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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
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ENQUIRY

ENQUIRY NO : IPR/EQL/18-19/288
Date : 27-11-2018

Due on : 20-12-2018 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:

Important Note:

Please note that e-mail quotations are not acceptable however you may send your queries (if any) to 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 / 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	Design,Supply of DC Main Distribution Board	1.0 No
2	Erection,Installation,inspection and testing and commissioning of DC Main Distribution Board	1.0 No
3	Supply of 1.1 kV voltage grade, copper conductor, XLPE insulated, armour power cable of reputed make Size: 2Cx10 sq. mm.	100.0 Mtrs.
4	Laying of 1.1 kV grade, copper, XLPE insulated, armour power cable - over cable trays, walls with suitable PVC clamps at regular interval, etc.	100.0 Mtrs.
5	Supply of Cable Termination accesories required for 1.1 kV grade,10 sq.mm XLPE insulated copper conductor, armored power cable with cost of all accessories like lugs ,cable glands,insulating tape etc.	2.0 Nos.

6	installation of Cable Termination on each end of the 1.1 kV grade,10 sq.mm XLPE insulated copper conductor, armored power cable.	2.0 Nos.
7	Installation , Laying and connection of copper Earth strip size of 25x6mm from PDB#5 to Nearest Panel earth strip with required all accessories like wall/soil clamps, anchor fasteners ,bolts etc. with all civil touch-up work. Earth strip provided by IPR	5.0 Mtrs.

Note: 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: as per attachment

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.

Vendor List for enquiry : IPR/EQL/18-19/288

Supply, Installation, Testing and Commissioning of Indoor DC Main Distribution Board (DC MDB#2) and associated 1.1 kV Grade cable laying and Termination

1.1 SCOPE:

The scope covers Design, Fabrication, Inspection and Testing at vendor's/his sub-vendor's work, delivery at site with including unloading, installation and commissioning of 01 No. of 220V DC indoor DC Main Distribution Board with all accessories, incoming and outgoing feeders as specified in this document and in the drawings i.e. civil works related to grouting and fixing of DC MDB-2 at the specified location and the scope also covers associated work like supply, laying and termination of 1.1 kV voltage grade, copper conductors, XLPE insulated, armoured power cables and other associated work as per requirement for distribution of DC supply.

1.2 CODES AND STANDARDS:

The design, materials, construction, manufacture, inspection, testing and performance DC Main Distribution Board shall comply with all currently applicable statutes, regulation and safety codes in the locality where the equipment will be installed. The equipment shall also confirm to the latest applicable standards and codes of practice.

The equipment covered by this specification shall unless otherwise stated, be designed, constructed and tested in accordance with the applicable sections of the latest Indian Standard Specification and Indian Electricity Rules and as per this technical specification. The degree of protection shall not be less than IP-52 as per IS: 2147.

2. Design Features:

- a) The MCCB panels are required for distributing Auxiliary DC voltage to various utilities.
- b) The Panel shall be suitable for use in 220V DC electrical system having maximum continuous voltage of 250V DC.
- c) The design and construction of the panel shall be strong enough to take the load of MCCB, MCB, bus bars, cables, instruments etc. and withstand rated maximum fault level and rigorous adverse weather conditions. Provision shall be made for expansion and contraction of enclosure due to temperature.
- d) The MCCB, busbars, cables etc. shall be suitable for continuous operation under site conditions indicated elsewhere with conductor temperature of 90 C maximum. Also the conductor temperature during short circuit shall not exceed 250 °C. Busbars shall be suitable for short time overloads.
- e) The panel shall be 100% insulated, which means there shall be no access to any live part all joint shall be shrouded with special removable PVC blocks.
- f) The hinged door shall be designed to withstand internal arcing and shall be interlocked in such a way that it cannot be opened with the breaker in closed position. Further all operations shall be possible with door closed.
- g) Special insulating barrier shall be provided where busbar passes from one panel to another to restrict arc from propagating, across the full length of the board in event of bus fault.
- h) Wiring circuits fed from a supply common to a number of feeder panels shall be protected so that failure of a circuit in any one feeder does not prevent operation of other feeders.

- i) Circuit of one feeder panel should be capable of isolation for maintenance purposes without affecting other circuits.
- j) Doors, covers and all non-current carrying metallic parts shall be earthed through flexible copper wires. This should also include instrument casing and cable armour, which should also be connected to the earth bus.

