Electrolux

SERVICE MANUAL

APAC MEA

Ultimate care II

Venting Tumble Dryer

300 Series

service manual

Ultimate care II Tumble Dryer

Series 300 model

Model: EDS854J3WB EDS854N3SB

EDV854J3WB EDV854N3SB

EDV754H3WB

EN

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Contents

1   PURPOSE OF THIS MANUAL

The purpose of this service manual is to provide service provider who is already authority with the repair procedures with information regarding appliances

This document specifies the Diamond Plus UI levels 300 Series (TC3 and TC4) and EDR18Q2x electronic platforms to be used for UltimateCare II (GEM 2) range of venting tumble dryers

The manual deals with the following topics:
o Safety
o Control panel
o Guide to diagnostics
o Technical and functional characteristics
o Access

Document Revisions

Rev.	Date	Description	Author
00	05/2021	Document creation	Vatcharapong S,

● Any work on electrical appliances must only be carried out by qualified personnel.

● Before carrying out work on the appliance, use suitable instruments to check that the power supply system in the house is fully efficient.

● This platform is not fitted with an ON/OFF switch. Before you access internal components, take the plug out of the socket to disconnect the power supply.

● When the servicing is completed, ensure that all the connections have been made properly and that all the appliance's safety conditions are as good as new.

● The connection between the earth terminal and the earthed metallic parts must have a low resistance.

● All the work to be performed inside the appliance requires specific skills and knowledge and may only be carried out by qualified and authorised service engineers.

● Some of the components in the mechanical part could cause injuries, so wear suitable protection and proceed with caution.

3 INTRODUCTION

3.1 APAC Fabric Care Model Denomination (Referance Rev009)

1 Brand	2 Product Category	3 Product Typology	4&5 Load Kg	6 Spin Speed	7 User Interface	8 Spec Level (Motor + Door for FL) (Motor + Lid + Agitator for TL)	9 Aesthetic Design	10 Body Colour	11 Generation
				Empty for Dryer	**Empty for Dryer** 0 = Colour LCD	**Empty for Twin Tub**			
E = Electrolux	W = Washing Machine	F = Front Load	45 = 4.5kg	6 = 1600rpm	0 = Colour LCD	A = Inverter + Full Lens (FL)	E = Emerald	W = White	A = 1st Gen
Z = Zanussi	D = Drying machine	W = Washer&Dryer	50 = 5kg	4 = 1400rpm	1 = TC1	B = Inverter + Chrome Plating Frame(FL)	Q = Quartz	S = Medium Silver	B = 2nd Gen
S = Simpson		T = Top Load	55 = 5.5kg	2 = 1200rpm	2 = TC2	C = Inverter + Bright Silver Painted Frame (FL)	A = Alexis	G = Slate Grey	C = 3rd Gen
W = Westinghouse		V = Vented Dryer (non-Mist)	60 = 6kg	1 = 1100rpm	3 = TC3	D = Inverter + White Frame (FL) / Inverter + White Lid + Agitator (TL)	M = Mini	M = Midnight Blue	D = 4th Gen
A = AEG / Authur Martin		C = Condenser	65 = 6.5kg	0 = 1000rpm	4 = TC4	E = Universal + White Frame (FL)	D = DiamondPlus	B = Black	
C = CHEF		H = Heatpump/Heater (TL)	70 = 7kg	5 = 850rpm	5 = TC5	F = Universal + Full Lens (FL)	C = Catamaran	D = Dark Silver	
P = Philco		S = Vented Dryer Mist (Dryer), Twin Tub (Washing Machine)	75 = 7.5kg	7 = 700rpm	6 = TC6 (Knob Electric)	G = Universal + Bright Silver Painted Frame (FL)	K = Kaizen		
K = Kelvinator		U = Undercounter	80 = 8kg	7 = 700rpm	7 = TC7 (Knob Timer)	H = Induction + White Lid+ LPA (TL) / Induction + White Frame (TD)	S = Saffron		
F = Frigidaire		G = Gas Dryer	85 = 8.5kg	8 = 680rpm	8 = OEM	J = Induction + Bright Silver Painted Frame (TD)	T = Topaz		
			90 = 9kg			K = Induction + Chrome Plating Frame (TD)	G = Granite		
			95 = 9.5kg			L = Inverter + White Lid + LPA (TL)	1 = Media		
			10 = 10kg			M = Inverter + Dark Silver Painted Frame (FL) / Inverter + Dark Grey Lid + LPA (TL) / Inverter + Dark Grey Frame (FL-Saffron) / Induction + Dark Grey Frame (TD-Saffron)	2 = Xinle		
			11 = 11kg			N = Induction + Dark Silver Painted Frame (TD) / Universal + Dark Silver Painted Frame (FL) / Induction + Dark Grey Lid + LPA (TL) / Universal + Dark Grey Frame (FL-Saffron)	3 = 300 Series Daewoo (OEM)		
			12 = 12kg			S = AutoDose + Inverter + Full Lens (FL)	5 = 500 Series		
			13 = 13kg			T = Induction + White Lid + Agitator (TL) / Induction + Mid Silver Frame (TD)	7 = 700 Series		
			14 = 14kg			Z = AutoDose + Inverter + Chrome Plating Frame (FL)	9 = 900 Series		
			15 = 15kg			P = Inverter + Lens + White Ring (FL)	4 = Ningbo		
			18 = 18kg			Q = Inverter + Lens + Bright Silver Painted Ring (FL/TD)			
			0H = 10.5kg			R = Inverter + Lens + Chrome Silver Painted Ring (FL/TD)			
			2H = 12.5kg			U = Universal + Lens + Bright Silver Painted Ring (TD)			
			6H = 16.5kg						

NOTES:

Example for Sales company

TD	EDS854J3WB	
	E	Electrolux Brand
	D	Drying Machine
	S	Vented Dryer Mist
	85	8.5 KG
	4	TC4
	J	Induction + Bright Silver Painted Frame (TD)
	3	300 Series
	W	White color
	B	2nd Generation

3.2 Control panel Range

EDV854J3WB (EN version)
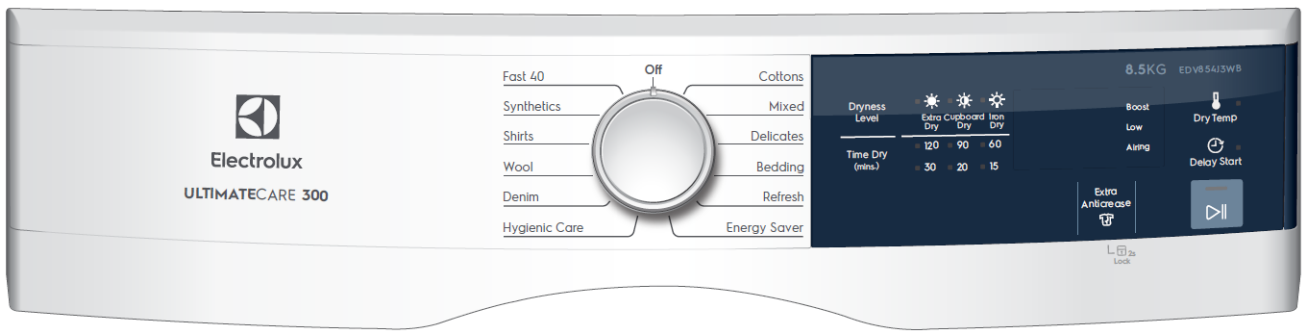
EDS854J3WB (EN/TH version)

### EDS854N3SB (EN/VN version)

3.3 Features & Functions

This section specifies the UI features and functions in the Series 300 Venting Tumble Dryer models.

FEATURES SET		Bluefire TC4 (with Mist)	Bluefire TC4 (without Mist)
ROTARY KNOB	Program #1 Program #2 Program #3 Program #4 Program #5 Program #6 Program #7 Program #8 Program #9 Program #10 Program #11 Program #12	• Cottons • Mixed • Delicates • Bedding • Vapour Refresh • Energy Saver • Hygienic Care • Denim • Wool • Shirts • Synthetics • Fast 40	• Cottons • Mixed • Delicates • Bedding • Refresh • Energy Saver • Hygienic Care • Denim • Wool • Shirts • Synthetics • Fast 40
DRYNESS LEVEL BUTTON		• Extra Dry • Cupboard Dry • Iron Dry	
TIME DRY BUTTON		•120 mins. • 90 mins. • 60 mins. • 30 mins. • 20 mins. • 15 mins.	
DRY TEMP BUTTON		• Boost • Low • Airing	
DELAY START BUTTON		30min, 60min, 90min, 2Hr - 20Hr (1 hour increments)	
ANTICREASE		1 hour (default)	
EXTRA ANTICREASE BUTTON		extra 2 hours	
SECONDARY FUNCTION		Child Lock	

