

# SmartTest



**Helium Leak Detector.  
The ingenious solution to your quality assurance.**

**Modular concept.  
Simple operation. Top performance.**

**PFEIFFER**  **VACUUM**

## Helium leak detection the easy way

With its modular design, ease of operation and modern optics, the SmartTest is setting new standards in vacuum leak detection.

A broad selection of interfaces affords simple system integration. The key advantages for you include minimum service requirements, robust engineering and the utmost in dependability.

Fast, reliable results, lowest detectable leak rates and short recovery time are what characterize the SmartTest and make it such a powerful and dependable product.

Take advantage of the opportunity for an on-site product presentation at your facility. It's the best way to experience the SmartTest in action!

## Top performance in quality assurance



*Automotive industry*



*Semiconductor production*



*Lamp manufacturing*



*Refrigeration, air conditioning*



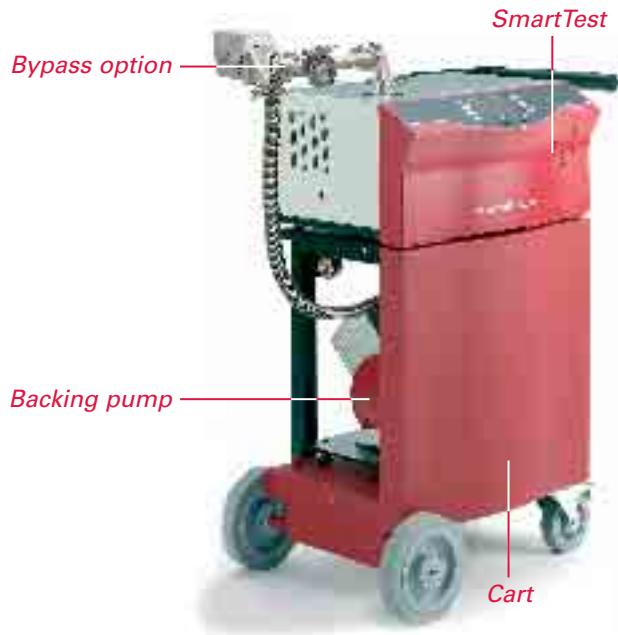
*Coating*



reddot design award  
winner 2005

SmartTest – Winner of the 2005 reddot design award in the "product design" category.

## Modular concept



A variety of configurations offers the optimum solution for your application:

- ▶ with a rotary vane pump, for general leak detection
- ▶ with a dry pump, for absolutely oil-free leak detection
- ▶ without a backing pump, for use in leak detection systems

The bypass option affords fast leak detection when testing large, contaminated items.

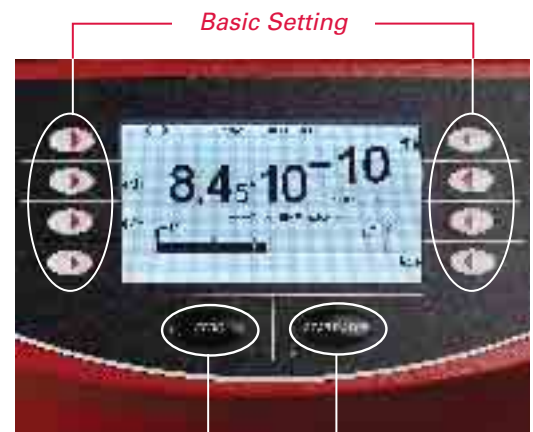


In addition, this concept is supplemented by a remote control unit, a cart and a selection of various sniffer probes.

## Simple operation

With its eight basic setting keys, you only have to program your SmartTest once. The ZEROING KEY enables you to display even the smallest leaks.

The START/STOP function offers a simple and secure way to start and stop the measurement.



