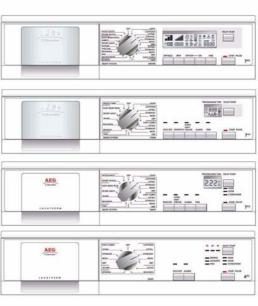


# DRYERS





© Electrolux Home Products Italy S.P.A Corso Lino Zanussi, 30 I-33080 Porcia - PN - Fax 0039 - 0434 394096	Publication no. <b>599 70 57 60</b> EN	Condenser dryer with electronic control ENV06 AEG Stylings With and without LCD	
SOI			
Edition: 01/2008 Rev 00			

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## **1 INTRODUCTION**

#### 1.1 Purpose of this Manual

The purpose of this Service Manual is to provide service engineers who already have the basic knowledge necessary to repair dryers with information concerning condenser dryers with electronic control systems.

The electronic control consists of a main board having an integrated selector and on some models a LCD display, supplied already mounted and tested by the building factory.

This Service Manual describes the following aspects:

- General characteristics.
- Control panel and drying programmes.
- Description of operation.
- Drying circuit.
- Electrical components and wiring diagram.
- Diagnostics guide.
- Alarms.
- Accessibility.

#### 1.2 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

Before touching internal components, always remove the plug from the power socket.

#### 1.3 Installation

- The appliance must be installed on a perfectly level surface in order to ensure that the condensed water flows correctly into the tank.
- The feet must NOT be removed. The gap between the bottom of the dryer and the floor is essential to prevent overheating.

## **2 TECHNICAL CHARACTERISTICS**

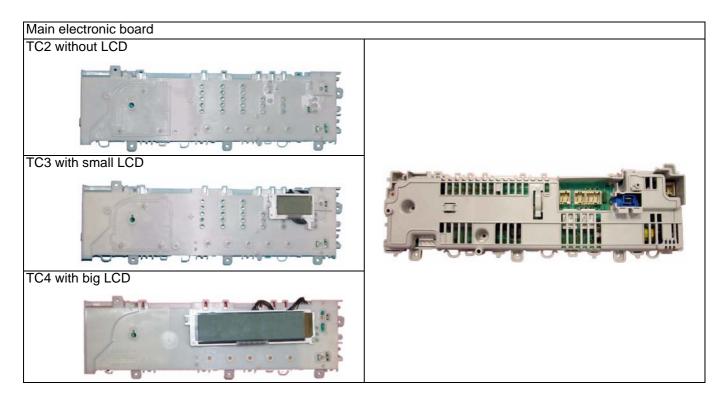
### 2.1 Technical data

	Height:	85 cm		
Dimensions of appliance	Width:	60 cm		
	Depth:	58 cm		
Power supply	Volt:	220 - 240		
	Hz.	50/60		
No. Buttons	Depending on the model			
No. LEDs	Depending on the model			
Type of display	small LCD on TC3 models.			
	big LCD on TC2 models			
Buzzer	Buzzer incorporated in the PCB.			
Serial port	DAAS-EAP protocol up to 230400 baud.			
	11 positions models without LCD	All models		
Programme selector	15 positions models with small LCD	with integrated ON/OFF switch		
	21 positions models with big LCD	5		
Drying system	Condensation of humidity by heat exchar	nger.		
Humidity control	Conductimetric sensor.			
Motor	Single-phase asynchronous motor with c	apacitor.		
Power of heater unit	Version 220 - 240 V 2200 W 1400 W + 800W			
Temperature control	NTC sensor.			
Tank capacity	Condensation tank ca 4I.			
Canister fill pump	With synchronous motor.			

#### 2.2 Electronic boards

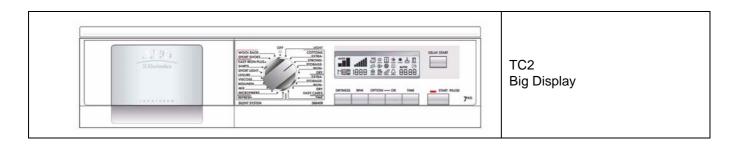
The electronic control consists of a main board having an integrated selector and on some models a LCD display, supplied already mounted and tested by the building factory.

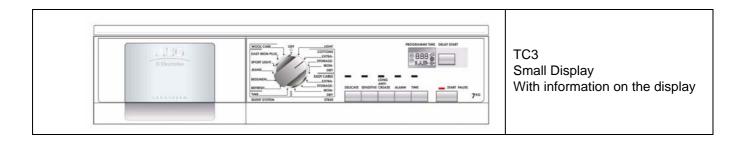
The pictures of the boards can differ slightly from the ones mounted on the appliances.

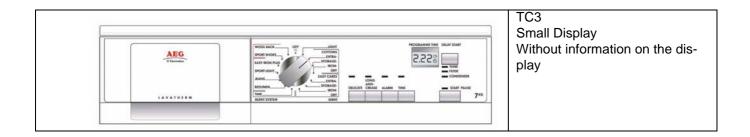


## **3 CONTROL PANEL**

## 3.1 Stylings







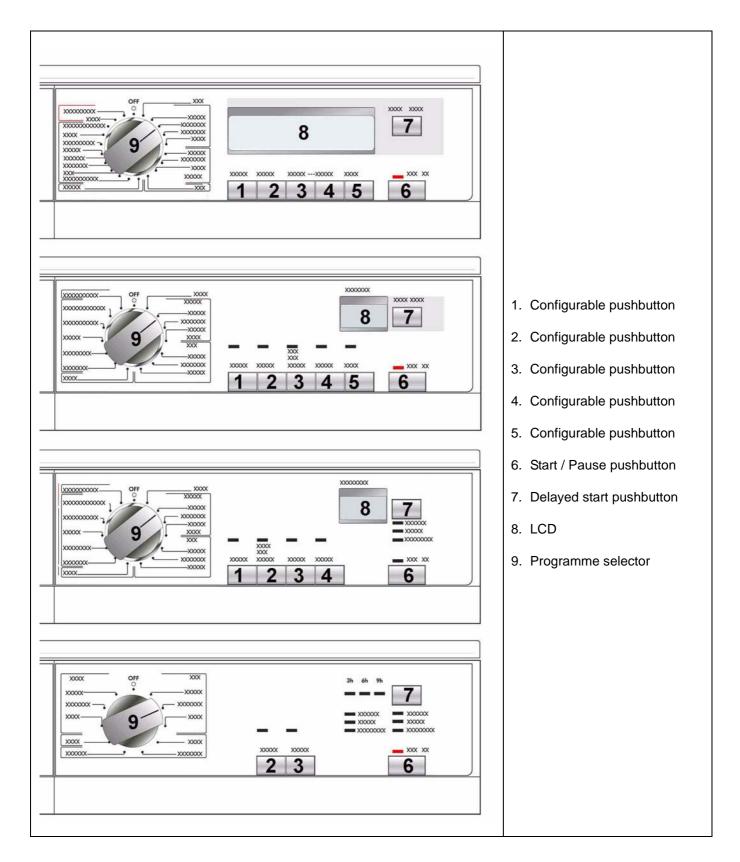
	- 1			Without display
AFG	EASY CARES OFF COTIONS		3h 6h 9h DELAY START	
AEG T Destados	STORAGE STORAGE			
	DRYRANS		END CONDENSER	
LAVATHERM	REFRESHREDUNEN	DELICATE ALARM	Stakt Muse	
( LAVAINERM	35540		)	

## 3.2 Programme selector

The 11-position selector on models without LCD (TC4), 15 positions on models with small LCD (TC3) and 21 positions on models with big LCD (TC2) feature an integrated ON / OFF switch and are part of the board. The symbols represent the various drying types for the different fabrics COT-TON, SYNTHETICS, SILK, WOOL and TIMER. All positions are configurable depending on the model



#### 3.3 Pushbuttons



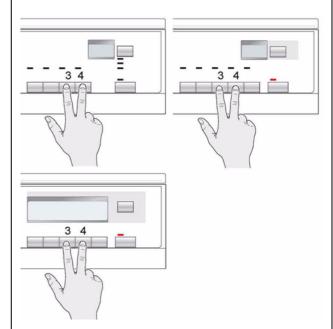
## 3.4 Symbols on stylings with LCD

Cycle options	icons		
8	Delicate	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Long anti-crease phase
ß	Sensitive	<b>!!!</b> 1888	Spin speed (washing machine)
	Final humidity level		
Cycle icons			
J	Iron ready	Ŀ	Cupboard dry
<u> </u>	Light drying	<u>*</u>	Strong Drying
*	Extra strong drying	<u> </u>	Drying phase
S	Cooling phase	Ĩ	Anti-crease phase
Alarms			
E.	Empty water collector		Clean filters
⋺	Clean heat exchanger	₽	Child Safety
$\Delta$	Buzzer		
Timer			
Û	Delayed start	8.88	Time-to-end / Alarm code

## 3.5 Child safety (on some models)

Pushing buttons 3 and 4 simultaneously forr 5 seconds the child safety is activated, all buttons are deactivated and no modification is possible.

To deactivate this protection, push the buttons previously pushed



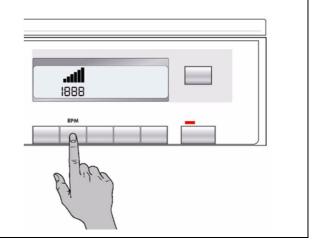
#### 3.6 Delicate <sup>1</sup>/<sub>2</sub> power (on some models)

This dryer features a heating group with two separate heating elements whose power varies according to the model.

When this pushbutton is pressed once, the electronic control system switches off the lower-power heating element, and the corresponding LED lights to indicate that the option has been selected; if the pushbutton is pressed again, the LED switches off to indicate that the option has been deaactivated, and the heating element switches on again during the cycle.

