TEMPERATURE CONTROLLER PROGRAMMER

1/16 DIN – 48 x 48

KM3 model

Quick Guide • ISTR-FKM3PENG02
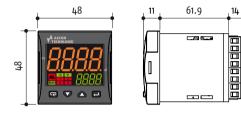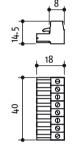
Kube LINE

CE

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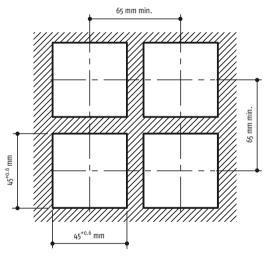E-mail: sales@ascontecnologic.com

1. DIMENSIONS AND CUT-OUT (mm)

Controller with non removable terminals

48 · 11 · 61.9 · 14 · 48

Removable terminals

8 · 14.5 · 18 · 40

Panel cut-out
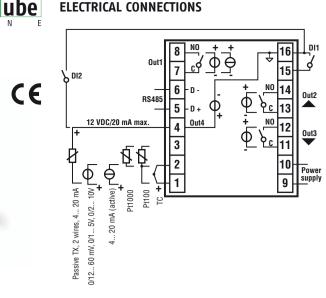
65 mm min. · 65 mm min. · 45+0.6 mm · 45+0.6 mm

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 fluids (i.e. condensation);
5. The ambient temperature is in accordance with the operative temperature (0… 50°C);
6. The relative humidity is in accordance with the instrument specifications (20… 85%);

The instrument can be mounted on panel with a maximum thickness of 15 mm.

When the maximum front protection (IP65) is desired, the optional gasket must be mounted.

2. ELECTRICAL CONNECTIONS

ELECTRICAL CONNECTIONS

Power supply voltage:
100… 240 Vac/20… 30 Vdc/18… 28 Vac;

Out1 relay: 4 (4) A/250 VAC, SPST;

Out2, 3 relay: 2 (1) A/250 VAC, SPST NA (*);

Out1, 2, 3 SSR: 10 VDC/15 mA;

Linear Out1: 0/4… 20 mA, 0/2… 10 V;

Out4 SSR: 12 VDC/20 mA.

* For KM3 **servodrive** models **both Out2** and **Out3** are to be selected as "**M**" in Configuration code; Out2: open, Out3: close.
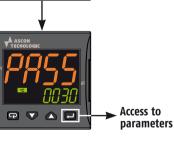
General notes about wiring

1. **Safety regulations require a line switch marked as instrument disconnecting device.** This switch must be easily reachable by the operator;
2. Do not run input wires together with power cables;
3. 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;
4. When a shielded cable is used, it should be connected at one point only;
5. Pay attention to the line resistance, a high line resistance may cause measurement errors;
6. To avoid electrical shocks, connect power line at last;
7. Before connecting the instrument to the power line, make sure that line voltage is equal to the voltage shown on the identification label;
8. The power supply input is NOT fuse protected. Please, provide an external fuse T type 1A, 250 V.

3. CONFIGURATION PROCEDURES

Setting the parameters

Press the [↵] key for 3 seconds

Insert Password 3 (default: 30)

Access to parameters

Key	Editing Mode
↵	Confirm and go to Next parameter
▲	Increase the displayed value or select the next element
▼	Decrease the displayed value or select the previous element
⟲	Exit from Operator commands/Parameter setting/Configuration

How to exit the "Configuration mode"

To exit from the Configuration mode, press the ⟲ key for 3 seconds.

