C 73

External calibration of the leak detector

Purpose of the external calibration

In some instances, it may be convenient to display a helium leak value so that matches a desired target value (typically the value of an external calibrated leak connected to the installation to test or at the inlet port of the leak detector):

■ **In hard vacuum test mode**

➪ when the measurement range is very different from the value of the internal calibrated leak.

■ **In sniffing test mode**

➪ when a specific calibration is required in the sniffing test mode to certify that the measurement is valid and accurate.

■ **In hard vacuum or sniffing test mode**

➪ when the leak detector is connected to an installation having its own pumping system in operation and a small amount of the leak goes into the leak detector. The external calibration allows to get a direct readout of the current leak value.
➪ when the helium signal needs to be displayed in a different unit for convenience or to calibrate the leak detector if the internal calibrated leak is temporary unavailable (manual auto-calibration selected).

The external calibration is provided for the operator to easily obtain a direct readout of the target value (or current external leak) thanks to a correction factor automatically calculated and applied to the digital display of the leak detector.

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External calibration of the leak detector

External calibrated leak

An external calibrated leak (defined in accordance to your own requirements) is required for the external calibration procedure.

Accessories A 70

Recalibration

It is recommended to have every calibrated leak recalibrated at regular intervals to validate its value.

Accessories A 70

Digital and analog display

When the external calibration is performed, the digital display will show a connected value. Then COR will come on to reflect it. The analog display is not connected and therefore both values might be different.

External calibration procedure

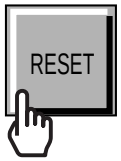
The external calibration should always be performed only when the leak detector is already auto-calibrated internally.

The external calibration procedure is performed in 2 steps:
- 1st step: selection of the test mode
- 2nd step: adjustment of the target value

These 2 steps are explained in below paragraphs.

External calibration cancellation

At any time, operator can cancel external calibration procedure.



COR

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External calibration of the leak detector

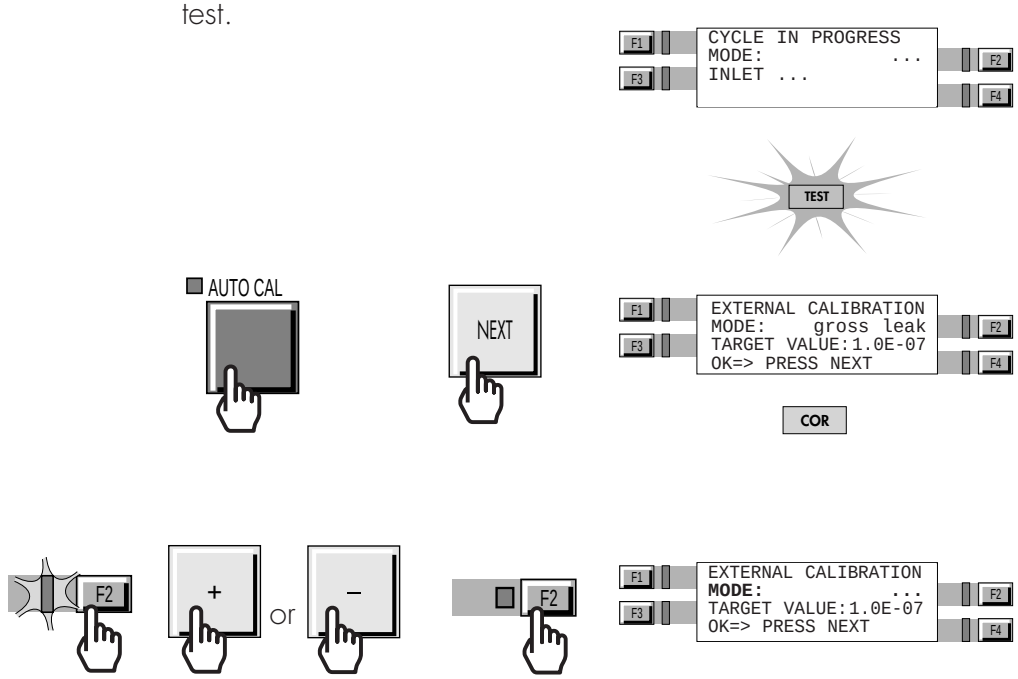
1st step: Selection of the test mode

Reminder *Operating principle of the control panel?* C 20

Press the key — activated

Note: External calibration should be performed in the test mode used by the operator: if operator uses the both test modes (hard vacuum and sniffing), he should performed one external calibration for each test mode.

The external calibrated leak is connected to the inlet port of the leak detector or at a suitable location of the installation to test.



