

Focus on **safety**,
for a clean environment.



Leak Detection Systems

www.asf-leckanzeiger.de

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Proven leak detection systems
for tanks and pipelines in ...



... Oil heating systems



... Petrol stations



... Industry

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THOMAS
A Gardner Denver Product

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Further Information:

www.asf-leckanzeiger.de

ABOUT US

Focus on Safety, for a clean environment

Since five decades, nearly 1 million ASF leak detectors have been installed in consumer heating oil facilities, gas stations, tank farms and industrial plants. This confirms the reliability of our products for monitoring of water-polluting liquids in double-walled tanks and piping.

All our leak detection systems working on the pressure or vacuum principle are corresponding with DIN EN13160 Class 1, and are approved by the DIBt (German Institute for Building Technology).

Since the merger with Gardner Denver, Inc. in 2005 and formation of the Thomas Products Division, we are part of one of the world's largest manufacturer and supplier of pump solutions for various applications.

The environmental protection is one of the main activities of the company. With high standards and application specific product solutions, we contribute to the active protection of our environment.

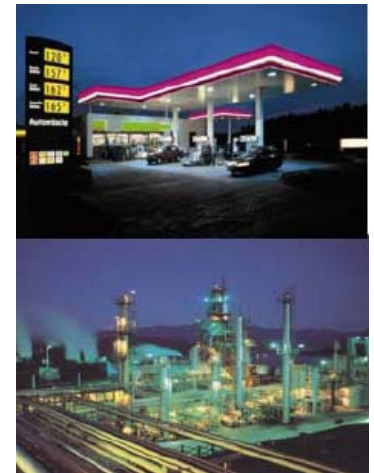


Best customer relations

We make a point to fulfil the expectations and needs of our customers in the best possible manner. This applies to the regional working specialists as well as to international organized companies.

Our customers are tank service companies, manufacturers of leak protection linings, petrol stations and industrial plant building companies, planners, real estate managing companies, tank manufacturers, petroleum industry and companies working in the waste and recycling business.

We see it for granted to support our customers with service and trainings on the selection, installation and service of our leak detection equipment, so they are able to serve the respective end customers properly and professionally.



Our Locations

Gardner Denver Thomas GmbH

Benzstrasse 28
82178 Puchheim / Germany

In our head office near Munich around 75 employees are supporting our operations with all necessary central functions.

Gardner Denver Thomas GmbH

Karatasstrasse 4
87700 Memmingen / Germany

The new plant in the Allgäu region has started production in the year 2004. With 200 employees and 5,000 m² production area, different pump versions as well as the ASF leak detection systems are produced in this facility on highest quality and safety standards.

The production is organized by following the GARDNER DENVER's LEAN principles, which guarantees high efficiency, transparency and best fulfilment of customer's demands. Particular importance we attach to a clean and ergonomic working environment.



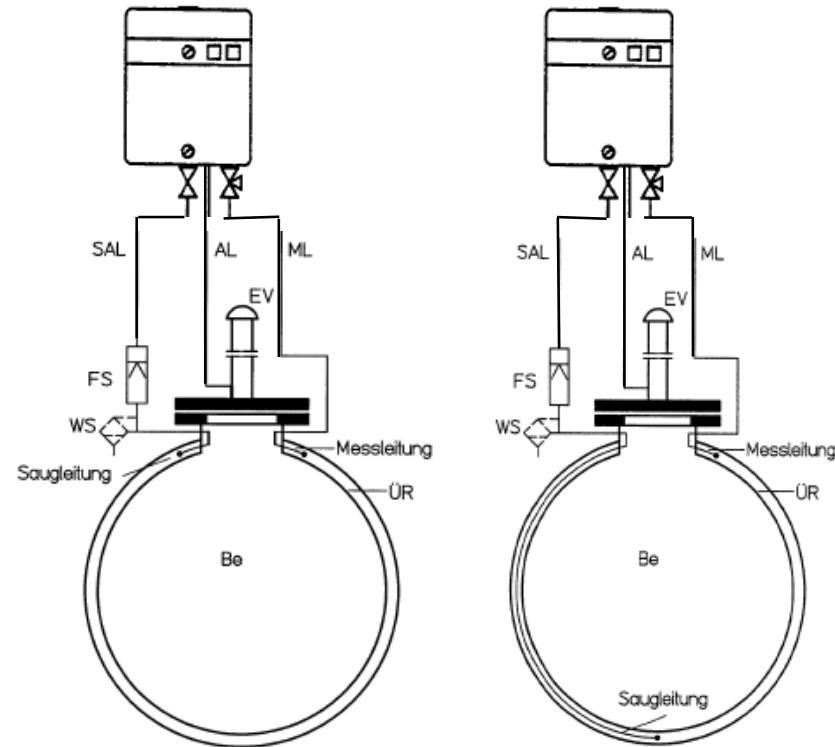
Alarm function vacuum leak detector:

- Air leakage

Air is sucked into the monitoring space,
pressure level in the monitoring space is changing
At the set point "Pump ON", the pump starts and evacuates the
monitoring space up to the vacuum level "Pump OFF"
If the leakage rate is higher than the flow rate of the pump, the
pressure level changes to the "Alarm ON" set point.

- Liquid leakage

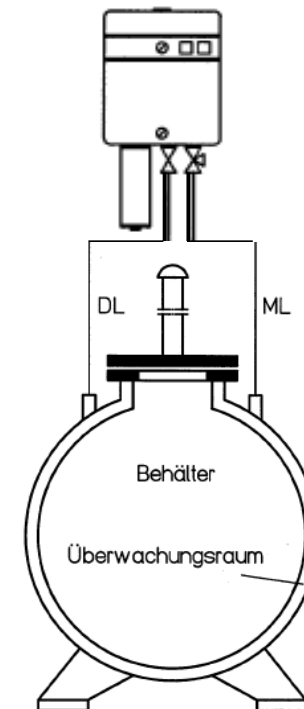
Liquid is sucked into the monitoring space
Because of the reduced volume inside the monitoring space, the
pressure level is changing.
At the set point "Pump ON", the pump starts and evacuates the
monitoring space up to the vacuum level "Pump OFF"
Liquid is still sucked into the monitoring space.
When the liquid level reaches the suction line connector on the top
of the tank, liquid fills the suction line, the flow stop valve will be
closed.
The pump is still running, but without connection to the measuring
line of the leak detector. Because there is still vacuum in the
measuring line, liquid is also sucked into the measuring line til the
volume and pressure level in the measuring line reaches the
"Alarm ON" point.



Alarm function pressure leak detector:

- Only air leakage

Air is pressed into the tank,
pressure level is decreasing in the monitoring space
At the set point "Pump ON", the pump starts and pressurizes the
monitoring space up the the pressure level "Pump OFF"
If the leakage rate is higher than the flow rate of the pump, the
pressure level changes to the "Alarm ON" set point.



