

AKO D14412 Temperature Controller



AKO D14412 Temperature Controller Instruction Manual

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AKO

AKO D14412 Temperature Controller

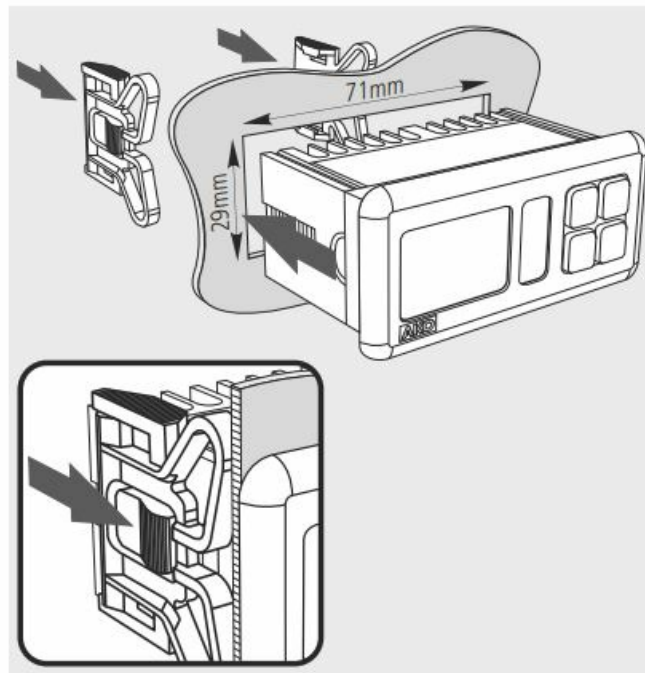


Warnings

- Using the equipment without following the manufacturer's instructions may affect the device's safety requirements. To ensure that the device operates correctly, only probes supplied by AKO should be used.
- The unit must be installed in a location protected from vibrations, water and corrosive gases, where the ambient temperature does not exceed that shown in the technical data.
- To ensure a correct reading, the probe must be situated in a location without any external heat influences except for the temperature that is being measured or controlled.
- The power supply circuit must be provided with a main switch rated at least 2 A, 230 V, located close to the equipment. The cables will enter through the back and should be type H05VV-F or H05V-K.
- The gauge will depend on local regulations, but should in no case be less than 1 mm . 2 -Connecting wires for the relay contacts should be sized 2.5 mm.
- Between -40 °C and +20 °C, if the probe NTC is prolonged till 1.000 m with a maximum of cable 0,5 mm², the maximum deviation will be of 0,25 °C (extension cable for probe ref. AKO-15586)

NOTE: Equipment not compatible with AKO-14917 (external communication module) and AKO-14918 (programming key)

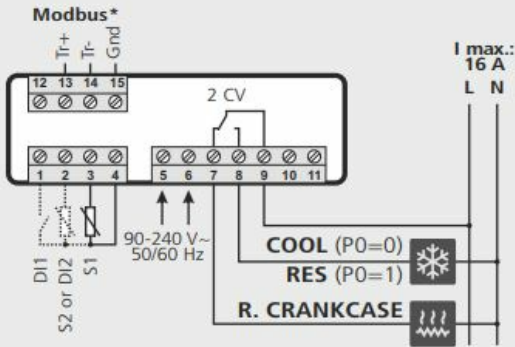
Installation



Wiring

The probe and its cable should NEVER be installed in the same conduit as power, control or supply cables

