multicomp PRO

TEMPERATURE CONTROLLER

Farnell Order Code: 4408456, 4408458

Manufacturer Part No: MP- 4U50C, MP-4U5A0

www.multicomp-pro.com

150 Armley Road, Leeds, LS12 2QQ.
Riverside One, Sir John Rogerson Quay, Dublin 2

CE RoHS

Please visit Farnell product page for full user manual

FEATURES

- 4 digit Dual bright display for better understanding
- Compact Size, Lower depth of 85mm
- Universal Inputs like Thermocouple, RTD, mV, Voltage & Current
  TC: J, K, T, R, S, C, E, B, N & RTD: Pt100
  Analog input: -5 to 60mV, 0 to 10V DC, 0 to 20 mA DC
- Memory card support to transfer the program from one device to other device.
- Universal Output (Relay, SSR or Analog output)
- Short circuit error for Load protection while using SSR o/p (SSR current capacity 50mA)
- Controlling : Auto tune & ON/OFF control
- 3 Different algorithms to control Fast & slow changing system
- High speed control capability (i.e. Signal sampling time ≈50mS)
- Compressor Protection : Feature to protect Compressor from continuous output ON-OFF during controlling
- 8 Profile Ramp-Soak function
- Different Alarm Function : Output can be set as alarm
- Configurable lower display : User selectable lower display for quick monitoring of parameters
- RS485 Modbus communication (Applicable for MP-4U50C)
- CT functionality : Which is used to monitor the current flowing to the load & trigger alarm (Applicable for MP-4U5A0)
- Wide auxiliary supply voltage range 90 -270V AC/DC
- Confirms the CE, EMC directive & IP65 frontal certified

Soft Special features :

- Dwell timer with timer indication
- Soft start
- Sensor Break, Over Range & Under range, SSR short circuit detection
- Loop break Alarm, Sensor break alarm
- Output in case of error function (OPE)
- Single acting (Heat/Cool) / Double acting (Heat & Cool function)
- 4 different Auto tune mode to start auto tune method
- Indication for Output, Auto tune, Dwell timer, Alarm

TECHNICAL SPECIFICATIONS

Supply Characteristics

Rated Supply voltage (Un)	90V to 270V AC/DC
Supply frequency	47/ 63 Hz
Typical Power Consumption	6VA @240VAC

Functional Characteristics

Sensor Inputs (IEC)			1) Thermocouple (J, K, T, R, S, C, E, B, N) 2) RTD (Pt-100, 3-wire, 2-wire) For 2 wire RTD short terminal number 9-10 3) mV input : -5 to 60mV 4) Analog input - 0 to 10V, 0 to 20mA
Sensor Measurement Range	J-type	°C °F	-199 to 750 -326 to 1382
	K-type	°C °F	-199 to 1350 -326 to 2462
	T-type	°C °F	-199 to 400 -326 to 752
	R & S-type	°C °F	0 to 1750 32 to 3182
	C-type	°C °F	0 to 2300 32 to 4172
	E-type	°C °F	-200 to 750 -328 to 1382
	B-type	°C °F	218 to 1820 424 to 3308
	N-type	°C °F	-200 to 1300 -328 to 2372
	RTD (PT-100)	°C °F	-200 to 850 -328 to 1562
Resolution			For Thermocouple & PT100 : 0.1/1°C CT input : 0.1 Analog Input & mV : 1/0.1/0.01/0.001
Measurement Accuracy			TC: ±0.5% of PV or ±2°C (Higher one) ±1 digit. R & S: ±0.5% of PV or ±3°C (Higher one) ±1 digit. RTD: ±0.5% of PV or ±3°C (Higher one) ±1 digit. mV:±0.1% of FS
Signal Sampling Time			50 mS
Key De-bouncing time			30 mS
Error Indications	S.Err		Sensor open/Break error
	ourg		Over range error
	Unrg		Under range error
	E.At		Error in auto tune
	SSr		SSR short circuit detection

