

## TECHNICAL SPECIFICATION

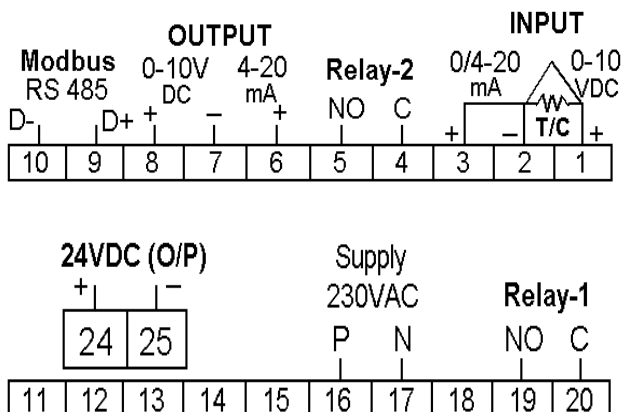
### INPUT SPECIFICATION:

Sr.	INPUT	Range
1	TC-J	0 To 700 °C
2	TC-K	0 To 1300 °C
3	TC-T	0 To 350 °C
4	TC-R	0 To 1650°C
5	TC-S	0 To 1650°C
6	TC-E	0 To 650°C
7	TC-N	0 To 1250°C
8	PT	-100 To 400°C
9	PT-1	-100.0 To 400.0°C
10	0-10VDC	-1999 To 9999
11	0-5VDC	-1999 To 9999
12	4-20mA	-1999 To 9999
13	0-20mA	-1999 To 9999
<b>Indication Accuracy</b>		±1% of FSD ± 1°C (FSD: full scale deflection)
<b>Resolution</b>		J,K,T,R,S,E,N,PT-100 = 1°C PT.1 = 0.1°C 0-10V DC,0-5VDC,0-20mA DC,4-20mA DC = 0.1,0.01,0.001,0001

### OUTPUT SPECIFICATION:

Analog Output	
Controlling Output	4-20mA DC/0-10VDC
Relay Output/ SSR Output (Factory Set)	
Relay/SSR	2
Relay Type	(NO-C)
Rating	Relay:10A, 230VAC/30V DC SSR: 12VDC,30mA
<b>24VDC Transmitter supply &amp; RS485 (Modbus)</b>	

### TERMINAL CONNECTION



### COMMUNICATION SPECIFICATION

Protocol	Modbus RTU Serial
Standard	RS - 485
Communication method	2 wire half duplex
Communication rate	9600,19200
Address range	1-127
Data type	Integer

### AUXILIARY SUPPLY:

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

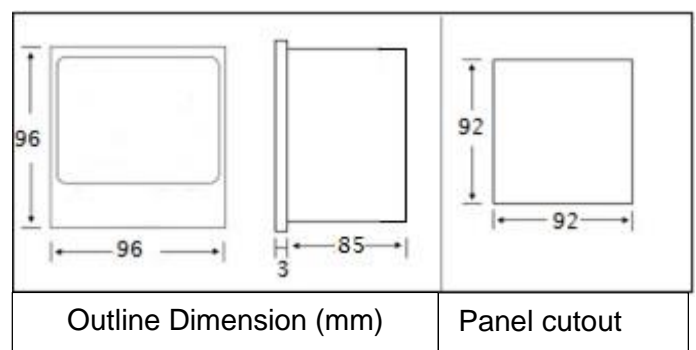
### ENVIRONMENT CONDITION:

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

### DIMENSION&DISPLAY:

Size	96(H) X 96(W) X 85(D)/ Cutout 92(H) X 92(W)
Display	128 x 64 Bit Graphical LCD

