

PROCESS TEMPERATURE CONTROLLER MULTISPAN PTC-4202A-M1



PV = Process value
SV = Set Value

TECHNICAL SPECIFICATION

INPUT SPECIFICATION:

Input Types	Input	Range
	J	0 to 600 °C,
	K	0 to 1200 °C,
	PT-100	-99 to 400 °C,
	PT.1	-99.9 to 400.0 °C,
	0-10V DC	-999 to 9999
	0-20mA DC	-999 to 9999
	4-20mA DC	-999 to 9999
Resolution	J,K,PT-100	= 1 °C
	PT.1	= 0.1 °C
	0-10V DC,0-20mA DC,4-20mA DC	= 0.1,0.01,0.001,0001
Indication Accuracy	±1% of FSD ± 1 °C (FSD:- full scale deflection)	

DISPLAY AND KEYS:

Display	Upper: 4 digit, 7 segment, 0.39" White Lower: 4 digit, 7 segment, 0.28" Green
Keys	SET, INC, DEC, ENT

DIMENSION:

Size	48 (H) x 48 (W) x 95 (D) mm
Panel Cutout	45 (H) x 45 (W) mm

CONTROL METHOD:

Heating	1) PID control with Auto-Tuning 2) ON-OFF control
Cooling	1) BL.TP (Blower Time Proportion) 2) ON-OFF control

OUTPUT SPECIFICATION

Relay Output	
Relay	2 nos.
Relay Type	(NO-C)
Rating	5A, 230V AC/30 V DC
Analog Output	
Controlling Output	4 to 20mA DC

AUXILIARY SUPPLY

Supply voltage	100 to 250V AC, 50-60Hz
Power consumption (VA RATING)	Approx 7 VA @ 230V AC MAX

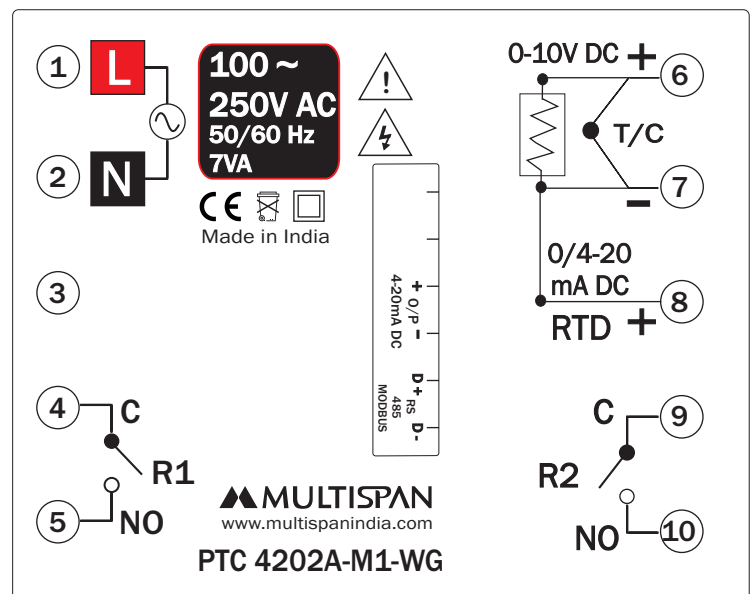
ENVIRONMENT CONDITION

Operating Temp.	0 °C to 55 °C
Relative Humidity	UP to 95% RH (non-condensing)
Protection Level	IP-65 (Front side) As per IS/IEC 60529 : 2001

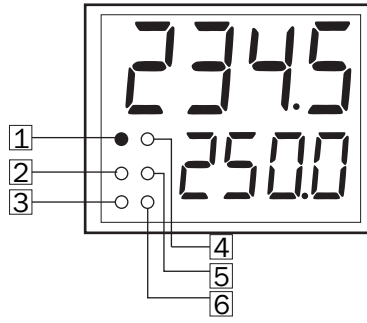
MECHANICAL INSTALLATION

Outline Dimension (mm)	Panel Cutout Dimension (mm)

TERMINAL CONNECTION



STATUS LED DESCRIPTION



- | | |
|-------------------|-----------------|
| 1 - Analog output | 4 - Receive |
| 2 - Output 1 | 5 - Transmit |
| 3 - Output 2 | 6 - Auto tuning |

KEY OPERATION

FUNCTION	PRESS KEY
OPERATOR MODE	
To enter in parameter setting	
For start/stop PID auto tuning	Press 6 sec
To go in factory setting mode	+ Press 3 sec
PARAMETER SETTING MODE	
To set parameter value	
To increment parameter value.	
To decrement parameter value.	
Set parameter to be save & exit.	

INSTALLATION GUIDELINES

- This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
- Do not allow pieces of metal, wire clippings, or fine metallic fillings from installation to enter the product or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
- Circuit breaker or mains switch must be installed between power source and supply terminal to facilitate power 'ON' or 'OFF' function. However this mains switch or circuit breaker must be installed at convenient place normally accessible to the operator.
- Use and store the instrument within the specified ambient temperature and humidity ranges as mentioned in this manual.

MECHANICAL INSTALLATION GUIDELINES

- Prepare the panel cutout with proper dimensions as shown above.
- Fit the unit into the panel with the help of clamp given.
- The equipment in its installed state must not come in close proximity to any heating source, caustic vapors, oil steam, or other unwanted process byproducts.
- Use the specified size of crimp terminal (M3.5 screws) to wire the terminal block. Tightening the screws on the terminal block using the tightening torque of the range of 1.2 N.m.
- Do not connect anything to unused terminals.

MAINTENANCE

- The equipment should be cleaned regularly to avoid blockage of ventilating parts.
- Clean the equipment with a clean soft cloth. Do not use isopropyl alcohol or any other cleaning agent.
- Fusible resistor must not be replaced by operator.



SAFETY PRECAUTION

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If all the equipment is not handled in a manner specified by the manufacturer, it might impair the protection provided by the equipment.



Read complete instructions prior to installation and operation of the unit.



WARNING : Risk of electric shock.