4. LIST OF THE PARAMETERS (PASS: 30)

⌐ inP Group - Main and auxiliary input configuration

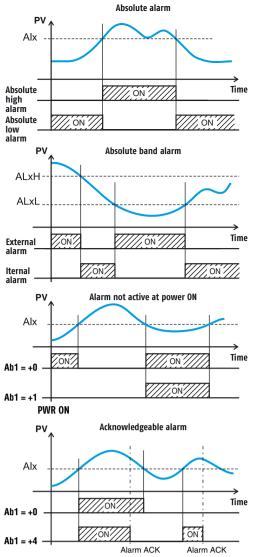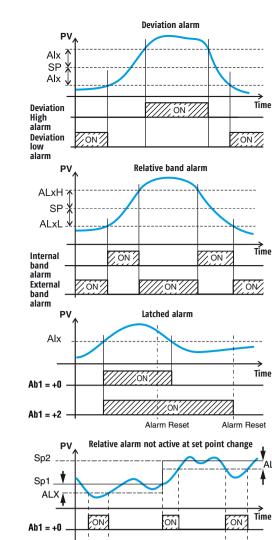| no.	Par.	Description	Dec.	Values	Default	Notes
1	SEnS	Model C		J = TC J (0… 1000°C/32… 1832°F); crAL = TC K (0… 1370°C/32… 2498°F); S = TC S (0… 1760°C/32… 3200°F); r = TC R (0… 1760°C/32… 3200°F); t = TC T (0… 400°C/32… 752°F); ir.J = Exergen IRS J (0… 1000°C/32… 1832°F); ir.cA = Exergen IRS K (0… 1370°C/32… 2498°F); Pt1 = RTD Pt 100 (−200… 850°C/−328… 1562°F); Pt10 = RTD Pt 1000 (−200… 500°C/−328… 932°F); 0.60 = 0… 60 mV; 12.60 = 12… 60 mV; 0.20 = 0… 20 mA; 4.20 = 4… 20 mA; 0.5 = 0… 5 V; 1.5 = 1… 5 V; 0.10 = 0… 10 V; 2.10 = 2… 10 V.	J	
		Model E		J = TC J (0… 1000°C/32… 1832°F); crAL = TC K (0… 1370°C/32… 2498°F); S = TC S (0… 1760°C/32… 3200°F); r = TC R (0… 1760°C/32… 3200°F); t = TC T (0… 400°C/32… 752°F); ir.J = Exergen IRS J (0… 1000°C/32… 1832°F); ir.cA = Exergen IRS K (0… 1370°C/32… 2498°F); Ptc = PTC (−55… 150°C/−67… 302°F); ntc = NTC (−50… 110°C/−58… 230°F); 0.60 = 0… 60 mV; 12.60 = 12… 60 mV; 0.20 = 0… 20 mA; 4.20 = 4… 20 mA; 0.5 = 0… 5 V; 1.5 = 1… 5 V; 0.10 = 0… 10 V; 2.10 = 2… 10 V.		
2	dp	Decimal Point Position (linear inputs) Decimal Point Position (non linear inputs)	0	0… 3 0/1	0	
3	SSC	Initial scale read-out for linear inputs	dp	−1999… 9999	0	
4	FSc	Full Scale Readout for linear inputs	dp	−1999… 9999	1000	
5	unit	Engineer unit		°C/°F	°C	
6	Fil	Digital filter on the measured value	1	0 (= OFF)… 20.0 s	1.0	

7	inE	Sensor error used to enable the safety output value		or = Over range;
				 ur = Under range;
				 our = Over and under range.
					our	

8	oPE	Safety output value (% of the output)		−100… 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; 7 = Timer RUN/Hold/Reset; 8 = Timer Run; 9 = Timer Reset; 10 = Timer Run/Hold; 11 = Timer Run/Reset; 12 = Timer Run/Reset with lock; 13 = Program Start; 14 = Program Reset; 15 = Program Hold; 16 = Program Run/Hold; 17 = Program Run/Reset; 18 = Sequential SP selection; 19 = SP1 – SP2 selection; 20 = SP1… SP4 binary selection; 21 = Digital inputs in parallel to ▲ / ▼ keys.	oFF	
11	diF2	Digital Input 2 function			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 - Output parameters

no.	Par.	Description	Dec.	Values	Default	Notes
13	o1t	Output 1 type (when Out 1 is a linear output)		0–20 = 0… 20 mA; 4–20 = 4… 20 mA; 0–10 = 0… 10 V; 2–10 = 2… 10 V.	0–20	