2.1 CONSTRUCTIONAL FEATURES:

The Basic Cubicle:

- a) The basic enclosure shall be fabricated from CRCA sheet steel material, of Gauge 16 SWG or better on a suitable angle iron framework.
- b) The cubicle shall have distinct compartments each separately earthed – MCCB compartment, Instrument chamber, Bus bar chamber, CT & Cable chamber.
- c) The doors and removable covers shall be provided with neoprene gaskets to make the panel dust and vermin proof.
- d) Any metal to metal joint anywhere inside the panel shall be gasketed to achieve zero gap. Between two panels special T type gasket shall be provided for zero gap and aesthetics.
- e) The panel board shall be complete with all internal wiring, bus-bars, labels, accessories etc. as specified.
- f) Labels shall be provided for all identifiable like MCCB, indicating lamps, control switches and accessories etc.
- g) The panel door shall be opened only by means of tools to prevent unauthorized opening.
- h) Painting: Seven-tank process treatment shall be followed for treatment of the fabrication parts of the panel. Two coats of epoxy based primer shall be applied before applying two final coats of epoxy paint which shall have good weather resistance and heat transfer properties. The colour of painting shall be SIEMENS RAL 7032.

2.2 Earthing

- a) A Copper earth bus of size not less than 10 x 5 sq.mm continuously runs inside the panel earthing shall be provided.
- b) The earth bus shall be robust and capable of carrying full short circuit current for 1 sec.
- c) Doors, covers and all non-current carrying metallic parts shall be earthed through flexible copper wires. This should also include instrument casing and cable armour, which should also be connected to the earth bus.
- d) The earth bus shall have provisions for terminals at each end for connecting to grid earthing.
- e) Installation of copper earth strips size of 20x5 mm for panel body earthing between outside of panel earth point to available nearest earth point with required fabrication, civil works and mechanical hardware's.

3.0 BILL OF MATERIAL

Sr. No.	Description of Panel	Description of Items	Quantity
1.	DC MDB- 2 (Location: MPH hall) Indoor, floor mounted suitable for use on 220 V ° 10%, 2	Incomer having 40A, 2 Pole, 10 kA, DC, MCCB with rotary handle with inbuilt feature of O/C, S/C protection	01 No.
		Outgoing feeders having 10A (12 Nos.),DC MCB, 10 kA, DP , C curve with inbuilt feature of O/C, S/C	12 Nos.

wire, DC system, with two main Copper bus bars of 50 Amp rating with bottom entry for cables including following -	protection	
	C/O Aux. Contact	01 No. for 40A MCCB
	C/O Trip. Contact	01 No. for 40A MCCB
	DC current measuring instrument 40A	01 No.
	Analog DC Voltmeter(Accuracy Class: 0.5) (Size: 96x96 mm)	01 No.
	Analog DC Ammeter(Accuracy Class: 0.5) (Size: 96x96 mm)	01 No.
	Indicating lamp (ON,OFF,TRIP), 220V DC rated	03 Nos.
	Phase Indicating lamp for I/C, 220V DC rated	02 Nos.
	Extended rotary handle	01 No.
	Suitable provision for receipt of 1Rx2Cx10 Sq.mm copper, XLPE insulated armoured cables with glands and lugs at the Top Entry. Gland plate should be provided at feeder for Entry at incomer.	01 No.
Suitable provision for receipt of 1Rx2Cx4 Sq.mm copper, XLPE insulated armoured cables with glands and lugs at the Top Entry. Gland plate should be provided at feeder for Entry at incomer.	12 Nos.	
Lugs for 1Rx2Cx10 sq.mm, copper, XLPE cable.	4 Nos.	

3.1. Supply of Cable:

1. SCOPE

This specification scope covers design, testing and supply of 1.1kV voltage grade copper conductor cable for 2C, 10sq.mm, Cu, XLPE, FRLS insulated, Armoured cable

2. CODES AND STANDARDS:

The design, material, construction, manufacture, inspection, testing and supply of 2C, 10sq.mm, Cu, XLPE, FRLS insulated, armoured cable shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment

shall be installed. Indian Standard for 2C, 10sq.mm, Cu, XLPE, FRLS, armoured cable as per IS-7098.