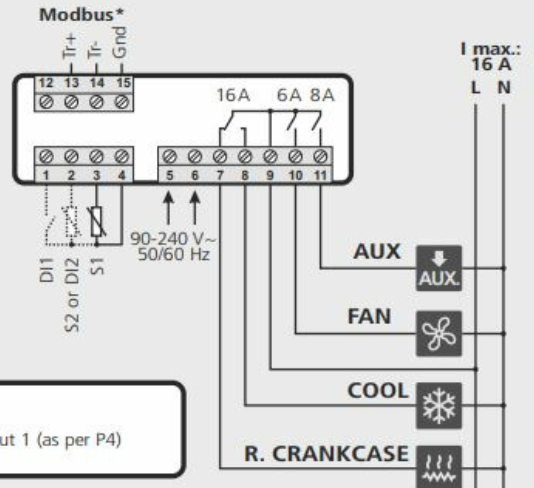
AKO-D14123-2-RC



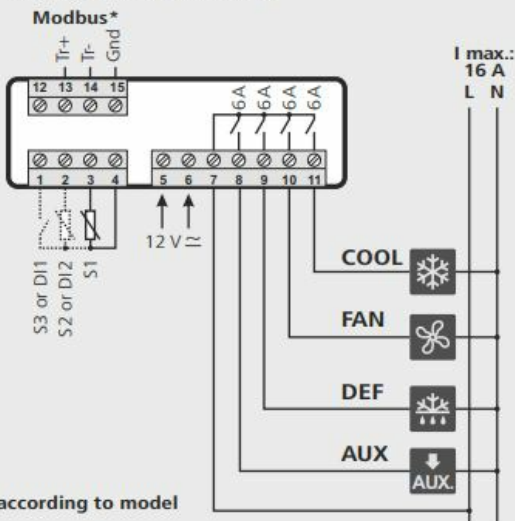
AUX Relay
Function as per
parameter P6

S1: Probe 1, temperature in the chamber or cabinet
S2/DI2: Probe 2, defrost or digital input 2 (as per P4)
S3/DI1: Probe 3, temperature of product / 2nd defrost, or digital input 1 (as per P4)
DI1: Digital Input 1

AKO-D14323-C

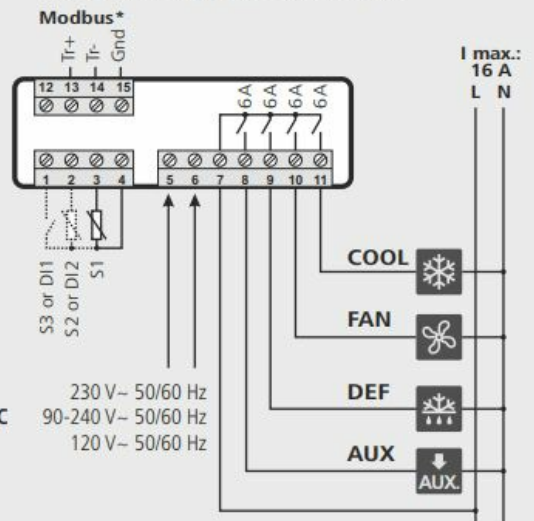


AKO-D14412 / D14412-RC

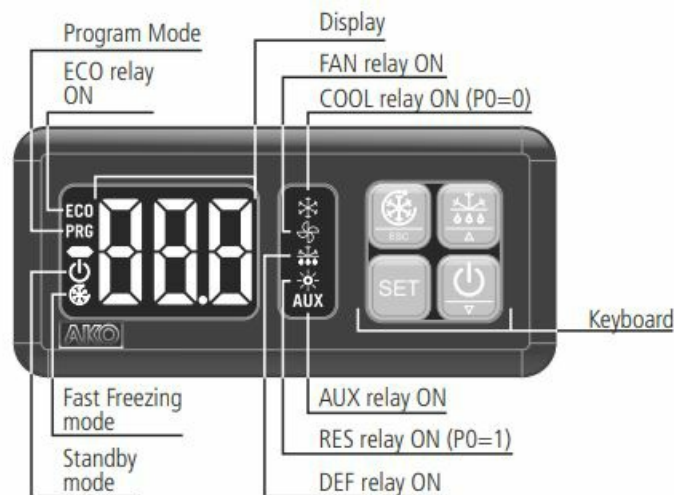


*according to model

AKO-D14423 / D14423-RC / D14420



Operation



ESC key /

- Press for 5 seconds to start/stop Fast Freezing mode (rapid cooling). In the programming menu, exit without saving the parameter, return to the previous level or exit programming.

SET key

- Press for 5 seconds to modify the set point (SP) (Set Point).
- Press for 10 seconds to go to the programming menu. In the programming menu, go to the level displayed or accept the new value while setting a parameter

