

REFRIGERATION INDUSTRY

Product Catalogue 2015

(3.000

ESA SERVICE srl

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At customer service since 30 years

ESA Service has been supplying plants and machines for refrigeration, automotive, mechanical and electrical industries since 1980.

Our strength is in our technicians' experience, advanced technology material and tools, reliability of machines, prompt and careful service.

Refrigeration Industry:

ESA Service supply a complete line of plants and machines for vacuum, leak detection by helium or other gas, refrigerant gas filling units, gas recovery systems, electric safety tests, performance tests on complete lines turnkey.

Automotive Industry:

ESA Service supply plants and machines able to detect leaks on car air-conditioning components, aluminium alloy wheels, fuel tanks, air bag and so on.

Electric and Mechanical Industry:

ESA Service supply helium leak detection systems for MV power switches, SF6 insulating gas filling units, recovery and purification of the same gas; leak detection systems for valves, tanks, filters and so on.

High quality:

ESA Service produce high quality plants and machines.

This is the reason why we are able to offer a wide range of guarantees.

Our standard warranty guarantees products without any faulty material or construction faults for one year from delivery.

In addition, the customer can extend the warranty period up to 2-3 years by purchasing a maintenance program including a new certification of the plants, instruments and machines previously bought.

Efficiency:

Our customers need to receive any plant and spare part in a very short time in order to reduce the costs of production stop. ESA Service is able to supply standard plants and spare parts in 24 hours. In case of failure to do this, ESA Service will bear the transport costs.

Training:

Quality of plants increases if operators are trained.

If you need a specific training for new plant applications, our factory can plan a special course in order to answer all your questions.

For ESA Service the constant collaboration with customer always comes first.



No components, devices or plants have perfectly tight welds. Perfect tightness does not exist. The unavoidable leak must be sufficiently small depending on the use; this means that it is necessary to define the value of the acceptable leak. In other words, a component can be considered tight for a specific use if the remaining leak is lower than the acceptable maximum leak value for that specific component.

A leak is a hole, a crack or porosity allowing the inlet or the leakage of a fluid from a container.

The main function of the leak detection is to locate and measure leaks from products that will contain a fluid or the vacuum.

The leak detection preferably uses non-destructive techniques.

There are various methods to check the tightness: from the emission of bubbles in water up to highly sophisticated systems using helium as tracing gas in sniffer or in vacuum.

The main considerations in choosing a method for tightness control are: sensitivity, reliability, easy use, the component to test, safety and cost.



Leak detection systems in comparison



The growing demand for tightness systems, elimination of returns, reduction of environmental pollution and an ever-increasing quality of an attentive and selective market, has produced new leak detection techniques.

The helium leak detection offers remarkable advantages in comparison with traditional methods, such as the air pressure drop or the bubbles test:

- More sensible method to detect leaks
- Reliable and objective sealing tests
- Quantity leak measurement also with sniffer method
- Sealing tests carried out in extremely safe conditions with pressure from 0.5 to 40 Mpa Marking of the positively tested pieces





Pressure and flow rate conversion table

	Pa N/m ²	bar	mbar	µbar dyn/cm²	Torr mm Hg	micron μ, mTorr	atm	at	mm WS	psi Ibf/inch ²	psf Ibf/ft ²
Ра	1	1 ·10 ⁻⁵	1 ·10 ⁻²	10	7.5 ·10 ⁻³	7.5	9.87 ·10 ⁻⁶	1.02 ·10 ⁻⁵	0.102	1.45 ·10 ⁻⁴	2.09 ·10 ⁻²
bar	1 ·10 ⁵	1	1 ·10 ³	1 ·10 ⁶	750	7.5 ·10 ⁵	0.987	1.02	$1.02 \cdot 10^{4}$	14.5	$2.09 \cdot 10^{3}$
mbar	100	1 ·10 ⁻³	1	1000	0.75	750	$9.87 \cdot 10^{-4}$	1.02 ·10 ⁻³	10.2	$1.45\cdot10^{2}$	2.09
µbar	0.1	1 ⋅10 ⁻⁶	1 •10 ⁻³	1	7.05 ·10 ⁻⁴	¹ 0.75	9.87 ·10 ⁻⁷	1.02 ·10 ⁻⁶	1.02 ·10 ⁻²	1.45 ·10 ⁻⁵	2.09 ·10 ⁻³
Torr	$1.33 \cdot 10^{2}$	1.33 .10-3	1.33	1330	1	1000	1.32 .10-3	1.36 ·10 ⁻³	13.6	1.93 ·10 ⁻²	2.78
micron	0.133	1.33 ·10 ⁻⁶	1.33 ·10 ⁻³	1.33	1 ·10 ⁻³	1	1.32 .10-6	1.36 ·10 ⁻⁶	1.36 ·10 ⁻²	1.93 ·10 ⁻⁵	2.78 ·10 ⁻³
atm	$1.01 \cdot 10^{5}$	1.013	1013	$1.01 \cdot 10^{6}$	760	7.6 ·10 ⁵	1	1.03	$1.03 \cdot 10^{4}$	14.7	$2.12 \cdot 10^{3}$
at	9.81 ·10 ⁴	0.981	981	$9.81 \cdot 10^{5}$	735.6	7.36 ·10 ⁵	0.968	1	1 ·10 ⁴	14.2	$2.04 \cdot 10^{3}$
mm WS	9.81	9.81 .10-5	9.81 ·10 ⁻²	98.1	7.36 .10-2	² 73.6	9.68 ·10 ⁻⁵	1 ·10 ⁻⁴	1	$1.42 \cdot 10^{-3}$	0.204
psi	6.89 ·10 ³	6.89 ·10 ⁻²	68.9	6.89 ·10 ⁴	51.71	5.17 ·10 ⁴	6.8 ·10 ⁻²	7.02 ·10 ⁻²	702	1	144
psf	47.8	4.78 ·10 ⁻⁴	0.478	478	0.359	359	4.72 ·10 ⁻⁴	4.87 ·10 ⁻⁴	4.87	6.94 · 10 ⁻³	1

	Pa m³/s	mbar I/s	Torr I/s	atm cm ³ /s	lusec	sccm	slm	Mol/s
Pa m³/s	1	10	7.5	9.87	7.5 ·10 ³	592	0.592	4.41 ·10 ⁻⁴
mbar I/s	0.1	1	0.75	0.987	750	59.2	5.92 ·10 ⁻²	4.41 ·10 ⁻⁵
Torr I/s	0.133	1.33	1	1.32	1000	78.9	$7.89 \cdot 10^{-2}$	5.85 ·10 ⁻⁵
atm cm ³ /s	0.101	1.01	0.76	1	760	59.8	5.98 ·10 ⁻²	4.45 ·10 ⁻⁵
lusec	1.33 .10-4	$1.33 \cdot 10^{-3}$	10 ⁻³	1.32 • 10 ⁻³	1	7.89 · 10 ⁻²	$7.89 \cdot 10^{-5}$	5.86 ·10 ⁻⁸
sccm	1.69 ·10 ⁻³	$1.69 \cdot 10^{-2}$	1.27 ·10 ⁻²	$1.67 \cdot 10^{-2}$	12.7	1	10 ⁻³	7.45 ·10 ⁻⁷
slm	1.69	16.9	12.7	16.7	$1.27 \cdot 10^4$	1000	1	7.45 · 10 ⁻⁴
Mol/s	2.27 ·10 ³	2.27 ·10 ⁴	1.7 ·10 ⁴	2.24 ·10 ⁴	1.7 •10 ⁷	1.34 ·10 ⁶	1.34 •10 ³	1

	cm	inch	ft		к	°C	F
cm	1	0.394	0.033	K	1	K-273.15	9/5 K-459.67
inch	2.54	1	0.083	°C	°C + 273.15	1	9/5 °C + 32
ft	30.48	12	1	F	5/9 (F + 459.67)	5/9 (F-32)	1

°C	F
100	212
80	176
60	140
40	104
20	68
0	32
-20	4
-40	-40



CONVERSION TABLE

Elio	R134a	R600a
[mbarl/s]	[g/a]	[g/a]
1,00E-06	0,223	0,199
2,00E-06	0,445	0,398
3,00E-06	0,668	0,596
4,00E-06	0,891	0,795
5,00E-06	1,114	0,994
6,00E-06	1,336	1,193
7,00E-06	1,559	1,392
8,00E-06	1,782	1,590
9,00E-06	2,004	1,789
1,00E-05	2,227	1,988
2,00E-05	4,454	3,976
3,00E-05	6,682	5,964
4,00E-05	8,909	7,952
5,00E-05	11,136	9,940
6,00E-05	13,363	11,928
7,00E-05	15,590	13,917
8,00E-05	17,817	15,905
9,00E-05	20,045	17,893
1,00E-04	22,272	19,881
2,00E-04	44,543	39,761
3,00E-04	66,815	59,642
4,00E-04	89,087	79,523
5,00E-04	111,359	99,404
6,00E-04	133,630	119,284
7,00E-04	155,902	139,165
8,00E-04	178,174	159,046
9,00E-04	200,445	178,926

Reference temperature 20°C



VEAMATIC, helium leak detection system, measurement principle



Component is connected to the VEAMATIC helium charging system, while GAS TRAP pliers are positioned on joints or weldings to be tested. Then it is evacuated and controlled by pressure-rise method. If this first control is ok, component is pressurized with helium and CAMPIOS instrument provides to manage the test sequence: all the GAS TRAP pliers are connected, one by one, to the mass spectrometer, which will detect presence of helium due to a leak. At the end of the sequence CAMPIOS will give a Good or No Good signal.

Minimum detectable leak:

till $3x10^{-6}$ mbar l/s of helium equal to to 0,5 g/y of R134a.



FINELEAK measurement principle in vacuum chamber



- 6. Sniffer
- 7. Helium leak detector
- 8. Vacuum pump for chamber
- 9. Vacuum pump for component

The component to be tested is placed inside the vacuum chamber and connected to the helium supply system, then it is evacuated from the atmospheric pressure and pressurized with the helium.

The vacuum chamber is also evacuated and, when the total pressure has reached the correct rate, it is connected to the mass spectrometer, which will detect the presence of helium due to a leak.

System is able to detect leaks between 1x10-3 and 1x10-7 mbar l/s of helium.

