CONTROLLER, PROGRAMMER AND SET POINT TRANSMITTER 1/16 DIN - 48 x 48 KM5 model

Quick Guide • ISTR-FKM5ENG00



ASCON TECNOLOGIC

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PREFACE

▲ This manual contains the information necessary for the product to be installed correctly and also instructions for its maintenance and use; we therefore recommend that the utmost attention is paid to the following instructions and to save it.

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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.

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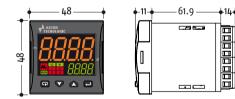
Disposal



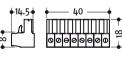
The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.

1. DIMENSIONS AND CUT-OUT (mm)

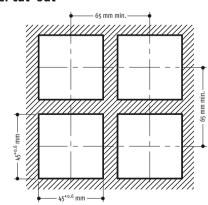
Controller with non removable terminals



Removable terminals



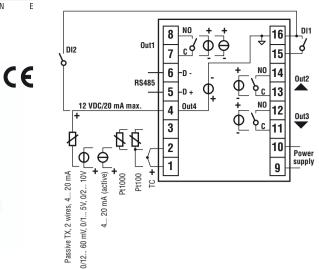
Panel cut-out



2. ELECTRICAL CONNECTIONS

ELECTRICAL CONNECTIONS

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Power supply voltage:

- 100... 240 Vac/24 Vdc/24 Vac; Outi relay: 4 (4) A/250 VAC, SPST;
- Out2, 3 relay: 2 (1) A/250 VAC, SPST NO (*);
- 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 servodrive models both Out2 and Out3 are to be selected as "M" in Configuration code; Out2: open valve, Out3: close valve.

General notes about wiring

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

3. CONFIGURATION PROCEDURES

Setting the parameters



4. LIST OF THE PARAMETERS (PR55: 30)

¹ inP Group - Main and auxiliary input configuration

n	0.	Par.	Description	Dec.	Values	Default	Notes
1	1 SEr		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 1520°F); n TC N (0 1000°C/32 1832°F); ir.J Exergen IRS J (0 1000°C/32 1832°F); ir.CA Exergen IRS K (0 1370°C/32 1832°F); Pti RTD Pt 100 (-200 850°C/-328 1562°F); Pti RTD Pt 1000 (-200 500°C/-328 1562°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.		
1		26112	Model E		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$,	
2		dp	Decimal Point Position (linear inputs)	0	0 3	0	
	_	SSC	Decimal Point Position (non linear inputs) Initial scale read-out for linear inputs	dp	0/1	0	
<u>3</u> 4	_	FSc	Full Scale Readout for linear inputs	dp		1000	
5		unit	Engineer unit			°C	
6		Fil			0 OEE'	-	
7		inE	Digital filter on the measured value Sensor error used to enable the safety output	1	or Over range;	1.0 our	
_			value		our Over and under range.		
8		oPE	Safety output value (% of the output)			0	
9		104.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		4 Stand by mode; 5 Manual mode; 6 Program Start (on transition):	oFF	
11		diF2	Digital Input 2 function		 7 Program Reset (on transition); 8 Program Hold (on transition); 9 Program Run/Hold; 	oFF	
12		di.A	Digital Inputs Action (DI2 only if configured)		0 DI1 direct action, DI2 direct action;	0	

