

BRUGG

Pipes

Leak Monitoring Systems

for double-walled piping

System description



**PIONEERS IN
INFRASTRUCTURE**

Leak monitoring for double-walled piping

The leak monitoring

Double-walled piping is permanently monitored using pneumatic leak detecting devices. These regulate the monitoring pressure in the surveillance space and register any changes of pressure which may occur. The surveillance space prevents uncontrolled spillages of the transport medium when leaks occur. The surveillance space must be so constructed that the functioning and operative security of the leak monitoring system (the leak detector) is assured at all times. The size of the surveillance space for each leak detector is limited to 10 m³ acc. to DIN EN 13160.

If the pipe is damaged the alarm is given by acoustic and optical signals.

Definition of leak detection equipment/leak detector

“Leak detection equipment/leak detector” according to the currently valid regulations refers to a device which automatically and under all operating conditions gives warning of leaks in the walls of double-walled piping in which water hazardous (flammable and non-flammable) fluids are transported. The term “leak detection equipment/leak detector” includes all the equipment necessary for the detection of leaks.

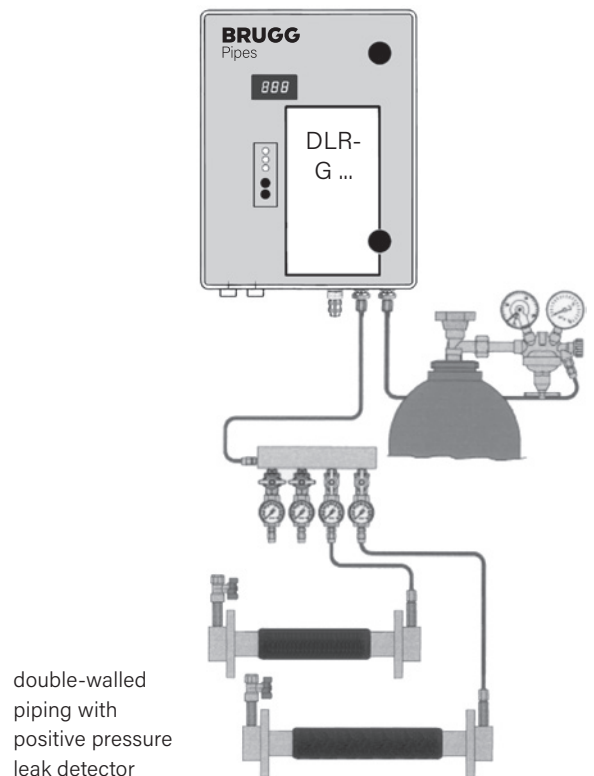
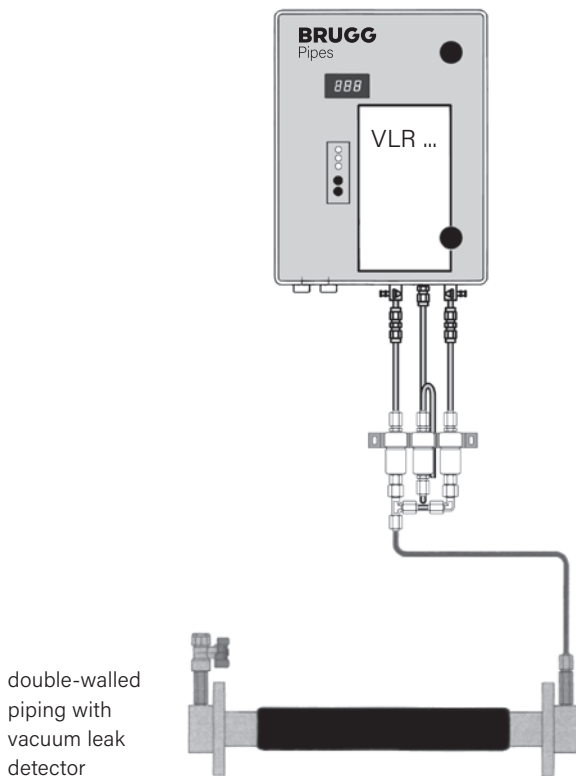
The main components are:

- the leak detector/leak monitoring equipment
- the connection between the surveillance space and leak detector
- double-walled piping:
 - FLEXWELL® Safety Pipe
 - BRUGG-STAMANT® Safety Pipe
 - SECON®-X Petrol station pipe
- the surveillance space
- a leak detection medium

The use of this system complies with the most stringent European safety standards (Class 1). Systems of this class give warning of a leak above or below the fluid level in a double-walled protective system. They are constructed on the principles of absolute safety and ensure that spillages of products into the environment cannot occur.

