SAHARA DRY

80VF - 120VF - 250VF

FORCED VENTILATION
BAKING OVEN with HUMIDITY CONTROL
from 80 to 250 litre
40° - 280°C

Instruction Manual

SECURITY

All the materials used were selected according to the UNI-CEI-EN specifications.
Thus these instruments, which received the CE marking, have reached a satisfactory degree of intrinsic safety, as long as the users are qualified operators with knowledge of the rules for use and maintenance as exposed in this Manual, and safety devices supplied are never misused.
There is even a ground point.
Acoustic pressure level is under 70dB.

I.P.D. (Individual Protection Devices) - Minimum Req.'s
To avoid accidents, please follow these minimum requirements:
- Use protective gloves heat & steam-resistant.
- Use face-protecting mask to avoid possible scald injurie

Precautions
Ensure that:
- the unit is installed in a stable, horizontal position.
- the internal ventilation openings are not blocked.
- the instrument has a minimum space of 100 mm from the wall for a correct installation
- the working space has a temperature range from 5° to 40°C and the humidity range has to be between 30% and 80%.
- the instrument has to be connect to an circuit with ground (system) and with conformity to law.
- the instrument is correctly connect to a plug near to the unit, accessible and with identification sign.
- need to introduce item in the correct way inside the instrument to avoid fall down of them.

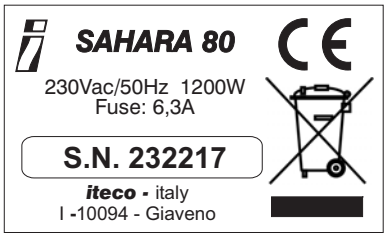
Avoid conditions of dust excess.

EC CONFORMITY

Units 8107.108-110-112, conform to EC directives **EMC - 2004/108/CE** , **LVD - 2006/*95*/CE**, **MD 2006/42/CE**,, the following harmonized standards are in use EN 60204-1, EN 61000-6-1, EN 61000-6-3, EN 292.

A weighted sound pressure <70dB (A)
A weighted sound power < 85dB (A)

Rear sign:



WARRANTY

This unit is guaranteed against all defects due to faulty materials and workmanship, within 12 months from the date of purchase.
A use not conforming to what specified might be dangerous to the safety of the operator and may damage the unit.
In such circumstances the manufacturer is relieved of any liability and the warranty itself will decay.

Protecting the environment

Separate collection.This product must not be disposed of with normal household waste.
Should you find one day that your product needs replacement,or if it is of no further use to you,do not dispose of it with household waste. Make this product available for separate collection.
Separate collection of used products and packaging allows materials to be recycled and used again.

Re-use of recycled materials helps prevent environmental pollution and reduces the demand for raw materials.
Local regulations may provide for separate collection of electrical products from the household,at municipal waste sites or by the retailer when you purchase a new product.

REPAIR

Repairs have not been attempted by anyone other than authorized repair distributors.
Do not try to repair the unit by yourself.

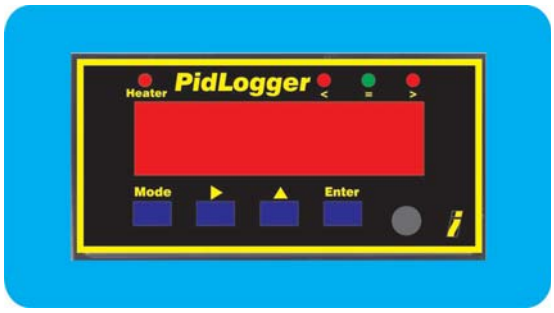
ATTENTION: Dangerous voltage is present inside the unit.

TECHNICAL FEATURES

- Forced Ventilation Baking Oven with digital PID temperature control and ON-OFF humidity control.
- Internal chamber in AISI 304 with rounded edges
- Thermal insulation with natural mineral fibre.
- Temperature range from +40°C to +280°C
- Air requirements: dry air from 3 to 8 atm
- Humidity control: <5% RH at 40°C ≤ T≤ 100°C
- Internal shelves adjustable in height
- Aeration chimney
- Base with castors

