

# TEMPERATURE CONTROLLER PROGRAMMER



33 x 72

KR3 model

Quick Guide • ISTR - FKR3ENG 03



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## DECLARATION OF CONFORMITY AND MANUAL RETRIEVAL

KR3 is a panel mounting, Class II instrument. It has been designed with compliance to the European Directives. All information about the controller use can be found in the Engineering Manual: ISTR-MKR3-ENGox ("x" is the revision). The Declaration of Conformity and the manual of the controller can be downloaded (free of charge) from the web-site:

www.ascontecnologic.com  
Once connected to the web-site, search:

**KR3**  
then click on **KR3**.

In the lower part of the product page (in any language) is present the download area with links to the documents available for the controller (in the available languages).

### 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.

### Warning!

All the order codes not present in the tables that follow (Digit **A**: Code **P**, Digit **E**: Code **M**, Digit **F**: Code **M**) are fully described in the "Engineering Manual" that can be freely downloaded from Ascon Tecnologic web site.

## MODEL CODE

The Hardware resources are identified by the following Model Code.

Model: KR 3 A B C D E F G H I - 0 0 0 0

Line	KR	3
<b>Optional functions</b>	<b>A</b>	
None	-	
Timer	T	
<b>Power Supply</b>	<b>B</b>	
100... 240Vac (-15... +10%)	H	
24Vac (-25... +12%) or 24Vdc (-15... +25%)	L	
<b>Input</b>	<b>C</b>	
TC, PT100, PT1000, mA, mV, V + Digital Input 1	C	
TC, NTC, PTC, mA, mV, V + Digital Input 1	E	
<b>Output OP1</b>	<b>D</b>	
Relay (1 SPDT, 4 A/250 Vac)	R	
VDC for SSR (12 Vdc/20 mA)	O	
Analogue Output (0/4... 20 mA, 0/2... 10 V)	I	
<b>Output OP2</b>	<b>E</b>	
None	-	
Relay (1 SPST NO, 2 A/250 Vac)	R	
VDC for SSR VDC for SSR (12 Vdc/20 mA)	O	

Output OP3	F
None	-
Relay (1 SPST NO, 2 A/250 Vac)	R
Vdc for SSR VDC for SSR (12 Vdc/20 mA)	O
<b>Output OP4</b>	<b>G</b>
Digital I/O (see the Electrical Connections paragraph for details)	D
<b>Serial Communications</b>	<b>H</b>
TTL	-
RS485 Modbus	S
<b>Terminal Type</b>	<b>I</b>
Standard (screw type non removable terminal blocks)	-
With plug-in screw type terminal blocks	E
With plug-in clamp type terminal blocks	M
With plug-in terminal blocks (fixed part only)	N

Model Code example: KR3-HCRRRD--

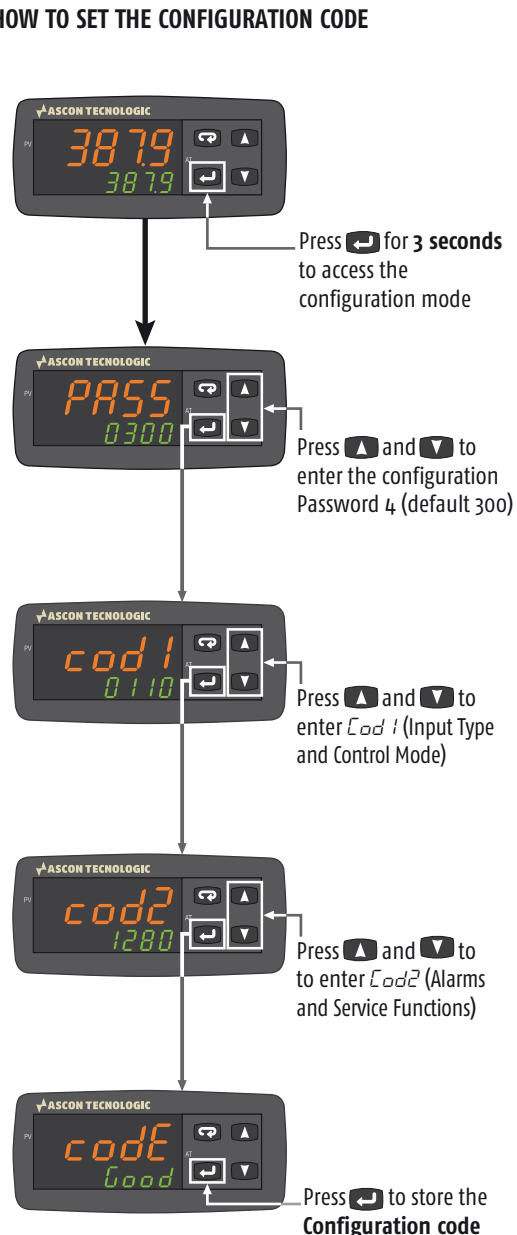
Controller KR3, no timer, 100... 240 Vac, TC/PT100/PT1000/mV/V + Digital Input 1, 3 Relay Outputs, Output 4, TTL, non removable screw type terminals.