²Out group - Output parameters

no.	Par.	Description	Dec.	Values	Default	Notes
13	01t	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	
		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.SFr Serial value retransmission.		
14	01F	Out 1 function (when Out 1 is a digital output)	0	NonEOutput not used;H.rEGHeating output;c.rEGCooling output;ALAlarm output;P.EndProgram end indicator;P.HLdProgram hold indicator;P.uitProgram wait indicator;P.runProgram Event 1;P.Et2Program Event 1;P.FALPower failure indicator;bo.PFOut of range or burn out indicator;b.P.FALPower failure indicator;b.P.FALPower failure indicator;b.P.FALpower failure indicator;b.P.FOut of range/burn out/Power failure indicator;St.DYStand by status indicator;diF.1The output repeats the digital input 1 status;diF.2The output repeats the digital input 2 status;onOut 1 always 0N;riSPInspection request.	H.reG	
15	A01L	Initial scale for the analog retransmission	dP	-1999 Ao1H	-1999	
16	Ao1H	Full scale for the analog retransmission	dP	Ao1L 9999	9999	
17	01AL	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 (burn out); +32 Overload on output 4.	1	
18	01Ac	Out 1 action	0	dir Direct action; rEU Reverse action; dir.r Direct with reversed LED; ReU.r Reverse with reversed LED.	dir	
19	02F	Out 2 function	0	See 01F – Out 1 function (digital output)	AL	
20	02AL	Alarms linked up with the out 2	0	See 01AL – Alarms linked up with the out 1	1	
21	02Ac	Out 2 action	0	See 01Ac – Out 1 action	dir	
22	03F	Out 3 function	0	See 01F – Out 1 function (digital output)	AL	
23	03AL	Alarms linked up with the out 3	0	See 01AL – Alarms linked up with the out 1	2	
24	озАс	Out 3 action	0	See 01Ac – Out 1 action	dir	
25	04F	Out 4 function	0	See 01F – Out 1 function (digital output)	AL	
26	04AL	Alarms linked up with the out 4	0	See 01AL – Alarms linked up with the out 1	AL1 + AL2	
27	04Ac	Out 4 action	0	See 01Ac – Out 1 action	dir	

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.

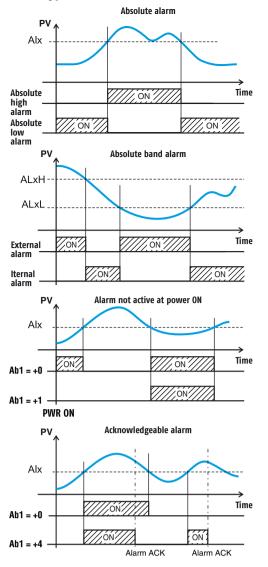
Select a mounting location having the following characteristics:

- 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);
- The ambient temperature is in accordance with the operative temperature (o... 50°C);
- 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.

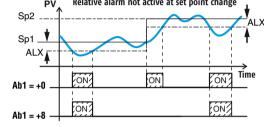
When the maximum front protection (IP65) is desired, the optional gasket must be mounted.

	parameters	16	Ao1H
Key	Editing Mode		
μ	When the upper display shows a group (the lower is blank), this key allows to enter the selected group. When the upper display shows a parameter name and the lower display the value, this key allows to store value set	17	01AL
	and access the next parameter within the same group.		
	Increase the displayed value or select the next element	18	01Ac
$\mathbf{\nabla}$	Decrease the displayed value or select the previous element	19	02F
	A short pression on the button exits from the current param-	20	02AL
~	eter group and selects a new parameter group.	21	02Ac
	A long pression allows to close the configuration parameter procedure (the instrument returns to the "Standard display").	22	03F
		2 <u>3</u> 24	03AL 03AC
ow	to exit the "Configuration mode"	25	04F
o exi	t from the Configuration mode,	26	04AL
ress	the 😱 key for 3 seconds.	27	04Ac

Note: When a servomotor control is desired, both Out2 and Out3 are to be selected as Heating or Cooling (o2F = $03F = H_r E G$ or $02F = 03F = c_r E G$). Parameter [56] cont must be set as $3P_E$. Alarm types



Deviation alarm PV, Alx ↑ SP ¥ Alx y Deviation High alarm Deviation low alarm Time // ON // /ON// ON Relative band alarm P۷ ALxH⊺∕ SP 🗶 ALxL ----Time Internal band alarm External band alarm ON ON / ÓŃ ÓŃ ÓN P۷ Latched alarm Alx Time ON 77 Ab1 = +0 Ab1 = +2 -Alarm Reset Alarm Reset ₽V Relative alarm not active at set point change Sp2 __