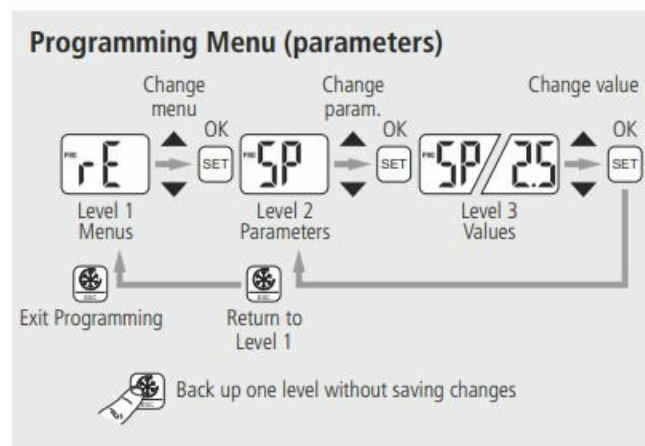
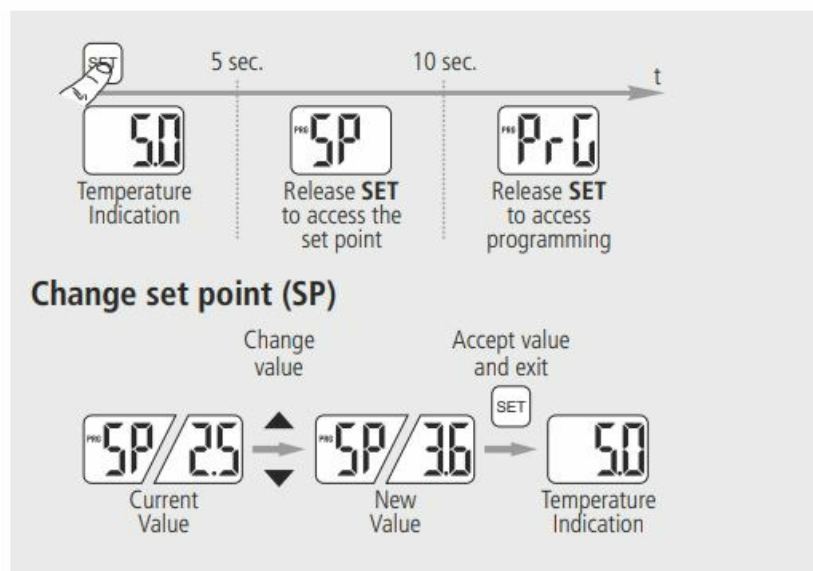
Up key ▲ / ❄

Pressing for 5 seconds starts/stops defrosting. The programming menu, allows you to scroll through the various levels or, during the setting of a parameter, to change the value.

Down key ▼ / ⏻

Pressing for 5 seconds activates Standby mode, and pressing for 2 seconds returns the equipment to normal mode. In Standby mode, the equipment performs no actions and only the indicator is displayed on the screen m. The programming menu, allows you to scroll through the various levels or, during the setting of a parameter, to change the value.

Access to set point and programming



Start-up

On power-up, the equipment will start up in Wizard mode (P3 / 1 flashing), press N or Q to select the most

appropriate application and press SET.

1. Multipurpose
2. Frozen
3. Fruits and vegetables
4. Fresh fish
5. Soft Drinks
6. Bottle racks
7. AC
8. Heat / Incubators

The wizard will configure the parameters of the equipment for the chosen application (see table “Default settings by application”).

WARNING:

The default parameters by type of application have been defined for the most common applications. Check that these parameters are suitable for your installation.

We reserve the right to supply materials which may be slightly different from those described in our Data Sheets. Updated information on our web site:

- www.ako.com

Table of parameters and messages

Def. column shows factory-set default parameters. Those marked with * are variable parameters depending on the application chosen in the wizard or the P3 parameter (see table “Default parameters by application”). Unless otherwise stated, temperatures are expressed in °C.

FAn	Level 2	FAN control (Evaporator) In 2-relay models P6 must be set to 0
-----	---------	--

