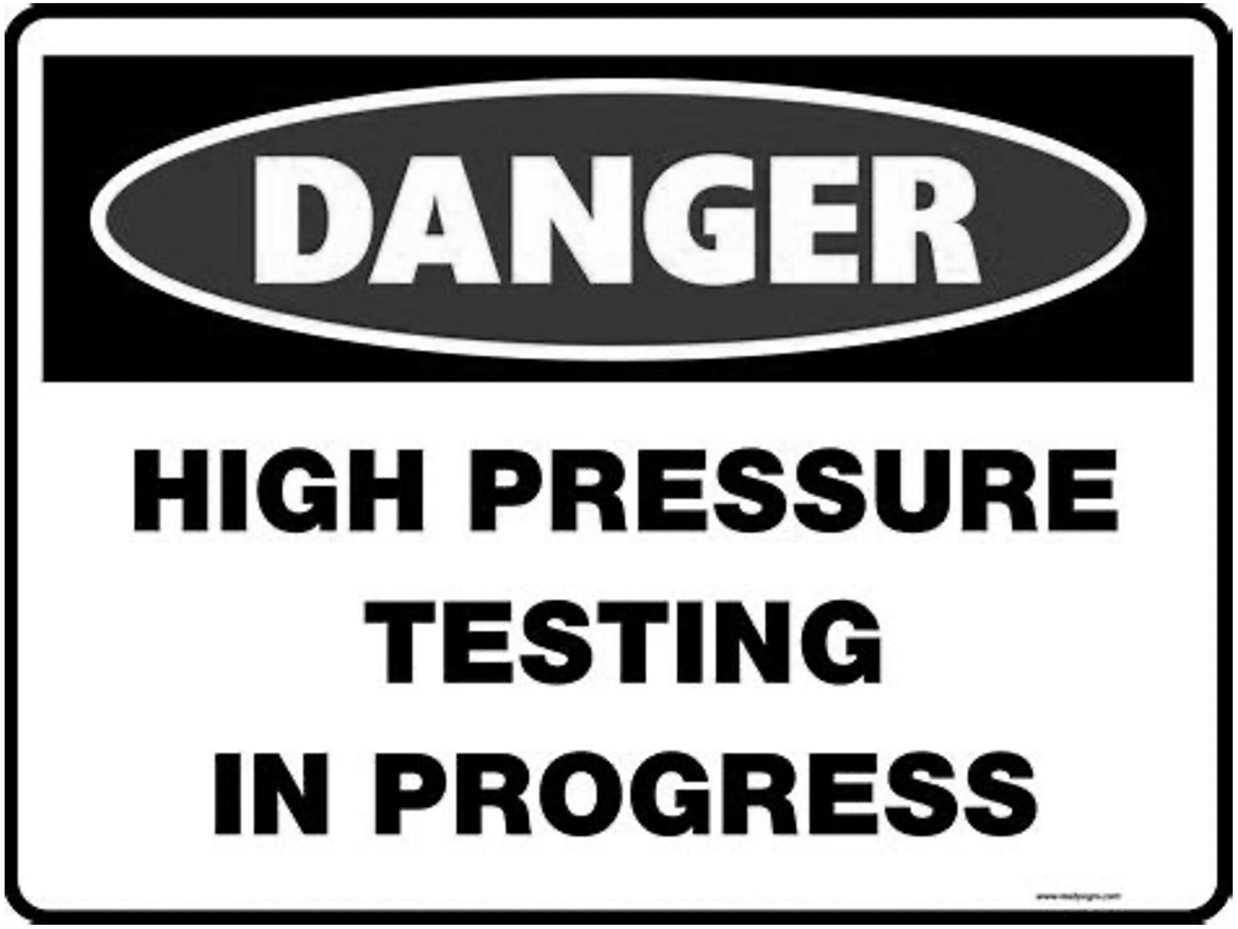
BSTC
We Train People

UNIT 4 – Carrying out a Leak Test

PRESSURE & LEAK TESTING TRAINING


DANGER
HIGH PRESSURE
TESTING
IN PROGRESS

Pre-used Checks on Equipment Used for Leak Testing

Some of the pre-use checks that should be carried out on equipment used for leak testing are:

Visual inspection of the equipment for any signs of damage, wear, or corrosion

Checking the compatibility of the leak detect solution with the materials used in the equipment construction oil based solutions, or those containing fatty acids, can ignite if they come in contact with oxygen.

