

TEMPERATURE CONTROLLER
1/16 DIN - 48 x 48
PT-16 Series

Quick Guide • QG PT16 - 0/12.11



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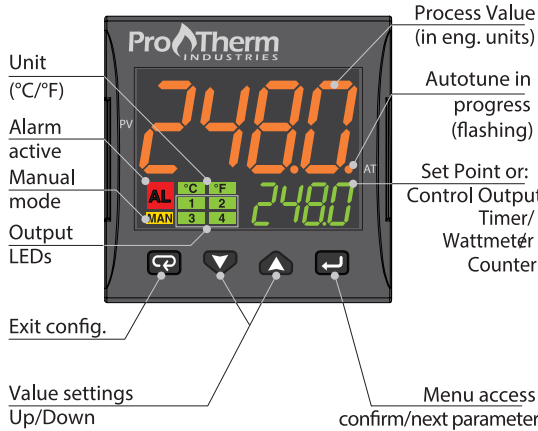


DECLARATION OF CONFORMITY AND
MANUAL RETRIEVAL
Class II instrument, panel mounting. This controller has been designed with compliance to the European Directives. Consult Declaration of Conformity for further details on Directives and Standards used for Compliance.
All information about the controller usage are inserted in the user manual.
The Declaration of Conformity and the manual of the controller can be downloaded (free of charge) from the web-site: www.prothermind.com

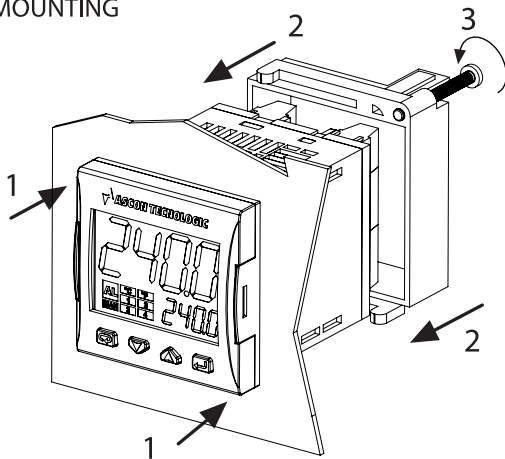
Warning

- Whenever a failure or a malfunction of the device may cause dangerous situations for persons, things or animals, please remember that the plant must be equipped with additional devices which will guarantee safety.
- We warrant that the products will be free from defects in material and workmanship for 18 months from the date of delivery. Products and components that are subject to wear due to conditions of use, service life and misuse are not covered by this warranty.

DISPLAY AND KEYS



MOUNTING



KEYS FUNCTIONS

Operator Mode	Editing Mode
Menu access	Confirm/Next parameter
Set Point Change Access	Value change (Down)
Display values of Output and Power/Timer/Wattmeter/Time count	Value change (Up)
Programmable	Exit Configuration session

DIMENSIONS

Overall dimensions (L x H x D): 48 x 48 x 63 mm
(1.89 x 1.89 x 2.48 in.)
Panel Cut-out (L x H): 45+0.6 x 45+0.6 mm
(1.78 +0.023 x 1.78 +0.023 in.)

MODEL CODE

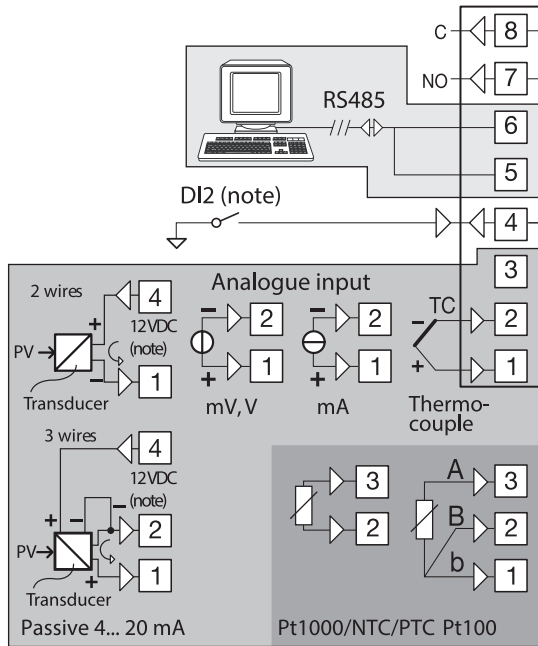
The Code identifies the controller hardware.

