GALILEO TP
PROCESS EQUIPMENT

KAIROS

Automatic system for leak detection

GALILEO TP PROCESS EQUIPMENT S.r.l.
Via del Pantano 73 – 50018 Scandicci (Firenze) Italia – Tel. (+39) 055 7221358 – Fax (+39) 055 7222225 –
Web site www.galileotp.com – E-mail info@galileotp.com

Introduction

The machine **KAIROS** has been designed and built to be used in any kind of small/medium assembly lines of cooling units (refrigerators, deep freezers, air conditioners etc...) performing the evacuation, pressurization with nitrogen for mechanical stress test and gross leak test and pressurization by tracer gas (helium/hydrogen mix) for fine leaks.

Technical features

Embedded control system

PC board GALILEO TP SGP32 V2 with microprocessor RISC 32 bit Freescale ColdFire® 5372L

User interface

LCD 4,8" monochromatic • Display LCD 4.8" (320x240) with keyboard 29keys

e.g. screenshot:

Vacuum line

The **KAIROS** is equipped by a double stage rotary vacuum pump D12 m3/h capable to reach a final vacuum of 1 x 10-2 Pa (1 x 10-4 mbar), with a pneumatic valve to keep out the vacuum pump and a Pirani sensor Galileo TP OG914 to measure the vacuum level reached during evacuation (dynamic measurement).

Valves group

The valves group is composed by :

- ✓ two valves for fluid inlet line
- ✓ two valves for fluids discharge/recovery line
- ✓ one pneumatic isolation valve for vacuum line
- ✓ one pneumatic isolation valve for leak testing in vacuum
- ✓ one pressure sensor for measuring the pressure inside the piece under test (outlet side)

Along with the optional "second filler", you have also:

- ✓ one by pass valve
- ✓ one pressure sensor for measuring the pressure inside the piece under test (inlet side)

Main programmable process phases

KAIROS is able to perform up to 9 steps. The structure is fixed and cannot be customized. The various steps may not be carried out by placing in the programming times of the phase to 0.

Phase 1 – Pressurization N2/dry air

Phase 2 – Drop Test

Phase 3 – Discharge N2

Phase 4 – Evacuation

Phase 5 – Leak test in vacuum method

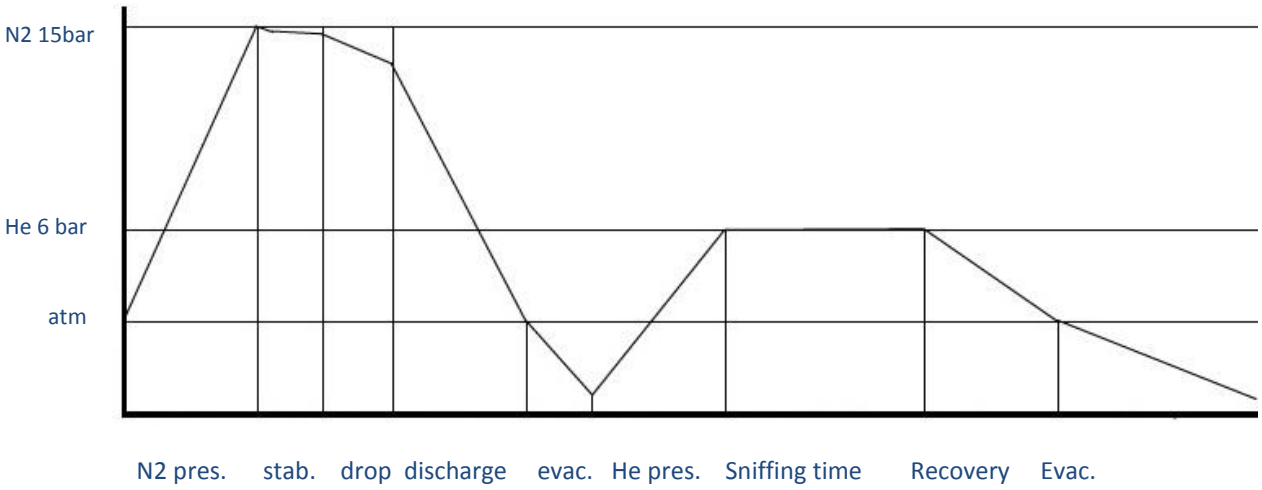
Phase 6 – Pressurization He/hydrogen mix

