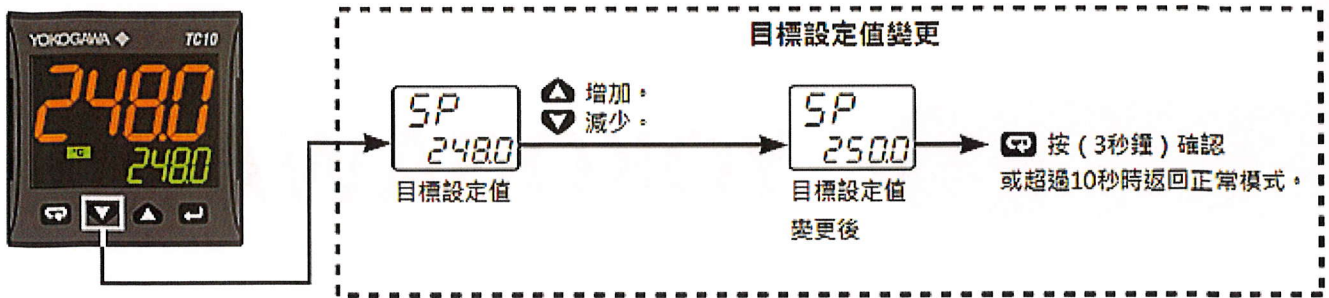


**YOKOGAWA**

**TC10 操作手冊**

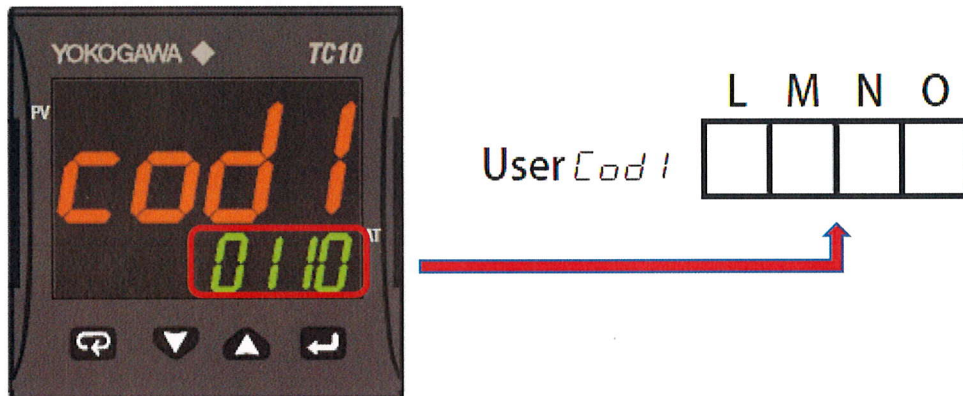
# 操作說明：

## (一)SP 值設定：



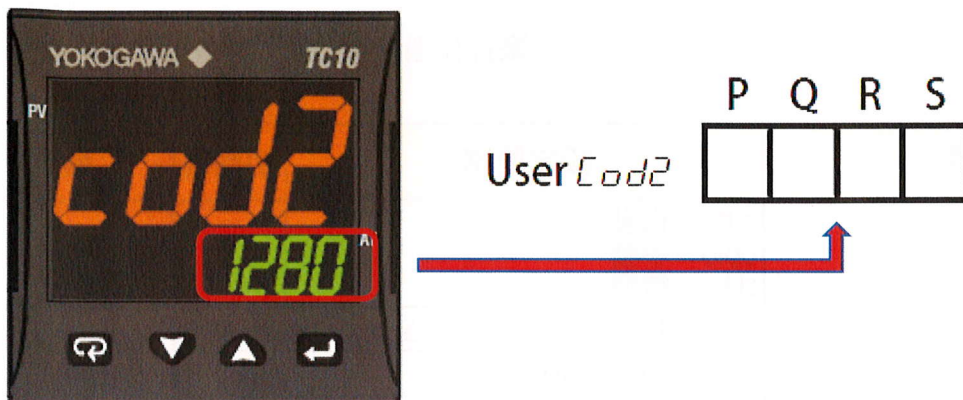
(二) 硬體參數設定：長按 鍵，顯示 PASS 後，輸入 300，按下 確認。

### 1. 設定輸入類型及控制模式 Cod 1：



輸入類型和範圍		L	M	Cod 1					
		L	M	L	M	N	O		
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						
PT 100	-200 ~ +850°C	0	7						
PT 1000	-200 ~ +850°C	0	8						
直流電壓0~60mV		0	9						
直流電壓12~60mV		1	0						
直流電流0~20mA		1	1						
直流電流4~20mA		1	2						
直流電壓0~5V		1	3						
直流電壓1~5V		1	4						
直流電壓0~10V		1	5						
直流電壓2~10V		1	6						
控制模式				OP1	OP2	OP3	OP4	N	O
開/關 加熱=H				H	AL1	AL2	AL3	0	0
開/關 冷卻=C				NU	AL1	AL2	H	0	1
不感帶 開/關 (H/C)				C	AL1	AL2	AL3	0	2
				NU	AL1	AL2	C	0	3
				H	C	AL2	AL3	0	4
PID加熱=H				H	AL1	AL2	C	0	5
				NU	H	AL2	C	0	6
PID冷卻=C				C	H	AL2	AL3	0	7
				NU	C	AL2	H	0	8
PID加熱/冷卻 (H/C)				H	C	AL2	AL3	1	0
				H	AL1	AL2	C	1	1
				C	H	AL2	AL3	1	2
				NU	H	AL2	C	1	3
				C	AL1	AL2	H	1	4
				NU	C	AL2	H	1	5
				H	AL1	AL2	C	1	6
				NU	H	AL2	C	1	7
				C	AL1	AL2	H	1	8
				NU	C	AL2	H	1	9