## CONFIGURATION CODE

The KR3 can be easily configured by the "Code Configuration" method for the most common requirements, just entering two 4-digit codes: **Code 1 [LMNO]** for the Input Type and Control Mode selection and **Code 2 [PQRS]** for the Alarms and the Service Functions. For complete controller configuration see the Engineering Manual.

**Note:** Before starting the configuration code setting, please define and write down **Code 1** and **Code 2** as needed:

## HOW TO SET THE CONFIGURATION CODE

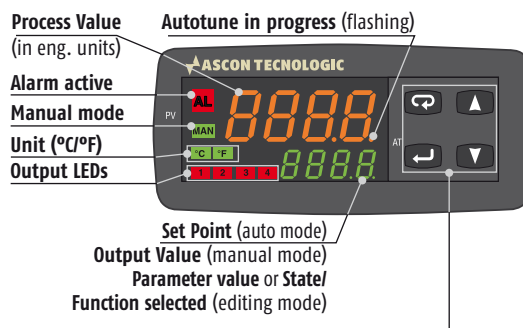


**Note:** To leave the Configuration session without saving the settings made, press the [Enter] key

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

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

## DISPLAY AND KEYS

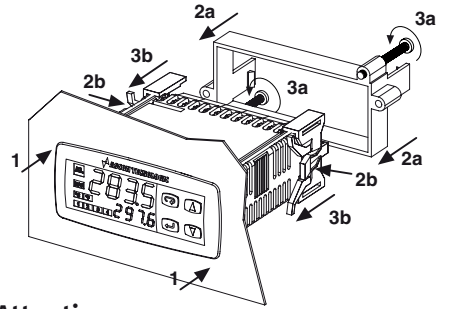


	Operator Mode	Editing Mode
[Enter]	Access to: - Operator Commands (Timer, Setpoint selection ...) - Parameters - Configuration	Confirm and go to Next parameter
[Up]	Access to: - Operator additional information (Output value, running time ...)	Increase the displayed value or select the next element
[Down]	Access to: - Set Point	Decrease the displayed value or select the previous element
[Enter]	Start the programmed function (Autotune, Auto/Man, Timer ...)	Exit from Operator commands/Parameter setting/Configuration

## DIMENSIONS

Overall dimensions (L x H x D): 78 x 35 x 69.5 mm  
(3.07 x 1.37 x 2.73 in.)  
Panel Cut-out (L x H): 71+0.6 x 29+0.6 mm  
(2.79+0.023 x 1.14+0.023 in.)

