LEAK DETECTION SOLUTIONS FOR POWER GENERATION AND CHEMICAL PLANTS

POWERGeneration
LEAK TESTING by Agilent

Agilent Technologies

Power Generation

Air leaks in power plant condensers, even small ones, can cause a significant loss of efficiency easily resulting in power losses in excess of one megawatt per turbine. The most widely accepted method to identify air in-leakage is the use of helium as a tracer gas and a mass spectrometer to detect the helium. Finding these leaks is a challenge due to the fact that sampling environment is primarily water vapor (steam) and may contain compounds that will destroy the detector.

To address the challenges of leak testing in these conditions Agilent has developed a specialized sampling probe and leak detector tailored to these requirements. The Agilent Harsh Environment Probe is designed to withstand the water vapor and high temperatures inside condenser piping without dryers, chillers, a secondary vacuum pump, or throttling valves. The probe can be positioned in the exhaust of a liquid ring pump on the condenser system, or flange-mounted directly into the piping of the system under test.

On the following pages you will find a detailed explanation of how this system works along with datasheets on the products and services Agilent provides to deliver a total solution.

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Leak Testing Steam Turbine Condensers

Introduction

Power generation turbines, regardless of the type of fuel used, are driven by steam generated in a boiler. The boiler heats water and converts it to steam, spinning the turbine and in turn, driving the generator that produces electrical power. After exiting the turbine, the steam is routed through a condenser, cooling the steam back to water, which is then returned to the boiler to start the cycle again.

The efficiency of this process is dictated by the pressure gradient across the turbine and condensing system. Leaks in the system degrade the pressure differential and can easily result in power loss in excess of one megawatt per turbine.

However finding leaks in power plant circuits presents a challenging set of problems. Agilent Technologies, Vacuum Products Division, (formerly Varian Vacuum Technologies) has developed a leak test solution specifically designed for the demanding conditions found in power generation condensers.

Steam Turbine Operation

The high pressure region of a turbine is working at pressures as high as 165 bar, while the low pressure region operates at a pressure of 0.03 to 0.07 bar. Turbine back pressure is a key parameter in steam to power efficiency. The typical design back pressure for a system is around 0.08 bar. If this vacuum level deteriorates, due to air in-leakage, leaky valves, or cooling tower problems, the efficiency of the entire system can decline rapidly.

If even small amounts of non-condensable gas (air) are allowed to accumulate, they will inhibit heat transfer in the condenser and adversely affect performance. Large amounts can virtually block the condensation process, which of course will cause a substantial rise in back pressure. To prevent excessive accumulation, most power plants use steam jet air ejectors and/or liquid ring vacuum pumps to remove the non-condensable gases. When these methods cannot keep pace with the rate of air in-leakage then the leaks must be found and repaired.