Model	**8107.108** 80VF	**8107.110** 120VF	**8107.112** 250VF
Internal Dimensions			
Volume (litre)	80	120	250
Width (mm)	458	498	593
Depth (mm)	372	477	522
Height (mm)	472	512	797
External Dimensions			
Width (mm)	796	836	956
Depth (mm)	570	680	730
Height (mm)	680	720	1025
Temperature Control	P.I.D.	P.I.D.	P.I.D.
Humidity control	ON-OFF at T≤ 100°C	ON-OFF at T≤ 100°C	ON-OFF at T≤ 100°C
Included shelves	2	2	2
Power (W)	1200	1600	3200
Weight (Kg)	45	50	90
Fuses "F" at 230V	6,3A	8A	16A

CONTROL PANEL



PIDLOGGER

Mode to enter the parameter setting function

▶ to change selected digit

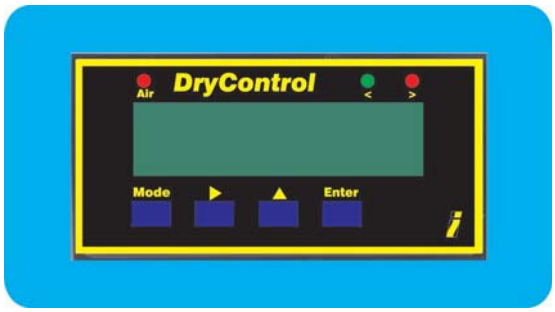
▲ to modify value

Enter to confirm

"Heater" Led lit when the heater is on.
"< = >" Leds show the condition when PID is working
< temperature inside the oven is under the SetPoint
= temperature inside the oven is equal the SetPoint
> temperature inside the oven is over the SetPoint
Jack for USB to PC connection

Alarm set point
- It is active when the value of operating temperature overtakes the safety temperature value, or for a malfunction of the digital thermo regulator.
- Set the safety temperature by means of a screwdriver
  0= 0°C 1=+50°C 2=+100°C 3=+150°C 4=+200°C 5=+250°C 6=+300°C
- Instrument will restart normal operation when red button is pressed at regular operating conditions.

HUMIDITY CONTROL PANEL



DRYCONTROL

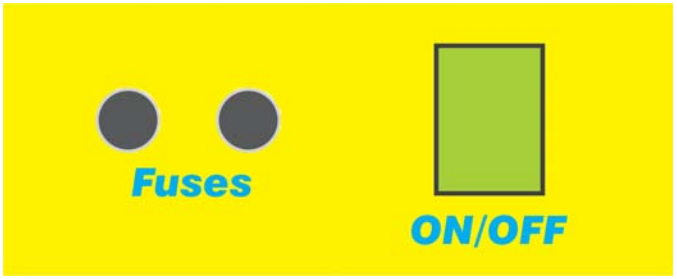
Mode to enter the parameter setting function

▶ to change selected digit

▲ to modify value

Enter to confirm

LED "Air" shows when the eletrovalve is ON and the dry air is insufflated
LED "< >" shows the condition when ON-OFF control is working
relative humidity is under 5%RH
relative humidity is above 5%RH



ON/OFF
main switch
Fuses
The maximum currents are written in the table showed in paragraph "Technical Specifications"

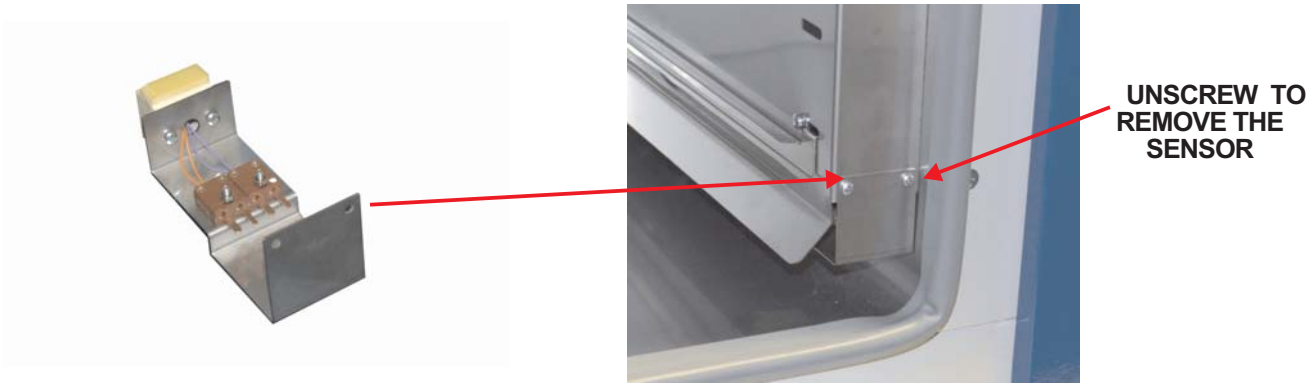
WARNING:

Inside model 250VF there are 2 extra power fuses to avoid extracurrent through the heating resistances.
In these models the fuses visible in the front panel are only protection devices for the electronic panel (PIDLogger) and the fan.