3.4 Panel Layouts and Controls

For the APAC MEA Ultimate care II Venting Tumble Dryer 300 Series models, Series 300 is based on TC4 UI platform. Please see control panel layout .
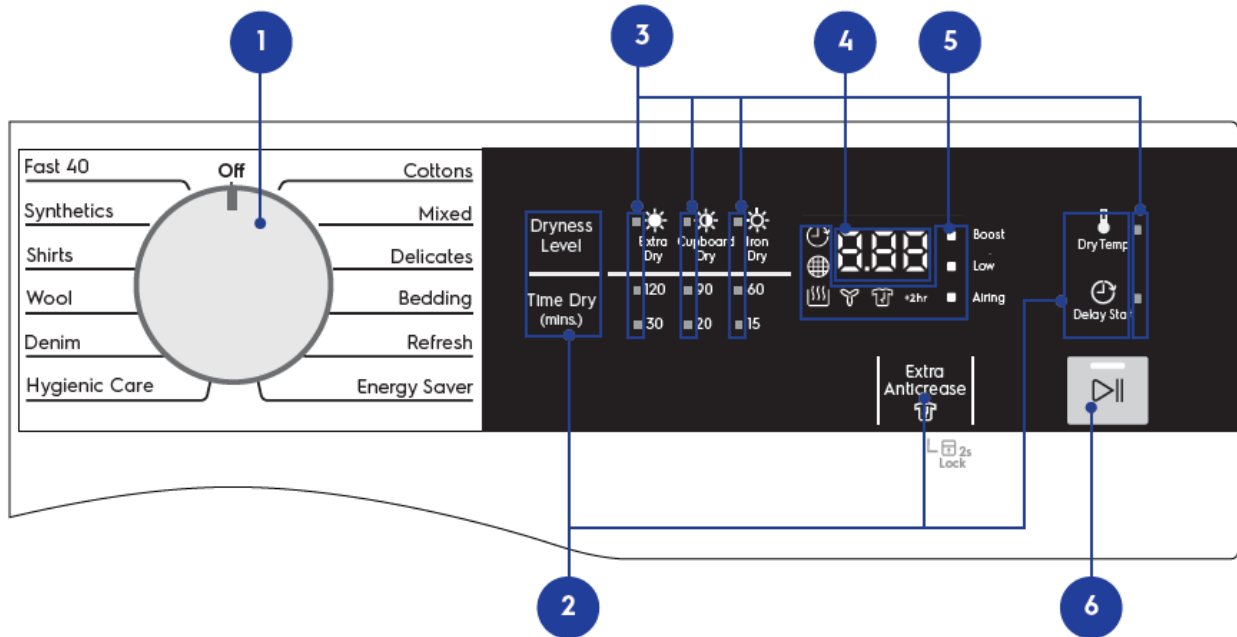
	FUNCTION	COMPONENT TYPE
1.	Program Rotary	Pointer Knob with 13 positions + On/Off Switch
2.	Function/ Option Button	Touch button
3.	Selection indicators	Independent LEDs
4.	Time Digits display	LED Segments display
5.	Icon Indicators	Independent LEDs
6.	Start/Pause button	Touch button with associated LED

Note: All LEDs used in the control panel are White.

3.5 UI Structure

The UI structure comprises of information architecture and how the features, buttons interact with each other.
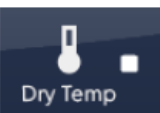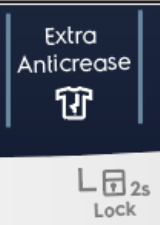
3.5.1 Rotary Knob Behaviour

The 300 Series vented dryer uses a 13-position rotary knob selector which consist of Power Off switchon the 12 o'clock position and 12 drying programs.

Selection of program is indicated by rotating the "pointer" to the line graphic around the knob associated with the desired program

3.5.2 Keys Behaviour

The table below shows a list of buttons that appear on the control panel and their behavior

descriptions. All buttons have sound feedback when tapped.

FUNCTION	IMAGE	ACTION	BEHAVIOUR
Dryness Level	Dryness Level	• Quick tap • Short tap & hold	This button selects the next available dryness level.
Time Dry	Time Dry (mins.)	• Quick tap • Short tap & hold	This button activates Time Dry and sets the drying time.
Start/Pause	▷‖	• Quick tap	Start or pause a dry cycle. Tap this button to start or pause the dry cycle at any time.
Dry Temp	Dry Temp	• Quick tap • Short tap & hold	This button selects the next available dry temperature.
Delay Start	Delay Start	• Quick tap • Short tap & hold	This buttons activates Delay Start and adjust the duration of delay.
Extra Anticrease	Extra Anticrease └ 2s Lock	• Quick tap	Activates an additional 2hr anticrease.
		• Long tap & hold for 2s	Long tap & hold this button to activate or deactivate Child Lock.

3.5.3 Sounds

A multi tone buzzer is provided to sound in following cases:

- switching machine on and off, with 2 different short jingles;

- pressing a button, with a very short "click" sound;

- when a selection error occurs, with three very short "click" sounds;

- when the cycle is finished, for about 2 minutes with a specific sequence of beeps;

- when alarms/warnings occur, for about 5 minutes with a specific sequence of short beeps.

The buzzer can be active or not by configuration; anyway the default factory setting has to be active to meet the norms regarding eyesight handicap people. To deactivate it the specific push buttons combination has to be used as specified .

When deactivated the buzzer doesn't play the cycle end melody, while sounds anyway in case of button "click" and selection error/alarms occurrence.

Volume level is pre fixed and can't be changed by user. The behaviour is the same for all UI levels.

3.5.4 Invalid Feedback

When user presses an invalid option, play Tone KeyInvalid sound and flash "---" for 3 times on the display and then switches back to total cycle duration.

Note: DO NOT display 'Err' as it is not an error

3.6 Machine States

There are 7 different states in Series 300 range.

	STATES	DISPLAY	START/PAUSE LED
1.	Idle State	• All LEDs static	• LED pulses (fade 0% > 100% in 0.6s, stay lit for 0.4s, fade out 100% > 0% in 0.6s, stay dismissed for 0.4s)
2.	Stand-by State	• All LEDs Off	• LED blinks (Lights up 0% > 100%, stay for 1s, 100% > 0%, dismissed for 2s)
3.	Execute State	• Timer counts down (Main Dry phases) • Current dry phase icon LED blinks at rate of 1s	• LED static
		• After timer goes to "0.00" (Anticrease phase), • Shows "End" and lint filter icon • Anticrease icon blinks at rate of 1s	• LED static
4.	Paused State	• LEDs static	• LED blinks at a rate of 1s
5.	Delayed State	• Shows no. of hours delayed • Delay End icon blinks at rate of 1s	• LED static
6.	Delayed Paused State	• Shows no. of hours delayed • LEDs static	• LED blinks at a rate of 1s
7.	End State	• LEDs static • Shows "End" & Lint filter icon	• LED Off

3.7 Operating Mode

When dryer is powered On,

1. UI shows a welcome lighting animation that will play together with the sound PowerOn.

2. when animation has ended, UI shows cycle time of selected Program.

   Note: Animation applies to every time the user powers on the appliance, not just the first time power on.

3.7.1 Power On (Note: LED lights in diagrams below are represented in Yellow.)
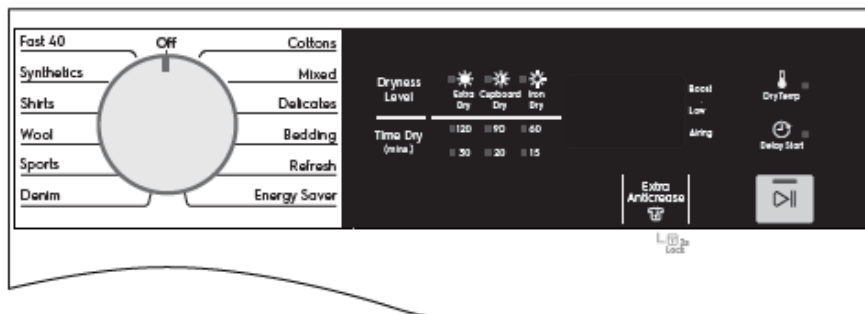
User turns knob to select program
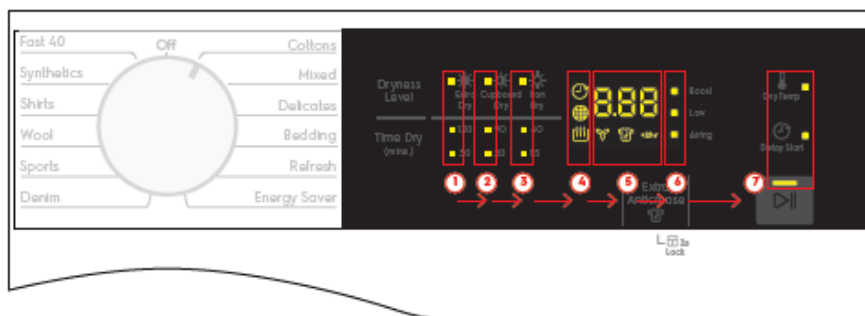
Individual LED lights up starting from the left moving to the right.

Upon power On,
(at 0:00.00)
• Play Tone PowerOn
• Light up section 1 LEDs
• Light up section 2 LEDs
• Light up section 3 LEDs
• Light up section 4 LEDs
• Light up section 5 LEDs
• Light up section 6 LEDs
• Light up section 7 LEDs

1s
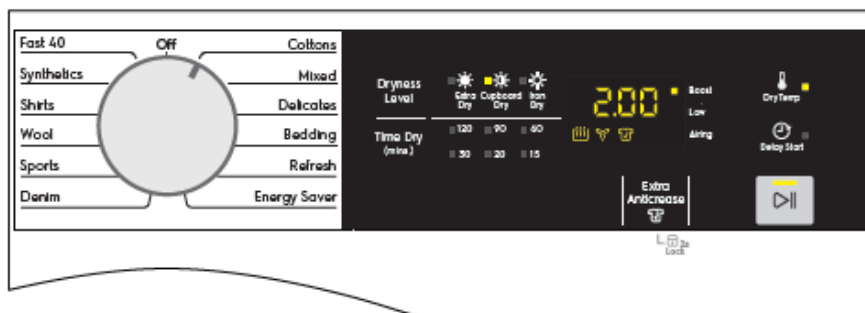
Goes to Idle State
• (Light up TTE and settings of select program
• Start/Pause LED pulsing

3.7.2 Power Off

Powering off the appliance can be done either by turning off the main power switch or turning the rotary knob to Off (12 O'clock position). All LEDs go Off.