Model: KM 1 A B C D E F G H - 0 0 0 0

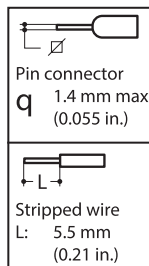
Line	KM	1
Optional functions	A	
None	-	
Timer	T	
Power Supply	B	
100... 240Vac (-15... +10%)	H	
24Vac (-25... +12%) or 24Vdc (-15... +25%)	L	
Input	C	
TC, PT100, PT1000, mA, mV, V + Digital Input 1	C	
TC, NTC, PTC, mA, mV, V + Digital Input 1	E	
Output OP1	D	
Relay	R	
VDC for SSR	O	
Output OP2	E	
None	-	
Relay	R	
VDC for SSR	O	

Output OP3	F
None	-
Relay	R
VDC for SSR	O
Output OP4	G
Digital I/O (see the Electrical Connections paragraph for details)	O
Serial Communications	H
TTL	-
RS485 Modbus	S
Terminal Type	I
Standard (screw type non removable terminal blocks)	-
Removable terminal blocks (fixed part only)	E
With plug-in screw type terminal blocks	N
With plug-in clamp type terminal blocks	M

ELECTRICAL CONNECTIONS



TERMINALS



- Note: Terminal 4 can be programmed as
- Digital Input(DI2) connecting a free of voltage contact between terminals 4 and 16
 - 0... 12 V SSR Drive Output (OP4) connecting the load between terminals 4 and 16
 - 12 Vdc (20 mA) transmitter power supply connecting the transmitter between terminals 4 and 1

