

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

The diagram illustrates the control panel and its relay connections for the AKO-D1461x / D1462x unit. The control panel features a digital display and a keyboard with a central 'SET' button and four directional arrows. The display shows 'ECO PRG' and '00.0'. The keyboard includes a power button and a fan speed control button. The relay connections are shown on the right, with four relays: COOL relay ON¹, FAN relay ON, DEF relay ON, and Light ON / RES relay ON². The AUX relay is also shown, connected to the AUX terminal on the control panel. The display shows 'ECO PRG' and '00.0'.

ECO mode ON
Program Mode
Stand-by mode ON
Fast Freezing mode ON

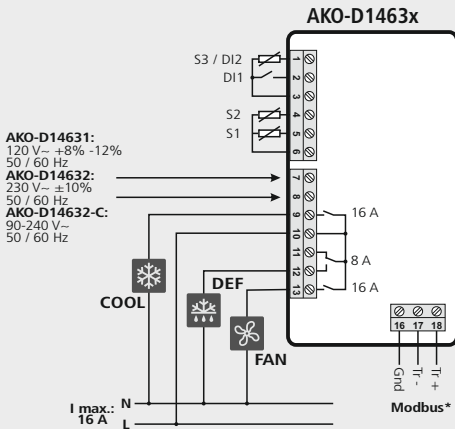
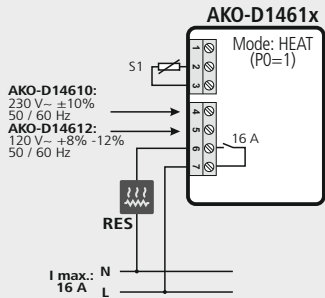
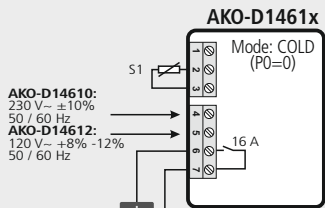
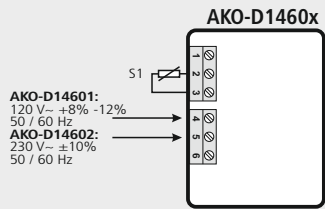
Display
Keyboard

COOL relay ON¹
FAN relay ON
DEF relay ON
Light ON / RES relay ON²
AUX relay ON

¹:In AKO-D1461x / D1462x, if P0=0
²:In AKO-D1461x / D1462x, if P0=1

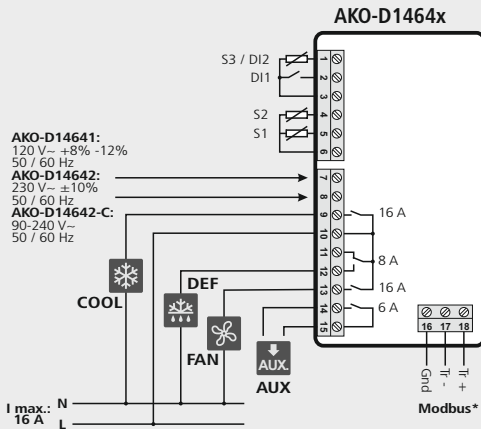
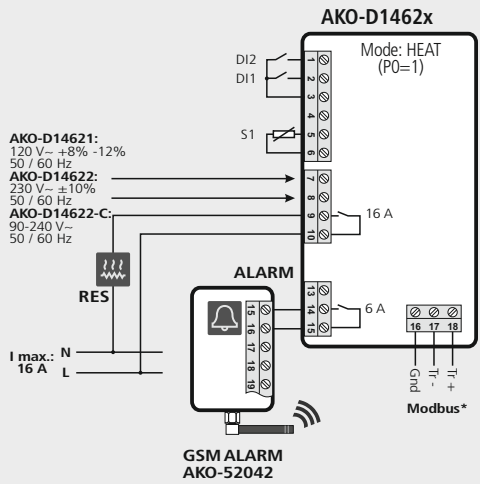
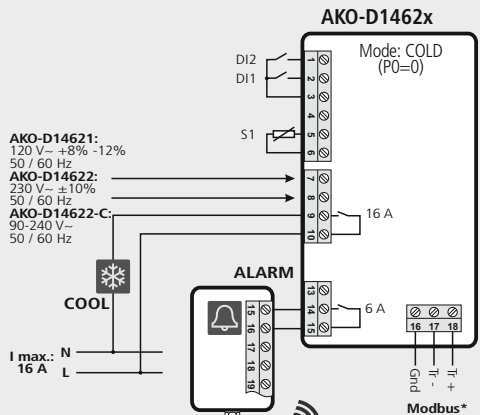
-  Press for 5 seconds, allows changing the set point (SP). (Not available in thermometers)
Pressing for 10 seconds goes to the programming menu.
In the programming menu, go to the level displayed or accept the new value while setting a parameter.
-  Pressing for 5 seconds starts/stops defrosting. (Not available in thermometers)
The programming menu, allows you to scroll through the various levels or, during the setting of a parameter, to change the value.
-  Press for 5 seconds to start/stop Fast Freezing mode (rapid cooling). (Function available depending on the model).
The programming menu, allows you to scroll through the various levels or, during the setting of a parameter, to change the value.
-  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 the programming menu, go to the level displayed.
-  Pressing it for 1 second, activates or deactivates the cold room light (if P6=3). This function stays active although the unit is in the stand-by mode. (Function available depending on the model).
In the programming menu, exit without saving parameter, return to previous level or exit programming.

