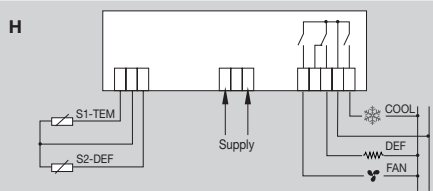


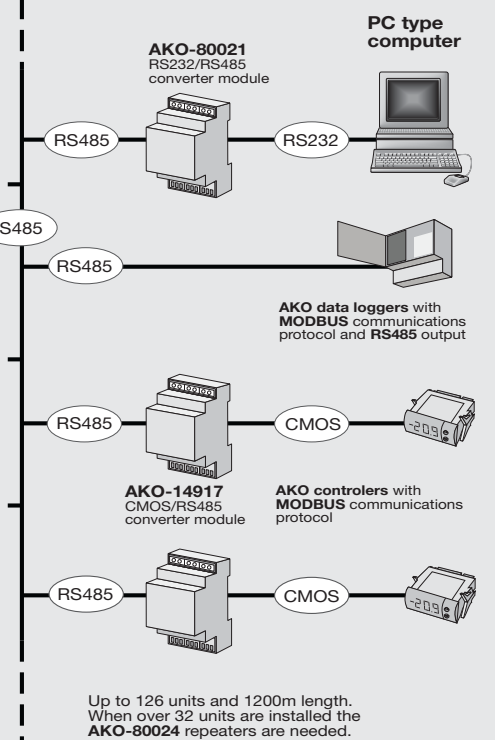
* The current specified for each relay is its individual maximum, if more than one is connected, the sum current (COOL + DEF + FAN + ALARM) should not exceed 17A.

SPECIFICATIONS	
Diagram for previous page	
2 Digits, from -50°C to + 99°C	
3 Digit decimal pt. from -49,9°C to 99,9°C	
Sensor 1, NTC 1,5m included, non-adjustable	
Sensor 1, NTC 1,5m included, adjustable	
Sensor 2, NTC not included	
Sensor 3, NTC not included	
Power supply	12V \approx ± 20%, 50/60Hz
Power supply	12/24V \approx ± 20%, 50/60Hz
Power supply	230V \sim ± 10%, 50/60Hz
Relay 1, Control (compressor) R16(4)A, 250V, cos φ =1,	
Relay 1, Control (compressor) R16(4)A, 250V, cos φ =1, SPDT switch	
Relay 1, Control (compressor) R20(6)A, 250V, cos φ =1,	
Relay 1, Control (compressor) R 30 max.18(5)A, 250V, cos φ =1, SPST	
Relay 2, Defrost or fans R 8A, 250V, cos φ =1, SPDT switch	
Relay 2, Defrost	R 8A, 250V, cos φ =1, SPDT switch
Relay 2, Defrost	R 8A, 250V, cos φ =1, SPST
Relay 3, Fan	R 6A, 250V, cos φ =1, SPST
Relay 3, Fan	R 8A, 250V, cos φ =1, SPST
Relay 4, Alarm	R 6A, 250V, cos φ =1, SPST
Internal acoustic alarm	
Digital input (for voltage-free contacts)	
Real time clock	
Connector for parameter transfer	
Connector for parameter transfer and communication	
Parameters password	