	Level 3	Description	Values	Min.	Def.	Max.			
	F0	Fan shut-down temperature as per probe 2 (if P4 ≠ 1)	(°C/°F)	-50 (-58°F)	★	99,9 (211°F)	●	●	●
	F1	Probe 2 differential (if P4 ≠ 1)	(°C/°F)	0,1	2,0	20,0	●	●	●
	F2	Stop fans when stopping compressor 0=No, 1=Yes		0	1	1	●	●	●
	F3	Fan status during defrost: 0=Off; 1=On		0	★	1	●	●	●
	F4	Starting delay after defrost (if F3=0) Will only operate if it is higher than d9	(min.)	0	3	99	●	●	●
	F5	Stop fans on opening the door 0=No, 1=Yes (Requires a digital input configured as port P10 or P11=1)		0	0	1	●	●	●
	EP	Exit to Level 1					●	●	●
AL	Level 2	ALARMS control (visual)							
	Level 3	Description	Values	Min.	Def.	Max.			
	A0	Configuration of temperature alarms: 0=Relative to SP; 1=Absolute		0	0	1	●	●	●
	A1	Maximum alarm probe 1 (must be greater than SP)	With NTC (°C/°F) With PTC	A2	99,9 (211°F) -	99,9 (211°F) 150 (302°F)	●	●	●
	A2	Minimum alarm probe 1 (must be less than SP)	(°C/°F)	-50 (-58°F)	-50 (-58°F)	A1	●	●	●
	A3	Temperature alarm delay during start-up	(min.)	0	0	120	●	●	●
	A4	Temperature alarm delay after completion of a defrost	(min.)	0	0	99	●	●	●
	A5	Temperature alarm delay after reaching the value of A1 or A2	(min.)	0	30	99	●	●	●
	A6	External alarm / Severe external alarm delay when receiving digital input signal (P10 or P11=2 or 3)	(min.)	0	0	120	●	●	●
	A7	Deactivation delay of the external alarm / Severe external alarm when the signal of the digital input disappears (P10 or P11=2 or 3)	(min.)	0	0	120	●	●	●
	A8	Show warning if defrost is terminated by time-out 0=No, 1=Yes		0	0	1	●	●	●
	A9	Alarm relay polarity 0=Relay ON in alarm (OFF no alarm) 1=Relay OFF on alarm (ON with no alarm)		0	0	1	●	●	●
	A10	Temperature Alarm Differential (A1 and A2)	(°C/°F)	0,1	1,0	20,0	●	●	●
	A12	Door open alarm delay (if P10 or P11=1)	(min.)	0	2	120	●	●	●
	EP	Exit to Level 1					●	●	●
CnF	Level 2	General status							
	Level 3	Description	Values	Min.	Def.	Max.			
	P0	Type of operation 0=Direct, Cold; 1=Inverted, Heat		0	★	1	●	●	●
	P1	Delay of all functions on receiving electrical power	(min.)	0	0	255	●	●	●
	P2	Access code (password) functions 0=Inactive; 1=Block access to parameters; 2=Keyboard lock		0	0	2	●	●	●
	P4	Selection of type of inputs 1=1 probe + 2 digital inputs; 2=2 probes + 1 digital input; 3=3 probes (1)		1	1	3	●	●	●
	P5	MODBUS address		1	1	255	●	●	●

AKO-D14412, AKO-D14412-RC, AKO-D14420, AKO-D14423, AKO-D14423-RC										
AKO-D14323-C										
AKO-D14123-2-RC										
Level 1 Menus and description										
rtC	P6	Configuration of AUX relay 1=Defrost / 2nd Defrost (1) 2=Alarm 3=Light 4=Pump down (1) 5=Master Defrost(1)	0	1	5					
	P7	Temperature display mode 0=Whole in °C 1=One decimal in °C 2=Whole in °F 3=One decimal in °F	0	1	3					
	P8	Probe to be displayed (as per parameter P4) 0=visualization of all the probes in sequence; 1=Probe 1; 2=Probe 2; 3=Probe 3 (1)	1	1	2					
	P9	Selection of probe type 0=NTC; 1=PTC	0	0	1					
	P10	Configuring digital input 1 0= Off 1=Door contact 2=External alarm 3=Severe external alarm 4=Slave defrost 5=Act. ECO mode by pushbutton 6=Act. Fast Freezing 7= Low pressure switch (1) 8=Remote defrost 9=Act. ECO mode by switch	0	0	9					
	P11	Configuring digital input 2 0= Off 1=Door contact 2=External alarm 3=Severe external alarm 4=Slave defrost 5=Act. ECO mode by pushbutton 6=Act. Fast Freezing 7=Not used 8=Remote defrost 9=Act. ECO mode by switch	0	0	9					
	P12	Digital input polarity 1 0=Energised on closed contact, 1=Energised on open contact	0	0	1					
	P13	Digital input polarity 2 0=Energised on closed contact, 1=Energised on open contact	0	0	1					
	P14	Maximum start-up time after pump down (Values between 1 and 9 seconds are not accepted) (Sec.)	1	0	120					
	P15	Maximum pump down time (min.)	0	0	15					
	P19	Lights in ECO Mode (P6=3) 0=ON; 1=OFF	0	0	1					
	EP	Exit Level 1								
Level 2 REAL TIME CLOCK Parameters (RTC required)										
rtC	Level 3 Description		Values	Min.	Def.	Max.				
	r1	Clock configuration: HOUR (h.)		0	0	23				
	r2	Clock configuration: MINUTES (min.)		0	0	59				
	EP	Exit Level 1								
Level 2 Access and information control										
tid	Level 3 Description		Values	Min.	Def.	Max.				
	L5	Access code (Password)		0	-	99				
	PU	Program version (Information)			-					
	Pr	Program revision (Information)			-					
	EP	Exit Level 1								
EP	Exit Programming									

