TECHN PRINT

Mistral 460

Forced Air Convection Oven

USER MANUAL

Version 2.09

TABLE OF CONTENTS

1. Preface

Congratulations! You have purchased a machine of high quality made with dedication to meet the highest standards possible. To ensure proper operation we strongly advise you to read this manual first.
This manual is designed to help you get the most out of the Forced Air Convection Oven program in the shortest possible time. It is written for both the new and experienced user in mind.

How this manual is organized:

The first section of the manual explains the unpacking and installation of the oven. Included is a description of the principles and specifications of the oven.
The main section of the manual is built around questions a user might have concerning the touch screen display. The software is designed to achieve the most user friendly control of the oven simply by using your fingertip.

The figures:

The figures in this manual were captured with the intention of providing the clearest possible tutorial for the program. Default screen positions and sizes were used in most cases.
Because the oven program can be configured in many different ways, do not be concerned if you detect minor differences between the figures in this manual and what you see on your own display.

2. Setting up

Unpacking the oven:
Carefully unpack the oven and save the original package in case you need to ship the unit.
Ensure that1 thermocouple wire is enclosed.

Before starting the oven:
Operate the oven in a well ventilated room only.
Keep people, who do not operate the unit, away from the oven.

Power source:
380 VAC, 6-phase +N, 16A 50/60Hz.
Make sure that the oven is connected to a well earthed outlet.

CAUTION! Always disconnect the main plug of the unit from the outlet before servicing the machine.

WARNINGS:

Notices on installation

- Installing the oven, in a location free from rain and snow, and near the fire extinguisher.
- Installation and/or servicing should only be done by a qualified electrical engineer.
- A wet oven can be a source of electrical shock and the oven can be damaged.
- Be sure to install complying with industry standards. Incomplete installation can cause stumbling accidents or electrical shock.
- Be sure to install the oven on a flat and solid surface.
- Be sure to provide with clearance of at least 4 inches (10 cm) between the unit and walls.
- Be sure to connect the power cord complying with industry standards.
- Check the power supply to se if it can satisfy the specifications of the oven. The working voltage ranch can not out of 10 % when the oven is working. Violating this standard can cause electrical shock or fire. If you cannot identify the specifications of the power supply used, consult the supplier.
- Be sure to connect a ground wire to the oven. Operating the oven without grounding it can cause electrical shock or fire by a short circuit.
- Do not bundle the power cord, otherwise a fire can be caused.
- Do not step on, squeeze, or forcedly twist the power cord; otherwise the power cord can be damaged, causing electrical shock or fire. If your power cord has been damaged, consult the supplier for replacement.

Notices on operation

- Do not operate any switch with a wet hand, otherwise you can get a electrical shock.
- Do not use combustibles (e.g. thinner), combustible gases, or volatile matter near the oven; otherwise explosion or fire can be caused.
- Co not put anything on the oven while using the oven. The heat could cause deformation, cracking, etc.
- Consult only your dealer for repairs. Incomplete repairs can cause electrical shock, fire or stumbling.
- When removing dirt on the oven, do not use chemicals, such as thinner or benzene; otherwise accidents can be caused.

Purpose of using the oven

The oven was designed only to be used for soldering or drying. Do not use for other purposes.

Exhaust:

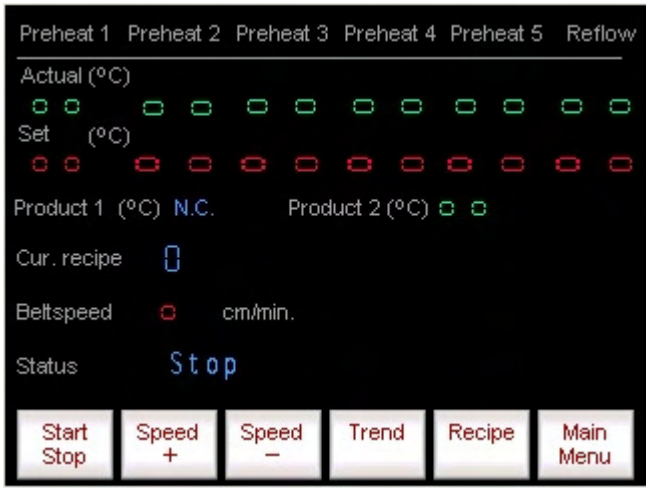
To connect the exhaust: move the exhaust pipe over the stud at the rear end of the oven. From there you can exhaust directly to the outside as long as the distance is less the 3 meter.
When the distance is more then 3 meter, an additional exhaust ventilation unit is required.
Note that when using an added ventilation unit air flow regulation may be required since excessive air exhaust can cause temperature drop in the oven.

3. Working with the TFT touch screen

3.1 Starting the program

After the machine is started up with the main switch, the display will start automatically and
you will see a screen that similar to the one shown on the left.

Controlling the unit throughout the complete
tutorial can be done by tapping on the function
buttons on the screen.



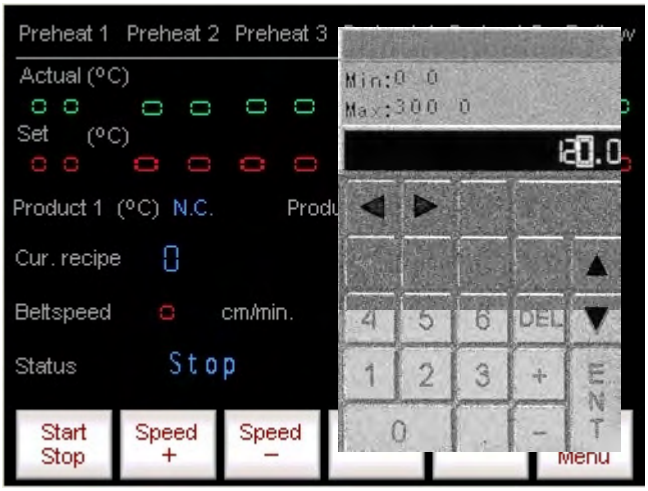
Tap anywhere on the screen and a new screen will appear.