- Remote teleprocessing

AKO-14XXX
With a connector for parameter transfer



REFERENCES AND PROGRAMMABLE PARAMETERS

AKO-14412, AKO-14423		4 relays, up to 3 sensors	Compressor + Defrost + fans + Alarms		
AKO-14312B,AKO-14323B		3 relays, up to 2 sensors	Compressor + Defrost + fans		
AKO-14530, AKO-14632		3 relays, up to 2 sensors	Compressor + Defrost + fans		
AKO-14212A,AKO-14223		2 relays, up to 2 sensors	Compressor + Defrost by electric heat or air		
AKO-14128, AKO-14129		1 relay, 1 sensor	Defrost by compressor stop		
AKO-14112, AKO-14123, AKO-14610		1 relay, 1 sensor	Defrost by compressor stop		
AKO-14031		Adjustable thermometer			
AKO-14012, AKO-14023, AKO-14602		Thermometers			
PARAMETERS			VALORES		
❄️	Control REFRIGERATION (Compressor)		Min.	Def.	Max.
C0	Sensor 1 calibration (Offset)		-20°C	0°C	+20°C
C1	Sensor 1 differential (Hysteresis)		1°C	2°C	20°C
C2	Set point upper limit (It cannot be set above this value)		xx°C	99°C	99°C
C3	Set point lower limit (It cannot be set below this value)		-50°C	-50°C	xx°C
C4	Compressor protection delay type: 0=OFF/ON (From de last to switch-off) 1=ON (At swicht-on)		0	0	1
C5	Protection delay time (Value for the option selected for parameter C4)		0min	0min	99min
C6	"COOL" relay status with faulty sensor 1 (1 relay equipment) 0=OFF/ON (Average last 24 hours) 1=OFF/ON (To C7 and C8 program)		0	0	1
C6	"COOL" relay status with faulty sensor 1 (2, 3, 4, relay equipment) 0=OFF 1=ON		0	1	2
C7	"COOL"relay (Compressor) ON time in case of sensor 1 failure if C7=0 and C8 ≠ 0, the relay will always be OFF de-energised		0min	10min	99min
C8	"COOL"relay (Compressor) OFF time in case of sensor 1 failure if C8=0 and C7 ≠ 0, the relay will always be ON energised		0min	5min	99min
❄️	Control DEFROST		Min.	Def.	Max.
d0	Elapsed time between 2 starts (1 relay equipment)		0h	1h	99h
d0	Elapsed time between 2 starts (2, 3, 4, relays equipment)		0h	6h	99h
d1	Maximum duration (1 relay equipment)		0min	0min	99min
d1	Maximum duration (2, 3, 4 relays equipment)		0min	30min	99min
d2	Type of message during defrost: (1=Display the defrost start temp.) (0=Display the actual temp.) (2=Display the message dF or dEF)		0	2	2
d3	Message maximum duration (Time added at the end of defrost)		0min	5min	99min
d4	Defrost final temperature by sensor 2 (If it is programmed in P4)		-50°C	8°C	99°C
d5	Defrost on equipment switch on: (0=No, first defrost according d0) (1=Yes, first defrost according d6)		0	0	1
d6	Defrost start delay on equipment switch-off if d5=1		0min	0min	99min
d7	Defrost type: (0=Electric heat) (1=Hot gas by-pass) To defrost by air in 2 relays, parameters P6 and F3 should be programmed		0	0	1
d8	Time calculation between defrost periods: (0=Total real time) (1=Compressor operation sum)		0	0	1
d9	Drip time, compressor stop and FAN/R2 relay off when defrost ends In 2-relay, R2 operates in all cases of P6		0min	1min	99min
d10	Defrost 1 start-up time		0	off	23
d11	Defrost 2 start-up time		0	off	23
d12	Defrost 3 start-up time		0	off	23
d13	Defrost 4 start-up time		0	off	23
d14	Defrost 5 start-up time		0	off	23
d15	Defrost 6 start-up time		0	off	23
💧	Control FANS (Evaporator)		Min.	Def.	Max.
F0	Sensor 2 fan stop temperatures (If it is programmed in P4)		-50°C	4°C	99°C
F1	Sensor 2 (F0) differential for switching the FAN/R2 relay A1 and A2 Differential In 2-relay models if P6=1 and P4=2/3		1°C	2°C	50°C
F2	Stop fans if compressor stops? (0=No) (1=Yes) (In 2-relay if P6=1)		0	0	1
F2	Stop fans if compressor stops? (0=Yes) (1=No)		0	1	1
F3	Fan status during defrost (0=Stopped) (1=Running)		0	0	1
F3	Fan status during defrost (0=Running) (1=Stopped)		0	1	1
F4	Start-up delay after defrost (Applicable if greater than d9)		0min	3min	99min
F5	Stop fans if the door opens?: (0=No) (1=Yes) (Door if P9=1)		0	0	1
🔊	Control ALARMS (Visual, acoustic or relay)		Min.	Def.	Max.
A1	Maximum, °C above the Set Point in sensor 1		0=off	0=off	99°C
A2	Minimum, °C below the Set Point in sensor 1		0=off	0=off	99°C
A3	Start-up temperature alarm delay (If programmed in A1, A2)		0=off	0=off	120min
A4	Temp. alarm delay from end of defrost		0=off	0=off	99min
A5	Temp. alarm delay from at which they should operate due to temperature		0=off	30min	99min
A6	Temp. alarm delay from digital input disable (Door if P9=1)		0=off	0=off	126min
A7	Temp. alarm delay from digital input enable (Door if P9=1)		0=off	0=off	126min
A8	Alarms if defrost ends for maximum time: (0=No) (1=Yes)		0	0	1
A9	Relay 4 alarm polarity configuration: (0=With alarm relay ON) (1=With alarm relay OFF)		0	0	1
!	GENERAL STATUS		Min.	Def.	Max.
P0	Type of operation: (0=Cold) (1=Heat)		0	0	1
P1	Delay for all function on power supply switch on		0min	0min	99min
P2	Programmed parameter block : (1=Yes, block) (0=No, unblock)		0	0	1
P2	Allocation of password to Set Point: (0=Without allocation) (1=With allocation of L5 password)		0	0	1
P3	Initial parameters: (1= Yes, configure to "Def" and exit progr.)		0	0	1
P4	Connected sensors: (1=Sensor 1) (2=Sensor 1+Sensor 2) (3=Sensor 1 +Sensor 2 +Sensor 3)		1	2	3
P4	Connected sensors: (0=Sensor 1) (1=Sensor 1+Sensor 2)		0	1	1
P5	Address for units with communication		0	0	126
P5	Address for units with communication (Not activated)		0	0	99
P6	Relay 2 (R2) function in 2 relays versions: (0=Defrost by electric heat) (1=Fan control)		0	0	1
P7	Temperature display mode: (0=Integers in °C) (1=One decimal in °C)		0	0	1
P7	Temperature display mode: (0=Integers in °C) (2=Integers in °F)		0	0	2
P8	Displayed sensor: (1=Sensor 1) (2=Sensor 2) (3=Sensor 3)		1	1	3
P9	Digital input configuration: (0=Disabled) (1=Door) (2=External alarm)		0	0	2
P10	Contact with open door or enabled alarm: (0=Open) (1=Closed)		0	0	1
P11	Transfer parameters: (0=Disabled) (1=Send) (2=Receive)		0	0	2
P12	Program version (Information) (In mod. 1 relay PU or L7)				
🕒	REAL TIME CLOCK		Min.	Def.	Max.
r1	Clock configuration: Hour		0	x	23
r2	Clock configuration: Minute		0	x	59
EP	Exit programming				
MESSAGES					
dF	Fixed - Indicates defrost is being carried out. In order to display "dF" o"dEF" when defrosting, it is essential that parameter d2 is set to option 2.				
AE	Intermittent with temperature- External alarm (if P9=2)				
AH	Intermittent with temperature- The sensor 1 temperature exceeds that programmed in A1				
AL	Intermittent with temperature- The sensor 1 temperature is lower than that programmed in A2				
Ar	Intermittent with temperature- Low-charge clock battery or non-programmed clock alarm				
E1	Sensor 1 failure (Open circuit, crossed, temp.> 110°C ó temp.<-55°C)				
E2	Sensor 2 failure (Open circuit, crossed, temp.> 110°C ó temp.<-55°C)				
E3	Sensor 3 failure (Open circuit, crossed, temp.> 110°C ó temp.<-55°C)				
E5	Incorrect sensor configuration (See P4, P8)				
--	Temperature > 99 °C/°F				
EE	Memory failure				
	Messages E2 and E3 are displayed if P4 has been suitable programmed. Equipment operation under these conditions is the same as if P4 had been programmed with option 1				
	In units needing a parameter password, the message PA is displayed when introducing password is required. Operation of adjustment, configuration and transfer, with L5, L6, L7 and PU, parameters are shown in specific instructions included in each unit.				

