

***Master Catalog
2020/21***



TM

Future Technologies



FT

Made in Italy

TM

Future Technologies
Vacuum and Fluids Charge Masters



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- *Assembling and testing*
- *sales management*
- *project management*
- *technical department/ R&D*
- *after-sales service*

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Future Technologies



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Company Profile

FT Future Technologies S.r.l. was founded in 1995, basing on more than twenty years of professional skills of its associates and managers about vacuum technology, filling of refrigerants, brake fluid circuits, industrial automation, data processing and communications.

FT headquarters and new production 500 sqm facility are located in Castel del Piano, a town of the Mount Amiata close to Siena and Florence cities.

FT is the ideal partner for Vacuum and Refrigerant treatment in the Cold Industry. All equipments and related services are completely designed inside our facility. Customer Engineering is at best standardized levels thanks to its continous Research and Develop that lead to improve the application related to the specific design requested from all customers.

Hundreds of FT equipments are now working 24h per day, 365 days per year in all worldwide customers, with high reliability, performances and quality of cycle production.

FT specialized technicians are every ready to reach each part of the world to support our directional customers, starting from the offer engineering up to the commissioning. And all our products and services have improved the production lines of our Customers.

Our key words: *Refrigerants Pump and Charging machines -
Ecologic and Hydrocarbons Refrigerant treatment -
Design and integration of production lines - Installation and startup -
Control Process Automation - Maintenance and Technical Support*



Solutions

Refrigerant charging units, Refrigerant transfer pumps, Preliminary evacuation units, Smart HC Monitoring systems, Tight tests Stations with tracer gas, Charging Units for leak detection Refrigerant recovery devices, Safety test equipment, Functional test equipments

Main Activities

Line engineering and integration, Production and assembling, Customer pre-sale support, Commissioning and start-up, Technical support and maintenance, Basic and Specialized level Training, Special customization on demand, Customer production optimization, Continuous Research & Development, Quality production procedures



Main Customer Applications

- Domestic refrigerators and freezers
- Professional refrigerators
- Refrigerators/food sales point
- Refrigerating units in transportation
- Machinery for ice cream
- Chillers, Dehydrating systems
- Domestic air conditioning/heat pumps
- Car/truck air conditioning systems
- Centralised air conditioning stations

Main Directional References



Main References



Vacuum and Refrigerant Charging

The FT Vacuum and Refrigerants charging Units represent for the worldwide cold industry market an essential reference for the production of any industrial or domestic device that works with Refrigerant Gases.

The FT Vacuum and Refrigerants charging Units are designed to meet the highest standards of quality and performance that modern industry can require.

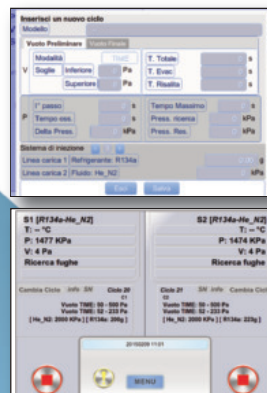
The main function of the vacuum and charging unit is to perform and control the vacuum inside the refrigeration circuits , and then make the refrigerant charge according with the design requirements of the constructor. For this process the FT Vacuum and Refrigerant charging Units perform automatic and configurable functions that are fully integrated to the production automation of the Customer Industry, leading a significant contribution to the quality of it.

The FT Vacuum and Refrigerants charging Units are continuously updated in terms of design according to the international guidelines on the refrigerant gases use. Therefore, they are ready to be used with modern and future refrigerants so to fulfill a wide range of processes during the entire life of the unit.

Who uses the FT Vacuum and Refrigerants charging Units, has the ability to integrate into the production schedule relevant information of each cycle on their tools in order to have accurate report of each job.

All FT Vacuum and Refrigerants charging Units are available with touch panel controls operated by modern operating systems that enable an intelligent display of processing cycles a fast reporting directly downloadable in remote PCs production lines and a telecare post-sale services.

FT is able to find "ad hoc " solutions for the customer so as to satisfy any requests for personalizations.





iTeide TT

Table Top smart refrigerant charging unit

ITEIDE TT is a Table Top system for the evacuation* and the injection of refrigerant fluids . It has been designed to perform excellent works, reliable, easily portable and suitable to work with any cooling fluid of normal use (HCFC and HFC refrigerants , including R410A and R452A).

ITEIDE TT is available, on demand, with an integrated printer to record results and performances of cycle works run.

ITEIDE TT is available with Data Collect transferring functions over TCP/IP Protocol to manage statistic reports for result of working cycles.



Other features:

- High flexibility
- Ready for the most common A1 Class refrigerants
- Electromagnetic Head Injector control PLUVIO
- Safety in the working area

Main using applications

- Professional Refrigeration
- Refrigerated show cases and cooling cabinets
- Automatic food and beverage dispenser machines
- Refrigerating units for transportation
- Ice-cream machines
- Dehumidifiers
- Chillers and centralized air conditioning stations (only refrigerant charging)
- Industrial refrigeration (only refrigerant charging)
- Electrical cabinet coolers
- Domestic air conditioners
- Refrigerators and air conditioners for boats or caravans
- IT coolers
- Compressed air driers
- Condensing units

* with optional vacuum pump not provided with the unit. For vacuum pump delivery please contact FT sales Service

Technical Characteristics

Injectors/Type	1/PLUVIO
Injector length	2,5 m
Refrigerant metering systems	1
Charging capacity	up to 10 kg
Charging speed	up to a 10 g/s (25 g/s with RTP and accumulator)
Charging accuracy	< 200 g: ±1 g > 200 g: ±0,5%
Heating belt	Available as optional
Injector connection	¼" Hansen F (ISO 7241B)
Connection to the refrigerant supply line	¼" Hansen M (ISO 7241B)
Connection to the external vacuum pump	DN16KF
Pirani vacuum sensor	Integrated
On-board alarms	3 light alarms (green/white/red)
Acoustic alarm	Integrated, activable via software
Programmable work cycles	1000
Connection to external PC	Ethernet
Control unit	TS690
Working temperature	5 °C .. 45 °C
Power Supply	110/220 V – 50/60 Hz – Single Phase
Dimensionis (L x W x H)	560 x 420 x 300 mm
Weight	~20 kg

Optional features and devices

3/8" Hansen Female PLUVIO Injector
RTP and Accumulator for 35 g/s charging speed
Heating Belt 400W RHP20
Refrigerant tank connection kit
Vacuum connection kits
Only charging functions on demand
Automatic working cycle selection performed by barcode reader
Remote Printer

iRockall Jr

Vacuum and Refrigerant Charging Unit for small productivity

iROCKALL Jr is a modular evacuation and small productivity charging station for HFC and HCFC refrigerants.

iROCKALL Jr is ideal for medium throughput production lines of domestic and commercial refrigerators/freezers, air conditioners, heat pumps, liquid coolers where amounts of medium size of refrigerant have to be charged.

- Compact and light weight
- Charging capacity: up to 10 kg
- Charging speed: up to 10 g/s with heating belt (up to 25 g/s with RTP and accumulator)
- High charging accuracy: 0,5% of the charged amount
- Digital refrigerant metering system
- **available with integrated Refrigerant transfer Pump equipped with volumetric metering system (I/B option)**
- Built-in vacuum pump (8,5 m³/h @ 50 Hz, different on request)
- Interactive Color Touchscreen
- Data Collection Application over TCP/IP protocol
- Up to 1000 programmable work cycles
- Microprocessor controlled
- Built in according to the European Machinery Directive, Safety standards CE marked



Main using applications

- Professional Refrigeration
- Refrigerated show cases and cooling cabinets
- Automatic food and beverage dispenser machines
- Refrigerating units for transportation
- Ice-cream machines
- Dehumidifiers
- Electrical cabinet coolers
- Domestic air conditioners
- Refrigerators and air conditioners for boats or caravans
- IT coolers
- Compressed air driers
- Condensing units

Technical Characteristics

Injectors/Type	1/PLUVIO
Injector length	3,5 m
Refrigerant metering systems	1
Charging capacity	up to 10 kg
Charging speed	up to a 10 g/s (35 g/s with RTP and accumulator)
Charging accuracy	< 200 g: ±1 g > 200 g: ±0,5%
Heating belt	Available as option 400 W
Injector connection	¼" Hansen F (ISO 7241B)
Connection to the refrigerant supply line	¼" Hansen M (ISO 7241B)
Nominal Vacuum pump rate	8,5 m ³ /h
Pirani vacuum sensor	Integrated
On-board alarms	3 light alarms (green/white/red)
Acoustic alarm	as option
Programmable work cycles	1000
Connection to external PC	Ethernet
Control unit	TS690
Working temperature	5 °C .. 45 °C
Power Supply	110/220 V – 50/60 Hz – Single Phase
Dimensions (L x D x H)	850 x 600 x 1400 mm
Weight	~120 kg

Optional features and devices

Light and Acoustic Alarm
On Board RTP kit including suction line, protection filter, 0,7 l accumulator
Customizable injector length
QS5 vacuum pump with TMF36 oil mist filter
Automatic working cycle selection performed by bar code reader
Printer
PLUVIO 3/8" Hansen Length = 3,5 m

iRockall

Vacuum and Refrigerant Charging Unit for medium productivity

iRockall is a modular evacuation and medium productivity charging station for HFC and HCFC refrigerants.

iRockall is ideal for medium/high throughput production lines of domestic and commercial refrigerators/freezers, air conditioners, heat pumps, liquid coolers where high amounts of refrigerant have to be charged.

