Quick User Guide

5040 Single Loop Controller

This is only a Quick User Guide for Easy Installation and Operation of the Product.
For detailed information about the operations and connections, please refer the product's operation manual.

CONTENTS:

KEY FUNCTION DESCRIPTION:

MENU/ENTER KEY:

It is used to enter in the sub menu (various levels) and save the parameters to nonvolatile memory, when user setting a proper data by Increment and shift key for parameter configuration.

ESCAPE KEY: ESC

It is used to come out from any sub menu (various levels) to the run mode.

INCREMENT KEY:

It is used to increment the parameter for selection. Value of parameter can be incremented by pressing this key. When first time increment key pressed, DP (decimal point) in SV display blink, so user can modify the value with increment key. It is used to increment the value in particular digit. Value can be incremented from 0- 9 and from '9' again it rollovers to '0'.

SHIFT KEY/DECREMENT KEY:

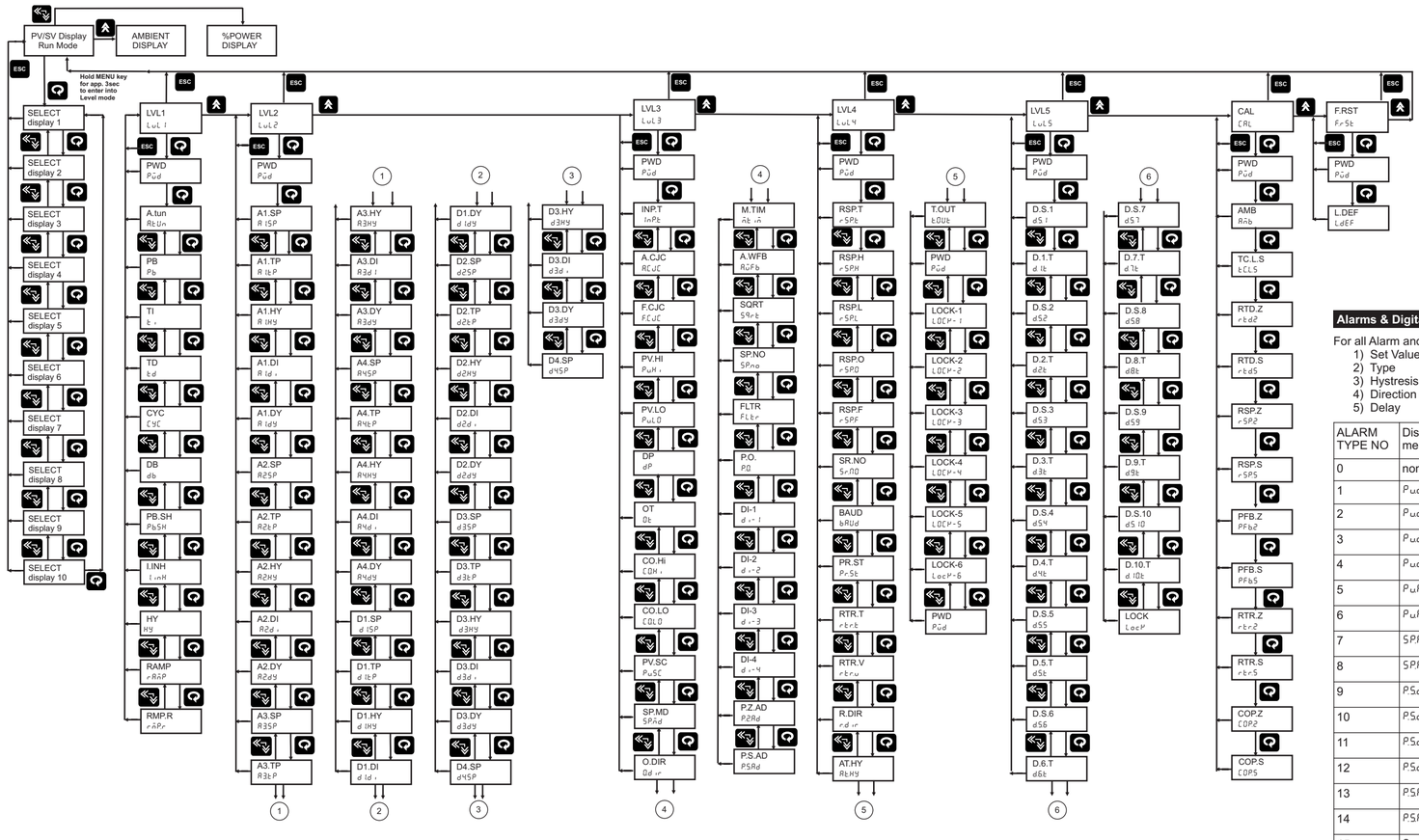
It is used to Shift the digit to set the parameter as describe in increment key when DP (decimal point) started to blink. Menu key is used to go forward to show next parameter and Shift key is used to go backward to show previous parameter. Also, in manual mode control output (%power) can be decreased using Shift/Decrement key.