Minimum detectable leak: till $5x10^{-7}$ mbar l/s of helium equal to 0,2÷ 0,5 g/y of R134A



ESA Service produces

Plants and machines for leak detection of: Iron evaporators Roll bonds Compressors **Complete refrigerators** Filters Valves Ice makers Condensers

Gas recovery systems

Refrigerant filling units and systems





PRODUCTS LEAK DETECTION by SNIFFER - VEA 1.1.1 - VEA 30 1.1.2 - VEAMATIC 1.2 - CAMPTOS 1.3 - CAMPIOS R 1.3.1 **LEAK DETECTION in VACUUM CHAMBER - FINELEAK** - AUTOMATIC PLANT FOR LEAK DETECTION ON IRON EVAPORATORS & ROLL BOND EVAPORATORS 2.1 - LEAK DETECTION ON ROLL BOND EVAPORATORS 2.2 - AUTOMATIC PLANT FOR LEAK DETECTION ON NO-FROST EVAPORATORS 2.3 - LEAK DETECTION ON HEAT PUMPS & CONDENSING UNITS 2.4 - HELIUM LEAK TESTING MACHINE OF HEAT EXCHANGERS FLT 1/20 2.5 - HELIUM LEAK DETECTION IN VACUUM CHAMBER PLACED ON CONVEYORS 2.6 GAS RECOVERY SYSTEMS - REA HELIUM RECOVERY SYSTEMS - LOW PRESSURE 3.1 - REA HELIUM RECOVERY SYSTEMS - HIGH PRESSURE 3.2 - REA HELIUM RECOVERY SYSTEMS FOR REFRIGERANT GAS 3.3 **REFRIGERANT GAS FILLING UNITS** - ESAFILL 4.1 - ESAFILL HC 4.1.1 - IVEC 4.2 - CART VACUUM TEST 4.3 - CART VACUUM TEST STAND ALONE 4.4 - RP REFRIGERANT TRANSFER PUMP 4.5 PERFORMANCE TEST - PERFORMANCE TEST 3T1 5.1 - FUNCTIONAL TEST 5.2 SAFETY TEST - MP500 SAFETY TESTING EQUIPMENT 6.1 ACCESSORIES - COMBUSTIBLE GAS LEAK DETECTOR GAS-MATE 7.1 - HELIUM LEAK DETECTOR PHD-4 7.1.1 UL300 7.1.2 PROTEC 7.1.3 - LEAK DETECTORS FOR REFRIGERANT GAS HLD5000 7.2.1 7.2.2 D-TFK GASCheck 7.2.3 ECOTEC 7.2.4 SNIFFER HS 7.2.5 - HELIUM CALIBRATED LEAKS PTL60 7.3.1 RL - REFRIGERANT GAS CALIBRATED LEAKS 7.3.2 SSL 7.3.3 RLD-Check 7.3.4 - GAS TRAP PLIERS GAS TRAP 7.4.1 - VACUUM GAUGE CONTROLLER DM300 7.5.2 - DISPLAY CONTROLLER VACUUM AND PRESSURE TM3 7.5.3 - DISPLAY CONTROLLER VACUUM, PRES. & TEMP. тм8 7.5.4 VP2010 - VACUUM GAUGE 7.5.5 - CAPILLARY FLOW RATE METER P2000 7.6.1 - VOLUME METER VM1 7.7.1 - VOLUME CALIBRATOR VC2 7.7.2 - HELIUM DRYER HELIDRY 7.8.1 - HELIUM ANALYSER HELITEST 7.9.1 - MOISTURE MEASURING DEVICE MMD 7.10.1 - GAS AREA MONITOR GAM 7.11.1 - SUCTION AIR SUCTION AIR 7.11.2 - THERMOSTAT TESTING STATION TTS 7.12.1 - TEST RESULT PROGRAM TS 7.13.1 - VACUUM GAUGE CALIBRATION UNIT 7.14.1 - THERMOSTAT LIFETIME TESTING SYSTEM 7.15.1 - REFRIGERANT GAS MONITOR R-GARD 7.16.1 - DROP PRESSURE LEAK DETECTION **MICROCHECK 1000** 7.17.1

Technical data subjected to modifications without notice

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LEAK DETECTION by SNIFFER

1.1.1

VEA – VACUUM HELIUM NITROGEN



VEA unit has the aim to test the hermetic sealing of a refrigerator circuit or a component.

VEA is a very simple and versatile instrument, adaptable to all the operating needs thanks to the chance to set the machine cycle and the use of work codes.

WORKING CYCLE

The circuit to be tested is connected to the **VEA** helium charging system, then it is evacuated and tested by pressure-rise method.

If this first control is positive, the circuit is pressurized with helium: when the unit gives the signal that helium has been charged, operator can check, by using a manual sniffer, the tightness of all the probable leakage points (welding, joints, etc.).

The leak detector will signal, by an optical and acoustic alarm, if a leak has been found. The system is able to detect leaks between 5x10-3 and 5x10-6 mbar l/s of helium, equal to leaks between 1000 and 1 g/year of R134a.

Depending on the model, it is possible to enable other tests like capillary flow rate, obstruction and dry air pressurization.

TECHNICAL DATA

Leak rate:	
By Gas Trap	5x10 ⁻⁶ mbar I/s of He
By sniffer	1÷2 g/y of R134a
Product codes to be set	20
Refrigeration circuit	18 different models
Cycle time	30÷50 sec/pcs depending on the piece

VEA unit can be connected to automatic leak detection units CAMPIOS and helium recovery units REA

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LEAK DETECTION by SNIFFER

VEA30 – VACUUM HELIUM NITROGEN



VEA unit has the aim to test the hermetic sealing of a refrigerator circuit.

VEA is a very simple and versatile instrument, designed to be integrated in the refrigerators production line.

Aim of the proposed system is to perform the helium leak test on complete domestic refrigerators, before the refrigerant gas charge.

WORKING CYCLE

The system is composed by three workstations, each one performing a part of the complete test:

- Station 1: evacuation, coarse leak test and helium charge
- Station 2: leak searching by using sniffer leak detector
- Station 3: helium pressure control, helium discharge and recovery

On stations 1 and 3 the connection between the machine and the refrigerators is made by means of Hansen connectors: it is required that refrigerators comes on the station with the plug connectors already mounted on the service tubes. Other connection type are available on request. The system is able to detect leaks between 5x10-3 and 5x10-6 mbar l/s of helium, equal to leaks between 1000 and 1 g/year of R134a.

Depending on the model, it is possible to enable other tests like capillary flow rate, obstruction and dry air pressurization.

TECHNICAL DATA

Leak rate:	
By Gas Trap	5x10 ⁻⁶ mbar l/s of He
By sniffer	1÷2 g/y of R134a
Product codes to be set	20
Refrigeration circuit	18 different models
Cycle time	30÷50 sec/pcs depending on the piece

VEA unit can be connected to automatic leak detection units CAMPIOS and helium recovery units REA

1.2

LEAK DETECTION by SNIFFER



VEAMATIC machine can be used wherever is necessary an accurate control of

joints or weldings on tubes. The leak detection is automatic and objective because it does not depend on the operator but just on the machine.

The leak detection is carried out by the GAS TRAP pliers which are envelopped around the joints. The test stations can be 1, 2 or more.

WORKING CYCLE

The component is connected to the **VEAMATIC** helium charging system, while GAS TRAP pliers are positioned on joints or weldings to be tested. Then it is evacuated and controlled by pressure-rise method. If this first control is ok, all the GAS TRAP pliers are connected, one by one, to the mass spectrometer, which will detect presence of helium due to a leak. At the end of the sequence the system will give a Good or No Good signal. System is able to detect leaks up to 9 points in a full automatic way, as a consequence there is a consistent time saving.

By using GAS TRAP pliers, which enclose completely the joint or welding to be tested, it is possible to detect the leak on its whole surface, with a better accuracy comparing to the manual sniffer system.

AVAILABLE TESTS

- coarse leak detection;
- circuit obstruction check;
- fine leak automatic detection;
- capillary flow rate meeasure.

TECHNICAL DATA

Leak rate	0,2 ÷ 1 g/y of R134a
Gas trap number	from 1 to 9 or more on demand
Product codes to be set	100
Refrigeration circuit	18 different circuits or more
Cycle time	30÷50 sec/pc depending on the model
Test stations	2 or more linked each other

VEA unit can be connected to helium recovery units REA

LEAK DETECTION by SNIFFER

CAMPIOS



The **CAMPIOS** unit is an instrument for the fine leak detection in an automatic way to look far and find leaks on the refrigerating circuits that have tram 3 to 9 (or more) welding points, by the help of The sealing test with **CAMPIOS** is absolutely objective and is not all influenced by the actions of the operator.

CAMPIOS can work independently or interfaced with the VEA unit above described. The leak values (set point) that have been fixed according to the customers specifications, con be set in a very simple and easy way on the leak detector. The sensitivity of the **CAMPIOS** is $0,5 \div 1$ g/a of R134a.

HOW TO WORK

The operator connects the GAS TRAP pliers on the welding spots and **CAMPIOS** begins to sniff the helium from the leak where there is one.

At the end of the leak detection special signals lamps indicate the welding point where there is a leak and a sound signal informs the operator that there is a leak.

The operator takes off the GAS TRAP pliers.

With CAMPIOS you can reach and fulfil the following aims:

- An automatic objective leak detection method that does not depend any more on the operator.
- A better and lager sensitivity to the leakin comparison with a manual sniffer.
- Shorter leak detection times, especially when the spots to check are more than 3.
- The welding points to be checked by a **CAMPIOS** system are max 9.

TECHNICAL DATA







CAMPIOS R

1.3.1



In order to meet the customers increased demand for higher sensitivity leak detection method, optimization of cost production, quality increasing and leak reduction of refrigerant gas through the welded joints of piping, ESA Service developed the **CAMPIOS R** for the automatic leak detection on joints during the production process, both in assembly and pre-assembly line.

CAMPIOS R increases the sensitivity of leak detectors, ensures a complete traceability of refrigerators and sub-assembled components through the complete manufacturing process. It detects the leak all around the joints in automatic mode; it is not the operator to decide if there is a leak but it is the Campios R.

Its sensitivity can arrive up to $0,1\div0,3$ g/y of R134A or R600A.

Campios R works in combination with a leak detector, and it can detect all gases like Helium, refrigerant gas, etc.

Applications

The Campios R is designed for the leak detection on:

- Refrigerators
- Bottle coolers
- Display units
- Heat pumps
- Air conditioners
- Components

Mode of work

Automatic mode with use of standard Gas Trap or HS (patented)

The operator selects the product to be tested through barcode reader or by the VT; so the gas trap pliers, corresponding to that product code, are enabled.

