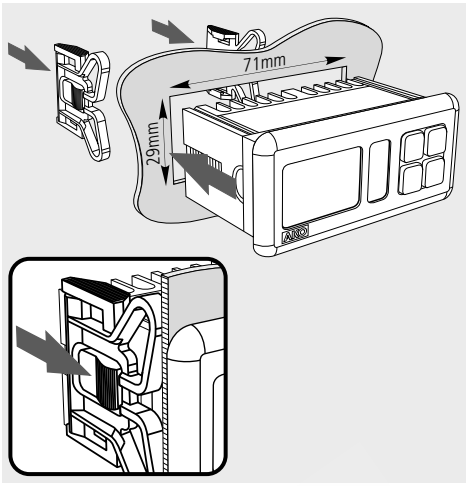
CE Instructions

AKO-D14724 AKO-D14725 AKO-D14726
AKO-D14727 AKO-D14728 AKO-D14729
AKO-D14726-C AKO-D14729-C

1- Warnings

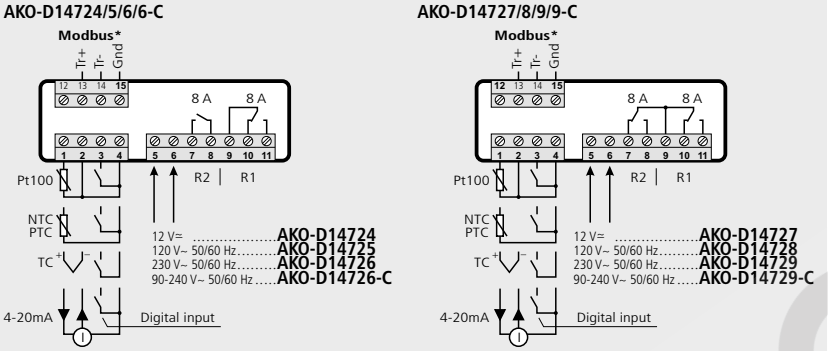
-Using the unit not observing the manufacturer's instructions may alter the appliance's safety requirements. Only probes supplied by AKO should be used for the appliance to operate correctly.
-The unit should be installed in a place protected from vibrations, water and corrosive gases, where the ambient temperature does not exceed the value indicated in the technical data.
-For the reading to be correct, the probe should be used in a place without heat influences apart from the temperature you want to measure or control.
-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 enter the back of the unit and will be H05VV-F or H05V-K.
-The section to be used will depend on current local regulations, but should never be less than 1 mm^2.
-Cables for relay contact wiring should have a section of 2.5 mm^2.
-From -40 °C to +20 °C, if the NTC probe is extended to 1000 m with at least 0.5 mm^2 cable, the maximum deviation will be 0.25 °C (cable for probe extension ref. AKO-15586)
ATTENTION: Unit not compatible with **AKO-14917** (External Communication Module) and **AKO-14918** (Programming Key)

2- Installation



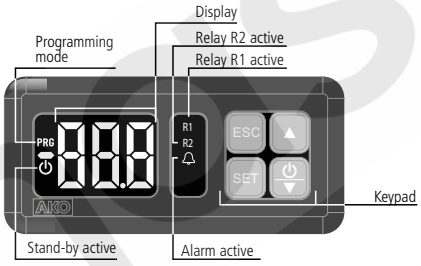
3- Wiring

The probe and its cable should **NEVER** be installed in a conduit together with power, control or feeder cables.



*According to model

4- Operation



ESC key

Deactivates alarms but they remain signalled (According to parameter A16).
The save without changes, return to previous level or exit programming parameter appears on the programming menu.

SET key

Pressing it for 5 seconds allows changing the SP set point of relay 1.
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.

