



प्लाज्मा अनुसंधान संस्थान
INSTITUTE FOR PLASMA RESEARCH
 परमाणु ऊर्जा विभाग, भारत सरकार का एक सहायता प्राप्त संस्थान
An Aided Institute of Department of Atomic Energy,
Government of India



इन्दिरा पुल के पास, भट, गांधीनगर – 382 428 भारत
 दूरभाष: (079) 2396 2020/2021/2028
 फैक्स: 91-079-23962277
 वेब: www.ipr.res.in

NEAR INDIRA BRIDGE, BHAT
 DIST. GANDHINAGAR - 382 428 (INDIA)
 Phone: (079) 2396 2000/2026/2332
 Fax : 91-079-23962277
 Web : www.ipr.res.in

ENQUIRY

ENQUIRY NO : IPR/EQF/18-19/092
 Date : 18-07-2018

Due on : 23-08-2018 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 which we are interested to import directly against Foreign Trade Policy 2015-2020.

Important Note:

Please note that e-mail quotations are not acceptable however you may send your queries (if any) to importpurchase@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-FP-01.V3**)
- 2) Bidding format

GST for Goods and Services (IGST/CGST/SGST TAX BENEFITS): Please refer **clause no: 14** of Form No: **IPR-FP-01.V3**

QUOTATION SHOULD BE ADDRESSED TO PURCHASE OFFICER ONLY

Sr No	Description	Quantity
1	RF generator, frequency 13.56 MHz, power 1200 Watt, impedance 50 Ohm, other specifications as per attached sheet	1.0 Nos.
2	RF matching network for matching of 1200 Watt, 13.56 MHz, 50 Ohm RF source with plasma load. Detailed specification sheet attached.	1.0 Nos.

Note: Please quote with complete technical details (Technical compliance sheet and product data sheet).
 Payment will be made as follows :-
 - Through Letter of Credit :- The L/C will be established for 90% value of purchase order will be paid against presentation of shipping documents.
 - Through Wire Transfer : 10% payment will be paid through wire transfer after receipt and final acceptance of the item/s at IPR site and on submission of performance Bank Guarantee

Encl: for 10% of the order value, valid throughout warranty period.
Refer attached sheet for detailed technical specification.

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/tendersenq.html> for our future requirement.

Specifications for RF Matching Network for Plasma Load**(All specifications are typical unless otherwise specified)**

Sr. No.	Description	IPR Specifications	Vendor's Specifications
1.	Frequency	13.56 MHz \pm 0.05 %	
2.	Input power	2.5 kW	
Unit with DC Input (preferable – 1 st preference or whichever is cheaper)			
3.	DC Input Power	24 VDC nominal \pm 10 %	
4.	DC Input Current	4.0 A maximum	
5.	DC Input Idle Current	\leq 2.0 A	
Unit with AC Input (2 nd preference or whichever is cheaper)			
6.	AC Input Power Voltage	230 V, \pm 10 %, single phase	
7.	AC Input Frequency	50 Hz	
8.	AC Input Current	\leq 1.4 A	
Other Common Specifications irrespective of Input Power Type (AC/DC)			
9.	Reflected power	5 Watt or 1 % maximum of forward power from 30W to 2500 W whichever is greater	
10.	Input impedance	50 Ohm nominal	
11.	Tuning time	\leq 10 seconds end to end	
		\leq 5 seconds from proper pre-set point to matched condition	
12.	Tuning range	Resistance: 1 – 40 Ohm or better Reactance: -30 Ohm to +40 Ohm Or better	
13.	Settling time	\leq 5 second (as the time for match network to re-establish a return loss \leq -20 dB when the load reactance is shifted sufficiently to introduce an instantaneous rise in the return loss to -10 dB)	

14.	Stability	There should be no oscillation of capacitor position for any stable load	
15.	Automatic/Pre-set threshold	For incident power ≤ 10 W, relative position of each tuning element remains in pre-set position For incident power ≥ 20 W, unit should remain in automatic tuning mode	
16.	RF output connector	7-16 DIN Female/ B20N Female or similar	
17.	RF input connector	N – Female or similar	
18.	Mode of Operation	Auto and Manual both	
19.	Cooling	Air Cooled	
20.	Operating temperature	+5 ⁰ C to + 40 ⁰ C	
21.	Relative humidity	≤ 80 %	
22.	Acceptance criteria	The vendor or its representative will demonstrate at IPR that the system works as per the specifications of IPR shown above. Only after that, acceptance will be given. IPR will provide the required facilities for testing which will be finalised with mutual consultation once the order is placed. Acceptance criteria sheet is attached along with.	