#### 3.7 Spin speed regulation

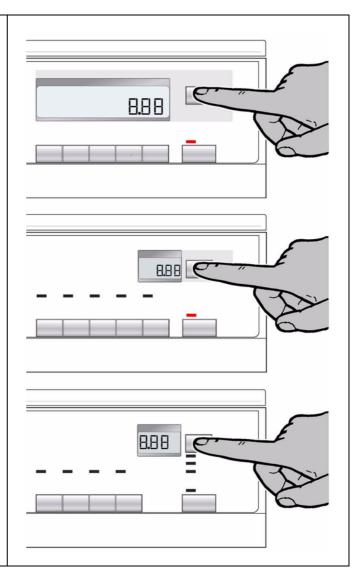
With this regulation the electronic circuit receives the information that the spin has occurred at a certain speed and the clothes consequently have a certain humididty degree. On some programmes this value modifies the time necessary to the final drying. Each time the button is pressed, the value increases by 200 rpm, from a minimum of 800 rpm till a maximum depending on the chosen programme; the maximum value is 1800 rpm. To reset this value, push repeatedly this button



## 3.8 Delayed start button

Pushing this button, it is possible to select, during the programme selection phase, a delayed start. On models with LCD the time varies up to a maximum of 20 hours; the time is shown on the Display Each time the button is pressed, the delay time increases:

- For the first two hours, the time increases by half an hour.
- After the first two hours the time increases by one hour.
- To reset the delay time either move the selector by one position or push the button till the Display is reset.



On models without LCD the time varies till a maximum of 9 hours. Push the button till the pilot lamp relative to the desired delay switches on.

This option must be selected after choosing the programme and before pushing START/PAUSE button.

#### 3.9 No buzzer

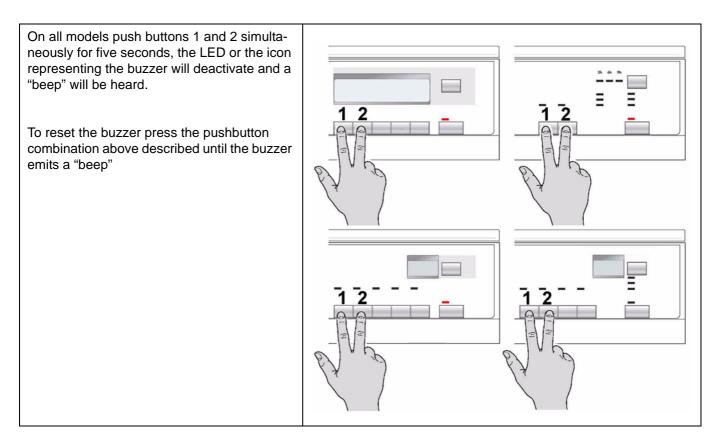
This option can be selected only when the dryer is in "selection" mode (set-up).

Press this pushbutton to deactivate the buzzer function: the activation is signalled by the switching on of the LED or of the icon. To deactivate the option push button

Even when the buzzer function is deactivated, the buzzer will continue to signal an alarm condition.

#### 3.9.1 "NO BUZZER" (not only for the affected cycle)

Setting to be made during the selection phase (set-up):



#### 3.10 START / PAUSE button

Start

When a drying programme is selected with the selector, the icons of the three phases (drying, cooling, anticrease) light up and the LED START/PAUSE flashes.

After having selected the options, press this button to start the cycle; the relative LED remains lit.

Pause

If a drying cycle is being executed, pressing the START/PAUSE button, the dryer interrupts the cycle and is in PAUSE mode; the relative LED flashes.

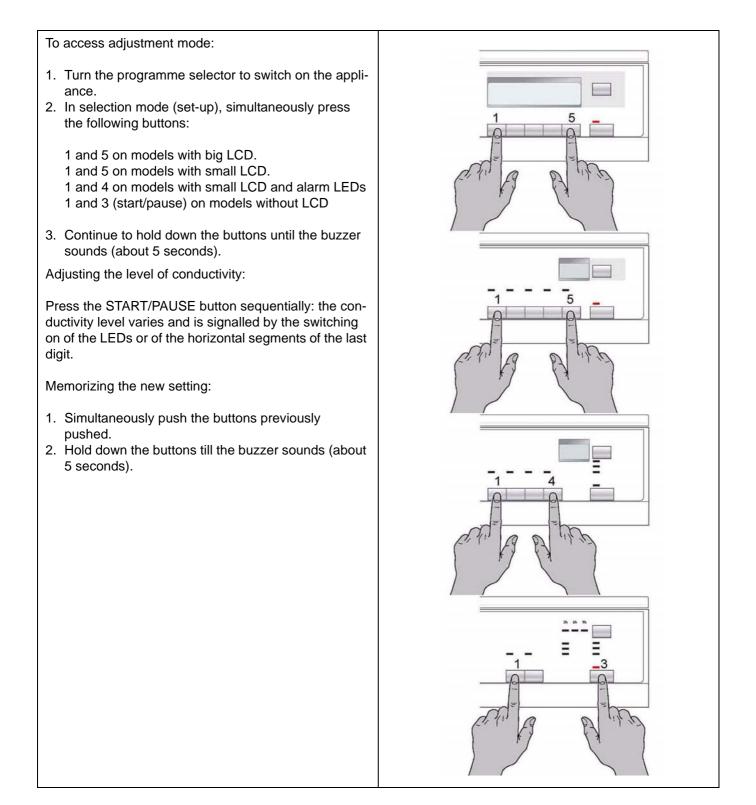
Pressing the START/PAUSE button, the drying cycle starts from the point at which it was interrupted.

## 3.11 Adjusting the level of conductivity

The "conductivity" of the water used to wash the fabrics varies from zone to zone: the conductimetric sensor is calibrated to a standard value; any major variations in the level of conductivity may affect the final drying result (i.e. the washing may be too dry or too humid):

These variations can be noticed above all in "slightly humid" or "iron ready" cycles; the "cupboard dry" cycles are not affected by the variations of the conductivity.

### 3.11.1 Procedure



## 3.11.2 Displaying the conductivity setting

Display LED	Conductivity level	Indicative value ( µS/cm )
START PAUSE	LOW	< 300
START PAUSE	MEDIUM	300 - 600
	HIGH	> 600

Normally, the appliance is factory-set to the highest level; however, certain models may be configured differently.

Your local water supply company can give you information concerning the conductivity of the water in your area.

#### 3.12 LEDs

L1 or

₽

Heat exchanger cleaning:

Lights after 80 drying cycles

To reset the cycle counter (for this function), open the door with appliance on, extract the heat exchanger, clean it and then close the door.



Filter cleaning:

Lights when the dryer has completed the cycle to remind the user to clean the fluff filter



L2 or

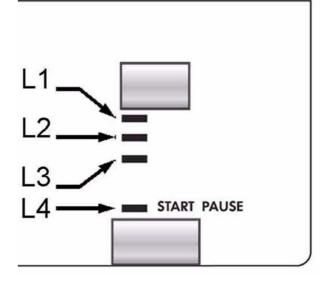


Canister full:

Lights during the drying cycle if the electronic circuit detects the closure of the floating microswitch, or at the end of the cycle to remind the user to empty the canister.

L4 START/PAUSE:

Lights with a green flashing light when the cycle is in pause; lights with a fixed green light when the cycle is performing. If there is an alarm, three beeps will be emitted and they will be repeated after some seconds and the LED will flash with a red light.



## 4 Description of operation of the appliance

When the selector is turned from OFF position to a drying programme, the icons relative to the drying phases light up and the START/PAUSE LED flashes with green light.

During this phase the various options can be entered, and the corresponding LEDs will light.

The lower right display shows the maximum time of drying cycle. If an option that is incompatible with the selected cycle is entered, the Buzzer sounds, the Display shows Err. The LEDs instead flash

Selecting one or more options the Display shows an increase or decrease of the time. If the position of the selector is changed after choosing the options, but before pressing START/PAUSE button, the options will be cancelled.

#### 4.1 Operation of a cycle

A drying cycle starts after a programme has been selected using the selector, one option (if necessary) has been selected and the START/PAUSE button has been pressed.

The LED corresponding to the START/PAUSE button remains lit with green light and, at the same time, the LED corresponding to the phase currently being performed lights and the display shows the maximum drying time.

The drying cycle consists of the following phases:

DRYING

If the cycle is automatic, its duration will be the time necessary to remove the humidity until the desired degree of final humidity is reached (maximum cycle time 180 minutes at full power and 240 minutes at half power).

If the cycle is timer-controlled, the duration will be the time selected by the user.

COOLING

For timer-controlled cycles, the maximum duration of the cooling phase is 10 minutes; for automatic cycles the duration depends on the temperature inside the drum.

ANTI-CREASE

The duration of the anti-crease cycle is 30 minutes.

No modifications to the programmes can be entered after the drying programme has started

If the position of the selector is changed, the green LED of the START / PAUSE button starts flashing, the buzzer sounds to warn the user that an incorrect operation has been attempted and the display shows Err.

If any button is pressed, the green LED of the START / PAUSE button starts flashing, the buzzer sounds to warn the user that an incorrect operation has been attempted and the display shows Err.

The options can be selected only after selecting a drying programme at the beginning of the cycle, or during a cycle after pressing the START/PAUSE button.

To cancel a drying cycle, it is necessary to turn the programme selector to OFF.

#### 4.2 Operation in PAUSE mode

If START/PAUSE is pressed while a drying cycle is being performed, the dryer interrupts the current cycle, the green LED of the START / PAUSE button flashes and the display shows time to end.

If the selector is turned, the buzzer warns the user of the error.

In this situation, only certain options can be modified, see tab. of Options.

If the button relative to an option that cannot be selected is pressed, the buzzer sounds to warn the user of the error and the display shows Err. When START/PAUSE is pressed again, the drying cycle resumes from the point at which it was interrupted.

### 4.3 Operation in DELAYED START mode

After selecting a drying cycle, press this button to enter the delayed start option. Every time the button is pressed the delay time increases.

To cancel this option move the selector of one position or press the button till the time is cancelled. The start of the cycle is always determined by pressing the START/PAUSE button.

