PROCESS & TEMPERATURE CONTROLLER

MULTISPAN PTC- 382A-M1

TECHNICAL SPECIFICATION

INPUT SPECIFICATION:

Input Types	Input	Range
Thermocouple	J	0 to 600°C
	K	0 to 1200°C
RTD	PT-100	-99 to 400°C
	PT.1	-99.9 to 400.0°C
Voltage	0-10V DC	-1999 to 9999
Current	0-20mA DC	-1999 to 9999
	4-20mA DC	-1999 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 Count (FSD : full scale deflection)	

DISPLAY AND KEYS:

Display	4 digit,7 seg 0.8" RED or WHITE LED
Keys	SET, ENT,INC,DEC

DIMENSION:

Size	51.5 (H) x 98 (W) x 84 (D) mm
Panel Cutout	46 (H) x 92 (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
Alarm	High/Low/Inband/Outband/ Absolute Low/Absolute Outband

OUTPUT SPECIFICATION :

Relay Output	
Relay	2 nos.
Relay Type	1ST C/O (NO-C-NC) , 2ND C/O (NO-C)
Rating	5A ,230V AC/30 V DC
Analog Output	
4 to 20mA DC	
Transmitter supply	
24V DC	
Modbus Communication	
RS-485	

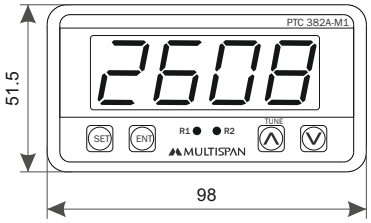
AUXILIARY SUPPLY :

Supply voltage	100 to 270V AC ,50-60Hz
Power consumption (VA RATING)	Approx 6 VA @ 230V AC MAX

ENVIRONMENT CONDITION :

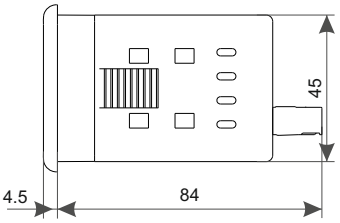
Operating Temp.	0°C to 55°C
Relative Humidity	UP to 95% RH (non-condensing)
Protection Level	IP-65 (Front side) As per IS/IEC 60529 : 2001

MECHANICAL INSTALLATION



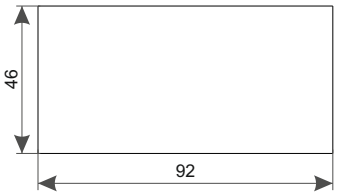
FRONT VIEW

All dimensions are in mm

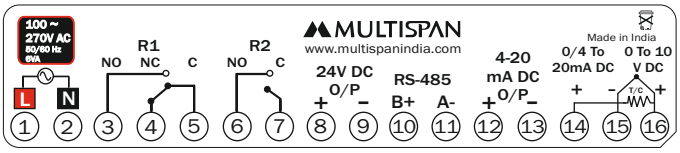


RIGHT SIDE VIEW

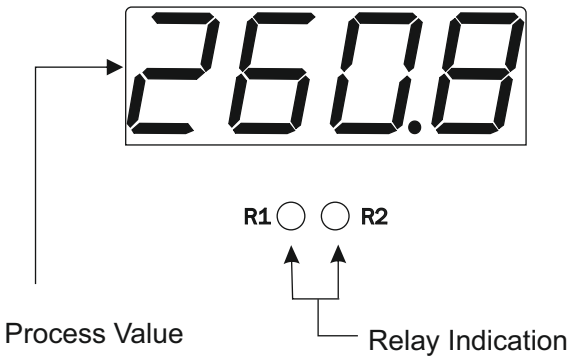
Panel Cutout



TERMINAL CONNECTION



DISPLAY INDICATION



KEY OPERATION

FUNCTION	PRESS KEY
OPERATOR MODE	
To enter in parameter setting	SET Press for 5 sec
For start/stop PID auto tuning	∧ Press 6 sec
To go in factory setting mode	∧ + ∨ Press 3 sec
To Reset soak process	ENT Long Press
PARAMETER SETTING MODE	
To set parameter value	SET
To increment parameter value.	∧
To decrement parameter value.	∨
Set parameter to be save & exit.	ENT

⚠ 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.