3.7.3 Setting Program

User can turn the rotary knob to select 1 of the 12 drying cycles.

3.7.4 Setting Dryness Level

User can tap on the Dryness Level option buttons to adjust the dryness levels, depending on the selected Dry program. There are 3 levels options - Extra Dry, Dry (Cupboard dry - default) and Damp (Iron dry). Cycle time adjusts accordingly

Options toggle from Left to Right, and loops back.
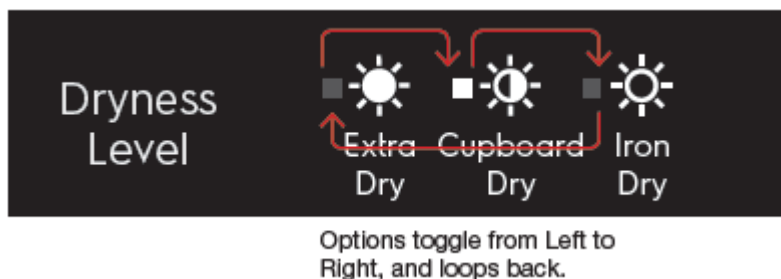
Selected dryness level is indicated by the LED light.

3.7.5 Setting Dry Time

When Time Dry button is pressed, user can select the drying time available for the selected program. Dryness level selections will be dismissed. Pressing Dryness Level will cancel Time Dry (with last set memory retained) and go back to selecting Dryness Level.

LEDs dismissed.

Default selection is 90min.
Options toggle from Left to Right, and loops back.
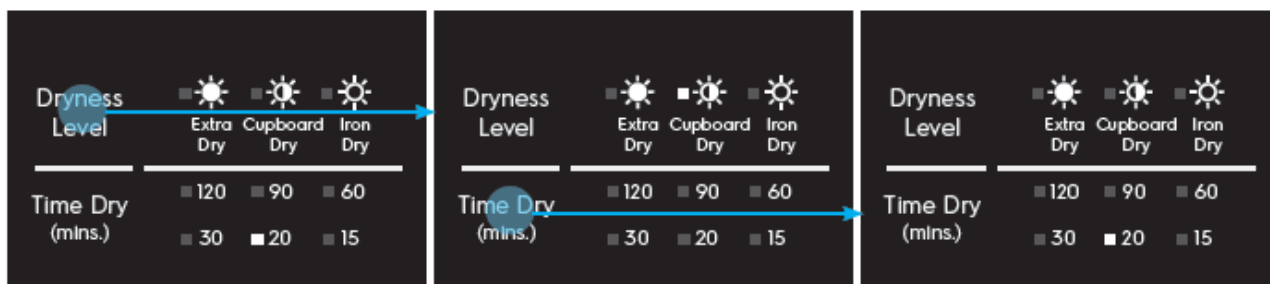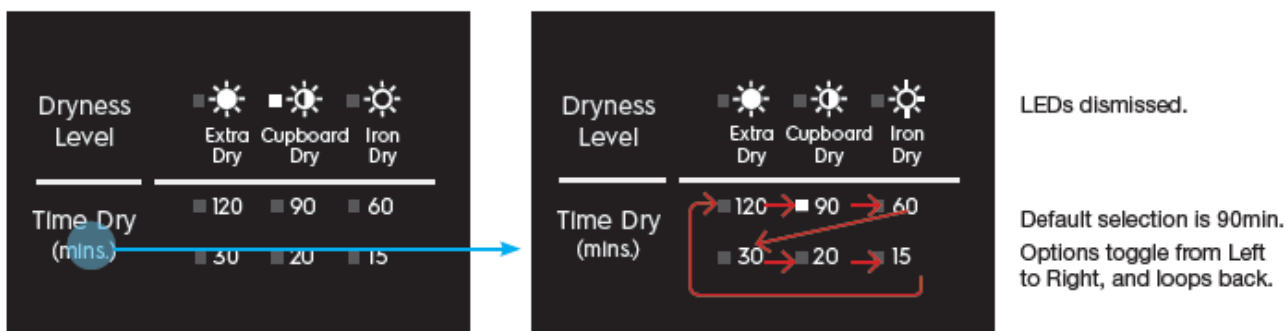
e.g. If 20min is selected

When Time Dry is next activated, 20min is selected.

3.7.6 Setting Dry Temp

User can tap on the Dry Temp option buttons to adjust the temperature setting. There are 3 levels options - Boost, Low, Airing, and the availability depends on the selected Dry program. The LED indicator is on the display.

Options toggle from Top to Bottom, and loops back.

3.7.7 Extra Anticrease

By factory default, at the end of the drying and cooling cycle, the vented dryer will run an Anticrease phase for 1 hour. User can activate Extra Anticrease to extend an additional 2 hours of Anticrease.

Extra Anticrease is triggered by tapping on the Extra Anticrease button. Upon activation the "+2Hr icon will light up.

To deactivate, tap on the Extra Anticrease button again and the icon will go off.
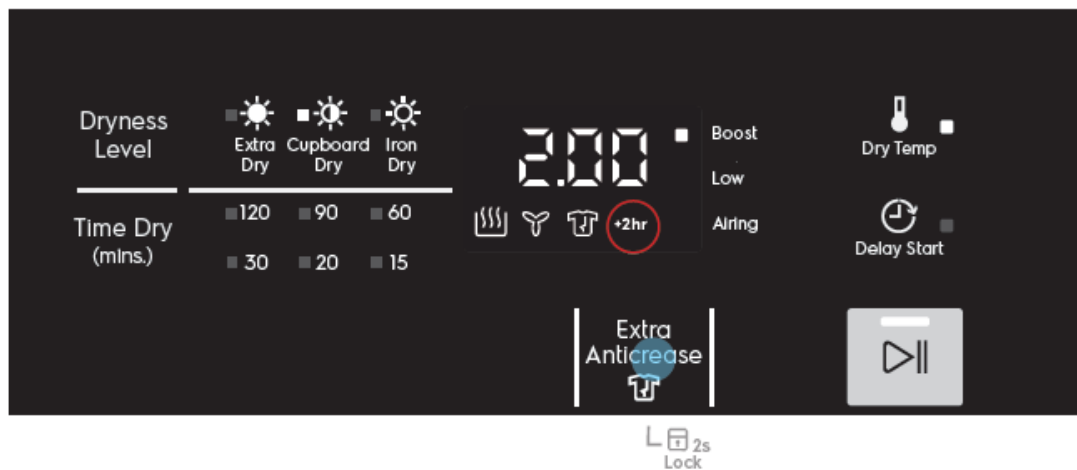
3.7.8 Child Lock

Child Lock is triggered by pressing and holding Extra Anticrease button for 2 seconds. Upon tap , play tone KeyAccept sound. Upon activation, tone KeyConfirm sound is played and "LOC" will be shown on the segmented display for 2s before going back to showing cycle duration.

When Child Lock is on

When Child Lock is activated, flash "LOC" 3 times when user presses any of the deactivated buttons, and then changes back to display cycle duration.

If the user turns the knob to another program, cycle duration will update accordingly on the display. "LOC" will show only when the user touches any button.
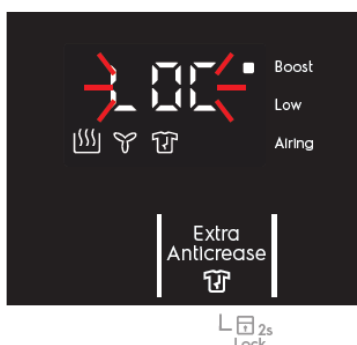
3.7.9 Deactivating Child lock

User can press and hold Dry Mode button for 2 seconds to deactivate Child Lock.

When Child Lock is deactivated, "unL" will be shown on the segmented display for 2 sec and goes back to showing cycle duration.
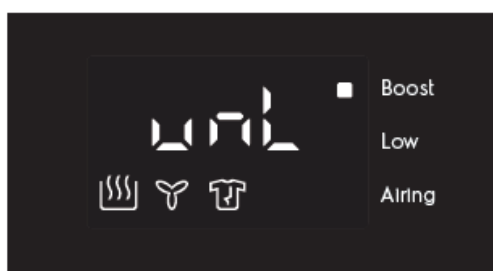
3.7.10 Activating Delay Start

Tapping the Delay Start button allows user to delay the start time of the dry cycle.

