(GB) Configurable electronic thermostats with 2 relays and up to 2 probes

Panel mounting

Rail DIN

The two probe inputs can be interrelated with the two relay outputs for the thermometer, thermostat and the timing functions in cold and heat applications.

CONFIGURATION allows that some parameters are **ADJUSTABLE** or not by the **USER** so that he or she has the exclusive information and adjustment that the device's use requires. The functions of the front part keys as well as the display of temperatures can be modified, while the configuration with a password can be blocked.

Examples of some of the many applications

Heat:
Thermostat with two probes to display and control.
Thermostat with control relay and alarm relay.
Action thermostat by a temperature difference between the two probes.
As two simple thermostats.
As two cyclic timing devices without enabling the probes.

Cold:
Double controller with defrost by compressor stop.
Simple controller with defrost by compressor stop and alarm relay.
Simple controller with defrost by air.
Simple controller with defrost by electric heat.
Thermostat with two phases or with a neutral zone.

Index:

1 - VERSIONS AND REFERENCES

MODEL	AKO-14722	AKO-14723	AKO-15223
FASTENING UNIT	Panel mounting	Panel mounting	DIN Rail
POWER SUPPLY, 50/60Hz	12V≈ ±20%	230V~±10%	230V~±10%

2 - TECHNICAL DATA

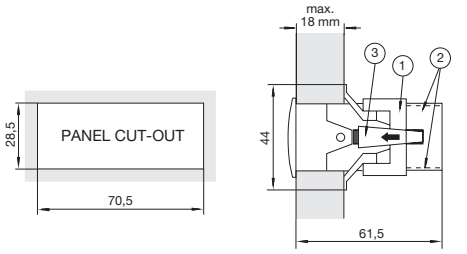
Temperature range ..... (-58°F a 211°F) -50°C a 99°C
S1 input for NTC probe: **AKO-149XX**
S2 input for NTC probe: **AKO-149XX**
Controller accuracy: ..... ±1°C
Probe tolerance at 25°C: ..... ±0,4°C
Relay **R1**: ..... 16(4)A*, 250V, cosφ=1, SPST
Relay **R2**: ..... 8A*, 250V, cosφ=1, SPDT
Maximum input power:. 5VA
Working ambient temperature: ..... 5°C a 40°C
Storage ambient temperature: ..... -30°C a 70°C
Installation category: ..... II según norma CEI 664
3 digits and an optional decimal point when programmed
Double insulation between the power supply, the secondary circuit and the relay output.

* The current specified for each relay is its individual maximum. When more than one relay is connected, the total current cannot surpass 17,5A (EN61010) or 13A (EN60730).

3 - INSTALLATION

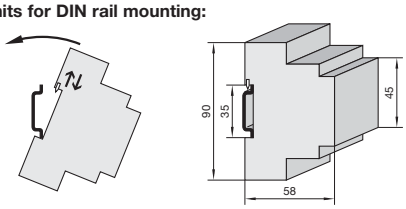
The controller must be installed in a place protected from vibrations, water and corrosive gases, and where the ambient temperature does not surpass the values specified in the technical data. In order for the panel mounting units to be suitable having IP65 protection, the gasket should be installed properly between the apparatus and the perimeter of the panel cut-out where it is to be fitted.
In order to give a correct reading, the probe has to be installed in a place without heat influences other than the temperature that is to be measured or controlled.

3.1 Fastening units for panel mounting:



To fix the unit, place the fasteners **1** over the sliders **2** as shown in the figure. Move the fasteners in the direction of the arrow. By pressing tab **3** the fasteners may be moved in the opposite direction of the arrow.

3.2 Fastening units for DIN rail mounting:

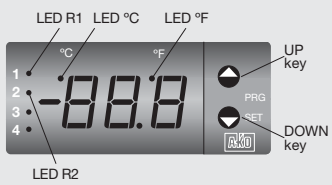


3.3 Connection:

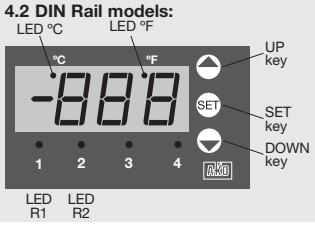
See diagram in the unit rating plate.
The probe and its lead shoud **NEVER** be installed in ducting along with power, control or power supply wiring.
The power supply circuit should be connected with a minimum 2A, 230V, switch located close to the unit. The cables should be of the type H05VV-F 2x0,5mm² or H05V-K 1x0,5mm².
Section of connecting wires for relays contacts must be between 1mm² and 2,5mm²

4 - FRONT PANEL FUNCTIONS

4.1 Panel mounting models:



4.2 DIN Rail models:



4.3 Common functions:

UP key (factory default)
By pressing this key, the temperature in probe 2 is displayed.
By pressing it during 5 seconds, the R2 SET POINT is displayed.
In programming, it increases the value being displayed.

