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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](http://www.ipr.res.in)

NEAR INDIRA BRIDGE, BHAT  
DIST. GANDHINAGAR - 382 428 (INDIA)  
Phone: (079) 2396 2000/2026/2332  
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## ENQUIRY

ENQUIRY NO : IPR/EQF/18-19/225  
Date : 13-03-2019

**Due on : 18-04-2019 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 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](mailto: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](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 power supply with 600w, frequency 13.56MHz with automated matching network, controller and cables	1.0 Nos.

- Note:
1. Please quote with complete technical details (Technical compliance sheet and product data sheet).
  2. TDS as per CGST Act: As per provisions of 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 orders/contracts/work orders exceeds Rs. 2.5 lakhs, in the event of order in Indian Rupees. Necessary TDS Certificate will be issued to the supplier after TDS deduction.
  3. Unsigned quotations will not be considered. Quotation should be submitted duly signed with official seal on each and every

Encl: page invariably.  
As per attached.

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.

## I. Technical Specifications

1. RF Power Supply with power 600 W, Frequency 13.56 MHz with automated matching network, controller and cables		
S. No.	Specification	Details
I	<b>RF power supply with Frequency 13.56 MHz &amp; Power 600 W</b>	
1	Frequency	13.56 MHz +/- 0.005%
2	Mode of operation	CW and pulse (via external TTL)
3	Power Output	600 Watts, with steps not more than 1W
4	Output impedance	50 ohm
5	RF connector	50 ohm, N-type
6	Reflected power limit	The power supply should be able to withstand at least 20% of full power (~600W) during unmatched conditions. Protection – Trip switch under overload / short-circuit conditions
7	Harmonics	-50 dBc
8	Spurious content	-60 dBc max. at full power
9	Pulse operation	1) TTL input via SMA socket preferably on rear panel.
		2) Minimum pulse width at least 10µs.
		3) Minimum duty cycle 5%.
		4) The external power control signal should vary the peak output from 0 to 600W, with a pulse-on duty cycle from zero to continuous DC (100% duty cycle).
		5) Display of pulse output levels on the front panel.
10	<b>Display</b>	Forward power
		Reflected power
		Reflected power exceed limit with indicator
		Remote operation indicator
		Automated matching network display
11	Rear panel connector	1) Remote connector
		2) Common exciter output
		3) Common exciter input
		4) External signal source
		5) Line input
		6) Mains switch
		7) RF output connector (N-type 50Ohm)

12	Front panel control	1) RF on
		2) RF off
		3) Output power/menu control dial
		4) Pulse/CW switch
		5) Remote switches/menu switches
13	Output voltage control	Required
14	Interlocks and Limits	
	Reflected power	Required
	Over temperature	
	Current limit	
	DC overload	
	RF power limit	
15	Cooling	Air cooling
16	Operating temperature	5 - 35 o C
17	AC line voltage (1-phase)	230 VAC +/- 10%
18	AC line frequency	50 Hz
19	Packaging and Mounting	½ rack mounting, 2U high
20	Quantity	1
<b>II Automated Matching Network with Manual Override Option</b>		
	Frequency of operation	13.56MHz
	Matching network configuration	Suitable Matching Network to tune impedance 0.1 Ω to 10Ω: Lower range – 0.10 Ω or less Upper range- 10Ω (minimum).
	Reflected power	Less than 1% of forward power
	Load impedance	50 ohm
	Tuning time	< 3 Sec
	Matching network control	Auto/ Manual with separate controller unit Connection cable from controller to the Matching network by RS 232 or equivalent.
	RF load connector	N-type with additional Stud option
	Communication	RS-232
	Connecting cables, Connectors and spares( one set each )	Should be provided with free of cost, cable from Matching Network to the system ~1 m
	Quantity	1
<b>III Note</b>		
	<ol style="list-style-type: none"> <li>1. The power Supplies should be rugged for application in plasma production/ plasma discharges.</li> <li>2. Supplied products should be EMI shielded with appropriate compliance for radiation safety and designed keeping in mind user convenience.</li> <li>3. Service engineer from supplier visit IPR for install &amp; commission the RF power Supply at the IPR site. Service engineer should perform the acceptance tests in</li> </ol>	

	presence of IPR representative and generate the test report for acceptance of RF power Supply
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## **II. Warranty**

One year warranty period shall be start from the date acceptance test report submitted to the IPR store.

## **III. Documentation**

- (1) Hard / Soft Copy of all the tests certificates should be provided along with RF power Supplies & matching network.
- (2) Hard / Soft copy of all the operational and troubleshooting manuals of RF power Supplies & matching networks should be provided.

Specification	IPR Requirement	Vendor
<b>RF power supply with Frequency 13.56 MHz &amp; Power 600 W</b>		
Frequency	13.56 MHz +/- 0.005%	
Mode of operation	CW and pulse (via external TTL)	
Power Output	600 Watts, with steps not more than 1W	
Output impedance	50 ohm	
RF connector	50 ohm, N-type	
Reflected power limit	The power supply should be able to withstand at least 20% of full power (~600W) during unmatched conditions. Protection – Trip switch under overload / short-circuit conditions	
Harmonics	-50 dBc	
Spurious content	-60 dBc max. at full power	
Pulse operation	1) TTL input via SMA socket preferably on rear panel. 2) Minimum pulse width at least 10µs. 3) Minimum duty cycle 5%. 4) The external power control signal should vary the peak output from 0 to 600W, with a pulse-on duty cycle from zero to continuous DC (100% duty cycle). 5) Display of pulse output levels on the front panel.	
Display	1.Forward power. 2.Reflected power. 3. Reflected power exceed limit with indicator.4. Remote operation indicator. 5.Automated matching network display.	
Rear panel connector	1) Remote connector. 2) Common exciter output.3) Common exciter input. 4) External signal source.5) Line input.6) Mains switch 7) RF output connector (N-type 50Ohm)	
Front panel control	1) RF on . 2) RF off. 3) Output power/menu control dial.4) Pulse/CW switch.5) Remote switches/menu switches.	
Output voltage control	Required	
Interlocks and Limits	Required	
Reflected power	Required	
Over temperature	Required	
Current limit	Required	
DC overload	Required	
RF power limit	Required	
Cooling	Air cooling	
Operating temperature	5 - 35 o C	
AC line voltage (1-phase)	230 VAC +/- 10%	
AC line frequency	50 Hz	
Packaging and Mounting	½ rack mounting, 2U high	

Quantity	1	
<b>Automated Matching Network with Manual Override Option</b>		
Frequency of operation	13.56MHz	
Matching network configuration	Suitable Matching Network to tune impedance 0.1 $\Omega$ to 10 $\Omega$ : Lower range – 0.10 $\Omega$ or less. Upper range- 10 $\Omega$ (minimum).	
Reflected power	Less than 1% of forward power	
Load impedance	50 ohm	
Tuning time	< 3 Sec	
Matching network control	Auto/ Manual with separate controller unit Connection cable from controller to the Matching network by RS 232 or equivalent	
RF load connector	N-type with additional Stud option	
Communication	RS-232	
Connecting cables, Connectors and spares( one set each )	Should be provided with free of cost, cable from Matching Network to the system ~1 m	

Bidder's Official Stamp and Sign:

Date: