

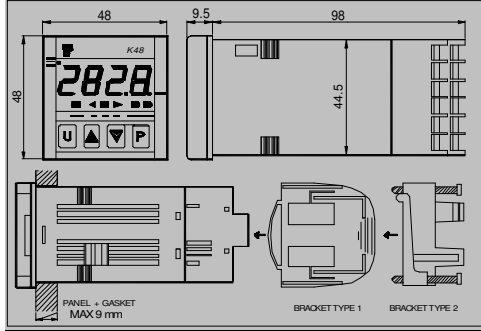
# K48

## CONTROLLER AND MINI-PROGRAMMER

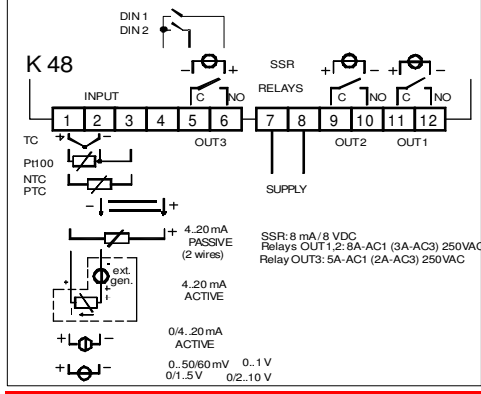


### Quick guide

## 1. OUTLINE DIMENSIONS (mm)



## 2. CONNECTION DIAGRAM



**PLS. NOTE:**  
**THE COMPLETE MANUAL IS AVAILABLE FREE OF CHARGE AT**  
**[www.SIKA.net](http://www.SIKA.net)**

### 2.1 - MOUNTING REQUIREMENTS

This instrument is intended for permanent installation, for indoor use only, in an electrical panel which encloses the rear housing, exposed terminals and wiring on the back.  
Select a mounting location having the following characteristics:  
1) it should be easily accessible  
2) there is minimum vibrations and no impact  
3) there are no corrosive gases  
4) there are no water or other fluid (i.e. condensation)  
5) the ambient temperature is in accordance with the operative temperature (from 0 to 50 °C)  
6) the relative humidity is in accordance with the instrument specifications (20% to 85 %)  
The instrument can be mounted on panel with a maximum thick of 15 mm. When the maximum front protection (IP65) is desired, the optional gasket must be mounted.

### 2.2 - GENERAL NOTES ABOUT INPUT WIRING

- 1) Don't run input wires together with power cables.
- 2) External components (like zener barriers, etc.) connected between sensor and input terminals may cause errors in measurement due to excessive and/or not balanced line resistance or possible leakage currents.
- 3) When a shielded cable is used, it should be connected at one point only.
- 4) Pay attention to the line resistance; a high line resistance may cause measurement errors.
- 5) To avoid electrical shock, connect power line at last.
- 6) For supply connections use No 16 AWG or larger wires rated for at least 75 °C.
- 7) Use copper conductors only.
- 8) Before connecting the instrument to the power line, make sure that line voltage is equal to the voltage shown on the identification label.
- 9) The power supply input is **NOT** fuse protected. Please, provide a T type 1A, 250 V fuse externally.

## 4. CONFIGURATION PROCEDURE

### 4.3. - HOW TO ENTER INTO THE CONFIGURATION MODE

1) Push the P button for more than 3 seconds.  
The display will show alternately 0 and "PASS".  
2) Using UP and/or DOWN buttons set the programmed password.  
**NOTES:**  
a) The factory default password for configuration parameters is 30.  
b) All parameter modification are protected by a time out. If no button is pressed for more than 10 second the instrument return automatically back to the Standard display, the new value of the last selected parameter is lost and the parameter modification procedure is closed. When you desire to remove the time out (e.g. for the first configuration of an instrument) you can use a password equal to 1000 plus the programmed password (e.g. 1000 + 30 (default) = 1030). It is always possible to end manually the parameter configuration procedure (see the next paragraph).  
c) During parameter modification the instrument continue to perform the control.  
In certain conditions, when a configuration change can produce a heavy bump to the process, it is advisable to temporarily stop the controller from controlling during the programming procedure (its control output will be Off)  
A password equal to 2000 + the programmed value (e.g. 2000 + 30 = 2030).  
The control will restart automatically when the configuration procedure will be manually closed.  
3) Push the P button  
If the password is correct the display will show the acronym of the first parameter group preceded by the symbol   
In other words the display will show   
The instrument is in configuration mode.

