AKO-D16323 Large Screen Temperature Controller Installation Guide

D16323 Large Screen Temperature Controller Installation Guide

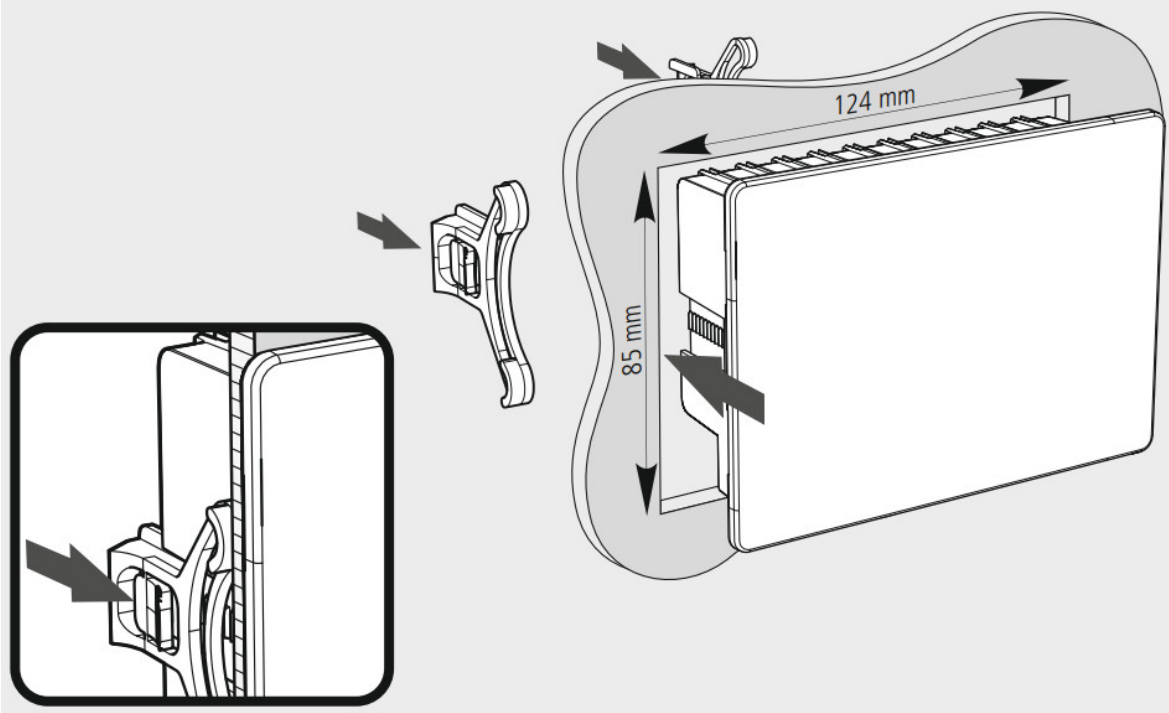
Contents

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 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 mm².
- Connecting wires for the relay contacts should be sized 2.5 mm².
- Between -40 ºC and +20 ºC, if the probe NTC is prolonged till 1.000 m with a mínimum of cable 0,5² mm, the maximum deviation will be of 0,25 ºC (extension cable for probe ref. AKO-15586)