NOTE

- 20 Min Warm-up time for all Thermocouple sensor
- Accuracy ±10°C over the temperature range & under influence of electromagnetic environment .
- Product innovation being a continuous process, we reserve the right to alter specifications without any prior notice
- Ensure that the input sensor connected at the terminals and the input type set in the product configuration are the same.
- To allow the heat to escape, do not block the area around the product. Do not block the ventilation holes around the product.
- To avoid inductive noise, do not wire power lines together with or parallel along with sensor cables

Environmental Parameters

Operating Temperature	0 °C to 60 °C
Storage Temperature	-20 °C to 75 °C
Humidity	85% RH (Without condensation)
Altitude	2000 meters (Max)
Pollution Degree	2
Over voltage category	II

Mechanical Parameters

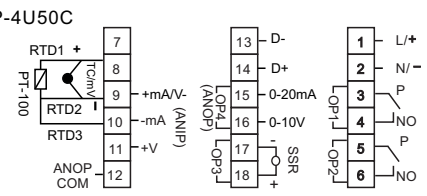
Degree of protection	Front fascia -IP 65 , Enclosure - IP 30 & Terminals- IP 20
Housing	UL94-00
Mounting	Panel Mounting
Dimensions (L X W X D)	48 x 48 x 85 in mm
Weight (Unpacked)	95 gm Approx.

Output Characteristics

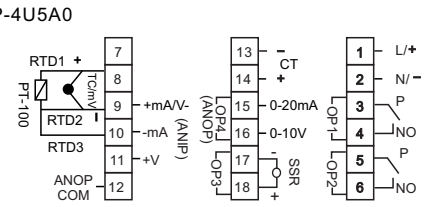
MODEL	MP-4U50C, MP-4U5A0
Output 1 Relay	SPST, 5A @250VAC/ 24VDC
Output 2 Relay	SPST, 5A @250VAC/ 24VDC
Output 3 (Relay/SSR)	SSR 12DC, 50mA
Output 4 Voltage/Current Analog Output (ANOP)	0-20mA, 4-20mA :Terminal 15(+mA) & 12(ANOP COM) 0-5V, 0-10V : Terminal 16(+V) & 12(ANOP COM)
Contact Material	AgNi
Mechanical Life	1×10^7 Operations
Electrical Life	1×10^5 Operations
SSR O/P Voltage	12VDC, 50mA (Max)

CONNECTION DIAGRAM

MP-4U50C



MP-4U5A0



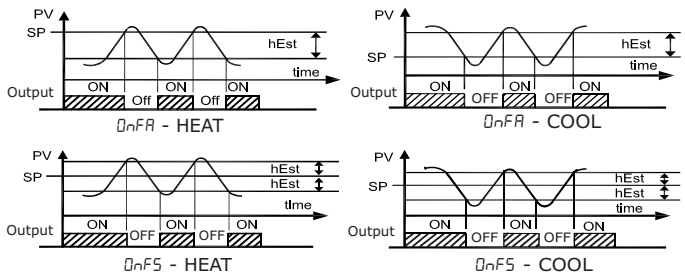
ELECTROMAGNETIC COMPATIBILITY

Product Standard IEC 61326	
EMI/ EMC TEST	
Harmonic Current Emissions	IEC 61000-3-2 Class A
Voltage Flicker and Fluctuations	IEC 61000-3-3 Class A
ESD	IEC 61000-4-2 Level 3
Radiated Susceptibility	IEC 61000-4-3 Level 3
Electrical Fast Transients	IEC 61000-4-4 Level 4
Surge	IEC 61000-4-5 Level 3
Conducted Susceptibility	IEC 61000-4-6 Level 3
Power Frequency Magnetic Field	IEC 61000-4-8
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Voltage Dips & Interruptions (DC)	IEC 61000-4-29
Conducted Emission	CISPR 11 Class A
Radiated Emission	CISPR 11 Class A
SAFETY DATA	
Dielectric strength(Input & Output)	IEC 60255-5 Level 2kV
Impulse Voltage between input and output	IEC 60255-5 Level 4kV
Insulation Resistance	UL 508, >100MΩ
Leakage Current	UL 508, <3.5mA
Single Fault test	IEC 61010-1
ENVIRONMENTAL DATA	
Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC60068-2-27
Non-repetitive Shock	IEC60068-2-27