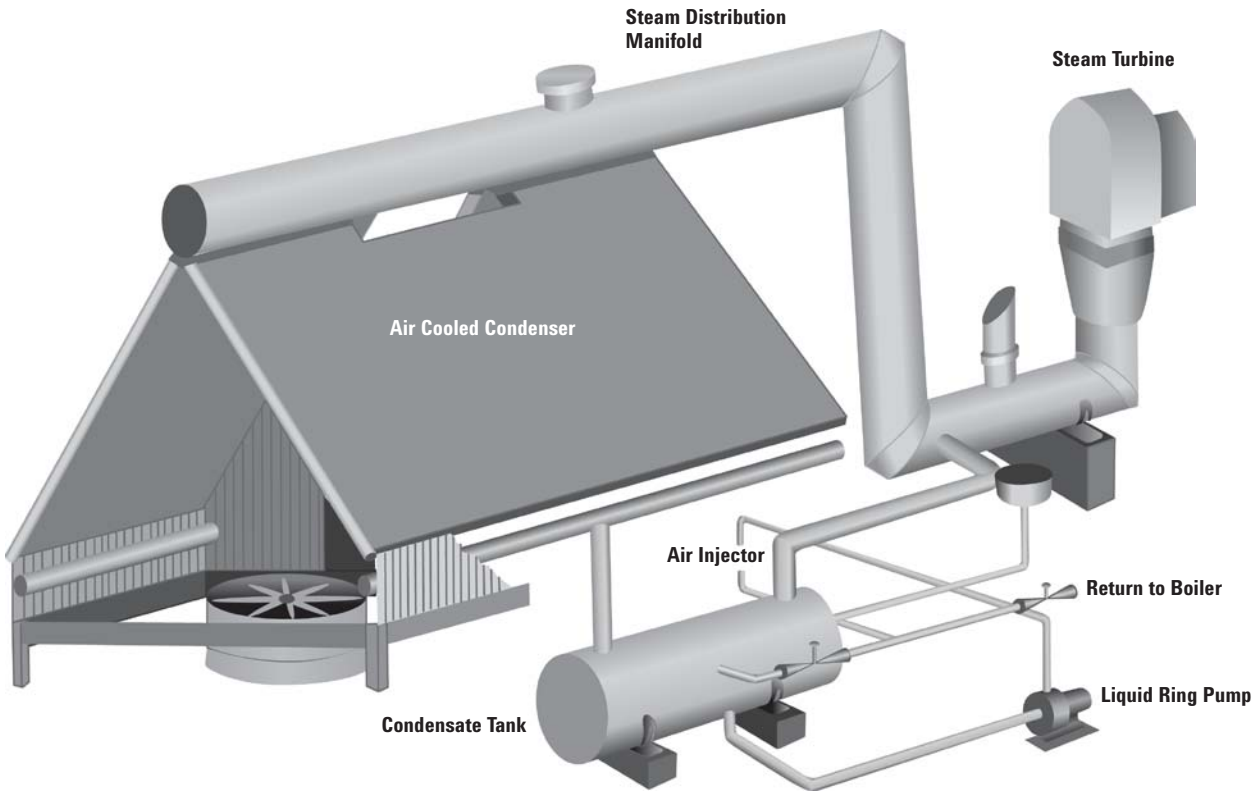


Figure 1: Typical Air Cooled Condenser

The most widely accepted method to identify air in-leakage is the use of helium as a tracer gas and a mass spectrometer to detect helium. Various other methods have been used with limited success including ultrasonic leak detectors. However, the latter do not work effectively in a noisy plant environment and have limited sensitivity.

Condenser Leak Testing Using Helium

A helium leak detector is comprised of a high vacuum pump and backing pump, which provides the correct vacuum conditions for a small mass spectrometer. In a mass spectrometer, gasses are ionized and accelerated through a magnetic field which isolates gas molecules by mass. This separation allows extremely small concentrations of helium to be detected, thus making it ideal for condenser leak testing. Helium is sprayed around the vacuum portions of the condenser (Figure 1), while a mass spectrometer detects low concentrations of the gas at the outlet of the extractor or at other sites within the vacuum region of the condenser.

In general, helium tracer gas testing works very well because leaks can be sealed as soon as identified, and subsequent testing can be performed immediately to confirm that the leaks are sealed. The use of helium is advantageous as the gas is non-toxic, non-flammable non-reactive with other chemicals and very quickly diffuses though small leaks. The helium method allows a maintenance engineer the flexibility to perform leak tests while the plant is operating, without the need to isolate the section under test.

Difficulties in Condenser Leak Testing

While from a detection standpoint finding the leak is very easy, the potential to damage the mass spectrometer is great. This is due to the environmental conditions inside the condenser. The gas being sampled is very hot, is almost entirely water vapor, and can be corrosive. Any of these conditions can potentially damage the leak detector, yet the gas must be sampled in order to find the leak.

The helium leak detector normally operates at vacuum levels lower than the condenser, so a special test probe (commonly called a sniffer probe) is used that permits detection at atmospheric level, which could be at the exhaust of the pumping system used to create the vacuum conditions in the condenser. However, use of a conventional sniffer probe would be a serious problem, since water vapor in the exhaust would be pumped directly into the leak detector resulting in breakdown of the pump lubricating oil and other damage to the unit. The sniffer probe performance would be quickly degraded by water vapor condensing and blocking the orifice and probe line.

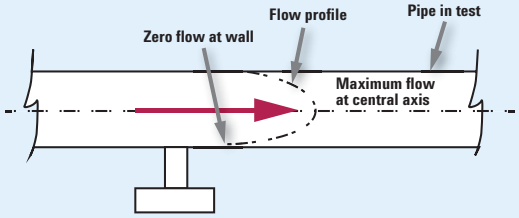
If a water/steam ejector pump is used for the condenser evacuation, connection to a conventional sniffer probe is not possible. In this case, an auxiliary vacuum pump is commonly used just before the ejector pump with the sniffer probe inserted into the exhaust of this auxiliary pump. This arrangement has the same shortcomings because the sample is still mostly water vapor. However, the steam can be conditioned with the use of a desiccant cartridge or a cold trap, thereby condensing water vapor that would otherwise enter the auxiliary pump and the leak detector. This solution adds significant cost and complexity to the leak test process.

In some cases, a permeable membrane has been used in the tube connecting the leak detector to the condenser piping. While this can keep water vapor out of the leak detector, it also severely limits the leak test sensitivity and makes the leak test process questionable. This is because the vacuum pressure in the condenser piping, at 0.08 bar, is sufficiently high to insure laminar viscous flow conditions. This means even though there is slight vacuum, there is also a very high density of gas molecules in the pipe and the mean free path for helium is only about 2 millimeters (0.08 inches). Any given helium molecule can only move laterally 2 mm before it collides with other gas molecules. Helium flowing within the gas stream in the pipe being tested is therefore swept along in the flow and cannot migrate laterally to an outlet in the side of the pipe where the leak detector is connected.

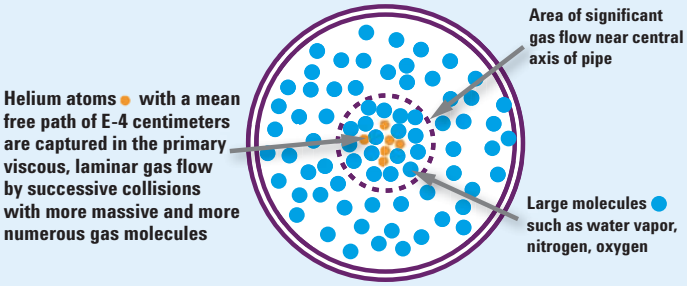
In simple terms, even though a leak is present, and even with helium flowing down the pipe, the helium frequently will not reach the test connection, and the leak detector will not recognize the leak. This condition is portrayed in the series of graphics in Figure 2, next page. These pictures will show: A. The behavior of the flow through a pipe, B. The concentration of helium within the flow, C. Sampling with a membrane mounted on the side wall of the pipe, and D. Using an insertable membrane probe to sample in the center of the pipe.