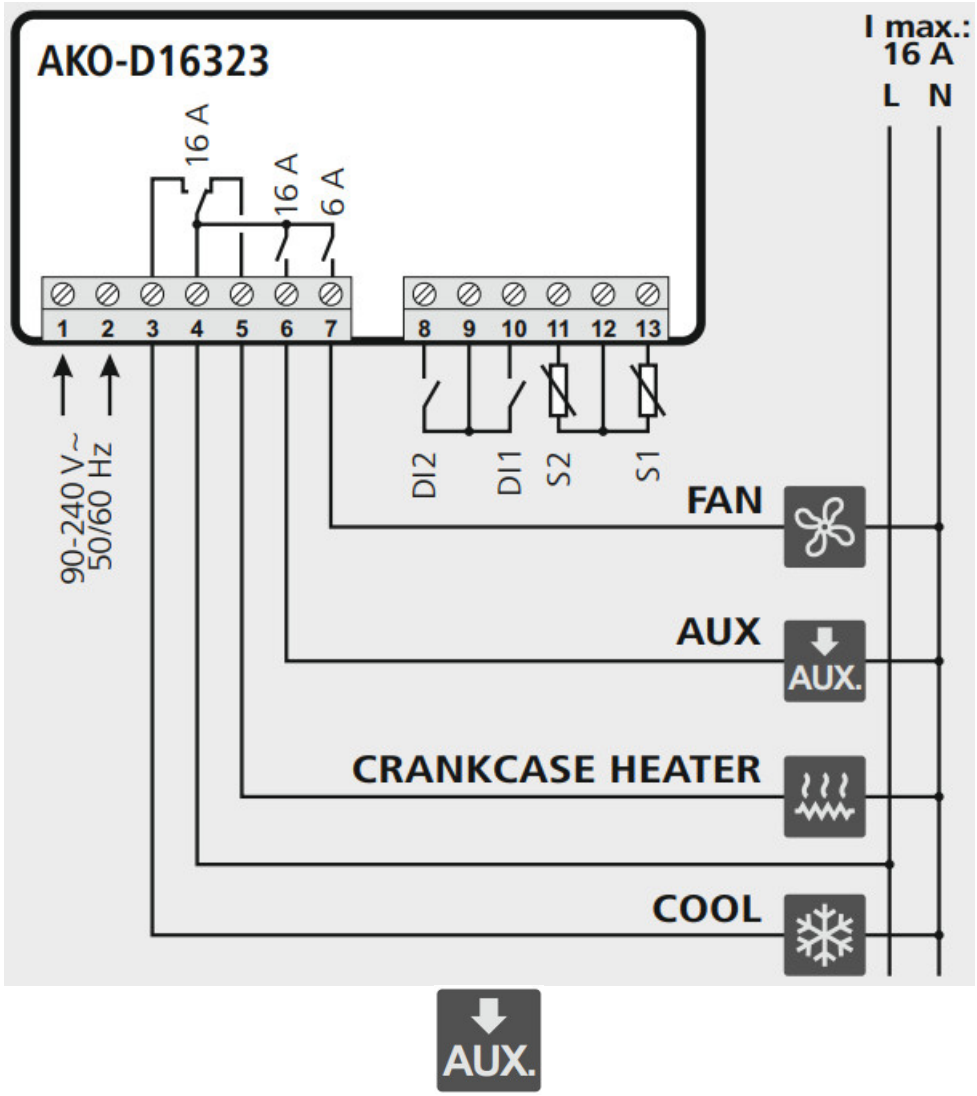
NOTE: Equipment not compatible with AKO-14917 (external communication module) and AKO-14918 (programming key)