## 2. 設定警報模式及服務功能 Cod 2 :



		Cod2			
		P	Q	R	S
警報3				R	服務功能
警報2			Q		無
警報1		P			瓦特表 (以kW表示的瞬時功率)
未使用		0	0	0	功率表 (功耗以kWh/h表示)
傳感器破損		1	1	1	運行時間 (天)
絕對值	上限	2	2	2	運行時間 (小時)
	下限	3	3	3	
絕對值上限/下限	外部上下限	4	4	4	
	內部上下限	5	5	5	
偏差	上限偏差	6	6	6	
	下限偏差	7	7	7	
偏差	外部偏差	8	8	8	
	內部偏差	9	9	9	

## 3. 保存設定 :



設定完成後會顯示此畫面，若要保存設定，只要按下  鍵即可。

若不想保存，則按  鍵返回。

(三) 參數設定：長按  鍵，顯示 PASS 後，輸入 20，按下  確認。

※操作過程中，按  可返回上一個參數

參數	內容	設定範圍	初始值	備註
oPEr	操作模式選擇	auto = 自動 oplo = 手動 st.by = 待機		
RSP	設定點選擇	0 = SP, 1 = SP2, 2 = SP3, 3 = SP4	0 = SP	
tunE	自動演算	OFF = 關閉、ON = 啟動	OFF	evoTUNE
Pb	比例帶	1 ~ 9999 (工業單位 = E.U.)	50	
t <sub>i</sub>	積分時間	OFF(0) ~ 9999 秒	200	Cod1 N值 = 1
t <sub>d</sub>	微分時間	OFF(0) ~ 9999 秒	50	
HSEt	遲滯ON / OFF控制	0 ~ 9999 (E.U.)	1	Cod1 N值 = 0
t <sub>cH</sub>	加熱輸出循環時間	0.1 ~ 130 秒	20.0	Cod1 N值 = 1
r <sub>cG</sub>	相對冷卻增益	0.01 ~ 99.99	1.00	Cod1 N值 = 1 Cod1 O值 > 4
t <sub>cC</sub>	冷卻輸出循環時間	0.1 ~ 130 秒	20.0	Cod1 N值 = 1 Cod1 O值 > 1
SP	目標設定值1	-1999 ~ +9999 (E.U.)		
SP2	目標設定值2			nSP > 1時
SP3	目標設定值3	-1999 ~ +9999 (E.U.)		nSP > 2時
SP4	目標設定值4			nSP > 3時
SPLL	目標設定值下限	-1999 ~ SPHL (E.U.)		
SPHL	目標設定值上限	SPLL ~ 9999 (E.U.)		
nSP	目標設定值數量	1 ~ 4	1	
AL1	警報1設定值	AL1L ~ AL1H		Cod2的P值 > 1時
AL1L	警報1下限設定值	-1999 ~ +9999 (E.U.)	-1999	
AL1H	警報1上限設定值		9999	
HAR1	AL1遲滯	1 ~ 9999 (E.U.)	1	
AL2	警報2設定值	AL2L ~ AL2H		Cod2的Q值 > 1時
AL2L	警報2下限設定值	-1999 ~ +9999 (E.U.)	-1999	
AL2H	警報2上限設定值		9999	
HAR2	AL2遲滯	1 ~ 9999 (E.U.)	1	
AL3	警報3設定值	AL3L ~ AL3H		Cod2的R值 > 1時
AL3L	警報3下限設定值	-1999 ~ +9999 (E.U.)	-1999	
AL3H	警報3上限設定值		9999	
HAR3	AL3遲滯	1 ~ 9999 (E.U.)	1	
StP	返啟動輸出值	-100 ~ 100%	0	
SSt	返啟動時間	OFF、0.01 ~ 8.00 (時間.分)	OFF	
SSc	輸入值下限	-1999 ~ 9999	-1999	僅限定於線性輸入
FSc	輸入值上限	-1999 ~ 9999	9999	類型