The enabled pliers light; the operator places them on the joints to be tested and the sniffing cycle automatically starts.

When the test is finished, a Green lamp OK (good) or a Red lamp NOK (reject) is shown and the flashing of a light on the gas trap informs the operator that gas trap can be removed.

After removing the gas trap, its cycle is reset while the result lamp stays switched on until a new cycle starts.



Leak detection time in automatic mode on 5 joints:

Positioning of 5 gas trapsfrom 5 to 10 sec depending on the gas trap typeLeak detection time10 secDisconnection of gas traps5 secTotal time for 5 gas traps20÷25 sec

Manual mode

The operator carries out the detection of leaks by a manual sniffer. It is the operator that decides if the tested piece is OK or NOK.

Advantages

- Verification of joints tightness after filling with refrigerant gas by gas trap for a complete leak free
- Higher sensitivity: until 0,1 g/y of refrigerant gases
- Automatic leak detection which is not influenced by operator
- Faster leak detection
- Full traceability
- Image guidance for operator (about the positioning of gas trap) according to the type of refrigerator in analysis
- Very small structure to put anywhere, upper or down, the conveyors
- Several types of gas traps, universal and specific according to the joint type
- Auto-calibration of the system by a standard leak at the nominal reject value

Optional

- □ Bar code reader for setting the product code
- Gas trap pliers depending on the dimensions of joints



TECHNICAL DATA

Sensitivity with gas trap	0,1÷ 0,3 g/y of R 600A /R134A		
Working mode	Automatic:Use of gas trapManual:Use of manual snifferFast:2 sec per jointsHigh sensitivity:5 sec per joints		
Configuration	- No. of gas trap pliers: from 1 to 9 - Mass spectrometer: Ecotec 2; Ecotec 3000; others on request		
Selectable code	By bar code reader or manually		
Self-diagnosis	included		
Parameters	to be set from Videoterminal		
Campios R calibration and sensitivity check	by certificated standard leak at the nominal reject value		
Auto-calibration	included		



LEAK DETECTION IN VACUUM CHAMBER - FINELEAK 2.1

FINELEAK units are plants with two vacuum chambers for overall leak detection (i.e. on all the component to be tested) and total leak detection (i.e. the total amount of all the leaks) on evaporators, roll-bond, compressors, refrigerator circuits, etc.

FINELEAK for IRON EVAPORATORS AND ROLL BOND EVAPORATORS



Two opposite vacuum chambers with indipendent pumping group. Two or more evaporators tested on each chamber in the same time. Detection of piece with leakage. Flow rate capillary test.

WORKING CYCLE

Component to be tested is placed inside the vacuum chamber and connected to the helium supply system, then it is evacuated from the atmospheric pressure and pressurized with the helium. The vacuum chamber is also evacuated and, when the total pressure has reached the correct rate, it is connected to the mass spectrometer, which will detect the presence of helium due to a leak. At the end of leak dtection, the helium is discharged (or recovered) and the flow rate capillary test is carried out.

While a chamber is running for a test, the operator unloads the evaporators already tested and loads the ones to be tested in the other chamber.

TECHNICAL DATA

Leak detection method	overall
Test pressure	from 10 to 30 bar
Reject leak	0,2 ÷ 0,5 g/y ofi R134a or R600
Tracer gas	100% helium or mixture
Cycle time	30" ÷ 50"
Productivity	1 pc every 15" ÷ 30"

Predisposed for the connection to REA helium recovery units

LEAK DETECTION IN VACUUM CHAMBER - FINELEAK

FINELEAK for ROLL BOND EVAPORATORS 2.2



Single vacuum chamber. Contemporaneous leak test of 2 or more evaporators. Marking of the pieces tested in case of good result. Determination of the piece with leakage. Flow rate capillary test.

WORKING CYCLE

Component to be tested is placed inside the vacuum chamber and connected to the helium supply system, then it is evacuated from the atmospheric pressure and pressurized with the helium. The vacuum chamber is also evacuated and, when the total pressure has reached the correct rate, it is connected to the mass spectrometer, which will detect the presence of helium due to a leak. At the end of leak dtection, the helium is discharged (or recovered) and the flow rate capillary test is carried out.

TECHNICAL DATA

Leak detection method	overall
Test pressure	6 bar
Tracer gas	100% helium
Reject leak	0,5 g/y of R134a or R600
Cycle time	30" ÷ 60"
Productivity	1 piece every 15"



LEAK DETECTION IN VACUUM CHAMBER - FINELEAK

FINELEAK for NO-FROST EVAPORATORS 2.3

Single Vacuum Chamber







LEAK DETECTION IN VACUUM CHAMBER - FINELEAK

LEAK DETECTION ON HEAT PUMPS & CONDENSING UNITS

2.4



WORKING CYCLE

Component to be tested is placed inside the vacuum chamber and connected to the helium supply system, then it is evacuated from the atmospheric pressure and pressurized with the helium. The vacuum chamber is also evacuated and, when the total pressure has reached the correct rate, it is connected to the mass spectrometer, which will detect the presence of helium due to a leak. At the end of leak detection, the helium is discharged (or recovered).

TECHNICAL DATA

Leak detection method	overall
Test pressure	from 10 to 30 bar
Reject leak	0,2 ÷ 0,5 g/y ofi R134a or R600
Tracer gas	100% helium or mixture
Cycle time	90″



LEAK DETECTION IN VACUUM CHAMBER

Helium Leak Testing Machine of heat2.5exchangers Fineleak Tester FLT 1/20



Single or double vacuum chamber to test heat exchangers Manual loading and unloading of heat exchangers Manual opening and closing of chamber cover Marking of the pieces tested in case of good result Determination of the piece with leakage

WORKING CYCLE

The heat exchangers are loaded in a vacuum chamber and connected to the couplings.

The chamber cover is closed and the test starts: the pieces are evacuated and pressurized with helium. The chamber is also evacuated and, when the total pressure has reached the right rate, it is connected to a mass spectrometer which will detect the presence of helium due to a leak.

At the end of leak detection, the helium is discharged or recovered.

2.5

LEAK DETECTION IN VACUUM CHAMBER

Helium Leak Testing Machine of heat exchangers Fineleak Tester FLT 1/20

TECHNICAL DATA

Leak detection method	overall
Test pressure	40 bar (others on request)
Tracer gas	helium
Pieces to be tested	heat exchangers (copper tubes)
Reject leak	1x10E-5 mbar l/sec 3x10-6 mbar l/sec
Cycle time	50 sec for 2 pieces (less time on request)
N° of operators	1
Test chamber	$N^{\circ}1$ (extendable to 2) – each chamber is able to test 2 pieces
Connectors	Special with high tightness

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FINELEAK

Helium leak detection in vacuum chamber - Chamber placed on conveyors -

2.6



Leak detection machine to test little and big units in vacuum chamber using helium as tracer gas.

The chamber is located in the production conveyor.

WORKING CYCLE

The unit to be tested is carried in the vacuum chamber manually or automatically. The units are connected to the bench through flexible pipes and quick connectors manually or automatically.

TECHNICAL DATA	
Piece to be tested	Refrigeration units; MV and HV power switches; Valves; etc.
Working pressure	10÷50 bar of helium
Reject leak	0,5 g/a of helium
Cycle time	From 15 sec
No. of operators	1
Vacuum chambers	No. 1 for 1 or 2 pieces per time
Opening and closure of chamber	Manual or automatic

SAS RECOVERY SYSTEMS

HELIUM RECOVERY MACHINE LOW PRESSURE

3.1



REA 1001

The helium recovery systems REA find their application on all those situations where the helium consumption of the leak testing plants is particularly high.

From the leak testing plant, which the REA unit is always connected to, helium used for the tests is recovered, filtered and finally compressed in a reservoir, where it will stay at disposal for the next test, at the required pressure. Helium concentration is kept under control by an analyzer, and it is restored by adding pure helium if needed.

The REA unit keeps always on vacuum the suction tube and on pressure the delivery tube, so the helium is available in any moment, at the desired pressure.

When the leak testing unit discharges the helium, REA provides to carry out recovery, filtration and compression in the delivery reservoir. Helium concentration is always kept under control by an analyzer. If the measured value goes under an alarm level, pure helium is inlet in order to restore the concentration to a pre-set value.

- CERTIFIED ACCORDING TO PED NORMS



3.1

HELIUM RECOVERY MACHINE – LOW PRESSURE

COMPOSITION OF REA 1001 UNIT

- Compressors, reservoirs, pressure regulator, valves, filters
- Electric switchboard controlled by PLC

OPTIONS

- Helium dryer HELIDRY
- Air dryer AIRDRY
- Helium consumption measuring device HCC
- Helium concentration analyzer HELITEST
- Available models REA 1001

Models	Helium Recovery system	Helitest	Helidry	Airdry
REA1001	X			
REA1001A	X	Х		
REA1001AD	X	Х	Х	
REA1001AD1	X	Х	Х	Х

	REA 20A	REA 30A	REA 1001A
Power installed	2,5 KW	4,5 KW	6 KW
Max Helium pressure	10 bar	15 bar	25 bar
Suction pressure	10 mbar	10 mbar	10 mbar
Recovery rate efficiency	95%	98%	98%
Nominal capacity	60 NI/min	90 Nl/min	150 Nl/min
N° leak testing connectable units	Till nominal capacity		
Dimensions	$130 \times 200 \times 130 \text{ cm}$	130 x 250 x 130 cm	240 x 210 x 110
	130 X 200 X 130 Cm	130 X 230 X 130 CIII	cm
Weight	250 kg	700 kg	800



GAS RECOVERY SYSTEMS

3.2

HELIUM RECOVERY MACHINE – HIGH PRESSURE



The mixture helium-air, coming from the leak detection units, is sucked by REA 60HP/C because of the pressure difference between the piece tested and the reservoir in vacuum.

When the gas in the high pressure reservoir goes down the fixed quantity, the helium-air mixture is recovered by HELYMIX. This gas is pumped by the compressors in the high pressure reservoir. The maximum helium pressure is 60 bar. The helium used for test is sent from the high pressure reservoir to the leak detection plants VEA or FINELEAK.

REA 60HP/C includes a helium concentration measuring device, HELITEST, that assures a continous control of the helium concentration used during the test and a helium-air mixture device HELIMIX allowing to top up at a controlled concentration.