Installation



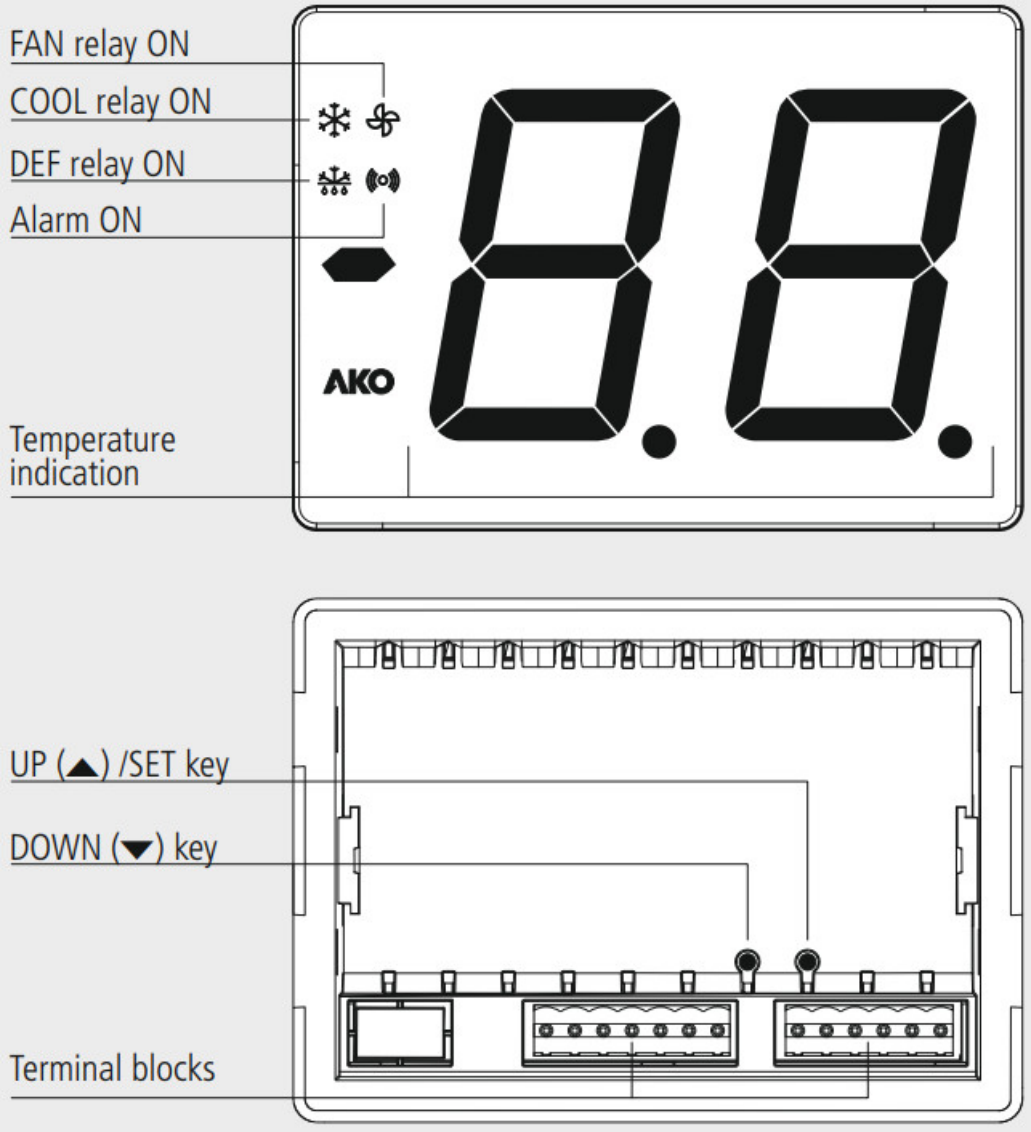
Wiring

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



AUX
Operation as per parameter P6
S1: Probe 1, temperature in the chamber or cabinet.
S2: Probe 2, defrost.
DI1/**DI2:** Digital Input 1 / Digital Input 2

Operation



UP(▲) /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 AKO indicator is displayed on the screen.

Pressing for 10 seconds goes to the programming menu.

In the programming menu, pressing for 5 seconds goes to the level displayed or, during the setting of a parameter, accepts the new value.

In programming menu, pressing briefly allows you to scroll through the various levels or, during the setting of a parameter, to change the value.

DOWN (▼) key

In programming menu, pressing briefly allows you to scroll through the various levels or, during the setting of a parameter, to change the value.