USER GUIDE

CONTROL ACTION:=>

1) ON/OFF Control: Parameters regarding ON/OFF control are placed in REG menu .This type of control can be set by programming parameter "cont"= OnFS for ON-OFF action with symmetric hysteresis OR OnFA for ON-OFF action with asymmetric hysteresis. It drives the output programmed as COP ,depending on the measured temperature value, on set point, Output mode (op1, op2,op3) and on the hysteresis (HYSt). The controller activates the output when the process value "PV" goes below [SP-HYS] & It deactivates the output when the PV goes above [SP+HYSt] in case of symmetric ON-OFF control and PV goes above "SP" in case of Asymmetric ON-OFF control. Similarly in case of direct action i.e. COOL being set to output. The controller activates the output when the process value "PV" goes above [SP+HYSt] & deactivates the output when "PV" goes below [SP-HYSt] in case of symmetric ON-OFF control & "SP" in case of Asymmetric ON-OFF control.

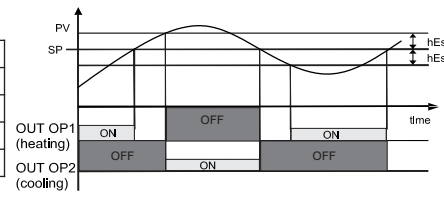


2) PID Control: Parameters regarding PID control are placed in REG menu .This type of control can be set by programming parameter "cont"= PID. A PID controller depending upon the effective setpoint "SP", and control output is calculated based on PID algorithm.
The PID algorithm foresees the setting of following parameter:
Pb: Proportional band
Int: integral Time
Der: derivative Time
hct : Heat cycle time

3)Double acting PID Control: The double acting PID control is used to control processes where there is an element which causes a positive increase in temperature (ex.Heating) and an element which causes a decrease in temperature (cooling). This type of control is selected by setting outputs as HEAT & COOL. The effective set Point "SP" and the PID algorithm decides the controller output of Double Acting PID control.
The cycle times "hct" (Heat cycle time: for output acting on heater) and "cct" (cool cycle time: for output acting on cooler) should have low value with frequent intervention of control outputs, so that good stability of process variable can be achieved, in case of fast processes. It is recommended to use solid state relays to drive actuators. The Double Acting PID control algorithm needs the programming of following parameters:
Pb: Proportional band
Int: integral Time
Der: derivative Time
hCt: Heat cycle time
CCt: Cool cycle time
rS: Manual reset (If Int=0)
coEF: Coefficient Relation between power heating and cooling element. Range between 0.1 to 10.
coEF > 1: Represents that the cooling element is stronger than heating element.
coEF = 1: Represents that the heating and cooling element are equally strong.
coEF < 1:Represents that the heating element is stronger than cooling element.

4) Neutral Zone ON/OFF Control (nr2n): Parameters regarding to neutral zone ON/OFF control are listed in the REG group. This type of control can be set when any two outputs configured by parameter one OP as heater and second OP as cooler and the parameters "cont" = nr2n. The neutral zone control is used to control processes in which there is an element which causes a positive increase in temperature (eg. Heater, Humidifier etc.) and an element which causes decrease in temperature (e.g. Cooler, de-humidifier, etc.)
Depending on measurements of effective set point "SP" and on hysteresis "HYSt", the control functions works on programmed outputs. The controller activates the output configured as heater when process value goes below [SP-HYSt] and deactivates it once the PV reaches SP. Further it activates the output configured on cooler when process value goes above [SP+HYSt].
The cooler output is deactivated when PV reaches SP again.
Note: This type of control is applicable for double acting cat ids only.