MECHANICAL INSTALLATION GUIDELINES

1. Prepare the panel cutout with proper dimensions as shown above.
2. Fit the unit into the panel with the help of clamp given.
3. The equipment in its installed state must not come in close proximity to any heating source, caustic vapors, oils steam, or other unwanted process byproducts.
4. Use the specified size of crimp terminal (M3 screws) to wire the terminal block. Tightening the screws on the terminal block using the tightening torque of the range of 1 N.m.
5. Do not connect anything to unused terminals.

MAINTENANCE

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

INSTALLATION GUIDELINES

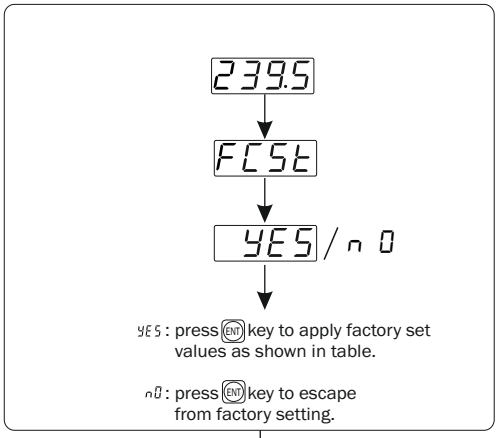
1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Do not allow pieces of metal, wire clippings, or fine metallic fillings from installation to enter the product or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. 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.
4. Use and store the instrument within the specified ambient temperature and humidity ranges as mentioned in this manual.

WARNING GUIDELINES

⚠ **WARNING : Risk of electric shock.**

1. 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.
2. To reduce electro magnetic interference, use wire with adequate rating and twists of the same of equal size shall be made with shortest connection.
3. Cable used for connection to power source, must have a cross section of $1mm^2$ or greater. These wires should have insulations capacity made of at least 1.5kV.
4. 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 (5Ω max per line) and no resistance differentials among three wires should be present.
5. 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

C.SEt	Controlling O/P Set Point
SEt 1	Set Point 1 For O/P 1
SEt2	Set Point 2 For O/P 2
LOU1	Low Set Point 1
HIG1	High Set Point 1
LOU2	Low Set Point 2
HIG 2	High Set Point 2
PASS	Password
InPt	Input (Sensor)
SLL	Set Low Limit
SHL	Set High Limit
OFSt	Offset
Pb	Proportional Band For PID Action
It	Integral Time Constant
dt	Derivative Time Constant
Ct	Cycle Time For PID Action
rr	Manual Reset
C-Pb	Cooling PB
C-On	Cooling On Time
C-OF	Cooling Off Time
HYS 1	Hysterisis 1

PARAMETER MESSAGE DESCRIPTION

HYS2	Hysterisis 2
OUt 1	OutPut 1 Mode
SOAP	Soak Time Select
SPrd	Soak Mode
SPUt	Soak Unit
SPtr	Soak Time Value
rEr0	Soak Time Memory
End	Soak Time End
Ctr 1	Control Action 1
OUt2	Output 2 Mode
Ctr2	Control Action 2
ALr 1	Alarm 1
ALr2	Alarm 2
S2rd	Set 2 Mode
r 1dL	Relay 1 Delay Time
r2dL	Relay 2 Delay Time
ALtr	Alarm Time
PI d	PID Action
OnOF	ON-OFF Action
bL.tP	Blower TP Action
HIGH	High Alarm
LOU	Low Alarm
Ot-b	OutBand Alarm
Ab-L	Absolute Low Alarm
In-b	In Band Alarm
Ab-O	Absolute Out Band Alarm
SEC	Second
rI n	Minute
HOUr	Hour
HEAt	Heating Mode
COOL	Cooling Mode
ALrr	Alarming Mode
OFF	OFF Mode
YES	Yes
n0	No
SAuE	Save
I ndI	Set 2 Individual to Set 1
rLtu	Set 2 Reletive to Set 1
FCSt	Factory Setting
AOUt	Analog Output
bASE	Basic Configuration
P.u	Retransmission O/P On PV
Su	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)
COn	Controlling Output

