



Electrolux

SERVICE MANUAL

Gemini Series 500/700 User Interface

Gemini Series 500/700

User Interface



EN

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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 UI for the Gemini range of topload washing machines for

- Electrolux UltimateCare II (GEM 2) Series 500 and 700.
- Westinghouse EasyCare (SWITCH) Series 500 and 700.

Here is the list of documents needed to fully understand the hardware and software interaction.

- Control Panel Specification: Defines the graphical layout of various components in the control panel that meets the engineering & design requirements.

Note: Graphics in this document may not be the most updated. Always refer to Artwork Specifications for updated product graphics.

- UI Requirements: Defines the behavior and functionality of the buttons, and LED indicators on the control panel

Document Revisions

Rev.	Date	Description	Author
00	02/2022	Document creation	Vatcharapong S,

2 SAFETY



- 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 CONTROL PANEL RANGE

Electrolux : Series 700



Electrolux : Series 500



Westinghouse : Series 700



Westinghouse : Series 500

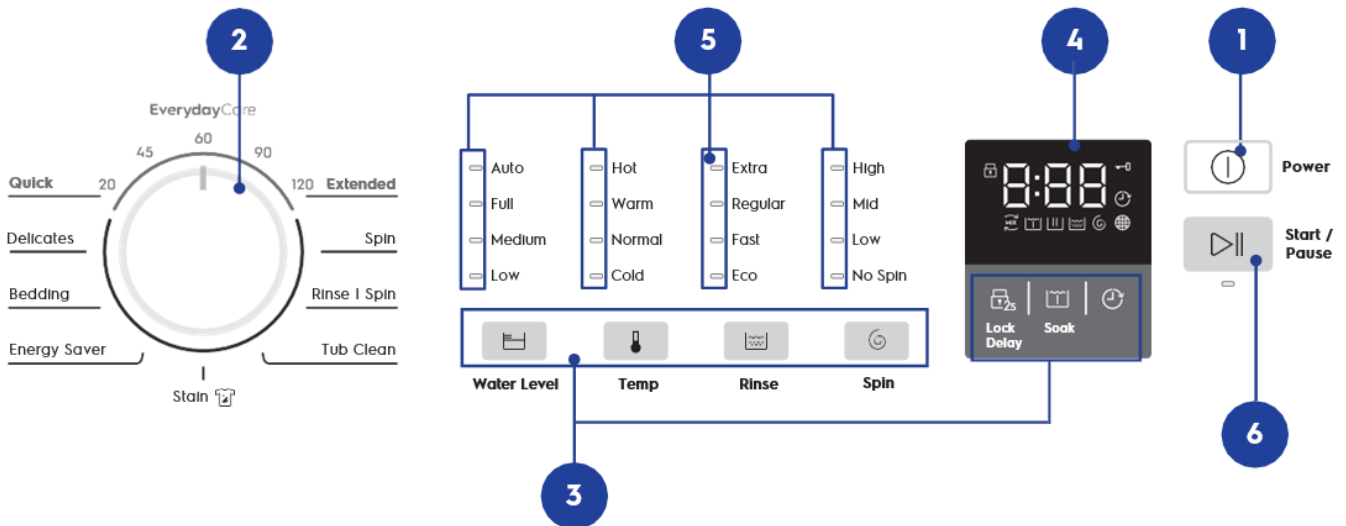


4 CONTROL PANEL

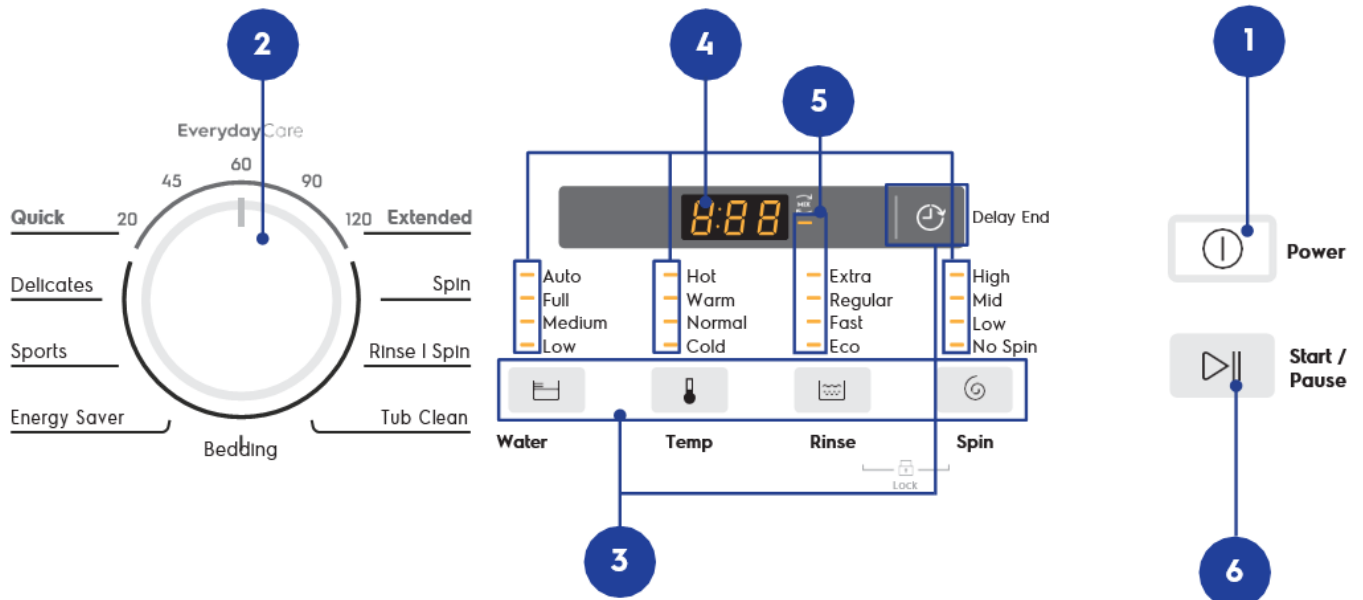
There are 2 types of control panels in the Gemini range. Series 700 control panel is based on existing Catamaran PCB board. Series 500 control panel is based on the PCB board, with an additional Power button and adjustments to some button positions.

4.1 Panel Layout and Control

4.1.1 Series 700



4.1.2 Series 500



		COMPONENT TYPE	
	FUNCTION	Catamaran (700)	Mini (500)
1.	Power Button	Touch button	Membrane switch button
2.	Program Rotary	Pointer Knob with 12 positions	Pointer Knob with 12 positions
3.	Option Buttons • Water Level • Temperature • Rinse • Spin • Delay End • Soak • Lock (Only 700)	Touch buttons	Membrane switch buttons
4.	Time Digits Display	LED module display	LED Segments display
5.	Selection Indicators	Individual LEDs	Individual LEDs
6.	Start/Pause Button	Touch button with 1 associated LED	Membrane switch button

Note: All LEDs used in 700 control panel are White. All LEDs used in 500 are Amber.

5 UI STRUCTURE

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

5.1 Rotary Knob Behaviour

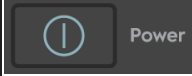
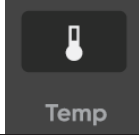
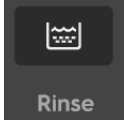
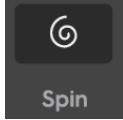
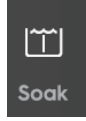

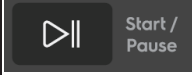
The Gemini range uses a 12-position rotary knob selector which consist of 12 washing programs.

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

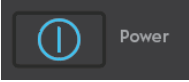

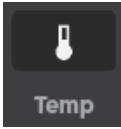


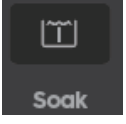
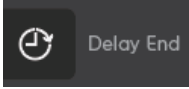
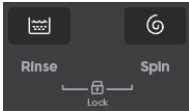
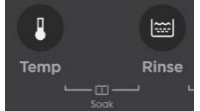
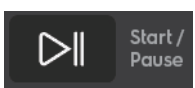
5.2 Keys Behaviour

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.