Condition	Heater	Cooler
PV < [SP-HYSt]	ON	OFF
PV=SP	OFF	OFF
PV > [SP+HYSt]	OFF	ON
PV = SP	OFF	OFF



cmdc Menu :Compressor duty cycle is used to protect compressor short cycling. It is a time based activation of the compressor.
The activation of compressor can be avoided till the time set on parameter "cmdc",thus providing the delay. Time programmed on cmdc is counted starting from last output deactivation and then even if the regulator requires to switch on the corresponding output, the activation is delayed till the time set on "cmdc" elapses.
Note : This menu is visible only when control type is Neutral zone

Auto tuning: Parameters regarding Auto tuning are placed under REG menu.
This Auto tuning can be set by programming parameter "tUnE"= oFF for Auto tune action with any Output = "hEAt" if using heater or "cooL" if using cooler. Auto tuning can be start depending on the setting:
"tEP" - Tune at every Power ON.
"t 1P" - Tune at first power ON.
"tMn" - Tune manually.
"tSP" - Tune at every set point change.
The condition needs to satisfy for to start Auto tune For Ag1 & Ag2:
If "OP" is "hEAt", : PV < [SP - |SP/3|] if soft start is not configured & PV < [SP - |SP/5|] if soft start is configured
If "OP" is "cooL", : PV > [SP + |SP/3|] if soft start is not configured & PV > [SP + [SP/5]] If soft start is configured
If the PV condition is not satisfied at start of auto tune, display will shows "E.At" message and device works according to previous set program of PID.

Rate (rAtE) & Offset (oFSt): Product can be re-calibrated according to application needs, by using parameter "oFSt" and "rAtE".
If "rAtE" = 1.000, then using parameter "oFSt", it is possible to set positive or negative offset that is simply added to the value read by the probe. If the offset is not to be constant for all measurements, it is possible to operate the calibration on any of two points.
In this case, in order to decide which values to program on parameter. "oFSt" and "rAtE", the following formulae must be applied:

"rAtE" = (y2-y1)/(x2-x1)
"oFSt" = y2 - rate*x2

Where, y1 = Measured temperature 1
x1 = temperature displayed by instrument
y2 = Measured temperature 2
x2 = temperature displayed by instrument.
The instrument thus visualizes the temperature as:

y = x * "rAtE" + "oFSt"

where y = displayed value and x = measured value.
Offset & Rate is placed in Input menu.

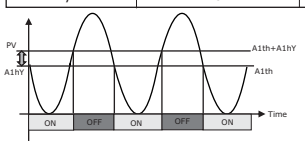
Soft Start: All parameters referring to the soft start functioning are contained in the group "MISC". The soft start functioning allows limitation of output power when System is switched ON for a limited period of time. Following parameters are needed:
"SSt" - Soft start time in hh: mm
"SSth" - Soft start threshold & "SSP" - Soft start power
Soft start functionality will abort when sst or ssth whichever earlier is met.

15LL010-00

ALARMS

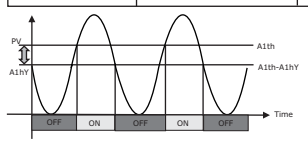
1. Absolute low ("AbLO" on display): Alarm is activated if PV goes below A1th and is deactivated if PV goes above (A1th+A1hY).

Menu	Sub menu	Option
AL1/AL2	A1tY	AbLo



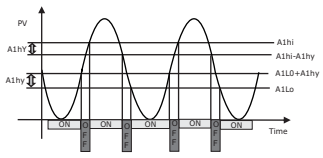
2. Absolute high ("AbhI" on display):Alarm is activated if PV goes above A1th and is deactivated if PV goes below (A1th-A1hy).

Menu	Sub menu	Option
AL1/AL2	A1tY	Abhi



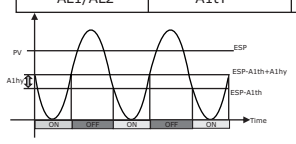
3. Absolute band ("AbbA" on display): Alarm is activated if PV goes above A1hi or below A1Lo. It is deactivated if it goes below (A1hi-A1hy) or above (A1Lo+A1hy).

Menu	Sub menu	Options
AL1/AL2	A1tY	AbbA



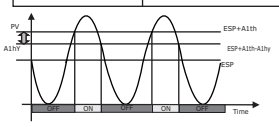
4. Deviation low ("dELo" on display): Alarm is activated if PV goes below (Effective Set Point(ESP) - A1th) and is deactivated when it goes above (Effective Set Point (ESP)–A1th + A1hy).