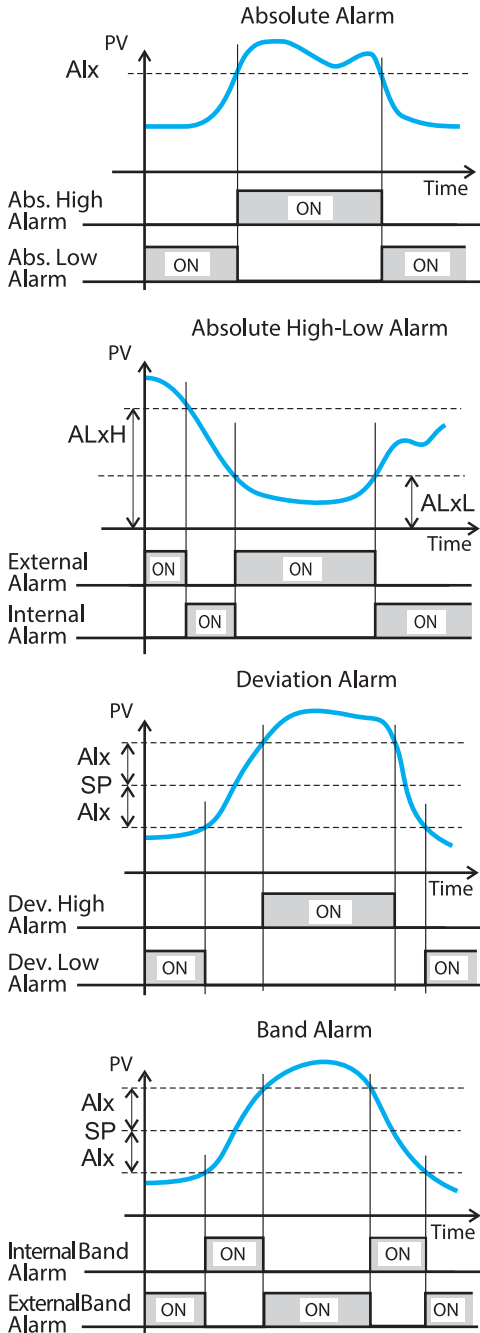
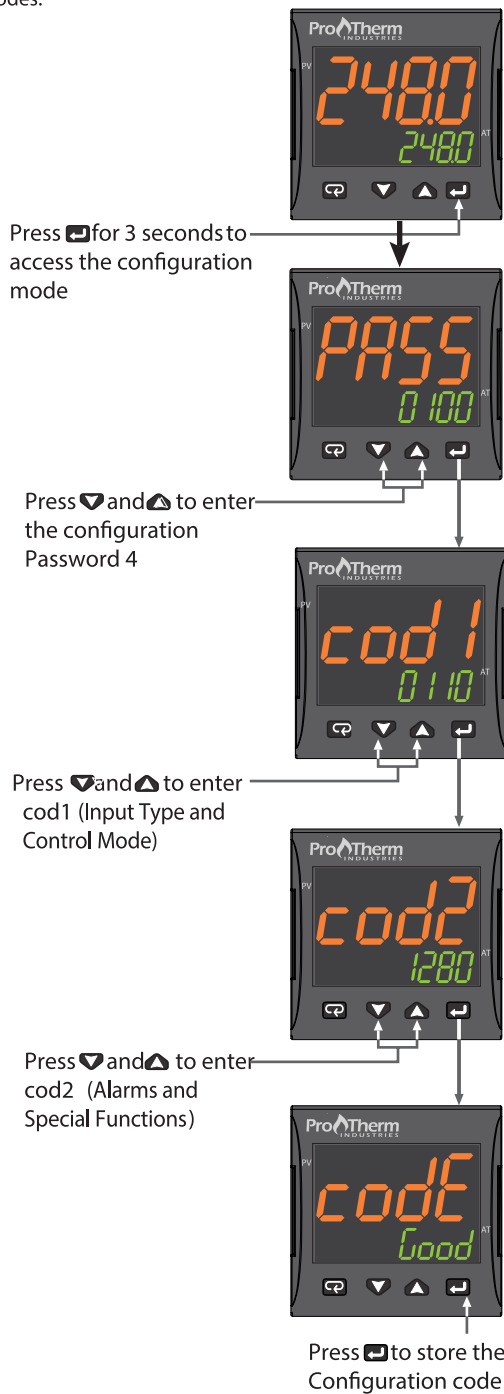
CONFIGURATION CODE (step 1)

The Controller Configuration (Input type, Control mode Alarms and Auxiliary functions) can be made entering two 4-digit codes.
Before to start Configuration procedure, prepare the 2 configuration codes according to the following tables.

Input Type and Range	L	M	Control mode	OP1	OP2	OP3	OP4	N	O
TC J	-50... +1000°C	0	0	H	AL1	AL2	AL3	0	0
TC K	-50... +1370°C	0	1	NU	AL1	AL2	H	0	1
TC S	-50... 1760°C	0	2	C	AL1	AL2	AL3	0	2
TC R	-50... +1760°C	0	3	NU	AL1	AL2	C	0	3
TC T	-70... +400°C	0	4	H	C	AL2	AL3	0	4
Infrared J	-50... +785°C	0	5	H	AL1	AL2	C	0	5
Infrared K	-50... +785°C	0	6	C	H	AL2	AL3	0	6
PT 100/PTC KTY81-121	-200... +850°C/-55... +150°C	0	7	NU	H	AL2	C	0	7
PT 1000/NTC 103-AT2	-200... +850°C/-50... +110°C	0	8	C	AL1	AL2	H	0	8