14	o1F	Out 1 function (when Out 1 is a linear 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 (when Out1 is a digital output)	0	NonE = Output 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 indicator;
				 P.HLd = Program hold indicator;
				 P.uit = Program wait indicator;
				 P.run = Program run indicator;
				 P.Et1 = Program Event 1;
				 P.Et2 = Program Event 2;
				 or.bo = Out of range or burn out indicator;
				 P.FAL = Power failure indicator;
				 bo.PF = Out of range/burn out/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 request.		

15	Ao1L	Initial scale for the analog retransmission	dP	−1999 … Ao1H	−1999	
16	Ao1H	Full scale for the analog retransmission	dP	Ao1L … 9999	9999	
17	o1AL	Alarms linked up with the out 1	0	0… 63: +1 = Alarm 1; +2 = Alarm 2; +4 = Alarm 3; +8 = Loop break alarm; +16 = Sensor Break; +32 = Overload on output 4.	1	

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	See O1F – Out 1 function (digital output)	AL	
20	o2AL	Alarms linked up with the out 2	0	See O1AL – Alarms linked up with the out 1	1	
21	o2Ac	Out 2 action	0	See O1Ac – Out 1 action	dir	
22	o3F	Out 3 function	0	See O1F – Out 1 function (digital output)	AL	
23	o3AL	Alarms linked up with the out 3	0	See O1AL – Alarms linked up with the out 1	2	
24	o3Ac	Out 3 action	0	See O1Ac – Out 1 action	dir	
25	o4F	Out 4 function	0	See O1F – Out 1 function (digital output)	AL	
26	o4AL	Alarms linked up with the out 4	0	See O1AL – Alarms linked up with the out 1	AL1 + AL2	
27	o4Ac	Out 4 action	0	See O1Ac – Out 1 action	dir	

Alarm types

Absolute alarm / Deviation alarm / Absolute band alarm / Relative band alarm / Alarm not active at power ON / Latched alarm / Acknowledgeable alarm / Relative alarm not active at set point change

AL1 Group - Alarm 1 parameters

no.	Par.	Description	Dec.	Values	Default	Notes
28	AL1t	Alarm 1 type	o	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	o	0… 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/low alarm, AL1 threshold low limit; For band alarm, AL1 low alarm threshold	dp	From −1999 to AL1H (E.U.)	−1999	
31	AL1H	For High/low alarm, AL1 threshold high limit; For band alarm, AL1 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… 9999 (E.U.)	1	
34	AL1d	AL1 delay	o	From 0 (oFF) to 9999 (s)	oFF	
35	AL1o	Alarm 1 enabling during Stand−by mode and out of range conditions	o	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 and overrange.	0	

AL2 Group - Alarm 2 parameters

no.	Par.	Description	Dec.	Values	Default	Notes
36	AL2t	Alarm 2 type	o	See AL1t	Loab	
37	Ab2	Alarm 2 function	o	See Ab1	0	
38	AL2L	For High/low alarm, AL2 threshold low limit; For band alarm, AL2 low alarm threshold	dp	See AL1L	−1999	
39	AL2H	For High/low alarm, AL2 threshold high limit; For band alarm, AL2 high alarm threshold	dp	See AL1H	9999	
40	AL2	AL2 threshold	dp	See AL1	0	
41	HAL2	AL2 hysteresis	dp	See HAL1	1	
42	AL2d	AL2 delay	o	See AL1d	oFF	
43	AL2o	Alarm 2 enabling during Stand−by mode and out of range conditions	o	See AL1o	0	