²AL1 Group - Alarm 1 parameters

no.	Par.	Description	Dec.	Values	Default	Notes
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 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 low limit; For band alarm, AL1 low alarm 	dp	From –1999 to AL1H (E.U.)	-1999	
31	AL1H	 For High/low alarm, AL1 high limit; For band alarm, AL1 high alarm 	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	0	From 0 (0FF) to 9999 (s)	oFF	
35	AL10	Alarm 1 enabling during Stand-by mode and out of range conditions	0	 Alarm 1 disabled during Stand by and out of range; Alarm 1 enabled in stand by mode; Alarm 1 enabled in out of range condition; Alarm 1 enabled in stand by and overrange. 	0	

no.	Par.	Description	Dec.	Values	Default	Notes
36	AL2t	Alarm 2 type	0	See AL1t	Loab	
37	Ab2	Alarm 2 function	0	See Ab1	0	
38	AL2L	 For High/low alarm, AL2 low limit; For band alarm, AL2 low alarm 	dp	See AL1L	-1999	
39	AL2H	 For High/low alarm, AL2 high limit; For band alarm, AL2 high alarm 	dp	See AL1H	9999	
40	AL2	AL2 threshold	dp	See AL1	0	
41	HAL2	AL2 hysteresis	dp	See HAL1	1	
42	AL2d	AL2 delay	0	See AL1d	oFF	
43	AL20	Alarm 2 enabling during Stand-by mode and out of range conditions	0	See AL10	0	

⁻⁷rEG Group - Control parameters

no.	Par.	Description	Dec.	Values	Default	Notes
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; 3Pt Servomotor control (when Out2 and Out 3 have been ordered wth code "M").	Pid	
57	Auto	Autotuning selection	0	 -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; Not used; 1 Fast auto tuning with auto-restart at all power ON only; 3 FAST auto-tune with auto-start the first power ON only; 3 FAST auto-tune with autoastart; 4 FAST auto-tune with autoastart; 5 Evo-tune with auto-restart at all power ON; 6 Evo-tune with auto-restart at all power ON; 7 Evo-tune with auto-restart at all power ON; 7 Evo-tune with auto-restart at all power ON; 8 Evo-tune with auto-restart at first power ON only; 7 Evo-tune with auto-restart at power ON and after a set point change. 		
58	Aut.r	Manual start of the Autotuning	0	oFF Not active; on Active.	oFF	
59	HSEt	Hysteresis of the ON/OFF control	dP	o 9999 (E.U.)	1	
60	Pb	Proportional band	dP	1 9999 (E.U.)	50	
61	ti	Integral time	0	o oFF; o 9999 (s).	200	
62	td	Derivative time	0	0 0FF; 0 9999 (s).	50	
63	Fuoc	Fuzzy overshoot control	2	0.00 2.00	0.50	
64	tcH	Heating output cycle time	1	0.1 130.0 (s)	20.0	
65	rcG	Power ratio between heating and cooling action	2	0.01 99.99	1.00	
66	tcc	Cooling output cycle time	1	0.1 130.0 (s)	20.0	
67	rS	Manual reset (Integral pre-load)	1	-100.0 +100.0 (%)	0.0	
68	Str.t	Servomotor stroke time	0	5 1000 seconds	60	
69	db.S	Servomotor dead band	0	0100%	50	
70	od	Delay at power up	2	0.00 oFF; 0.01 99.59 (hh.mm).	oFF	
71	St.P	Maximum power output used during soft start	0	-100 100 (%)	0	
72	SSt	Soft start time	2	0.00 oFF; 0.01 7.59 (hh.mm); inF Always 0N.	oFF	
73	SS.tH	Threshold for soft start disabling	dP	-1999 +9999 (E.U.)	9999	

²SP Group - Set point parameters

no.	Par.	Description	Dec.	Values	Default	Notes
74	nSP	Number of used set points	0	1 4	1	
75	SPLL	Minimum set point value	dP	From -1999 to SPHL	-1999	
76	SPHL	Maximum set point value	dP	From SPLL to 9999	9999	
77	SP	Set point 1	dP	From SPLL to SPLH	0	
78	SP 2	Set point 2	dP	From SPLL to SPLH	0	
79	SP 3	Set point 3	dP	From SPLL to SPLH	0	
80	SP 4	Set point 4	dP	From SPLL to SPLH	0	
81	A.SP	Selection of the active set point	0	From 1 (SP 1) to nSP	1	
82	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; PEr The value will be scaled on the input range and this value will be used as remote SP. 	trin	
83	SPLr	Local/remote set point selection	0	Loc Local; rEn = Remote.	Loc	
84	SP.u	Rate of rise for POSITIVE set point change (ramp UP)	2	0.01 99.99 (inF) engineering units per minute	inF	
85	SP.d	Rate of rise for NEGATIVE set point change (ramp DOWN)	2	0.01 99.99 (inF) engineering units per minute	inF	