This is called the operating menu. Here you can find all information about the temperatures for each zone and conveyor belt speed.
In this menu screen you are allowed to set any temperature between 0 and 300°C for each zone with increments of 0.1°C and any conveyor speed between 15 and 110 cm/min with increments of 1cm.

In the upper part of the screen you will see the actual temperature for each zone PV (°C) and the set temperature for each zone SV (°C). The default value is 0.0 °C for each zone.

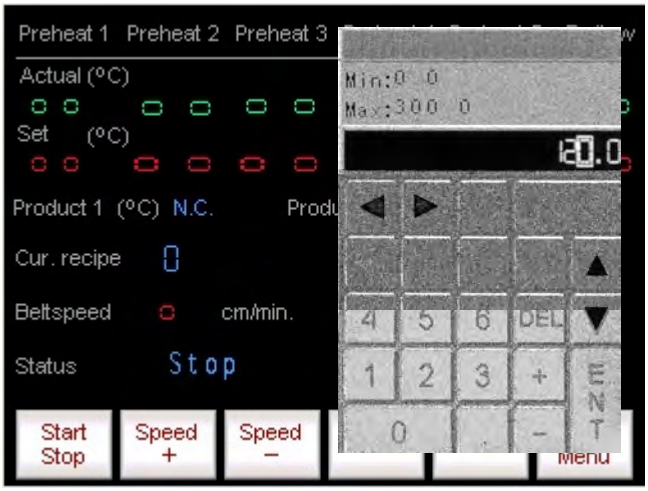
In the middle of the screen you will see the Product temp. This is the actual temperature measured by the probe of the thermocouple when it is connected to the outlet. If no thermocouple is connected a message Not connected is shown.
Following that the current recipe is shown. Up to 8 named recipes can be stored in the program. The default value is 1 <empty>.
Below the Cur. recipe you will find the Belt speed showing the actual speed of the conveyor. The default value of the speed is 15 cm/min.
After powering down the machine the control will always save all last settings entered.

3.2 Creating a program



Creating a program can be done in the operating menu.
Tap within the square with the temperature setting for the zone you want to change. A soft keypad as shown on the left will appear on the
screen. Enter the desired value within the range indicated on the top left of the soft keypad.

All settings entered with the soft keypad will be remembered after powering down the machine.



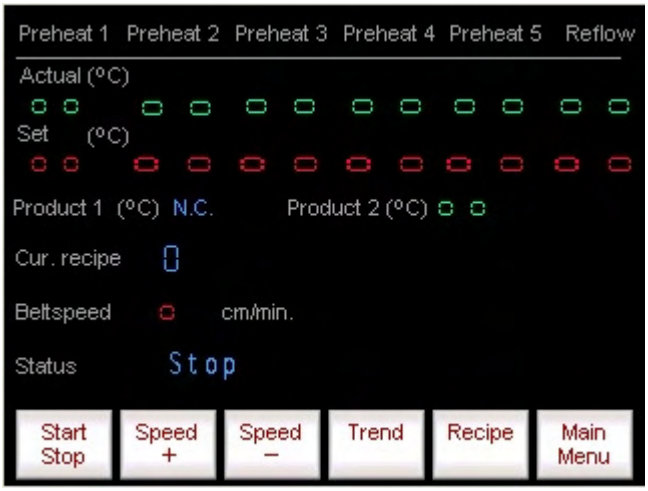
Setting the conveyor speed can be done as follows:
Tap within the square with the conveyor speed setting. A soft keypad as shown on the left will
appear on the screen. Entering a value for the conveyor speed is done in the same way as entering a value for the temperature. Settings entered both ways will always be
saved after powering down the machine.

After all settings are entered the screen will show the desired settings as shown for example in the screen on the left. To activate the program tap on the 

button once; the status will show “RUN” next to the button. To stop the program tap on the 

button once again; the status will show “STOP” next to the button.

3.3 Temperature progress for each zone



Tap on the 

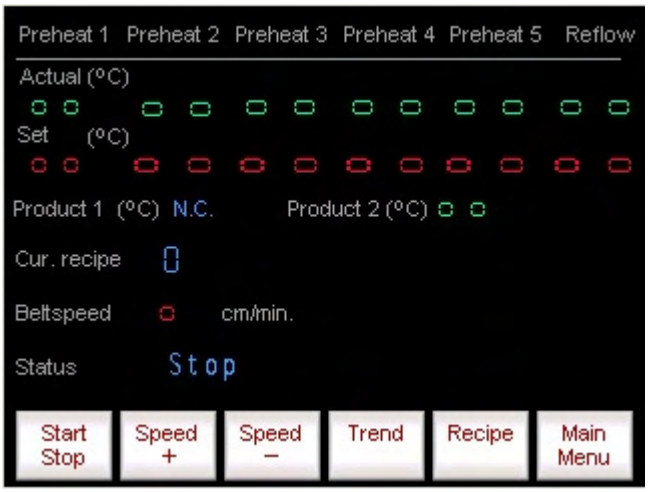
button in the operating menu or tap on the 

button in the main menu (figure 1 on page 11) to see a temperature curve for each zone and thermo coupler (if connected) on a time base.

A screen like this will appear with graphs steadily changing for each temperature zone. When a thermocouple is connected a dotted line will appear indicating the probe's temperature.

Tap anywhere in the screen to go back to the operating menu.