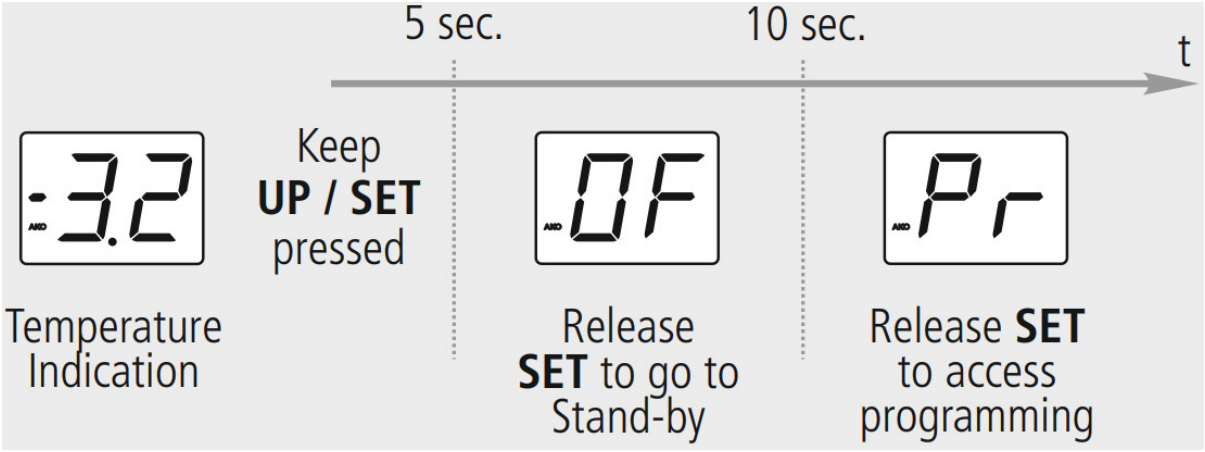
5- Start-up

On power-up, the equipment will start in Wizard mode (InI / 1 flashing), select the most appropriate application using the UP / DOWN keys and press SET

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

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

Access to set point and Stand-by



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.

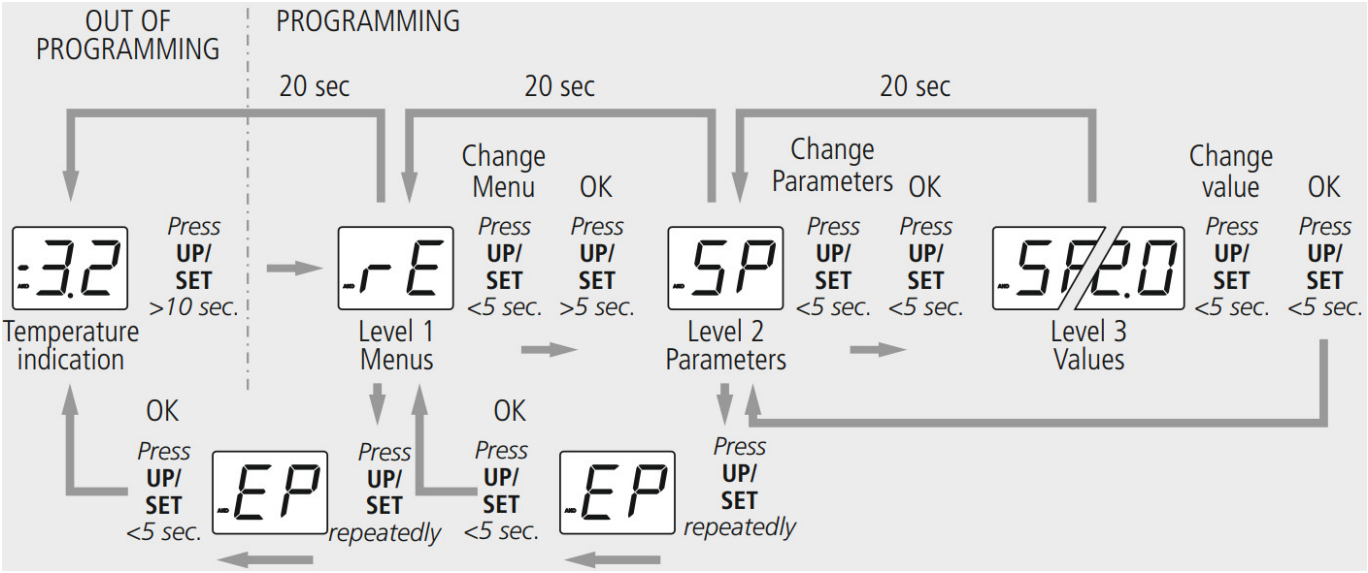


Table of parameters and messages

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.

