

CE Quick guide



AKO-14545 AKO-14545-C

3- Quick start

- 1 By using keys ▲ and ▼, select the most suitable option according to the installation type in accordance with the table in the "WIZARD" appendix and press **SET**. The wizard **configures the equipment parameters and assigns the input and output functions** according to the installation type chosen.
- 2 Select the refrigerant gas type used from amongst the following options:
 0=R134a 1=R404a 2=R717a 3=R22 4=R410a 5=R507a 6=R744
 7=R407a 8=R407f 9=R1234y 10=R448a 11=R449a 12=R450a
- 3 Select the primary and secondary display units from amongst the following options:
 0=bar-°C; 1=psi-°F; 2=psi-°C; 3=bar-°F; 4=°C-bar; 5=°F-psi; 6=°C-psi; 7=°F-bar
- 4 Configure the rest of the parameters to their default value?
 0=No, the configuration is kept for all the parameters except for C01, C02, C04, C05 C06, C08 and C09.
 1=Yes, all the parameters are configured to their default value (see parameters table)
 (This option does not affect parameters C01, C02, C04, C05 C06, C08 and C09)

4- "WIZARD" table

The "WIZARD" table in the appendix is divided into 3 groups of columns. The first describes the different installation types (number of compressors and fans, if they have an inverter, etc.) associated with the **INI** option. The second group specifies the function assigned to each relay depending on the **INI** option selected. The third group specifies the function assigned to each digital input depending on the **INI** option selected.

Installation type

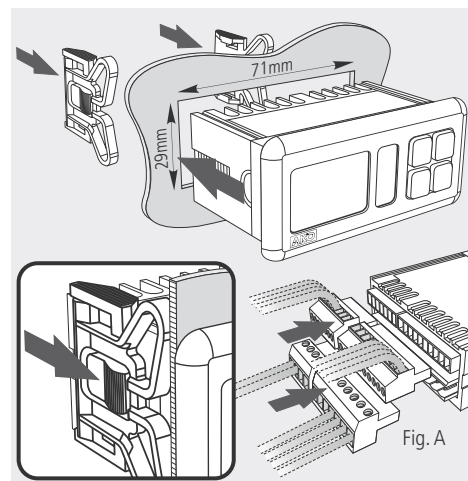
INI	Stages by compressor		Compressors with inverter		Fans without inverter		Fans with inverter	
	Compressors without inverter	Compressors with inverter	Fans without inverter	Fans with inverter	Fans without inverter	Fans with inverter	Fans without inverter	Fans with inverter
1	1	1	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-
3	1	3	-	-	-	-	-	-

1- Warnings

- If the equipment is used without adhering to the manufacturer's instructions the device safety requirements could be compromised.
- The installation location of the equipment must be protected from vibrations, water and corrosive gases where the ambient temperature does not exceed the value featured in the technical data.
- To ensure a correct reading the probe must be located away from external effects.
- The power circuit should be equipped with a switch for its disconnection of at least 2 A, 230 V, situated near the appliance. The cables will be fed in from the rear and will be types H05VV-F or H05V-K.
- The section to be used will depend on the local standard in force, however must never be less than 1 mm².
- The wiring cables for the contact relays must have a section of 2.5 mm².
- Make the connection before plugging in the terminals to the equipment** (See Fig. A).

ATTENTION: The equipment is not compatible with **AKO-14917** (external communication module) and **AKO-14918** (programming key).

