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# 1 PURPOSE OF THIS MANUAL

The purpose of this Service Manual is to provide service engineers who already have the basic knowledge necessary to repair washing machines and dryers with information concerning the DRYING TOP.

This Service Manual describes the following aspects:

- General characteristics
- Control panel
- Technical and functional characteristics
- Accessibility

## 2 IMPORTANT

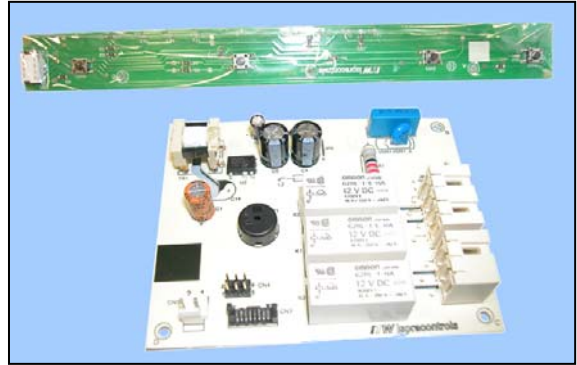


- **Repairs to electrical appliances must be carried out only by qualified service engineers.**
- **Before touching internal components, always remove the plug from the power socket.**

### 3 GENERAL CHARACTERISTICS

The electronic control consists of two electronic boards:

- a display board
- a power board



Through the display board it is possible to set the functions of the drying top: switch it on, set the temperature, the drying cycle duration and pushing the START/PAUSE button, to start it.

The settings are displayed through the switching on of the LEDs (four to indicate the duration of the cycle and three to indicate the relative temperature).

Depending on the settings, the power board powers the various components: fan and heater. The temperature is regulated by the NTC sensor and in case of overheating the thermostats with manual reset intervene.

In some washing machine models, the drying top replaces the work top and the fixing is the same.

The power supply occurs by means of a connector located in the electric circuit of the washing machine and inserted in the power board of the top.

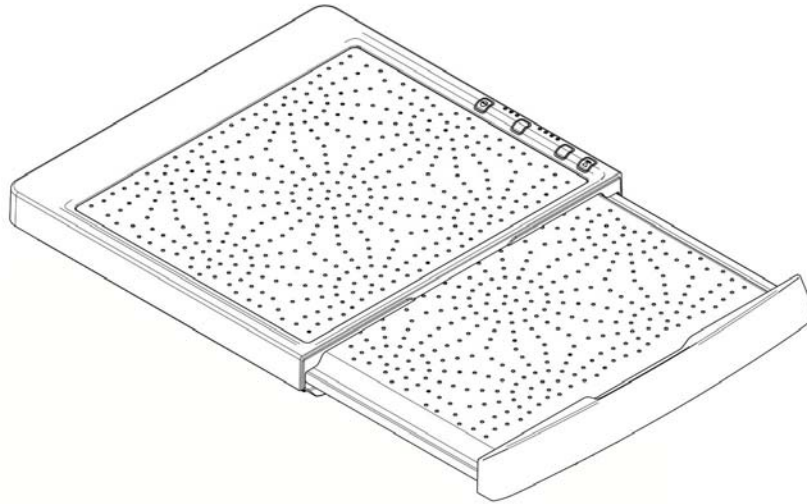
When the drying top is integrated in the washing machine, it takes the function of main appliance and its operation has the priority.

Therefore, if a drying cycle is being performed, automatically the power supply to the washing machine is excluded and it is not possible to start a washing cycle. If a washing cycle is being executed and by accident the ON/OFF button of the top is pressed, automatically the cycle is interrupted and the top is in stand-by.

<b>No of buttons</b>	<ul style="list-style-type: none"> <li>▪ max 4 (1 start/pause)</li> </ul>
<b>No of LEDs</b>	<ul style="list-style-type: none"> <li>▪ max 8</li> </ul>
<b>Power supply</b>	<ul style="list-style-type: none"> <li>▪ 230V</li> <li>▪ 50/60 Hz</li> </ul>
<b>Working temperature</b>	<ul style="list-style-type: none"> <li>▪ 5°÷70°C</li> </ul>
<b>Absorbed power in stand-by</b>	<ul style="list-style-type: none"> <li>▪ 2W</li> </ul>
<b>Absorbed power in drying</b>	<ul style="list-style-type: none"> <li>▪ 1Kw</li> </ul>
<b>Power of heater unit</b>	<ul style="list-style-type: none"> <li>▪ 800W</li> <li>▪ 220-250 V</li> </ul>
<b>Maximum power</b>	<ul style="list-style-type: none"> <li>▪ 2,3 Kw</li> </ul>
<b>Fan</b>	<ul style="list-style-type: none"> <li>▪ 20W,</li> <li>▪ 220-250 V</li> <li>▪ 118 m³/h</li> </ul>
<b>Temperature control</b>	<ul style="list-style-type: none"> <li>▪ NTC sensor</li> <li>▪ 2 thermostats with manual reset 75°</li> </ul>
<b>Buzzer</b>	<ul style="list-style-type: none"> <li>▪ Traditional integrated in the electronic board</li> </ul>

### 3.1 Control panel

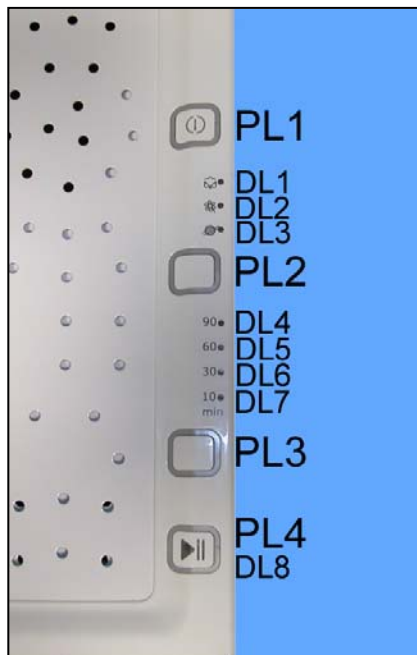
- max. 4 buttons
- 8 LEDs



- Disposition of LEDs and buttons



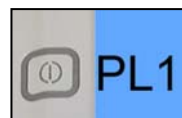
### 3.2 Configuration of the control panel



#### 3.2.1 Buttons and LEDs

- Button PL1 ON/OFF

It has the function of switching on and off the top.  
When it is switched on, the combined appliance (in this case the washing machine) is excluded.



- Button PL2 TEMPERATURE REGULATION

Pushing it sequentially, it is possible to vary the drying temperature and this variation is indicated by the switching on of the LEDs DL3÷DL1.  
When it is switched on, the top sets for the more delicate drying cycle turning on LED DL3.