AUTO/MANUAL KEY: A/M

It is used to switch between auto to manual mode and manual to auto mode. During manual mode Increment key is used to increase to power and Shift/Decrement key is used to decrease the power.

Following parameters can view or change during run time.

- Press Shift/Dec key to show percentage power (0.0 to 100.0%)
- For Thermocouple input type, Press Inc key to show ambient temperature
- During manual mode, Inc key and Shift key/Decrement Key will use to modify the percentage power
- During manual mode, If VPFB/VPNA output type is selected, Inc key and Shift key will use to OPEN or CLOSE the Valve
- Press Escape key to show percentage Valve Position(0.0 to 100.0%) in SV display (available only if Valve position feedback is selected)



Alarms & Digital Outputs

For all Alarm and Digital outputs (open collector) there are five settings. (AS shown in LEVEL – 2 Menu)

1) Set Value
2) Type
3) Hystresis
4) Direction (Normal/Fail safe)
5) Delay

ALARM TYPE NO	Display message	ALARM TYPE	Note
0	none	None	NO operation available
1	PudH	Deviation High alarm	Ref figure 3
2	PudL	Deviation Low alarm	Ref figure 4
3	Pudr	Deviation High & Low Range alarm	Ref figure 5
4	Pudb	Deviation High & Low Band alarm	Ref figure 6
5	PuRH	Absolute value High alarm	Ref figure 1
6	PuRL	Absolute value Low alarm	Ref figure 2
7	SPRH	Absolute value set point high alarm	Ref figure 7
8	SPRL	Absolute value set point low alarm	Ref figure 8
9	PSdH	Deviation High alarm with standby	Same as figure 3
10	PSdL	Deviation Low alarm with standby	Same as figure 4
11	PSdr	Deviation High & Low Range alarm with standby	Same as figure 5
12	PSdb	Deviation High & Low Band alarm with standby	Same as figure 6
13	PSRH	Absolute value High alarm with standby	Same as figure 7
14	PSRL	Absolute value Low alarm with standby	Same as figure 8
15	Pu-E	PV error (OPEN/OVER/UNDER)	Note 1
16	rSPE	RSP error	Note 1
17	uP-E	VPFB error	Note 1
18	Prue	Any type of error	Note 1

NOTE-1: The fault diagnosis output turns on in case of input burnout (PV, Remote set point, Feedback slide wire) failure.

