

PLEXOR®

Inspection system for pressure regulating stations



Example inspection protocol

Functional test protocol			
PRS	GPRS Station		
GCL	Working Line		
Identification	1502	Date	17.03.16
Signature			
	Date		Name of 1st Technician
Regulator			
	Ref. value (Min.):	Ref. value (Max.):	Actual value:
Net pressure:	36 mbar	44 mbar	38,1mbar
Actual flow over ventilation:	36 mbar	44 mbar	39,1mbar
Lockup pressure 1:	40 mbar	48 mbar	47,5mbar
Lockup pressure 2:	40 mbar	48 mbar	47,3mbar
Leakage:	-0,5 mbar/min	0,5 mbar/min	0,3mbar/min
Safety Relief Valve SRV			
	Ref. value (Min.):	Ref. value (Max.):	Actual value:
Maximum set point:	60 mbar	66 mbar	70,4mbar
Lockup pressure:	54 mbar	60 mbar	55,3mbar
Leakage:	-0,3 mbar/min	0,3 mbar/min	-0,3mbar/min
Safety valve SSV 1			
	Ref. value (Min.):	Ref. value (Max.):	Actual value:
Maximum set point 1:	80 mbar	88 mbar	85,1mbar
Maximum set point 2:	80 mbar	88 mbar	84,8mbar
Maximum set point 3:	80 mbar	88 mbar	83,2mbar
Tightness Membrane:	-0,3 mbar/min	0,3 mbar/min	0mbar/min
Leakage:	-0,3 mbar/min	0,3 mbar/min	0mbar/min
Pressure range of the GCL:	DPS		
Remarks:	Performed by Is the GCL in the original working po <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 1st Technician: Bartl Name of 2nd Technician: Jan		

Example of inspection protocol



PLEXOR® Features and benefits

Safe:
The PLEXOR® test device meets the Ex requirements as stated in the specifications. Only high quality materials and components are used, connection hoses have dual locking and cannot be interchanged. Gas trapped in the connection hoses and the inspection system is automatically vented to a safe location outside at the end of the inspection.

Paperless:
Generated measurements are automatically stored on the laptop or tablet of the inspector. From there the data is automatically transferred to the host system. None of these steps require any paperwork, eliminating human error and duplication.

Cost saving:
The PLEXOR® inspection system enables fast, highly efficient, standardized and objective inspection of the gas pressure regulating stations. Many users have been able to significantly reduce the number of inspections required. Furthermore, significant savings on repairs and maintenance expenditures are possible, especially when switching to condition based maintenance. Experience has shown that the system can typically pay for itself within 4 years. Wigersma & Sikkema can help you to calculate a customer specific business case in which the savings using the PLEXOR® inspection system are compared with the investment which is required to implement it.

Operator independent:
The PLEXOR® inspection system leads the inspector step-by-step through the test procedure. It is therefore not possible to forget or skip any part of the test. Pressure increases or decreases are standardized and therefore generate operator independent and reproducible results.

Condition Based Maintenance:
Comprehensive and accurate test data is generated during the test procedure. This data can be used for detailed analysis and gives a clear insight in the static and dynamic performance of the various components in the gas control line. The inspection data can immediately be compared with the test results from previous inspections. This allows for Condition Based Maintenance, giving you the opportunity to optimize and further save on maintenance costs.

Easy operation:
The PLEXOR® test device is very easy to work with. The connection hoses are connected manually via a double secure "click" system and designed so that they cannot be mixed up. Operation of the PLEXOR® test device is simple, and the inspectors are guided step-by-step through the inspection procedure, by the INSPECTOR PC.

Environmental friendly:
The PLEXOR® inspection system isolates the gas control line which eliminates the need to increase the pressure in the outlet section. Therefore, there is no need for (multiple) releases of gas in the outlet section. Methane, the main component of natural gas, is 25 times more potent in terms of climate change than carbon dioxide.

Reporting:
Upon completion of the test procedure a PDF report can be generated representing the actual measurement results and the rejection boundaries. The lay-out of the report can be easily tailored to your needs, and printed on your letterhead. This provides an independent and auditable proof of the inspection results.

