

LS-300HP

Variable Reference Leak Operating Instructions



Standard Specification

This reference leak consists of a rechargeable gas reservoir; the output of which is controlled by a variable pressure regulator; an output pressure gauge is included to monitor the gas output to the reference leak.

The product is intended for use in a clean laboratory or industrial environment with precision leak detection equipment.

CONTENTS

The LS-300HP is shipped with :

- 1 off LS-300HP: Variable Reference Leak
- 1 off Certificate of Calibration with Traceability to National Standards
- 1 off Graph of Flow rate and Output Pressure

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HTP reserves the right to change at any time the design and data given in these instructions.

Getting Started...

It is important to understand that the reference leak is a highly precise instrument designed to produce an accurate flow of gas under very specific laboratory conditions. Careful handling and correct use of the reference leak is essential to prolong the service life and preserve the accuracy of the equipment.

Before using the reference leak carefully read the guidelines below...

- Keep leak element clean at all times.
- Do not expose to oils or liquids, during gas charge use an in-line filter where necessary.
- Wherever possible ensure the leak element is exposed to the vapour portion of the refrigerant only.
- If contamination is suspected, detach the leak element and wash in an ultrasonic bath in alcohol OR heat the leak element using a heat gun or furnace.
For further guidance please contact HT Products Ltd.
- Increment flow slowly when activating gas bottle.
- Handle pressurised gases safely at all times and minimise venting when removing from pressurised fittings.
- **THE MAXIMUM RESERVOIR PRESSURE IS 40 BAR, NEVER ATTEMPT TO CHARGE THE REFERENCE LEAK BEYOND THE 40 BAR THRESHOLD.**
- **RE-CHARGING AND HANDLING OF HIGH PRESSURE GASES SHOULD ONLY BE CARRIED OUT BY SUITABLY QUALIFIED OPERATORS.**

Activating the Reference Leak

The LS-300HP is usually charged with gas when shipped so the item is ready to use as soon as it is unpacked (unless special arrangements have been made in which case it may be necessary to charge the reference leak before use).

Follow the instructions below to set a flow rate and activate the reference leak.

1. Ensure the protective cap is removed from the leak element.
2. Turn the pressure regulator clockwise until the needle on the output pressure gauge starts to move.
3. Use the graph, certificate or label to select a pressure, adjust the regulator until the needle matches the required pressure. This will set the flow rate you require.
4. Select the required pressure using the regulator increasing and decreasing the output as required.
5. You are now ready to begin taking measurements from the reference leak.

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Using the Reference Leak

After activating the reference leak and setting the desired flow rate the reference leak is ready to use with a leak detector. The LS-300HP will respond very quickly to any adjustments in pressure but typically 2-3 minutes should be allowed after activating the leak or making pressure adjustments to allow the output flow to stabilise at the new rate.

Before testing check in the detector's instructions that the instrument will respond to the gas contained in the LS-300HP and that the flow rate is set within the sensitivity range of the detector.

Allowing 2-3 minutes after any adjustment in pressure follow the instructions below to test the detector with the reference leak.

1. Offer the end of the leak detector probe over the centre of the leak body.

A small air gap must be left between the face of the detector probe and the leak body, If the probe is completely sealed the flow will be restricted and the detector may give an error message due to insufficient flow.

2. Keep probe in close contact with the leak until the maximum reading on the leak detector is obtained.

If the position of the detector probe is changed the detector's response will be affected, this is because the calibration gas dilutes in the air. A locating shroud can be used to help to keep the probe position uniform and ensure a suitable air gap. Individual test standards may also have specific guidelines about the air gap that should be allowed, please contact HT Products if you wish to discuss your requirements.

3. Compare the detector's response to the selected output flow rate of the LS-300HP. If the response does not match the expected flow then the machine needs to be calibrated to adjust the response accordingly.

The calibration function will depend on the individual leak detector, please consult the detector's instructions for further details. With detectors that don't give a numerical reading or allow for an adjustment to calibration then any response from the detector as it is offered to the reference leak would prove sensitivity to the expected flow rate. No response may indicate that the battery or sensor needs to be replaced or that the equipment needs to be serviced.

Adjusting the Pressure / Flow Rate

If a different flow rate is required the graph can be used to find the output pressure for the desired flow rate and the regulator can be adjusted to the new value. The operator should allow 2-3 minutes before taking readings from the reference leak to allow the flow to stabilise at the new rate.

**NB: If the output pressure is decreased the regulator will not automatically 'relieve', the regulator needs to be reduced and the excess gas vented manually.
TO REDUCE FLOW SEE SECTION 'VENTING THE REGULATOR'**

The reference leak should be used in a well ventilated environment and suitable care should be taken after any venting. to allow any gas to disperse from the test area before further measurements are taken.