General Information about Leak Detection Systems

In Germany leak detection systems based on three different laws:

- Law for products, installed in buildings → approval of the systems by the DIBT institute required
- Law for water protection → only special certified companies are allowed to make installations, service and repair on leak detection systems
- Regulations for safety for materials → e.g. actions required for explosion protection

Technical details for leak detection systems described in EU regulation EN 13160 Part 1 to 7

This regulation distinguishes five different classes of systems

Alarm signal before liquid is dropped into the environment
Class1 – Pressure and vacuum systems (like ASF systems)

At the time of alarm signal, leaking fluid can be diffused into the environment

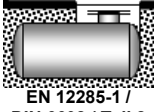
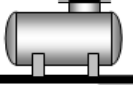











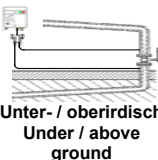










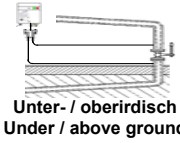


- Class2 – Monitoring space controlled by liquid
- Class3 – Liquid sensors, e.g. placed in sumps
- Class4 – Leak detection by controlling the filling level of the tank
- Class5 – Sensors placed in the soil

Selection of requirements for leak detection systems:









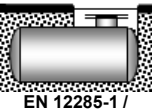
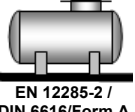
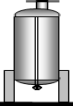
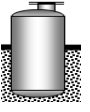
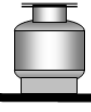
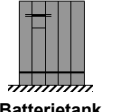













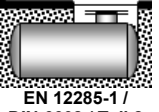
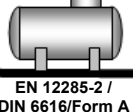
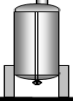






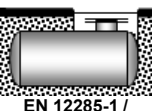
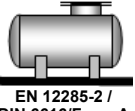
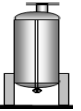

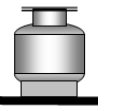





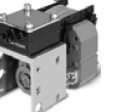

- Visual and acoustic alarm signal
- Systems within ex zones must have special explosion protection
- Acoustic signal designed for continuous operation, also with switch off function
- The visual alarm signal must not be switched off
- No switch or connector in the power cord allowed
- Max. monitoring space for tanks 8m³, for tubes 10m³ (because of handling and service, we recommend max. 4m³ each leak detector)
- Pump flow rate 85 +/-15 l/h at alarm set point
- Colors for tubings: Measuring line → red, pressure or suction line → white, exhaust line (only on vacuum systems) → green
- Alarm pressure minimum 30mbar more than the maximum pressure, generated by the fluid level (hydrostatic pressure) at the tank bottom (e.g. tank DIN 6608, max. diameter 2,90m, density 1 kg/dm³ > ALARM ON set point > 320mbar), or the suction line of the leak detector is installed down to the lowest point of the monitoring space.
- Alarm pressure for tube systems have to be minimum 1 bar above the operation pressure of the tube

Stand 09/2010

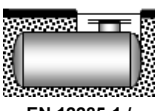
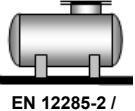
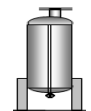











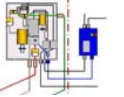
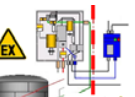



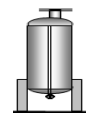






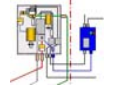

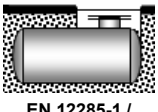
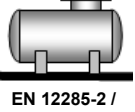
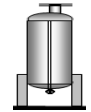














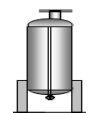







General features for the use of Pressure Leak Detectors	General features for the use of Vacuum Leak Detectors
<ul style="list-style-type: none"> - Less installation effort than for vacuum systems (no exhaust pipe no water trap is necessary). - With manifold systems multiple monitoring spaces of underground tanks can be monitored at the same time by one leak detector. - Considering the required guideline on protection against explosion, flammable liquids with flashing point $\leq 55^{\circ}\text{C}$ can be monitored by pressure systems. - The permitted operating pressure and monitoring pressure of the tanks and the pipes have to be considered. - The monitoring medium (air or nitrogen) of the leak detector has to have a minimum air humidity. This can be managed by the use of air dryer which have to be serviced adequately. At higher operating pressure, usually nitrogen is used. - The reaction behaviour of the monitoring medium together with the stored liquid has to be considered. If necessary an inert gas has to be used as monitoring medium. - By monitoring double walled pipes with higher operating pressure, the guidelines according to item 3 passage 3 of the EU pressure equipment directive have to be considered. - The specific approval documents of the leak detector, the tank and the pipeline have to be considered. This also applies to the operating limits in terms of the density of the stored liquid and the maximum allowable pressure in the control room. 	<ul style="list-style-type: none"> - Tanks with a protective lining system as well as large and high tanks can be monitored with vacuum leak detector systems. The suction pipe to the leak detector has to be placed at the lowest point of the monitoring space. - For monitoring of flammable liquids with flashing point $\leq 55^{\circ}\text{C}$, leak detectors with protection against explosion have to be used. - With vacuum leak detector systems only one leak detector can be used for each single monitoring space. - The leak detector and the connecting pipes have to be checked to the resistance against the stored medium. - Tanks with flexible lining and plastic pipes can be monitored with vacuum leak detectors. - Double walled tanks, which have been monitored by liquid leak detection systems (DIN EN 13160, class II system) in the past can be monitored by vacuum leak detectors. A certain volume of the monitoring liquid has to be removed from the monitoring space. - A water trap has to be installed into the suction pipe. - The exhaust air of the leak detector has to be fitted with an exhaust pipe. If it is not possible to lead the exhaust pipe back into the tank (for example tanks operated by pressure) a liquid trap has to be installed in the exhaust. - If it is not possible to install the monitoring pipe or the pressure pipe with a constant slope base, then additional water traps have to be installed at each low point of each pipe. - The specific approval documents of the leak detector, the tank and the pipeline have to be considered. This also applies to the operating limits in terms of the density of the stored liquid and the maximum allowable pressure in the control room.

<u>Überdruck Leckanzeiger / Pressure Leak Detectors</u>									
Type	Einsatzbereiche; Eigenschaften / Application *								
D9 Zulassung Z-65.23-109	 EN 12285-1 / DIN 6608 / Teil 2	 EN 12285-2 / DIN 6616/Form A DIN 6624 / Teil 2	 DIN 6619 / Teil 2	 DIN 6623 / Teil 2	 FP<>55°C / R10,R11(F) R12 (F+), Al, All, AIII	 Druck / Pressure Alarm ≥ 330mbar	 Pumpe		
D29 Zulassung Z-65.26-410	 Betriebsdruck Working Pressure ≤ 0,1 bar	 FP<>55°C / R10,R11(F) R12 (F+), Al, All, AIII	 Druck / Pressure Alarm: 1,1 bar	 Pumpe	 Unter- / oberirdisch Under / above ground				
D25 Zulassung Z- 65.26-250	 Betriebsdruck Working Pressure ≤ 16bar	 FP<>55°C / R10,R11(F) R12 (F+), Al, All, AIII	N₂	 Nur unterirdisch Only underground					
D26 Zulassung Z- 65.26-249	 Betriebsdruck Working Pressure ≤ 17bar	 FP<>55°C / R10,R11(F) R12 (F+), Al, All, AIII	 N₂ Automatic	 Unter- / oberirdisch Under / above ground					

* Weitere Details – siehe Dokumentation / Montageanleitung des jeweiligen Leckanzeigers / Further application details see in the product documentation and installation instruction