The three different drying levels are represented below

Temperature	Fabric temperature degree	LED on
T1	LOW WOOL	DL3
T2	MEDIUM SYNTHETIC	DL2
T3	HIGH COTTON	DL1

- Button PL3 REGULATION OF DRYING TIME

Pushing it sequentially, it is possible to vary the drying time and this variation is indicated by the switching on of the LEDs DL7=DL4.

When it is switched on, the top sets for the shorter drying cycle turning on LED DL7.



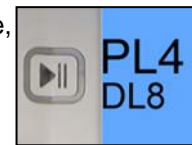
The drying time and the lit LEDs are represented below.

Time	Minutes	LED
T1	10	DL7
T2	30	DL7-DL6
T3	60	DL7-DL6-DL5
T4	90	DL7-DL6-DL5-DL4

- Button PL4 START/PAUSE

Pushing it sequentially, it is possible to start the drying programme or pause the cycle, to modify the settings previously selected.

Internally there is a LED DL8 which flashes during the setting phase, in pause and at the end of the cycle, while during the execution of the cycle it is on with a fixed light.



Status	DISPLAY	COMPONENT STATUS
OFF	All LEDs are off	<b>Drying top off</b> <b>Fan off</b> <b>Heater off</b>
STAND-BY <sup>3</sup>	Switching on	<b>Drying top on</b> <b>Fan not powered</b> <b>Heater not powered</b>
	Setting <sup>1</sup>	
	End of cycle <sup>2</sup>	
DRYING	DL8 on The programme and cycle duration LEDs chosen during the setting are on.	<b>Drying top on</b> <b>Fan powered</b> <b>Heater powered / not powered</b>
PAUSE <sup>4</sup>	DL8 flashes The programme and time LEDs chosen for the cycle are on.	<b>Drying top on</b> <b>Fan powered / not powered</b> (depending on the cooling phase). <b>Heater not powered</b>
ALARM	LEDs: DL7 or DL6 DL4 flash at the end of the cycle depending on the alarm	<b>Drying top on</b> <b>Fan not powered</b> <b>Heater not powered</b>

1) After the last modification to the programme, there is only 1 minute to restart it, after that, the setting switches to the basic one.

2) At the end of the programme only the selected temperature and time LEDs flash. Pushing the Start or Time or Temperature button the appliance switches on.

3) The STAND-By lasts 10 minutes and then the appliance switches off.

4) The duration of the PAUSE phase is 10 minutes, then the appliance switches on.



- OFF

During this phase, only the ON/OFF button is activated and all the LEDs are off.

- STAND-BY

During this phase all the buttons are activated:

the programmes, the drying time and start/pause buttons, while LED DL8 flashes.

- DRYING

During the drying phase only the ON/OFF and START/PAUSE buttons are activated, the fan, the heater are powered and the LED DL8 is lit. Their operation is controlled by the electronic board.

At the beginning of the cycle, the first functional component to be powered is the fan and if the programme includes also the supply to the heater, this is powered after about 2 seconds.

At the end of each drying cycle there is a 3-minute cooling phase.

- PAUSE

While the appliance is in pause, all the buttons are activated, and it is possible to modify the time, the drying cycle and to push the START/PAUSE button to confirm the modifications carried out.

The LED DL8 flashes.

During the pause the heater is deactivated, while the fan is powered.

- POWER-FAIL

During a drying cycle the various phases (time and temperature) are memorised every five minutes, so as to reset the cycle after a power-fail.

### 3.3 ALARM

LED flashing	Possible faulty component	Activated buttons	Drying top status
DL7 (10 min.)	<ul style="list-style-type: none"> <li>• NTC wiring</li> <li>• NTC (with altered values)</li> <li>• Electronic board</li> </ul>	ON/OFF (PL1)	The power supply to the heater is cut and only the fan is powered. The programme continues till the end.
DL6 (30 min.)	<ul style="list-style-type: none"> <li>• Wiring</li> <li>• Thermostats</li> <li>• NTC</li> <li>• Interrupted heater</li> <li>• Electronic board</li> </ul>	ON/OFF (PL1)	During the first eight minutes, the sensors have not detected any temperature variation (reaching a certain threshold). The programme continues till the end.
DL4 (90 min.)	<ul style="list-style-type: none"> <li>• Electronic board</li> </ul>	ON/OFF (PL1)	The programme continues till the end.

## 4 DIAGNOSTIC SYSTEM

### 4.1 Access to diagnostics

Switch off the appliance removing the plug from the socket.

1. Insert the plug into the socket and within two seconds push the buttons simultaneously.

**PL2 and PL4**



The diagnostic cycle starts:

- checking all LEDs (switching on each LED for 0.5")

- checking the buzzer with a long BEEP

If the diagnostic cycle does not identify any faulty component, all LEDs light up till the end of the test and the buttons and the relays are now checked.

If some faults are identified, all LEDs flash (and the check of the buttons and relays can not be executed).

- checking the buttons and the relative relays:

- Push button PL4 (START/PAUSE) and the relay which powers the drying top activates.
- Push button PL3 (TIME) and the relay which powers the fan activates.
- Push button PL2 (TEMPERATURE) and the relay which powers the heater activates (during this check the temperature control is active in order to avoid the damages caused by the too high temperature).
- Push button PL1 (ON/OFF) and the relay which powers the drying top deactivates, the appliance switches off.

End of diagnostic cycle

It is possible to interrupt the diagnostic cycle at any time pushing button PL1 (ON/OFF).

If during the diagnostic cycle a power failure occurs, when it is restored, the appliance switches OFF.

After the switching on of all the LEDs, five minutes remain to perform the last phase of the diagnostic cycle (check of buttons and relays), then the appliance switches off.

### 4.2 Exiting the diagnostic system

→ To exit the diagnostic system, switch off the appliance.

## 5 BUZZER

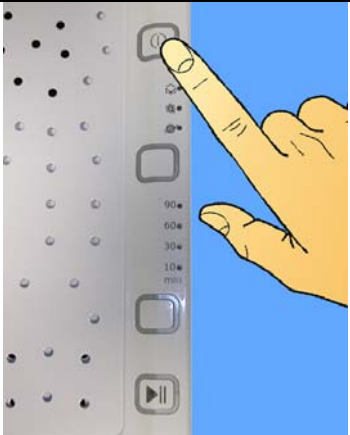

The appliance is normally supplied by the factory with the buzzer deactivated.

### 5.1 Activation and deactivation

The activation/deactivation can be carried out only during the setting phase.