Menu	Sub menu	Options
AL1/AL2	A1tY	dELo



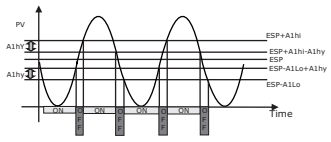
5. Deviation high("dEhi" on display):Alarm is activated when PV goes above Effective Set Point(ESP) +A1th) and is deactivated When it goes below (Effective Set Point(ESP) + A1th-A1hy).

Menu	Sub menu	Option
AL1/AL2	A1tY	dEhi



6. Deviation band ("dEbA" on display): Alarm is activated when PV goes above (Effective Set Point(ESP) + A1hi) or below (Effective Set Point(ESP) - A1Lo) and is deatived when PV goes below (Effective Set Point (ESP)+ A1hi - A1hy) or above (Effective Set Point(ESP) - A1Lo + A1hy).

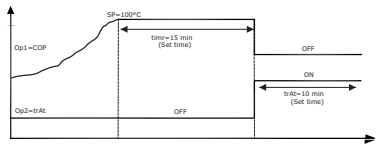
Menu	Sub menu	Option
AL1/AL2	A1tY	dEbA



Alarm Functions :

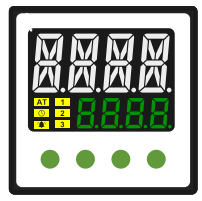
Sr	Value	Details	Application
1	0	**Normal** **Activation**:When alarm condition occurs. **Deactivation**:When the alarm condition disappears.	Normal
2	1	**Acknowledged** **Activation**:When alarm condition occurs. **Deactivation**: 1. When the alarm condition disappears. 2. When Configurable key programmed for alarm acknowledgment and press in alarm condition.	To ignore the alarm condition
3	2	**Delayed** **Activation**: delayed by time set in A1dL parameter after occurrence of the alarm condition. **Deactivation**: When the alarm condition disappears. **Note**:During the delay if the alarm condition disappears, alarm will not be generated.	To delay the alarm generation, some times alarm can be generated for shorter time due to some disturbance in system.
4	4	**Latched** **Activation**: When alarm condition occurs. **Deactivation**:When Configurable key programmed for alarm acknowledgment and press once alarm generated. Note: Alarm will not get automatically deactivated once generated.	To record or draw attention of alarm generation condition every time. Since no automatic of alarm.

Timer: 1) When PV value reach or cross to SP then the timer will start, during this process Op1=Heat/Cool will be in controlling action.
2)OP2 and OP3 can be assign to Timer alarm
3)Timer functionality works in both PID & in ON-OFF mode.
For e.g: When PV reaches to SP=100°C then the timer will start, Timer will be ON for timr=15 minutes then after completing timer time Op1 will be continues OFF and "ovEr" will displays on lower display. If alarm is configure to timer then alarm will be ON as the timer time is elapsed & Timer alarm will remain ON till Timer Alarm time.



Output in case of measurement error: In case of measurement error (over range/under range/sensor break), the instrument supplies the power as programmed on parameters "O.P.ER". In case of PID control, the power output is as a percentage of cycle time parameter "CyT". Output in case of measurement error will work only in PID control action.

FRONT FACIA



Front Keys Description		
1	ESC (Escape key)	To exit from main menu. To return to home screen. To abort changed value or parameter. Press 2 sec to display SP menu.
2	DN (Down key)	Press once to display the effective set value.To decrement the value.
3	UP (Up key)	Press once to display the set value. To increment the value.
4	ENT (Enter key)	Press 2 sec to enter into the main menu. To save & move to next parameter. To acknowledge alarm condition.