COMPRESSED AIR SETUP

Air requirements: dry air from 3 to 8 atm

HUMIDITY SENSOR



WARNING

When the RH sensor is inserted the control temperature is limited to max 100°C, in order to avoid damage to the RH sensor
Always remove the RH sensor from the internal chamber when you want to reach temperatures of over 100°C

FRESH AIR EXCHANGER

Setting of air exchanger
- Air output, 35mm diameter is placed on the rear side of the oven
- The opening and closing of the output is made with an airtight cap.
- It is possible to connect the output to an extractor fan

WARNING

Close the air output when you want to achieve low levels of humidity (<5%).

TEMPERATURE CONTROL (PIDLOGGER)

The PIDLogger can work in 6 modes:

SET-POINT
The oven reaches a setpoint temperature and stays steady.

COUNT DOWN
It's like the SetPoint mode but with a time limit. After the countdown time is expired the oven stops.Time limit can be set from 1 minute to 999 hours and 59 minutes.

CLOCK
It's useful when you want to start-up the oven on a precise date/time (for example at 6:30 on monday after the weekend the oven start-up to SetPoint 200°C)

PROG
It's possible to execute one of the 10 thermal programs with 100 steps each. In every step are set: the temperature setpoint, the maximum gradient to reach it and the duration. These programs are edited on a PC and then downloaded to the digital controller.

COMMUNICATION
It's used to allow communications between PIDLogger and PC. In this mode the PID controller is inactive.

STOP
The oven is in stand-by, the PID controller is inactive and the display shows the temperature inside.

SET-POINT MODE

Hold down Mode for 2 seconds to enter the parameter setting function.
Press ▲ until the display will show **"SetP."**

Press Enter and insert the following parameter: setpoint ("t ???")
Set parameter value by pressing ▶ to select digit and ▲ to modify the value.
By pressing Enter the parameter will be memorized, otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.

Example of setpoint at 195°C:
"t 195"

After confirmation the oven is in SetPoint mode and the PID is working. The display shows the temperature, the heating led shows when the heater is on and one of the < = > led is on.

NOTE: to view/modify the SetPoint parameter just repeat the above procedure.

Switch off
The oven can be switched off in two ways:
1) using the main switch ON/OFF. At the next switch on the oven will be again in SetPoint mode and the PID will work immediately.
2) using the **STOP** mode. Hold down Mode for 2 seconds, the display will show **"SetP."** Press ▲ until the display will show **"StoP"** , press Enter to confirm. The oven is now in stand-by, the PID is inactive and all the leds are off.

COUNT DOWN MODE

Hold down Mode for 2 seconds to enter the parameter setting function.
Press ▲ until the display will show **"C.doun".**

Press Enter and insert the following parameters: hour ("H ???"), minutes ("M ??"), setpoint ("t ???")
Set parameter value by pressing ▶ to select digit and ▲ to modify the value
By pressing Enter the parameter will be memorized, otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.

Example of setpoint at 240°C for 10 hours and 30 minutes:
"H 010"
"M 30"
"t 240"

After confirmation the oven is in CountDown mode and the PID will works until the countdown time is expired.
The display swaps through:
- temperature
- remaining time
the heating led shows when the heater is on and one of the < = > led is on

NOTE: to view/modify the CountDown parameters just repeat the above procedure.