Proceed as follows:

Switch off the appliance:

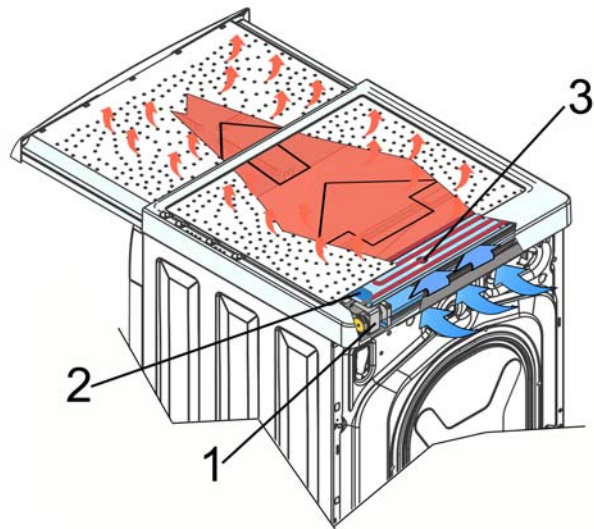
<p>1. Push <b>ON/OFF</b> button</p>	
<p>2. Push buttons PL2 and PL3 simultaneously</p>	
<p>After some seconds, the buzzer emits a “beep” which indicates that it is activated.</p> <p>To deactivate the buzzer, repeat the same operations till a “beep” is heard.</p>	

### 5.2 Buzzer signal

- A short “beep” is generated when a button is pushed.
- A longer “beep” is generated at the start of the programme or when the ON/OFF button is pressed to interrupt a drying cycle.
- Three “beeps” are generated at the end of a drying cycle.

## 6 DRYING CYCLE

1. Fan
2. Heater
3. NTC sensor



The air enters the slots located in the rear part of the drying top, sucked by the tangential fan (1) and pushed towards the heater (2) which heats it up.

The heated air flows inside the top and exits through the holes of the top to dry the cloth placed above.

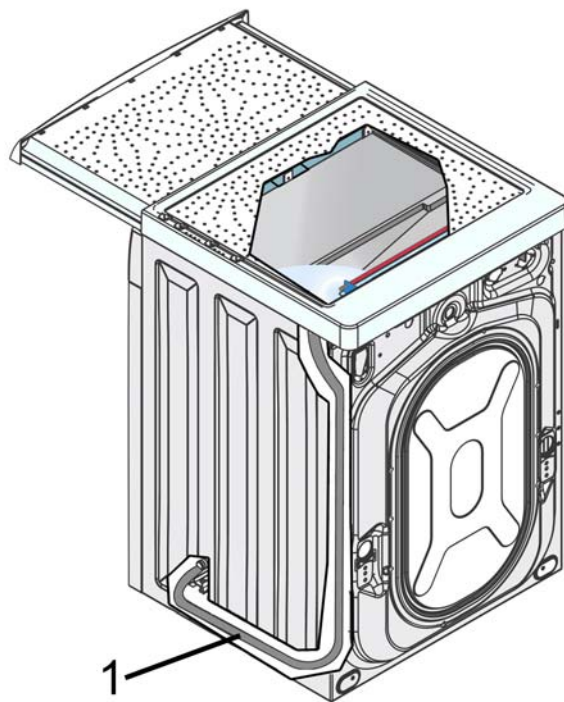
The air temperature is controlled by a NTC sensor that varies its ohmic value depending on the heat degree.

The electronic circuit, reading these variations, powers or not the heater so as to maintain the temperature within the limits in order not to damage the cloth.

Besides the NTC sensor, there are two thermostats with Manual Reset, which intervene if for any reason the temperature reaches excessive values, cutting power to the heater.

## 7 DRAIN CIRCUIT

1. Drain hose of drying top



The drying top features a drain hose (1) connected to the pump body, which allows draining the water collected at the bottom of the top, due to a too humid cloth, or by an accidental spillage of a liquid over the top.

Start the DRAIN programme of the washing machine before every drying cycle.

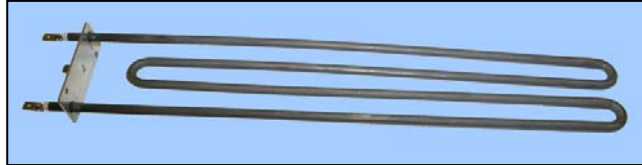
## 8 ELECTRIC COMPONENTS

### 8.1 Drying heater

#### 8.1.1 General characteristics

The drying heater is armoured, inserted in a watertight stainless steel tubular casing.

Its electric power is 800W.



#### 8.1.2 Checking the efficiency

IT DOES NOT HEAT

- Check if the heating element is interrupted, measure is the value between the two terminals is 65 Ohm.

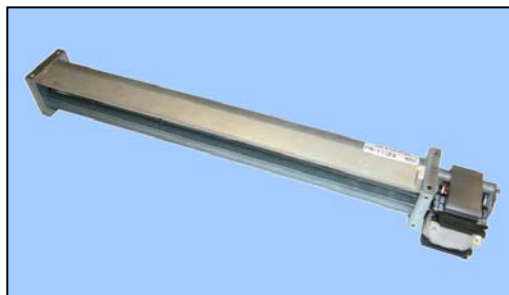
INTERVENTION OF ELECTRICAL SAFETY CUT-OUT

- Check with an ohmmeter if the heating element is not connected to mass and check for current leakage (40 MOhm).

### 8.2 Tangential fan

#### 8.2.1 General characteristics

The tangential fans are used where the space is limited and a big air mass, a low noise level and at the same time a regular flow are needed.



#### 8.2.2 Checking the efficiency

IT DOES NOT WORK

- Check if the motor is jammed.
- Measure if between the terminals the value of the stator winding resistance is 190 Ohm.

## 8.3 Manual reset thermostat

### 8.3.1 General characteristics

Some appliances feature safety thermostats with manual reset.

Inside there is a bimetal disk, which if the temperature is higher than the one set for this thermostat, switches on and opens the contacts. For a correct operation, it is necessary to push manually the relative button placed between the terminals, to set the bimetal to the initial position.

In case of intervention of the thermostats, after resetting or replacing them, verify the causes that provoked it (such as: no ventilation, fan jammed, etc.)



### 8.3.2 Checking the efficiency

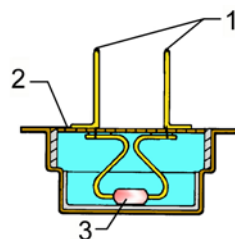
- Check with a tester if there is a resistance of zero Ohm between the contacts.
- Heat the thermostat bulb and check that the contacts commutate.

## 8.4 NTC temperature sensor

### 8.4.1 General characteristics

The NTC sensor is used to check the drying temperature. It is made in a way so that its internal heater decreases while the temperature increases. The decrease of the heater is detected by the electronic control, which, when the desired temperature is reached, switches off the heating element.