Unterdruck Leckanzeiger für Flüssigkeiten mit Flammpunkt >55°C/ Vacuum Leak Detectors									
Type	Einsatzbereiche; Eigenschaften / Application *								
IV F Zulassung Z-65.22-2	 Tankinnenhülle Tank with Lining	 SL zum Tiefpunkt / down to tank bottom	 DIN 6618 Teil 2+4	 Nur / only FP>55°C, AIII	 Vacuum Alarm ≥ -34mbar	 Pumpe			
III F Zulassung Z-65.22-2	 EN 12285-1 / DIN 6608 / Teil 2	 EN 12285-2 / DIN 6616/Form A DIN 6624 / Teil 2	 DIN 6618 Teil 2+4	 DIN 6619 / Teil 2	 DIN 6623 / Teil 2	 Batterietank DIN 6625	 Change Class II into Class I detection, EN13160, liquid > air	 Nur / only FP>55°C, AIII	
	 Vacuum Alarm ≥ -330mbar	 Pumpe							
V8 Zulassung Z-65.22-5	 Flachbodentank Flat Bottom Tank (DIN 4119)	 Betriebsdruck Working Pressure ≤ 3bar	 Nur / only FP>55°C, AIII	 Vacuum Alarm ≥ -330mbar	 Pumpe				
V13 Zulassung Z-65.22-143	 EN 12285-1 / DIN 6608 / Teil 2	 EN 12285-2 / DIN 6616/Form A DIN 6624 / Teil 2	 DIN 6618 Teil 2+4	 DIN 6619 / Teil 2	 Chemicals FP>100°C	 Vacuum Alarm ≥ -330mbar	 Pumpe		
V33 Zulassung Z-65.22-6	 EN 12285-1 / DIN 6608 / Teil 2	 EN 12285-2 / DIN 6616/Form A DIN 6624 / Teil 2	 DIN 6618 Teil 2+4	 DIN 6619 / Teil 2	 DIN 6623 / Teil 2	 Flachbodentank Flat Bottom Tank (DIN 4119)	 Nur / only FP>55°C, AIII	 Stainless Steel Standard DIN 6601	
	 Vacuum Alarm ≥ -330mbar	 Pumpe							

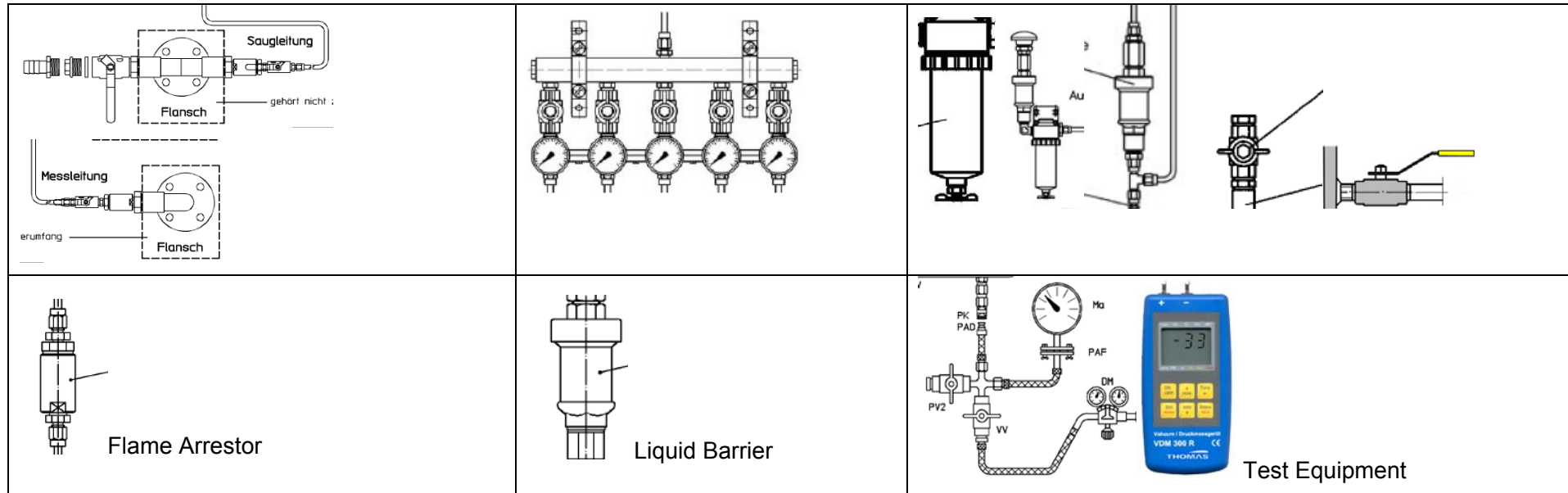
* Weitere Details – siehe Dokumentation / Montageanleitung des jeweiligen Leckanzeigers / Further application details see in the product documentation and installation instruction

Unterdruck Leckanzeiger für entzündliche Flüssigkeiten / Vacuum Leak Detectors with Ex Protection										
Type	Einsatzbereiche; Eigenschaften / Application *									
V80Ex H Zulassung Z-65.22-217 PTB 99 ATEX 2037 X	 EN 12285-1 / DIN 6608 / Teil 2	 EN 12285-2 / DIN 6616/Form A DIN 6624 / Teil 2	 DIN 6618 Teil 2+4	 DIN 6619 / Teil 2	 DIN 6623 / Teil 2	 Flachbodentank Flat Bottom Tank (DIN 4119)	 Change Class II into Class I detection, EN13160, liquid > air	 Betriebsdruck Working Pressure ≤ 6bar	 Stainless Steel Option DIN 6601	
	 Ex proofed IIA / IIB Option / T4	 FP<55°C / R10, R11(F), R12 (F+), Al, All, AllI	 Vacuum Alarm ≥ -330mbar	 Pumpe	 Ersetzt / Replaces Type V17Ex					
V80Ex N Zulassung Z-65.22-217 PTB 99 ATEX 2037 X	 Tankinnenhülle Tank with Lining	 SL zum Tiefpunkt / down to tank bottom	 DIN 6618 Teil 2+4	 Ex proofed IIA / IIB Option / T4	 FP<55°C / R10, R11(F), R12 (F+), Al, All, AllI	 Stainless Steel Option DIN 6601	 Vacuum Alarm ≥ -34mbar	 Pumpe		
	 Ersetzt / Replaces Type V18Ex									
V90 H Zulassung Z-65.22-399, Z-65.22-400	 EN 12285-1 / DIN 6608 / Teil 2	 EN 12285-2 / DIN 6616/Form A DIN 6624 / Teil 2	 DIN 6618 Teil 2+4	 DIN 6619 / Teil 2	 DIN 6623 / Teil 2	 Flachbodentank Flat Bottom Tank (DIN 4119)	 Change Class II into Class I detection, EN13160, liquid > air	 Betriebsdruck Working Pressure FP>55°C: ≤ 6bar FP<55°C: 0 bar	 Stainless Steel Option DIN 6601	
	 Mechanic Part Ex protected IIA / IIB Option / T4	 FP<55°C / R10, R11(F), R12 (F+), Al, All, AllI	 Vacuum Alarm ≥ -330mbar	 Pumpe						
V90 N Zulassung Z-65.22-399	 Tankinnenhülle Tank with Lining	 SL zum Tiefpunkt / down to tank bottom	 DIN 6618 Teil 2+4	 Mechanic Part Ex protected IIA / IIB Option / T4	 FP<55°C / R10, R11(F), R12 (F+), Al, All, AllI	 Stainless Steel Option DIN 6601	 Vacuum Alarm ≥ -34mbar	 Pumpe		

* Weitere Details – siehe Dokumentation / Montageanleitung des jeweiligen Leckanzeigers / Further application details see in the product documentation and installation instruction

Accessory Programm:

We also offer a wide range of accessories to connect our leak detectors to the different tanks or pipes, as well as other installation components to complete the leak detection system, e.g. water separators, flame arrestors, liquid barriers, enclosure with external alarm signal, heatings, valves, filters, test equipment



Leak Detectors

Data Sheets

LEAK DETECTOR TYPE D9 – PRESSURE PRINCIPLE

- without / with Manifold

Field of application:

- Underground and aboveground double-walled tanks with a monitoring space permitted to an pressure up to 0.6 bar.
- With an appropriate manifold system, up to 6 underground tanks can be monitored with one leak detector - the overall monitoring space volume may not exceed 8 m³.
- Tanks without leak detection fluid in the monitoring space.

Stored liquids: Water-endangering liquids, also with a flash point $\leq 55^\circ \text{C}$

Approval: General Design Permit (DIBT) No. **Z-65.23-109**
Tested by TÜV Nord, Hamburg

Assembly place: Within dry, frost-protected area, or outside into a protective enclosure.
It is not allowed to install the leak detector in an ex - zone!