² PAn Group - Operator HMI

			3 Alarin Ferlableu in stand by and overlange.			' —			-			
¹ AL2	Group - Alarm 2 parame	ters				no.		Level 2 password	Dec.	oFF levels not protected by password:	Default	Not
Ť				Default	Natas	1 86	PAS2	(limited access level)	0	1 200.	20	
IO. Par.		Dec.	Values	Default	Notes	87	PAS3	Level 3 password	0	3 200	30	
36 AL2t	Alarm 2 type	0	See Alit	Loab				(complete configuration)	-) -	
37 Ab2	Alarm 2 function	0	See Ab1	0						nonE No function; tunE Auto-tune/self-tune enabling. A single press (longer than 1		
38 AL2L	 For High/low alarm, AL2 low limit; For band alarm, AL2 low alarm 	dp	See AL1L	-1999						second) starts the auto-tune; oPLo Manual mode. The first pressure puts the instrument in manual		
39 AL2H	Tor Danu alann, ALZ mgn alann	dp	See AL1H	9999		88	uSrb	🖙 button function		mode (oPLo) while a second one puts the instrument in Auto mode; AAc Alarm reset; ASi Alarm acknowledge;	tunE	
+0 AL2	AL2 threshold	dp	See AL1	0			usib	during RUN TIME		chSP Sequential set point selection;	lunc	
+1 HAL2	AL2 hysteresis	dp	See HAL1	1						St.by Stand by mode. The first press puts the instrument in stand by		
+2 AL2d	AL2 delay	0	See AL1d	oFF						mode while a second one puts the instrument in Auto mode; P.run Program run;		
+3 AL20	Alarm 2 enabling during Stand-by mode and out of range conditions	0	See Al10	0						P.rES Program reset; P.r.H.r Program run/hold/reset.		
⁷ AL3	Group - Alarm 3 parame	ters	Values	Default	Notes	1				nonE Standard display; Pou Power output; SPF Final set point; Spo Operative set point;		
4 AL3t	Alarm 3 type	0	See ALIT	nonE	Notes					AL1 Alarm 1 threshold; AL2 Alarm 2 threshold;		
45 Ab3	Alarm 3 function	0	See Ab1	0						AL3 Alarm 3 threshold;		
46 AL3L	 For High/low alarm, AL3 low limit; For band alarm, AL3 low alarm 	dp	See AL1L	-1999						 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 <i>P.E.n.d</i> 		
47 AL3H	 For High/low alarm, AL3 high limit; For band alarm, AL3 high alarm 	dp	See AL1H	9999						 and the measured value; When no program is running, the instrument shows the standard display; 		
48 AL3	AL3 threshold	dp	See AL1	0				Display management		Pr.td – During a soak, the instrument shows the soak remaining		
+9 HAL3	AL3 hysteresis	dp	See HAL1	1		89	diSP			time (count down); – During a ramp the display shows the operative set point.	0	
50 AL3d	AL3 delay	0	See AL1d	oFF		11				At program end, the instrument alternately displays PEnd		
51 AL30	Alarm 3 enabling during Stand-by mode and out of range conditions	0	See AL10	0]				and the measured value; - When no program is running, the instrument shows the standard display;		
[,] LBA	Group - Loop break alar	m								P.t.tu When the programmer is running, the display shows the total elapsed time. At program end, the instrument alternately displays PE ad and the measured value.		
no. Par	Description	Dec.	Values	Default	Notes					P.t.td When the programmer is running, the display shows the total remaining time (count down). At program end, the instrument		
52 LbAt	LBA time	0	0 0FF; 1 9999 (s).	oFF						alternately displays <i>P.E.n.d.</i> and the measured value; PErc Percent of the power output used during soft start (when the soft		
53 LbSt	Delta measure used by LBA during Soft start		0 0FF; 1 9999 (E.U.)	10						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).		
54 LbAS	Delta measure used by LBA	dP	19999 (E.U.)	20			-			o The display colour shows the actual deviation (PV – SP);		
		1	uP Active when Pout = 100%;				4: 41	Diamlass colours		1 Display red (fix);		1
55 LbcA	Condition for LBA enabling	0	dn Active when Pout = -100%; both Active in both cases.	both		90	di.cL	Display colour		2 Display green (fix); 3 Display orange (fix).	0	

