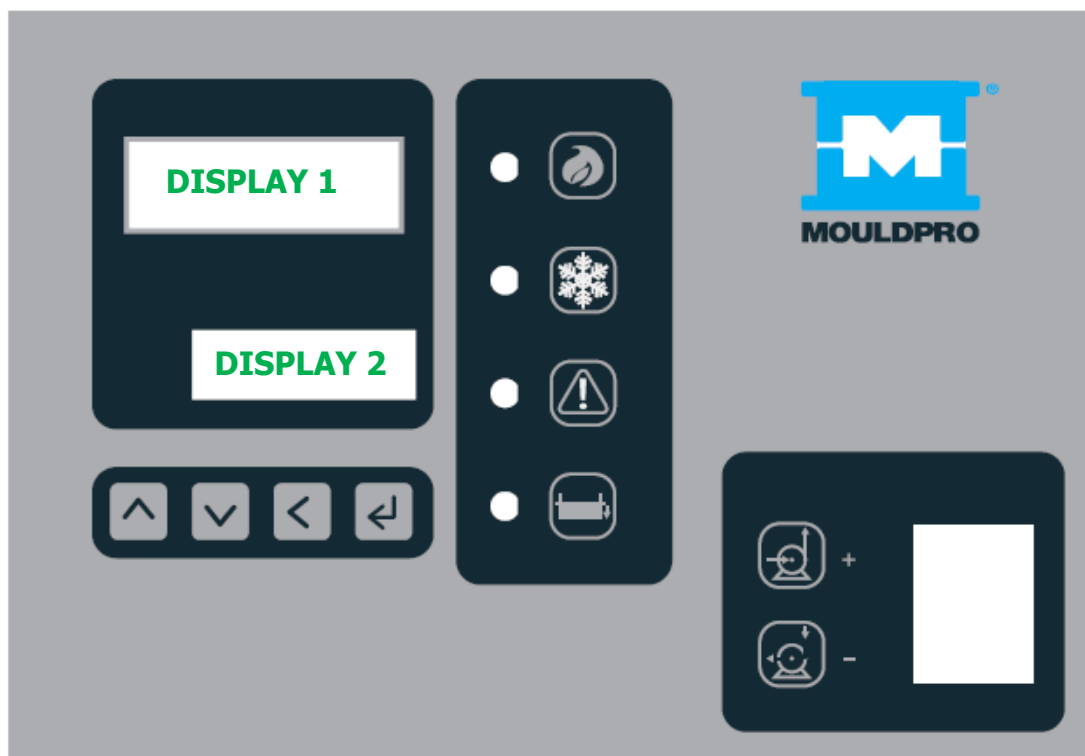


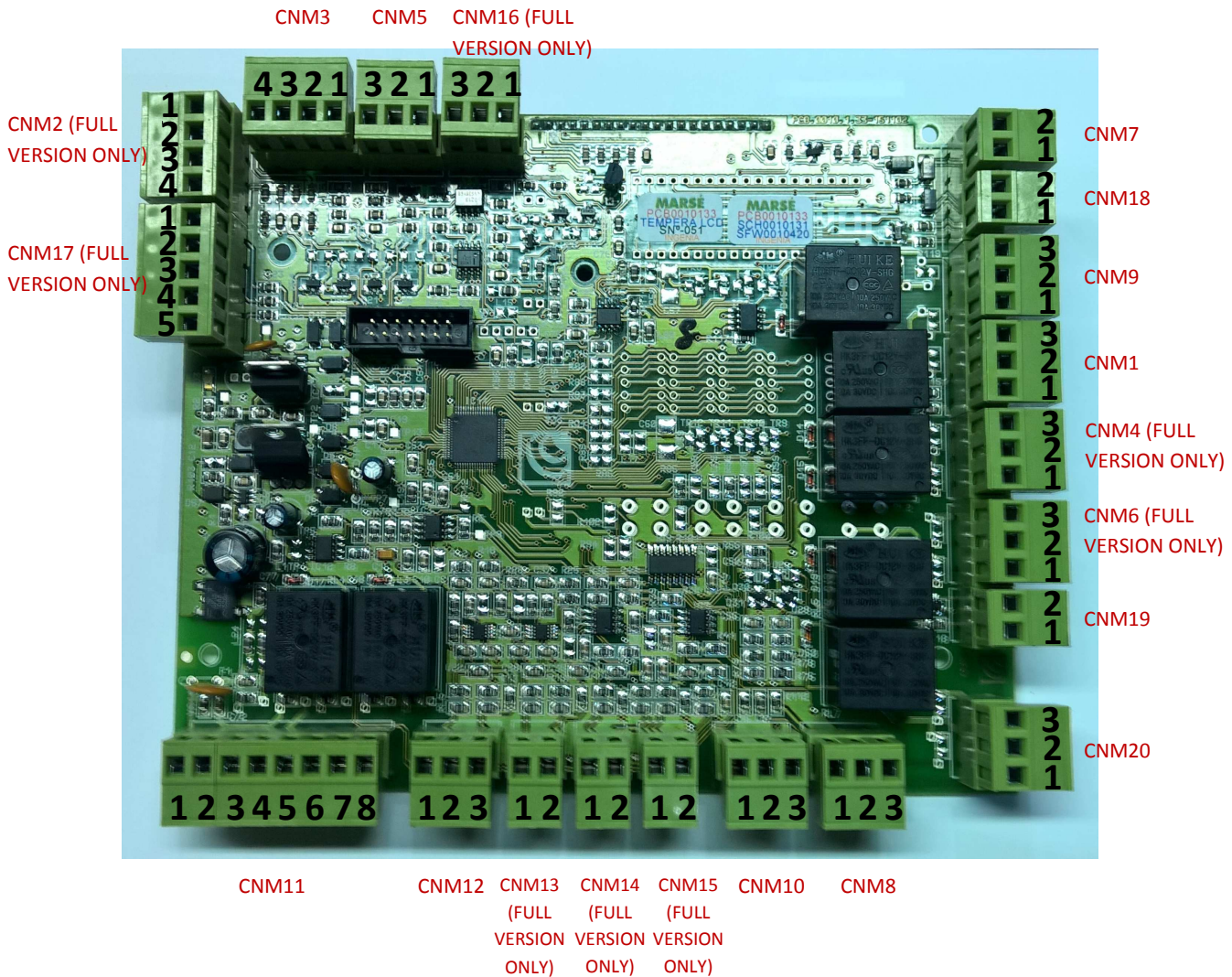
## PCB setting instructions

<u>SET 0</u>		<u>Default values</u>
<b>pb</b>	Heat process's proportional value.	3
<b>ti</b>	Process's time integral.	20
<b>td</b>	Process's time derivative.	25
<b>rE.ty</b>	Type heat relay.	SSr
<b>cli</b>	Heat ramp.	0,3
<b>Br</b>	Heat brake.	12
<u>SET 1</u>		
<b>CL.pb</b>	Cold process's proportional value.	1,3
<b>CL.br</b>	Cold brake.	40
<b>CL.CL</b>	Cold ramp .	0,6
<u>SET 2</u>		
<b>in.Sr</b>	Temperature's read input.	tC1
<b>FL.AC</b>	Flowmeter's activation.	Off
<b>FL.SC</b>	Flowmeter's signal type.	SrC.A
<b>FL.FS</b>	Flowmeter's full scale.	50
<b>FL.LL</b>	Flowmeter's minimum level.	5
<b>FL.AL</b>	Flowmeter alarm.	15
<b>Vi.AC</b>	Sensor 2 temperature's visualization activation. (FULL VERSION ONLY)	Off
<b>Vi.Sr</b>	Sensor 2 temperature's type outlet. (FULL VERSION ONLY)	tC2
<u>SET 3</u>		
<b>AL.ty</b>	Temperature's alarm type.	Rel
