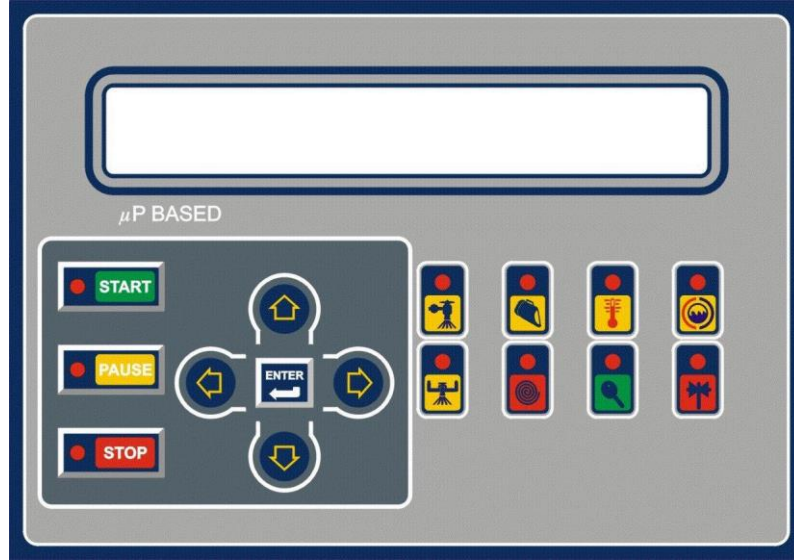


ST 2002 CONTROL UNIT USER'S MANUAL



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GENERAL FEATURES

1. 24 programmable programs (Possibility of increasing to 48 programs).
2. Harmony to Inverter.
3. Feature of continuing from pause mode.
4. Feature of shifting between steps.
5. Analog outputs between 0-10 Volts.
6. 16 Digital outputs.
7. 8 Digital inputs (8 optional inputs).
8. LCD screen.
9. Comfort of following the errors on the screen.
10. Cover lock system
11. Slow and fast extraction options.
12. Comfort of following the program with leds.
13. Adjustable parameters. Around 50 parameters such as extraction speed, washing speed, water taking time value, detergent taking time value etc.

ST2002 CONTROL UNIT KEYPAD



Start button, runs the selected program.



Stop button, if you press this button, the running program will end.



Pause button, if you press this button, the machine will pause



Enter button. This button is used to confirm the selected parameters.

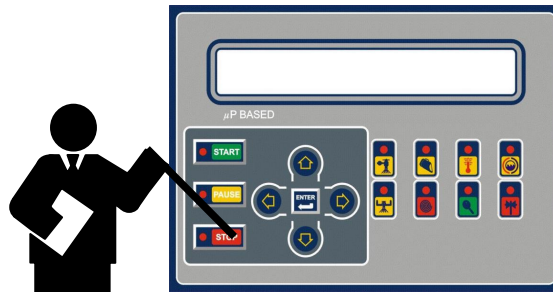


UP-DOWN Arrow buttons, allows the cursor to go up and down.



LEFT-RIGHT Arrow buttons, allows the cursor to go left and right.

ENTERING THE SERVICE PARAMETERS



Shut down the system by pressing the “Emergency Stop” button. Turn the system on by turning the “Emergency Stop” button while pressing the “Stop” button for 10 seconds. Once you see the “Service Parameters” article on the screen you are in the service parameters mode.

Select any parameter with up – down arrow and set the value with left - right arrow. After selecting the values, press the “Enter” button and save the values to the memory of the system. If you don’t want any changes to be saved, don’t press “Enter”. Press the “Stop” button and exit from the service parameters.

SERVICE PARAMETERS

WATER CHARGING ERROR TIME LIMIT: It is the amount of time that the machine gives an error while taking water. On places where the water installations are insufficient it is necessary to enhance this value.

WATER LEVEL CONTROL TIME: The drum keeps on spinning and the system checks the water level inside for this amount of time. This function has been developed to prevent washing the laundry which absorbs too much water with low amount of water.

DETERGENT CHARGING TIME: Determines how long the machine will charge detergent. This duration should be adjusted depending on the quality of the detergent used. (If the detergent is lumpy the duration must be increased)

LEFT-RIGHT ROTATION TIME: This is the amount of time that the drum spins to left and right during washing process.

