CALT 9
Leakage Tester

Description

The CALT 9 leakage tester has been designed and developed to measure leakage rates and give a detailed print-out of the test parameters and results. It is particularly suitable for measuring and calculating the leakage rate of double O-ring seals as fitted to packages for the transport of radioactive materials.

The CALT 9 is a portable instrument supplied in a robust case. The instrument is complete with all fittings including a reference volume to measure interspace volumes and a comprehensive instruction manual.

Operation

The CALT 9 is easy to operate. The internal computer displays a series of screen prompts which lead the operator through the leakage testing procedure in a manner that is easy to understand and follow.

All calculations are made by the computer. Full test details and results are printed out automatically at the end of the test (see over page).

The CALT 9 uses the pressure drop or pressurise method to give a quantitative result. The software automatically corrects for the change in dynamic viscosity of air which varies with temperature, and also converts the calculated leakage rate into Standardised Leakage Rate (SLR).

Variations

The instrument has been designed to be flexible to meet user requirements. Bespoke software and/or hardware can be supplied to meet specific customer requirements.

Further Information

Contact: Croft Associates Ltd, F4 Culham Science Centre, Abingdon, Oxon, OX14 3DB, UK
Tel: (01865) 407740 Fax: (01865) 407449 E-mail: sales@croftltd.com
Web site: http://www.croftltd.com

March 2009

Menu Options

The current version of the CALT software has five main options:

- **Leakage Test** - Pressure drop or Pressure Rise
- **Measure Volume** - The volume of the interspace must be known or measured before leakage testing can be carried out
- **Gauge** - Pressure/temperature gauge with or without a print-out
- **Utilities**:
  - Password
  - Calibration
    Calibrate temperature & Pressure sensors
    Print-out calibration history
    Select primary or secondary calibration
  - System set
    Pressure rise or drop
    Standard (ISO or ANSI)
    Reference pressure
    User name to appear on printout
  - Date
    Set system clock and date

Features

- Portable and robust
- Quality Pressure Transducer
- Built-in printer
- User calibration
- Store calibration for spare transducers
- Calibration protected against power loss
- Flat front panel for easy contamination checking
- Temperature probe
- Built-in electric pressuring pump
- Comprehensive print-out
- Battery operated and portable
- External battery socket for charging during storage
- Supplied with 2cc reference volume

Dimensions and Weight

458 mm wide x 331 mm deep x 190 mm
9 kg

After sales service

A full after sales service is offered including:

- Calibration and complete instrument functional check over
- Spare parts/consumables either installed or supplied for user installation
- Training at Croft Associates' offices or on site
- Software upgrades and customer specific changes
- Hardware modification
- Hot line support
- Instrument service

Typical Print-outs

Measure Volume

```
                USER NAME

          Test Date: 29 Dec 2008 11:51:03
         CALT9 SeNr: 0001
       Asset Number: 00025
   Software Version: 1804v01
  Press Sensor SeNr: 1054857
   Calibration Date: 19 Dec 2008 17:20:53
   Calibration Span: 10 days old
   Temp Sensor SeNr: ISN234
   Calibration Date: 17 Dec 2008 12:15:47
   Calibration Span: 13 days old
   ____________________________________
             TEST INPUT DATA
   Reference Volume: 2cc
Reference Volume No: CI001
  Test Reference No: CI95001
 Number of Readings: 3
            Comment: Lid
   ____________________________________
             MEASURE VOLUME

      Pressure (mbar)         Volume
 Atmos    Start      Final       cc

996.15   2119.33   1954.81    11.89
995.91   2104.92   1952.48    11.92
996.03   2123.07   1955.96    11.90
   ____________________________________

          Average Volume: 11.90


Sig: _________________
    (Tested by)

Date: _________


Sig: _________________
    (Supervisor)

Date: _________
```

Pressure Drop Test

```
                USER NAME

          Test Date: 29 Dec 2008 11:51:03
         CALT9 SeNr: 0001
       Asset Number: 00025
   Software Version: 1804v01
  Press Sensor SeNr: 1054857
   Calibration Date: 19 Dec 2008 17:20:53
   Calibration Span: 10 days old
   Temp Sensor SeNr: ISN234
   Calibration Date: 17 Dec 2008 12:15:47
   Calibration Span: 13 days old
   ____________________________________
             TEST INPUT DATA

          Test Mode: ISO
  Test Reference No: CI95001
          Design No: 2863B
          Serial No: 001
            Comment: Lid
  Interspace Volume: 11.90 cc
        Temperature: 25 degC
     Test Duration: 10 mins
     Settling Time: 5 mins
         Pass Rate: 5.00e-05 bar cc/s SLR
                    (5.00e-04 Pa cc/s)
    Viscosity Ratio: 1.00
     Upstream Press: 1013 mbar
   Downstream Press: 0 mbar
   ____________________________________
             LEAKAGE TEST

Time       Pressure          SLR
             mbar            bar cc/s
11:53:48   2099.75          2.97e-05
11:58:48   2097.31          2.61e-05
12:03:49   2095.62          2.42e-05
   ____________________________________
             TEST RESULTS

       Pressure          Date/Time
         mbar
   ____________________________________

Atmos: 1002.89
Start: 2099.75   29 Dec 2008 11:53:48
Final: 2095.62   29 Dec 2008 12:03:49
   ____________________________________

Leakage Rate: 2.4e-05 bar cc/sec SLR
              (2.4e-04 Pa cc/sec)

               *** PASS ***


Sig: _________________
     (Tested by)

Date: _________


Sig: _________________
    (Supervisor)

Date: _________
```

CALT 9 progression

The CALT 9 supersedes the CALT 8B with the introduction of a bespoke internal computer. The CALT 8B will continue to be supported for spares, maintenance, calibration, software and hardware upgrades.

Hardware

The CALT 9 hardware includes all the features of the CALT 8 with following new features:

- Interface auto-switch off
- Display sleep mode
- Li-ion battery pack
- External charger socket
- Comprehensive battery management LED's
- Audible alarm
- A single battery to power the interface, printer and computer
- Low EM emissions and susceptibility

Software

The software is based on the CALT 8B version 2.42 software which includes:

- Easy reboot
- Safe/protected calibration
- Multi-calibration (which allows a spare transducer to be used)
- Automatic parameter testing

If you are a CALT 8 user you will feel at home with the CALT 9, as the testing principles and the test procedure remain unchanged.

The CALT 9 builds on the experience of both the CALT 8 and CALT 5, incorporating features to meet users comments and generally to improve the instrument. Particularly noteworthy is the new Li-ion battery pack, this is robust and will take a lot of abuse with respect to over charging, over discharging and being left completely discharged for months. The battery compartment is accessible by removing the front panel cover.