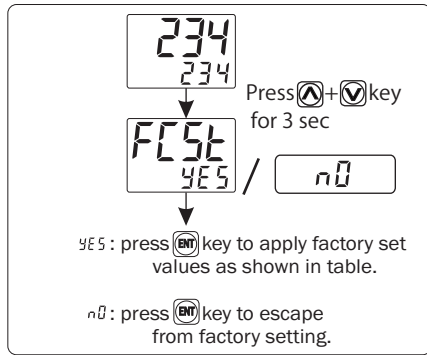
WARNING GUIDELINES



WARNING : Risk of electric shock.

- To prevent the risk of electric shock, power supply to the equipment must be kept OFF while doing the wiring arrangement. Do not touch the terminals while power is being supplied.
- To reduce electro magnetic interference, use wire with adequate rating and twists of the same of equal size shall be made with shortest connection.
- Cable used for connection to power source, must have a cross section of 1mm or greater. These wires should have insulations capacity made of at least 1.5kV.
- When extending the thermocouple lead wires, always use thermocouple compensation wires for wiring for the RTD type, use a wiring material with a small lead resistance (5 max per line) and no resistance differentials among three wires should be present.
- A better anti-noise effect can be expected by using standard power supply cable for the instrument.

FACTORY SETTING



FACTORY SETTING

SR.	PARAMETER	VALUES
1	PB	20.0° C
2	IT	300
3	DT	75
4	CT	15 sec
5	MR	0° C
6	OFFSET	0° C
7	HYSTERISIS-1	3° C
8	HYSTERISIS-2	3° C
9	C-PB	4.0° C
10	C-ON	1 Sec
11	C-OFF	48 Sec
12	CRFC	0

PARAMETER MESSAGE DESCRIPTION

CtrlSet	Controlling O/P Set Point
Set1	Set Point 1 For O/P 1
Set2	Set Point 2 For O/P 2
LO1	Low Set Point 1
HIG1	High Set Point 1
LO2	Low Set Point 2
HIG2	High Set Point 2
PASS	Password
Input	Input (Sensor)
SLL	Set Low Limit
SHL	Set High Limit
OFFSet	Offset
Pb	Proportional Band For PID Action
It	Integral Time Constant
dt	Derivative Time Constant
Ct	Cycle Time For PID Action
Mr	Manual Reset
C-Pb	Cooling PB
C-On	Cooling On Time
C-Off	Cooling Off Time
HYS1	Hysterisis 1

PARAMETER MESSAGE DESCRIPTION

HYS2	Hysterisis 2
OUT1	OutPut 1 Mode
SOAK	Soak Time Select
SMOD	Soak Mode
SMUT	Soak Unit
SMEN	Soak Time Value
MEMO	Soak Time Memory
End	Soak Time End
Ctrl1	Control Action 1
OUT2	Output 2 Mode
Ctrl2	Control Action 2
ALM1	Alarm 1
ALM2	Alarm 2
Set2	Set 2 Mode
r1dL	Relay 1 Delay Time
r2dL	Relay 2 Delay Time
ALtM	Alarm Time
PI d	PID Action
ONOFF	ON-OFF Action
BLTTP	Blower TP Action
HIGH	High Alarm
Ab-L	Absolute Low Alarm
In-b	In Band Alarm
Ab-O	Absolute Out Band Alarm
SEC	Second
min	Minute
HOUr	Hour
HEAT	Heating Mode
COOL	Cooling Mode
ALrM	Alarming Mode
OFF	OFF Mode
YES	Yes
n0	No
SAVE	Save
Indl	Set 2 Individual to Set 1
Relto	Set 2 Reletive to Set 1
FCSE	Factory Setting
AOUt	Analog Output
BASE	Basic Configuration
MBUS	Modbus
Pv	Retransmission O/P On PV
SV	Retransmission O/P On SV
4-20	Manual Selection Of 4-20 mA Analog O/P
PERC	Percentage wise Selection Of 4-20 mA Analog O/P (Manually)
COnt	Controlling Output

PARAMETER MESSAGE DESCRIPTION

LOPC	Low percentage
HIPC	High percentage
Frwd	Forward
Rev	Reverse
Addr	Address
bAud	Baud Rate
Prty	Parity
dAtA	Data Type
SI nt	Intenger
FLDt	Float

ERROR DISPLAY

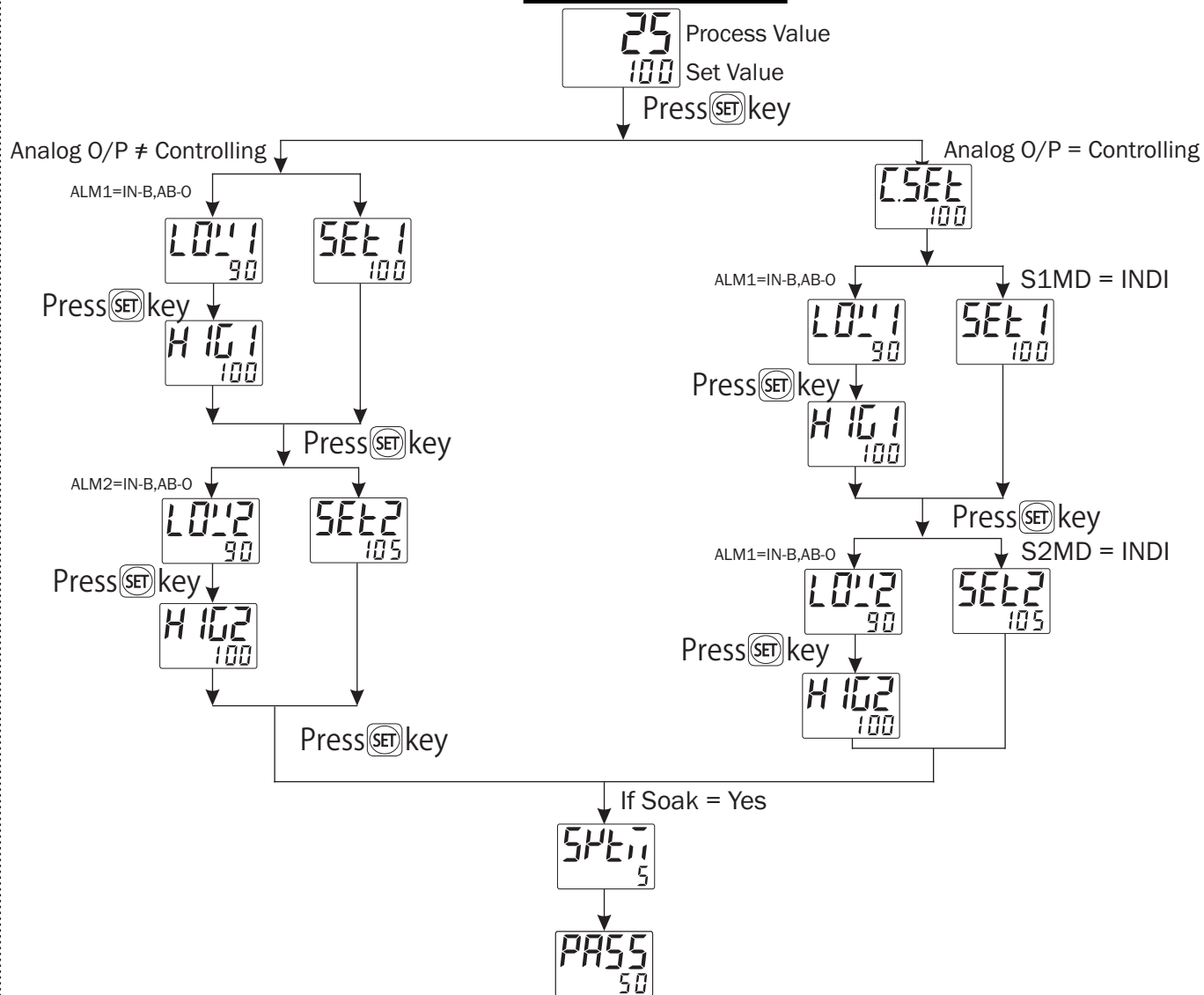
When an error has occurred the display indicates error codes as given below.