The unit can be supplied with two injectors (**iRockall - DUE**)

- Compact and light weight
- Charging capacity: up to 10 kg
- Charging speed: up to 10 g/s with heating belt
- High charging accuracy: 0,5% of the charged amount
- Digital refrigerant metering system
- **Available with integrated Refrigerant transfer Pump equipped with volumetric metering system (/B option)**
- Built-in vacuum pump (17 m³/h @ 50 Hz, different on request)
- Interactive Color Touchscreen
- Data Collection Application over TCP/IP protocol
- Up to 1000 programmable work cycles
- Microprocessor controlled
- Built in according to the European Machinery Directive, Safety standards CE marked



Main using applications

- Professional Refrigeration
- Refrigerated show cases and cooling cabinets
- Automatic food and beverage dispenser machines
- Refrigerating units for transportation
- Ice-cream machines
- Dehumidifiers
- Centralized Conditioning stations and refrigerators
- Electrical cabinet coolers
- Domestic air conditioners
- Refrigerators and air conditioners for boats or caravans
- IT coolers
- Compressed air driers
- Condensing units

Technical Characteristics

	iRockall - UNO	iRockall - DUE
Injectors/Type	1/PLUVIO	2/PLUVIO
Injector length	3,5 m	
Refrigerant metering systems	1	2
Charging capacity	up to 100 kg	
Charging speed	up to 35 g/s	
Charging accuracy	< 200 g: ±1 g > 200 g: ±0,5%	
Injector connection	¼" Hansen F (ISO 7241B)	
Refrigerant supply connection	¼" Hansen M (ISO 7241B)	
Refrigerants	HFC, HCFC	
Working compressed air	6÷7 bar not lubricated	
On-board alarms	3 light alarms (green/white/red) on column	
Programmable work cycles	up to 1000	
Nominal Vacuum pump rate	17 m ³ /h	
Control unit	TS690	
Working temperature	5 °C ... 45 °C	
Power Supply	400 V @ 50 Hz – 3ph + GND	
Dimensions (L x D x H)	850 x 600 x 1400 mm	
Weigth	~130 kg	

Optional features and devices

Heating Belt
Only Vacuum Heads with 1/4" Hansen or 1/4" SAE Schrader connections
On Board RTP kit including suction line, protection filter, 0,7 l accumulator
Only vacuum extension Injector Head
Injector extension Length
Injector with 1/4" SAE Auto connector
Injector with 1/4" Schrader connector
Injector with 3/8" Hansen connector
Automatic working cycle selection performed by bar code reader
Remote Printer

iRockall HS

Vacuum and Refrigerant Charging Unit with High Speed Capability

iRockall HS is a modular evacuation and high productivity charging station for HFC and HCFC refrigerants.

The unit represent the TOP model of the Rockall Series.

The unit can be supplied with two injectors (**iRockall HS - DUE**)

iRockall HS is ideal for high throughput production lines of domestic and commercial refrigerators/freezers, air conditioners, heat pumps, liquid coolers where high amounts of refrigerant have to be charged.

- Compact and light weight
- Weight charging capacity: up to 100 kg
- Charging speed: 65 g/s
- High charging accuracy: 0,5% of the charged amount
- Digital refrigerant metering system
- Built-in vacuum pump (17 m³/h @ 50 Hz, different on request)
- Interactive Color Touchscreen
- Data Collection Application over TCP/IP protocol
- Up to 1000 programmable work cycles
- Microprocessor controlled
- Built in according to the European Machinery Directive, Safety standards CE marked



Main using applications

- Domestic refrigerators and deep freezers
- Professional Refrigeration
- Refrigerated show cases and cooling cabinets
- Automatic food and beverage dispenser machines
- Refrigerating units for transportation
- Ice-cream machines
- Dehumidifiers
- Big Chillers and centralized air conditioning stations
- Industrial refrigeration
- Electrical cabinet coolers
- Domestic air conditioners
- Car, bus, truck, tractors air conditioners
- Refrigerators and air conditioners for boats or caravans
- IT cooler
- Compressed air driers
- Condensing units

Technical Characteristics

	Rockall HS UNO	Rockall HS DUE
Injector/Type	1/PLUVIO	2/PLUVIO
Injector lenght	3,5m	
Refrigerant metering systems	1	2
Charging capacity	up to 100kg	
Charging speed	up to 130 g/s (260 g/s on XS Version)	
Charging accuracy	< 400 g: ±2 g > 400 g: ±0,5%	
Power supply	400 V @ 50 Hz – 3ph + GND	
Injector connection	¼" Hansen F (ISO 7241B)	
Refrigerant supply connection	¼" Hansen M (ISO 7241B)	
Vacuum pump rate	17 m ³ /h	
Programmable work cycles	1000	
Control unit	TS690	
Working temeprature	5 ÷ 45 °C	
Power Consumption	0,9 kW	
Operative compressed air	6 ÷ 7 bar - filtered - not lubricated	
Dimensions (L x D x H) / Weight	850 x 600 x 1400 mm / 150 kg	

Optional features and devices

/XS version with extra charging speed up to 300 g/s
-TRE or -QUATTRO version with 3 or 4 Injectors and relevant Refrigerant dosing Systems
Light and Acustic Alarm
Injector with 3/8" Hansen connector
Injector Lenght extension
Injector with 1/4" SAE Auto connector
Injector with 1/4" Schrader connector
Only vacuum extension Injector Head
Automatic working cycle selection performed by bar code reader
Printer



Description of a typical FT HC Refrigerants treatment System

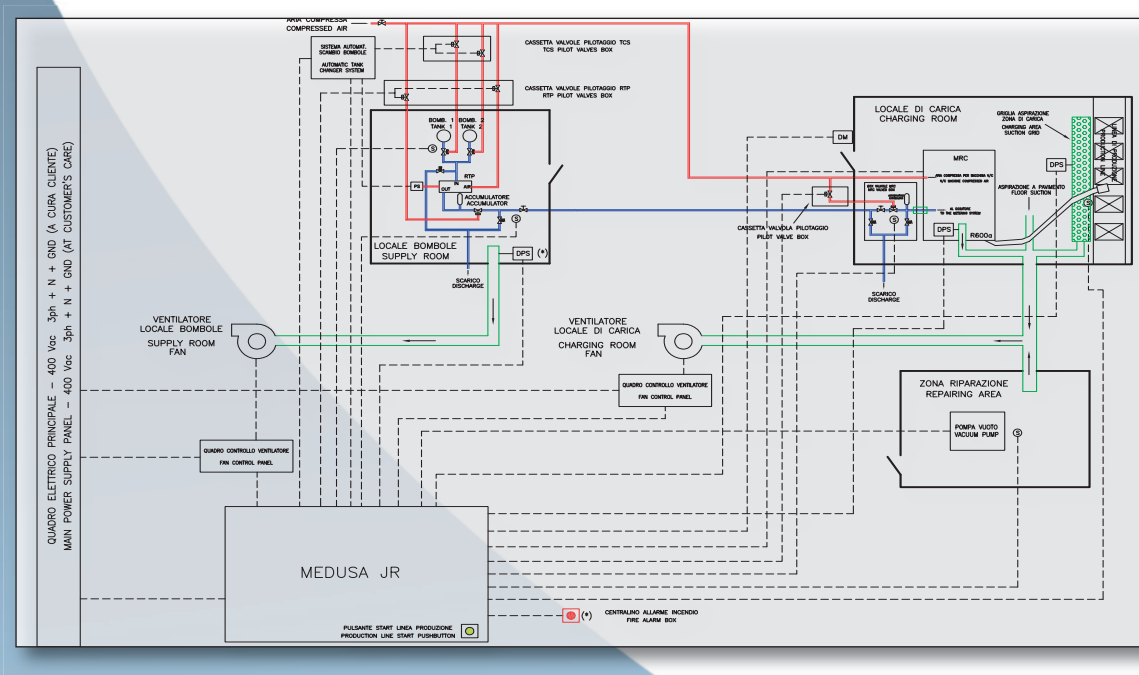
The equipment for the final vacuum and the charge of HC refrigerants are realized according to ATEX Directive 99/92 / EC, inside a proper workspace for refrigeration units to be loaded with flammable gas. Within that area flames or wells are not allowed, and smoking is prohibited. The area is delimited by walls and ventilation ducts. For security reasons, sources of potential danger to the fire ignition should be placed not less than 2-3 meters from the perimeter of the work area.

Usually a bounded working area is provided by an enclosure in which, the cooling units to be treated are moved inside through a sliding door. The same door is the access point to the work area by the staff engaged. The door can be controlled by microswitch timed. The size of the charging Area is approximately 20 m², with height of 1 meter from the floor and is enclosed by fireproof panels, which are also supplied by **FT srl**.

On the internal perimeter of the working area, a supply of extraction system is installed, which provides for the necessary change of air, so as to keep under control the concentration of hazardous gas. Inside of this area work it is placed and fixed the HC vacuum and charging machine with one / two injectors.

The refrigerant tank in use, can be installed inside another area and it can deliver the refrigerant to the charging station by means of Refrigerant Transfer Pump systems.

The devices to check the the environmental safety are installed in the vicinity of the outer walls of the charging area, while the ventilation unit with variable speed is located on the wall perimeter of the plant, in correspondence of the charging area.



Full layout example of a FT HC systems installation



FT System components for HC refrigerants treatment

FT srl can supply a full and customizable components package that realizes a full HC system.

Every FT srl component system respects the Electrical security normatives (EN 60529, EN60204-1), Hydraulic mechanics and working places safety normatives.

Every FT srl component system is delivered with relevant test certification and user manual that describe the all the necessaries steps to follow in order to work with high performances and security conditions during use and maintenance.

Every FT srl component system has been realized according to standardized production and testing procedures .

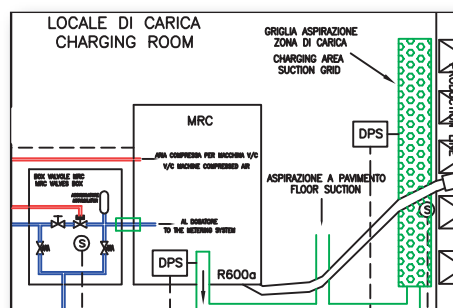
In this section there is a summary description of the functional characteristic of every FT srl component system. For a more detailed description please look at the relevant technical table.

Vacuum and Charging Machine (iRockall HC)

iRockall HC realizes the vacuum, a preliminary test leaks and Refrigerant (in liquid status) on the cooler circuits.

iRockall HC is designed to work inside a potential dangerous Area classified as zone 2, according to the CEI EN 60079-10 normative.

iRockall HC is realized with a unic cabinet internally separated by two separated volumes:



Electrical Unit - it contains the all electrical components as relevant power supply, safety relays to limit over possible current shortcuts conditions. The electrical unit is also equipped with a door microswitch in order to cut the power supply to the unit when the door is opened.

Intermediate Empty space - this component separated the electrical unit from the hydraulic unit. In this case there is warranty of perfect insulation between the two subunits.