2- Installation



7- Technical specifications

- Power supply 90-240V~ 50/60 Hz
- Maximum voltage in the SELV circuits 20V
- Inputs 2 analog inputs + 6 digital inputs
- Relays R1 to R4 (EN60730-1:5(4)A 250V~ SPST)
- Relay R5 (EN60730-1:5(4)A 250V~ SPDT)
- No. of relay operations EN60730-1: 100.000 operations
- Types of probes NTC **AKO-149xx**
- 4-20 mA
- Measuring range 0-5V ratiometric
- NTC** -50,0°C to +99,9°C (-58,0°F to 211°F)
- 4-20 mA / 0-5V** -60 to 999
- Resolution
- NTC** 0.1°C (0.1°F)
- 4-20 mA / 0-5V** -99.9 to 99.9 0.1
- ≤-100 / ≥100 1
- Working environment -10 to 50°C, moisture <90 %
- Storage environment -30 to 70°C, moisture <90 %
- Protection degree of the front part IP65
- Fixing Panel mounting with anchors
- Panel cavity dimensions 71 x 29 mm
- Front part dimensions 79 x 38 mm
- Depth 61 mm
- Connections:
- . . . Terminal to screw for cables with a section of up to 2.5 mm²
- Control device classification: Built-in assembly, with Type 1.B automatic operation action feature, for use in clean situations, logical support (Software) class A and continuous operation.
- Degree of contamination 2 acc. to UNE-EN 60730-1.
- Double power input insulation, secondary circuit and relay output.
- Rated pulse voltage 2500V
- Pressure ball test temperature:
- Accessible parts 75°C
- Parts that position active elements 125°C
- Voltage and current declared by the EMC tests:
- 207V, 17 mA
- Radio interference suppression test current 270 mA

Relay function

OUTPUTS				
R1	R2	R3	R4	R5
CV	C2	C2a	FV	AL
CV	C2	C2a	C2b	FV
CV	C2	C3	FV	AL

Function assigned to each relay depending on the **INI** option selected*

Input function

INPUTS					
I1	I2	I3	I4	I5	I6
T-VAR-C1	T-C2	T-VAR-F	-	L.P.	H.P.
T-VAR-C1	T-C2	T-VAR-F	-	L.P.	H.P.
T-VAR-C1	T-C2	T-C3	T-VAR-F	L.P.	H.P.
T-VAR-C1	T-C2	T-VAR-F	-	L.P.	H.P.

Function assigned to each input depending on the **INI** option selected*

*The meaning of each function is described in the "WIZARD" appendix

5- Operation

ESC key
 In the programming menu, exit the parameter without saving changes, return to previous level or exit programming.

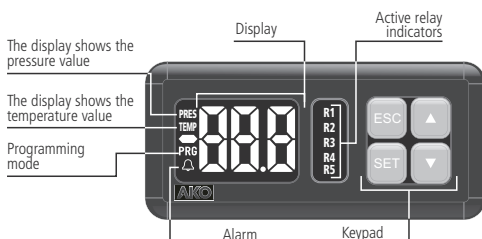
SET key
 By pressing this key for 1 second the probe display units change (according to parameter C09). Pressing it for 10 seconds accesses the programming menu. In the programming menu, it accesses the level shown on the display or, during the setting of a parameter accepts the new value.

▲ UP key
 By pressing this key for 1 second probe 2 is displayed for 5 seconds (or probe 1, according to parameter P02). By pressing a second time the probe ambient temperature value will be shown (only if I07 or I08=3).

In the programming menu it allows scrolling around the different levels, or during the setting of a parameter, changing its value.

▼ DOWN key
 Pressing this key returns the equipment to its normal operation after an alarm which require a reset (the causes which triggered the alarm must have disappeared).

In the programming menu it allows scrolling around the different levels, or during the setting of a parameter, changing its value.



6- Operation start-up

Upon being supplied with power the equipment will start up in WIZARD mode (INI / 1 flashing), press ▲ or ▼ to select the most suitable option for the installation type, check the options in the "WIZARD" appendix.

The wizard **configures the equipment parameters and assigns the input and output functions** according to the installation type chosen.

We reserve the right to supply materials that might vary slightly to those described in our technical Sheets. Updated information is available on our website.

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8- Table of parameters and messages

The **Def.** column indicates the ex-works configured default parameters. The pressure values featured on the table are expressed in **bar** and those for temperature in **°C**. If the wizard meanwhile selects another set of units (parameter C09), the equipment will make the conversion automatically.