Figure 1: Absolute Value High Alarm

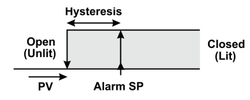


Figure 2: Absolute Value Low Alarm

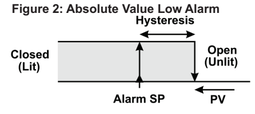


Figure 3: Deviation High Alarm

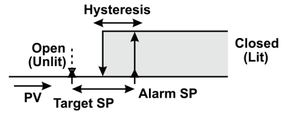


Figure 4: Deviation Law Alarm

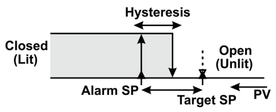


Figure 5: Deviation High/Low Range Alarm

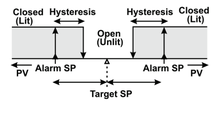


Figure 6: Deviation High/Low Band Alarm

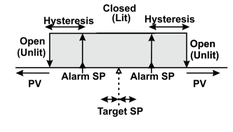


Figure 7: Absolute Value Set Point High Alarm

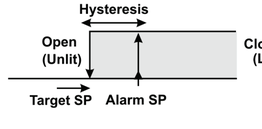
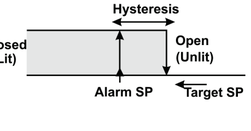
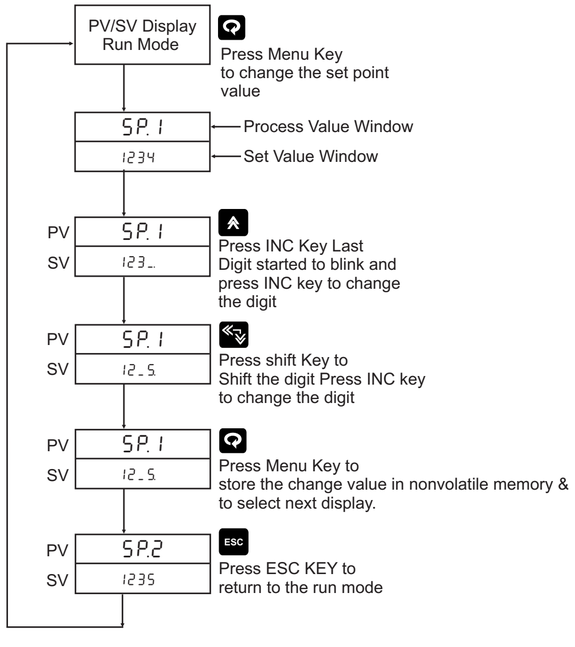


Figure 8: Absolute Value Set Point Low Alarm



How to change Set Point:

SP.1 and SP.2 will be shown in operator mode if they are selected in one of the SELECT Display Parameter from LEVEL-5 Menu.
Here SELECT display 1(D.S.1) is set for SP-1 and SELECT display 2(D.S.2) is set for SP-2 and D.T.1 & D.T.2 is R+W. So they can be editable.



NOTE: ALL other parameters can EDIT according to the above steps.

Set Point Setting:

Pressing MENU key PV Display shows SP.1 (SP.1) message (if dS.1 is selected for SP.1). SV display shows Set Point Value Use Inc and shift key to modify value. OR press MENU key again to set value for next parameter.

Set Point Setting:				
Parameter (PV display)		Setting name and Description (SV Display)	Default value	Reg.No
Symbol	Name			
SP.1 (SP.1)	Target Set point-1	Depending on PV sensor type selected	200	1
SP2 (SP.2)	Target Set point-2	Depending on PV sensor type selected	300	2

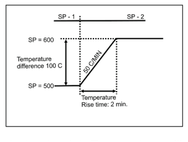
Control Function Details:

Direct/Reverse Control (Output Direction):

For Heat (Reverse Action) and Cool (Direct Action) type PID control logic, user has to program the proportional band, integral time and derivative time for proper control. They can either be set by auto tuning or can be changed manually as explained in control parameters.

Ramp Function:

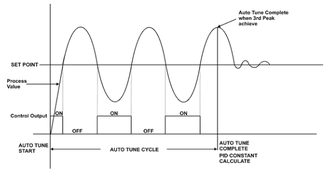
This function is used to stop the sudden change of set point. The ramp function is performed in following conditions. The target set point is changed. Target set point number is changed. (For example: Switching from SP-1 to SP-2). The power is turned ON or the controller is recovered from power failure. A change is made from manual mode to auto mode.



Auto Tunig:

The Auto tuning process is performed at set point. Temperature will oscillate around the set point during tuning process. Set a set point to a lower value if overshooting around the normal process value is likely to cause damage. To start the auto tuning process, set the set point properly, select the parameter A.TUN (A.TUN) in program menu (Level-1) and set it to YES.