5.2.1 Series 700

FUNCTION	IMAGE	ACTION	BEHAVIOUR
Power		<ul style="list-style-type: none"> • Quick press 	<p>Controls power state of appliance.</p> <p>Turn On the appliance if it is in the Offstate. When in On state, button is tap to turn Off the appliance.</p>
Water Level		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button selects the next available water level for the wash cycle.
Temperature		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button selects the next available temperature options for the wash cycle.
Soak		<ul style="list-style-type: none"> • Quick press • Short press & hold 	(Only for models for SEA) This button selects the next available soak time options for the wash cycle.
Rinse		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button selects the next available rinse options for the wash cycle.
Spin		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button selects the next available spin options for the wash cycle.
Soak		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button selects the next available soak time options for the wash cycle.
Delay End		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button (or '+'/'-' buttons) activates Delay End and adjust the duration of delay.
Child Lock		<ul style="list-style-type: none"> • Press & hold 	Press & hold Child Lock button to activate or deactivate Child Lock.
Start/Pause		<ul style="list-style-type: none"> • Quick press 	<p>Start or pause a wash/ dry cycle.</p> <p>Tap this button to start or pause the wash/dry cycle at any time.</p>

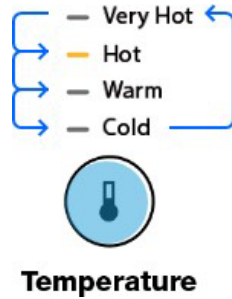
5.2.2 Series 500

FUNCTION	IMAGE	ACTION	BEHAVIOUR
Power		<ul style="list-style-type: none"> • Quick press 	<p>Controls power state of appliance.</p> <p>Turn On the appliance if it is in the Offstate. When in On state, button is tap to turn Off the appliance.</p>
Water Level		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button selects the next available water level for the wash cycle.
Temperature		<ul style="list-style-type: none"> • Quick press • Short press & hold 	<p>(For ANZ and EA with heater models)</p> <p>This button selects the next available temperature options for the wash cycle.</p>
Rinse		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button selects the next available rinse options for the wash cycle.
Spin		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This button selects the next available spin options for the wash cycle.
Soak		<ul style="list-style-type: none"> • Quick press • Short press & hold 	<p>(Only for models with no heater/hotwater)</p> <p>This button selects the next available soak time options for the wash cycle.</p>
Delay End		<ul style="list-style-type: none"> • Quick press • Short press & hold 	This buttons activates Delay End and adjust the duration of delay.
Child Lock		<ul style="list-style-type: none"> • Press & hold 	Press & hold Rinse and Spin buttons to activate or deactivate Child Lock.
Soak		<ul style="list-style-type: none"> • Press & hold 	Press & hold Temp and Rinse buttons to activate or deactivate Soak.
Start/Pause		<ul style="list-style-type: none"> • Quick press 	<p>Start or pause a wash/ dry cycle.</p> <p>Tap this button to start or pause the wash/dry cycle at any time.</p>

5.3 Common Behaviours

5.3.1 Option Selection Navigation

As the user presses the options buttons, the selection will move in a top-down direction to the next available option and loops to the top selection if the current selection is at the bottom. The respective LED will light up accordingly in the same sequence. There will be a feedback sound when user presses any button.



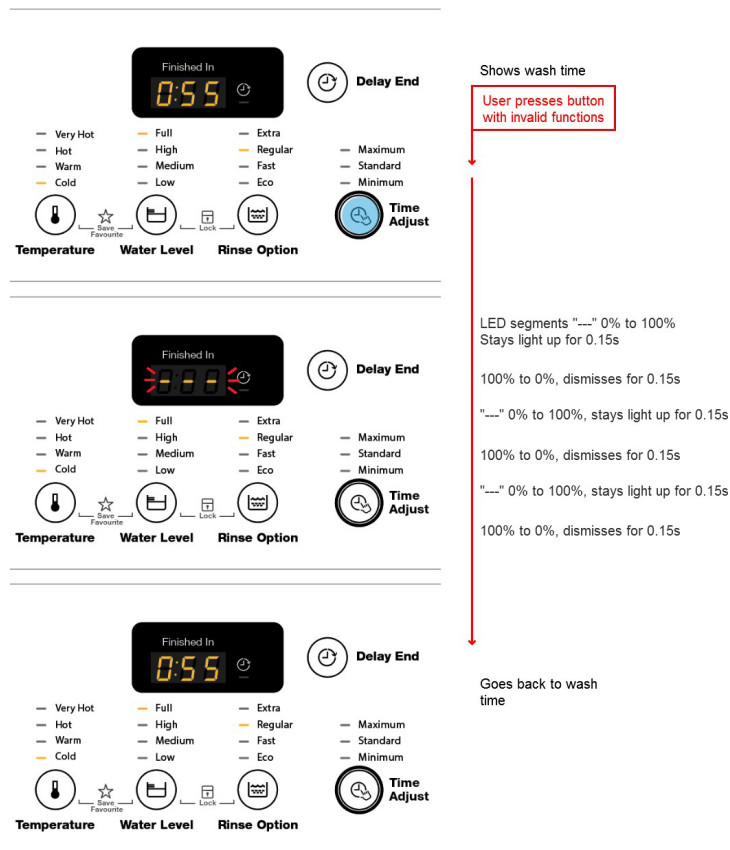
5.3.2 Option Selection Navigation

In general, when options are not available to the selected program, selection indicators associated with the functions should be Off. Pressing the buttons will result in an invalid feedback.

5.3.3 Option Selection Navigation

When user presses an invalid option, there will be a feedback sound and flash "----" for 3 times at a rate of 0.15 seconds on the display and then switches back to total wash time.

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



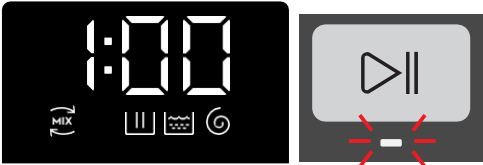

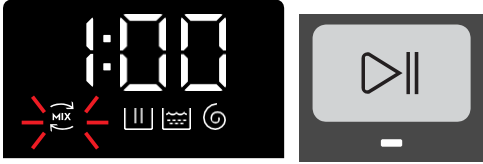

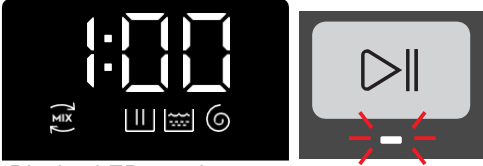

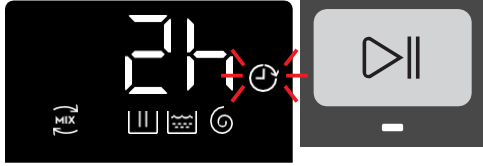



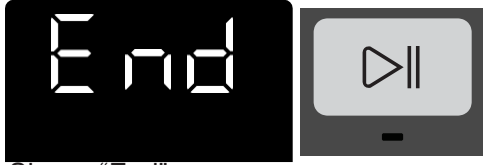

6 MACHINE STATES

There are 7 different states in washing machine range:

1. Idle State
 - After appliance is powered On.
 - Allows user to setup, select wash program.
 - 5 minutes of inactivity goes to Stand-off State
2. Stand-off State
 - Appliance is powered Off.
3. Execute State
 - Washing cycle in progress.
 - Buzzer will sound after cycle ends.
4. Paused State
 - Cycle paused.
5. Delayed State
 - Delay end time is set and started.
6. Delayed Pause State
 - Delay end time is set and paused.
7. End State
 - Cycle completed.
 - 5 minutes of inactivity goes to Stand-off State

6.1 User interface test LED Behaviour in Difference states

The table below shows how the display LED behave:

	STATES	DISPLAY AND LED INDICATORS	
		700	500
1.	Idle State	 <ul style="list-style-type: none"> All display LEDs static Start/Pause 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) 	 <ul style="list-style-type: none"> All LEDs static
2.	Stand-Off State	<ul style="list-style-type: none"> All LEDs Off 	<ul style="list-style-type: none"> All LEDs Off
3.	Execute State	 <ul style="list-style-type: none"> Timer counts down Current wash phase icon LED blinks at rate of 1s Start/Pause LED static 	 <ul style="list-style-type: none"> Timer counts down Colon ":" LED blinks at rate of 1s
4.	Paused State	 <ul style="list-style-type: none"> Display LEDs static Start/Pause LED blinks at a rate of 1s 	 <ul style="list-style-type: none"> Time digits blink at rate of 1s
5.	Delayed State	 <ul style="list-style-type: none"> Shows no. of hours delayed Delay End icon blinks at rate of 1s Start/Pause LED static 	 <ul style="list-style-type: none"> Shows no. of hours delayed
6.	Delayed Paused State	 <ul style="list-style-type: none"> Shows no. of hours delayed Display LEDs static LED blinks at a rate of 1s 	 <ul style="list-style-type: none"> Shows no. of hours delayed Delay hours blink at rate of 1s
7.	End State	 <ul style="list-style-type: none"> Shows "End" LEDs static All other LEDs are Off 	 <ul style="list-style-type: none"> Shows "End" LEDs static All other LEDs are Off

7 OPERATING MODE

7.1 Power On

When washing machine is powered On,

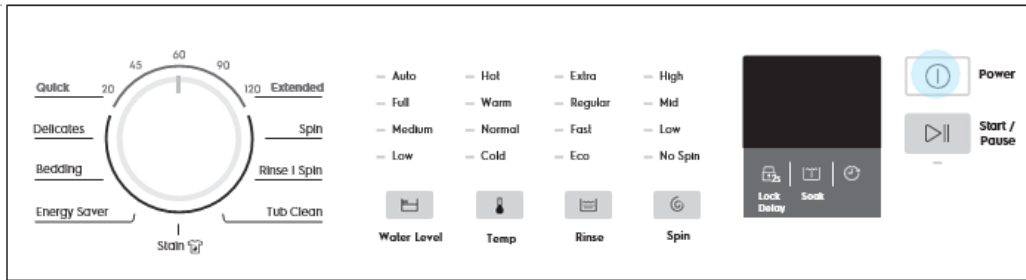
1. UI shows a welcome lighting animation together with a melody.
2. When animation has ended, UI shows settings of the selected program, depending on the direction which the user rotates the knob.

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

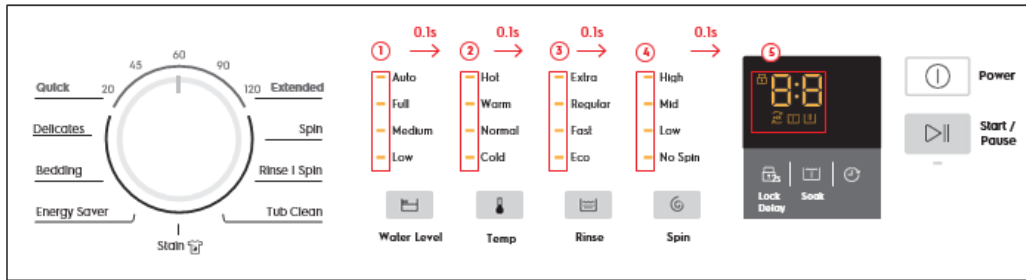
7.1.1 Power On Animation Sequence

Upon powering On, the LEDs on the control panels will light up starting from the right (closest to the On/Off button) to the left until all LEDs are lit. Then all LEDs will be dismissed, leaving just the last setup program and settings on the display.

Series 700

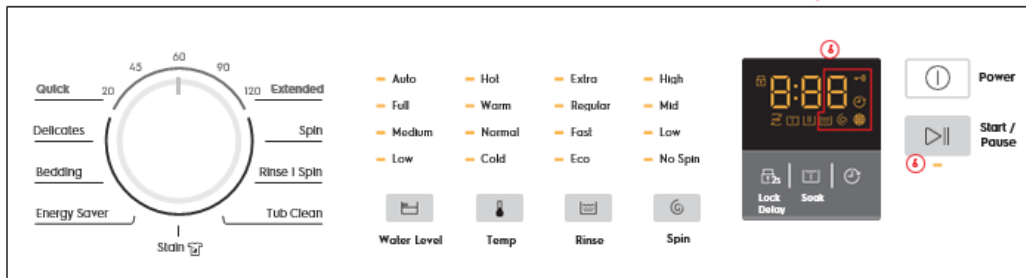


User presses Power button

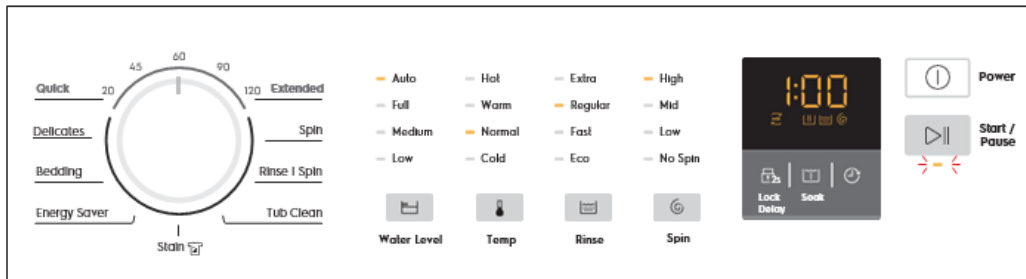


Upon power On, (at 0:00.00)

- Play Tone PowerOn
- Light up Column 1 LEDs 0% to 100% (at 0:00.10)



- Light up Column 2 LEDs 0% to 100% (at 0:00.20)
- Light up Column 3 LEDs 0% to 100% (at 0:00.30)
- Light up Column 4 LEDs 0% to 100% (at 0:00.40)



- Light up Group 5 LEDs 0% to 100% (at 0:00.50)
- Light up Group 6 LEDs 0% to 100% (at 0:01.50)
- Start/Pause LED starts pulsing
- Last washed settings LEDs based on selected program remain lit
- Dismiss all other LEDs.

Series 500 Standard Models



User turns knob to select program



Upon power On, (at 0:00:00)
 • Play start up melody
 • Light up Column 1 LEDs 0% to 100%



(at 0:00:10)
 • Light up Column 2 LEDs 0% to 100%
 • Light up "8.8" Segmented LEDs 0% to 100%



(at 0:00:20)
 • Light up Column 3 LEDs 0% to 100%
 • Light up "8" Segmented LEDs 0% to 100%
 • Light up Delay End indicator LED 0% to 100%



(at 0:00:30)
 • Light up Column 4 LEDs 0% to 100%



(at 0:01:30)
 • Program wash duration & settings LEDs remain lit
 • Dismiss all other LEDs 0% to 100%

7.2 Power Off

Powering off the appliance can be done either by turning off the main power switch or pressing the On/Off power button once if it is already turned on. All LEDs go Off from 100% to 0%.

7.3 Setting Program

User can turn the rotary knob to select 1 of the 12 wash cycles. Once program is selected, the default selection for the Temperature, Water Level, Rinse and Spin options will light up and user can adjust the options, if applicable. Users should be allowed to adjust the options for the 5 Time-based programs as well and Display will change accordingly.

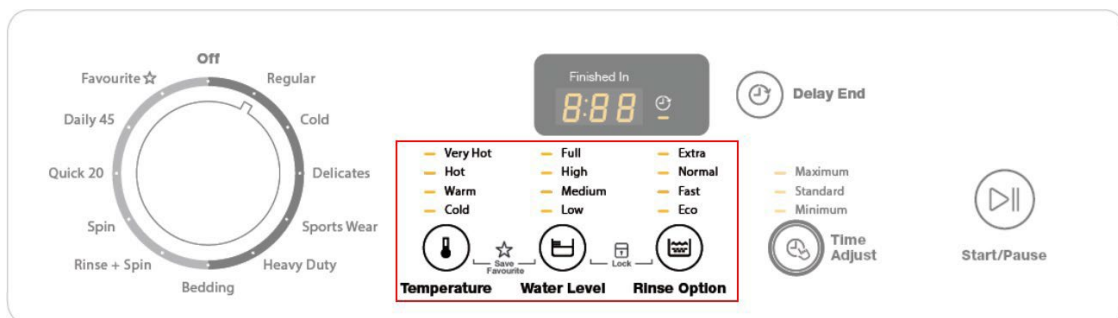
7.4 Setting Water Level, Temperature, Rinse and Spin Options

User can tap on the option buttons to adjust:

- Water Temperature
- Water Level
- Rinse Options

for the selected program.