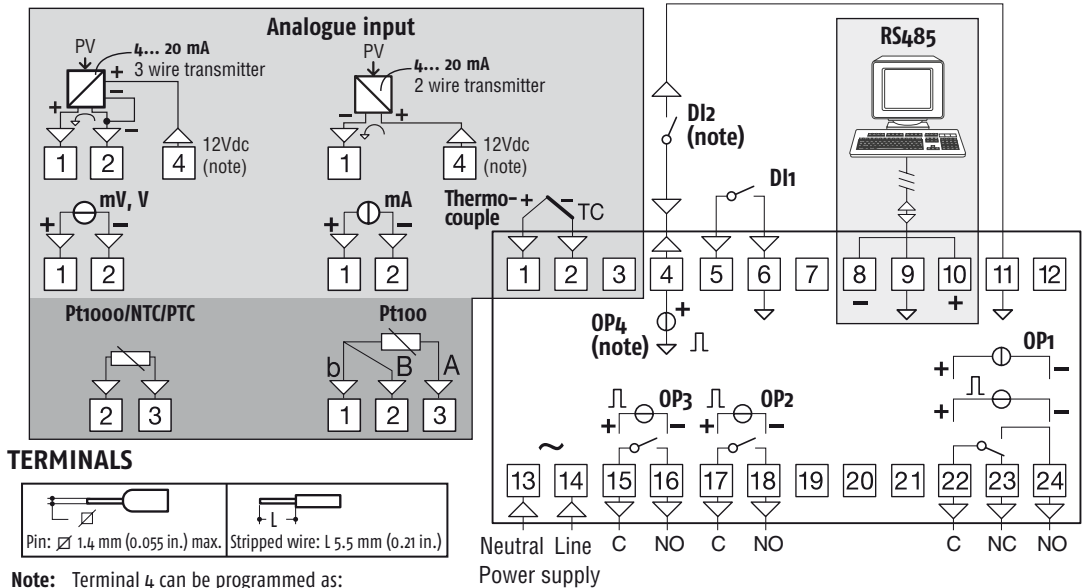
## MOUNTING



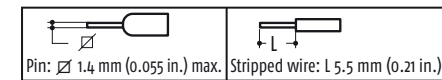
### Attention

The controller can be installed using 2 different types of brackets. Follow the sequence 1, 2a, 3a for the closed version of the bracket, the sequence 1, 2b, 3b for the 2 pieces bracket type.

## ELECTRICAL CONNECTIONS



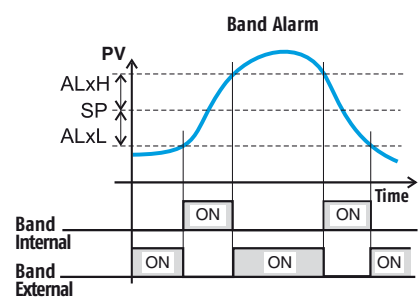
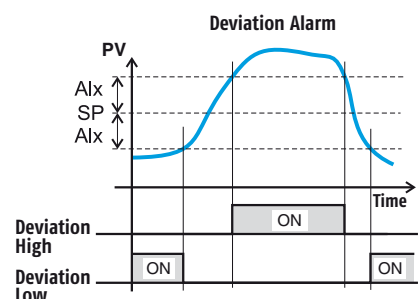
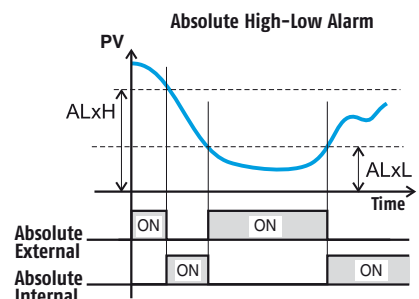
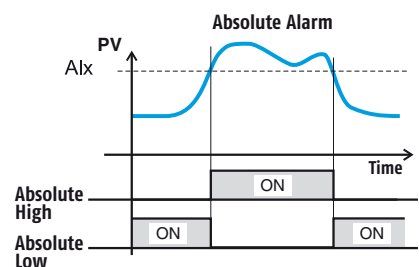
### TERMINALS



- Note:** Terminal 4 can be programmed as:
- **Digital Input (DI2)** connecting a free of voltage contact between terminals 4 and 11;
  - **0... 12 V SSR Drive Output (OP4)** connecting the load between terminals 4 and 11;
  - **12 Vdc (20 mA) transmitter power supply** connecting the 2 wire transmitter between terminals 4 and 1; for 3 wire transmitter connect terminal 4 to transmitter power supply input and terminal 1 and 2 to transmitter signal output.

