***

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 Guideline 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 55 014-1:1998+A1:1999
- EN 55 014-2: 1998, Cat. I
- EN 61 000-3-3: 1995
- EN 61 000-3-2: 1997 + A1:1998 + A2:1998

EC Guideline 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 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)

Siegen, 8 July 2003

M. Hücking, Development

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
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