Auto Tune Function:



Control Parameter:

Proportional Band:

Proportional action is the action which the control output varies in proportion to the deviation between the setting value and the processing temperature. If the proportional band is narrowed, even if the output changes by a slight variation of the processing temperature, better control results can be obtained as the offset decreases. However, if when the proportional band is narrowed too much, even slight disturbances may cause variation in the processing temperature, and control action changes to ON/OFF action and the so called hunting phenomenon occurs. Therefore, when the processing temperature comes to a balanced position near the setting value and a constant temperature is maintained, the most suitable value is selected by gradually narrowing the proportional band while observing the control results.

Integral Time:

Integral action is used to eliminate offset. When the integral time is shortened, the returning speed to the setting point is quickened. However, the cycle of oscillation is also quickened and the control becomes unstable.

Derivative Time:

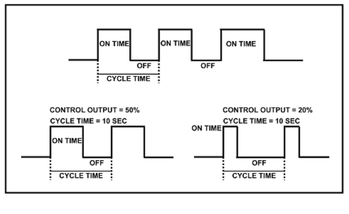
Derivative action is used to restore the change in the processing temperature according to the rate of change. It reduces the amplitude of overshoot and undershoots width. If the derivative time is shortened, restoring value becomes small, and if the derivative time is made longer, an excessive returning phenomenon may occur and the control system may be oscillated.

Manual Reset:

Virtually no process requires precisely 50% output on single output controls or 0% output on two output controls. Because of this many older control designs incorporated an adjustment called manual reset (also called offset on some controls). This adjustment allows the user to redefine the output requirement at the set point. A proportioning control without manual reset or Integral time (defined above) will settle out somewhere within the proportioning band but likely not on the set point.

Cycle Time:

The Cycle time for output is the time where the output is on for percentage of that time and off for a percentage of that time, creating a portioning effect.



Level 1:

Pressing MENU key for 3 seconds (approx.) PV Display shows Mode (mode) message. SV display shows LuL1 (LvL1) Use Inc key to move to other menu levels. Or Press MENU key again to scroll through the menu items of Level - 1. This level allows user to auto tune a process or manually set the PID values and some other parameters as shown below.

Level 1: Alarm AND Digital Output Settings

Parameter (PV display)		Setting name and Description SV Display	Default value	Shows only if	Reg. No.
Symbol	Name				
Pud (Pwd)	Password	0 to 9999 (Password Protection for Level-1)	-	LOCK-1 set on in Level-4	-
AtUn (A.tUn)	Auto tune	YES / no 1 : (YES) & 0 : (no)	no	Output Type is RLY, SSR, CUR	-
Pb (Pb)	Proportional Band	0.1 to 999.9	50.0	Not available for Output type OnOF	3
ti (ti)	Integral Time	0 to 1000 seconds	120	Not available for Output type OnOF	4
td (td)	Derivative Time	0 to 250 seconds	30	Not available for Output type OnOF	5
dFCt (d.FCt)	Derivative Factor	0.01 to 1.00	0.01	Not available for Output type OnOF	6
Ct (Ct)	Cycle Time	1 to 250 seconds	10	Not available for Output type OnOF	7
dC (DC)	Duty Cycle	10% to 100%	20%	Not available for Output type OnOF	8
db (db)	Position Proportional Dead Band	0.1 to 50.0	1.0	Not available for Output type OnOF	9
PbSH (Pb.SH)	P band shift (Overshoot suppression)	-50 to 50 %	0%	Not available for Output type OnOF	10
Mr (MR)	Manual Reset	-50 to 50 %	0%	Not available for Output type OnOF	11
HY (HY)	hysteresis (For On/Off control)	1 to 250	2	Control type is on/off	12
rAMP (Ramp)	Ramp Rate type	nonE/ Unr/ hrr 0 : none 1 : min.r 2 : hr.r	None	Not available for Output type OnOF	13
rMPr (rmp.r)	Ramp rate value	0.1 to 999.9 Degree per minutes or hour	0.1	Not available for Output type OnOF	14

Level 2:

Pressing MENU key for 3 seconds (approx.) PV Display shows Mode (mode) message. SV display shows LuL2 (LvL2) Use Inc key to move to other menu levels.
Please refer Alarm / Digital output section for better understanding and selection of alarm types.