The number of available settings for each button depends on the configuration of selected program. If a certain setting is not available for the currently selected program, it will be skipped when cycling through the list of available settings.



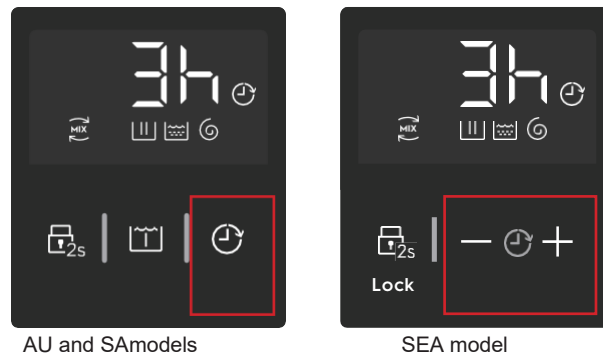
7.5 Delay End

7.5.1 SERIES 700

Tapping the Delay End button (or the + and - buttons) allows user to delay the end time of the washcycle. The display will show the delay time set (in Xh format) and the Delay End icon will light up together. Long tap and hold gesture activates the auto repeat function.

The first delay option would be rounded up to the nearest number from the total wash time of the selected program. (e.g. if the wash time is 2:08, pressing Delay End button once would delay the endtime to 3h). Options increases in 1hr increment and the maximum delay time is 20h.

Once the user presses Start/Pause, the timer will start counting down (Delayed State). The display will show the hours until the duration of the selected program is left, at which the display will show the wash time (e.g. 4h > 3h > 2h > 1.50) and the timer will countdown as per normal.



7.5.2 SERIES 500

7.5.2.1 ACTIVATE DELAY END

Pressing the Delay End button allows user to delay the end time of the wash cycle. The display will show the number of hours as "<X>h" (e.g. 4h) and the Delay End icon will light up together. Quick press and hold gesture activates the auto repeat function.

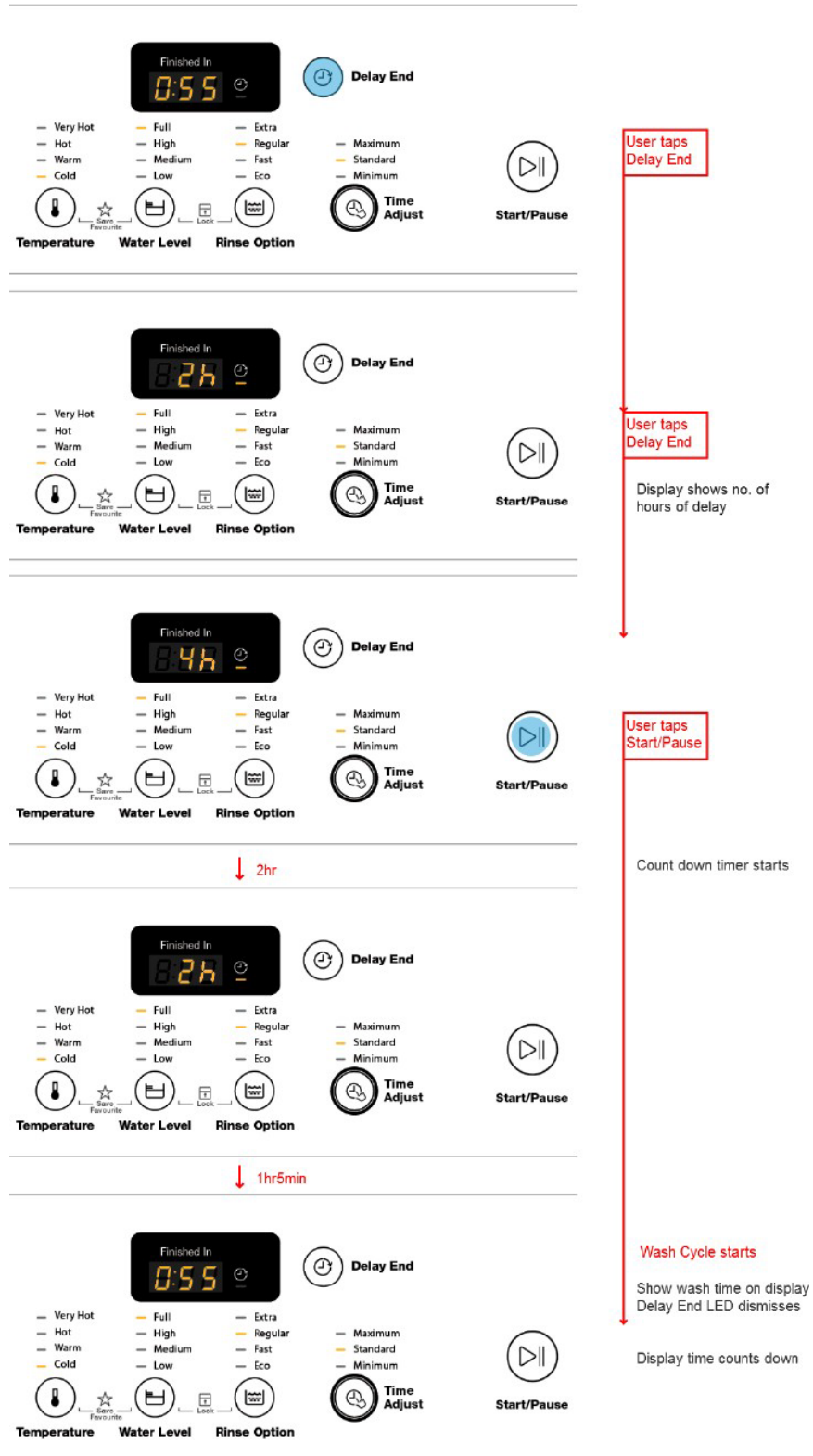
User can delay end of wash cycle for 2, 4, 6, 8, 10 or 12 hours, with the first option rounded up to the closest number from the total wash time of the selected program. (e.g. if the wash time is 1:05, pressing Delay End button once would delay the end time to 2h).

Once the user presses Start/Pause, the timer will start counting down. The display will show the hours until the duration of the selected program is left, at which the display will show the wash time (e.g. 6h > 4h > 2h > 1.05) and the timer will countdown as per normal.

7.5.2.2 CHANGING SETTINGS WHILE DELAY END IS ON

While in Idle State, if the user adjusts any other settings after setting Delay End, current delay timing will remain unchanged on the display. If the cycle time is changed and current delay time is no longer valid, display will update to the next valid delay time (e.g. If cycle time is 1:25 and delay set at 2h, display should automatically jump to 4h when cycle time becomes 2:05 after changing an option).