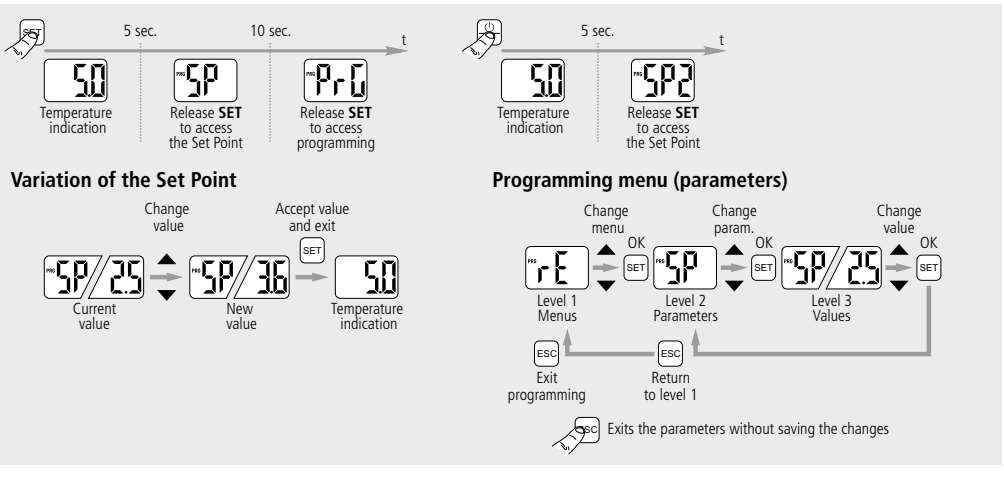
Up key ▲

Pressing it for 5 seconds allows changing the SP2 set point of relay 2.
In the programming menu it allows scrolling around the different levels, or during the setting of a parameter, changing its value.

Down key ▼ / ⏻

Pressing it for 5 seconds activates the Stand-by mode, and pressing if for 2 seconds returns the device to the normal mode. In the Stand-by mode, the unit does not carry out any action and the display only shows the ⏻ indicator.
In the programming menu it allows scrolling around the different levels, or during the setting of a parameter, changing its value.

4.1- Access to set point and to programming



5- Technical specifications

Power supply	**AKO-D14724/D14727**	12 V ≃ ±20% 2.5 VA
	AKO-D14725/D14728	120 V~ +8% -12% 50/60 Hz 4 VA
	AKO-D14726/D14729	230 V~ ±10% 50/60 Hz 3.75 VA
	AKO-D14726-C/D14729-C	90-240 V~ ±10% 50/60 Hz 7 VA
Maximum voltage in the SELV circuits		20 V
Inputs		1 input NTC/PTC/Pt100/Thermocouple J or K/4-20 mA + 1 digital input
Relay R1		EN60730-1: 8(4) A 250 V~ SPDT
Relay R2	**AKO-D14724/25/26/26-C**	EN60730-1: 8(4) A 250 V~ SPST
	AKO-D14727/28/29/29-C	EN60730-1: 8(4) A 250 V~ SPDT
No. of relay operations		EN60730-1: 100,000 operations
Measuring range	NTC	-50.0 °C to +99.9 °C (-58.0 °F to 211 °F)
	PTC	-50.0 °C to +150 °C (-58.0 °F to 302 °F)
	Pt100	-100 °C to +440 °C (-148.0 °F to 824 °F)
	4-20 mA	-999 to 999 (Configurable)
	Thermocouple J	0 °C to +600 °C (32 °F to 1112 °F)
	Thermocouple K	0 °C to +999 °C (-32 °F to 1830 °F)
Resolution	NTC	0.1 °C
	PTC -50 to 100 °C	0.1 °C
	PTC > 100 °C	1 °C
	Pt100 -100 to 100 °C	0.1 °C
	Pt100 > 100 °C	1 °C
	4-20 mA	0.1 from -100 to 100 and 1 for values <-100 or >100
	Thermocouple J/K	1 °C
Precision	NTC/PTC/Pt100	±0.5 °C
	4-20 mA	±0.1 mA
	Thermocouple J/K	±2°C or 1%
Working environment		-10 to 50 °C, <90 % humidity
Storage environment		-30 to 70 °C, humidity <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	
Wiring	Terminal to screw for cables with a section of up to 2.5 mm^2	

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. Contamination degree 2 acc/ UNE-EN 60730-1.
Double power input insulation, secondary circuit and relay output.

Rated pulse voltage	2,500 V
Pressure ball test temperature	
Accessible parts	75 °C
Parts that position active elements	125 °C
Voltage and current delayed by the EMC tests	
AKO-D14724/D14727	9.6 V, 181 mA
AKO-D14725/D14728	105 V, 36 mA
AKO-D14726/D14729/D14726-C/D14729-C	207 V, 17 mA
Radio interference suppression test current	270 mA

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35D147242 REV.02 2013

6- Parameter and message table

The **Def.** column indicates the factory default parameters. Unless otherwise indicated, the temperature values are expressed in °C. (Equivalent temperature in °F)

Level 1	Menus and description				
rE	**Level 2**	**Control relay R1**			
	Level 3	**Description**	**Values**	**Min.**	**Def.**	**Max.**
	SP	Relay R1 temperature setting (Set Point)	(°C/°F)	A	0	B
	C0	Probe 1 calibration (Offset)	(°C/°F)	-20.0	0.0	20.0
	C1	Differential of R1 and SP (Hysteresis)	(°C/°F)	-50	1	50
	C2	Upper lock of the Set Point (Relay R1) (it cannot be set above this value)	(°C/°F)	C3	B	B
	C3	Lower lock of the Set Point (Relay R1) (it cannot be set under this value)	(°C/°F)	A	A	C2
	C6	State of relay R1 with damaged probe **0**=OFF; **1**=ON; **2**=Average according to last 24h prior to probe error; **3**=ON-OFF according to prog. C7 and C8 (In heat mode always OFF)		0	0	3
	C7	Time of relay R1 in ON in the event of damaged probe (If C7=0 and C8?0, the relay will always be OFF disconnected)	(min.)	0	10	120
	C8	Time of relay R1 in OFF in the event of damaged probe (If C8=0 and C7?0, the relay will always be ON connected)	(min.)	0	5	120
	C12	Variation of Set Point (Relay 1) per digital input (**0**= deactivated)	If P35 = 2 If P35 = 4	(°C/°F)	C3-SP C3	0	C2-SP C2
	C16	Duration of the variation Set Point (Relay R1) per digital input (if P35 = 2)	(min.)	0	0	254
	C17	ON-OFF delay time for R1 (from the last disconnection)	(min.)	0	0	120
	C18	ON-OFF delay time for R1 (from the last connection)	(min.)	0	0	120
	EP	Output to level 1				
rE2	**Level 2**	**Control relay R2**				
	Level 3	**Description**	**Values**	**Min.**	**Def.**	**Max.**
	SP2	Relay R2 temperature setting (Set Point)	(°C/°F)	A	0	B
	C51	Differential of R2 and SP2 (Hysteresis)	(°C/°F)	-50	1	50
	C52	Upper lock of the Set Point (Relay R2) (it cannot be set above this value)	(°C/°F)	C53	B	B
	C53	Lower lock of the Set Point (Relay R2) (it cannot be set under this value)	(°C/°F)	A	A	C52
	C56	State of relay R2 with damaged probe **0**=OFF; **1**=ON; **2**=Average according to last 24h prior to probe error; **3**=ON-OFF according to prog. C57 and C58 (In heat mode always OFF)		0	0	3
	C57	Time of relay R2 in ON in the event of damaged probe (If C57=0 and C58≠0, the relay will always be OFF disconnected)	(min.)	0	10	120
	C58	Time of relay R2 in OFF in the event of damaged probe (If C58=0 and C57≠0, the relay will always be ON connected)	(min.)	0	5	120
	C62	Variation of Set Point 2 (Relay R2) per digital input (**0**= deactivated) (If P31=2, not applicable)	(°C/°F)	C53 -SP2	0	C52 -SP2
	C66	Duration of the variation Set Point 2 (Relay R2) per digital input (if P35 = 2)	(min.)	0	0	254
	C67	ON-OFF delay time for R2 (from the last disconnection)	(min.)	0	0	120
	C68	ON-OFF delay time for R2 (from the last connection)	(min.)	0	0	120
	EP	Output to level 1				
dEF	**Level 2**	**DEFROST Function (R1)**				
	Level 3	**Description**	**Values**	**Min.**	**Def.**	**Max.**
	d0	Frequency of disconnection of relay R1 (Time between 2 starts)	(h.)	0	6	120
	d1	Disconnection period of relay R1 (**0**= deactivated)	(min.)	0	0	120
	EP	Output to level 1				