ERROR	MEANING
OPEN	Sensor is not connected Over range condition or sensor break
SrE	Sensor connection is reversed
OVER	Over range condition For 0 to 10V DC - exceed 10V DC For 4 to 20mA DC - exceed 20mA DC
LOG	When I/P is 4 to 20mA DC is selected, than I/P signal is lower than SLL (0-5mA)

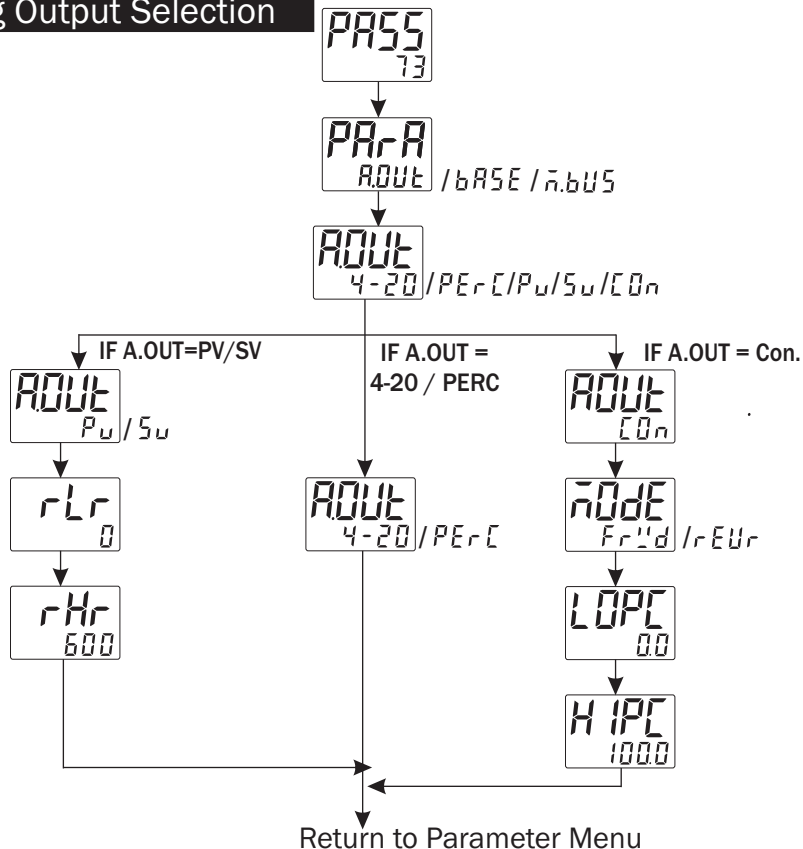
RANGE FOR CONTROL PARAMETER

Sr.	Parameter	Range for J,K,PT-100	Range for PT.1 Sensor	Range for Analog Input	
1	PB	0.0 to 999.9 °C	0.0 to 999.9 °C	0.0 to 999.9	
2	IT	0 to 9999	0 to 9999	0 to 9999	
3	DT	0 to 9999	0 to 9999	0 to 9999	
4	CT	4 to 99 sec	4 to 99 sec	4 to 99 sec	
5	MR	-9 to 9 °C	-9.0 to 9.0 °C	DP 3	-0.009 to 0.009
				DP 2	-0.09 to 0.09
				DP 1	-0.9 to 0.9
				DP 0	-9 to 9
6	OFFSET	-20 to 20 °C	-20.0 to +20.0 °C	DP 3	-0.999 to 0.999
				DP 2	-9.99 to 9.99
				DP 1	-99.9 to 99.9
				DP 0	-999 to 999
7	HYS1	1 to 100 °C	0.1 to 100.0 °C	DP 3	0.001 to 0.999
				DP 2	0.01 to 9.99
				DP 1	0.1 to 99.9
				DP 0	1 to 999
8	HYS2	1 to 100 °C	0.1 to 100.0 °C	DP 3	0.001 to 0.999
				DP 2	0.01 to 9.99
				DP 1	0.1 to 99.9
				DP 0	1 to 999
9	C-PB	2.0 to 25.0 °C	2.0 to 25.0 °C	2.0 to 25.0	
10	C-ON	1 to 20 sec	1 to 20 sec	1 to 20 sec	
11	C-OFF	5 to 200 sec	5 to 200 sec	5 to 200 sec	
12	R1DL	0.0 to 99.59 mm.ss	0.0 to 99.59 mm.ss	0.0 to 99.59 mm.ss	
13	R2DL	0.0 to 99.59 mm.ss	0.0 to 99.59 mm.ss	0.0 to 99.59 mm.ss	
14	ALTM	0 to 99 sec	0 to 99 sec	0 to 99 sec	
15	CRFC	-	-	DP 3	-0.999 to 0.999
				DP 2	-9.99 to 9.99
				DP 1	-99.9 to 99.9
				DP 0	-999 to 999
16	FLTR	-	-	0.1 to 10.0 Sec	
17	SLL	-	-	0.0 to 5.0 mA	