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



AUX Relay
Function as per
parameter P6

S1: Probe 1, temperature in the chamber or cabinet.
S2: Probe 2, defrost.
S3: Probe 3, temperature of product / 2nd defrost.
DI1/DI2: Digital Input 1 / Digital Input 2.



* Depending on mode

On power-up, the equipment will start up in Wizard mode (Inl / 1 flashing), press ▲ or ▼ to select the most appropriate application and press **SET**.

- 1: Chilling** **2: AC** **3: Heat/Incubators**

The wizard will configure the parameters of the equipment for the chosen application (see table).

	WIZARD			
	SP	d0	d1	P0
Inl=1: Chilling	0	6	20	0
Inl=2: AC	21	0	0	0
Inl=3: Heat/Incubators	37	-	-	1

On power-up, the equipment will start up in Wizard mode (Inl / 1 flashing), press ▲ or ▼ to select the most appropriate application and press **SET**.

- 1: Chilling 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).

	WIZARD				
	SP	d0	d1	F0	F3
Inl=1: Chilling	2	4	20	8	1
Inl=2: Frozen	-18	4	20	0	0
Inl=3: Fruits and Vegetables	10	4	20	30	1
Inl=4: Fresh fish	0	4	20	8	1
Inl=5: Soft Drinks	3	24	20	8	1
Inl=6: Bottle racks	12	24	20	30	1
Inl=7: AC	21	96	0	99	1



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.

Access to set point and programming



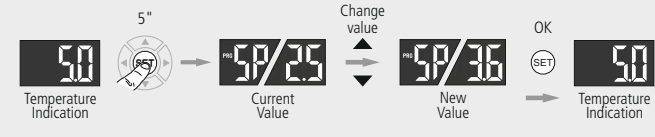
Table of parameters and messages

Def. column shows factory-set default parameters. Those marked with * are variable parameters depending on the application chosen in the wizard (see Start-up). Unless otherwise stated, temperatures are expressed in °C.

Level 1	Level 2	AKO-D1460x	AKO-D1461x	AKO-D1462x	AKO-D1463x	AKO-D1464x						
CONTROL												
rE	Description		Values	Min.	Def.	Max.						
SP	Temperature Adjustment (Set Point) (limits depending on probe type)	With NTC With PTC	(°C / °F)	-50.0	* - 150	99.0 150	●	●	●	●	●	●
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 With PTC	(°C / °F)	C3	99.0 - 150	99.0 150	●	●	●	●	●	●
C3	Lower blocking of the set point (cannot be set below this value)		(°C / °F)	-50.0	-50.0	C2	●	●	●	●	●	●
C4	Type of delay for protection of the compressor: 0=OFF/ON (since the last disconnection); 1=OFF-ON/ON-OFF (since the last shut-down /start-up)			0	0	1	●	●	●	●	●	●
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; 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	2	2 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 y C7≠0, the relay will always be ON energised)		(min.)	0	5	120	●	●	●	●	●	●
C9	Maximum duration of fast freezing mode. (0=off)		(h.)	0	24	48	●	●	●	●	●	●
C10	Change set point (SP) in fast freezing mode, when it reaches this point (SP + C10) returns to normal. (SP+C10 ≥ C3) (0=OFF)		(°C / °F)	0	-50.0	C3-SP	●	●	●	●	●	●
C11	Length of inactivity at digital input to activate ECO mode (Only if P10 or P11=1) (0=OFF)		(h.)	0	2	24	●	●	●	●	●	●
C12	Change set point (SP) in ECO mode (SP+C12 ≤ C2) (0=off)		(°C / °F)	0	2	C2-SP	●	●	●	●	●	●
EP	Exit to Level 1						●	●	●	●	●	●
DEFROST (If P0=0)												
dEF	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	●	●	●	●	●	●
d4	Defrost end temperature (probe 2) (If P4 ≠ 1)		(°C / °F)	-50.0	8.0	99.0	●	●	●	●	●	●
d5	Defrost on equipment start-up 0=NO, First defrost as per d0, 1=YES, First defrost as per d6			0	0	1	●	●	●	●	●	●
d6	Defrost start delay on equipment start-up		(min.)	0	0	255	●	●	●	●	●	●
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	255	●	●	●	●	●	●
EP	Exit to Level 1						●	●	●	●	●	●