COMPOSITION

- Reservoir
- Compressors
- Helium cylinder for topping with reducer (optional)
- HELITEST: helium concentration measuring device
- HELIMIX: helium-air mixture device (setable concentration)
- Helium dryer HELIDRY
- Air dryer AIRDRY
- Helium consumption measuring device HCC
- Electric switchboard controlled by VT

	REA 60 HP	REA 120 HP	REA 300 HP
Max Helium pressure	60 bar	100 bar	300 bar
Suction pressure	10 mbar	10 mbar	10 mbar
Recovery rate efficiency	98%	98%	98%
Nominal capacity	200 NI/min	200 Nl/min	400 NI/min
Helium concentration analyser	By thermal	By thermal	By thermal
	conductivity	conductivity	conductivity
Reservoir certificates	included, according to PED norms		
N° leak testing connectable units	Till nominal capacity		
Certification	PED		

GAS RECOVERY SYSTEMS

3.3

RECOVERY UNIT FOR REFRIGERANT GAS RGR F188010



This unit is used in the refrigeration and air conditioning industry to recover the refrigerant gas from the circuits previously charged.

This has to be done mainly in the maintenance stations when it is needed to carry out a reparation on a defective product, so it is necessary to discharge the circuit. By using the recovery unit, it is possible to avoid the pollution coming from discharging the refrigerant gas in the environment.

This unit is also useful to recover the refrigerant gas that has been used for the check of ESAFILL filling.

The recovery unit is provided with one suction line and three delivery lines: through these ones, the refrigerant gas (which is partially in liquid phase and partially in gaseous phase) can be recovered and sent to the storage bottles. The suction line, as well as the delivery lines, is provided with a manual valve to connect and disconnect the tubes. Pressure is controlled in both circuits by the means of pressure switches and displayed on two pressure gauges located on the front panel of the unit.





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GAS RECOVERY SYSTEMS

3.3



TECHNICAL DATA

Working mode	automatic
Recovery nominal capacity	50 NI/min
Recovering gas	HFC HCFC
Main voltage	230V – 50 Hz
Power consumption	1 kW
Protection	IP 45
Working temperature	10÷40 °C
Dimensions	mm 600 x 600 x 600
Weight	60 kg

High precision Refrigerant Gas Filling Unit for production lines and laboratory

ESAFILL

4.1



Vacuum and filling unit for refrigerant gases HFC and HCFC, ESAFILL finds his application in domestic refrigerators and freezers, ice makers, chillers, air conditioning industry, both on production bay and in laboratory.

The unit provides to make vacuum inside the circuit, carries out a coarse leak test by pressure rise method, then goes on with the refrigerant charge.

TECHNICAL DATA

Vacuum pump	2 stages of 16 m3/h; others on demand
Charging precision	± 1% or 0,5% ± 2 g for measures higher than 200 g
Charging guns	HANSEN 1/4" - 3/8" Female
Measuring devices	3 year warranty without maintenance
Chargeable refrigerant gases	HFC- HCFC (e.g. R134a, R141b, R407c, R410a) HC (R600, R290a) ATEX version
N° guns	from 1 to 4

Optional

Printer, bar code reader; RP transfer pump; simultaneous working cycles; GAM gas area monitor; Suction Air ventilation system.

CO-1-O-ENG-CM



ESAFILL HC for green gases R600a/R290a

4.1.1



TAILOR-MADE INJECTOR



ESAFILL HC UNIT

The ESAFILL HC is a unit for loading refrigerating gas into refrigerator circuits. It is particularly used in the following industries: domestic refrigerators, freezers, refrigerated counters and display cases.

ESAFILL HC is completely automatic apart from the process of connecting the injector to service tube of the circuit to be filled.

ESAFILL HC can be used:

-for small factory units/laboratories (evacuation/check on leak-tightness/gas-filling or replenishment) -inserted into a production line involving circuits already evacuated (check on leak-tightness/ gas-filling) With ESAFILL HC it is possible to use up to two different types of gas (of which at least one must be of the HC family), and up to 4 injectors.

All components are EX certified.

VT – CART VACUUM TEST

4.3

C61-1-0-ENG-CM



VT Cart Vacuum Test finds application on production lines of refrigerators and air conditioners, where provides to evacuate the refrigerant circuit before the charge of refrigerant gas.

System is composed by double stage rotary pump, comprising exhaust gas filter, vacuum-meter, condensate trap, connection system to the circuit to be evacuated.

A control threshold of the final total pressure, displayed on the analogic gauge, can be set and a green light will show that this value has been reached.

Working cycle can be integrated with a gross leak test, made by pressure rise method.

The double-stage vacuum pump assures high reliability and fast pumping speed

TECHNICAL DATA

Vacuum pump	Double stage
Nominal pumping speed	18,9 m ³ /h
Real pumping speed	16,5 m ³ /h
Maximum partial pressure	<1x10-4 mbar
Maximum total pressure with gas ballast	<2x10-3 mbar
Connection	Hansen 1/4" F; 1 or 2

EVACUATION – CAR

4.3



The Evacuation - CAR is designed **for carousel**. The Evacuation - CAR finds application on production lines of refrigerators and air conditioners, where provides to evacuate the refrigerant circuit before the charge of refrigerant gas.

System is composed by double stage rotary vaccum pump, comprising exhaust gas filter, vacuum gauge, condensate trap, connection system to the circuit to be evacuated. Working cycle can be integrated with a gross leak test, made by pressure rise method. When a leak is detected the red lamp lights up. The double-stage vacuum pump assures high reliability and fast pumping speed

TECHNICAL DATA

Vacuum pump	Double stage
Nominal pumping speed	18,9 m ³ /h
Real pumping speed	16,5 m ³ /h
Maximum partial pressure	<1x10-4 mbar
Maximum total pressure with gas ballast	<2x10-3 mbar
Connection	Hansen 1/4" F
EVACUATION-CAR 1	
Connection number:	1 - vacuum from 1 side
EVACUATION-CAR 2	
Connection number:	2 - vacuum from 2 sides

C61-3-1-ENG-CM

VT – DMR300

4.3



VT-DMR300 is designed for vacuum test in static applications. VT-DMR300 finds application on production lines of refrigerators and air conditioners, where provides to evacuate the refrigerant circuit before the charge of refrigerant gas. For vacuum test in static applications.

Vacuum group, to make the vacuum in the refrigerator before charging the refrigerant gas. The system is composed by double stage rotary vacuum pump, with exhaust gas filter, vacuum-gauge, condensate trap, connection system to the circuit to be evacuated.

The double-stage vacuum pump assures high reliability and fast pumping speed

LEAK DETECTION

The vacuum gauge combined with vacuum valve provide a leak detection facility to select the refrigerators with leak.

The start of the test cycle is automatic and the cycle time is programmable from the touch screen video terminal.

At the end of the time the vacuum goes on and is displayed the result OK or not OK.

COMPOSITION

N.1 - Vacuum pump

- N.1- Vacuum meter. Digital with touch screen display Time and thresholds programmable
- N.1- Exhaust gas filter
- N.1 Condensate trap
- N.1- Vacuum valve

TECHNICAL DATA

Vacuum pump	Double stage
Nominal pumping speed	18,9 m³/h
Real pumping speed	16,5 m ³ /h
Maximum partial pressure	<1x10-4 mbar
Maximum total pressure with gas ballast	<2x10-3 mbar
Connection	Hansen 1/4" F
VT-DMR300-1	
Connection number:	1 - vacuum from 1 side
VT-DMR300-2	
Connection number:	2 - vacuum from 2 sides

C61-4-0-ENG-CM

VACUUM CART STAND ALONE

4.4



Vacuum Cart stand alone provides to evacuate the refrigerant circuits and detect leaks in a set time.

System is composed by double stage rotary pump, comprising exhaust gas filter, vacuum-meter, condensate trap, connection system to the circuit to be evacuated. A control threshold of the final total pressure, displayed on the analogic gauge, can be set and a green light will show that this value has been reached.

Cart Vacuum is complete of electrical cabinet and protection systems for vacuum pump.

The coarse leak detection system is highly selective.

TECHNICAL DATA

Vacuum pump	Double stage
Nominal pumping speed	18,9 m³/h
Real pumping speed	16,5 m³/h
Maximum partial pressure	<1x10-4 mbar
Maximum total pressure with gas ballast	<2x10-3 mbar
Connection	Hansen 1/4" F; 1 or 2
Vacuum and leak detection time	Adjustable

RP REFRIGERANT TRANSFER PUMP 4.5



RP transfer pump for refrigerant gases finds application on assembly lines of refrigerators and air conditioners, where provides to transfer refrigerant gas, in a pressurized liquid phase, from bottles or storage tanks to the distribution pipework or directly to the charging units.

Pumping system is volumetric: two balanced pistons working in opposition of phase, driven by means of a single double-effect pneumatic piston.

The **RP** exclusive design and extremely compact dimensions allows, with only one regulation device, to get the same delivery pressure from both pumping pistons.

The special design and geometry of the piston heads, together with the delivery valves, guarantees an extremely high efficiency and very good performance, even after long continuous work operations.

RP transfer pump is suitable to work in both continuous and discontinuous mode. In absence of refrigerant flux, it assures the set overpressure in the delivery line without consumption of compressed air.

It is available in two versions RP500 and RP900, depending on the requested pumping capacity.

SPECIAL VERSION FOR HC REFRIGERANT GAS

The special versions RP 500HC and RP 900HC have been specifically developed for pumping of HC refrigerants: special dynamic seals allow to isolate and collect potential leak of flammable gas, avoiding risk coming from dispersion of the refrigerant in the compressed air line or in the environment. RP pumps in this version are designed to operate in combination with the gas monitoring system of the working area.

f	for HC (hydrocarbons)	
Functioning	Totally pneumatic	
Max refrigerant throughput (HFC,	RP 500: 3,5 kg/min	
	RP 900: 6 kg/min	
Volumetric capacity	RP 500 = 500 cc RP 900= 900cc	
Type of refrigerant gases	HFC ; HCFC ; HC	
Compressed air supply	From 2 to 5 bar	
Weight	RP500 = 45 Kg; RP900 = 55Kg	

AVAILABLE MODELS : for HFC- HCFC



FUNCTIONAL TEST

5.2



FT equipment is designed to run functional tests on electrical equipment, in particular domestic appliances or commercial refrigerators. It consists of several DA Acquisition "DA-01" and a control unit placed near the products under test.

FT measures data from the product under test, identifies the product references parameters, decides the test program and then compares the data in order to decide whether the unit has passed the test or not.