3. DESIGN FEATURES:

1. The cables are required for supplying 220V DC Power from DC charger to battery banks and it's associated DCDBs.
2. The cable shall maintain their insulating properties as required by the operating conditions when subjected to maximum ambient temperature of 50 °C and a maximum conductor temperature of 70°C.
3. The cables shall maintain its required insulating properties when exposed environment and mechanical stresses resulting during installation and operation.
4. Cables shall be suitable for installation on multi-tier ladder type cable trays running horizontally or vertically in the buildings.
5. No forced ventilation is envisaged for the cables.
6. All material used shall be new and shall confirm to this specification and relevant IS.

4. CONSTRUCTION FEATURES:

1. The cable shall be manufactured and tested in accordance with IS: 7098 (latest Revision).
2. The cable size required is 2C of 10 sq. mm.
3. The conductor shall be annealed, stranded, high conductivity copper, XLPE insulated, coded, and then laid up, extruded PVC inner sheathed, single galvanised round steel wire armoured and overall jacketed with extruded FRLS PVC.
4. The conductor shall be annealed copper wire and shall be circular in section, smooth, uniform in quality, free from scales, spill, inequalities and other defects. The stranded conductor shall be of reasonably uniform size, shape, clean and its surface shall be free from sharp edges. Conductors shall confirm to the latest IS 8130.
5. Insulation shall be of extruded PVC material type 'A' confirming to latest IS 5831 and IS 7098.
6. The armour used shall be galvanised round steel wire and shall confirm to the Latest IS 3973.
7. The individual cores of each cable shall have core identifying numerals, alphabets or combinations thereof, distinctly printed/inscribed in white at a regular intervals apart from colour coding as per IS 1554. The alphabets and numerals shall be so printed /inscribed as to eliminate wrong identification of cores due to similarity between various numerals and alphabets.

5. TESTS & INSPECTION:

1. Type tests and routine tests shall be conducted as per relevant IS standard.
2. In case supplier has carried out similar tests on similar cables, test reports may be submitted with the offer.

3. Factory Acceptance Tests shall be carried out by the vendor and the reports have to send to IPR for approval prior to dispatch.

6. SCHEDULE OF QUANTITY:

Sr. No.	Type of Cable	Unit	Quantity
1	2C x 10 sq. mm. Cu, XLPE, FRLS,armoured cable	Mtrs.	100

7. CABLE DRUM:

Cable shall be supplied in specified non-returnable drum. The drum shall be of heavy construction. All wooden components shall be manufactured from seasoned wood. All ferrous parts used shall be treated with a suitable rust preventive finish or coating to avoid rusting during transit or storage.

8. PACKING AND TRANSPORT:

The cable shall be placed on drum in such a manner that it will be protected from injury during transit. Each end of the cable shall be firmly and properly secured to the drum. The end of each length shall be sealed before shipment. The drums shall be secured firmly in position so that they will not shift during transit.

The labels shall be securely attached to each end of the drum indicating the purchaser's order number, length of cable, size of conductor, number of cores, type of cable and voltage grade for which it is suitable. A tag containing the same information shall be attached to the leading end of the cable inside the lagging. An arrow and suitable accompanying wording shall be marked on one end of the drum indicating the direction in which it should be rolled. The number of each drum shall be either branded at the end of the drum or stamped on Metal discs to an end of the drum. Packing and marking shall be in accordance with applicable Indian standard IS-1554(Part-1).

9. 1.1kV, 2C,10 sq.mm Copper cable specification cum data sheet

SR No.	Description	Required Specification	Offered Specification
1	Operating Voltage	1.1kV	
2	Cross section Area	10 sq.mm	
3	No. of cores	2	
4	Conductor material and type	Copper & Stranded	
5	Insulation	XLPE	
6	Sheath if any	PVC	
7	Current carrying capacity in Air	60 Amp	
8	Max DC conductor resistance at 20 °C for Cu	1.83Ω /km	
9	Max AC conductor resistance at 90 °C for Cu	2.19Ω /km	
10	Approx. Reactance at 50Hz	0.0907Ω /km	
11	Nominal thickness of Inner sheath	0.30mm	

12	Nominal thickness of Outer sheath	1.24mm	
13	Approximately Overall diameter	17mm	
14	Compliance to IS code	7098(Part-1)- 1988	
15	Approximately net weight of copper cable	400Kg/km	
16	Acceptance/test criteria	Routine test certificate to be produce	
17	Make if any available		

3.2. Cable Laying and Termination:

This work includes:

Laying and termination of 1.1 kV voltage grade, copper conductors, XLPE insulated, armoured power cable of size: 1Rx2Cx10 sq. mm between newly installed Main DCDB at charger room to DC MDB#2 at MPH hall.