Level 2: Alarm AND Digital Output Settings

Parameter (PV display)		Setting name and Description SV Display	Default value	Shows only if	Reg. No.
Symbol	Name				
Pud (Pwd)	Password	0 to 9999 (Password Protection for Level-2)	-	LOCK-2 set on in Level-4	-
A1SP (A1.SP)	Alarm 1 Set point	PV range selected[1]	0		15
A1tP (A1.tP)	Alarm 1 Type	0 to 18. Refer alarm type Table	0 (none)		16
A1HY (A1.HY)	Alarm 1 Hysteresis	1 to 250	2		17
A1LC (A1.LC)	Alarm 1 Logic (normal or fail safe selection)	norM / FLSF 0:(norm) & 1: (FLSF)	Normal		18
A1dy (A1.Dy)	Alarm 1 Delay	1 to 99 seconds	10		19
A2SP (A2.SP)	Alarm 2 Set point	PV range selected[1]	0		20
A2tP (A2tP)	Alarm 2 Type	0 to 18. Refer alarm type Table	0 (none)		21
A2HY (A2.HY)	Alarm 2 Hysteresis	1 to 250	2		22
A2LC (A2.LC)	Alarm 2 Logic (normal or fail safe selection)	norM / FLSF 0:(norm) & 1: (FLSF)	Normal		23
A2dy (A2.Dy)	Alarm 2 Delay	1 to 99 seconds	10		24
A3SP (A3.SP)	Alarm 3 Set point	PV range selected[1]	0		25
A3tP (A3.tP)	Alarm 3 Type	0 to 18. Refer alarm type Table	0 (none)		26
A3HY (A3.HY)	Alarm 3 Hysteresis	1 to 250	2		27
A3LC (A3.LC)	Alarm 3 Logic	norM / FLSF 0:(norm) & 1: (FLSF)	Normal		28
A3dy (A3.Dy)	Alarm 3 Delay	1 to 99 seconds	10		29
A4SP (A4.SP)	Alarm 4 Set point	PV range selected[1]	0		30
A4tP (A4.tP)	Alarm 4 type	0 to 18. Refer alarm type Table	0 (none)		31
A4HY (A4.HY)	Alarm 4 Hysteresis	1 to 250	2		32
A4LC (A4.LC)	Alarm 4 Logic	norM / FLSF 0:(norm) & 1: (FLSF)	Normal		33
A4dy (A4.Dy)	Alarm 4 Delay	1 to 99 seconds	10		34
d1SP (d1.SP)	Digital Output 1 Set point	PV range selected[1]	0		35
d1tP (d1.tP)	Digital Output 1 Type	0 to 18. Refer alarm type Table	0 (none)		36
d1HY (d1.HY)	Digital Output 1 Hysteresis	1 to 250	2		37
d1LC (d1.LC)	Digital Output 1 Logic	norM / FLSF 0:(norm) & 1: (FLSF)	Normal		38
d1dy (d1.Dy)	Digital Output 1 Delay	1 to 99 seconds	10		39

continued....

d2SP (d2.SP)	Digital Output 2 Set	PV range selected[1]	0		40
d2tP (d2.tP)	Digital Output 2 Type	0 to 18. Refer alarm type Table	0 (none)		41
d2HY (d2.HY)	Digital Output 2 Hysteresis	1 to 250	2		42
d2LC (d2.LC)	Digital Output 2 Logic	norM / FLSF 0:(norm) & 1: (FLSF)	Normal		43
d2dy (d2.Dy)	Digital Output 2 Delay	1 to 99 seconds	10		44
d3SP (d3.SP)	Digital Output 3 Set point	PV range selected[1]	0		45
d3tP (d3.tP)	Digital Output 3 Type	0 to 18. Refer alarm type Table	0 (none)		46
d3HY (d3.HY)	Digital Output 3 Hysteresis	1 to 250	2		47
d3LC (d3.LC)	Digital Output 3 Logic	norM / FLSF 0:(norm) & 1: (FLSF)	Normal		48
d3dy (d3.Dy)	Digital Output 3 Delay	1 to 99 seconds	10		49
d4SP (d4.SP)	Digital Output 4 Set point	PV range selected[1]	0		50
d4tP (d4.tP)	Digital Output 4 type	0 to 18. Refer alarm type Table	0 (none)		51
d4HY (d4.HY)	Digital Output 4 Hysteresis	1 to 250	2		52
d4LC (d4.LC)	Digital Output 4 Logic	norM / FLSF 0:(norm) & 1: (FLSF)	Normal		53
d4dy (d4.Dy)	Digital Output 4 Delay	1 to 99 seconds	10		54