Sr.no	Display/ Indicatios	Description
1	PV	To display the Process Value
2	SV	To display the Set Value
3	OP/1	To indicate the LED for Output 1
4	OP/2	To indicate the LED for Output 2
5	OP/3	To indicate the LED for Output 3
6	AT	To indicate the LED for Auto tuning process
7		To indicate that Timer functionality is in process
8		To indicate the Alarm status

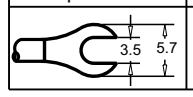
CAUTION

- Installation should be done by skilled person only, avoid incorrect connections
- When extending the thermocouple lead wires, always use thermocouple compensation wires for wiring
- For RTD sensor, use a wiring material with a small lead resistance (5Ω max per line) & no resistance differentials among 3 wires
- Product should be cleaned with a clean soft cloth & Do not use isopropyl alcohol or any other cleaning agent to avoid blockage of ventilating parts
- Use of contactors is recommended if load exceeds the contact rating Please see Inductive load category
- When replacing the sensor, please turn OFF the power

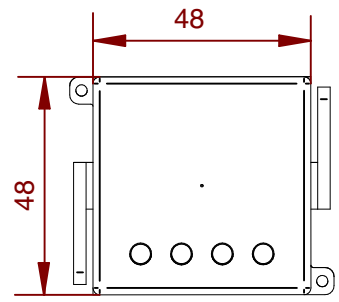
Information on waste disposal for consumers of electrical and electronic equipment:

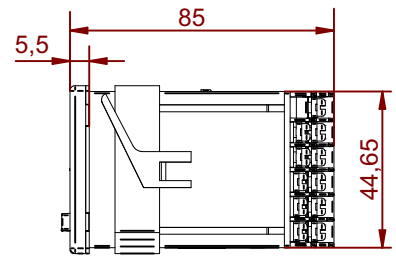
When this product has reached the end of its life it must be treated as Waste Electrical & Electronic Equipment (WEEE). Any WEEE marked products must not be mixed with general household waste, but kept separate for the treatment, recovery and recycling of the materials used. Contact your local authority for details of recycling schemes in your area.

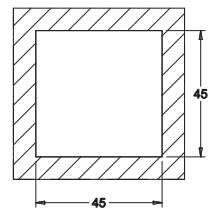
TERMINAL TORQUE AND CAPACITY

Tightening Torque	0.5 Nm(4.5 LB.in) Terminal Screw - M3
	1 x 2.5 mm² Wire with Lug AWG: 1 X 22 to12

MOUNTING DIMENSION (mm)



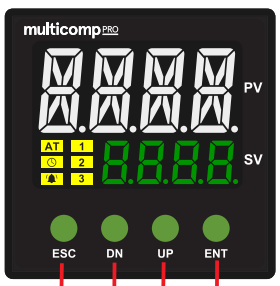




RECOMMENDED PANEL CUTOUT
45 mmX 45 mm +0.5 mm

Press key for 2sec see table mentioned

Note



(C) (D)

(A)

Main menu

Display value	Parameter Description	Table refrence
inP	Input	(A)
oP	Out put	(B)
SP	Set point	(C)
REG	Regulator	(D)
AL 1	Alarm 1	(E)
AL2	Alarm 2	(E)
ANOP	Analog output	(F)
MISC	Miscellaneous	(G)
Modb	Modbus	(H)
FASt	Factory reset	YES/no
PWd	Password	(J)
Adv	Advance menu	

AL1 menu is visible if OP1/OP2/OP3 is selected as AL1
AL2 menu is visible if OP1/OP2/OP3 is selected as AL2
ANOP menu Visible if output 4 is not equal to OFF
Modb menu applicable only for MP- 4U50C

(J) Password menu (PWd)

Display value	Parameter Description	Default value	Range
StAt	status	dSbL	EnbL / dSbL
SEt	Set password value	107	1 to 9950
LoCK	Lock	nA in	nA in / PArA

IF	Visible menu	Default value	Range
LoCK = nA in	inP,oP,SP,rEG, AL 1,AL2,AnOP, MiSC,Modb,F.rSt	UnLH	rEAd, LOCH, UnLH
LoCK = PArA	SP 1 to SP8, tUnE, tI Mr	UnLH	rEAd, LOCH, UnLH

(A) Press DN key for 2 Sec Input menu (INP)