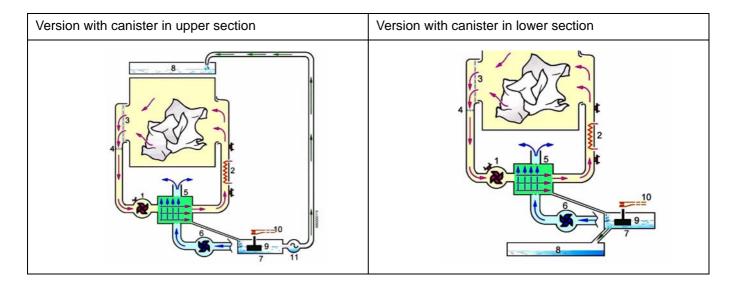
#### 4.4 Power failure

The table below shows how the dryer behaves in the event of a power failure during a drying cycle.

Before the power failure	After power is restored
Set-up	Set-up
Drying cycle	Pause
Cycle paused	Pause
Anti-crease phase	End of cycle
Delayed-start cycle	Delayed start cycle paused
Delayed start cycle paused	Delayed start cycle paused
End of cycle	End of cycle
"Canister full" alarm	"Canister full" alarm

## **5 CONSTRUCTIONAL FEATURES**

## 5.1 Drying circuit



There are two air circuits inside the dryer:

- the first is a warm-air circuit, which is sealed within the appliance
- the second is an open cold-air circuit, which circulates air from the ambient through certain sections of the appliance

In the sealed warm-air circuit, the air circulates inside the appliance:

The fan (1), ducts the air through a heat exchanger (5), and then to the heater unit (2). The heater unit heats the air, which is then ducted into the drum through the perforations in the rear flange of the drum. The warm, dry air passes through the wash load, which is agitated by the rotation of the drum, and removes the humidity from the fabrics; the air, which is now warm and humid, passes then through the front aperture of the drum via the fluff filter (3) and the lower filter (4), then the air is ducted by the fan (1) to the heat exchanger (5), where the humidity is condensed. The air coming from the heat exchanger is now dry and the cycle continues as described above.

The cold-air circuit (the air circulates in one side of the appliance) is not sealed:

the fan (6) draws in air through an air intake on the rear of the appliance, and ducts the air to the heat exchanger (5), cooling it, after which the air is expelled on the opposite side of the heat exchanger dissipating inside the appliance and exiting from the venting grille in the plinth.

The warm and cold air circuits cross inside the heat exchanger (5), which results in a thermal exchange which condenses the humidity contained in the warm air.

The condensation water, which forms in the heat exchanger, is collected in a sump (7) which contains a float (9):

- In versions with the canister in the upper section, a pump (11) ducts the water from the sump (7) to the canister (8). When the canister is full, any overflow is collected in the canister support and returned through a tube (not shown in the figure) into the sump (7). This causes the float (9) to rise, thus actioning the microswitch (10).
- In versions with the canister in the lower section, the water flows by gravity from the sump (7) into the canister (8); when the canister is full, the water level in the sump (7) rises. This causes the float (9) to rise, thus actioning the microswitch (10).

The electronic control system detects the closure of the microswitch, cuts off the power to the appliance and switches on a LED warning the user that the canister is full.

The tank capacity is about 4 lt., which is sufficient for one drying cycle.

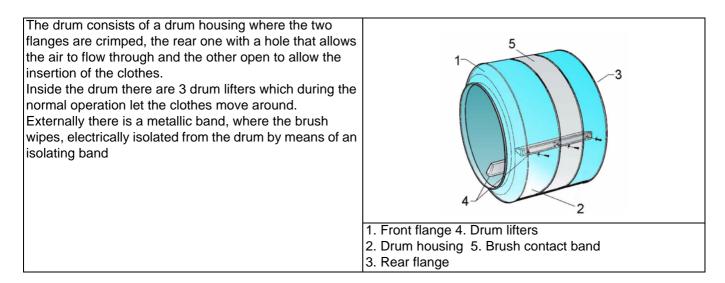
### 5.2 Constructive parts

Upper tank version	Lower tank version	
<ol> <li>Work top</li> <li>Control panel support</li> <li>Control panel</li> <li>Fluff filter</li> <li>Fluff filter support</li> <li>Door seal</li> <li>Door internal frame</li> <li>Door external frame</li> <li>Rear panel cover protection</li> <li>Rear panel cover</li> <li>Rear panel</li> <li>Cross-member</li> <li>Side panels</li> <li>Upper tank</li> <li>Tank support</li> <li>Duct</li> <li>Front panel</li> <li>Pheat exchanger</li> <li>Panel</li> <li>Pinth</li> <li>Front fluff filter</li> </ol>	<ol> <li>Work top</li> <li>Control panel support</li> <li>Control panel</li> <li>Fluff filter</li> <li>Fluff filter support</li> <li>Door seal</li> <li>Door internal frame</li> <li>Door external frame</li> <li>Rear panel cover protection</li> <li>Rear panel cover</li> <li>Rear panel</li> <li>Cross-member</li> <li>Side panel</li> <li>Duct</li> <li>Front panel</li> <li>Lower fluff filter</li> <li>Base</li> <li>Heat exchanger</li> <li>Lower canister</li> <li>Panel</li> <li>Panel</li> <li>Panel</li> </ol>	

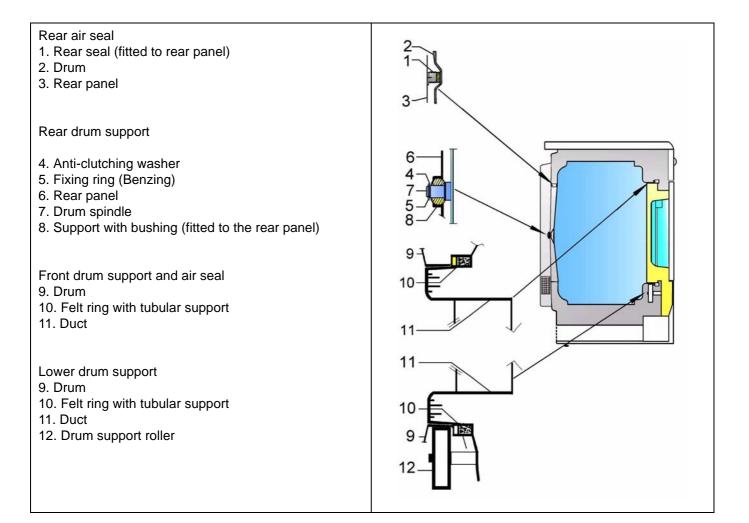
The front panel and the side panels are in enamelled sheet metal, while the rear panel is in zinc-plated sheet metal; these parts are fitted with self-tapping screws to the base.

The shaped carboran base houses the main components.

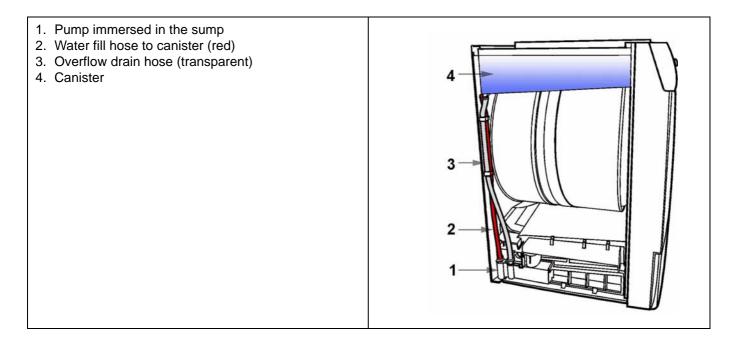
## 5.3 Drum



#### 5.4 Air seals and drum shaft supports

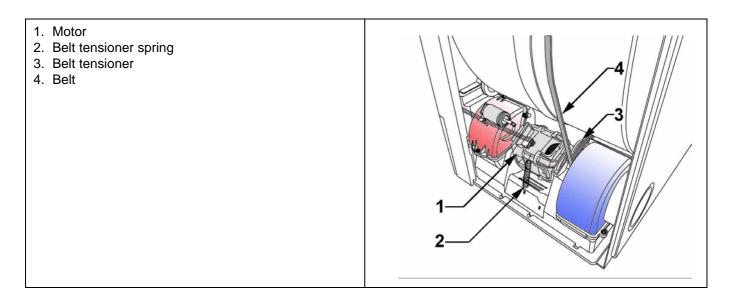


### 5.5 Hydraulic circuit (versions with upper canister)



The condensation water is ducted from the sump (1) to the tank (4) by the pump immersed in the sump via the hose (2). When the canister is full the overflow is collected in the canister support and ducted to the sump through the hose (3).

#### 5.6 Drum rotation



The drum is rotated by a belt (4), which is driven by the pulley of the drum motor (1) fitted to the base; on the bearing shield there is a belt tensioner (3), which has the function of increasing the winding angle of the belt to the drum and works in conjunction with the belt tensioner spring (2).

Bidirectional operation of the drum rotation is determined by the electronic board which inverts the motor power direction for brief periods. Reversal of the direction of rotation allows the clothes to unroll. During these short periods, the heater unit is switched off.

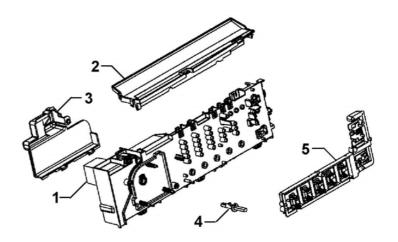
The heat exchanger features a safety device which ensures that, if the panel is opened to check the heat exchanger, a microswitch disconnects the dryer from the power supply.