1 If the value falls outside the range, output is unpredictable.

Level 3:

Use Inc key to move to other menu levels. This level allows user to select input type and some other parameters as shown below.
Pressing MENU key PV for 3 seconds (approx.) Display shows Mode (mode) message. SV display shows Lvl3 (LvL3)

Level 3: Functional Parameters Configuration Part - 1

Parameter (PV display)		Setting name and Description SV Display	Default value	Shows only if	Reg. No.
Symbol	Name				
Pud (Pwd)	Password	0 to 9999 (Password Protection for Level-3)	-	LOCK-3 set on in Level-4	-
inPt (inP.t)	PV Input Type (E, J, K, T etc.)	Follow Table-1.1	K-TC		55
ACJC (A.CJC)	Auto Cold junction Compensation	YES/ no 1:(YES) & 0: (no)	YES	Input sensor is T/c. type	56
FCJC (F.CJC)	Fix cold junction Compensation	0 to 60.0 Degree	0.0	Input sensor is T/c. type	57
PvH i (Pv.Hi)	Process value range high setting (span > zero)	Range of the sensor (Table 3.1) / -1999 to 9999 (for linear input types)	1370		58
PvLo (Pv.Lo)	Process value range lower setting		-200		59
dP (dP)	Decimal Point Setting	0 to 3	0	Input is linear type	60
ot (oT)	Output Type	rELY / SSr/ cUr/ onoF/ vPFb/vPFn 0:(rLY) – Relay 1:(SSR) – Pulse Output 2:(Cur) – Current 3:(OnOF) – on-off control 4:(vpfb)-position with feedback 5:(vpfn)-position without feedback	0(Relay)		61
CoH i (Co.Hi)	Control Output high limit (high limit >low limit)	0.0 to 100.0 %	100.0		62
CoLo (Co.Lo)	Control Output low limit	0.0 to 100.0 %	0		63
PvSC (PV.SC.)	Process value scale	doUn / UP / nonE 0:(down) 1:(up) 2:(none)	down		64
SPMd (SP.Md.)	Remote/Local SP selection	LoCL / rMot 0:(LoCL) – Local 1:(rMot) - Remote	Local		65
od ir (o.dir)	Output (Cool / Heat) Direction (Dir / Rev)	d ir / rEv 1:(dir) & 0:(rev)	Rev		66
Mt in (m.tim)	Motor Travel Time (position proportional without feedback)	10 to 500 sec	60	Pid type selected is valve position with/without	67
AFUb (A.FWB)	Auto feedback	YES/ no 1:(YES) & 0:(no)	No	Pid type selected is valve position with/without	68
Sqrt (Sqrt)	Square Root for Linear Inputs Type	YES/ no 1:(YES) & 0:(no)	No	Input type selected is linear	69
SPno (SP.no)	Set point selection(Target set point to control the process)	1/ 2 1:(sp.1) & 2:(sp.2)	1 (Set Point–1)		70
FLtr (FLtr)	Filter for Process value (1st order low-pass IIR filter)	0 to 60 seconds	5		71
Po (Po)	Preset Control output during stop mode	0.0 to 100.0% power	0.0%		72
di -1 (di -1)	Digital input-1	YES/ no 1:(YES) & 0: (no)	No		73
di -2 (di-2)	Digital input-2	YES/ no 1:(YES) & 0: (no)	No		74
di -3 (di-3)	Digital input-3	YES/ no 1:(YES) & 0: (no)	No		75
di -4 (di-4)	Digital input-4	YES/ no 1:(YES) & 0: (no)	No		76

continued....