UP key (configurable)
By default, the configuration of this key is factory-set for the preceding actions. However, it can be configured according to the options of parameters 42, 43.

DOWN key (factory default)
By pressing this key during 5 seconds, the R1 SET POINT is displayed.
In programming, it decreases the value being displayed.

DOWN key (configurable)
By default, the configuration of this key is factory-set for the preceding functions. However, it can be configured according to the options of parameters 44, 45.

UP + DOWN keys (in panel mounting models) (SET) **SET key** (in DIN rail models)
Pressing these keys during 10 seconds accesses to the configuration of the controller parameters.

UP + DOWN keys (in panel mounting models) (SET) **SET key** (in DIN rail models)
Pressing these keys once accesses to the adjustment of the user's parameters.
By default, the configuration of these keys is factory-set for the preceding function. However, they can be configured according to the options of parameter 46.

LED °C **Permanent:** Temperature display in °C.
Flashing: Parameters programming phase.
LED °F **Permanent:** Temperature display in °F.
LED R1 **Permanent:** Relay R1 activated.
LED R2 **Permanent:** Relay R2 activated

5 - CONFIGURATION AND ADJUSTMENT

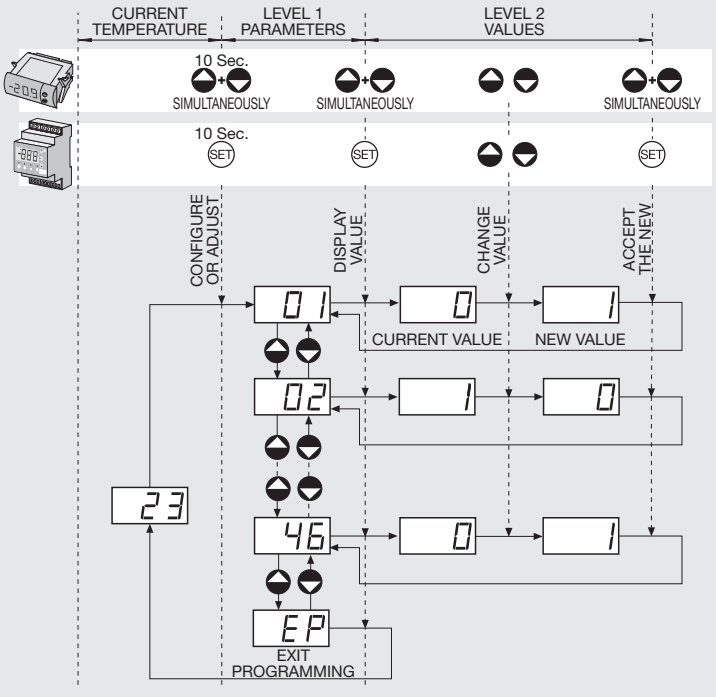
CONFIGURATION: It should only be programmed or modified by personnel who are fully conversant with the operation and possibilities of the equipment.

Level 1 Parameters

- Press the CONFIGURE OR ADJUST keys for 10 seconds. The LED "**°C**" will be flashing to indicate programming phase and the first parameter "**01**" will appear on the display.
- Pressing the ▲ key accesses the next parameter and the ▼ key will produce a return to the previous one.
- Pressing DISPLAY VALUE key in the last display EP the controller will return to the current temperature display status and the LED "**°C**" will stop flashing.

Level 2 Values

- In order to display the current value of any parameter, select the desired parameter and press the DISPLAY VALUE keys. Once it is displayed, it can be modified by pressing the ▲ or ▼ keys
- Pressing the ACCEPT THE NEW keys sets the new value. When this operation is performed, the programming returns to Level 1 (parameters).



ADJUSTMENT: Pressing once the CONFIGURE OR ADJUST keys accesses the user's parameters adjustment. The proceeding is the same as for the configuration and access is only possible to the parameters defined as adjustable by the user in the configuration. In order to access the parameters the parameter 39 parameter should be configured.

REMARK: If no key is pressed for 25 seconds in any of the previous steps, the controller will automatically return to the current temperature display status without modifying any of the parameters values.

6 - DESCRIPTION OF PARAMETERS AND MESSAGES

The values in the Def column are factory-set.

