SniffIT

HELIUM & HYDROGEN SNIFFER

SniffIT X1

"First mobile leak detector with real intelligence"

Specialist in leak testing & leak detection since 1973

nolek

40 Years

1973-2013

- Leak Testing -

SIMPLE, MOBILE, ACCURATE & AFFORDABLE

Nolek, the world´s leading expert in leak testing & detection since 1973, is proud to present a new generation of the unique SniffIT X1 product series of gas leak detectors. The new SniffIT X1 is fully digitalized with a screen that shows both quantitative numeric measurement values as well as graphical leak indications.

The new SniffIT X1 Digital contains temperature, pressure and humidity sensors that ensures very accurate measurements and a whole new level of sensitivity in the handheld leak detector market. The SniffIT X1 also has built in intelligence which in combination with the SniffIT Technology Sensor literally revolutionizes the gas detection market, as it is today.

The SniffIT X1 can log and store large amounts of measurement data. Simply attach the sniffer to a computer via a USB and transfer data. Software upgrades will be available through the Nolek.com website, and will be easy to install by connecting the SniffIT X1 to the computer.

SniffIT X1 is ergonomic and the smallest high quality instrument on the market, it weighs approximately 320g (0.7 lbs). The smallest detectable levels of Helium and Hydrogen with the SniffIT Technology Sensor is 1x10-5 mbar.l/s, making the technology one of the most sensitive in the marketplace today. The flexibility to detect both Helium and Hydrogen makes SniffIT X1 independent of the tracer gas used for leak detection, and it is the only one of its kind.

The SniffIT X1 at a glance

1. Replaceable filter
2. Flexible probe
3. Flashlight LED
4. Auto-zero / Flashlight button
5. OLED screen with various GUI options
6. Screen menu-button/ on-off switch
7. Micro-usb connection

SniffIT

AFFORDABLE

The SniffIT X1 is the lowest priced high sensitivity sniffer in the marketplace today. The SniffIT X1 also has added cost benefits with its short response time, high accuracy, short recovery time and no variable costs. Most importantly, the SniffIT X1 will detect even the smallest leak and will save money in terms of shorter time used testing a specific object.

MOBILE

One important feature of the SniffIT X1 is that it is very small, light and handy. It is ergonomically designed for long term use.

In order to start looking for leaks one simply has to push the on button and start moving the SniffIT X1 probe across an area that could contain a possible leak.

ACCURATE

The revolutionizing SniffIT Technology makes the SniffIT X1 very fast and accurate in detecting leaks. The immediate leak detection response means that the operator will detect the leak at the same time as passing by the actual leak. Conventional sniffers can take up to five seconds, which is very time consuming.

SIMPLE

The main idea behind the SniffIT X1 is that it should be easy to use and easy to understand with an easily navigated menu screen.

When one buys the SniffIT X1 it comes in a carrying case with a charger and two sniffer probes ready to be used instantly.

APPLICATIONS

Below are just some examples where SniffIT X1 can be used:

- Complement your leak test with leak detection by locating leaks on rejected parts by pressure decay test.
- Test your engines, pumps, valves, gear boxes etc. After you have leak tested your product with pressure decay fill the product with helium or hydrogen and find the exact leak location with SniffIT.
- Test your product in a simple and manual way.
- For heat pumps after leak testing your complete pump, find the exact leak location with SniffIT.
- Tanks often have too large volume for pressure decay and complete helium system are expensive. Fill the product with Helium and Hydrogen and find your potential leaks, quick and efficient without any messy and inaccurate leak detection sprays.
- Testing of brake pipes and ABS systems after installation.
- Surface testing for water and oil tightness of engine blocks and other automotive parts.
- Location of internal leaks in valves etc.
- Test Automotive oil coolers.
- Test Pharmaceutical packages.
- Test Valves and valve manifolds
- Test welded seams on tanks.
- Clamp testing of joints with very high sensitivity.
- Ideal for Leak testing in small volume production
- Use for testing new products and statistical samples as well as inline production testing.
- Analysis of potential leak points by locating leaks on rejected products.
- Regardless if the product is small or big, hot or cold, if you use Helium or Hydrogen, SniffIT X1 can find your leaks.

TECHNICAL DATA SniffIT X1

Battery capacity	8 hours
Charging time	4 hours
Dimensions HxWxD	149x238x55mm (5.86x9.37x2.17″)
Weight	320 gram
Detectable gases	Helium and hydrogen, calibrated for the chosen gas but sensitive for both.
Detect leaks greater than	1*10-5 mbarl/s
Accuracy	± 20% of reading or min ± 3* 10-5 mbarl/s
Available units	mbarL/s
Response time	< 0,5 second
Recovery time	< 1 second
Operating Temperature	0-40°C (32-104°F)
Storage temperature	-10°C to 60°C (14-140°F)
Humidity	85% RH NC
Input Voltage	5 V(dc)
Input Current	500 mA max
Signal presentation	Numeric and bar graph, OLED Display
Alarm level	Yes
Audio alarm	Yes

Vibration alarm	Yes
Logging possibilities	Yes
Auto Zero	Yes
Probe lenghts	50mm and 350mm
Wrist strap	Yes
Two extra filter	Yes
USB Charger	Yes
Language	English, Swedish
Package Weather protected case	Included
Calibration certificate	Yes
Certificates	CE, FCC
Warranty	1-year
Multiple gas detection	Helium, Hydrogen

Dimensions

SIMPLE: Turn it ON and start sniffing.

MOBILE: It is not bigger than a human hand, weighs 320g (0.7 lbs) and has 10 hours battery capacity.

ACCURATE: SniffIT provides very accurate results based on a reliable technology.

AFFORDABLE: least expensive sniffer on the market.

If you need to charge your product with either helium or hydrogen before you use your SniffIT, please see the Nolek ChargeIT-series of instruments which is built for that exact purpose.

For more information please visit: www.nolek.com

SniffIT

SniffIT Control Leak

SniffIT verfification tool

Specialist in leak testing & leak detection since 1973

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- Leak Testing -

The SniffIT Control Leak at a glance

In order to verify the function of the SniffIT X1 Leak detector, Nolek has developed the SniffIT Control Leak. SniffIT Control leak is also to be used as a verification tool. It is used when you want to compare a leak rate on your test object in order to verify if the leak is under or over accepted limits.

The leak is pressurized to 15 bar helium* at delivery. The cylinder is rechargeable, and can easily be filled by customers themselves. Nolek also provides the service of refilling the leak. A Schrader valve for simple customer refilling is included. The leak is also equipped with a trigger for releasing the gas through the leak. When checking the SniffIT X1 unit, simply put the probe into the leak nozzle, push the trigger and indications of a leak will be shown in the detector. The control leak is also equipped with a trigger and safety lock/lever. To use, simply release the safety and then pull the trigger. After use lock the safety lever again to protect against accidental leakage. SniffIT Control Leak is a portable device, all in line with Noleks portable SniffIT Leak Detector X1, that can easily be used and transported all over the world.

**) Helium is standard. In case of hydrogen used, please indicate when ordering. When filled with hydrogen it comes with a mixture of 5% hydrogen in Nitrogen, a non flammable gas mixture and completely harmless.*



Leak Flow Chart

The leak rate of the control leak will differ depending on the pressure in the cylinder. At 15 bar the leak rate is approximately 5.0 X 10-3 mbar.l/s, whilst at 1 bar the rate is approximately 5.0 X 10-5 mbar.l/s. Enclosed with each leak there is a flow chart. The flow chart gives you an indication of the expected leak rate at various pressure levels. You are able to charge the leak to a certain pressure in order to achieve the specific leak rate you are looking for.

The SniffIT Control Leak is only a tool for checking function of leak detectors; even though it has a high accuracy it is NOT a calibrated reference leak.

TECHNICAL DATA SniffIT Control Leak

Leak	**Metal Capillary Leak**
Flows	**Approx. 5 X 10-3 mbar.l/s @ 15 bar** **Approx. 5 X 10-5 mbar.l/s @ 1 bar**
Container size	**45 cc pressurize to 15 bar at delivery.**
Included in leak	**Schrader fitting with 7/16”-20 UNF male thread, watertight casing**

For more information please visit: www.nolek.com

ChargeIT
LITE

Gas charging station

ChargeIT Lite

"Simple, Safe, Accurate and Affordable"

Specialist in leak testing & leak detection since 1973

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- Leak Testing -

Description of the product

ChargeIT Lite is a small and efficient system used as tool for easy gas handling when trying to locate leaks (leak detection). Avoid time consuming and inconsistent adjustments on a normal gas regulator, whilst the operator with the ChargeIT Lite just have push start and accept in order to handle the gas in and out from test object. Tracer gas is handled in an efficient way and high background levels are avoided. Setting are made normally once and then the unit is up and running. The unit is available in two pressure ranges; normal and high pressure.
Advantage compared to normal gas regulator

- Consistent pressure
- Improved safety, avoid high pressure
- Ensure gas is spread in entire test object
- Minimize risk for high background levels of tracer gas
- Time saving, just press start & accept

The ChargeIT Lite at a glance

1. HMI-Human Interface
2. Connections
3. Safety valve

ChargeIT
LITE

What the product does:

ChargeIT Lite ensures that gas is spread into the entire test object. Settings are made regarding pre evacuation, pressure limit, acceptance pressure, and after evacuation. Pre evacuation is often required in order to make sure tracer gas is spread throughout the entire product, especially when charging long or narrow test objects. When a test is accepted, tracer gas is evacuated away from the test area, in order to minimize tracer gas backgrounds that may cause problems.

APPLICATIONS

Below are just some examples where and by whom the ChargeIT can be used:

- Together with a tracer gas leak detector after a pressure, flow or vacuum decay test
- After an overall test, normally helium- or hydrogen accumulation tests
- In reject areas where gas has to be charged in order to detect leaks
- In machines, instruments where systems need to be tight.
- When you need instrument adjusted for tough production purposes, just press start & accept
- To avoid time consuming and inconsistent adjustments on a normal gas- regulator

TECHNICAL DATA ChargeIT Lite

Dimensions H*W*D	250 X 140 X 240 (9,8 X 5,5 X 9,5 Inch)
Weight	5,9 Kg
Operating Temperature	10-40°C (50-104°F)
Storage temperature	-10°C to 60°C (14-140°F)
Supply Voltage	Single phase 85-260 VAC
Compressed air	5 – 9 bar, 72 – 130 PSI
Connections	Test object, compressed air, tracer gas 8 mm tubing NPT
Pressure interval	0,1 – 15 bar, 1,4 – 217 psi

Dimensions

For more information please visit: www.nolek.com

ChargeIT

HELIUM CHARGING STATION

- A NEW ERA IN LEAK DETECTION TECHNOLOGY -

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Specialist in leak testing since 1973

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HELIUM CHARING STATION

ChargeIT is a multifunctional system with a user friendly touch screen interface that allows for easy selection and configuration of the various unique functions shown below. The ChargeIT unit is the first one of its kind and solves problems that many customers have today with leak detection. The pioneer Nolek technology will start a new era in leak detection technology. Functions are:

- Proof Test
- Pressure Decay
- Evacuation (vacuum pump)
- Vacuum Decay
- Helium Charging and Mixing
- Helium Recovery Management
- Cleaning and Back Fill
- PC control and Communication

Product description

A product that needs to be leak tested with the use of tracer gases e.g. Helium or Hydrogen, later to be either Sniffed or detected by a helium leak detector (LD) has one big challenge; the gas has to be charged correctly into the (entire) product.

ChargeIT charges the (entire) product correctly; this is its main purpose.

Furthermore, before the LD is used one have to check that the product does not have a gross leak. Otherwise the charged gas leak out in the surrounding atmosphere and will increase the gas background. This makes it practically impossible to test for a long while since helium is all around.

The ChargeIT conducts this gross leak test both with a pressure and vacuum decay test.