dP	小數點位置	0~3 (線性輸入)、 0~1 (其他輸入)	0	
F <sub>iL</sub>	輸入濾波常數	0 (關閉)、0.1~20.0秒	1.0	
io <sup>4F</sup>	I/O 4 功能	ON = 傳送器電源 OUT4 = SSR輸出 Di2C = DI接點 Di2U = 24VDC DI	OUT4	
d <sub>iF.1</sub>	DI 1 功能	OFF、1~21	OFF	DI1、DI2功能表 (參考下表)
d <sub>iF.2</sub>	DI 2 功能	OFF、1~21	OFF	
d <sub>iR</sub>	DI動作選擇	0 = DI1正動作、DI2正動作 1 = DI1逆動作、DI2正動作 2 = DI1正動作、DI2逆動作 3 = DI1逆動作、DI2逆動作	0	僅在配置DI2時使用
u5rb	[  ]功能選擇	nonE, tunE, oplo, aac, asi, chsp, st.by, str.t	tunE	 功能表 (參照下表)
d <sub>icL</sub>	輸入值顯示顏色切換	0 = 自動切換 1 = 紅色 2 = 綠色 3 = 橘色	2	設置為“自動切 換”時，當PV在 AdE到SP的範圍內 時變為綠色，當它 高於AdE時變為紅 色，如果PV低於 AdE則變為橙色。
RdE	顏色切換設定值 (diCL=0時)	0 (關閉) ~9999 (E.U.)		
d <sub>ist</sub>	電源自動關閉時間	OFF (不關閉電源) 0.1~99.59 (分秒)	OFF	
Rdd	通訊機號	1~254	1	Modbus RTU 通訊協定
bRud	通訊速率	1200、2400、9600、19200、38400	9600	
UoLt	負載電壓	1~999 (V)	230	Cod2 的S值 >1時
cur	負載電流	1~9999 (A)		
PR54	硬體參數層密碼設置	201~400	300	
PR52	參數層密碼設置	OFF(0)、1~200	20	

d<sub>iF.1</sub> d<sub>iF.2</sub> DI1、DI2 功能表

顯示代碼	內容
0	關閉 (初始值)
1	重置警報
2	警報確認 (ACK)
3	輸入值保持
4	待機模式
5	手動模式
6	「SP」加熱、「SP2」冷卻
7~17	備用
18	選擇設定點順序 [轉換時]
19	SP/SP2選擇
20	SP二進制代碼切換 (DI1、DI2使用) (00=SP、01=SP2、10=SP3、11=SP4)
21	數字輸入 與 [向上鍵] 和 [向下鍵] 並行 (DI1=「向上」鍵、DI2=「向下」鍵)

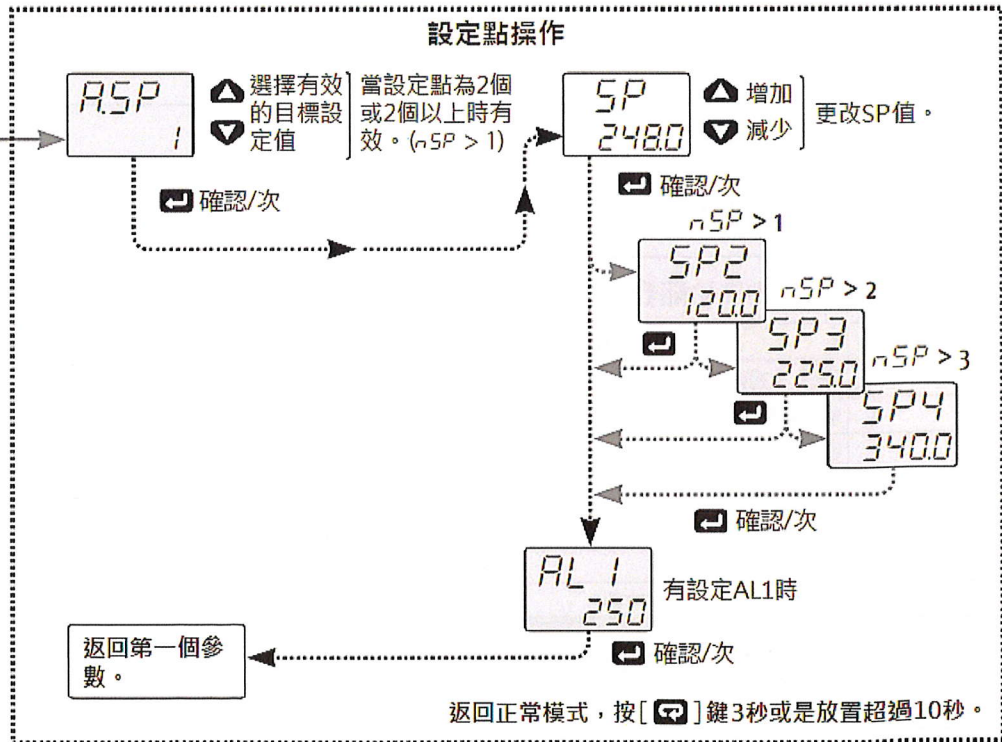
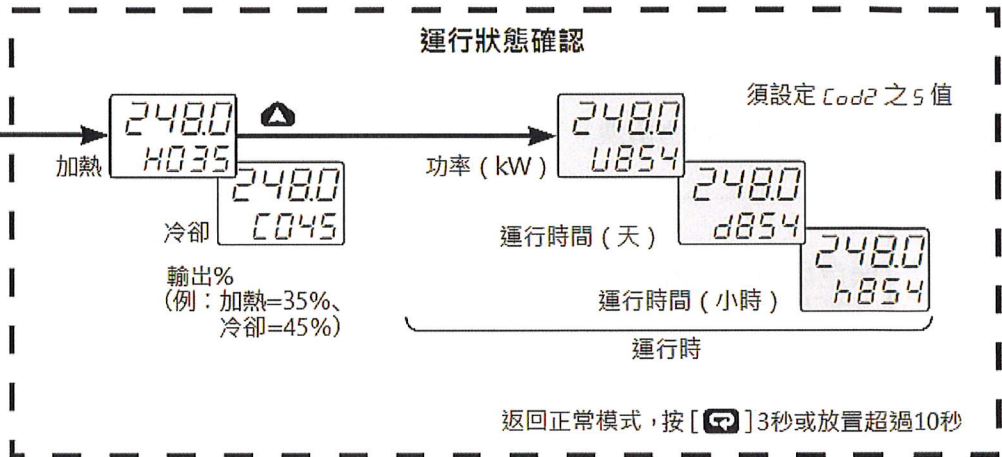
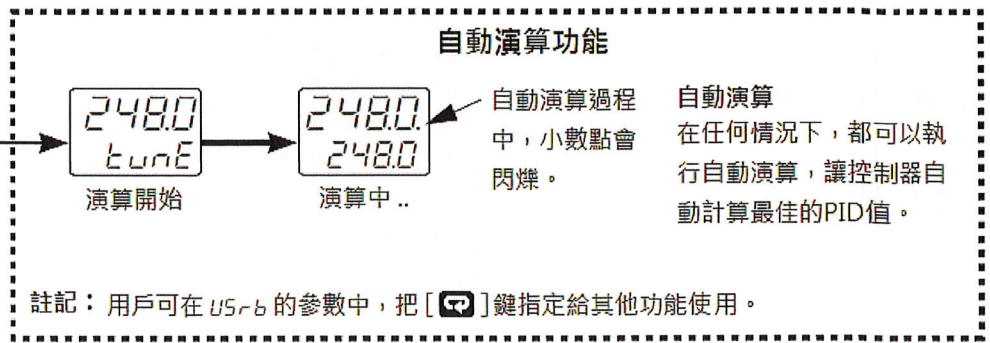
u5rb  功能表