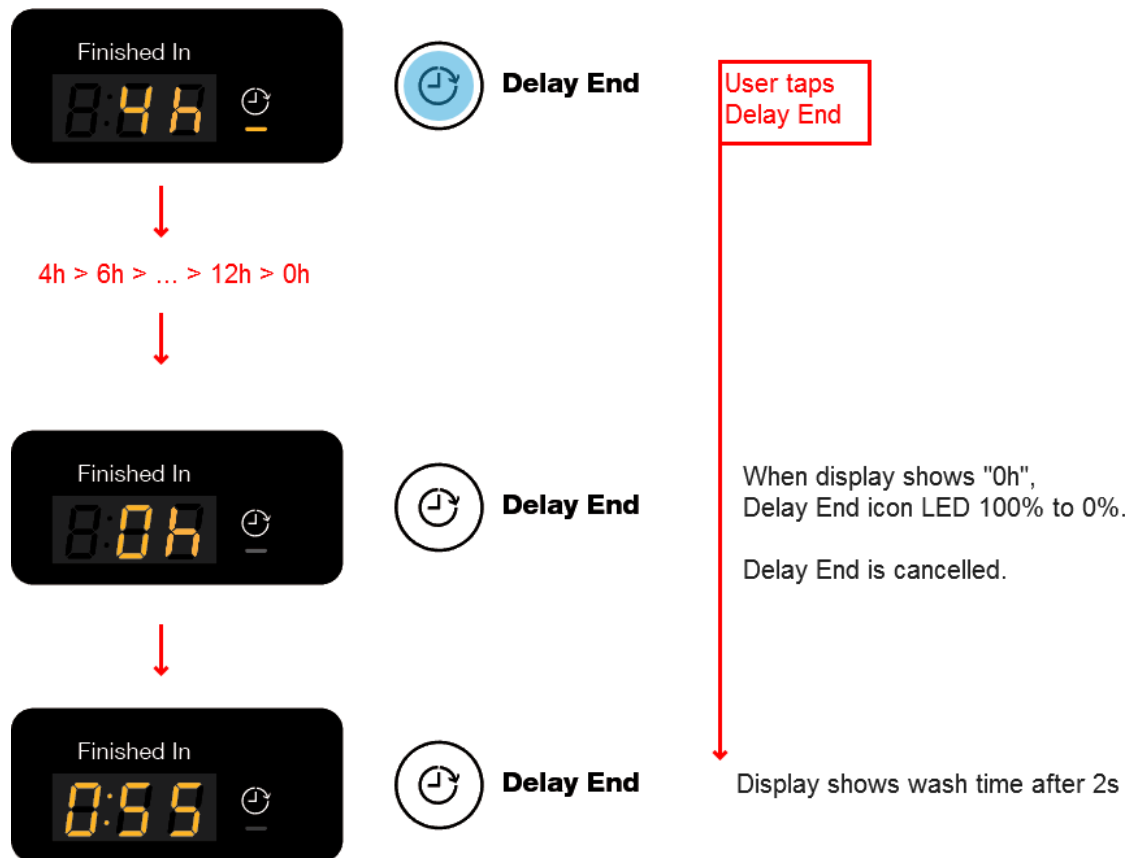
Note: Changing of program will cancel any Delay timing set and the Delay indicator will be dismissed



7.5.2.3 CANCELLING DELAY END

1. DURING SETUP (IDLE STATE):

To cancel Delay, press Delay End button until it cycles through the options to select 0h.



2. AFTER PRESSING START (DELAYED STATE):

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

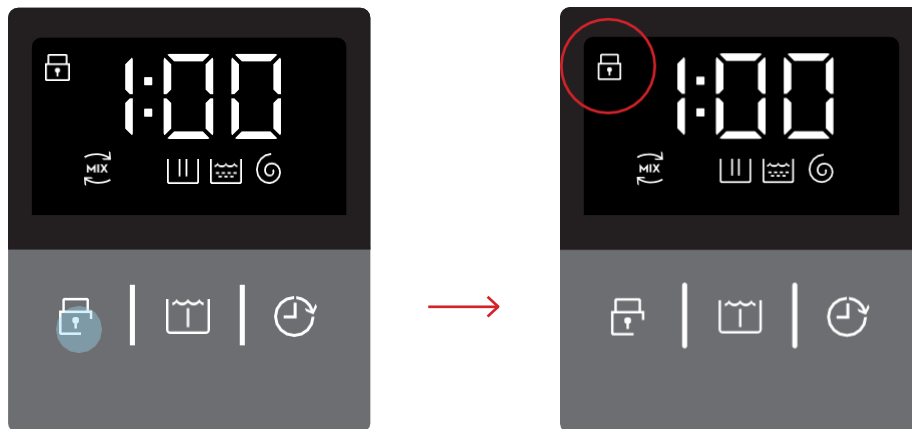
However, if the user press Delay End button again, Delay End will be activated again starting from the first available option (e.g 2h if the cycle time is 1:05).

7.6 Child Lock

7.6.1 SERIES 700

Child Lock is triggered by tapping and holding Lock button for 2 seconds. Upon tap, play tone KeyAccept sound. Upon activation (t=2s), Child Lock indicator LED will light up and tone KeyConfirmsound is played. The icon remains On until Child Lock is deactivated.

To deactivate, tap and hold the Lock button again for 2 second. Upon tap, tone KeyAccept sound is played. When deactivated (t=2s), the Child lock LED indicator will turned off and Tone KeyConfirmsound (for Electrolux) or Tone KeyCancel sound (for Westinghouse) is played.



7.6.2 SERIES 500

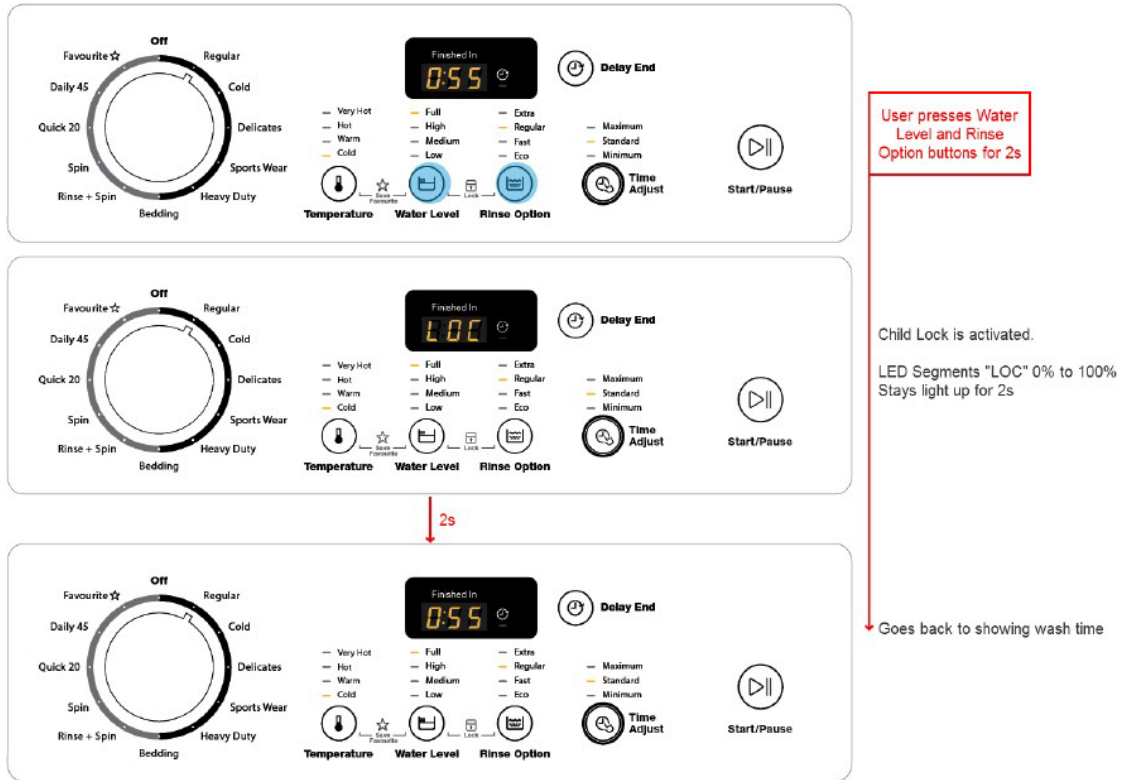
When activated, all buttons will be disabled. User is only allowed to power Off the machine by turning the knob to the Off position.

7.6.2.1 ACTIVATE CHILD LOCK

Child Lock is triggered by pressing and holding Water Level and Rinse Option buttons for 2seconds.

There is no Child Lock icon on the Standard 6 and 7 KG models. Upon activation, "LOC" will beshown on the segmented display for 2s, together with KeyConfirm sound and goes back to showing wash time.

For the Event model, Child Lock icon will light up together with "LOC" on the display.

