

# FANOX

## TEMPERATURE CONTROLLER FANOX TP 730

- Packaging content:**
- » PID Controller.
  - » Back cover.
  - » Brackets.
  - » Rubber outline.
  - » User manual.

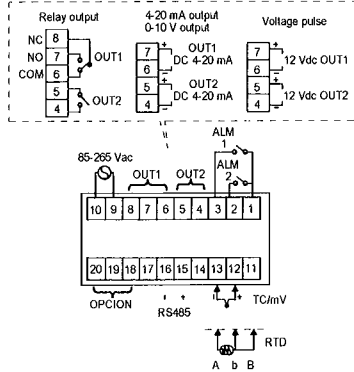


Thank you for purchasing this product. We suggest to read the user manual carefully before using the equipment with the purpose of getting used to its configuration and operating. Keep the manual for any after-query.

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### WARNING

- » Make sure to tight correctly the connection terminals. If this is not done correctly mechanical failures or even fire may occur.
- » Please, do not install this equipment in locations where inflammable gases can exist, due to the possibility of explosion.
- » The life-time of the equipment depends on the way of use. If that life-time is exceeded, the probability of deterioration of the equipment increases.
- » Do not dismantle, review or repair the equipment by your own without authorization. This can cause short circuits on electrical parts, failures or fire.
- » Do not introduce metallic elements between the chips of the interior of the equipment or short circuits and fire could be produced.



### CAUTION

Please read the following warnings carefully, which will allow you to use correctly the equipment:

- » Use the equipment within the specified limits for its water immersion and exposure to oil.
- » Do not use the equipment in locations exposed to vibrations or thumps. The use of the equipment in these locations can cause damages due to stress.
- » Do not use the equipment in locations exposed to dust, corrosive gases or direct sun.
- » Separate the input signal devices, the cables of input signal and the equipment from noise sources or high voltage cables that generate noises.
- » Separate the equipment from static electricity sources when the equipment is used in areas where a lot of static electricity is generated (e.g. manufacture of compounds, dusts or transport of fluid material by pipes).
- » The organic solutions as well as basic or acid solutions could damage the case of the temperature controller.
- » Store it to the specified temperature. If the temperature controller has been stored under -10 °C, keep the equipment to room temperature during a minimum of 3 hours before using it.

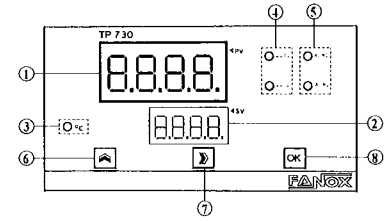
Please, verify the supply characteristics of the equipment. Do not connect the terminals that are not going to be used.

We propose the use of AWG 18 - 24 cables for the signal line and AWG 25 - 30 cable for the supply and exit contact relay.

### SPECIFICATIONS

- Supply:** 85-265 V<sub>ac</sub>, 50/60 Hz
- Display:** Upper display (red): 4 digits 0,39" 7 segments  
Lower display (green): 4 digits 0,28" 7 segments
- Input signal:** Thermocouple: J, K, B, N, R, S, T, E  
RTD: PT100, JPT100  
Voltage DC: 0-350 mV  
Output relay (resistive) SPDT-NO, 5A/250 V<sub>ac</sub>  
Output pulse voltage (SSR) NPN, 20 mA at 12 V<sub>dc</sub>  
Analog output (max. 600Ω): 4-20 mA, 0-10 V<sub>dc</sub>  
SPST-NO, 3A/250 V<sub>ac</sub> (resis.) 00-99 s
- Alarm relay:** Hysteresis: 0-999,9 °C (°F)
- Communications:** Output RS485
- Operating conditions:** 0-50 °C (20-85 % HR)
- Output control cycle:** 0-999,9 s
- Decimal point:** 1-100
- Control method:** ON/OFF or PID (Autotuning)
- Offset input:** -199,9-999,9
- Fraction value:** 0000-9999
- Setting range:** -1999-9999
- Accuracy:** ± 0,3 % ± 1 digit
- Sampling time:** 200 ms
- Memory:** EEPROM