## 6 Electrical components

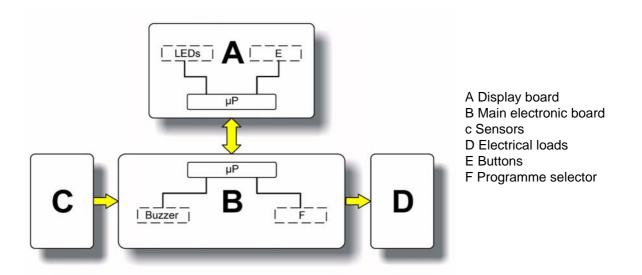
#### 6.1 Electronic control

The electronic control consists of a main electronic board fitted into a plastic container, fixed behind the control support. On models with LCD also the display board is mounted on this container.

- 1. Main PCB assembly
- 2. Cover for connectors
- 3. Cover for selector
- 4. Programme selector shaft
- 5. Button springing



#### 6.1.1 Functions of the main PCB

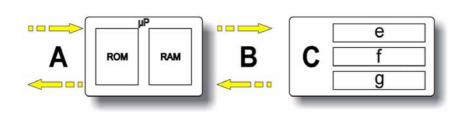


- The electronic board receives the controls relative to the drying cycle setting through the control/display board.
- The electronic board powers the main components: motor, pump (for dryers with canister in the upper section), heater and door interlock.
- The board also controls the door interlock, the temperature of the air inside the dryer (using an NTC sensor), the level of humidity of the washing (using a conductimetric sensor) and the level of condensation water in the canister.

- The buzzer is incorporated in the main board.

#### 6.1.2 Memory of the electronic control: general structure

The system features an EEPROM, positioned externally to the microprocessor, which memorizes the configuration data, the description of the cycle, the status of the appliance in case of a power failure, and the alarms.



A External asynchronous serial port

B Internal synchronous serial port C EPROM external to the mP e Power fail and machine status f Configuration of the board g Description of the cycle

#### ROM

This area of the memory contains the "firmware" code including the functionalities of the appliance

- Control of electrical loads (motor, pump, heater).
- Control of the sensors (NTC, conductimetric sensor, door switch status).
- Control of the user interface.
- Control of the serial port.
- Control of power failures and alarms.
- Alarms.

In standard-production appliances, this area is a Read-Only Memory, and thus cannot be modified.

#### RAM

This memory contains the variables, i.e. all the dynamic information used during execution of the programme:

- Machine status.
- Cycle selected.
- Alarms.

The contents of this memory are cancelled each time the appliance is disconnected (by switching off or in the event of a power failure).

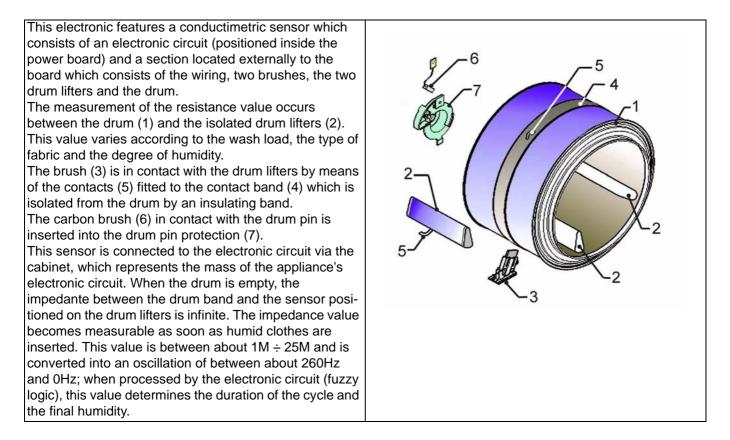
The contents can be read using a computer connected via a DAAS interface.

#### EPROM

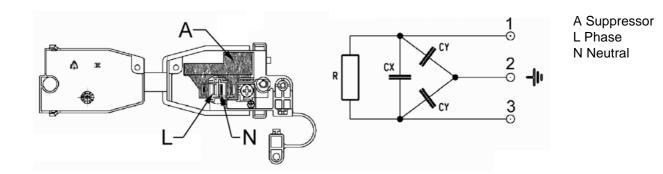
The EEPROM contains data of various types:

- Power failure and machine status, i.e. the information necessary to resume operation of the appliance after a power failure.
- Configuration of the drying cycle: this file describes the various steps in the drying cycle for each family of appliances (vented, condenser etc.)
- Machine configuration: the data contained in this area of memory define the configuration of the individual appliance, and are interpreted by the functional software. These files define the following:
- Programmes.
- Number of buttons and their functions.
- Operation of the LEDs.
- Operation of the buzzer.
- Operational limits (voltage/frequency)
- Identification of the appliance (PNC + ELC + serial number)
- Heater unit power.
- Preferential direction of motor rotation.

## 6.2 Conductimetric sensor



#### 6.3 Terminal block with incorporated suppressor



The suppressor, which is incorporated in the terminal block, prevents radio disturbance generated by the dryer from entering the power lines.

This device functions correctly only if the appliance is grounded.

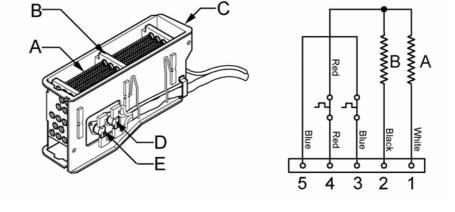
Checking for efficiency:

Use a tester to measure the resistance across the following terminals:

- 1 2 = ∞
- 2 3 = ∞
- 1 2 = ~2M€Ω

#### 6.4 Heater unit

- A Filament heating element **B** Ceramic supports
- C Sheet metal casing
- D TH2 Safety thermostat E TH1 Safety thermostat



The heater unit consists of two wire heating elements with different powers. The two heating elements are fitted to ceramic supports, and the entire assembly is housed in a sheet metal casing.

Two safety thermostats (normally closed) are positioned to one side of the casing:

- TH1 automatic reset (4) intervenes at a temperature of 92±3°C, and disconnects both heating elements
- Thermostat TH2 (5) intervenes at 160°C; when the contact opens, it remains open, permanently discon-• necting all the electrical components in the appliance.

The heater unit is powered via two relays fitted to the board.

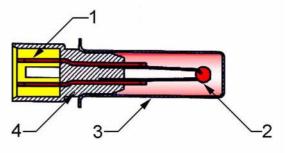
HEATER UNIT VERSIONS					
Туре	Total power (-2 + 8% ) W Rated voltage V	2400 240	2400 230	2000 240	2200 240
Branch A	Power(-2 + 8% ) W Resistance $\Omega$	1400 36	1400 33	1400 36	1400 36
Branch B	Power(-2 + 8% ) W Resistance $\Omega$	1000 51	600 78	600 85	800 72

Warning: In the event of a thermostat failure, the entire heater unit must be replaced!

#### 6.5 NTC Sensor

The NTC sensor is fitted to the hot air fan duct. This sensor consists of a resistor contained in a metallic capsule. Its resistance decreases as the temperature increases. The electronic circuit reads the resistance (which varies with the temperature inside the dryer); when this resistance falls below a certain value, the heater unit is switched off. As the air cools, the resistance increases; when it reaches a given value, the electronic circuit re-connects the heater unit to the power supply. This occurs each time the temperature inside the dryer exceeds a given value, which varies according to the drying cycle that has been selected.

- 1. Terminals
- 2. NTC Resistor
- 3. Metallic capsule
- 4. Plastic casing

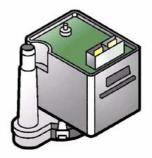


TEMPERATURE	RESISTANCE ( $\Omega$ )		
( °C )	Rated value	Maximum value	Minimum value
20 60 80	6050 1250 640	6335 1278 620	5765 1222 660

#### 6.6 Canister filling pump (models with canister in upper section)

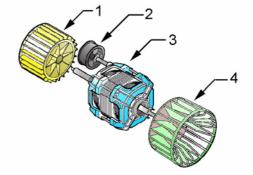
The pump is actioned by a synchronous motor with a power of about 17W. The function of the motor is to pump the condensation water from the sump to the canister.

The pump, too, is powered by a triac. The resistance of the stator winding is approximately 750 W.

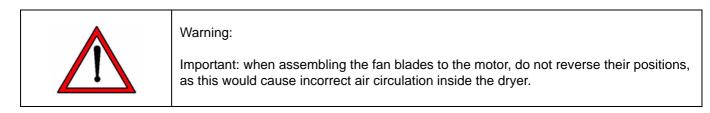


### 6.7 Motor

- 1. Fan (inclined blades for cold air circulation)
- 2. Belt tensioner
- 3. Motor
- 4. Fan (straight blades for warm air circulation)



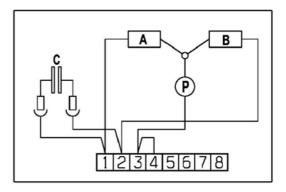
The motor group consists of a belt tensioner (2), two fan blades (1 and 4) for circulating cold and warm air respectively, fitted to the motor shaft using bolts, and a single-phase asynchronous motor (3) featuring a temperometric protector.



The efficiency of the motor can be checked by measuring the resistance across the windings:

Winding A ohm 29 ~ (contacts 1-3)

Winding B ohm 29 ~ (contacts 2-3)

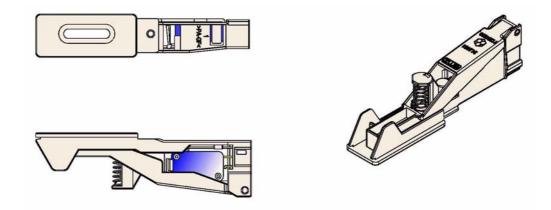


The motor is powered by the electronic board via a relay (which determines the direction of rotation) and a triac.

#### 6.8 Door switch

The door switch allows the electronic board to power the electrical components only if the door is closed, if a programme has been chosen and the ON/OFF button has been pushed.

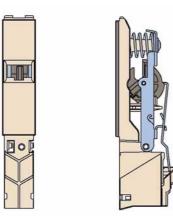
The switch is positioned centrally and above the front opening and it is actioned by a catch placed on the door.