Function: The leak detector works on the pressure principle. Visual and audible alarms are triggered by a pressure drop as a result of leaks in the tank walls, above or below the liquid level. Ambient air is drawn by the pump through an integrated air dryer and pumped with a max. relative humidity of 10% into the monitoring space. Small system leakages are balanced by the pump automatically. An integrated pressure valve on the pump protects the tank against damage ($P_{\text{ÜS}}$).

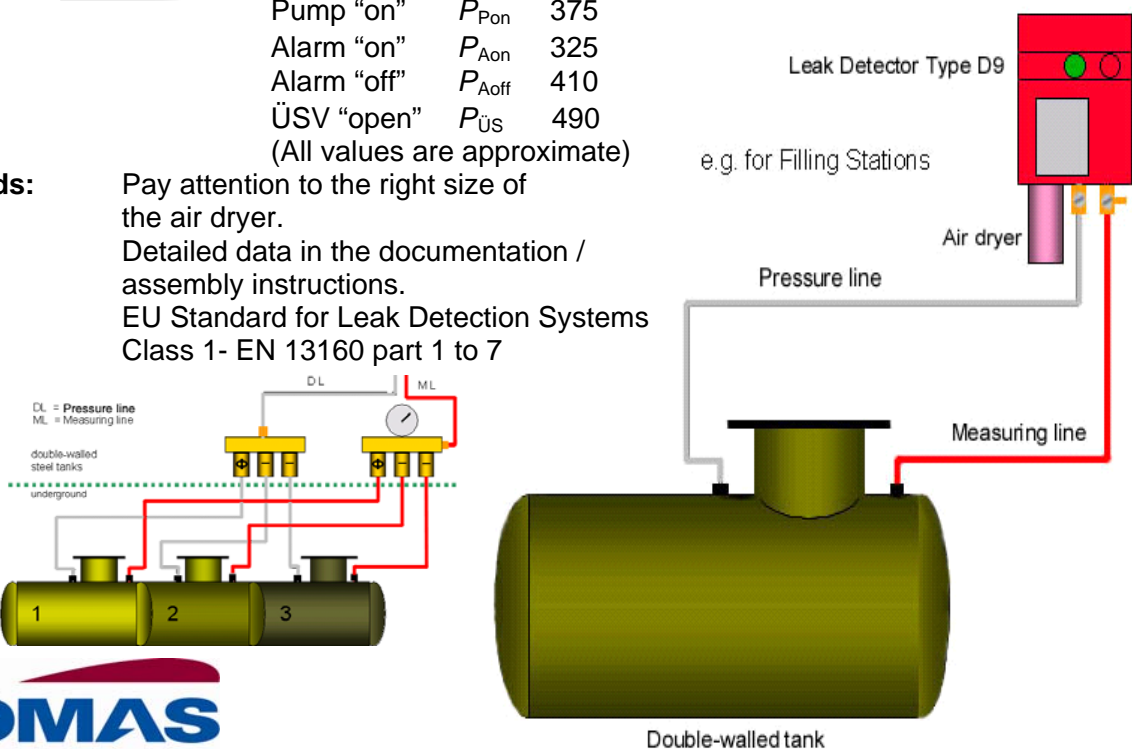
Switching values:	in mbar	Pump "off"	P_{Poff}	450
		Pump "on"	P_{Pon}	375
		Alarm "on"	P_{Aon}	325
		Alarm "off"	P_{Aoff}	410
		ÜSV "open"	$P_{\text{ÜS}}$	490

(All values are approximate)

Drying beads: Pay attention to the right size of the air dryer.

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE D29 – PRESSURE PRINCIPLE

Field of application:

- Underground / aboveground double-walled pipes with an appropriate monitoring space, operated at ambient pressure.
- With an appropriate manifold system, up to 6 underground pipes can be monitored with one leak detector - the overall monitoring space volume may not exceed 10 m³.

Stored liquids: Water-endangering liquids, also with a flash point $\leq 55^\circ \text{C}$

Approval: General Design Permit (DIBT) No. **Z-65.26-410**
Tested by TÜV Nord, Hamburg

Assembly site: Within dry, frost-protected area, or outside into a protective enclosure.
It is not allowed to install the leak detector in an ex - zone!

Function: The leak detector works on the pressure principle.
Visual and audible alarms are triggered by a pressure drop as a result of leaks in the pipe.
Ambient air is drawn by the pump through an integrated air dryer and pumped with a max. relative humidity of 10% into the monitoring space. Small system leakages are balanced by the pump automatically.
An integrated pressure valve on the pump protects the system against damage ($P_{\text{ÜS}}$).

Switching values: in bar

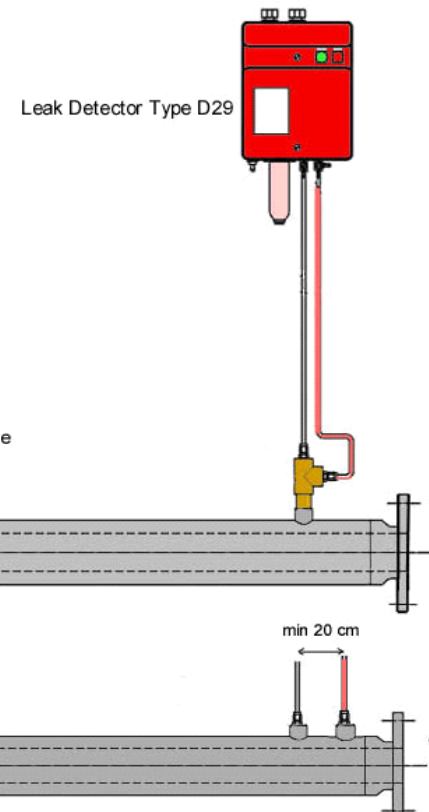
Pump "off"	P_{Poff}	1,5
Pump "on"	P_{Pon}	1,3
Alarm "on"	P_{Aon}	1,1
Alarm "off"	P_{Aoff}	1,4
ÜSV "open"	$P_{\text{ÜSV}}$	1,65

(All values are approximate)

Drying beads: Pay attention to the right size of the air dryer.

Note: Detailed data in the documentation / assembly instruction.

Standard: EU Standard for
Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE D25 – PRESSURE PRINCIPLE

- Nitrogen

Field of application:

- Double-walled underground pipes with an appropriate monitoring space and max. operating pressure of 16bar.
- Operated without stationary nitrogen bottle
- With an appropriate manifold system, up to 8 underground pipes can be monitored with one leak detector, the overall monitoring space volume may not exceed 10 m³.