1. Terminals
2. Plastic casing
3. NTC heater



### 8.4.2 Checking the efficiency

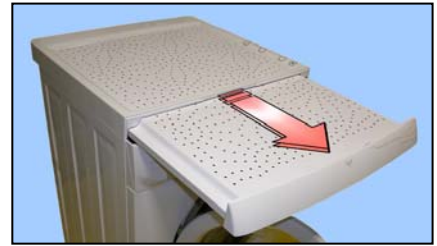
- Check with a tester if there is a resistance of 20KOhm at room temperature (25°C) between the contacts.

## 9 ACCESSIBILITY TO COMPONENTS

### 9.1 Removable top

The removable top slides on two rails provided with a safety device with double protection, in order to avoid that the user slides off the top.

Extract the removable top.



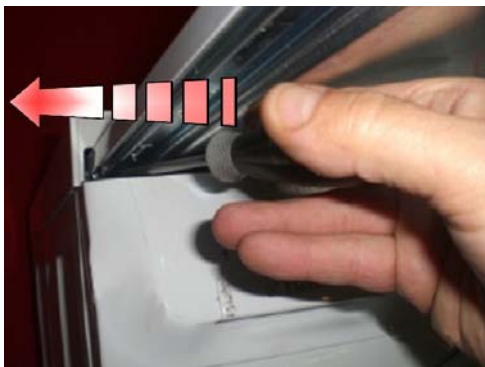
Use a screwdriver with the following characteristics:

Rod Ø 6.5mm  
Length = 153mm

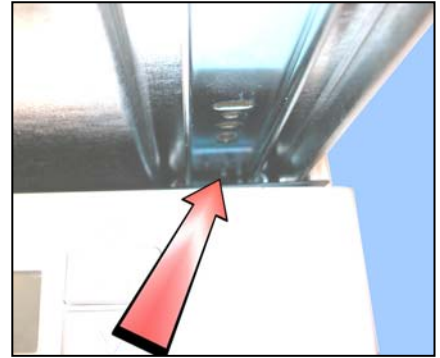


Handgrip Ø 35mm  
Length = 115mm

Operate on both guides.



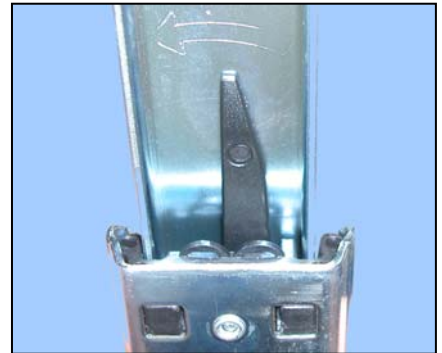
Inside each rail there is the safety device. The arrow indicates the lever to block the device.



Procedure to release the safety device

Only one rail is considered hereafter, but the operations are the same for both.

The picture shows the normal position of the lever.



1. Release the first safety catch

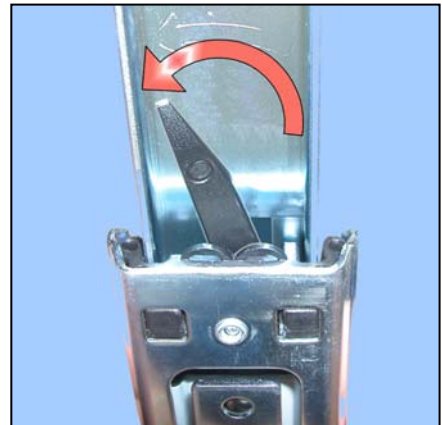
Move the lever with a screwdriver as indicated by the arrow and simultaneously extract the top (a little).

Repeat the same operation for the other rail.

When the lever is released, the safety catch locks.

2. Release the second safety catch

Repeat the same operations carried out at step 1, so the top will slide more.



Follow the same procedure for the other rail.

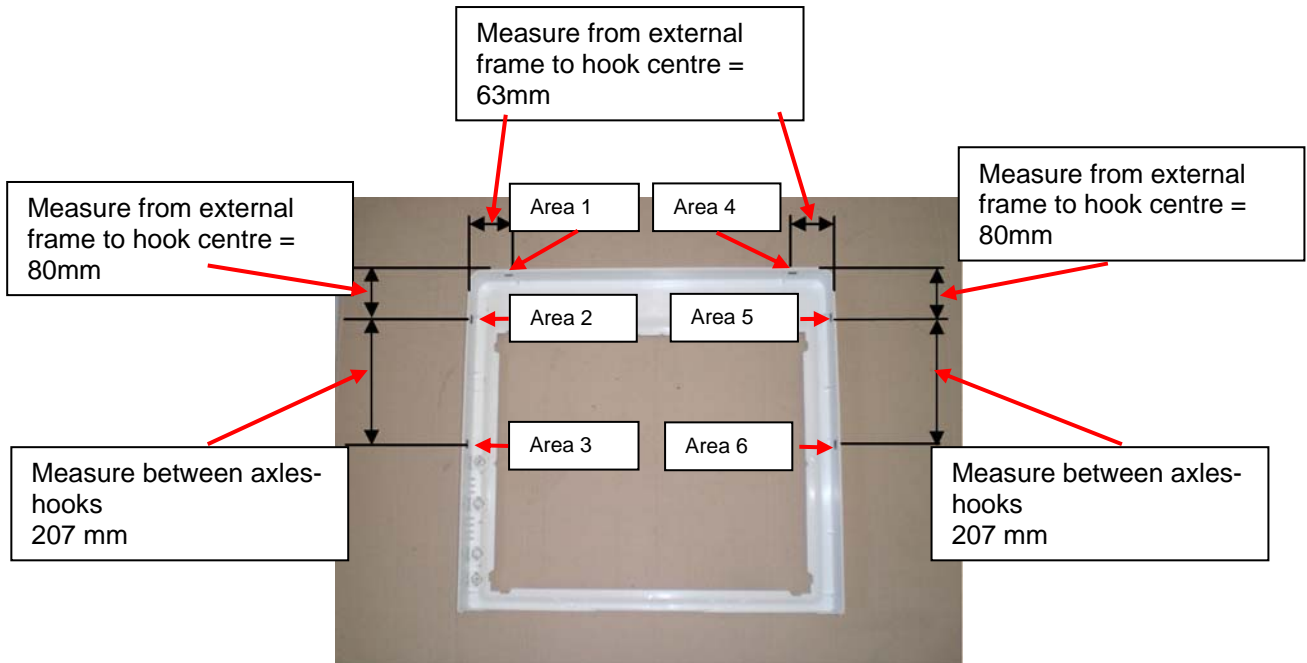
At this point the safety catches have been released and it is possible to remove the top from the rails completely.



## 9.2 Fixed top

**Proceed carefully in order to avoid breaking or cracking the material which the frame is made of**

Insert the screwdriver into 1 / 2 / 3 / 4 / 5 / 6 area of the frame and with a light bending lift it up upwards.