Parameters					
	Functions and description	**Values**	**Min.**	**Def.**	**Max.**
01	Temperature display mode:	(0 = Whole in °C) (1 = One decimal in °C) (2 = Whole in °F) (3 = One decimal in °F)	0	1	3
02	Probe 1, input **S1**	Enable?	0=No	1=Yes	1=Yes
03	Probe 1, input **S1**	Calibration (Offset) (°C/°F)	-20,0	0,0	20,0
04		Parameter **03** adjustable by the user?	0=No	0=No	1=Yes
05	Probe 2, input **S2**	Enable?	0=No	1=Yes	1=Yes
06	Probe 2, input **S2**	Calibration (Offset) (°C/°F)	-20,0	0,0	20,0
07		Parameter **06** adjustable by the user?	0=No	0=No	1=Yes
08	Thermostat relay **R1**,	Enable?	0=No	1=Yes	1=Yes
09	Thermostat relay **R1**,	Probe selection (0=S1 - S2) (1=S1) (2=S2)	0	1	2
10	Thermostat relay **R1**,	Operation type (0=Cold) (1=Heat)	0	1	1
11	Thermostat relay **R1**,	Set Point (°C/°F)	-50,0	0,0	99,0
12		Parameter **11** adjustable by the user?	0=No	1=Yes	1=Yes
13	Thermostat relay **R1**,	Differential (Hysteresis) (°C/°F)	-90,0	1,0	90,0
14		Parameter **13** adjustable by the user?	0=No	1=Yes	1=Yes
15	Thermostat relay **R1**,	Connection delay or protection (min)	0	0	120
16		Parameter **15** adjustable by the user?	0=No	1=Yes	1=Yes
17	Thermostat relay **R2**,	Enable?	0=No	1=Sí	1=Yes
18	Thermostat relay **R2**,	Probe selection (0=S1 - S2) (1=S1) (2=S2)	0	2	2
19	Thermostat relay **R2**,	Operation type (0=Cold) (1=Heat)	0	1	1
20	Thermostat relay **R2**,	Set Point (°C/°F)	-50,0	0,0	99,0
21		Parameter **20** adjustable by the user?	0=No	1=Yes	1=Yes
22	Thermostat relay **R2**,	Differential (Hysteresis) (°C/°F)	-90,0	1,0	90,0
23		Parameter **22** adjustable by the user?	0=No	1=Yes	1=Yes
24	Thermostat relay **R2**,	Connection delay or protection (min)	0	0	120
25		Parameter **24** adjustable by the user?	0=No	1=Yes	1=Yes
26	Timing relay **R1**,	Enable?	0=No	0=No	1=Yes
27	Timing relay **R1**,	Elapsed time between starts (h)	0	0	120
28		Parameter **27** adjustable by the user?	0=No	1=Yes	1=Yes
29	Timing relay **R1**,	Duration (min)	0	0	120
30		Parameter **29** adjustable by the user?	0=No	1=Yes	1=Yes
31	Timing relay **R1**,	Relay status during P29 (0=OFF) (1=ON)	0	0	1
32	Timing relay **R2**,	Enable?	0=No	0=No	1=Yes
33	Timing relay **R2**,	Elapsed time between starts (h)	0	0	120
34		Parameter **33** adjustable by the user?	0=No	1=Yes	1=Yes
35	Timing relay **R2**,	Duration (min)	0	0	120
36		Parameter **35** adjustable by the user?	0=No	1=Yes	1=Yes
37	Timing relay **R2**,	Relay status during P35 (0=OFF) (1=ON)	0	0	1
38	Parameters transfer	(0=disabled) (1=send) (2=receive)	0	0	2
39	Password to modify the configuration		0	0	126
40	Program version (information)				
41	Display without pressing any key		1	1	4
42	Function by pressing UP key		0	2	7
43	Function by pressing UP key during 5”		0	4	7
44	Function by pressing DOWN key		0	0	7
45	Function by pressing DOWN key during 5”		0	3	7
46	Function by pressing UP + DOWN keys in panel mounting models Function by pressing SET key in DIN rail models		0	7	7

The meaning for the options for parameters 41 to 46 is:

0=Key disabled
1=Display Probe 1 of input S1
2=Display Probe 2 of input S
3=R1 Set Point display
4=R2 Set Point display
5=Start R1 timing
6=Start R2 timing
7=Accessible parameters adjustment

Messages		
_ _ _	**Permanent**	Probe S1 and Probe S2 disabled.
E1	**Permanent**	Probe S1 damaged (open, crossed circuit, temp. > 110°C or temp. <-55°C). Assigned relay OFF.
E2	**Permanent**	Probe S2 damaged (open, crossed circuit, temp. > 110°C or temp.<-55°C). Assigned relay OFF.
E1+E2	**Flashing**	Probes S1+S2 damaged (open, crossed circuit, temp. > 110°C or temp. <-55°C). Relays R1 and R2 OFF.
EE	**Permanent**	Memory error

