



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,  
Government of India

इन्दिरा पुल के पास, भाट, 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 2020/2021/2028  
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## ENQUIRY

ENQUIRY NO : IPR/EQL/19-20/421  
Date : 28-02-2020

**Due on : 18-06-2020 by 1:00 PM IST**

Reminder-1 Dt: 20-04-2020

Reminder-2 Dt: 19-05-2020

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](mailto: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](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	Supply, installation, testing and commissioning of 45 kW VFDs with mounting electrical panel for centrifugal DM water pumps. Scope also includes supply and laying of power cables and electrical job work. Other details is as per attached sheet.	1.0 Job

Note: 1. Delivery Time : 10 weeks.

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.

Encl: Refer attached sheets for detailed technical specifications.

**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.

Supply, Installation, Testing and Commissioning of Variable Frequency Drive for Centrifugal DM Water Pump

1. Scope:

The supply, installation, testing and commissioning of 2 Nos. of 45 kW variable frequency drives for centrifugal DM water pump as per SOQ. The Scope includes supplying, installation, testing and commissioning of variable frequency drives, its enclosure panel with mounting, input chokes, start / stop push button, indication lamps, selector switch, door mounted programmable LCD control panels, semiconductor switch fuse units and all the controls and accessories with all the control wiring etc. necessary for working of VFDs. **Both VFDs should be mounted in a single enclosure panel side by side.** Operations of VFDs are separate from each other so, separate SFUs/MCCBs to be provided for VFDs on enclosure panel door. The scope also includes power cabling from MCC to VFD and VFD to MCC. *The supplied VFDs will be installed, tested and commissioned with all the accessories and performance tests shall be carried out in IPR.* Pre-dispatch inspection shall be carried out by IPR at vendor's factory site for routine tests, finish and workmanship.

The scope also includes supply, laying, cable lugging, glanding, termination and testing of 1.1 KV volts grade XLPE insulated aluminum conductor armoured power cable of size 3.5C x 120 sq. mm for 45 KW VFDs. Bidder should take site visit before submission of offer to estimate the cable quantity, routing and location of VFD panel etc. Payment of power cable will be made based on actual cable qty. to be laid at the site.

2. Technical Specifications for 45 kW VFD:

*For Variable Frequency Drive*

Description	Specifications
Mains Input voltage	385 – 440 VAC
Mains Power frequency	50 Hz ± 5 %
Motor rating	45 kW, 76 A
Power Rating	45 kW normal duty use
Output frequency	0 Hz to 50 Hz
Output Voltage	0 to 415 V AC three phase as per linear V/f characteristics
Power factor	≥ 0.90 or better
Control Panel	Door mounted 02 nos. LCD assistant control panels for programming and status monitoring of drive. <b>Single enclosure panel require for 02 nos. of VFDs</b>
Fieldbus connectivity	Must have Modbus building automation adapter so that drive can be integrated into existing BMS system
Integrated DC chokes and input chokes	Required
Power Devices	IGBT Power Devices
Acceleration/Deceleration time	Programmable
Serial interfaces	RS-485

Degree of protection	IP20
Operating temperature range	Up to 50 °C
Relative humidity	95 % (non-condensing)
Protection features	Under voltage, over voltage, overload, earth faults, short-circuits, locked motor protection, motor over temperature, inverter over temperature, parameter change protection
Conformity with standards	CE
Cooling-air volumetric flow	Should be suitable as per Cooling requirement of VFD drive unit
Make	ABB / Siemens / Schneider Electric / Danfoss / Allen-Bradley / Emerson / Amtech / Hitachi / Rockwell / L & T / Hi-Rel

***For Enclosure Panel***

<b>Description</b>	<b>Specifications</b>
Type	Indoor Enclosure panel fabricated from 14 SWG CRCA MS sheet, Duly Powder Coated, floor mounted, Dust proof.
Protection	IP 54
Color	Siemens Gray
Panel Size:	Approx. 1500 (W) x 2000 (H) x 560 (D) Subject to approval of IPR before manufacturing starts
Gland-plate thickness	Minimum 3 mm thick
Door	Openable on hinges
Control Panel	Door Mounted LCD assistant Control panels
Air Filter	Both Sides
Exhaust Fan Size	Suitable
Exhaust Fan No	Suitable
Exhaust Fan Air Flow Capacity in CFM	Suitable as per VFD manufacture's recommendation
Input Disconnect Switch Fuse Unit/MCCB <b>(Separate for each VFD)</b>	Semiconductor fuses gR type or as per VFD manufacture's recommendation
Power Cable Entry	Bottom Entry
Make of Power Cable	Polycab, KEI, Havells, Finolex, RR Kabel

**3. Eligibility Criteria:**

- Vendor must be either manufacturer of VFD of the approved make or authorized dealer of VFD from the approved makes.

**4. Testing and Acceptance Criteria:**

- Vendor has to submit all the GA drawings, wiring drawings, catalog, manuals etc. of enclosure panel and VFD unit.