Another aspect to consider is the logistics of leak testing in a large, multi-story power plant where the leaks are usually a long distance from the mass spectrometer. Since most helium leak detectors are not equipped with remote readout and control capability, leak detection is typically a 2- or 3-person operation where contact between one operator spraying helium and another observing the leak detector display is conducted literally by shouting or by two-way radio.

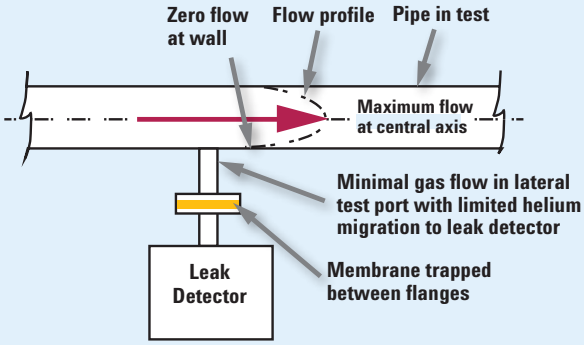
A – the behavior of the flow through a pipe



B – the concentration of helium within the flow



C – sampling with a membrane mounted on the side wall of the pipe



D – using an insertable membrane probe to sample in the center of the pipe

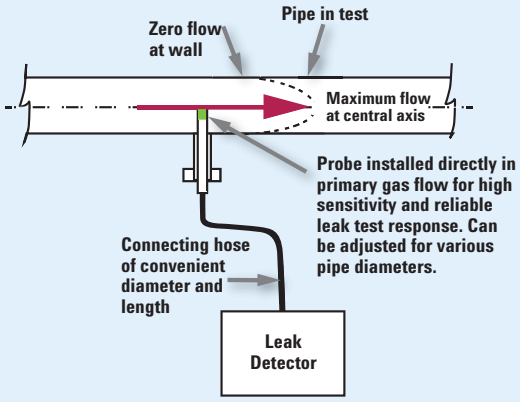


Figure 2: Gas flow characteristics and the effect on sampling

Summary

Successful leak testing of power plant systems requires overcoming three significant problems:

1. Heated water vapor in the piping to be tested
2. Detection of tracer gas helium in viscous laminar flow conditions
3. Communication with the leak detector over long distances within the power plant

The Agilent Solution

To address the challenges of leak testing in the harsh environments of the power generation industry, Agilent has developed a specialized sampling probe and leak detector configuration tailored to these requirements. The Agilent VS Harsh Environment (HE) Probe (Figure 3) is designed to withstand the wet environment and high temperatures inside condenser piping without dryers, chillers, a secondary vacuum pump, or throttling valves. The probe can be: positioned in the exhaust of a pump on the condenser system, or flange-mounted directly into the piping of the system under test (as shown to the right).

The probe is connected to the flange via an adjustable compression fitting so the probe tip can be positioned in the center of the pipe. This guarantees the probe tip is in the maximum helium flow for the best sensitivity.

Equipment damage or failure due to corrosion or water in the leak detector or roughing pump is eliminated. The Agilent HE Probe will withstand water, amines (corrosive ammonia derivatives), and operate at temperatures up to 95 °C (200 °F). The probe connects directly to a VS leak detector with no additional water trapping or auxiliary pumping required.

The probe consists of a corrosion resistant 316L stainless steel tube with a composite permeable membrane at its tip. The membrane readily permeates helium tracer gas while protecting the leak detector from water vapor that would destroy the pumps, valves, and spectrometer.

Also, the Agilent VS Helium Leak Detector has an optional wireless remote control that permits an operator to work up to 100 meters from the leak detector. (Transmission distance may be affected by building walls and floors). The wireless remote gives a single operator the freedom to perform all leak test operations (Figure 4).

Finally, it may be desirable to collect data from the test for analysis, recordkeeping and/or certification purposes. When helium is sprayed on a leak location at the condenser, it takes time for the helium to be detected and displayed by a leak detector. That time could be a few seconds to a few minutes depending on the helium concentration, the condenser and tube volume and the distance from the leak. The leak response of the VS leak detector can be viewed and recorded graphically using Agilent's "Leak Test Data Wizard" software. The PC-based program enables extensive VS control, display, and data acquisition capabilities.