Switch off
The oven can be switched off in two ways:
1) using the main switch ON/OFF. At the next switch on the oven will be again in Count-down mode and the PID will work immediately.
2) using the **STOP** mode. Hold down Mode for 2 seconds, the display will show **"C.doun"** Press ▲ until the display will show **"StoP"** , press Enter to confirm. The oven is now in stand-by, the PID is inactive and all the leds are off

CLOCK MODE

Hold down Mode for 2 seconds to enter the parameter setting function.
Press ▲ until the display will show **"Clock".**

Press Enter , the display will show "CURRE" "TIME"

Press Enter and insert the following parameters: current year ("Y ??"), current month ("M ??"), current day ("d ??"), current hour("h ??"), current minutes("m ??")
Set parameter value pressing ▶ to select digit and ▲ to modify the value
By pressing Enter the parameters will be memorized otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.
At the end the display will show "START" "TIME"
Press Enter and insert the following parameters: start month ("M ??"), start day ("d ??"), start hour("h ??"), start minutes("m ??")
Set parameter value pressing ▶ to select digit and ▲ to modify the value
Press Enter , the parameters will be memorized otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.

Example of setpoint at 250°C one month ahead (current time: 5th october 2010 at 14:00)
"Y 10"
"M 10"
"D 05"
"H 14"
"m 00"
"M 11"
"D 05"
"H 14"
"m 00"
"t 250"

After confirmation the oven is in Clock mode. Remember that the PIDLogger doesn't accept programmed start-up ahead in the future more than 999 hours and 59 minutes.
The display swaps through:
- start date
- start time
- setpoint temperature
the heating led above the display are off. When the start time is arrived the oven will change to SetPoint mode.

NOTE: to view/modify the Clock parameters just repeat the above procedure.

Switch off
The oven can be switched off in two ways:
1) using the main switch ON/OFF. At the next switch on the oven will be again in Clock mode and the PID will work immediately.
2) using the **STOP** mode. Hold down Mode for 2 seconds, the display will show **"Clock"** Press ▲ until the display will show **"StoP"** , press Enter to confirm. The oven is now in stand-by, the PID is inactive and all the leds are off

PROG MODE

Hold down Mode for 2 seconds to enter the parameter setting function.
Press ▲ until the display will show **"Prog."**

Press Enter and insert the following parameter: program number ("P ??")
Set parameter value by pressing ▶ to select digit and ▲ to modify the value
Press Enter , the parameters will be memorized otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.

Example of execution of program number 3
"P 3"

After confirmation the oven is in Prog mode and the PID will work.
The display swaps through:
- temperature
- program information (for example P3_12 means program number 3 in execution at step number 12)
the heating led shows when the heater is on and one of the < = > led is on

NOTE: to view/modify the Prog parameters just repeat the above procedure.

Switch off
The oven can be switched off in two ways:
1) using the main switch ON/OFF. At the next switch on the oven will be again in Prog mode and the PID will work immediately.
2) using the **STOP** mode. Hold down Mode for 2 seconds, the display will show **"Prog"** Press ▲ until the display will show **"StoP"** , press Enter to confirm. The oven is now in stand-by, the PID is inactive and all the leds are off

COM.ON MODE

Hold down Mode for 2 seconds to enter the parameter setting function.
Press ▲ until the display will show **"Com.on"**
Press Enter , the parameters will be memorized otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.

The display shows a moving segment and all the leds are off.
After 10 minutes of inactivity the PIDLogger will change to Stop mode.

EXIT THE COM.ON FUNCTION
1) using the main switch ON/OFF. At the next switch on the oven will be in STOP mode.
2) using the **STOP** mode. Hold down Mode for 2 seconds, the display will show **"Stop"** .
Press Enter to confirm. The oven is now in stand-by, the PID is inactive and all the leds are off

HUMIDITY CONTROL (DRYCONTROL)

Activate the ON-OFF humidity control

Hold down Mode for 2 seconds to enter the parameter setting function.
The display will show **"Start"**

Press Enter and insert the working mode
"**Eco**" or "**Fast**"

Press ▲ to modify the value.

By pressing Enter the parameter will be memorized, otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.

After confirmation the ON-OFF humidity control is working. The display shows the relative humidity, the air led shows when the electrovalve is on and the dry air is insufflated in the chamber, and one of the "< >" led is on.

NOTE: In Fast mode, dehumidification occurs at the maximum possible speed. In Eco mode dehumidification occurs gradually to reduce the consumption of compressed air.
The Eco mode is provided for a more rational use of compressed air, in fact, the low humidity is reached for cycles (later and not in a direct way)

Deactivate the ON-OFF humidity control

Hold down Mode for 2 seconds, the display will show **"Stop".**

Press Enter to confirm.

INTERNAL DRY AIR FLUX SETTING

The Dry Air Flux is setted at 0.6 ATM (9 PSI) for better optimization between speed and air consumption.
This value can be changed up to 1.0 ATM or down to 0.3 ATM for increasing speed or lowering air consumption.