3.4 Setting date and time

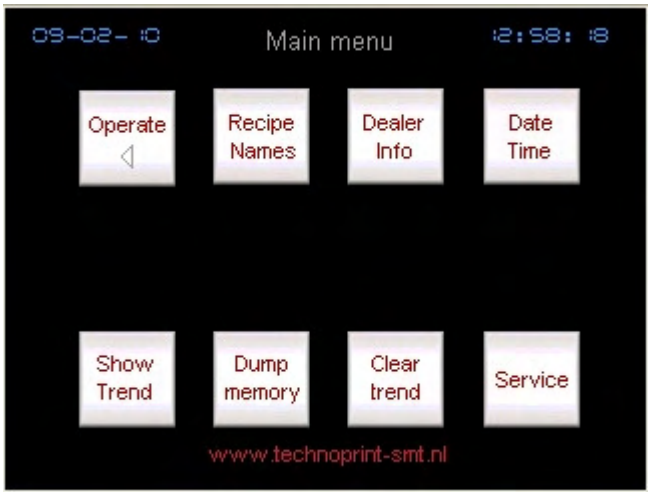


To alter date and/or time go to the operator menu shown to the left.

The operator menu can be called up by tapping on the

or

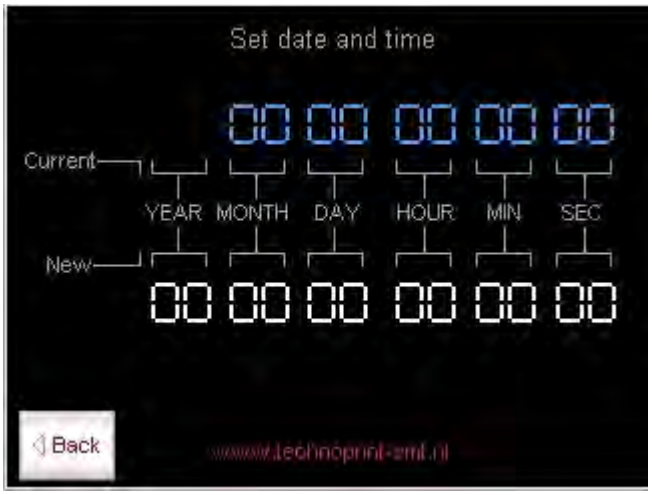
button if shown in your current screen.



Tap on the

button and

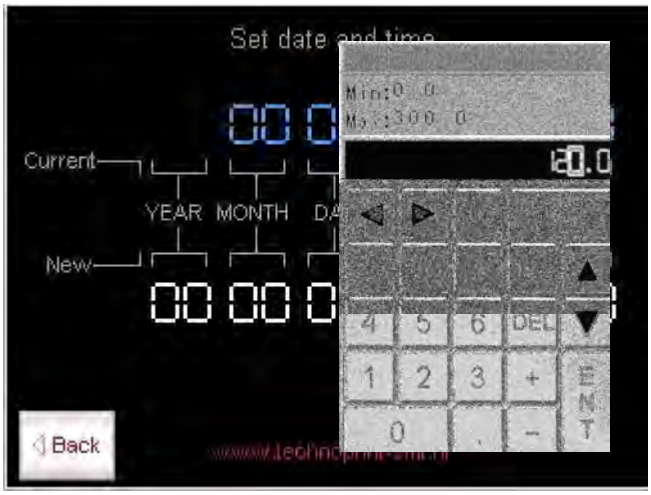
the main menu screen as shown to the left will appear.



Tap on the

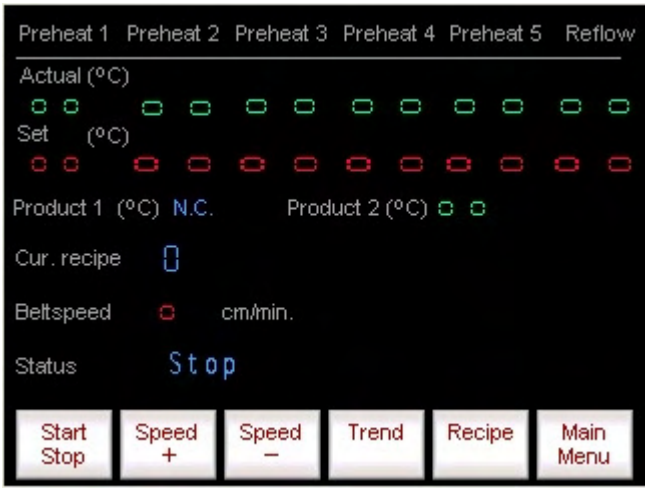
button to

jump to the setting screen to alter or set date and/or time. Tap on each set of numbers (default is 00) below the date or time indication.



With the soft keypad appearing in the screen any number between 1 and 99 can be entered. Note that any number exceeding the maximum allowed value for the specific field entered will not be stored.

3.5 Selecting a recipe



Up to 8 recipes can be stored for your convenience.
Each recipe can hold a program, as created for example in chapter 3.2.

After creating your program the screen will look similar the one on the left (with possible other entered values).
The first recipe you create is stored under recipe number 1 (default). By calling up another recipe number you can create a new program which will automatically be stored under that number.

To change to another recipe number:

Tap on the 

button, a screen looking like the one on the left will appear. You are now in the recipe menu.

To select the recipe number you want to activate tap within the square next to "SELECT YOUR RECIPE:"