WAITING DURATION BETWEEN LEFT-RIGHT: This is the amount of time that the drum waits before spinning to the opposite direction during the washing process.

WASHING CYCLE: This cycle must be set so that the laundry would fall from the 1 or 11 o’clock position to 7 or 5 o’clock position during washing process. This function of the machine is called rinsing and helps to wash the laundries in best quality.

WATER HEATING ERROR TIME LIMIT: This is the amount of time that the machine waits before giving an error during the heating process. On regular systems, this duration is set to 30 - 60 minutes however on this system is it between 5 - 10 minutes. Two points should be considered while setting this time; first one is that this time is related with the heating error tolerance parameter, and second one is that this time is related with the strength of the resistances or the pressure of the steam.

WATER HEATING ERROR TOLERANCE: It must be set as high as the resistances or the steam can heat the water in the “Heating Error Time”.

ADDITIONAL DRAIN TIME: This is the amount of time necessary for the machine to discharge the water left inside after reaching the bottom level. This parameter also determines the draining duration. 20 times of this duration gives the draining duration of the machine; however the system does not contain a regular draining system. The draining time can decrease in relation with the quality of the water installments and their draining speed.

SLOW EXTRACTION CYCLE: The slow extraction speed must be set so that the sensitive laundries like pullovers, tulle drapes or silk materials will not be harmed.

FAST EXTRACTION CYCLE: This is the maximum extraction speed of the machine.

INTERVAL EXTRACTION CYCLE: This is the extraction speed between the steps of the selected washing program. This speed should be set so that no laundry would be damaged.

MOTOR STOPPING DURATION AFTER EXTRACTION: Determines the amount of time that the machine needs to stop after extraction process.

NUMBER OF EXTRACTION TRIALS: This is the number of times that the machine will retry extracting after an extraction error.

WAITING TIME AFTER VIBRATION ERROR: This is the amount of time that the machine will wait between two extraction trials. This time should be set long enough for the tumble to stop completely.

INTERVAL EXTRACTIONS STATUS: Every program step includes an extraction option. This is the parameter to cancel or activate these extractions.

HEATER TYPE: Heating type (electric or steam) of the machine can be selected from this parameter.

DISPERSING CYCLE AFTER EXTRACTION: This is the cycle of the machine to disperse the laundry after extraction.

TYPE OF WATER LEVEL SENSOR (FOR MECHANICAL): The water level count of the machine is related with the type of the water level sensor on the machine. (FOR LEVEL SENSOR TYPE)

EXTRACTION TYPE: This parameter determines whether the machine will extract with or without water.

TYPE OF LEVEL INDICATOR: This parameter is related with the type of the water level sensor on the machine. If a litre counter is used on the machine, the parameter should be set as in “litre”, if the machine

has water level sensor the parameter should be set as “level” and if the relay card has pressure sensor the parameter should be set as “pressure”.

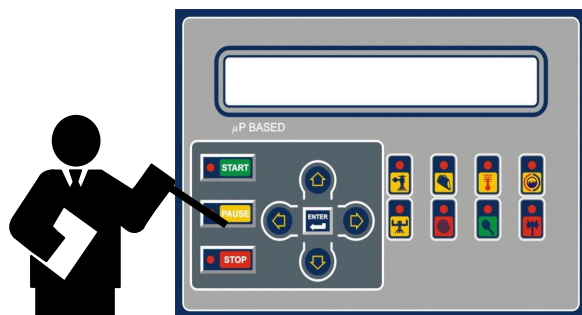
WATER COUNTER MULTIPLIER RATIO(FOR COUNTER): If the machine contains a litre counter, the system takes the 10 times of the parameter entered here as the minimum count level and counts with times of this value forward. (FOR COUNTER)

WATER COUNTER DIVIDEND RATIO(FOR COUNTER): If the machine contains a litre counter, this parameter should be changed related to the type of this counter (the parameter should be changed related to how many pulses on how many litre the counter shows) (FOR COUNTER)

START HEATING WHILE WASHING: If this parameter "1 = YES" is selected, device bypasses the heating process and passes to washing process. Heating will continue during the Washing process.