Leak detector

We distinguish two types of differential pressure leak detection equipment: Leak surveillance to detect leaks in double-walled piping on the vacuum principle and on the positive pressure principle.



Leak monitoring for double-walled piping

Approval/suitability

All leak detection equipment/leak detectors in use must comply with the basic criteria laid down for construction and testing standards. All such preconditions which could have a bearing on the functional and operative safety of the system must therefore be observed.

It therefore goes without saying that the conditions for operative use have been tested by the competent authorities and clearly defined and set down in the documents of approval issued by them.

Double-walled piping with leak monitoring is an approved leak detection equipment/leak detector system.

Example: a fuelling station

Each plant can be assembled to fit the needs of the individual situation by combining elements of several monitoring systems.

Two-line system

A monitoring lead runs from the positive pressure leak detector DLR-G 1-7 to the distributor block and from there to lines 1 and 3.

Ring line

The double-walled pipes 1 and 2 are connected one after the other with a monitoring lead. A test valve PV is installed at the end of the double-walled pipe. If a vacuum leak detector is used, a monitoring lead runs back to the device.

The advantages of the system

Using double-walled FLEXWELL® Safety Pipe with leak monitoring offers, besides a high degree of operative safety, substantial economic advantages:

- the entire system can be easily and simply monitored at any time without interrupting operations
- requirements such as e.g. pressure/volume measurements, pressure tests or route surveys can be dispensed with
- when a leak occurs, operations can normally be continued without interruption; repairs can be planned.

Single-line system

The double-walled line no. 4 is also monitored. A test valve PV is similarly installed at its end.

Operating limits

- pressure range (acc. to pipe system and monitoring)
- maximum monitorable pipe length see Worksheets LDS 8.120 and LDS 8.130
- distributor block 2 – 8 connections

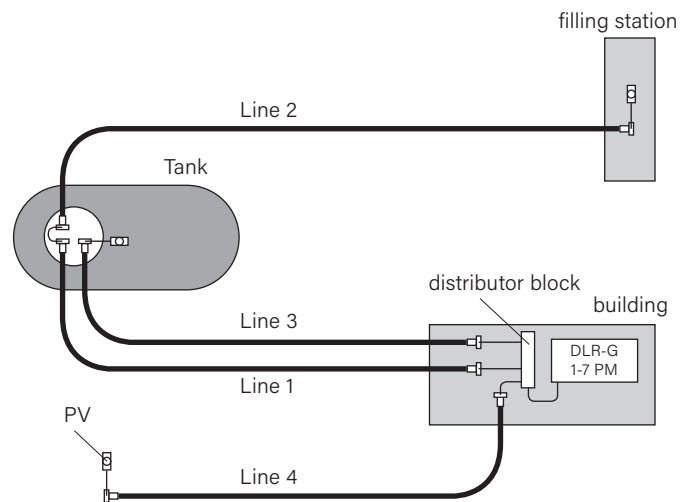


diagram of routing plan

Leak monitoring for double-walled piping

Overview of leak detectors



Type of leak detector	VLR 410 PMMV Si*	VLX 330/A-Ex	Detector unit	DLR-G ... PM	DLR-P ...
Type of pipe					
FLEXWELL® Safety Pipe	•	•	•	•	•
BRUGG-STAMANT® Safety Pipe	•	•	•	•	–
SECON®-X Petrol Station Pipe	•	•	•	–	•
Area for installation					
Dry and frost-free area	•	•	•	•	•
Outside buildings	•	•	–	•	–
	•	•	•	•	•
	–	•	–	–	–
Flashpoint of transport medium					
< 55 °C	–	•	•	•	•
> 55 °C	•	•	•	•	•
Max. pipe length see worksheet	LDS 8.120	LDS 8.120		LDS 8.130	LDS 8.130
Max. operating pressure	25 bar	10 bar		22 bar	1 bar
Potential-free relay	•	•	•	•	•
Dimensions of housing (H x B x T) in mm	280 x 230 x 130	300 x 200 x 160		280 x 230 x 130	210 x 260 x 110
Dimensions detector unit		200 x 120 x 90			
Additional criteria for selection	Compact, uncomplicated leak detector for consumer heating oil plants	Leak detector for flammable media with minimum maintenance		Electronic leak detector for all pressure stages	Reliable leak detector for petrol stations low operating pressure

* Also available as a version with an additional sensor for drip trays.