Linear 0... 60 mV		0	9	NU	C	AL2	H	0	9
Linear 12... 60 mV		1	0	H	AL1	AL2	AL3	1	0
Linear 0... 20 mA (this selection forces Out 4 = TX)		1	1	NU	AL1	AL2	H	1	1
Linear 4... 20 mA (this selection forces Out 4 = TX)		1	2	C	AL1	AL2	AL3	1	2
Linear 0... 5 V		1	3	NU	AL1	AL2	C	1	3
Linear 1... 5 V		1	4	H	C	AL2	AL3	1	4
Linear 0... 10 V		1	5	H	AL1	AL2	C	1	5
Linear 2... 10 V		1	6	C	H	AL2	AL3	1	6
TC J	-58... +1832°F	1	7	NU	H	AL2	C	1	7
TC K	-58... +2498°F	1	8	C	AL1	AL2	H	1	8
TC S	-58... 3200°F	1	9	NU	C	AL2	H	1	9
TC R	-58... +3200°F	2	0	H	C	AL2	AL3	2	0
TC T	-94... +752°F	2	1	NU	H	AL2	C	2	1
Infrared J	-58... +1445°F	2	2	C	AL1	AL2	AL3	2	2
Infrared K	-58... +1445°F	2	3	H	C	AL2	AL3	2	3
PT 100/PTC KTY81-121	-328... +1562°F/-67... +302°F	2	4	NU	C	AL2	H	2	4
PT 1000/NTC 103-AT2	-328... +1562°F/-58... +230°F	2	5	C	AL1	AL2	H	2	5