If this parameter "0 = NO" selected, device will run the machine in the normal operation which is heating and after heating continues to work as a wash.

ENTERING THE FACTORY PARAMETERS



Shut down the system by pressing the “Emergency Stop” button. Turn the system on by turning the “Emergency Stop” button while pressing the “PAUSE” button for 10 seconds. Once you see the “Factory Parameters” article on the screen you are in the Factory Parameters mode.

Select any parameter with up – down arrow and set the value with left - right arrow. After selecting the values, press the “Enter” button and save the values to the memory of the system. If you don’t want any changes to be saved, don’t press “Enter”. Press the “Stop” button and exit from the factory parameters.

FACTORY PARAMETERS MODE

NUMBER OF WATER LEVEL CONTROLS: Determines how many times the machine will check the water level.

TEMPATURE BALANCE TOLERANCE: This parameter is to set the heating regulation tolerance.

Note: If the tolerance is set to 2 and the heat is set to 70 °C, the resistances or the steam valve will be activated at 68 °C.

DISPERSING PARAMETERS

DISPERSING CYCLE: This parameter is to reach the optimum extracting cycle with minimum vibration.

DISPERSING TIME: This parameter sets the waiting durations between the dispersing cycles.

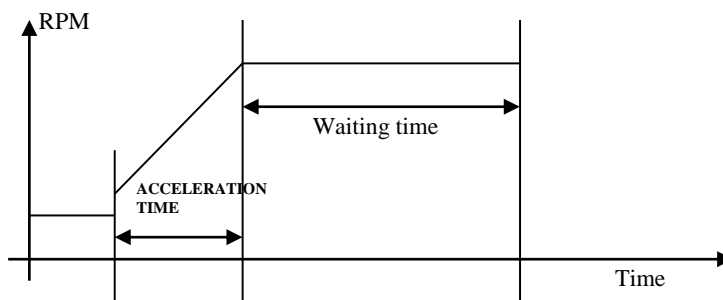
Note: The system contains 10 dispersing cycles and times.

ACCELERATION PARAMETERS

ACCELERATION TIME: Ascending times are related to the ascending cycles. Determines the ascending durations of the machine. These durations allow the inverter to set the optimum ascending times while checking the electric flow.

ACCELERATION CYCLE: Determines the maximum ascending cycle. The ascending time should be equal to the ascending duration.

WAITING TIME BETWEEN ACCELERATIONS: Determines the waiting time after each ascending time.



MOTOR PULLEY TO MAIN PULLEY RATIO: This is the ratio of the diameter of the belt behind the cylinder to the pulley on the motor axle. example : motor pulley diameter 100mm, main pulley diameter 800mm , value: 80

MAX.SPEED CONTROL FREQUENCY :This is the maximum frequency that the inverter can reach.

MOTOR NORMINAL SPEED(FOR 50Hz) :This value is the last two digits of the value in the label of the motor.

Example: If the value on the motor cycle sticker is 1438 cycles/minute the value should be entered as 38.

IMPORTANT NOTE: Don't set the "cycle" before entering the belt-pulley ratio, maximum converter frequency and motor cycle, since the "cycle" will be calculated by using these parameters.

The cycle is calculated as shown below;

$$\text{Maximum Machine Cycle} = \frac{\text{Maximum Converter Frequency} \times \text{Motor Cycle}}{50 \times \text{Belt -Pulley Ratio}}$$

VIBRATION SAMPLING PERIOD :Sampling period of the vibration electrode's input after the first contact.

NUMBER OF SAMPLING FOR VIBRATION ERROR :Determines how many times the vibration electrode has to contact before the "vibration error" warning.

EXTRACTION DISPENSING NO TO START DRAIN:Determines on which extracting phase the machine will discharge the water.

TEMPERATURE PROBE CALIBRATION :This parameter is used to equalize the actual water temperature inside the drum with the screen value.

SPEED CONTROL ERROR OUTPUT CONTACT: Determines the type of the speed control error circuit.

TYPE OF LOADING COVER SWITCH CONTACT :Determines the type of the cover error circuit.

LOADING COVER UNLOCK TIME :This parameter determines the amount of time that the magnetic cover lock system will stay open after completing any operation and pressing the “Stop” button.