NOTE: 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.

FRONT PANEL FUNCTIONS

- ➡️ Key UP

-When pressed for at least 5 seconds, a manual defrost is started with programmed duration.
-In programming, it increases the value being displayed.
-In 2, 3 and 4 relay models, it cancels the alarms, but they remain displayed.
- ⬅️ Key DOWN

-When pressed for at least 5 seconds, it displays the SET POINT temperature value.
-In programming, it decreases the value being displayed.
-In 2, 3 and 4 relay models, it cancels the alarms, but they remain displayed.

MODELS WITH 1 RELAY:

LED 1

LED 2

ON

❄️

-88

°C

AKO

Key UP

❄️

PRG

SET

Key DOWN

LED 1 Permanent: Indicates defrost in operation.

LED 2 Permanent: Indicates compressor relay is ON.

Flashing: Set Point or parameter programming phase.

MODELS WITH 2, 3 AND 4 RELAYS:

LED PR

LED COOL

LED FAN

LED DEF

LED ALARM

PR

DT

-88.8

°C

AKO

Key UP

❄️

❄️

❄️

❄️

PRG

SET

Key DOWN

LED DT Permanent: Indicates last defrost ended by time.

LED PR Flashing: Set Point or parameter programming phase.

LED COOL Permanent: Cooling relay COOL (compressor) energised.