ZEROING KEY for suppressing the background signal

One-key operation START/STOP

## Helium leak detection – the right test method for every application

*Selection of the appropriate quality assurance method for products and production processes is based upon the nature and size of the item to be tested.*

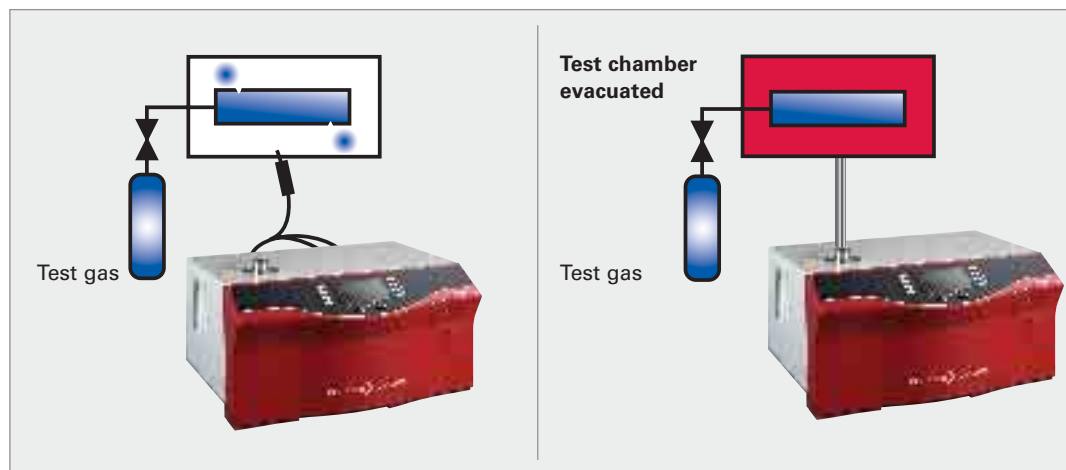
*In helium leak detection, a distinction is made between two different test methods – integral and local leak detection.*

### Integral leak detection for determining the total leak rate

The item to be tested is placed in a test chamber, filled with helium to test pressure and tested for leaks. The helium, which can egress through even the smallest leaks, reaches the SmartTest unit, enabling leak detection rates of down to  $10^{-12}$  mbar l/s\*.

The integral leak detection is suitable for either sniffer leak detection or vacuum leak detection.

- ▶ Measurement of the total leak rate in smaller test items
- ▶ Clear GO/NO-GO indication
- ▶ Highest objective measurement accuracy
- ▶ Short cycle time



#### Sniffer leak detection

- ▶ Overpressure-resistant test item
- ▶ Use of a sniffer probe
- ▶ Detection limit  $< 5 \cdot 10^{-8}$  mbar l/s

#### Vacuum leak detection

- ▶ Vacuum-tight test item
- ▶ Test item filled with helium
- ▶ Detection limit  $< 5 \cdot 10^{-12}$  mbar l/s

\* 1 mbar l/s = 0.1 Pa m<sup>3</sup>/s = 0.987 sccs

# Helium – the ideal test gas

Only a minute percentage of this gas is contained in the atmosphere, enabling even the smallest leak rates to be identified. Because of their very low atomic mass, helium atoms move through the air at higher speed. This ensures very fast measurements.

Further advantages at a glance:

- ▶ Utmost sensitivity in identifying even the smallest leaks
- ▶ Quantification of the leaks
- ▶ Outstanding reproducibility of the measurement
- ▶ Helium test gas is non-toxic and non-flammable
- ▶ Short measurement times