Hydraulic Unit - it is contained under the Electrical Unit and it is generally composed by:

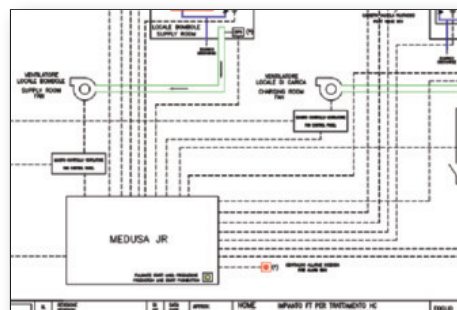
- Refrigerant supply line
- Refrigerant pipes
- Refrigerant metering system (Volumetric or by RTP automatic dosator)
- Injector refrigerant line
- Pneumatic vacuum pump for Injector internal vacuum
- Sensor to detect refrigerant leaks
- Sensor to detect internal forced ventilation

All components of each line of refrigerant charge are sectioned by type of quick couplings Hansen or Faster, which simplify the replacement procedure of every component, making it easier and safer.

Each line also sectioned by two normally closed valves, one on the injector, the other on the refrigerant metering system which limit the amount of refrigerant lost, in case of leakage or malfunction of the sealing devices to the outside.

Medusa Monitoring System

The monitoring system **Medusa** represents the general central control and command of the entire plant for the treatment of refrigerant gas. It is essentially composed by electrical panel with electronic control unit and gas concentration detection sensors installed inside the charging working area, one of which directly installed inside the station Vacuum and Charging. The **Medusa** system provides to control a forced ventilation system (see Eolo system) so to enhance the air flow rate in the presence of dangerous concentrations.



Medusa provides to give the Vacuum and Charging unit power supply electrical permission and the relevant Refrigerant Transfer pumps connected to the delivery line.

The electrical permission is real time determined according to the continuous monitoring of the refrigerant concentration detected from the sensors and a ventilation level detected from relevant differential pressure switches installed on the charging area ventilation circuit.

Medusa provides to alert operators and supplies additional ventilation, when the gas concentration reaches 15% of the Lower Flammability. The system will cut power to the vacuum system and charge, putting it in a stand-by safety, if the concentration exceeds 30% of the Lower Flammability. The warning sound and lighting is available with a remote column to advise the operators to leave the working area as well as fire prevention devices are running. In case of lowering the level of concentration below the threshold value, the system must be reset manually by the operator.

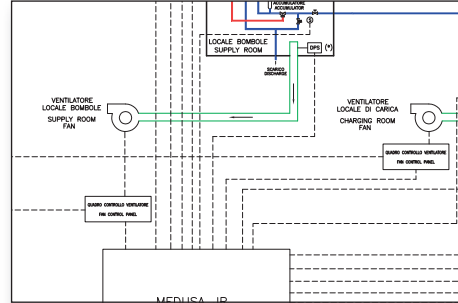
Medusa is also supplied with:

- control box valves placed inside the storage box, each essentially equipped with a valve of the barrier pneumatically operated with relevant pilot valve, manual valve, safety valve and accumulator
- safety valves for the refrigerant lines,
- valves control box placed in the supply room, each with sectioning valves, solenoid and manual, to stop, in case of need the power supply the power lines of the refrigerant
- box fire alarm, placed in proximity of the two doors of the storage box
- differential pressure switch for continuous efficiency check of the forced ventilation
- column indicating abnormal concentration of hazardous gas
- alarm indicators door or fan, in addition to the microswitch control opening of the doors of the storage box.

Extraction System Eolo

Eolo extraction system consists of a fan soundproof / free multispeed in Ex execution, with rate capacity up to more than 3500 m³/h, controlled by smart inverter.

The control system is regulated by a special electrical panel, interfaced with the Medusa monitoring system and with the charging unit iRockall HC



The ventilation delivered by the Eolo system is routed in a pipe appropriately sized according to the factory layout. If the ventilation system ends to work (broken fan motor, accidental clogging ducts etc. ...) the Medusa system activates a procedure for disarming of the refrigerant pumping systems and the refrigerant charging machine as it no longer guaranteed safety.

The control of the operation takes place by means of differential pressure switches connected to the Medusa system that is dimensioned to detect the presence of air flow in the ventilation areas potentially more critical.

Operation Constraints of the Eolo System:

- The fan must be always in operation, the lower operating speed, when the machines are in operation, so as to maintain a continuous change of air in the working area
- the ventilation flow rate is set at the maximum speed, when one or more sensors detect a gas concentration greater than 15% of the Lower Flammability.
- The fan continues to run at full capacity even when, exceeded the threshold of 30% of the Lower Flammability, the power to the charging unit is cut and is given indication that you are in an emergency situation.



Refrigerant Transfer Pump (RTP)*

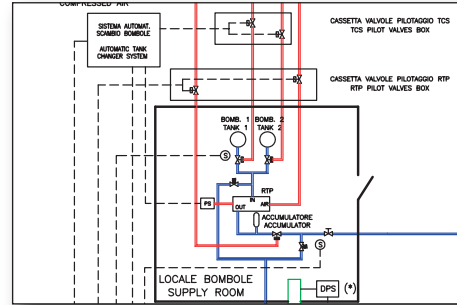
The **Refrigerant Transfer Pumps** are volumetric pumps with cylindric movement designed to pressurize and transfer in liquid phase the refrigerant. The **RTP** actioning is realized by means of compressed air.

Basically they are installed close to a tank or storage systems from which they aspire the refrigerant fluid thank to the cylinders moved by compressed air and proper pneumatic valves. After that the fluid is compressed in liquid phase and transferred to the refrigerant charging machine.

The **RTP** is equipped on the refrigerant sending line with a barrier realized by means of unidirectional valves that avoid the fluid return towards the pump. As all the Refrigerant fluid tend to increase their specific volume with the temperature increasing, some events of uncontrolled pressure increase can appear due to the incompressibility of the fluid itself.

The **RTP** have a safety valve settled at 40 Bar that allows to exhaust on the ventilation circuit eventual overpressure events on the refrigerant delivery line.

* The device is integrated on the execution iRockall HC /B



Automatic Tank Changer System (TCS)

This system is used to automatically replace the supply of refrigerant gas to the transfer pump when the tank runs out of stock. The principle of operation is based on monitoring of the movement of the piston of the pump RTP that in case of lack of refrigerant in the cylinder, tends continuously to make extraction cycles at a frequency much higher than that of normal use. The monitoring takes place by means of electrical signals from the appropriate limit sensors which close an electrical contact shown on the electronic control unit.



The **TCS** provides automatically to supply an alarm sound when the current tank is going to be empty and it must be replaced with a full tank. The alarm sound is also emitted with a red alarm light that (optionally) can be installed in a remote place.

As soon the **TCS** detects a empty tank status it provides to:

- close the pneumatic valve of the empty tank aspiration line and switch the suction line to the filled tank by opening the relevant pneumatic valve
- indicates the relevant procedures to restart the suction process from the filled tank.

iRockall HC

Vacuum and Flammable Refrigerant Charging Unit

iROCKALL HC is an evacuation and charging station for A2L, A2 A3 Class refrigerants and not flammable classes. It is an easy and effective to handle machine with a top charging accuracy.

iROCKALL HC is for medium and high throughput production lines of domestic and commercial refrigerators / freezers and other fields of application and it well designed and tested for making use of isobutane (R600a) and propane (R290). Assembly lines making use of most recent refrigerants as R1234yf and R1234ze are also the natural workplace for **iROCKALL HC**

- Microprocessor or smart OS (optional) controlled
- Charging speed: up to 25 g/s for HC/HFO refrigerants and up to 40 g/s for HCFC/HFC refrigerants
- Charging capacity: according to local limitations
- High charging accuracy
- Built-in vacuum pump (20,5 m³/h)
- **Available with integrated Refrigerant transfer Pump equipped with volumetric metering system (/B option)**
- Interactive Color Touchscreen
- Data Collection Application over TCP/IP protocol
- Up to 1000 programmable work cycles
- Microprocessor controlled
- Built in according to the European Machinery Directive, Safety standards for Potential Dangerous Areas

Main using applications

- Domestic refrigerators and deep freezers
- Professional Refrigeration
- Refrigerated show cases and cooling cabinets
- Deep Cooling for Medical Products
- Automatic food and beverage dispenser machines
- Ice-cream machines
- Dehumidifiers
- Domestic air conditioners

The equipments for vacuum and HC-R600a and R290 charge are designed and assembled for the construction of areas of assembly of refrigeration units to be charged with flammable gases according to the indications of the ATEX Directive 99/92 / EC. As the working areas are classified as hazardous, these equipments must be installed within an enclosure and ventilated able to withstand any refrigerant leaks. The electric and hydraulic components of the vacuum and charging station have been chosen by FT to comply with ATEX for the classification of areas at high risk of explosion and thus make the whole system suitable for working with flammable liquids.





Technical Characteristics

	iROCKALL HC UNO	iROCKALL HC DUE
Injectors/Type	1/PLUVIO HC	2/PLUVIO HC
Injectors Length	3,5 m, different on demand	
Refrigerant metering system	1	2
Charging capacity*	max 10 kg for HFC	
Charging speed	up to 25 g/s (HC refrigerants) up to 40 g/s (HFC refrigerants)	
Charging accuracy	±0,5 g (<100 g HC), ±0,5 % (>100 g HC) ±1,0 g (<200 g HFC), ±0,5 % (>200 g HFC)	
Injector connection	¼" Hansen F (ISO 7241B)	
Connection to the refrigerant supply line	¼" Hansen M (ISO 7241B)	
Vacuum pump capacity	20,5 m ³ /h	
Number of programmable working cycles	1000	
Control Unit	TS690	
Working temperature	5 ÷ 45 °C	
Compressed air supply	6 ÷ 7 bar not lubricated	
Requested Refrigerant supply	Pressurized, in liquid phase	
Power Supply	400 V @ 50 Hz – 3ph+GND	
Power consumption	0,6 kW, with 20,5 m ³ /h vacuum pump	
Dimensions (LxWxH)	600x 850 x 1430 mm	
Weight	170 kg	

* the maximum quantity is settled according to the local limitations

Optional features and devices

Light and Acoustic Alarm
Injector MFILL for High production lines
Refrigerant dosing system with Massic Coriolis flowmeter
30,2 m ³ /h Vacuum pump
Automatic working cycle selection performed by Bar code reader
Remote printer



Medusa

Monitoring and Gas Extraction System

Medusa is the environment monitoring system that allows to keep constantly in the safety the vacuum and charging machine within the working area storage area and, if present, the refrigerant suction and transferring area.