<b>SP.AL</b>	Overtemperature alarm .	6
<b>Al.d</b>	Management alarm relays.	Dir
<b>Sr.AC</b>	Activation remote setpoint.	Off
<b>Sr.SC</b>	Remote setpoint's signal type.	SrC.A
<b>Sr.FS</b>	Remote setpoint's full scale.	90
<b>Sr.LL</b>	Remote setpoint's minimum level.	0
<b>Sr.HL</b>	Remote setpoint's maximum level.	90
<b>Out.t</b>	Temperature's signal output selection. (FULL VERSION ONLY)	Out.A
<u>SET 4</u>		
<b>BiAS</b>	Offset temperature's correction.	0
<b>unit</b>	Temperature's unit.	°C
<b>SP.LL</b>	Setpoint's minimum level.	0
<b>SP.HL</b>	Setpoint's maximum level.	90
<b>R1</b>	Authorization pump operation (CNM20)	Pump
<b>R1.Va</b>	Associated value at R1	0
<b>R2</b>	Configurable relay 2 (CNM6) (FULL VERSION ONLY)	Off
<b>R2.Va</b>	Associated value at R2 (FULL VERSION ONLY)	0
<b>R3</b>	Configurable relay 3 (CNM4) (FULL VERSION ONLY)	Off
<b>R3.Va</b>	Associated value at R3 (FULL VERSION ONLY)	0
<u>SET 5</u>		
<b>deF</b>	Reprogramming.	
<b>ver</b>	Show the software version.	

