PROCool Electronic Panel

AKO-17635-1 / AKO-17635-2

Quick guide

Maintenance

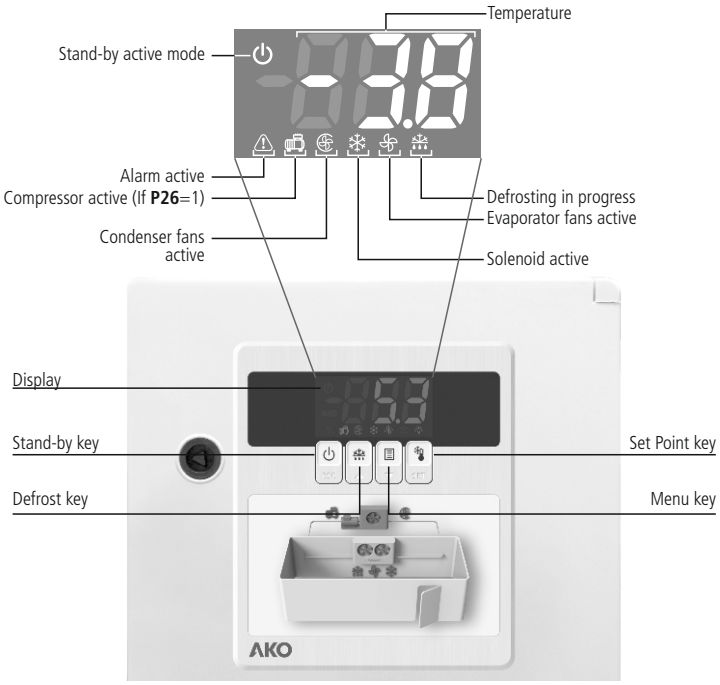
Clean the surface of the unit with a soft cloth, water and detergent. Do not use abrasive detergents, petrol, white spirits or solvents.

Precautions

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.
Between -40 °C and +20 °C, if the NTC probe is extended up to 1,000 m with minimum 0.5 mm² wire, the maximum deviation will be 0.25 °C (Wire for probe extension ref. **AKO-15586**)

IMPORTANT:
- The function of the digital inputs depends on the configuration.
- The recommended currents and powers are the maximum working currents and powers.

Description



Key function

Pressing it for 5 seconds activates the Stand-By mode. Pressing it for 2 seconds the unit returns to the normal mode. In Stand-by mode, the unit performs no action and the display only shows the ⏻ indicator along with the temperature.
During configuration, it exits the parameter without saving changes, returns to previous level, or exits programming.

One short press* shows the non-displayed probe reading (see **P8** parameter).
Pressing it for 5 seconds starts/stops the defrost.
During configuration, it allows you to scroll through the different levels, or when setting a parameter, to change its value.

Pressing for 5 seconds accesses the **quick configuration** menu.
Pressing for 10 seconds accesses the **advanced configuration** menu.
During configuration, it allows you to scroll through the different levels, or when setting a parameter, to change its value.

One short press* displays the current set point value (SP).
Pressing it for 5 seconds accesses change set point.
During configuration, it accesses the level shown on the display or, when setting a parameter, it accepts the new value.

*Short press: Less than 5 seconds.