The display will show the delay time set (in :mm or Xh format) and both the Delay Start button LED and the Delay Start icon will light up together. Long tap and hold gesture activates the auto repeat function.
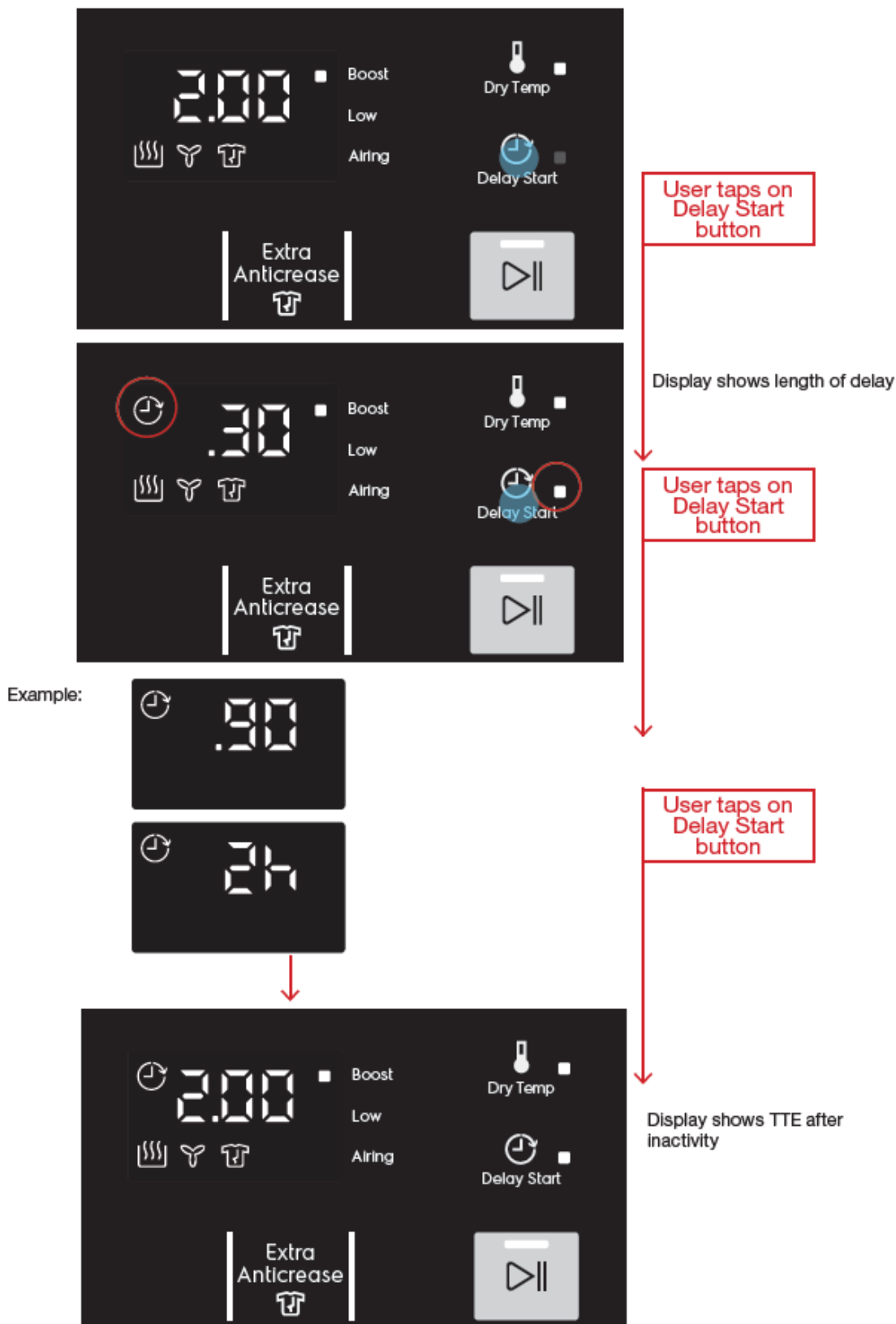
While in Idle State, if the user adjusts any other settings after setting Delay Start, the display will reflect the updated TTE accordingly as the user taps on the option keys and the Delay icon remains lit. The cycle duration will remain on the display and not switch back to delay time.

Note: Changing of program will cancel any Delay timing set and the Delay icon will be dismissed.

e.g. Changing Dry Temp to Low
TTE remains
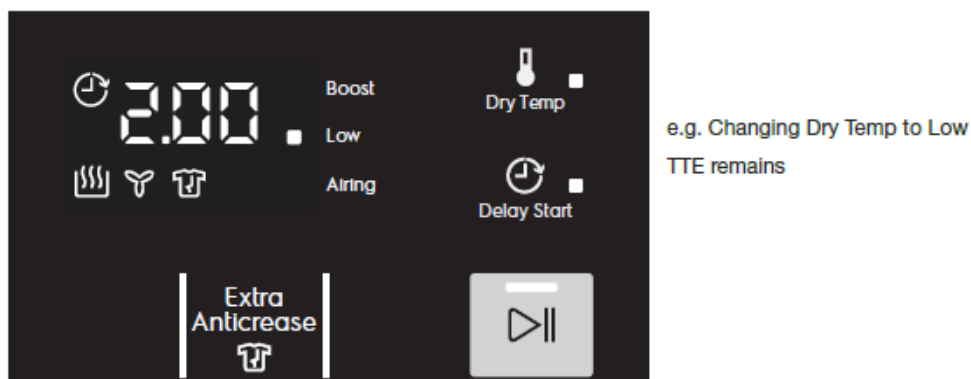
If user presses the Delay Start button, show the current selected delay settings for 3s before reverting to cycle duration.

When Delay Start is activated (Delayed State)

Once the user presses Start/Pause, Delay Start information takes priority over cycle duration.

The timer will start counting down and the display will show the hours (Xh format) until it reaches 90 mins delay. Afterwhich, it will show .90 > .60 > .59 > .58 > .... > .01 > cycle duration (e.g. 2:00) with the Delay Start icon turned off and the cycle starts running.

If the user pause the machine when delay start is set, pressing on any available settings/options will display updated cycle duration. The display will switch back to show delay start time after 3s of inactivity.

3.7.11 Cancelling Delay Start

1. During setup : To cancel Delay, press Delay Start button until it cycles through the options to select 0h.

2. After pressing Start : If the user has pressed Start/Pause button while Delay Start is activated, the appliance goes into a Delayed Pause State. Pressing the Delay Start button again will jump to 0h and the Delay Start previously set will be cancelled.

However, if the user press Delay Start button again, Delay Start will be activated again starting from the first available option (e.g. 30min).

3.7.12 Start Cycle

After selecting the program and closing the door, pressing the Start/Pause button will start the drying cycle. The Start/Pause LED turns steady and display time then decreases and updated minute by minute. All buttons except the Start/Pause button will be disabled.

When cycle is in progress, all buttons except the Start/Pause button will be disabled. Turning the knob to other program positions or pressing any option buttons will trigger an invalid feedback

Progress Indicators

The progress of the drying cycles are indicated by the blinking of the progress indicators. During setup, the progress icons will light up if they are applicable to the selected program and settings. When the drying cycle has started, the icon will blink at a rate of 1 second during the duration when that particular phase is active. The LED will then be dismissed one by one after the end of each phase.
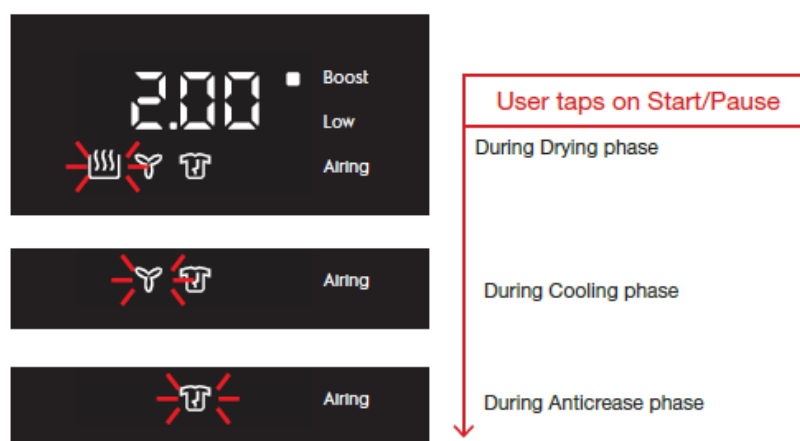
Opening the door during cycle

Opening the door during drying and cooling phases would put the machine to Paused State. If the door is closed within a time limit , the cycle will resume automatically. Otherwise, user can press Start/Pause to continue the cycle.

If the user opens the door during Anticrease phase, Anticrease would stop and the machine goes into End State.

Pause Cycle

Pressing the Start/Pause during the cycle will pause the appliance. During paused state, drying options may be changed but not the program.

Cycle End and Anticrease Phase

When the cycle is completed, the segmented digits will change TTE to "End". All program and settings LED indicators will go off, leaving only the segmented display, the Extra Anticrease icon (if activated) and Lint Alert icon. At the same time, Anticrease phase will start.

If the buzzer is enabled, Tone CycleEnd will be played 6 times .

During this time, if the user touches any button on the control panel or opens the door, sound will be cut immediately.

Anticrease Phase

The Anticrease progress indicator will start blinking during the time anticrease phase is running. During this period, the display continues to show "End" until the anticrease phase has ended completely and the appliance goes into End State.

User can also terminate the anticrease phase by:

• Turning the knob to Off position - machine is Powered Off

• Pressing Start/Pause button - machine goes into End State. Anticrease stops and Anticrease indicator LED is dismissed. "End" remains on the display.

• Opening the door - machine goes into End State. Anticrease stops and Anticrease progress LED is dismissed. "End" and Lint icon LED remains on the display.

1. End of Cycle, during Anticrease phase

- Display shows "End"
- Anticrease icon - blinks at rate of 1s
- Lint Filter icon LED - lit

↓

2. End of Anticrease phase (End State)

End State to Idle State

When in the End State, touching the control panel, turning the knob to another program or closing the door brings the appliance into Idle State, but not trigger any action.