All data are stored in order to comply with the standard specifications. At the end of the cycle, **FT** displays the results of test and declares the production.



MAIN FEATURES

- Suitable both for static that for carousel
- Communication by Ethernet, wireless or IR
- Up to 140 stations connectable
- Compensation of environment temperature
- Models recognition by barcode reader
- Self-learning system

The comparison between the measured parameters and the test program is carried out The acquisition is done at a fixed period to be set up.

The system reads the functional parameters at a programmed time. It checks if the parameters are between T1 \pm x °C; I \pm x A.

TECHNICAL FEATURES OF BASIC MODEL

- PT100 for environment temperature acquisition

- 30 mA differential switch for operator safety; short circuit protection

- Temperature range: -50°C to + 100 °C
- Temperature accuracy 1÷2°C
- Current range from 0,5 to 10 A
- Current accuracy +/-2% of range f.s.
- N.2-4 temperature probes, 5 meters flat cable, and integrated locking clips)
- Current sensor
- Power sensor
- Communication port
- Supply sockets for product under test
- Supply voltage: 230V 50HZ



MP500 SAFETY TESTING EQUIPMENT

6.1



MP500 testing equipment is a semiautomatic appliance coming in one portable metal box. Test sequences can be set up directly by the user.

The main features of the device under test (code number and serial number, by default) can be entered by keyboard or bar-code reading.

All the equipment is managed by microprocessor and can be connected to a remote Personal Computer for test management.

A functional check of the electrical safety tests can be run by using an external box containing certified components in order to make sure that all measurements are accurate **(optional)**.

MAIN FEATURES

- Firmware with the following main features:
- Set of testing programs
- Test management
- Alarm monitoring
- Visualisation of operator messages
- Print of test reports
- On board storage up to 200 programs and 100 test results
- Intuitive user interface with controls and test results available on the front panel
- LCD Display with back-light 4 x 16 characters

TESTS AVAILABLE

- Earth Connector Efficiency
- Electric Insulation
- Dielectric Strength
- Residual voltage
- Absorbed power



7.1

GAS-MATE COMBUSTIBLE GAS LEAK DETECTOR



GAS-Mate is a high-quality, economical and portable ags leak detector. It is perfect for checking leaks in residential and commercial combustion appliances, such as gas or propane fired heating systems, or gas pipelines.

With its rugged construction and high-impact case, GAS-Mate is a strong instrument.

Features

- Sensitive to 5 ppm methane (twice as sensitive as nearest competitor)
- Also detects natural gas, propane, butane, cyclopentane, ethane, ethanol, isobutane and ammonia
- Small sensor and prove tip permit leak checking in tighter places
- Auto zeroing for ignoring background gas levels in leak test area
- Variable audio alarm and flashing LED indicate leak strength
- Complete of storage case

TECHNICAL DATA

Sensitivity	5PPM methane
Opearting temperature	0°C - +45°C (50 °F - 113°F)
Storage temperature	-10°C - +60°C (14°F - 140°F)
Humidity	85% without condensation
Power supply	2 D-size alkaline batteries
Battery life	60 hours
Weight with batteries	0,7 kg
Probe	43 cm long
Dimensions	22,4x5,1x7,6 cm
Certifications	Atex

F19-8-0-ENG-CM

PHD-4 PORTABLE/FIX HELIUM LEAK DETECTOR



The PHD-4 is a portable or fix compact leak detector that can detect very small leaks in objects that have a slight helium/air pressure inside. It is sensitive to helium concentrations as small as 2 parts per million. That is equivalent to a leak rate of $5 \times 10-6$ atm-cc/sec, which is far superior to the performance of other means of detecting leaks, such as bubble-testing.

The PHD4 can run on its own battery for up to four hours. Weighing only 2.6 kg including the battery, it can be taken anywhere.

It can works also in a fix station with a suitable probe with a cable lenth of 5-10 meter.

Controlled by a microprocessor, the PHD-4 is easy to use. No training is required. All tuning and zeroing are handled automatically. The display can be set to use any of four languages (English, French, German, and Italian).

The basic PHD-4 package includes:

- PHD-4 basic module
- Transformer/battery charger (115V-240V)
- Carrying strap
- 15-pin I/O connector
- Instruction manual on CD-ROM

OPTION

- Spare battery
- Travel case
- Probe set

TECHNICAL FEATURES

Lowest Detectable Helium Concentration:	2 ppm (parts per million)
Lowest Detectable Helium leak:	5 x 10-6 mbar l/s 5 x 10-7 Pa m3/s
Response Time:	< 2 sec
Recovery Time:	<10 sec (from 50 ppm to 0 ppm)
Start up time, including self check-up:	3 min approx.
Power Supply:	12 Vdc, 1.2 A / 230v 50 Hz
Battery operation Time:	4 hours
Maximum Signal Drift:	10 ppm/10 min
Operating Conditions Temperature:	+5°C to +35°C
Humidity:	90% maximum relative humidity
Weight:	2,6 Кд



L300 HELIUM LEAK DETECTOR

7.1.2



L300 leak detectors set new standards for modern and up-to-date leak detection. The L300 excels through ruggedness, rapid entry into the measurement mode, high measurement accuracy and reliability as well as flexibility of use. Being a mobile helium leak detector, the L300 is equally suited for use on mass production lines and service work.

It excels through its rapid entry into the measurement mode and an extremely short response time thereby fulfilling

the requirements of industrial series production testing – for example in the refrigerating and air conditioning industry.

The oil-free gas admission system allows the use of this leak detector in testing of optical systems, in analytical systems or in the semiconductor industry.

MODE OF WORK

- Vacuum operation

Upon request, our application consulting department is prepared to customise the L 300 also in response to specific customer specifications.

- Sniffer operation

In connection with the corresponding accessories, the leak detector may be operated as a sniffer

leak detector.



OPTIONS

- Partial flow pump set

The L300 Modul is suited for leak testing large volume vessels. In combination with a partial

flow pump set, the L300 can also be equipped for such applications offering leak rate measurements starting at 1000 mbar

- Remote control

The optional remote control unit is equally suited for right handers and left handers The L300 helium leak detectors are so-called counterflow leak detectors which contain many well proven own

- Calibrated leak

Integrated calibrated leak and automatic calibration 1xE-7 mbar l/sec

- Leak Ware

Software for PC connection in order to record the leak rate measured on a database and print a certificate

APPLICATION

- Quality assurance in production lines for leak detection by helium
- High and ultrahigh vacuum technology

TECHNICAL DATA

		L 300
Lowest detectable helium leak rate Vacuum operation	mbar l/s	≤ 5 x 10-12
Sniffer operation	mbar l/s - ppm	≤ 1 x 10-7 - ≤0,1÷100.000
Maximum measurable helium leak rate		
Vacuum operation	mbar I/s	> 0.1
Measurement ranges		12 decades
Selectable mass	m	2 – 3 - 4
Maximum permissible inlet pressure	mbar	15
Trigger thresholds	n	3
Pumping speed during pumpdown 50 Hz/ 60 Hz	m3/h	2.5
Helium pumping speed in the vacuum mode	l/s	> 2.5
Time constant for the leak rate signal	S	< 1
Time until ready for operation	min	≤ 2
Power consumption	VA	420
Inlet flange	mm	DN 25 KF
Dimensions (W x H x D)	mm	495 x 456 x 314
Weight	kg	40



7.1.2

L300

PERFORMANCE

- Maintenance friendly concept the mechanical connections have been separated from the electrical connections and have each been arranged in a protected connection strip
- Extremely long service life of the cathodes due to their Iridium/Yttrium coating; two ion sources with two automatically switchable cathodes
- Faster detection times through an averaging method which adapts itself dynamically to the leak rates
- > Leak detection starting at an inlet pressure of 15 mbar
- ➤ The leak detector may be moved to a different location immediately (≤ 30 s) after switching off
- > Transportation in any orientation
- > R134a equivalent leak rate readout
- High helium pumping speed 2.5 l/s
- Data output and external driving analog / RS 232
- The preamplifier of the mass spectrometer is located in a hermetically sealed metal enclosure and is thereby protected against external influences like humidity in the air, for example

MAINTENANCE-FRIENDLY

The design of the L300 is such that all components can be accessed rapidly when maintenance becomes necessary.

• The internal arrangement completely separates the mechanical from the electrical and electronic subassemblies.





service

ACCESSORIES FOR LEAK DETECTION

PROTEC P3000 HELIUM LEAK DETECTOR

7.1.3



Protec P3000 Helium Leak Detector is specifically designed for full-time sniffing applications.

MODE OF WORK

The Protec P3000 is very tolerant of variations in operator technique. It detects leaks at a greater distance from the leak location, and the sniffer tip can be moved faster without missing leaks. A search mode allows operators to quickly scan for leaks. If any are detected, they can be easily localized.

When a leak exceeding a preset rejection rate is detected, multiple alarms provide an indication that can not be overlooked. The background color of the sniffer probe display changes from green to red, the LEDs lighting the sniffer tip flash, an acoustic alarm sounds and the probe handle vibrates.



I Guide, a new operator-guiding mode, ensures that each location is tested for the predetermined minimum time. Up to ten testing protocols can be easily preprogrammed to ensure that the correct number of locations on each unit are tested. Individual leak rates can also be automatically added together to determine the overall leak rate for the unit being tested. This provides a more accurate basis for pass/fail decisions than the leak rates of individual joints, leading to lower rejection rates and increased manufacturing productivity.

7.1.3

PROTEC P3000

OPTIONS

The built-in PRO-Check reference leak allows the operator to verify the Protec P3000 is functioning correctly at any time. The test leak can also be used remotely with the base unit placed conveniently out of the way.

APPLICATION

- Helium leak detection on production lines of refrigerators

TECHNICAL DATA

Smallest detectable leak	1 x 10-7 mbarl/s
Measuring range	5 decades
Sensor response time	0,5-1 sec
Leak rate	300 sccm
Leak rate units	mbar l/s; Pa m3/s; ppm
Refrigerant equivalent leak rates	g/y; oz/yr; lb/yr
Start-up time	< 3 min
Dimensions (width x depth x height)	610 x 265 x 370 mm
Weight	27 kg
Ambient temperature range	10-45°C

PERFORMANCE

- Automatic standby stops the needless intake of contaminants and helium into the sniffer probe while the unit is idle, saving filter and sensor life. Standby mode is automatically activated after a pre-set time. Operation automatically resumes, as soon as the operator picks up the probe handle.
- All relevant messages will appear on the probe display and all operator commands can be entered via the two push buttons on the probe handle.
- Protec P3000 can convert helium leak rates and display them in refrigerant-equivalent leak rates.
- Differences in fill pressure from helium to refrigerant and the dilution of helium, to save helium cost, can be automatically calculated.
- The sniffer tip is positioned at an angle to the probe handle an ergonomic design that allows for easy and comfortable access to all leak testing sites.
- A built-in, adjustable illumination source helps operators precisely position the sniffer tip.
- The newly designed graphic display makes entering set-up parameters very easy. The menu is self-explanatory.
- Operating software is available in many languages.



