ENGLISH

CHARACTERISTICS AND SAFETY PRECAUTIONS

BEFORE REMOVING THE PROTECTIVE GUARDS TO CARRY OUT ANY MAINTENANCE ON THE MACHINE, SWITCH OFF THE ELECTRIC POWER SUPPLY AND DISCHARGE THE RESIDUAL PRESSURE INSIDE THE UNIT.
ALL WORK ON THE ELECTRIC PLANT, HOWEVER SLIGHT, MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL.

The manufacturer does not accept responsibility for damage caused as a result of negligence of failure to abide by the instructions given above.

THIS MACHINE IS NOT SUITABLE FOR EXTERNAL INSTALLATION

THIS MACHINE CORRESPOND TO THE ESSENTIAL SAFETY REQUIREMENTS FORESEEN FROM THE EUROPEAN STANDARD 2006/42.

THE LUBRICATING LIQUIDS AND OTHER EVENTUAL FLUIDS MUST NOT BE DISCHARGED IN THE ENVIRONMENT. THESE POLLUTING AND HAZARDOUS PRODUCTS MUST COMPULSORY BE DISPOSED BY CHARGING AUTHORISED AND SPECIALISED FIRMS ACCORDING TO THE DIFFERENT TYPOLOGY OF PRODUCT.

DIFFERENTIATE THE COMPRESSOR COMPONENTS ACCORDING TO THE DIFFERENT CONSTRUCTION MATERIALS (PLASTIC, COPPER, IRON, OIL FILTER, AIR FILTER ECC…)

1.0 *GENERAL CHARACTERISTICS*

The dryer is a chilling machine with direct expansion and dry evaporator.
The air to be dried is sent to the heat exchanger in which the water vapour present is condensed: the condensate gathers in the separator and is discharged outside through a steam trap.

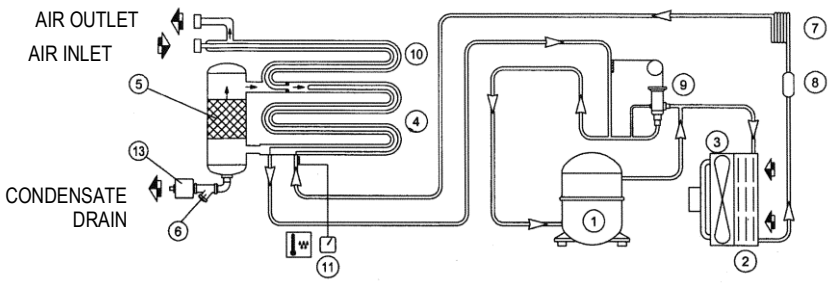
2.0 INTENDED USE

The dryer has been built to dry the compressed air for industrial use. The dryer cannot be used in premises where there is a risk of fire or explosion or where work is carried out which releases substances into the environment which are dangerous with regard to safety (for example: solvents, inflammable vapours, alcohol, etc.).
In particular the appliance cannot be used to produce air to be breathed by humans or used on direct contact with foodstuffs. These uses are allowed if the compressed air produced is filtered by means of a suitable filtering system
(Consult the manufacturer for these special uses.)
This appliance must be used only for the purpose for which it was specifically designed. All other uses are to be considered incorrect and therefore unreasonable. The Manufacturer cannot be held responsible for any damage resulting from improper, incorrect or unreasonable use.

3.0 OPERATION

The gaseous refrigerant coming from the evaporator (4) is sucked by the refrigeration compressor (1) and it is pumped into the condenser (2). This one allows its condensation, eventually with the help of the fan (3); the condensed refrigerant passes through the dewatering filter (8) and it expands through the capillary tube (7) and goes back to the evaporator where it produces the refrigerating effect.Due to the heat exchange with the compressed air which passes through the evaporator against the stream, the refrigerant evaporates and goes back to the compressor for a new cycle.
The circuit is equipped with a bypass system for the refrigerant; this intervenes to adjust the available refrigerating capacity to the actual cooling load. This is achieved by injecting hot gas under the control of the valve (9): this valve keeps constant the pressure of the refrigerant in the evaporator and therefore also the dew point never decreases below (32 °F / 0 °C) in order to prevent the condensate from freezing inside the evaporator. The dryer runs completely automatically; it is calibrated in the factory for a dew point of (37,4 °F / 3 °C) and therefore no further calibrations are required.