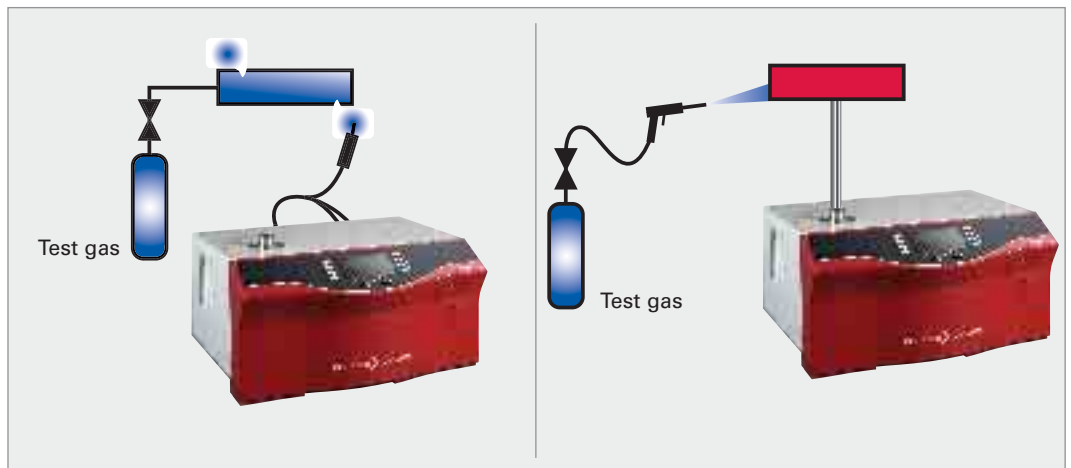
## Local leak detection for identifying individual leaks

Sniffer leak detection is performed by filling the item to be tested with helium and testing with a sniffer probe.

In vacuum leak detection, the item to be tested is first evacuated and then sprayed with helium. This enables leaks to be localized and analyzed with the aid of the sniffer probe. Local leak detection identifies leaks of down to  $10^{-12}$  mbar l/s\* and provides precise information about the size and location of any leaks.

The local leak detection, too, is also suitable for either sniffer leak detection or vacuum leak detection.

- ▶ Precise localization of the leak site in large test items
- ▶ Indication of the exact magnitude of the leak
- ▶ High measurement accuracy
- ▶ Repetitive production defects can be easily identified



Sniffer leak detection	Vacuum leak detection
▶ Overpressure-resistant test item	▶ Vacuum-tight test item
▶ Use of a sniffer probe	▶ Spraying with helium
▶ Detection limit $< 5 \cdot 10^{-8}$ mbar l/s	▶ Detection limit $< 5 \cdot 10^{-12}$ mbar l/s

\* 1 mbar l/s = 0.1 Pa m<sup>3</sup>/s = 0.987 sccs

## Selection aid

Leak detectors	Leak detector backing pump [m <sup>3</sup> /h]		Pumpdown time until ready for operation [s]			Applications										
	Rotary vane pump	Dry pump	Volume of the item to be tested			Semiconductor production	Vacuum furnaces	Lamp manufacturing	Vacuum coating systems	Automotive manufacturing	Refrigeration, air conditioning	Particle accelerators	Pharmaceutical	Fuel cell fabrication	UHV engineering	Packaging
	Pumping speed	Pumping speed	0.5 l	10 l	100 l											
HLT 550 without backing pump						▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
HLT 560 with rotary vane pump	5	–	1	45	590		●	●	●	●	●	▲	▲	●	●	●
HLT 565 with rotary vane pump UNO 30 M and cart	30	–	1	16	160		●	●	●	●	▲			▲	●	▲
HLT 570 with diaphragm pump	–	2	1	125	1300	●	▲	▲	▲	▲	▲	▲	▲			●
HLT 572 with dry pump XtraDry™ and cart	–	7.5	1	35	410	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
HLT 575 with dry pump and cart	–	28	1	16	160	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲

● Recommended ▲ Possible

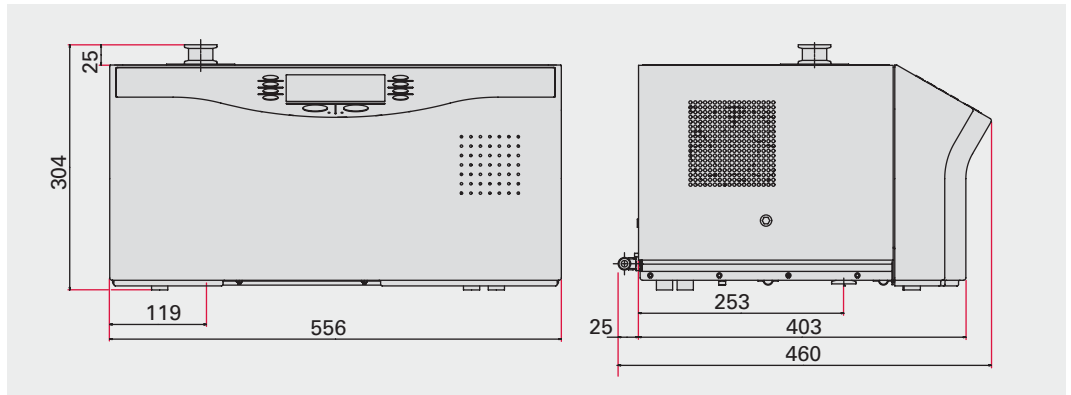


*The SmartTest with cart and the XtraDry™ dry pump for testing valves in air conditioning*