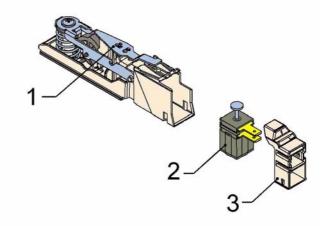


#### 6.9 Door interlock

Depending on the versions, the door interlock can be mechanical with manual door opening or electronic with door opening by pushing a button. In the latter case, the door is opened by an electromagnetic coil which unlocks the door catch by means of a lever.

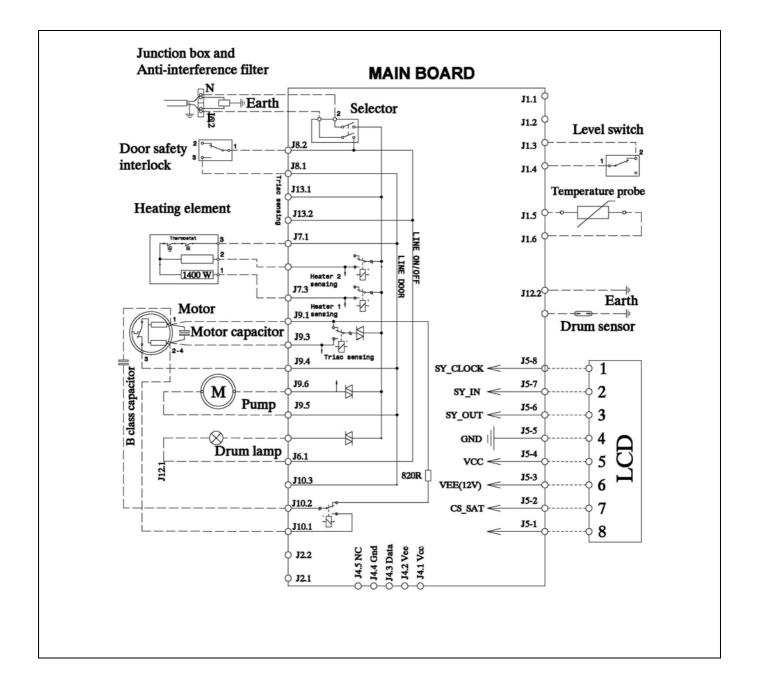
The interlock features a child safety device so that, in case of necessity, the door can be opened by pressing from inside the appliance.





- 1. Catch door lever
- 2. Coil (in versions with automatic opening)
- 3. Coil protection

## 7 Electrical circuit

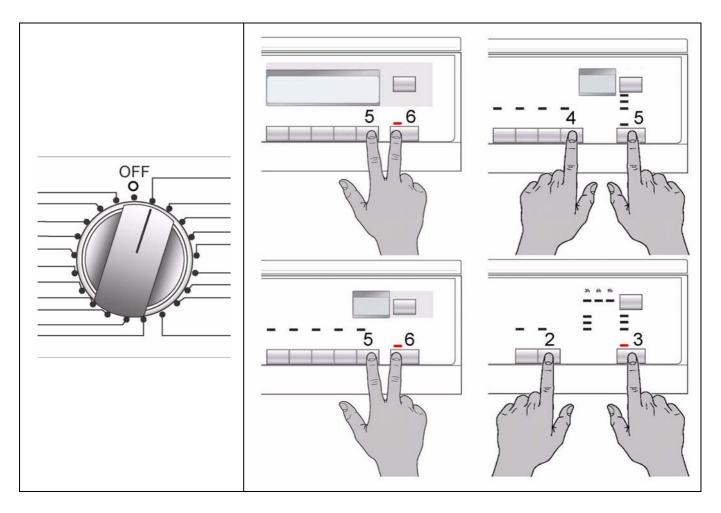


## 8 DIAGNOSTICS SYSTEM

In diagnostics mode, it is possible to check the operation of the appliance and to read the alarm codes

#### 8.1 Access to diagnostics

- 1. The appliance must be switched OFF.
- 2. Switch the appliance ON by turning the programme selector knob one position clockwise.
- 3. Wait till the LEDs switch on and the "beep" of the buzzer, then push the buttons simultaneously depending on the model.
  - ATTENTION THIS OPERATION MUST BE CARRIED OUT WITHIN 5 SECONDS
- 4. Continue to hold down the buttons until the LEDs begin to flash and the buzzer sounds.



#### ATTENTION

- The alarms remain active during component diagnostics testing. If an alarm should be displayed, turn the programme selector to the first position to exit the alarm situation, then continue the testing cycle (if the alarm is not repeated).
- In order to check for correct operation of the floating switch and the pumpthe sump is filled with approximately 0.7 litres of water.
- For correct control of the conductimetric sensor in a condition of short-circuit (position 8), remove the cover and create a short-circuit between the two half-shells of the drum or between the front shell and ground. After entering this phase, the time available for creation of the short circuit is just one second; therefore, prepare the short circuit before turning the programme selector knob to position seven (it is advisable to do this in a position in which the drum is stationary, then pass quickly to this position). If the short circuit is not performed correctly, the electronic board will display alarm E32 (sensor frequency too low). To exit the alarm condition, turn the programme selector knob to the first position.
- Open the condenser access panel and check that the switch operates correctly: the buzzer will emit four "beeps" (in different tonalities), repeated every 7 seconds.

#### 8.2 Exiting the diagnostics system

To exit the diagnostics system, turn the programme selector knob to zero, then switch the appliance ON and OFF again.

## 8.3 Selector positions for diagnostics on conductimetric appliances



When the various functions in the diagnostic mode are entered, in the LCD models, in the right lower part of the display some writings appear (ex. C7 - C5 etc.). These represent the codification of the selector and are not relevant for the test being executed.

Position Selector	Active components	Operating conditions	Function checked
1	All the LEDs and digits light in sequence. When a button is pressed, the corre- sponding LED lights and the buzzer sounds.	Always active.	Operation of the user interface.
2	Condensation canister level sensor. Canister fill pump.	Door closed. Sump full with about 0,7 litre water.	Operation of the floating switch and condensa- tion canister fill pump.
3	Motor triac and relay. Canister fill pump always powered.	Door closed. Maximum time 10 minutes Pump 30 seconds.	Control of counter-clock- wise drum rotation.
4	Triac motor in stepping operation.	Door closed max time 10 minutes.	Control of clockwise drum rotation (low speed for visual inspection of drum shell assembly).
5	Higher-power heating element. Fan motor Triac.	Door closed. Maximum time 10 minutes.	Control of correct direc- tion of drum motor and fan motor.
6	Full-power heating element. Clockwise drum rotation motor. Full-power fan motor.	Door closed. Maximum time 10 minutes.	Heating unit (full-power).
7	Conductimetric sensor with drum short- circuited. The check lasts 4 sec., 1 sec. to create the short circuit. The phase/warn- ing LEDs flash during this period: if the result is correct at the end, the LEDs switch off; if not, the LEDs flash and alarm E32 is displayed.	Door closed. Short circuit between the 2 drum shells.	Control of the conducti- metric sensor when short-circuited.
8	Conductimetric sensor. This check has a duration of 4 sec. The phase/warning LEDs flash during this period: if the result is correct at the end, the LEDs remain lit; if not, the LEDs flash continuously.	Door closed.	Control of the conducti- metric sensor when the circuit is open.
9	Floating switch. Canister fill pump: with switch closed.	Door closed. Maximum time 30 sec.	Operation of floating switch (sump empty).

	Reading/cancellation of the last alarm code. Turn the knob till position 10, paying attention not to stop to position 7, other- wise error 32 may occur.	10
--	--	----

## 9 ALARMS

#### 9.1 Displaying the alarms to the user

Operation of the alarms is configurable according to the model. Some or all of the alarms may be displayed to the user.

Normally, all alarms except E61, E97, EH2 are displayed to the user.

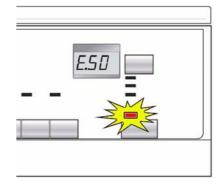
When an alarm condition occurs, the drying cycle may be interrupted or paused; in some cases, for the sake of safety, a forced cooling cycle is performed. In this case, the electronic board, if possible, disconnects the power relay from the heater unit and powers the motor of the drum cooling fan. The cycle remains active until the user switches off the appliance.

#### 9.1.1 Alarm display during normal operation

On models with LCD the family of the current alarm is displayed to the user. In the event of, for example, alarm E53 (problems with the motor triac), the code will be displayed as follows

- First digit: letter "E" (error)
- Second-third digit: the number "5 0", the alarm family E53)

The alarm code is displayed by a repeated sequence of flashing of the START LED of red colour (0.4 seconds on, 0.4 seconds off, with a pause of 2.5 seconds between sequences)



The five flashes indicate the first of the two numbers in the alarm code E53 (the alarms relative to the same function are grouped into families).

#### 9.2 Reading the alarm codes

To read the last alarm code memorized in the EEPROM of the electronic board, proceed as follows:

- Access diagnostic mode (see paragraph )
- Turn the programme selector clockwise to the tenth position in conductimetric models and to the eight position in temperometric models, paying attention not to stop in the other positions, because error 32 may occur)

#### 9.2.1 Displaying the alarm on CD3 models

- First digit: Letter E
- Second digit: The alarm family
- Third digit: Tha alarm code

#### 9.2.2 Displaying the alarm on all models

The alarm code is displayed by a repeated sequence of flashing of the START LED (0.4 seconds on, 0.4 seconds off, with a pause of 2.5 seconds between sequences). The buzzer emits a series of "beeps" in synchronization with the flashing of the LEDs

LED START with RED light: indicates the first number of the alarm code (family)

LED START with GREEN light: indicates the second number of the alarm code (number within the family category).

Displaying any other alarms

Pushing the START button, alla alarms in the appliance are displayed in sequence.

Configuration errors (E93) are indicated by all the LEDs flashing and it is not possible to access the diagnostic system.