顯示代碼	內容
nonE	未使用
tunE	啟動自動演算 (初始值)
oPLo	自動/手動 切換
RRc	重置警報
R5 <sub>i</sub>	警報確認
chSP	目標設定點選擇 (顯示SP、SP2、SP3)
StBy	待機模式

(四) 其他：



按著3秒。



# Appendix A

## inP GROUP - Main and auxiliary input configuration

no.	Param.	Description	Dec. Point	Values	Default
1	SEnS	Sensor selection	0	J = TC J, crAL = TC K, S = TC S, r = TC R, t = TC T, Pt1 = RTD Pt100, Pt10 = RTD Pt1000, 0.60 = 0 to 60 mV, 12.60 = 12 to 60 mV, 0.20 = 0 to 20 mA, 4.20 = 4 to 20 mA, 0.5 = 0 to 5 V, 1.5 = 1 to 5 V, 0.10 = 0 to 10 V, 2.10 = 2 to 10 V	J
2	dp	Decimal Point Position (linear inputs)	0	0 to 3	0
		Decimal Point Position (different than linear inputs)		0/1	
3	SSC	Initial scale read-out for linear inputs	dp	-1999 to 9999	0
4	FSc	Full Scale Readout for linear inputs	dp	-1999 to 9999	1000
5	unit	Engineer unit		°C/°F	°C
6	Fil	Digital filter on the measured value	1	0 (= OFF) to 20.0 s	1.0
7	inE	Sensor error used to enable the safety output value		or = Over range ou = Under range our = Over and under range	our
8	oPE	Safety output value (% of the output)		-100 to 100	0
9	IO4.F	I/O 4 function		on = Output used as PWS for TX, out4 = Output 4 (digital output 4), dG2c = Digital input 2 driven by contact, dG2U = Digital input 2 driven by voltage	out4
10	diF1	Digital Input 1 function		oFF = Not used, 1 = Alarm reset, 2 = Alarm acknowledge (ACK), 3 = Hold of the measured value, 4 = Stand by mode, 5 = Manual mode, 6 = HEAt with SP1 and Cool with SP2,	oFF
11	diF2	Digital Input 2 function		7 to 17 = No action 18 = Sequential SP selection, 19 = SP1 - SP2 selection, 20 = SP1 to SP4 binary selection, 21 = Digital inputs in parallel to ▲ and ▼ keys	oFF
12	di.A	Digital Inputs Action (DI2 only if configured)		0 = DI1 direct action, DI2 direct action 1 = DI1 reverse action, DI2 direct action 2 = DI1 direct action, DI2 reverse action 3 = DI1 reverse action, DI2 reverse action	0