Medusa can be configured according to the customer specific installation:

- Built in agreement to the European Machinery Directive, CE marked, CE Safety standards for potential dangerous areas
- Basic version suggested with three ambient sensors
- Microprocessor controller
- User interface with alarm lights
- Provided with integrated Acoustic Alarm
- Provided with UPS (Uninterruptible Power Supply) to constantly supply the sensors and the relevant light and sound alarms



Medusa supply and control the EOLO fan rate ventilation by means of a proper Power Electric cabinet. The Power rate can be configured according to the customer layout.

Medusa standard version is provided with catalytic sensors that include (optionally) a sensitivity calibration device to check their performances according to the European Machine Directive.

Components included in the Medusa System

- Main control box
- **EOLO** multi speed Atex fan
- Fire alarm box
- Gas alarm indicators column (up to three)
- Fan/door alarm indicators column (up to three)
- Spring + microswitch for charging room door
- Pneumatic, hand and safety valves group + 0,7 l accumulator
- Pneumatic, hand and safety valves group + refrigerant filter
- 30/40 bar safety valve

Main using applications

Medusa advise operators and initiate additional ventilation, when the concentration of Isobutane/Propane reaches 15% of the Lower Flammability. The system provides to cut the power supply to the vacuum and charging unit, putting it in a safety position, where the concentration exceeds 30% of the Lower Flammability. At this point is also given the Alarm because the operators to leave the working area and activate all systems of fire prevention.



Technical Characteristics

Environment sensors	From 3 to 8
Type of environment sensors	Catalytics
EOLO fans monitored	2 or 4
Differential pressure switches	1 or 2
Available Outputs to	<ul style="list-style-type: none">• cut the supply to the charger, to tank changer system, to the vacuum pump in the repair area, to the refrigerant delivery line from the transfer pump• audible and light alarms• opening delivery valve for "anti-fire agent"
Available Inputs to	<ul style="list-style-type: none">• state (ON/OFF) of charger• state (Open/Closed) of working area door• state (Activated/Not activated) of fire alarm push button
Available Eolo Rates	<ul style="list-style-type: none">• 3100 m³/hr /EOLO Jr• 3100 m³/hr /EOLO• 4000 m³/hr /EOLO L• 4500 m³/hr /EOLO XL
Control Unit	PL4+
Working temperature	5 ÷ 45 °C
Power supply	400 V – 50 Hz – 3ph + N + GND
Rated electric current	~ 7 A controlling 2 ventilation units ~ 14 A controlling 4 ventilation units
Dimensions	800 x 600 x 250 mm
Weight (Medusa Cabinet)	45 kg

Optional features and devices

Calibration kit for HC sensors
IR environment sensors



Eolo Fan Unit



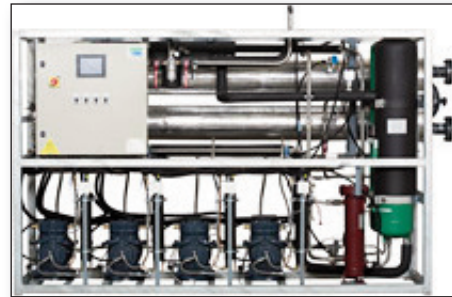
Example of complete installation

Ecologic No-Flammable Refrigerants

Introduction to the Ecologic No-Flammable refrigerants use

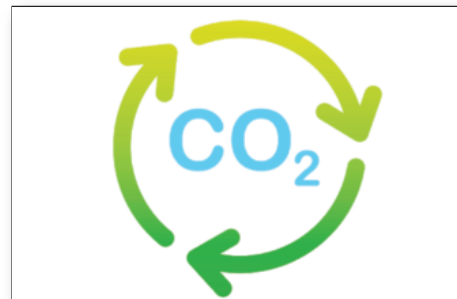
The market for refrigeration and air conditioning is focusing more and more on issues related to the environmental impact of their systems in order to comply with established of the Montreal Protocol (1987) and the Kyoto Protocol (1997).

During the last ten years the use of Carbon Dioxide (CO₂) as a refrigerant has gained renewed interest because of ecological problems caused by the use of synthetic fluids (CFC-HCFC-HFC).



As matter of fact, Carbon Dioxide

- is a natural refrigerant
- has ODP = 0 (Ozone Depletion Potential)
- has GWP = 1 (Global Warming Potential)
- is not a flammable refrigerant
- is not toxic
- is a product available in all the world
- is a low cost product



Furthermore, European governments are planning the progressive restriction of the use of synthetic refrigerants in any type of heating system: for example, the Norwegian government provides for the payment of fees for the use of HFC refrigerants while the Austrian has prohibited the use from 2008; in the same direction are moving the Switzerland and Denmark governments.

It is still a fact that the governments of the North-European Nations are strongly promoting the use of natural refrigerants, collaborating with organizations like NGO (Non Governmental Organizations) as Greenpeace and UNEP.

As of today the challenge that leads to the use of air conditioning and refrigeration without HFC and HCFC was already full collected by famous multinationals that are making several thousand Field Test worldwide.

FT srl works every day to encourage and provide industrial solutions that relate to the processing of refrigerant gases in total respect of the environment and according to international protocols that have been adopted over the years.



iRockall CO₂

Vacuum and Charging High pressure Refrigerant Unit

iRockall CO₂ is the most recent FT srl solution for vacuum and high pressurized refrigerant charging Station.

Rockall CO₂ is dedicated to the most recent production lines for commercial and domestic refrigerators/freezers, conditioners, heating pumps, liquid cooler where the production is realized with vapour Carbon Dioxide.

- Compact and light weight design
- Charging capacity: up to 10 kg
- Charging speed: up to 10 g/s with CO₂ in vapour phase
- Charging accuracy: 1% of settled dose
- Refrigerant Metering system realized by massic flowmeter
- Built-in vacuum pump (17,0 m³/h @ 50Hz, different on request)
- Interactive Color Touchscreen
- Data Collection Application via TCP/IP protocol
- Up to 1000 programmable work cycles
- Microprocessor controlled
- Built in according to the European Machinery Directive, Safety standards for Potential Dangerous Areas



Main using applications

- Domestic refrigerators and deep freezers
- Professional Refrigeration
- Refrigerated show cases and cooling cabinet
- Domestic air conditioners
- Heat pumps
- IT coolers
- compressed air driers
- Condensing units
- Deep Cooling for Medical application*



* For this kind of products FT can deliver an ATEX Execution of the machine to be integrated with the relevant monitoring system and gas detection sensors. The most relevant fluid used are Ethane and Ethylene to realize refrigerant mixtures

Technical Characteristic

	ROCKALL CO₂
Injectors/Type	<i>1/PLUVIO HC Special</i>
Injector lenght	<i>3,3 m, different on demand</i>
Refrigerants	<i>CO₂ or similar</i>
Refrigerant Metering system	<i>1</i>
Charging capacity	<i>up to 10 kg</i>
Charging speed	<i>up to 10 g/s*</i>
Charging accuracy	<i>< 300 g: ±1 g > 300 g: ±1 %</i>
Injector connection	<i>¼" Hansen F (ISO 7241B)</i>
Refrigerant delivery line connection	<i>¼" Hansen M (ISO 7241B)</i>
Vacuum pump rate	<i>17 m³/h</i>
Programmable cycle number	<i>1000</i>
Control Unit	<i>TS690</i>
Working Temperature	<i>5 ÷ 45 °C</i>
Refrigerant delivery	<i>pressurized in vapour phase</i>
Power supply	<i>400 V @ 50 Hz – 3ph+GND</i>
Power consumption	<i>0,7 kW with 17,0 m³/h vacuum pump</i>
Dimensions (L x W x H)	<i>600 x 850 x 1350 mm</i>
Weight	<i>140 kg</i>

*CO₂ charged in vapur phase

Optional features and devices

Light and Acoustic Alarm
20,3 m ³ /h Vacuum Pump with Oil Mist filter TMF36
PLUVIO Injector lenght on demand
Automatic working cycle selection performed by bar code reader
Only vacuum head Injector 1/4" Hansen
Available the ATEX Execution for gas treatment as Ethylene and Ethane

iFuji

All-In-One Evacuating Pressurization and Refrigerant Charging Unit

iFuji is designed to fulfill the highest standards of the processing requirements of the processes of vacuum pressurizing and refrigerant charge.

iFuji is equipped with an electronic control of the latest generation, high computing capacity and memory, and is able to be managed by a smart operating system and easily interactive with the user.

The smart electronic control of **iFuji** allows to integrate multiple processes in a unique cycle program:

- Vacuum and relevant Test with vacuum decay
- Tracer Gas or Helium+Nitrogen automatic mixture pressurizing with Pressure Decay and Leak Detection point-to-point leak search (data displayed on the unit controller)
- Refrigerant charging
- General report release



iFuji communicates with the User facility network and is an integral part of the production process. It has its own standard communications interfaces and software suitable to be connected to company networks for control and export directly to the office the reports of work performed. This also allows to integrate other digital devices (such as a Leak detector) directly to the machine thus to speed up and integer the Vacuum, Leak detection and Charging proces in a unique cycle All executed in complete safety.

Thanks to its smart connectivity, **iFuji** is ready for tele-assistance from the mother company, **FT srl**, enabling significant cost and time savings in critical situations of post-sale.



* For this kind of products FT can deliver an ATEX Execution of the machine to be integrated with the relevant monitoring system and gas detection sensors.