### MECHANICAL INSTALLATION



## MODBUS PARAMETER

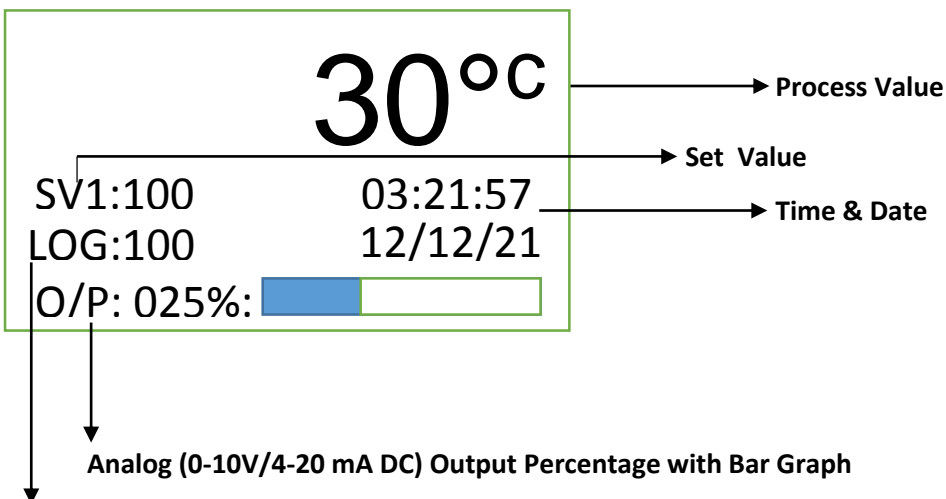
Read/Write	Parameter	Read Function Register(0x03/0x04) ADDRESS(INT)	Write Function Register (0x06/0x10) ADDRESS(INT)	REMARK
R	Process Value	40001/30001	-	
R/W	Set Value1	40002/30002	40002	
R/W	Set Value2	40003/30003	40003	
R/W	Set Value3	40004/30004	40004	
R/W	Retransmission Low Value	40005/30005	40005	
R/W	Retransmission High Value	40006/30006	40006	
R/W	Input*	40007/30007	40007	
R/W	Lower Range(0-10V,4-20mA)	40008/30008	40008	
R/W	Higher Range(0-10V,4-20mA)	40009/30009	40009	
R/W	OFFSET	40010/30010	40010	
R/W	CRFC(0-10V,4-20mA)	40011/30011	40011	
R/W	SSL	40012/30012	40012	
R/W	SHL	40013/30013	40013	
R/W	4-20 Output Action*	40014/30014	40014	
R/W	Relay1 Mode*	40015/30015	40015	
R/W	Relay2 Mode*	40016/30016	40016	
R/W	Hysteresis1	40017/30017	40017	
R/W	Hysteresis2	40018/30018	40018	
R/W	Hysteresis3	40019/30019	40019	

\*INPUT (Range: 0-12) 0:TC-J, 1:TC-K, 2:TC-T, 3:TC-R, 4:TC-S, 5:TC-E, 6:TC-N, 7:PT, 8:PT.1, 9:0-10V, 10:0-5V, 11: 4-20mA, 12: 0-20mA

\*4-20 Output Action (Range: 0-2) 0: ONOF, 1: PID, 2: Retransmission

\*Relay1/2 Mode (Range: 0-5) 0:HEAT,1:COOL,2:H-AL,3:L-AL,4:IB-A,5:OB-A

## DISPLAY PARAMETER



USB Data Log

LOG BLINKING (IF 90% Memory Used)

NOTE: IF LOG Memory is full then all previous data will be Deleted and Logging start again

## PARAMETER SETUP

Press Left (←) AND Right (→) key Enter into Parameter Menu

**Enter Password**  
**00000**

Press Up (↑) or Down (↓) Key to Change Value of Digit  
Press Left (←) or Right (→) key to Change Digit  
Press SET Key to Enter Password (Default Password 00000)  
Press ENT Key for Exit Menu

1.IO Setup  
2.USB COPY  
3.LOG Setup  
4.Communication

Press Up (↑) or Down (↓) Key to Select Menu  
Press SET Key to Enter Into Menu  
Press ENT Key for Exit Menu

1.IO Setup	6.PID Setup
2. Communication	7.Hystersis
3.Analog Input	8.OFFSET
4.Analog Output	9.Date & TIME
5.Relay Mode	10. Change Password

### IO Setup (Input-Output Setup):

**INPUT** : TC-J  
**OUTPUT** : 4-20mA  
**CONTROL**: PID

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

INPUT	TC-J,TC-K,TC-T,TC-R,TC-S,TC-E,TC-N,PT,PT-1,0-10VDC,0-5VDC,4-20mA,0-20mA
OUTPUT	0-10VDC,4-20mA
CONTROL	ONOF,PID,RT (Retransmission)

#### 4-20mA/0-10VDC Output Control Action:-

**ONOF:** 4mA/0 VDC when OFF, 20mA/10VDC when On [Heat mode]

**PID:** 4-20mA/0-10VDC Output according to PID equation

**Retransmission:** 4-20mA/0-10VDC output according to Retransmission Low Value -> Retransmission High Value

[Ex.1. Input (TC-J), RTLO (Retransmission Low Value) = 0 °C RTHI (Retransmission High Value) =200°C 0 °C->4mA,50°C->8mA,100°C->12mA, 150°C->16mA, 200°C->20mA.

Ex.2. Input (4-20mA), Low Range=0, High Range=1000,RTLO=0 & RTHI=1000 4-20mA Output according 4-20mA Input.]

#### PID Auto-Tuning

- The Auto-tuning function automatically computes and sets the proportional band (P), integral time (I), Derivative time (D), cycle time as per process characteristics.
- While Auto-tune is in progress, lower display alternate shows AT & set-point. Lower display stops alternating between AT & set-point at the completion of Auto-tuning.
- Press **UP (↑)** Key 6 sec. to start tuning .