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External calibration of the leak detector

2nd step: Adjustment of the target value

The target value is the desired value to be displayed on the digital display at the end of the auto-calibration.
The target value adjustment procedure is the same in hard vacuum and sniffing test mode.

The target value can be memorized following 2 methods:
■ the operator enters directly the target value: see below paragraph.
■ the target value is automatically calculated by the leak detector **C 74**.

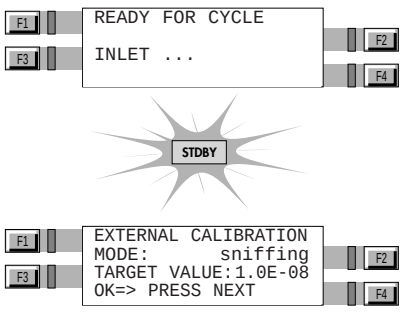
About sniffing test mode

In sniffing test mode, the calibration can be performed with:
■ the ambient atmosphere
■ an external calibrated leak
■ a container or installation, at atmospheric pressure, filled with a known gas mixture including Helium.

The sniffer probe will be exposed to one of the 3 items listed above (3rd one represents the most reliable and accurate way of calibrating a leak detector in sniffing mode).

The 1st and 2nd ones are the most common and practical methods.

Before using one of the 2 methods:
Connect the sniffer probe to the sniffer port of the leak detector.



Please use after chosen method.

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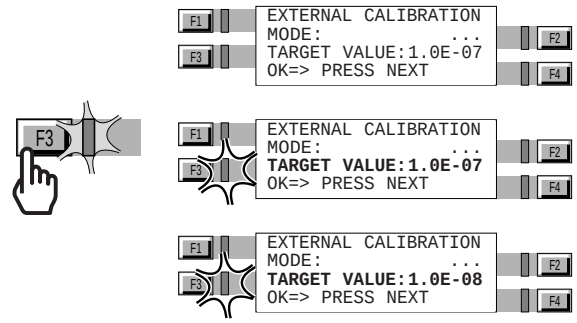
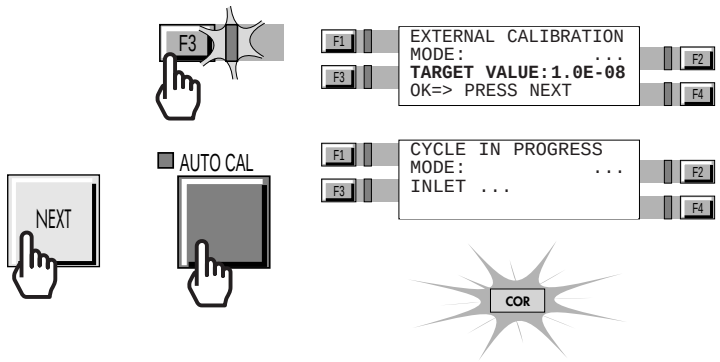
External calibration of the leak detector

Enter target value



Adjust target value.

Adjustment of a value **C 20**



Target value determination

■ In hard vacuum test mode, 1 possible case:

➪ The target value is the value of an external calibrated leak connected to the installation to test or at the inlet port of the leak detector. ➪ Case **A**

■ In sniffing test mode, 2 possible cases:

➪ the target value is the value of an external calibrated leak ➪ Case **A**

➪ If a container or installation is filled with a known gas mixture including Helium, it is possible to enter helium concentration as a target value. ➪ Case **B**

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External calibration of the leak detector

Case **A** When an external calibrated leak is used, it is recommended to take into account date of calibration and temperature effect for calculating the target value from the calibrated leak value as shown on its identification label.

HELIUM CALIBRATED LEAK
Helium leak rate: 1.0×10^{-8} mbar.l/s at 20°C
Date of calibration: 10 Dec 1997
% loss per year: 2%
% increase per °C: 3%

Example of calibrated leak label indications (as listed here): If the date is 1 Dec 1999 (about 2 years after calibration) and calibrated leak (ambient) temperature is 25°C:

Target value $= 1.0 \times 10^{-8} \times [1+0.03 \times (25-20)] \times [1-(0.02 \times 2)]$
$= 1.1 \times 10^{-8}$ mbar.l/s

Case **B** **Reminder:** 1 PPM = 1.0×10^{-6} (concentration)

Example : container with 100 PPM helium mixture.

2 possibilities:

- enter target value = 1.0 E+02 to display the test result in PPM
- enter target value = 1.0 E-04 to display the test result in helium concentration ($100 \text{ PPM} = 100 \times 10^{-6} = 1 \times 10^{-4}$)

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