P2Rd (P.Z.Ad)	Zero position adjustment	0% TO 80%	0%	o/p VPFB selected	-
P5Rd (P.S.Ad)	Span position adjustment	20% TO 100%	100%	o/p VPFB selected	-

Level 4:

Pressing MENU key for 3 seconds (approx.) PV Display shows nodE (mode) message. SV display shows LuL4 (LvL4) Use Inc key to move to other menu levels. Press set key again to scroll through the menu items of particular level.

Level 4: Functional Parameters Configuration Part - 2

Parameter (PV display)		Setting name and Description SV Display	Default value	Shows only if	Reg. No.
Symbol	Name				
Pud (Pwd)	Password	0 to 9999 (Password Protection for Level-3)	-	LOCK-3 set on in Level-4	-
rSPt (rSP.t)	Remote SP Input type	0-5uV 1-5u 0:(0-5v) – 0-5 V 1:(1-5v) – 1-5 V	0 – 5v	Set point is remote type	77
rSPH (rsP.H)	Remote SP range High setting	can be set within -1999 to 9999 but not outside PV-High and PV-LOW limit	1370		78
rSPL (rsp.L)	Remote SP range Low Setting	Can be set within -1999 to 9999 but not outside PV-High and PV-LOW limit	-200		79
rSPo (rSP.o)	Remote SP Offset	-100.0 to 100.0	0.0		80
rSPF (rSP.F)	Remote SP factor	00.01 to 10.00	01.00		81
Srno (Sr.no)	Unit ID	1 to 247	1	-	82
bAUd (bAUd)	Communication Baud rate	9600/ 192P 0:(9600) – 9600 bps 1:(19.2K) –19.2 Kbps	19.2k bps		83
PrSt (Pr.St)	Parity/Stop bit selection	PnS1/ PnS2/ PoS1/ PES1 0:(P.N.S.1)-parity none-stop bit - 1 1:(P.N.S.2)-parity none - stop bit - 2 2:(P.O.S.1)-parity odd -stop bit - 1 3:(P.E.S.1)-parity even - stop bit - 1	No parity /Stop bit - 2		84
rtrt (rtr.t)	Retransmission Output Type	0-20/ 4-20 / 0-5u / 1-5u 0- 10u 0:(0-20) – 0-20mA 1:(4-20) – 4-20mA 2:(0 - 5) – 0 – 5volt 3:(1 - 5) – 1 – 5volt 4:(0 – 10) - 0 -10volt	4-20 mA		85
rtrv (rtr.v)	Retransmission variable	SP/ Pv/ Co/ Zu 0:(SP) – Set point 1:(Pv) –Process value 2:(CO) – Control output 3:(Zv) – Feedback value	PV		86
rdir (r.dir)	Retransmission direction	d ir/ rEu 1:(dir) & 0:(rev)	Dir		87
rtrH (rtr.H)	Retransmission upper limit	-5.0% to 105.0%	105.0%		88
rtrL (rtr.L)	Retransmission lower limit	-5.0% to 105.0%	-5.0%		89
AtHY (At.HY)	AT hysteresis	0 to 25.0	5.0		90
tout (t.out)	Timeout of display back to PV/SV	10 to 100 Seconds	60		91
Pud (Pwd)	Password to Enter into lock mode	0 to 9999	-		-
LoCP (LOCK)	Lock LEVEL-1	L 1on/ L 1oF 1:L1on & 0:L1oF	L1 OF		-
LoCP (LOCK)	Lock LEVEL-2	L2on/ L2oF 1:L2on & 0:L2oF	L2 OF		-
LoCP (LOCK)	Lock LEVEL-3	L3on/ L3oF 1:L3on & 0:L3oF	L3 OF		-
LoCP (LOCK)	Lock LEVEL-4	L4on/ L4oF 1:L4on & 0:L4oF	L4 OF		-
LoCP (LOCK)	Lock LEVEL-5 Calibration	L5on/ L5oF 1:L5on & 0:L5oF	L5 ON		-
SPud (S.Pwd)	Password Set password to lock selected level	0 to 9999	0	if lock is on user can set password for all level	-

Level 5:

Pressing MENU key for 3 seconds (approx.) PV Display shows nodE (mode) message. SV display shows LuL5 (LvL5) Use Inc key to move to other menu levels. Press set key again to scroll through the menu items of particular

Select the 'SELECT display' parameter, and then enter register number (Reg. No.) to accompanying that Parameter. The registered parameter can be accessed in operator mode by pressing MENU key. Select the 'Display Parameter Type' as R to make selected parameter as read only and R+W to read + write.