End State to Stand-By State

When in the End State, appliance goes into Stand-By State if there is no activity for 5 minutes. During Stand-By, pressing on the touch buttons will "wake up" the UI, but not trigger any action. It will show the last State that it was in before it goes to Stand-By. Turning the knob to another program will change the appliance state to Idle, with the cycle duration of the new selected program updated on the display.

3.7.13 Lint Alert

The lint icon appears after every drying cycle has completed to remind user to clean the lint filter. Lint filter icon will light up after the Cooling phase (during the Anticrease process), as well as in the End State.

The Lint filter icon will never show during Idle State. Once appliance goes into Idle State (when user touches the control panel or opens the door), the Lint filter icon will be dismissed.

3.8 Combination Key function

The following key combinations are available.
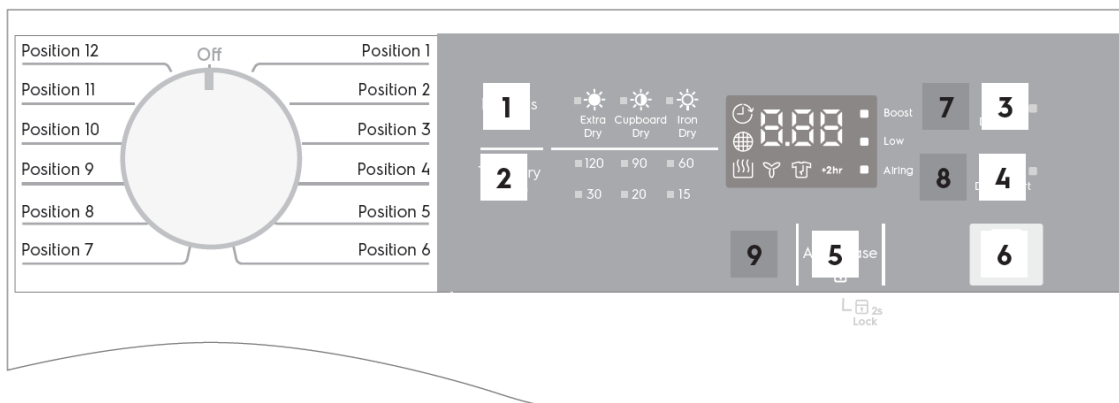
FUNCTION	KNOB POSITION	1ST BUTTON	2ND BUTTON	ACTION
Enable/Disable Buzzer Sound	-	1	2	Tap and hold for >3s
Inverted Mounting Mode	-	5	6	Tap and hold for >5s
Working hour counter	5	4	6	Tap and hold for >5s
Demo Mode	3	4	6	Tap and hold for >5s
Diagnostic Mode	1	4	6	Tap and hold for >5s
Last Alarm reading		4	6	Tap and hold for >5s During cycle process.

3.8.1 Enable/ Disable Buzzer Sound

The buzzer sound can be disabled by the user (except for event of appliance malfunction). To disable or enable buzzer sound, tap and hold Dryness Level and Time Dry buttons for >3 seconds.

Upon press, play Tone KeyAccept. Upon activation ,

• play Tone KeyConfirm and display "bOF" (when buzzer is disabled) for 2s, or

• play Tone KeyAccept and display "bOn" (when buzzer is enabled) for 2s.

When buzzer is disabled, pressing On and Off to power up or off the appliance will not play the PowerUp and PowerOff sound. Tone KeyAccept is played instead. After a wash cycle is completed,w Tone CycleEnd will not be played.
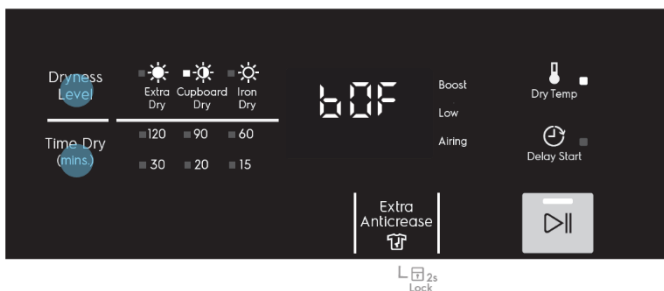
"bOF"   "bOn"
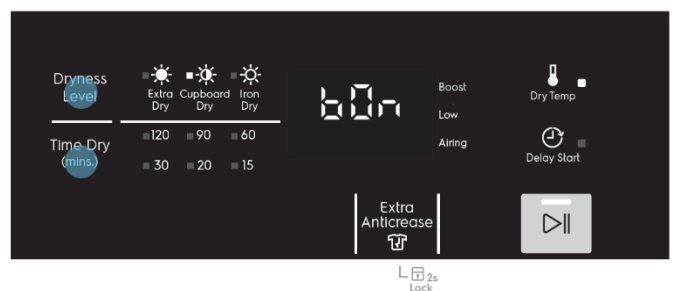
3.8.2 Inverted Mounting Mode

The vented dryer allows for inverted wall mounting and user is able to set the dryer to an Inverted Mounting Mode through a hidden key combination. This would adjust the display to read correctly when it is wall-mounted up-side-down.

To set the appliance to Inverted Mounting Mode, press and hold Extra Anticrease and Start/Pause buttons for less than 5 seconds. Upon press , play Tone . Upon activation , play Tone , KeyConfirm and show the inverted TTE.

User press and hold Program & Time buttons

Goes into Inverted Mounting Mode
- Display shows TTE inverted.
- "." is dismissed.

4
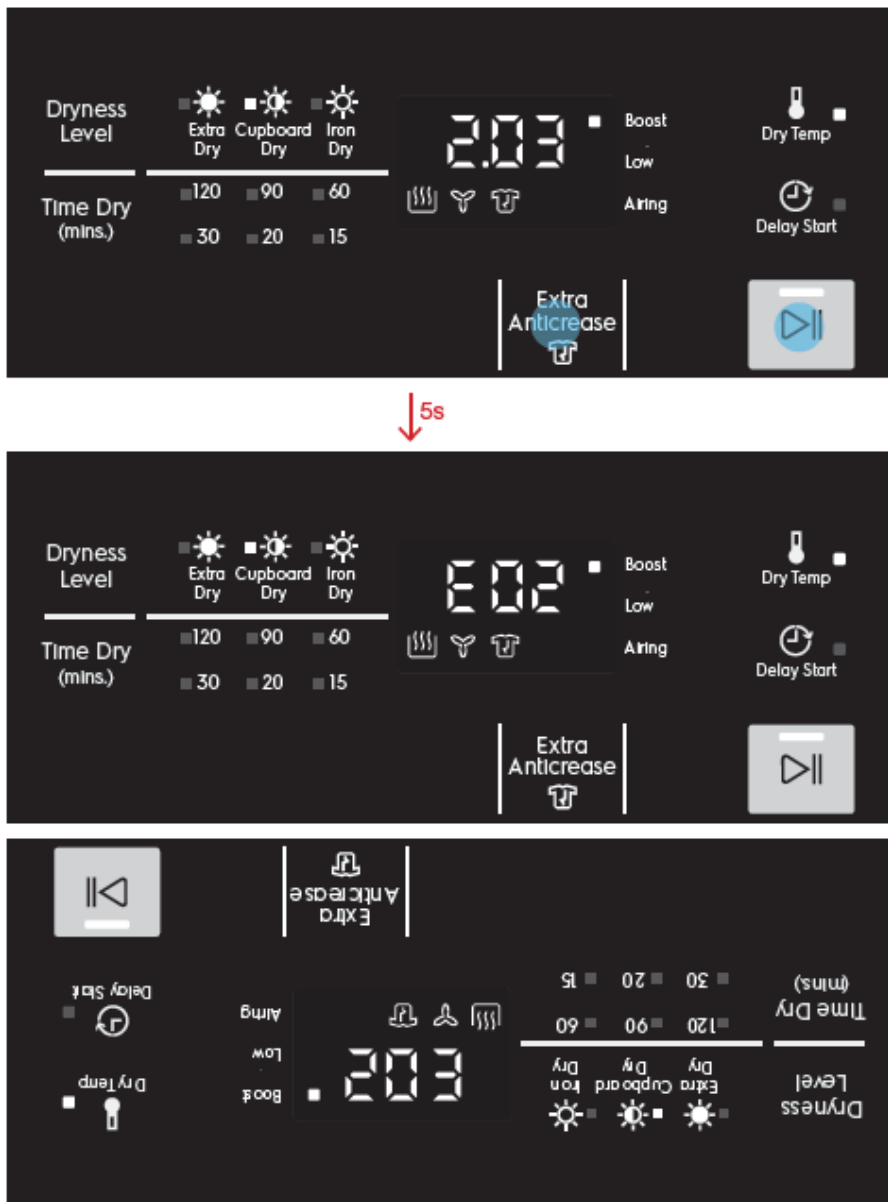
3.8.3 Working hour counter

Using a specific procedure, the operator can display the total operating time for the appliance, which is counted from the moment it is first switched on.

The unit can count up to a maximum of 65 50 hours of operating time.

- Only the operating time of normal programmes (and not diagnostic cycles) is counted

- The precision of the counter is 30 seconds per programme.

- Only whole hours of operation are counted (1hr and 59 min = 1hr)

This time is displayed with a sequence of two digits at a time: the first two digits indicate thousands and hundreds, the second two digits indicate tens and units. For example, if the operating time is 6,550 hours, the display will show the following sequence:

	Phase 1	Phase 2	Phase 3
Display	For 2 sec it displays Hr	For 2 sec the following digits are displayed: • Thousands – 6 • Hundreds - 5	For the next 2 sec the following digits are displayed: • Ten – 5 • Unit - 0

At the end of phase three (after the tens and units are displayed), the cycle is repeated.