Stored liquids: Water-endangering liquids, also with a flash point $\leq 55^\circ \text{C}$

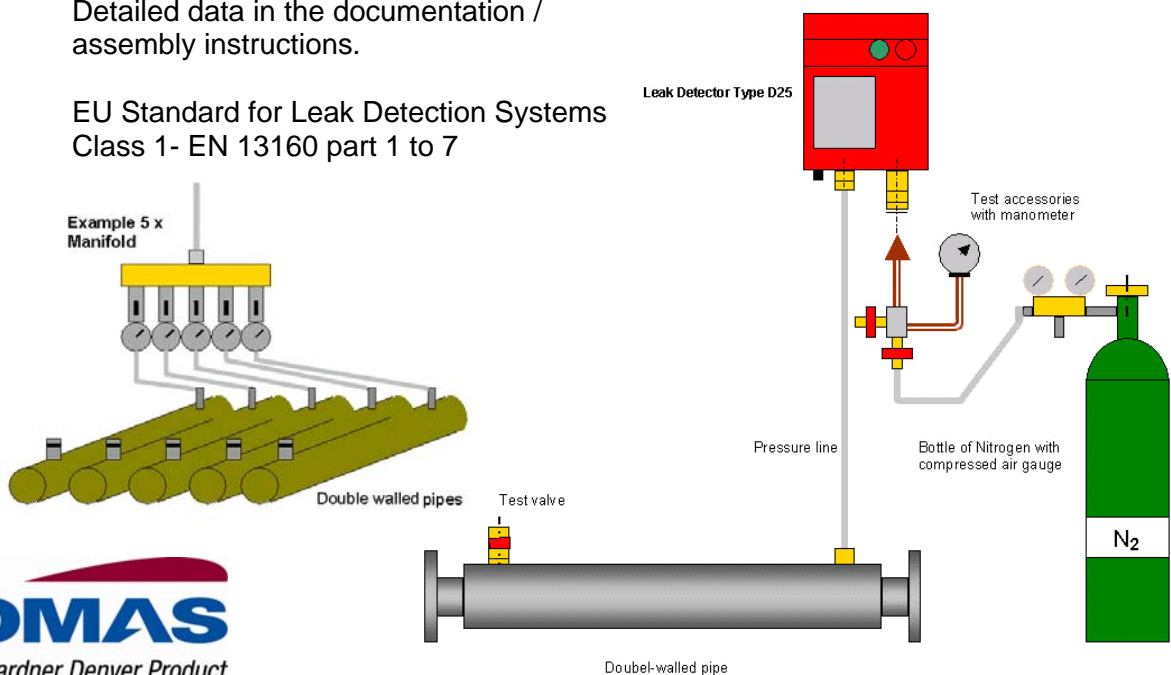
Approval: General Design Permit (DIBT) No. **Z-65.26-250**
Tested by TÜV Nord, Hamburg

Assembly site: Within a dry, frost-protected area, or outside in a protective enclosure.
It is not allowed to install the leak detector in an ex - zone!

Function: The leak detector works on the pressure principle. Visual and audible alarms are triggered by a pressure drop as a result of leaks in the pipe.
Nitrogen is led from an external bottle to the leak detector and into the monitoring space, up to the adjusted monitoring pressure. Afterwards, the external bottle will be disconnected from the leak detector.
Max. operating pressure of the pipe: 16bar
Max. allowed monitoring pressure: 21bar
The alarm ON has be adjusted at least 1 bar over the operating pressure of the pipe.

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE D26- PRESSURE PRINCIPLE

- Nitrogen

Field of application:

- Double-walled underground or aboveground pipes with an appropriate monitoring space and max. operating pressure of 17bar¹⁾
- For operation with stationary nitrogen bottle or external supply.
- With an appropriate manifold system, up to 8 underground or aboveground pipes can be monitored with one leak detector - the overall monitoring space volume may not exceed 1.2 m³.

Stored liquids: Water-endangering liquids, also with a flash point $\leq 55^\circ \text{C}$

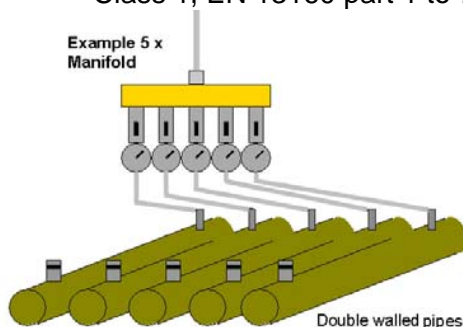
Approval: General Design Permit (DIBT) No. **Z-65.26-249**
Tested by TÜV Nord, Hamburg

Assembly site: Within dry, frost-protected area, or outside into a protective enclosure.
It is not allowed to install the leak detector in an ex – zone.!

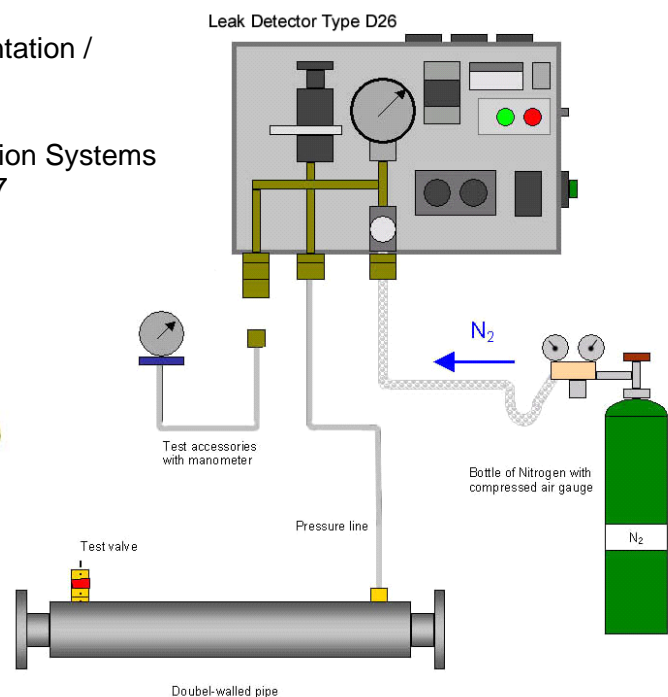
Function: The leak detector works on the pressure principle. Visual and audible alarms are triggered by a pressure drop as a result of leaks in the pipe.
Nitrogen is led from an external bottle to the leak detector and into the monitoring space, up to the adjusted monitoring pressure. Small system leakages are balanced by the system.
Max. operating pressure of the pipe: 17bar
Max. allowed monitoring pressure: 21bar
The alarm ON has be adjusted at least 2 bar over the operating pressure of the pipe.

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems Class 1, EN 13160 part 1 to 7



¹⁾ Type D26/4 only for underground pipes.



LEAK DETECTOR TYPE "VAKUMATIK IIIF"

VACUUM PRINCIPLE

Field of application:

- The leak detector is applicable for double-walled tanks (providing the monitoring space is suitable for the connection of the leak detector).
- Tanks, which have been monitored by liquid controlled leak detection so far, can be monitored via the version IIIF in the future. A certain amount of the liquid in the monitoring space has to be removed.
- The viscosity of the stored liquid has to be considered (height and diameter of the tank)

Stored liquids: Water-endangering liquids regarding approved listing, with a flash point > 55°C

Approval: General Design Permit (DIBT) No. **Z-65.22-2**
Tested by TÜV Nord, Hamburg

Assembly place: Within dry, frost-protected area, or outside into a protective enclosure.
It is not allowed to install the leak detector in an ex - zone!

Function: The leak detector works on the vacuum principle.
Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level.
The vacuum pump draws air from the monitoring space through suction line.
Normally, the exhaust air is pumped back into the tank. Others constructions are using a separate exhaust line with an additional liquid barrier.
Small system leakages are balanced by the pump automatically.