Figure 3: Agilent Harsh Environment Probe and VS Helium Leak Detector

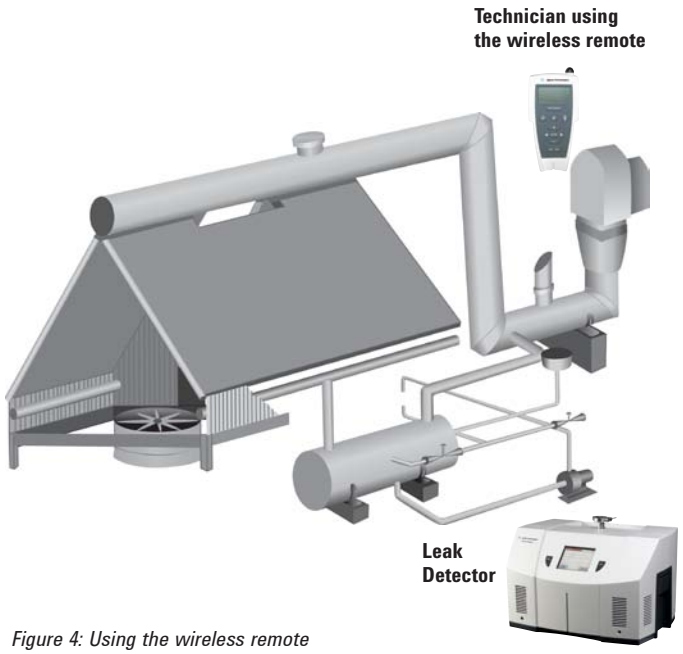


Figure 4: Using the wireless remote

Savings Analysis

It is well within reason to assume that leaks are causing an increase in condenser vacuum of 0.016 bar (0.5" HgA). If this is the case, here are the potential savings:

Each plant has different operating characteristics, but calculating the answer is simply a matter of gathering some data and multiplying*.

1. In your "Turbine Data File" there should be a graph or table that shows Turbine Efficiency Improvement as a function of turbine back pressure [condenser absolute pressure]. For this example the improvement is assumed to be 0.3%, from 0.08 bar to 0.07 bar (2.5" HgA to 2.0" HgA).
2. Determine the Turbine Heat Rate, which is the BTU input to the turbine required to produce a kilowatt of electricity. A typical value is about 8500 Btu/kW.
3. Determine the cost of fuel. A recent spot price for natural gas was $3.00 per million BTUs.

Use the following calculation: **[0.003] [8500 Btu/kW-hr] [$3.00/$10^6$ Btu] = 7.65 x 10^{-5} $/kW**
This appears to be insignificant until we factor in the amount of power produced over an entire year. If the plant is rated at 500 megawatts (500,000 kW) and it operates 8000 hours per year:

[7.65 x 10^{-5} $/kW] [5.0 x 10^5 kW] [8 x 10^3 hr] = $306,000 per year

Detecting and stopping leaks with the VS Leak Detector and HE Probe delivers an outstanding return on your investment and potentially pays for itself on the first use. For more information contact Agilent Technologies Vacuum Products Division at 800.882.7426, or www.agilent.com/chem/leakdetection.

** All of this depends on the conditions at your particular plant. Use the above formula to calculate your own potential savings. Calculation courtesy of Dekker Vacuum Technologies, Inc.*

HE Probe Technical Specifications

Operating temperature range	+10 °C (+50 °F) to +95 °C (+200 °F)
Storage temperature range	-18 °C (0 °F) to +65 °C (+150 °F)
Operating vacuum pressure	Atmospheric pressure to low vacuum 1µ Hg, <1e-03 mbar/Torr, 1e-01 Pa
Maximum internal overpressure	1 bar, (14.7 PSI), (105 Pa)
Probe length	450 mm (17.7") Hose high density polyethylene, 5 meters (16.4') long
Weight of probe assembly	0.5 kilogram (1 pound)
Hose fitting size	½" (12.7 mm) Swagelok compression or equivalent
Vacuum flanges	ISO KF25
Adapter flange o-ring	Butyl rubber, Parker B2-016 or equivalent
Chemical resistance	Probe resists virtually all chemicals except complex halogenated compounds

Agilent VS Series Leak Detectors

Features and Benefits

Easy-to-Use – Two Button Operation

VS Series Leak Detectors combine the simplicity of two-button operation with advanced expert system intelligence.

- Fully automated start-up and calibration maximizes productivity
- Intuitive menu structure is easy to navigate
- Programmable test sequences improves testing efficiency
- Color touch screen provides excellent clarity, even at wide angles

Powerful – Broad Range of Test Methods

The state-of-the-art spectrometer and vacuum system design provides powerful capability, enabling a broad range of test methods for specific applications.

- High test port pressure allows for detection of large leaks
- 5 x 10^{-12} MDL (sensitivity) meets the most stringent leak test requirements
- High helium pumping speed ensures fast system response and clean-up times
- New high efficiency ion source and beam optics optimize sensitivity and mass separation

Versatile – Multiple System Configurations

A wide range of options allows for broad configuration flexibility, meeting all application requirements and test environments.