Entering Working hour counter mode

To turn on Working hour counter mode, select the 5th knob program position, then tap and hold Delay Start and Start/ Pause buttons for >5 seconds

Exit Working hour counter mode

To return to normal mode, either: Turn the selector knob to off position for switch the appliance off

3.8.4 Demo mode

   In the shops and exhibitions sometime it could be necessary to show to the customer the machine behavior in set-up condition and also during cycle execution. The duration of a cycle execution is in any case too long for a brief show.

   The Demo works in two ways: one interactive mode and one automatic loop.

   The interactive mode enables the user to try the interface without activating the appliance. If no one has interacted with the interface for 3 minutes, or Start button hasn't been pushed, it proceeds to display an automatic loop instead, simulating the cycle execution only on display.

   Demo mode alters the execution of a cycle in such a way that these problems are avoided:

- In set-up state the machine behavior is the same of the user mode one.

- During cycle execution all times are shorter.

- Mist mode : No water load executed (Mist model)

- All the user interface functionality is shown as in the normal condition (time to end …).

 Entering Demo mode

To turn on demo mode, Turn program knob for off stage to the 3rd Program position, then tap and hold Delay Start and Start/ Pause buttons for >5 seconds.

 Exit Demo mode

The machine has to be unplugged from mains power supply.

3.8.5 Diagnostic Mode

This mode is used in several conditions:

- In factory assembly line to perform a manual test of the machine functionality

- By service people to check for faults and repair the machine.

Entering Diagnostic Mode

To turn on demo mode, Turn program knob for off stage to the 1st Program position , then tap and hold Delay Start and Start/ Pause buttons for >5 seconds.

Within about 3 seconds the UI shall enter the diagnostic mode; the acknowledge of the operation is given by all LEDs and groups of display icons switching on sequentially; otherwise, switch machine off and repeat sequence from the beginning.

Diagnostic program definition

In the User Interface test is performed; all LEDs are lighted on sequentially to allow checking the outputs. Pressing any button the associated LEDs are lighted on and the related position number is shown on cycle time (TTE) digits, till button is released; besides, the buzzer plays a single "click" sound.

When press and hold the key Program will change from lamp test to diagnostic test position, the TTE digits show the "C" letter followed by the number code for about 2 seconds.

Press the key Program will go to next position, for any position there is a different test as shown in below

- ➢ Position 2: Half test for production line test.
- ➢ Position 3: Full test for production line test.
- ➢ Position 4: Mist valve test. (Only for mist model)
- ➢ Position 5: Motor turn ON in CW direction test.
- ➢ Position 6: Motor turn ON in CCW direction test.
- ➢ Position 7: Motor turn ON in CW direction, Heater ON and read NTC test.
- ➢ Position 8: N/A.
- ➢ Position 9: Accelerate life test. (Skip. Not for Service, For Reliability Lab purpose only)
- ➢ Position 10: Last alarm display and possible reset.
- ➢ Position 11: N/A.
- ➢ Position 12: N/A.

User interface test

Selector position:	Position 1 in clockwise direction
Purpose of test:	To test the functionality of all lights,switches and buzzer.
Activated components:	All LEDs, and buzzer
UI behaviour	See below
Working conditions:	There isn't any control to run the test (always active).

Test of outputs

All visible LEDs are switched on singularly and sequentially for about 300 milliseconds.

In the same way also the 7 segments of the three digits for UI displays are lighted on sequentially.

The buzzer plays a "beep" sound each time a button is pressed.

Half test for production line test.

Selector position:	Position 2 in clockwise direction
Purpose of test:	To test the motor for CW and CCW direction
Activated components:	Motor on both of CW and CCW direction
UI behaviour	The Display report the **"HLF"**
Working conditions:	Sequence turn on motor CW 10 sec, stop 2 sec, CCW 10 sec, stop 2 sec

Full test for production line test.

Selector position:	Position 3 in clockwise direction
Purpose of test:	To test the motor for CW and CCW direction and heater.
Activated components:	Motor on both of CW and CCW direction, heater on
UI behaviour	The Display report the **"FUL"**
Working conditions:	Sequence turn on motor CW 10 sec, stop 2 sec, CCW 10 sec, stop 2 sec and always on heater

Mist valve test. (Only for mist model)

Selector position:	Position 4 in clockwise direction
Purpose of test:	To test the water loading from mist valve
Activated components:	Mist valve
UI behaviour	The Display report the **"ΠSU"**
Working conditions:	Turn on mist valve 3 minutes

Motor turn in CW direction test

Selector position:	Position 5 in clockwise direction
Purpose of test:	To test the motor on in CW direction.
Activated components:	Motor CW direction
UI behaviour	The Display report the **"CU"**
Working conditions:	Turn on motor in CW direction 3 minutes

Motor turn in CCW direction test

Selector position:	Position 6 in clockwise direction
Purpose of test:	To test the motor on in CCW direction.
Activated components:	Motor CCW direction
UI behaviour	The Display report the **"CCU"**
Working conditions:	Turn on motor in CCW direction 3 minutes

Motor turn in CW direction, Heater and NTC test

Selector position:	Position 7 in clockwise direction
Purpose of test:	To test the motor on in CW direction, heater and NTC
Activated components:	Motor CW direction, heater and NTC
UI behaviour	The Display report NTC temperature value
Working conditions:	Turn on motor in CW direction and on heater 3 minutes

Accelerate life test

Selector position:	Position 9 in clockwise direction
Purpose of test:	To test the machine for reliability
Activated components:	Motor in CW and CCW direction, heater and NTC (mist valve if available)
UI behaviour	The Display report the word **"ACL"**
Working conditions:	Depend on the cycle defined by R&D Engineer

Last alarm and reset alarm.

Selector position:	Position 10 in clockwise direction
Purpose of test:	Display last alarm and Possible reset
UI behaviour	Alarm complete code is showed in the format Exx (E 4 2) on display
Working conditions:	● To press "Start/Pause" for display $2^{nd}\rightarrow 3^{rd} \rightarrow 1^{st}$ Alarm ● To press "Time" and "Start/Pause" together for reset/delete alarm record.

Exit Diagnostic Mode

To return to normal mode, either: Turn the selector knob to off position for switch the appliance off.

3.8.6 Last Alarm reading

Using a specific procedure, the operator can display the last Error code record during the cycle process by not need to stop the cycle,

Entering Last Alarm reading.

To tap and hold Delay Start and Start/ Pause buttons for >5 seconds during the cycle running.

the TTE digits show the last Error code record.

Entering Last Alarm reading.

To tap any button to return back to the last TTE update.

4   WARNINGS

Buzzer sounds (regardless of configuration) on alarm presence only for warnings that are shown to user (E40,E50,E60,E70,E91) , mains supply alarms excluded (EH0).

● Buzzer sounds (also if deactivated by customer via buttons combination) with a specific sequence of 3 short beeps about every 20 seconds for maximum 5 minutes.

● Stand-by mode is disabled on alarm presence only for warnings that are shown to customer.

● Warning code is displayed as long as the fault condition is present.

Standard warnings codes that can be showed to final user, with related actions to perform, are the following:

Displayed code	Warning condition
E40	Door locking timeout. Check if door porthole is properly closed
E91	No communication between User Interface and Main boards. Switch off and on
E92 / E93 / E94	Software configuration. Main board has not been correctly programmed.
EH0	Low mains voltage or irregular mains frequency (out of standard working range). Wait for stable mains supply condition.

5   ALARMS

One of the main requirements of the diagnostic system is to be transparent to the final user except for some most common warning related to the door handling and power abnormal.

To increase the flexibility of the system it was introduced the possibility to enable/disable the alarms display by the machine configuration in order to cover requirement as field test context, particular countries requirement …

Some alarms require a cool cycle activation in order to put the machine in a safe condition.

All alarms display is enabled during diagnostic test/cycles. Alarm codes are displayed on the TTE digits of the display.

Please note that writing an alarm code on the Display, all occurrences of "b" are replaced by "H" in order to avoid mistaking the "6" symbol, so for instance "EB3" is shown like "EH3".

5.1   Alarms software management description

E41 – Door opened

This alarm happens if the door is open while the machine is execute the cycle. Display will be show "E40" and the cycle paused.

This alarm is clear by closed the door.

E45 – Door closed sensing circuit failure

The door closed sensing circuit is not working properly.

When this condition is detected the cycle will be stop.

To clear this alarm is necessary switch off the machine or reset the current cycle.

E51 – Drum Motor Short Circuit Alarm

This alarm is set because of the motor is running without command by the cycle execute.

The possible cause can be due to motor relay is short circuit or a high level of electromagnetic noise or motor fault.

When this condition is detected the cycle will be stop.

To clear this alarm is necessary switch off the machine or reset the current cycle.

E52 - Drum Motor Alarm

This alarm is set because of the motor is running without command by the cycle execute.

The possible cause can be due to motor relay is short circuit or a high level of electromagnetic noise or motor fault.

When this condition is detected the cycle will be stop.

To clear this alarm is necessary switch off the machine or reset the current cycle.

E62 – Heater Short Circuit Alarm

This alarm is set because of the heater is ON without command by the cycle execute.

The possible cause can be due to heater relay is short circuit or a high level of electromagnetic noise or motor fault.

When this condition is detected the cycle will be stop.

To clear this alarm is necessary switch off the machine or reset the current cycle.

