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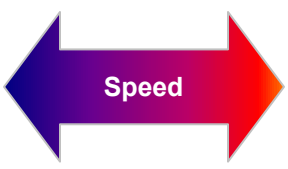
Product Selection Issue

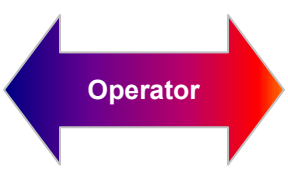
Leak Detection Methods & Equipment: 6 Factors to Consider

Leak Detection encompasses many different techniques and equipment, all possessing distinct qualities that make them either less or more suitable for the particular application. We have isolated six main characteristics for evaluating method and equipment: speed, operator dependency, leak rate, the level of integration possible, comprehensiveness and the amount of capital investment. Each of these factors is explained in detail below:

VTech 75 Multifunction Leak Detection System



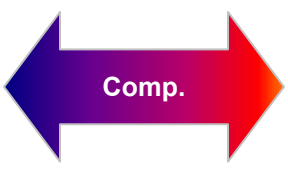
Speed (slow, moderate, fast) Some leak test methods are more time consuming than others. Pressure Decay, for instance, can take several minutes based on the size of the circuit, pressure stabilization time, etc. Manual tracer gas sniffing depends on how many brazed joints need to be leak checked; the industry standard is about 3 seconds/ joint. Automatic tracer gas tests are generally the fastest (e.g. Vacuum Chamber Testing). Your speed will depend mainly on your productivity level.



Operator Dependency (non, somewhat, high) Depending on whether or not the method and equipment is completely automatic, semi-automatic, or totally manual, one can gauge the level of operator dependency. Pressure Decay and Automatic Tracer Gas tests are non-operator dependent, while combination methods involving pressure decay and manual sniffing are a little of both. Methods that involve only manual operations, depending solely on the operator's skill and judgment, are considered highly operator dependent (e.g. soap bubble testing). Finding leak location is the key benefit to manual tests, while the key drawback is the possibility of human error. Ideally, a combination of automatic and manual tests keep operator dependency at a minimum. How much operator dependency you will allow depends on productivity, as well as availability of skilled personnel.

Lowest Leak Rate (gross, fine, both) Leak rates are grouped into one of two categories: gross leak detection, for finding large leaks (i.e. several tens of ounces/year of refrigerant) and fine leak detection, for ranges of a half or tenth of an ounce/year. Pressure decay or "Nitrogen testing" is a gross leak test. Fine leak detection can only be performed by utilizing some type of tracer gas such as Helium or a mixture of Hydrogen and Nitrogen. Some systems incorporate both types of tests and leak rates, for instance, combining automatic pressure decay and manual sniffing. Gross or preliminary leak testing is always recommended prior to fine leak detection since trying to perform fine leak testing on a system that has large leaks is a waste of time and tracer gas. Your leak rate will depend on the amount of permissible refrigerant loss per year.

Integration (standalone, partial, full) Leak detection systems vary in their degree of integration. Standalone systems perform a specific function and aren't typically integrated with other systems. An infrared refrigerant sniffer is an example of a standalone system. Other systems combine technologies that can be integrated with one another: preliminary or gross leak detection by pressure decay and fine leak detection with manual sniffing. Some systems are all-in-one equipment, combining various technologies and techniques in a fully integrated system. The level of integration you will require depends on various factors including production layout, productivity rate, leak rate and operator dependency.



Comprehensiveness (limited, partial, total) As with Integration, each leak detection method varies in the degree in which it combines automatic and manual techniques with gross and fine leak testing capabilities. Systems that perform only one test have a limited comprehensiveness. Other systems that combine more than one method but leave out a key factor such as leak location, have partial comprehensiveness. A completely comprehensive machine addresses each of the leak detection methods (automatic and manual) as well as gross and fine leak detection. The level of comprehensiveness will depend on many factors as in the section on integration above.

Investment (small, moderate, large) Based on a purely price tag-based scale, leak detection systems have various investment ranges. They can be viewed as a small investment, around $10,000 or less, a moderate investment ($30,000-$50,000) and large investment ($100,000+). Prices are of course relative to the technology and capabilities of the system. Your budget will determine what level of investment is possible.

Which method or system is best for you? That depends largely on your particular project requirements. VTech can lend its extensive expertise in determining the best solution for your needs. For more information on each of our products, please browse our catalog by clicking here.

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Example: VTech 75 Multifunction Leak Detection System

How does the VTech 75 (shown above) rate on these various factors?

Speed: moderate
Depending on the size of the coil or system being tested, the pressurization and stabilization of the nitrogen used in the pressure decay (preliminary) leak test can take several minutes. Sniffing can also take a few minutes, depending on the number of brazed joints. One way the time is mitigated is by testing two or more identical units simultaneously.

Operator Dependency: somewhat
Since the VTech 75 combines both automatic and manual tests, it has some operator dependency when it comes to the sniffing operation. The pressure decay test is completely automatic, as well as the tracer gas filling if the part passes the gross leak test.

Lowest Leak Rate: both The VTech 75 finds gross leaks, in the range of 1×10^{-3} atm cc's/sec. (50 oz. refrigerant/year) as well as fine leaks in the range of 1×10^{-7} for helium and 5×10^{-7} or 0.1 oz of HFC refrigerant(R134a)/year for hydrogen. So, understanding the need to perform a preliminary leak test prior to final leak test, the system is designed to address both of these requirements.

Integration: full The VTech 75 is fully integrated, combining preliminary and fine leak detection technologies in one complete system. The VTech 75 can also work well in a larger plant setting that incorporates other methods. For instance, it can be employed as a repair line system using hydrogen tracer gas for retesting coils that have previously been tested with helium, without the danger of tracer gas cross-contamination.