Messages

L5	**Flashing 0:** Access code (Password) request You must enter the access code configured on **L5** to execute the requested function. See also parameter **P2**.
E1/E2	Probe 1 or 2 faulty (open circuit, crossover or temperature outside the probe limits; **NTC**: -50 To 99 °C).
dEF	Indicates a defrost is underway. When the defrost process has finished, the message will continue to be displayed during the time defined in parameter **d3**.
Ah	**Alternating with temperature:** Maximum temperature in control probe alarm. Temperature set in **A1** has been reached.
AL	**Alternating with temperature:** Minimum temperature in control probe alarm. Temperature set in **A2** has been reached.
AE	**Alternating with temperature:** External alarm activated (by digital input).
AES	**Alternating with temperature:** Severe external alarm activated (by digital input).
AdE	**Alternating with temperature:** Defrost alarm time-out. Displayed when a defrost ends after the maximum time elapsed as defined in parameter **d1**.
PAb	**Alternating with temperature:** Door open alarm. Shown if the door remains open longer than specified in parameter **A12**.
Pd	**Alternating with temperature:** The maximum pump down stop time has been exceeded (**P15**)
LP	**Alternating with temperature:** The maximum pump down start-up time has been exceeded (**P14**).
ASC	It indicates that a component in the compressor's safety chain has triggered (compressor motor guard, thermistors or high pressure controller).

Quick configuration

The quick configuration menu allows the unit to be configured for the most common applications. Press the ☰ key for 5 seconds to access it.

SP: Set point
It sets the coldroom's working temperature

d0: Defrost frequency
Time that must elapse between the starting of each defrost.

d1: Maximum defrost duration
The defrost will end after this time has elapsed since it started.

F3: Fan status during defrost
It defines the status of the fans during defrost.
- **0=** Stopped
- **1=** Running

A1: Maximum alarm probe 1
Defines the temperature at which the maximum alarm will be triggered. Only affects probe 1.

A2: Minimum alarm probe 1
Defines the temperature at which the minimum alarm will be triggered. Only affects probe 1.

P26: Stoppage owing to pump down
It defines whether this function is active
- **0**= Without pump down
- **1**= With pump down

Advanced configuration

The parameters are grouped into 6 sections depending on their function. To access it, press the ☰ key for 10 seconds. The **Def.** column shows factory-set default parameters. Temperature values are expressed in °C. (Equivalent temperature in °F)
If the access code is activated, a 2 digit code is requested, if the code entered is incorrect the unit will not enter programming mode.
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.

Level 1	Level 2	REGULATION AND CONTROL				
		Description	Value	Min.	Def.	Max.
rE	SP	Temperature Adjustment (Set Point)	°C / °F	-45	0.0	99
	C0	Calibrating probe 1 (Offset)	°C / °F	-20.0	0.0	20.0
	C1	Probe 1 differential (Histeresis)	°C / °F	0.1	2.0	20.0
	C2	Upper blocking of the set point (cannot be set above this value)	°C / °F	C3	99	99
	C3	Lower blocking of the set point (cannot be set below this value)	°C / °F	-45	-45	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; **3**=ON-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 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
	C11	Idle time of the digital input for the change Set Point function to be activated (Only if P10 or P11 =1) (**0**=OFF)	h.	0	0	24
	C12	Variation of the set point (SP) when the change set point function is active. (SP+C12 ≤ C2) (**0**= disabled)	°C / °F	C3-SP	0.0	C2-SP
	EP	Exit to Level 1				

		DEFROST CONTROL				
		Description	Value	Min.	Def.	Max.
dEF	d0	Defrost frequency (Time between two starts)		0	6	96
	d1	Maximum defrost duration (**0**=defrost deactivated)	min.	0	15	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 process)	min.	0	5	255
	d4	Defrost end temperature (probe 2) (If P4 ≠ 1)	°C / °F	-45	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
	d8	Calculated time between defrost period : **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				

		FAN CONTROL				
		Description	Value	Min.	Def.	Max.
FAn	F0	Fan shut-down temperature as per probe 2 (if P4 ≠ 1)	(°C/°F)	-45	45	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**=Parados; **1**=En marcha		0	0	1
	F4	Starting delay after defrost (if F3=0) Will only operate if it is higher than d9	(min.)	0	3	99
	EP	Exit to Level 1				