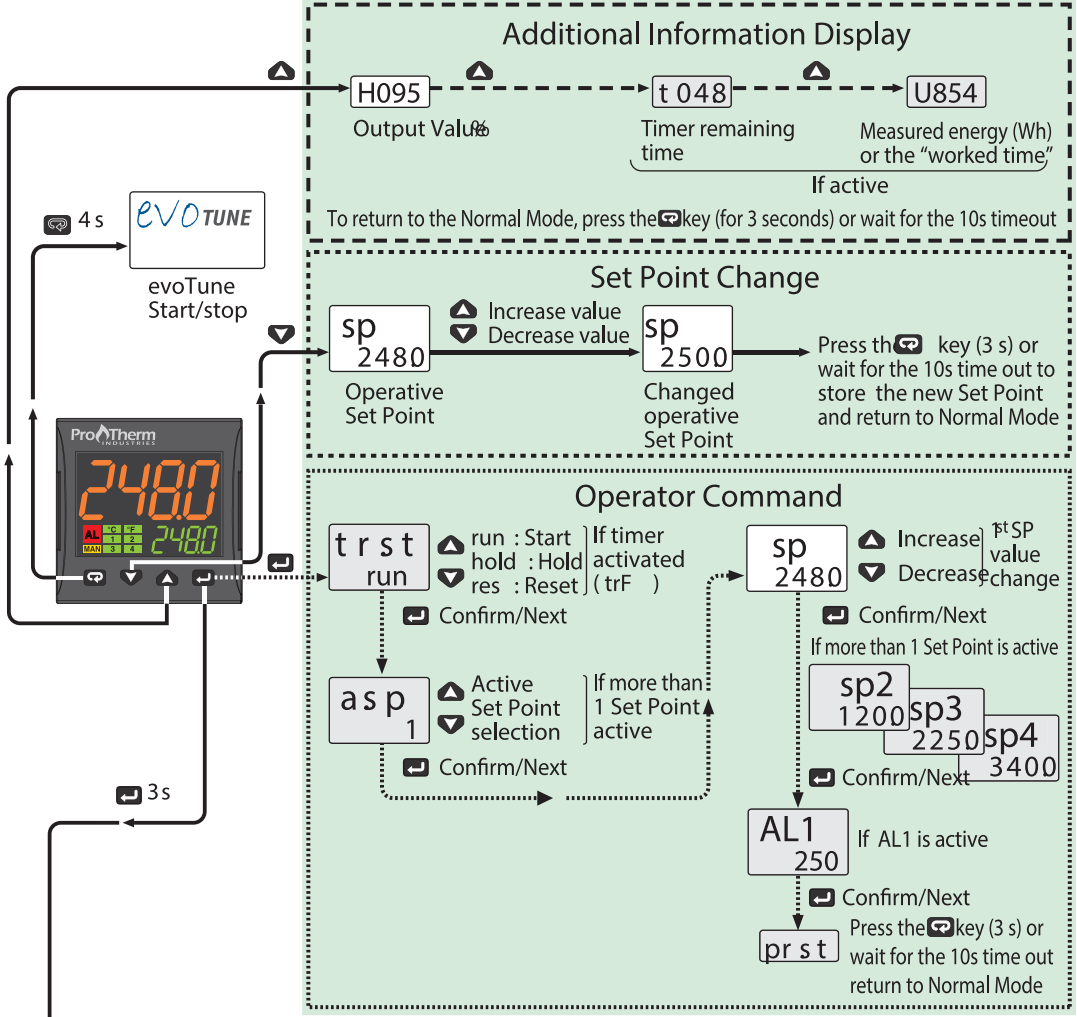
Alarm 3	Alarm 2	Alarm 1	P	Q	R	S
Not used	0	0	0	0	0	0
Sensor break	1	1	1	1	1	1
Absolute	High	2	2	2	2	2
Absolute	Low	3	3	3	3	3
Absolute High/Low	External High/Low	4	4	4	4	4
Absolute High/Low	Internal High/Low	5	5	5	5	5
Deviation	Deviation high	6	6	6	6	6
Deviation	Deviation low	7	7	7	7	7
Band	External band	8	8	8	8	8
Band	Internal band	9	9	9	9	9