Open the lateral cover and turn the air regulator knob while the system is sourcing the dry air

NOTE:
PULL THE KNOB TO EXT. AND TURN , PUSH BACKWARD WHEN SETTED.
THE OUTPUT OF THE MANOMETER IS AN 8mm TUBE OPEN AT THE END , SO MANOMETER INDICATES ALWAYS 0 ATM.
TO READ THE VALUE OF THE REGULATED PRESSURE DISCONNECT THE OUTPUT OF THE REGULATOR AND BLOCK THE AIR FLUX DURING THE SETTING PROCEDURE.

PIDManager: Operative instructions

SOFTWARE INSTALLATION

The PIDManager software (compatible with Windows XP/2000/Vista/7/8) and specific USB cable are an option (8107.215). This option is necessary to set thermal programs and to download and view datalogger records.

Install the drivers that are in the directory "VCP Driver" of the installation disc.

The PIDManager software doesn't need any installation: simply copy the file "PIDManager.exe" in a directory of your PC and run it to be operative

SETTING THE PIDLOGGER CONNECTION

1) Connect the Sahara oveb to the PC using the specific USB cable.
2) Set the oven in Com.On mode
3) Run PIDManager, pull down the "Settings" menu and click on "COM port select".
Select the right port from the availables (COM1, COM2, COM3 etc..).

The status of the connection between the PIDLogger and the PC is clearly indicated:

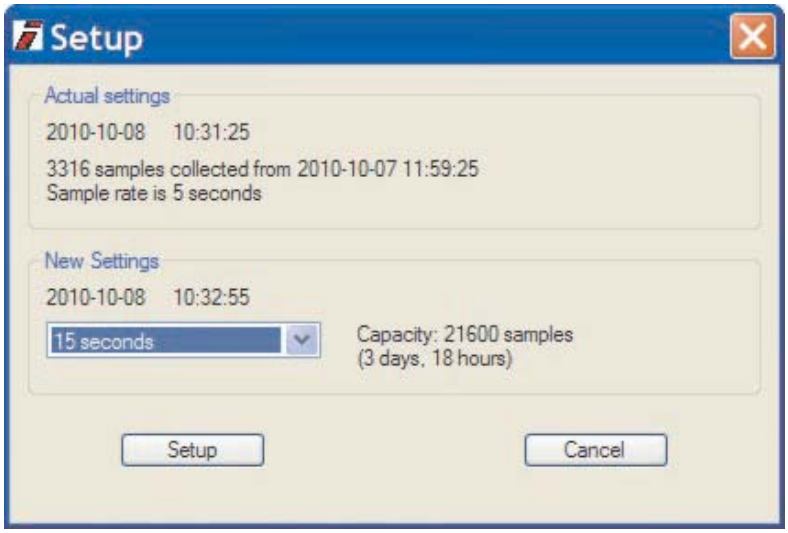
Sahara not connected

Sahara connected

DATALOGGER

SETTINGS THE DATALOGGER PARAMETERS

Pull down the "Datalogger" menu and click on "Setup" to set the time, the date and the sample rate of the PIDLogger.



The sample duration depends on the sample rate.

Sample rate	*Duration* (soloT)	*Duration (T + RH%)*
1 sec	6 hours	3 hours
5 sec	1 day e 6 hours	15 hours
10 sec	2 days e 12 hours	1 day and 6 hours
15 sec	3 days e 18 hours	2 days and 12 hours
30 sec	7 days e 12 hours	3 days and 18 hours
1 min	15 days	7 days and 12 hours
5 min	75 days	37,5 days
10 min	150 days	75 days
15 min	225 days	112,5 days
30 min	450 days	225 days

ATTENTION: when you set the new value of date, time and sample rate any collected data logged into the PIDLogger memory will be erased.