Note: Magnetic lock systems are used in washer – extractor machines.

LOADING COVER LOCK TYPE :This parameter determines whether the cover lock system is magnetic or working with air pressure.

Note: Magnetic lock systems are used in washer – extractor machines.

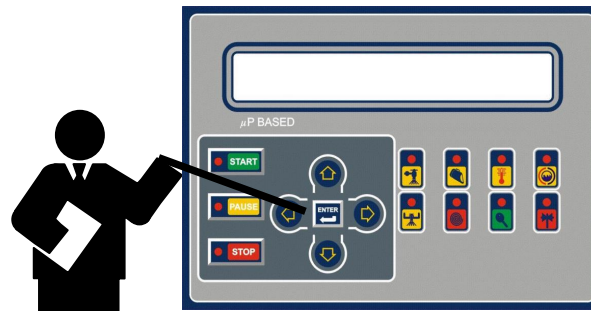
AMOUNT OF WATER FOR EXTRACTION(FOR COUNTER) :This parameter determines how much (litre) water the machine will take while starting the extraction operation. This parameter is only active on the machines with litre counter.

Note: Because the extraction operation is usually done without water, this parameter is set to zero.

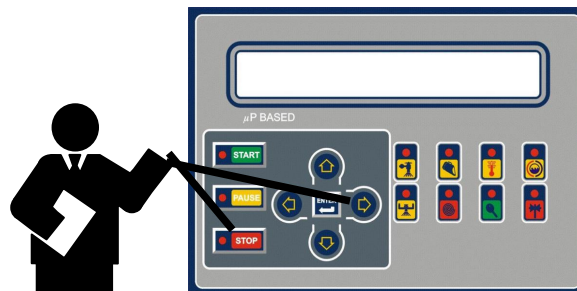
PRESSURE SENSOR CALIBRATION

Entering the calibration mode

Turn off the control unit, ST2002.



While pressing ENTER button, turn on the control unit and keep pressing the button until 'PRESSURE SENSOR CALIBRATION MODE' message displayed on the screen.



You can leave this mode by pressing the STOP button.

If you wish to enter calibration menu press RIGHT ARROW button.

Calibration Process

Water level in washing machine's drum is measured by a pressure sensor. The output of the pressure sensor changes in respect to the amount of water in the drum.

The water is measured in five levels by using the pressure sensor.

During the calibration, use START button to take water in and STOP button, to drain the water. Water is taken in or drained as long as the related button is pressed.

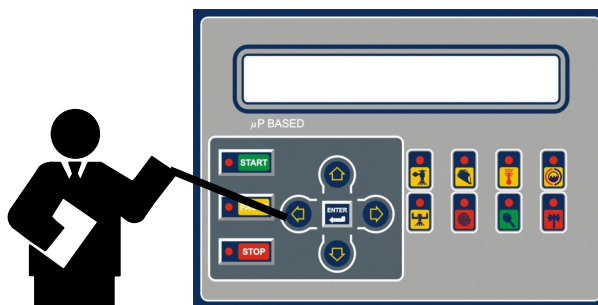
To select the level to be set (L0 ... L4), use UP ARROW and DOWN ARROW buttons.

Labels displayed to show the levels

During calibration	As program parameter	Explanation
L0	[space]	No water in the drum
L1	'Low'	Safe water level for the electrical water heaters.
L2	L1	Level 1
L3	L2	Level 2
L4	L3	Level 3

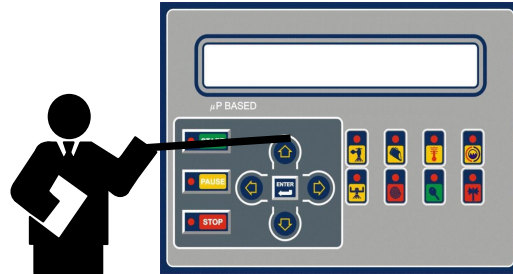
Calibration steps:

- a) Choose the level to be set.
- b) Take in or drain water until reaching to desired water level in the drum.
- c) Press ENTER button to save the amount of water loaded to the level chosen at step (a).
- d) Repeat the steps for each, which level needed to be set.