Technical Characteristic

	iFuji UNO	iFuji DUE
Injector/Type	1/PLUVIO SPECIAL	2/PLUVIO SPECIAL
Injectors lenght	3,3 m, different on demand	
Refrigerant Metering System	1	2
Charging capacity	310 g for HC* / 10 kg for HFC	
Charging speed	up to 25 g/s (HC Refrigerants) fino a 40 g/s (HFC refrigerants)	
Charging accuracy	±0,5 g (<100 g HC), ±0,5 % (>100 g HC) ±1,0 g (<200 g HFC), ±0,5 % (>200 g HFC)	
Mixture capacity	Helium and Nitrogen, with two independent pressurizing stadiums	
Pressurizing Capacity	up to 55 Bar	
Injector connection	¼" Hansen F (ISO 7241B)	
Refrigerant delivery line connection	¼" Hansen M (ISO 7241B)	
Vacuum pump rate	20,5 m ³ /h	
Programmable working cycle	1000	
Control Unit	TS690	
Working Temperature	5 ÷ 45 °C	
Compressed air supply	6 ÷ 7 bar not lubricated	
Refrigerant supply	pressurized in liquid phase	
Power supply	400 V @ 50 Hz – 3ph+GND	
Power consumption	0,7 kW, with vacuum pump 20,5 m ³ /hr	
Dimensions (L x W x H)	600 x 850 x 1350 mm	
Weight	160 kg	

* the maximum quantity is settled according to the local limitations

Optional features and devices*

Light and Acoustic Alarm
30,5 m ³ /hr Vacuum Pump with Oil Mist filter EMF20
Inficon Family Leak detector function integrated
Automatic working cycle selection performed by bar code reader
Available third and fourth processing line
Only vacuum head Injector 1/4" Hansen

*Refer to FT sales department for details on iFuji customization

Vacuum and Charging Injectors

General Overview

The injector is the connection device between the Refrigerant charging machine and the cooler refrigerant circuit.

Its characteristics are very important and variable according to the refrigerant charging unit characteristics that depend on the production assembly line.

The main FT injectors parameters are:

- light and easy on the use
- high affidability and low maintenance frequence
- low cost electric version or high performances pneumatic version are available
- high speed switch of internal micro-valves for high repeatability and accuracy
- safety during use
- further services to increase performances on HC refrigerant use applications

General Injectors Overview

High performances HC Applications, Multi Refrigerant

PLUVIO HC

High Precision, Medium/Low productivity



Also CO₂ Application available

MFIL

High Precision, High Productivity



HCFC, HFC Application

PLUVIO



PLUVIO M







PLUVIO HC

for 1/4" or 3/8" quick connectors

PLUVIO HC is a vacuum and charging injector with pneumatic/electromagnetic control, which minimizes any dead spaces to ensure the maximum compactness and the entire transfer towards the group circuit in the cooling fluid computed from the charging station.

PLUVIO HC is an injector without any refrigerant release on the environment, designed for medium/low throughput production lines.

The pneumatic needle valve and automatic connection to the unit to be processed are 1/4 "or 3/8" Hansen (ISO 7241B). They are also available in alternative connections 1/4 "or 3/8" SAE Automotive. The standard length of the injector is 3.5 m.

PLUVIO HC is standard supplied in **iROCKALL HC**, but it can specially configured to other applications such as the **CO2** or **High Speed** applications

High Productivity proceses: FT suggests the use of the MFIL Injector

Thanks to its micropneumatic technology united to the speed of Electric Valves this Injector is capable to manage very frequent charge cycles without any stress. The typical use is mass production where it is strictly required to continously work h-24 with small quantity charges without loosing the general technical features of reliability.



PLUVIO

for 1/4" quick connectors

The **PLUVIO** series injectors are electromagnetic piloted, this to control the vacuum and refrigerant cartridge on the valve.

They are equipped with 1/4" Hansen quick connector or -as optional- with 1/4 SAE Schrader.

PLUVIO is equipped with a ergonomic holder and START button, or as per request can be supplied with Automatic quick release



PLUVIO is standard supplied in **iTEIDE TTD** and **iROCKALL**

The standard length of the injector is 3,5 m.

Multi Refrigerant Injectors

for special applications with 1/4" quick connectors

These multi refrigerant injectors are dedicated to special applications where the customer requires a more compact solution in a limited space, or a general multi stadium filling mixture composed by two or mor refrigerants.

The solution can be arranged for two or three refrigerants, vacuum and service exhaust thanks to the modular design to host the relevan Electric Valves, also available on ATEX configuration The Automatic coupling, and the needle are pneumatic operated.



Available in the following versions:

- 1/4" or 3/8" Hansen quick coupler (ISO 7241B)
- automotive connection (suction or send side)
- 1/4" SAE quick coupler with Schrader valve
- Start Button integrated
- Standard Lenght = 3,5 meters

Refrigerant Transfer Pumps

RTP - Devices to pressurize and transfer refrigerant to delivery lines

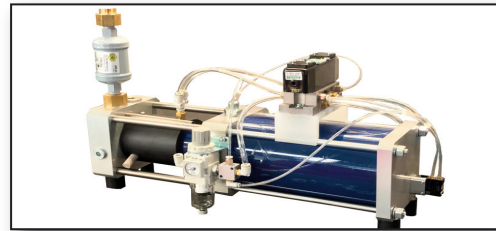
The pumps designed specifically for the transfer and pressurization of refrigerants are provided with a complete equipment in adjunct, which includes:

- Pressure regulator fluid in the supply line
- Gauge pressure of the fluid in the supply line
- Safety valve by-pass to protect the RTP from possible over-pressure in the discharge line
- Unit filter / dryer for compressed air

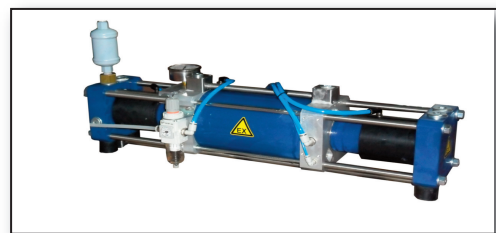
Suggested accessories

- Filter on inlet with high capacity, to protect the pump from solid impurities that may be present the treated refrigerant
- Quick couplings with flat faces for couplings having the suction and discharge, to enable rapid connections and disconnections from the refrigerant lines, in case of pump maintenance operations
- Suction hose to connect the filter to the storage tank and to the pump
- Hose in the supply to connect directly the pump to the refrigerant charging unit
- Safety valve for emission of refrigerant to the outside or inside the tank in case of emergency
- Hydropneumatic accumulator to maintain stable discharge pressure the case of unexpected refrigerant flow variation in the distribution system

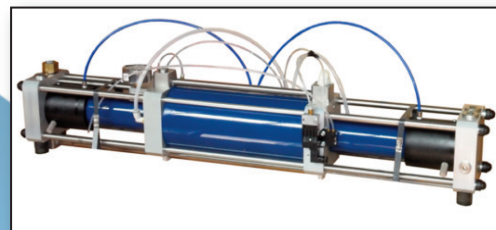
RTP 6315



RTP 6315T



RTP 6325T



Technical Characteristics

	RTP6315 (-HC)	RTP6315T (-HC)	RTP6325T (-HC)
Maximum rate	6,0 l/min	10,0 l/min	13,0 l/min
Dimensions	540x200x340 mm	700x200x350 mm	1100x200x350 mm
Weight	15 kg	17 kg	40 kg
Refrigerant compatibility	HFC, HCFC, HFO, HC		
Number of Hydraulic cylinders	1, single compression action	2, double compression action	2, double compression action
Geometrical multiplier ratio**	4,27		
Integrated safety valve setting	4000 kPa		
Delivery line connection	1/2" GAS-M		
Suction line connection	3/4" GAS-M		
Compressed Air supply	Dried, filtered, not lubricated		
Compressed air Pressure	2 ÷ 6 bar		
Compressed air Pressure pipe typology	RILSAN Ø _e 8 mm		

** Equal to the ratio:refrigerant delivery pressure–refrigerant supply pressure) / compressed air pressure
features subject to change without notice; please contact FT Sales Service for more informations

Optional features and devices

RTP Connection KIT
Automatic RTP Stopping System (RTP SS) (with acustic alarm, red -green light, HFC or HC)
Automatic Tank Change system (TCS)
Customization on special platform composed by RTP SS + TCS + Hydropneumatic accumulator

Automatic RTP stopping system



Automatic Tank Change system



Hydropneumatic Accumulators

The hydropneumatic accumulator is a device designed specifically for the storage of liquids under pressure. As liquids are, for all practical purposes, incompressible, the objective is achieved by utilising the compressibility of gases.

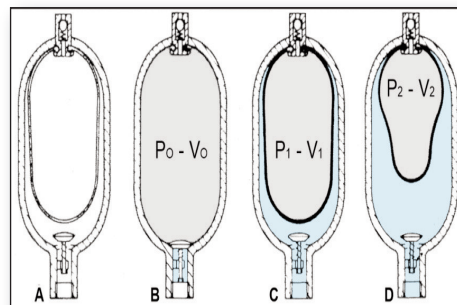
A- A flexible separator bladder is fitted into a pressure vessel (accumulator shell).

B- Through a special valve an inert gas (nitrogen) is introduced into the bladder with pressure P_0 . The bladder expands, filling the entire volume V_0 of the accumulator shell.

C- When circuit pressure P_1 is higher than the gas precharge pressure P_0 , the liquid valve opens, and the bladder is compressed reducing the gas volume to V_1 .

D- When the liquid pressure rise to P_2 , the volume of gas reduces to V_2 with an attendant rise in pressure, thus balancing the liquid pressure.

This means that the accumulator has been pressurised $\Delta V = V_1 - V_2$ and a potential energy has been created to be utilised as desired



The accumulators can be conveniently used in different applications, of which the main ones are:

- Reserve liquid under pressure, to temporarily maintain high levels of flow rate.
- Stabilizer of pressurized lines, to limit the fluctuations for thermal changes or the flow rate.
- Energy reserve in the form of pressurized fluid or hydraulic spring.
- Absorber hammering or pulsation of the fluid.

The accumulators are available for many standards Industrial Refrigerants and fluids as:

- refrigerants HFC (R134a, R404A, R407C, R410A, R507, others)
- refrigerants HCFC
- refrigerants CFC
- refrigerants HC and HFO (R600a, R290, R32, R1234ze R1234yf)
- other "natural gases" as NH₃ (R717) e CO₂ (R744), industrial oils or general fluids
- CE-PED, ATEX and ML available on request

FT srl provides accumulators with preloaded pressurized nitrogen as standards. When choosing an accumulator please contact the technical department of **FT srl** to communicate the nature of the fluid used.