## Out group

no.	Param.	Description	Dec. Point	Values	Default
13	o1t	Output 1 type (when Out 1 is an analog output)		0-20 = 0 to 20 mA; 4-20 = 4 to 20 mA; 0-10 = 0 to 10 V; 2-10 = 2 to 10 V.	0-20
14	o1F	Out 1 function (when Out 1 is an analog output)	0	NonE = Output not used; H.rEG = Heating output; c.rEG = Cooling output; r.inP = Measure retransmission; r.Err = Error (SP - PV) retransmission; r.SP = Set point retransmission ; r.SEr = Serial value retransmission.	H.rEG
		Out 1 function	0	NonE = Output not used H.rEG = Heating output c.rEG = Cooling output AL = Alarm output t.out = Reserved t.HoF = Reserved P.End = Reserved P.HLd = Reserved P.uit = Reserved P.run = Reserved P.Et1 = Reserved P.Et2 = Reserved or.bo = Out-of-range or burn out indicator P.FAL = Power failure indicator bo.PF = Out-of-range, burn out and Power failure indicator St.bY = Stand by status indicator diF.1 = The output repeats the digital input 1 status diF.2 = The output repeats the digital input 2 status on = Out 1 always ON riSP = Inspection requested (the worked hours/days counter has reached the programmed threshold)	
15	Ao1L	Initial scale value of the analog retransmission (when Out 1 is an analog output)	dP	-1999 ... Ao1H	-1999
16	Ao1H	Full scale value of the analog retransmission (when Out 1 is an analog output)	dP	Ao1L ... 9999.	9999
17	o1AL	Alarms linked up with the out 1	0	0 to 63 +1 = Alarm 1 +2 = Alarm 2 +4 = Alarm 3 +8 = Loop break alarm +16 = Sensor Break +32 = Overload on output 4	AL1
18	o1Ac	Out 1 action	0	dir = Direct action rEU = Reverse action dir.r = Direct with reversed LED ReU.r = Reverse with reversed LED	dir
19	o2F	Out 2 function	0	NonE = Output not used H.rEG = Heating output c.rEG = Cooling output AL = Alarm output t.out = Reserved t.HoF = Reserved P.End = Reserved P.HLd = Reserved P.uit = Reserved P.run = Reserved P.Et1 = Reserved P.Et2 = Reserved or.bo = Out-of-range or burn out indicator P.FAL = Power failure indicator bo.PF = Out-of-range, burn out and Power failure indicator St.bY = Stand by status indicator diF.1 = The output repeats the digital input 1 status diF.2 = The output repeats the digital input 2 status on = Out 2 always ON riSP = Inspection requested (the worked hours/days counter has reached the programmed threshold)	AL
20	o2AL	Alarms linked up with the out 2	0	0 to 63 +1 = Alarm 1 +2 = Alarm 2 +4 = Alarm 3 +8 = Loop break alarm +16 = Sensor Break +32 = Overload on output 4	AL1



no.	Param.	Description	Dec. Point	Values	Default
21	o2Ac	Out 2 action	0	dir = Direct action rEU = Reverse action dir.r = Direct with reversed LED ReU.r = Reverse with reversed LED	dir
22	o3F	Out 3 function	0	NonE = Output not used H.rEG = Heating output c.rEG = Cooling output AL = Alarm output t.out = Reserved t.HoF = Reserved P.End = Reserved P.HLd = Reserved P.uit = Reserved P.run = Reserved P.Et1 = Reserved P.Et2 = Reserved or.bo = Out-of-range or burn out indicator P.FAL = Power failure indicator bo.PF = Out-of-range, burn out and Power failure indicator St.bY = Stand by status indicator diF.1 = The output repeats the digital input 1 status diF.2 = The output repeats the digital input 2 status on = Out 3 always ON riSP = Inspection requested (the worked hours/days counter has reached the programmed threshold)	AL
23	o3AL	Alarms linked up with the out 3	0	0 to 63 +1 = Alarm 1 +2 = Alarm 2 +4 = Alarm 3 +8 = Loop break alarm +16 = Sensor Break +32 = Overload on output 4	AL2
24	o3Ac	Out 3 action	0	dir = Direct action rEU = Reverse action dir.r = Direct with reversed LED ReU.r = Reverse with reversed LED	dir
25	o4F	Out 4 function	0	NonE = Output not used H.rEG = Heating output c.rEG = Cooling output AL = Alarm output t.out = Reserved t.HoF = Reserved P.End = Reserved P.HLd = Reserved P.uit = Reserved P.run = Reserved P.Et1 = Reserved P.Et2 = Reserved or.bo = Out-of-range or burn out indicator P.FAL = Power failure indicator bo.PF = Out-of-range, burn out and Power failure indicator St.bY = Stand by status indicator	AL
26	o4AL	Alarms linked up with the out 4	0	0 to 63 +1 = Alarm 1 +2 = Alarm 2 +4 = Alarm 3 +8 = Loop break alarm +16 = Sensor Break +32 = Overload on output 4	AL1 + AL2
27	o4Ac	Out 4 action	0	dir = Direct action rEU = Reverse action dir.r = Direct with reversed LED ReU.r = Reverse with reversed LED	dir

