AUTOMATISMOS
Control y Programación S.L.U.

TEMPERATURE CONTROLLER FOR THERMOCOUPLE PROBES

XCT55Bxxx

Temperature controller for J and K thermocouple probes.
Simultaneous display of setpoint and temperature.
Changeover relay or SSR output, depending on model.
PID and autotuning.
Configurable multi-alarm.
IP65 front protection.



SPECIFICATIONS

Housing	Grey UL94 - V - 0 polycarbonate
Panel mounting	Snap-in bracket
Size	48mm x 48mm
Weight	170 g
Panel cutout	45mm x 45mm
Connection	Plug-in terminals (XCT55BxxC) 11-pin connector (XCT55BxxU)

POWER SUPPLY

Consumption	2.3 VA
Voltage	24 VAC - 48 VAC - 110 VAC - 230 VAC 12 VDC - 24 VDC

OUTPUT

Outputs	1 changeover contact 8A 250 VAC
	2 normally open contacts 5A 250 VAC

FUNCTIONS

Temperature range	0 ºC to 1100 ºC
Operating modes	On - off function
	P I D function
	6 operating modes

PROBES	J and K thermocouple

ENVIRONMENTAL CONDITIONS

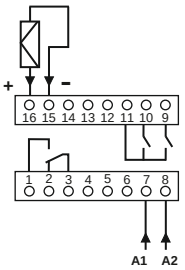
Operating temperature	- 10º C + 55ºC
Storage temperature	- 25º C + 85ºC

STANDARDS

CE compliance	2014/35/EU ; 2014/30/EU

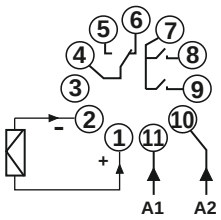
WIRING

XCT55BxxC



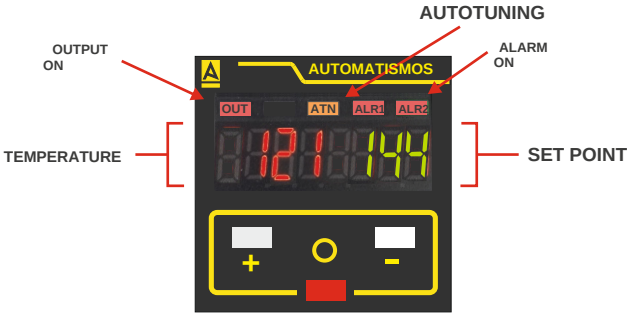
7 - 8	Power supply
1 - 2 - 3	Control output
11 - 10	Alarm 1 output
11 - 9	Alarm 2 output
15 - 16	Thermocouple probe input

XCT55BxxU



10 - 11	Power supply
1 - 2	Thermocouple probe input
4 - 5 - 6	Control output
7 - 8	Alarm 1 output
7 - 9	Alarm 2 output

FRONT PANEL



ORDERING CODES

XCT55B □□□

- **C** Plug-in terminals
- **U** 11-pin connector

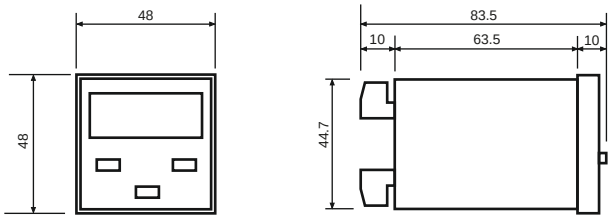
B Programming lock

- No alarm
- **1** With 1 alarm
- **2** With 2 alarms

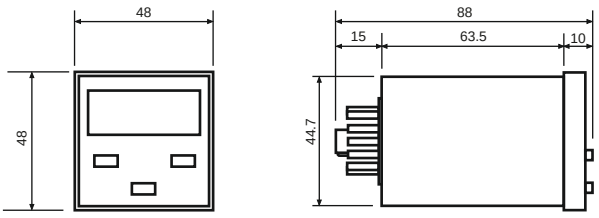
- **S** SSR output
- **R** Relay output

DIMENSIONS

XCT55BxxC



XCT55BxxU



PROGRAMMING

1.- Setpoint and alarm display

When the unit is powered up, the display shows the process variable PV (red) and the setpoint SV (green).

1.1- Setpoint (SP)

The setpoint can be changed with the arrow keys within the limits set by parameters US and LS (upper and lower limit, respectively). US and LS can be changed in the parameter menu as described in section 2.10.

During operation, an active alarm is shown by a red “ALR” indicator.

2- PARAMETER MENU

Pressing the programming key (red) shows the % indication. Holding it for 5 s opens the parameter menu.

2.1- Control output percentage

The first indication shown is the percentage of the control output. This value cannot be changed; it is calculated internally by the unit according to the operating conditions. The symbol is %.

2.2- Process control (PID / ON-OFF)

Either PID or ON-OFF control can be selected with the arrow keys. With PID, the parameters to set are the **proportional band, integral, derivative and cycle time**. With ON-OFF, the parameter is the **setpoint hysteresis**.

2.3- Autotuning

This automatic function calculates and sets the P, I and D parameters for the system analysed. When it finishes, the unit starts the appropriate control. Set all other parameters before running this function.
The autotuning parameter has three settings: 0, 1 and 10.