- Primary pump and system mounting options may be selected to best suit your needs
- Multiple language and units capability permits easy implementation worldwide
- Compact lightweight design enables easy transport from one application to another

Dependable – Robust Design

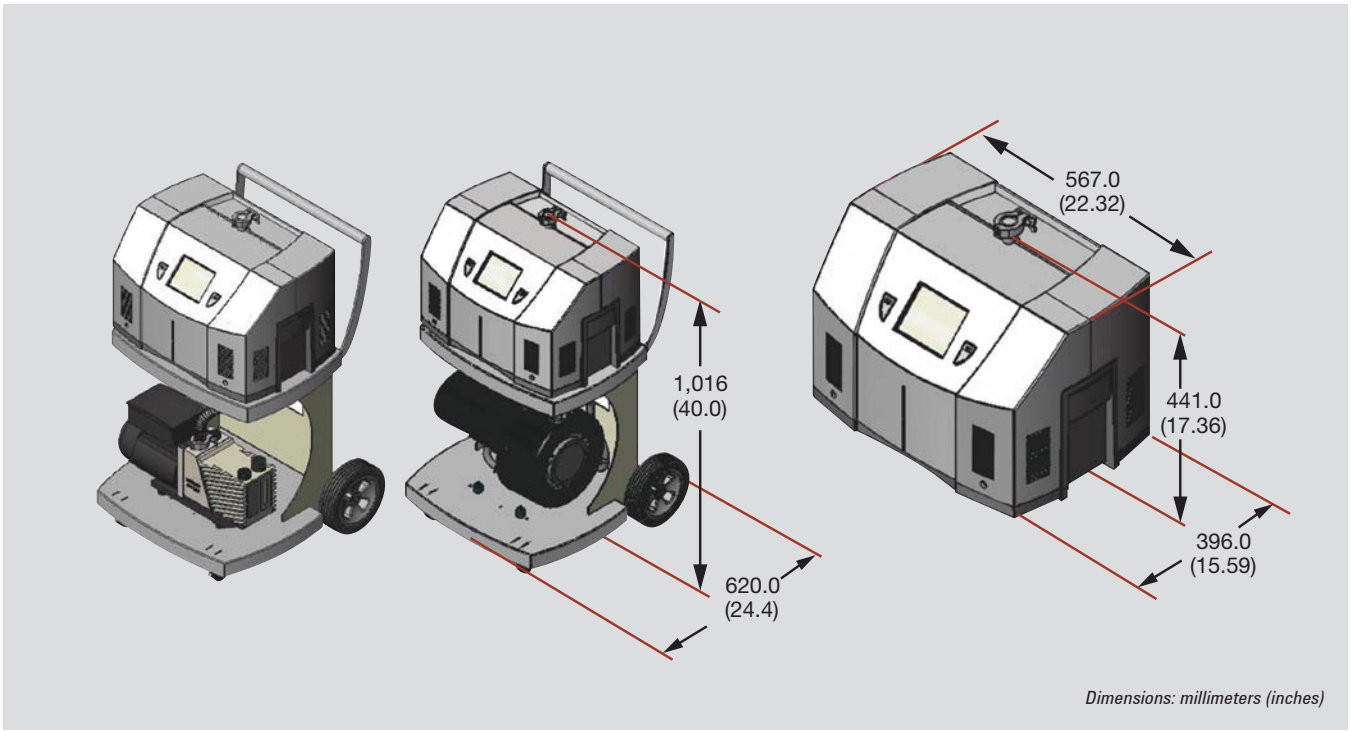
Robust design innovations allow the VS series to conform to the most rigorous industrial standards and operate dependably in the most challenging environments.

- Fast clean-up time enhances system up-time
- Robust Faraday cup technology delivers proven reliability with low cost of ownership
- Conforms to CE, UL and CSA standards, assuring global acceptance

Truly Portable – Wireless Remote Control/Display

Hand-held remote performs essential functions up to 100 meters (328 feet) indoors, facilitating access to all leak sites.

- Eliminates cumbersome cables while extending range
- Allows testing of large systems by a single operator
- Leak detector can be located outside cleanroom to prevent contamination
- Multiple channels for use of one remote with up to ten leak detectors



Dimensions: millimeters (inches)

Technical Specifications

Model Number		**PR02 & PD03**	**MR15 & MD30**
Configuration options		Portable	Mobile
Primary pump type	Rotary vane pump	DS-42 2 m^3/hr (34 l/m)	DS-302 14 m^3/hr (232 l/m)
	Dry scroll pump	Dry pump combo 3 m^3/hr (50 l/m)	TS-620 30 m^3/hr (500 l/m)
Minimum detectable leak at 1000 ppm ambient helium		5 x 10^{-12} atm cc/sec: 5 x 10^{-12} mbar l/s: 5 x 10^{-13} Pa m^3/sec helium	
Maximum test port pressure		13 mbar, 10 Torr, 1330 Pa	
Helium pumping speed @ test port (fine test)		1.8 l/s	
Calibration routine		Automated or manual (internal or external)	
Background suppression		Push button initiated auto zero, and auto zero<zero function	
User interface		High clarity, color display, TFT touch screen	
Selectable languages		English, French, German, Japanese, Korean, Mandarin, Russian, Spanish	
Automated cycling		Programmable rough time, test time, reject set points	
Response time		< 0.5 seconds	
Set points		Standard, 5 set points, N/O or N/C; 3 leak rate, 1 pressure, 1 audio	
Communications interface		RS232 and analog (standard), Discrete IO (optional)	
Conformance standards		UL/CSA, CE	