Specifications

PLEXOR® PN100 test device	
Working pressure	20 mbar - 100 bar / 8 inH2O - 1450 PSI
Designed according to	EN14382
IP classification	IP67
Explosion safety Wireless Interface	ATEX II 1G Ex ia op is IIC T3 Ga IECEX Ex ia op is IIC T3 Ga
Explosion safety Digital manometer	ATEX II 2G Ex ia op is T4...T3 Gb IECEX Ex ia op is T4...T3 Gb
Stainless Steel connection hoses (standard)	2* 3 m / 10 ft (outlet and SSV) 1* 5 m / 16 ft (inlet)
Nylon vent hose (standard)	1* 10 m / 33 ft
Accuracy manometers	0.1% of reading
Weight	15,5 kg / 34 lbs
Software requirement	Windows 7 or higher
Cable magnetic sensor SSV (optional)	5 m / 16 ft



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product video:

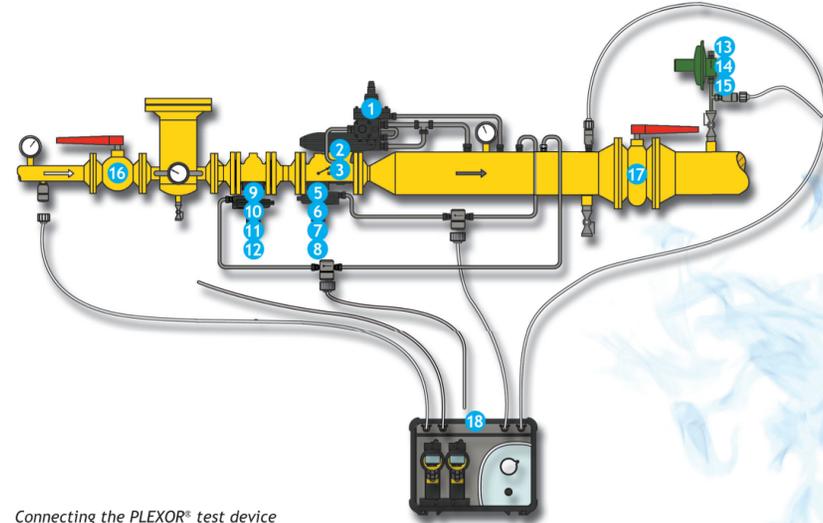


The PLEXOR® inspection system

With the PLEXOR® inspection system Wigiersma & Sikkema has set a new standard to inspect gas pressure regulating stations. The PLEXOR® inspection system for gas pressure stations consists of three main parts:

1. PLEXOR®, the mobile test device
2. CONNEXION software suite
3. System couplings

The PLEXOR® mobile test device is connected to a gas control line by means of safe system couplings and connection hoses. It can be used for inlet pressures up to 100 bar / 1450 PSI. No gas can escape when the PLEXOR® test device is being connected or disconnected, and the system couplings automatically revert to their original operating position when disconnected. The system couplings each have their own specific diameter and thread, so it is impossible to make connection mistakes. The PLEXOR® inspection system is therefore fully safe and fool-proof.



BDA 06 system coupling

Connecting the PLEXOR® test device

What can be tested?

With the PLEXOR® inspection system the main components of a gas pressure regulating station can be tested separately and dynamically. Because of the measurement frequency of 10 Hz a detailed, dynamic and complete overview of the components is obtained, enabling Condition Based Maintenance.

Functional inspection

1. The set point of the gas pressure regulator
2. The lock-up pressure of the gas pressure regulator
3. The leak-tightness of the gas pressure regulator at the lock-up pressure
4. The set points of gas pressure regulators in **monitor set-up** (not shown)
5. The trip pressure (maximum value) of the main safety device
6. The trip pressure (minimum value) of the main safety device
7. The internal leak-tightness of the main safety device
8. The leak-tightness of the diaphragm of the main safety device
9. The trip pressure (maximum value) of the second safety device
10. The trip pressure (minimum value) of the second safety device
11. The internal leak-tightness of the second safety device
12. The leak-tightness of the diaphragm of the second safety device
13. The trip pressure of the pressure relief valve
14. The lock-up pressure of the pressure relief valve
15. The leak-tightness of the pressure relief valve
16. The leak-tightness of the inlet valve
17. The leak-tightness of the outlet valve
18. The leak-tightness of the PLEXOR® test device itself

Visual inspection

Next to a full functional test of the main gas components the PLEXOR® inspection system can also be used to carry out a customized visual inspection procedure of the gas pressure regulating station. The PLEXOR® inspection system works independent of the make or model of the gas components.

Software

The PLEXOR® inspection system comes complete with the CONNEXION software suite which consists of the following four modules:

1. MANAGER

This module is used (by management) to manage the gas station data, rejection boundaries and test procedures. Customized inspection procedures can be established for each type of pressure regulating station and can be completely tailored to incorporate the existing inspection procedures (incl. visual inspection of the pressure regulating station).

By using the open XML interface the PLEXOR® inspection system can be easily linked to any data management system such as SAP, Maximo, K3V or MainT.