Acceptance Criteria for RF Matching Network for Plasma Load:

The following tests will be performed on the system and system should pass the test as per the following criteria:

Sr. No.	Description	Required Value / Specifications as per IPR Enquiry	Tested Value of the System	Acceptance Status (Accepted / Not Accepted)
1.	Frequency	The system should be able to do matching in the frequency range of 13.56 MHz \pm 0.05 %		
2.	Input power	The system should be able to withstand 2.5 kW		
Unit with DC Input (preferable – 1 st preference or whichever is cheaper. IPR will provide the DC source)				
3.	DC Input Current	DC input current should not exceed 4.0 A		
4.	DC Input Idle Current	DC input idle current should not exceed 2.0 A		
Unit with AC Input (2 nd preference or whichever is cheaper)				
5.	AC Input Current	System should not draw more than 1.4 A current		
Other Common Specifications irrespective of Input Power Type (AC/DC)				
6.	Reflected power	Reflected power should be 5 Watt or 1 % maximum of forward power from 30W to 1200 W whichever is greater		
7.	Input impedance	Input impedance of the system should be 50 Ohm nominal		
8.	Tuning time	Tuning time should be \leq 10 seconds end to end and		
		\leq 5 seconds from proper pre-set point to matched condition		

9.	Tuning range	System should be able to match the impedance as per following range: Resistance: 1 – 40 Ohm or better Reactance: -30 Ohm to +40 Ohm Or better		
10	Settling time	The settling time should be \leq 5 second (as the time for match network to re-establish a return loss \leq -20 dB when the load reactance is shifted sufficiently to introduce an instantaneous rise in the return loss to -10 dB)		
11	Stability	There should be no oscillation of capacitor position for any stable load.		
12	Mode of Operation	The system operation will be checked in both Auto and Manual operation.		
13	Operating temperature	The system will be checked for operation between +5 ⁰ C to + 40 ⁰ C		
14	Relative humidity	System will be checked during any period of time during one year of warranty period for 10 - 80 % humidity. If system fails or deteriorate the performance, the supplier shall have to rectify the same or replace the system without any cost to IPR		

RF Power Source**(All specifications are typical unless otherwise specified)**

Sr. No.	Descriptions	IPR Specifications	Vendor's Specifications
1.	RF Frequency	13.56 MHz \pm 0.05%	
2.	RF Power	1200 Watt	
3.	Load impedance	50 Ohm	
4.	Delivered power into mismatch load	16 % of nominal power	
5.	Maximum reflected power	200 Watt	
6.	Harmonics into matched load at full rated power	30 dB down or better	
7.	Spurious output signal	50 dB below the RF output	
8.	RF Power regulation	2 % of set point or 0.2 % of full rated power whichever is greater	
9.	RF Power stability	2 % of set point or 0.2 % of full rated power whichever is greater	
10.	RF pulse frequency	10 Hz to 10 KHz	
11.	RF pulse duty cycle	10 % to 90 %	
12.	Cooling	Air cooled	
13.	Operating temperature range	5 ^o to 35 ^o C or better	
14.	Operating relative humidity range	10 - 80 % or better	
15.	Minimum output power	20 Watt or less	
16.	Efficiency	55 % or better from load to line at full rated power into match load	
17.	Power factor	90 % or better at full rated power, mid-frequency and nominal line into 50 Ohm load	
18.	AC input voltage	230 V AC \pm 10 %, single phase	

19.	AC line frequency	50 Hz	
20.	Front panel display	LCD graphics display or better technology	
21.	RF output connector	N-type female	
22.	AC input power connector	Indian standard	
23.	Matching interface	System should have facility for interfacing with matching network	
24.	Acceptance criteria	The vendor or its representative will demonstrate at IPR that the system work as per the specifications of IPR shown above. Only after that acceptance will be given. IPR will provide the required facilities for testing which will be finalised with mutual consultation once the order is placed. Acceptance criteria sheet is attached along with.	

Acceptance Criteria for RF Power Source:

The following tests will be performed on the system and system should pass the test as per the following criteria:

Sr. No.	Descriptions	Required Value / Specifications as per IPR Enquiry	Tested Value of the System	Acceptance Status (Accepted / Not Accepted)
1.	RF Frequency	Maximum variation in the frequency will be checked and it should not exceed $\pm 0.05\%$ about the central frequency of 13.56 MHz		
2.	RF Power	The maximum output power in 50 Ohm load should be at least 1200 Watt, CW for at least half an hour with air cooling. 50 Ohm load will be provided by IPR		
3.	Delivered power into mismatch load	System should be able to delivered at least 16 % of power into mismatched load.		
4.	Maximum reflected power	System should be able to withstand 200 Watt of reflected power from mismatch load.		
5.	Harmonics into matched load at full rated power	At full power harmonic will be checked and they should be 30 dB or more down.		
6.	Spurious output signal	The spurious signal will be measured to be 50 dB or more down		
7.	RF Power regulation	RF power regulation should be 2 % of set point or 0.2 % of full rated power whichever is greater.		
8.	RF Power stability	2 % of set point or 0.2 % of full rated power whichever is greater		

9.	RF pulse frequency	The RF pulse frequency should be at least 10 Hz to 10 KHz		
10.	RF pulse duty cycle	The RF pulse duty cycle should be 10 % to 90 % or more.		
11.	Cooling	Cooling should be Air cooled.		
12.	Operating temperature range	System will be checked for operation between 5 ^o to 35 ^o C and should perform without any degradation in output power and frequency or any other parameter.		
13.	Operating relative humidity range	System will be checked during any period of time during one year of warranty period for 10 - 80 % humidity. If system fails or deteriorate the performance, the supplier shall have to rectify the same or replace the system without any cost to IPR		
14.	Minimum output power	The system should be capable of delivering 20 Watt or less power.		
15.	Efficiency	Efficiency of the system should be 55 % or better from load to line at full rated power into match load		
16.	Power factor	Power factor should be 90 % or better at full rated power, mid-frequency and nominal line into 50 Ohm load		

Date :**Bidder's Sign and official Stamp**