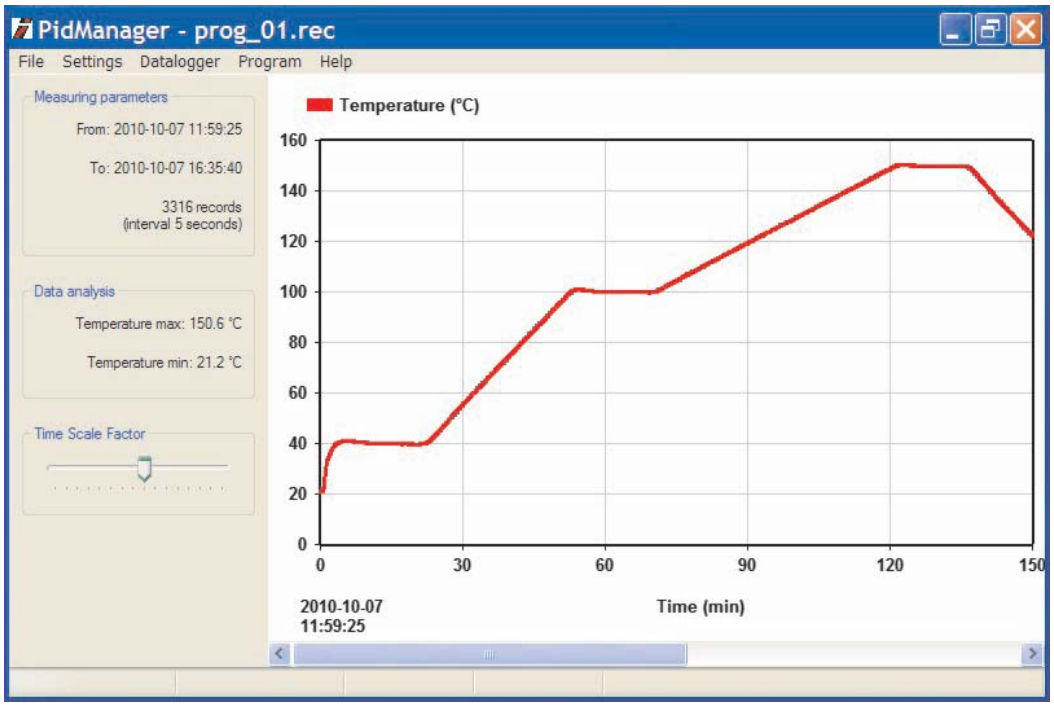
DATALOGGER SAMPLE STARTING

The Sahara oven starts to sample when one of these mode is activated:
- SETPOINT
- COUNT-DOWN
- PROG

The sampling activity is interrupted when STOP mode is activated or the end of memory is reached (21600 samples).
Every tyme SETPOINT, COUNTDOWN and PROG mode are activated all previous data in memory are erased and overwritten.
The sample data are written inside non-volatile memory so are readable even after a black-out.

DATA DOWNLOAD

Pull down the "Datalogger" menu and click on "Read" for downloading and displaying the collected temperature data.



Immediately after the downloading a message prompt will ask you if you want to save the data.
The format used to save the data is "*rec" that is a simply text file like this:

TEMP,TIME
Interval=5 Seconds
158.1,2010/10/04 17:11:25
158.5,2010/10/04 17:11:30
158.9,2010/10/04 17:11:35
.... This file can be easily edited into a text editor or imported into a spreadsheet.

PRINTING

To print the showed graph pull down the "File" menu and click on "Print".