Phase 7 – Sniffing time by the means of He/H_2 leak detector

Phase 8 – Recovery

Phase 9 – Evacuation

e.g. flow diagram – domestic refrigerator



Software features

Two different privileged log-in levels with password:

1) Operator: working cycle access;

2) Maintenance/production/quality managers: diagnostics and programming access

Language programming

You can set your own language, the program includes: Italian, English, Chinese, Spanish, Portuguese and Russian. Others upon request.

Serial Communication

You can choose the communication speed of the serial ports COM1 and COM2;

Display calibration values

All calibrations parameters can be displayed

Serial ports and interfaces

- ✓ COM1: serial port RS232 for barcode
- ✓ COM2: serial port RS232 for printer
- ✓ COM3: serial port RS485
- ✓ **Ethernet interface for software GEDA* (Galileo Equipment Data Acquisition) and/or data report to the PC.**
- ✓ USB port for mass storage connection (only for maintenance service)

GEDA management software

*The **KAIROS** comes with a complete integration with the **GEDA** system for data acquisition and statistics, remote programming as well as external supervision of the line:

-Cycle reports sent directly from the machine to your computer (always updated) in real time;

-Possibility to program the machine from the computer and vice versa;

-Search by bar code reader, date and time or by model of machine;

- Working cycle start inhibition;

-Production/maintenance/quality queries (alarm, cycles, failed pieces, passed pieces etc…);

-Possibility to print all information and report displayed;

-Possibility to export the cycle report to other programs like Office Excel;

- SQL interface;

Upgrade accessories list:

- ✓ Barcode reader
- ✓ Barcode reader wireless
- ✓ Kit light tower
- ✓ Kit second injector filler

KAIROS complies with the standards foreseen by CE directive (2006/42).

Electric and electronic fixtures complies with standards on electric safety (EN 60204-1) and on electromagnetic compatibility (EMC).

Available models and accessories

Models	Max working pressure	Fluid inlet line	Number of filler
KAIROS	**30 bar (40bar*)**	**2**	**1 + 1***

*optional

Data sheets

Number of phases in each work cycle	**Up to 9**
Sequence of phases in each work cycle	**fixed**
No. Programmable cycles	**100 (more upon request)**
Programming protection	**Account level protection**
No. fillers	**1+1(the secondi s optional)**
Lenght of each filler	**3 m**
Filler quick couplers	**¼" Hansen, PCU ¼" female**
Units of measurement:	
Weight	**g, oz**
Vacuum	**Pa, µHg, mbar**
Pressure	**kPa, psi, bar**
Temperature	**°C, °F**
Time	**s**
Vacuum pump	**Double stage, 12 m^3/h**
Final vacuum	**<1x10^{-2} Pa (1x10^{-4} mbar)**
Dimensions (HxLxW)	**1200x700x400mm**
Weight	**90 kg**
Working temperature	**0 ÷ +50 °C**
Electric power supply	**Δ 200 ÷ 230 / Y 380 ÷ 415 V 50 Hz 3 Ph** **Δ 200 ÷ 230 / Y 460 V 60 Hz 3 Ph** **(others upon request)**
Power consumption	**570 W**
Noise level	**< 70 dB (A)**
Inlet fluids	**Nitrogen(dry air), Helium, Hydrogen mix**
Number of inlet valves	**Up to 2**
Max pressure inlet valve	**30 bar** **(optional 40bar line 1 N2)**
Leak detector interfaced	**ECOTEC 3000, PROTEC, ASM 142, LDS 3000, Phoenix XL 300**

**data subject to change*