AL3 Group - Alarm 3 parameters

no.	Par.	Description	Dec.	Values	Default	Notes
44	Al3t	Alarm 3 type	o	See AL1t	nonE	
45	Ab3	Alarm 3 function	o	See Ab1	0	
46	Al3L	For High/low alarm, Al3 threshold low limit; For band alarm, Al3 low alarm threshold	dp	See AL1L	−1999	
47	Al3H	For High/low alarm, Al3 threshold high limit; For band alarm, Al3 high alarm threshold	dp	See AL1H	9999	
48	Al3	Al3 threshold	dp	See AL1	0	
49	HAl3	Al3 hysteresis	dp	See HAL1	1	
50	Al3d	Al3 delay	o	See AL1d	oFF	
51	Al3o	Alarm 3 enabling during Stand−by mode and out of range conditions	o	See AL1o	0	

LBA Group - Loop break alarm

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

rEG Group - Control parameters

no.	Par.	Description	Dec.	Values	Default	Notes
56	cont	Control type	o	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; 3Pt = Servomotor control.	Pid	
57	Auto	Autotuning selection	o	−4 = Oscillating auto-tune with auto-restart at power ON and after all point change; −3 = Oscillating auto-tune with manual start; −2 = Oscillating tune with auto-start at first power ON only; −1 = Oscillating auto-tune with auto-restart at all power ON; 0 = Not used; 1 = Fast auto tuning with auto-restart at all power ON; 2 = Fast auto-tune with auto-start the first power ON only; 3 = FAST auto-tune with manual start; 4 = FAST auto-tune with automatic restart at power ON and after a set point change; 5 = Evo-tune with auto-restart at all power ON; 6 = Evo-tune with auto-start at first power ON only; 7 = Evo-tune with manual start; 8 = Evo-tune auto-restart at power ON and after a set point change.	7	
58	Aut.r	Manual start of the Autotuning	o	oFF = Not active; on = Active.	oFF	
59	SELF	Self tuning enabling	o	no = The instrument does not perform the self-tuning; YES = The instrument performs the self-tuning.	no	
60	HSEt	Hysteresis of the ON/OFF control	dP	0… 9999 (E.U.)	1	
61	cPdt	Time for compressor protection	o	From 0 (oFF) to 9999 (s)	oFF	
62	Pb	Proportional band	dP	1… 9999 (E.U.)	50	
63	ti	Integral time	o	From 0 (oFF) to 9999 (s)	200	
64	td	Derivative time	o	From 0 (oFF) to 9999 (s)	50	
65	Fuoc	Fuzzy overshoot control	2	0.00… 2.00	0.50	
66	tcH	Heating output cycle time	1	0.1… 130.0 (s)	20.0	
67	rcG	Power ratio between heating and cooling action	2	0.01… 99.99	1.00	
68	tcc	Cooling output cycle time	1	0.1… 130.0 (s)	20.0	
69	rS	Manual reset (Integral pre-load)	1	−100.0… +100.0 (%)	0.0	
70	Str.t	Servomotor stroke time	o	5…1000 seconds	60	
71	db.S	Servomotor dead band	o	0…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	o	−100… 100 (%)	0	
74	SSt	Soft start time	2	0.00 (oFF); 0.01… 7.59 (hh.mm); inF (always ON).	oFF	
75	SS.tH	Threshold for soft start disabling	dP	−1999… +9999 (E.U.)	9999	

SP Group - Set point parameters

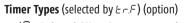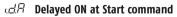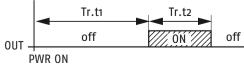| no.	Par.	Description	Dec.	Values	Default	Notes
76	nSP	Number of used set points	o	1… 4	1	
77	SPLL	Minimum set point value	dP	From −1999 to SPHL	−1999	
78	SPHL	Maximum set point value	dP	From SPLL to 9999	9999	
79	SP	Set point 1	dP	From SPLL to SPLH	0	
80	SP 2	Set point 2	dP	From SPLL to SPLH	0	
81	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	o	From 1 (SP 1) to nSP	1	
84	SP.rt	Remote set point type	o	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	o	Loc = Local; rEn = Remote.	Loc	
86	SP.u	Rate of rise for POSITIVE set point change (ramp UP)	2	0.01… 99.99 (inF) engineering units per minute	inF	
87	SP.d	Rate of rise for NEGATIVE set point change (ramp DOWN)	2	0.01… 99.99 (inF) engineering units per minute	inF	

