

ANNEXURE –I TO PI 830691061

1) ITEM NO 1
Specification of Panel Mounted Paperless recorder:

S No	Characteristics	Specification
1	Screen size	12.1” (inches)
2	Number of Input	48 channel
3	Input signal type	Universal input Thermocouple, RTD .0mA to 20 mA / 4 mA to 20 mA, Ma, V, ohms
4	Display Rate	1mm/hr to 6000mm/hr
5	Scan Rate	20ms(linear input)
6	Data storage	Removable Compact flash & USB storage
7	Accuracy	0.1% typical Thermocouple
8	Internal memory	70 MB
9	USB Interface	Two number USB Port one at front and one at rear
10.	Display	Colour LCD (Active TFT) SVGA
11.	Math Function	Full (Block) Math
12.	Communication	Ethernet Connectivity – the Ethernet (DHCP standard) connection, with support for various protocols provides unlimited connectivity to local area network (LANs). The standard Ethernet interface makes networking of the recorder to a LAN or the world wide fast and convenient. Modbus master enables the recorder to communication with upto 32 stave devices on both Ethernet and RS 485 SNTP- The recorder can be synchronized over the Ethernet networks via a SNTP client or synchronies other recorders via a server. Web Server –with the recorder connection to a LAN, all process variables, alarm and messages can be viewed from an internet browser values are automatically refreshed.
13	Chart Type	Electronics
14	Front Face Protection Rating	IP 66 – NEMA 4 X
15	Product configuration	Touch screen
16	Instrument Power	90 Vac to 240 V ac
17	Totalizer	Each pen can be associated with a totalizer. The totalized values can be displayed and recorded. Multiple totals can be calculated out of the same variables (weekly, monthly etc). The totalizer function can handle Fo and Po sterilization

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		calculation) Microsoft Office Word 2003.Ink
18	Mounting	Panel
19	Alarm	4Relay NO/NC 24V/1A
20	Noise Rejection	Common Mode – 120 dB
21	Software	Real time viewing and archiving of data with communication
22	Qty	02 No.

2) ITEM NO 2: Auto tune PID Controller

Two Universal input
 Upto 5 setpoints, 4~20 mA + 4 relays
 Isolated 2 x 0/4~20 mA or 0-10 V DC for control /retransmission output:
 RS485 / MODBUS RTU
 85~265 V AC SMPS
 Autotuning : From cold start
 At setpoint
 Auto / Manual selection
 PID, Proportional and ONOFF control
 PID versions
 - Standard analog control output
 Operating Temperature range Ambient to 200 deg C

INPUT

No. of inputs 2 (input 1, input 2)
 Input group 1(common for both inputs)
 RTD: Pt100, 3-wire
 Input group 2(common for both inputs)
 RTD: Pt100, 3-wire, Cu53
 Transmitter supply (VTX) 22 V nominal, 30 mA max
 Cold junction compensation: Automatic
 Sensor break protection: User programmable

REMOTE SET POINT

Function: when configured, input2 functions as a remote set point input
 Input signal: 4~20 mA
 Range: User programmable
 Display: Middle display

INDICATION

Upper: 4 digit, 7 segment, 0.56” (14.2 mm) red LED display
 Middle: 4 digit, 7 segment, 0.56” (14.2 mm) green LED display
 Lower 3 digit, 0.39” (9.9 mm) red LED display
 Status indication
 LEDs for relay status
 LEDs for set point indication
 LED for auto/manual power status
 LEDs for communication

OUTPUT

No. of relays: 4



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Relay contact type NO-C-NC

Relay contact rating 5A / 230V AC, resistive

No. of analog outputs 2 (current)

Current output 4~20 mA isolated from input

Maximum load for current output 500 ohms

ERROR: 0.1% of the full-scale

AUTO/MANUAL OPERATION

Function Output power is increased / decreased by UP/DOWN keys in manual mode

Auto / Manual transfer Bumpless

COMMUNICATION

Port RS485

Protocol Modbus RTU

Slave ID User programmable (1~247)

ISOLATION

Mutual isolation between input, Supply, relays, analog output, RS485 1500 VAC RMS, 50 hz / 1minute

PROGRAMMABLE PARAMETERS

Set point Full range

Unit °C, °F, EU

Resolution User selectable

0.01 for linear input,

0.1 for temperature

High scale Full range

Low scale Full

Digital filter A (minimum) ~ F (maximum)

Hysteresis (ONOFF control) 0~25% span

Offset -50 to 50% of range limit

Band (P) 0.1~999.9%

Integral time (I) off, 1~9999 seconds

Derivative time (D) Off, 1~9999 seconds

Cycle time for SP1/SP2 1~640 second

Upper limit for output power 0~100%

Lower limit for output power 0~100%

Electromagnetic relays trigger heating, cooling or any of 6 types of alarms - full-scale high/low, deviation high/low, in band and out band. It also retransmits an isolated output signal to other devices such as a Programmable Logic Controller (PLC). Signal isolation protects devices and machines downstream of instruments from damaging fluctuations in the input signal.