The cable shall be laid either in trays/wall depending on the conditions at site including accessories for the same. The bidder shall supply all accessories including terminating materials, compound tapes, supporting materials cleats, brackets, cable lugs, glands, PVC clamps, supports for cable tray and cable tags etc. as required to make the installation complete in all respects. All required opening for cable entry at panel (gland plate) shall be made by the vendor.

Details of Cable Laying and Termination:

Sr. No.	Description	Unit	Quantity (Approx.)
1.	Supply of 1.1 kV voltage grade, copper conductor, XLPE insulated, armour power cable of reputed make Size: 2Cx10 sq. mm.	Mtrs.	100 Mtr.
2.	Laying of 1.1 kV grade, copper, XLPE insulated, armour power cable - over cable trays, walls with suitable PVC clamps at regular interval, etc. between (1)DCDB to DC MDB#2 at relay room- 100 Meter Cable: 1 run x 2C x10 sq. mm.	Mtrs.	100 Mtr.
3.	Cable Termination on each end of the 10 sq.mm XLPE insulated copper conductor, armored power cables of 1.1 kV grade, including cost of all accessories like lugs & double compressed, brass type glands suitable, insulation tape, sealing compound, panel opening for cable top entry etc. (complete).	Nos.	02 Nos.
4.	Installation , Laying and connection of copper Earth strip size of 25x6mm from DC MDB#2 to Nearest Panel earth strip with required all accessories like wall/soil clamps, anchor fasteners ,bolts etc. with all civil touch-up work. Earth strip provided by IPR.	Mtrs.	5 Mtr.

***Note:**

- (i) The quantity mentioned above (cable laying /termination) is indicative and likely to change depending upon the actual requirement.
- (ii) Billing of laying of cable and termination will be done on actual measurements.

3.3 Specification of MCCB:

Sr. No.	Parameters	Data
1	General :	
	Type of L. T. Panel	MCCB
	Application	For DC Distribution
	Quantity	As per BOM
	Installation	Indoor
	Type of panel mounting	Floor mounted
	Ambient temperature	45°C
2	System Data :	
	Rated Voltage	220 V DC
	No. of Phases	2 Ph., 2 wire
	Fault Level	As per SLD
3	Ratings :	
	Rated normal current	As per BOM
	No. of Poles	2 P
	Rated Operational Voltage	220 V DC
	Rated insulation voltage	500V DC
	Rated short circuit breaking capacity	10 kA or above
	Rated short circuit making capacity (Peak)	2.5 times
	Type of Mounting	Fixed
	Releases	O/L,S/C
4	Bus Bar :	
	Rated normal current	50 Amp
	Rated voltage	220 V DC
	No. of phases	2 P

	Rated insulation test voltage	500V DC
	Rated short circuit current	10 kA
	Rated peak short circuit current	2.5 times short ckt. Current
	Max. rise in temperature above ambient	45°C
5	Terminal Connections :	as per BOM
	Incoming Feeders	By PVC/XLPE Cables
	Outgoing Feeders	By PVC/XLPE Cables
6	DC measuring instrument :	
	Type	Shunt
	Ratio	as per BOM
	Accuracy Class	0.5
	Short time current rating	of breaker rating with which it is associated as per BOM
	Rated insulation test voltage	500V DC
7	Accessories :	
	Visual indicating lamp	Phase Indication, ON, OFF & TRIP
	Digital ampere/voltage	As per BOM
8	Panel Box :	Single, Cubical pattern, sheet steel, dust and vermin proof suitable for indoor installation with IP-52 degree of protection.
9	Clearances :	Various electrical clearances like phase to phase & phase to earth on poles, bus bars & cable etc. shall be in accordance with applicable standards and Indian Electricity Rules.
10	Preferred Brand of MCCB	Schneider, L&T, Siemens, Havells, ABB etc.

