**TENDER NOTICE NO. IPR/TN/PUR/TPT/ET/19-20/8 DATED 12/06/2019**

**Technical Compliance Form**

| Sr. No. | Parameters | Technical Specification of IPR | Technical Specification of Vendor |
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| 1 | Inputs | 3 phase, 415V, 50Hz | |
| 2 | Output<br>a) Open circuit voltage<br>b) Full load voltage<br>c) Full load current<br>d) Resolution<br>e) Source type | <br>300V DC<br>125V DC<br>800 A (Current should be adjustable from 50A to 800A with resolution of 1A)<br>1 A<br>Constant current (Independent of the load voltage) | |
| 3 | Interlocks<br>a) Cooling water temperature<br>b) Water flow<br>c) Stack temperature<br>d) Over voltage<br>e) Over current<br>f) Single phasing<br>g) Emergency Off<br>h) Panel door | <br>All Sensors NO/NC input will be provided by IPR for interlock purpose except overvoltage, over current, single phasing, emergency off and panel door interlocks. The vendor should demonstration the functioning of these interlocks using dummy inputs of 0 to 5 V. Vendor should also provide a 5V TTL for external communications. This includes all analog controls of power supply for example current setting. The interlocks operation should be implemented using PLC and HMI. | |
| 4 | Meters & display<br>a) Input Voltage<br>b) Input Current<br>c) Output Voltage<br>d) Output Current<br>e) Water Temperature<br>f) Digital Multifunction Energy Meter<br>g) Stack temperature | <br>DPM (3 ½ digit) or on HMI<br>DPM (3 ½ digit) or on HMI<br>DPM (3 ½ digit) or on HMI<br>DPM (3 ½ digit) or on HMI<br>0 – 50 Deg C or on HMI<br>The kW, kVA, PF, V, I readings should be displayed by this meter.<br>0 – 100 Deg C or on HMI | |
| 5 | Indications<br>a) R, Y, B indications | <br>All the indicators should be of reputed company and CE | |

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| | b) All interlocks status<br>c) Mains ON<br>d) Power supply ON/OFF<br>e) All switches ON/OFF indications | certified. Indication can be displayed through HMI. | |
| 6 | Switches<br>a) Push button On<br>b) Push button Off<br>c) Emergency Off<br>d) Input voltage selector switch<br>e) Input current selector switch | The on/off provision should also be done through external control through 5V TTL except emergency switches. Other On/Off should be controlled through PLC and HMI. | |
| 7 | Current setting pot | The current setting should be done through HMI. The current setting should also be possible through external control through TTL. | |
| 8 | Grounding | The positive output terminal should be grounded along with the panel body. | |
| 9 | External control | A 5V TTL should be provided for external cut off and current control. | |
| 10 | Input and Output cable | ■ Flexible copper conductor.<br>■ Both input and output cables should be of 10 meter length each and should be of appropriate ratings as per the suitable IS standards for power cables. | |
| 11 | Input Power Factor | 0.85 or better | |
| 12 | Efficiency | 90% or above | |
| 13 | Current Ripple | Current should be always within $\pm$ 0.5% of the set value. The ripple should be demonstrated by the vendor on oscilloscope for all ranges of current on plasma load. | |
| 14 | Cooling | IGBT heat sink should be water cooled/air natural cooled. The inlet and outlet connection port (manifold) should be provided in case of water cooled. The chiller | |

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| | | and compressor unit should be supplied by vendor in case of water cooled. Water inlet and outlet should be through properly tight and mounted manifold. The vendor will have to demonstrate one time 24 hours operation of power supply at full load on resistive load. Resistive load for testing to be arranged by vendor only. | |
| 15 | MCCB | MCCB of suitable rating with shunt release coil should be there on the power supply panel. | |
| 16 | Acceptance Criteria | The pre-dispatch inspection will be carried out by the IPR engineers. The power supply would be tested for 24 hours continuous operation at full load i.e. 125V and 800A on the resistive load first. After successful testing on resistive load, the power supply will be tested on the plasma torch load supplied by IPR at the time of testing. The testing on plasma torch will be done for 8 hours operation for 2 times. The vendor will have to demonstrate two successful consecutive operations on plasma torch load each for 8 hours operation. Vendor will have to arrange electrical power for testing these power supplies at its premise at the time of pre-dispatch inspection. | |
| 17 | User's Manual | Vendor should supply user's manual mentioning sequence of operation, bill of material, circuit diagram, wiring diagram with ferrules, troubleshooting chart, preventive maintenance chart etc. | |
| 18 | Warrantee | Vendor should provide one year full warrantee of the complete unit from the date of installation and commissioning at IPR. | |
| 19 | Panel support | Panel (Cabinet) should be mounted on heavy duty caster wheels; Panel should also have provision for lifting the panel from the top. Panel door should be mounted on appropriate hinges to smooth movement of the door. The sheet of the panel should have appropriate gauges as per the IS | |

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| | | standards for electrical panel. Vendor should provide the panel details for approval within 20 days from receipt of purchase order for approval in terms of foot print and color of the panel. Panel should be powder coated. The color of panel should be ash grey or light blue with matt finish. All fasteners in the panel should be made of SS 304. | |
| 20 | PLC and HMI | Vendor should provide PLC and HMI of reputed company and CE certified company such as Allen Bradley, Siemens, and Schneider etc. Vendor should also supply programming software and soft copy of the PLC and HMI program for operating this power supply. Vendor should provide following **extra** points for future use in each power supply unit:<br>1. Digital output: 20 nos.<br>2. Digital input: 20 nos.<br>3. Analog output: 1 nos.<br>4. Analog input: 1 nos.<br>5. Temperature input (R type): 4 nos<br>6. PWM output (8 kHz or higher): 2 nos.<br>The DC power supply to PLC should be 24V. PLC and HMI should be operated using 24V, 10A rating SMPS. 1A fuse through proper housing connector should be used in all input and output lines of PLC except temperature input. | |
| 21 | Certification of components | All electrical bought out components should be of standard companies having CE certification for the components. All the components ratings and the wirings should be as per IS standards. | |