<b>SET 6</b>		
<b>LEvF</b>	Keyboard protection.	0
<b>SET 7</b>	<b>(FULL VERSION ONLY)</b>	
<b>COMS</b>	Communications activation.	Off
<b>Addr</b>	Address assigned to the circuit.	1
<b>bAud</b>	Transmission speed.	1
<b>PAr</b>	Parity bit.	1
<b>in.ty</b>	Interface type.	420
<b>dEn</b>	Data enable.	1
<b>SET 8</b>		
<b>in.LE</b>	Selection level detection.	ELEC
<b>dC.ti</b>	Time to the main disconnection control.	0
<b>CO.ti</b>	Time to the main connection control.	0
<b>iP.AC</b>	Output pressure's visualization activation. <b>(FULL VERSION ONLY)</b>	Off
<b>iP.AL</b>	Output pressure's alarm. <b>(FULL VERSION ONLY)</b>	8.0
<b>iP.LL</b>	Output pressure's minimum level. <b>(FULL VERSION ONLY)</b>	0
<b>iP.FS</b>	Output pressure's full scale. <b>(FULL VERSION ONLY)</b>	10.0
<b>rP.AC</b>	Return pressure's visualization activation. <b>(FULL VERSION ONLY)</b>	Off
<b>rP.LL</b>	Return pressure's minimum level. <b>(FULL VERSION ONLY)</b>	0
<b>rP.FS</b>	Return pressure's full scale. <b>(FULL VERSION ONLY)</b>	10.0
<b>VA.ti</b>	Valve open time before alarm.	9
<b>Va.ty</b>	Control type water inlet valve's management.	dir
<b>LM</b>	Leak Monitor	On



## CONNECTOR'S CARDS



**CNM1:** General alarm relay.

**CNM2:** Inputs pressure transducers. (FULL VERSION ONLY)

**CNM3:** Input flowmeter.

**CNM4:** Configurable relay (R3). (FULL VERSION ONLY)

**CNM5:** Input electrical pump protection.

**CNM6:** Configurable relay (R2). (FULL VERSION ONLY)

**CNM7:** Input level detection (magnetic buoy).

**CNM8:** Output power SSR 24 Vdc.

**CNM9:** Fill water relay.

**CNM10:** Input external RSP.

**CNM11:** Input 24 Vac power / control of heating and cooling.

**CNM12:** Input process thermocouple J type.

**CNM13:** Input return/external thermocouple J type. (FULL VERSION ONLY)

**CNM14:** Input process thermocouple PT100 type. (FULL VERSION ONLY)

**CNM15:** Input return/external thermocouple PT100 type. (FULL VERSION ONLY)

**CNM16:** Analog output process temperature. (FULL VERSION ONLY)

**CNM17:** Inlet / outlet communications. (FULL VERSION ONLY)

**CNM18:** Input water level detection (electrode).

**CNM19:** Input 24VAC to start the pump.

**CNM20:** Authorization pump operation (R1).

## **Programming**

The voltage of this electronic card are 24 Vac and the maximum intensity are 250 mA.

On DISPLAY 1 we have the real temperature of the machine. On DISPLAY 2 we have the temperature at wich we want to get.

To change the value of setpoint's temperature (display 2) press key ◀, with keys ▼ and ▲ change the value of the parameter and with ◀ key change the digit.

Confirm with key ↵ .

To enter programming of the electronic board, press keys ◀↵ at the same time for 5 seconds.