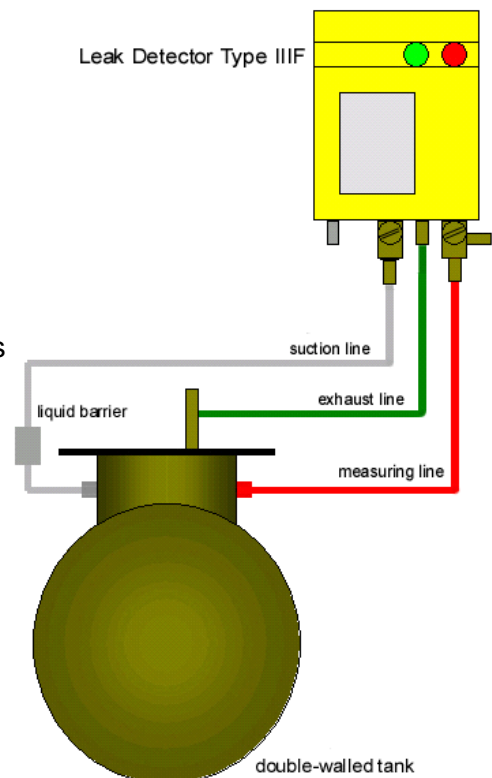
Switching values: in mbar

Pump "off"	P_{Poff}	-450
Pump "on"	P_{Pon}	-375
Alarm "on"	P_{Aon}	-325
Alarm "off"	P_{Aoff}	-410

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE "VAKUMATIK IV F"

VACUUM PRINCIPLE

Field of application:

- The leak detector is applicable for single-walled tanks with a lining system and the suction line down to the bottom of the tank
- The viscosity of the stored media has to be considered (height and diameter of the tank)

Stored liquids: Water-endangering liquids regarding approved listing, with a flash point > 55°C

Approval: General Design Permit (DIBT) No. **Z-65.22-2**
Tested by TÜV Nord, Hamburg

Assembly place: Within dry, frost-protected area, or outside into a protective enclosure.
It is not allowed to install the leak detector in an ex - zone!

Function: The leak detector works on the vacuum principle. Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level. The vacuum pump draws air from the monitoring space through suction line. Normally, the exhaust air is pumped back into the tank. Others constructions are using a separate exhaust line with an additional liquid barrier. Small system leakages are balanced by the pump automatically.

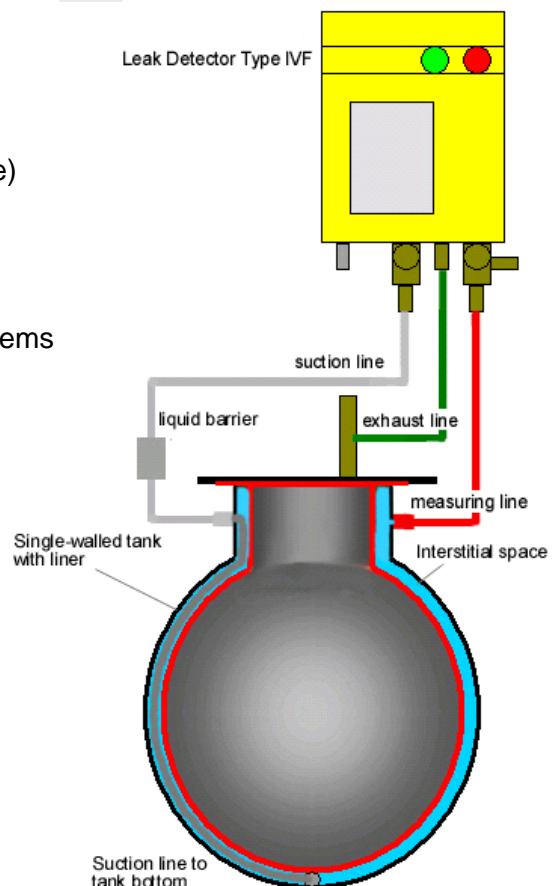
Switching values: in mbar

Pump "off"	P_{Poff}	-80
Pump "on"	P_{Pon}	-65
Alarm "on"	P_{Aon}	-34
Alarm "off"	P_{Aoff}	-50

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE V8 – VACUUM PRINCIPLE

- for flat base tanks and double walled pipes

Field of application:

- The leak detector is applicable for double-walled bottoms, or flat base tanks (providing the monitoring space is suitable for the connection of the leak detector).
- It is also applicable for double-walled pipes with an operating pressure of max. 3bar.

Stored liquids: Water-endangering liquids regarding approved listing, with a flash point > 55°C

Approval: General Design Permit (DIBT) No. **Z-65.22-5**
Tested by TÜV Nord, Hamburg

Assembly place: Within dry, frost-protected area, or outside into a protective enclosure.
It is not allowed to install the leak detector in an ex - zone!

Function: The leak detector works on the vacuum principle.
Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level.
The vacuum pump draws air from the monitoring space through suction line.
Normally, the exhaust air is pumped back into the tank. Others constructions are using a separate exhaust line with an additional liquid barrier.
Small system leakages are balanced by the pump automatically.

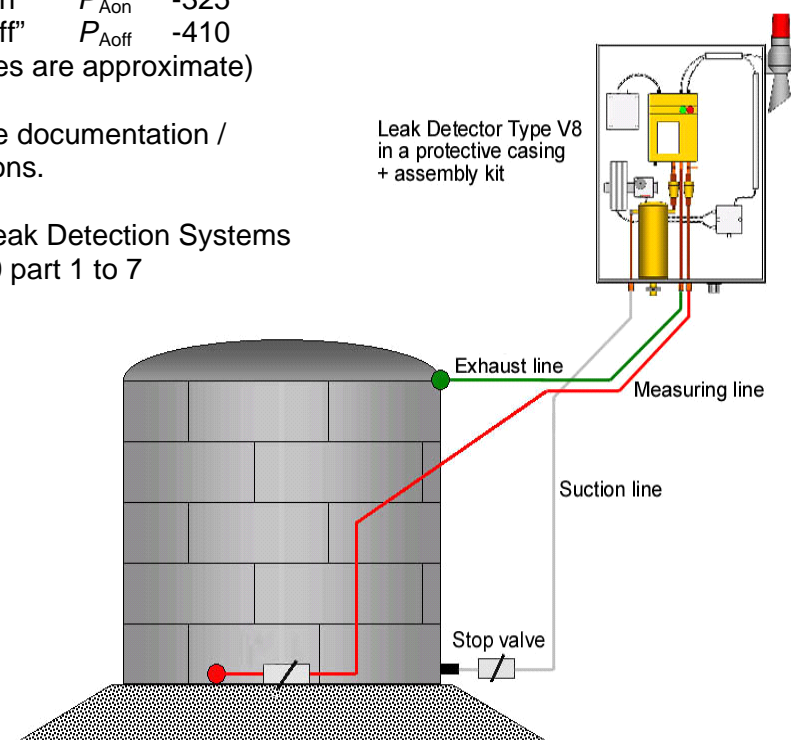
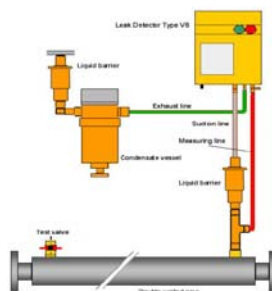
Switching values: in mbar

Pump "off"	P_{Poff}	-450
Pump "on"	P_{Pon}	-375
Alarm "on"	P_{Aon}	-325
Alarm "off"	P_{Aoff}	-410

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE V13 — VACUUM PRINCIPLE

Field of application:

- The leak detector is applicable for double-walled tanks (providing the monitoring space is suitable for the connection of the leak detector).
- It is also applicable for tanks made of concrete with a lining system
- This type of leak detector is mainly used in the chemical industry.
- All parts of the leak detector, which may come in contact with the stored liquid are made of high resistance materials.
- The viscosity of the stored media is to be considered (height and diameter of the tank)

Stored liquids: Water-endangering liquids regarding approved listing, with a flash point > 100°C

Approval: General Design Permit (DIBT) No. **Z-65.22-143**
Tested by TÜV Nord, Hamburg

Assembly place: Within dry, frost-protected area, or outside into a protective enclosure.
It is not allowed to install the leak detector in an ex - zone!

Function: The leak detector works on the vacuum principle.
Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level.
The vacuum pump draws air from the monitoring space through suction line.
Normally, the exhaust air is pumped back into the tank.
Small system leakages are balanced by the pump automatically.