TIN Group - Timer function parameter

no.	Par.	Description	Dec.	Values	Default	Notes

88	tr.F	Independent timer function	o	NonE = Timer 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 OFF;
				i.L.P = Asymmetrical oscillator with start ON.
					nonE	

89	tr.u	Timer unit	o	hh.nn = Hours and minutes;
				nn.SS = Minutes and seconds;
				SSS.d = Second and tenth of seconds.
					nn.SS	

90	tr.t1	Time 1	2	When tr.u < 20: 0.01… 99.59	1.00	
			1	When tr.u = 200: 0.1… 995.9		
91	tr.t2	Time 2	2	When tr.u < 2: From 00.00 (oFF) to 99.59 (inF)	1.00	
			1	When tr.u = 2: From 000.0 (oFF) to 995.9 (inF)		

92	tr.St	Timer status	o	rES = Timer reset;
				run = Timer run;
				Hold = Timer hold.
					rES	

Timer Types (selected by tr.F) (option)

id.A Delayed ON at Start command / uP.d Delayed ON at Power ON / id.d At Start command / iP.L Asymmetrical oscillator with start in OFF / iL.P Asymmetrical oscillator with start in ON

⌐ PRG Group - Programmer function parameters

no.	Par.	Description	Dec.	Values	Default	Notes
93	Pr.F	Program action at power up	0	nonE = Programmer not used; S.uP.d = Start at power up with a first step in stand-by; S.uP.S = Start at power up; u.diG = Start at Run command detection only; u.dG.d = Start at Run command with a first step in stand-by.	nonE	
94	Pr.u	Engineering unit of the soaks	2	hh.nn = Hours and minutes; nn.SS = Minutes and seconds.	hh.nn	
95	Pr.E	Instrument behaviour at the end of the program execution	0	cnt = Continue; SPat = Go to the set point selected by SPat; St.by = Go to stand-by mode.	SPat	
96	Pr.Et	Time of the end program indication	2	From 0.00 (oFF) to 99.59 (inF) minutes and seconds	oFF	
97	Pr.S1	Set point of the first soak	dP	From SPLL to SPHL	0	
98	Pr.G1	Gradient of the first ramp	1	0.1... 999.9 (inF= Step transfer) Engineering Unit/minute	inF	
99	Pr.t1	Time of the 1st soak	2	0.00... 99.59	0.10	
100	Pr.b1	Wait band of the 1st soak	dP	From 0 (oFF) to 9999 (E.U.)	oFF	
101	Pr.E1	Events of the 1st group	2	00.00... 11.11	00.00	
102	Pr.S2	Set point of the 2nd soak	dP	OFF or from SPLL to SPHL	0	
103	Pr.G2	Gradient of the 2nd ramp	1	0.1... 999.9 (inF= Step transfer) Engineering Unit/minute	inF	
104	Pr.t2	Time of the 2nd soak	2	0.00... 99.59	0.10	
105	Pr.b2	Wait band of the 2nd soak	dP	From 0 (oFF) to 9999 (E.U.)	oFF	
106	Pr.E2	Events of the 2nd group	2	00.00... 11.11	00.00	
107	Pr.S3	Set point of the 3rd soak	dP	OFF or from SPLL to SPHL	0	
108	Pr.G3	Gradient of the 3rd ramp	1	0.1... 999.9 (inF= Step transfer) Engineering Unit/minute	inF	
109	Pr.t3	Time of the 3rd soak	2	0.00... 99.59	0.10	
110	Pr.b3	Wait band of the 3rd soak	dP	From 0 (oFF) to 9999 (E.U.)	oFF	
111	Pr.E3	Events of the 3rd group	0	00.00... 11.11	00.00	
112	Pr.S4	Set point of the 4th soak	dP	OFF or from SPLL to SPHL	0	
113	Pr.G4	Gradient of the 4th ramp	1	0.1... 999.9 (inF= Step transfer) Engineering Unit/minute	inF	
114	Pr.t4	Time of the 4th soak	2	0.00... 99.59	0.10	
115	Pr.b4	Wait band of the 4th soak	dP	From 0 (oFF) to 9999 (E.U.)	oFF	
116	Pr.E4	Events of the 4th group	0	00.00... 11.11	00.00	