Level 1 Menus and description						
rE	Level 2 Control					
		Level 3 Description	Values	Min.	Def.	Max.
	SP	TemperatureAdjustment (Set Point) (limits depending on probe type)	(°C/°F)	50 (-580	a, *	99 (99°f)
	CO	Calibrating probe 1 (Offset)	(°C/°F)	-20	0.0	20
	C 1	Probe 1 differential (Histeresis)	(°C/°F)	0.1	2.0	20

	C2	Upper blocking of the set point (cannot be set above this value)	(°C/°F)	ra L.)	99 (99°F)	99 (99°F)
	C3	Lower blocking of the set point (cannot be set below this value)	(°C/°F)	-50 (-58º F)	-50 (-58º F)	C2
	C4	Type of delay for protection of the compressor: **0**=OFF/ON (since the last disconnection); **1**=OFF-ONION-OF F (since the last shut-down /start-up)		0	0	1
	C5	Protection delay time (value of the option selected in paramet er C4)	(min.)	0	0	99
	C6	Status of COOL relay with probe 1 fault **0**=OFF, **1**=0N, **2**=Average based on last 24 hours prior to prob e fault; **3**=0N-OFF as prog. C7 and C8		0	2	3
	C7	Time relay ON in case of faulty probe (If C7=0 and C8#0, the relaywil l always be OFF deenergised)	(min.)	0	10	99
	C8	Relay OFF time in the event of Probe 1 fault ((If C8=0 and C7#0, the relay will always be ON energised)	(min.)	0	5	99
	C9	Maximum duration of fast freezing mode. (**0**=off)	(h.)	0	24	48
	CA	Change set point (SP) in ECO mode (SP+C 12 C3) (**0**=OFF) Sat this point (SP + CA), returns to normal. (SP+CA C3) (**0**=O FF)	(°CPF)	0	-50 (-58º F)	C3 S P
	Cb	Length of inactivity at digital input to a F) ctivate ECO mode (Only if PA or Pb=1 ands (**0**=OF	(h.)	0	2	24
	CC	Change set point (SP) in ECO mode (SP+CC C2) (**0**=off)	(°C/°F)	0	2	C 2-S P
	EP	Exit to Level 1				
dE	**Level 2 DEFROST Control (if P0=0 Direct, Cold)**					
		Level 3 Description	Values	Min.	Def.	Max.
	dO	Defrost frequency (Time between 2 starts)	(h.)	0	*	96
	dl	Maximum defrost duration (0=defrost deactivated)	(min.)	0	*	99
	d2	Type of message during defrost: **0**=Current temperature **1**=temperature at start of defrost; **2**=Di spl ay dE message		0	2	2
	d3	Maximum duration of message (Time added at the end of defr ost)	(min.)	0	5	99
	d4	Defrost end temperature (as per probe 2) (If P4* 1)	(ºC/ºF)	-50 (-58º F)	8 (46ºF)	99 (99ºF)
	d 5	Defrost on equipment start-up **0**=NO, First defrost as per dO, **1**=YES, First defrost as per d6		0	0	1
	d6	Defrost start delay on equipment start-up	(min.)	0	0	99