no.	Par.	Description	Dec.	Values	Default	Notes
92	di.St	Display Timeout	2	oFF Display always ON; o.1 99.59 (mm.ss).	oFF	
93	fiLd	Filter on the displayed value	1	oFF Filter disabled; o.1 20.0 (E.U.).	oFF	
95	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	
96	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.SD Auto and Stand-by modes only will be selectable by the next parameter 	ALL	
97	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	

²Ser Group - Serial link parameter

no.	Par.	Description	Dec.	Values	Default	Notes
98	Add	Instrument address		oFF Not used; 1 254.	1	
99	bAud	baud rate		1200 1200 baud; 2400 2400 baud; 9600 9600 baud; 19.2 19200 baud; 38.4 38400 baud.	9600	
100	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 becomes a Master and retransmits the power output.	nonE	

⁻CAL Group - User calibration group

no.	Par.	Description	Dec.	Values	Default	Notes
101	AL.P	Adjust Low Point		From –1999 to (AH.P – 10) in engineering units	0	
102	AL.o	Adjust Low Offset		-300 +300 (E.U.)	0	
103	AH.P	Adjust High Point		From (AL.P + 10) to 9999 engineering units	9999	
104	AH.o	Adjust High Offset		-300 +300	0	

Notes: 1. All parameters between numbers 105 and 125 are reserved for factory use.

2. For more information, please see the "Parameters Configuration" on the "Engineering manual".

³ PRG Group - Programmer function parameters



These instruments are equipped with 8 programs divided into 2 pages of 4 programs each. For this reason we have Program 1 to 4 when Page 1 is selected and Program 5 to 8 when Page 2 is selected.

no.	Par.	Description	Dec.	Values	Default	Notes
126	PAGE	Active program page election		1 2		
127	Pr.n	Active program		1 4		
128	Pr.St	Active program Status		rES Program reset; run Program Start; HoLd Program Hold; cnt Continue (read only).		