HOW TO SET THE CONFIGURATION CODE (step 2) ALARM TYPES

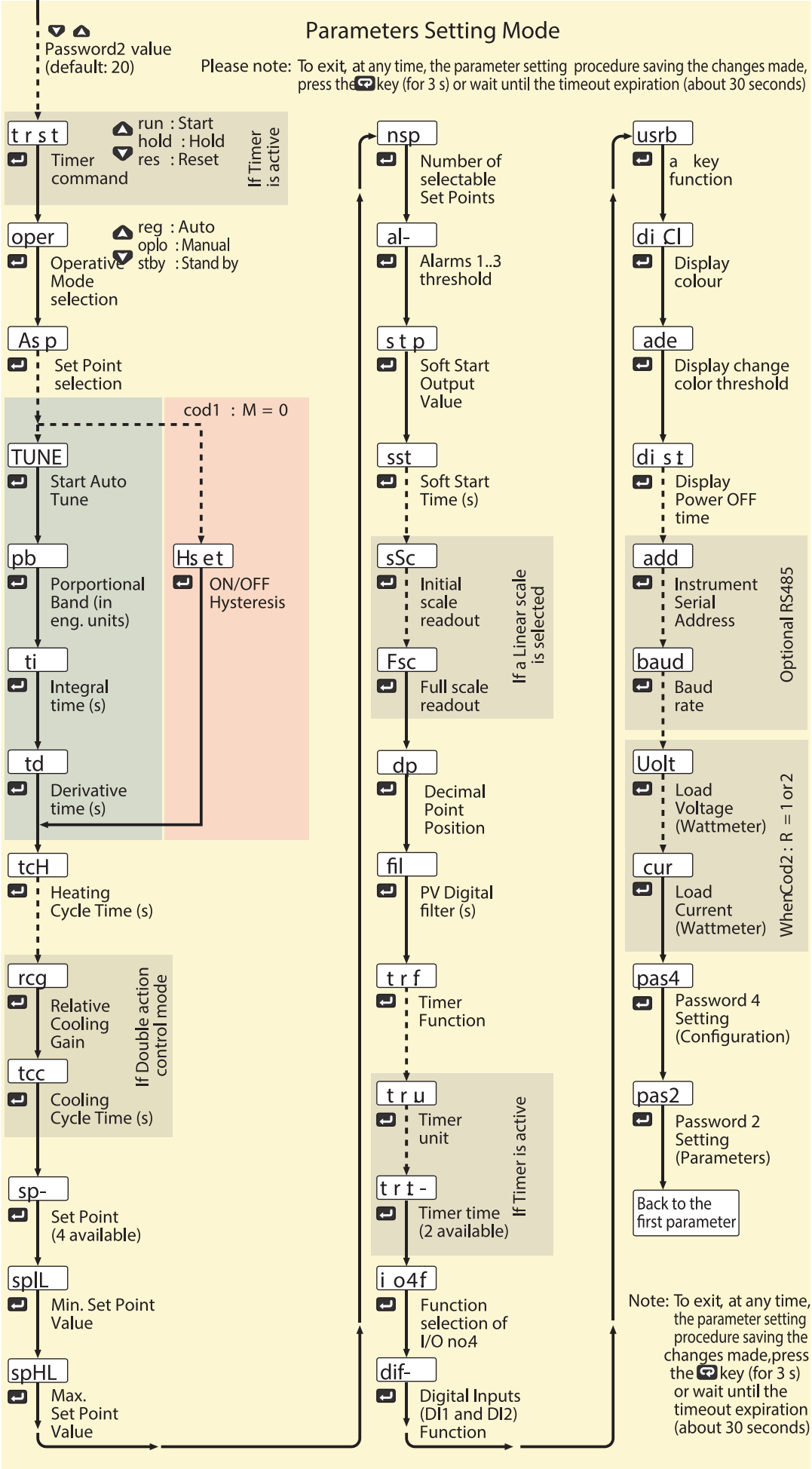


Note: To leave the Configuration session without saving the settings made, press the [Exit] button

CONTROLLER OPERATION



pass Password4 value (default: 300) - Setting the Configuration Code (see page 1)



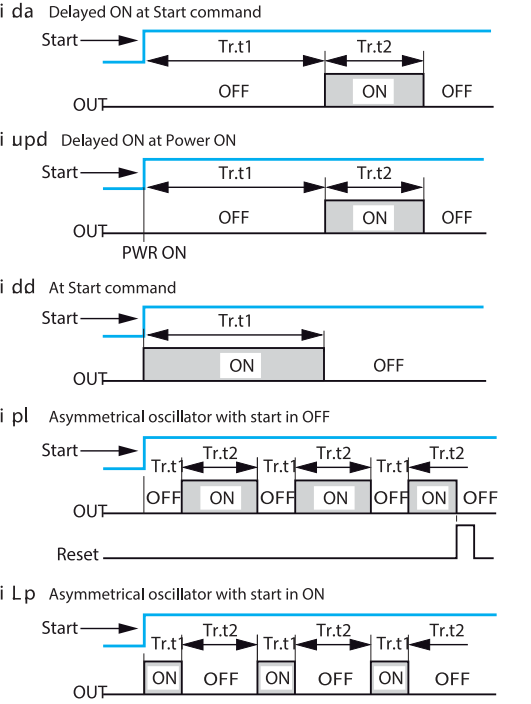
Parameters List (PASS : 20)