2. INSPECTOR PC

This module is used by the inspector in the field and is available either on a laptop/tablet. It leads the inspector step-by-step through all the actions, in the sequence established for the gas station. The results of the functional inspection of the pressure regulating station are stored in a laptop or tablet for further processing. The data is transmitted wirelessly via BlueTooth, without the intervention of the inspector, thereby preventing any key-in errors, and eliminating the need to manually enter/write test results.



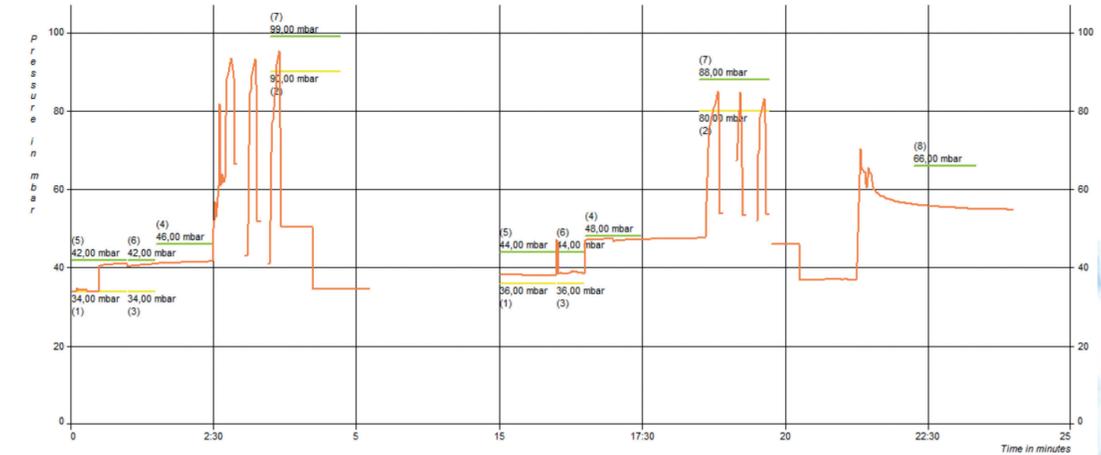
Easy operation with tablet or laptop

3. RESULTS

The RESULTS module allows for direct selection of a specific gas pressure regulating station and easy access to all relevant functional- and visual inspection results. The module also enables storage and printing capability of these results. RESULTS is supplied with standard reports which can be tailored to customer specific requirements, e.g. adding the company logo. Next to the functional inspection results also the rejection limits per measurement are shown. Measured values that are outside the rejection limits are marked and indicated with a different color. Moreover, RESULTS allows for simple selection of all GPRS's which have rendered one or more measured values outside the rejection limits.

4. DIAGNOSTICS

This module is used by the maintenance manager. It provides accurate graphical representation of the measurement data. This gives insight into the condition of the various components of the pressure regulating station. With such data an accurate inspections and maintenance plan can be made based on condition based maintenance: "If it aint broke, don't fix it!" Using the many years of experience Wigiersma & Sikkema also offer the service of analyzing your inspection results and providing you with expert advice with regards to maintenance and repair.



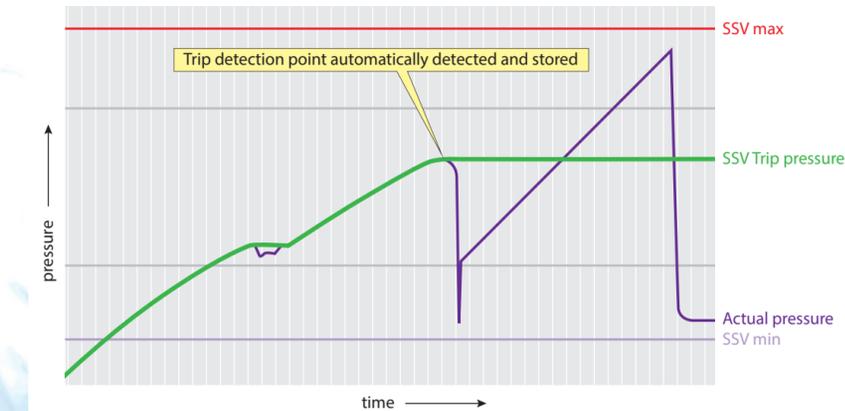
graphical representation of the measurement data

Optional: automated trip detection of the slam shut device

With a specially designed sensor which is magnetically connected to or near the slam shut device it is possible to automatically detect the tripping point, making the test fully operator independent. When the sensor is activated the exact trip pressure is stored even though the start lever is still activated. In this way, it is prevented that the correct value is lost. The sensor is connected to the PLEXOR® test device by means of a wired connection.



Magnetic sensor



Automated trip detection