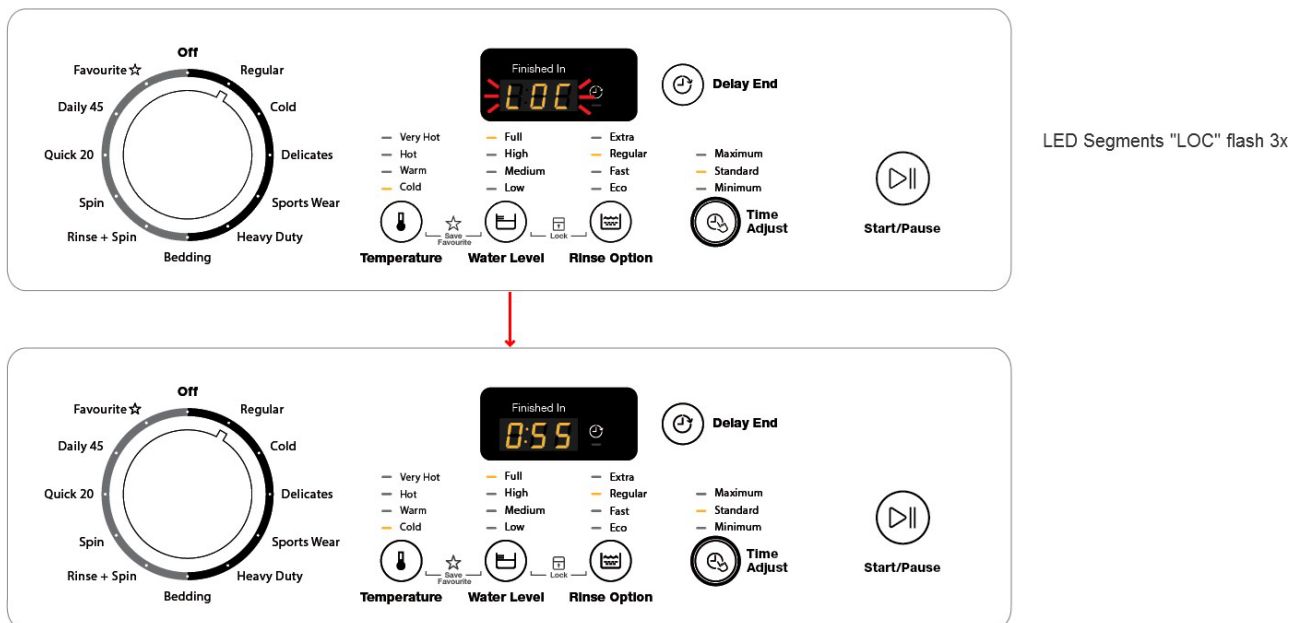


7.6.2.2 WHEN CHILD LOCK IS ON

When Child Lock is activated, flash “LOC” 3 times at a rate of 0.15s when user presses any of the deactivated buttons, and then changes back to display wash duration.

For Event model, when Child Lock is activated, “LOC” will also flash 3 times, but the child lock icon remains static.

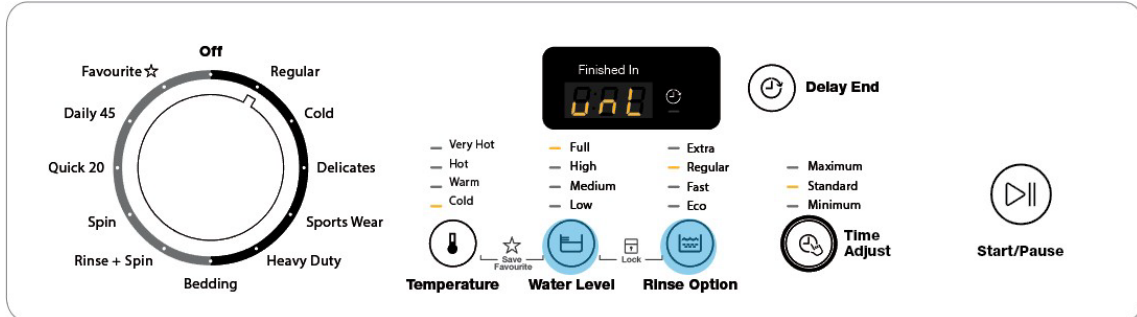
If the user turns the knob to another program, allow wash time and wash settings indicators to update accordingly on the control panel. Only buttons are deactivated.



7.6.2.3 DEACTIVATE CHILD LOCK

User can press and hold Water Level and Rinse Option buttons for 2 seconds to deactivate ChildLock.

When Child Lock is deactivated, "unL" will be shown on the segmented display for 2 sec, togetherwith KeyConfirm sound and goes back to showing wash time. Child Lock indicator on Event model will also be dismissed at the same time.



Note: the only difference is that Child Lock is activated and deactivated by pressing and holding Rinse and Spin buttons for 2s.

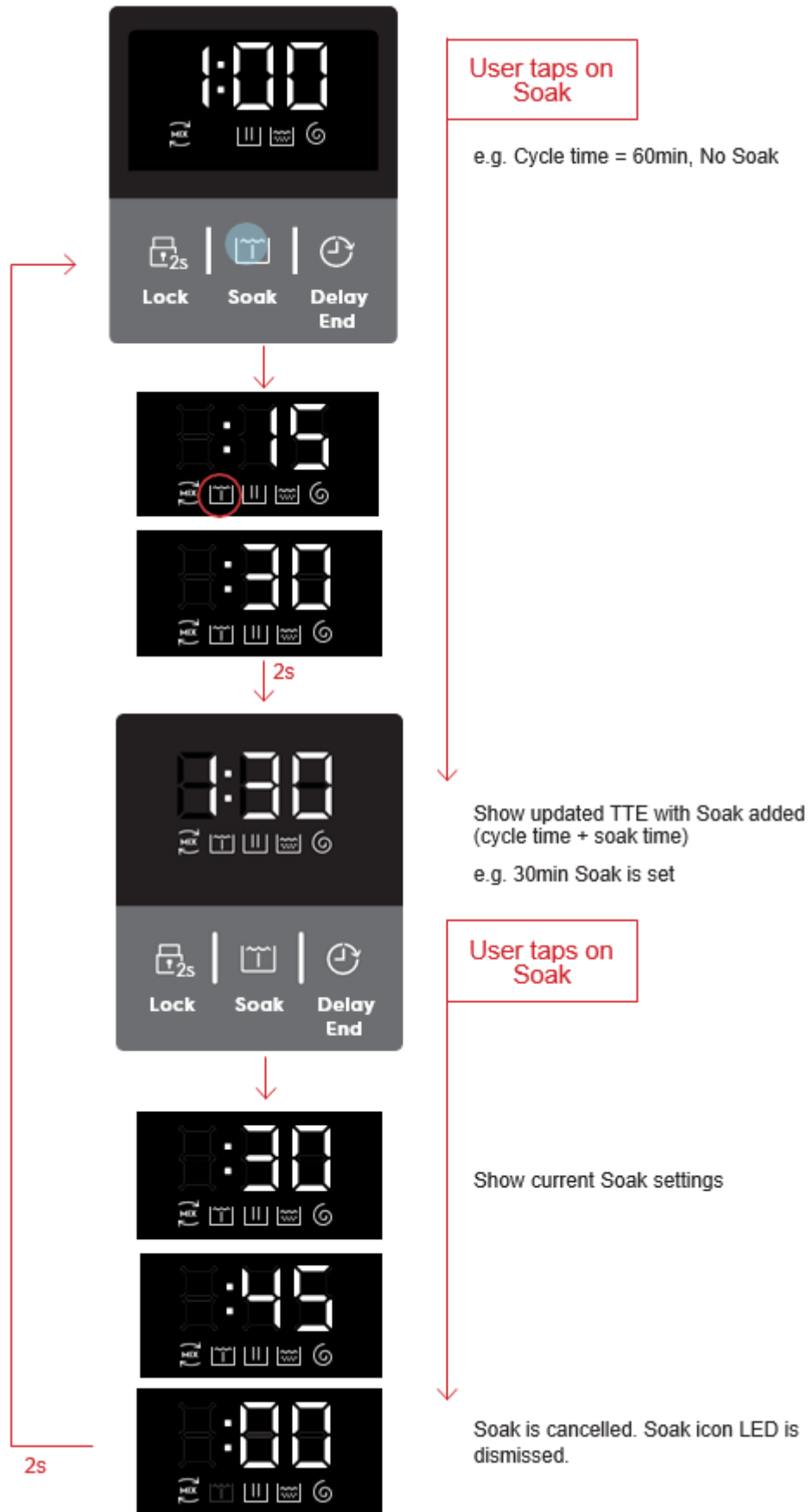
7.7 Soak (700 and AU 500)

7.7.1 SERIES 700

There are 3 options of Soak - 15mins, 30mins and 45mins. To activate, tap on the Soak button to toggle through the options. The display will show the soak timing in “:mm” format (:15 > :30 > :45 > :00) with the Soak icon turning on when activated. Long tap and hold would activate auto repeat. To cancel Soak, press the Soak button until it cycles through the options to select :00.