Flashing: Because of the temperature detected by Sensor 1 (TEM), the COOL relay should be energised, but is not due to a programmed parameter.

LED FAN Permanent: FAN relay energised.

Flashing: Because of the temperature detected by Sensor 2 (DEF), the FAN relay should be energised, but is not due to a programmed parameter

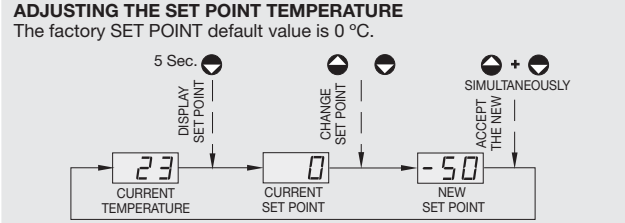
LED DEF Permanent: Indicates defrost in operation.

LED ALARM Permanent: ALARM relay energised (or acoustic alarm).

Flashing: Alarm detected, relay de-energised, but display maintained.

ADJUSTMENT AND CONFIGURATION

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



- Press ⬅️ key for at least 5 seconds to DISPLAY SET POINT. It displays the CURRENT SET POINT value and LED "2" / "PR" starts flashing.
- Press ⬅️ or ➡️ keys to CHANGE SET POINT into the required value.
- Press ⬅️ + ➡️ keys simultaneously to ACCEPT THE NEW SET POINT. The display returns to the current temperature display status and LED "2" / "PR" stops flashing.

PARAMETERS CONFIGURATION

LEVEL 1 PARAMETERS:

- Press ⬅️ + ➡️ keys simultaneously for at least 10 seconds. LED "2" / "PR" will be flashing, indicating that we are in the programming LEVEL 1 PARAMETERS and the first parameter "C0" is displayed.

- Press ⬅️ key to access the next parameter and ➡️ key to return to the previous one.

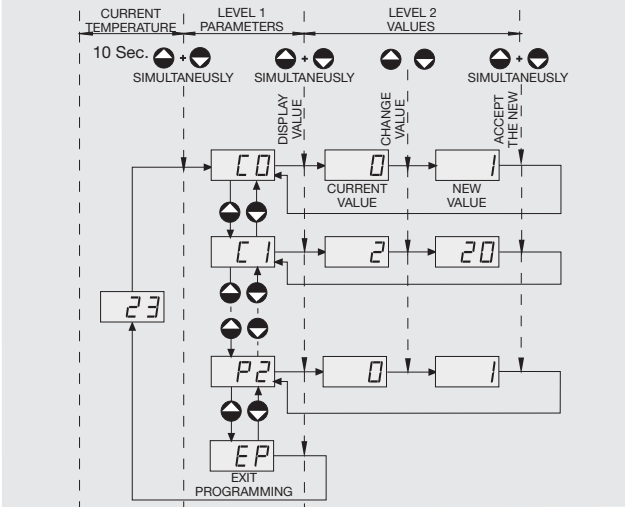
- Pressing ⬅️ + ➡️ keys simultaneously in the last parameter EP, the controller returns to the current temperature display status and LED "2" / "PR" will stop flashing.

LEVEL 2 VALUES:

- To DISPLAY CURRENT VALUE of any parameter, select the required one and press ⬅️ + ➡️ keys simultaneously. Once it is displayed, pressing ⬅️ or ➡️ key can CHANGE VALUE.

- Press ⬅️ + ➡️ keys simultaneously to ACCEPT THE NEW VALUE. Theç programming returns to LEVEL 1 PARAMETERS.

NOTE: If a key is not pressed for 25 seconds in any of the previous steps, then the equipment will automatically return to the current temperature display situation without modifying any of the values.



GENERAL TECHNICAL DATA

Thermometric accuracy: ±1 °C
Probe tolerance at 25 °C: ±0,4 °C
Maximum input power: 4,5VA
Working ambient temperature: 5°C a 50°C
Storage ambient temperature: -30°C a 70°C
Double insulation between power supply, secondary circuit and relay output.

PARTICULAR TECHNICAL DATA

Working ambient temperature for AKO-14530:..... 5°C a 40°C
Units with 2, 3 and 4 relays, also AKO-14128, AKO-14129, AKO-14602, AKO-14610, AKO-14632
Installation category II under CEI 664 standard
Units AKO-14012, AKO-14023, AKO-14031, AKO-14112, AKO-14123
Control device classification: With independent mounting, with characteristic of automatic operation action Type 1.B, to be used in clean situation, logical medium (software) class A