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प्लाज़्मा अनुसंधान संस्थान
INSTITUTE FOR PLASMA RESEARCH
परमाणु ऊर्जा विभाग, भारत सरकार का एक सहायता



प्राप्त संस्थान
An Aided Institute of Department of Atomic Energy,
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ENQUIRY

ENQUIRY NO : IPR/EQL/19-20/128

Date : 25-06-2019

Due on : 25-07-2019 by 1:00 PM IST

Please send your offer in sealed envelope specifying Enquiry No, Date & Due Date,
ALONG WITH your credentials for the following items:

Important Note:

Please note that e-mail quotations are not acceptable however you may send your queries (if any) to localpurchase@ipr.res.in

Please ensure your sealed quotation reaches this office not later than above mentioned due date and time.

Kindly go through the following documents properly before quoting which are available on the IPR web portal i.e., http://www.ipr.res.in/documents/tender_terms.html / attached herewith.

- 1) Instructions to the bidders & Terms and conditions (refer Form No: **IPR-LP-01.V4**)
- 2) Bidding format

GST for Goods and Services (IGST/CGST/SGST TAX BENEFITS): Please refer **clause no: 8** of Form No: **IPR-LP-01.V4**

QUOTATION SHOULD BE ADDRESSED TO PURCHASE OFFICER ONLY

Sr No	Description	Quantity
1	Three phase variable power controller Panel for hydrogen isotopes extraction from Liquid Pb-Li experimental Loop	1.0 Nos.

- Note:
1. Please quote with complete technical details (Technical compliance sheet and product data sheet).
 2. As per the provisions mentioned under Section No. 51

of the CGST Act 2017, TDS @ 2% (IGST 2% or CGST 1% and SGST 1%) will be deducted while making payment to the suppliers where total value of the purchase order/contracts/work orders exceeds Rs.2.5 Lakhs.

Necessary TDS Certificate will be issued to the supplier after TDS deduction.

3. Delivery within 12 weeks

Encl: As Per Attachment

Sd/-

Mr. D. Ramesh
Purchase Officer-II

Information to Vendors: We are working towards a single platform for our future requirement. Hence, please refer IPR website i.e, <http://www.ipr.res.in/documents/tenderseng.html> for our future requirement.

Three phase variable power controller Panel for hydrogen isotopes extraction from Liquid Pb-Li experimental Loop

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1 Introduction

The three phase variable power Controller Panel should be capable of controlling 3 individual Lead Lithium tanks heaters of 15KW capacity using variable power control based control system and will be operating on 3 phase supply.

This control panel should have 3 no's PID controllers, 3 no's of isolated temp transmitters, 3 no's of three phase variable power controller and other accessories integrated in single panel. The control panel should be operated in both auto and manual control modes. In auto mode, the power output to heating element is controlled by PID controller, while in manual mode the power output to the heating element is controlled manually using external potentiometer. Finally, control panel should be interfaced with the computer for remote operation.

2 Scope of Supply

2.1 Hardware Deliverables

S. No.	Item Description	Qty.
1	Microprocessor based PID temperature controller	3 No.
2	Isolated Temperature Transmitter	3 No.
3	Three phase variable power controller	3 No.
4	Control panel with other accessories	1 No.

Table 1: Hardware Deliverables

2.1.1 Microprocessor based PID temperature controller specifications (03 nos.)

S. No.	Parameters	Specifications
1	Input	Universal Type (all thermocouples, Pt 100, mV or mA) - Factory set for 4-20 mA input from Isolated Temperature Transmitter
2	Range	RT - 1200 °C for K type
3	Alarm Output	2 relay output for alarm
4	Resolution	1 deg.C.
5	Measuring Accuracy	For K type: ± 1 deg.C.
6	Control output	4-20 mA isolated
7	Control action	PID/ON-OFF (For Analog Output only PID, for pulse Output PID or ON-OFF selectable)
8	Tuning	Auto / Manual tuning of PID values
9	Setting	Setting using front panel membrane keyboard to set the PID values, set values alarm values, hysteresis and band values
10	Display	3 ROW display to display Process Value - 4 digit, 7 segment: red LED display Set Value - 4 digit, 7 segment: green LED display % Output – 3 digit, 7 segment: red LED display
11	Memory backup	Required
12	Over Range indication	Required
13	Communication	RS485 MODBUS
14	Operation Modes	Auto/Manual
15	Operating temperature	RT - 50 °C, 0~95% RH
16	Supply	230 V AC, 50-60 Hz.
17	Interfacing	All the PID controllers should be interfaced with the PC with provision to set all the parameters from PC.
18	Communication cable	20 meter of communication cable should be provided. Any signal converter/adaptor also to be supplied, If required.