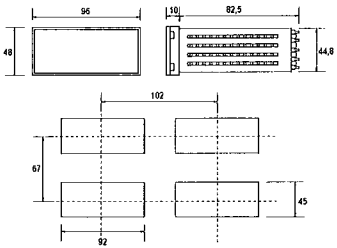
### FRONTAL PANEL



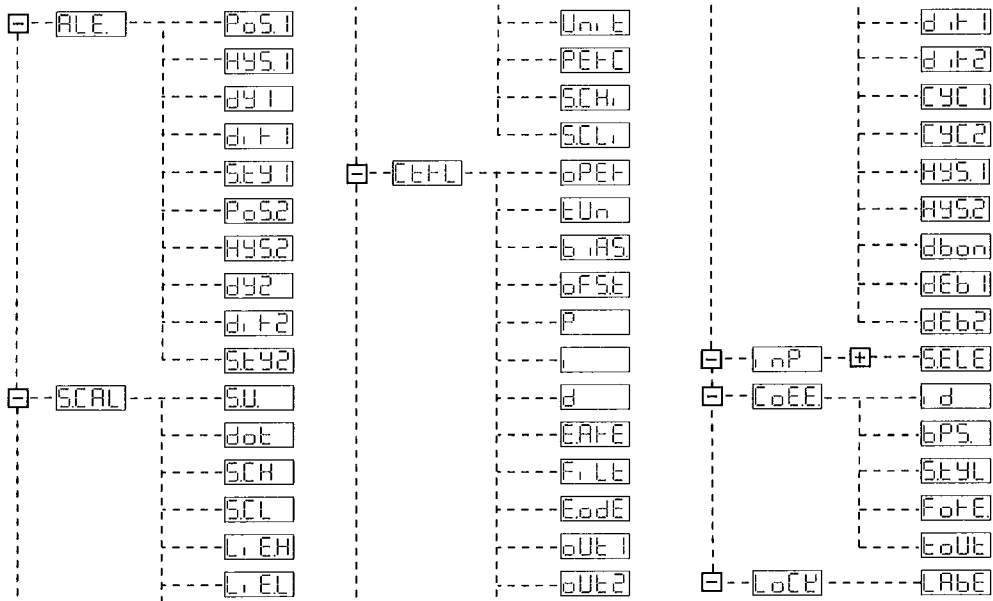
- 1 Process value and function visualization: Red LED of 7 segments
- 2 Setting value and parameters visualization: Green LED of 7 segments.
- 3 Indication of units.
- 4 Indication of the output control.
- 5 Indication of alarms.
- 6 [Back] key: Back up to a superior level and add.
- 7 [Forward] key: Advance to an inferior level and position.
- 8 [OK] key: Move in a level and confirm.

### DIMENSIONS / CUTOUT

Unit: mm



### PROGRAM SETTING FLOWCHART



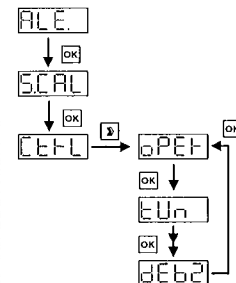
### BUTTONS EXPLANATION

The settings of the equipment are controlled by means of 3 push-buttons located in the front. First you must decide to which function you want to enter and then use the push-buttons to reach it. The push-buttons are used in the following way:

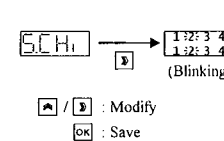
	Selection	Settings
[Forward]	Advance to inferior level	Position
[Backward]	Back up to a superior level	Add
[OK]	Move in a level	Confirm

#### [OK] BUTTON "OK"

- 1) Allows to move in a menu.
- 2) Confirm to save the settings.

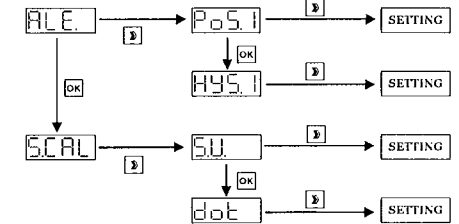


- 2) Confirm to save the settings.