With key ↵ you go to SET that you want (display 1).

With key ◀ you enter inside SET.

With key ↵ you go to the parameter that you want (display 1).

With key ◀ you enter in the parameter (display 2).

With keys ▼ and ▲ change the value of parameter and with ◀ key change the digit.

With key ↵ confirm the value.

Wait for a few seconds to appear the temperature of the machine.

- PID Is a type of proportional integral and derivative control. This is archieved through a formula that calculated the parameters "Pb", "ti", and "td" automatically that it used in the heating or cooling process.

## SET 0

**Pb:** Heat process's proportional value (3 ssr - 15 cont).

There is no unit of measure (proportional value that multiplies the time that KM3 is connected giving current to there to the resistances. This time is given by PID). How much higher is the value, more time. How much smaller, less time.

Maximum value with "cont" are 5,0 and minimum 0,1.

Maximum value with "ssr" are 2,0 and minimum 0,1.

**ti:** Process's time integral (20 ssr - 100 cont).

It's changed automatically by the PID control of the electronic board.

**td:** Process's time derivative (25 ssr - 125 cont).

Is changed automatically by the PID control of the electronic board.

**rE.ty:** Type heat relay (SSr).

Ssr- Activates the heating through the solid state relays. This exit is always 24 Vdc. The maximum intensity of this output are 100 mA. When you put this value, the values of parameters "Pb", "ti", "td" i "Cli" changing automatically.

Cont- Activates the heating through KM3.

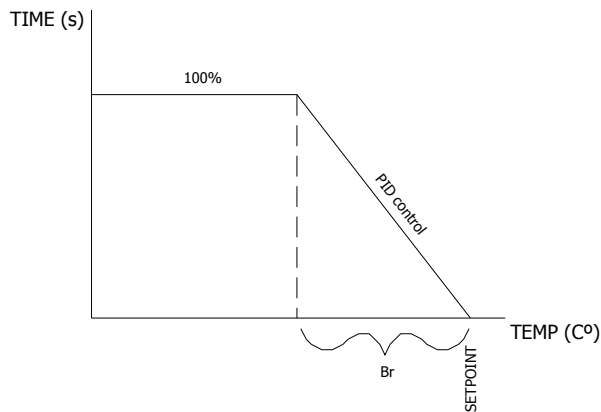
**Cli:** Heat ramp (0,3 ssr - 1,25 cont C°).

This parameter is activated when it enters the PID control.

In cycles of 10 seconds, if the temperature has not exceeded this value, it will activate again the heating. If to the contrary has passed, the heating isn't activated until the next cycle, it will look again.

**Br:** Heat brake (12 C°)

Heating gives 100% until it arrives at the setpoint's temperature minus the value of "Br". When it comes to this value, PID control starts.



SET 1

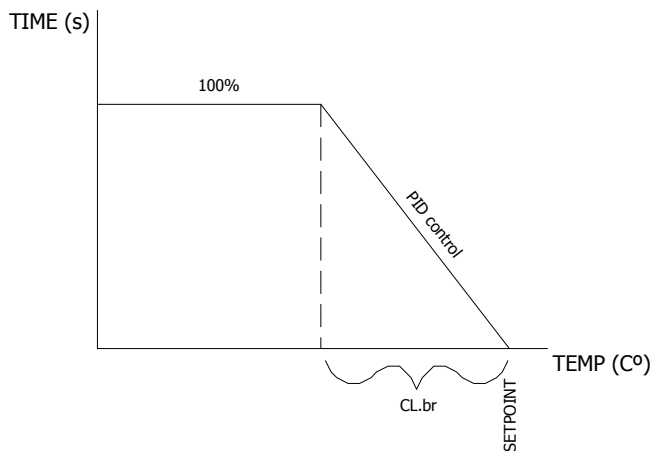
**CL.pb:** Cold process's proportional value (1,3).

There is no unit of measure (proportional value that multiplies the time that cooling electrovalve is connected. This time is given by PID). How much higher is the value, more time. How much smaller, less time.

Maximum values are 2,4 and minimum 0,2.

**CL.br:** Cold brake (40 C°).

Cooling gives 100% until arrives at the setpoint's temperature plus the value "CL.br". When it comes to this value, starts the PID control.