HLD5000 LEAK DETECTION for REFRIGERANT GAS



HLD 5000 finds application in leak detection by sniffer on production lines of commercial refrigerators after refrigerant gas filling.

HLD 5000 detects refrigerant gas such as CHFC (R22); HFC (R134, R404, R407, R410) **HLD 600** detects HC gas (R600A, R290A) **HLD 5000 CO2** detects CO2 gas (R744)

WORKING MODE

The infrared detection technique plus the nonconsumable sensor components deliver stability previously unknown in this class of leak detectors.

The gas samples are drawn from a switching valve into an absorption cell. Infrared light is directed through the cell. When refrigerant is present in the flow, it absorbs some of the infrared light and this amplitude drop is detected. Sensitivity is optimized for a specific gas by filtering out all of the light except that gas peak absorption wavelength.

The HLD5000 uses a design that simultaneously sucks in gas from the tip of the probe and ports on the side. Because ambient refrigerant and chemically related compounds are drawn equally into both flow paths, they are ignored and will not trigger a false alarm.

VERSIONS AVAILABLE FOR DIFFERENT REFRIGERANT GAS

To further ensure that the HLD5000 reliably detects the leaks you want it to detect while ignoring everything else, each unit is tuned to a specific refrigerant. Versions are available for R134a, R22, R404A, R407C, R410A and R744. Conversion kits allow users to convert their HLD5000 to a different version.

VERSIONS FOR ALL REFRIGERANTS

The "SMART PROBE" is able to detect all refrigerants.

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7.2.1

HLD5000

PERFORMANCE

- The acoustic alarm changes pitch as the leak rate changes, so leaks can be pinpointed quickly. A lamp in the hand piece provides additional confirmation
- Calibration is fast and automatic
- Easy to move and install
- It operates in all orientations and can be securely mounted to a bench or wall to save space in narrow test booths.

- Automatic standby function: If the hand piece is idle for longer than a preset time, the unit turns off the pump and valve to reduce wear and filter contamination. Operation automatically resumes as soon as the operator picks up the hand piece.

- To lower the total cost of ownership, the HLD5000 uses an infrared absorption sensor that has no consumable parts.

- It doesn't auto-zero itself., so it is not necessary to withdraw the probe from a leak site to reset the zero level. A lamp on the hand piece changes color to provide additional confirmation when the leak threshold is exceeded.

- Internal calibrated leak: built-in internal leak contains unique circuitry to compensate

the leak rate for temperature changes to ensure accurate calibration and also monitors the lifetime of the cal leak and provides warning when it needs to be replaced.

- Special and automatic applications for production lines can be realised by HLD5000.

Smallest detectable leak	0,5÷1,0 g/y
Measuring range	1,0 – 50 g/s
Response time	<1s
Leak rate units	g/y; mbar l/s; lb/yr; Pa m3/s
Warm-up time	30 s
Dimensions (height, diameter)	365 mm; 260 mm
Weight	9 kg
Length of sniffer probe	4,8 m
Sniffer tip length	100 mm
Gas flow	320 sccm
Detectable refrigerants - HLD 5000	R134a; R404A; R407C; R410A; R22; R744
Detectable gas - HLD 600	R600A; R290A
Ambient temperature	5 - 50 °C

TECHNICAL DATA



7.2.2

D-TEK Select REFRIGERANT LEAK DETECTION



Portable leak detector for refrigerant gas R22, R134a ; R404A; R410A, R5607, R744; all CFC, HCFC, and HFC.

Working mode

This next-generation refrigerant leak detector uses an innovative infrared absorption sensing cell that is extremely sensitive to all refrigerants and only refrigerants.

At the heart of the D-TEK Select Refrigerant Leak Detector is an infrared absorption filtometer. It consists of a sampling cell with an infrared source (or emitter) at one end, an infrared energy detector at the other end, and an optical filter in between them.

Like the visible light we see, infrared energy is part of the electromagnetic energy spectrum. Most materials absorb specific and known wavelengths of infrared energy. The particular wavelengths of energy absorbed by a material are known as its absorption spectra All refrigerants have similar absorption spectra in the range of 7.5–14 micrometers.

The infrared source (emitter) creates a high-intensity stream of energy incorporating all wavelengths in the infrared spectrum.

The stream passes through the optical filter, which blocks all wavelengths except those that refrigerants absorb. The filtered infrared energy strikes the detector and causes it to heat up.

When refrigerant is drawn through the sampling cell by the internal pump, some of the infrared energy is absorbed by the refrigerant. This causes a decrease in the amount of infrared energy reaching the detector and a corresponding drop in the detector's temperature, which triggers the D-TEK Select to alarm. This whole process takes a fraction of a second.

By utilizing an optical filter with precise characteristics, D-TEK Select is sensitive to all refrigerants, while eliminating false alarms. In addition, because there is no depletion of chemicals like in heated sensor detectors, the sensor will not be harmed by high refrigerant doses nor degrade over time. The detector recovery time is also immediate after the refrigerant clears the cell.



7.2.2

D-TEK Select

APPLICATIONS

Leak detection of refrigerant gas for service assistance and for little production of industrial and commercial refrigerators.

PERFORMANCE

D-TEK Select maintains that sensitivity over time for consistent, accurate and reliable performance, even with the newer refrigerant blends. Best of all, the sensing cell lasts for approximately 800 hours — almost 10 times longer than the original D-TEK sensor — to lower your cost of ownership and improve job site productivity.

All in an easy-to-use unit with the quality and durability

High-efficiency air sampling pump provides quick response and quick clearing ("zeroing")

On-board diagnostics indicate charging status and warn of low battery or infrared cell failure.

TECHNICAL DATA

Minimum sensitivity	3 g/year
Minimum sensitivity for CO2	6 g/year
Controls	Power: on/off
	Sensitivity: high/low
Weight (with battery)	0,54 kg
Power	NiMH power stick for 6.5 hours of operation
Charging options	Charging options 110VAC adapter with 6 ft cord
	12V adapter with cigarette lighter plug
Probe length	43,2 cm
Recharger	Built in
Operating temperature range	from 0°C to 50°C *
Storage temperature range	from -10°C to 60°C
Case material	Self-extinguishing, for UL94HB
Certifications	CE Marking Power Safety and EMC. SAEJ1627

OPTIONS AND SPARES

220 V Model Headphones 12V power cord with cigarette lighter plug Replacement 120V adapter and cord Replacement NiMH power stick Replacement infrared cell Replacement tip/filter kit Replacement hard storage case

F19-13-0-ENG-CM

Service

ACCESSORIES FOR LEAK DETECTION

UNIVERSAL CHECK

7.2.3



Helium leak detector

MODE OF WORK

Universal Check is a unique instrument as not only can it detect leaks of almost any known gas or gas mixture, it can also measure the leak. Its micro thermal conductivity sensor responds rapidly to a leak helping you to detect even the smallest quantities of escaped gas.

Universal Check is conveniently calibrated against helium.

The instrument range offers intrinsically safe versions for use in flammable areas and can also safely detect flammable gases.

FEATURES

- · Detects even the smallest of leaks
- . Max detectable leak: 20 cc/sec (2% of He)
- · Repeatable readings
- · Accurate leak measurement
- · Intrinsically safe versions
- · Data logging capability
- · Hand held
- · Large back lit display
- · Choice of readings in ppm or ml/sec
- · Holds peak reading

TECHNICAL DATA

Sensor	Micro thermal conductivity detector (TDC)
Intrinsically safe approvals:	II 2 G EEx ia II T4 Baseefa 02ATEX0093
Sensitivity (cc/sec):	Min: 1 x 10-5, CH4 1 X 10-4, Ar 2 x 10-4; Max: 20 cc/sec He (2% He)
Batteries:	4 x AA alkaline 40 hours (non is) 20 hours (is versions)
Response:	T90 - 1 second rise and clear down
Accuracy:	+ 5% displayed reading + one digit
Alarm:	Flashing LED and 90 dBA (10 cm) audible sounder
Data logging*:	36,000 data points with date and time stamp
Calibration:	Using standards
Operating temperature:	-20 to 60 °C (-13 to 140 °F)
Storage temperature:	-20 to 70 °C (-13 to 158 °F)
Dimensions:	390 x 60 x 49 mm
Weight:	: 0.45 kg



7.2.4

ECOTEC 3000 REFRIGERANT LEAK DETECTORS



Quadrupole Leak detector able to detect all refrigerant gases and helium with high sensitivity.

APPLICATION

Specifically designed for domestic and industrial refrigerant production environments.

WORKING PRINCIPLE

It is a mass spectrometer, quadrupole, able to select with high precision the leak gas. Because of its working principle, ECOTEC 3000 is able to notify different gases according to their mass.

PERFORMANCE

- The Ecotec E3000 is very tolerant of variations in operator technique. It detects leaks at a greater distance from the leak location, and the sniffer tip can be moved faster without missing leaks. A search mode allows operators to quickly scan for leaks. If any are detected, they can then be easily localized.

- When a leak exceeding a preset rejection rate is detected, multiple alarms provide an indication that can not be overlooked. The background color of the sniffer probe display changes from green to red, the LEDs lighting the sniffer tip flash, an acoustic alarm sounds and the probe handle vibrates.

- I'Guide, a new operator-guiding mode, ensures that the correct number of locations on each unit are tested and that each location is tested for the predetermined minimum time. Up to ten testing protocols can be easily preprogrammed.

Individual leak rates are automatically added together to determine the overall leak rate for the unit being tested. This provides a more accurate basis for pass/fail decisions than the leak rates of individual joints, leading to lower rejection rates and increased manufacturing productivity.

ECOTEC 3000

7.2.4

- The sniffer tip is positioned at an angle to the probe handle an ergonomic design that allows for easy and comfortable access to all leak testing sites.
- A built-in, adjustable illumination source helps operators precisely position the sniffer tip.
- The newly designed graphic display makes entering set-up parameters very easy.
- The software is available in several languages.