4. Drawings:

Detailed GA, Power and Control circuit drawing along with Fabrication drawings showing MCCB arrangement and the overall size of bus bars, enclosure, fixing details, support, joints, etc. shall be submitted by the successful bidder for approval of purchaser. The bidder shall incorporate purchaser's comments/modification suggested. Actual fabrication of the Panels shall be carried out only after the approval of the purchaser.

4.1 Acceptance test to be performed at IPR site:

- a. Visual checks

- b. IR test
- c. Functional check of accessories

4.2 Test reports /Drawings:

Three copies of Test and Inspection reports/QA documents, power and control drawing for the panel, test certificate of each component with operation manual shall be supplied along with the above items.

5. Warranty Period:

Minimum 1 year warranty should be provided by the vendor from date of acceptance of Main Distribution Board.

6. Technical compliance form:

Sr. No.	Particulars	IPR requirements	Vendors Specification
1.	Design, Supply of DC Main Distribution Board	As per BOM and SLD	
2.	Erection, Installation, Testing and commissioning of DC Main Distribution Board	As per BOM and SLD	
3.	Supply of cable	Supply of 1.1 kV voltage grade, copper conductor, XLPE insulated, armoured power cable of reputed make Size: 2Cx10 sq. mm.	
4.	Cable Laying	Laying of 1.1 kV grade, copper, XLPE insulated, armoured power cable - over cable trays, walls with suitable PVC/metal clamps at regular interval, etc. between DC MDB#2 and DC DB. Cable Size: 1 run x 2C x 10 sq. mm	
5.	Cable Termination	Cable termination on both ends of the 10 sq.mm XLPE insulated copper conductor, armoured power cables of 1.1 kV grade, including cost of all accessories like lugs & glands suitable, insulation tape, sealing compound, panel opening for cable entry etc. (complete)	
6.	Painting	Seven-tank process treatment shall be followed for treatment of the fabrication parts of the panel. Two coats of epoxy based primer shall be applied before applying two final coats of epoxy paint which shall have good weather resistance and heat transfer properties. The colour of paint shall be SIEMENS RAL 7032.	
7.	Enclosure	The basic enclosure shall be fabricated from CRCA sheet steel material, of gauge 16 SWG or better on a suitable angle iron framework.	
8.	Earthing	Copper earth bus of size not less than 10 x 5 sq.mm continuously at the bottom of the panel shall be provided.	
9.	Acceptance test to be performed at IPR site	a. Visual checks b. IR test	

		c. Functional check of accessories	
10.	Test reports /Drawings:	Three copies of Test and Inspection reports/QA documents, power and control drawing for all the panel, test certificate of each component with operation manual shall be supplied along with the above items.	
11.	Warranty Period:	Minimum 1 year warranty should be provided by the vendor from date of acceptance of DC Main Distribution Board.	

Price Bid Format

Sr No	Description	Unit	Qty.	Unit rate (Rs.)	Total cost (Rs.)	Applicable GST %	Total Cost with taxes (Rs.)
1.	Design, Supply of DC Main Distribution Board	No	1No.				
2.	Erection,Installation,inspection and testing and commissioning of DC Main Distribution Board	No	1No.				
3.	Supply of 1.1 kV voltage grade, copper conductor, XLPE insulated, armour power cable of reputed make Size: 2Cx10 sq. mm.	Mtrs.	100 Mtrs.				
4.	Laying of 1.1 kV grade, copper, XLPE insulated, armour power cable - over cable trays, walls with suitable PVC clamps at regular interval, etc.	Mtrs.	100 Mtrs.				
5.	Supply of Cable Termination accessories required for 1.1 kV grade,10 sq.mm XLPE insulated copper conductor, armored power cable with cost of all accessories like lugs ,cable glands,insulating tape etc.	Nos.	2Nos				
6.	Installation of Cable Termination on each end of the 1.1 kV grade, 10 sq.mm XLPE insulated copper conductor, armored power cable.	Nos.	2Nos				
7.	Installation , Laying and connection of copper Earth strip size of 25x6mm from DC MDB-2 to Nearest Panel earth strip with required all accessories like wall/soil clamps, anchor fasteners ,bolts etc. with all civil touch-up work. Earth strip provided by IPR	Mtrs.	5 Mtrs.				
Total Cost (Rs.)							