Leak monitoring for double-walled piping



The Wall Street Heliport in Manhattan/
New York



Installation work with no interruption in
flight services



The explosion-protected vacuum leak
detector next to the pumping station

Use case

A helicopter fuelling station in New York City – safe thanks to explosion-protected vacuum leak monitoring

The Wall Street Heliport, located in lower Manhattan, is used for both tourist excursion flights and business air traffic. On any typical sunny summer day at the height of the tourist season, this heliport will experience more takeoffs and landings than JFK International Airport over the same period of time. In July 2010, during this peak operating season, a new fuelling system was installed by BRUGG Pipesystems using BRUGG FLEXWELL®-HL pipe.

The first step was to lay out and connect a 500 ft. length of pipe along the length of the pier, to the first fuel station. The whole length of pipe was then carefully secured to the side of the pier, using a boat and mobile crane located onsite. This

was a very complex and difficult process to complete, due to the changing tides, wave action caused by the movement of boat traffic on the East River and the constant helicopter rotors. At this point the piping was placed beneath the deck of the pier, and positioned in a channel between a support beam and the deck, and finally raised through a hole into the pump station – all the while being subjected to the constant waves on the river.

Lastly, an additional length of piping was installed between the tank and the pump station for filling and transferring jet fuel. The final pressure test confirmed that the BRUGG FLEXWELL®-HL piping installation and the vacuum leak detector had no errors or leaks anywhere in the system. The customer will be able to rely on the quality, reliability and durability of this pipe installation for many years to come.



Tony Ramos,
Core Engineered
Solutions

Again and again BRUGG

“We at Core sell compliance, value and long service life. The BRUGG pipe offers all of these values and stands alone in above ground applications. It also exceeds all the criteria for pipe below ground and under piers.

I don't know any other double-wall pipe that protects against fires, UV and offers the same durability and flexibility. Core looks forward to many more opportunities with this product.”

Leak monitoring for double-walled piping



Installing the outer pipe casing
BRUGG-STAMANT® Safety Pipe



Routing crossing the motorway below



Positive pressure leak detectors in
protective housings

Use case

Safe monitoring of the piping in a fuel depot

The rebuilding of the Horny Hricov Terminal has been under discussion since 1997, when the first studies on re-routing the piping from the upper to the lower plant of SLOVNAFT were carried out. The lower SLOVNAFT plant in the Horny Hricov Terminal served as a distribution centre for petrol stations in Central and Eastern Slovakia, while the upper plant was used as the state material reserve. Following a number of changes in the SLOVNAFT refinery, the Horny Hricov Terminal was re-evaluated as the storage facility of the state material reserves of the Slovak Republic. The necessity to re-route the piping between the two plants resulted from the extension of the motorway from Bratislava in the West to Kosice in the East. This motorway ran over the piping connecting the two plants. In order not to hinder operations it was necessary to re-route

the piping so that the motorway routing would not have to be taken into consideration in the event of reconstruction work being needed.

The project consists of 13 lines of BRUGG-STAMANT® double-walled safety piping laid below the surface. BRUGG Rohrsysteme GmbH supplied 4,446 m of double-walled piping and 1,611 m of single-walled piping, with dimensions ranging from DN 80 to DN 300. Transport media are petrol, crude oil and gas. DLR-G 8 S positive pressure leak detectors are used.

The piping is in service trouble-free since the installation in 2007.