- Multiple alarms make sure leaks can not be overlooked.



Leak rate with distance from leak

OPTIONS

-Sophisticated interfering gas suppression (IGS) algorithms allows the Ecotec E3000 to ignore background gases such as foaming agents, thereby eliminating false alarms. The system's high-speed mass spectrometer applies new intelligent algorithms to clearly distinguish between R600a and cyclopentane, making the Ecotec E3000 ideal for leak checking refrigeration or automotive products.

- The built-in ECO-Check reference leak allows the operator to verify the Ecotec E3000 is functioning correctly directly at the production line at any time. The test leak can be placed right at the production line and connected to the base unit, which can also be placed conveniently out of the way.

- Certified calibrated leaks can be supplied on demand

TECHNICAL DATA

Smallest detectable leak rate	0,05 g/y
Measuring scale	0,05 – 999,99 g/y
Sensor response time	0,3 sec
Leak rate units	g/y; mbar l/s; lb/yr; Pa m3/s
Start-up time	<2 min.
Dimensions (width x height x depth)	610x370x265 mm
Weight	34 kg
Probe length	3-5-10 mt
Sniffer tip length	120 mm
Gas flow	160 sccm
Ambient temperature range	10 - 45 °C



"Sniffer HS" system has the purpose to replace the traditional sniffing probes with new "gas trap" probes (sniffing pliers) able to increase the sensitivity of leak detectors by introducing the accumulation of gas in leak detection process.

Application

This system is used in the leak detection on joints of whichever component or machine containing liquid/gas for working, where mass spectrometer, quadrupole, infrared, electronic sensor and other leak detectors are used.

It can work with leak detectors ECOTEC 3000 and ECOTEC II.

Working cycle

	Gas trap assembly on the joint to be tested (fixed yellow light) Correct assembling acknowledgement by an internal sensor which detects the presence of copper pipe inside the gas trap and let the cycle start.	Time: 1 sec
	Accumulation of any gas escaping from the joint for a fixed time (blinking red and green light) Background measurement in the environment Background zeroing Suction of gas from gas trap by leak detector	Time: 2 sec
\triangleright	Measuring of cooling gas concentration	Time: 1 sec
	Signal to operator for removing gas traps from the joints (blinking)	ellow light)
	Audio-visual information about test result (fixed red or green light	:)
۶	Gas trap disassembling	Time: 1 sec

The gas trap, which is connected to the leak detector, performs the cycle phases automatically.

It is the sniffer HS, instead of the operator, to decide if the joint is with or without leak.

HOW TO ORDER

Sniffer HS for ECOTEC II	Cat. No. F270001
Sniffer HS for ECOTEC 3000	Cat. No. F270002

ESA SERVICE srl - via Rossaro, 13 - Treviglio (BG) ITALY - Tel +39.0363.301550 - http://www.esaservice.com

F27-0-0-ENG-CM

service

ACCESSORIES

PTL60 HELIUM CALIBRATED LEAK

7.3.1



Calibrated leak certified for the calibration control of leak detectors by manual sniffer and under vacuum chamber.

On industrial field, integral eak testing on vacuum chamber with the mass spectrometer leak detector is now used in a wide range of applications.

For the first calibration of this kind of plants and the following periodic controls, it is mostly important to have at your disposal a device able to supply to the system a controlled flow of helium in the same range of the leaks to be detected.

Calibrated Leaks PTL have exactly the aim to meet this requirement. The construction technology b quartz capillary guarantees high precision and reliability and allows to realyze leaks between 1x10- and 5x10-7 mbar l/s of helium.

They are supplied with a Calibration Certificate, according to ISO norms and with traceability to the National Standards.

TECHNICAL DATA

Tank volume	100 cc
Rechargeable connector	quick 1/8
Safety valve	6 bar
Pressure indicator	analogical/ digital
Storage case	Wooden material
Uncertainty of measurement	Less than 5% of declared value
Construction Technology	Quartz capillary
Leak rate	By request; between 1x10-4 and 1x10-7 mbar l/s
Validity of Calibration Certificate	1 year
Available Gas	He - H2, others on request



7.3.1 F39-3-0-ENG-CM

PTL60

APPLICATION

Calibrated Leaks PTL have two different applications:

- they can be enclosed in the plant as permanent component, so they can be used for the automatic calibration control
- they can be inserted on a master component, so they can be used for a manual efficiency test of the system.

They can be also used for the calibration control of leak detectors by manual sniffer.

LEAK RATE

The output flow rate is variable; it depends on the helium pressure in the tank. In order to get the leak rate wanted, you need to adjust the helium pressure at the value indicated on the diagram which is supplied with the calibrated leak.



RL

7.3.2

REFRIGERANT GAS CALIBRATED LEAK



RL Calibrated Leaks find application in calibration control of Sniffer Leak Detectors used in refrigeration industry for the leak searching of refrigerant gases

WORKING PRINCIPLE

The RL Calibrated Leaks are equipped with their own tank, where reference gas is charged at 6 bar. A needle valve allows to feed the Calibrated Leak with a minimum quantity of gas, enough to use it just for one time: in this way tank is able to guarantee up to 3.000 measures before it needs to be re-charged.

Gas pressure to the Calibrated Leak can be set at a fixed value, by using an internal pressure regulator, or can be regulated manually, by discharging the exceeding pressure through a discharge valve.

TECHNICAL DATA

Uncertainty of measurement	Less than 5% of declared value
Construction Technology	Quartz capillary
Leak rate	Between 1 and 20 g/year – variable pressure
Validity of Calibration Certificate	1 year
Available gas	All refrigerant gas
	(HFC, HCFC, HC) – He – H2

Please specify the gas type in your order.



7.3.3

SSL REFRIGERANT GAS CALIBRATED LEAK



ESA Vacuum Systems presents the new generation of Reference Leaks, intended for calibration control of leak detectors used in the refrigeration industry.

These leak detectors work either with helium, with reject level around 10-6 mbar l/s, or directly with refrigerant gases, with reject level between 0,5 and 3 g/year: in both cases, to carry out a correct calibration control it is needed to have calibrated leaks in the same measuring range of values.

ESA Vacuum Systems has improved its Reference Leak's construction technology and it is now able to supply leaks of 1 x 10-6 mbar l/s of helium or 0,3 g/year of refrigerant gas; it guarantees that the value of the supplied leak will be within the $\pm 10\%$ of the required one.

A new pressure regulator allows to obtain considerable improvements in pressure regulation's accuracy, so that the new Reference Leaks guarantee a real stable and precise flow rate for a long time, without requiring the operator to make any kind of regulation.

The leak is fed by a tank charged with helium at 10 bar or refrigerant gas in liquid phase. When the tank is exhausted, it can be simply and quickly replaced with a new one directly by the user. The tank has 1 year endurance.

Both versions are supplied with Calibration Certificate having traceability to the European Standards.

TECHNICAL DATA

Uncertainty of measurement	Less than 5% of declared value
Construction Technology	Quartz capillary
Leak rate	By request, between 0,3 and 20 g/year
Validity of Calibration Certificate	1 year
Available gas	All refrigerant gas (HFC, HCFC, HC) and He or H2

HOW TO ORDER

Туре	Gas	g/y
SSL	R134A/R290A/R600A	0,3 20



VACUUM GAUGE VP 2010 7.5.5



TECHNICAL FEATURES

Measuring principle	Heat conduction (Pirani) depending on the gas type
Material for vacuum	Stainless steel 1.4307, Tungsten, Nickel, glass
Measuring range	1000 - 1,0x10-4 mbar (750 - 1,0x10-4 Torr)
Max. overload	4 bar a
Precision	1000 - 20mbar: about 30% of reading 20 - 0,001mbar: 10 % of reading < 0,001mbar: < factor 2 of reading
Repeatability	2% of reading
Response time	< 200 ms
Supply	15 – 30 VDC
Electrical connector	Hirschmann, 6pin, male, with lock fitting
Power consumption	about 10mA
Working temperature	550 oC
Charging temperature	-20+70 oC
Bakeout temperature	80°C at flange
Output signal	0 – 10 VDC, load > 10 • range 1.5 – 8.5 VDC, logarithmic (1V/decade)
Vacuum connection	Flange DN16 ISO KF
Protection level	IP 40
Weight	120g
Dimensions (including connector)	85 mm ø 32,5 mm

HOW TO ORDER



P2000 CAPILLARY FLOW RATE METER

7.6.1



One of the most important characteristics in calculation of a freezing machine efficiency is the capillary flow rate, so it has to be measured with precision.

To meet this requirement, ESA SERVICE has developed a flow rate meter highly reliable, with excellent performances concerning precision and repeatability.

Measurement is not affected by temperature and use is very easy.

Flow Rate Meter **P2000** finds his application in domestic refrigerator and air conditioner industry, both on production bay and in laboratory.

It's able to carry out flow measurements in a working range between 0 and 10 bar and it is supplied with pneumatic device for connection to the capillary to be tested.

Flow Rate Meter P2000 is able to manage up to 200 product codes, for each one of those it is possible to set different parameters concerning test pressure and reject levels.

WORKING CYCLE

Operator provides to insert the extremity of the capillary to be tested inside the pneumatic connector, then he starts the working cycle. Capillary is blocked and begins the measurement.

When the flow is constant and stable, P2000 displays the measured flow, ends cycle and releases the capillary. Measured value is compared with Min and Max reject levels and a Good or No Good signal is given.

P2000 STANDARD EQUIPMENT

- Flow rate meter with digital display
- Pressure meter with digital display
- Temperature sensor
- Pressure regulator
- Pneumatic connection device



7.6.1

P2000

OPTIONS

- SENSOR connection device with automatic Start cycle
- FLOW WARE software for statistic treatment of results
- Serial port RS 232 for printer
- Serial port RS 232 for external PC (allows to set parameters by remote)
- Analogic outputs

TECHNICAL DATA

Supply	
Main voltage	230 V single-phase + ground, 50/60 Hz
Auxiliary devices voltage	24 Vdc
Power consumption	20 W
Nitrogen (or dry air) pressure	12 bar max
Working range	from 0 to 10 bar
Flow measurement	
Available ranges	0-10, 0-20, 0-30, 0-100, 0-200 l/min
Measure unit	l/min, l/h, sccm, scfm
Precision	+/- 0,5% F.S
Repeatibility	+/- 0,2% F.S
Response time	2 s at 63% FS.
Temperature compensation	Included
Pressure measurement	
Range	0-16 bar
Measure unit	kPa, bar, psi
Precision	0,5% F.S
Temperature measurement	
Range	0-50 °C
Measure unit	C or °F
Other characteristics	
Product codes	200 max
Digital inputs	Start, Stop, Reset, Hold
Digital outputs	Busy, Good, No Good
Analogic outputs	0-10 Vdc or 4-20 mA
Hold function	On, Off, Only if Good, Only if No Good
Measurement cycle	Manual, Timer, Automatic
Reference Temperature	Adjustable at 23 °C
Dimensions (W x D x H)	590 x 480 x 210
Weight	20 kg

By request, our Laboratory is able to certify flow rate of Master Capillary, according to ISO norms and with traceability to National Standards ESA S.R.L.