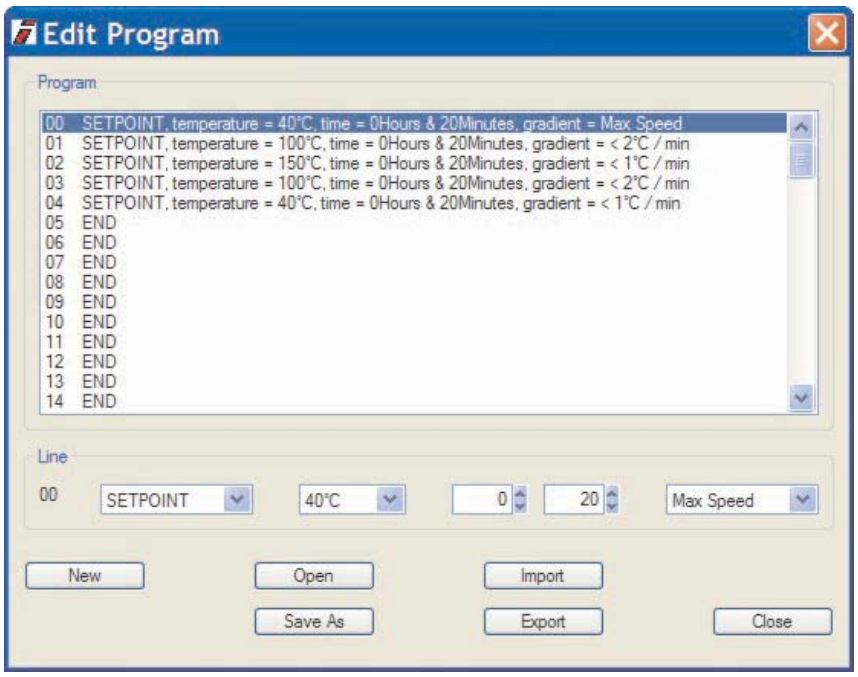
OPENING OF A FILE

Pull down the menu "File", click on "Open" and insert the path of the "*.rec" file to open.

THERMAL PROGRAMMER

EDIT A THERMAL PROGRAM

Pull down the "Program" menu and click on "Edit" to open the window editor.



In this window it's possible:
- open a *.pid file on PC with "Open" button
- save a *.pid file on PC with Save As" button
- import from one of the 10 program memorized into the Sahara oven with "Import" button
- export to one of the 10 program memorized into the Sahara oven with "Export" button

In every step of a program is possible to execute one of these 3 commands:
- "SET POINT" the oven reach a setpoint temperature with a gradient selectable from "MAX SPEED", "2°C / min" or "1°C / min". The oven stays steady there for a selectable time. These time starts when the temperature is within 5°C the value of the setpoint.
- "STAND-BY" the heating elements are off for a selectable time.
- "END" the oven exit from the program.

PIDLOGGER - PID OPTIMIZATION

(for skilled personnel only)

The PID parameters are factory optimized for most of use. However it's possible to change them to best suite particular conditions of:
- heavy load (heavier load means greater thermal inertia)
- fresh air on or off

To change the PID parameters hod down together Mode and ▶ button for 6 seconds.
Insert the following parameter: proportional band at 40°C ("1 ??"), proportional band at 280°C ("2 ??"), integral time ("3 ???"), derivative time("4 ???")
Set parameter values by pressing ▶ to select digit and ▲ to modify the value
By pressing Enter the parameters will be memorized otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.

Example of PID parameters
"1 10" (proportional band at 40°C is +-10°C)
"2 05" (proportional band at 280°C is +-5°C)
"3 150" (integral time is 150 seconds)
"4 37" (derivative time is 37 seconds)

The proportional band (BP) is calculated with linear interpolation. For example at 100°C it is:

BP@100°C = BP@40°C + (BP@280°C - BP@40°C) * (100 - 40) / (280 - 40) - 40) / (280 - 40)

DRYCONTROL - ON-OFF OPTIMIZATION

(for skilled personnel only)

To change the PID parameters hod down together Mode and ▶ button for 6 seconds.
Insert the following parameter: setpoint_low (on the left) and setpoint_high(on the right)
?.?-?.?
Set parameter values by pressing ▶ to select digit and ▲ to modify the value

The parameter will be accepted if setpoint_high > (setpoint_low + 0.5%RH)
By pressing Enter the parameters will be memorized otherwise if you hold down Mode for 2 seconds you will exit from the parameter setting function.

The factory parameter of the ON-OFF humidity control are:
- setpoint_low = 4.5%RH
- setpoint_high = 5.0%RH

ERROR MESSAGES

The PIDLogger and Drycontrol warn when one of the following error is happened:

Err 1: 230Vac is not detected at the heating elements when the PID wants to heat the oven. Possible cause is an interruption of the Solid State Relay (SSR)
Err 2: 230Vac is detected at the heating elements when the PID doesn't want to heat the oven. Possible cause is a short circuit of the Solid State Relay (SSR). It's a dangerous condition because the oven heat without control and only the Alarm Set Point can stop him.

Err 5: Humidity control activated but the RH sensor is not inserted

OPTIONAL ACCESSORIES

- **8107.154** Additional shelf 80VF (max. 7 shelves)
- **8107.156** Additional shelf 120VF (max. 9 shelves)
- **8107.158** Additional shelf 250VF (max. 11 shelves)

MAINTENANCE

- Switch off the oven and disconnect the power cord from mains.
- Wait until all parts have reached a normal temperature.
- Use a detergent with less than 5% of non ionic surfactant.
- Lubricate the door inge and the closing system of the handle.