Miroslav Tomsik
CHEMPROCES
GmbH

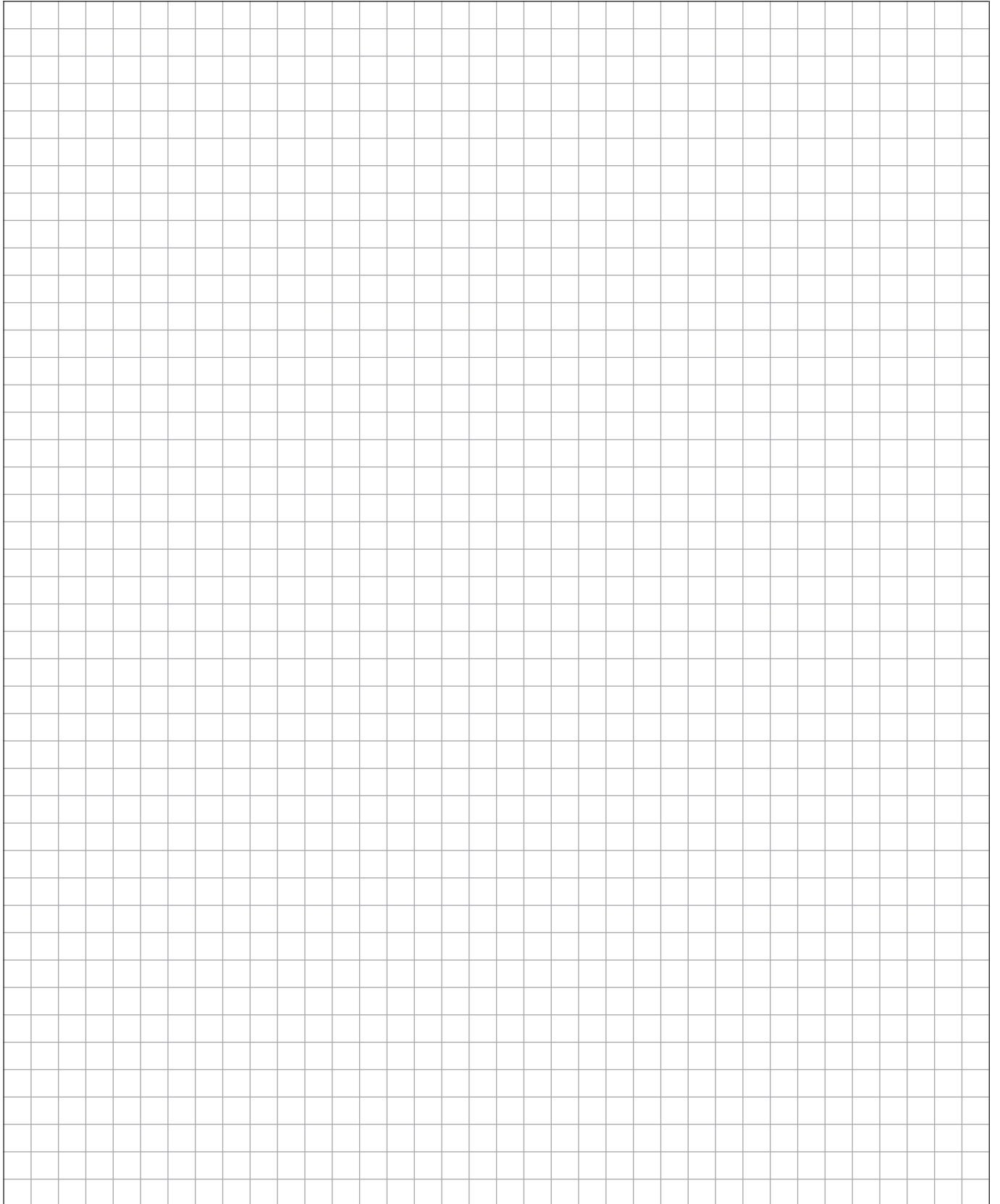
Further 811 m of BRUGG-STAMANT® safety piping delivered

“We got the contract for the SLOVNAFT project because of already existing know-how and it was an important reference in the Slovak Republic. Thanks to this reference our companies delivered a further 811 m of BRUGG-STAMANT® safety piping in the following years for the project “Port on the Danube” in Bratislava.

With the need for retrofitting equipment, two more projects are expected on top of this within the next three years.”

Leak monitoring for double-walled piping

Notes

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A BRUGG GROUP COMPANY

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