PARAMETER MESSAGE DESCRIPTION

LOPC	Low percentage
HI PC	High percentage
Frwd	Forword
rEvr	Reverse
Lrn9	Low Range for analog input
Hrn9	High Range for analog input
CrFC	Correction Factor for analog input
FLtr	Filter Time
SLL	Signal Low Limit for 4-20mA input
rLY1	Relay 1 parameter setting
rLY2	Relay 2 parameter setting
n.bUS	Modbus Parameter setting

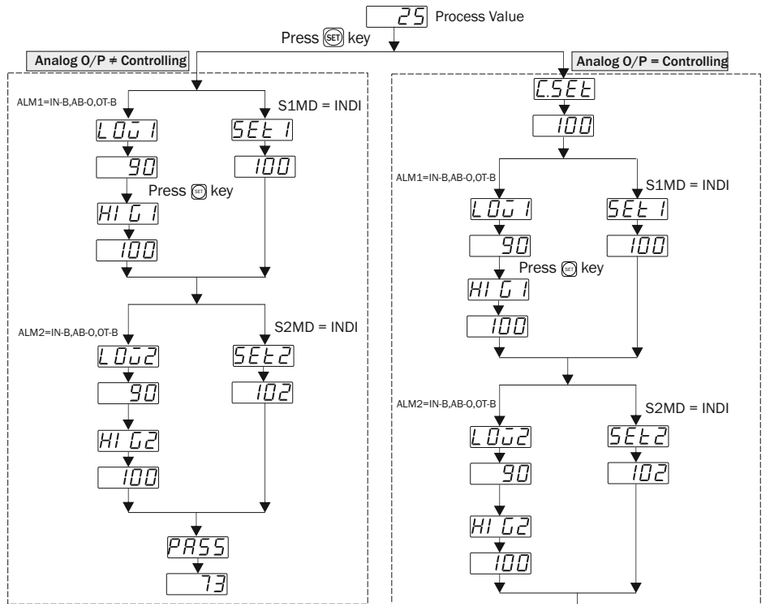
LOPC	Low percentage
HI PC	High percentage
Frwd	Forword
rEvr	Reverse
SPPS	Soak Passing
SPrG	Soak Remaining
SPtn	Soak Time Normal
Addr	Address
bAUd	Baudrate
PrtY	Parity
dAtA	Datatype

nOnE	None Parity
EvEn	Even Parity
Odd	Odd Parity
SI nt	Sign Integer
FLOt	Float datatype
CntL	Controlling Output
AUtO	Auto
Addr	Address
bAUd	Baudrate
PrtY	Parity
dAtA	Datatype

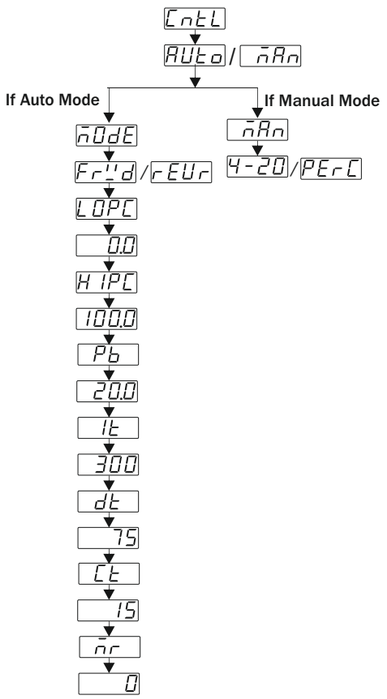
RANGE FOR CONTROL PARAMETER

SR.	PARAMETER	RANGE FOR J,K,PT-100	RANGE FOR PT.1	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	-0.099 to 0.099
				DP 2	-0.99 to 0.99
				DP 1	-9.9 to 9.9
				DP 0	-99 to 99
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	0.01to 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-OF	5 to 200 sec	5 to 200 sec	5 to 200 sec	
12	R1DL	0.00 to 99.59 mm.ss	0.0 to 99.59 mm.ss	0.00 to 99.59 mm.ss	
13	R2DL	0.00 to 99.59 mm.ss	0.0 to 99.59 mm.ss	0.00 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	