**Supply voltage:** 100... 240 Vac/  
18... 28 Vac/  
20... 30 Vdc

## ALARM TYPES (Code 2 digits: P, Q, R)

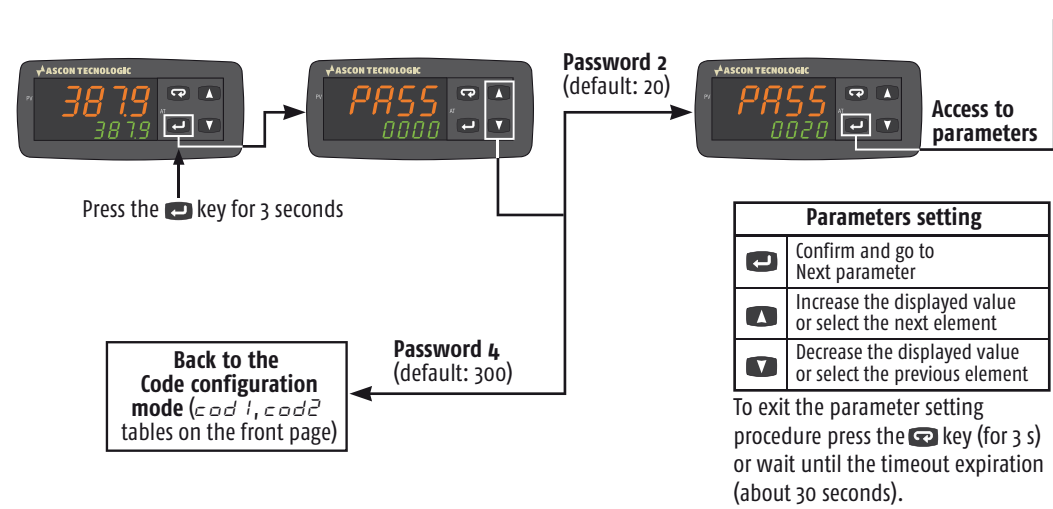


**Note:** As default, when the alarms are active, only AL1 threshold is available at "Operator Command" level to perform non critical tasks. To protect the AL2 and AL3 thresholds against undesired changes, they are available only at "Parameters list" level (password: 20). For different configurations, see the Engineering Manual.