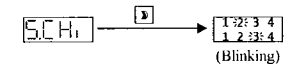


#### [Forward] BUTTON "FORWARD"

Allows to advance from a superior level to an inferior level.

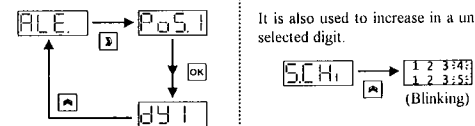


It is also used to move between the positions of the digits of a value to change.



#### [Backward] BUTTON "BACKWARD"

Allows to back up from an inferior level to a superior one:



It is also used to increase in a unit the selected digit.

## FUNCTION LIST

Item	Subitem	Range	Default	Description
AL.E	Po51	-1999-9999	0	Alarm relay position 1
	HYS1	0000-9999	0	Alarm relay hysteresis 1
	dY1	00-99	00 s	Alarm relay delay 1
	d.F1	H/L/O	H	Alarm relay direction 1
	SEY1	SE1-SE8	SE1	Alarm relay style 1
		SE9		Alarm follow the action of Out 1
		SE10		Alarm follow the action of Out 2
	Po52	-1999-9999	0	Alarm relay position 2
	HYS2	0000-9999	0	Alarm relay hysteresis 2
	dY2	00-99	00 s	Alarm relay delay 2
SCAL	d.F2	H/L/O	H	Alarm relay direction 2
	SEY2	SE1-SE8	SE1	Alarm relay style 2
		SE9		Alarm follow the action of Out 1
		SE10		Alarm follow the action of Out 2
	SV	-1999-9999	0	Set value SV
	dot	dot0-dot3	dot1	Decimal point set
	SCH	-1999-9999	9999	Scale upper limit value
	SCL	-1999-9999	0	Scale lower limit value
	L.EH	-1998-9999	9999	Maximum range value SV
	L.EL	-1999-9998	-1999	Minimum range value SV
CTFL	Un.t	oC/oF	°C	Unit
	PEFC	on/off	OFF	Percentage
	SCH	000,0-100,0	100	Scale input upper limit value
	SCL	000,0-100,0	0	Scale input lower limit value
	oPEt	Pi d/ on/off	ON/OFF	Operation
	tUn	tUn/off	OFF	Autotuning
	b.AS	-1999-9999	0	Input setting PV
	oFSE	-1999-9999	0	SV offset value during autotuning
	P	0000-9999	3	P value
	I	0000-9999	200	I value
D	0000-9999	20	D value	
CoEE	EAPE	0000-9999	0	Manual reset
	F.Lt	1-100	1	Input digital filter
	EodE	H-C	H-C	Hold temperature over room temperature
		Coal		Hold temperature below room temperature
	oUt1	HEAt	HEAt	Heater is controlled by Out 1
		Coal		Cooler is controlled by Out 1
	oUt2	HEAt	HEAt	Heater is controlled by Out 2
		Coal		Cooler is controlled by Out 2

Item	Subitem	Range	Default	Description
CTFL	d.F1	H/L/O	H	Control output direct / reverse operation 1
	d.F2	H/L/O	H	Control output direct / reverse operation 2
	CYC1	0000-9999	5 s	Cycle time 1 (seconds)
	CYC2	0000-9999	5 s	Cycle time 2 (seconds)
	HYS1	0000-9999	0000	Control output hysteresis 1
	HYS2	0000-9999	0000	Control output hysteresis 2
	dbon	on/off	OFF	Deadband control
	dEb1	-1999-9999	0	Deadband parameter of heater
	dEb2	-1999-9999	0	Deadband parameter of cooler
	SELE	E EP	E EP	Thermocouple type K (-200-1370 °C)
CoEE	J EP	J EP	Thermocouple type J (-210-1200 °C)	
	T EP	T EP	Thermocouple type T (-200-400 °C)	
	E EP	E EP	Thermocouple type E (-200-1000 °C)	
	R EP	R EP	Thermocouple type R (-50-1760 °C)	
	S EP	S EP	Thermocouple type S (-50-1760 °C)	
	B EP	B EP	Thermocouple type B (250-1820 °C)	
	N EP	N EP	Thermocouple type N (-200-1300 °C)	
	PtEP	PtEP	Pt100 (-200-850 °C)	
	JPTEP	JPTEP	JPT100 (-200-850 °C)	
	dCTEP	dCTEP	DC Type (0-350 mV)	
LoCE	id	0000-0255	0001	Device ID number
	bPS	600	9600	BaudRate : 600
		1200		BaudRate : 1200
		2400		BaudRate : 2400
		4800		BaudRate : 4800
		9600		BaudRate : 9600
		19200		BaudRate : 19200
		38400		BaudRate : 38400
	SEYL	8n1	8n1	8 byte size, no parity, 1 stop bit
		8n2		8 byte size, no parity, 2 stop bit
	8o1		8 byte size, odd parity, 1 stop bit	
	8E1		8 byte size, even parity, 1 stop bit	
LoCE	FoPE	HEH	HEH	Hex
		ASC		Ascii
	EOUE	0100-9999	0100	Time Out / ms
	LABE	L600	L600	Lock label 0
		L601		Lock label 1
	L602		Lock label 2	
	L603		Lock label 3	