2.1.2 Isolated Temperature Transmitter

S. No.	Parameters	Specifications
1	Input	Universal Type: Thermocouple : K – Type, RTD : Pt100, 0~50 mV, 0~100mV, 0~500mV, 0~1V Factory Set : K type thermocouple {Range 0 – 1200 deg.C}
2	Output	4 - 20mA isolated output to PID controller
3	Accuracy	For K – type : ± 0.2% of span. For Pt-100-3 wire : ±0.2 % of span For linear analog input : ±0.2% of span
4	Isolation between input / output	1500 V AC RMS for 1 minute / 250 V AC RMS continuous
5	Mounting	DIN rail mounting
6	Operating temperature	RT - 50 °C, 0~95% RH
7	Calibration	On site calibration and Input type setting should be possible Using PC software

2.1.3 Three phase variable power controller for 15KW resistive heater load

S. No.	Parameters	Specifications
1	Control input	0-5VDC, External Potentiometer for manual mode, 4 – 20mA for auto mode
2	Control method	Phase angle control & Zero crossover {FIELD SELECTABLE}
3	Limiting feature	Current / voltage limit & firing angle limit.
4	Output voltage	0-230 VAC w r t star point { no neutral } and proportional to control input
5	Maximum Operating	35 Amps per phase

	load current	
6	Ramp up/down and max/min power	Adjustable on board single turn presets
7	Control range	0 to 100%
8	Starting Type	Soft Start Variable 1~50 sec.
9	Output Limit	0% to 100% adjustable through preset
10	Indication	For Output Indication
11	Safety feature	Required
12	Type of Load	Resistance Heater
13	Supply	440 V \pm 10% , 50Hz
14	Auxillary supply	230VAC

2.1.4 Control Panel with other accessories (1 Panel)

Microprocessor based PID temperature controllers, Single Phase Thyristor power packs and 2-wire temperature transmitters should be integrated in single panel as per above specifications.

S. No.	Item Description	Qty.
1	3 Pole MCCB for Incoming Supply	1
2	R Y B Phase indicating lamp for Incoming supply	1
4	CT of desired rating	3
5	ON-OFF Switch for Instruments	3
6	2 Pole, 6 A MCB for control Supply	3
7	Isolation Transformer 415VAC/230VAC for Controller	1

8	3 Pole MCCB for Thyristor Supply	3
9	Digital Current meter	9
10	PID Controller (230VAC)	3
11	Signal Isolator	3
12	Variable Power controller	3
13	Isolator contactor of rating 50A	3
14	Auto / off / manual mode selector switch.	3
15	Heaters ON/OFF switch	3
16	Heater ON/OFF indicator	3
17	Potentiometer	3
18	On delay Timer for power ON/OFF surge protection	1
19	Hooter/Buzzer common for all with acknowledgment	1
20	Alarm Indication	3
21	Service Socket	1
22	Panel fan with filter	1
23	Panel Tube Light with door Switch	1
24	AL Busbar	1
25	2.5 sqmm, normal terminals (Approx.)	1
26	Power & control wiring	1
27	Panel fabrication & finishing	1

3 Scope of Work

3.1 Interface with Computer

All the three PID controllers should be interfaced with the PC with provision to set all the parameters from the Personal Computer. The interface should be developed to perform following

- Configure the COM (communication) port settings
- Setting of log interval
- Setting of security passwords
- Viewing of current data and historical data in the tabular and graphical format.
- The logged data should be stored in computer hard-disk, by start date and start time wise continuously at the rate of programmed log interval.
- All the PID controller parameters to be stored in the computer.
- Print out of the report and graph can be taken for the selected channel, with real time and date.

3.2 Site Acceptance Test (SAT)

S. No.	Site Acceptance Test	Result (P/F)
i	All the individual units should be tested individually at IPR.	
ii	The complete integrated system will be accepted only after all the units are tested at IPR. The whole test setup will be provided by the IPR.	
iii	The test should contains <ul style="list-style-type: none">• Temperature reading from the thermocouple,• Control output signal from the temperature controller with different set points,• Output current from the thyristor controller with different set points,• The test should be done in both manual and auto mode and• Ensure that all the switches on the panel are working properly or not.	
iv	Test Certificate for the hardware deliverables.	

3.3 Training

The vendor has to provide end user training on the configuration, operation and maintenance of the supplied system to IPR's engineers at IPR Campus.

4 Acceptance Criteria

The delivered system shall be accepted after successful completion of following

- Inspection for visual damages and verification of the Bill of Material against mentioned specifications.
- Successful completion of SAT.
- Delivery of documentation, SAT programs and manuals.
- Completion of training.

5 Warranty/Guarantee

5.1 The Vendor has to provide a free support and maintenance for a period of one year.

5.2 The vendor should provide a Warranty / Guarantee for the instruments will be a period of one year from the date of installation & commissioning.