### 4.4. - HOW TO EXIT FROM THE CONFIGURATION MODE

Push U button for more than 5 seconds.  
The instrument will come back to the "standard display".

### 4.5. - KEYBOARD FUNCTION DURING PARAMETER MODIFICATION

**KEY U:** A short press allows you to exit from the current parameter group and select a new parameter group.  
A long press allows you to close the configuration parameter procedure (the instrument will come back to the "standard display").  
**KEY P:** When the display is showing a group, it allows you to enter in the selected group.  
When the display is showing a parameter, it allows you to memorize the selected value and to go to the next parameter within the same group.  
**KEY UP:** It allows you to increase the value of the selected parameter.  
**KEY DOWN:** It allows you to decrease the value of the selected parameter.  
**NOTE:** The group selection is cyclic as well as the selection of the parameters in a group.

### 4.6. - FACTORY RESET - DEFAULT PARAMETERS LOADING PROCEDURE

Sometimes, e.g. when you re-configure an instrument previously used for other works or from other people or when you have made too many errors during configuration and you decided to re-configure the instrument, it is possible to restore the factory configuration.  
This action allows you to put the instrument in a defined condition (in the same condition it was at the first power up).  
The default data are the typical values loaded in the instrument prior to shipment from factory.  
To load the factory default parameter set, proceed as follows:  
1) Press the P button for more than 5 seconds  
2) The display will show alternately "PASS" and "0".  
3) By UP and DOWN buttons set the value -481.  
4) Push P button.  
5) The instrument will turn OFF all LEDs then it will show "dFLt" messages and than it turn ON all LEDs of the display for 2 seconds and than it will restart as for a new power up.  
The procedure is complete.

## 6. OPERATIVE MODES

**6.4.1 - Keyboard function when the instrument is in Auto mode**  
**KEY U:** It will perform the action programmed by [116] uSrb (U button function during RUN TIME) parameter.  
**KEY P:** It allows entry into parameter modification procedures.  
**KEY UP:** It allows you to start the "Direct set point modification" function (see below).  
**KEY DOWN:** it allows you to display the "additional informations" (see below).  
**6.4.2 Direct set point modification**  
This function allows to modify rapidly the set point value selected by [79] SPAt or to the set point of the segment group currently in progress.  
The instrument is showing the "standard display".  
1) Push DOWN button.  
The display will show alternately the acronym of the selected set point (e.g. SP2) and its value.  
**NOTE:** when the programmer is running, the instrument will show the set point of the group currently in use.  
2) By UP and DOWN buttons, assign to this parameter the desired value.  
3) Do not push any button for more than 5 second or push the P button. In both cases the instrument memorize the new value and come back to the "standard display".  
**NOTE:** If the selected set point has not been promoted to the Operator level, the instrument allows you to see the value but not to modify it.

### 6.4.3 - Additional informations

This instrument is able to show you some additional informations that can help you to manage your system.  
1) When the instrument is showing the "standard display" push UP button. The display will show "H" or "c" followed by a number. This value is the current power output applied to the process. The "H" show you that the action is a Heating action while the "c" show you that the action is a Cooling action.  
2) Push UP button again. When the programmer is running the instrument will show the segment currently performed and the Event status as shown below:  
  
where the first figure can be "r" for a ramp or "S" for a soak, the next digit show the number of the segment (ex. S3 indicates stasis 3) and the two less significant digits show you the status of the two event (LSD is the Event 2).  
3) Push UP button again. When the programmer is running the instrument will show the theoretical remaining time to the end of the program preceded by a P letter:

4) Push UP button again. When the wattmeter function is running the instrument will show "U" followed by the measured energy.  
**Note:** The energy calculation will be in accordance with the [123] Co.tY parameter setting.  
5) Push UP button again. When the "Worked time count" is running the instrument will show "d" for days or "h" for hours followed by the measured time.  
6) Push UP button again. The instrument will come back to the "standard display".  
**NOTE:** The additional information visualization is subject to a time out of 10 seconds.