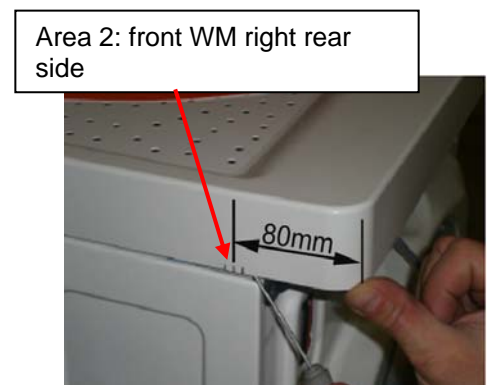


The 3 left hooks are symmetrical to the right ones.

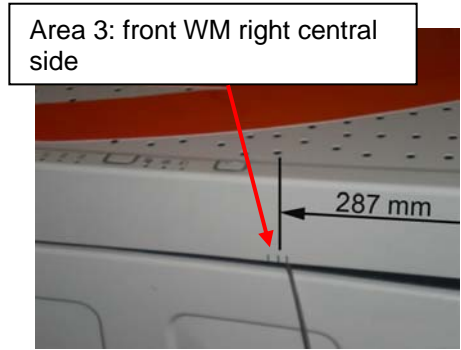
Insert the screwdriver into area 1 and slightly bending, lift the frame upwards.



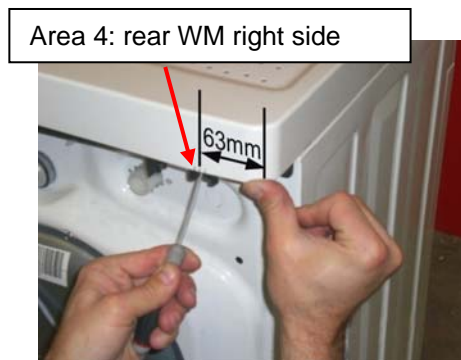
Insert the screwdriver into area 2 and slightly bending, lift the frame upwards.



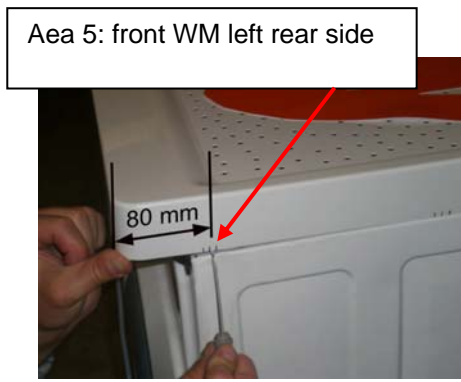
Insert the screwdriver into area **3** and slightly bending, lift the frame upwards.



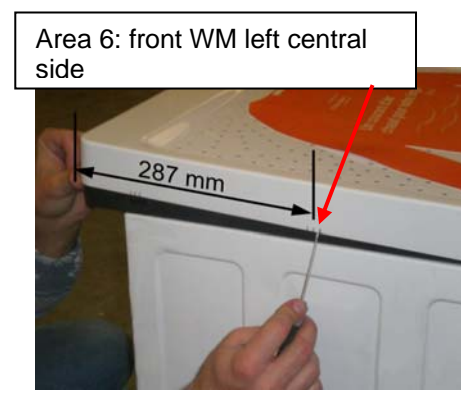
Insert the screwdriver into area **4** and slightly bending, lift the frame upwards.



Insert the screwdriver into area **5** and slightly bending, lift the frame upwards.



Insert the screwdriver into area **6** and slightly bending, lift the frame upwards.



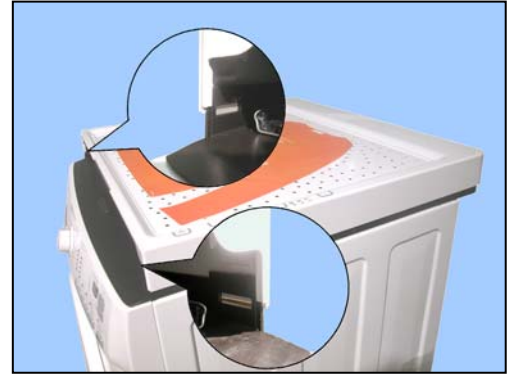
**Lift the frame up, paying attention not to damage the flat cable connected to the display board.**



### 9.2.1 Reassembling the frame and removable top

After the intervention, position the upper frame parallel to the base as represented in figure, paying attention that the joints in the front part are perfectly aligned.

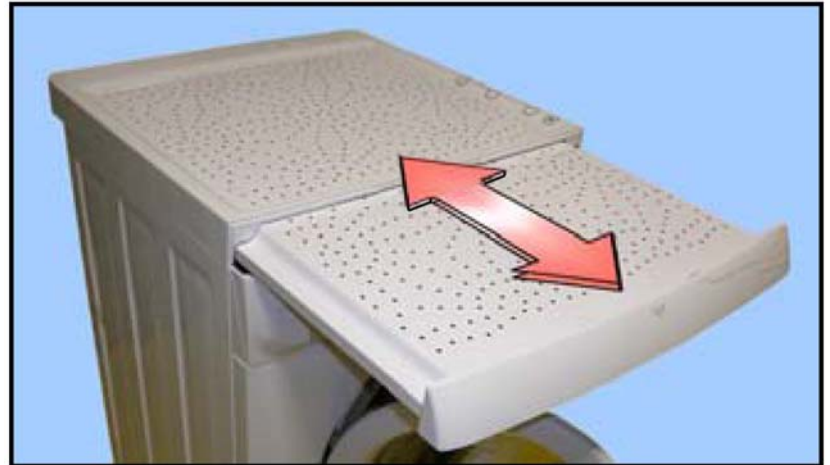
Push downwards the upper frame till the “clack” of each hook that enters its seat is heard.



Insert the removable top guides into those of the base.



Push the removable top inside the drying top.  
Extract it again and check that the slipping is regular and it stops when it reaches the limit stop.



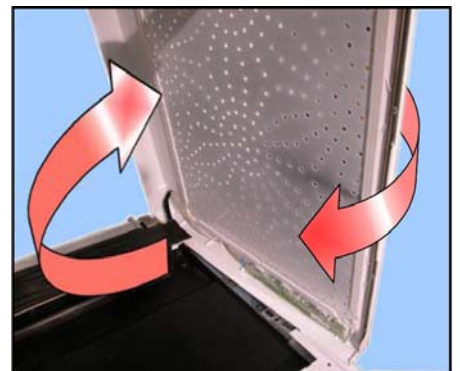
Lift the top.