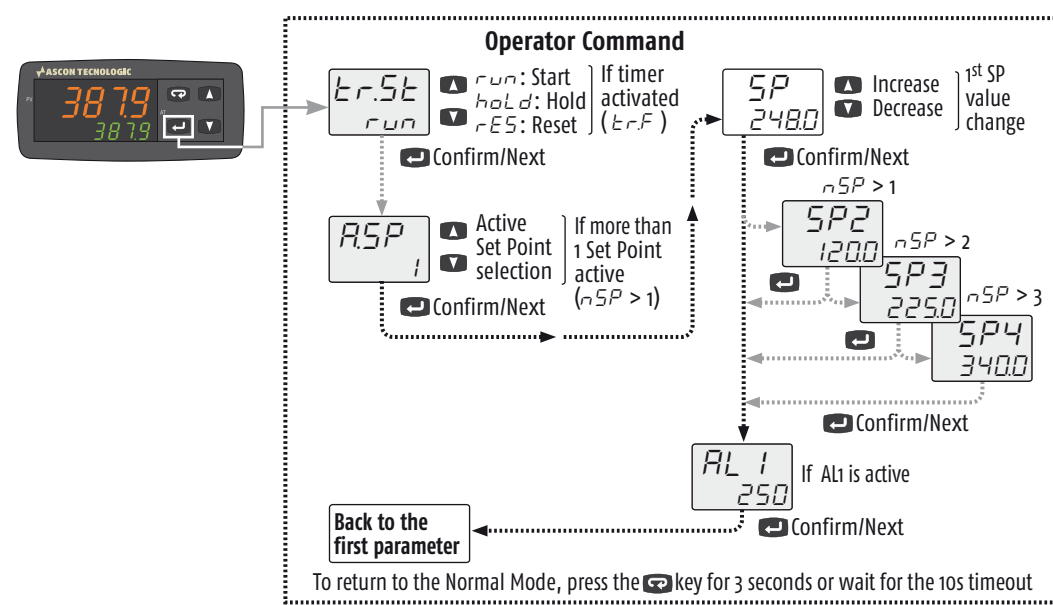
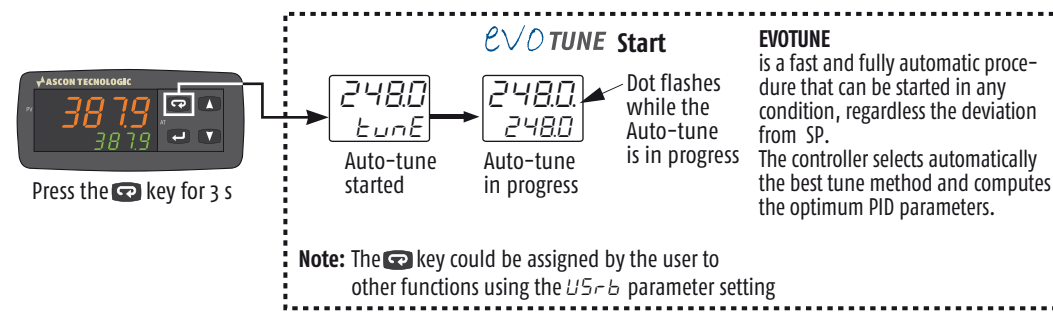
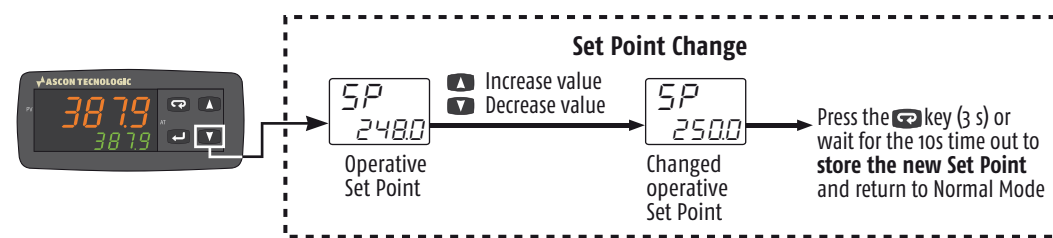
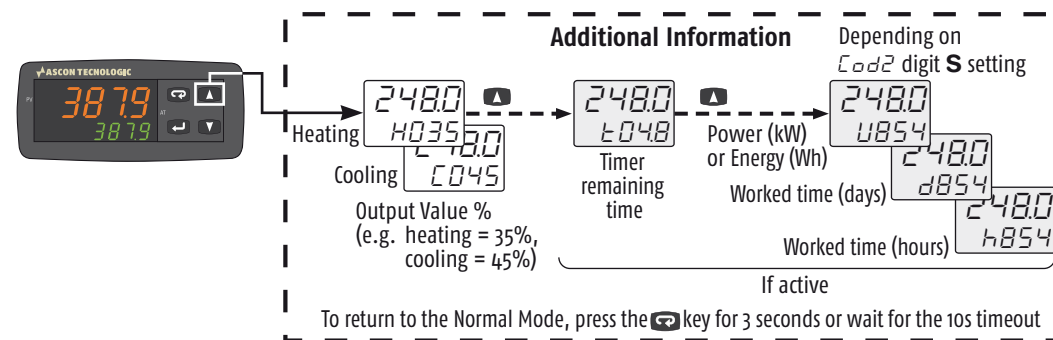
Service functions activation	S
None	0
Wattmeter (instantaneous power expressed in kW) (note 1)	1
Wattmeter (Power consumption expressed in kWh/h) (note 2)	2
Absolute worked time (expressed in days) (note 3)	3
Absolute worked time (expressed in hours) (note 3)	4

- Note:**
- 1. Wattmeter Instantaneous power** is continuously computed as multiplication of the Load Voltage, Load Current parameter values and the controller output instantaneous value.
  - 2. Wattmeter power consumption** is the estimated hourly energy consumption (using Load Voltage and Load Current parameter values), computed on the previous 15 minutes period. The readout is updated every 15 minutes.
  - 3. Worked Time counter** is continuously increased when the controller is turned ON.

## PARAMETERS SETTING

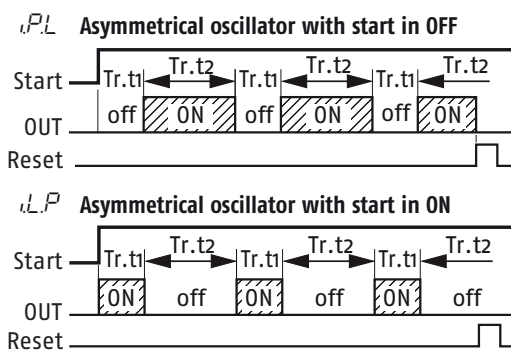
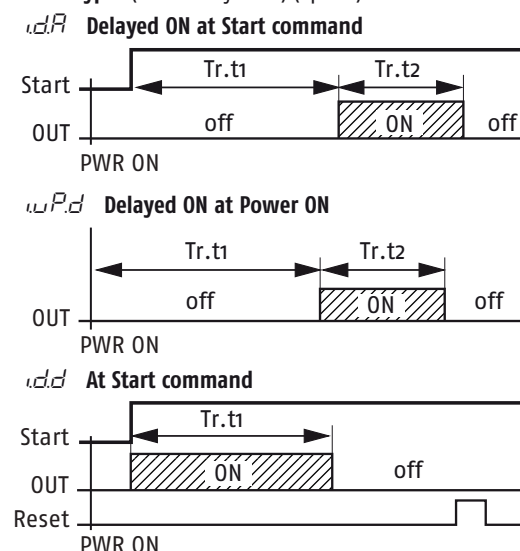


