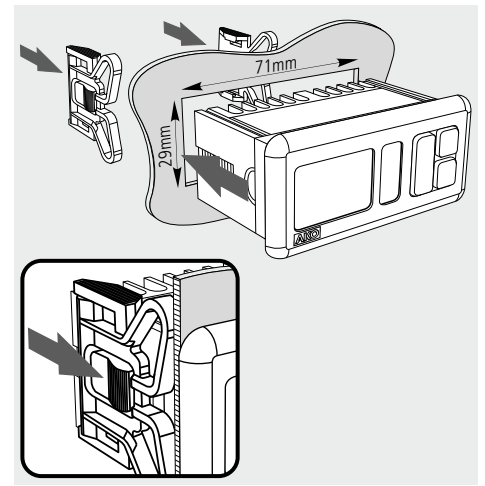


## 1- Warnings

- 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 which is being measured or controlled.
  - The power supply circuit must be provided with a main switch rated at least 2A, 230V, 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<sup>2</sup>.
  - Connecting wires for the relay contacts should be sized 2.5 mm<sup>2</sup>.
  - Between -40 °C and +20 °C, if the probe NTC is prolonged till 1.000 m with a minimum of cable 0,5 mm<sup>2</sup>, 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).

## 2- Installation



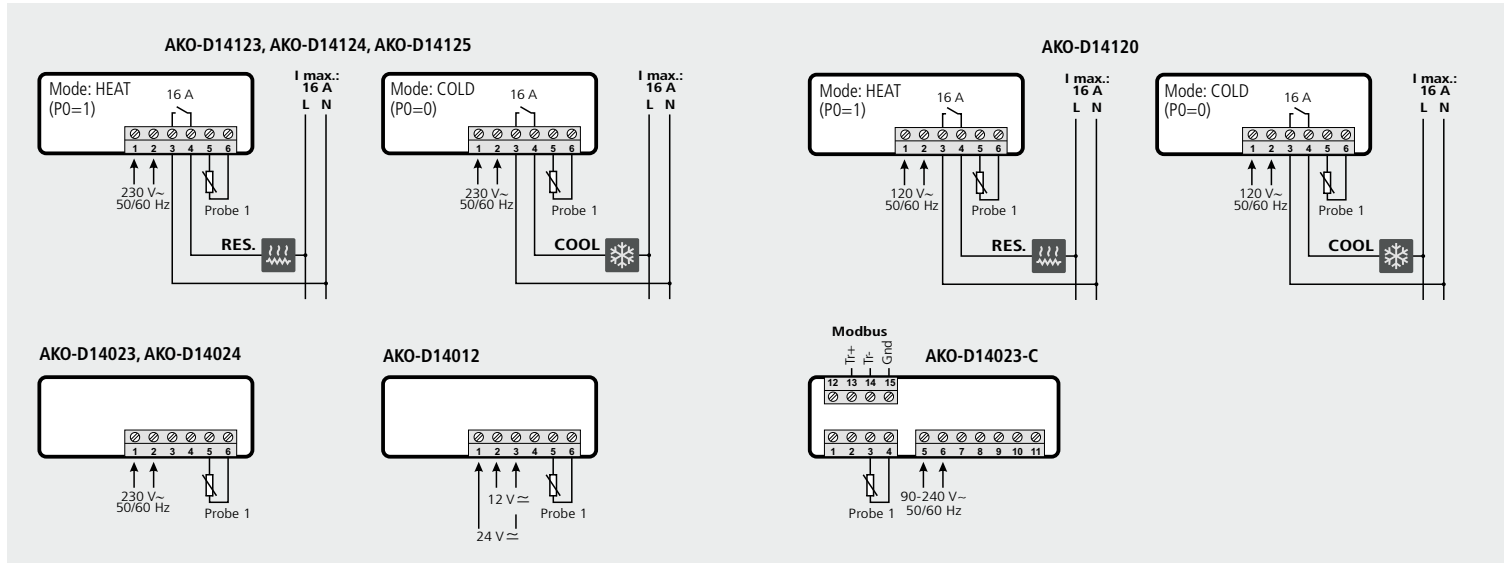
## CE Installation instructions



**AKO-D14120 AKO-D14123 AKO-D14012**  
**AKO-D14023 AKO-D14023-C AKO-D14024**  
**AKO-D14124 AKO-D14125**

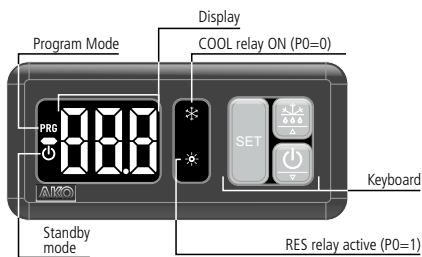
## 3- Wiring

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



## 4- Operation

### 3 key equipment



### SET key

Press for 5 seconds to modify the set point (SP).  
 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.