Display value	Parameter Description	Default value	Range
SENS	Sensor	J	J,K,S,r,t,c,b,E,n,Pt 1, 0-20,0- 10,mu
Unit	Unit	C	C,F
dP	Decimal Point	1	1, 0. 1, 0.0 1 , 0.00 1
ISCL	Analog input low	0	- 1999 to 9999
ISCH	Analog input high	20	- 1999 to 9999
AInL	Analog input range low	0.00	For 0-20 : 0.00 to AIRH For 0- 10 : 0.00 to AIRH For mu : -5.00 to AIRH
AInH	Analog input range High	20.00	For 0-20 : AIRL to 20.00 For 0- 10 : AIRL to 10.00 For mu : AIRL to 60.00
RAtE	Rate	1.000	0.00 1 to 2.000
oFSt	Offset	0	- 1999 to 9999

For Analog input - ISCL, ISCH, AIRL, AIRH will be visible & Unit will not applicable
For TC & RTD DP= 1 & 0.1 is only applicable

(B) Output menu (oP)

Display value	Parameter Description	Default value	Range
oP 1	Output 1	HEAt	HEAt/COOL/OFF/AL 1/ AL2/SEn.b/Ct/LbrH/trAL
oP2	Output 2	OFF	HEAt/COOL/OFF/AL 1/ AL2/SEn.b/Ct/LbrH/trAL
oP3	Output 3	OFF	HEAt/COOL/OFF/AL 1/ AL2/SEn.b/Ct/LbrH/trAL
oP4	Output 4	OFF	OFF/0-20/4-20/0-5/0- 10
A1CF	Alarm 1 Output configuration	no	no / nc
A2CF	Alarm 2 Output configuration	no	no / nc
o.P.ER	Output in case of error	0.0	0.0% to 100.0% -100.0 to 100.0 in case of double acting
tMR	Timer	OFF	OFF to 9999 min
tRAt	Timer Alarm time	OFF	On to 9999 min
LbAt	Loop break time	OFF	OFF to 9999 sec

A1CF visible if OP1/OP2/OP3 is assigned as AL1
A2CF visible if OP1/OP2/OP3 is assigned as AL2
LBRT visible if OP1/OP2/OP3 is assigned as LBRK
TRAT visible if OP1/OP2/OP3 is assigned as TRAL & Timer is not equal to OFF
CT visible only in MP-4U5A0 cat ids.

(C) Press ESC key for 2 Sec for SP menu (SP)

Display value	Parameter Description	Default value	Range
NSP	Number of set point	1	1 to 8
SP 1	Set Point 1	- - - -	SPLL to SPHL
SP2	Set Point 2	- - - -	SPLL to SPHL
SP3	Set Point 3	- - - -	SPLL to SPHL
SP4	Set Point 4	- - -	SPLL to SPHL
SP5	Set Point 5	- - -	SPLL to SPHL
SP6	Set Point 6	- - -	SPLL to SPHL
SP7	Set Point 7	- - -	SPLL to SPHL
SP8	Set Point 8	- - - -	SPLL to SPHL
EFSP	Effective Set Point	SP1	SP 1 to SP8
SPLL	Set point low level	-199	- 1999 to SPHL
SPHL	Set point high level	750	SPLL to 9999

Note : SP range will be updated as per selected sensor's SPLL & SPHL.

(D) Press UP key for 2 Sec Regulator menu (REG)

Display value	Parameter Description	Default value	Range
CoNt	Control Action	P id	PI d/OnFS/ OnFA/nr2n
tUNE	Auto tune method	oFF	OFF/tEP/ t IP/tUn/tSP
ALGo	Controlling Algorithm	A9 1	A9 1/A92/A93
Pb	Proportional Band	10	1 to 9999
INt	Integral time	120	0 to 9999 sec
dER	Derivative time	30	1 to 9999 sec
Hct	Cycle time	10	1 to 130 sec
cct	Cool Cycle time	10	1 to 130 sec Visible only in double acting mode
rS	Manual reset	0.0	- 100 to 100% 0.0 to 100.0% for single acting
dUR	Display update rate	1	1 to 100

if CONT= ONFS or ONFA or NrZN then above all parameter will hide, only HYST will be visible

HYSt	Hysteresis	0	0 to 9999

(E) Alarm 1 menu (AL 1)