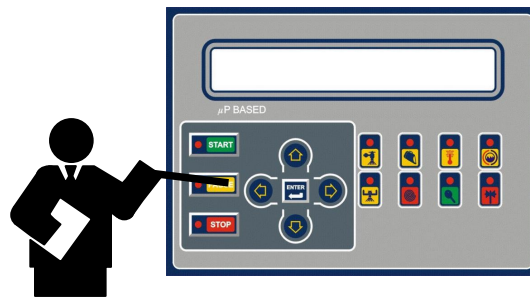
Press LEFT button to exit from the calibration menu and press STOP button to re-start the control unit.

SYSTEM OPERATING INSTRUCTIONS



Use the up – down arrows to select the programs. Use the right – left arrows to skip the programs ten by ten.

After selecting the program press the “START” button to run the process. When the process starts the “STOP” led will go off and the “START” led will go on.



If you press the “Pause” button during the operation, the system will get in to the “pause” mode and the “Pause” led will turn on. If you press the “Start” button the program will run from the point it has been paused. . If you press the “Stop” button , the program will end and the cover lock will be opened.

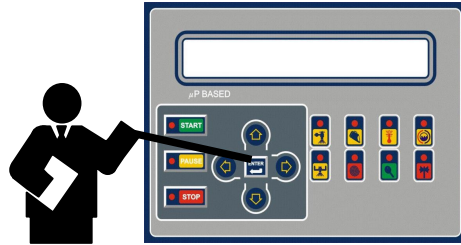
Note: The cover lock will not be opened if there is any water left in the machine and/or if the “cover lock open time” is not over. On these cases the “Start” led blinks.

The steps of the selected program appear on the screen when you press “Enter” on the main screen. It is possible to run the program from any of its steps by pressing the “Start” button when the cursor is on that step.

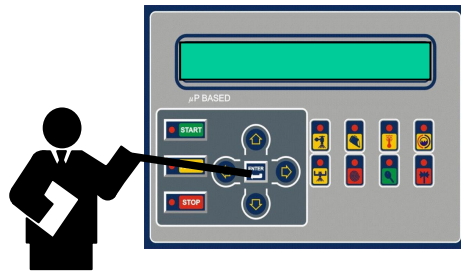
ATTENTION:

- **Opening the cover when machine is in operation is dangerous and forbidden.**
- **Do not try to get in to the machine before shutting down the main power and putting up a notice on the fuse door even if the machine is on stop position.**
- **Do not use the machine before connecting it to the ground line.**
- **The grease oil inside the cylinder must be checked once a month as written in the manual.**
- **It is recommended to check your laundry before loading. Remove any dangerous and hard objects which can harm your machine (like scissors, coins, needles etc.).**
- **Classify your laundry according to their type and color before loading.**

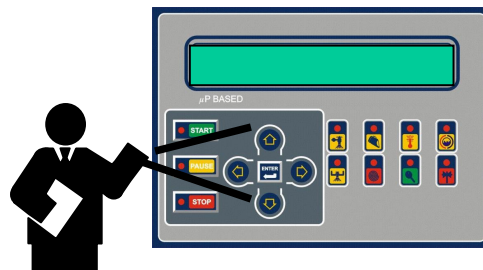
PROGRAMMING THE SYSTEM



See the steps of the selected program by pressing the “Enter” button. If you press the “Enter” button once more for 5 seconds you will reach the programming mode.

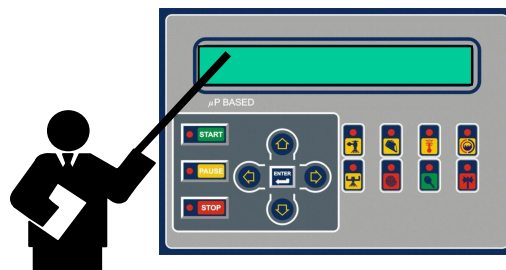


When you see the “WELCOME TO PROGRAMMING MODE” **title** on the screen release the “Enter” button and press the “Start” button for the next page.



Select the program number you want to change by using the up – down arrows. If you also want to change the name of this program press Enter.