Ordering Information

VS Models

Description	Ordering Instructions
VS PR02 Portable Leak Detector, 2 m^3/hr rotary vane pump	Choose Product Number G8600A
VS PD03 Portable Leak Detector, 3 m^3/hr dry scroll pump combo	Choose Product Number G8600B
VS MR15 Mobile Leak Detector, 15 m^3/hr rotary vane pump	Choose Product Number G8601A
VS MD30 Mobile Leak Detector, 30 m^3/hr dry scroll pump	Choose Product Number G8601B
VS BR15 Bench Mount Leak Detector, 15 m^3/hr rotary vane pump	Choose Product Number G8602A
VS BD30 Bench Mount Leak Detector, 30 m^3/hr dry scroll pump	Choose Product Number G8602B

Additional Options *(Add Option Number to Product Number as desired)*

Description	Ordering Instructions	Benefit
Oil Mist Eliminator for DS42 RVP	Add Option #100	Reduces oil vapor in pump exhaust.
Discrete IO Interface	Add Option #101*	Allows control and monitoring via PC or PLC. 12 outputs allow recording of key test data and 8 inputs permit total control of the instrument.
Wireless remote, base unit	Add Option #102	Allows communication with wireless hand-held remote control, ordered separately (p/n G8600-60002).
Nitrogen vent	Add Option #103	Allows the VS leak detector to be vented with nitrogen or other gas of the users preference. Maximum supply pressure 2 PSI (0.14 bar). Requires user supplied overpressure protection.
1 ⅛ inch compression testport	Add Option #104	For customers who prefer the old-style 1 ⅛ in. compression fitting on the leak detector inlet.
Test fixture cable	Add Option #105*	For customers who wish to add a test fixture and test initiation switch. Requires Discrete IO Interface. Order Option #101.
Harsh Environment (HE) Probe	Add Option #106	Designed to withstand the wet environment and high temperatures inside condenser piping without the need for dryers, chillers, a secondary vacuum pump, or throttling valves.

* *Option #101 is required when Option #105 is ordered. Example: G860xx#101#105.*

Accessories *(Ordered Separately)*

Description	**Part Number**	**Benefit**
Power probe, NW25	K9565306	Rugged sniffer probe for testing of sealed containers pressurized with helium; adjusts for varying sensitivity and response time.
Helium spray probe	K0167301	Allows spraying of helium to find the exact location of a leak. Includes three nozzle types for different application requirements.
Wireless remote (hand held unit)	G8600-60002	Brings all major functions of the leak detector to the user's fingertips, enabling a truly portable solution at up to 100 meters.
External calibrated leaks	F8473xxx	Leak traceable to NIST standards for precise calibration of your instrument.
Tuning leaks	K1608301 R1947301	Ten segment calibrated needle valve to aid gross leak testing.
Universal test fixture (Flapper box)	L6241xxx	This accessory makes testing of small parts very fast and almost totally automatic.
Leak Test Data Wizard	VSLTDW	Comprehensive, user-friendly data management software enables automation of basic leak test processes, tracks data history, and provides graphical display of leak test data.

Agilent Harsh Environment Probe for Helium Leak Detection

Power generation facilities, chemical plants and similar facilities require a leak detector to sample gas that is primarily water vapor (steam) and/or contains chemicals that would damage the detector. To prevent this damage from happening, Agilent has developed a specialized probe and leak detector configuration tailored to the demanding requirements of these applications.

The VS Harsh Environment (HE) Probe is designed to withstand the wet environment and high temperatures inside condenser piping without the need for dryers, chillers, a secondary vacuum pump, or throttling valves. The probe can either be held or installed in the exhaust of a pump on the condenser system, or can be flange-mounted directly into the piping of the system under test. The probe is connected to the flange via an adjustable compression fitting so the probe tip can be positioned in the center of the pipe. This guarantees the probe tip is in the maximum helium flow for the best sensitivity.

Equipment damage due to corrosion or water in the leak detector or roughing pump is eliminated. The Agilent HE Probe is able to withstand water, amines (ammonia derivatives), and operate at temperatures up to 95 °C (200 °F). The probe is connected directly to a VS Leak Detector with no additional water trapping or auxiliary pumping required. The probe consists of a corrosion resistant 316L stainless steel tube with a composite permeable membrane at its tip. The membrane readily permeates helium tracer gas while protecting the leak detector from water vapor and chemicals that would destroy the pumps, valves, and spectrometer.

When the HE Probe is used in conjunction with an Agilent VS Leak Detector equipped with a wireless remote, the manpower needed for a leak test can be cut in half. A single operator can spray helium remotely from the location where the detector is sampling gas, yet can still monitor the instrument's response.