LEVEL 5: SELECT Display settings

Parameter (PV display)		Setting name and description (SV display)	Default value	Shows only if
Symbol	Name			
Pud (Pwd)	Password	0 to 9999 (Password Protection for Level-3)	-	LOCK is set on in Level-5
dS1 (D.S.1)	SELECT display 1	0 to 91 (0 = None) Can be set within 0 to 91.	1	
d1t (D.1.T)	Display 1 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
dS2 (D.S.2)	SELECT display 2	0 to 91	2	
d2t (D.2.T)	Display 2 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
dS3 (D.S.3)	SELECT display 3	0 to 91	0	
d3t (D.3.T)	Display 3 Parameter Type	r / r-u 0: r-u : Read+write 1: r: Read only	0	
dS4 (D.S.4)	SELECT display 4	0 to 91	0	
d4t (D.4.T)	Display 4 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
dS5 (D.S.5)	SELECT display 5	0 to 91	0	
d5t (D.5.T)	Display 5 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
dS6 (D.S.6)	SELECT display 6	0 to 91	0	
d6t (D.6.T)	Display 6 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
dS7 (D.S.7)	SELECT display 7	0 to 91	0	
d7t (D.7.T)	Display 7 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
dS8 (D.S.8)	SELECT display 8	0 to 91	0	
d8t (D.8.T)	Display 8 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
dS9 (D.S.9)	SELECT display 9	0 to 91	0	
d9t (D.9.T)	Display 9 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
dS10 (D.S.10)	SELECT display 10	0 to 91	0	
d10t (D.10.T)	Display 10 Parameter Type	r / r-u 0: r-u: Read+write 1: r: Read only	0	
LOCP (LOCK)	Password Set password to lock selected level	LoFF/ Lon 0: L.OFF: Level-5 Menu Lock OFF 1: L.ON:Level-5 Menu Lock ON	0	

Table 1.1: Input Type Selection Table:

Type	I/PNO	Type Display	Range	Resolution
E	1	E tc	-200 to 1000 °C	0.1 °C
J	2	J tc	-200 to 1200 °C	
K	3	K tc	-200 to 1370 °C	
T	4	t tc	-200 to 400 °C	
B	5	b tc	450 to 1800 °C	
R	6	r tc	0 to 1750 °C	
S	7	S tc	0 to 1750 °C	
N	8	n tc	-200 to 1300 °C	
RTD	9	rtd	-199.9 to 850.0 °C	
-10 to 20mV	10	-1020	-1999 to 9999 Counts	1 Count
0 to 75mv	11	0-75		
0 to 100mV	12	0-100		
0 to 2V	13	0-2u		
0.4 to 2V	14	04-2		
4 to 20mamp	15	4-20		
0 to 20mamp	16	0-20		
0 to 5V	17	0-5u		
1 to 5V	18	1-5u		
0 to 10V	19	0-10u		

Control Output Selection:

OUTPUT TYPE	RELAY CAN CONFIGUR AS			
	RELAY 1	RELAY 2	RELAY 3	RELAY 4
RELAY	USE FOR CONTROL HEAT/COOL ACTION	ALARM 2	ALARM 3	ALARM 4
SSR (Pulse output)	ALARM 1	ALARM 2	ALARM 3	ALARM 4
CURRENT (Analog current output)	ALARM 1	ALARM 2	ALARM 3	ALARM 4
ON-OFF ACTION	USE FOR CONTROL ACTION	ALARM 2	ALARM 3	ALARM 4
Position feedback Action	USE TO CONTROL FORWARD RELAY	USE TO CONTROL REVERSE RELAY	ALARM 3	ALARM 4
Without feedback Action	USE TO CONTROL FORWARD RELAY	USE TO CONTROL REVERSE RELAY	ALARM 3	ALARM 4