You can change the letters of the program name with up – down keys



You can jump to the next or previous letter by using the right – left buttons. After completing the adjustments press “Enter” to go back to the program number section and press “Start” to move to the next page. Select the step you want to adjust by using up – down arrows and press “Enter” to change its parameters. Use up – down arrows to make the necessary changes.

By pressing the right arrow after selecting the “WTime” (Washing Time) parameter you will enter to the Extraction Parameters. Set the parameters by using the up – down arrows. You can leave this section by pressing “Enter”. If you need to make any other changes repeat the steps above. If there is no other parameter to change exit the page by pressing the “Stop” button. You can leave the programming mode by pressing the “Stop” button once more.

ABBREVIATIONS

LEV	:	WATER LEVEL (FOR MACHINES WITH LEVEL COUNTER)
TMR	:	OPERATING TIME
TEMP/TMP	:	OPERATING TEMPERATURE
TOT	:	TOTAL OPERATING TIME
DET	:	DETERGENT UNIT
PRNO	:	PROGRAM NO
PNAME	:	PROGRAM NAME
WTIM	:	WASHING TIME
ETYP	:	EXTRACTION TYPE
ETIM	:	EXTRACTION TIME

SYSTEM ERRORS

WATER CHARGING ERRORS

Charging Error

1. Water pressure might be low.
 - The problem can be solved by increasing the water charging parameter.
2. The water charging valve could be closed.
3. The time value of water charging error parameter could have been set too short.
 - The problem can be solved by increasing the time value of water charging parameter.
4. The drain can be leaking.
5. The waste holder of the water installment can be blocked or filled.

Low Water Charging

Water level sensor might be damaged.

Excess Water Charging

1. Water level sensor might be damaged.
2. The water level sensor hose could be leaking air.
3. The water level sensor hose could be blocked.
4. The water valve could be leaking.

HEATING ERRORS

1. If the machine works with electric heating; the resistances could be closed or damaged, if the machine works with steam the steam valve could be closed or damaged.
2. The steam pressure could be insufficient.
 - If the steam pressure can not be increased the problem can be solved by adjusting the heating parameters.
3. The heating error time and/or heating error tolerance could be unadjusted.
 - This problem can be solved by adjusting the “Heating Parameters” in the “Service Parameters”.

WATER LEAKING ERRORS

1. The outer drum could be damaged.
2. Water level sensor might not be sensing the bottom level.
3. Level cable of the water level sensor might be damaged.
4. The drain might be left open or leaking.

DRAINING ERRORS

If the system shows draining but the machine can not drain;

1. The water draining hose could be blocked.
2. The sewerage of the system could be insufficient.
3. The level sensor could be locked at the bottom level.
4. Additional draining time could be insufficient.

-The additional draining time should be enhanced from the service parameters.

If the machine can not start draining;

1. Water level sensor might not be sensing the bottom level.

VIBRATION ERRORS

If the system gives a vibration error;

1. The amount of the laundry in the machine could be low.
2. The springs could be damaged.
3. Vibration error parameter could be not adjusted
4. The area where the machine is placed could be unbalanced
5. The machine could be placed unbalanced
6. Vibration electrode could be stuck

If there is high vibration but the system does not give any errors

1. Vibration electrode could be damaged
2. Vibration electrode cable could be damaged

EXTRACTION ERRORS

If the machine can not perform extraction operation:

1. Extraction parameters could be not adjusted
2. Electrode cable could be damaged.

If the machine can not perform interval extraction operation:

1. Interval extraction parameters could be not adjusted

If the machine performs extraction but the cycle is low:

1. Extraction parameters could be not adjusted
2. Speed control parameters could be not adjusted

If the machine drains earlier or later than needed:

1. Dispense no for drain parameter could be not adjusted

If the speed control gives error;

1. The ascending parameters could be not adjusted.
2. There could be some problems with the system parameters.
3. The speed control parameters could be not adjusted.

SPEED CONTROL ERRORS

1. There could be some problems with the input voltage.

-
2. The motor could be damaged.
 3. The motor and speed control cables could be damaged.
 4. The speed control fuses could be off.
 5. It could be that the speed control haven't been reset after the last speed control error (the power of the speed control must be shut down for 1 minute after it gives an error)

COVER ERRORS

1. The cover could be not closed well.
2. The switch on the cover could be damaged

CONNECTIONS