Then one has to be sure that the gas enters the product correctly and completely and that all parts of the product is filled with the gas with equal concentration. This is very difficult when the product volume is at atmospheric pressure. It is therefore very difficult to guarantee correct filling without a charging station, which means one is not checking the integrity of the whole product and it is not considered as a valid leak test.

ChargeIT pumps vacuum in the product before filling it, which guarantees complete filling in the entire product.

The thickness of the walls of the product can cause delays with the spreading of gases. Furthermore, the capillaries can take time to fill, up to a couple of minutes. When an operator fills a product manually he will never know how long he has to fill before the gas is spread entirely in the product and if he waits long enough to see the leaks.

ChargeIT solves this with pumping vacuum and having set time parameters for charging.

To test products with 100% helium concentration is quite expensive, actually most products (leak rates) does not require 100% helium concentration.

ChargeIT enables you to mix the helium to the level you need for the specific leak rates of the product. It is possible to mix down to 10% helium.

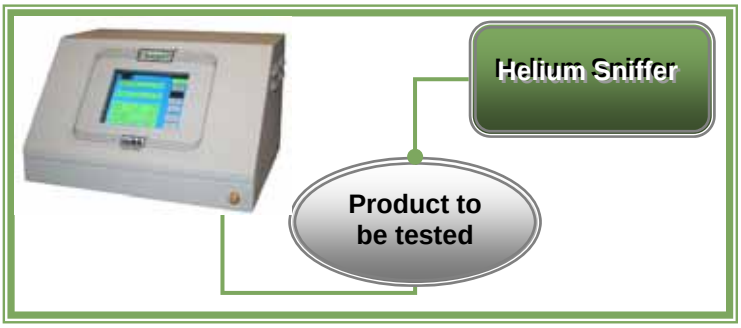
Generally companies have several different products that need to be tested which have different requirements and parameter settings. It is very time consuming to program these parameters every time one changes product to be tested.

The ChargeIT makes it possible to communicate with a PC and directly to a leak detector. This gives a lot of possibilities e.g. to program and save test parameters for all the different products, name the products, put the operator name, save test results etc.

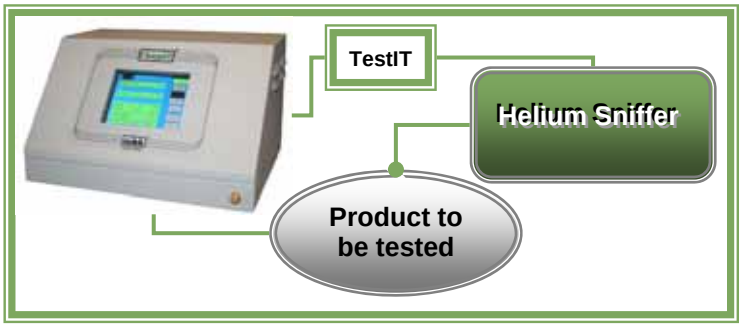
APPLICATIONS & POSSIBILITIES

The ChargeIT was mainly developed to encompass helium leak detectors and/or sniffers which lack essential charging possibilities. The complete system turned out to do much more and today includes; Proof test, Pressure and Vacuum decay, helium mixing and recover capabilities, evacuation of test objects (vacuum pump), cleaning and back-fill and PC control and communication. The ChargeIT can be used both in sniffing and hard vacuum applications. Following system build-ups are possible:

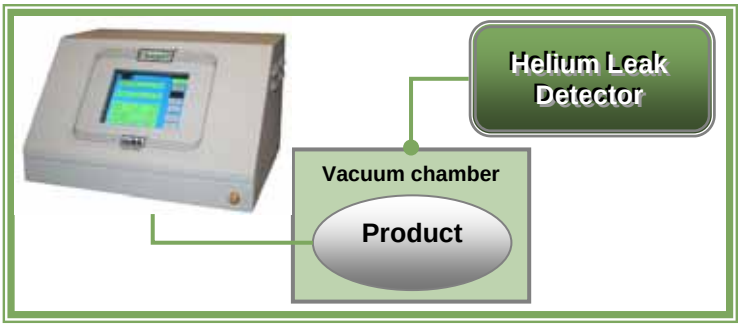
1) Sniffer application without TestIT communication:
The ChargeIt is connected to the test object and conduct all the steps including; Proof test, Gross leak test, evacuation, mixing and charging and recovery management. When ChargeIT indicates that it is ready, the operator uses the He Sniffer to detect helium outside the product. After completed test He is removed from the product by ChargeIT.



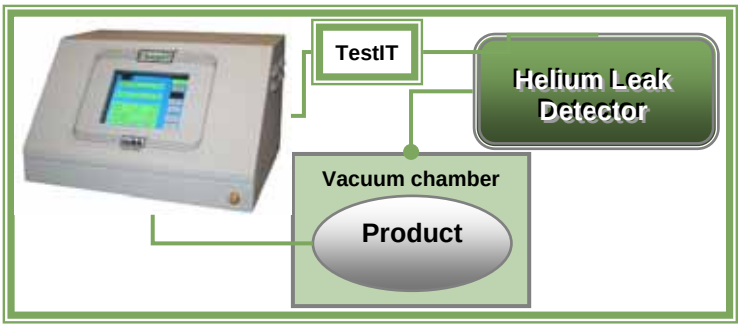
2) Sniffer application with TestIT communication:
As the example above (1) but with communication with Nolek's own developed PC software; TestIT. This enables the operator to program and save parametres for many different products, name the products in the program, from which he can pick from and save time and get a better overview of the tests. Test parametres can also be stored by TestIT.



3) Hard vacuum application without TestIT com.:
The ChargeIt is connected to the test object which is placed in a vacuum chamber. It conducts all the steps including; Proof test, Gross leak test, evacuation, mixing and charging and recovery management. When ChargeIT indicates that it is ready, the operator start the He leak detector and it tries to detect helium inside the chamber. After completed test He is removed from the product by ChargeIT.



4) Hard vacuum application with TestIT com.:
As the example above (3) with added feature as example (2). The difference is that here the operator can set it so that when the ChargeIT is ready TestIT can start the He leak detector automatically. After the detector is finished ChargeIT removes the helium from the product and can recover it (option).



FUNCTIONS

1 Proof test
The Proof Test function is a stress test during which the test part is pressurized to a specified positive pressure in relation to the part's standard operating condition.

2 Pressure decay
The Pressure Decay function is a check for gross leaks under positive pressure conditions. After the pressure specified in the Proof Test function is achieved, the test part is isolated and the internal pressure of the part is monitored for a specified period of time. If the pressure decay exceeds the specified limit an optional incremental pressure test is available to locate the leak(s). The test is done at incremental pressure levels using a 10% helium concentration.

3 Evacuation (vacuum pump)
The Evacuation function evacuates the test part to a specified vacuum level. Without evacuating the test part there are limitations to the helium concentration that can be achieved during the charging process. This function is also essential in assuring the proper charging of test parts with capillary channels.

4 Vacuum decay
The Vacuum Decay function is a check for gross leaks under vacuum conditions. After the vacuum level specified in the Evacuation function is achieved, the test part is isolated and the internal pressure of the part is monitored for a specified period of time. If the vacuum decay exceeds the specified limit an optional incremental pressure test is available to locate the leak(s). The test is done at incremental pressure levels using a 10% helium concentration.

5 Helium Charging & Mixing
The Helium Charging function charges the test part with helium. As a feature the charging function allows for the selection of the helium mixture that is charged into the test object. Although a certain mixture may be selected, the system will display the actual mixture charge into the test part depending on the selected evacuation level.

6 Helium Recovery Management
The Helium Recovery Management function controls and sets the parameters of the optional **RecoverIT** Helium Recovery System. With RecoverIT it is possible to recover up to 98% of the helium used depending on the allowed time for recovery.

7 Cleaning and Backfill
The Cleaning and Backfill function is a three step process by which the helium is removed from the part and can be back filled with the connected test gasses (commonly Air or N_2).

Pressure ranges: with or without mixing capabilities:

Low:	Up to 3 bar pressure (43 PSI)
Normal:	Up to 16 bar pressure (230 PSI)
High:	Up to 21 bar pressure (300 PSI)

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- Leak Testing -

DATA SHEET

nolek deFlux®

"Accuracy and reliability are cornerstones in any leak testing process"

deFlux® PLATFORM

We have developed a new platform; deFlux, for the next generation of leak test instruments. Electronics and pneumatics have been redesigned from the ground up to meet our customer demands and future needs. The operator interface has been updated with color display, touch control, real time display of the measurement sequence and active schemas and graphs.

Remote control is made possible through Siemens Smart Service. The need for a separate calibration instrument can be eliminated through the option to integrate it inside the leak test instrument.

FEATURES & BENEFITS

- Extreme accuracy
- DiFlow® configuration
- Easy to use
- Color Touch Screen
- Multiple measurement types
- Leak find function
- Easy to calibrate

SPECIFICATIONS

Ranges of leak measurement	-500 Pa to 500 Pa (dpt)
Pressure range	-100 till 0 kPa (Vacuum) 0 till 800 kPa (Overpressure)
Communication	IO, *ProfiNet*(o), others on request.
Interface	4,3" TFT Display, Color and Touch Operation
Optional Smart Solution	Sm@rtServer / Sm@rtClient
Dimensions H x W x D	12.67x5.9x14.96"
Weight	Approx 12kg
Power Source	100 - 250 V, 50 - 60 Hz
Air supply	5.5 - 10 Bar / 79 - 150 PSI
Operating temperature	5 to 40°C
Languages	English(US) and Swedish
Display Unit	kPa, mm^3/s, others on request

www.nolek.com

Visit Today for your enquiry or specific need!

LEAK TEST INSTRUMENTS

The global leader in leak testing, leak detection and proof testing solutions.

SP Certified ISO 9001 ISO 14001

CE

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DATA SHEET

nolek deFlux®

"Accuracy and reliability are cornerstones in any leak testing process"

Configuration overview:

Function	deFlux A	deFlux AV	deFlux D	deFlux-DV	deFlux DK	deFlux DF	deFlux DFV	deFlux F	deFlux FV
Overpressure	✓	✓	✓		✓			✓	
Vacuum		✓		✓	✓		✓		✓
DiFlow® configuration						✓	✓		
Flow measurement								✓	✓
Abs. measurement	✓	✓							
DPT-500 measurement			✓	✓	✓				
4,3" TFT Color touchscreen	✓	✓	✓	✓	✓	✓	✓	✓	✓
Build-In Web Server	✓	✓	✓	✓	✓	✓	✓	✓	✓
ProfiNet	o	o	o	o	o	o	o	o	o
I/O	✓	✓	✓	✓	✓	✓	✓	✓	✓

Example Applications :

Air conditioning components - Automotive - Heat-exchangers - Casting - Packaging - Electronics - Machine building
Pharmaceutical and medical - Pumps and water armature - Quality control

YOUR PARTNER IN LEAK DETECTION!

We are the world's leading total solution provider of leak testing, proof testing, leak detection, helium charging and recovery and non-destructive testing equipment.
As leak detection is most often an additional step in the production process, which adds cost, it is imperative to work with a company with a wide range of experience. Important, as well, is a willingness to work with customers as partners to define a test method that allows for the optimal ratio between equipment cost and productivity.
In addition to building test systems, Nolek can provide customers with guidance throughout the entire process ranging from product design advice to assistance with maintenance, service and calibration.
Nolek's headquarter and manufacturing facilities are located in the southern part of Stockholm, Sweden with a large manufacturing facility in Malaysia. To serve our worldwide customer base we have direct offices in the USA, Denmark, China, Hungary and The Netherlands. Nolek proudly has approximately 15 distributors worldwide.

PressurizeIT

Leak Testing Instrument S9

MODERN AND USER FRIENDLY LEAK
TESTING LEADING TO INCREASED PROFITS!