² Pr1 Group - Program 1 Parameters

no.	Par.	Description	Dec.	Values	Default	Notes
129	P1.F	Program 1 – 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	
130	P1.u	Program 1 – Engineering unit of the soaks	2	hh.nn Hours and minutes; nn.SS Minutes and seconds.	hh.nn	
131	P1.E	Program 1 – Instrument behaviour at the end of the program execution	0	cnt Continue; SPAt Go to the set point selected by A.SP; St.by Go to stand-by mode.	A.SP	
132	P1.nE	Program 1 - Number of executions	0	1 99 times; inF Indefinitely.		
133	P1.Et	Program 1 – Time of the end program indication	2	0.00 oFF; 0.01 99.59 mm.ss; inF Steady ON.	oFF	
134	P1.S1	Program 1 – Set point of the first soak	dP	From SPLL to SPHL	0	
135	P1.G1	Program 1 – Gradient of the first ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	
136	P1.t1	Program 1 – Time of the 1 st soak	2	0.00 99.59 time units	0.10	
137	P1.b1	Program 1 – Wait band of the 1 st soak	dP	From o (oFF) to 9999 (E.U.)	oFF	
138	P1.E1	Program 1 – Events of the 1 st group	2	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
139	P1.S2	Program 1 – Set point of the 2 nd soak	dP	OFF or from SPLL to SPHL	0	
140	P1.G2	Program 1 – Gradient of the 2 nd ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	
141	P1.t2	Program 1 – Time of the 2 nd soak	2	0.00 99.59 time units	0.10	
142	P1.b2	Program 1 – Wait band of the 2 nd soak	dP	From o (oFF) to 9999 (E.U.)	oFF	
143	P1.E2	Program 1 – Events of the 2 nd group	2	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
144	P1.S3	Program 1 – Set point of the 3 rd soak	dP	OFF or from SPLL to SPHL	0	
145	P1.G3	Program 1 – Gradient of the 3 rd ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	
146	P1.t3	Program 1 – Time of the 3 rd soak	2	0.00 99.59 time units	0.10	
147	P1.b3	Program 1 – Wait band of the 3 rd soak	dP	From 0 (oFF) to 9999 (E.U.)	oFF	
148	P1.E3	Program 1 – Events of the 3 rd group	0	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
149	P1.S4	Program 1 – Set point of the 4 th soak	dP	OFF or from SPLL to SPHL	0	
150	P1.G4	Program 1 – Gradient of the 4 th ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	
151	P1.t4	Program 1 – Time of the 4 th soak	2	0.00 99.59 time units	0.10	
152	P1.b4	Program 1 – Wait band of the 4 th soak	dP	From 0 (oFF) to 9999 (E.U.)	oFF	
153	P1.E4	Program 1 – Events of the 4 th group	0	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
154	P1.S5	Program 1 - Set point of the 5 th soak	dP	OFF or from SPLL to SPHL	0	
155	P1.G5	Program 1 – Gradient of the 5 th ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	
156	P1.t5	Program 1 – Time of the 5 th soak	2	0.00 99.59 time units	0.10	
157	P1.b5	Program 1 - Wait band of the 5 th soak	dP	From 0 (oFF) to 9999 (E.U.)	oFF	
158	P1.E5	Program 1 – Events of the 5 th group	0	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
159	P1.S6	Program 1 – Set point of the 6 th soak	dP	OFF or from SPLL to SPHL	0	
160	P1.G6	Program 1 – Gradient of the 6 th ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	
161	P1.t6	Program 1 – Time of the 6 th soak	2	0.00 99.59 time units	0.10	

no.	Par.	Description	Dec.	Values	Default	Notes
162	P1.b6	Program 1 – Wait band of the 6 th soak	dP	From 0 (0FF) to 9999 (E.U.)	oFF	
163	P1.E6	Program 1 – Events of the 6 th group	0	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
164	P1.c2	Program 1 – Continues on program 2	0	no Program 1 is ended; YES Program 1 will continue on program 2.		

⁻PR2 Group- Program 2 Parameters

Program 2 parameters are the same as those described for Program 1 (the display shows P2.XX instead of P1.XX; e.g.: $P \ge F$ = Program 2 – Action at power up). Program 2 parameter numbers range from **165** to **200**. Parameter **200** = $P \ge a \ge 2 = Pr2$ continues with Pr3 (Program 2 continues with Program 3).

⁻PR3 Group- Program 3 Parameters

Program 3 parameters are the same as those described for Program 1 (the display shows P3.XX instead of P1.XX; e.g.: $P \exists F$ = Program 3 - Action at power up). Program 3 parameter numbers range from **201** to **236**. Parameter **236** = $P \exists_{c} \forall$ = **Pr3 continues with Pr4** (Program 3 continues with Program 4).