Accessories suggested with Accumulators

- Support brackets
- Holding collars
- Kit pipe / fittings for interfacing with systems RTP
- Verification system Preload nitrogen

Contact the technical FT srl for proper sizing accumulators, size and accessory piping

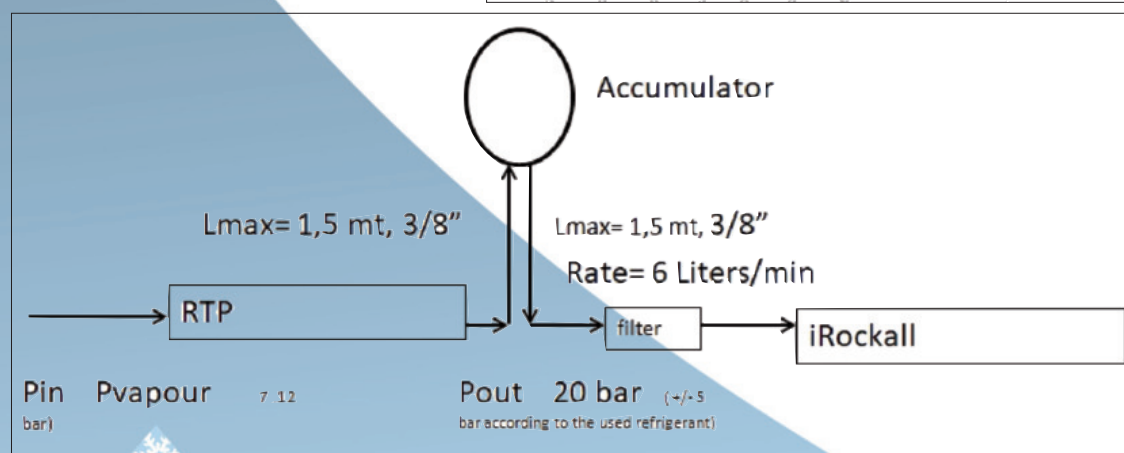
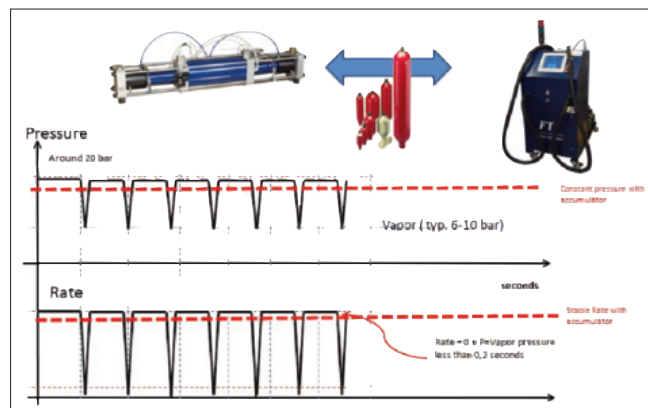
Capacity and Typology Accumulators

Typical Charge Amount on Refrigerant Circuit	Available and suggested capacity	Dimensions (H x D mm) weight (kg)
from 30 g to 100 g	0,35 Liters	190 x 70mm 2,5 kg
from 100 g to 300 g	0,70 Liters	220 x 92mm 3,2 kg
from 300 g to 1 kg	1,5 Liters	270 x 115mm 6,2 kg
from 1 kg to 3 kg	3,0 Liters	400 x 115mm 9,8 kg
from 3 kg to 10 kg	5,0 liters	365 x 168mm 15 kg
from 10 kg to 25 kg	15,0 liters	750 x 168mm 25 kg
over 25 kg	25 liters	750 x 220mm 36kg

Example of connection and functionality

picture shows the rate and relevant waveform smoothing with presence (red line) of the accumulator.

The FT charging units have the best accuracy performances with a correct working of the accumulator



Portable Leak Detectors

infrared leak detector portable version - for A1 and A2 refrigerant gas

D-TEK-SELECT

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

D-TEK Select Refrigerant Leak Detector maintains the sensitivity over time for consistent, accurate and reliable performance, even with the newer refrigerant blends.

Best of all, the sensing cell lasts for approximately 1,000 hours. Additional enhancements include a charging status indicator, sensor failure indication, and rechargeable NiMH batteries.



Detection capabilities	R22, R134a, R404a, R410a, R448a, R507 (AZ-50), R32, HFO1234yf, SF6, and all other CFCs, HCFCs, HFCs, and HFOs
Minimum Sensitivity	3,0 g/year
Sensitivity according to EN14624 (R134a)	1,0 g/year
Operating Principle	Sniffer with evaluation of thermo conductive sampled gas
Heating time / reaction time	~ 1 minute / 1 s
Leak detection method	Multiple LEDs, variable intensity audio alarm indicate leak strength
Probe lenght	38 cm
Autonomy	6,5 hours
Recharging time	8 hours (230 Vac battery charger)
Dimensions / Weight	220x65x30 mm / 0,45 kg
Standard content of the supply	Infrared cell, NiMH battery, spare filters, wall charger, 12 V car charger, hard plastic carrying case.



Portable Leak Detectors

safely detect flammable refrigerant and combustible A3 refrigerant leaks

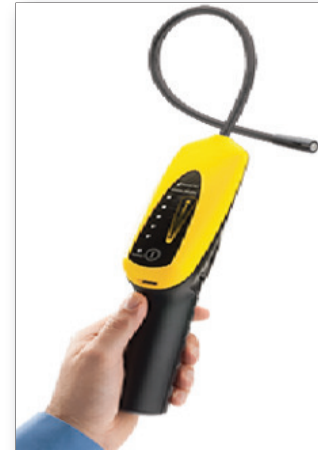
GAS-Mate

GAS-Mate, the ideal tool for locating leaks in forming gas, flammable refrigerant, or combustible heating and appliance applications. GAS-Mate is also intrinsically safe, so you can leak check with confidence.

GAS-Mate outperforms other models with twice the sensitivity of many competitors - down to 5 ppm methane, the main component of natural gas. GAS-Mate also detects many other combustible gases, such as ammonia, propane, ethanol and hydrogen sulfide.

No calibration is required for GAS-Mate or its field-replaceable sensor. Simply turn the unit on, allow it to warm up for two minutes and it is ready to quickly pinpoint any gas leaks present.

When the GAS-Mate detects combustible gas, it emits an acoustic sound and the leak indicators flash. The faster emission of a sound or a fixed alarm indicates a higher concentration of gas.



Detection capabilities	R290, R600a, and R441a; Detects forming gas (95% Nitrogen, 5% Hydrogen)
Minimum Sensitivity	5 ppm: methane, R290 (propane), R600a (isobutane), hydrogen;
Certifications	Intrinsically Safe for Class I, Division I, Groups A-D, T4 and II 3G Ex nA nL IIC T4 X as per MET Laboratories Listing #E112145
Operating Principle	Sniffer with evaluation of thermo conductive sampled gas
Heating time / reaction time	~ 1 minute / 1 s
Leak detection method	Multiple LEDs, variable intensity audio alarm indicate leak strength
Probe length	38 cm
Autonomy	25 hours
Recharging time	8 hours (230 Vac battery charger)
Dimensions / Weight	220x65x30 mm / 0,45 kg
Standard content of the supply	Sensor, two "D" size alkaline batteries, hard plastic carrying case

Professional Leak Detectors

portable version - for refrigerant gas and tracers mixtures

HRD 92

leak detector compact size, portable, high versatility.

Equipment supplied with battery supply system and relevant charger, double plug-in cable, sensor unit integrated suction, provided with suction tip, shock-proof case.



Available probes	All refrigerant gases detection block R1234ze, R134a, R404, R407, R410... R290, R600, NH3. Blends R1234ze & R134a Tracer mixture gases N ₂ /H ₂ (5% H ₂)
Sensitivity probes for HFC and HC	from 0,3 to 30 g/year HFC, on three scales: <i>0,3 ÷ 3 g/year HFC, alarm @ 1 g/year</i> <i>1 ÷ 10 g/year HFC, alarm @ 3 g/year</i> <i>3 ÷ 30 g/year HFC, alarm @ 10 g/year</i> from 0,1 to 10 g/year HC, on three scales: <i>0,1 ÷ 1 g/year HC, alarm @ 0,3 g/year</i> <i>0,3 ÷ 3 g/year HC, alarm @ 1 g/year</i> <i>1 ÷ 10 g/year HC, alarm @ 10 g/year</i>
Sensitivity probes for tracer mixtures N₂/H₂	from 2x10 ⁻⁶ to 2x10 ⁻⁴ cm ³ /s H ₂ , on three scales: <i>2x10⁻⁶ ÷ 2x10⁻⁴ cm³/s H₂, alarm @ 6x10⁻⁶ cm³/s</i> <i>8x10⁻⁶ ÷ 8x10⁻⁵ cm³/s H₂, alarm @ 2x10⁻⁵ cm³/s</i> <i>2x10⁻⁵ ÷ 2x10⁻⁴ cm³/s H₂, alarm @ 6x10⁻⁵ cm³/s</i>
Operating Principle	Sniffer with evaluation of thermo conductive sampled gas
Heating time / reaction time	~ 1 minute / 1 s
Reading display	Array of 6 LED alarm light and sound, self-diagnosis by means of LEDs indicating temporary malfunction or permanent as saturation, degassing, etc.
Cable lenght	1,5 m
Autonomy	4 hours (8 hours special version at request)
Recharging time	8 hours (230 Vac battery charger)
Dimensionis / Weight	220x65x30 mm / 0,45 kg
Standard content of the supply	Charger, sensor with integrated suction unit, suction tip, shockproof case

Possible changes without notice

Professional Leak Detectors

industrial version - for refrigerant and HFO gas and tracers mixtures

MTD 930

leak detector compact size, industrial use for bench tests. High versatility.

Power supply with cable. Equipment provided with dual double plug-in cable, sensor unit with integrated suction, provided with suction tip



Available probes	R1234ze, R134a, R404, R407, R410a R290, R600 tracer mixture gases N ₂ /H ₂ (5% H ₂)
Minimum Sensitivity for HFC, HC and HFO	1 g/yr
Minimum Sensitivity for tracer mixtures N₂/H₂	H ₂ /N ₂ : 1 * 10 ⁻⁵ cc/s Equivalent R134a: 1 g/yr
Operating Principle	Sniffer with evaluation of thermo conductive sampled gas
Heating time / reaction time	~ 2 minutes / 1 s
Reading display	<ul style="list-style-type: none"> • 4 lines LCD screen • Light ramp with 3-tone sound signal • Saturation indication with 10 times the set value • Degassing Countdown timer • Adjustable sound volume • Indication of environmental contamination
Cable lenght	1,5 m
Power supply / consumption	230/110 V, 50/60 Hz, 25 W
Dimensions / Weight	300x200x150 mm / 5 kg
Standard content of the supply	power supply cable, sensor with integrated suction unit, suction tip

Possible changes without notice

Professional Leak Detectors

Infrared version - for Refrigerant Gas including HC

HLD 6000

Leak detection in a compact, portable, high versatility and speed of use.