117	Pr.St	Program status	0	rES = Program reset;
				run = Program start;
				HoLd = Program hold.
					rES	

⌐ PAn Group - Operator HMI

no.	Par.	Description	Dec.	Values	Default	Notes
118	PAS2	Level 2 password (limited access level)	0	oFF (Level 2 not protected by password); 1... 200.	20	
119	PAS3	Level 3 password (complete configuration)	0	3... 200	30	
120	PAS4	Level 4 password (CODE configuration level)	0	201... 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 = Timer run/hold/reset;
				P.run = Program run;
				P.rES = Program reset;
				P.r.H.r =Program run/hold/reset.
					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 = – During a soak, the instrument shows the soak elapsed time; – During a ramp the display shows the operative set point. At program end, the instrument alternately displays PEnd and the measured value; – When no program is running, the instrument shows the standard display; Pr.td = – During a soak, the instrument shows the soak remaining time (count down); – During a ramp the display shows the operative set point. At program end, the instrument alternately displays PEnd and the measured value; – When no program is running, the instrument shows the standard display; P.t.tu = When the programmer is running, the display shows the total elapsed time. At program end, the instrument alternately displays PEnd and the measured value; P.t.td = When the programmer is running, the display shows the total remaining time (count down). At program end, the instrument alternately displays PEnd and the measured value; ti.uP = When the timer is running, the display shows the timer counting up. At count end, the instrument alternately displays tEnd and the measured value; ti.du = When the timer is running, the display shows the timer counting down. At count end, the instrument alternately displays tEnd and the measured value; PErc = Percent of the power output used during soft start (when the soft start time is equal to infinite, the limit is always active and it can also be used when ON/OFF control is selected); PoS = Valve position (servomotor control).	0	
123	di.cL	Display colour		0 = The display colour shows 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... 999 (E.U.)	5	

no.	Par.	Description	Dec.	Values	Default	Notes
125	di.St	Display Timeout	2	oFF (display always ON); 0.1... 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.O = Starts in manual mode with power output = 0; 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	

⌐ Ser Group - Serial link parameter

no.	Par.	Description	Dec.	Values	Default	Notes
131	Add	Instrument address		oFF; 1... 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	

⌐ COn Group - Consumption parameters

no.	Par.	Description	Dec.	Values	Default	Notes
134	Co.tY	Count type		oFF = Not used; 1 = Instantaneous power (kW); 2 = Power consumption (kW/h); 3 = Energy used during program execution. This measure starts from zero when a program runs end stops at the end of the program. A new program execution will reset the value; 4 = Total worked days: number of hours the instrument is turned ON divided by 24; 5 = Total worked hours: number of hours that 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 that 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... 9999 (V)	230	
136	cur	Nominal current of the load		1... 999 (A)	10	
137	h.Job	Threshold of the working period		oFF = Threshold not used; 0... 9999 days (when [134] cotY = 4); 0... 9999 hours (when [134] cotY = 5).	0	
138	t.Job	Worked time (not resettable)		0... 9999 days		

⌐ CAL Group - User calibration group

no.	Par.	Description	Dec.	Values	Default	Notes
139	AL.P	Adjust Low Point		From –1999 to (AH.P – 10) in engineering units	0	
140	AL.o	Adjust Low Offset		–300... +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... +300	0	

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.**

Factory reset – Default parameters loading procedure

Sometime, 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 to put the instrument in a defined condition (the same it was at the first power ON).