E63 – Heater Alarm

While heater is ON by cycle execute, this alarm is set because of line safe relay closed, heater sensing detects voltage on heater, due to heater short circuit to ground (heater or wiring), electrical noise, line safe relay problem (main board failure), heater relay open or short, or heater connection loose.

When this condition is detected the cycle will operate the cool cycle action.

To clear this alarm is necessary switch off the machine or reset the current cycle.

E64 – Heater Sensing Alarm

This alarm is set because of the waveform of the sensing signal is abnormal. The sensing of the relay gives to the microprocessor a signal out of the limits. The limits are different depending on the half wave of the power supply and the value refers to the conversion steps of the A/D converter. In the positive half wave the limit value is 250, while in the negative half wave the limit is 5. The alarm appears if the read value exceeds these intervals for a time longer than 1 second.

The possible cause can be due to heater fault or a high level of electromagnetic noise or power supply noise.

When this condition is detected the cycle will be stop.

To clear this alarm is necessary switch off the machine or reset the current cycle.

E71 – Drying NTC Alarm

This alarm is set because of the NTC reading is out of range.

The possible cause can be due to NTC wiring failure, NTC fault or NTC reading circuit failure, NTC sensor is in open circuit or in short circuit.

When this condition is detected the cycle will be stop.

To clear this alarm is necessary switch off the machine or reset the current cycle.

E83 – Wrong selector position reading

The code read on the selector is not supported by the configuration data.

When this condition is detected the cycle will be continue.

E91 – Communication error between UI and Motherboard

There are communication problems in between User Interface and Motherboard.

Problems could be due to Hardware (problems on connectors for example disconnection of user interface or of the motherboard) or due to noise (burst on wiring).

In this case the cycle doesn't start if the problem is detected at the power-ON.

The alarm is displayed on the display.

To clear the alarm is necessary reset the current cycle by selector or pressing start/pause button at the end of cycle or simply switching off the machine.

E93 – Machine configuration error

There is an incongruent situation between the read checksum and the calculated one at the power-on of the machine.

The configuration saved on the FLASH is divided into 3 parts, each one with a separated checksum. One of them is the machine configuration; the others are related to the cycle.

At the power-on, during the reading of the configuration, the machine calculates the checksum and compares it with the written one.

When an error condition is detected the machine is blocked.

The alarm is displayed on the display.

E94 – Cycle configuration error

There is an incongruent situation between the read checksum and the calculated one at the power-on of the machine.

Differently from the E93 the checksum of the cycle configuration is divided into two parts and so the machine has to check both.

When an error condition is detected the machine is blocked.

The alarm is displayed on the display.

E97 – Incongruence between selector and cycle tables configuration

The program id value read from the selector table, contained in the machine configuration data area, is not available in the cycle table contained in the cycle configuration data area.

This situation can be caused by a read error from FLASH or by a wrong configuration file selected for the appliance configuration.

When an error condition is detected the machine is blocked.

To clear the alarm is necessary reset the current cycle by selector.

E9C – User Interface wrong Configuration

Configuration wrongly or not received correctly by UI.

To clear the alarm is necessary reset the current cycle by selector or pressing start/pause button at the end of cycle or simply switching off the machine.

E9E – User Interface Touch failure

User Interface touch sensor not working.

To clear the alarm is necessary reset the current cycle by selector or pressing start/pause button at the end of cycle or simply switching off the machine.

EB1 (EH1) – Power supply frequency out of limits

Power supply period lower or higher than configured values (45 and 55 Hz).

The machine measures continuously the power supply period and if its value exceeds a configurable interval the machine starts the power failure management.

EB1 (EH1) – Power supply frequency out of limits

Power supply period lower or higher than configured values (Rated 50Hz $\pm$ 10% or 60Hz $\pm$ 10%).

The machine measures continuously the power supply period and if its value exceeds a configurable interval the machine starts the power failure management.

At the restart the machine waits a stable frequency value and measures the reaching time needed, if it exceeds the set timeout (5 s) the machine is blocked in alarm situation.

This alarm can be auto reset if the power supply period returns at normal values.

EB2 (EH2) – Power supply voltage too high

The power supply voltage value is higher than the maximum accepted value (~270 Volt for 220-240V).

The machine measures continuously the power supply voltage and if its value exceeds the limit for a time longer than 5 seconds, the machine is blocked in alarm situation.

The limit is referred to the conversion steps of the A/D converter and the value is calculated in order to recognise the wrong reading of the voltage sensing.

This alarm can be auto reset if the power supply voltage return at normal values

EB3 (EH3) – Power supply voltage too low

The power supply voltage value is lower than the configured value (~175 Volt for 220-240V).

The machine measures continuously the power supply voltage and if its value exceeds the configurable limit the machine starts the power failure management.

At the restart the machine waits a stable voltage value and measures the reaching time needed, if it exceeds the 5 seconds timeout, the machine is blocked in alarm situation.

The limit is referred to the conversion steps of the A/D converter and the value is calculated in order to recognise the wrong reading of the voltage sensing or a voltage value lower than the configured one.

To avoid intermittence problem (due to a voltage level very close to the threshold) a hysteresis of 5VRMS is managed. It means that to restart, the supply voltage must go over the voltage threshold level by 5VRMS.

This alarm can be auto reset if the power supply voltage return at normal values.

EBD (EHD) – Safety relay short circuit

There is an incongruent situation between the sensing of the relay that drives the line safe relay and the output given by the microprocessor, this fault can be detected only with door opened and line safety relay switched off.

The alarm appears if these situations persist for 2 seconds.

To clear this alarm is necessary reset the machine.

EBE (EHE) – Safety relay fault

There is an incongruent situation between the sensing of the relay that drives the line safe relay and the output given by the microprocessor, this fault can be detected only with door closed and line safety relay switched on.

The alarm appears if these situations persist for 2 seconds.

To clear this alarm is necessary reset the machine, reset the current cycle.

EBF (EHF) – Safety relay sensing fault

The sensing of the safety relay gives to the microprocessor a signal out of the limits.

The alarm appears if the read value exceeds these intervals for a time longer than 2 second.

This alarm can be set only when the line safe relay is switched off.

To clear this alarm is necessary reset the machine.

EF6 – Safety reset

This warning is set when the machine fails a certification protection check.

When it recognizes a possible safety risk the machine "reset" itself and restarts again.

Can be set also if the machine is driven externally by a PC and the "Remote control mode" isn't activated. In this case reset itself to avoid wrong load activations.

EC7 – Mist valve triac alarm

This alarm is set because of the mist valve is ON without command by the cycle execute.

The possible cause can be due to triac is short circuit or a high level of electromagnetic noise or valve fault.

Or while mist valve is ON by cycle execute, this alarm is set because of line safe relay closed, triac sensing detects voltage on valve, due to triac short circuit to ground (valve or wiring), electrical noise, line safe relay problem (main board failure), triac open or short, or valve connection loose.

When this condition is detected the cycle will be continue.

To clear this alarm is necessary switch off the machine or reset the current cycle.

EC9 – Mist valve triac sensing alarm

This alarm is set because of the waveform of the sensing signal is abnormal. The sensing of the relay gives to the microprocessor a signal out of the limits. The limits are different depending on the half wave of the power supply and the value refers to the conversion steps of the A/D converter. In the positive half wave the limit value is 250, while in the negative half wave the limit is 5. The alarm appears if the read value exceeds these intervals for a time longer than 1 second.

The possible cause can be due to the valve fault or a high level of electromagnetic noise or power supply noise.