## 7. ERROR MESSAGES

### 7.1 - OUT OF RANGE SIGNALS

The display shows the OVER-RANGE and UNDER-RANGE conditions with the following indications:



Over-range Under-range  
The sensor break will be signalled as an out of range:

**NOTE:** When an over-range or an under-range is detected, the alarms operate as in presence of the maximum or the minimum measurable value respectively.  
To check the out of span Error condition, proceed as follows:  
1) Check the input signal source and the connecting line.  
2) Make sure that the input signal is in accordance with the instrument configuration.  
Otherwise, modify the input configuration (see section 4).  
3) If no error is detected, send the instrument to your supplier to be checked.

### 7.2 - LIST OF POSSIBLE ERRORS

**ErAt** - Fast Auto-tune can't start. The measure value is too close to the set point. Push the P button in order to delete the error message.  
**NoAt** - Auto-tune not finished within 12 hours.  
**ErEP** - Possible problem of the instrument memory. The messages disappears automatically. When the error continues, send the instrument to your supplier.

## 8. NOTE GENERALI

### 8.1 - PROPER USE

Every possible use not described in the complete manual ([www.SIKA.net](http://www.SIKA.net)) must be considered as a improper use.  
This instrument is in compliance with EN 61010-1 "Safety requirements for electrical equipment for measurement, control and laboratory use"; for this reason it could not be used as a safety equipment.  
Whenever a failure or a malfunction of the control device may cause dangerous situations for persons, thing or animals, please remember that the plant has to be equipped with additional safety devices.  
**SIKA GmbH and its legal representatives do not assume any responsibility for any damage to people, things or animals deriving from violation, wrong or improper use or in any case not in compliance with the instrument's features.**

### 8.2 - GUARANTEE AND REPAIRS

This product is under warranty against manufacturing defects or faulty materials that are found within 12 months from delivery date.  
The guarantee is limited to repairs or to the replacement of the instrument.  
The tampering of the instrument or an improper use of the product will bring about the immediate withdrawal of the warranty's effects.  
In the event of a faulty instrument, either within the period of warranty, or further to its expiry, please contact our sales department to obtain authorisation for sending the instrument to our company.  
The faulty product must be shipped to SIKA with a detailed description of the faults found, without any fees or charge for SIKA, except in the event of alternative agreements.  
Before supplying tension to the instrument, make sure that it is perfectly dry.

## PARAMETERS TABLE

### InP group (parameters relative to the inputs)

Parameter	Description	Range	Def.	Vis. Promo	
1	HcFG	It shows the current hw	TC/RTD - TC/PTC - Current - Volt	Acc. hw	Unvis
2	SEnS	Sensor TC, Pt100 input	J, crAL, S, r, t, Ir,J, Ir,cA, Pt1, 0.50 (mV), 0.60 (mV), 12.60 (mV)	J	A-4
		TC, PTC, NTC input	J, crAL, S, r, t, Ir,J, Ir,cA, Ptc, ntc, 0.50 (mV), 0.60 (mV), 12.60 (mV)	Ptc	
		I input	0.20 (mA), 4.20 (mA)	4.20	

Parameter	Description	Range	Def.	Vis. Promo	
	V input	0.5(V), 1.5(V), 0.10(V), 2.10(V), 0.1 (V)	0.10		
3	dP	Decimal fig.	0÷3	0	A-5
4	SSc	Initial scale readout	-1999 ÷ FSC (E.U.)	- 1999	A-6
5	FSc	Final scale readout	SSc ÷ 9999 (E.U.)	9999	A-7
6	unit	Engineering unit (E.U.)	°c or °F	0 = °c	A-8
7	FiL	Digital filter on the measured value	0 (oFF) ÷ 20.0 (s)	1.0	C-0
8	inE	Selection of the Sensor Out of Range type that enables the safety output value	or = Over range ur = Under range our = Over e Under	our	C-0
9	oPE	Safety output value	-100 ÷ 100 (%)	0	C-0
10	diF1	Digital input 1 function	oFF = No function 1 = Alarm Reset 2 = Alarm acknowledge 3 = Hold of the measured value 4 = Stand by mode 5 = HEAt with SP1 and CooL with "SP2" 6 = Timer run/hold/reset 7 = Timer run 8 = Timer reset 9 = Timer run/hold 10 = Program run 11 = Program reset 12 = Program hold 13 = Program run/hold 14 = Program run/reset 15 = Manual mode 16 = Sequential set point selection 17 = SP1 / SP2 select. 18 = Set point Binary selection 19 = Digital inputs in parallel to the UP and Down keys	nonE	A-13
11	diF2	Digital input 2 function	oFF = No function 1 = Alarm Reset 2 = Alarm acknowledge (ACK) 3 = Hold of the measured value 4 = Stand by mode 5 = HEAt with SP1 and CooL with "SP2" 6 = Timer run/hold/reset 7 = Timer run 8 = Timer reset 9 = Timer run/hold 10 = Program run 11 = Program reset 12 = Program hold 13 = Program run/hold 14 = Program run/reset 15 = Manual mode 16 = Sequential set point selection 17 = SP1 / SP2 selection 18 = Set point Binary selection 19 = Digital inputs in parallel to the UP and Down keys	nonE	A-14