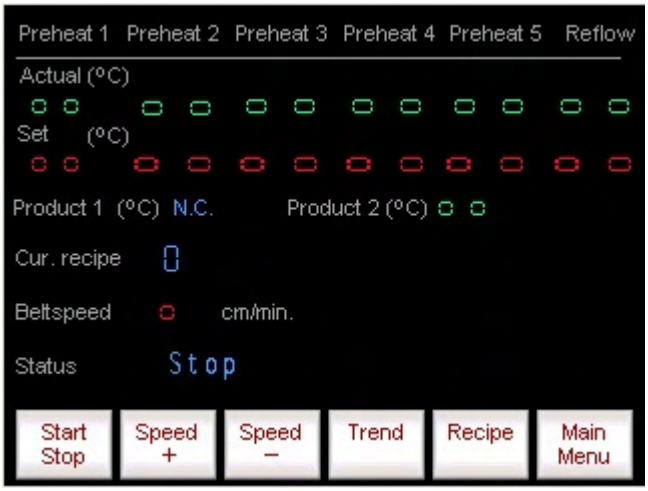
A soft keypad as shown in the screen on the right will appear. Here you can enter the desired recipe number within the range indicated on the
top left of the soft keypad.
All settings entered with the soft keypad will be remembered after powering down the machine. To go back to the operating menu after you have called up a new

recipe number tap on the 

button.
From the operating menu you can create a

new program under the set recipe as explained in chapter 3.2

3.6 Creating and changing the recipe name

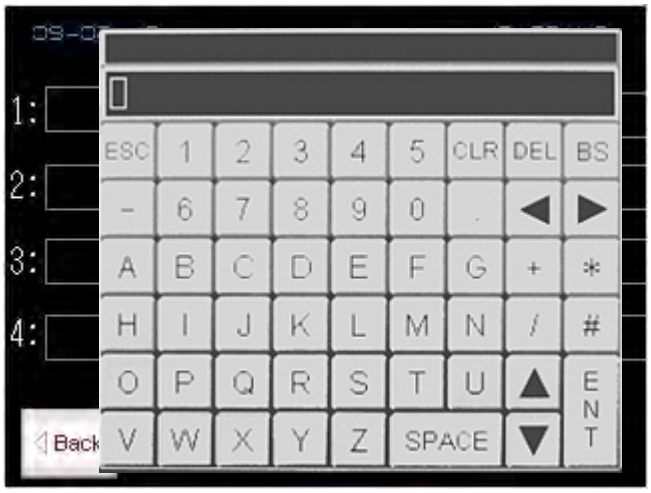


To create a new recipe name or to change an existing recipe name tap on the Main Menu button in the operating menu.

You should see a screen as shown on the left.

Tap on the Recipe Names button to access the input fields for all 8 recipes.

A screen as shown on the left will appear. Tap in the desired recipe field box that you wish to name or rename.



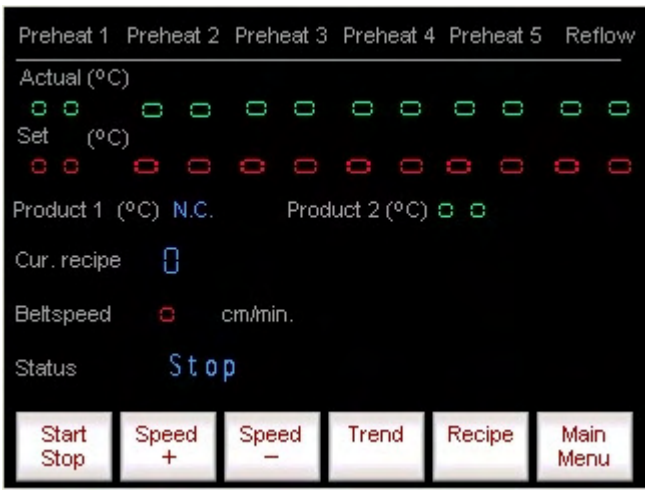
A soft keypad will appear so that a 16 character name can be entered.

All settings entered with the soft keypad will be saved after powering down a machine.

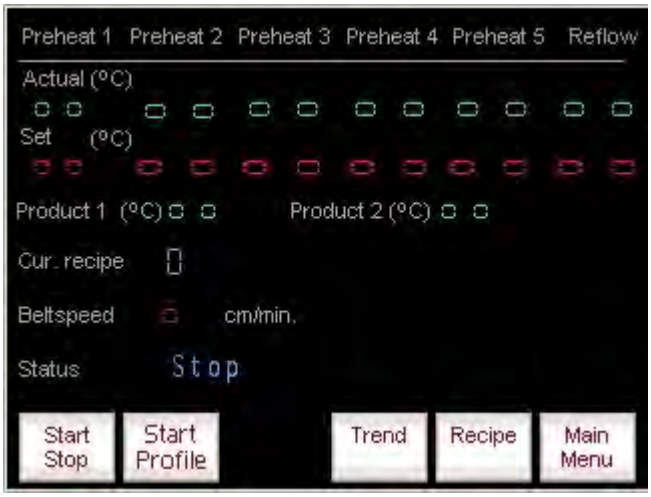
Tap on the 

button to enter main menu.