DRYER FLOW DIAGRAM



1) REFRIGERANT COMPRESSOR	7) EXPANSION CAPILLARY TUBE
2) CONDENSER	8) REFRIGERANT FILTER
3) MOTOR FAN	9) HOT GAS BYPASS VALVE
4) EVAPORATOR	10) AIR-TO-AIR EXCANGER
5) DEMISTER CONDENSATE SEPARATOR	11) DIGITAL CONTROLLER
6) IMPURITY TRAP	13) CONDENSATE DRAIN

4.0 GENERAL SAFETY STANDARD

The appliance may be used only by specially trained and authorized personnel.
Any tampering with the machine or alterations not approved beforehand by the Manufacturer relieve the latter of responsibility for any damage resulting from the above actions.
The removal of or tampering with the safety devices constitutes a violation of the European Standards on safety.

ALL WORK ON THE ELECTRIC PLANT, HOWEVER SLIGHT, MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL.

5.0 DESCRIPTION OF DANGER SIGNALS





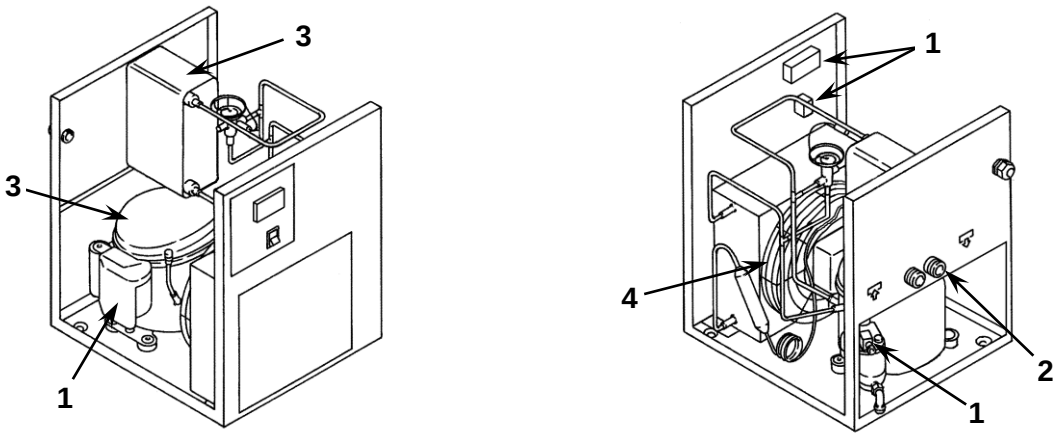
1) Dangerous electricvoltage	2) Air not fit for breathing	3) High pressure	4) Fan rotating	5) Hot parts

6.0 DANGER ZONES
6.1 DANGER ZONES

(1)  (2)  (3)  (4) 

Risks present on the whole machine

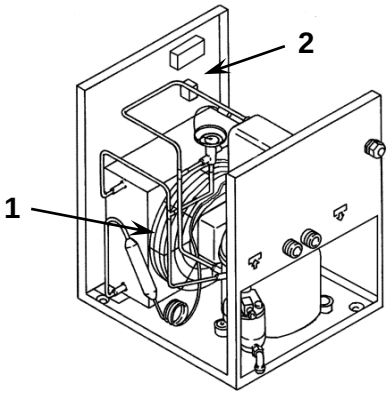
FIG. 2



7.0 SAFETY DEVICES
7.1 SAFETY DEVICES

1) Cooling fan shield	2) Earth

FIG. 3



REMOTE ALARM FUNCTION (Option "free contact")

The controller allows to remotely control a number of alarms. This is managed by means of a free NC (Normally Closed) contact.
The contact opens in case of an alarm or when the dryer is switched off.
Refer to the table below to identify the availability of the function and refer to the related picture Fig. 9a Ref. 1 to identify the physical location of the free contact connector.