### Out group (parameters relative to the outputs)

Parameter	Description	Range	Def.	Vis. Promo	
12	o1F	Out 1 function	NonE = Not used H.rEG = Heating output c.rEG = Cooling output AL = Alarm output t.out = Timer output t.HoF = Timer out -OFF in hold P.End = Program end P.HLd = Program hold P.uit = Program wait P.run = Program run P.Et1 = Progr. Event 1 P.Et2 = Progr. Event 2 or.bo = Out-of-range or burn out indicator P.FAL = Power failure bo.PF = Out-of-range, burn out and Power failure diF.1 = The output repeats the digital input 1 status diF.2 = The output repeats the digital input 2 status St.bY = Stand by status	H.reg	A-16
13	o1AL	Alarms linked up with the out 1	from 0 to 31 +1 = AL 1, +2 = AL 2, +4 = AL 3, +8 = Loop break alarm, + 16 = Sensor break (burn out)	AL1	A-17
14	o1Ac	Out 1 action	dir = Direct action rEU = Reverse action dir.r = Direct with reversed LED ReU.r = Reverse with reversed LED	dir	C-0
15	o2F	Out 2 function	NonE = Not used H.rEG = Heating output c.rEG = Cooling output AL = Alarm output t.out = Timer output t.HoF = Timer out -OFF in hold P.End = Program end P.HLd = Program hold P.uit = Program wait P.run = Program run P.Et1 = Progr. Event 1 P.Et2 = Progr. Event 2 or.bo = Out-of-range or burn out indicator P.FAL = Power failure bo.PF = Out-of-range, burn out and Power failure indicator diF.1 = The output repeats the digital input 1 status diF.2 = The output repeats the digital input 2 status St.bY = Stand by status	AL	A-19
16	o2AL	Alarms linked up with the out	from 0 to 31 +1 = AL 1, +2 = AL 2 +4 = AL 3, +8 = Loop	AL1	A-20

Parameter	Description	Range	Def.	Vis. Promo	
	2	break alarm, + 16 = Sensor break (burn out)			
17	o2Ac	Out 2 action	dir = Direct action rEU = Reverse action dir.r = Direct with reversed LED ReU.r = Reverse with reversed LED	dir	C-0
18	o3F	Out 3 function	NonE = Not used H.rEG = Heating output c.rEG = Cooling output AL = Alarm output t.out = Timer output t.HoF = Timer out -OFF in hold P.End = Program end P.HLd = Program hold P.uit = Program wait P.run = Program run P.Et1=Program Event 1 P.Et2=Program Event 2 or.bo = Out-of-range or burn out indicator P.FAL = Power failure bo.PF = Out-of-range, burn out and Power failure indicator diF.1 = The output repeats the digital input 1 status diF.2 = The output repeats the digital input 2 status St.bY = Stand by status	AL	A-22
19	o3AL	Alarms linked up with the out 3	from 0 to 31 +1 = AL 1, +2 = AL 2 +4 = AL 3, +8 = Loop break alarm, + 16 = Sensor break (burn out)	AL2	A-23
20	o3Ac	Out 3 action	dir = Direct action rEU = Reverse action dir.r = Direct with reversed LED ReU.r = Reverse with reversed LED	dir	C-0
21	o4F	Out 4 function	NonE = Not used H.rEG = Heating output c.rEG = Cooling output AL = Alarm output t.out = Timer output t.HoF = Timer out -OFF in hold P.End = Program end P.HLd = Program hold P.uit = Program wait P.run = Program run P.Et1=Program Event 1 P.Et2=Program Event 2 or.bo = Out-of-range or burn out indicator P.FAL = Power failure bo.PF = Out-of-range, burn out and Power failure indicator diF.1 = The output repeats the digital input 1 status diF.2 = The output repeats the digital input 2 status St.bY = Stand by status indicator	AL	A-24
22	o4AL	Alarms linked up with the out 4	from 0 to 31 +1 = AL 1, +2 = AL 2 +4 = AL 3, +8 = Loop break alarm, + 16 = Sensor break (burn out)	AL2	A-25
23	o4Ac	Out 4 action	dir = Direct action rEU = Reverse action dir.r = Direct with reversed LED ReU.r = Reverse with reversed LED	dir	C-0

