LELIT	EXPERIMENTAL LABORATORY	7900038 REV01

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LCC

SETTINGS/ PARAMETERS MODIFICATION of the TECHNICAL MENU

To enter the technical menu:

With the machine off, keep pressed both "**−**" and "**+**" of the LCC, switch the machine on and wait until the display shows KP, then release the "**−**" and "**+**" of the LCC.
With the left key/button you scroll the parameters.
With the right key/button you enter to program the chosen parameter.
Once you are in the programming phase of the chosen parameter, the value will blink on the display and you can increase it pressing "**+**" or decrease it pressing "**−**".
Once you finished modifying the settings, wait three seconds and the display will stop blinking and the new set value will be memorized. Turn the machine off.

PARAMETERS

KP: up value, when this value increases, the heating element heats more frequently in the ascent phase, therefore it generates more inertia which means more degrees than the value set by the user.
On the contrary, if you decrease this value, the heating element heats less frequently in the ascent phase, therefore it generates less inertia which means less degrees than the value set by the user.
Allowed values 0÷9,99
Set value by us 1.0

KI: maintenance value, it increases the cycles of activation of the heating element when it's in stand-by mode.
Allowed values 0÷9,99
Set value by us 0.0

KD: down value. Increasing this value, LCC activates the heating element more frequently when the boiler is in the descent phase, if the value is increased, more impulses are given, therefore it decreases a little bit less.
Allowed values 0÷9,99
Set value by us 20.0

B: - value, compared to the set value within which the LCC works (expressed in °Farenheit)
Allowed values 1÷40
Set value by us 30 (around 16°C)

E: offset LCC/boiler. Setting 0, LCC rules the set temperature; setting 10, LCC rules the boiler temperature with 10° (expressed in °C or °F depending on the set parameter) more than the value set by the user.
Allowed values 0÷50
Set value by us 0

F01: lighting of the buttons. 1=ON; 0=OFF
Set value by us 1

F02: time for refilling the boiler with water when the steam mode is finished
Allowed values 0÷60
Set value by us 20

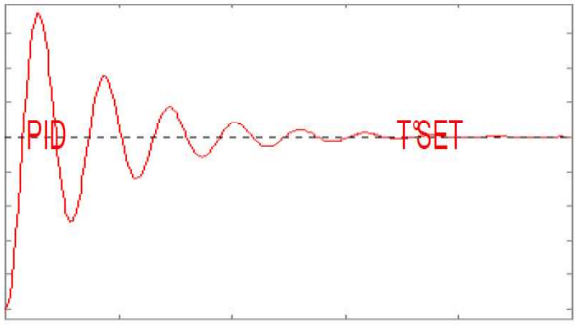
LCC RESET

If you wish to reset the LCC, with the machine OFF, keep pressed the right key/button "+", turn the machine ON and wait until the display shows PRS then turn the machine OFF again.

FUNCTIONS OF THE PID VALUES

The default regulation of the temperature is realized according to an algorithm called PID.
The constants that determine the thermoregulation are called

- Proportional constant Kp
- Integrative constant Ki
- Derivative constant Kd
- The proportional range is the range, within which the temperature is set by the PID, outside it the heating element is regulated by ON/OFF.



The three constants and the proportional range have to be adapted to the espresso machine, depending from the heating element power, the boiler dimensions, the fluidic and its dispersion. This regulation usually requires a bit of time in order to get the best possible result.

We call "set point value" or T°SET the boiler temperature it has to have during normal functioning.

- If, during the heating or maintenance phase, the temperature excessively swings around the T°SET, with values that do not weaken in time, the proportional constant Kp needs to be diminished.
- If, in the maintenance phase, the temperature excessively swings around the T°SET, with a very long swing period and with values that do not weaken in time, the integrative constant Ki needs to be diminished.
- If, in the heating or maintenance phase, the temperature has an excessive swing and it's often more than the T°SET but then weakens in time, the derivative constant Kd needs to be diminished.
- If, in the heating phase, the temperature tends to be below the T°SET and gets more and more far away from it, the derivative constant Kd needs to be increased.
- If, in the heating phase, the temperature tends to be below the T°SET, in a constant way, the proportional constant Kp needs to be increased and also the integrative constant Ki needs to be slightly increased.
- If, in maintenance phase, the temperature tends to be below or above the T°SET value in a constant way, the integrative constant Ki needs to be increased and also the proportional constant Kp needs to be slightly increased.