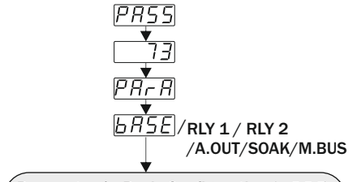
PARAMETER SETTING



To set Controlling Output Mode press ▽ + SET key



Password 73 Explanation

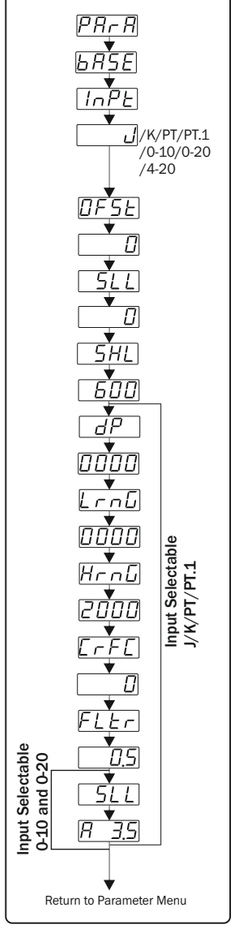


Parameter 1 : Basic Configuration (bASE)
Parameter 2 : Relay 1 (rLY1)
- Case 1 : Heat
- Case 2 : Cool
- Case 3 : Alarm
- Case 4 : Off

Parameter 3 : Relay 2 (rLY2)
- Case 5 : Heat
- Case 6 : Cool
- Case 7 : Alarm
- Case 8 : Off

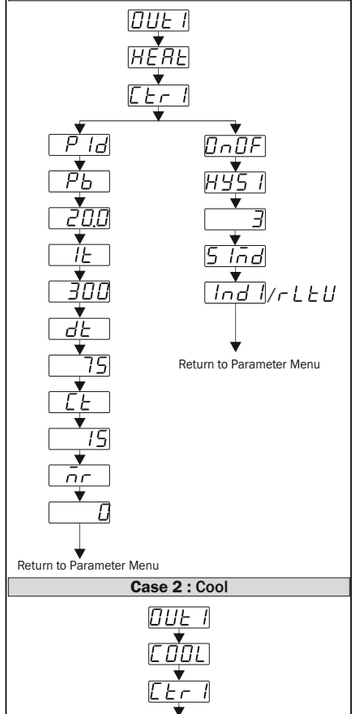
Parameter 4 : Analog Output (A.OUt)
Parameter 5 : Soak Timer(SOAK)
Parameter 6 : Modbus (n.bUS)

Parameter 1 : Basic Configuration (bASE)

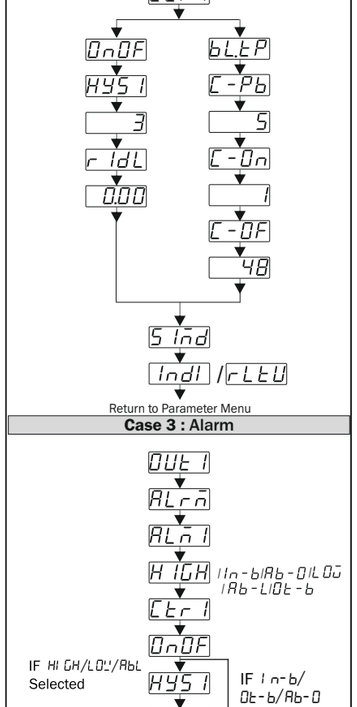


Parameter 2 : Relay 1 (rLY1)

Case 1 : Heat



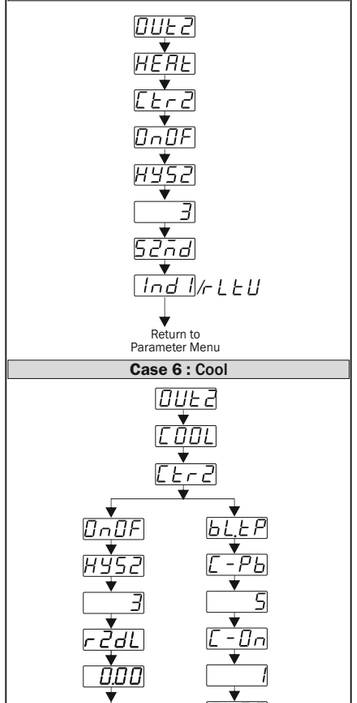
Case 2 : Cool



Case 3 : Alarm

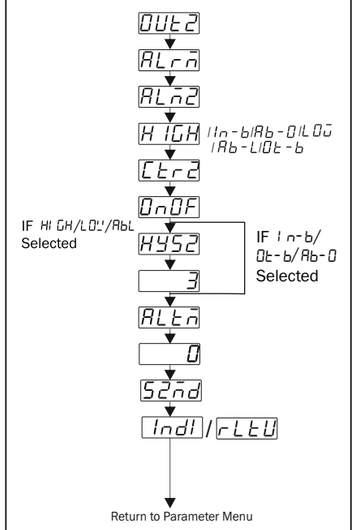
Parameter 3 : Relay 2 (rLY2)