### AL1 group (parameters relative to AL1 - alarm 1)

Parameter	Descript.	Range	Def.	Vis. Promo	
24	AL1t	Alarm 1 type	nonE = Not used LoAb = Absolute low HiAb = Absolute high LHAb = Absolute band SE.br = Sensor break LoDe = Deviation low (relative) HiDe = Deviation high (relative) LHDe = Relative band	LoAb	A-47
25	Ab1	Alarm 1 function	From 0 to 15 +1 = Not active at power up +2 = Latched alarm (manual reset) +4 = Acknow. alarm +8 = Relative alarm not active at SP change	0	C-0
26	AL1L	- For High and low alarms, it is the low limit of the AL1 threshold - For band alarm, it is low alarm threshold	From -1999 to AL1H (E.U.)	- 1999	A-48
27	AL1H	- For High and low alarms, it is the high limit of the AL1 threshold - For band alarm, it is high alarm threshold	From AL1L to 9999 (E.U.)	9999	A-49
28	AL1	AL1 threshold	From AL1L to AL1H (E.U.)	0	A-50
29	HAL1	AL1 hysteresis	From 1 to 9999 E.U.	1	A-51
30	AL1d	AL1 delay	From 0(oFF) to 9999 (s)	oFF	C-0
31	AL1o	Alarm 1 enabling during Stand-by mode	0 = Never 1 = During stand by 2 = During overrange and underrange 3 = During overrange, underrange and stand-by	No	C-0

### AL2 group (parameters relative to AL2 - alarm 2)

Parameter	Descript.	Range	Def.	Vis. Promo
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Parameter	Descript.	Range	Def.	Vis. Promo
32	AL2t	Alarm 2 type	nonE = Not used LoAb = Absolute low HiAb = Absolute high LHAb = Absolute band SE.br = Sensor break LodE = Deviation low (relative)	HiAb A-54
33	Ab2	Alarm 2 function	From 0 to 15 +1 = Not active at power up +2 = Latched alarm (manual reset) +4 = Acknowledg. alarm +8 = Relative alarm not active at SP change	0 C-0
34	AL2L	- For High and low alarms, it is the low limit of the AL2 threshold - For band alarm, it is low alarm threshold	From -1999 to AL2H (E.U.)	-1999 A-56
35	AL2H	- For High and low alarms, it is the high limit of the AL2 threshold - For band alarm, it is high alarm threshold	From AL2L to 9999 (E.U.)	9999 A-57
36	AL2	AL2 threshold	From AL2L to AL2H (E.U.)	0 A-58
37	HAL2	AL2 hysteresis	From 1 to 9999 (E.U.)	1 A-59
38	AL2d	AL2 delay	From 0 (oFF) to 9999 (s)	oFF C-0
39	AL2o	Alarm 2 enabling during Stand-by mode	0 = Never 1 = During stand by 2 = During overrang and underrange 3 = During overrange, underrange and stand-by	no C-0

#### AL3 group (parameters relative to AL3 - alarm 3)

Parameter	Descript.	Range	Def.	Vis. Promo
40	AL3t	Alarm 3 type	nonE = Not used LoAb = Absolute low HiAb = Absolute high LHAb = Absolute band SE.br = Sensor break LodE = Deviation low (relative) HidE = Deviation high (relative) LHdE = Relative band	nonE C-0
41	Ab3	Alarm 3 function	From 0 to 15 +1 = Not active at power up +2 = Latched alarm (manual reset) +4 = Acknowledg. alarm +8 = Relative alarm not active at SP change	0 C-0
42	AL3L	- For High and low alarms, it is the low limit of the AL3 threshold - For band alarm, it is low alarm threshold	From -1999 to AL2H (E.U.)	-1999 C-0
43	AL3H	- For High and low alarms, it is the high limit of the AL3 threshold - For band alarm, it is high alarm threshold	From AL3L to 9999 (E.U.)	9999 C-0
44	AL3	AL3 threshold	From AL3L to AL2H (E.U.)	0 C-0
45	HAL3	AL3 hysteresis	From 1 to 9999 (E.U.)	1 C-0
46	AL3d	AL3 delay	From 0 (oFF) to 9999 s	oFF C-0
47	AL3o	Alarm 3 enabling during Stand-by mode	0 = Never 1 = During stand by 2 = During overrange and underrange 3 = During overrange, underrange and stand by	no C-0