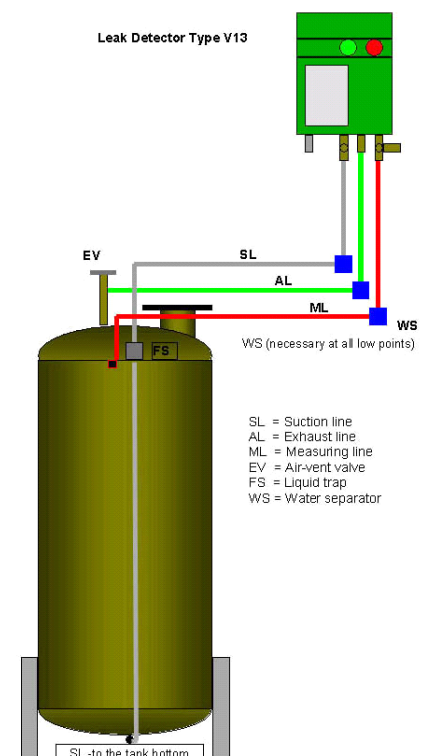
Switching values: in mbar

Pump "off"	P_{Poff}	-450
Pump "on"	P_{Pon}	-375
Alarm "on"	P_{Aon}	-325
Alarm "off"	P_{Aoff}	-410

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE V33 – VACUUM PRINCIPLE

Field of application:

- The leak detector is applicable for double-walled tanks (providing the monitoring space is suitable for the connection of the leak detector).
- The leak detector is applicable for single-walled tanks, with a lining system and suction line down to the bottom of the tank.
- The leak detector is applicable for double-walled bottoms, or flat base tanks (providing the monitoring space is suitable for the connection of the leak detector).
- All parts of the leak detector, which may come in contact with the stored liquid are made of high resistance materials (e.g. stainless steel).
- The viscosity of the stored media is to be considered (height and diameter of the tank)

Stored liquids: Water-endangering liquids regarding approved listings (e.g. DIN6601) with a flash point > 55°C

Approval: General Design Permit (DIBT) No. **Z-65.22-6**
Tested by TÜV Nord, Hamburg

Assembly place: Within dry, frost-protected area, or outside into a protective enclosure. It is not allowed to install the leak detector in an ex - zone!

Function: The leak detector works on the vacuum principle. Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level. The vacuum pump draws air from the monitoring space through suction line. Normally, the exhaust air is pumped back into the tank. Small system leakages are balanced by the pump automatically.

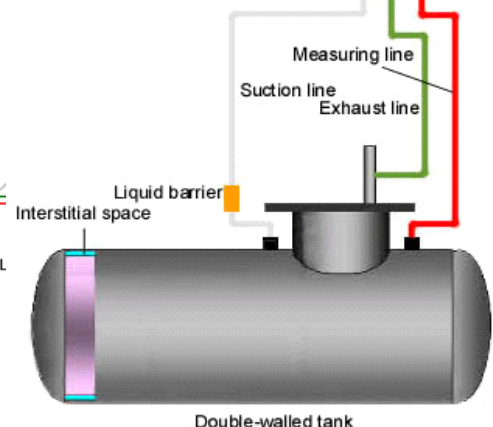
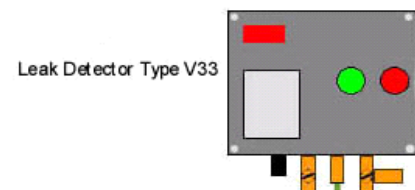
Switching values: in mbar

Pump "off"	P_{Poff}	-450
Pump "on"	P_{Pon}	-375
Alarm "on"	P_{Aon}	-325
Alarm "off"	P_{Aoff}	-410

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE V80 EX – Version “H”

VACUUM PRINCIPLE

Field of application:

- The leak detector is applicable for double-walled tanks, for double-walled bottoms, or flat base tanks (providing the monitoring space is suitable for the connection of the leak detector).
- The viscosity of the store media is to be considered (height and diameter of the tank).
- It is also be applicable for double-walled pipes with max. operating pressure of 6bar.

Stored liquids: Water-endangering liquids regarding approved listing, also with a flash point $\leq 55^\circ \text{C}$, temperature class T4, explosion group IIA, (IIB-option)

Approval: General Design Permit (DIBT) No. **Z-65.22-217**
Tested by TÜV Nord, Hamburg
ATEX Certificate **PTB99 ATEX 2037 X**

Assembly site: The mechanical enclosure can be installed in the ex zones 1 and 2. The switch enclosure must be installed outside the ex zones, in dry, frost-protected areas or outside into a protective enclosure.

Function: The leak detector works on the vacuum principle. Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level. The vacuum pump draws air from the monitoring space through suction line. Normally, the exhaust air is pumped back into the tank. Small system leakages are balanced by the pump automatically.

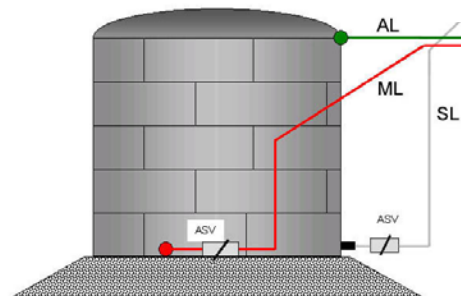
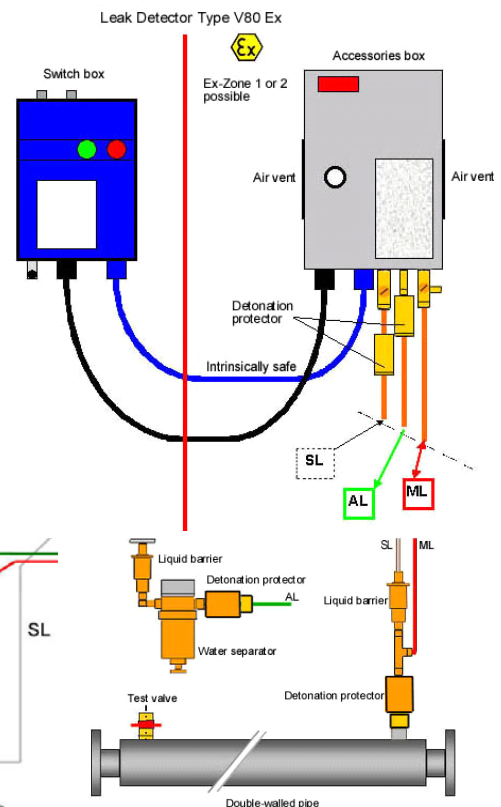
Switching values: in mbar

Pump “off”	P_{Poff}	-450
Pump “on”	P_{Pon}	-375
Alarm “on”	P_{Aon}	-325
Alarm “off”	P_{Aoff}	-410

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE V80 EX – Version “N”

VACUUM PRINCIPLE

Field of application:

- The leak detector is applicable for single-walled tanks, with a lining system and a suction line to the bottom of the tank.
- It is applicable for double-walled tanks with the suction line to the bottom of the tank.
- The viscosity of the stored media is to be considered (dimensions of the tank).

Stored liquids: Water-endangering liquids regarding approved listing, also with a flash point $\leq 55^\circ \text{C}$, temperature class T4, explosions group IIA, (IIB-option)

Approval: General Design Permit (DIBT) No. **Z-65.22-217**
Tested by TÜV Nord, Hamburg
ATEX Certificate **PTB99 ATEX 2037 X**

Assembly site: The mechanical enclosure can be installed in the ex zones 1 and 2. The switch enclosure must be installed outside the ex zones, in dry, frost-protected areas or outside into a protective enclosure.

Function: The leak detector works on the vacuum principle. Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level. The vacuum pump draws air from the monitoring space through suction line. Normally, the exhaust air is pumped back into the tank. Small system leakages are balanced by the pump automatically.