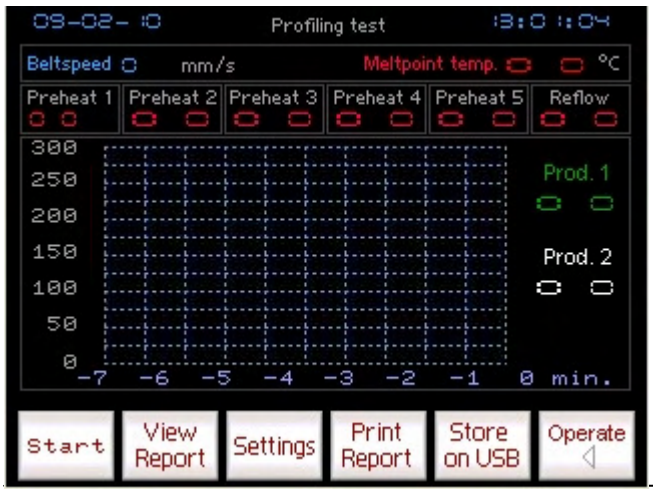
3.7 Using the Profiler menu



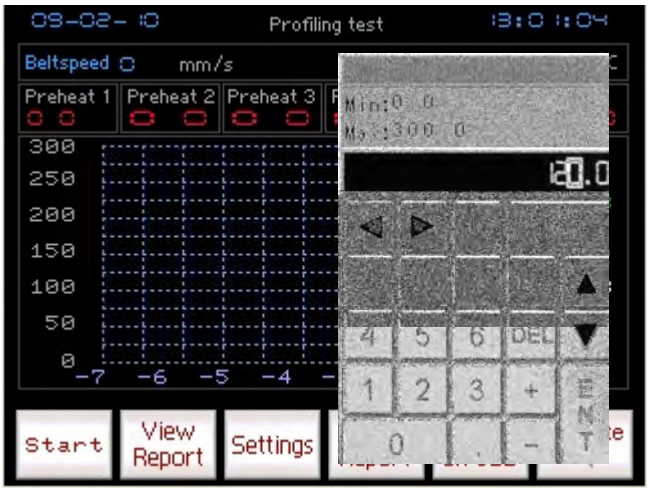
The profiling menu can be used to store, print or view important data registered by the thermo coupler(s).
Before this can be done some variable must be entered in the profiling menu.
First go to the operator menu shown to the left.
If you connect the thermo couple to the thermocouple input, on the left of the oven, the next screen will appear.



From here there profiler menu can be called up by tapping on the Start Profile button.



From this menu several sub menus can be accessed. (For that purpose this screen will be indicated as “profiling test screen” for further use in this manual, when referred to this screen.)



When you tap “meltpoint temperature” a soft keypad will appear and a value for meltpoint temperature can be entered ore altered.

On the profiling test screen there will appear a red line. This screen shows the parameters for:

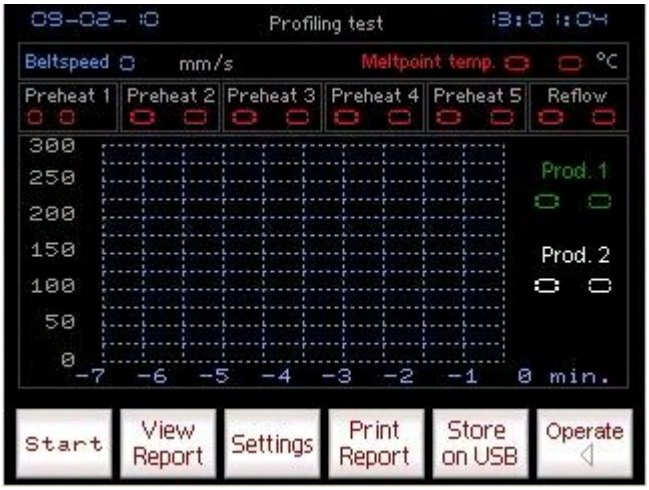
- Peak temperature
- Critical temperature

And it also shows the time (that the PCB is on ore above meltpoint temperature which is important for maximum time and temperature, the most critical component of the PCB require.)

Each time you tap on 

you can see all entered parameters in one screen.

3.7.1 Start profile test

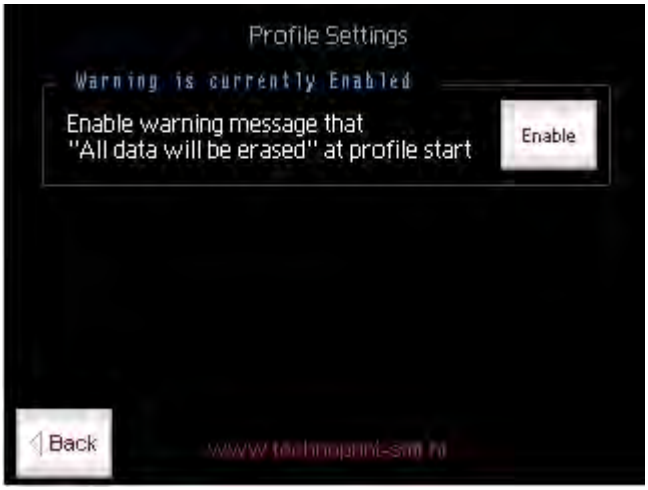


Make sure the machine is running. Tap on Start Stop in the operating menu. Place PCB and thermocouples in starting position and tap on Start Profile in operating menu. You enter the profile test screen as shown on the left. Than tap on start.

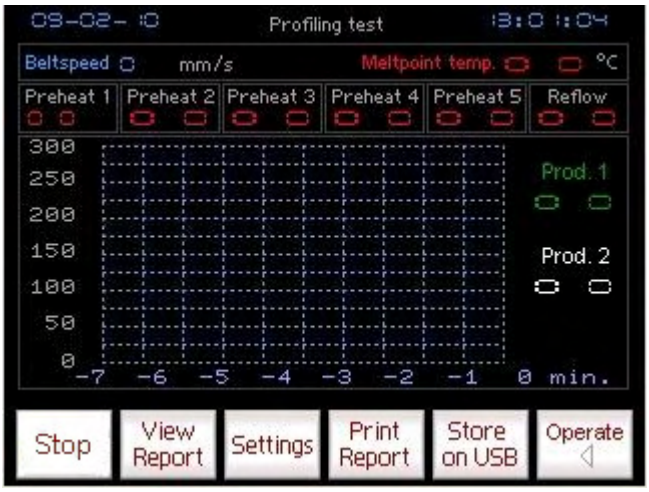
Than tap on and wait for about 15 seconds for the curve to appear.

This warning screen will appear every time you do a new profiling test.
If you don't want to have this warning again, you can disable it by tapping on

Don't show this message again.