Specialist in leak testing since 1973

nolek

- Leak Testing -

S9; LEAK TESTING AS IT SHOULD BE

Nolek has developed a powerful instrument used for leak testing of most kinds of products; from blister packages for medicine to V8 engine blocks on trucks, the instruments is called **PressurizeIT S9.** The S9 is available in several different standard editions and pressure ranges; from Vacuum to 15 bars.

What is leak testing?
Leak testing is carried out on products that for example have to be air or liquid proof to a certain extent; e.g. a medicine can has to be moisture resistant and an engine has to be totally liquid proof.

What does PressurizeIT S9 do?
It conducts exactly this kind of leak test with air in overpressure or vacuum, which is faster, simpler and more cost efficient than if you would conduct the test using water or oil. The measurement is carried out using one of two available methods; Differential pressure testing or Flow testing, they are explained in detail on page 3 in this document.

Which product can be leak tested?
All products containing any type of liquid, gas or air; e.g. water, oil, gasoline, Freon or Glycol. Most products actually.

Argument 1:
Low price with high quality

Why invest in S9 leak testing?

- **Time saving:** quicker and drier then submerging under water
- **Cost saving** through less rework as one will directly know after a test if the product is tight/working.
- **Quality argument**, one knows that the delivered products are tested and that they have a good quality.
- **Environmental argument**, products does not leak, e.g. oil, out in the nature. Also that the products works directly and does not have to be transported back and forward between customer and supplier.
- **Sales argument** for a company that leak test, as they can guarantee the tightness of their products, which is quality rewarding. Furthermore, it lets one argue for less impact on the environment.

Examples of application areas for the S9:
- Automotive
- Air Condition
- Electronics
- Medicine and Pharmaceuticals
- Heat Exchangers
- Hydraulic and Pneumatic
- Casting
- Water armature and pumps
- Packaging
- Machine builders

PressurizeIT

S9 IS USER FRIENDLY:

Selection of Display Options

The following options are available:

- Graphical display
- Combo (Numerical and Graphical display)
- Numerical display with large characters for an easy to read display, even at a distance!

Text Field

Name your programs. This provides security and the assurance that the correct program/recipe is used.

Tower or Desk Format

Argument 2:
High reliability

Tower or Desk Format
Select according to your layout needs. They both have the large and easy-to-read display with a clear and practical menu system.

Optical Signals
The distinct green and red signal lamps displays all test results clearly.

Adjustable Calibration Leak
The calibration leak can be adjusted continuously and is well protected against unintentional adjustments.

Streamlining Functions and Properties

Argument 3:
Impressive technical performance

PC collection of test data
Perfect for when you need to analyze or store data.

Automatic Setting
The instrument creates its own standard setting.

Optional Additional Language
In addition to the standard languages Swedish, English and German you can connect to a PC and add two more languages of your choice.

Automatic Power supply Accommodation
Simplifies transportation to other countries, 100 240V.

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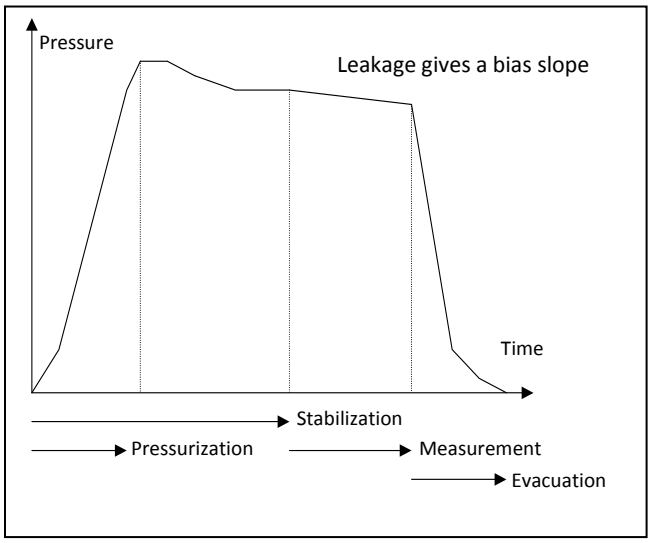
MEASURING METHODS IN PressurizeIT S9:

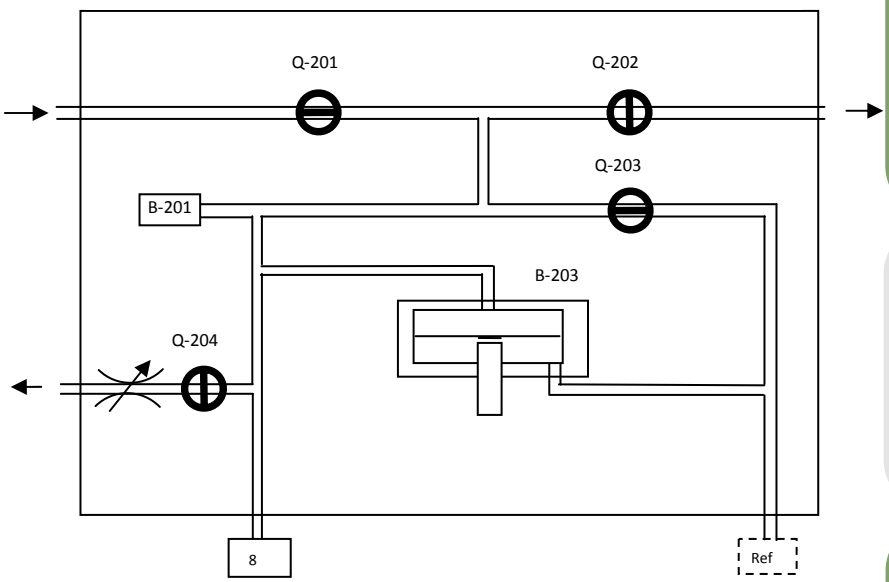
Leak testing is carried out using either differential pressure measurement with overpressure or vacuum, or through flow testing. There are also instrument configurations with combinations of the different test methods and pressure ranges.

Facts about differential pressure measurement
With differential pressure measurement, systems are divided into two volumes, a test volume and a reference volume. These are pressurized to a uniform pressure. One volume contains the test object. When the pressure has equalized, the two volumes are separated by a valve and any pressure changes between them are measured with a differential pressure gauge. If the test object leaks, the pressure in the test volume changes.

A typical measurement cycle for differential pressure might look like the picture to the right. The stabilization time is the time it takes for the test volume and the reference volume to fill with air. This is followed by pressure equalization and then a measurement time during which pressure changes due to leakage in the test object are measured. Finally, the air is released from the test obiect.



Measurement sequence with Differential pressure meas. Pressurization, Stabilization, Measurement & Evacuation



1.Pressurization:
The evacuation valve “Q-202” closes and the entire piping system including test object and reference volume are filled to the specified test pressure. The pressurization valve “Q-201” remains open until pressure sensor B1 registers the correct test pressure P. The pressurization valve then closes and the stabilization time starts.

2. Stabilization:
Pressure equalization now takes place so that the pressure and temperature in the test object and the reference volume are the same when measurement begins. At the end of the stabilization time, the stabilization valve “Q-203”closes and the measurement time begins.

3.Measurement:
If the test object leaks, differential pressure sensor “B-203” registers a pressure difference between the test object at port 8 and the reference volume. If the pressure difference becomes too great within the programmed measurement time, a leak signal is given and the test is aborted.

4. Evacuation:
The test pressure is evacuated.

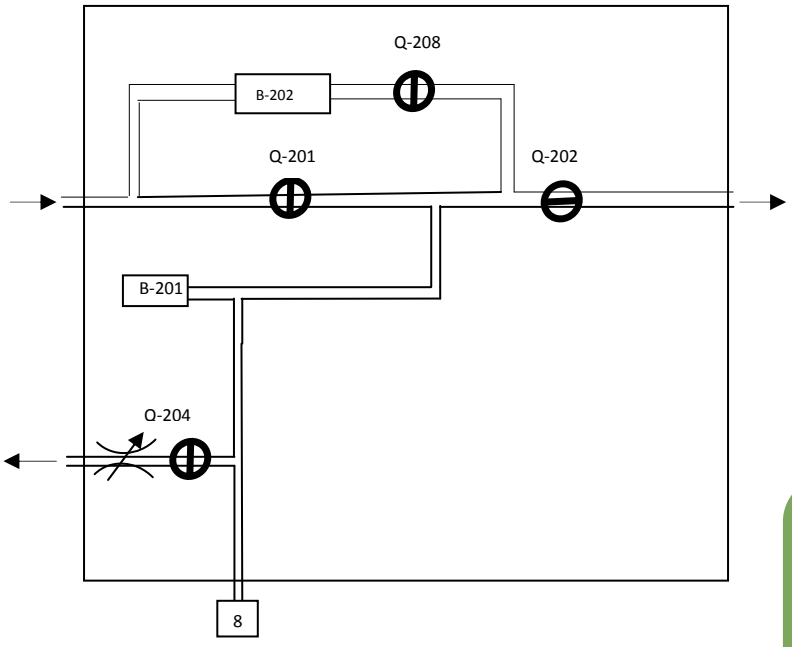
Function check (Q-204):
For checking that the equipment is correctly adjusted and that it registers the specified leak levels. The reference leak valve is adjusted using a Calibration instrument, recommended is Noleks CalibrateIT C9.

The reference leak valve can be controlled manually or automatically, e.g. once per day.

MEASURING METHODS IN PressurizeIT S9:

Facts about flow measurement
The instrument measures the amount of air that is added at a potential leakage in the tested object. This makes it possible to show the exact leak rate on the display continuously. It is used e.g. at volume variations between tested objects. Calibration is carried out by the build in reference leak that can be adjusted to the correct leak rate.

Measurement sequence with Flow meas.
Pressurization, Stabilization, Measurement & Evacuation



1. Pressurization
The evacuation valve Q-202 is closed, the pressurezation valve Q-201 is opened. The test pressure is read with B-201, when the right test pressure is reached the flow valve Q-208 is opened, to speed up the stabilization the flow valve and the pressurization valve are both open.

2. Stabilization
If the test pressure falls more than 5% of the decided leak rate a signal for gross leak is given. During the stabilization one can read the flow signal continuously.

3. Measurement
One can now read the flow value from B-202. Also the flow signal against the leak rate. If the flow is higher than the leak rate a red signal is shown and the test is cancelled. If the flow is not higher than the leak rate a green signal is shown and the test object is evacuated.

4. Evacuation
Flow valve Q-208 is closed and the evacuation valve is opened.

Dosing and PI Measurement:
Through an additional function module system the S9 is easily made to work with measurements were the object is completely shut and the measurement is carried out in a chamber (dosing). If the object is appropriate for pressure increase measurement, this module is very useful and gives very short measurement (PI).

Fixture Control Capability

Argument 4:
Small and compact instrument

The internal control program with eight I/O has the capability to control external sequences. This is a cost effective solution as it replaces the PLC during minor control changes.

For example:
– Fixture movements
– External valves
– Automatic program changes
– Labeling the object

All programming is entered directly into the S9, no additional equipment is required – everything is included!

S9 IS A SUPERIOR INSTRUMENT

Time Saving Functions

QuickStop

Reduced measuring time with the help of a new technique! Reduces the measuring time to approximately 1/4 of the original time using an advanced calculation of the leak development.

ZeroOffset

Compensate during external interference!
This function can offer extremely short cycles without affecting the test value negatively.

Measuring Unit

The separate measuring unit offers advantages such as easy access and a closer distance between the test site and the testing unit. This increases the possibility of achieving short cycles.

Argument 5:
Nice design

Argument 6:
Strong brand, specialist in leak testing since 1973.

Argument 7:
100 test programs.

FACTORY OPTIONS:

The **Factory options** are important to order together with the instrument. Some options are possible to add afterwards but not all. The **Factory & Aftermarket accessories** are options that are possible to add at any time, before or after an order. When ordering the **Factory options** you just add the letter indicated to each option below after the instrument article number e.g. S9-T-…-ADG. The **Factory & Aftermarket accessories** options will follow later in the document.