⁻PR4 Group- Program 4 Parameters

no.	Par.	Description	Dec.	Values	Default	Notes
237	P4.F	Program 4 - Action at power up	0	nonE Programmer not used; S.uP.d Start at power up, 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, first step in stand-by.	nonE	
238	P4.u	Program 4 - Engineering unit of the soaks	2	hh.nn Hours and minutes; nn.SS Minutes and seconds.	hh.nn	L
239	P4.E	Program 4 – Instrument behaviour at the end of the program execution	0	cnt Continue; SPAt Go to the set point selected by A.SP; St.by Go to stand-by mode.	A.SP	L
240	P4.nE	Program 4 - Number of executions	0	1 99 times; inF Indefinitely.		
241	P4.Et	Program 4 - Time of the end program indication	2	0.00 oFF; 0.01 99.59 mm.ss; inF Steady 0N.	oFF	
242	P4.S1	Program 4 – Set point of the first soak	dP	From SPLL to SPHL	0	
243	P4.G1	Program 4 – Gradient of the first ramp	1	0.1 999.9 (E.U./minute); inF Step transfer.	inF	
244	P4.t1	Program 4 – Time of the 1 st soak	2	0.00 99.59 time units	0.10	
245	P4.b1	Program 4 – Wait band of the 1 st soak	dP	From 0 (oFF) to 9999 (E.U.)	oFF	
246	P4.E1	Program 4 – Events of the 1 st group	2	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
247	P4.S2	Program 4 – Set point of the 2 nd soak	dP	OFF or from SPLL to SPHL	0	
248	P4.G2	Program 4 – Gradient of the 2 nd ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	
249	P4.t2	Program 4 – Time of the 2 nd soak	2	0.00 99.59 time units	0.10	
250	P4.b2	Program 4 – Wait band of the 2 nd soak	dP	From 0 (0FF) to 9999 (E.U.)	oFF	
251		Program 4 – Events of the 2 nd group	2	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
252	P4.S3	Program 4 – Set point of the 3 rd soak	dP	OFF or from SPLL to SPHL	0	
253	P4.G3	Program 4 – Gradient of the 3 rd ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	L
254		Program 4 – Time of the 3 rd soak	2	0.00 99.59 time units	0.10	L
255	P4.b3	Program 4 – Wait band of the 3 rd soak	dP	From 0 (0FF) to 9999 (E.U.)	oFF	
256	P4.E3	Program 4 – Events of the 3 rd group	0	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
257	P4.S4	Program 4 – Set point of the 4 th soak	dP	OFF or from SPLL to SPHL	0	
258	P4.G4	Program 4 – Gradient of the 4 th ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	L
259		Program 4 – Time of the 4 th soak	2	0.00 99.59 time units	0.10	
260	P4.b4	Program 4 – Wait band of the 4 th soak	dP	From 0 (0FF) to 9999 (E.U.)	oFF	
261		Program 4 – Events of the 4 th group	0	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
262	P4.S5	Program 4 – Set point of the 5 th soak	dP	OFF or from SPLL to SPHL	0	
263	P4.G4	Program 4 – Gradient of the 5 th ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	L
		Program 4 – Time of the 5 th soak	2	0.00 99.59 time units	0.10	
		Program 4 – Wait band of the 5 th soak	dP	From 0 (0FF) to 9999 (E.U.)	oFF	
		Program 4 – Events of the 5 th group	0	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	
267	P4.S6	Program 4 – Set point of the 6 th soak	dP	OFF or from SPLL to SPHL	0	
268	P4.G6	Program 4 – Gradient of the 6 th ramp	1	o.1 999.9 (E.U./minute); inF Step transfer.	inF	
269	P4.t6	Program 4 – Time of the 6 th soak	2	0.00 99.59 time units	0.10	
		Program 4 – Wait band of the 6 th soak	dP	From o (oFF) to 9999 (E.U.)	oFF	
271	P4.E6	Program 4 – Events of the 6 th group	0	00.00 11.11 (0 = event OFF; 1 = event ON)	00.00	

Unlike Program 1, Program 4 can not continue on Program 5 because they belong to different program pages.

² PR5 Group- Program 5 Parameters

Program 5 parameters are the same as those described for Program 1 (the display shows P5.XX instead of P1.XX; e.g.: PSF = Program 5 - Action at power up). Program 5 parameter numbers range from **272** to **307**. Parameter **307** = PSEB = **Pr5 continues with Pr6** (Program 5 continues with Program 6).

⁻PR6 Group- Program 6 Parameters

Program 6 parameters are the same as those described for Program 1 (the display shows P6.XX instead of P1.XX; e.g.: PGF = Program 6 - Action at power up). Program 6 parameter numbers range from **308** to **343**. Parameter **343** = PGc 7 = **Pr6 continues with Pr7** (Program 6 continues with Program 7).

⁻PR7 Group- Program 7 Parameters

Program 7 parameters are the same as those described for Program 1 (the display shows P7.XX instead of P1.XX; e.g.: $P \ \mathcal{F} = Program 7$ – Action at power up). Program 7 parameter numbers range from **344** to **379**. Parameter **379** = $P \ \mathcal{I}_{C} B$ = **Pr7 continues with Pr8** (Program 7 continues with Program 8).