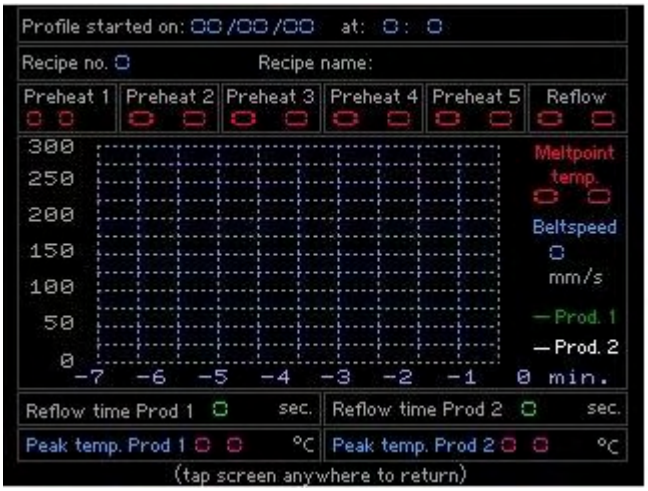


If you want to re-enable the warning message tap on Settings in profile test menu.



After the curve has been made tap on

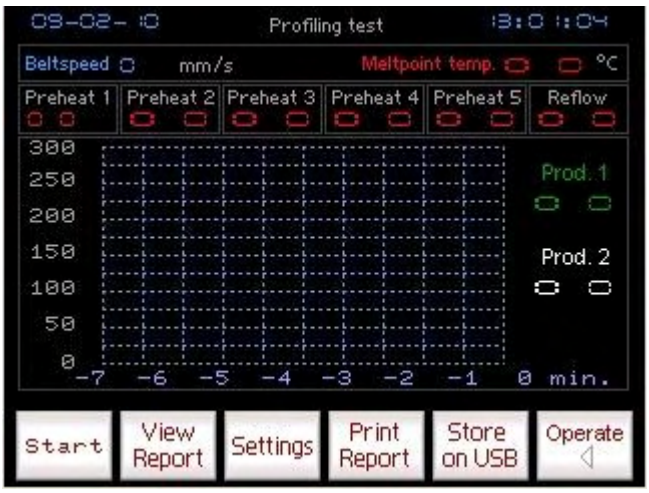
Now all data have been registered.



Tap on

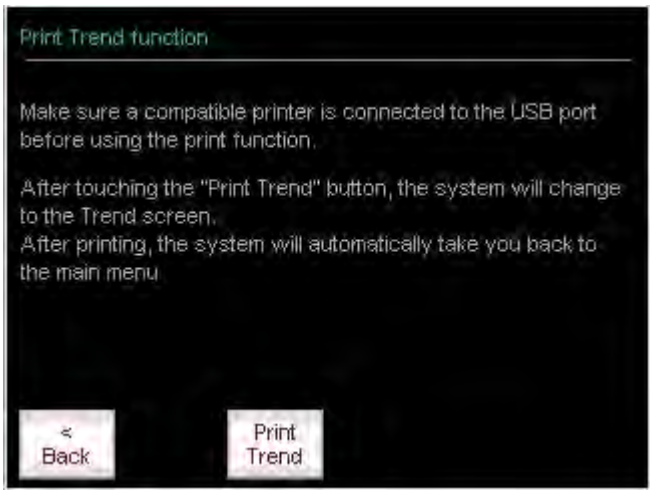
to see all of the information you will need.
Touch the screen anywhere to return to “profiling test” screen.

3.7.2 Print report



All data captured from the profile test can be printed by a printer connected to USB connector located on the left side of the oven. (see page 22)

Tap on 



Tap on 

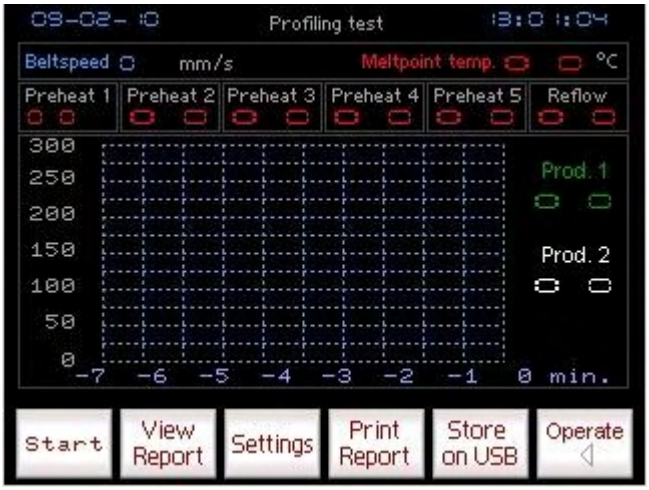
to start printing.

Tap on 

to enter profiling test again.

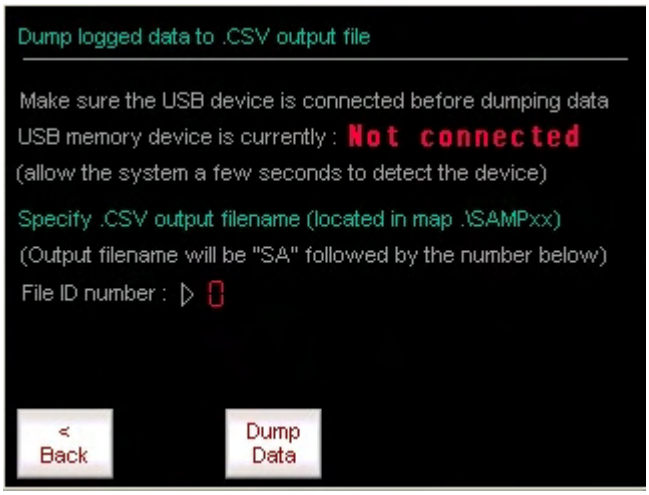
Use a printer that is compellable to HP laserjet