Features

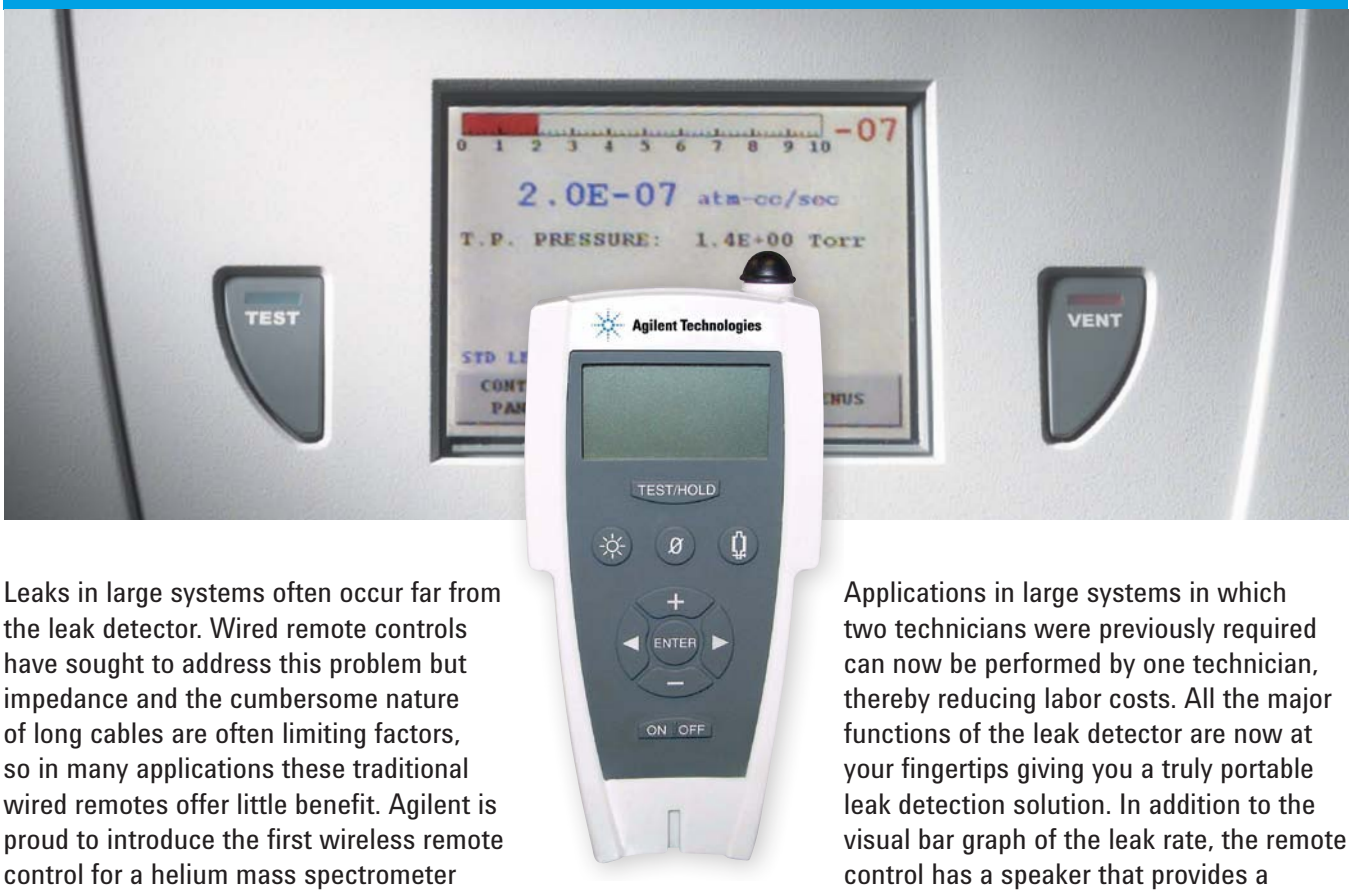
Benefits

Features	Benefits
• Permeable membrane technology	• Prevents water and chemicals from contaminating and damaging the leak detector
• Can be inserted directly into the center of the pipe	• Faster response time and better sensitivity
• Extremely durable	• Withstands hot, wet, corrosive environments
• Easy to use	• Simple system connection. No maintenance or adjustments
• Economical	• Less expensive than dryers and repeated purchases of sacrificial pumps

Ordering Information

The HE Probe is compatible with any Agilent VS Series Leak Detector. Specify Option #106.

Wireless Hand-Held Remote Control for VS Series Leak Detectors



Leaks in large systems often occur far from the leak detector. Wired remote controls have sought to address this problem but impedance and the cumbersome nature of long cables are often limiting factors, so in many applications these traditional wired remotes offer little benefit. Agilent is proud to introduce the first wireless remote control for a helium mass spectrometer leak detector. By utilizing modern wireless technology, leak testing hard-to-reach locations is now much easier, and can be performed at much greater distances of up to 100 meters.

Applications in large systems in which two technicians were previously required can now be performed by one technician, thereby reducing labor costs. All the major functions of the leak detector are now at your fingertips giving you a truly portable leak detection solution. In addition to the visual bar graph of the leak rate, the remote control has a speaker that provides a variable tone indicating the trend and relative size of the leak. The wireless remote can operate for a full 8-hour shift, or longer, on four AA batteries and conforms to ISM band, 2.4 GHz FHSS standards.