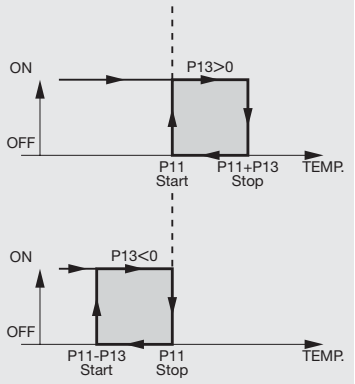
REMARK: When the time parameters are modified, the new values are applied once the current cycle is completed. In order for it to have an immediate effect, switch the controller off and then on again.

7 - RELAYS R1 AND R2 OPERATION AND CONTROL

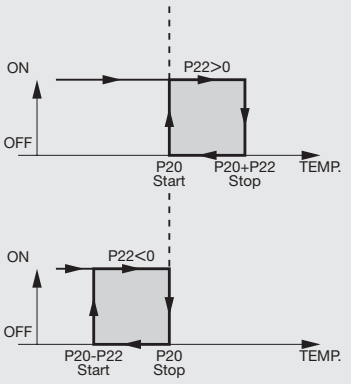
Thermostat relay R1
P11=Parameter 11, Set Point

Thermostat relay R2
P20=Parameter 20, Set Point

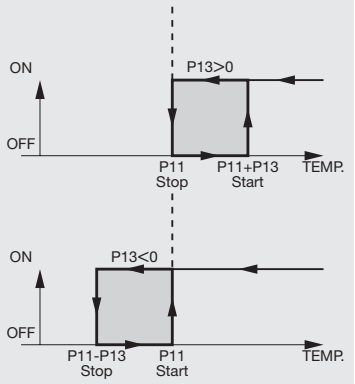
Operation for HEAT (P10=1)



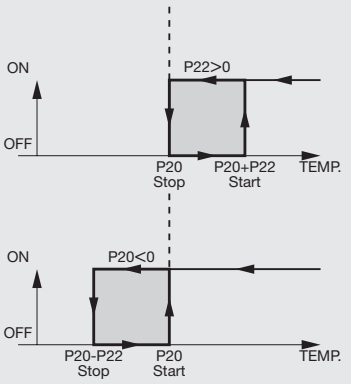
Operation for HEAT (P19=1)



Operation for COLD (P10=0)

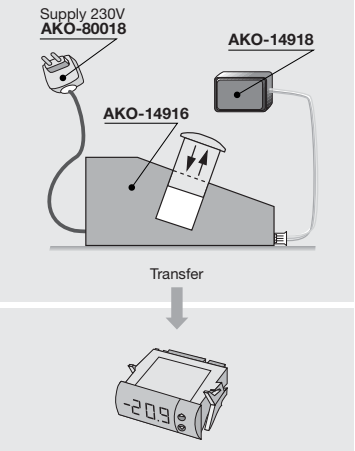


Operation for COLD (P19=0)



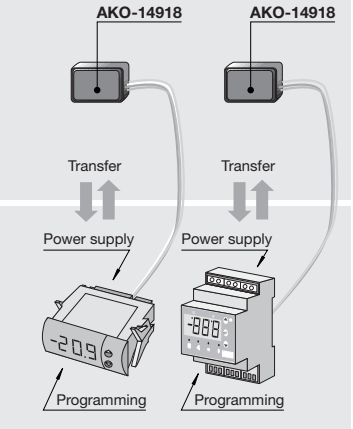
8 - PARAMETERS TRANSFER

AKO-14916
Tabletop server which is connected by means of the **AKO-80018**, 230/12V, to the power supply. Permit to transfer parameters previously recorded in one server **AKO-14918**, to other **panel mounting** controllers without these having to be powered.



Panel mounting models

AKO-14918
A portable server without supply to which the parameters programmed in powered **AKO** controllers can be copied. The parameters may then be transferred from the server to other identical powered units.



Panel mounting or DIN rail models

9 - MAINTENANCE

Clean the unit surface with a soft cloth and soap and water. Do not use abrasive detergents, petrol, alcohol or solvents.

10 - WARNINGS

The use of the unit different to the manufacturer's instructions voids the safety qualification.
To ensure correct operation of the apparatus, only NTC type probes supplied by AKO should be used.
Between -40 °C and +20 °C, when the probe is extended up to 1.000m with minimum 0,5mm² cable, deviation will be less than 0.25 °C (probe extension cable ref. **AKO-15586**).

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