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- Vendor has to get drawings (panel GA, SLD and control wiring) approval of IPR before manufacturing enclosure panel.
  - Vendor has to submit routine factory test certificates for VFD unit and enclosure panel.
  - Pre-dispatch inspection shall be carried out by IPR for the VFD unit with enclosure panel for routine tests, finish and workmanship.
  - The VFDs shall be tested at IPR to its full parameters for performance testing before final acceptance. The following tests will be carried out in IPR after installation.
    1. Full load test of VFD
    2. Variable Speed test with pump motor
    3. Steady state operation for at least 06 hours

**5. Guarantee:**

- *Minimum one year from the date of final acceptance.*

**6. Completion Period:**

- *10 Weeks from the date of Purchase Order*

**7. Technical Data Sheets:**

*(List of technical information's to be furnished by the bidder to IPR)*

- Separate technical data sheets shall be furnished for different type/ model/ configuration for different items.
- All the data sheets shall be endorsed with stamp and signature by the bidder.
- Bidder has to provide minimum technical details as enclosed herewith, however shall also provide remaining / additional details. All the Items shall be ordered only after Technical specification approval.
- Attach Technical leaflets, performance curves, GA drawings etc. for all products / system parts offered.
- Bidder has to execute work as per relevant IS standards and as per standard code of practice.
- Please refer technical specifications asked for before filling the blank data sheets.

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**Technical Compliance Form (To be filled up by bidder)**

**45 kW Variable Frequency Drives (Attach detailed catalog, drawings, performance curves etc.):**

Sr. No.	Particulars	IPR Requirement	Vendor's Specification
1.	Make / Model / Size	-	
2.	Mains voltage	385 – 440 VAC	
3.	Power Rating	45 kW normal duty use	
4.	Power frequency Range	50 Hz ± 5 %	
5.	Output frequency Range	0 to 50 Hz	
6.	Output Voltage	0 to 415 V AC three phase as per linear V/f characteristics	
7.	Rated Output Current	-	
8.	Input Power factor	≥ 0.90 or better	
9.	Fieldbus connectivity	Modbus	
10.	Integrated DC chokes and input chokes	Required	
11.	Acceleration/Deceleration time	Programmable	
12.	Serial interfaces	RS 485	
13.	Degree of protection	IP 20	
14.	Operating temperature range	Up to 50 °C	
15.	Relative humidity	95 % (non-condensing)	
16.	Protection features	Under voltage, over voltage, overload, earth faults, short-circuits, locked motor protection, motor over temperature, inverter over temperature, parameter change protection	
17.	Conformity with standards	CE	
18.	Make	ABB / Siemens / Schneider Electric / Danfoss / Allen-Bradley / Emerson / Amtech / Hitachi / Rockwell / L & T / Hi-Rel	

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**Technical Compliance Form (To be filled up by bidder)**

**Enclosure panel for 45 kW VFDs (Attach detailed catalog, drawings, performance curves etc.):**

<b>Sr. No.</b>	<b>Particulars</b>	<b>IPR Requirement</b>	<b>Vendor's Specification</b>
1.	Panel Size	Approx. 1500 (W) x 2000 (H) x 560 (D). Subject to approval of IPR before manufacturing starts	
2.	SWG of Sheet (thickness in mm)	14 SWG	
3.	Protection class	IP 54	
4.	Color	Siemens Gray	
5.	Gland-plate thickness	Min. 3 mm	
6.	Type of Door	Openable on hinges	
7.	Type of Control Panel	Door Mounted LCD assistant Control panel	
8.	Air Filter	Both Sides	
9.	Input Disconnect Switch Fuses type / MCCB	Semiconductor fuses gR type or as per VFD manufacture's recommendation	
10.	Power Cable Entry	Bottom Entry	

**Place:**

**Date:**

**(Signature & Official Seal of Bidder)**





**SCHEDULE OF QUANTITY**

(To be filled in by bidder and returned to IPR)

Sr. No	Item Description	Qty.	Unit	Supply		Installation, Testing & Commissioning		
				Unit rate (Rs.) B	Amount (Rs.) C=AxB	GST %	Unit rate (Rs.) D	Amount (Rs.) E=AxD
1.	<p><b>45 kW Variable Frequency Drives:</b>                      The supply, installation, testing and commissioning of 02 nos. of 45 kW variable frequency drives for centrifugal DM water pumps mounted in single panel side by side. The Scope includes supplying, installation, testing and commissioning of variable frequency drives, its enclosure panel with mounting, input chokes, start / stop push buttons, indication lamps, local / remote selector switch, door mounted programmable LCD control panels, semiconductor switch fuse units and all the controls and accessories with all the control wiring etc. necessary for working of VFDs. Both VFDs should be mounted in a single enclosure panel side by side. Operation of both VFDs is separate from each other so separate SFUs/MCCBs to be provided for each VFDs.  <b>Make:</b> ABB / Siemens / Schneider Electric / Danfoss / Allen-Bradley / Emerson / Amtech / Hitachi / Rockwell / L &amp; T /Hi-Rel</p>	A	Job					
2.	<p><b>Power Cabling:</b>                      Supply, laying, glanding, cable lugging, termination and testing of 1.1 KV volts grade XLPE insulated aluminum conductor armoured power cable of size 3.5C x 120 sq. mm for 45 KW VFDs. The qty. mentioned is approximate one and payment will be made for actual cable to be laid at</p>	65	RMT					

site.														
3.	Supply, laying, glanding, cable lugging, termination of 1.1 KV volts grade 35 sq. mm single core flexible PVC insulated copper cable. This cable requires lugging at both ends and cut in 06 pieces of approx. 1 to 1.5 meter to be layed from feeder CT to cable alley TB.	10	RMT											
4.	Cutting of existing DIN rail cannel mounted in cable alley, making holes in DIN rail for fixing insulators, fixing of copper links on insulators and other minor electrical work.	1	Job	--	--	--	--							
<b>Total (in Rs.)</b>														

**Completion Period ----- Weeks from Date of PO**

**Guarantee Period -----months from Date of Final Acceptance**

**Place:**

**Date:**

**(Signature & Official Seal of Bidder)**