Display value	Parameter Description	Default value	Range
A 1tY	Alarm 1 type	AbLO	AbLO/AbHI /AbbA/ dELO/dEHI /dEbA
A 1SP	Alarm 1 SP	EFSP	Sp1 to Number of SP, EFSP
A 1Lo	Alarm 1 Low	0	- 1999 to A 1HI
A 1HI	Alarm 1 High	100	A 1LO to 9999
A 1tH	Alarm 1 threshold	0	- 1999 to 9999
A 1HY	Alarm 1 hystersis	0	0 to 9999
A 1FN	Alarm 1 function	1 nSt	1 nSt / ACH / LtCH / dELY
A 1dY	Alarm1 delay	oFF	OFF to 9999 Sec

A1SP visible only if Alarm type DELO/DEHI/DEBA
A1LO & A1HI visible only if Alarm type ABBA/DEBA & A1TH will hide
A1TH will visible if Alarm type ABLO/ABHI/DELO/DEHI
A1dy will visible if A1FN = dely

Note: Menu for Alarm 2 are same as Alarm 1

(F) Analog output menu (ANOP)

Display value	Parameter Description	Default value	Range
MANL	Analog output manual	OFF	oFF/on
PtA9	Analog output Percentage	0.0	0.0 to 100.0 Visible if MANL = on
SERR	Sensor error	h 1Sh	h 1Sh/Lo1'
AotY	Analog output	tEMP	tEMP/ESP/COP
PVLo	Process value low	0	- 1999 to 9999
PVHI	Process value high	100	- 1999 to 9999
CoLo	Cop value low	0.0	- 199.9 to 999.9 Visible if AotY = COP
CoHI	Cop value high	100.0	- 199.9 to 999.9 Visible if AotY = COP

(G) Miscellaneous menu (MISC)

Display value	Parameter Description	Default value	Range
HrMt	Hour meter	OFF	OFF/HOUr/dAY
HCth	Counter threshold	OFF	OFF to 9999 Visible if HRMT other than OFF
SSt	Soft start time	OFF	OFF to 9999 min
SSP	Soft start power	0_0	-100.0 to 100.0 in Dual acting 0 to 100 in Single acting
SSth	Soft start threshold	0	- 1999 to 9999
Conf	Down, UP & Display key configuration	no	If yes, Down key, UP key, Lower display configuration
RMSo	Ramp soak	OFF	OFF to 8 (for menu see below table G.1)
CtAL	CT Alarm	OFF	OFF, ctLO, ctHI , ctbA (for CT menu see below table G.2)

(G.1) RAMP (RAMP) & SOAK menu (SOAK)

Display value	Parameter Description	Default value	Range
PrMd	Power down mode	cont	Cont / rbcH / rSEt
RMP 1	Ramp 1	0.0 1	0.0 1 to 99_99 min
SoK 1	Soak 1	0.0 1	0.0 1 to 99.59 hh:mm
Up to set number of ramp & soak same parameter will appear as shown in Ramp1 & Soak 1			
Hbck	Hold Back	OFF	OFF to 9999

(G.2) CT Menu for MP-4U5A0

Display value	Parameter Description	Default value	Range
ISCL	Display scale low	0_ 1	0. 1 to 1 SCH
CtLo	CT input low	0_ 1	0. 1 to CtHI -0. 1
ISCH	Display scale high	100_0	1 SCL to 999.9
CtHI	CT input high	100_0	CtLo + 0. 1 to 108.0
Ltch	latch	OFF	On / OFF
PdLY	Power on delay	3_00	0.00 to 59.59 min
tdLY	Reset time delay	0.00	0.00 to 59.59 min
LO	Alarm low limit	0. 1	0. 1 to 1 SCH For CtAL = LO 0. 1 to HI -0. 1 For CtAL = bA
HI	Alarm high limit	30	0. 1 to 1 SCH For CtAL = HI LO+0. 1 to 1 SCH For CtAL = bA

(H) Modbus menu (Modb) Applicable for MP- 4U50C

Display value	Parameter Description	Default value	Range
AddR	Device ID	1	1 to 247
bAUd	Baud rate	96	48 / 96 / 192 / 384 / 576 / 1 152
Prt	Parity	nonE	EvEn, Odd, nonE
bitS	Number of bits	8	8/9
StPb	No. of stop bits	1	1/2