Checking the pressure gauges, valves, hoses, and fittings for proper functioning and tightness.

Pre-used Checks on Equipment Used for Leak Testing, contd

Checking	Checking	Checking	Performing
Checking the calibration of the test equipment and ensuring it is within the specified range.	Checking the availability and quality of the test gas and ensuring it is suitable for the test technique.	Checking the safety devices and alarms on the equipment and ensuring they are working correctly.	Performing a leak test on the equipment before use by applying the leak detect solution to all joints and observing for any bubbles or changes in pressure.

Examples of Equipment for Leak Testing

A leak detector or sensor that can detect the presence and amount of the leaking substance. There are different types of leak detectors or sensors, such as pressure, flow, mass spectrometer, acoustic, optical, and thermal.

A test chamber or fixture that can seal the component or system and apply the desired pressure or vacuum to create a pressure differential. The test chamber or fixture should also have ports or connections for the leak detector or sensor and the leaking substance.

A source of the leaking substance, such as air, nitrogen, helium, water, or oil. The source should be able to provide the required flow rate, pressure, and purity of the substance for the leak test.

Examples of Equipment for Leak Testing, contd

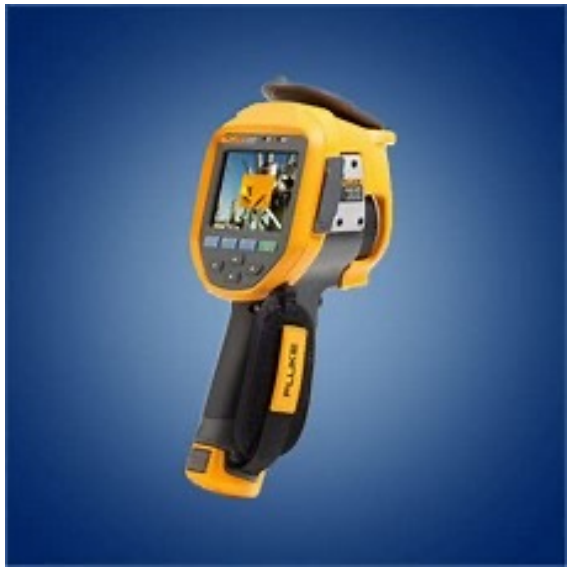
A controller or instrument that can control the test parameters, such as pressure, time, and temperature, and display the test results, such as leak rate, pass/fail, and graphs. The controller or instrument should also have the capability to store, analyze, and communicate the test data.

A calibration device or standard that can verify the accuracy and repeatability of the leak test equipment. The calibration device or standard should have a known and stable leak rate that can be compared with the measured leak rate of the component or system.

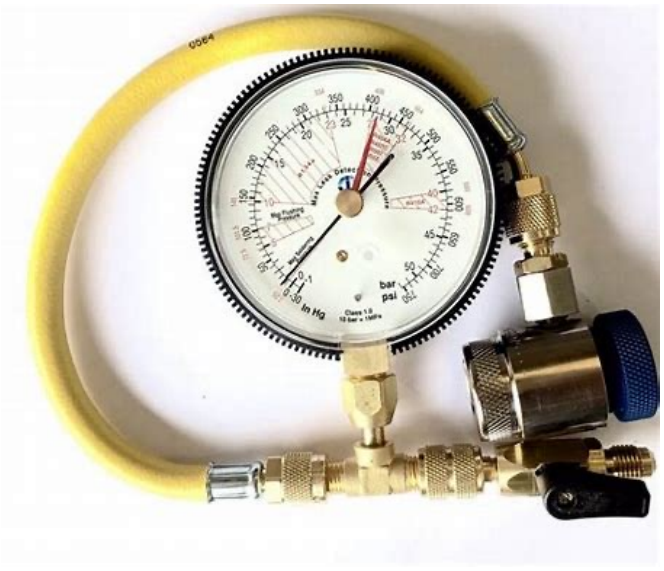
Depending on the specific leak test method, some additional equipment may be required, such as pumps, valves, regulators, filters, tracer gas injectors, sniffers, and accumulators.