#### 9.3 Cancelling the last alarm memorized

It is good practise to cancel the alarm code from memory:

- After reading the alarm, to check whether it is repeated during the diagnostics cycle.
- After effecting repairs to the appliance, to check whether it is repeated during testing.
- 1. Activate the diagnostic mode.
- 2. Turn the programme selector knob to the tenth position on condensation models and to the eighth position on vented models.
- 3. Push the start/pause button and its nearest left button simultaneously.
- 4. Hold the buttons down for about 5 seconds.
- 5. Once the alarm has been cancelled, E00 is displayed.

#### 9.4 Notes concerning certain alarm codes

- Configuration alarm E93: When configuration alarms are displayed (when the appliance is switched on), the appliance is inoperative and all the LEDs light: it is not possible to access diagnostics mode and the only possible operation is that of switching off the appliance (selector knob on position "0").
- Alarms EH1-EH2-EH3: In the event of problems with the power supply, the appliance remains in alarm mode until the voltage and frequency are restored to within the normal limits or the appliance is switched off (selector knob on position "0"). Alarm family "B" is displayed and it is not possible to access diagnostics mode nor to use the "rapid alarm display" function. The complete alarm can be read only when the abnormal condition has terminated.

### 9.5 Table of alarms

Alarm	Description	Possible fault	Action/machine status	Reset command
E00	No alarm.			
E21	Canister fill pump triac faulty.	Wiring faulty. Electronic board faulty.	Cycle interrupted.	OFF
E22	Triac "sensing" circuit for the can- ister fill pump faulty	Electronic board faulty.	Cycle interrupted.	OFF
E31	Conductimetric sensor signal fre- quency too high.	Electronic board faulty.	Alarm activated only during diagnostics.	
E32	Conductimetric sensor signal fre- quency too low.	Wiring faulty. Brushes worn/faulty. Electronic board faulty.	Cycle interrupted.	OFF
E33	It is displayed in the last alarm, if position 8 is NOT OK.	Wiring faulty. Brushes worn/fault. Electronic board faulty.	Alarm activated only during diagnostics.	
E45	Door closure sen- sor.	Door interlock faulty. Wiring faulty. Electronic board faulty.	Cycle interrupted.	OFF
E51	Motor power triac short-circuited.	Motor faulty. Wiring faulty. Electronic board faulty.	Cycle interrupted.	OFF
E52	Intervention of motor overheating safety cut-out.	Motor faulty. Intervention of motor overheating cut- out. Wiring faulty. Electronic board faulty.	Power to the heater unit and reversal of the direction of rotation are interrupted. If the problem does not re- occur, the alarm is memo- rized and the cycle contin- ues; if the fault persists after several attempts to supply power (about 35 min.), alarm E51 is generated.	OFF
E53	Motor triac "sens- ing" circuit faulty.	Electronic board faulty.	Cycle interrupted.	OFF
E54	Motor inopera- tional.	Excessive wash load. Voltage too low. Motor/transmission system inopera- tive.	Cycle paused after several attempts at powering the motor.	Start
E61	Insufficient heat- ing (maximum time exceeded)	Heater unit faulty. Wiring faulty. NTC sensor faultyd/out of position. Electronic board faulty.	Cycle paused.	Start
E62	Power relay to heater unit faulty	Heater unit faulty. Wiring faulty. Electronic board faulty.	Forced cooling. cycle	OFF

E63	Intervention of auto-reset ther- mostat on the heater unit.	Thermostat faulty. Heater unit faulty. Wiring faulty. Electronic board faulty.	Disconnects the power sup- ply to the heater unit. If the problem does not re- occur, the alarm is memo- rized and the cycle contin- ues. If, after several attempts to restore power, the fault persists, alarm E62 is generated.	OFF
E64	Heater thermo- stat.	Thermostat faulty. Wiring faulty. Electronic board faulty.		
E65	Fan motor triac faulty.	Fan motor wiring not connected. Motor faulty. Triac interrupted.		
E66	Fan motor ther- mal protection.	Fan motor wiring not connected. Motor faulty. Triac interrupted.		
E67	Triac control faulty.	Fan motor wiring not connected. Electronic board faulty.		
E71	NTC1 sensor faulty.	NTC1 sensor faulty. Wiring faulty. Electronic board faulty.	Forced cooling cycle.	OFF
E72	NTC2 sensor faulty.	NTC2 sensor faulty. Wiring faulty. Electronic board faulty.		OFF
E82	Selector in OFF position faulty.	Board wiring. Electronic board faulty.		
E83	Selector posi- tions wrong	Board wiring Electronic board faulty		
E93	Error in the con- figuration of the appliance.	EEPROM configuration incorrect. Electronic board faulty.	Cycle interrupted.	OFF
E94	Error in the con- figuration of the drying cycle.	EEPROM configuration incorrect. Electronic board faulty.	Cycle interrupted.	OFF
E97	Incongruence between selector and cycles.	Configuration error.	Cycle interrupted.	OFF
EA3	Board selector faulty.	Electronic board faulty.	Cycle interrupted.	OFF
EA4	Selector protocol wrong.	Electronic board faulty.	Cycle interrupted.	OFF
EH1	Power frequency to appliance out of limits.	Problems with the power supply. Electronic board faulty.	Cycle interrupted. If a stable power supply is restored before the time-out has elapsed, the cycle resumes.	OFF
EH2	Power voltage too high.	Problems with the power supply. Electronic board faulty.	Cycle interrupted.	OFF
EH3	Power voltage too low.	Problems with the power supply. Electronic board faulty.	Cycle interrupted. If a stable power supply is restored before the time-out has elapsed, the cycle resumes.	OFF

# 10 NO ACCESS TO DIAGNOSTIC PROGRAMME

# 10.1 No LEDs on the display board light.

Are the power cable and the connec- tion working?	NO	Replace/fix the power cable and per- form the diagnostic cycle			
YES					
Is the suppressor filter, integrated in the junction box, working correctly?	NO	Replace the junction box with suppres- sor filter and perform the diagnostic cycle			
YES					
Detach the connector from the main junction box and the connector from the electronic board. Measure the con- tinuity of the wiring between the termi- nals and L. Is the circuit closed?	NO	Replace/fix the power cable and per- form the diagnostic programme			
YES					
Measure the continuity of the wiring between terminals and N. NO Is the circuit closed	Detach the connector from the heating unit and measure the closure of the thermostat between the terminals 3 - 5 of the heating unit, is the circuit closed?	NO Identify the reason that has caused the interruption of the ventilation, letting the thermostat to switch on, and eliminate it. Replace the heating unit and start the diagnostic cycle			
	YES				
YES	Replace/fix the wiring and perform the diagnostic cycle				
Does the programme selector knob function mechanically ?	NO	Replace / fix knob / pin			
VES					

YES

Does the wiring that connects the main board to the display board function correctly? (insert and remove the connector)

YES

Appliance is OK

Replace the main board and perform the diagnostic cycle. Does the appliance function correctly?

#### 10.2 Some of the LEDs on the display board light

Are the power cable and the connection working ?

YES

Does the suppressor filter, integrated in the main junction box, function correctly?

YES

Appliance is OK

#### ATTENTION

It is not possible to access to the diagnostic system if the main board has not been correctly configured: Configuration errors (E93) are indicated by all the LEDs flashing

Replace/fix power cable and perform the diagnostic cycle

Replace the junction box with suppressor filter and perform the diagnostic cycle

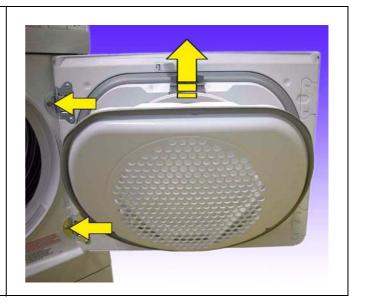
# 11 ACCESSIBILITY TO COMPONENTS

#### 11.1 Door

To remove the door, remove the screws which secure it to the hinge.

Fluff filter

Open the filter support pushing the relative button, lift out and clean it at the end of each cycle

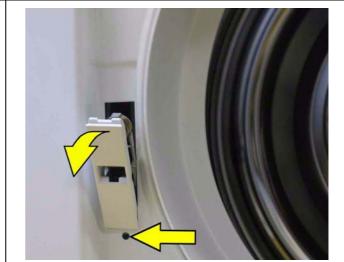


#### 11.2 Lower fluff filter



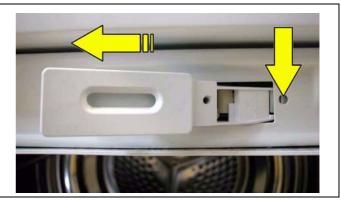
### 11.3 Door interlock

Remove the screw which fits it, lower it slightly spinning it forward.

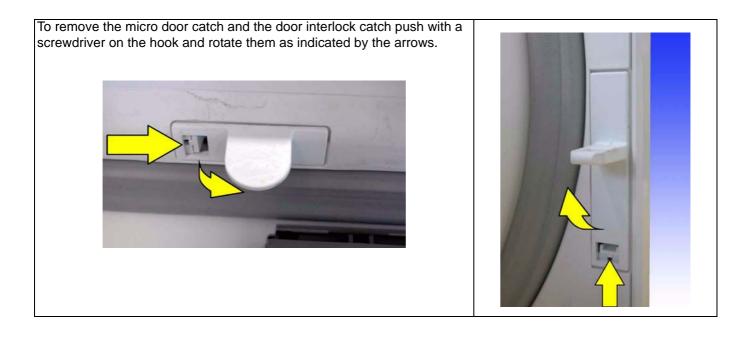


#### 11.4 Microswitch door

Remove the screw extract it slightly and move it towards left till to reach the connector. Detach the connector and fix it with some adesive tape on the front side so as to avoid losing it inside the appliance.