Level 1	Level 2	Read only parameters can only be edited using the INI wizard.			
INSTALLATION CONFIGURATION					
	Description	Units	Min.	Def.	Max.
EnP	C01 Total number of compressors (with or without inverter)	-	-	-	-
	C02 Number of stages per compressor	-	-	-	-
	C03 Polarity of the capacity reduction contact 0=Active when closing the contact; 1=Active when opening the contact	0	0	1	1
	C04 Compressor 1 with frequency inverter 0=No; 1=Yes	-	-	-	-
	C05 Total number of fans (1 inverter only is considered with inverter)	-	-	-	-
	C06 Fan control type 0=ON/OFF; 1=Frequency inverter	-	-	-	-
	C07 Operation type 0=Direct; 1=Inverse	0	0	1	1
	C08 Refrigerant gas type 0=R134a 1=R404a 2=R717a 3=R22 4=R410a 5=R507a 6=R744 7=R407a 8=R407f 9=R1234y 10=R448a 11=R449a 12=R450a	-	-	-	-
	C09 Display units (Primary-Secondary) 0=bar-°C 1=psi-°F 2=psi-°C 3=bar-°F 4=°C-bar 5=°F-psi 6=°C-psi 7=°F-bar	-	-	-	-
	C10 Frequency inverter output type 0=4-20 mA; 1=0-10 V	0	0	1	1
InI This indicates the configuration selected in the wizard (read only)	-	-	-	-	
EP Output to level 1	-	-	-	-	
EVAPORATION CONFIGURATION					
	Description	Units	Min.	Def.	Max.
EP _r	E01 Pressure / evaporation temperature set point	bar	E03	5	E02
	E02 Evaporation set point upper limit (It cannot be set above this limit)	bar	E03	75	75
	E03 Evaporation set point lower limit (It cannot be set below this limit)	bar	-0.7	-0.7	E02
	E04 Compressor rotation type: 0=Balancing, depending on the operation time 1=Sequential (the last in is the first out)	0	0	1	1
	E05 Compressor control type: 0=Neutral zone; 1=Proportional	0	0	1	1
	E06 Evaporation regulation bandwidth	bar	0.0	2.0	50
	E07 Integral time (PID inverter control)	sec.	2	5	10
	E08 Stop value for pump down (If C07=0)	bar	-0.7	0.1	0.1
	E09 Maximum pump down time (If C07=0) (0= deactivated)	sec. x 10	0	0	255
	EP Output to level 1	-	-	-	-
CONDENSATION CONFIGURATION					
	Description	Units	Min.	Def.	Max.
EnD	F01 Condensation pressure / temperature set point	bar	F03	19	F02
	F02 Condensation set point upper limit (It cannot be set above this limit)	bar	F03	75	75
	F03 Condensation set point lower limit (It cannot be set below this limit)	bar	-0.7	-0.7	F02
	F04 Fan rotation type: 0=Balancing, depending on the operation time 1=Sequential (the last in is the first out)	0	1	1	1
	F05 Fan control type: 0=Neutral zone; 1=Proportional	0	0	1	1
	F06 Condensation regulation bandwidth	bar	0.0	2.0	50
	F07 For fans when the compressors stop 0=No; 1=Yes	0	0	1	1
	F08 Floating condensation 0=No; 1=Yes	0	0	1	1
	F09 Integral time (PID inverter control)	sec.	2	5	10
	F10 Floating condensation minimum set point value (see remark 1)	°C	-50	28	99.9
	F11 Condenser temperature delta	°C	6	12	20
EP Output to level 1	-	-	-	-	
PROBE CONFIGURATION					
	Description	Units	Min.	Def.	Max.
EnP	P01 Probe type selection 0=4-20 mA; 1=0-5 V; 2=NTC	0	0	2	2
	P02 Probe to be displayed: 0=Probe 1 (Aspiration) 1=Probe 2 (Discharge); 2=Probes 1 and 2 in carousel	0	0	2	2
	P03 Value 4 mA / 0 V (according to P01) probe 1	bar	-60	-60	999
	P04 Value 20 mA / 5 V (according to P01) probe 1	bar	-60	999	999
	P05 Probe 1 calibration (Offset)	bar	-20	0	20
	P06 Value 4 mA / 0 V (according to P01) probe 2	bar	-60	-60	999
	P07 Value 20 mA / 5 V (according to P01) probe 2	bar	-60	999	999
	P08 Probe 2 calibration (Offset)	bar	-20	0	20
	P09 Calibration of the outside temperature probe for floating condensation	°C	-20	0	20
	EP Output to level 1	-	-	-	-
DIGITAL INPUT CONFIGURATION					
	Description	Units	Min.	Def.	Max.
EnI	I01 Polarity digital input 1 (thermal stage 1): 0=Activates on closing contact; 1=Activates on opening contact	0	0	1	1
	I02 Polarity digital input 2 (thermal stage 2): 0=Activates on closing contact; 1=Activates on opening contact	0	0	1	1
	I03 Polarity digital input 3 (thermal stage 3): 0=Activates on closing contact; 1=Activates on opening contact	0	0	1	1
	I04 Polarity digital input 4 (thermal stage 4): 0=Activates on closing contact; 1=Activates on opening contact	0	0	1	1
	I05 Polarity digital input 5: 0=Activates on closing contact; 1=Activates on opening contact	0	0	1	1
	I06 Polarity digital input 6: 0=Activates on closing contact; 1=Activates on opening contact	0	0	1	1
	I07 Digital input 5 function: 0=Low pressure alarm 1=High pressure alarm 2=Thermal stage alarm 5 3=Ambient temperature probe 4=External alarm 5=Remote disconnection ON-OFF 6=Variation in the aspiration set point (E01) (see remark 2)	0	0	6	6
	I08 Digital input 6 function: 0=Low pressure alarm 1=High pressure alarm 2=Thermal stage alarm 5 3=Ambient temperature probe 4=External alarm 5=Remote disconnection ON-OFF 6=Variation in the aspiration set point (E01) (see remark 2)	0	1	6	6
	I09 Turn-on delay time of digital input 5 (not applicable if I07=2)	sec.	0	0	255
	I10 Turn-on delay time of digital input 6 (not applicable if I08=2)	sec.	0	0	255
	I11 Variation in the evaporation set point (new set point=E01+I11) (see remark 2)	bar	-20	0	20
	I12 Duration of the variation in the evaporation set point (see remark 2)	min.	0	0	255
EP Output to level 1	-	-	-	-	
ENERGY SAVING CONFIGURATION					
	Description	Units	Min.	Def.	Max.
ES	S01 Start of energy saving - Day of the week: 0=Deactivated 1=Monday 2=Tuesday 3=Wednesday 4=Thursday 5=Friday 6=Saturday 7=Sunday 8=Monday to Sunday 9=Monday to Saturday 10=Monday to Friday 11=Saturday to Sunday	0	0	11	11
	S02 Start of the energy saving - Hour (see remark 2)	h.	0	0	23
	S03 Start of the energy saving - Minute (see remark 2)	min.	0	0	59
	S04 Duration of the energy saving (see remark 2)	h.	0	0	24
	S05 Variation in the evaporation set point during energy saving (E01+S05) (see remark 2)	bar	-20	0	20
EP Output to level 1	-	-	-	-	