[¬]PR8 Group- Program 8 Parameters

Program 8 parameters are the same as those described for Program 4 (the display shows P4.XX instead of P4.XX; e.g.: *PBF* = Program 8 – Action at power up). Program 8 parameter numbers range from **380** to **414**.
 As for Program 4, also Program 8 can not continue on the next program because it is the last program of the page.

Accessories for setting of parameters

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.

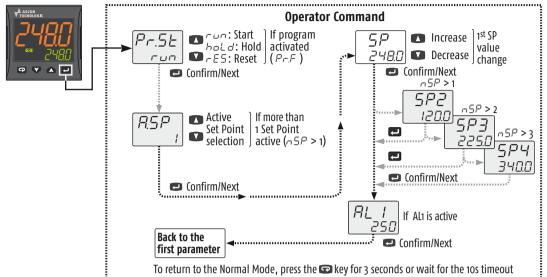
To load the factory default parameter set, proceed as follows:

- 1. Press the Dutton for more than 5 seconds. The upper display will show PR55 while the lower display shows D;
- 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 dFLE (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.

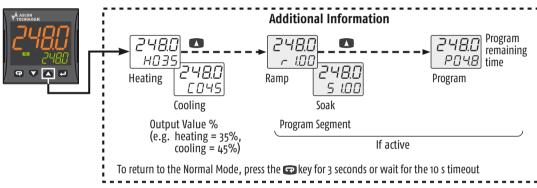
Keyboard function when the instrument is in Auto mode

Key	ey Operator Mode	
ſ	Access to: – Operator Commands (Setpoint selection) – Parameters – Configuration	
	Access to Operator additional information (Output value, program running time)	
$\mathbf{\nabla}$	Set Point Access	
5	Start programmed function with asrameter (Autotune, Auto/Man, Program Run/Hold/Reset)	1

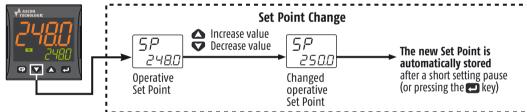
Operator Commands



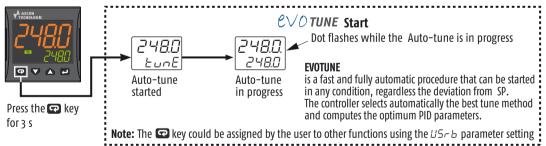
Additional information



Set Point Change



Running the Tuning functions



6. ERROR MESSAGES

Out of range signals

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

range	Under-range
00	<u></u>

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

_ _ _ _

lote: 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:

- 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

- Er RE 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.

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

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.

Declaration of conformity and Manual retrieval

KM5 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-MKM5-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:

then click on KM5.

KM5

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,H,OH] or
- Isopropyl Alcohol (pure or denatured) [(CH₂),CHOH] or
- Water (H₂0).
- 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.

8. ORDER CODE

Model: KM 5 ABCDEFGHI

Line	KM	5
Optional functions		Α
Controller + programmer + Setpoint setter		Р
Controller + programmer + Setpoint setter with white display		PW
Power Supply		В
100 240Vac (-15 +10%)		н
24Vac (-25 +12%) or 24Vdc (-15 +25%)		L
Input		С
TC, PT100, PT1000, mA, mV, V + Digital Input 1		С
TC, NTC, PTC, mA, mV, V + Digital Input 1		E

Output OP1	D
Isolated 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)	0
Output OP2	E
None	-
Relay (1 SPST NO, 2 A/250 Vac)	R
VDC for SSR VDC (12 Vdc/20 mA)	0
Servomotor drive Relay (1 SPST NO, 2 A/250 Vac)	м
Output OP3	F
None	-
Relay (1 SPST NO, 2 A/250 Vac)	R
VDC for SSR VDC (12 Vdc/20 mA)	0
Servomotor drive Relay (1 SPST NO, 2 A/250 Vac)	м

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

Serial Communications	
π	-
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	м
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".