Below is a description of the different options, answering three questions about each option: What is it? When is it required? And How to you use it? Please do not hesitate to ask if you need any further clarifications.

A. INLET REGULATOR WITH FILTER

For high pressure

Placed here →

For low/normal pressure

What is it?
The regulator determines that the instrument obtains a stable pressure. On the regulator a filter is placed to protect the instrument from unwanted pollution from the inlet air.

When is it required?
This option is always necessary on Flow instruments when there is no external regulator to control that the pressure is stable. This is also always necessary when you have a vacuum ejector. Finally this is also necessary when the pressure in the supplied air exceeds 7 bars for L (Low) and N (Normal) pressure instruments.

How to use it?
This is mounted externally on port 1 on the backside of the instrument. The regulator must always be regulated to a minimum of 5 bar and always 1 bar over the final test pressure.

B. BUILT IN WHEEL-ADJUSTABLE CONTROL LEAK

What is it?
This is adjustable leak used for calibration of the instrument. It is easy to adjust with the wheel.

When is it required?
It is recommended when there is no other control leak. Without a control leak, it is not possible to set a leak rate with a differential pressure instrument. With this option it is possible to use the S9's Auto control function.

How to use it?
The external control leak must be adjusted with the calibration instrument CalibrateIT C9. A separate manual for the C9 is available.

C. AMS9-142 SCREW ADJUSTABLE CONTROL LEAK

What is it?
This adjustable control leak is similar to "Built in wheel-adjustable control leak", but can only be adjusted with a screwdriver.

When is it required?
Compared to "Built in wheel-adjustable control leak", this is used when there is a risk of that the control leak would be adjusted by mistake by moving the wheel. With this option it is also possible to use Auto control.

How to use it?
The external control leak must be adjusted with the calibration instrument C9. A separate manual is available.

FACTORY OPTIONS:

D. EXTERNAL EVACUATION PREPARATION

What is it?
A port (port 9) on the instrument is connected to the evacuation valve in order to be able to connect an external evacuation.

When is it required?
When one want to use external evacuation.

How to use it?
You control an external evacuation valve through port 9. Hence, this is a preparation for external evacuation explained further below.

E. KIT EXTERNAL EVACUATION VALVE INCL. FILTER

What is it?
This kit contains a valve with a filter to prevent pollution from getting inside the valve.

When is it required?
When test objects contain pollution this kit reduces wear and service cost of the instrument If you have small objects with a low leak rate, filters should not be used (min 2dl volume at 10mm3/s).

How to use it?
The kit is mounted on the back of the instrument which has to be prepared for external evacuation (see above). The external evacuation is ready to be used at delivery.

F. CHANGE OF FLOW RANGE

What is it?
The standard flow range 60ml/min (1000 mm^3/s) can be changed to the following flow ranges depending on instrument type: Low & Normal: 200 or 1000 ml/min (3333 or 16666 mm^3/s), High & Extra High: 10 to 1000 ml/min (166 to 16666 mm^3/s).

When is it required?
If you have a flow instrument and need a different flow range than the standard 60ml/min (0-1000 mm^3/s).

How to use it?
The new flow range is used without any change in settings or other requirements.

G. VACUUM MEASUREMENT FUNCTION

What is it?
This function enables the user to switch between overpressure and vacuum measurements.

When is it required?
When the flexibility to change the instrument between measuring in overpressure and vacuum is required.

How to use it?
With this option, a vacuum pump can be connected to port 3 to have the ability to change between overpressure and vacuum. The vacuum pump is not included in this option but can be purchased separately from Nolek.

FACTORY OPTIONS:

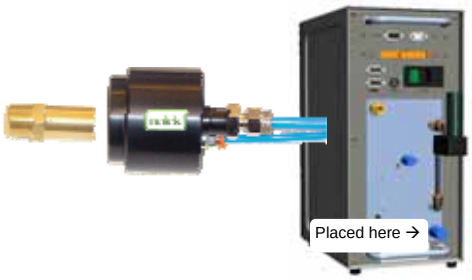
H. VACUUM EJECTOR

What is it?
This is a small vacuum pump directly mounted on the instrument with maximum vacuum of -93kPa. There is also an extra valve inside the instrument that controls air to port 5.

When is it required?
This is necessary with a vacuum inst, if you do not have an external vacuum pump. With bigger volumes or/and when higher pumping capacity is required, we recommend to purchase a vacuum pump from Nolek instead.

How to use it?
It is directly mounted on the backside of the instrument, port 5 is air outlet with a restrictor to control the vacuum in small volumes. Port 3 is the vacuum port. A prerequisite is to have the option vacuum measurement function. One cannot have both an external vacuum pump and a vacuum ejector.

I. QUICK CONNECTOR OUTLET PREPARATION

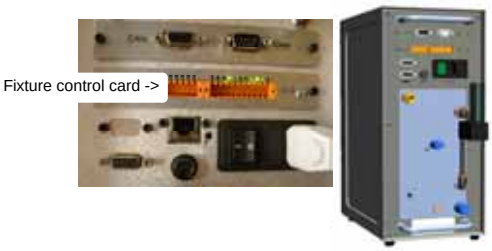


What is it?
There is an extra valve in the instrument connected to port 7 that adds the possibility to control a connected quick connector. You also have the possibility to control other functions on a fixture.

When is it required?
If the instrument has a quick connector connected that should be activated by the instrument.

How to use it?
When this is prepared you just have to connect a quick connector to port 7 on the backside of the instrument.

J. AMS9-100 FIXTURE CONTROL



What is it?
This is a control card for fixtures. It has 8 I/0 outlets and 8 I/0 inlets.

When is it required?
When the instrument is used to control a fixture or when PLC communication is required.

How to use it?
The fixture control card is mounted on the inside of the instrument. A separate manual is available.

K. ETHER-S9 TCP/IP ETHERNET

What is it?
This is an Ethernet TCP/IP module that makes it possible to communicate data from the instrument using Ethernet. With this option, the RS232 port is removed.

When is it required?
If Ethernet is required to communicate with for example other types of instruments or a PC.

How to use it?
An outlet for Ethernet is available on the backside of the instrument, one just have to connect an Ethernet cable. Separate manual available.

FACTORY OPTIONS:

L. SPLIT S9 WITH SEPARATE FRONTPANEL

What is it?
The display of the S9 can be separated from the instrument and placed closer to the operator. A three (3) meter cable is included.

When is it required?
When the instrument is placed close to the machine/fixture and operator is further away, for example for operator safety reasons. Hence, the display can be placed closer in order to operate the instrument more easily.

How to use it?
The display comes separate from the instrument and is connected by a three (3) m long cable (standard) from the CAN-BUS. The front of the instrument is closed. The longest possible distance is ten (10) meters.

M. AMS9-143 VOLUME DOSING

What is it?
There is an external adjustable volume on the back of the instrument that will be used for controlling the dosing pressure.

When is it required?
This is used when you have very small test volumes and would like more stable results. Dosing is used when a test volume cannot be connected to the test object due to lack of opening; then it is preferable to measure that nothing enters the volume from the outside. Smaller volumes/leak rates than option N.

How to use it?
You need a fixture, which Nolek can supply, that seals of the volume. The instrument then measures if the stable pressure changes inside the fixture, hence recognizing if the object is leaking or not. A separate manual is available.

N. AMS9-144 TIME DOSING FOR SMALL VOLUMES

What is it?
The pressurization valve is replaced with a smaller type that enables time dosing for smaller volumes.

When is it required?
When the object volume is lower than 0.2 liter. Dosing is used when a test volume cannot be connected to the test object due to lack of opening; then it is preferable to measure that nothing enters the volume from the outside.

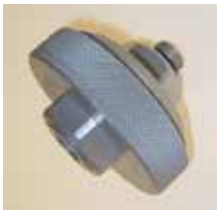
How to use it?
See option M above.

AFTERMARKET ACCESSORIES:

The Aftermarket accessories can both be ordered at the time of instrument order, but can also be ordered after a purchase has been made.

Below is a description of the different options, answering three questions about each option: What is it? When it is it required? and How to use it? Please do not hesitate to ask if you need any further clarifications.

1. TEST PORT FILTER



Connected here →

What is it?
This is a filter to protect the instrument from pollution coming from the test object. The filter house has a length of 45mm and a diameter of 70 mm. The filter insert has specification 77 my.

When is it required?
When test objects are dirty or if there is a risk they may be dirty, this filter maintains the performance of the instrument. Note that Nolek's S9 warranty does not cover faults caused by dirt if filter is not used.

How to use it?
The filter is directly connected to port 8 and independent from airflow direction. This filter will decrease the sensitivity because it increases the volume. If you have small objects with a low leak rate, filters should not be used (min 2dl volume at 10mm3/s).

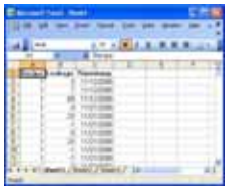
2. FILTER INSERT

What is it?
This is the filter that is inserted in the test port filter. Come in five-packs.

When is it required?
The test port filter has to be replaced when it becomes too full. Change intervals depend on application and use.

How to use it?
The Test port filter is easily disassembled without removing the hoses and connections. Then it is just to change the filter.

3. DATA COLLECTION SOFTWARE



What is it?
This software enables the user to store test data, export it to Microsoft Access and/or Excel, where they can view it, print it or save it.

When is it required?
When the user wants to store data.

How to use it?
See separate manual. Only available in English.

4. TESTIT DATA COLLECTION SOFTWARE

What is it?
This software enables the user to store test data, export it to Microsoft Access and/or Excel where they can view it, print it or save it. The software is required when using a barcode reader, otherwise option above is recom.

When is it required?
When the user wants to store data and use a barcode reader.

How to use it?
See separate manual. Only available in English.

AFTERMARKET ACCESSORIES:

5. REMOTE CONTROL BOX, WITH START AND RESET

What is it?
This is an external remote control box for start and reset.

When is it required?
When user wants to start and reset the instrument externally, perhaps at a more ergonomic placement for the user. The box can be placed up to two meters from the instrument.

How to use it?
Connect the control box with the included cable to port x (see pic left). It is then ready to be used.

6. REMOTE CONTROL BOX, WITH START, RESET AND THUMB WHEEL SWITCH

What is it?
This is an external remote control box for start and reset with a thumb wheel to change test recipes.

When is it required?
When users want to start and reset the instrument externally and also change between up to nine different recipes. The box can be placed up to two meters from the instrument, which may be required to find a more ergonomic placement for the user. A fixture control card is required to use this control box with thumb wheel, but when using this control box the fixture control card cannot be used for other purposes.

How to use it?
Connect the control box to port X17 and X18 (see pic left) with the included cable. Separate manual is available.

7. EXTERNAL CONTROL LEAK

What is it?
This is a control leak that is connected to the front of the instrument.

When is it required?
It is necessary to add an external reference leak when there is no built-in control leak. It is recommended to have in all cases when one does not have any other reference leak, to be sure that one measure correctly. It is possible to use one control leak for several instruments. With this option it is not possible to use Auto control (as with internal control leaks).

How to use it?
It is mounted directly on the front connector of the instrument. Then it is adjusted to a correct leak rate by connecting it to a C9 calibration unit. Separate manual is available.

AFTERMARKET ACCESSORIES:

8. EXTRA CONTROL LEAK W/ MANUAL VALVE.

What is it?
This is an extra control leak with a manual valve. Standard is one extra control leak but up to 100 can be added upon request.

When is it required?
Used when there are two or more different leak limits. The different leak rates can be controlled without adjusting one control leak every time.

How to use it?
It is connected to the measurement port or the test object and controlled by a manual valve.

9. EXTRA CONTROL LEAK W/ ELECTRONIC VALVE

What is it?
This is an extra control leak controlled with electronic valve controlled by the fixture control card or a separate PLC. Standard is one extra control leak but several can be added upon request.