## Communication:

SLAVE ID : 001  
BuadRate : 9600  
Parity : None

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

## Analog Input:

DECIMAL : 00.00  
LOW : 00.00  
HIGH : 10.00

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

## Analog Output:

Analog O/P Limit  
LOW(%) : 0  
HIGH(%) : 100

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

## Relay Mode

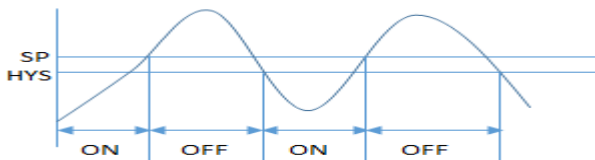
Relay Mode  
RELAY1 : HEAT  
RELAY2 : HEAT

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

Heat/COOL/HIGH-AL/LOW-AL/IN-BAND/OUT-BAND

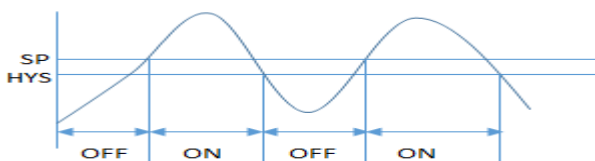
## Relay1 & Relay2 Operating Modes

- Heat Mode:



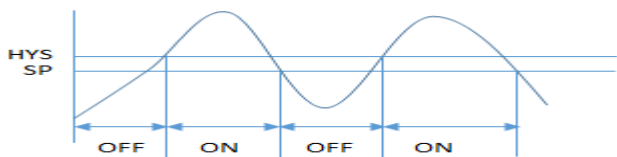
Initially Relay will be on condition. When Process value equals to Set Point Relay will turn off. When Process value equal to Set Point- Hysteresis then again Relay will be on.

- Cool Mode:



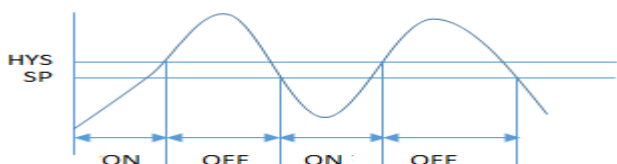
Initially Relay will be off condition. When Process value equals to Set Point Relay will turn on. When Process value equal to Set Point- Hysteresis then again Relay will turn off.

- High Alarm Mode [H-AL]:



Initially Relay will be off condition. When Process value equals to Set Point + Hysteresis Relay will turn on. When Process value equal to Set Point then again Relay will turn off.

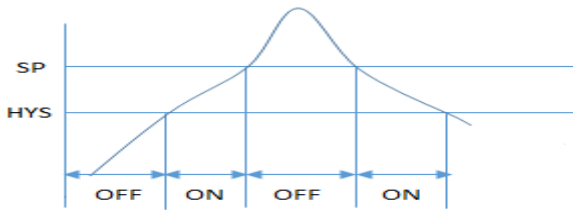
- Low Alarm Mode [L-AL]:



Initially Relay will be on condition. When Process value equals to Set Point + Hysteresis Relay will turn off. When Process value equal to Set Point then again Relay will turn on.

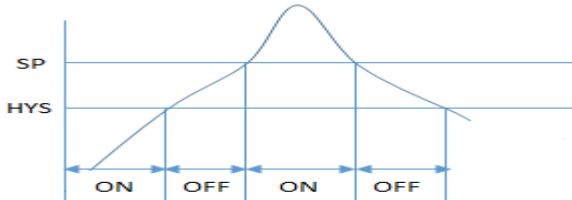
## Relay1 & Relay2 Operating Mode

- In Band Alarm Mode [IB-A]:**



Relay will be on between Set point & Hysteresis condition. If Set Point=100 & Hysteresis=3 than Relay on between 97to100.

- Out Band Alarm Mode [OB-A]:**



Relay will be off between Set point & Hysteresis condition. If Set Point=100 & Hysteresis=3 than Relay off between 97to100.

### PID Setup

PB :30.0  
IT :240  
DT :60  
CT :20

Proportion Band
Integration Time
Derivative Time
Cyclic Time

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

### Hysteresis

HYS1 : 00.00  
HYS2 : 00.00  
HYS3 : 10.00

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

### OFFSET

OFFSET:0000

Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

### Date & Time

DATE :29 HOUR:22  
MONTH:12 MIN:20  
YEAR :20 SEC: 20

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Change (Date & Time)  
Press ENT Key for Exit Menu

### Change Password

Enter Password  
00000

#### Enter Current Password

Press Up (↑) or Down (↓) Key to Change Value of Digit  
Press Left (←) or Right (→) key to Change Digit  
Press SET Key for Enter Value or Press ENT Key for Exit Menu

Set New Password  
00000

#### Set New Password

Press Up (↑) or Down (↓) Key to Change Value of Digit  
Press Left (←) or Right (→) key to Change Digit  
Press SET Key for Enter Value

## SET POINT SETUP

Press SET Key Enter into Set-Point Menu

**IF 4-20mA/0-10VDC-O/P Control Action: ONOF/PID**

**SetValue1 : 100**  
**SetValue2 : 105**  
**SetValue3 : 110**

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu

**IF 4-20mA/0-10VDC-O/P Control Action: Retransmission**

**RT-LOW :100**  
**RT-HIGH :600**  
**SetValue2 :105**  
**SetValue3 :110**

Press Up (↑) or Down (↓) Key for Select Menu  
Press Left (←) or Right (→) key for Desire Value  
Press SET Key for Enter Value  
Press ENT Key for Exit Menu