Government of India
Bhabha Atomic Research Centre
Laser & Plasma Technology Division
Trombay, Mumbai -85

Date: 24-03-2022

REF: Works/LPTD/RK/2022/35447

NOTICE INVITING TENDER

for the

Fabrication of cold atmospheric pressure plasma devices with necessary power supplies, accessories, flow control devices and their integration with a control-environment chamber as per specifications

1. Sealed Quotations are invited on behalf of the President of India by Head, L&PTD, Bhabha Atomic Research Centre, Trombay, Mumbai-400085 for the "Fabrication of cold atmospheric pressure plasma devices with necessary power supplies, accessories, flow control devices and their integration with a control-environment chamber as per specifications" as per the scope of work described in Tender document.
2. **Quotations are to be in printed letter head / quotation format which should consist of Sales Tax Registration Number registered with local ST authority / CST authority, PAN Number of the firm, Service Tax registration Number etc. Quotations that are received in computer-generated form are to be construed as invalid and rejected.**
3. The quotations are to be submitted only through Registered / Speed post through Indian Postal Service.
4. The price part shall be submitted with taxes and duties quoted separately.
5. The quotations must reach, ***Director, Beam Technology Development Group*** by **07/04/2022** and must be sent in a sealed envelope ***superscribed*** with the above reference number and due date given above.
6. The address on the envelope should read:

   Director,
   Beam Technology Development Group
   Bhabha Atomic Research Centre,
   Trombay, Mumbai - 400 085
   (Attn.: Dr. Rajib Kar)
7. Income Tax @2%, surcharge, primary education cess and secondary and higher education cess on Income Tax as applicable will be deducted from the payment made to the contractor.
8. Payment will be made after satisfactory completion of work. Payment will be released only through ECS.
9. Head, Laser & Plasma Technology Division, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.

Yours faithfully,

24-3-2022

Dr. Archana Sharma
Director, BTDG

डॉ. (श्रीमती) अर्चना शर्मा / ARCHANA SHARMA
निदेशक / Director
किरणपुंज प्रौद्योगिकी विकास वर्ग
Beam Technology Development Group
भारत सरकार / Government of India,
भा.प.अ. केंद्र / B. A. R.C.
ट्रॉम्बे, मुंबई / Trombay, Mumbai - 400 085.

Copy to: Accounts Officer, GSS, CC.
The quotations will be opened on 08/04/2022

Annexure-D

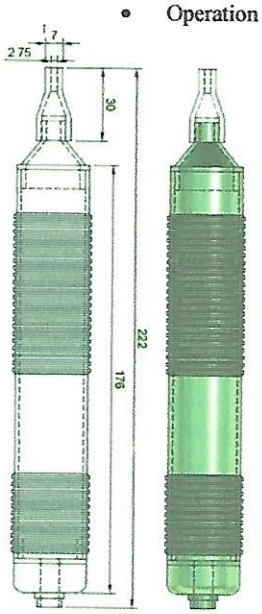
Scope of the work includes:

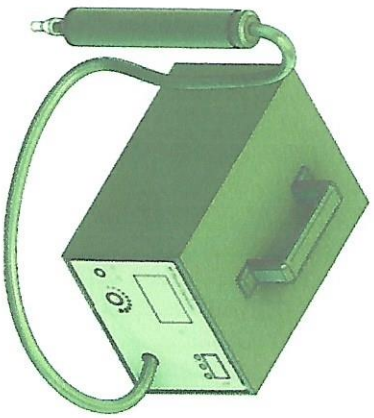
1. Fabrication of single electrode 10 MHz cold atmospheric pressure plasma devices with necessary power supply and accessories.

    - The single electrode plasma device will have to be fabricated based on Tesla coil design and will be connected to 10 MHz power supply. The device will work in plug and play manner with the power supply.
    - There will be no water cooling in the power supply. Forced air cooling have to be provided.
    - Impedance matching has to be done by combining inductors inside the device and power supply. No additional matching network will be used for this fabrication.
    - Electrode material: SS
    - Outer body: Quartz and PU
    - Terminal: N type
    - Gas Connection: 6/8 PU push fit.

    Fabrication of 10 MHz RF Plasma Generator with following specifications

    - Frequency: 10 MHz
    - Maximum output Power: 250W
    - Primary AC power source: 230V, 50Hz.
    - Cooling system: Air cooling
    - Operating temperature: 25-45 C
    - Overvoltage, arcing and output short circuit protection to be provided.
    - Safety interlock function is to be provided.
    - Accessories to be supplied: Cables, Connectors and any other necessary accessory.
    - Operation manual and service manual to be provided.