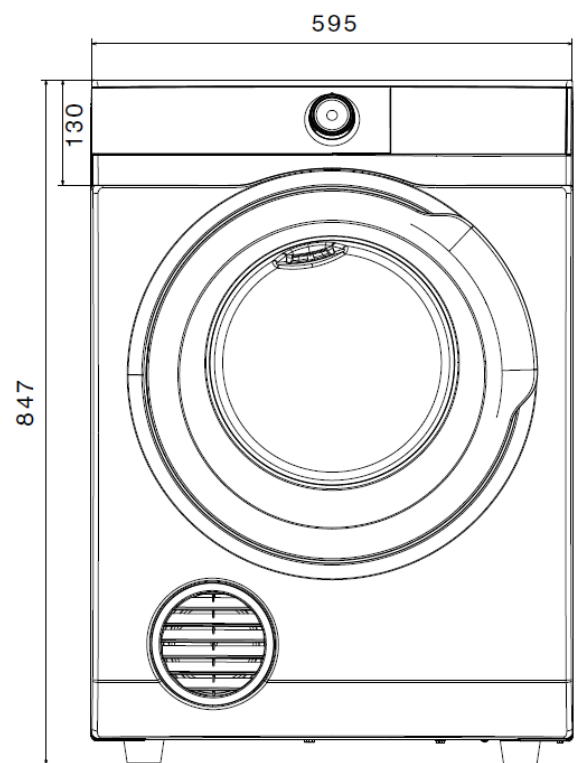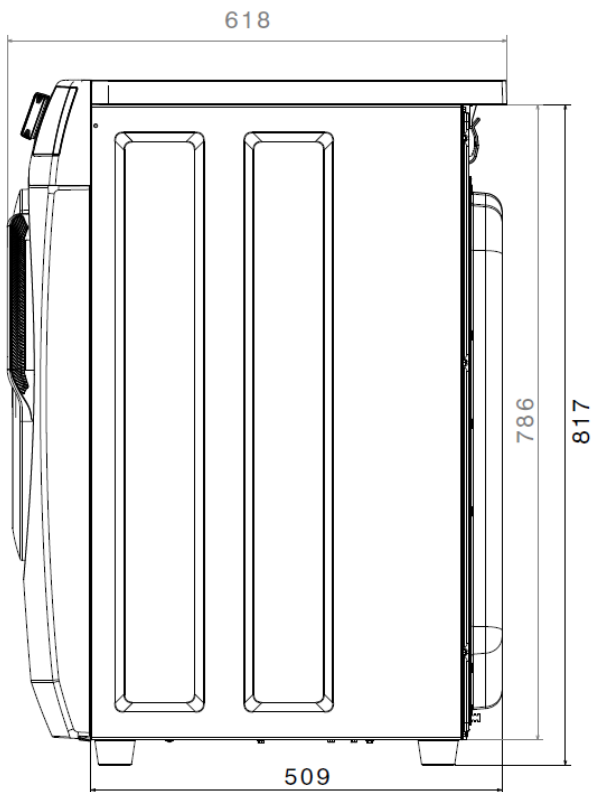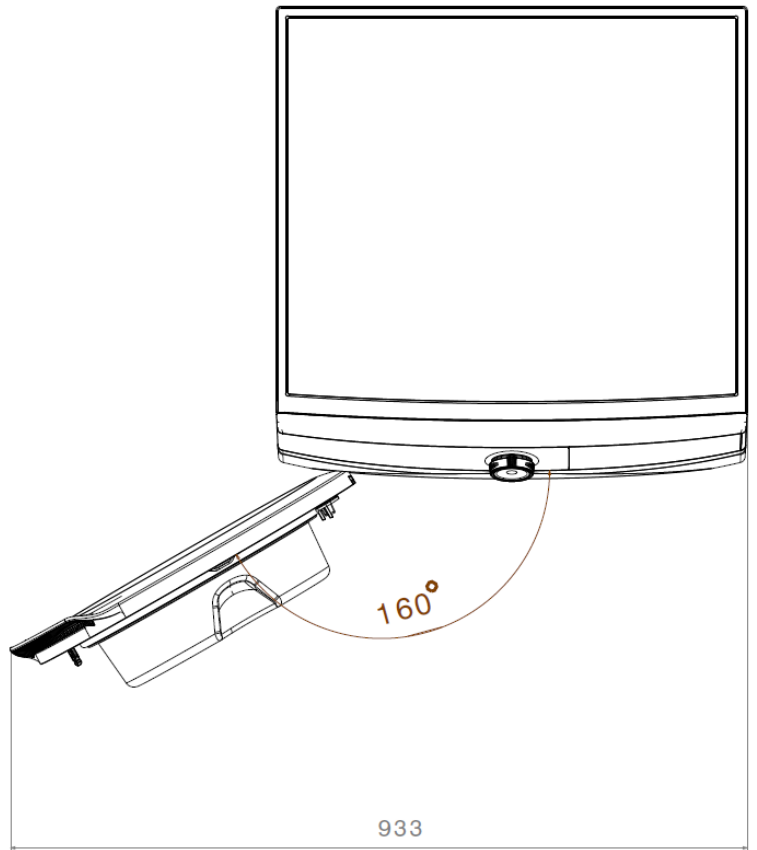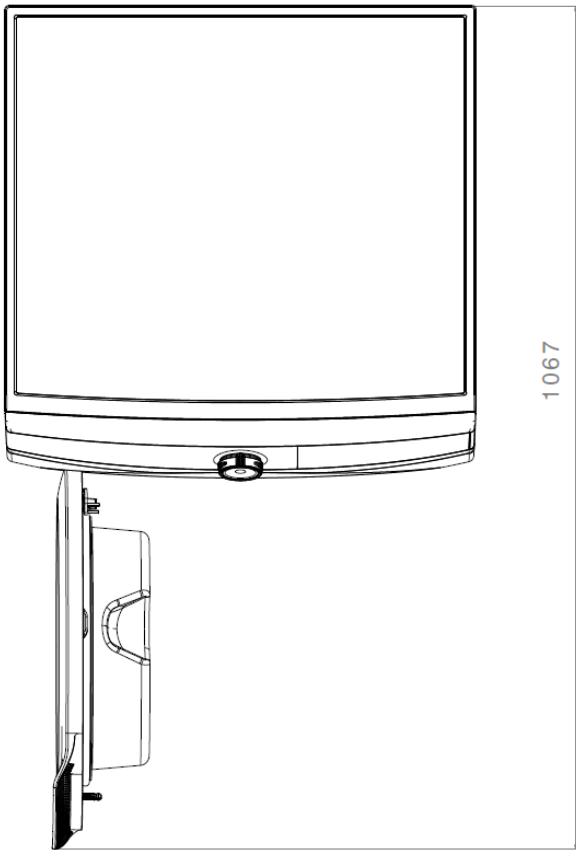When this condition is detected the cycle will be continue.

To clear this alarm is necessary switch off the machine or reset the current cycle.

5.2 Alarms Sumarry Tabel

Code	Alarm Description	Fault Condition	Possible Fault	Machine Action/Status	Reset Key
E41	Door opened	Door opened while the machine executing the cycle	Door opened while running the cycle / Door switch defective	Cycle paused	Close the door
E45	Door close sensing fault	The door closed sensing circuit damaged.	Main broad defective	Cycle blocked	OFF/ON
E51	Drum Motor Short Circuit Alarm	the motor is running without command by the cycle execute	Motor relay is short circuit or a high level of electromagnetic noise or motor fault	Cycle blocked	OFF/ON
E52	Drum Motor Alarm	While motor is running by cycle execute, this alarm is set because of line safe relay closed, motor sensing detects voltage on motor	Motor short circuit to ground (motor or wiring), electrical noise, line safe relay problem (main board failure), motor relay open or short, or motor connection loose	Cycle blocked	OFF/ON
E62	Heater Short Circuit Alarm	The heater is ON without command by the cycle execute	Heater relay is short circuit or a high level of electromagnetic noise or motor fault	Cycle blocked	OFF/ON
E63	Heater Alarm	Line safe relay closed, heater sensing detects voltage on heater	Heater short circuit to ground (heater or wiring), electrical noise, line safe relay problem (main board failure), heater relay open or short, or heater connection loose	Cool cycle	OFF/ON
E64	Heater Sensing Alarm	The waveform of the sensing signal is abnormal	Heater fault or a high level of electromagnetic noise or power supply noise	Cycle blocked	OFF/ON
E71	Drying NTC Alarm	The NTC reading is out of range	NTC wiring failure, NTC fault or NTC reading circuit failure, NTC sensor is in open circuit or in short circuit	Cycle blocked	OFF/ON
E83	Wrong selector reading	Selector position code value not supported by the configuration data	Wrong configuration data on microprocessor / Main board defective	Reset cycle	OFF/ON
E91	UI-MB Communication error	Communication problem between UI and MB	Wiring defective / UI defective / MB defective	---	OFF/ON
E92	UI-MB protocol Incongruence error	Protocol communication between UI and MB not compatible	Main board incompatible with user interface board	Cycle blocked	OFF/ON
E93	Machine configuration error	Incorrect configuration of appliance	Incorrect configuration data / Main board defective	Cycle blocked	OFF/ON

Code	Alarm Description	Fault Condition	Possible Fault	Machine Action/Status	Reset Key
E94	Cycle Configuration error	Incorrect configuration of washing cycles	Incorrect configuration data Main board defective	Cycle blocked	OFF/ON
E97	Incongruence between selector and cycles configuration	Incongruence between program selector and cycle configuration	Incorrect configuration data Main board defective	Cycle blocked	OFF/ON
E9C	User Interface Configuration fault	Configuration wrongly or not received	Display Board	No actions	OFF/ON
E9E	User Interface Touch failure	Touch display not working	Display Board	No actions	OFF/ON
EB1 (EH1)	Power supply frequency out of limits	Power supply period lower/higher than configured values	Wrong or disturbed Power Supply line. Main board defective	Wait for nominal power supply conditions	OFF/ON
EB2 (EH2)	Power supply voltage too high	MAIN_V sensing input voltage value greater than configured value	Wrong or disturbed Power Supply line. Main board defective	Wait for nominal power supply conditions	OFF/ON
EB3 (EH3)	Power supply voltage too low	MAIN_V sensing input voltage value lower than configured value	Wrong or disturbed Power Supply line. Main board defective	Wait for nominal power supply conditions	OFF/ON
EBD (EHD)	Safety relay short circuit	Safety relay damage.	Main broad defective	Cycle blocked	OFF/ON
EBE (EHE)	Safety relay fault	Safety relay damage.	Main broad defective	Cycle blocked	OFF/ON
EBF (FHF)	Safety relay sensing fault	LINE_SAFE sensing input voltage value out of range	Main broad defective	Cycle blocked	OFF/ON
EF6	Safety reset	MB microcontroller damaged	Main Board defective	No actions to be performed. If still present replace the Main Board	OFF/ON
EC7	Mist valve triac alarm	The mist valve is ON without command by the cycle execute or line safe relay closed, triac sensing detects voltage on valve	Triac short circuit to ground (valve or wiring), electrical noise, line safe relay problem (main board failure), triac open or short, or valve connection loose or valve fault	No actions	OFF/ON
EC9	Mist valve triac sensing alarm	The waveform of the sensing signal is abnormal	The valve fault or a high level of electromagnetic noise or power supply noise	No actions	OFF/ON

6 PRODUCT DIMENSION