431I : Is possible remote alarm for P2, L2 and H2. For the details of alarm see Cap. 17.1 Pag. 11.
431& : Is possible remote alarm for P1, P2, L2 and H2. For the details of alarm see Cap. 17.1 Pag. 11.

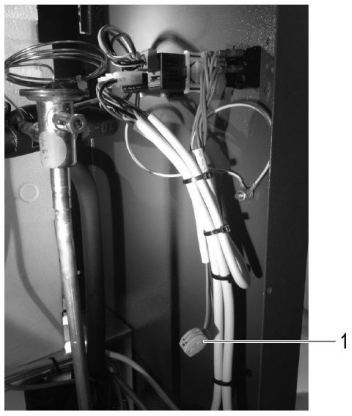


FIG. 9a

Location of the free contact connector (1)

SILENT ALARM FUNCTION

To snooze the alarm, press button Ref. 7 (See Fig. 9)

15.0 SCRAPPING THE UNIT

If the machine is to be scrapped, it must be dismantled into parts of the same material, to be disposed of according to the local regulations in force.

ALWAYS RESPECT THE REGULATIONS IN FORCE FOR DISPOSING OF OLD OIL AND OTHER POLLUTING MATERIALS SUCH AS INSULATING FOAM, ETC.

PART "B"

THIS PART "B" OF THE INSTRUCTIONS MANUAL IS RESERVED FOR PROFESSIONALLY SKILLED PERSONNEL APPROVED THE MANUFACTURER.

16.0 PARTIAL ROUTINE MAINTENANCE

BEFORE CARRYING OUT ANY MAINTENANCE JOBS IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER MAINS AND FROM THE COMPRESSED AIR DISTRIBUTION NETWORK.

16.1 MAINTENANCE SCHEDULE

These maintenance intervals are recommended for work environments that are not dusty and are will ventilated. For particularly dusty environments, double the frequency of controls.

Every week	■■	Brush/blow off the finned surface of the condenser
	■■	Clean the filter of the automatic condensate drain
Every 2000 hours / 1 year	■■	Replace the filter of automatic condensate drain (2902016102)
Every 4000 hours / 2 year	■■	Replace drain kit (2200902017)

16.2 CLEANING OF THE AUTOMATIC CONDENSWATER DISCARGER FILTER (Fig. 10)

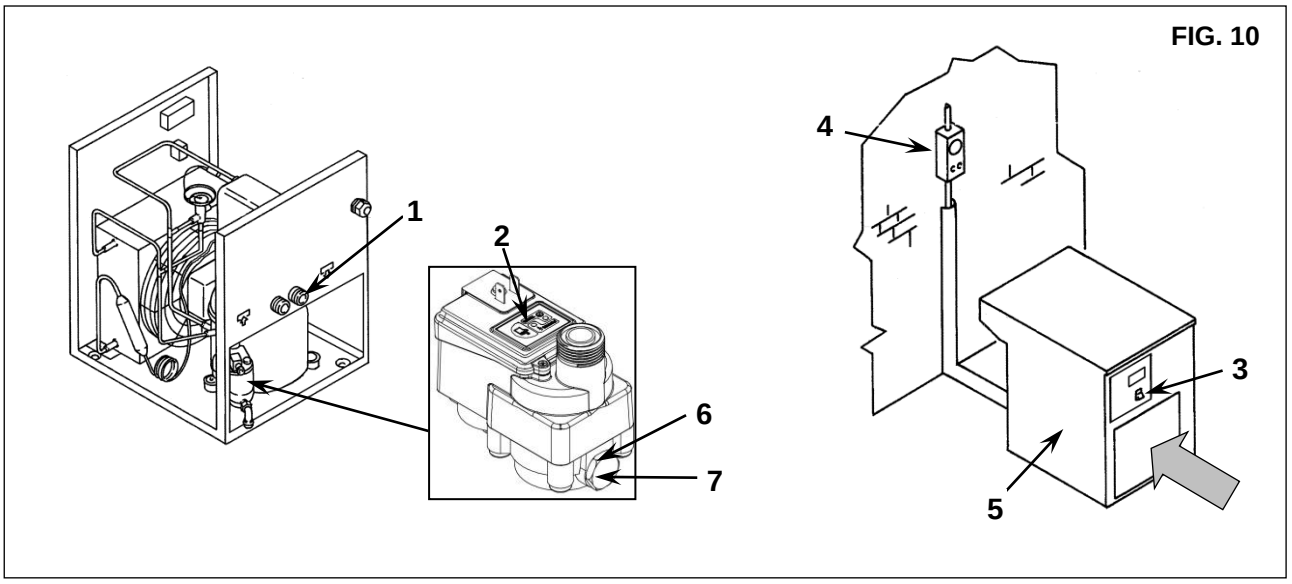
Clean the filter of the steam trap.