	Param.	Description	Range	Default value	User value
Commands	t r St	Timer status		Option	
	oPEr	Operative Mode Selection	Auto = reg, Manual = oplo, Standby = stdy		
	as p	Set Point Selection	0... 3	0 = SP	
	tune	Start Auto Tune	0... 1	0 = OFF	
	Pb	Proportional Band	1... 9999	20	
Control	ti	Integral Time	0... 10000 s	200	
	td	Derivative Time	0... 1000 s	50	
	HSEt	Hysteresis ON/OFF Control	0... 9999	1	
	t c H	Heating output cycle time	0.1... 130 s	20.0	
	rcg	Relative Cooling Gain	0.01... 99.99	1.00	
Set Point	tcC	Cooling output cycle time	0.1... 130 s	20.0	
	SP	Set Point 1			
	SP2	Set Point 2	-1999... +9999 (E.U.)		
	SP3	Set Point 3			
	SP4	Set Point 4			
Alarms	SPLL	Set Point min. Value (E.U.)	-1999... SPHL		
	SPHL	Set Point max. Value (E.U.)	SPLL... 9999		
	nSP	No. of Set Points	1... 4	1	
	AL1	Alarm 1 threshold	AL1L... AL1H		
	al1L	Alarm 1 low th reshold/AL1 low limit	-1999... +9999	-1999	
	al1H	Alarm 1 high th reshold/AL1 high limit		9999	
	AL2	Alarm 2 threshold	AL2L... AL2H		
	al2L	Alarm 2 low th reshold/AL2 low limit	-1999... +9999	-1999	
	al2H	Alarm 2 high th reshold/AL2 high limit		9999	
	AL3	Alarm 3 threshold	AL3L... AL3H		
	al3L	Alarm 3 low th reshold/AL3 low limit	-1999... +9999	-1999	
	al3H	Alarm 3 high th reshold/AL3 high limit		9999	
	stp	Soft Start Output value	-100... 100%	0	
	Sst	Soft Start Time	0.00... 8.00 (hh.mm)	0	
	ssc	Low Scale readout	-1999... sch	-1999	
Input	fsc	High Scale readout	scl... +9999	9999	
	dP	Number of decimal	0... 3	0	
	FIL	Measured value Digital filter	OFF; 0.1... 20.0	0 = OFF	
	t r F	Timer Type	nonE i.d.A i.u.P.d i.d.d i.P.L i.L.P	none	
	t r u	Timer Units	0 = hh.mm 1 = mm.ss 2 = sss.d	1 = mm.ss	
I/O	t r t 1	Time 1	00.01... 995.9	1.00	
	t r t 2	Time 2	00.00... 995.9	1.00	
	i o4F	I/O 4 Function	ON = Transmitter Power Supply OUT4 = SSR out Di2C = Dig. In. from contact Di2U = 24 VDC Digital Input	ON	
	di F1	Digital Input 1 Function	On 21	0	
	di F2	Digital Input 2 Function	On 21	0	
Digital Inputs	usrb	Key "a" Function	nonE, tunE, oPLo, stand-by	nonE	
	di c l	Display colour	0 = Change 1 = Red 2 = Green 3 = Orange	2	
	ade	Display change color threshold (when di Cl = 0)	0 (OFF)... 9999 (E.U.)		
	di s t	Display Power OFF time (mm.ss)	0.1... 99.59	OFF	
	Add	Instrument Address	1... 254	1	
Serial interface	bAud	Baud rate	1200, 2400, 9600 baud, 19.2, 38.4 kbaud	9600	
Wattmeter	Uolt	Load Voltage	1... 999 (V)	230	
	cur	Load Current	1... 9999 (A)		
Password	PAS4	Configuration access Password	0... 999	300	
	PAS2	Parameters access Password	0... 999	20	

Functions selection

t r f	Timer Type
Code displayed	Description
none	Timer not used
i da	Delayed ON at start command
i upd	Activation ON at Power ON
i dd	At start command
i pl	Asymmetrical oscillator with start in OFF
i l p	Asymmetrical oscillator with start in ON

Timer functioning diagram



DI1 and DI2 Functions

Code displayed	Description
0	Disabled (OFF)
1	Alarm Reset
2	Alarm Acknowledge (ACK)
3	Hold of the measured value
4	Stand by mode
5	Manual Mode
6	Heat with "SP" and Cool with "SP2"
7	Timer Run/Hold/Reset [on transition]
8	Timer Run [on transition]
9	Timer Reset [on transition]
10	Timer Run/Hold
11	Timer Run/Reset
12	Timer Run/Reset with lock at the end of the time count
13	No function (OFF)
14	No function (OFF)
15	No function (OFF)
16	No function (OFF)
17	No function (OFF)
18	Sequential Set Point selection [on transition]
19	SP/SP2 selection
20	Binary coding for Set Point selection on DI1 and DI2 (00 = SP, 01 = SP2, 10 = SP3, 11 = SP4)
21	Digital inputs in parallel to the UP and Down keys (DI1 = UP key, DI2 = DOWN key)

usrb Key "a" Function

Code displayed	Description
nonE	Not used
tune	Starts auto tuning functions
oplo	Manual mode
aac	Alarm Reset
asi	Alarm Acknowledge
chsp	Circular Set Point Selection
s t by	Stand-by
s t r t	Starts/Stop/Reset timer