	d7	Defrost type: **0**=Resistors, **1**=Inverted cycle		0	0	1
	d8	Calculated time between defrost periods: **0**=Total actual time; **1**=Sum of times the compressor is on		0	0	1
	d9	Drip time at end of defrost (compressor and fans off) (If P4# 1)	(min.)	0	1	99
	EP	EAt to Level 1				
FA	**Level 2 FAN control (Evaporator)** **In two-relay models P6 must be set to zero**					
		Level 3 Description	Values	Min.	Def.	Max.
	F0	Fan shut-down temperature as per probe 2 (if P4# 1)	(ºC/ºF)	-50 (-58º F)	*	99 (99ºF)
	Fl	Probe 2 differential (If P4* 1)	(°CPF)	0.1	2.0	20
	F2	Stop fans when stopping compressor 0=No, 1=Yes		0	1	1
	F3	Fan status during defrost(0=0ff) (1=0n)		0	*	1
	F4	Starting delay after defrost (if F3=0) Will only operate if it is hig her than d9.	(min.)	0	3	99
	F5	Stop fans on opening the door 0=No, 1=Yes (Requires a digital input configured as port PA or P11=1).		0	0	1
	EP	Exit to Level 1				
AL	**Level 2 ALARMS control (visual)**					
		Level 3 Description	Values	Min.	Def.	Max.
	AO	Configuration of temperature alarms (0=Rdative to SP) (1=Ab solute)		0	0	1
	Al	Maximum alarm probe 1 (must be greater than SP)	(°C/°F)	A2 At	99 (99°F)	99 (99°F)
Level 1 Menus and description						
	A2	Minimum alarm probe 1 (must be less than SP)	(ºC/ºF)	-50 (-58° F)	-50 (-58° F)	A1
	A3	Temperature alarm delay during start-up.	(min.)	0	0	99
	A4	Temperature alarm delay after completi on of a defrost	(min.)	0	0	99
	A5	Temperature alarm delay after reaching the value ofAl or A2.	(min.)	0	30	99
	A6	External alarm / Severe external alarm delay when receiving d igital input signal (PA or Pb=2 or 3)	(min.)	0	0	99
	A7	Delay on deactivation of external alarm / Severe external alar m when digital input signal disappears (PA or Pb=2 or 3)	(min.)	0	0	99
	A8	Show waming if defrost is terminated by time-out 0=No, 1=Yes		0	0	1

	A9	Alarm relay polarity O=Relay ON in alarm (OFF no alarm) 1= Relay OFF on alarm (ON with no alarm)		0	0	1
	AA	TemperatureAlarm Differential (Al andA2)	(°CPF)	0.1	1.0	20
	AC	Door open alarm delay (if PA or Pb=1)	(min.)	0	2	99
	EP	Exit to Level 1				
Cn	**Level 2 General status**					
		Level 3 Description	Values	Min.	Def.	Max.
	P1	Delay of all functions on receiving electrical power	(min.)	0	0	99
	P2	Access code (password) functions **0**=Inadve; **1**=Block access to parameters; **2**=Keyboard lock		0	0	2
	In	Set the default parameters according to the type of application (see accom panying table) **1**=Multipurpose **2**=Frozen **3**=Fruits and vegetables **4**=Fresh fish **5**=Soft drinks **6**=Bottle racks **7**=AC		1	–	7
	P4	Selection of type of input: 1=1 probe; 2=2 probes		1	2	2
	p5	Address (only systems with built-in communications)		0	0	99
	P6	Configuration ofAUX relay **1**=Defrost **2**=Alarm **3**=Light		0	1	3
	P7	Temperature display mode: **0**=Whole in °C **1**=One dedmal in °C **2**=Whole i n °F **3**=One decimal in °F		0	1	3
	P8	Probe to be displayed (as per parameter P4) **0**=visualization of all the prob es in sequence, **1**=Probe 1; **2**=Probe 2		1	1	2
	pg	Selection of probe type 0=NTC; 1=PTC		0	0	1
	PA	Configuring digital input 1 **0**.0ff **1**=Door contact **2**=Extemal alarm **3**=Severe external alarm **4**=Slave d efrost **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
	Pb	Configuring digital input 2 **0**=0ff **1**=Door contact **2**=External alawn **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
	PC	Digital input polarity 1 0=Energised on dosed contact, 1=Energised on ope n contact		0	0	1
	Pd	Digital input polarity 2 0=Energised on dosed contact, 1=Energised on ope n contact		0	0	1
	PJ	Lights in ECO Mode (P6=3) **0**=0N; **1**=OFF		0	0	1
	EP	Exit to Level 1				
ti	**Level 2 Access and information control**					
		Level 3 Description	Values	Min.	Def.	Max.
	L5	Access code (Password)		0	0	99
	PU	Program version (Information)				