#### LbA group (parameters relative to the Loop Break Alarm)

Parameter	Description	Range	Def.	Vis. Promo
48	LbAt	LBA time	From 0 (oFF) to 9999 (s)	oFF C-0
49	LbSt	Delta measure used by LBA during Soft start	From 0 (oFF) to 9999 (E.U.)	10 C-0
50	LbAS	Delta measure used by LBA	From 1 to 9999 (E.U.)	20 C-0
51	LbcA	Condition for LBA enabling	uP = Active when Pout = 100% dn = Active when Pout = -100% both = Active in both cases	both C-0

#### REG group (parameters relative to the control)

Parameter	Description	Range	Def.	Vis. Promo
52	cont	Control type	Pid = PID (heat and/or cool) On.FA = ON/OFF asymmetric hysteresis On.FS = ON/OFF symmetric hysteresis nr = Heat/Cool ON/OFF control with neutral zone	Pid A-25

Parameter	Description	Range	Def.	Vis. Promo
53	Auto	Autotuning selection	-4 = Oscillating auto-tune with automatic restart at power up and after all SP change -3 = Oscillating auto-tune with manual start -2 = Oscillating auto-tune with auto-matic start at the first power up only -1 = Oscillating auto-tune with auto-matic restart at every power up 0 = Not used 1 = Fast auto tuning with automatic restart at every power up 2 = Fast auto-tune with automatic start at the first power up only 3 = FAST auto-tune with manual start 4 = FAST auto-tune with automatic restart at power up and after a SP change	2 C-0

54	Aut.r	Manual start of the Autotuning	oFF = Not active on = Active	oFF A-26
55	SELF	Self tuning enabling	YES = Active no = Not active	no C-0
56	HSEt	Hysteresis of the ON/OFF control	From 0 to 9999 (E.U.)	1 A-27
57	cPdt	Time for compressor protection	From 0 (oFF) to 9999 (s)	oFF C-0
58	Pb	Proportional band	From 0 to 9999 (E.U.)	50 A-28
59	int	Integral time	From 0 (oFF) to 9999 (s)	200 A-29
60	dEr	Derivative time	From 0 (oFF) to 9999 (s)	50 A-30
61	Fuoc	Fuzzy overshoot control	From 0.00 to 2.00	0.50 A-31
62	H.Act	Heating output actuator	SSr = SSR rELY = relay SLou = slow actuators	SSr A-32
63	trcH	Heating output cycle time	From 0.1 to 130.0 (s)	20.0 C-0
64	PrAt	Power ratio between heating and cooling action	From 0.01 to 99.99	1.00 A-34
65	c.Act	Cooling output actuator	SSr = SSR rELY = relay SLou = slow actuators	SSr A-35
66	trcC	Cooling output cycle time	From 0.1 to 130.0 (s)	20.0 C-0
67	rS	Manual reset (Integral pre-load)	From -100.0 to 100.0 (%)	0.0 C-0
68	od	Delay at power up	From 0.00 (oFF) to 99.59 (hh.mm)	oFF C-0
69	St.P	Maximum power output used during soft start	From -100 to 100 (%)	0 C-0
70	SSt	Soft start time	From 0.00 (oFF) to 8.00 (inF) (hh.mm)	oFF C-0
71	SSiH	Threshold for soft start disabling	From -1999 to 9999 (E.U.)	9999 C-0