# Dimensions

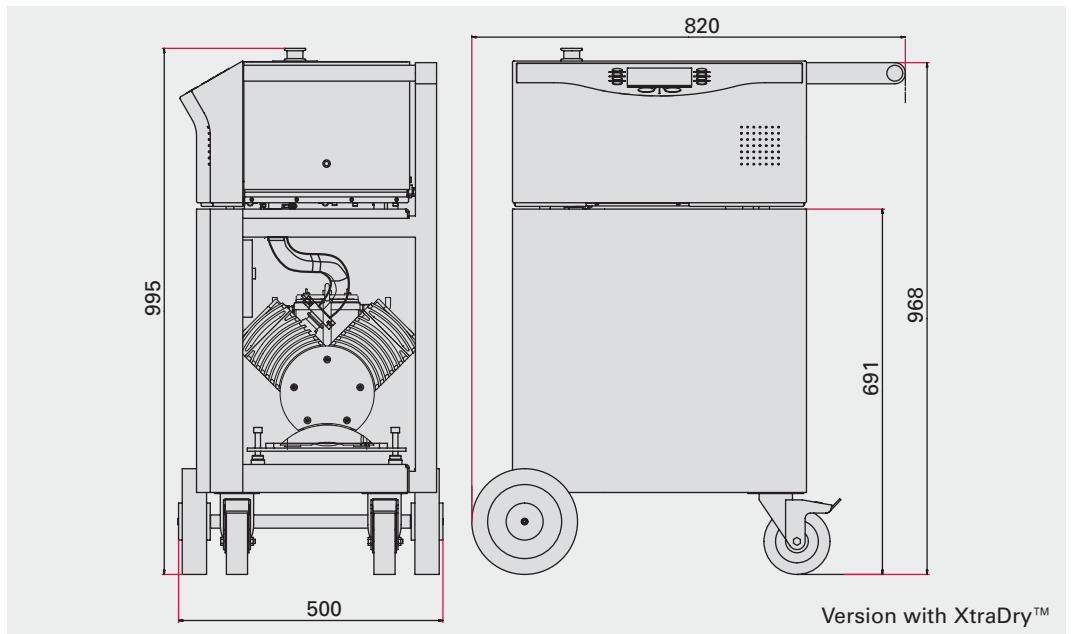
## SmartTest

- HLT 550
- HLT 560
- HLT 570

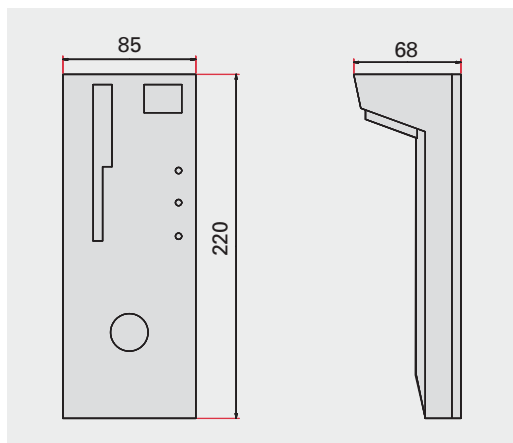


## SmartTest with cart

- HLT 565
- HLT 572
- HLT 575



## Remote control



Dimensions in mm

## General technical data

	HLT 550 – 575
Smallest detectable leak rate for He	< 5 · 10 <sup>-12</sup> mbar l/s
Test method	Vacuum and sniffing leak detection
Detectable gases	<sup>4</sup> He, <sup>3</sup> He, H <sub>2</sub>
Internal He-Test leak	10 <sup>-7</sup> mbar l/s
Leak rate display	10 <sup>-12</sup> – 1 mbar l/s
Cold start to ready	3 min
Response time	0.5 s
Pumping speed: for He	2.5 l/s
Flange (in)	DN 25 ISO-KF
Inlet pressure max.	25 mbar
Ambient temperature	+10 to +35 °C in process
Input: Analog	Compact Gauge
Input: Digital	Start/Stop, Zero, Calibration, bypass identification
Interface	RS-232-C, RS-485
Output: Analog	Leak rate signal 2 x 0–10 V, lin/log
Output: Digital	Ready to start, Ready to measure, Leak, Error, Bypass valve
Relay: Switching capacity	2 x 230 V AC
Relay: Switching current	3 A

## Technical data

	HLT 550	HLT 560
Backing pump	without	Rotary vane pump 5 m <sup>3</sup> /h
Power consumption	150 VA	400 VA
Weight	34 kg	44 kg

## Ordering numbers SmartTest

	HLT 550	HLT 560
230 V, 50 Hz	PT L02 020	PT L02 000
120 V, 60 Hz	PT L02 020	PT L02 001
100 V, 50/60 Hz	PT L02 020	PT L02 002



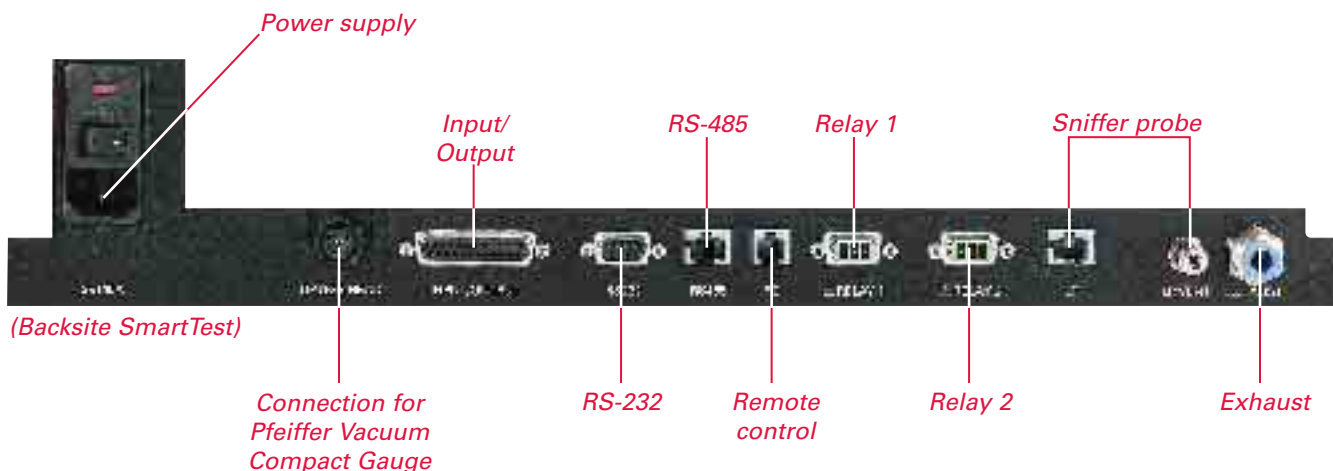
HLT 565 with cart	HLT 570	HLT 572 with cart	HLT 575 with cart
Rotary vane pump UNO 30 M 30 m³/h	Diaphragm pump 2 m³/h	Dry pump XtraDry™ 7.5 m³/h	Dry pump 28 m³/h
900 VA/50 Hz, 1050 VA/60 Hz	300 VA	700 VA	900 VA
133 kg	44 kg	119 kg	140 kg