Level 1	Level 2	ALARM CONTROL				
		Description	Value	Min.	Def.	Max.
AL	A0	Configuration of temperature alarms : **0**=Relative to SP **1**=Absolute		0	1	1
	A1	Maximum alarm probe 1 (must be greater than SP)	(°C/°F)	A2	99,0	99,0
	A2	Minimum alarm probe 1 (must be greater than SP)	(°C/°F)	-45	-45	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 delay when receiving digital input signal (P10 or P11=2 or 3)	(min.)	0	0	120
	A7	Deactivation delay of the 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
	A10	Temperature Alarm Differential (A1 and A2)	(°C/°F)	0,1	1,0	20,0
	A12	Door open alarm delay (if P10 or P11=1)	(min.)	0	10	120
	EP	Exit to Level 1				

		GENERAL STATUS				
		Description	Value	Min.	Def.	Max.
CnF	P1	Delay of all functions on receiving electrical power	(min.)	0	0	255
	P2	Función del código de acceso (password) **0**= Inactivo; **1**= Bloqueo acceso a parámetros; **2**= Bloqueo del teclado		0	0	2
	P3	Configures the default factory settings **0**= No changes **1**=Return to default settings		0	0	1
	P4	Selection of type of inputs **1**=Sonda S1 **2**=Sondas S1 + S2		1	1	2
	P7	Temperature display mode **0**=Integers in °C **1**=One decimal in °C **2**=Integers 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		0	1	2
	P10	Configuring digital input 1 **0**= Off **1**= Door contact **2**= External alarm **3**= Severe external alarm **4**= Change Set Point **5**=Remote defrost		0	0	5
	P11	Configuring digital input 2 **0**= Off **1**= Door contact **2**= External alarm **3**= Severe external alarm **4**= Change Set Point **5**=Remote defrost		0	0	5
	P12	Digital input polarity 1 **0**=Energised on closed contact, **1**=Energised on open contact		0	1	1
	P13	Digital input polarity 2 **0**=Energised on closed contact, **1**=Energised on open contact		0	1	1
	P14	Maximum start-up time after pump down (Values between 1 and 9 seconds are not accepted) (**0**=Disabled)	(seg.)	0	0	120
	P15	Maximum pump down time (**0**=Disabled)	(min.)	0	0	15
	P23	Stop evaporator fans and compressor on opening door **0**=No **1**=Yes		0	0	1
	P24	Start up delay for fans and compressor with door open	(min.)	0	0	999
	P26	Pump Down **0**=Without pump down **1**=With pump down		0	1	1
	EP	Exit to Level 1				

		ACCESS CONTROL AND INFORMATION (tid)				
		Description	Value	Min.	Def.	Max.
tid	L5	Access code (Password)		0	0	99
	PU	Control board software version(Information)			-	
	Pr	Control board software review (Information)			-	
	PUd	Display board software (Information)			-	
	Prd	Display board software review (Information)			-	
	EP	Exit to Level 1				

Technical specifications

Rated voltage Un ..... 400 V~ ±10 % 50/60 Hz ±5 %
Rated voltage Ue ..... 230 V~ ±10 % 50/60 Hz ±5 %
Maximum nominal input current ..... 32 A
Short-circuit current at the connection point ..... 6 kV
Probe temperature range ..... –45.0 °C to 99.9 °C
Resolution, setting and differential ..... 0.1 °C
Thermometric precision ..... ± 1 °C
Precision of the NTC probe at 25 °C ..... ± 0.4 °C
Input for NTC probe AKO-14901
Maximum input power in the operation ..... 30 VA
Working ambient temperature ..... -5 °C to 40 °C
Storage ambient temperature ..... –30 °C to 70 °C
Overvoltage category ..... II s/ EN 61439-1
Degree of pollution ..... II s/ EN 61439-1
Degree of protection IP65
Dimensions **AKO-17635-1 / 17635-2** ..... 400(An) x 300(Al) x 165(P) mm
Double isolation between power supply, secondary circuit and relay output.
Type of assembly ..... Fixed internal
Programming key compatible **AKO-D14918**
Encapsulated assembly

Recommendations

Disconnect the voltage before carrying out any operations inside the electrical panel. All wiring should be according to current standards and should be carried out by authorised staff. Only carry out the wiring foreseen in the wiring diagrams. Using the electrical panel not observing the manufacturer's instructions may alter the appliance's safety requirements. A tool is needed to remove any fixed part.