When is it required?
Used when there are two or more different leak limits. The different leak rates can be controlled without adjusting one control leak every time.
A fixture control card and program or PLC is required for this to work.

How to use it?
It is connected to the measurement port or the test object; it is controlled by the fixture card. Instrument has to be in Fixture control mode (not in PLC mode). When used together with fixture control card please see fixture control manual.

10. START-UP KIT WITH TUBES AND CONNECTIONS

What is it?
This kit includes: a 2m long 8mm tube made especially for leak testing and two connections with ¼ inch thread (BSP).

When is it required?
Recommended when one want to connect instrument to a test object.

How to use it?
First mount the connection on the hose (or mount them later). Then connect one connection to port 8 and the other to the test object.

12. INSTRUMENT TRAINING

What is it?
Training on the practical way of using the instrument.

When is it required?
Recommended to all first time users or as a refreshment.

How to use it?
Nolek offers a standard training course at the customer's location or at our facilities.

AFTERMARKET ACCESSORIES:

13. INSTALLATION

What is it?
Installation of the instrument and a possible fixture.

When is it required?
To all users who are not qualified to do this installation themselves.

How to use it?
A Nolek service technician will come half a day and install the instrument and fixture and show the basics on how it is used. This is not as extensive as the Instrument Training.

14. C9 – CALIBRATION UNIT

What is it?
Nolek C9 Calibration instrument.

When is it required?
For certainty that measurements are accurate. When you want to assure that you are measuring accurate. This is a prerequisite to have with a differential pressure instrument in order to calibrate it.

How to use it?
Separate manual available.

15. INLET REGULATOR WITH FILTER

For high prressure

Placed here →

For low/normal pressure

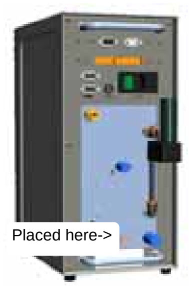
What is it?
The regulator determines that the instrument obtains a stable pressure. On the regulator a filter is placed to protect the instrument from unwanted pollution from the inlet air.

When is it required?
This is always necessary on Flow instruments when there is no external regulator to control that the pressure is stable. This is also always necessary when you have a vacuum ejector. Finally this is also necessary when the pressure in the supplied air exceeds 7 bars for L (Low) and N (Normal) pressure instruments.

How to use it?
This is mounted externally on port 1 on the backside of the instrument. The regulator must always be regulated to a minimum of 5 bar and always 1 (one) bar over the final test pressure.

AFTERMARKET ACCESSORIES:

16. KIT EXTERNAL EVACUATION VALVE INCL. FILTER



What is it?
This kit contains a valve with a filter to reduce pollution going inside the instrument.

When is it required?
When test objects contain pollution this kit reduces wear and service cost of the instrument.

How to use it?
The kit is mounted on the back of the instrument which has to be prepared for external evacuation. The external evacuation is ready to be used at delivery.

17. M8*8 INPUT BOX

What is it?
This is a communication cable-kit for connection to the fixture card inlets.

When is it required?
When communication between fixture and fixture control card in instrument is necessary.

How to use it?
Just connect one side of the cable to the fixture card outlet on the instruments and your external connections to the other side.

18. M8*8 OUTPUT BOX

What is it?
This is a communication cable for connection to the fixture card outlets.

When is it required?
When communication between fixture and fixture control card in instrument is necessary.

How to use it?
Just connect one side of the cable to the fixture card outlet on the instruments and your external connections to the other side.

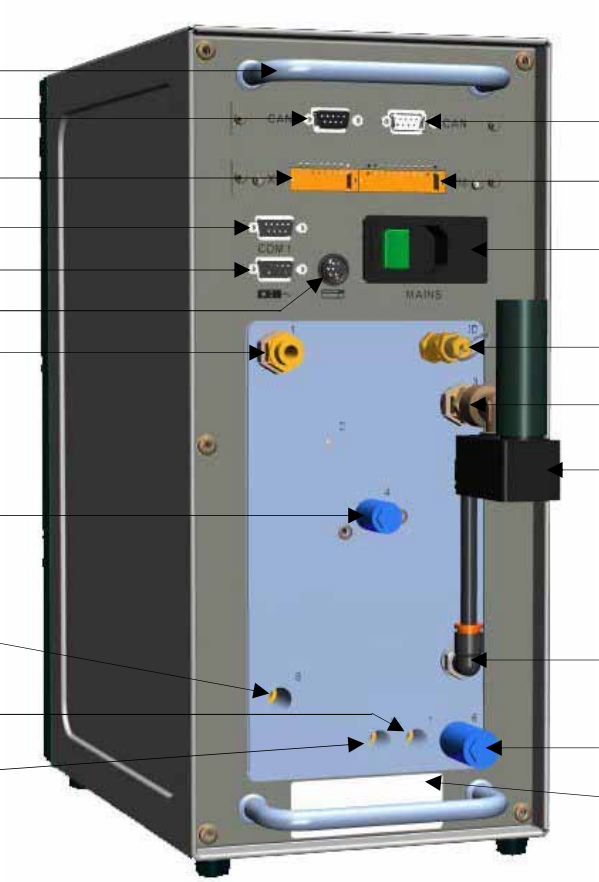
18. CONNECTIT-QUICK CONNECTORS

What is it?
Nolek has developed tool solutions to rationalize temporary seals since 1973. We have a very large selection of quick connectors and fittings. Activation can be carried out manually or pneumatically. These products are gathered under the product group: ConnectIT.

When is it required?
When temporary sealing of test objects are necessary.

How to use it?
Activation can be carried out manually or pneumatically. See separate product information on www.nolek.com

CONNECTIONS & CONTACT:



Argument 9:
Short delivery times!

Dimensions and Data

Network connection:
100-240 VAC / 0.9 A 50-60 Hz
Weight: Approx. 16 kg
Size: 188mm x 400mm x deep 315mm
Sealing grade: IP32
Color: Silver gray (RAL 6021) with a dark green front panel.
Designed for industrial use
CE - marked

Standard editions

5 Standard editions: (…) = denomination
Vacuum:
-1 till 0 bar (Vacuum)
Overpressure:
0.05 till 0.5 bar (Low)
0.2 till 5 bar (Normal)
0.5 till 10 bar (High)
1 till 15 bar (Extra high)

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www.nolek.com

APPLICATION EXAMPLES:

S9 can be used for a great variety of leak tests in most application areas. These are some examples of different application areas and products that the S9 can be used for/in:

Automotive: Engine block, clutch, transmission/gear box, transmission/gear box houses, intake manifold, intake manifold gas channels, exhaust pipe, exhaust valve, clutch plate, cylinder head, retarder house, crank pit, valve body, valve housing cover, common rail systems, all types of bearing houses, retarder bearing house, cylinder blocks, fuel channel, fuel pipes, fuel tanks, radiator, brake cylinder, caliper, fuel systems, steering servo, size control, bedplate, pressure tank, tank coupling, water pump, clutch cover, pressure cap, air pipe, filler cap.

Packaging: test for closure and seal integrity of packages for example: sterile products, ink cartridges and perishables that can be negatively affected by oxygen and/or moisture.

Medicine and Pharmaceuticals: Blister packages, medicine bottles, medicine cans, sachets, and plasma bags etc

Air Condition: Test several components, including: different types of valves, including: control valves, adjustment valves, ball valves, vacuum valves, hydraulic valves, temperature regulator valves, and tools, bellows, thermostats, different types of filters, and different types of piping.

Electronics: Test for example: different types of electronic parts and devices, different types of batteries, different types of casings, cellular phones, casings for cellular phones, cellular phone antennas, alarm buttons, different types of lights, amplifiers, phones, optical sensors, com radios, ink containers, electric heaters, shavers, and weapon sights etc.

Hydraulic and Pneumatic: Test for example: different types of hydraulic and pneumatic components, valves, hydraulic motors, cylinders, all types of tubing, pipes and couplings, different types of water mixers, outboard drives, compressors, pressure tanks, bottle gas tanks, WC flushing mechanisms, and different types of jacks.

Casting: Test for example: different types of housing and covers, oil sumps, gear box houses, bearing box covers, clutch housing, range housing, engine blocks, coolers etc.

Argument 10:
Infinite backup

Argument 11:
Free user language

Argument 12:
1 year complete guarantee on the product

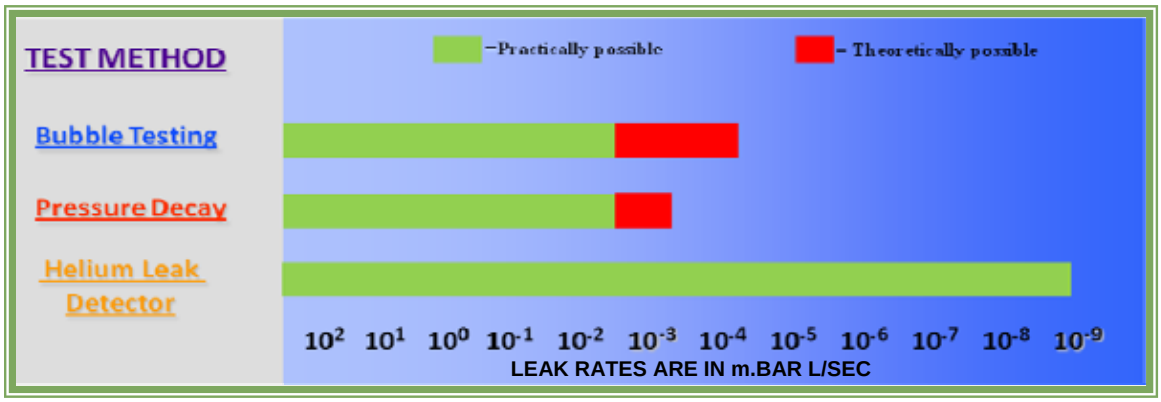
Argument 13:
Return on Investment is very high.

ENCLOSURE 1: COMPARISON B/W AIR & WATER TEST

INTRODUCTION

One of the first questions that usually arise when talking to customers with little or no previous experience of "professional leak testing" is why they should invest in a more expensive system when their cost effective bubble test is doing the work. The reasons are many and this document aims to give these persons an overview of the arguments for selecting "professional leak testing", meaning pressure decay, instead of bubble testing. First we will show some **general** remarks and the **pros** and **cons** about the different methods and then add some **concluding** remarks including common misconceptions. Below is a table that shows the approximate leak detection rates with the different methods. Difference with practically being able to detect leaks and theoretically is described further below. This directly shows one common misconception; Air does not find smaller leaks than water, it is actually the opposite, but using water test is not a leak test, it is a way to locate leaks which is further described in the following pages. Helium leak detection is the most "sensitive" leak testing method; Nolek is also a specialist with Helium.

APPROXIMATE LEAK DETECTION RATES



General, Pros and Cons about "Bubble test" – Test using water

General:

- The bubble method is an inside out method, where the part is first pressurized
- The part is then submerged down in water
- Soap solution can be added on the part for easier identification of bubbles
- This is only a leak search not a leak test

Pros:

- Positive identification of the leak location(s)
- Cheap system

Cons:

- Objects with smaller leaks than the leak rate are identified as "leaking = no good" and thrown away when it is not actually necessary.
- Objects with large leaks are missed and approved.
- Products are put in water, hence they become wet, it takes long time to dry.
- Total leak measurement is NOT possible
- Very operator dependent, impossible to focus and see all leaks when observing 8 hours a day.
- When lowering the object air is brought down, which makes it difficult to see if it is leaking or if it just the air that came with the lowering movement that show bubbles.
- No exact time specifications, some operators only dip the product in the water up and down, then a lot of leaks are missed as it takes time before some leaks to appear as bubbles.
- Water has a sealing effect on the object if not handled correctly.
- Sensitivity depends on fluid surface tension and on operator
- If water is not changed it could cause severe health issues on the operator
- Lowering objects in water can cause rust on objects
- If anti-rust agent is used it is not possible to paint the object directly after. The object must first be put in a washing machine and then it has to be dried before the paint can be put on.