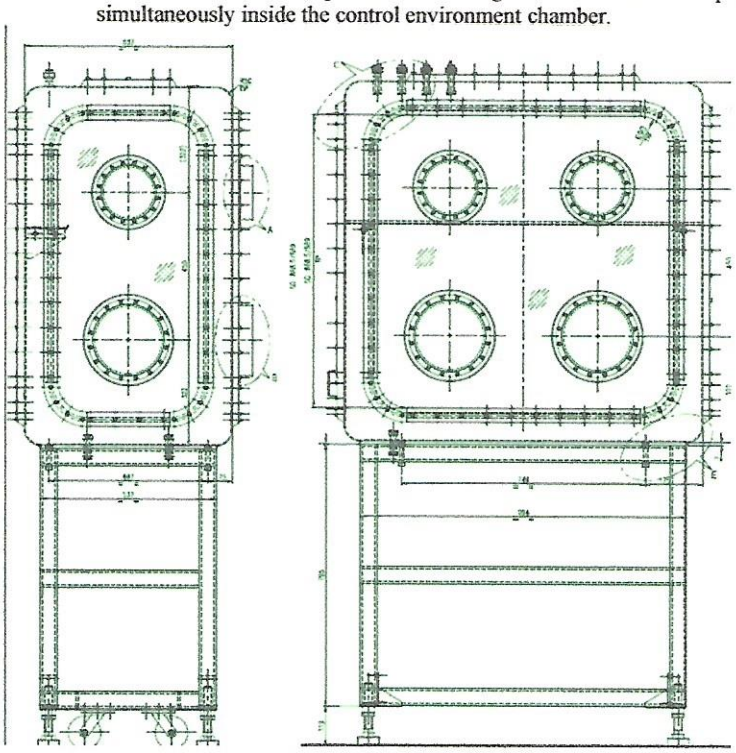


Quantity Required: 03 Nos.

2. Fabrication of single electrode variable frequency low power cold atmospheric pressure plasma devices with necessary power supply and accessories.
    - This single electrode plasma device will be connected to a variable high frequency (50-500 kHz), low wattage (~ 40 watts) power supply.
    - The device should produce cold plasma with temperature less than 40^0 C.
    - Electrode material: SS
    - Outer body: Quartz and PU
    - Gas Connection: 6/8 PU push fit.
    - The power supply should be provided with air cooling.
    - Overvoltage, arcing and output short circuit protection to be provided.
    - Safety interlock function is to be provided.

Quantity Required: 05 Nos.

3. Fabrication of control environment chamber for conducting experiment.
    - Dimension of the control environment will be ~ 1 mtr x 1 mtr x 1 mtr. Exact dimensions are given below in the drawing below.
    - All dimensions are in mm.
    - Make sure to remove sharp corners and bars.
    - All welds have to Argon arc and die penetrate tested.
    - All butt welds on the box floor should be ground flushed, free from crevices and pits.
    - All gasket seats must be perfectly flat and free from scratches.
    - Metal used for making the chamber should be 3 mm thick SS 304.
    - All M.S surfaces should be painted with epoxy paint.
    - The chamber will have metallic top and bottom with laminated safety glass on all four sides.
    - Neoprene gasket must be provided at appropriate places.
    - The chamber should maintain a 25 mm negative pressure below atmosphere.
    - The control chamber must be placed on epoxy painted MS frame.
    - Facilities have to be provided to bring at least four cold plasma devices (mentioned above) simultaneously inside the control environment chamber.



Quantity Required: 01 No.

4. Flow control instruments with the control environment chamber with display and required power supply.

    General specifications for all flow control instruments:
    - Each of these instruments should be assembled with its own digital display notifying the flow value.
    - Control mechanism must be provided to set the flow value within desired range as detailed below.
    - Power supplies must be supplied with each flow control instrument.
    - Backlit monochrome LCD screen
    - Multivariate measurements include: mass flow, volumetric flow, absolute pressure, and temperature
    - Necessary firmware to customize gas presets
    - Option for RS-232 data communication
    - Power Requirements: 12-30 Vdc, 250 mA
    - Standard Accuracy: ±0.6% of reading OR ±0.1% of full scale, whichever is greater
    - NIST traceable calibration certificate to be included for each instrument
    - RoHS compliant

Gas specifications for flow control instrument:

- Flow control instrument for Ar between 2 to100 sccm. The turndown ratio for model should not be more than 200:1.