The default data are those typical values loaded in the instrument prior to ship it from factory.

To load the factory default parameter set, proceed as follows:

1. Press the 🔲 button for more than 5 seconds. The upper display will show PASS while the lower display shows 0;
2. Using ▲ and ▼ buttons set the value –481;
3. Push 🔲 button;
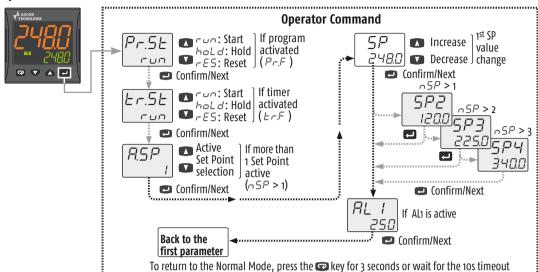4. The instrument will turn OFF all LEDs for a few seconds, then the upper display will show dFLt (default) and then all LEDs are turned ON for 2 seconds. At this point the instrument restarts as for a new power ON.
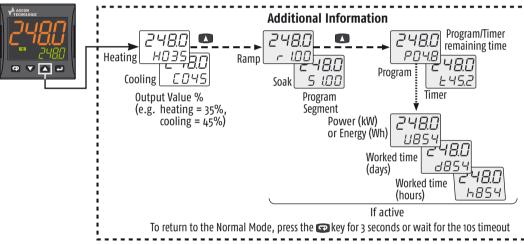
The procedure is complete.

5. OPERATIVE MODES

Keyboard function when the instrument is in Auto mode

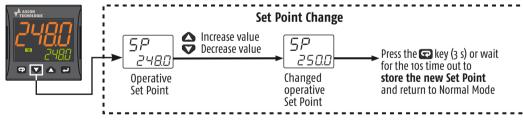| Key	Operator Mode
⏎	Access to: – Operator Commands (Timer, Setpoint selection ...) – Parameters – Configuration
▲	Access to Operator additional information (Output value, running time ...)
▼	Accesso to Set Point
▣	Start programmed function with $uSrb$ parameter (Autotune, Auto/Man, Timer ...)

Operator Commands

Operator Command

Pr.St / run — ▲ run: Start / ▼ hold: Hold / rES: Reset — If program activated (PrF)

tr.St / run — ▲ run: Start / ▼ hold: Hold / rES: Reset — If timer activated (trF)

A.SP / 1 — ▲ Active Set Point ▼ selection — If more than 1 Set Point active ($nSP > 1$)

SP / 248.0 — ▲ Increase / ▼ Decrease — 1st SP value change

nSP > 1 → SP2 / 120.0 — nSP > 2 → SP3 / 225.0 — nSP > 3 → SP4 / 340.0

AL 1 / 250 — If AL1 is active

Back to the first parameter

To return to the Normal Mode, press the ▣ key for 3 seconds or wait for the 10s timeout

Additional information

Additional Information

Heating 248.0 / H035 — Cooling C045 — Output Value % (e.g. heating = 35%, cooling = 45%)

Ramp 248.0 / r 1.00 — Soak 248.0 / S 1.00 — Program Segment

Program/Timer remaining time 248.0 / P048 — Program 248.0 / t 45.2 — Timer

Power (kW) or Energy (Wh) 248.0 / u854 — Worked time (days) 248.0 / d854 — Worked time (hours) 248.0 / h854 — If active

To return to the Normal Mode, press the ▣ key for 3 seconds or wait for the 10s timeout

Set Point Change

Set Point Change

SP / 248.0 — ▲ Increase value ▼ Decrease value — SP / 250.0

Operative Set Point → Changed operative Set Point

Press the ▣ key (3 s) or wait for the 10s time out to **store the new Set Point** and return to Normal Mode

Running the Tuning functions

Press the ▣ key for 3 s

evo TUNE Start

248.0 / tunE — Auto-tune started → 248.0 / 248.0 — Auto-tune in progress

Dot flashes while the Auto-tune is in progress

EVOTUNE is a fast and fully automatic procedure that can be started in any condition, regardless the deviation from SP. The controller selects automatically the best tune method and computes the optimum PID parameters.