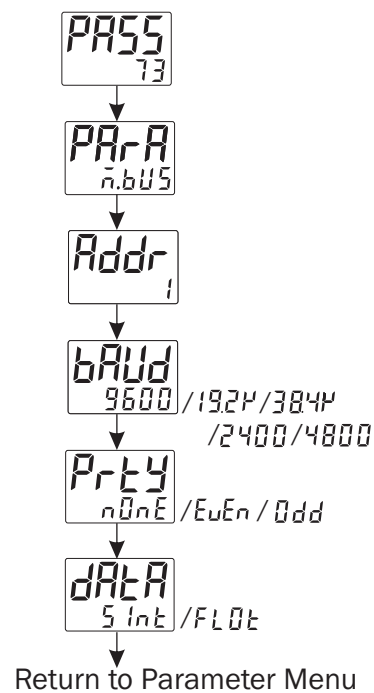
Set Point Setting



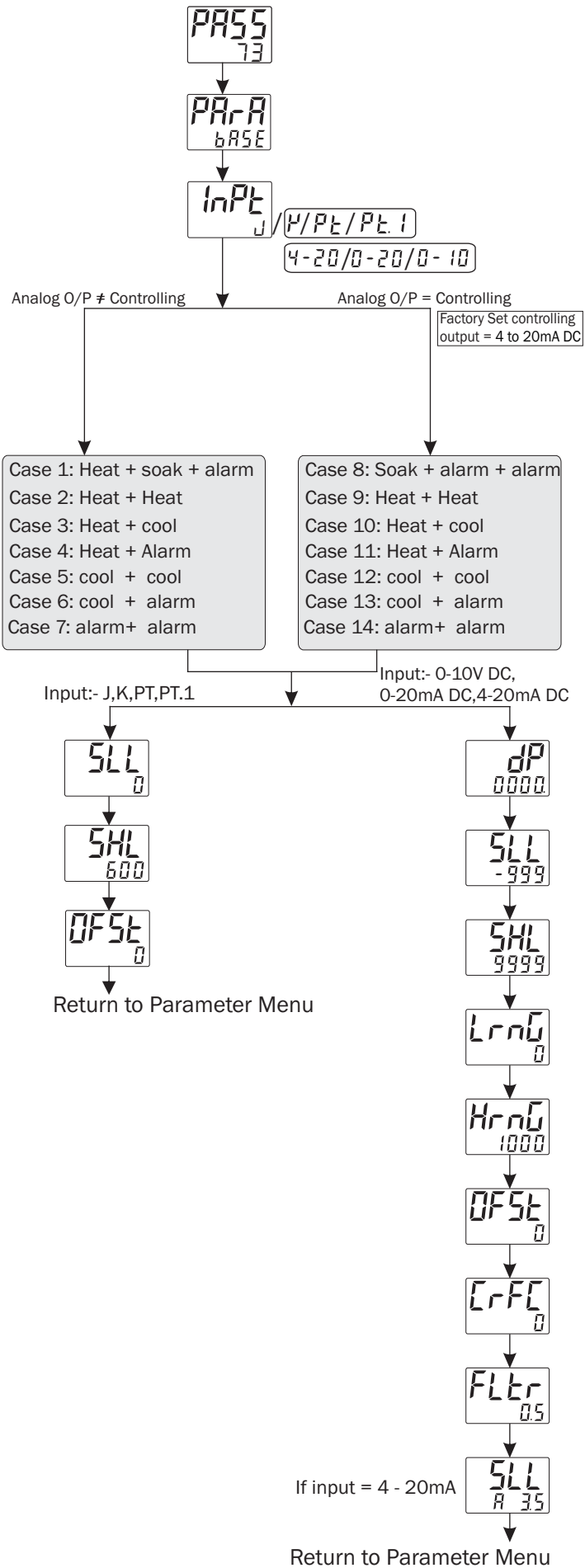
Analog Output Selection



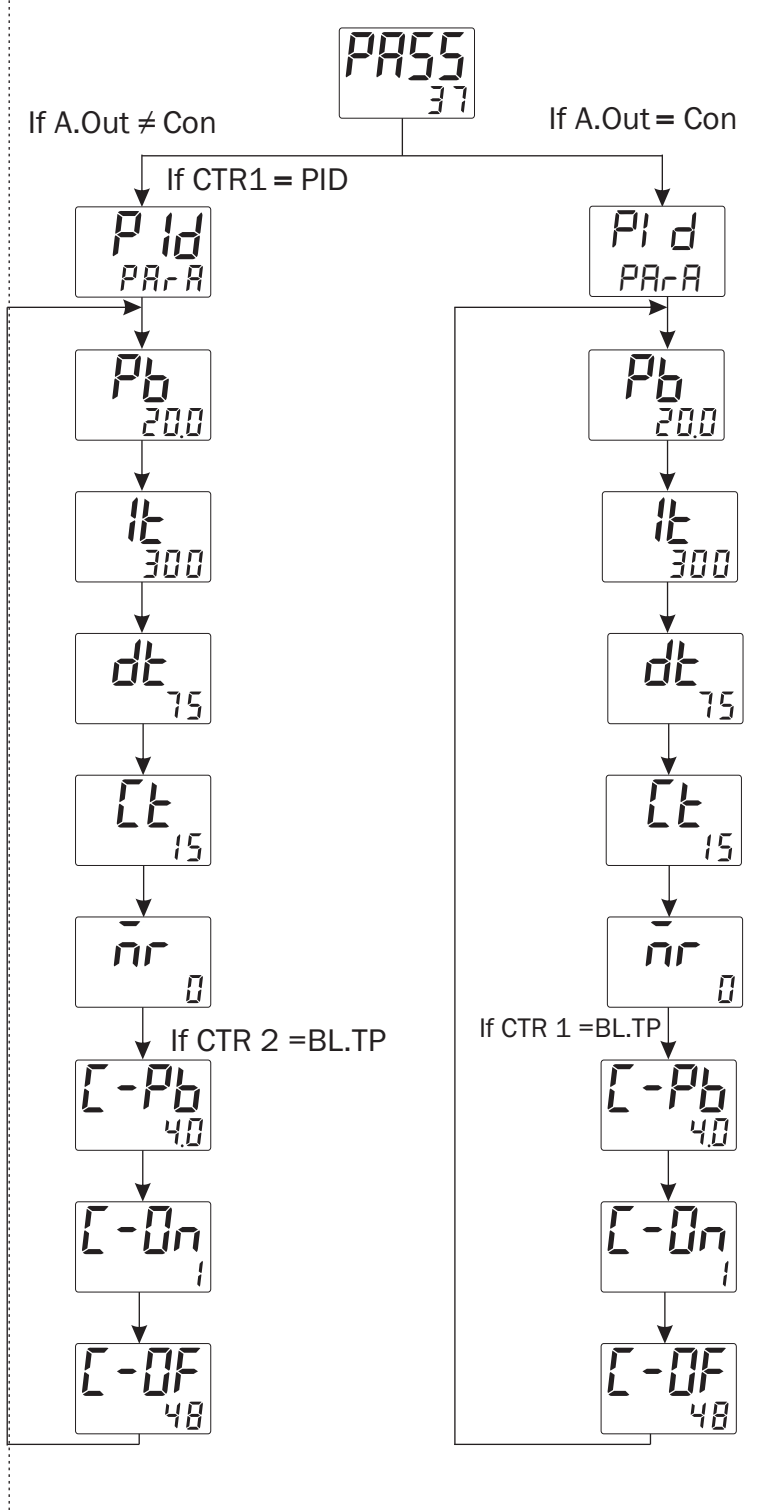
ModBus



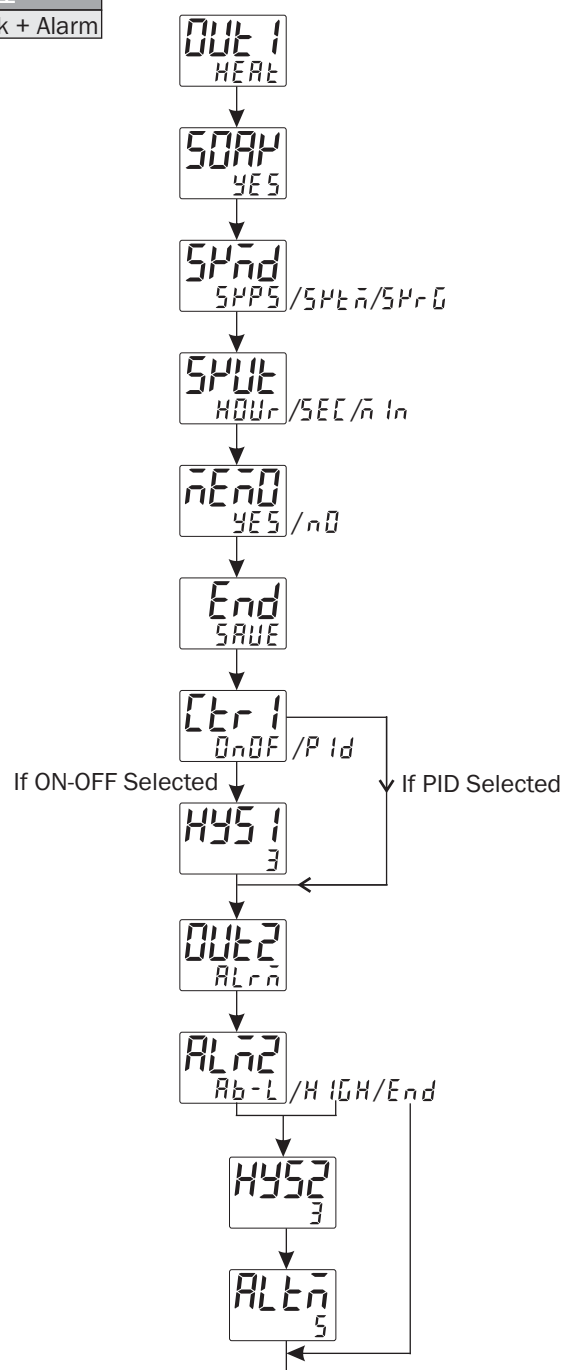
BASIC CONFIGURATION



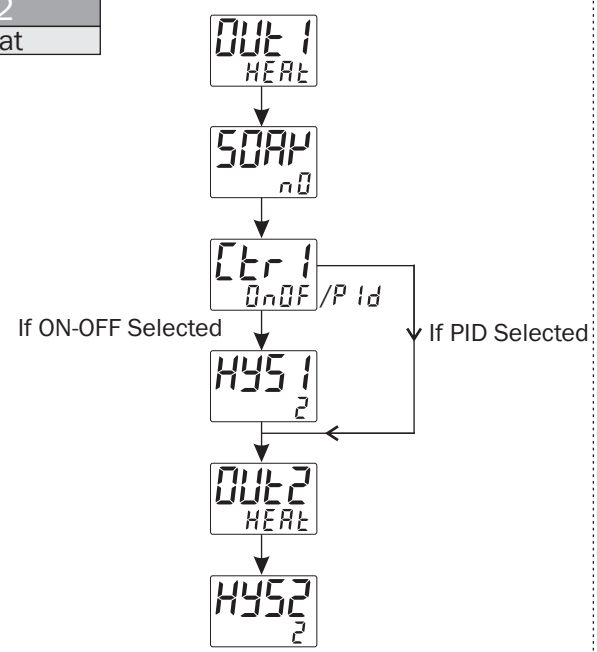
CONTROL PARAMETER SETTING