## AL1 group

no.	Param.	Description	Dec. Point	Values	Default
28	AL1t	Alarm 1 type	0	nonE = Alarm not used LoAb = Absolute low alarm HiAb = Absolute high alarm LHAo = Windows alarm in alarm outside the windows LHAi = Windows alarm in alarm inside the windows SE.br = Sensor Break LodE = Deviation low alarm (relative) HidE = Deviation high alarm (relative) LHdo = Relative band alarm in alarm out of the band LHdi = Relative band alarm in alarm inside the band	HiAb
29	Ab1	Alarm 1 function	0	0 to 15 +1 = Not active at power up +2 = Latched alarm (manual reset) +4 = Acknowledgeable alarm +8 = Relative alarm not active at set point change	0
30	AL1L	- For High and low alarms, it is the low limit of the AL1 threshold; - For band alarm, it is low alarm threshold	dp	From -1999 to AL1H (E.U.)	-1999
31	AL1H	- For High and low alarms, it is the high limit of the AL1 threshold; - For band alarm, it is high alarm threshold	dp	From AL1L to 9999 (E.U.)	9999
32	AL1	AL1 threshold	dp	From AL1L to AL1H (E.U.)	0
33	HAL1	AL1 hysteresis	dp	1 to 9999 (E.U.)	1
34	AL1d	AL1 delay	0	From 0 (oFF) to 9999 (s)	oFF
35	AL1o	Alarm 1 enabling during Stand-by mode and out of range conditions	0	0 = Alarm 1 disabled during Stand by and out of range 1 = Alarm 1 enabled in stand by mode 2 = Alarm 1 enabled in out of range condition 3 = Alarm 1 enabled in stand by mode and in overrange condition	0

## AL2 group

no.	Param.	Description	Dec. Point	Values	Default
36	AL2t	Alarm 2 type	0	nonE = Alarm not used LoAb = Absolute low alarm HiAb = Absolute high alarm LHAo = Windows alarm in alarm outside the windows LHAi = Windows alarm in alarm inside the windows SE.br = Sensor Break LodE = Deviation low alarm (relative) HidE = Deviation high alarm (relative) LHdo = Relative band alarm in alarm out of the band LHdi = Relative band alarm in alarm inside the band	Loab
37	Ab2	Alarm 2 function	0	0 to 15 +1 = Not active at power up +2 = Latched alarm (manual reset) +4 = Acknowledgeable alarm +8 = Relative alarm not active at set point change	0
38	AL2L	- For High and low alarms, it is the low limit of the AL2 threshold; - For band alarm, it is low alarm threshold	dp	From -1999 to AL2H (E.U.)	-1999
39	AL2H	- For High and low alarms, it is the high limit of the AL2 threshold; - For band alarm, it is high alarm threshold	dp	From AL2L to 9999 (E.U.)	9999
40	AL2	AL2 threshold	dp	From AL2L to AL2H (E.U.)	0
41	HAL2	AL2 hysteresis	dp	1 to 9999 (E.U.)	1
42	AL2d	AL2 delay	0	From 0 (oFF) to 9999 (s)	oFF
43	AL2o	Alarm 2 enabling during Stand-by mode and out of range conditions	0	0 = Alarm 2 disabled during Stand by and out of range 1 = Alarm 2 enabled in stand by mode 2 = Alarm 2 enabled in out of range condition 3 = Alarm 2 enabled in stand by mode and in overrange condition	0

## AL3 group

no.	Param.	Description	Dec. Point	Values	Default
44	AL3t	Alarm 3 type	0	nonE = Alarm not used LoAb = Absolute low alarm HiAb = Absolute high alarm LHAo = Windows alarm in alarm outside the windows LHAi = Windows alarm in alarm inside the windows SE.br = Sensor Break LodE = Deviation low alarm (relative) HidE = Deviation high alarm (relative) LHdo = Relative band alarm in alarm out of the band LHdi = Relative band alarm in alarm inside the band	nonE
45	Ab3	Alarm 3 function	0	0 to 15 +1 = Not active at power up +2 = Latched alarm (manual reset) +4 = Acknowledgeable alarm +8 = Relative alarm not active at set point change	0
46	AL3L	- For High and low alarms, it is the low limit of the AL3 threshold; - For band alarm, it is low alarm threshold	dp	From -1999 to AL3H (E.U.)	-1999
47	AL3H	- For High and low alarms, it is the high limit of the AL3 threshold; - For band alarm, it is high alarm threshold	dp	From AL3L to 9999 (E.U.)	9999
48	AL3	AL3 threshold	dp	From AL3L to AL3H (E.U.)	0
49	HAL3	AL3 hysteresis	dp	1 to 9999 (E.U.)	1
50	AL3d	AL3 delay	0	From 0 (oFF) to 9999 (s)	oFF
51	AL3o	Alarm 3 enabling during Stand-by mode and out of range conditions	0	0 = Alarm 3 disabled during Stand by and out of range 1 = Alarm 3 enabled in stand by mode 2 = Alarm 3 enabled in out of range condition 3 = Alarm 3 enabled in stand by mode and in overrange condition	0