Proceed as follows:
- Close the cock Ref. 1 Fig. 10
- Release the pressure in the dryer by pressing the condensate drain "TEST" pushbutton locate on the steam trap Ref. 2 Fig. 10.
- Switch off the machine by pressing the STOP button Ref. 3 Fig. 10
- Turn on the supply automatic differential switch Ref. 4 Fig. 10

HOT PARTS INSIDE

- Remove the panels Ref. 5
- Remove the stopper Ref. 6
- Remove the filter Ref. 7
- Clean the filter Ref. 5 with a jet of air, working from inside to outside
- Install the filter, fix the plug Ref. 7 - 6
- Close the panels Ref. 5

FIG. 10



16.3 CLEANING THE CONDENSER (Fig. 10)

The condenser must be cleaned every month.
Proceed as follows:
- Switch off the machine by pressing the STOP button Ref. 3 Fig. 10
- Turn on the supply automatic differential switch Ref. 4 Fig. 10
- Remove the panels Ref. 5 Fig. 10
- Clean the condenser fins Ref. 1 with compressed air (Fig. 10) **DO NOT USE WATER OR SOLVENTS**
- Close the panels Ref. 5 Fig. 10

17.0 TROUBLE-SHOOTING AND EMERGENCY REMEDIES

ALL WORK MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL. BEFORE CARRYING OUT ANY MAINTENANCE JOBS IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER MAINS.

N.B. OPERATIONS MARKED ■■ MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL APPROVED THE MANUFACTURER

FAULT FOUND	POSSIBLE CAUSES	OBSERVATIONS
1) No compressed air passes through the dryer outlet	**1A)** The pipes are frozen inside	■■ -The bypass valve of the hot gas is broken or out-of-calibration -The room temperature is too low and the evaporators piping are obstructed with ice
2) Presence of condensate in the pipings.	**2A)** The condensate separator does not work correctly	- Clean the filter from the condensate drain ■■-Check the condensate drain
	2B) The dryer is working outside its rating	-Check the flow rate of treated air -Check the room temperature -Check the air temperature at the drier inlet. -Clean the condenser.
	2C) The dryer is working under bad conditions of condensation	■■-Check the good operation of the fan.
3) The compressor head is very hot (> 55 °C)	Make reference to **2B** Make reference to **2C**	
	3A) The cooling circuit is not working with the right gas charge	■■ -Check if there are leaks of refrigerating gas. ■■ - Charge it again.
4) Motor cuts out on overload	Make reference to **2B** Make reference to **2C** Make reference to **3A**	
5) The motor hums and does not start.	The line voltage is too low.	-Contact the electric power company
	You switched the machine off and on again without leaving enough time for the pressure balancing.	-Wait a few minutes before starting the machine again.
	The starting system of the motor is defective.	■■ -Check the running and starting relays and condensers (if any)
6) The machine has stopped and does not restart even after a few minutes.	The overload protection with has intervened: make reference to **2B-2C-3A.**	
	The motor has burnt out.	
7) The compressor is very noisy.	Troubles with the internal mechanical parts or with the valves	

17.1 DIGITAL CONTROL ALARMS

N.B. OPERATIONS MARKED ■■ MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL APPROVED THE MANUFACTURER

DISPLAY	FLASHING WARNING	NOTES	Possible root causes	Observations
		Dryer is working OK	n/a	n/a
				
		Warning icon NOT fashing, label P1 flashing	Fan control probe failed	■■ replace probe
		Warning icon NOT fashing, label P2 flashing	PDP Temp probe failed	■■ replace probe
		Warning icon NOT fashing, label H2 flashing	High PDP call for service	■■ refrigerant leak ■■ flow rate / inlet ■■ temperature exeeding the limit.
		Warning icon NOT fashing, label L2 flashing	Low PDP call for service	■■ hot gas by pass valve out of order. ■■ ambient temperature lower then limits

EE ALARM

EE alarm is shown when internal EPROM errors happens, if this warning will appear, the dryer will stop running. The error can be reset by pressing one of the four buttons of the controller, anyway please replace the controller itself.