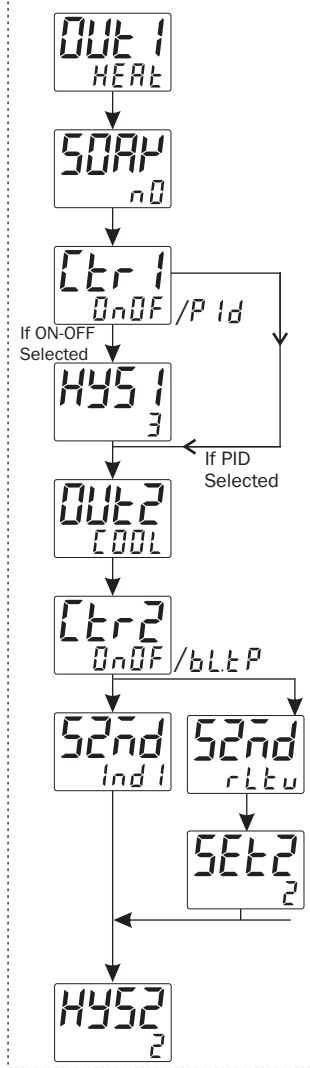
Case - 1
Heat + Soak + Alarm



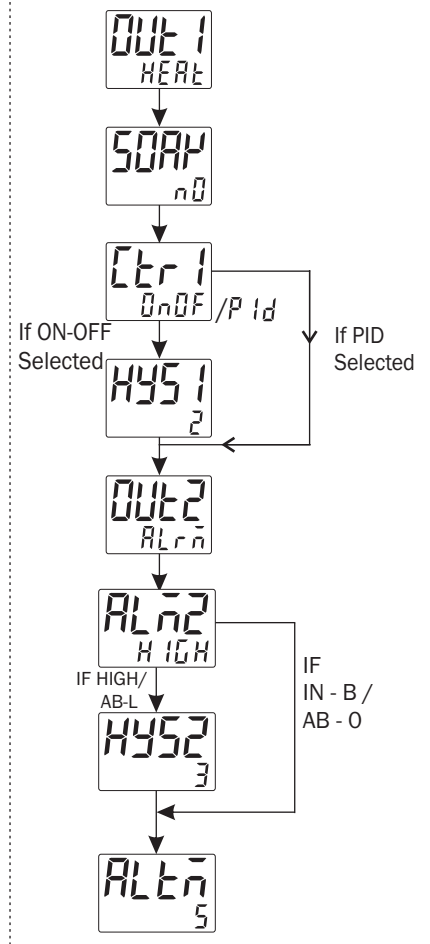
Case - 2
Heat + Heat



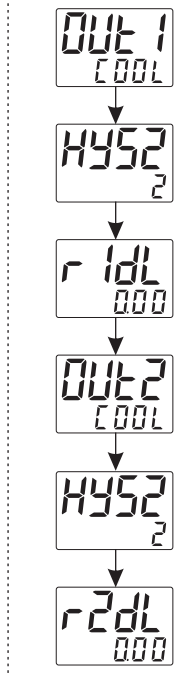
Case - 3
Heat + Cool



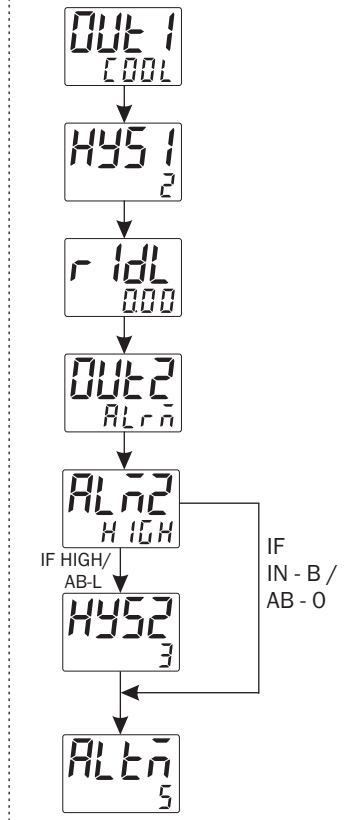
Case - 4
Heat + Alarm



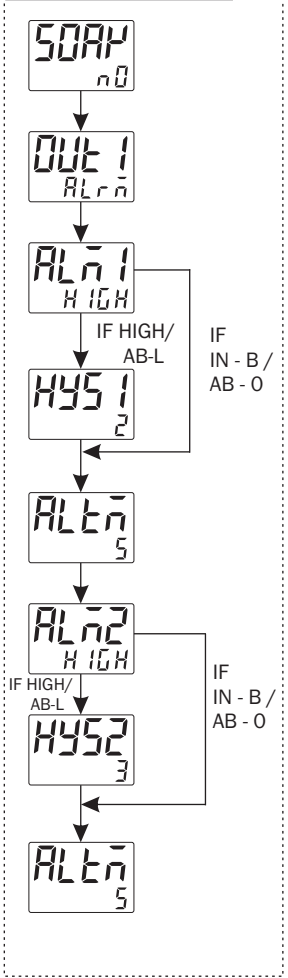
Case - 5
Cool + Cool