Versions for R134a, R404A, R407C, R410A, R22, CO₂, other gases. Equipped for power supply



Sensitivity	<i>1 ÷ 50 g/year</i>
Probe length	<i>4,8 m</i>
Reaction time	<i>< 1 s</i>
Signaling	<i>Digital</i>
Zero	<i>Automatic, with self-compensation of environmental contamination</i>
Power Supply	<i>220/240 V - 50/60 Hz</i>
Calibration	<i>Feasible within seconds by referring to internal calibrated leak</i>
Gas	<i>Version available for R134a, R404A, R407C, R410A, R22, CO₂ and other gases</i>
Auto Test	<i>available, aspirated gas flow 320 sccm</i>
Working temperature	<i>10 ÷ 50 °C</i>
Dimensions (high x diameter)	<i>365 x 260 mm</i>
Weight	<i>4,5 kg</i>

Possible changes without notice

Industrial Leak Detector

mass spectrometer - for refrigerant gases and tracer mixtures

Ecotec E3000

The Ecotec E3000 is a professional bench Leak detector with High functionality and versatility.

Power supply with cable. Equipment provided with dual plug-in cable , sensor unit with integrated suction, suction tip.

This device can be interfaced with the Pressurizing station **iAmiata**



Maximum Sensitivity	<i>0,05 g/year 1×10^{-6} mbar l/s for He</i>
Probe lenght	<i>3 m, more on request</i>
Reaction time	<i>< 0,8 s</i>
Number of detectable gases at the same time	<i>up to 4</i>
Number of gas in the database	<i>Over 100</i>
Signaling	<i>Digital by means of bar graph</i>
Zero	<i>Automatic, with self-compensation of environmental contamination</i>
Power suply	<i>220/240 V - 50/60 Hz</i>
Calibration	<i>Feasible within seconds by referring to internal certified calibrated leak ECO. The operation cn be done by external instruments</i>
Gas	<i>Gas CFC, HCFC, HFC, HC, He, etc.</i>
Auto Test	<i>available, aspirated gas flow 160 sccm</i>
Working temperature	<i>10 ÷ 45 °C</i>
Dimensions / Weight	<i>610 x 370 x 265 mm / 34 kg</i>

Possible changes without notice

Industrial Leak Detectors

quartz window technology - for He tracer gas

Protec P3000

Protec P3000 is a professional bench Leak detector with High versatility. The device can be connected to the **iAmiata** and **iFuji** units for a full data communication relevant to leaks activity detection.

Power supply with cable. Equipment provided with dual plug-in cable , sensor unit with integrated suction, suction tip.



	PROTEC P3000	PROTEC P3000XL
Maximum sensitivity / Range measure	1×10^{-7} mbar l/s / 5 decades	1×10^{-7} mbar l/s / 5 decades
Probe Length	3 m, higher on request	
Reaction time	< 700 ms	< 450 ms
Signaling	Digital by means of bar graph	
Zero	Automatic, with self-compensation of environmental pollution	
Power Supply	220/240 V 50/60 Hz	
Calibration	Feasible within a few seconds referring to the calibrated leak certified PRO-Check integrated into the instrument	
Tracer Gas	Helium	
Auto Test	Available, gas flow aspirated 300 sccm	Available, gas flow aspirated 3000 sccm
Working Temperature	10 ÷ 45 °C	
Dimensions / Weight	610 x 370 x 265 mm / 27 kg	

Possible changes without notice

iAmiata

Vacuum, tracer gas (H₂ or He) mixtures Pressurization unit

iAMIATA is a bench station for mixing Helium + Nitrogen gases and realize tests leaks with rising vacuum, pressure decay and point to point micro leaks detections.

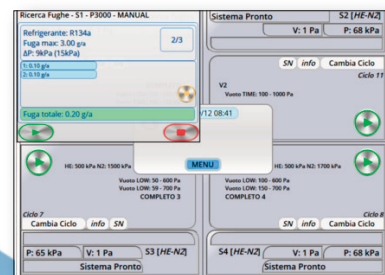
iAMIATA has been designed in particular for making pressure tests and leak test of refrigerating units with the use of inert gas or tracer gases such as helium or nitrogen/hydrogen, according to the ISO 10156 Standard; before the charge of the test gas it is possible to perform a vacuum cycle so to get a first cleaning of the unit and to make a preliminary tightness test.

iAMIATA is ideal for the tracing of components and refrigerating units, on production lines for any kind of appliance, wherever a pressure test or/and a trace gas leak test is required.

iAMIATA can be easily interfaced with the Inficon and Pfeiffer Leak detector professional device, with complete control of the main functionalities, configuration and report of the leak test over the relevant copper circuits.

Functional Characteristics

- High versatility and portability thanks to compact design
- Maximum test pressure 55 bar
- Digital gauges for pressure and vacuum measurement
- Integrated pneumatic vacuum pump (5,2 m³/h capacity)
- Setting of working cycle parameters, filing/monitoring and printing test reports by connection to external PC
- Bar code reader -as optional
- Microprocessor controlled
- 1000 programmable working cycles
- Reporting of the subcycle in progress
- Built in agreement to the European Machinery Directive, Safety standards CE marked



Technical Characteristics

	iAMIATA	iAMIATA DUE
Tracer gas/mixtures	1	2
Injectors	2	2 + 2
Pressurizzazione System	1 Aluminium block	2 Aluminium block
Injector Length	3,5 m, other at request	
Maximum Test pressure	55 bar	
Pressure Sensor resolution	1 kPa	
Connection to the unit to be tested	¼" Hansen F (ISO 7241B), ¼" SAE at request	
Vacum pump capacity	Integrated pneumatic depressor 5,2 m ³ /h; DN16KF flange for connection to ext. vacuum pump	
Programmable cycles	1000	
Safety valve security setting	63 bar, configurable at request	
Control Unit	microprocessor	
PC connection	LAN	
Power supply	400 V @ 50 Hz – 3ph+GND	
Power consumption	0,7 kW	
Compressed air supply	6÷7 bar, not lubricated	
Dimensions (LxWxH)	560x800x1400 mm	
Weight	~150 kg	
Working temperature	from 5 °C to 45° C	

The provided unit could not exactly match with the one described

Optional features and devices

DCA (Data Collector Application over TCP/IP protocol)
Available up to 4 Mixture pressurization Systems and 2 Vacuum Pumps
Automatic working cycle selection performed by bar code reader
On-Board printer
Obstructed vacuum group test and/or capillary test
iAmiata UNO - Special configuration without Vacuum Pump

Systems for preliminary evacuation

for pre evacuation circuits carousels

GV-E2M18

The GV units are designed for pre-evacuation of refrigeration units. They are provided with pipe fittings and ready for use.

The power supply is recommended using three-phase systems to facilitate the initial stages of the pump in the winter period

In the suction line of the pump:

- Filter to protect the vacuum pump from liquids, such as compressor oil or moisture
- Digital Pirani vacuum gauge with adjustable set point. Alternatively Vacuum State Indicator, with Gems for indicating the degree of vacuum detected: Green (vacuum threshold reached) and Red (vacuum threshold not reached)
- Two lines of high conductance vacuum with quick Hansen F to connect the units to be evacuated

The the exhaust line of the pump can be equipped with high efficiency filter (efficiency up to 99.999% DOP test); the filter allows the recovery of the oil retained, in order to drastically reduce the consumption of oil of the vacuum pump.



MP series vacuum pumps

MP vacuum pumps are top quality and last generation pumps very easy to be put in use, very quiet during operation and really intuitive in the maintenance.

All controls are clearly marked and have large finger grips for ease of use. The sight glass is clearly visible and both inlet and outlet are fitted with standard NW 25 flanges for the easiest connection to accessories.

Large diameter oil pass ages allow easy maintenance and any filling spillage is contained by the oil box well. No special tools are needed for servicing. The high reliability and top performance of this innovative line of pumps are well experienced in the refrigeration and A/C applications



Systems for preliminary evacuation

for pre evacuation circuits carousels

E2M series vacuum pumps

E2M series is the international reference point both for performance and long term reliability for vacuum pumps in the industrial installations. E2M pumps can be equipped, according to the application needs, with a very large set of accessories and are available in broad range of capacities: 18, 28, 40, 80, 175 and 275 @ 50 Hz.

In the cases where very high pumping speeds are required, E2M pumps can suitably be coupled to Roots mechanical booster pumps. Other pump models available on request.



EPS XX Expert Pumping System

Compact system for pre-evacuation has four flexible lines vacuum, **EPS** is capable of processing from one to four groups simultaneously.

It is designed for high-capacity production.

- working cycles including functions emptying until vacuum level assigned to be achieved within the settled time and evidence of rising pressure.
- digital indication the level of vacuum reached through active head Pirani.
- connectable to the sides of the high and low pressure of two independent groups, or to the different sections of the larger groups. Overall dimensions 1150x600x400 mm.



- Pumps are available with different flow rates: 16, 20, 30, 40, 80 m³ / h
- setting up to 100 different cycles can be preset; more on request.
- Power: 400 V - 50 Hz - 3ph + N + earth

Available accessories (on request)

- Printer
- Inlet catchpot with centering ring and clamping collar
- Phase sequence relay

Electrical safety test

Semiautomatic electrical safety tester

MP500 MP510

Portable semiautomatic systems—consisting of one (MP500) or two (MP510) control boxes—designed to test single-phase powered appliances, rated with power up to 3 kVA (MP500) or up to 4,5 kVA (MP510).

The system is controlled by microprocessor and provided with LCD display allowing the configuration of different test programs for the different appliance to be tested. It can locally store up to 200 test programs and 100 test results. It is ready to be fitted to barcode reader.

Serial interface for remote PC connection to manage, program and file data of performed tests.