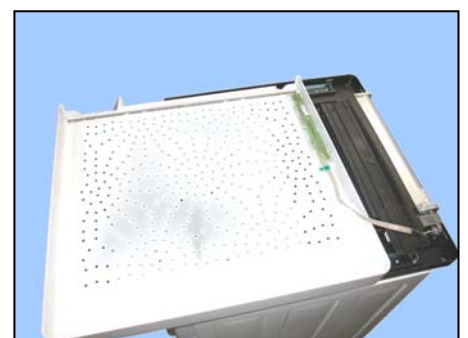
Pay attention not to damage the wiring of the display board (placed in the right corner, see figure).  
Extract the wiring from the hook (indicated by the arrow).



Place the top on the right side of the top.



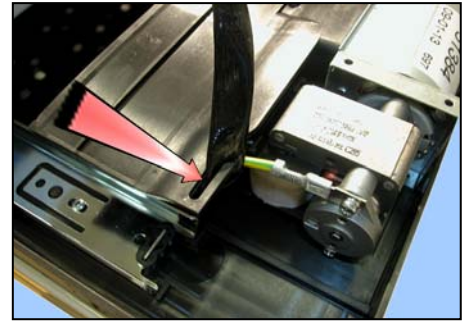
Rotate the top and position it on the removable top (as represented in figure), putting some protections to avoid scratching the varnished parts.



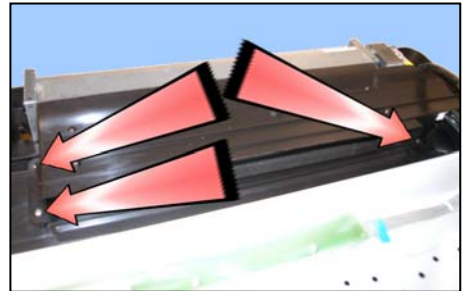
### 9.3 Heater

After removing the fixed top (see par. 9.2)

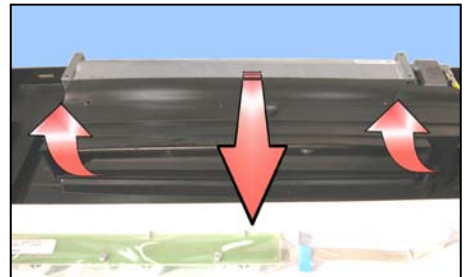
Remove the wiring.



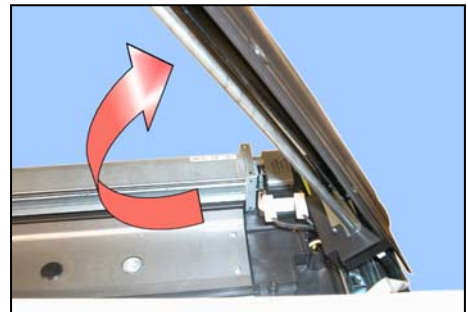
Remove the three screws which secure the conveyor.



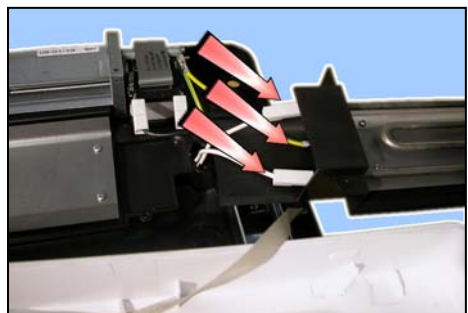
Move it inside the drying top.  
Lift the front part of the conveyor.



Lift and rotate outwards.

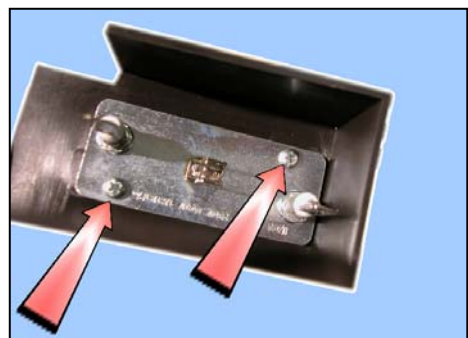


Detach the connectors and the ground wire.



Remove the screws which fit the heater to the conveyor and remove it.

While reassembling, repeat the same operations in opposite order.



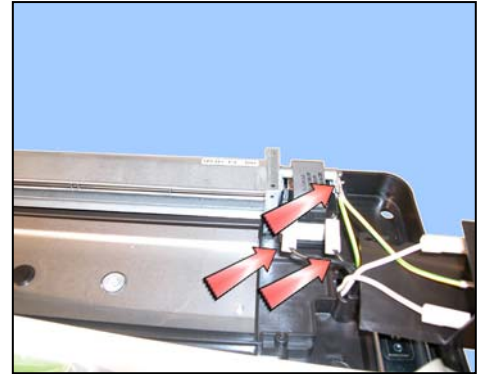


## 9.4 Fan

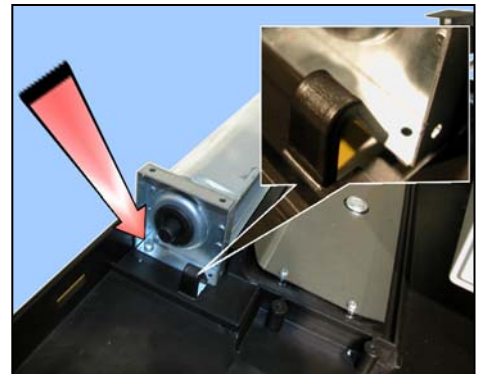
After removing:

- The fixed top (see par. 9.2)
- The heater (see par. 9.3)

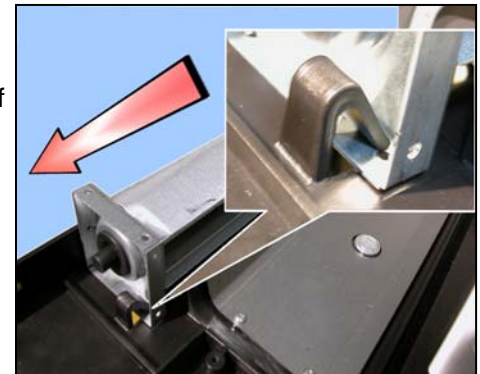
Detach the connectors of the stator and the ground wire.



Remove the screw which fits it at the bottom (note the position of the catch on the fan).



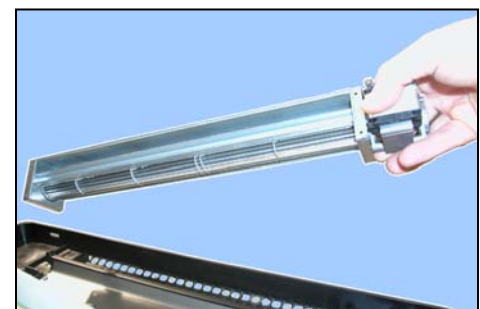
Move the fan following the direction of the arrow (see the movement of the fan compared to the catch).