What is a Nitrogen Booster Pump

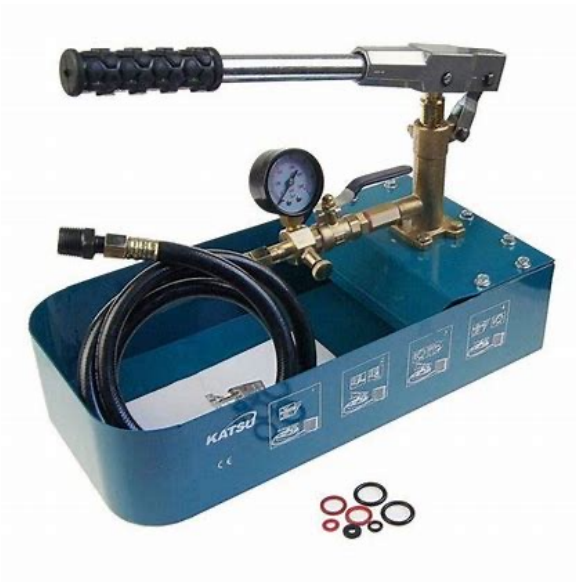
- Nitrogen booster packages offer an economical method of boosting nitrogen (or other select gases or air) gas pressure up to 36,000 psi. HPT nitrogen booster package features a compact and lightweight arrangement that is turn-key and fully tested. Single and double acting nitrogen gas booster pumps are available to meet flow rate requirements. Maximator high pressure nitrogen booster pumps are capable of increasing pressures as low as Atmospheric to pressures as high as 36,000 psi.Two Stage Gas Boosters are available for Applications that require very low gas pressures (0-500 psi) to be increased to higher pressures. Two Stage Gas Boosters are commonly found in applications such as bottle scavenging, bottle filling from the sources such as nitrogen generators and etc.



