

# Programmable thermocontroller (L / J / K)



## Technical data:

Code : MC200  
Model : AP-212 AP\_213  
Supply : 220 v , 50 Hz , +/- 10%  
Range : **0...300 (L type)**  
0 ...600 C (J type)  
0 ...1250 C (K type)  
Outputs : **Analog current 4...20 mA**  
Relay (5 A / 250 Vac)

Control : **Smart PID (all P, I and D parameters included in one P parameter). The same as previously represented for test.**

Accuracy: **1 %**

Connections : **Scrwe type**

Amb. Temp.: -10...+50 C

Dimensions : **72x72 mm front panel mounting**

Warranty : **One year**

## Features:

- Smart & Simple control.
- Auto reset using watch dog.
- On line parameter editing.
- Programmable UP & DOWN hysteresis (for On-Off mode).
- Offset for zero calibration.
- Relay output for alarm.

## Details:

A : Front panel

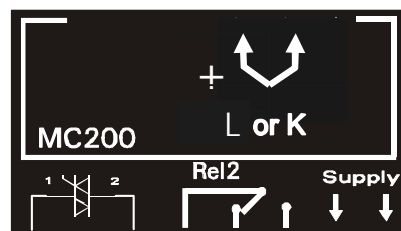
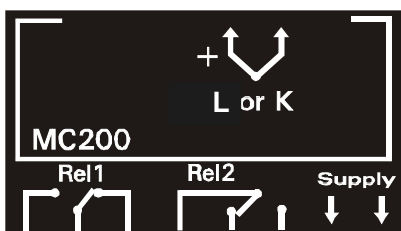
- 1- Set key : This key is used to:
  - Display and edit preset value.
  - Enter programming mode .
  - Display and edit parameter values.
- 2- UP key : This key is used to :
  - Increase parameter value .
  - Choose the next parameter.
- 3- DN. key : This key is used to :
  - Decrease parameter value .
  - Choose the previous parameter.
- 4- LED-OUT1 : Relay 1 status (ON=Relay is active)
- 5- LED-OUT2 : Relay 2 status (ON=Relay is active)

B : Rare side (Input /Output)

## INPUTS:

- 1- Supply : Supply terminals ( 220 v , 50 Hz , +/- 10%)
- 2- L or J & K : Thermocouple connection terminals .

## OUTPUTS:



## Operating Instructions :

- This unit operates in two different modes Normal mode (Displaying temp.) Programming mode (Displaying parameters). Connect supply and thermocouple wires ,apply power and the unit will flash the characters A.P. for 4 seconds and starts operating in normal mode. (if sensor is misconnected or faulty the word Error will be displayed until )
- To view and edit the set value (S\_V) press the “Set” key S\_V will be displayed in flashing mode ,use UP or DN key to edit the value.
- To view and edit the control parameters (“Per.”, “hy\_uP” , “hy\_dn” ) Press and hold the “Set” key until one of the above parameters is displayed ,release the set key ,now you can view the para. value by pressing the “Set” key again and edit the value by UP/DN keys.
- To view and edit all the parameters ,power off the unit and while pressing the set key Power on the unit again ,the unit will start in programming mode by displaying the first para.( “hy\_uP”) release the set key ,now you can view the para. value by pressing the “Set” key again and edit the value by UP/DN keys. Or use UP/DN keys to choose another parameter and view or edit it’s value. To return to normal mode power the unit off and on again . If untouched the unit will return to normal mode after timeout.

Fig 1: Typical ON/OFF control.

### On/off control

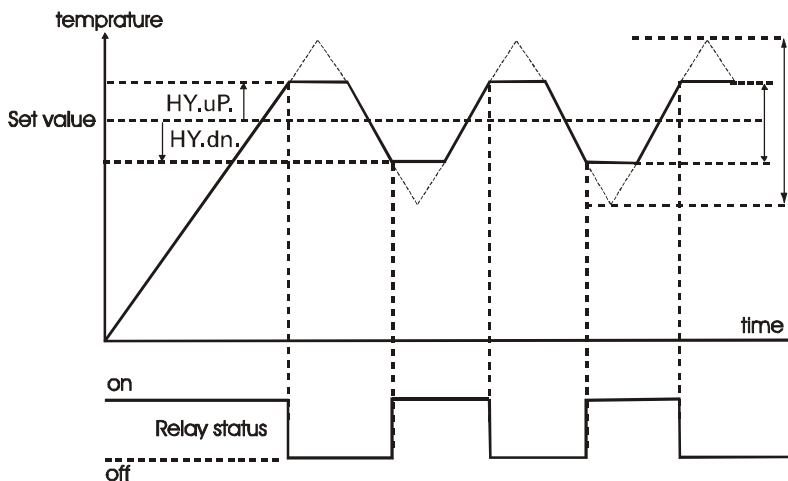


Fig 2 : Typical smart control system.