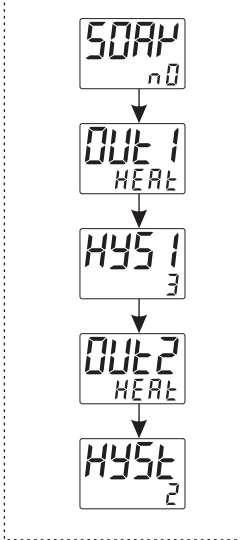
Case - 6
Cool + Alarm



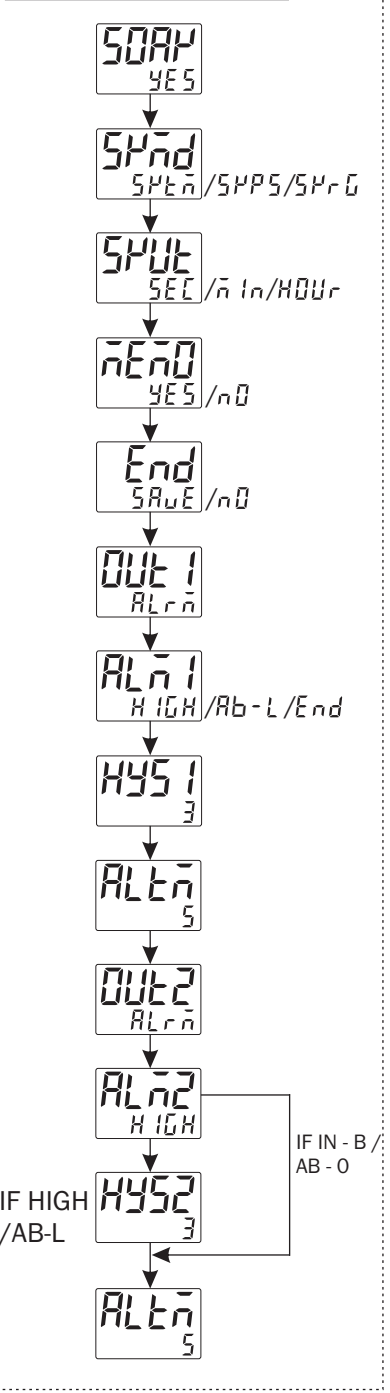
Case - 7 & 14
Alarm + Alarm



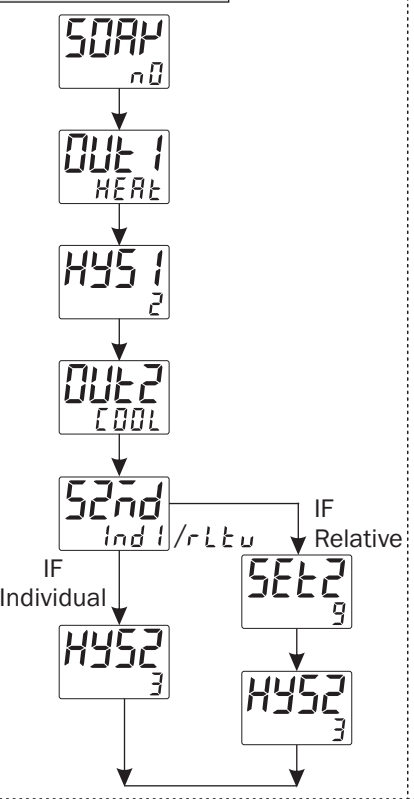
Case - 9
Heat + Heat



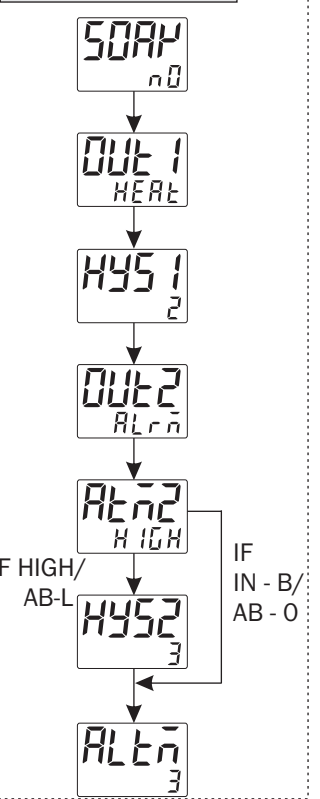
Case - 8
SOAK + ALRM + ALRM



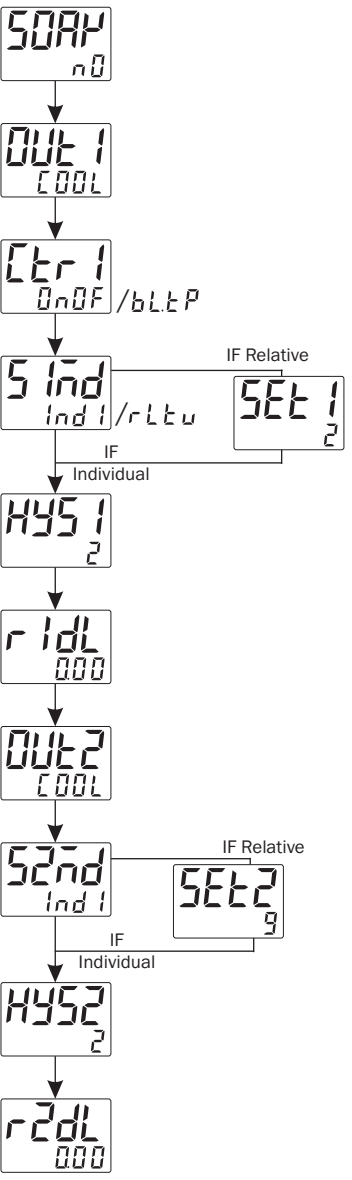
Case - 10