Level 1	Menus and description				
AL	**Level 2**	**ALARM control (Visual)**			
	Level 3	**Description**	**Values**	**Min.**	**Def.**	**Max.**
	A0	Configuration of the temperature alarms **0**=Relative to the SP of R1; **1**=Absolute		0	0	1
	A1	Alarm for maximum (it should be higher than the SP)	(°C/°F)	A2	999	B
	A2	Alarm for minimum (It should be lower than the SP)	(°C/°F)	A	-99	A1
	A3	Delay of temperature alarms in the start-up	(min.)	0	0	250
	A5	Delay of temperature alarms from when the A1 or A2 value is reached.	(min.)	0	0	250
	A6	Delay of the external alarm on receiving a signal in digital input (P35=1)	(min.)	0	0	120
	A9	Polarity alarm relay (if P31=4) **0**= Relay ON in alarm (OFF without alarm) **1**= Relay OFF in alarm (ON without alarm)		0	0	1
	A10	Differential temperature alarms (A1 and A2)	(°C/°F)	1	1	20,0
	A16	Disconnection of the alarm relay after pressing the ESC key **0**= Yes; **1**= No		0	0	1
	EP	Output to level 1				
CnF	**Level 2**	**General status**				
	Level 3	**Description**	**Values**	**Min.**	**Def.**	**Max.**
	P0	Type of R1 operation **0**=Direct, Cold;**1**=Reverse, Heat (If P31≠3)		0	1	1
	P1	Delay of all functions on receiving power supply	(min.)	0	0	255
	P2	Access code (password) function **0**=Inactive; **1**=Access to parameters locked; **2**=Keypad locked		0	0	2
	P3	Return to initial parameters (press SET to activate)		1	1	1
	P5	Address (Only units with built-in communication)		0	1	255
	P7	Temperature display mode **0**=Integers in °C **1**=A decimal in °C* **2**=Integers in °F **3**=A decimal in °F*		0	1	3
	P9	Selection of type of probe **0**=NTC; **1**=PTC; **2**=Pt100; **3**=TJ; **4**=TK; **5**=4-20 mA		0	2	5
	P12	Polarity digital input **0**= Activates on closing contact **1**= Activates on opening contact		0	0	1
	P30	Type of R2 operation **0**=Direct, Cold;**1**=Reverse, Heat (If P31=1)		0	1	1
	P31	Type of relation between R1 and R2 **1**= 2 separate stages **2**= 2 related stages **3**= Neutral zone **4**= One stage + alarm		1	1	4
	P32	Maximum scale value (If 4-20 mA)		-999	100	999
	P33	Minimum scale value (If 4-20 mA)		-999	0	999
	P34	Scale locked with probe 4-20 mA **0**= Without lock **1**= Locked according to P32 and P33		0	0	1
	P35	Configuration digital input **0**= Deactivated **1**= External alarm **2**= Variation of SP and SP2(SP+C12, SP2+C62) **3**= Reversal of type of operation of R1 **4**= Changing the SP (SP=C12)		0	0	4
	EP	Output to level 1				
tid	**Level 2**	**Access control and Information**				
	Level 3	**Description**	**Values**	**Min.**	**Def.**	**Max.**
	L5	Access code (Password)		0	-	99
	PU	Programme version (Information)			-	
	Pr	Programme revision (Information)			-	
	EP	Output to level 1				
EP	Exit programming					

A: Minimum value according to probe used (See table 1); **B:** Maximum value according to probe used (See table 1)
***** Option not available if the probe is a thermocouple
Note: If the probe is 4-20 mA, the values may not refer to temperatures.