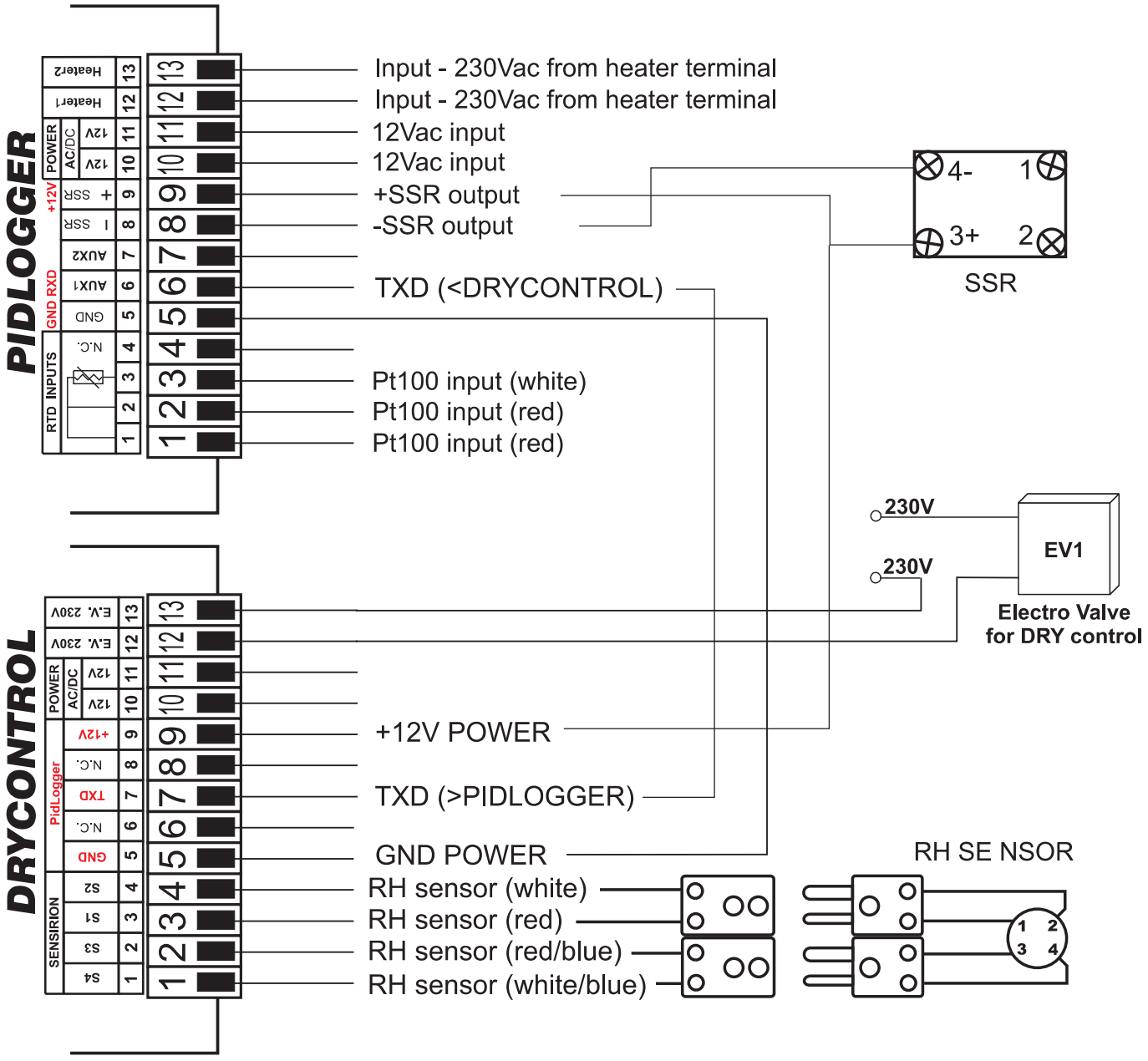
SPARE PARTS

- **8107.202** Pidlogger
- **8107.204** Drycontrol
- **8107.210** Temperature sensor

- **8107.236** Electric resistance for 80VF
- **8107.237** Electric resistance for 120VF
- **8107.238** Electric resistance for 250VF

- **8107.300** Motor 40/60/80/120VF
- **8107.302** Motor 250/400/700VF

PIDLogger/DRYControl CONNECTIONS



SCHEMATICS (OVEN only)