Level 1	Level 2	AKO-D1460x	AKO-D1461x	AKO-D1462x	AKO-D1463x	AKO-D1464x
FAN CONTROL (Evaporator)						
	Description	Values	Min.	Def.	Max.	
Fan	F0 Fan shut-down temperature as per probe 2 (if P4 ≠ 1)	(°C / °F)	-50.0	*	99.0	• •
	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					• •
ALARMS CONTROL						
	Description	Values	Min.	Def.	Max.	
AL	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)	A2	99.0 -	99.0 150	• • • •
	A2 Minimum alarm probe 1 (must be less than SP)	(°C / °F)	-50.0		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	• • •
	A12 Door open alarm delay (if P10 or P11=1)	(min.)	0	2	120	• • •
EP	Exit to Level 1					• • •
GENERAL STATUS						
	Description	Values	Min.	Def.	Max.	
CnF	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 (S1+D11+D12) 2=2 Probes (S1+S2+D11+D12) 3=3 Probes (S1+S2+S3+D11) 4=2 Probes (S1+S3+D11)		1	1	4	• •
	P5 MODBUS address (Only AKO-D146xx-C)		1	1	255	• • •
	P6 Configuration of AUX relay 1=2nd Defrost 2=Alarm 3=light 4=Pump down 5=Master Defrost		1	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		0	1	3	• •
	P9 Selection of probe type 0=NTC; 1=PTC		0	0	1	• •

Change set point



Technical specifications

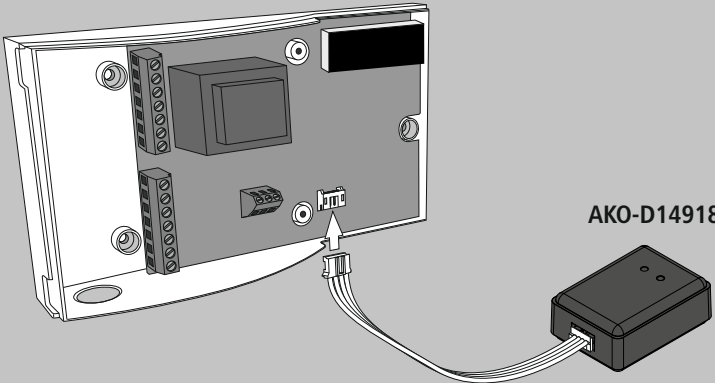
Power supply
AKO-D14602 / AKO-D14610 230V~ ±10 % 50/60 Hz 3.5 VA
AKO-D14622 / AKO-D14632 / AKO-D14642 230V~ ±10 % 50/60 Hz 3.75 VA
AKO-D14601 / AKO-D14612 / AKO-D14621 /
AKO-D14631 / AKO-D14641 120V~ +8 % - 12 % 50/60 Hz 4 VA
AKO-D14622-C / AKO-D14632-C / AKO-D14642-C 90-240V~ 50/60 Hz 7 VA
Maximum Voltage SELV circuits 20V
Inputs
AKO-D1460x / AKO-D1461x 1 input NTC/PTC
AKO-D1462x 1 input NTC/PTC + 2 digitised inputs
AKO-D1463x / AKO-D1464x (According to P4) 2 inputs NTC + 2 digitised inputs
. 3 inputs NTC + 1 digitised input

Relay COOL 16 A (EN60730-1: 12(9)A 250V~)
Relay DEF 8 A (EN60730-1: 8(4)A 250V~)
Relay FAN 16 A (EN60730-1: 5(4)A 250V~)
Relay AUX 6 A (EN60730-1: 5(4)A 250V~)
Relay ALARM 6 A (AKO-D1462x). (EN60730-1: 5(4)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 210 °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 IP40
Fixation Wall assembly, adaptable to built-in housing
Dimensions 171 x 94 x 42 mm
Connections Connections via screw terminals for cables up to 2.5 mm²
Rating of control device: Independent mounting, 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-D14602 / D14610 / D14622 / D14622-C / D14632 /
D14632-C / D14642 / D14642-C 207V, 17 mA
AKO-D14601 / AKO-D14612 / AKO-D14621 / D14631 / D14641 105V, 36 mA
Current of radio jamming supression tests 270 mA

Accessories

The AKO-D14918 programming key allows you to quickly and easily copy configured settings from one controller to another with the same functionality.



* Only available on AKO-D1464x / D-1464x-C.
P10/P11: Options available depending on the model.

MESSAGES			
L5	Access code (Password) request	D	-
dEF	Indicates a defrost is underway. (Only if parameter d2=2)	D	-
E1/E2/E3	Probe 1/2/3 faulty (open circuit, crossover or temperature outside the probe limits)	D	A
InI	Setup wizard (See section "Start-up")	D	-
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 P10 or P11=2)	D	A
AES	Severe external alarm activated (only if parameter P10 or P11=3)	D	A
Adt	Defrost time-out alarm (only if parameter A8=1)	D	-
PAb	Door open alarm (Only if P10 or P11=1 and as per time at A12)	D	-
Pd	Flashing: Pump down malfunction error (Stop).	D	-
LP	Flashing: Pump down malfunction error (Start-up).	D	-

D: Displays the message on the display A: Activates the alarm relay (if available).