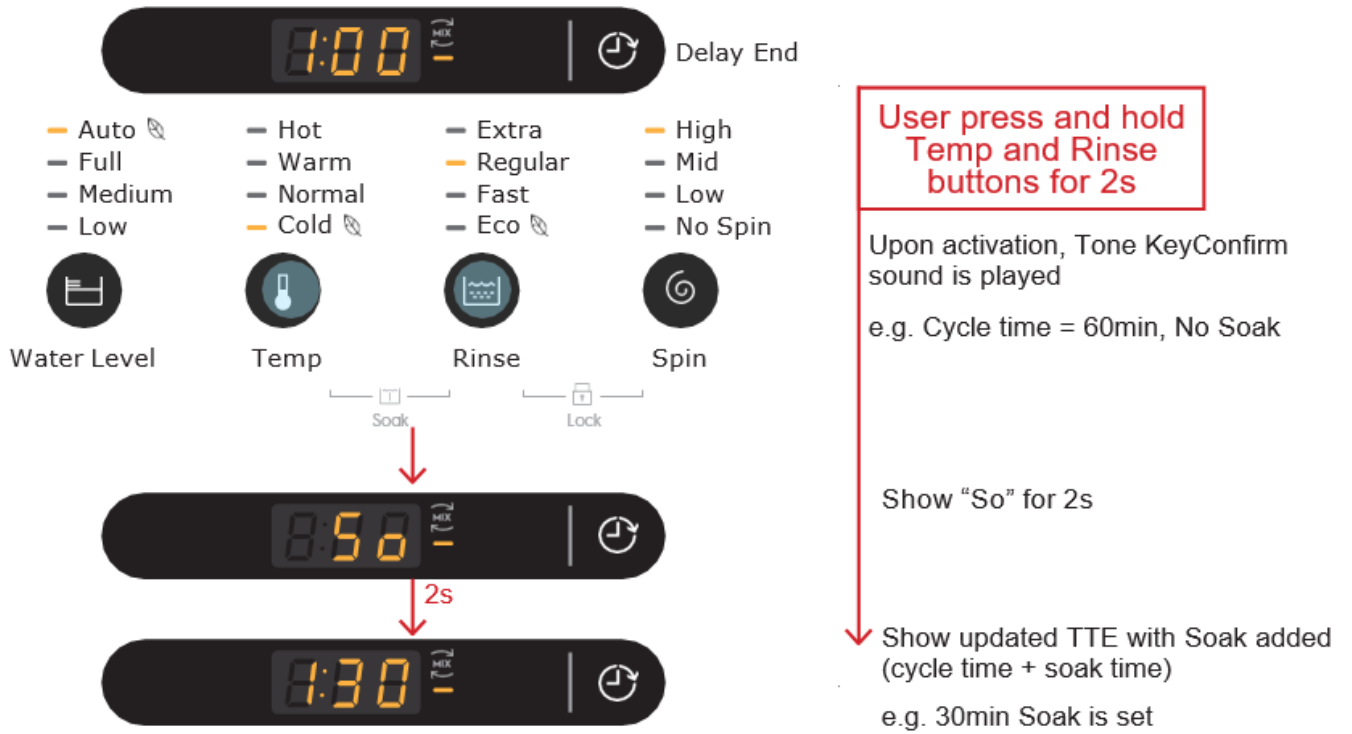
While in Idle State, if the user adjusts any other settings after setting Soak, the display will reflect the updated display accordingly as the user taps on the option keys and the Soak icon remains lit.

Note: Changing of program will cancel Soak and the Soak icon will be dismissed.

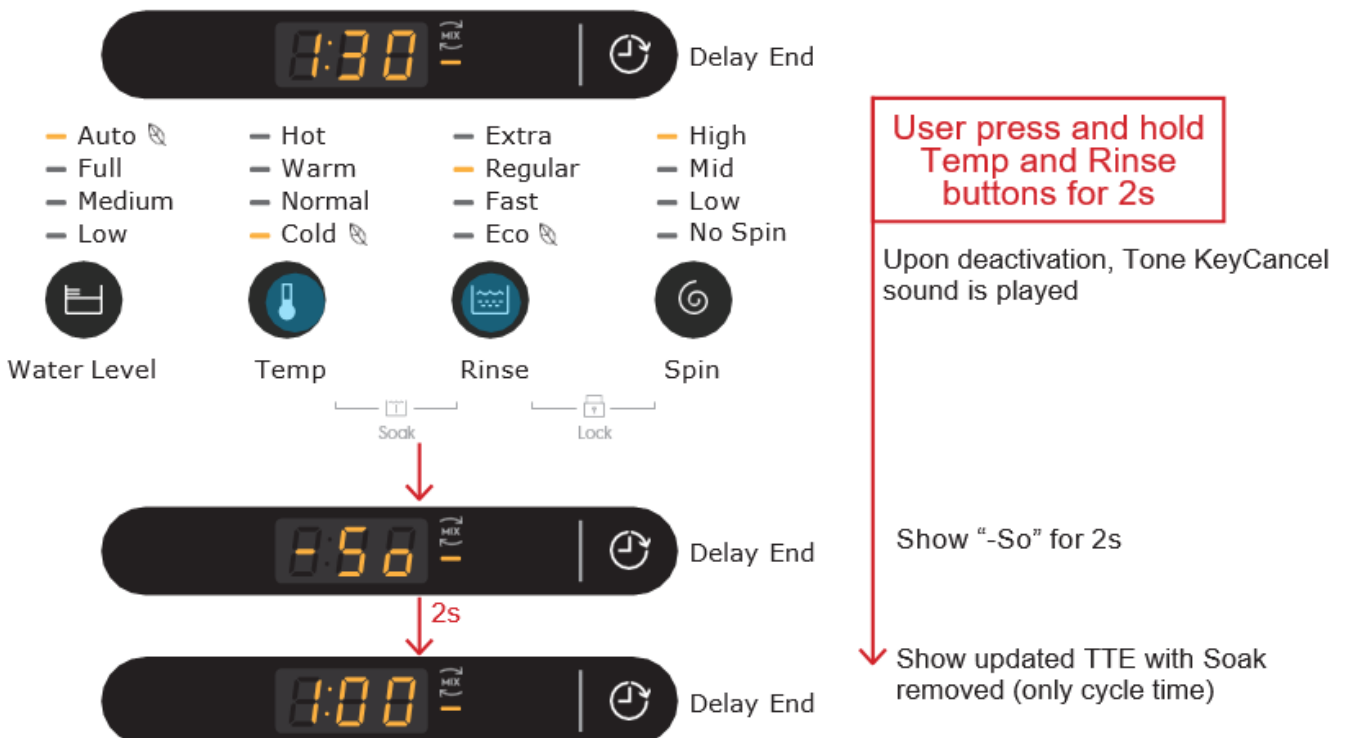


7.7.2 SERIES 500 (AU)

Only a 30 minute Soak option is available. To activate, tap and hold Temp and Rinse buttons for 2s. Upon activation (t=2s), the display will show “So” and tone KeyConfirm sound is played. After 2s, the display will revert back to show the TTE with a 30min of soak added to it.