## CONTROLLER OPERATION



## FUNCTION SELECTION

### Timer Types (selected by *trF*) (option)



## Parameters List (*PASS: 20*) (in gray the parameters related to optional features)

Group	Param.	Description	Range value or selection list elements	Default	User value	Note
Commands	<i>trSt</i>	Timer status				Option
	<i>oPEr</i>	Operative Mode Selection	reg = Auto, oplo = Manual, stdy = Standby			
	<i>RSP</i>	Set Point Selection	0 = SP, 1 = SP2, 2 = SP3, 3 = SP4	0 = SP		
	<i>tunE</i>	Start Auto Tune	0 = OFF, 1 = start	0 = OFF		evoTUNE
Control	<i>Pb</i>	Proportional Band	1... 9999 (Engineering Units = E.U.)	20		
	<i>tI</i>	Integral Time	0... 10000 s	200		<i>cod1</i> Digit <b>N</b> = 1
	<i>tD</i>	Derivative Time	0... 1000 s	50		
	<i>HSEt</i>	Hysteresis ON/OFF Control	0... 9999 (E.U.)	1		<i>cod1</i> Digit <b>N</b> = 0
	<i>tCH</i>	Heating output cycle time	0.1... 130 s	20.0		<i>cod1</i> Digit <b>N</b> = 1
	<i>rCG</i>	Relative Cooling Gain	0.01... 99.99	1.00		<i>cod1</i> Digit <b>N</b> = 1 <i>cod1</i> Digit <b>O</b> > 4
	<i>tCC</i>	Cooling output cycle time	0.1... 130 s	20.0		<i>cod1</i> Digit <b>N</b> = 1 <i>cod1</i> Digit <b>O</b> > 1
Set Point	<i>SP</i>	Set Point 1	-1999... +9999 (E.U.)			
	<i>SP2</i>	Set Point 2				If <i>nSP</i> > 1
	<i>SP3</i>	Set Point 3	-1999... +9999 (E.U.)			If <i>nSP</i> > 2
	<i>SP4</i>	Set Point 4				If <i>nSP</i> > 3
	<i>SPLL</i>	Set Point min. Value	-1999... SPHL (E.U.)			
	<i>SPHL</i>	Set Point max. Value	SPLL... 9999 (E.U.)			
Alarms	<i>nSP</i>	No. of Set Points	1... 4	1		
	<i>AL1</i>	Alarm 1 threshold	AL1L... AL1H			
	<i>AL1L</i>	Alarm 1 low threshold/Low limit	-1999... +9999 (E.U.)	-1999		If digit <b>P</b> of <i>cod2</i> is > 1
	<i>AL1H</i>	Alarm 1 high threshold/High limit		9999		
	<i>HAL1</i>	AL1 hysteresis	1... 9999 (E.U.)	1		
	<i>AL2</i>	Alarm 2 threshold	AL2L... AL2H			
	<i>AL2L</i>	Alarm 2 low threshold/Low limit	-1999... +9999 (E.U.)	-1999		If digit <b>Q</b> of <i>cod2</i> is > 1
	<i>AL2H</i>	Alarm 2 high threshold/High limit		9999		
	<i>HAL2</i>	AL2 hysteresis	1... 9999 (E.U.)	1		
	<i>AL3</i>	Alarm 3 threshold	AL3L... AL3H			
	<i>AL3L</i>	Alarm 3 low threshold/Low limit	-1999... +9999 (E.U.)	-1999		If digit <b>R</b> of <i>cod2</i> is > 1
	<i>AL3H</i>	Alarm 3 high threshold/High limit		9999		
Soft Start	<i>SSP</i>	Soft Start Output value	-100... 100%	0		
	<i>SSt</i>	Soft Start Time	0.00... 8.00 (hh.mm)	0		
	Input	<i>SSc</i>	Low Scale readout	-1999... 9999	-1999	
<i>FSc</i>		High Scale readout	-1999... 9999	9999		
<i>dP</i>		Number of decimals	0... 3 (linear inputs); 0... 1 (other inputs)	0		
<i>FIL</i>		Measured value Digital filter	OFF; 0.1... 20.0 s	0 = OFF		