3.7.3 Store on USB

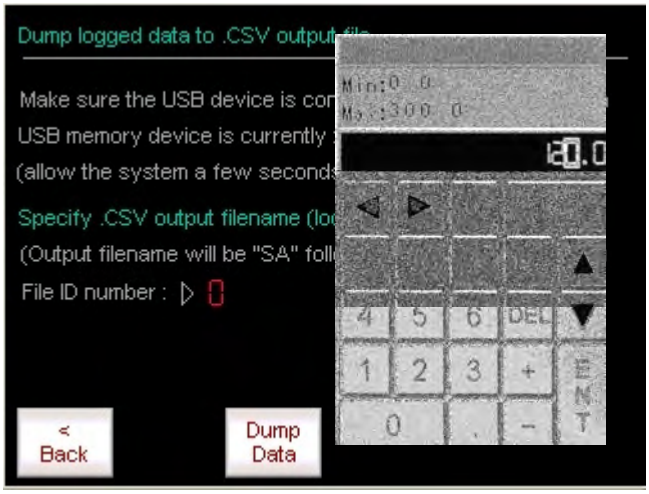


Collected data from the profiler menu can be "dumped" to a external storage device connected to the USB connector on the left side of the oven. (see page 22)

Tap on 



The next screen will indicate if USB storage is connected ore not. Before data is dumped, a number can be assigned to the file by tapping on the "0" behind the file ID number.



A softkey pad will appear and the ID number can be entered. Than tap on 

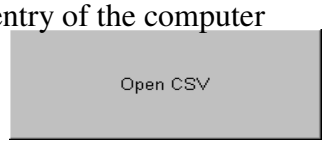
to start downloading the data.

You can use all kinds of USB sticks **except** the ones with **password protection.**

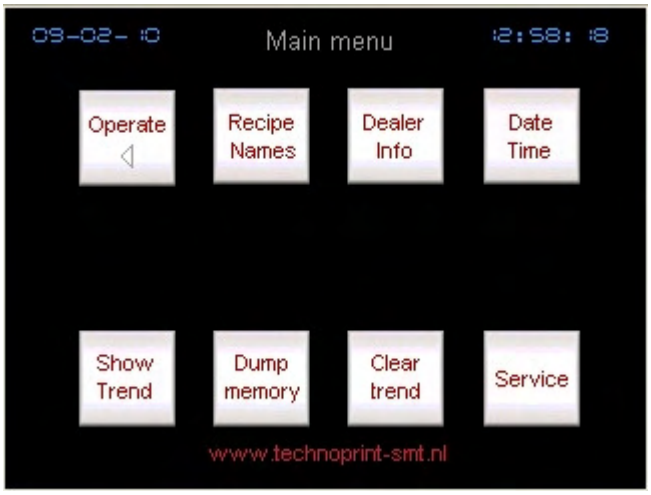
3.7.4 Macro information

Data stored on USB stick can be visualised in a graphic drawing. To simplify the process there is a macro tool installed on the USB stick. (Delivered with the computer)

Step 1 Place USB stick in USB entry of the computer
2 Open the USB stick
3 Open macro file
4 Click on “Open CSV”
5 Look up USB stick (my computer)
6 Open SAM... with ID number
7 Open SA... (With stored data)
8 Curve appears



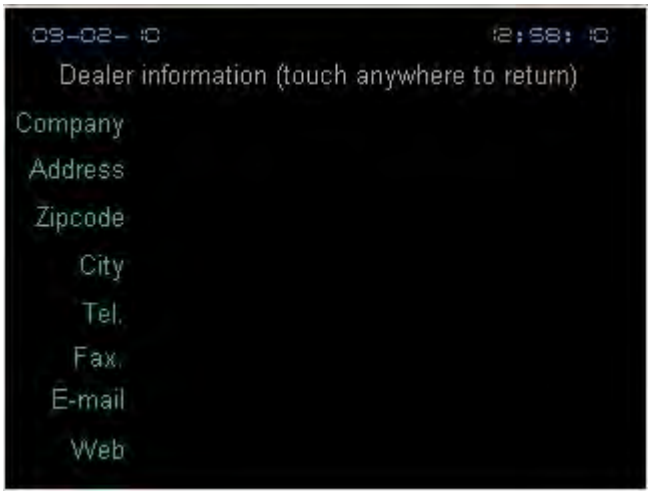
3.7.5 Show the Dealer information



Dealer information is factory set and can only be changed by an authorized dealer.

Dealer information can be accessed from the main menu. Starting from the operator menu tap on the

button to go to the main menu.



The dealer information screen will show all necessary information to contact the dealer where this machine was purchased from. Tap anywhere in the screen to go back to the main menu.

3.8 The service menu

The Service menu should only be used by a certified technician and is therefore protected with a password.

4. Specifications

The reflow oven **MISTRAL-460** is developed for RoHS ***lead free*** reflow soldering of SMT boards, hybrid boards or curing adhesives.

Transport system
The boards are transported through the oven on a conveyor belt made from high grade stainless steel spring wires with variable speed between 15 and 120 cm/min (6 to 47inch/min).

Heating system
Heating is achieved by forced air convection. This reduces the shadow effects and results in no colour sensitivity, no hot spots and no cold solder joints. The heating system is suitable for lead-free soldering.

Cooling system
Bottom cooling fans at the offload section ensure cooling of your circuits before leaving the transport belt.

Control
All functions are controlled by a TFT touch screen display which is easy to program with a user friendly interface. Furthermore this control is equipped with a USB  2.0 compatible data interface for data output to a printer or storage device.

Exhaust
The integrated exhaust system transports fumes to an outdoor ventilation or filtration unit.