Level 1	Level 2				
TIMING CONFIGURATION					
	Description	Units	Min.	Def.	Max.
tEP	t01 Minimum operation time for a compressor	sec.x10	1	2	999
	t02 Minimum disconnection time for a compressor **	sec.x10	1	2	999
	t03 Delay time between the compressor start-up/stage and the next one	sec.	1	30	999
	t04 Delay time between the compressor stop/stage and the next one	sec.	1	10	999
	t05 Minimum operation time for a fan	sec.x10	1	1	999
	t06 Minimum disconnection time for a fan	sec.x10	1	1	999
	t07 Delay time between the fan start-up and the next one	sec.	1	2	999
	t08 Delay time between the fan stop and the next one	sec.	1	2	999
EP Output to level 1	-	-	-	-	
CONFIGURATION OF PROTECTIONS AND ALARMS					
	Description	Units	Min.	Def.	Max.
RL	A01 Number of active compressor stages with error in probe 1	0	0	***	***
	A02 Number of active fans or inverter % with error in probe 2	Without inverter With inverter	0 100%	C05 100%	C05 100%
	A03 Low pressure alarm in probe 1	bar	-0.7	0	75
	A04 Low pressure alarm differential	bar	0.1	1.0	20
	A05 High pressure alarm in probe 2	bar	-0.7	20	75
	A06 High pressure alarm differential	bar	0.1	1.0	20
	A07 Alarm delay after reaching the value	sec.	0	60	999
	A08 Delay of temperature alarms in the start-up.	sec.	0	0	255
	A09 High pressure alarm limit (per digital input) per hour without manual reset. (If I07 or I08=1) (0=deactivated) Once the limit has been exceeded a manual reset will be required for each new alarm.	0	0	255	255
	EP Output to level 1	-	-	-	-
DATE AND TIME CONFIGURATION					
	Description	Units	Min.	Def.	Max.
rEt	r01 Hour	00	00	23	23
	r02 Minutes	00	00	59	59
	r03 Day	1	1	31	31
	r04 Month	1	1	12	12
	r05 Year	00	15	99	99
	EP Output to level 1	-	-	-	-
ACCESS AND INFORMATION CONTROL					
	Description	Units	Min.	Def.	Max.
t Id	P5 Address for units with communication	1	1	1	255
	L5 Access code (Password)	0	0	999	999
	PU Programme version	-	-	-	-
	Pr Check	-	-	-	-
EP Output to level 1	-	-	-	-	
OPERATION TIMES					
	Description	Units	Min.	Def.	Max.
tFC	c1 This shows the operation time for the compressor or fan 1	hours x10	-	-	999
	c2 This shows the operation time for the compressor or fan 2	hours x10	-	-	999
	c3 This shows the operation time for the compressor or fan 3	hours x10	-	-	999
	c4 This shows the operation time for the compressor or fan 4	hours x10	-	-	999
	c5 This shows the operation time for the compressor or fan 5	hours x10	-	-	999
	EP Programming output	-	-	-	-