To cancel Soak, press and hold Temp and Rinse buttons for 2s. Upon deactivation (t=2s), the display will show “-So” and tone KeyCancel sound is played. After 2s, the display will revert back to show the TTE with a 30min of soak removed.



While in Idle State, if the user adjusts any other settings after setting Soak, the display will reflect the updated display accordingly.

Note:

- Soak option is non-sticky. It will not stay on after the cycle is completed or when machine powers off.
- Changing of program will cancel Soak.

7.8 Start Cycle

7.8.1 SERIES 700

After pressing the Start/Pause button, the Start/Pause LED turns steady and display time then decreases and is updated minute by minute. Refer to 5.1 Machine States on display and Start/Pause LED behaviour for details.

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

On Series 500, the main wash phases (UltraMix, Soak, Main Wash, Rinse, Spin) will be indicated by the blinking of the wash phase indicators. During setup, the wash phase icons will light up on the display if they are applicable to the selected program and settings.

When the wash cycle has started, each phase indicator will blink at a rate of 1s during the duration when that particular phase is active. The icons will then be dismissed one by one after the end of each phase.



7.8.2 SERIES 500

After selecting the program, pressing the Start/Pause button will start the wash cycle. The display time then decreases and is updated minute by minute.

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

Note: For programs with Ultramix phase, during Ultramix phase, blink the indicator LED at a rate of 1s. LED then stays steadily lit until cycle ends.



For programs without Ultramix phase, the indicator will not light up when selected.

7.9 Pause Cycle

7.9.1 SERIES 700

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

7.9.2 SERIES 500

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

7.10 Pause Cycle Lifting the lid middle cycle

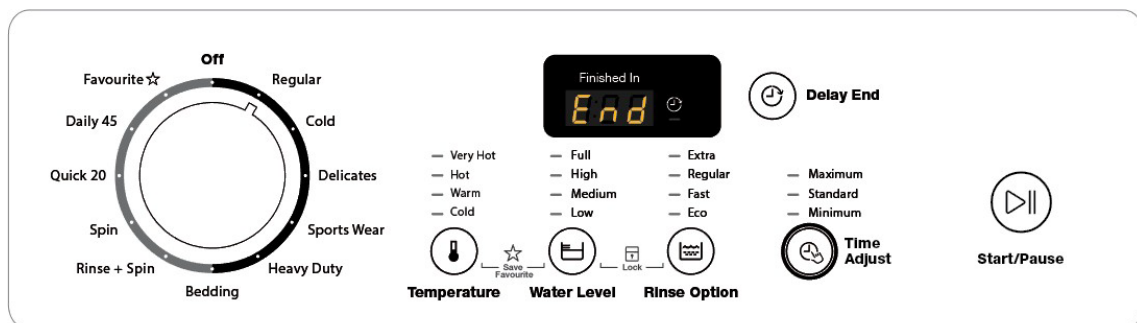
For both 700 and 500 series, the user can open the lid at any time to add clothes. When the user lifts up the lid while the appliance is running, the appliance will go into paused state and the display will show "Ld". User would need to close the lid and press Start/Pause button again to resume the wash cycle.



6.9 Cycle End

When the cycle is completed, the timer goes to "0:00" and the segmented digits will then show "End". All other LEDs on the control panel will be turned off.

Pressing any button or turning the knob during End State will bring the appliance back into Idle/Setup mode. If Child Lock is on, it will show "LOC" (and Child Lock icon, if applicable) on display first before changing back to show wash settings. At this point, Child Lock icon will also be lit for Event model.



The Gemini range automatically goes into Stand Off state after 5min of inactivity after cycle ends.

7.11 Rinse Hold (Series 500 models with no Eco Valve)

For Series 500 models without Eco valve, there is a Rinse Hold option. If the user has set the Rinse setting as Hold, the cycle will pause at last rinse. At which,

- If buzzer is enabled, it will sound.
- Segmented display shows the remaining time at the moment it is paused, and blink at a rate of 1s.
- Hold LED indicator will blink at a rate of 1s.



- During Rinse Hold, the cycle is in an execution state with the impeller moving almost every minute (frequency as defined by R&D Lab) to move the water and clothes in the drum.

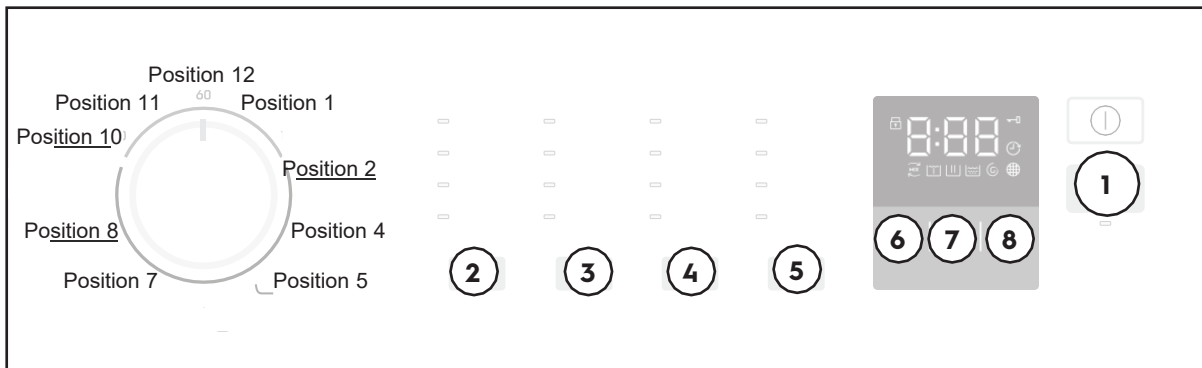
At this point, user may

1. Adjust spin speed settings by pressing Spin button. All other options buttons are disabled. Turning of knob will result in an invalid feedback.
2. Press Start/Pause to continue the wash with the final spin phase. The timer will resume counting down.

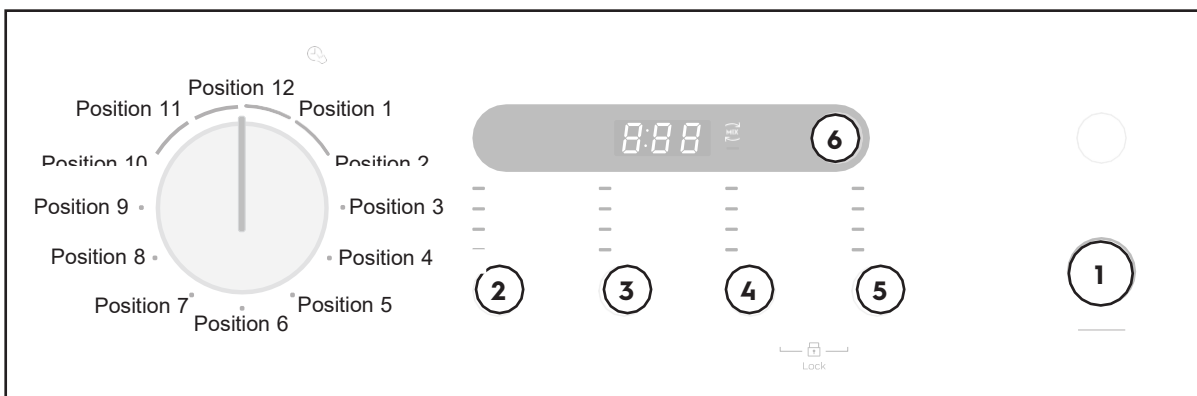
The machine will automatic stop rinse hold and continue the cycle if the Start button is not pressed after 18 hours.

8 HIDDEN FUNCTION

Series 700



Series 500



FUNCTION	KNOB POSITION	1ST BUTTON	2ND BUTTON	ACTION
Enable/ Disable Buzzer sound	-	2	3	Tap and hold for >3s
Diagnostic Mode	1	8 (Series700)	1	Tap and hold for >5s
		5 (Series 500)	1	
Demo mode	3	8 (Series700)	1	Tap and hold for >5s
		5 (Series 500)	1	