MESSAGES	
L5	Access code (Password) request
E1	Probe 1 broken (Open, crossed circuit or probe out of range)
EE	Memory fault
AH	**Flashing:** Maximum temperature alarm (A1)
AL	**Flashing:** Minimum temperature alarm (A2)
AE	External alarm activated (Only if parameter P10 or P11=2)
---	Measured value above 999

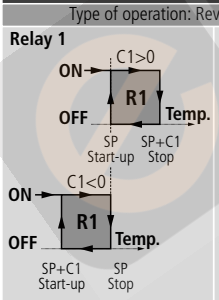
Table 1: Max. and min. values according to type of probe

Type of probe	Minimum value	Maximum value
NTC	-50	100
PTC	-50	150
Pt100	-100	440
Thermocouple J	0	600
Thermocouple K	0	999
4-20 mA	-999	999

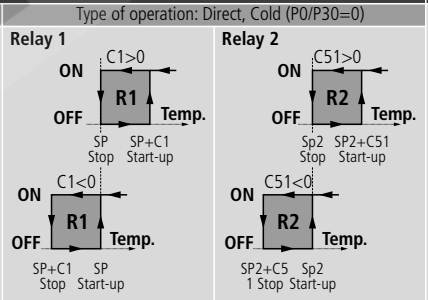
7- Operating modes

TWO SEPARATE STAGES (P31=1)

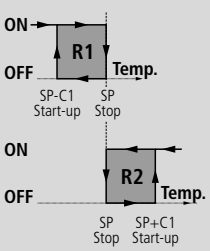
Type of operation: Reverse, Heat (P0/P30=1)



Type of operation: Direct, Cold (P0/P30=0)

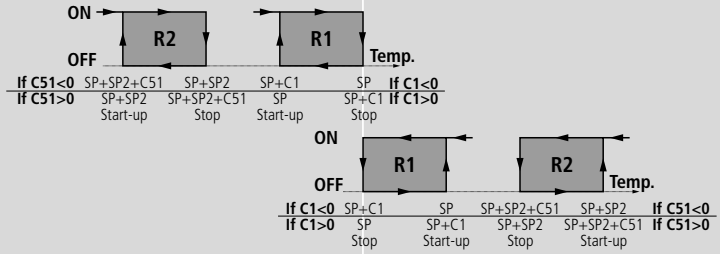


NEUTRAL ZONE (P31=3)



TWO RELATED STAGES (P31=2)

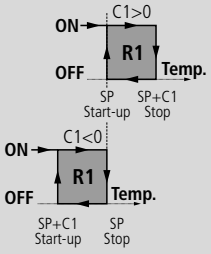
Type of operation: Reverse, Heat (P0=1)



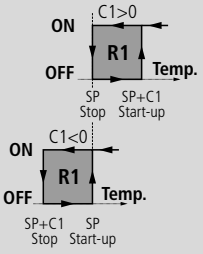
Type of operation: Direct, Cold (P0=0)

ONE STAGE + ALARM (P31=4)

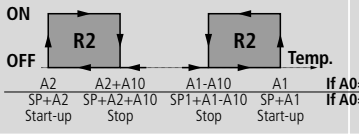
Type of operation: Reverse, Heat (P0=1)



Type of operation: Direct, Cold (P0=0)



Polarity R2: ON in alarm (A9=0)



Polarity R2: OFF in alarm (A9=1)