Performed Tests

- Ground conductor efficiency
- Insulation resistance
- Dielectric strength (applied voltage)
- Residual current
- Electrical absorption, 50 or 60 Hz
- Leakage current (only with MP510)

Available options

- Ground test probe
- Calibration box
- Bar code reader
- On-board printer
- Software for collecting data in external PC

MP500



MP510



Electrical safety test

Automatic electrical safety tester

ESC is an automatic test system housed in a metallic cabinet (with or without castors) designed to test single-phase or three-phase appliances having rated power up to 10kVA, with the possibility to supply the appliance with stabilized tension. The system is provided with microprocessor controller and LCD display which allows the configuration of different testing programs for different appliance to be tested. The system can locally store up to 200 test programs and 100 test results. It is ready to be fitted to barcode reader. Serial interface for remote PC connection to manage, program and file data of performed tests.



Performed Tests

- Ground conductor efficiency
- Insulation resistance
- Dielectric strength (applied voltage)
- Residual current
- Electrical absorption, 50 or 60 Hz
- Short-circuit

Available options

- Ground test probe
- Calibration box
- Bar code reader
- On-board printer
- Software for collecting data in external PC



Functional safety tests

Low TAKT Time Productivity System for appliance performance tests

CAR1000

CAR1000 system is designed to run performance functional tests on electrical equipment, in particular refrigerators and AC units of all kinds. It consists of a central control unit and a number of acquisition boxes placed nearby the products under test.

Each acquisition box monitors up to 3 temperatures as standard (or up to 5 as option) and the current of the unit under test (power load as an option).



The control unit reads the data collected by the acquisition boxes, stores the test data on a database, identifies the product model by identification code, and then compares the test data with the reference parameters for such model, in order to decide whether the unit has successfully passed the test or not.

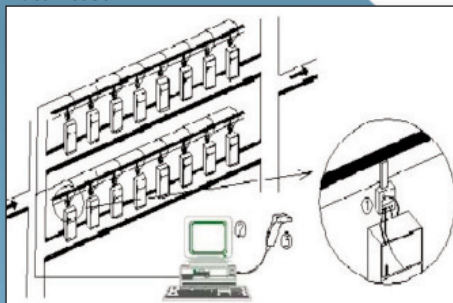
The Pass/Reject result is displayed on the screen and stored on the database. All data can be traced in order to comply with the ISO 9000 standard framework.

CAR1000 is available on the following versions:

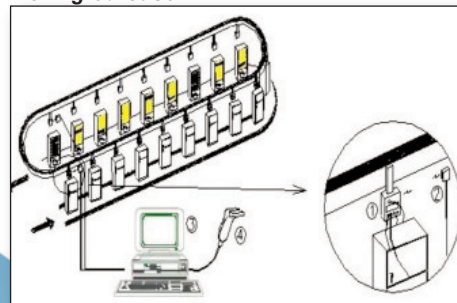
- **Moving Carousel**, suitable for mass production lines of domestic appliances
- **Batch Test**

In the *Batch Test* version the products are tested in batches. The acquisition boxes are mounted in a fixed position, usually on a wall, and the items to test are placed next to them. Once the test cycle is completed the products are removed and a new batch is connected to the test system. The acquisition boxes send the data to the control station via RS422 serial link. This version is more suitable for small and medium production lines.

Batch test



Moving Carousel



Technical Characteristics of the CAR 1000

Personal computer and test management software
Keyboard or barcode reader for data input
Printer for reports
PC/box interface with relevant acquisition board
PT100 probe for temperature detecting
C-loop Data acquisition
Dimensions: L = 550 mm, W = 600 mm, H = 1800 mm on cabinet

Technical Characteristics of the Acquisition Box

Acquisition Box Dimension: L = 400mm, W= 300mm, H = 350mm
N. 2 NTC temperature probes (range -50 ÷ +100 °C, +/-1 °C), (up tp 5 as option)
N. 1 amperometer (or wattmeter as option) to measure the current or power absorption (0-10A +/-1 f.s.)
N. 1 Schuko electric plugs 230 V, 50 Hz (other on demand)
N. 1 magnetics and thermics switch device
N. 1 safety connector
N. 1 RS485 port + C-Loop connector

Optional features

Nr. 1 Digital Input for Stop acquisition
N. 6 DIP switch to identify the acquisition box (up to 128)
Bar code reader (batch test)
Portable bar code reader for reading of acquisition box code-D.U.T.code and transmission to the control unit through suitable interface (batch test)



Fridges performance tests

High TAKT Time Productivity System for appliance performance tests

FT KING SYSTEM TEST

FT King System Test is dedicated for a high speed production lines where all the fridges have to be tested at same time in a carousel room.

FT King System Test consists of a central control unit (Server PC) and a number of acquisition boxes placed nearby the products under test.

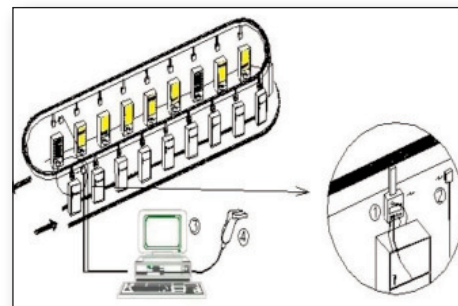
Each acquisition box controls up to 5 temperature probes and the current absorbed by the unit under test (power load as an option). Finally, the management software creates and summarizes a final report of the temperature trend (visibel in ral time) and a power absorption diagram with its operating ratio based on the parameters stored for each model under test.

FT King System Test Data acquisition communication method is realized by a radio communication by means of Industrial protocols RS-485 WiFi installed on the acquisition box and in the central Personal Computer that works as server receiver

General Overview:

FT King System Test is a kind of refrigerator temperature performance data acquisition and processing system, which is mainly used to detect the temperature inside the refrigerator and the pipeline temperature during the refrigeration process.

The system can collect temperature and power data according to the device under test setup cycle. At the outlet, the temperature and power data collected over a period of time is transmitted via radio to the computer. The computer displays the values and curves so that the inspector can visually see the data. The temperature change to the product. After the inspection is completed, the system can automatically determine whether the product is qualified according to the established standards. The generadet reports can be exported in DB file so to be acquired by a Quality Elaboration System .

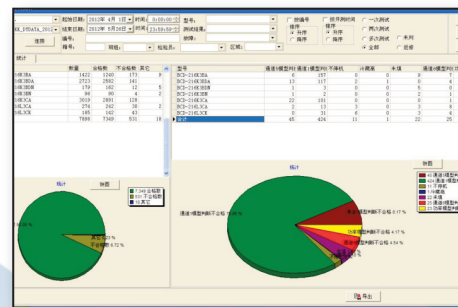


FT King System Test Features

Server PC with preinstalled Software and relevant drivers
Barcode reader for data input
Realtime Temperature and Power consumption charts displayed on Monitor
Up to 200 acquisition boxes that can be managed at same time for a 180 minutes test time
Wireless Board for radio data broadcasting to acquisition box.
Wireless Data acquisition by continous loop Boxes query
Reports stored in Microsoft standard Databases by SQL standardized language with all relevant function of searching and order the results
Pass/fail criteria related to particuar type of fridge for model such as power consumption and temperature
Test duration up to 180 minutes

Technical Characteristics of the Acquisition Box

Acquisition Box Dimension: L = 400mm, W= 300mm, H = 350mm
up to 5 NTC digital temperature probes (range -50 ÷ +100 °C, +/-1 °C)
N. 1 amperometer to measure the current or power absorption (0-10A +/-1 f.r.)
N. 1 Schuko electric plugs 230 V, 50 Hz (110 V 50/60 Hz on demand)
N. 1 magnetic and thermic switch device
N. 3 Service Lamps for working phases
N. 1 Wireless Radio module for communication to Server PC
On demand: Onboard display for an immediate monitoring of running test





Ultrasonic Tube Sealing

System for copper pipe fast sealing with ultrasonic technology

URV 20

The ultrasonic tube sealer **URV-20** series represents a profound new design of industrial tube sealers, which are equipped with several innovative features, based on the experience of engineers and the manufacturing know-how of machine users all over the world.

The **URV-20** series provides unique performance at extremely compact dimensions and low weight.

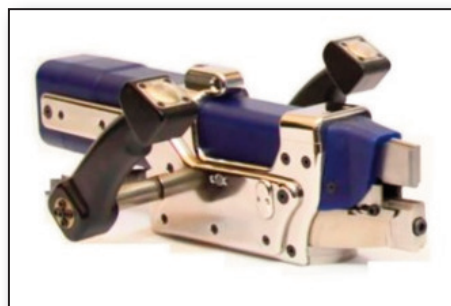
A particular focus throughout the design phase has been on ergonomics, to allow the worker to handle the machine effortlessly and conveniently. Thus, all handling and activation features are designed according to the latest perceptions of industrial requirements.

Application

- Gas-tight sealing with simultaneous cutting of Copper service pipes up to 1/2" or 12mm outer diameter
- Used for refrigerators or air-conditioners to seal and cut the compressor and, when present, dryer filter service pipe after filling with coolant
- Up to 3500 gas-tight weldings/cuttings per shift

Benefits

- Smallest and lightest machine (only 7kg) on the market with extremely compact design. This allows welding even in confined spaces
- Consistent good welding results, even when tube quality changes. Especially since the copper pipes are made in hard quality or the copper material is not perfectly clean and free of oxides
- Precise power graph for process control at a glance
- Lowest maintenance requirements





General Features

<i>Weight of the machine</i>	<i>7Kg</i>
<i>Weight of the 360° suspension</i>	<i>1 Kg</i>
<i>Weight of the generator</i>	<i>18 Kg</i>
<i>Weight of the connecting cable</i>	<i>~ 3 Kg</i>
<i>Gross weight including packing</i>	<i>~ 35 Kg</i>
<i>Compressed air pressure</i>	<i>5,5 bar (recommended 6 bar filtered and no lubricated)</i>
<i>Voltage Supply</i>	<i>230V +/-5% (single phase + GND) @50/60 Hz</i>
<i>Booster - Converter frequency</i>	<i>20 kHz</i>
<i>Power consumption</i>	<i>2,2 kW peak</i>
<i>Typical welding time</i>	<i>below 1 second</i>

Available Options



<i>Atex version for Fridges charged with Flammable Gas</i>
<i>3-D suspension</i>
<i>360° suspension</i>
<i>Horizontal suspension</i>
<i>Light pointer on the welding area</i>