ENCLOSURE 1: COMPARISON B/W AIR & WATER TEST

Pros and Cons about Pressure decay – Test using air

General:

- A part is put under pressure/vacuum condition
- A pressure variation is observed over time
- The detected pressure variation is directly proportional to the leak rate
- This is a leak test not a leak location/identifying test

Pros:

- Total leak measurement is possible
- Able to measure to a specified leak rate
- Able to conduct a real leak test hence a quality control
- Product is only tested with air, hence products stay dry
- Less products are thrown away, only the ones that have a larger leak than the specified leak rate will be identified as leaking.
- Tests are not operator dependent, rather instrument dependent.

Cons:

- This system cost more than a bubble test
- The test cycle can be longer
- Not possible to find exact location of leak, hence a good combination is recommended. (Nolek can supply)

CONCLUSION

It is impossible to secure the level of quality with the water method. It is not a quality control since it only works as a leak search and does not replace leak testing with air. That is not to say that the two methods cannot be combined:

- Use pressure decay to conduct a leak test and certify the quality of the product
- Use water to identify where the leak is located on the product

One does not actually measure more precise with air, one rather measures to the defined leak rate. With the water method it is not possible to define the rate at which it leaks and the most common mistake is that the operator believes that the product is leaking while in fact it is well above the rate at which it is classified to have a leak according to product specifications.

Products that are leaking when tested with pressure decay instruments sometimes are leaking when tested in water. The most common fault is that the product is not pressurized before it is lowered in the water and then all leaks will not be identified, especially smaller leaks. Hence, the issue of high dependence of operator arises, the operator has to conduct the test correctly at the same time as he has to be fully focused not to miss bubbles arising. Furthermore, he has to decide how many bubbles that decide if a product is leaking or not, a task which is as impossible as it sounds.

The leak rate; 10^{-4} mbar.l/sec is theoretically the lowest level where air bubbles are produced in water, below that level the air dissolves in the water without becoming bubbles. A lot of companies with leak rates under this level test products in water but will never see if the product is leaking at the specified level. For example some test gas pipes for air condition applications in water. These products often have a leak rate in the area of 10^{-6} mbar.l/sec which means that one is 2-3 decimals from being able to see if the product is leaking or not at the specified level.

The conclusion is that one need pressure decay to do a complete quality control on products. The initial investment might be higher but we help companies to leak test their products, leading to a:

- **Saving in cost,** being able to deliver to your customers PPM requirements.
- Increased **quality** of delivered products when leak testing in the correct way.
- Improved **environment** through less leakage and through less transports.
- Substantial **time reduction** compared to other leak test methods.
- Great **selling argument** when selling your product; the product is leak tested…

PressurizeIT

Leak Testing Instrument
S9 Lite

Specialist in leak testing since 1973

nolek

- Leak Testing -

S9 LITE; EASY AND EFFICIENT!

Noleks range of leak testing instruments has in the beginning of 2009 been extended with one additional instrument called; ***PressurizeIT* S9 Lite**. It has been launched to fill an important gap between the instruments PressurizeIT S9 and the PressurizeIT TS 500? The S9 Lite is a "simplified" version of the S9, used for more simple measurements especially when customers have few products they want to test with a high accuracy. The S9 Lite gives the customers their money's worth;

- Extreme accuracy
- Easy to use
- Unmet quality standards
- Markets most modern leak testing instrument
- Low cost option

Nolek can recommend which instrument is best for each application. As a general overview; if a customer wants the below features they should rather look at the S9. These features are not necessary for all customers and is what enables the low price of the S9 Lite.

- Fixture control capabilities
- Ethernet communication
- Possibility to test at different pressures in one test through the electronic regulator
- Multi-circuit system
- Combination instrument (e.g. Vacuum and Overpressure)
- Other pressure ranges than normal (Low, High, Extra High)
- Split display (Display close to operator, instrument close to object)
- Start-box with Start, Reset and thumbwheel switch
- Volume dosing
- Time dosing
- shock filling

Why invest in S9 Lite leak testing?

- **Time saving:** quicker and drier then submerging under water
- **Cost saving** through less rework as one will directly know after a test if the product is tight/working.
- **Quality argument**, one knows that the delivered products are tested and that they have a good quality.
- **Environmental argument**, products does not leak, e.g. oil, out in the nature. Also that the products works directly and does not have to be transported back and forward between customer and supplier.
- **Sales argument** for a company that leak test, as they can guarantee the tightness of their products, which is quality rewarding. Furthermore, it lets one argue for less impact on the environment.

Argument 1:
Low price with high quality

Argument 2:
High reliability

Argument 3:
Nice design

Examples of applications for the S9 Lite:
- Automotive
- Air Condition
- Electronics
- Medicine and Pharmaceuticals
- Heat Exchangers
- Hydraulic and Pneumatic
- Casting
- Water armature and pumps
- Packaging
- Machine builders

PressurizeIT

S9 LITE IS USER FRIENDLY:

Selection of Display Options

The following options are available:

- Graphical display
- Combo (Numerical and Graphical display)
- Numerical display with large characters for an easy to read display, even at a distance!

Text Field

Name your programs. This provides security and the assurance that the correct program/recipe is used.

Tower or Desk Format

Tower or Desk Format
Select according to your layout needs. They both have the large and easy-to-read display with a clear and practical menu system.

Optical Signals
The distinct green and red signal lamps displays all test results clearly.

Optional adjustable Calibration Leak
The calibration leak can be adjusted continuously and is well protected against unintentional adjustments (option).

Streamlining Functions and Properties

Argument 4:
Impressive technical performance

PC collection of test data
Perfect for when you need to analyze data.

Automatic Setting
The instrument creates its own standard setting.

Optional Additional Language
In addition to the standard languages Swedish, English and German you can connect to a PC and add two more languages of your choice.

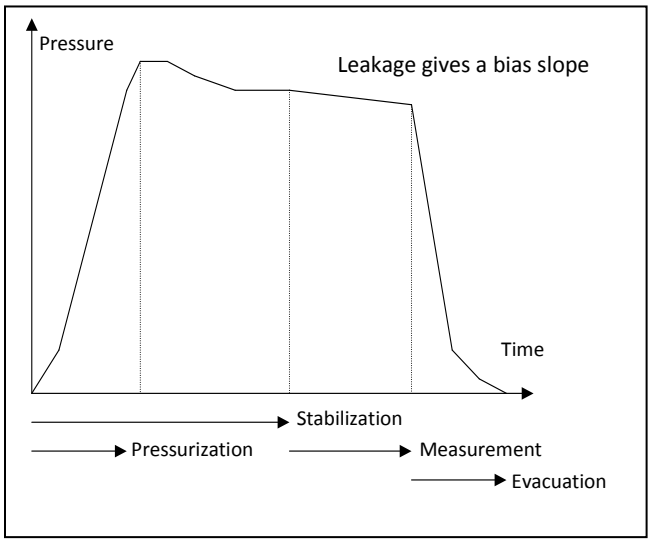
Automatic Power supply Accommodation
Simplifies transportation to other countries, 100 240V.

MEASURING METHODS IN PressurizeIT S9 Lite:

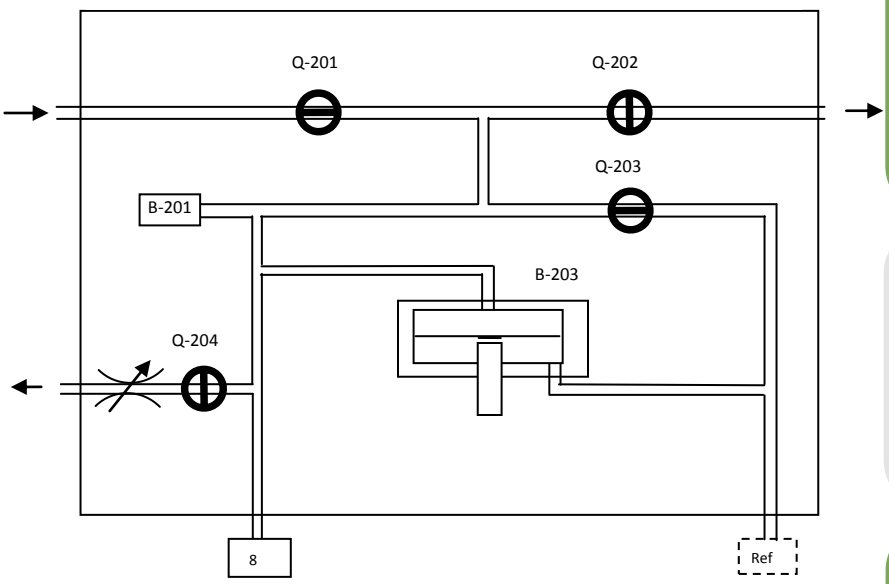
Leak testing is carried out using either differential pressure measurement with overpressure or vacuum, or through flow testing.

Facts about differential pressure measurement
With differential pressure measurement, systems are divided into two volumes, a test volume and a reference volume. These are pressurized to a uniform pressure. One volume contains the test object. When the pressure has equalized, the two volumes are separated by a valve and any pressure changes between them are measured with a differential pressure gauge. If the test object leaks, the pressure in the test volume changes.

A typical measurement cycle for differential pressure might look like the picture to the right. The stabilization time is the time it takes for the test volume and the reference volume to fill with air. This is followed by pressure equalization and then a measurement time during which pressure changes due to leakage in the test object are measured. Finally, the air is released from the test object.



Measurement sequence with Differential pressure meas. Pressurization, Stabilization, Measurement & Evacuation



1.Pressurization:
The evacuation valve “Q-202” closes and the entire piping system including test object and reference volume are filled to the specified test pressure. The pressurization valve “Q-201” remains open until pressure sensor B1 registers the correct test pressure P. The pressurization valve then closes and the stabilization time starts.

2. Stabilization:
Pressure equalization now takes place so that the pressure and temperature in the test object and the reference volume are the same when measurement begins. At the end of the stabilization time, the stabilization valve “Q-203”closes and the measurement time begins.

3.Measurement:
If the test object leaks, differential pressure sensor “B-203” registers a pressure difference between the test object at port 8 and the reference volume. If the pressure difference becomes too great within the programmed measurement time, a leak signal is given and the test is aborted.

4. Evacuation:
The test pressure is evacuated.

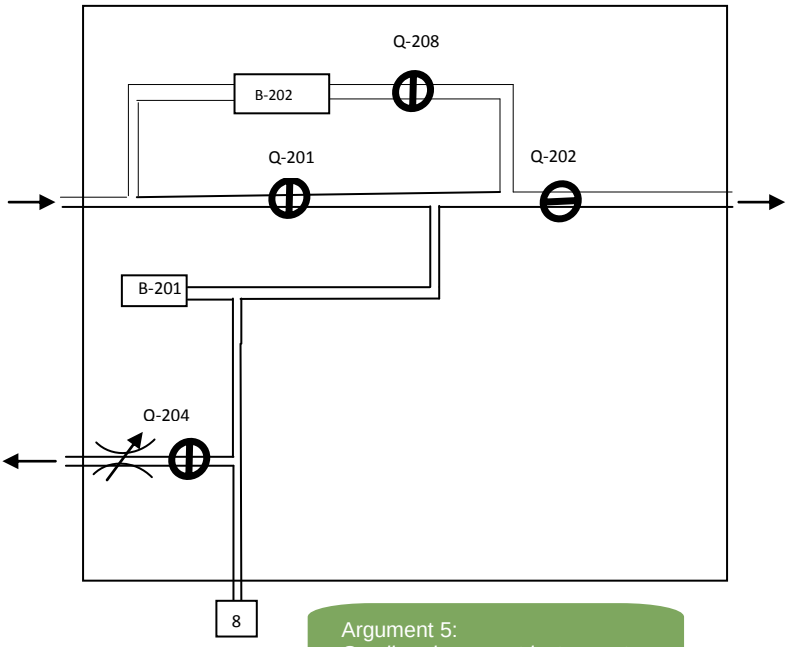
Function check (Q-204):
For checking that the equipment is correctly adjusted and that it registers the specified leak levels. The reference leak valve is adjusted using a Calibration instrument, recommended is Noleks CalibrateIT C9.