Gas leak detection equipment

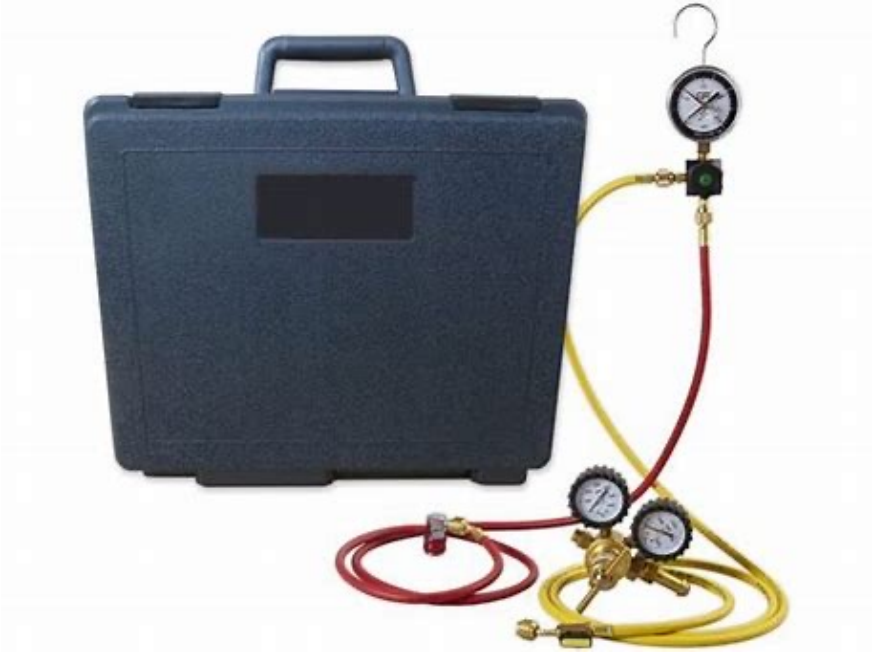


Leak detection gauge

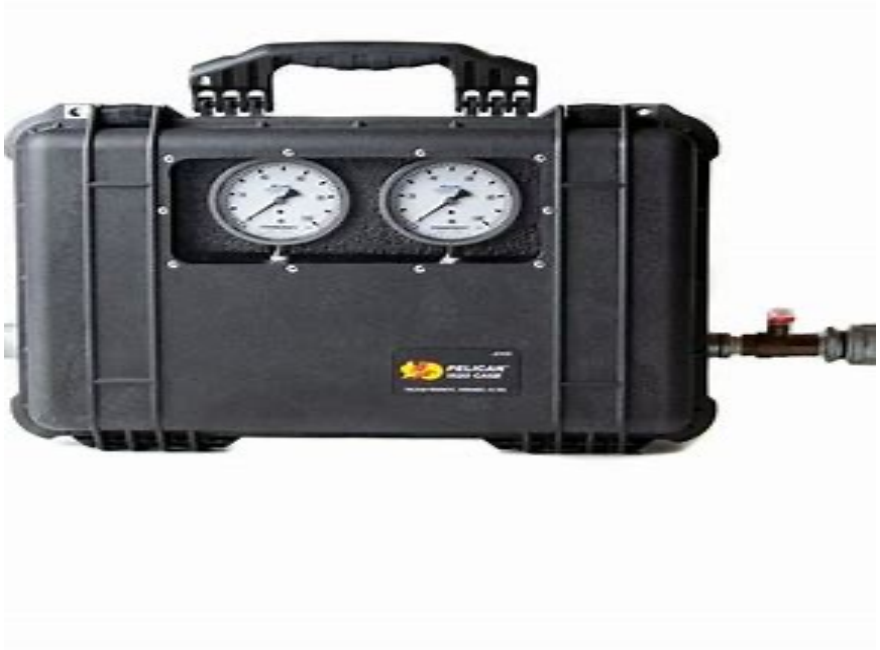


Manual hydraulic water pressure leakage tester

Helium Leak Detector



Nitrogen pressure leak test kit



Pressure decay leak test kit

Why Helium is Widely Used for Detecting Gas Leak

Reasons **why helium is widely used for detecting gas leaks**, its advantages, and how it enhances the accuracy and efficiency of leak detection processes

1. Helium's Low Density

Helium is an inert, non-toxic, and non-flammable gas with a low density compared to the majority of gases. When mixed with another gas, helium can easily escape through even the tiniest openings or leaks. This property makes it highly effective for detecting leaks in various systems, including pipelines, industrial equipment, and refrigeration systems.

◦

Why Helium is Widely Used for Detecting Gas Leak, contd

2. Enhanced Sensitivity

Due to its low density, helium is more sensitive to minute leaks. When helium is used as a tracer gas, it can quickly identify even the smallest leaks that might be difficult to detect using other methods. This sensitivity allows for early leak detection, reducing the potential for further damage or safety hazards.

Why Helium is Widely Used for Detecting Gas Leak, contd

3. Non-Toxic and Environmentally Friendly

Helium is an excellent choice for gas leak detection because it is non-toxic and environmentally friendly. When released into the atmosphere during leak tests, helium poses no harm to humans or the environment. This is especially important in industries where safety and environmental concerns are paramount.

Why Helium is Widely Used for Detecting Gas Leak, contd

4. Easy Detection with Mass Spectrometers

Helium leak detection is often performed using mass spectrometers, specialized instruments that can accurately detect and measure trace amounts of helium. These devices can precisely pinpoint the location of the leak, making it easier for technicians to conduct repairs or take appropriate actions.

Why Helium is Widely Used for Detecting Gas Leak, contd

5. Versatility in Leak Testing

Helium leak detection can be used for a wide range of applications, from simple household appliances to complex industrial systems. It is effective in identifying leaks in gas pipelines, vacuum systems, refrigeration units, and even spacecraft components. Its versatility makes it a popular choice across various industries.

Why Helium is Widely Used for Detecting Gas Leak, contd

6. Cost-Effectiveness

While helium is an essential gas used in various industries, it is relatively abundant and affordable. Considering its sensitivity and efficiency in leak detection, the cost-benefit ratio of using helium for this purpose is highly favorable.

Why Helium is Widely Used for Detecting Gas Leak, contd

7. International Standards and Regulations

Many industries and regulatory bodies recognize the effectiveness of helium leak detection. Numerous international standards and guidelines recommend or require the use of helium as a tracer gas for specific applications. Complying with these standards ensures that leak detection processes are reliable and consistent.

-

When Helium Test Device Should Be Used

A HeliTest leak detection device should be used when there is a need to locate and measure leaks in enclosed devices and systems, such as fuel tanks, oxygen lines, engine lines, vacuum chambers, sealed devices, and power plants. The HeliTest device uses a technology called selective ion pump detection (SIPD), which detects helium based on a patented technology using the physical properties of quartz membranes and a unique ionizing process of gases that penetrate the membrane. The HeliTest device is highly sensitive and less susceptible to helium saturation, and can save considerable time and resources.