Case 5 : Heat



Case 6 : Cool

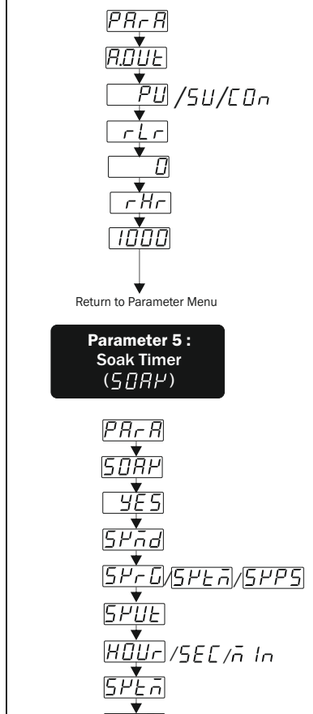
Case 7 : Alarm



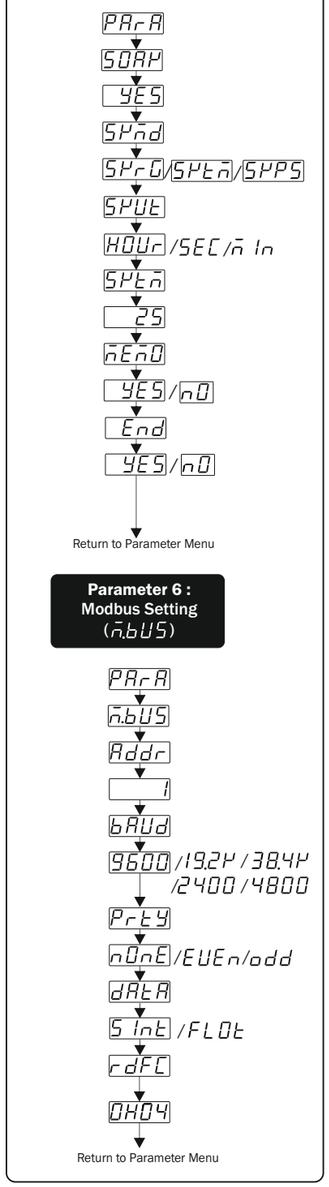
Note : In case 4 & 8 relay will be in off condition

Case 4 & 8 : OFF

Parameter 4 : Analog Output (A.OUt)



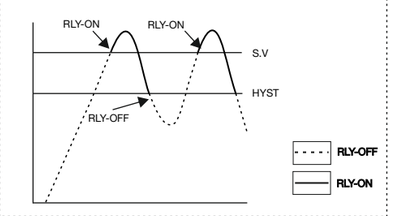
Parameter 5 : Soak Timer (SOAK)



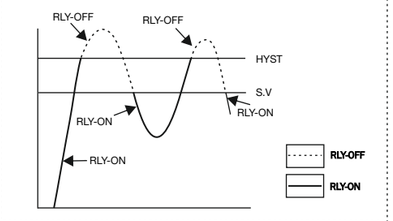
Parameter 6 : Modbus Setting (n.bUS)

CONTROL FUNCTION

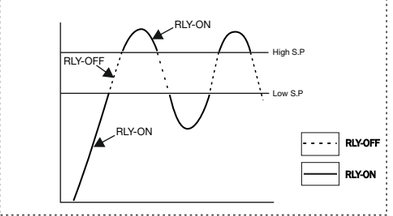
HIGH ALARM:



LOW ALARM:

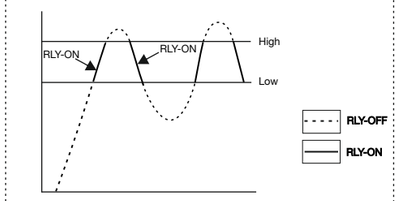


OUTBAND ALARM



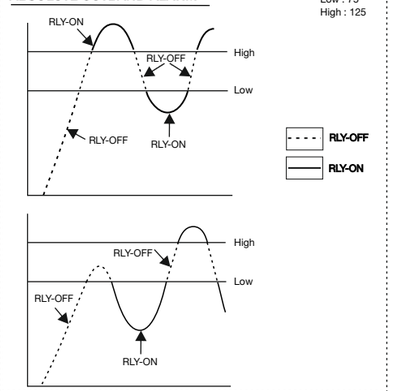
INBAND ALARM

Low : 75
High : 125

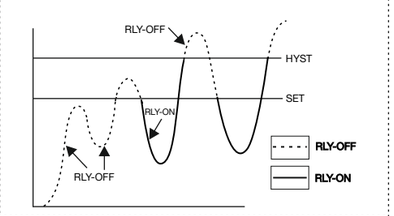


ABSOLUTE OUTBAND ALARM

Low : 75
High : 125



ABSOLUTE LOW ALARM



MODBUS

Slave Address :	1 to 127
Baudrate :	2400,4800,9600,38400bps
Parity :	None,Even,Odd
Datatype :	Sign integer, Float (32 Bit Little Endian Byte Swap)
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 Selection: On=1, Off=0	1	2
3	R	R2 Status Selection: On=1, Off=0	2	4
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 J=0, K=1, PT-100=2, PT.1=3, 0 - 10V DC=4, 0 - 20mA DC=5, 4 - 20mA DC=6	14	28
16	R/W	Relay1 Mode Heat=0, Cool=1, Alarm=2, Off Mode=3	15	30
17	R/W	Control Action1 Pid=0, On-Off=1, Blower TP=2	16	32
18	R/W	Alarm1 End Alarm=0, Abs Low=1, High Alarm=2, In Band=3, Abs Out Band=4, Outband=5, Low alarm=6	17	34
19	R/W	Hys1	18	36
20	R/W	Delay Time1	19	38
21	R/W	Alarm Time1	20	40
22	R/W	Relay2 Mode Heat=0, Cool=1, Alarm=2, Off Mode=3	21	42
23	R/W	Control Action2 On-Off=1, Blower TP=2	22	44
24	R/W	Alarm2 End Alarm=0, Abs Low=1, High Alarm=2, In Band=3, Abs Out Band=4, Outband=5, Low alarm=6	23	46
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 Relative=0, Individual=1	27	54
29	R/W	Relay3 Mode Heat=0, Cool=1, Alarm=2, Off Mode=3	28	56
30	R/W	Control Action3 On-Off=1, Blower TP=2	29	58
31	R/W	Alarm3 End Alarm=0, Abs Low=1, High Alarm=2, In Band=3, Abs Out Band=4, Outband=5, Low alarm=6	30	60
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 Relative=0, Individual=1	34	68
36	R/W	Soak On=1, Off=0	35	70
37	R/W	Soak Mode Soak Time Normal=0, Soak Pass=1, Soak Remaining=2	36	72
38	R/W	Soak Unit Sec=0, Min=1, Hour=2	37	74
39	R/W	Soak Time	38	76
40	R/W	Memory NO=0, Yes=1	39	78
41	R/W	End Save	40	80
42	R	Run Soak Value	41	82
43	R	Soak Status End=0, Run=1, Hold=2	42	84
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 0000=0, 000.0=1, 00.00=2, 0.000=3	46	92
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
57	R/W	MR	56	112
58	R/W	PB2	57	114
59	R/W	CT2	58	116
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 No=0, Yes=1	62	124
64	R/W	Address	63	126
65	R/W	Baudrate B 2400=0, B 4800=1, B 9600=2, B 19200=3, B 38400=4	64	128
66	R/W	Parity None=0, Even=1, Odd=2	65	130
67	R/W	Data Type Sign Integer=0, Float=1	66	132
68	R/W	Read function code 0H03=0, 0H04=1	67	134
69	R/W	Analog Output Type	68	136
70	R/W	RT Low Range	69	138
71	R/W	RT High Range	70	140
72	R/W	Control Mode Forward=1, Reverse=0	71	142
73	R/W	Low Percentage	72	144
74	R/W	High Percentage	73	146
75	R/W	Filter Timer	74	148

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 0-20 mA DC 4-20mA DC	Value/1	0
	Value/10	1
	Value/100	2
	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