Alarm types Self reset or latched and can be disabled at power on

Alarm acknowledge Front panel function used to reset relay in alarm condition

Set point lock ON, OFF

Level lock ON, OFF

Relay action Reverse / direct

Programming through 3 tactile keys

Dimensions (in mm) 96(H) x 96(W) x 100(D)

Mounting Panel mount

Panel cutout 92 x 92 mm

Supply voltage a) 85~265 V AC, 50/60 Hz


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Power consumption 4 watts maximum
Operating ambient temperature 0~50 °C
Relative humidity below 90%, non-condensing
Qty=02 nos

3)ITEM NO 3

Specification of Control Valve:

Double acting actuator operated Pneumatic diaphragm type control valve for regulating duty and for steam applications

Actuator data

Actuator: Liner spring type Pneumatic diaphragm

Diaphragm cover : Sheet metal pressing

Diaphragm: Nitrile rubber

Inlet air supply: 2.5 to 4 kg/cm²

Stem movement: Reversible

Actuator action: Air to open

Spring action: closed (Plug to seat)

Air fail position closed (Normally closed)

Body : SS316

Trims : SS 316

Ends : Flanged

Working Pressure : 40 Kg/cm²

Working Temp : 150 Deg C

Size : 1"

Qty. : 04 Set.

Each set comprising following accessories.

Accessories of valve:

3.1 Pressure Gauge: Dial size -4", range 0 to 10kg/cm², bottom mounting, connection – 3/8"BSP

3.2 Filter Regulator combination

Body –aluminum die cast

Bowl – P.C.bowl

Element – 5 micron

Operating pressure – up to 10 kg/cm².

Size – 1/4"BSP

4)ITEM NO 4

Positioner

Smart electro pneumatic valve positioner with 4 – 20 mA position feedback transmitter

Input; 4 to 20mA

Output: 3 to 15psi

Input Signal=4~20 mA DC

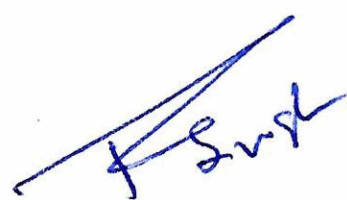
Supply Air Pressure: =20~100 psi Max. (7.0 kgf/cm²)

Standard Stroke=10~80mm

Air Piping Connection=1/4" NPT

Ambient Temperature:-20° to 70° C

Degree of Protection=IP 66



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Out Put Characteristics Linear / Rotary

Material Aluminium Die Cast Body

Conduit Connection=1/2" NPT

Quantity – 02 nos

5) ITEM NO 5

RTDs : RTDs (10 Nos) each having 10 Meter wire length

Qty=10 Nos

6) ITEM NO 6: PANEL

Specification of Panels:-

6.1) Panel will be completely metal enclosed and will be dust, moisture and vermin proof. Panel enclosure will provide a degree of protection IP 42 as per IEC.

6.2) Panel will be free standing, floor mounting type and will be suitable for indoor installation.

6.3) Panel will comprise of rigid welded structural frames enclosed completely with specially selected smooth finished, cold rolled sheet steel of thickness not less than 3mm for the front and rear portion and 2mm for sides, top and bottom portions. Doors will be on rear side and hinged.

6.4) Rear door, removable covers and panels will be gasket all around.

6.5) Cable entries to the panels will be from the bottom

6.6) Component Mounting: All equipment on front/back of panel will be mounted flush or semi flush. In case of semi-flush mounting, only flange or bezel will be visible from the front.

6.7) Panel will be provided with cubicle illumination lamp. In each panel, one 3-pin 10 Amp industrial type power plug along with control switch will be provided for extending 240V AC supply. Panel will be provided with one earth bus of size 25 x 3 mm (minimum). The earth bus will be tinned plated copper, and all metallic cases of instruments etc will be connected to this earth bus independently for their effective earthing

6.8) Quantity – 02 nos

7) Scope of work:- Complete erection, installation and commissioning of above items and proving of process parameters to our satisfaction will be in suppliers scope of work. The scope of work shall involve:

7.1) Dismantling of existing panels, instruments and valves.

7.2) Installation of new thermocouples and RTDs

7.3) Laying of complete wiring in conduits with proper dressing

7.4) Erection of new panels: Termination of all control wiring

7.5) Installation of recorder and accessories, commissioning and demonstration of complete system for one complete heating process of Transformers and doing corrections, if called for.

7.6) The material will be inspected by BHEL Engineers at Suppliers works before dispatch to ensure the material is being furnished in accordance with this specification. BHEL shall have the right to test the material at our works and the final acceptance of the material shall be based on these test results.



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7.7) The equipment will be unconditionally guaranteed for 12 months against any manufacturing defect/faulty workmanship from the date of supply and no charge shall be levied for the visit during the guarantee period.



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