Note: The ▣ key could be assigned by the user to other functions using the $uSrb$ parameter setting

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6. ERROR MESSAGES

Out of range signals

The instrument points out, on the upper display, the OVER-RANGE and UNDER-RANGE conditions using the following indications:

Over-range: 0000

Under-range: u.u.u.u.

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.

List of possible errors

ErAT Fast Auto-tune cannot start. The measure value is too close to the set point. Push the ⏎ button in order to delete the error message.

ouLd Overload on output 4. The message shows that a short circuit is present on Out 4 when it is used as output or transmitter power supply. When the short circuit disappears the output restarts to operate.

NoAt Auto-tune not finished within 12 hours.

ErEP Possible problem in the instrument memory. The message should automatically disappear, if the error persists, send the instrument to your supplier.

RonE Possible problem of the firmware memory. If this error is detected, send the instrument to your supplier.

Errt Possible problem of the calibration memory. If this error is detected, send the instrument to your supplier.

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7. GENERAL NOTES

Proper use

Every possible use not described in this manual must be consider 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.

Ascon Tecnologic S.r.l. 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.

Declaration of conformity and Manual retrieval

KM3 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-MKM_-ENG0x** ("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:

KM3

then click on **KM3**.

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).

Maintenance

This instrument does not requires periodical recalibration and it have no consumable parts so that no particular maintenance is required.

Sometimes it is advisable to clean the instrument.

1. SWITCH THE EQUIPMENT OFF (power supply, relay output, etc.).
2. Using a vacuum cleaner or a compressed air jet (max. 3 kg/cm²) remove all deposits of dust and dirt which may be present on the case and on the internal circuits being careful not to damage the electronic components.
3. To clean external plastic or rubber parts use only a cloth moistened with:
   - Ethyl Alcohol (pure or denatured) [C_2H_5OH] or
   - Isopropyl Alcohol (pure or denatured) [$(CH_3)_2CHOH$] or
   - Water (H_2O).
4. Make sure that there are no loose terminals.
5. Before turning ON the instrument make sure it is perfectly dry.
6. Apply the power supply to the instrument.

Warranty

This product is under warranty against manufacturing defects or faulty materials that are found within 18 months from delivery date. The warranty 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 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 Ascon Tecnologic with a detailed description of the faults found, without any fees or charge for Ascon Tecnologic, except in the event of alternative agreements.

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8. ORDER CODE

Model: KM 3 A B C D E F G H I

Line	KM	3

Optional functions	A
Controller	–
Controller + timer	T
Controller + timer + programmer	P

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
Analogue Output (0/4... 20 mA, 0/2... 10 V)	I
Relay (1 SPST NO, 4 A/250 Vac)	R
VDC for SSR (12 Vdc/20 mA)	O

Output OP2	E
None	–
Relay (1 SPST NO, 2 A/250 Vac)	R
VDC for SSR VDC (12 Vdc/20 mA)	O
Servomotor drive Relay (1 SPST NO, 2 A/250 Vac)	M

Output OP3	F
None	–
Relay (1 SPST NO, 2 A/250 Vac)	R
VDC for SSR VDC (12 Vdc/20 mA)	O
Servomotor drive Relay (1 SPST NO, 2 A/250 Vac)	M

Output OP4	G
Digital I/O (see the Electrical Connections paragraph for details)	D

Serial Communications	H
TTL	–
RS485 Modbus	S

Terminal Type	I
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

Note: For **servomotor drive**, **both Output 2 and Output 3** codes must be selected as "**M**".