Lift the fan from the motor part and remove it (see the arrow direction).



While reassembling repeat the same operations in opposite order.



## 9.5 Thermostats

The intervention to the thermostats can be divided in two operations:

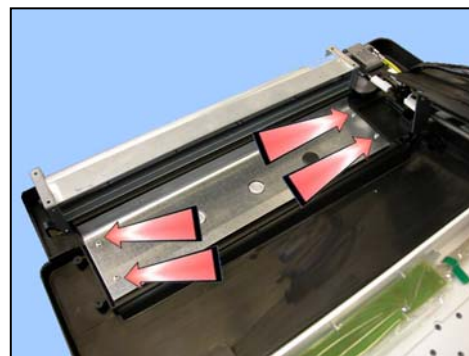
1. For the replacement it is necessary to carry out the two phases below described.
2. If it is necessary only to push the button to activate them again, see the second phase.

### 9.5.1 First phase: inside the drying top

After removing:

- The fixed top (see par. 9.2)
- The heater (see par. 9.3)

Remove the four screws which secure the lower display.

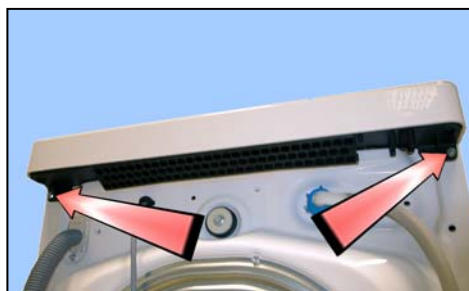


To replace the thermostat, unscrew the relative screws which secure it to the bottom.

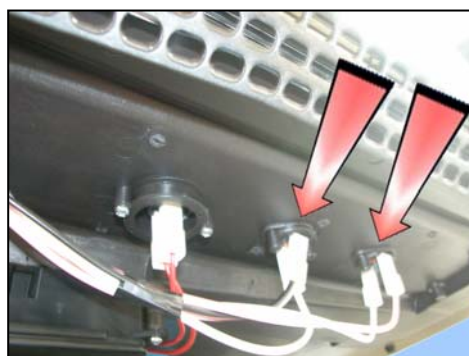


### 9.5.2 Second phase: inside the drying top

To remove the top, unscrew the two screws which secure it to the washing machine and push the top towards the rear part, as a normal work top.

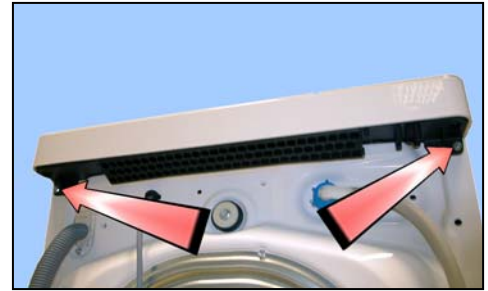


Lift the top, so it is possible to remove the connectors from the thermostat.

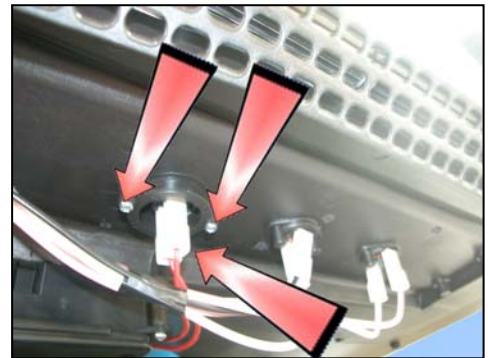


## 9.6 NTC

To remove the top, unscrew the two screws which secure it to the washing machine and push it towards the rear part, as a normal work top.



Lift the top, so it is possible to unscrew the screws which secure it to the bottom and extract the connectors from the terminals.

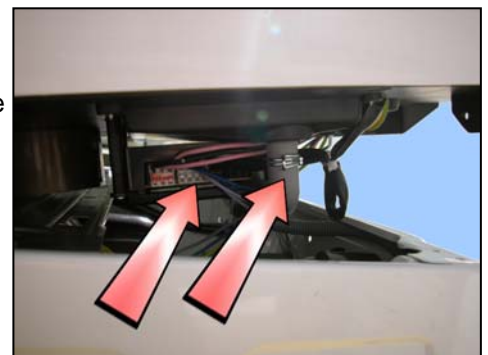


## 9.7 Power board

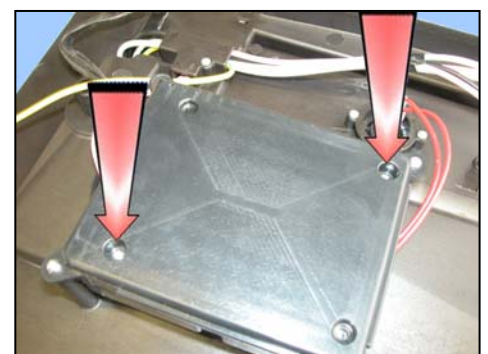
The power board is inserted in a casing fixed with screws to the external part of the bottom.

Remove the two screws which secure the top to the washing machine, push it towards the rear part.

Lift the top, so it is possible to remove the connector which powers the top and to slide off the drain hose.



Remove the two screws which secure the cover.



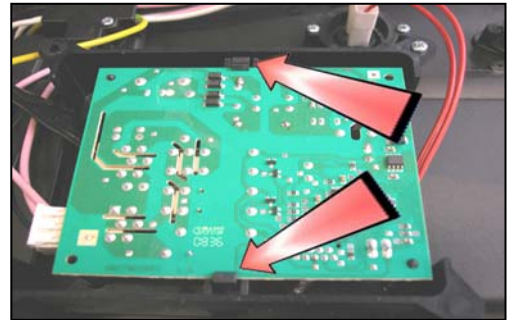




**Before operating on the electronic board, discharge yourself from the electrostatic electricity, so as not to damage the electronic components.**

Release the two hooks which secure the board to the casing.

Remove it.



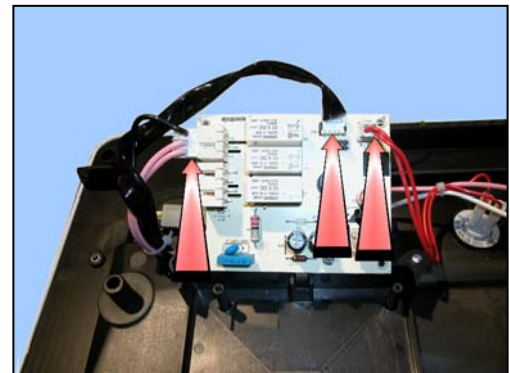
Rotate it on itself.