7.7.1

VM3 **VOLUME METER**





7.7.1

VM3 is able to measure the volume of little refrigerator components, evaporators, condensers, compressors.

HOW TO USE

Connect the piece to be tested to the pneumatic coupling device, then push START button. When the pressure becomes stable, the volume of the piece is indicated on VT display. The volume test cycle is carried out automatically. At the end cycle the measured values are displayed or printed (optional).

ACCESSORIES INCLUDED

N^1 Reference volume

- N^1 Pneumatic coupling device for pipe ext. Ø6
- N^1 Hansen quick connection male and female 1/4"

OPTIONS

- Printer: 40 column printer
- VM3-Ware software: to connect the volume meter to a PC in order to record the test results and extract them in excel format
- Bar code reader: code selection through the scanning of the bar code

TECHNICAL DETAILS

VOLUME TO BE SET:	Up to 9999 cc others on request
REFERENCE VOLUME:	500 cc, others on request
ACCURACY:	+/- 1% value f.s.
WORKING TEMPERATURE:	0÷50°C
N ₂ OR DRY AYR PRESSURE SUPPLY:	5 bar g
TEMPERATURE MEASURE:	°C
RESOLUTION	0,01 сс
REPEATABILITY	+/- 1% value f.s.
ELECTRICAL POWER SUPPLY:	230 V 50 Hz.
MAX PRESSURE INTO COMPONENT:	1,5 bar g

APPLICATIONS

- Measure the volume of components with high accuracy
- No-destructive test
- Use in both production and laboratory environment
- Use in quality gates for the receipt of components coming from suppliers

DIMENSIONS AND WEIGHT

- Dimensions: 535x250x470 mm
- Weight: 21 kgs

HOW TO ORDER

VM3	Cat. No. V190903
Printer	Cat. No. V190904
VM3-ware	Cat. No. V190905
Bar code reader	Cat. No. V190906

7.8.1



ACCESSORIES

HELIDRY – HELIUM DRIER

During the time of the helium pressure recompression in the tank, the helium drying plant "helidry" lowers the dew point of the helium gas and, using special filters, purifies it from eventual impurities absorbed during the leak detection cycle.

Helidry is completely automatic and works automatically.

HOW TO USE

Two modes of work are available: 24 hour Mode: The drier works no stop 24 hours every day. Timer Mode: The drier works in a set time.

COMPOSITION

n.1 Drying plant with 2 colums (no. Cat. H19800)

n.1 Pneumatic panel for the automatic excharge of the columnsn.1 Electrical panel for the control of the

work cycle and the regeneration process.

OPZIONI

1 Air drying instrument for the regeneration of the resins (no. Cat. H19603) Humidity analyser

TECHNICAL DATA

ELECTRICAL FEEDING	220V – 50 Hz
POWER	1000 w max.
HELIUM GAS HUMIDITY WITH HELIDRY	- 40°c DI Dew point
HELIUM ANALYSER	Optional
HELIUM GAS PRESSURE	From 10 to 30 bar max
DRY AIR PRESSURE	10 bar
DIMENSIONS	W 500 x H 1600 x L 500





7.9.1

HELIUM CONCENTRATION METER "HELITEST"



To be used:

- With helium recovery systems to check the efficiency;
- On helium measuring systems in Hood.

Cat. No. A190059

TECHNICAL DATA

MEASURE RANGE	0,0 - 99,9 % He
GAS FLOW	0,5 lt/min
OUTPUT SIGNAL	2-10V dc 4-20mA
SET POINT	2 TRIGGER A RELE' (alarm and alert)
HOLD FUNCTION	Indicator display block
GAS CONNECTION	Tube diam 4x6 mm
RESPONSE TIME	< 40 seconds 63%
RELIABILITY	2% F.S.
REPEATABILITY	2% F.S.
PRECISION	2% F.S.
POWER SUPPLY	230V 50/60Hz and 24V dc
DIMENSIONS	H128XL212XP310 mm
WEIGHT	3100 g

The helium concentration analyser Helitest is also supplied with a pump used to suction the gas to be analysed and with a flow indicator and a filter.

A19-2-0-ENG-CM



TECHNICAL DATA

Measurable Gases:	R11, R12, R22, R123, R134a, R404A, NH₃
Measuring Range:	01000 ppm
Accuracy:	0100 ppm \pm 1 ppm 1001000 ppm \pm 10% of the reading
Linearity:	050 ppm \pm 1 ppm (ammonia \pm 2 ppm), 511000 ppm \pm 10% of reading
Sensitivity:	1 ppm
Resolution:	1 ppm
Response Time:	70 s for 90% of the final reading, based on a single point instrument
Operating Temperature:	0 °C+ 50 °C
Temperature Effect:	± 0.3% of reading per °C
Relative Humidity:	095% RH, non-condensing, no effect on the reading
Sample Flow Rate:	0.75 l/min
Power Supply:	120 VAC ± 10%, 0.56 A; 240 Vca ± 10%, 0.30 A
Alarm Relays:	3 relays, 240 VAC, 8 A resistive
Analog Output:	420 mA, 010 V for channel recognition
Maximum Signal Load:	010 V into 2K ohm or 420 mA into 1K ohm
Sample Tubing Connector:	6 mm OD, 3 mm ID
Flow Switch:	activates at flow < 0,5 l/min
Multipoint Sequencer Option:	4 or 8 measuring points
Maximum Sample Tubing Length:	45 m (per measuring point)
Dimensions (H x W x D):	460 x 410 x 180 mm
Weight:	20 kg

Monitoring of refrigerants: R-11; -12; -13; -22; -113; -114; -123; -124; -125; -134 a; -141 b; -142 b; -152a; -402 A; -404 A; -407 c; -500; -502; -507; -508 B; ammonia

FEATURES AND BENEFITS

- · Reliable, precise and stable
- Detects concentrations as low as 1 ppm
- Prevents loss of refrigerants and poisoning of the cold goods
- · Easy to install, adjust and maintain
- · Highly developed IR measuring technology at comparatively low cost
- Operation over a wide temperature range

• Large 2-lines x 20 character vacuum fluorescent display which shows alarm indications and actual gas concentration

- 3 adjustable alarm levels
- Relay outputs for each alarm level (latching/nonlatching)
- Optional Multipoint Sequencer to monitor up to 8 measuring points
- Air humidity, a problem for IR analysers, has no effect on the new R-GARD

• Measurement according to the principle of photoacoustic infrared absorption in the range of 0...1000 ppm. This permits monitoring below the TLV of 10 ppm for HCFC 123 and much higher concentrations in case of an accident.

MEASURING PRINCIPLE

R-GARD measures the gas of interest by the principle of infrared photoacoustic absorption. Sample gas enters the monitor measuring cell and is exposed to infrared. The sample gas absorbs some of the infrared and this absorbed energy is a function of the gas concentration. The absorbed radiation has a unique spectrum for each gas making it possible to detect refrigerants selectively using special infrared filters. When the infrared is modulated a pressure change is generated in the measuring cell. This photoacoustic pressure signal is measured with a sensitive condenser microphone. The signal from the microphone is electronically filtered, linearised and amplified to provide a readout of the actual gas concentration.



7.17.1

MICROCHECK



Microprocessor electronic device which can be used to perform: M1: MICROFLOW LEAK DETECTION

- M2: DROP PRESSURE LEAK DETECTION
- M3: INTERCEPTION LEAK DETECTION
- M4: VOLUMETRIC LEAK DETECTION
- M5: FLOW TESTS
- M6: DIMENSIONS TESTS

ADVANTAGES:

- OBJECTIVE TESTS
- LOW COST
- CONTINUOUS
 AUTOCORRECTION

- COMPACT DESIGN
- DIFFERENTIAL OR ABSOLUT MEASUREMENT
- HIGH REPEATABILITY

- EFFICIENCY TEST INCLUDED
- CONTROL PARAMETERS SETTABLE WITH THE KEYBOARD
- TIME SETTING USING THE KEYBOARD
- VISUALIZATION ON THE LED DISPLAY
- AUTODIGNOSTICS WITH VISUALIZATION ON THE LED DISPLAY
- CONVERTION SPEED UP TO 200 Hz
- HIGH SESITIVITY AND REPEATABILITY
- SERIAL OUTPUT FOR PC CONNECTION
- DIGITAL OUTPUTS FOR EASY INTERFACE WITH THE PLC



TECHNICAL DATA

ELETTRONIC	Microprocessor 68HC11
	A/D 16 bit
	Software amplification and analog filter
	Input-Output PNP
	Outputs protected against short-circuits
PANEL	Frontal panel equipped with display 6+2 high dimension digits
	11 LED diagnostics (POWER, reset, watch-d, test results and
	efficiency). Easy programmable numerical keyboard
STEPS	Time programmable from 0 to 999.9 s
	Different programmable phases, depending on the application.
PRESSURES	Adjustable from 0,1 to 200 bar
CAPACITY	Adjustable from 60 NI/h to 12000 NI/h
PRESSURE SENSITIVITY	0,01 mbar (1 Pascal)
PNEUMATIC	Test circuits and transducers installable both inside or outside the
	equipment
INTERFACE	Serial RS232C or RS485
DIAGNOSTICS	By means of LED, placed on the frontal panel, and display
SUPPLY	220 V ac or 24 V ac/dc
INSTALLATION	Table-top, supplied with mouting accessories
DIMENSIONS	235 L x 134 H x 318 P mm
WEIGHT	10 kg
OPTIONAL	Device for master leaks (LEAK MAKER)
	Hermetically sealed box
	Battery supply
	High capacity filling electrovalve
	Pressure regulator with filtersi



Microcheck rear side



Microcheck for side-by-side



Tools for side-by-side