The reference leak valve can be controlled manually or automatically, e.g. once per day.

MEASURING METHODS IN PressurizeIT S9 Lite:

Facts about flow measurement
The instrument measures the amount of air that is added at a potential leakage in the tested object. This makes it possible to show the exact leak rate on the display continuously. It is used e.g. at volume variations between tested objects. Calibration is carried out by the build in reference leak that can be adjusted to the correct leak rate.

Measurement sequence with Flow meas.
Pressurization, Stabilization, Measurement & Evacuation



Argument 5:
Small and compact instrument

1. Pressurization
The evacuation valve Q-202 is closed, the pressure-zation valve Q-201 is opened. The test pressure is read with B-201, when the right test pressure is reached the flow valve Q-208 is opened, to speed up the stabilization the flow valve and the pressurization valve are both open.

2. Stabilization
If the test pressure falls more than 5% of the decided leak rate a signal for gross leak is given. During the stabilization one can read the flow signal continuously.

3. Measurement
One can now read the flow value from B-202. Also the flow signal against the leak rate. If the flow is higher than the leak rate a red signal is shown and the test is cancelled. If the flow is not higher than the leak rate a green signal is shown and the test object is evacuated.

4. Evacuation
Flow valve Q-208 is closed and the evacuation valve is opened.

Time Saving Functions

QuickStop

Reduced measuring time with the help of a new technique! Reduces the measuring time to approximately 1/4 of the original time using an advanced calculation of the leak development.

ZeroOffset

Compensate during external interference! This function can offer extremely short cycles without affecting the test value negatively.

Argument 6:
Strong brand, specialist in leak testing since 1973.

Argument 7:
User-friendly with a easy-to-use meny.

Argument 8:
100 test programs.

FACTORY OPTIONS:

The **Factory options** are important to order together with the instrument. Some options are possible to add afterwards but not all. The **Aftermarket accessories** are options that are possible to add at any time, before or after an order. When ordering the **Factory options** you just add the letter indicated to each option below after the instrument article number e.g. S9-T-…-ADG. The **Aftermarket accessories** options will follow later in the document.

Below is a description of the different options, answering three questions about each option: What is it? When is it required? And How to you use it? Please do not hesitate to ask if you need any further clarifications.

A. INLET REGULATOR WITH FILTER

For high pressure

Placed here →

For low/normal pressure

What is it?
The regulator determines that the instrument obtains a stable pressure. On the regulator a filter is placed to protect the instrument from unwanted pollution from the inlet air.

When is it required?
This option is always necessary on Flow instruments when there is no external regulator to control that the pressure is stable. This is also always necessary when you have a vacuum ejector. Finally this is also necessary when the pressure in the supplied air exceeds 7 bars.

How to use it?
This is mounted externally on port 1 on the backside of the instrument. The regulator must always be regulated to a minimum of 5 bar and always 1 bar over the final test pressure.

B. BUILT IN WHEEL-ADJUSTABLE CONTROL LEAK

What is it?
This is adjustable leak used for calibration of the instrument. It is easy to adjust with the wheel.

When is it required?
It is recommended when there is no other control leak. Without a control leak, it is not possible to set a leak rate with a differential pressure instrument. With this option it is possible to use the S9's Auto control function.

How to use it?
The external control leak must be adjusted with the calibration instrument CalibrateIT C9. A separate manual for the C9 is available.

C. AMS9-142 SCREW ADJUSTABLE CONTROL LEAK

What is it?
This adjustable control leak is similar to "Built in wheel-adjustable control leak", but can only be adjusted with a screwdriver.

When is it required?
Compared to "Built in wheel-adjustable control leak", this is used when there is a risk of that the control leak would be adjusted by mistake by moving the wheel. With this option it is also possible to use Auto control.

How to use it?
The external control leak must be adjusted with the calibration instrument C9. A separate manual is available.

FACTORY OPTIONS:

D. EXTERNAL EVACUATION PREPARATION

What is it?
A port (port 9) on the instrument is connected to the evacuation valve in order to be able to connect an external evacuation.

When is it required?
When one want to use external evacuation.

How to use it?
You control an external evacuation valve through port 9. Hence, this is a preparation for external evacuation explained further below.

E. KIT EXTERNAL EVACUATION VALVE INCL. FILTER

What is it?
This kit contains a valve with a filter to prevent pollution from getting inside the valve.

When is it required?
When test objects contain pollution this kit reduces wear and service cost of the instrument. . If you have small objects with a low leak rate, filters should not be used (min 2dl volume at 10mm3/s).

How to use it?
The kit is mounted on the back of the instrument which has to be prepared for external evacuation (see above). The external evacuation is ready to be used at delivery.

F. CHANGE OF FLOW RANGE

What is it?
The standard flow range 60ml/min (1000 mm^3/s) can be changed to the following flow ranges depending on instrument type: Low & Normal: 200 or 1000 ml/min (3333 or 16666 mm^3/s).

When is it required?
If you have a flow instrument and need a different flow range than the standard 60ml/min (0-1000 mm^3/s).

How to use it?
The new flow range is used without any change in settings or other requirements.

FACTORY OPTIONS:

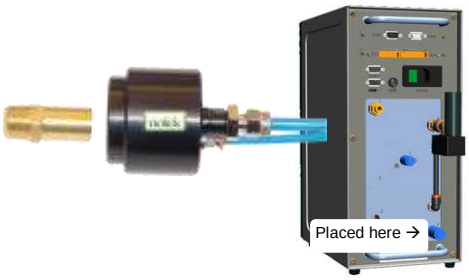
G. VACUUM EJECTOR

What is it?
This is a small vacuum pump directly mounted on the instrument with maximum vacuum of -93kPa. There is also an extra valve inside the instrument that controls air to port 5.

When is it required?
This is necessary with a vacuum inst, if you do not have an external vacuum pump. With bigger volumes or/and when higher pumping capacity is required, we recommend to purchase a vacuum pump from Nolek instead.

How to use it?
It is directly mounted on the backside of the instrument, port 5 is air outlet with a restrictor to control the vacuum in small volumes. Port 3 is the vacuum port. A prerequisite is to have the option vacuum measurement function. One cannot have both an external vacuum pump and a vacuum ejector.

H. QUICK CONNECTOR OUTLET PREPARATION



What is it?
There is an extra valve in the instrument connected to port 7 that adds the possibility to control a connected quick connector. You also have the possibility to control other functions on a fixture.

When is it required?
If the instrument has a quick connector connected that should be activated by the instrument.

How to use it?
When this is prepared you just have to connect a quick connector to port 7 on the backside of the instrument.

I. CALIBRATION PROTOCOL.

What is it?
The instrument is calibrated to assure measurement accuracy. A protocol is also produced and sent to customer together with the calibrated instrument.

When is it required?
When one want to assure measurement accuracy and have a written document for traceability reasons.

How to use it?
The protocol is shipped together with the instrument.

AFTERMARKET ACCESSORIES:

The **Aftermarket accessories** can both be ordered at the time of instrument order, but can also be ordered after a purchase has been made.

Below is a description of the different options, answering three questions about each option: What is it? When it is it required? and How to use it? Please do not hesitate to ask if you need any further clarifications.

1. TEST PORT FILTER

What is it?
This is a filter to protect the instrument from pollution coming from the test object. The filter house has a length of 45mm and a diameter of 70 mm. The filter insert has specification 77 my.

When is it required?
When test objects are dirty or if there is a risk they may be dirty, this filter maintains the performance of the instrument. Note that Nolek's S9 warranty does not cover faults caused by dirt if filter is not used.

How to use it?
The filter is directly connected to port 8 and independent from airflow direction. This filter will decrease the sensitivity because it increases the volume. If you have small objects with a low leak rate, filters should not be used(min 2dl volume at 10mm3/s).

2. FILTER INSERT

What is it?
This is the filter that is inserted in the test port filter. Come in five-packs.

When is it required?
The test port filter has to be replaced when it becomes too full. Change intervals depend on application and use.

How to use it?
The Test port filter is easily disassembled without removing the hoses and connections. Then it is just to change the filter.

3. DATA COLLECTION SOFTWARE

What is it?
This software enables the user to store test data, export it to Microsoft Access and/or Excel, where they can view it, print it or save it.

When is it required?
When the user wants to store data.

How to use it?
See separate manual. Only available in English.

4. TESTIT DATA COLLECTION SOFTWARE

What is it?
This software enables the user to store test data, export it to Microsoft Access and/or Excel where they can view it, print it or save it. The software is required when using a barcode reader, otherwise option above is recom.

When is it required?
When the user wants to store data and use a barcode reader.

How to use it?
See separate manual. Only available in English.

AFTERMARKET ACCESSORIES:

5. REMOTE CONTROL BOX, WITH START AND RESET

What is it?
This is an external remote control box for start and reset.

When is it required?
When user wants to start and reset the instrument externally, perhaps at a more ergonomic placement for the user. The box can be placed up to two meters from the instrument.

How to use it?
Connect the control box with the included cable to port x (see pic left). It is then ready to be used.

6. EXTERNAL CONTROL LEAK

What is it?
This is a control leak that is connected to the front of the instrument.

When is it required?
It is necessary to add an external reference leak when there is no built-in control leak. It is recommended to have in all cases when one does not have any other reference leak, to be sure that one measure correctly. It is possible to use one control leak for several instruments. With this option it is not possible to use Auto control (as with internal control leaks).

How to use it?
It is mounted directly on the front connector of the instrument. Then it is adjusted to a correct leak rate by connecting it to a C9 calibration unit. Separate manual is available.

7. INLET REGULATOR WITH FILTER

What is it?
The regulator determines that the instrument obtains a stable pressure. On the regulator a filter is placed to protect the instrument from unwanted pollution from the inlet air.

When is it required?
This is always necessary on Flow instruments when there is no external regulator to control that the pressure is stable. This is also always necessary when you have a vacuum ejector. Finally this is also necessary when the pressure in the supplied air exceeds 7 bars.

How to use it?
This is mounted externally on port 1 on the backside of the instrument. The regulator must always be regulated to a minimum of 5 bar and always 1 (one) bar over the final test pressure.

AFTERMARKET ACCESSORIES:

8. EXTRA CONTROL LEAK W/ MANUAL VALVE.

What is it?
This is an extra control leak with a manual valve. Standard is one extra control leak but up to 100 can be added upon request.

When is it required?
Used when there are two or more different leak limits. The different leak rates can be controlled without adjusting one control leak every time.

How to use it?
It is connected to the measurement port or the test object and controlled by a manual valve.

9. EXTRA CONTROL LEAK W/ ELECTRONIC VALVE

What is it?
This is an extra control leak controlled with electronic valve controlled by a separate PLC. Standard is one extra control leak but several can be added upon request.

When is it required?
Used when there are two or more different leak limits. The different leak rates can be controlled without adjusting one control leak every time.
A PLC is required for this to work.

How to use it?
It is connected to the measurement port or the test object; it is controlled by the PLC.

10. START-UP KIT WITH TUBES AND CONNECTIONS

What is it?
This kit includes: a 2m long 8mm tube made especially for leak testing and two connections with ¼ inch thread (BSP).

When is it required?
Recommended when one want to connect instrument to a test object.

How to use it?
First mount the connection on the hose (or mount them later). Then connect one connection to port 8 and the other to the test object.

12. INSTRUMENT TRAINING

What is it?
Training on the practical way of using the instrument.

When is it required?
Recommended to all first time users or as a refreshment.