Position it as in figure

While removing the connectors from the wiring pay attention:

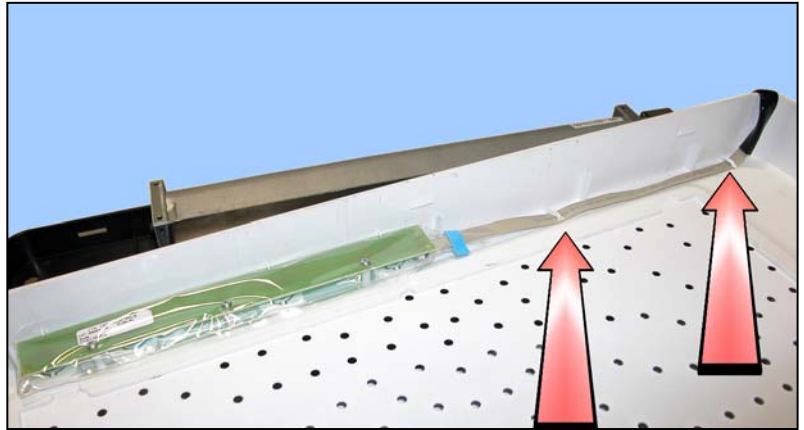
- To the connector of the flat cable of the display board, for its dimensions.
- For the connector of the NTC sensor, push the lever which secures it to the board.



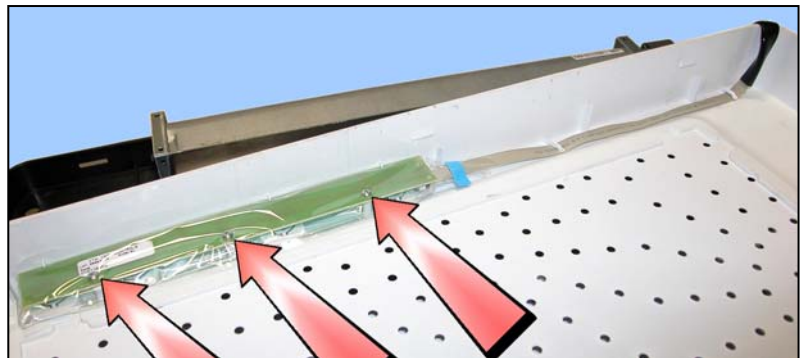
## 9.8 Display board

Remove the wiring from the power board and extract it.

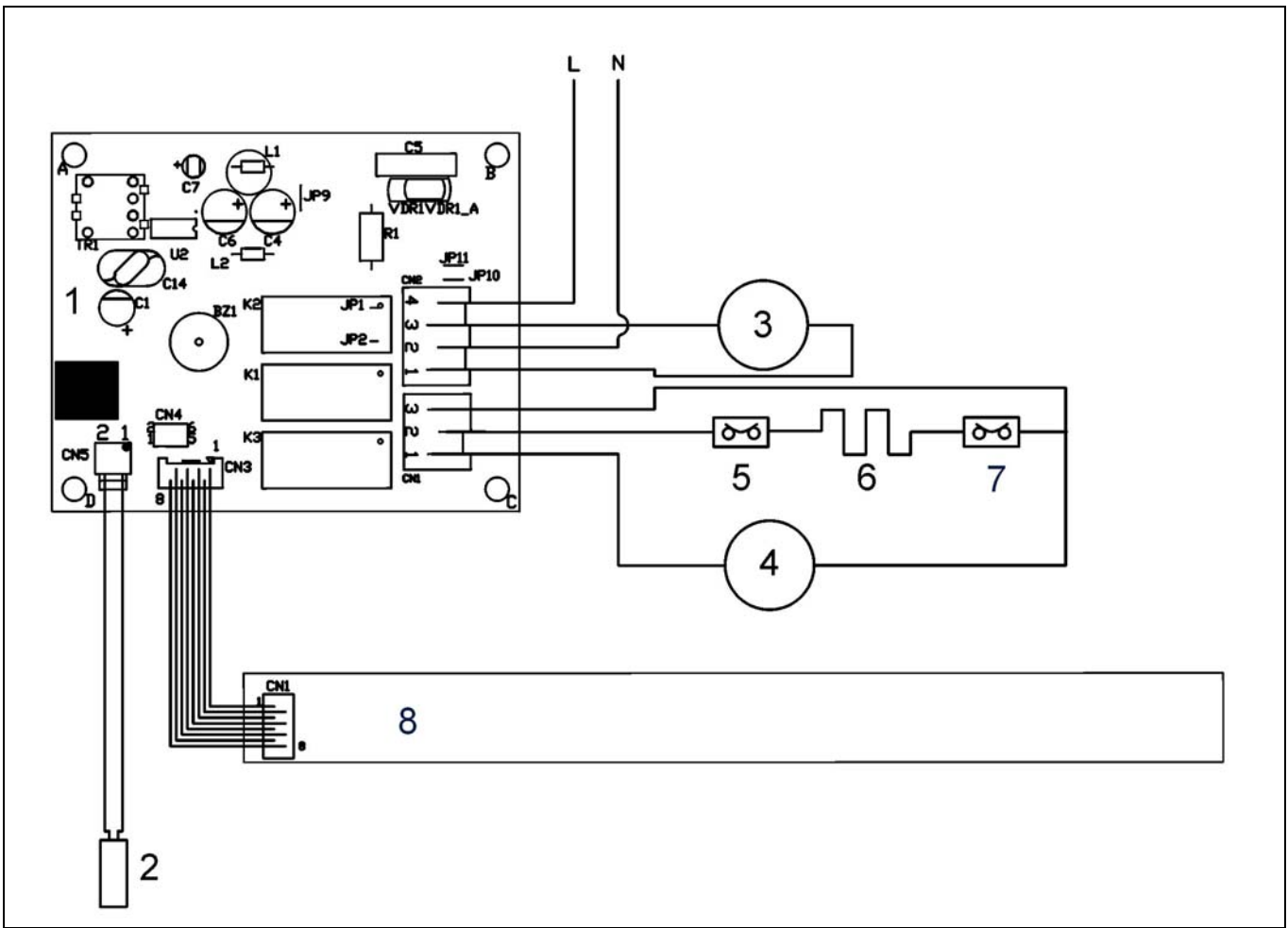
Remove the hooks which secure it to the frame, paying attention not to break them.



Remove the three screws which secure it to the frame.



# 10 WIRING DIAGRAM



## Wiring diagram LEGEND

- |                    |                            |
|--------------------|----------------------------|
| 1. Power board     | 5. Manual reset thermostat |
| 2. NTC Sensor      | 6. Drying heater           |
| 3. Washing machine | 7. Manual reset thermostat |
| 4. Fan             | 8. Display board           |