**CL.CL:** Cold ramp (0,6 C°).

This parameter is activated when it enters the PID control.

In cycles of 8 seconds, if the temperature has not exceeded this value, it will activate again the cooling. If to the contrary has passed, the cooling isn't activated until the next cycle, it will look again.

## SET 2

**in.Sr:** Temperature's read input (tC1).

Here we choose if we read the temperature from thermocouple (tC1) or for PT100 (Pt1). (FULL VERSION ONLY)

**FL.AC:** Flowmeter's activation (Off).

Activate or not the flowmeter. On-Off.

**FL.SC:** Flowmeter's signal type (SrC.A).

Choose if the flowmeter signal type is in mA (SrC.A) or in Vdc (SrC.v).

**FL.FS:** Flowmeter's full scale (50 L/min).

Maximum value in l/min that can pass. According to characteristics of the manufacturer. This parameter has the value 20 mA or 10 Vdc.

**FL.LL:** Flowmeter's minimum level (4 L/min).

Minimum value in l/min that can pass. According to characteristics of the manufacturer. This parameter has the value 4 mA or 0 Vdc.

**FL.AL:** Flowmeter alarm (15 L/min).

Minimum value of the flowmeter to activate alarm.

**Vi.AC:** Sensor 2 temperature's visualization activation (Off). (FULL VERSION ONLY)

Activate or not the visualization sensor 2 temperature's. On-Off.

**Vi.Sr:** Sensor 2 temperature's type outlet (tC2). (FULL VERSION ONLY)

We choose if the visualization sensor 2 temperature's is done by thermocouple (tC2) or for PT100 (Pt2).



## SET 3

**Al.ty:** Temperature's alarm type (rel).

rEl: It's relative to setpoint just above depending on the value of the parameter "SP.AL".

GAP: It's relative to setpoint above and below according to the value of parameter "SP.AL".

**SP.AL:** Overtemperature alarm (6 C°).

Is the maximum value in degrees that you can move up or down the setpoint before activate the alarm.

**Al.d:** Management alarm relays (dir).

dir: In the connector of the board CNM1 it active the alarm signal by NO.

rEv: In the connector of the board CNM1 it active the alarm signal by NC.

**Sr.AC:** Activation remote setpoint (Off).

Activate or not the remote setpoint. On-Off. We see on display 2 "0" if we activate this parameter but receive any signal.

**Sr.SC:** Remote setpoint's signal type (SrC.A).

Choose if the remote setpoint's signal type is in mA (SrC.A) or in Vdc (SrC.v).

**Sr.FS:** Remote setpoint's full scale (90 C°).

This parameter is the maximum temperature of the remote setpoint when enter the 20 mA or 10 Vdc whenever it is the same value as the parameter "Sr. HL". If the input is 5 Vdc this value should be twice that the parameter "Sr. HL".

**Sr.LL:** Remote setpoint's minimum level (0 C°).

Minimum value in degrees that you can program the machine for the remote setpoint.

**Sr. HL:** Remote setpoint's maximum level (90 C°).

Maximum value in degrees that you can program the machine for the remote setpoint.

**Out.t:** Temperature's signal output selection (Out.A). (FULL VERSION ONLY)

Choose if the temperature's output signal type is in mA (Out.A) (4-20 mA) or in volts (Out.v) (0-10 Vdc). These values will always be proportional between the values that have been given to the parameters for SET 4 "SP.LL" (4 mA-0 Vdc) and " SP.HL" (20 mA-10 Vdc).

#### SET 4

**BiAS:** Offset temperature's correction (0 C°).

It used to correct the reading of temperature for above and below, if this is not what we think they should be.

**unit:** Temperature's unit (C°).

Choose if you want the temperature in degrees celsius (C°) or in degrees fahrenheit (F°).

**SP.LL:** Setpoint's minimum level (0 C°).

It's the minimum temperature that you can program the machine for the setpoint.

**SP.HL:** Setpoint's maximum level (90 C°).

It's the maximum temperature that you can program the machine for the setpoint.

**R1:** Authorization pump operation (CNM20).

This relay only authorizes, or not, the pump operation.