## DESCRIPTION OF PARAMETERS

**HYS**

Control output hysteresis

A hysteresis can be adjusted around the set point to prevent chattering.

**EAPE**

Manual reset

In PID control, I=0, PV=SV, reset the control output to the fixed value in this section.

**FILE**

PV input filter

This function should be used when the value of PV fluctuates widely, due to noises in the input signal. If a longer constant time is fixed, the filter eliminate more noises.

**CYCL**

Control output cycle time

The cycle time is the period of ON/OFF repetitions of a relay or voltage pulse output in the proportional PID control. The ratio of the ON time to the cycle time is proportional to the control output value.

**d.F**

Direction of relay.

**LoCE**

Function list lock

You can set the mode of function lists which can be displayed and edited.

## TROUBLESHOOTING

**1**

Display over scale

**4**

Display under scale

**0000**

PV over scale

**0000**

PV under scale

**----**

Sensor break

## FUNCTION LOCK

LOCK	L603	L602	L601	L600
AL.E				
Po51			0	0
HYS1				0
dY1				0
d.F1				0
SEY1				0
Po52		0		0
HYS2				0
dY2				0
d.F2				0
SEY2				0
SCAL				
SV		0	0	0
dot				0
SCH				0
SCL				0
L.EH				0
L.EL				0
Un.t				0
PEFC				0
SCH				0
SCL				0
CTFL				
oPEt			0	0

LOCK	L603	L602	L601	L600
tUn			0	0
b.AS			0	0
oFSE			0	0
P			0	0
I			0	0
D			0	0
EAPE			0	0
F.Lt			0	0
EodE			0	0
oUt1			0	0
oUt2			0	0
d.F1			0	0
d.F2			0	0
CYC1			0	0
CYC2			0	0
HYS1			0	0
HYS2			0	0
dbon			0	0
dEb1			0	0
dEb2			0	0
CoEE				
J EP				0
T EP				0
E EP				0

LOCK	L603	L602	L601	L600
E EP				0
R EP				0
S EP				0
B EP				0
N EP				0
PtEP				0
JPTEP				0
dCTEP				0
CoEE				
id				0
bPS				0
SEYL				0
FoPE				0
EOUE				0
LoCE				
LABE	0	0	0	0

FANOX ELECTRONIC  
PAE. Asuaran, Edif. Artxanda, 23  
48950 ERANDIO (Bizkaia)  
Tel: +34 94 471 14 09 ; Fax: +34 94 471 05 92  
www.fanox.com

## HYSTERESIS

	Heat.	Cool.
sv+dEb2	X	0
sv	X	X
sv+dEb1	X	X
	0	X

$$dEb1 < 0 ; dEb2 > 0$$

	Heat.	Cool.
sv+dEb1	X	0
sv	0	0
sv+dEb2	0	0
	0	X

$$dEb1 > 0 ; dEb2 < 0$$

X: (Disable): Inhibit output.  
O: (Enable): Enable control output to follow PID / ON-OFF control algorithm

## ALARM MODE SETTING

▲: SV    △: Alarm setting value    ↓: Hysteresis setting value