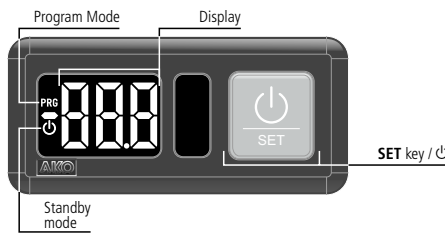
### Up key

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

### 1 key equipment



### SET key

Pressing for 5 seconds activates Standby mode, 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.

Pressing for 10 seconds goes to the programming menu.  
 Pressing for 5 seconds in the programming menu goes to the level displayed on the screen or, during the setting of a parameter, accepts the new value.  
 In the programming menu, a short press allows you to scroll through the various levels or, during the setting of a parameter, to increment the value. When upper limit is reached, it will start again from the lower limit.

## 5- Start-up

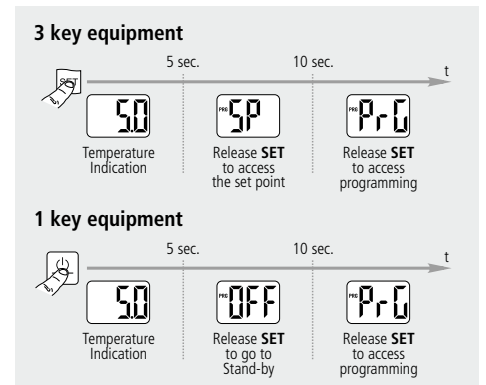
(Only 3 key models)

On power-up, the equipment will start up in Wizard mode (P3 / 1 flashing), press **▲** or **▼** 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").

### 5.1- Access to set point and programming



Information on our web site: [www.ako.com](http://www.ako.com)  
 We reserve the right to supply materials which may be slightly different from those described in our Data Sheets. Updated

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350141232 REV03 2013

<http://www.ako.com/wdnp/npa/page/qr/?qrCode=AKODOC0017>

User Manual available at

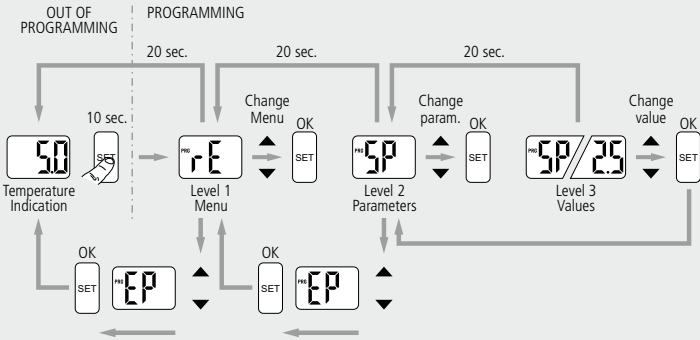


## 5.2- Setting parameters

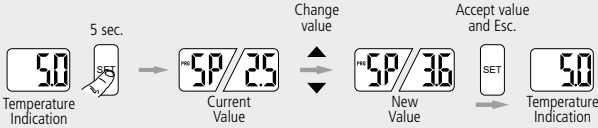
### Programming Menu (parameters)

After 20 seconds with no key being pressed, the equipment will return to the previous level. If you are on level 3, the changes will not be saved