#### SP group (parameters relative to the Set Point)

Parameter	Description	Range	Def.	Vis. Promo
72	nSP	Number of used SP	From 1 to 4	1 A-38
73	SPLL	Minimum set point value	From -1999 to SPHL	-1999 A-39
74	SPHL	Maximum set point value	From SPLL to 9999	9999 A-40
75	SP 1	Set point 1	From SPLL to SPLH	0 O-41
76	SP 2	Set point 2	From SPLL to SPLH	0 O-42
77	SP 3	Set point 3	From SPLL to SPLH	0 O-43
78	SP 4	Set point 4	From SPLL to SPLH	0 O-44
79	SPAt	Selection of the active SP	From 1 (SP 1) to nSP	1 O-45
80	SP.r	Remote set point type	RSP = The value coming from serial link is used as remote set point trin = The value will be added to the local set point selected by SPAt and the sum becomes the operative set point PErc = The value will be scaled on the input range and this value will be used as remote set point	trin C-0
81	SP.Lr	Local/remote SP selection	Loc = local rEn = remote	Loc C-0

Parameter	Description	Range	Def.	Vis. Promo
82	SP.u	Rate of rise for POSITIVE SP change	From 0.01 to 100.00 (inF) E.U. per minute	inF C-0
83	SP.d	Rate of rise for NEGATIVE SP change	0.01 + 100.00 (inF) E.U. per minute	inF C-0

#### Tin group (parameters relative to the timer)

Parameter	Description	Range	Def.	Vis. Promo
84	tr.F	Independent timer function	nonE = Not used i.d.A = Delayed start timer i.uP.d = Delayed start at power up i.d.d = Feed-through timer i.P.L = Asymmetrical oscillator with start in OFF i.L.P = Asymmetrical oscillator with start in ON	nonE A-62
85	tr.u	Timer unit	hh.nn = Hours and minutes nn.SS = Minutes and seconds SSS.d = Second and tenth of seconds	nn.SS A-63
86	tr.t1	Time 1	From 00.01 to 99.59 when tr.u < 2 From 000.1 to 995.9 when tr.u = 2	1.00 A-647
87	tr.t2	Time 2	When tr.u < 2: From 00.00 (oFF) to 99.59 (inF) When tr.u = 2: From 000.0 (oFF) to 995.9 (inF)	1.00 A-65
88	tr.St	Timer status	rES = timer reset run = timer run HoLd = timer hold	rES C-0

#### PrG group (parameters relative to the programmer)

Parameter	Description	Range	Def.	Vis. Promo
89	Pr.F	Program action at power up	nonE = Not used S.uP.d = Start at power up with 1st step in stand-by S.uP.S = Start at power up u.dIG = Start at Run command detection only u.d.G.d = Start at Run command with 1st step in stand-by	nonE A-67
90	Pr.u	Engineering unit of the soak	hh.nn = Hrs + min nn.SS = Min + sec	hh.nn A-68
91	Pr.E	Instrument behaviour at the end of the program execution	cnt = continue SPAt = go to the SP selected by SPAt St.by = go to stand-by mode	SPAt A-71
92	Pr.Et	Time of the end program indication	From 0.00 (oFF) to 100.00 (inF) min. and sec.	oFF A-72
93	Pr.S1	SP of the first soak	From SPLL to SPHL	0 A-73
94	Pr.G1	Gradient of the first ramp	From 0.1 to 1000.0 (inF= Step transfer) E.U./minute	inF A-74
95	Pr.t1	Time of the first soak	From 0.00 to 99.59	0.10 A-75
96	Pr.b1	Wait band of the first soak	From 0 (oFF) to 9999 (E.U.)	oFF A-76
97	Pr.E1	Events of the first group	From 00.00 to 11.11	00.00 C-0
98	Pr.S2	SP of the second soak	OFF or from SPLL to SPHL	0 A-78
99	Pr.G2	Gradient of the second ramp	From 0.1 to 1000.0 (inF= Step transfer) E.U./minute	inF A-79
100	Pr.t2	Time of the second soak	From 0.00 to 99.59	0.10 A-80
101	Pr.b2	Wait band of the second soak	From 0 (oFF) to 9999 (E.U.)	oFF A-81
102	Pr.E2	Events of the second group	From 00.00 to 11.11	00.00 C-0
103	Pr.S3	SP of the third soak	OFF or from SPLL to SPHL	0 A-83
104	Pr.G3	Gradient of the third ramp	From 0.1 to 1000.0 (inF= Step transfer) E.U./minute	inF A-84
105	Pr.t3	Time of the third soak	From 0.00 to 99.59	0.10 A-85
106	Pr.b3	Wait band of the third soak	From 0 (oFF) to 9999 (E.U.)	oFF A-86
107	Pr.E3	Events of the third group	From 00.00 to 11.11	00.00 C-0
108	Pr.S4	SP of the fourth soak	OFF or from SPLL to SPHL	0 A-88
109	Pr.G4	Gradient of the fourth ramp	From 0.1 to 1000.0 (inF= Step transfer) E.U./minute	inF A-89
110	Pr.t4	Time of the fourth soak	From 0.00 to 99.59	0.10 A-90
111	Pr.b4	Wait band of the fourth soak	From 0 (oFF) to 9999 (E.U.)	oFF A-91
112	Pr.E4	Events of the fourth group	From 00.00 to 11.11	00.00 C-0
113	Pr.St	Program status	rES = Prg reset run = Prg start HoLd = Prg hold	rES C-0