Heat + Cool



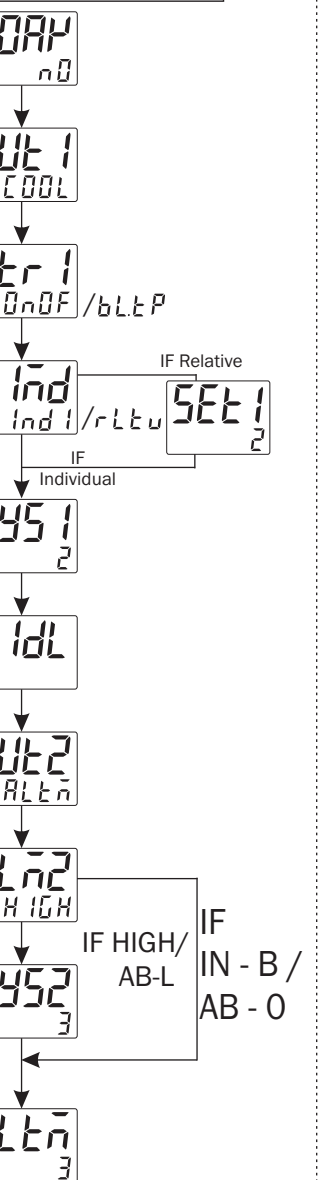
Case - 11
Heat + Alarm



Case - 12
Cool + Cool



Case - 13
Cool + Alarm



MODBUS

Salve Address :	1 to 127
Baudrate :	2400,4800,9600,38400bps
Parity :	None,Even,Odd
Datatype :	Sign integer, Float
Read Function Register :	0x03 and 0x04
Write Function Register :	0x06 and 0x10