(1): Only available on AKO-D144xx and AKO-D144xx-RC

MESSAGES				
L5	Access code (Password) request	D		
dEF	Indicates a defrost is underway. (Only if parameter d2=2)	D		S
E1	Probe 1 faulty (open circuit, crossover or temperature outside the probe limits)	D	A	S
E2	Probe 2 faulty (open circuit, crossover or temperature outside the probe limits)	D	A	S
E3	Probe 3 faulty (open circuit, crossover or temperature outside the probe limits)	D	A	S
AH	Flashing: maximum temperature alarm on probe 1 (A1)	D	A	S
AL	Flashing: minimum temperature alarm on probe 1 (A2)	D	A	S
AE	External alarm activated (only if parameter P10 or P11=2)	D	A	S
AES	Severe external alarm activated (only if parameter P10 or P11=3)	D	A	S
Adt	Defrost time-out alarm (only if parameter A8=1)	D		S
PAb	Door open alarm (Only if P10 or P11=1 and as per time at A12)	D		S
Pd	Pump down malfunction error (Stop).	D		S
LP	Pump down malfunction error (Start-up).	D		S
Ar	Clock battery discharged or clock deprogrammed	D		S

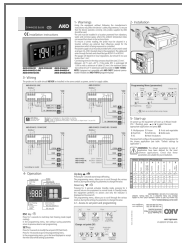
- D: Displays the message on the display, A: Activates the alarm relay (if available).
- S: Message expressed in the software AKONet

Technical specifications

- Power supply AKO-D14412 12 V $\sim \pm 20\%$ 2 VA
 - AKO-D14412-RC 12 v $\sim \pm 20\%$ 3 VA
 - AKO-D14420 120 V $\sim +8\% -12\%$ 50/60 Hz 4 VA
 - AKO-D14123-2-RC/D14423-RC/D14323-C 50/60 Hz 7 VA
 - AKO-D14423 50/60 Hz 3,75 VA
- Maximum Voltage SELV circuits 20 V
- Communication Modbus RTU RS485
- Inputs (According to P4) 3 NTC/PTC inputs (Sólo AKO-D14412-RC y AKO-D14423-RC)
 - 2 NTC/PTC inputs + 1 digitised input
 - 1 NTC/PTC input + 2 digitised input
- Relay 2 CV (EN60730-1: 16(10) A 250 V $\sim$)
- Relay 16 A (EN60730-1: 12(9) A 250 V $\sim$)
- Relay 6 A (EN60730-1: 5(4) A 250 V $\sim$)
- Relay 8 A (EN60730-1: 8(4) A 250 V $\sim$)
- Number of relay operations EN60730-1: 100.000 operations
- Types of probe NTC AKO-149xx / PTC AKO-1558xx
- Measurement range NTC -50,0 °C to +99,9 °C (-58,0 °F to 211 °F)
- PTC -50,0 °C to +150 °C (-58,0 °F to 302 °F)
- Resolution -50 to 100 °C 0,1 °C
- > 100 °C 1 °C
- Working environment -10 to 50 °C, humidity <90 %
- Ambient storage humidity -30 to 70 °C, humidity <90 %
- Class of protection – front panel IP65
- Fixation Panel-mounted with anchors
- Panel cutout dimensions 71 x 29 mm
- Front panel dimensions 79 x 38 mm
- Depth 61 mm
- Connections Connections via screw terminals for cables up to 2.5 mm²
- Rating of control device: built-in, automatic operation feature Type 1.B, for use in clean environments,
- Class A software and continuous operation. Pollution classification 2 s / UNE-EN 60730-1.
- Double insulation between supply, secondary circuit and relay output.
- Rated pulse voltage 2500 V
- Temperature during ball-pressure test Accessible parts 75 °C
- Parts which position active elements 125 °C
- Voltage and current as per EMC test
- AKO-D14123-2-RC/D14423/D14423-RC/D14323-C 207 V, 17 mA
- AKO-D14420 105 V, 36 mA
- AKO-D14412/D14412-RC 9,6 V, 181 mA
- Current of radio jamming suppression tests 270 mA

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Documents / Resources



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D14412 Temperature Controller, D14412, Temperature Controller, Controller

References

- [User Manual](#)

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