How to use it?
Nolek offers a standard training course at the customer's location or at our facilities.

AFTERMARKET ACCESSORIES:

13. INSTALLATION

What is it?
Installation of the instrument and a possible fixture.

When is it required?
To all users who are not qualified to do this installation themselves.

How to use it?
A Nolek service technician will come half a day and install the instrument and fixture and show the basics on how it is used. This is not as extensive as the Instrument Training.

14. C9 – CALIBRATION UNIT

What is it?
Nolek C9 Calibration instrument.

When is it required?
For certainty that measurements are accurate. When you want to assure that you are measuring accurate. This is a prerequisite to have with a differential pressure instrument in order to calibrate it.

How to use it?
Separate manual available.

15. KIT EXTERNAL EVACUATION VALVE INCL. FILTER

What is it?
This kit contains a valve with a filter to reduce pollution going inside the instrument.

When is it required?
When test objects contain pollution this kit reduces wear and service cost of the instrument.

How to use it?
The kit is mounted on the back of the instrument which has to be prepared for external evacuation. The external evacuation is ready to be used at delivery.

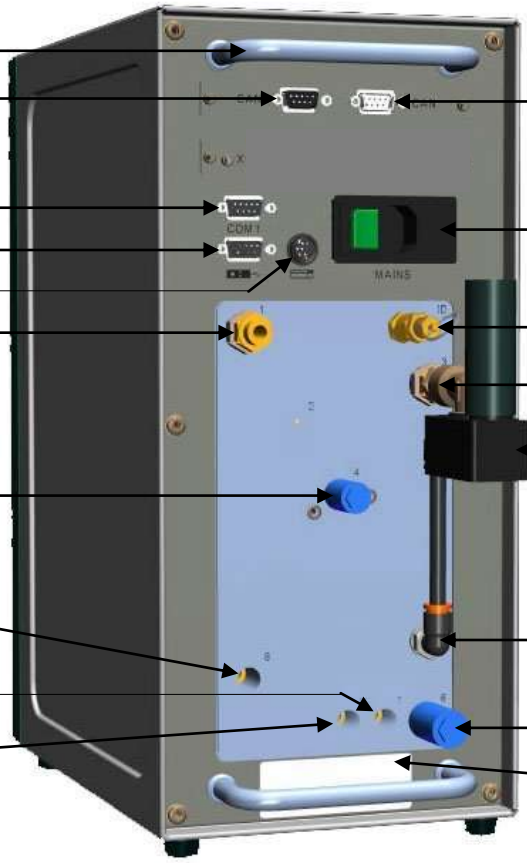
16. CONNECTIT-QUICK CONNECTORS

What is it?
Nolek has developed tool solutions to rationalize temporary seals since 1973. We have a very large selection of quick connectors and fittings. Activation can be carried out manually or pneumatically. These products are gathered under the product group: ConnectIT.

When is it required?
When temporary sealing of test objects are necessary.

How to use it?
Activation can be carried out manually or pneumatically. See separate product information on www.nolek.com

CONNECTIONS & CONTACT:



Argument 9:
Short delivery times!

Dimensions and Data

Network connection:
100-240 VAC / 0.9 A 50-60 Hz
Weight: Approx. 16 kg
Size: 188mm x 400mm x deep 315mm
Sealing grade: IP32
Color: Silver gray (RAL 6021) with a dark green front panel.
Designed for industrial use
CE - marked

Standard editions

3 Standard editions:
Diff/Vacuum: -1 to 0 bar
Diff/Overpressure: 0.2 to 5 bar
Flow/Overpressure: 0.2 to 5 bar (0-1000 mm3/s)

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APPLICATION EXAMPLES:

S9 Lite can be used for a great variety of leak tests in most application areas. These are some examples of different application areas and products that the S9 can be used for/in:

Automotive: Engine block, clutch, transmission/gear box, transmission/gear box houses, intake manifold, intake manifold gas channels, exhaust pipe, exhaust valve, clutch plate, cylinder head, retarder house, crank pit, valve body, valve housing cover, common rail systems, all types of bearing houses, retarder bearing house, cylinder blocks, fuel channel, fuel pipes, fuel tanks, radiator, brake cylinder, caliper, fuel systems, steering servo, size control, bedplate, pressure tank, tank coupling, water pump, clutch cover, pressure cap, air pipe, filler cap.

Packaging: test for closure and seal integrity of packages for example: sterile products, ink cartridges and perishables that can be negatively affected by oxygen and/or moisture.

Medicine and Pharmaceuticals: Blister packages, medicine bottles, medicine cans, sachets, and plasma bags etc

Air Condition: Test several components, including: different types of valves, including: control valves, adjustment valves, ball valves, vacuum valves, hydraulic valves, temperature regulator valves, and tools, bellows, thermostats, different types of filters, and different types of piping.

Electronics: Test for example: different types of electronic parts and devices, different types of batteries, different types of casings, cellular phones, casings for cellular phones, cellular phone antennas, alarm buttons, different types of lights, amplifiers, phones, optical sensors, com radios, ink containers, electric heaters, shavers, and weapon sights etc.

Hydraulic and Pneumatic: Test for example: different types of hydraulic and pneumatic components, valves, hydraulic motors, cylinders, all types of tubing, pipes and couplings, different types of water mixers, outboard drives, compressors, pressure tanks, bottle gas tanks, WC flushing mechanisms, and different types of jacks.

Casting: Test for example: different types of housing and covers, oil sumps, gear box houses, bearing box covers, clutch housing, range housing, engine blocks, coolers etc.

Argument 10:
Infinite backup

Argument 11:
Free user language

Argument 12:
1 year complete guarantee on the product

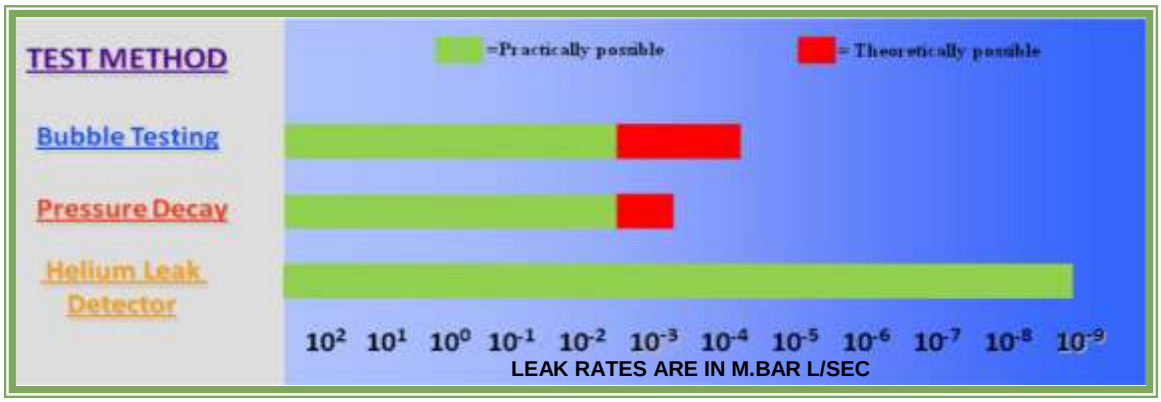
Argument 13:
Return on Investment is very high.

ENCLOSURE 1: COMPARISON B/W AIR & WATER TEST

INTRODUCTION

One of the first questions that usually arise when talking to customers with little or no previous experience of "professional leak testing" is why they should invest in a more expensive system when their cost effective bubble test is doing the work. The reasons are many and this document aims to give these persons an overview of the arguments for choosing "professional leak testing", meaning pressure decay, instead of bubble testing. First we will show some **general** remarks and the **pros** and **cons** about the different methods and then add some **concluding** remarks including common misconceptions. Below is a table that shows the approximate leak detection rates with the different methods. Difference with practically being able to detect leaks and theoretically is described further below. This directly shows one common misconception; Air does not find smaller leaks than water, it is actually the opposite, but using water test is not a leak test, it is a way to locate leaks which is further described in the following pages. Helium leak detection is the most "sensitive" leak testing method; Nolek is also a specialist with Helium.

APPROXIMATE LEAK DETECTION RATES



General, Pros and Cons about "Bubble test" – Test using water

General

- The bubble method is an inside out method, where the part is first pressurized
- The part is then submerged down in water
- Soap solution can be added on the part for easier identification of bubbles
- This is only a leak search not a leak test

Pros

- Positive identification of the leak location(s)
- Cheap system

Cons

- Objects with smaller leaks than the leak rate are identified as "leaking = no good" and thrown away when it is not actually necessary.
- Objects with large leaks are missed and approved.
- Products are put in water, hence they become wet, it takes long time to dry.
- Total leak measurement is NOT possible
- Very operator dependent, impossible to focus and see all leaks when observing 8 hours a day.
- When lowering the object air is brought down, which makes it difficult to see if it is leaking or if it just the air that came with the lowering movement that show bubbles.
- No exact time specifications, some only dip the product in the water up and down, then a lot of leaks are missed as it takes time before some leaks to appear as bubbles.
- Water has a sealing effect on the object if not handled correctly.
- Sensitivity depends on fluid surface tension and on operator
- If water is not changed it could cause severe health issues on the operator
- Lowering objects in water can cause rust on objects
- If anti-rust agent is used it is not possible to paint the object directly after. The object must first be put in a washing machine and then it has to be dried before the paint can be put on.

ENCLOSURE 1: COMPARISON B/W AIR & WATER TEST

Pros and Cons about Pressure decay – Test using air

General

- A part is put under pressure/vacuum condition
- A pressure variation is observed over time
- The detected pressure variation is directly proportional to the leak rate
- This is a leak test not a leak location/identifying test

Pros

- Total leak measurement is possible
- Able to measure to a specified leak rate
- Able to conduct a real leak test hence a quality control
- Product is only tested with air, hence products stay dry
- Less products are thrown away, only the ones that have a larger leak than the specified leak rate will be identified as leaking.
- Tests are not operator dependent, rather instrument dependent.

Cons

- This system cost more than a bubble test
- The test cycle can be longer
- Not possible to find exact location of leak, hence a good combination is recommended

CONCLUSION

It is impossible to secure the level of quality with the water method. It is not a quality control it only works as a leak search and does not replace leak testing with air. That is not to say that the two methods cannot be combined:

- Use pressure decay to conduct a leak test and certify the quality of the product
- Use water to identify where the leak is located on the product

One does not actually measure more precise with air, one rather measure to the defined leak rate. With the water method it is not possible to define the rate at which it leaks and the most common mistake is that the operator believes that the product is leaking while in fact it is well above the rate at which it is classified to have a leak according to product specifications.

Products that are leaking when tested with pressure decay instruments sometimes are leaking when tested in water. The most common fault is that the product is not pressurized before it is lowered in the water and then all leaks will not be identified, especially smaller leaks. Hence, the issue of high dependence of operator arises, the operator has to conduct the test correctly at the same time as he has to be fully focused not to miss bubbles arising. Furthermore, he has to decide how many bubbles that decide if a product is leaking or not, a task which is as impossible as it sounds.

The leak rate; 10^{-4} mbar.l/sec is theoretically the lowest level where air bubbles are produced in water, below that level the air dissolves in the water without becoming bubbles. A lot of companies with leak rates under this level test products in water but will never see if the product is leaking at the specified level. For example some test gas pipes for air condition applications in water. These products often have a leak rate in the area of 10^{-6} mbar.l/sec which means that one is 2-3 decimals from being able to see if the product is leaking or not at the specified level.

The conclusion is that one need pressure decay to do a complete quality control on products. The initial investment might be higher but we help companies to leak test their products, leading to a:

- **Saving in cost,** being able to deliver to your customers PPM requirements.
- Increased **quality** of delivered products when leak testing in the correct way.
- Improved **environment** through less leakage and through less transports.
- Substantial **time reduction** compared to other leak test methods.
- Great **selling argument** when selling your product; the product is leak tested…