Features	Benefits
• Wireless technology	• Significantly extends range without cumbersome, restrictive cables
• 100 meter (328 ft) range	• Enables single operator testing
• Internal speaker	• Emits variable tone that corresponds to leak rate signal
• Head phone jack	• Enables testing even in noisy environments
• 20 channels	• Allows use of hand-held remote with multiple leak detectors
• 2.4 GHz frequency, ISM band compliant	• Free license band with minimum cross-talk

Technical Specifications

Frequency/Band	2.4 GHz, ISM Band FHSS compliant
Range	100 m (328 ft)
Functions	Test/Hold, Zero, Read Standard Leak, Set-up
Power supply	4 (four) AA batteries or by 5 1 VDC, 1 A (min)
Operating life	Approximately 12 hrs (dependent on batteries)
Internal speaker	85 dB min @ 1.0 ft
Head phones	Mono, 3.5 mm plug, @32 ohm impedance, 1000-10,000 Hz frequency response
Operating temperature	+12 °C to +40 °C
Ruggedness	Meets industrial standards for hand-held equipment (Section 8.4.2 of UL 61010-1 2nd edition)

Ordering Information

Description	**Part Number**
VS Wireless Remote Controller	G8600-60002
VS Wireless Remote Control Base Unit Kit (field installed)	G8600-68001
Also available as a factory installed option on VS leak detectors (Order Option #102 for the base unit and G8600-60002 for the hand-held controller, see also VS Leak Detectors Additional Options on page 10)	

Advantage Services for Leak Detection

The Best Service Available for Your Agilent Leak Detector

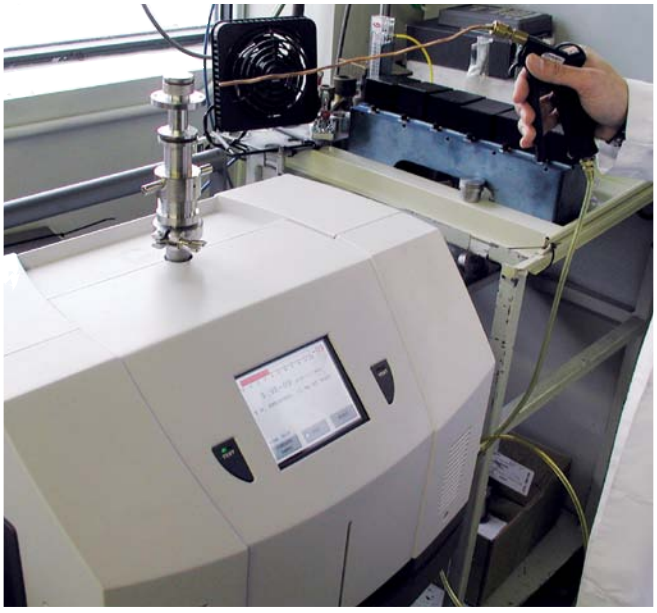
Agilent Advantage Service not only protects your investment in Agilent leak detectors – it connects you with our global network of experienced service professionals dedicated to your success and productivity so you can rest assured that every day, you are:

- ✓ Maximizing your throughput
- ✓ Producing reliable results with the greatest accuracy and sensitivity
- ✓ Ensuring your equipment is fully compliant with industry regulations

Skilled engineers keep your system operating at peak performance.

With the most highly trained engineers in the industry, Agilent completes over 85% of service calls the first day, and enjoys a 98% satisfaction rate among customers.

With Agilent attending to your equipment, you can stay focused on the work at hand knowing your leak detector is operating at peak performance.



Choose the Plan That's Right for You

Agilent Advantage GOLD: *When you simply can't afford downtime.* Priority response coverage for operations that need mission-critical systems up and running at all times. Comprehensive support ensures continuous high performance operation.

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www.agilent.com/chem/leakdetection

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Agilent service guarantee	✓	✓	✓
Response	Priority	Standard	Standard
Includes all hardware and software updates	✓	✓	
Phone and e-mail technical support	✓	✓	✓
Maintenance Services			
Annual preventive maintenance service	✓	✓	
Annual re-certification and replacement of calibrated leak	✓	✓	

And more...

We offer special customer defined services not offered in standard agreements.

Maximize equipment performance with training courses, onsite training and leak detection technology/application seminars.

Application Consulting to assist you in evaluating your requirements to determine the leak detection solution best suited to your application.

Get the best price available with a multi-year service plan

Purchased with your new leak detector, a multi-year service plan gives you the coverage you need at the best price available. In addition to receiving discounts on multi-year service coverage, you are protected against price increases because your rate is locked in for the life of your agreement.

Application Consulting

Agilent Global Support Network begins when our field engineers assist you in evaluating your requirements to determine the leak detection solution best suited to your application.

Field & Factory Support

To maximize system uptime and extend the value of your investment, we offer a complete range of support programs to meet any need.

Ongoing Technical Support

Agilent Global Support Network delivers support for the life of your instrument with unlimited telephone and e-mail technical support, application analysis and rapid problem resolution.

Trade-Up Program

Offers you trade-in opportunities of your older units toward the purchase of a new VS Leak Detector to maximize return on investment.

Onsite Integration Support

When its time to install your new equipment, your local engineer will provide hands-on integration and training assistance.

Agilent Service Guarantee

Agilent's service guarantee means that if we can't fix it, we'll replace it. No other company offers this level of commitment to keeping your lab up and running at peak efficiency.

Agilent Certified Parts

Repairs and maintenance performed by factory-trained field engineers using Agilent certified parts. This protects the quality, reliability, and performance of your leak detector.

For more information
Learn more:
www.agilent.com/chem/leakdetection

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