Quantity Required: 02 Nos.

- Flow control instrument for N_2 between 2 to100 sccm. The turndown ratio for model should not be more than 200:1.

Quantity Required: 01 No.

- Flow control instrument for H_2 between 2 to100 sccm. The turndown ratio for model should not be more than 200:1.

Quantity Required: 01 No.

- Flow control instrument for He between 2 to100 sccm. The turndown ratio for model should not be more than 200:1.

Quantity Required: 01 No.

- Flow control instrument for O_2 between 2 to100 sccm. The turndown ratio for model should not be more than 200:1.

Quantity Required: 01 No.

- Flow control instrument for O_2 between 10 to1000 sccm. The turndown ratio for model should not be more than 1000:200.

Quantity Required: 02 Nos.

- Flow control instrument for CF_4 between 10 to1000 sccm. The turndown ratio for model should not be more than 1000:200

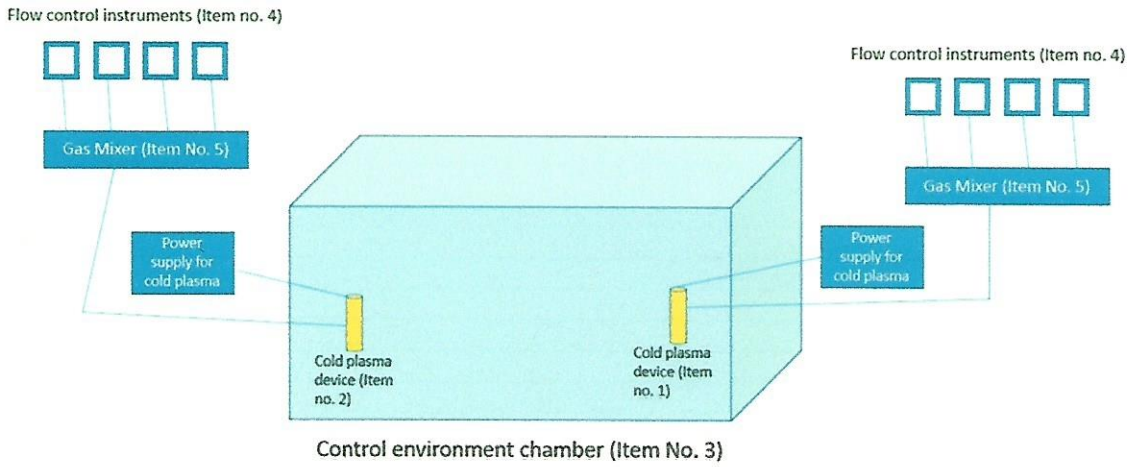
Quantity Required: 02 Nos.

Total Quantity Required: 10 Nos.

5. Stainless steel 304 cyllindrical gas mixer with 4 input of PU 8*6 mm and single output of PU 8*6 mm
   Quantity Required: 02 Nos.

6. PU tube spool of 8*6 mm and 10*8 mm
   Quantity Required: 01 Nos. each
   Total Quantity Required: 02 Nos.

The complete fabricated assembly should look like the schematic below.
No part tender will be accepted.
All tube connections must be completed using PU pipe of 8*6 mm with required connectors.



Note:

1. Procuring material of appropriate dimension, quantity and quality, fabrication of the components as per the design and specification, delivery of the item to the users place.

2. Work shall be carried out to Indian Standards and Code of Practices. In absence, latest issue of International Standards shall be followed.

Any discrepancies / conflict noticed shall be directed to the Executing Officer for his direction/approval.

3. The supplier has to supply the material at Hall-9, BARC, Trombay.

4. Procuring material of appropriate dimension, quantity and quality, fabrication of the components as per the design and specification, assembling of the components to form the final device, delivery of the item to the users place and installation at the site.

5. No part tender will be accepted.

6. The complete integration of fabricated items are in supplier's scope. The supplier must make sure that they have understood the scope of work completely.

7. For any technical queries, clarifications, dimensions etc. please contact the following person.

Dr. Rajib Kar
Laser &Plasma Technology Division
Bhabha Atomic Research Centre, Mumbai-400085
Contact No: 022 25595837
email: rajibkar@barc.gov.in / rajibkar.ph@gmail.com