* Depending on the compressor control type: Proportional=E01; Neutral zone=E01-E06.

** If the compressor is equipped with an inverter, this period of time halves.

*** The number of stages depends on the configuration selected in the wizard.

Remark 1: The equivalent value in pressure is calculated depending on the refrigerant gas specified in the wizard.

Remark 2: In the event of the energy saving and the variation in the set point per digital input being activated at the same time, the variation in the set point per digital input will always prevail.

MESSAGES		
L5	Access code (Password) request	D -
PdR	Pump down detained due to time	D -
Rr	Clock battery dead or clock deprogrammed	D -
RLl	Low pressure alarm due to probe 1	D R
RLh	High pressure alarm due to probe 2	D R
REl	Thermal alarm 1	D R
RE2	Thermal alarm 2	D R
RE3	Thermal alarm 3	D R
RE4	Thermal alarm 4	D R
RE5	Thermal alarm 5	D R
RES	Severe external alarm (input I5 or I6)	D R
OFF	Remote regulation detained due to digital input (input I5 or I6)	D -
LPR	Low pressure alarm due to digital input (input I5 or I6)	D R
hPR	High pressure alarm due to digital input (input I5 or I6)	D R
Ei	Error in probe 1 (open circuit, probe crossed or out of range)	D R
E2	Error in probe 2 (open circuit, probe crossed or out of range)	D R
E3	Error in probe 3 (open circuit, probe crossed or out of range)	D R

D: The message is shown on the display.

R: Alarm relay activated (if available, see WIZARD table).