#### 11.5 Door interlock catch and micro door catch



## 11.6 Drum light

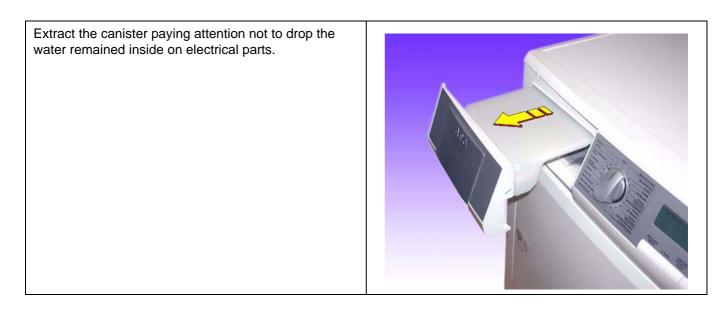
The bulb can be replaced from inside the drum.

Remove the two screws which secure the bulb cover Unscrew the bulb from the bulb-holder.

When replacing the cover, ensure that the sealing ring is correctly positioned in its seat.



#### 11.7 Canister

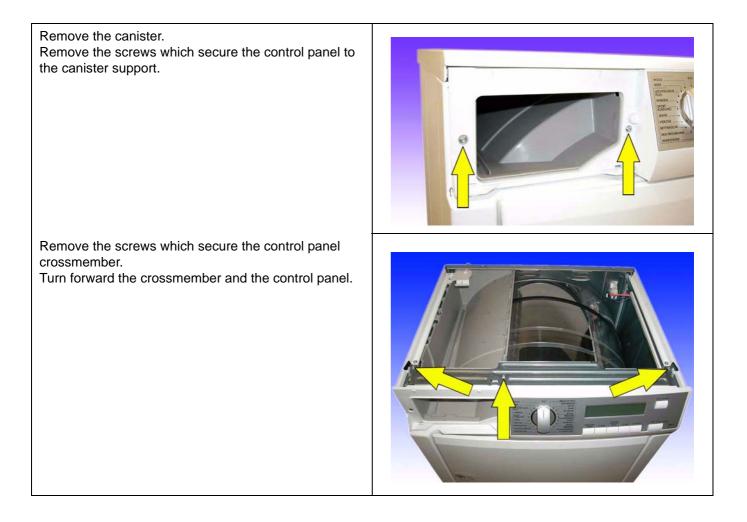


### 11.8 Work top

To remove the work top, first remove the screws which secure the top to the rear edge of the appliance and remove it pushing it towards the rear side.



## 11.9 Control panel support and control panel assembly



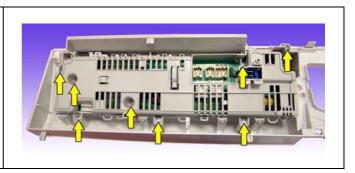
### 11.10 Main electronic board

Removing the electronic board

To remove the electroni board:

Remove the 8 screws which secure the electroni board to the control panel.

Push moderately on the fixing clips and remove the board.

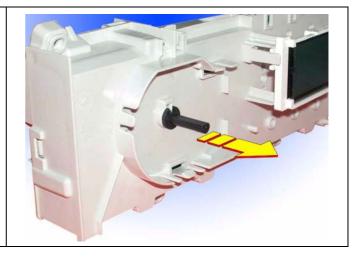


#### Removing the selector pin

After removing the main board it is possible to remove the selector pin positioning to OFF and pulling it forward.

#### ATTENTION

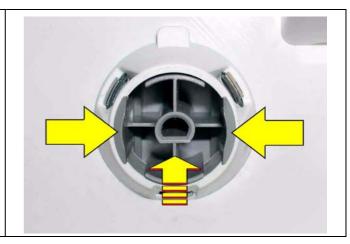
Should the pin not come out, check if it is in OFF position



#### Removing the selector knob

Afer removing the main board it is possible to remove the selector knob.

Push the long side parts toward the centre and simultaneously push the knob externally.

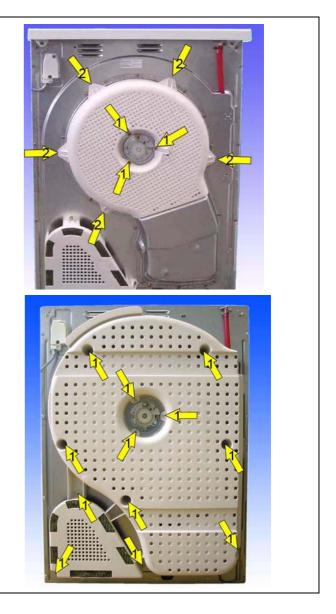


#### Button springing system

The button springing system remains hooked to the main board support by means of the side clips.

### 11.11 Rear panel cover

Remove the screws (1) which secure the plastic rear panel cover (in the centre of the panel) and release the anchor tabs (2) from around the external perimeter using a screwdriver.



Remove all the perimetral screws which secure the rear panel cover and remove it.



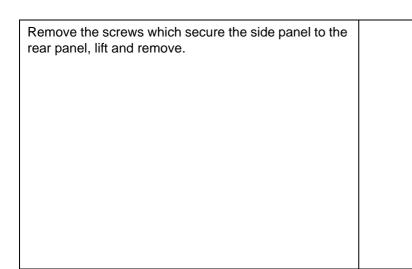
### 11.12 Heater unit

Remove the left side panel (viewing the appliance from the front).

Remove the screw which secures the side panel to the cross-member (after removing the canister).

When replacing the side panel, replace the screws in their original positions, otherwise the continuity of the earth circuit will be broken.



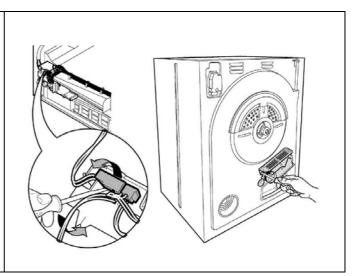


The terminal block for the heater unit is located inside the microswitch support, and secured in position by an anchor tab.

Insert a screwdriver, move the hook and extract the junction box, remove the wire ties that secure the wiring to the base and extract the wiring.

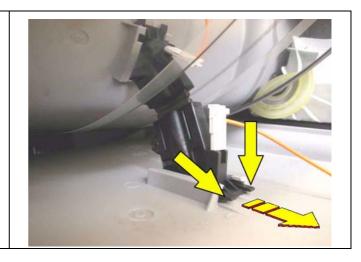
Remove the two screws which secure the heater unit to the rear panel. The right-hand screw of the heater unit also secures a deflector.

Before replacing the heater unit, be sure to re-position the wiring in its original position



### 11.13 Lower brush conductimetric sensor

To access the lower brush of the conductimetric sensor detach the connector (faston). Push downward the two fixing clips and simultaneously extract the brush assembly.

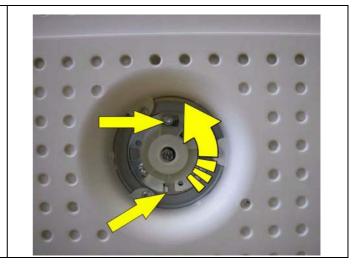


#### 11.14 Rear brush conductimetric sensor

Remove the screw which secures the drum spindle cover.

Rotate the drum spindle cover until it is released from the anchor in the lower section.

The brush is located inside the protective cover.



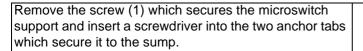
## 11.15 Floating microswitch

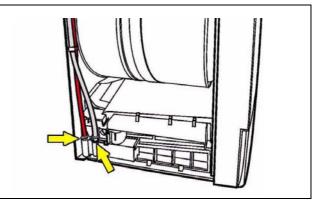
Remove the work top (see above).

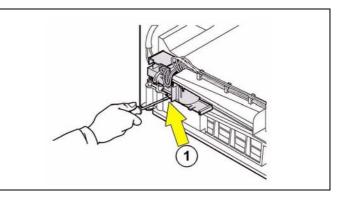
Remove the screws which secure the side panel and remove it (see above).

In the rear section of the base, the sump contains the pump, the floating microswitch and the float.

Remove the two tubes from their couplings (the red tube which fills the canister, and the transparent tube through which water overflow is ducted back to the sump when the canister is full).

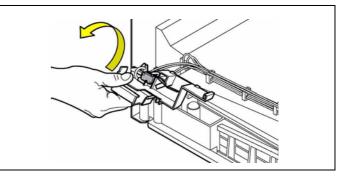




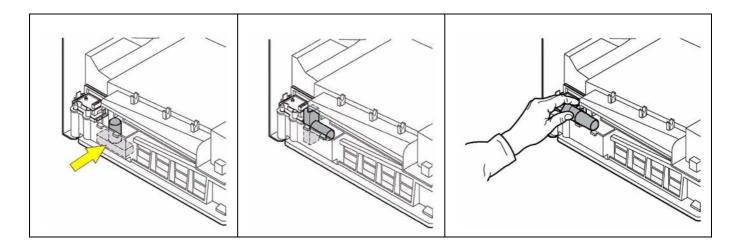


Lift both parts simultaneously and slide the microswitch support outwards.

Turn the support upside-down to access the floating microswitch.



#### 11.16 Float



Inside the pump there is the float.

To remove the float, turn it 90° clockwise as shown in the figure.

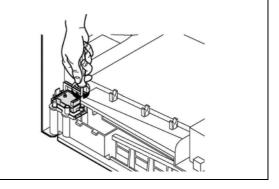
Lift the float, rotate outwards, and remove it.

To replace the float, repeat this procedure in reverse sequence.

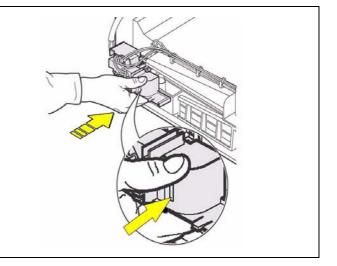
#### 11.17 Pump

The pump, which ducts the water from the sump to the canister in the upper section is located next to the sump containing the float.

To remove the pump from its seat, it is necessary to disconnect the wiring connectors, remove the screw and release the anchor tab (shown by the arrow) which secures the pump to the sump; extract it.