HLT 565 with cart	HLT 570	HLT 572 with cart	HLT 575 with cart
PT L02 050	PT L02 010	PT L02 060	PT L02 065
PT L02 051	PT L02 011	PT L02 061	PT L02 066
PT L02 051	PT L02 012	PT L02 062	PT L02 066

## Ordering numbers accessories

Accessories	Ordering numbers
<b>Remote control</b>	
Remote control unit	PT 445 400
Connection cable for remote control, 4 m	PT 445 401
Extension cable, 8 m	PT 445 402
<b>External test leak</b>	
CT 408, He-Test leak rate approx. $10^{-8}$ mbar l/s, DN 10 ISO-KF	B8 116 557
CT 446, He-Test leak adjustable $10^{-6}$ – $10^{-4}$ mbar l/s, DN 10 ISO-KF	B8 115 580
<b>Bypass option</b>	
with mains cable and German plug	PT 445 410-T
with mains cable UL plug	PT 445 412-T
<b>Cart for SmartTest</b>	
100–120 V, without pump	PT 445 416
230 V, without pump	PT 445 415
<b>Sniffer probe</b>	
LP 503, with standard tip, 3 m	BG 449 207-T
LP 505, with standard tip, 5 m	BG 449 208-T
LP 510, with standard tip, 10 m	BG 449 209-T
<b>Sniffer probe</b>	
CL 004, He, leak rate approx. $10^{-4}$ mbar l/s	BG 447 704-T
CL 004, He, leak rate approx. $10^{-5}$ mbar l/s	BG 447 705-T
CL 004, He, leak rate approx. $10^{-6}$ mbar l/s	BG 447 706-T
CL 002 A, Mixture He : H <sub>2</sub> = 95 % : 5 %, leak rate H <sub>2</sub> ca. $10^{-6}$ mbar l/s	BG 449 025A
<b>Software</b>	
Software for SmartTest Helium Leak Detector	PT 882 610-T
<b>Other accessories</b>	
Centering ring with poral filter DN 25 ISO-KF	PF 117 225-T
Connection flange (input) DN 16 ISO-KF to connect an external, additional backing pump	PM 043 687
Helium pistol	BG 512 125-T
Transport case for SmartTest, dimensions: 730 x 570 x 500 mm, weight: 18 kg	PT 445 403

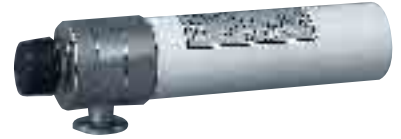
## Connections and interfaces for accessories



# Accessories



Remote control



External test leak



Software



Sniffer probe



Sniffer probe



Cart



Helium pistol

## Vacuum is nothing, but everything to us!

Pfeiffer Vacuum has been setting technological milestones for creating, measuring and analyzing vacuum for over 100 years. Our comprehensive product range covers individual components to complex vacuum systems.

Quality and service worldwide from the inventor of the turbopump: Pfeiffer is the international market leader with more than 250,000 turbopumps sold to date.

Take advantage of the opportunity for an on-site product presentation at your facility. It's the best way to experience the SmartTest in action!



All data subject to change without prior notice. PK 0084 PE (March 2005)

## Sales, consulting and service

- ▶ Worldwide on-site service
- ▶ Comprehensive training programs including at customer sites
- ▶ Modular service system ranging from spare parts to maintenance contracts



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