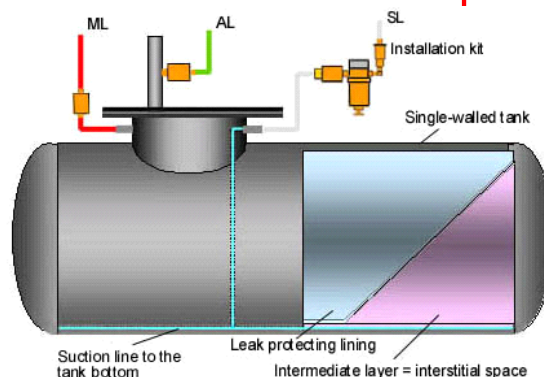
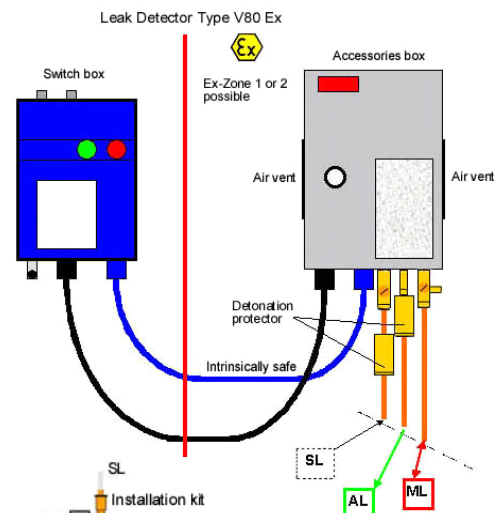
Switching values: in mbar

Pump “off”	P_{Poff}	-80
Pump “on”	P_{Pon}	-65
Alarm “on”	P_{Aon}	-34
Alarm “off”	P_{Aoff}	-50

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE V90 – Version “H”

VACUUM PRINCIPLE

Field of application:

- The leak detector is applicable for double-walled tanks, for double-walled bottoms, or flat base tanks (providing the monitoring space is suitable for the connection of the leak detector).
- The viscosity of the store media is to be considered (height and diameter of the tank).
- It is also applicable for double-walled pipes with max. operating pressure of 6bar for liquids with flame point $>55^{\circ}\text{C}$, for flame point $<55^{\circ}\text{C}$ only for pipes operated at ambient pressure.

Stored liquids: Water-endangering liquids regarding approved listing, also with a flash point $\leq 55^{\circ}\text{C}$, temperature class T4, explosion group IIA, (IIB-option)

Approval: General Design Permit (DIBT) No. **Z-65.22-399 ; Z-65.25-400**
Tested by TÜV Nord, Hamburg

Assembly site: The leak detector fulfils the requirements for the Ex protection guidelines temperature class T4 and explosion group IIA/B, but must be installed outside of Ex zones, in dry, frost-protected and well ventilated areas.

Function: The leak detector works on the vacuum principle. Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level. The vacuum pump draws air from the monitoring space through suction line. Normally, the exhaust air is pumped back into the tank. Small system leakages are balanced by the pump automatically.

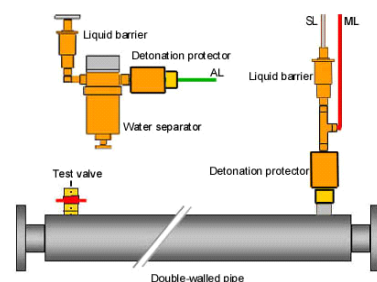
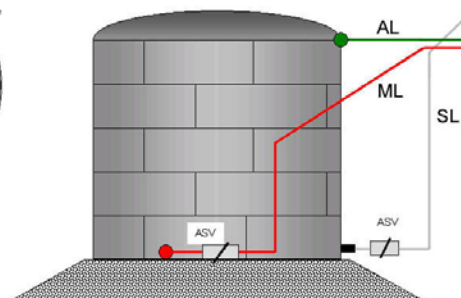
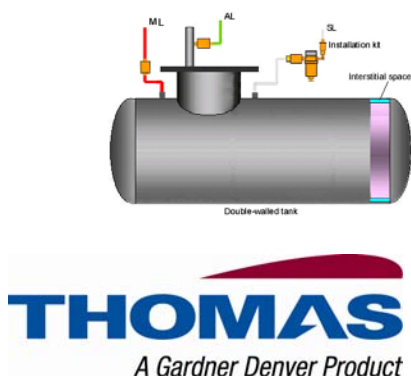
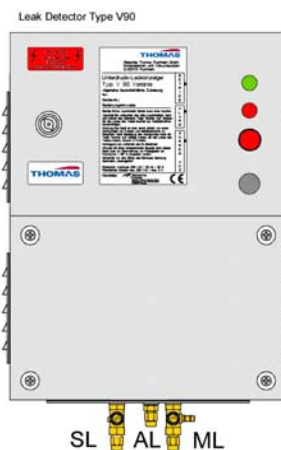
Switching values: in mbar

Pump “off”	P_{Poff}	-450
Pump “on”	P_{Pon}	-375
Alarm “on”	P_{Aon}	-325
Alarm “off”	P_{Aoff}	-410

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



LEAK DETECTOR TYPE V90 – Version “N”

VACUUM PRINCIPLE

Field of application:

- The leak detector is applicable for single-walled tanks, with a lining system and a suction line to the bottom of the tank.
- It is applicable for double-walled tanks with the suction line to the bottom of the tank.
- The viscosity of the stored media is to be considered (dimensions of the tank).

Stored liquids: Water-endangering liquids regarding approved listing, also with a flash point $\leq 55^\circ \text{C}$, temperature class T4, explosion group IIA, (IIB-option)

Approval: General Design Permit (DIBT) No. **Z-65.22-399**
Tested by TÜV Nord, Hamburg

Assembly site: The leak detector fulfils the requirements for the Ex protection guidelines temperature class T4 and explosion group IIA/B, but must be installed outside of Ex zones, in dry, frost-protected and well ventilated areas.

Function: The leak detector works on the vacuum principle. Visual and audible alarms are triggered by a pressure increase as a result of leaks in the tank walls, above or below the liquid level. The vacuum pump draws air from the monitoring space through suction line. Normally, the exhaust air is pumped back into the tank. Small system leakages are balanced by the pump automatically.

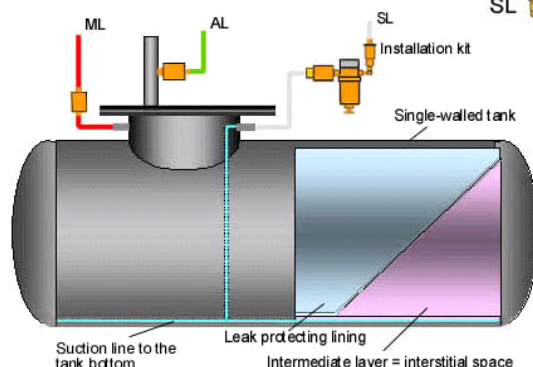
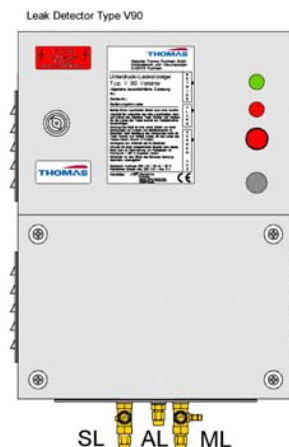
Switching values: in mbar

Pump “off”	P_{Poff}	-80
Pump “on”	P_{Pon}	-65
Alarm “on”	P_{Aon}	-34
Alarm “off”	P_{Aoff}	-50

(All values are approximate)

Note: Detailed data in the documentation / assembly instructions.

Standard: EU Standard for Leak Detection Systems
Class 1- EN 13160 part 1 to 7



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