## LBA group - Loop Break Alarm Parameters

no.	Param.	Description	Dec. Point	Values	Default
52	LbAt	LBA time	0	From 0 (oFF) to 9999 (s)	oFF
53	LbSt	Delta measure used by LBA during Soft start	dP	From 0 (oFF) to 9999 (E.U.)	10
54	LbAS	Delta measure used by LBA	dP	1 to 9999 (E.U.)	20
55	LbcA	Condition for LBA enabling	0	uP = Active when Pout = 100% dn = Active when Pout = -100% both = Active in both cases	both

## rEG group - Control Parameters


no.	Param.	Description	Dec. Point	Values	Default
56	cont	Control type	0	Pid = PID (heat and/or) On.FA = ON/OFF asymmetric hysteresis On.FS = ON/OFF symmetric hysteresis nr = Heat/Cool ON/OFF control with neutral zone	Pid
57	Auto	Autotuning selection	0	-4 = Oscillating auto-tune with automatic restart at power up and after all point change -3 = Oscillating auto-tune with manual start -2 = Oscillating -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 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 set point change 5 = Evo-tune with automatic restart at every power up 6 = Evo-tune with automatic start the first power up only 7 = Evo-tune with manual start 8 = Evo-tune with automatic restart at power up and after a set point change	7
58	Aut.r	Manual start of the Autotuning	0	oFF = Not active on = Active	oFF

no.	Param.	Description	Dec. Point	Values	Default
59	SELF	Self tuning enabling	0	no = The instrument does not perform the self-tuning YES = The instrument is performing the self-tuning	no
60	HSEt	Hysteresis of the ON/OFF control	dP	0 to 9999 (E.U.)	1
61	cPdt	Time for compressor protection	0	From 0 (oFF) to 9999 (s)	oFF
62	Pb	Proportional band	dP	1 to 9999 (E.U.)	50
63	ti	Integral time	0	From 0 (oFF) to 9999 (s)	200
64	td	Derivative time	0	From 0 (oFF) to 9999 (s)	50
65	Fuoc	Fuzzy overshoot control	2	0.00 to 2.00	0.50
66	tcH	Heating output cycle time	1	0.1 to 130.0 (s)	20.0
67	rcG	Power ratio between heating and cooling action	2	0.01 to 99.99	1.00
68	tcc	Cooling output cycle time	1	0.1 to 130.0 (s)	20.0
69	rS	Manual reset (Integral pre-load)	1	-100.0 to +100.0 (%)	0.0
70	Str.t	Servomotor stroke time	0	5 to 1000 seconds	60
71	db.S	Servomotor dead band	0	0 to 100%	50
72	od	Delay at power up	2	From 0.00 (oFF) to 99.59 (hh.mm)	oFF
73	St.P	Maximum power output used during soft start	0	-100 to 100 (%)	0
74	SSt	Soft start time	2	- 0.00 (oFF); - 0.01 to 7.59 (hh.mm); - inF (always ON).	oFF
75	SS.tH	Threshold for soft start disabling	dP	-1999 to +9999 (E.U.)	9999

### <sup>1</sup> SP group - Set point parameters

no.	Param.	Description	Dec. Point	Values	Default
76	nSP	Number of used set points	0	1 to 4	1
77	SPLL	Minimum set point value	dP	From -1999 to SPHL	-1999
78	SPHL	Maximum set point value	dP	From SPLL to 9999	9999
79	SP	Set point 1	dP	From SPLL to SPLH	0
80	SP 2	Set point 2	dP	From SPLL to SPLH	0
81	SP 3	Set point 3	dP	From SPLL to SPLH	0
82	SP 4	Set point 4	dP	From SPLL to SPLH	0
83	A.SP	Selection of the active set point	0	From 1 (SP 1) to nSP	1
84	SP.rt	Remote set point type	0	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 A.SP 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 SP.	trin
85	SPLr	Local/remote set point selection	0	Loc = local; rEn = remote.	Loc
86	SP.u	Rate of rise for <b>POSITIVE</b> set point change (ramp UP)	2	0.01 to 99.99 (inF) Eng. units per minute	inF
87	SP.d	Rate of rise for <b>NEGATIVE</b> set point change (ramp DOWN)	2	0.01 to 99.99 (inF) Eng. units per minute	inF