Panel installation:

It is advisable to leave a clean safety space without obstacles around the panel.
Do not knock or make sudden movements on the panel.
Carry out the wiring according to the installation manual.
The probes and their cables should **NEVER** be installed in a conduit together with power, control or feeder cables.
The earth terminals that the panels contain are installed to guarantee the continuity of earthing, however, earthing is not carried out by the terminal and should be carried out outside the panel.
The neutral ratings are of the TT type. The IT rating should not be used.
Circuit breakers (protective switches) are of the phase/s + neutral, curve C type, guaranteeing switching and protection against overcurrents.
Close the panel when your are not working on it.
Residual current protection outside the electrical panel according to low voltage electrotechnical regulations.
The panels comply with European Standards EN 61439-1 and EN-61439-3 for the electrical panel and EN-60730 for the control board.
Terminals for copper external conductors.

Checks before starting the panel up:

Power supply voltages and frequencies will be the ones that figure in the "Technical specifications" section.
Check that there are no loose parts or foreign bodies on connections or switchgear.
Check that there is no dust or damp inside the panel.
Check the correct fastening of the switchgear and components.
Check the correct tightening of the screws and power connections.
Check the correct connection of the power conductors.
Check the correct insulation of the outer lines and that they do not mechanically force the inner connections of the panel.
Check that the maximum current of the FK1, FK2 and FK3 motor guards has been set correctly (depending on the model).
Before starting the installation up, we recommend preheating the compressor's housing.

Checks during the panel start-up:

Check that no electric arcs occur.
Check that the relays or contactors do not produce ratios.
Check that there is no overheating in cables, controllers and the rest of the switchgear.

Checks after the first 24 hours of operation:

Check that no overheating occurs.
Retighten screws and power connections.

Periodical preventive maintenance:

The panel should remain closed using its lock.
Retighten the power connections once a year.
Check the wear of the switchgear once a year.
Clean the outer surface of the panel with a soft cloth, water and detergent. Do not use abrasive detergents, petrol, white spirits or solvents.

Technical data:

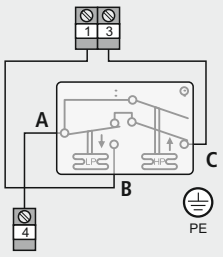
Working ambient temperature: –5 °C to 40 °C
Rated isolation voltage Ui = 440 V~
Electrical panels with degree of protection: IP 65
CEM B environment
Terminals for copper conductors
Resistance to short-circuits Icc=6 kA
Rated pulse voltage (Vimp) 2,5 KV

Cable isolation voltage:

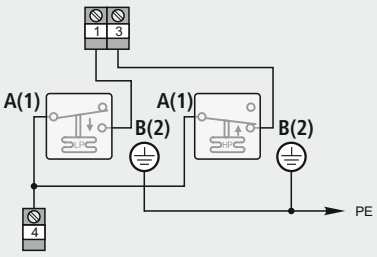
Operation: 500V
Power: 750V

Pressure switch wiring options

Combine high-low pressure controller

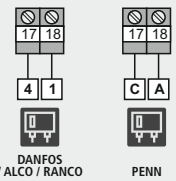


Separate Low pressure controller per AC input

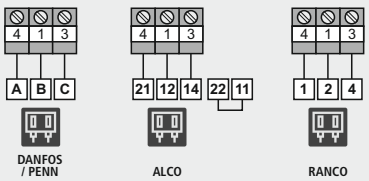


Pressure controller equivalence

FAN CONTROL



HIGH / LOW



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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.

351763502 Rev 02 2025