#### Pan group (parameters relative to the operator interface)

Parameter	Description	Range	Def.	Vis. Promo
114	PAS2	Password level 2	From 0 (oFF) to 999	20 A-93
115	PAS3	Password level 3	From 3 to 999	30 C-0
116	uSrb	U button function during run time	nonE = Not used tunE = Starts auto tuning functions oPLO = Manual mode (OPLO) AAc = Alarm reset ASi = Alarm acknowledge chSP = Sequential set point selection St.by = Stand-by mode Str.t = Run/hold/reset timer P.run = Prgr start P.rES = prgr reset P.r.H.r = Run/hold/reset program	nonE A-94
117	diSP	Display management	nonE = Standard display Pou = Power output SPF = Final SP Spo = Operative set point AL1 = Alarm 1 threshold AL2 = Alarm 2 threshold AL3 = Alarm 3 threshold Pr.tu = Prgr time up Pr.td = Prgr time down P.t.tu = Prgr total time up P.t.td = Prgr total time down ti.uP = Timer time up ti.du = Timer time down PErc = % of the power output used during soft start	nonE A-95
118	AdE	Bargraph deviation	From 0 (oFF) to 9999	2 A-96
119	FiLd	Filter on the displayed value	From 0 .0(oFF) to 20.0	oFF C-0
120	dSPu	Status of the instrument at power up	AS.Pr = Starts in the same way it was prior to the power down Auto = Starts in Auto mode oP.0 = Starts in manual mode with power output = 0 St.by = Starts in stand-by mode	AS.Pr C-0
121	oPr.E	Operative mode enabling	ALL = All Au.oP = Auto or manual (oPLO) only Au.Sb = Auto and Stand by only	ALL C-0
122	oPEr	Operative mode selection	Auto = Automatic oPLO = Manual St.by = Stand-by	Auto O-1

#### Ser group (parameters relative to the serial interface)

Parameter	Description	Range	Def.	Vis. Promo
123	Add	Address	0 (oFF) ÷ 254	1 C-0
124	bAud	Baud rate	1200 – 2400 – 9600 - 19.2 - 38.4	9600 C-0
125	trSP	Selection of the value to be retransmitted (Master)	nonE = Not used rSP = Operative SP PErc = Current power output (%)	nonE C-0

#### Con group (parameters relative to the consumption) Wattmeter

Parameter	Description	Range	Def.	Vis. Promo
126	co.ty	Measurement type	oFF = Not used 1 = Instantaneous power (kW) 2 = Power consumption (kW/h) 3 = Energy used during prgr execut. 4 = Total worked days with threshold 5 = Total worked hrs with threshold	nonE A-97
127	UoLt	Nominal voltage of the load	From 1 to 999 (Volt)	230 A-98
128	cur	Nominal current of the load	From 1 to 999 (A)	10 A-99
129	h.Job	Threshold of the worked hours/days	From 0 (oFF) to 9999	oFF A-100

#### CAL group (parameters relative to the user Calibration)

Parameter	Description	Range	Def.	Vis. Promo
130	A.L.P	Adjust low Point	From -1999 to AH.P-10 (E.U.)	0 A-9
131	A.L.o	Adjust low Offset	From -300 to 300 (E.U.)	0 A-10
132	A.H.P	Adjust High Point	From A.L.P +10 -to 9999 (E.U.)	9999 A-11
133	A.H.o	Adjust High Offset	From -300 to 300 (E.U.)	0 A-12