	Pr	Program revision (Information)			–	
	EP	Exit to Level 1				
EP	Exit P ogramming					

⚠ **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 (Inl)

	1 Multipurpose	**2 Frozen**	**3 Fruits and Vegatables**	**4 Fresh fish**	**5 Soft Drinks**	**6 Bottle racks**	**7 AC**
SP	2 (36ºF)	-18 (-0.4ºF)	10 (50ºF)	0 (32ºF)	3 (37ºF)	12 (54ºF)	21 (70ºF)
d0	4	4	4	4	24	24	96
d1	20	20	20	20	20	20	0
F0	8 (46ºF)	0 (32ºF)	30 (86ºF)	8 (46ºF)	8 (46ºF)	30 (86ºF)	99 (99ºF)
F3	1	0	1	1	1	1	0

MESSAGES

L5	Access code (Password) request	D	
EC	ECO mode ON	D	
dE	Indicates a defrost is underway. (Only if parameter d2=2)	D	
E1	Probe 1 faulty (open circuit, crossover or temperature outside the probe limits)	D	A
E2	Probe 2 faulty (open circuit, crossover or temperature outside the probe limits)	D	A
AH	Flashing: maximum temperature alarm on probe 1 (A1)	D	A
AL	Flashing: minimum temperature alarm on probe 1 (A2)	D	A
AE	External alarm activated (only if parameter PA or Pb=2)	D	A
AS	Severe external alarm activated (only if parameter PA or Pb = 3)	D	A
Ad	Defrost time-out alarm (only if parameter A8=1)	D	
PA	Door open alarm (Only if PA or Pb=1 and as per time at AC)	D	

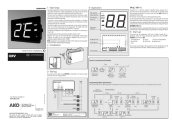
D: Shows the message on the display, **A:** Activates the alarm relay (If P6=2).

Technical specifications

Power supply . . . . . 90-240 V~ 50/60 Hz 7 VA
Maximum Voltage SELV circuits . . . . 20 V
Inputs. . . . . 2 NTC/PTC inputs + 2 digital inputs
16 A COOL relay. . . . . (EN60730-1: 12(9) A 250 V~)
6 A FAN Relay . . . . . (EN60730-1: 5(4) A 250 V~)

16 A AUX Relay . . . . . (EN60730-1: 12(9) A 250 V~)
Number of relay operations . . . . . EN60730-1: 100.000 operations
Types of probe . . . . . NTC AKO-149xx / PTC AKO-1558xx
Measurement range NTC . . . . . -50,0 ºC to +99,9 ºC (-58,0 ºF to 211 ºF)
PTC. . . . . -50,0 ºC to +150 ºC (-58,0 ºF to 302 ºF)
Resolution -50 to 100 ºC . . . . . 0.1 ºC
>100 ºC . . . . . 1 ºC
Working environment . . . . . -10 a 55 ºC, humidity <90 %
Ambient storage humidity. . . . . -30 a 70 ºC, humidity <90 %
Class of protection – front panel IP40
Fixing . . . . . Can be panel-mounted with anchors
Panel cutout dimensions . . . . . 124 x 85 mm
Front panel dimensions. . . . . 139 x 100 mm
Depth . . . . . 40 mm²
Connections. . . . . Connections via screw terminals for cables up to 2.5 mm
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 ºC
Parts which position active elements . . . . . 125 ºC
Voltage and current as per EMC tests . . . . . 207 V, 17 mA
Current of radio jamming supression tests . . . . . 270 mA

Documents / Resources

	AKO AKO-D16323 Large Screen Temperature Controller [pdf] Installation Guide AKO-D16323, AKO-D16323 Large Screen Temperature Controller, Large Screen Temperature Controller, Temperature Controller, Controller

References

- Industrial refrigeration: control and safety | AKO Group