Note :- When Parameter 32100 = no available
 When Process Value 32101 = Initialization Value
 When Process Value 32102 = Sensor Open
 When Process Value 32103 = Sensor Reverse
 When Process Value 32104 = Over Range
 When Process Value 32105 = I/P Signal Lower then SLL

Sr.No	Access Type	Parameter	Register		
			Data Type		
			Integer	Float	
1	R	Process Value	0	0	
2	R	R1 Status	1	2	
		Selection			Value
		On			1
	Off	0			
3	R	R2 Status	2	4	
		Selection			Value
		On			1
		Off			0
4	R	Control Percentage	3	6	
5	R	Analog Output Value	4	8	
6	R/W	Set1	5	10	
7	R/W	Low Set1	6	12	
8	R/W	High Set1	7	14	
9	R/W	Set2	8	16	
10	R/W	Low Set2	9	18	
11	R/W	High Set2	10	20	
12	R/W	Set3	11	22	
13	R/W	Low Set3	12	24	
14	R/W	High Set3	13	26	
15	R/W	Input	14	28	
		Selection			Value
		J			0
		K			1
		PT-100			2
		PT.1			3
		0 - 10V DC			4
		0 - 20mA DC			5
0 - 40mA DC	6				
16	R/W	Out1 Mode	15	30	
		Selection			Value
		Heat			0
		Cool			1
		Alarm			2
Off Mode	3				
17	R/W	Control Action1	16	32	
		Selection			Value
		Pid			
		On-Off			
		Blower TP			

Sr.No	Access Type	Parameter	Register		
			Data Type		
			Integer	Float	
32	R/W	Hys3	31	62	
33	R/W	Delay Time3	32	64	
34	R/W	Alarm Time3	33	66	
35	R/W	Set3 Mode	34	68	
		Selection			Value
		Individual			0
		Relative	1		
36	R/W	Soak	35	70	
37	R/W	Soak Mode	36	72	
		Selection			Value
		Soak Time Normal			0
		Soak Pass			1
		Soak Remaining	2		
38	R/W	Soak Unit	37	74	
		Selection			Value
		Sec			0
		Min			1
		Hour	2		
39	R/W	Soak Time	38	76	
40	R/W	Memory	39	78	
		Selection			Value
		NO			0
		Yes	1		
41	R/W	End Save	40	80	
42	R	Run Soak Value	41	82	
43	R	Soak Status	42	84	
		Selection			Value
		End			0
		Run			1
		Hold	2		
44	R/W	Set Low Limit	43	86	
45	R/W	Set High Limit	44	88	
46	R/W	Offset	45	90	
47	R/W	DP Process	46	92	
		Selection			Value
		0000			0
		000.0			1
		00.00			2
		0.000	3		
48	R/W	Low Range	47	94	
49	R/W	High Range	48	96	
50	R/W	CRFC	49	98	
51	R/W	FLTR Process	50	100	
52	R/W	Signal Low Limit	51	102	
53	R/W	PB	52	104	
54	R/W	IT	53	106	
55	R/W	DT	54	108	
56	R/W	CT	55	110	

18	R/W	Alarm1		17	34
		Selection	Value		
		End Alarm	0		
		Abs Low	1		
		High Alarm	2		
		In Band	3		
Abs Out Band	4				
19	R/W	Hys1		18	36
20	R/W	Delay Time1		19	38
21	R/W	Alarm Time1		20	40
22	R/W	Out2 Mode		21	42
		Selection	Value		
		Heat	0		
		Cool	1		
		Alarm	2		
Off Mode	3				
23	R/W	Control Action2		22	44
		Selection	Value		
		Pid	0		
		On-Off	1		
Blower TP	2				
24	R/W	Alarm2		23	46
		Selection	Value		
		End Alarm	0		
		Abs Low	1		
		High Alarm	2		
		In Band	3		
Abs Out Band	4				
25	R/W	Hys2		24	48
26	R/W	Delay Time2		25	50
27	R/W	Alarm Time2		26	52
28	R/W	Set2 Mode		27	54
		Selection	Value		
		Individual	0		
Relative	1				
29	R/W	Out3 Mode		28	56
		Selection	Value		
		Heat	0		
		Cool	1		
		Alarm	2		
Off Mode	3				
30	R/W	Control Action3		29	58
		Selection	Value		
		Pid	0		
		On-Off	1		
Blower TP	2				
31	R/W	Alarm3		30	60
		Selection	Value		
		End Alarm	0		
		Abs Low	1		
		High Alarm	2		
		In Band	3		
Abs Out Band	4				

57	R/W	MR		56	112
58	N/A	N/A		N/A	N/A
59	N/A	N/A		N/A	N/A
60	R/W	C PB		59	118
61	R/W	C ON		60	120
62	R/W	C OF		61	122
63	R/W	Auto Tune		62	124
		Selection	Value		
		No	0		
Yes	1				
64	R/W	Address		63	126
65	R/W	Baudrate		64	128
		Selection	Value		
		B 2400	0		
		B 4800	1		
		B 9600	2		
		B 19200	3		
B 38400	4				
66	R/W	Parity		65	130
		Selection	Value		
		None	0		
		Even	1		
Odd	2				
67	R/W	Data Type		66	132
		Selection	Value		
		Sign Integer	0		
Float	1				
68	R/W	Analog Output Type		67	134
69	R/W	RT Low Range		68	136
70	R/W	RT High Range		69	138
71	R/W	Control Mode		70	140
		Selection	Value		
		Forward	1		
		Reverse	0		
72	R/W	Low Percentage		71	142
73	R/W	High Percentage		72	144

Data type = Sign Integer show value as per following

Input	Actual Value	DP Selection
J,K,Pt	Value/1	Fix
Pt.1	Value/10	Fix
Where Parameter is 1,6-14,19,25,32,44-46,48,49,57,69,70		
0-10V DC	Value/1	0
	Value/10	1
0-20 mA DC	Value/100	2
4-20mA DC	Value/1000	3
Where Parameter is 5 ,20,26,33		
0-10V DC 0-20 mA DC 4-20mA DC	Value/10	Fix
Where Parameter is 4,51-53,72,73		
0-10V DC 0-20 mA DC 4-20mA DC	Value/100	Fix