Comprehensiveness: total The VTech 75 can be considered a completely comprehensive machine that addresses each of the leak detection methods (automatic and manual) as well as gross and fine leak detection. For refrigeration customers, who later fill their leak-tested circuits with refrigerant, they will need to perform a final run test using a halogen or infrared refrigerant detector. Some leaks appear during operation that can go undetected prior to charging. But, for coil and other components manufacturers, this can be considered a complete system.

Investment (moderate) Depending on the features and options, the VTech 75 is a moderate investment.

VTech COOL INNOVATION

VTech Process Equipment LLC Alpharetta, GA **Tel:** (678) 691-4935 **Email:** americas@vtechonline.com

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Product Selection Issue

Clima 1000 for R&D Applications of R1234yf

Clima 1000

The Clima 1000 provides a practical and affordable solution for R1234yf R&D requirements.

Available in February 2011, the Clima 1000 is designed primarily for end users such as automotive garages and service stations, but for Automotive A/C system manufacturers, this system can be easily applied for evacuation, oil and refrigerant recovery/separation and system recharge in laboratory environments.

The Clima 1000 is fully automatic and can be programmed to run custom cycles as well as standard cycles according to each vehicle's specifications. As a standalone, self-contained system, the Clima 1000 requires no additional safety equipment for its limited use.

For more information on the Clima 1000, click here, or contact Gordon Purkis at (404) 432-1629 or g.purkis@vtechonline.com

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New to Refrigerant R1234yf?

New HFO Refrigerants such as R1234yf are beginning to enter the market as a replacement for R134a. In particular, manufacturers of Mobile Air Conditioning systems, such as compressors, are beginning to apply this new technology. To find out more details about this gas and its implementation, please click here to read a technical paper on R1234yf and its potential impact in the automotive market.

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Product Selection Issue

Decide with Confidence

The Capital Equipment purchase decision is not one that is made lightly. You want to start by doing your homework on the technical side by evaluating available systems side by side to create a technological baseline from which to begin, all while comparing the available equipment solutions to your specific requirements. Even within VTech's own online catalog, one can compare similar machine models to determine which one is the right choice from a technical standpoint. A long list of available options and accessories help customize the equipment to your specific needs. We are always willing to compare our systems from an "apples to apples" standpoint with any others on the market.

The next thing to think about is who's offering the best value. Price is, of course, an important factor to consider but what kind of "more" do you get for the money? Our approach to adding value is about using automation and design to make the lives of the operators and their supervisors much easier by designing and building equipment that is intrinsically simple to operate and requires a minimum amount of maintenance. These are ineffable qualities that show up in the bottom line later on.

What about company reputation? Experience? References? How will they stand behind their product? VTech has over 50 years experience in the A/C and Refrigeration Industry dating back to the first mechanical systems for charging refrigerant that were pioneered in the 1960's. Our reference list, available on request, is comprised of a wide array of companies both large and small, with applications ranging from Medical and Scientific to Automotive and Construction equipment. We guarantee in writing the performance of the equipment and warranty each machine for 12 months against material defects and workmanship.

But, at the end of the day, all we ask is the opportunity to serve you. If you'd like our assistance with any current or future projects, please contact Gordon Purkis at (404) 432-1629 or g.purkis@vtechonline.com

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VTech has experience in a wide range of market segments including:

- **Domestic & Commercial Refrigeration**
- **Beverage Dispensing**
- **Vending**
- **Medical & Scientific**
- **Automotive & Construction**
- **Air Conditioning**
- **Coil & Component Testing**

Our reference list is available on request. We hope to add you to our list of success stories!

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Product Selection Issue

Installation Update:
Repeat Business Illustrates VTech's Value to Customers

With the recent installation of VTech 50 Pressure Decay Leak Test Systems at two different customer's locations, we have seen how delivering the first time generates second opportunities...and orders.

We know it takes work to get new customers but keeping them is the key to long term success. Business is about building relationships and that's what we try to do. Our flexibility on the technical side allows us to adapt to customer's varied requirements. This shows that our customers can come to us with a new problem to solve and we can offer a solution.

An example of this was the recent installation of two VTech 50 Pressure Decay Leak Test Systems, which were realized in two entirely different manners. The first was a large in-line system at Price Industries, in Auburn, GA. In our last newsletter we featured an article about the first installation and the focus being on their beginning to manufacture their own coils that they once purchased from a supplier. The second machine only proves that the first one does the job and does it well.

The other VTech 50 system, installed at an undisclosed location in NY, is our standard slope-top enclosure but the key is the integration of a custom testing bench designed specifically for the parts they are manufacturing. A picture of this set up is shown at right.

While we strive to attract new customers our pride is in keeping our existing customers coming back. Of course, we have to start somewhere. Do you have a project in mind? Let's get started! Please contact Gordon Purkis at (404) 432-1629 or g.purkis@vtechonline.com

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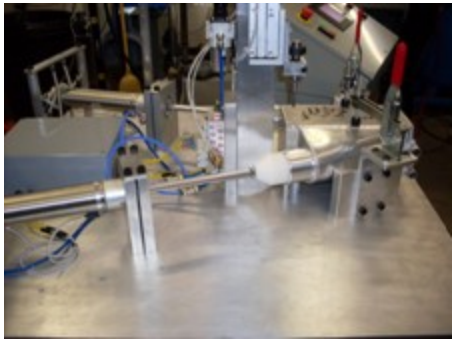

Custom Test Fittings

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