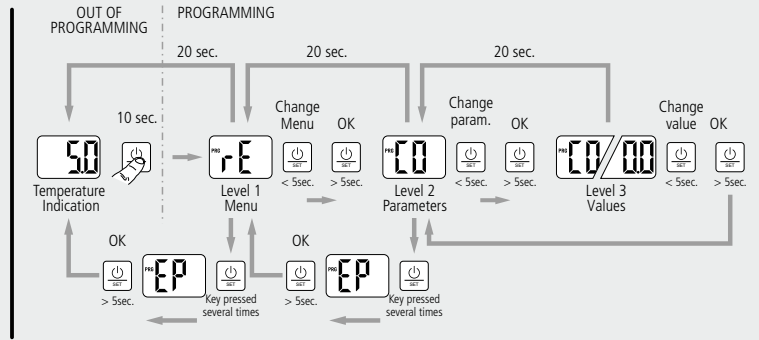
#### 3 KEY EQUIPMENT



#### Change set point (only equipment with three keys)



#### 1 KEY EQUIPMENT



## 6- 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. (Equivalent values in °F)

AKO-D14023-C					
AKO-D14012, AKO-D14023, AKO-D14024					
AKO-D14120, AKO-D14123, AKO-D14124, AKO-D14125					
Level 1 Menus and description					
rE	Level 2 Control				
	Level 3	Description	Values	Min.	Def. Max.
SP		Temperature Adjustment (Set Point) (limits depending on probe type)	With NTC (°C/°F) With PTC	-50 (-58°F)	* 99 (210°F) 150 (302°F)
C0		Calibrating probe 1 (Offset)	(°C/°F)	-20.0	0.0 20.0
C1		Probe 1 differential (Hysteresis)	(°C/°F)	0.1	2.0 20.0
C2		Upper blocking of the set point (cannot be set above this value)	With NTC (°C/°F) With PTC	C3	99 (210°F) 150 (302°F)
C3		Lower blocking of the set point (cannot be set below this value)	(°C/°F)	-50 (-58°F)	-50 (-58°F) C2
C4		Type of delay for protection of the compressor: 0=OFF/ON (since the last disconnection); 1=ON (since start-up/reset); 2=OFF-ON/ON-OFF (since the last shut-down/start-up)		0	0 2
C5		Protection delay time (value of the option selected in parameter C4)	(min.)	0	0 120
C6		Status of COOL relay with probe fault 0=OFF; 1=ON; 2=Average based on last 24 hours prior to probe fault; 3=ON-OFF as prog. C7 and C8		0	0 3
C7		Time relay ON in case of faulty probe (if C7=0 and C8=0, the relay will always be OFF deenergised)	(min.)	0	10 120
C8		Time relay OFF in case of fault of probe 1 (if C8=0 and C7=0, the relay will always be ON energised)	(min.)	0	5 120
EP		Exit to Level 1			
dEF	Level 2 DEFROST Control (if P0=0 Direct, Cold)				
	Level 3	Description	Values	Min.	Def. Max.
d0		Defrost frequency (Time between two starts)	(h.)	0	* 96
d1		Maximum defrost duration (0=defrost deactivated)	(min.)	0	* 255
d2		Type of message during defrost: 0=Current temperature; 1=Temperature at start of defrost; 2=Display dEF message		0	2 2
d3		Maximum duration of message (time added at the end of the defrost)	(min.)	0	5 255
d8		Calculated time between defrost periods: 0=Total actual time; 1=Sum of times the compressor is on		0	0 1
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
P5		Address (only systems with built-in communications)		1	1 255
P7		Temperature display mode 0= Integer °C 1=One decimal in °C 2=Integer °F 3=One decimal in °F		0	1 3
P9		Selection of probe type 0=NTC; 1=PTC		0	0 1
EP		Exit to Level 1			
tid	Level 2 Access and information control				
	Level 3	Description	Values	Min.	Def. Max.
L5		Access code (Password)		0	- 99
PU		Program version (Information)			
Pr		Program revision (Information)			
EP		Exit to Level 1			
EP		Exit Programming			



**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.

DEFAULT SETTINGS BY APPLICATION (P3)								
	1 Multipurpose	2 Frozen	3 Fruit and Vegetables	4 Fresh Fish	5 Soft Drinks	6 Bottle Racks	7 AC	8 Heat/ Incubators
SP	2 (35,6°F)	-18 (-0,4°F)	10 (50°F)	0 (32°F)	3 (37,4°F)	12 (53,6°F)	21 (69,8°F)	37 (98,6°F)
d0	4	4	4	4	24	24	96	-
d1	20	20	20	20	20	20	0	-
P0	0	0	0	0	0	0	0	1

MESSAGES			
L5	Access code (Password) request		D
dEF	Indicates a defrost is underway. (Only if parameter d2=2)		D -
E1	Probe 1 faulty (open circuit, crossover; NTC: temp. >110°C or <-55°C PTC: temp. >150°C or <-58°C - (equivalent limits in °F)		D S

**D:** Displays the message on the display

**S:** Shows the message in the AKONet software (Only AKO-D14023-C)

## 7- Technical specifications

Power supply	AKO-D14023/D14024/D14123/D14124/D14125	. 230V ~ ±10 % 50/60 Hz 3.5 VA
	AKO-D14120	. 120V ~ +8 % - 12 % 50/60 Hz 4 VA
	AKO-D14023-C	. 90-240V ~ 50/60 Hz 6 VA
	AKO-D14012	. 12/24V ≈ ±20% 2.5 VA
Maximum Voltage SELV circuits		20V
Communication (Only AKO-D14023-C)		Modbus RTU RS485
Inputs (According to P4)		1 NTC/PTC
Relay COOL 16 A		(EN60730-1: 12(9) A 250V~)
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		0,1°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	AKO-D14023-C	61 mm
	Other models	43 mm
Connections		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.		
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 tests	AKO-D14023/D14023-C/D14024/	
	AKO-D14123/D14124/D14125/	207 V, 17 mA
	AKO-D14120	105 V, 36 mA
	AKO-D14012	9,6 V, 181 mA
Current of radio jamming suppression tests		270 mA