**R1.Va:** Associated value at R1.

**R2:** Configurable relay 2 (CNM6). [\(FULL VERSION ONLY\)](#)

This relay is used to give an alarm in the following situations

**TP1:** Outlet temperature to process.

**TP2:** Process return temperature.

**P1:** Pump pressure.

**P2:** Process back pressure.

**FM:** Return process flow.

**AL:** General alarm.

**R2.Va:** Associated value at R2. [\(FULL VERSION ONLY\)](#)

Value in degrees, bars, liters/minute or minutes, depending type of configuration of the previous parameter **R2**.

**R3:** Relé configurable 3 (CNM4). [\(FULL VERSION ONLY\)](#)

This relay is used to give an alarm in the following situations

**TP1:** Outlet temperature to process.

**TP2:** Process return temperature.

**P1:** Pump pressure.

**P2:** Process back pressure.

**FM:** Return process flow.

**AL:** General alarm.

**R3.Va:** Associated value at R3. [\(FULL VERSION ONLY\)](#)

Value in degrees, bars, liters/minute or minutes, depending type of configuration of the previous parameter **R3**.

## SET 5

**deF:** Reprogramming.

If we put "1562" we can change the parameters of SET 0 and SET 1.

**ver:** Show the software version.

## SET 6

**LEvF:** Keyboard protection.

If we put the value "1" we block keyboard and we will have to press the two keys programming for 15 seconds.

## SET 7 (FULL VERSION ONLY)

**COMS:** Communications activation (Off).

Activate or not the communications. On-Off.

**Addr:** Address assigned to the circuit (1).

The first unit would the address 1, if there were more units linked the next unit would be 2 and so on.

**bAud:** Transmission speed (1).

(2400bauds) **1** (4800bauds) i **2** (9600bauds).

**Par:** Parity bit (1).

**0**(sense paritat), **1**(paritat senar) i **2**(paritat parell).

**in.ty:** Interface type (420).

**420**(0-20mA) o **485**(RS485).

When we select the interface type **485**, the next parameter **dEN** doesn't appear.

**dEn:** Data enable (1).

When the interface is **20mA** and has only one unit with communications with the **MASTER** unit, the value of the parameter **dEN** will be **1** (close circuit); if have more than one linked unit, all have the parameter **dEN** value at **0** except the last unit that will have the value **1**.

## SET 8

**in.LE:** Selection level detection (ELEC).

We select if the water level is detected by electrode (ELEC) or by the buoy (buOy).

**dC.ti:** Time to the main disconnection control (0).

This parameter delay the connection of the main control relay when the correct water level in the tank was detected.

**THIS PARAMETER CAN'T BE CHANGED WITHOUT CONSULTING THE MANUFACTURER.**

**CO.ti:** Time to the main connection control (0).

This parameter delay the disconnection of the main control relay when the correct water level in the tank wasn't detected.

**THIS PARAMETER CAN'T BE CHANGED WITHOUT CONSULTING THE MANUFACTURER.**

**iP.AC:** Output pressure's visualization activation (Off). [\(FULL VERSION ONLY\)](#)

Activate or not the output pressure's visualization. On-Off.

**iP.AL:** Output pressure's alarm (8.0 bar). [\(FULL VERSION ONLY\)](#)

Maximum value of the output pressure before activate the alarm and disconnect the heat.

**iP.LL:** Output pressure's minimum level (0 bar). [\(FULL VERSION ONLY\)](#)

Minimum output pressure's value of the transducer according to the manufacturer.

**iP.FS:** Output pressure's full scale (10.0 bar). (FULL VERSION ONLY)

Maximum output pressure's value of the transducer according to the manufacturer.

**rP.AC:** Return pressure's visualization activation (Off). (FULL VERSION ONLY)

Activate or not the return pressure's visualization. On-Off.

**rP.LL:** Return pressure's minimum level (0 bar). (FULL VERSION ONLY)

Minimum return pressure's value of the transducer according to the manufacturer.

**rP.FS:** Return pressure's full scale (10.0 bar). (FULL VERSION ONLY)

Maximum return pressure's value of the transducer according to the manufacturer.

**VA.ti:** Valve open time before alarm (9 min).

It's the time that passes between starting the machine and don't reached water. Active alarm.

**VA.ty:** Control type water inlet valve's management (dir).

The level water uses a contact NC (dir) or NO (rEv).

**LM:** Leak Monitoring.

Enable/Disable the leak monitoring process (On).