NOTE: In case of EE alarm please contact your tech support.

SE ALARM

After 6000Hrs, the controller will issue a “SE” warning. This is the maintenance due warning.

How to reset the maintenance warning: follow steps 1 to 12

1	 PDP is flashing between standard view and “SE” alarm	2	 Push and hold buttons “SET” and “DOWN” to enter in the menu.	3	 Message “SE” appears on display.
4	 Push and release button “UP”.	5	 Message “rS” appears on display.	6	 Push and release button “SET”.
7	 Message “n” appears on display.	8	 Push and release button “UP”.	9	 Message “y” appears on display.
10	 Push and release “SET” to reset service alarm.	11	 Message “y” blinks for 3 seconds.	12	 Then “rL” is fixed and “°C” blinks on display for ~10 seconds. Service alarm is reset

PROCEDURE TO SET THE SERVICE INTERVAL ON PDP DEVICE

1	 PDP is showing standard view.	2	 Push and hold buttons “SET” and “DOWN” to enter in the menu.	3	 Message “SE” appears on display.
4	 Push and release “SET” to enter in the “SE” menu.	5	 Current service interal is displayed. (“60” or different value from “0” to “99”)	6	 Select desired service interval using “UP” or “DOWN”. (40=4000h, 55=5500h, 80=8000h,…)
7	 Push and release “SET” to configure new service interval.	8	 Value selected blinks for 3 seconds.	9	 Then “rS” is fixed and “°C” blinks on display for ~10 seconds. New service interval is set

18.0 STARTING UP

BEFORE CARRYING OUT ANYOPERATION ON THE MACHINE, ENSURE THAT THE ELECTRIC POWER SUPPLY HAS BEEN DISCONNECTED

18.1 PRELIMINARY CONTROLS

Before starting the dryer, check:
- The correct connection to the compressed air piping: remember to remove eventual caps on the drier inlet and outlet.
- The correct connection to the condensate drainage system.
- That the power supply is right.

18.2 STARTING AND STOP

Start the system before the air compressor starts running and stop it after the air compressor has been stopped. The compressed air piping will be free of condensate only by doing so. The drier must be kept running during all the time the air compressor is running. **WARNING**: if the drier is switched off, before starting it again, wait at least 5 minutes in order to allow the pressure balancing.

BEFORE CARRYING OUT ANY MAINTENANCE JOBS IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER MAINS AND FROM THE COMPRESSED AIR DISTRIBUTION NETWORK.

PRESSURE DISCHARGE PROCEDURE (Fig. 10)

Proceed as follows:
- Close the taps Ref. 1 Fig. 10
- Release the pressure in the dryer by pressing the condensate drain “TEST” pushbutton locate on the steam trap Ref. 1 Fig. 10
- Switch off the machine by pressing the STOP button Ref. 3 Fig. 10
- Turn on the supply automatic differential switch Ref. 4 Fig. 10

CALIBRATIONS

BYPASS VALVE FOR HOT GAS

N.B.These valves have already been calibrated and they do not require any adjistment. A dew point different from the rated one generally depends on causes which are not attributable to their operation.

Ref. 1) Closing cap
Ref. 2) Adiusting screw

WORKING PRESSURES AND TEMPERATURES OF **R513A**

	SUCTION SIDE OF REFRIGERATION COMPRESSOR	
	Evaporat. Temperat. ° F (°C)	Evaporating Pressure psi (bar)
RATED VALUES Temperat. 68°F (20 °C)	33,8 ÷ 35,6 (1 ÷ 2)	**R513A** 34,08 ÷ 35,82 (2,35 ÷ 2,47)