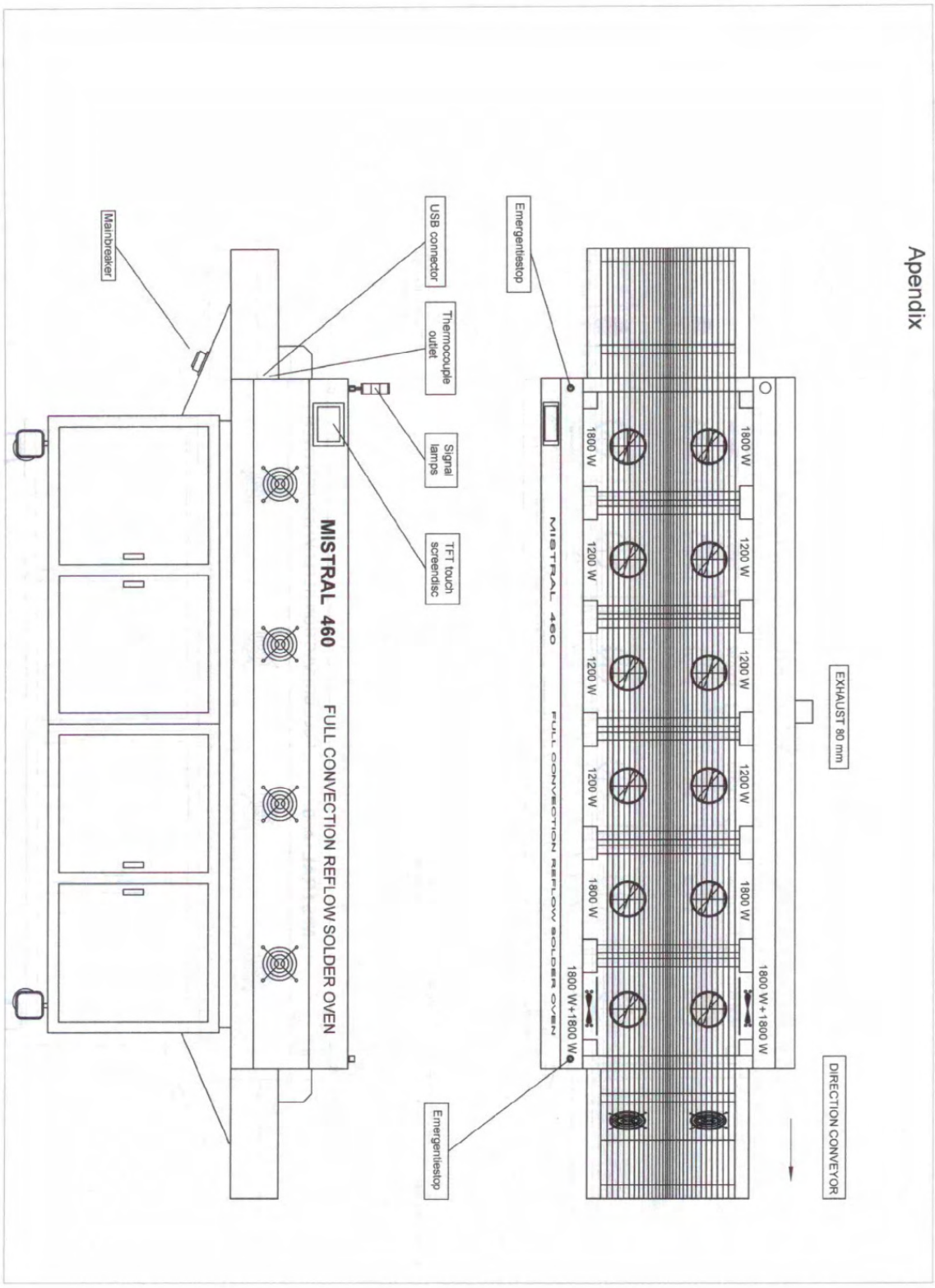
Thermocouple wire
The included thermocouple wire can be used to monitor the temperature progress when attached to a PCB or any other object running through the oven on the conveyor belt.

5. List of spare parts

Part number:	Description:
M-460/AGP-3300	Touch screen, 5.8” full colour
M-460/Z-TO-A	Control module for touch screen
M-460/28201	Forced air heater ventilator
M-460/BNG/460	Bearing for roller, round 32 x 15 x T 9
M-460/C9527	Cooling front/rear blower 120x120x38
M-460/DRS	Step motor belt
M-460/EST	Emergency stop switch
M-460/H/1200	Heater element 1200W
M-460/H/1800	Heater element 1800W
M-460/MR/TEC255	Main relay
M-460/MSW	Conveyor spring wire
M-460/OVEN GLASS	Oven glass hardened
M-460/PH/632	Step motor
M-460/SMB	Step motor belt
M-460/RAIDIS	Supporting roller, round 13
M-460/RAIDIS	Supporting roller, round 16
M-460/ROL/IO	Conveyor roller, input/output
M-460/SSR	Solid state relay 25 A
M-460/SW	Main switch
M-460/TH	Thermocouple sensor for measuring inside chamber

- **M-460/THPC** Thermocouple plug, female
- **M-460/THW** Thermocouple wire with plug, set of 2 (profiling)
- **M-460/TPSTEP** Step motor power card

Apendix


Mainbreaker
USB connector
Thermocouple outlet
Signal lamps
TFT touch screendisc
MISTRAL 460
FULL CONVECTION REFLOW SOLDER OVEN
Emergentiestop
Emergentiestop
1800 W
1200 W
1200 W
1200 W
1200 W
1800 W
1800 W+1800 W
1800 W+1800 W
MISTRAL 460
FULL CONVECTION REFLOW SOLDER OVEN
EXHAUST 80 mm
DIRECTION CONVEYOR

CE Declaration of Conformity

Technoprint
Veldzichtweg 10
3851 SH Ermelo
Tel. : 0341 563026
Fax.: 0341 563027
E-mail: info@technoprint-smt.nl
www.technoprint-smt.nl

Technoprint as stated above, herewith declares that:

FORCED AIR CONVECTION OVEN
MISTRAL 460

- are in compliance with the machinery directive (89/392/EEC, as amended, 91/368/EEC,93/44/EEC, 93/68/EEC);
- are in conformity with the provisions of the following other EEC directives; 73/23/EEG, 89/336/EEG
- the following harmonized standards have been applied: EN 60204-1

Serial number: _____

Year of manufacturing: _____

The Netherlands, Ermelo, 01-01-2009

R.van de Beek , Director