## PA group - Operator HMI parameters

no.	Param.	Description	Dec. Point	Values	Default
118	PAS2	Level 2 password (limited access level)	0	- oFF (Level 2 not protected by password); - 1 to 200.	20
119	PAS3	Level 3 password (complete configuration level)	0	3 to 200	30
120	PAS4	Level 4 password (CODE configuration level)	0	201 to 400	300
121	uSrb	 button function during RUN TIME		nonE = No function; tunE = Auto-tune/self-tune enabling. A single press (longer than 1 second) starts the auto-tune; oPLo = Manual mode. The first pressure puts the instrument in manual mode (OPLO) while a second one puts the instrument in Auto mode; AAc = Alarm reset; ASi = Alarm acknowledge; chSP = Sequential set point selection; St.by = Stand by mode. The first press puts the instrument in stand by mode while a second one puts the instrument in Auto mode; Str.t = Reserved; P.run = Reserved; P.rES = Reserved; P.r.H.r = Reserved.	tunE
122	diSP	Display management		nonE = Standard display; Pou = Power output; SPF = Final set point; Spo = Operative set point; AL1 = Alarm 1 threshold; AL2 = Alarm 2 threshold; AL3 = Alarm 3 threshold; Pr.tu = Reserved; Pr.td = Reserved; P.t.tu = Reserved; P.t.td = Reserved; ti.uP = Reserved; ti.du = Reserved; PErc = Percent of the power output used during soft start (when the soft start time is equal to infinite, the limit is ever active and it can be used also when ON/OFF control is selected).	0
123	di.cL	Display colour		0 = The display colour is used to show the actual deviation (PV - SP); 1 = Display red (fix); 2 = Display green (fix); 3 = Display orange (fix).	0
124	AdE	Deviation for display colour management		1 to 999 (E.U.)	5
125	di.St	Display Timeout	2	- oFF (display always ON); - 0.1 to 99.59 (mm.ss).	oFF
126	fiLd	Filter on the displayed value	1	- oFF (filter disabled) - From 0.0 (oFF) to 20.0 (E.U.)	oFF
128	dSPu	Instrument status at power ON		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 a power output equal to zero; St.bY = Starts in stand-by mode.	AS.Pr
129	oPr.E	Operative modes enabling		ALL = All modes will be selectable by the next parameter; Au.oP = Auto and manual (OPLO) mode only will be selectable by the next parameter; Au.Sb = Auto and Stand-by modes only will be selectable by the next parameter.	ALL
130	oPEr	Operative mode selection		If oPr.E = ALL: - Auto = Auto mode; - oPLo = Manual mode; - St.bY = Stand by mode. If oPr.E = Au.oP: - Auto = Auto mode; - oPLo = Manual mode. If oPr.E = Au.Sb: - Auto = Auto mode; - St.bY = Stand by mode.	Auto

### 3 Ser group - Serial link parameters

no.	Param.	Description	Dec. Point	Values	Default
131	Add	Instrument address		- oFF - 1 to 254	1
132	bAud	baud rate		1200 = 1200 baud 2400 = 2400 baud 9600 = 9600 baud 19.2 = 19200 baud 38.4 = 38400 baud	9600
133	trSP	Selection of the value to be retransmitted (Master)		nonE = Retransmission not used (the instrument is a slave); rSP = The instrument becomes a Master and retransmits the operative set point; PErc = The instrument become a Master and it retransmits the power output.	nonE

### 3 COn group - Consumption parameters

no.	Param.	Description	Dec. Point	Values	Default
134	Co.tY	Count type		oFF = Not used; 1 = Instantaneous power (kW); 2 = Power consumption (kW/h); 3 = Reserved; 4 = Total worked days: number of hours the instrument is turned ON divided by 24; 5 = Total worked hours: number of hours the instrument is turned ON; 6 = Total worked days with threshold: number of hours the instrument is turned ON divided by 24, the controller is forced in stand-by when Co.ty value reaches the threshold set in [137] h.Job; 7 = Total worked hours with threshold: number of hours the instrument is turned ON, the controller is forced in stand-by when Co.ty value reaches the threshold set in [137] h.Job; 8 = Totalizer of control relay worked days: number of hours the control relay has been in ON condition, divided by 24; 9 = Totalizer of control relay worked hours: number of hours the control relay has been in ON condition; 10 = Totalizer of control relay worked days with threshold: number of hours the control relay has been in ON condition divided by 24, the controller is forced in stand-by when Co.ty value reaches the threshold set in [137] h.Job; 11 = Totalizer of control relay worked hours with threshold: number of hours the control relay has been in ON condition, the controller is forced in stand-by when Co.ty value reaches the threshold set in [137] h.Job.	oFF
135	UoLt	Nominal Voltage of the load		1 to 9999 (V)	230
136	cur	Nominal current of the load		1 to 999 (A)	10
137	h.Job	Threshold of the working period		oFF = threshold not used 0 to 9999 days (when [133] cotY = 4) 0 to 9999 hours (when [133] cotY = 5)	0
138	t.Job	Worked time (not resettable)		0 to 9999 days	

### 3 CAI group - User calibration parameters

no.	Param.	Description	Dec. Point	Values	Default
139	AL.P	Adjust Low Point		From -1999 to (AH.P - 10) in engineering units	0
140	AL.o	Adjust Low Offset		-300 to +300 (E.U.)	0
141	AH.P	Adjust High Point		From (AL.P + 10) to 9999 engineering units	9999
142	AH.o	Adjust High Offset		-300 to +300	0