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Filling of the Reference Leak's Gas Reservoir

Only qualified personnel should carry out recharging of the gas reservoir. Depending on the leak rate and how often the leak is used, the gas in the reservoir may require re-charging.

To refill the reservoir the procedure is as follows: -

Check the leak graph, label or certification to identify which gas to use!

1. Ensure the regulator is fully closed before proceeding.
2. Locate the recharge port by removing the aluminium cap from the rear of the reference leak.
3. Connect the gas supply to a flexible hose to accept the 1/4" Flare (7/16" UNF) Schrader valve fitting for attachment to the port.
4. Flush hose through with gas before making the connection.
5. Maintain a low flow of gas and make the connection to the recharge port fitting.
6. Charge the reservoir with gas until the pressures are equalised.
DO NOT EXCEED 40 BAR RESERVOIR PRESSURE!
7. Maintaining a flow of gas remove the hose from the leak valve. (Preferably use a quick release connector). Replace cap.



Remove the Aluminium Cap.

Recharge Port:
7/16" UNF Schrader



Connect a charge line to the shrader fitting - **ensure the charge line includes a schrader valve depressor.**

Note: It is not recommended that the gas type be changed without first evacuating the reservoir, if this is done the resulting leak rate cannot be guaranteed.

Contact HT Products Ltd. for a technical support or with any questions about the use of the product.

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Venting the Regulator / Reducing the Output Pressure



A) VENT ADAPTOR
1/4" Flare Nut with Schraeder
Depressor to 1/8" BSPP



B) VENT PORT
1/4" Flare with Schraeder Valve



C) VENT FITTING
ATTACHED TO VENT PORT

Excess gas will vent, use caution, duct gas away from test area as required.

To reduce the regulator's output pressure you will need to wind the regulator control anti-clockwise slightly (fully clockwise to vent completely). You can then attach the supplied 'Vent Adaptor' (image A) to the vent port (image B) momentarily which will actuate the schraeder valve and vent the excess gas. You can attach an inline valve or a vent line to the 1/8" BSPP outlet of the vent line to control or direct the gas when venting.

WARNING: If the regulator is still activate the gas from the reservoir will start to flow out as the vent adaptor is attached. Be sure to use very short vents when reducing the regulator pressure to ensure the reservoir contents does not empty completely.

Technical Data

Typical leak rate adjustment range:

1 Decade

(e.g. 1-10 g/year, 1x10⁻⁴ to 1x10⁻⁵ mbl/s)

Temperature coefficient for leak element:

0.5% per degree C.

Leak Technology:

Stainless Steel Vacuum Sinter

Reference Leak Body:

St/St 1/8" 1/8" BSP Body

Maximum Reservoir Pressure:

40 bar

Output Pressure Gauge:

0 - 2.5 bar (Regulator Range 0-1.5 bar)

Recharge Fitting:

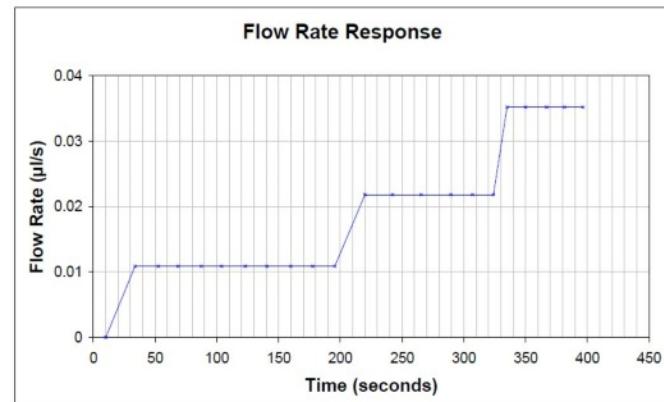
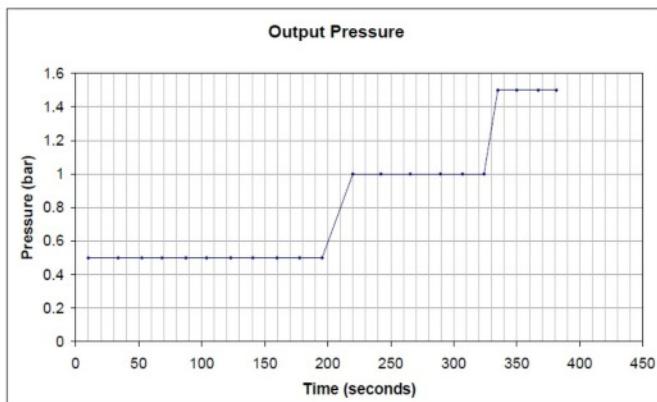
1/4" SAE Flare w/ Schrader Valve

Vent Port Fitting:

1/4" SAE Flare w/ Schrader Valve

Response Time:

Instant - allow 2-3 Minutes for stable flow



The graphs show that the flow rate closely follows the output pressure providing a very quick response to adjustments.

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