0.- No autotuning.
1.- Autotuning at the setpoint.
10.- Autotuning at 10% below the setpoint.

While the unit runs this function, the display shows “Atn” flashing.

2.4- Proportional band

Shown as four digits, three of them integers, giving the width of the control band in degrees. A high P value gives slow control without saturation. A low P value gives fast control but saturates the control output (overshoot). The maximum value is 600.0 degrees.

2.5- Integral (I) (reset)

This parameter is set in seconds and gives how often the integral term corrects the control output according to the error. The lower the integral value, the more often the integral term acts on the output. The maximum value is 3600 seconds.

2.6- Derivative (D)

This parameter is set in seconds and gives how effectively a fall or rise in temperature is corrected, taking its rate of change into account. The higher the value, the stronger the effect. Take special care when setting the derivative parameter: too high a value can cause unwanted oscillation around the setpoint.

The maximum value is 3600 seconds.

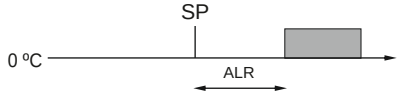
2.7- Cycle time (CP)

Sets how often the output is switched. It can be set from 1 to 20 seconds. The shorter the cycle time, the more precise the control. When the control output is a relay, bear in mind its electromechanical life and set the cycle time as long as possible.

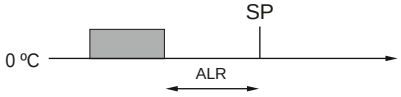
2.8- Alarm 1 type (AT1). Alarm 2 type (AT2)

This parameter sets the type of each alarm independently. There are seven settings (0 to 6); setting 0 disables the alarm. The other settings are:

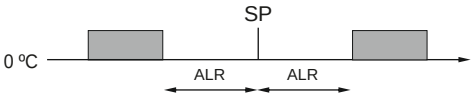
1- High alarm relative to setpoint (active above the alarm value)



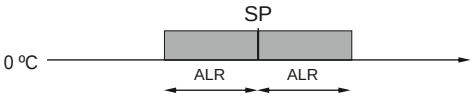
2- Low alarm relative to setpoint (active below the alarm value)



3- Symmetrical alarm relative to setpoint (active below the low and above the high alarm values)



4- Inverted symmetrical alarm relative to setpoint (active between the low and high alarm values)



5- Absolute high alarm



6- Absolute low alarm



2.9- Alarm hysteresis (ALH)

Sets the alarm hysteresis. The minimum value is 0.1.

2.10- Setpoint upper and lower limits (US/LS)

These parameters limit the maximum and minimum setpoint value.

2.11- SHIFT. Process variable (PV) offset

A value in degrees that shifts the displayed process variable (PV). It can be set from -100 to +100.

2.12- Automatic exit from the parameter menu (RET)

Sets the time after which the unit leaves the parameter menu. The time starts when the user stops operating the keys. With RET=0 the automatic exit is disabled.

2.13- Sensor type and unit selection (SENS)

Selects the sensor type and, at the same time, the temperature unit.

XCT55 model .... JC, JF, KC and KF
XCT65 model .... PtC and PtF

3- ON - OFF PARAMETER MENU

Pressing the programming key (red) shows the % indication. Holding it for 5 s opens the parameter menu.

3.1- Control output percentage

The first indication shown is the percentage of the control output. This value cannot be changed; it is calculated internally by the unit according to the operating conditions. It reads 0% or 100% depending on the ON - OFF control state. The symbol is %.

3.2- Setpoint hysteresis

A setpoint-relative parameter that sets the value at which the output switches off. The minimum value is 0.1, to avoid repeated switching of the output.

The other parameters are: At1, ALH1, RET and SENS.
These parameters work as described in section 2.

4- ERROR MESSAGES

SErr

If this error message appears, check the following:
.- Check that the probe has been selected correctly (section 2.13).
.- Check the probe wiring at the terminals.
.- If an RTD is used, check the link between terminals 2 and 3 of the terminal block.

5- PROGRAMMING LOCK

To lock or unlock the programming parameters:

1.- Disconnect the power supply.
2.- Hold down the “+” and “-” keys while switching the power on.
3.- Use the “+” and “-” keys to choose locked (disabled) or unlocked (enabled) parameters.
4.- Press the “O” key to confirm.

PRECAUTIONS ⚠

.- Before connecting the unit, make sure the supply voltage is within the ranges given on the label; otherwise internal parts of the unit may be damaged.

.- Use crimp terminals to wire the unit. Stranded wire without terminals can cause a short circuit if a loose strand gets in.

.- If the units are used where there is a lot of electrical noise, keep the unit and its wiring away from the noise source.

.- If the units are powered continuously, leave some free space between them for better ventilation; excessive temperature can shorten the life of the internal components.

.- Do not expose the unit to solvents or acids, as they can damage the housing. In highly corrosive or very humid environments, both the internal components and the printed circuit board (PCB) may be affected.

ACCESSORIES

ZB11-0 SOCKET



11-pin socket for
DIN-rail mounting

PG11 SOCKET



11-pin socket with screw
terminals on the back

XAMPDH MEMBRANE



Silicone protective membrane

TC11 BLANKING COVER



Blanking cover for
48 × 48 mm panel cutout