### smart control

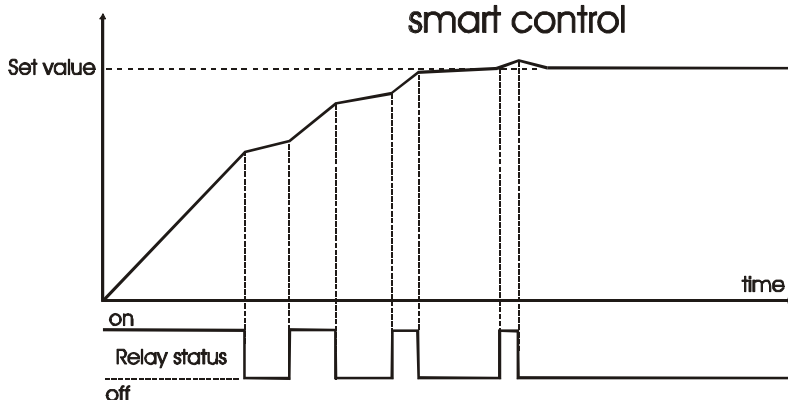


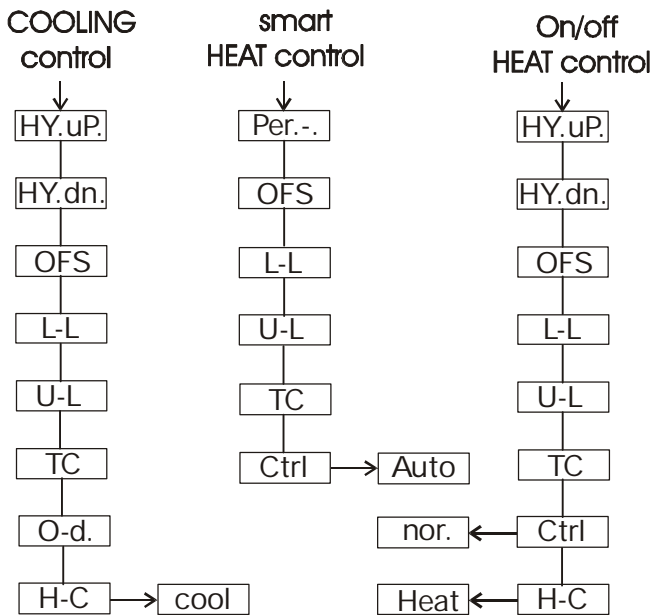
Table 1 shows available parameters and corresponding possible values.

Para.	Possible value	presence
Hy.uP.	0..50 C	Simple control only
Hy.dn.	0..50 C	Simple control only
Per._.	0.0..100 %	Smart control only
OFS	0..50 C	All cases
L_L	0..600 C for J 0..1200 C for k <b>0...300 C for L</b>	All cases
U_L	0..600 C for J 0..1200 C for k <b>0...300 C for L</b>	All cases
tc	<b>J-K- L</b>	<b>All cases</b>
Ctrl	Auto-nor	Heating control only

### Parameter description.

- Hy.uP. :hysteresis up
- Hy.dn. :hysteresis down
- Per.\_. :% of energy to maintain temperature at S\_V
- OFS :zero calibration
- L\_L :S\_V can not be set lower than this value.
- UL :S\_V can not be set higher than this value.
- Tc : thermocouple choice (J or K)
- Ctrl :control type (Simple or Smart)
- H\_C :choose heating or cooling control.
- o.d. :delay time for output relay activation.

Parameter flow chart.



### OPTIONAL :

The following optional temperature controllers are available on request.  
(Do not hesitate to contact us for additional requirements. )

#### SAFETY temperature controller

When temperature becomes higher than a preset value a relay is activated to switch off the HEAT supply until reset manually.