When re-assembling the pump, the float and the canister microswitch, repeat the procedure described above in reverse sequence. When replacing the microswitch support, insert a screwdriver into the gap (shown by the arrow) in order to lift the microswitch lever and place it against the top of the float. If this procedure is not performed, the microswitch lever will remain alongside the float and become bent. In this case, the two components will not function correctly.



### 11.18 Motor capacitor

Remove the work top (see above).

Remove the screws which secure the right-hand side panel to the cross-member and remove the panel.

When replacing the side panel, replace the screws in their original positions, otherwise the continuity of the earth circuit will be broken.

Remove the screws which secure the side panel to the rear panel.

Lift and remove the panel.

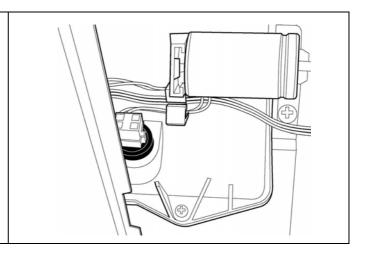




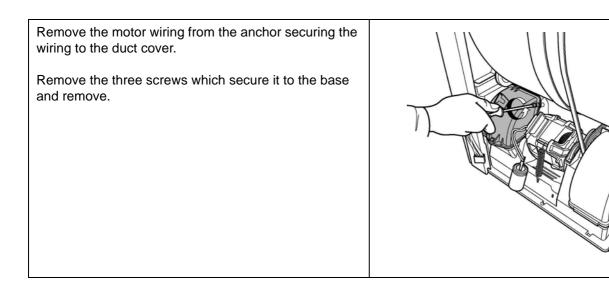
Detach the connectors, release the anchor tab and remove the capacitor.

#### 11.19 NTC sensor

Remove the sensor from the seal and detach the connector.



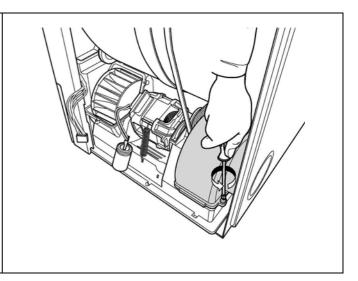
### 11.20 Front air duct cover (hot air circulation)



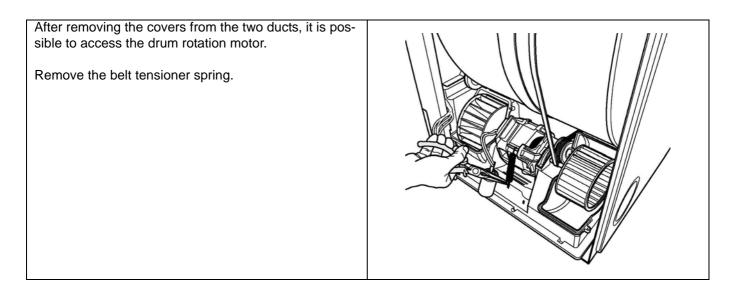
### 11.21 Rear air duct cover (cold air circulation)

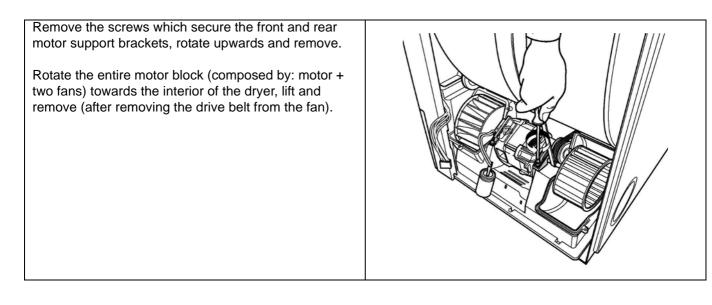
#### Remove the screw.

Detach the duct cover from the three anchor tabs (two upper lateral tabs, one lower tab) which secure it to the base, and remove.



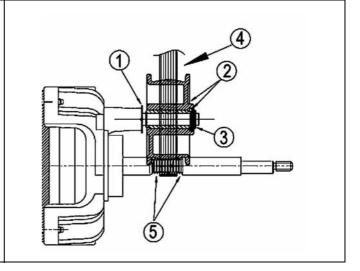
### 11.22 Drum rotation motor





Note for replacing the belt tensioner roller / drive belt

- 1. Spacer.
- 2. Belt tensioner roller with with incorporated spacer.
- 3. Elastic ring.
- 4. Belt in central position.
- 5. Leave two grooves free on each side of the pulley.

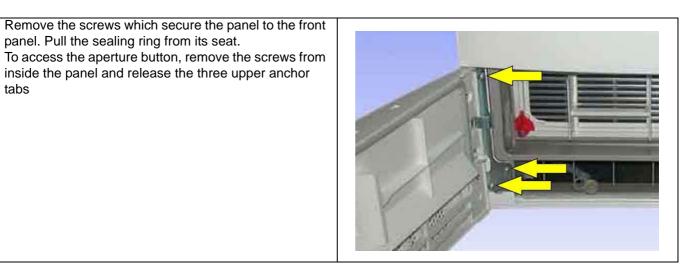


#### 11.23 Capacitor (heat exchanger)



Open the door, turn the two anchor tabs and extract the heat exchanger pulling it externally.

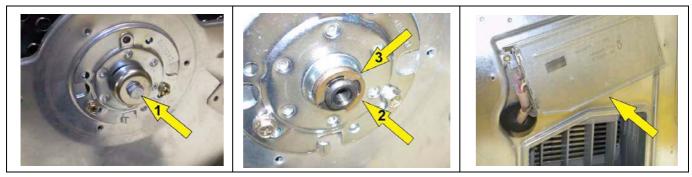
#### 11.24 Front panel



When replacing the panel in its housing, first ensure that the three anchor tabs are correctly positioned in their seats, and only then tighten the screws.

Check that the panel latch, when closed, actions the lever of the microbox, otherwise the dryer will not be powered.

#### 11.25 Rear panel



Remove the work top.

Remove the screw which secures the canister support.

Remove the left- and right-hand side panels.

Remove the rear air protection.

Remove the rear brush.

Remove the screw which secures the bush (1).

Remove the Benzing ring (2) and remove the spacing washer (3).

Disconnect the terminal block from the heater unit.

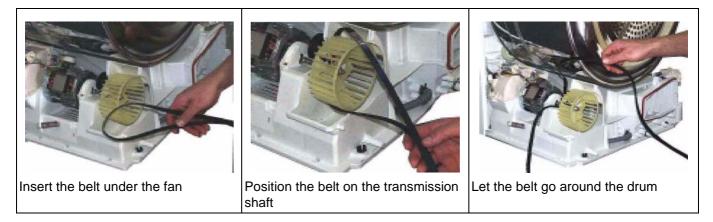
Detach the connectors from the junction box.

Remove the screws which secure the rear panel to the cross-memebers and to the base.

Under the heater unit there is a screw which secures the rear panel to the base.

#### 11.26 Drive belt

Remove the work top. Remove the side panels. Remove the belt tensioner spring Cut the damaged belt Remove the rear panel. Cut the rear scroll cover (it is not necessary to remove the motor). Remount the belt following the phases in figure.



### 11.27 Duct

Remove the work top.

Remove the rear panel.

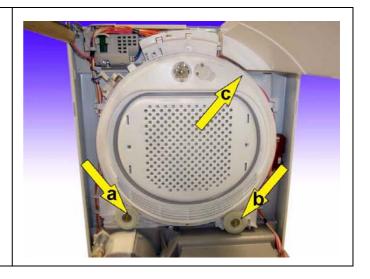
Remove the drum.

Remove the screws which secure the drum to the hinges and to the hinge hole masking plates.

Remove the duct.

#### 11.28 Duct rollers

Remove the work top. Remove the rear panel. Remove the drum. Remove the screws (a) and (b) which secure them to the duct.

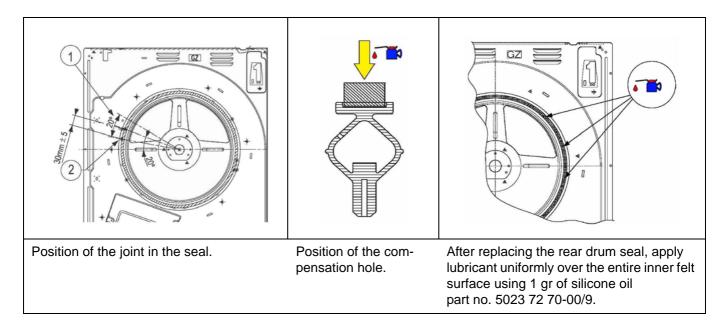


#### 11.29 Front and rear seals

Slide the front seal (C) from its seat.

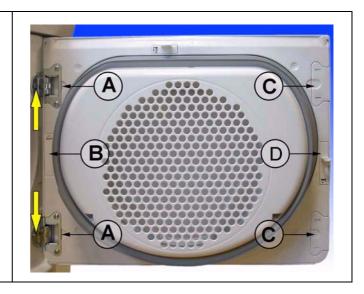
The rear seal can be simply pulled away from the ring fitted to the rear panel.

Notes for replacement of the rear drum seal



## 12 Reversibility of the door

- Open the door
- Remove the door unscrewing the 2 screws which secure the hinges (A) to the appliance.
- Remove the masking plates (B) and (C) pushing them with a subtile screwdriver.
- Remove the door interlock catch (D) pushing it with a screwdriver and reuse it on the opposite side turned by 180° (upside-down).
- Remove the hinges (A) and reuse them on the opposite side turned by 180°
- Remount the masking plates (B) and (C) on the opposite side turned by 180° so as to cover the remaining holes.



- - Remove the door latch (F), push it downwards and remove it turning it down.
  - Push the anchor tab of the cover (G) and simultaneously push it downwards.
  - Position the door (F) on the opposite side of the appliance and fix it with the screw previously removed.
  - Position the cover (F) on the opposite side of the appliance paying attention that the anchor tab enters the hole.
  - Remount the door with the hinges on the opposite side, fix the screws and check the correct operation.