Timer	<i>trF</i>	Timer Type	nonE = Timer not used i.d.A = Delayed ON at start command i.uP.d = Activation ON at Power ON i.d.d = At start command i.P.L = Asymmetrical oscillator, start in OFF i.L.P = Asymmetrical oscillator, start in ON	none		Timer management (Start, Stop, Reset) can be done using the <i>trSt</i> command or the  key (if programmed) or by the Dh/Dl2 digital inputs (if programmed).
	<i>trU</i>	Timer Units	0 = hh.mm 1 = mm.ss 2 = sss.d	1 = mm.ss		
	<i>trt1</i>	Time 1	00.01... 995.9	1.00		
<i>trt2</i>	Time 2	00.00... 995.9	1.00			
If the ordered controller is equipped with the Programmer option, see the "ISTR-FKR3P" Addendum						
I/O	<i>io4F</i>	I/O 4 Function	ON = Transmitter Power Supply OUT4 = SSR out Di2C = Dig. In. from contact Di2U = 24 VDC Digital Input	ON		
	Digital Inputs	<i>dIF1</i>	Digital Input 1 Function	0... 21	0	
<i>dIF2</i>		Digital Input 2 Function	0... 21	0		
<i>usrb</i>		Key  Function	nonE, tunE, oplo, aac, asi, chsp, st.by, str.t	tunE		See the  Key function table
Display	<i>dCL</i>	Colour of the Process Value display	0 = Change 1 = Red 2 = Green 3 = Orange	2		If Change, the colour is green if PV differs from SP less than <i>AdE</i> , red if higher than <i>AdE</i> and orange if is lower than <i>AdE</i>
	<i>AdE</i>	Display change color threshold (when <i>dCL</i> = 0)	0 (OFF)... 9999 (e.u.)			
	<i>dStE</i>	Display Power OFF time (mm.ss)	OFF (display ON) 0.1... 99.59	OFF		
Serial communications	<i>AdD</i>	Instrument Address	1... 254	1		Modbus RTU slave protocol
	<i>BRud</i>	Baud rate	1200, 2400, 9600 baud, 19.2, 38.4 kbaud	9600		
Wattmeter	<i>UoLt</i>	Load Voltage	1... 999 (V)	230		If digit <b>S</b> of <i>cod2</i> is > 1
	<i>cur</i>	Load Current	1... 9999 (A)			
Password	<i>PRs4</i>	Configuration access Password	0... 999	300		
	<i>PRs2</i>	Parameters access Password	0... 999	20		

**Note:** To access all the instrument features, please see the "Complete configuration procedure" in the "Engineering Manual".

Complete Configuration and Parameter setting can be easily uploaded from the controller and downloaded to other controllers using the Configuration Key and Communication Adapter model: A-01.

### *dIF* Digital Inputs Dh and Dl2 Functions

Code displayed	Description
0	Disabled (OFF) (default)
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/Reset [on transition]
8	Timer Run [on transition]
9	Timer Reset [on transition]
10	Timer Run/Reset
11	Timer Run/Reset
12	Timer Run/Reset with lock at the end of the time count
18	Sequential Set Point selection [on transition]
19	SP/SP2 selection
20	Binary coding for Set Point selection on Dh and Dl2 (00 = SP, 01 = SP2, 10 = SP3, 11 = SP4)
21	Digital inputs in parallel to  and  keys (Dh = , Dl2 = )

### *usrb* Key Function

Code displayed	Description
nonE	Not used
tunE	Starts auto tuning functions (default)
oPLo	Manual mode
ARc	Alarm Reset
AS	Alarm Acknowledge
chSP	Circular Set Point Selection (shows SP, SP2, SP3)
Stby	Stand-by mode
StEt	Starts/Stop/Reset timer