

This file has been cleaned of potential threats.

To view the reconstructed contents, please SCROLL DOWN to next page.



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 2020/2021/2028  
Fax : 91-079-23962277  
Web : [www.ipr.res.in](http://www.ipr.res.in)

## ENQUIRY

ENQUIRY NO : IPR/EQL/18-19/051  
Date : 23-05-2018

**Due on : 21-06-2018 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](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	Design, fabrication, inspection, testing & Supply of Low Voltage Distribution Panel (3 Phase MDB), with all accessories	8.0 Nos.
2	Design, fabrication, inspection, testing & Supply of Low Voltage Distribution Panel (Single Phase MDB), with all accessories	8.0 Nos.
3	Erection, Testing & commissioning of Low Voltage Distribution Panel (3 phase and single phase DB) at site	16.0 Job

Note: (1). 90% of order value will be made against delivery of material at IPR site and its verification by IPR representative. Balance 10% will be made within 30 days from the date of acceptance and on receipt of Performance Bank Guarantee for 10% of the order value from SBI/nationalized/scheduled bank (Scheduled banks acceptable to IPR are Axis Bank, HDFC Bank, ICICI Bank and IDBI Bank) valid throughout the warranty period.

(2). Please quote with complete technical details (Technical compliance sheet and product data sheet).

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.

## **PROJECT INFORMATION & AUXILIARY FACILITIES**

1	Purchaser	Institute For Plasma Research, Village Bhat, Gandhinagar - 382 428, Gujarat, INDIA. Phone : (079)-23962000 Fax : (079)-23969017 Web: www.ipr.res.in
2	Site elevation (avg.)	55 meters above MSL
3	Ambient temperature	Max.(annual):47 °C; Min. (annual): 4 °C; Average (annual): 35 °C Design (max): 50°C, (min): 4°C
4	Relative humidity	Max. : 95%; Min. : 10%
5	Rainfall	823 mm average (annual) June-August
6	Wind data	Max. wind speed : 130 km/h Prevailing direction : SW to W Design wind pressure : 150 kgm <sup>-2</sup>
7	Seismic data	0.08 g (as per latest guidelines)
8	Accessibility	by road : upto site(on Hansol-Gandhinagar H-way) by rail : Ahmedabad Rly. Stn. (12 km.) by sea : Bombay Harbour (525 km.) by air : Ahmedabad Airport (6 km.)
9	Auxiliary power supply (each of the voltages can be made available at one point of connection to the sources)	AC 230 ± 10% V
10	Expected date of commissioning.	2 months after the date of approval of drawings

## **SPECIFICATION FOR LOW VOLTAGE DISTRIBUTION PANELS**

### **1.1 SCOPE:**

The scope covers design, fabrication, inspection and testing at contractor's/his sub-contractor's work, Supply, installation and commissioning at IPR site of Eight (8) number of low voltage distribution MCCB/MCB panel (3 phase MDB) and Eight (8) number of low voltage MCB panel (1 phase MDB), with all accessories, as specified in this document and in the tender drawings.

### **1.2 CODES AND STANDARDS:**

The design, materials, construction, manufacture, inspection, testing and performance of MDB shall comply with all currently applicable statutory 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. Some of the reference standards are mentioned in this tender document.

### **1.3 DESIGN FEATURES:**

- a) The MDBs are required for distributing power to various system and utilities.
- b) The MDB shall be suitable for use in rated voltage of 415V earthed electrical system having maximum system voltage of  $415V \pm 10\%$ .
- c) The design and construction of the panel shall be strong enough to take the load of breaker, bus bars, cables, relays 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 breaker, bus bars, cables etc. shall be suitable for continuous operation under site conditions indicated elsewhere with conductor temperature of 105 °C maximum. Also the conductor temperature during short circuit shall not exceed 250 °C. Bus bars shall be suitable for short time overloads.
- e) The MDB 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 bus bar 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.

#### **1.4 CONSTRUCTIONAL FEATURES:**

##### **1.5 The Basic Cubicle:**

- a) The basic enclosure shall be fabricated from Cold rolled sheet steel material, of thickness not less than 2 mm in all sides. For all the load bearing application sheet steel thickness shall not be less than 2 mm. Doors and covers shall be made of cold rolled sheet steel of thickness not less than 1.6 mm. Stiffeners shall be provided wherever required. The panel frames shall be fabricated using cold rolled sheet steel of thickness not less than 2.5 mm.
- b) The doors and removable covers shall be provided with neoprene gaskets to make the panel dust and vermin proof.
- c) 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.
- d) The panel board shall be complete with all internal wiring, bus-bars, labels, accessories etc. as specified.
- e) Labels shall be provided for all identifiable like breakers, relays, indicating lamps, control switches, selector switches and accessories etc.
- f) The panel door shall be opened only by means of tools to prevent unauthorized opening.
- g) 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. Electrostatic epoxy powder coating shall be applied after pre-treatment. The colour of painting shall be RAL 7032.
- h) The cubicle shall be stand mount type. The stand shall be of cage type and shall be fabricated from not less than ISA 35x35x5 mm. The stand shall be painted with anti-rust paint and final coat of black epoxy paint.
- i) Proper fixing of the stand and panel shall be done by suitable anchor fasteners/nuts/bolts.

## **1.6 The Breaker Compartment:**

- a) The MCCB compartment shall be separate, which houses the MCCB with Door operating mechanism.
- b) MCCBs and MCBs shall be arranged in multi-tier form if design permits looking at its size and thermal properties for better optimization of overall size of enclosure and of available space.

## **1.7 The Bus bar Chamber:**

- a) The bus bar chamber on the top shall house the bus bars, which shall be accessed only by special tools.
- b) Bus bars shall be of Electrolytic Copper material and shall comply the requirements of IS: 8130. The bus bars should have rectangular section. The size of the bus bar should be clearly indicated in the quotation and the current density while calculating the size of the bus bars should be 1.6 A/sq.mm.
- c) The bus bars shall be supported non-hygroscopic, anti-tracking high impact epoxy cast resin insulator. The support shall be rigid and suitable for all thermal and electro dynamic stresses arising out of short circuit current for 3 sec.
- d) Bus bars shall be designed for rated normal continuous current and fault level for one second as specified in BOM, without injurious heating.
- e) Bus bars in the switchgear may be provided with insulating sleeves OR insulating coatings. The sleeves or coating material shall comply with the following requirements:
  - 1. The insulating material shall safely withstand the hot-spot temperatures of the bus bars.
  - 2. The material shall be flame retardant in accordance with ANSI-C37.20.
  - 3. Thermal cycling tests should have been carried out (on representative samples of insulated bus bars) to prove that insulation will not flake off or deteriorate during the expected life of the switchgear which is 30 years. One cycle is from full – load temperature to no-load temperature. Expected numbers of cycles are 20,000.
  - 4. Accelerated thermal and dielectric aging tests should have been conducted on the material for expected life of the switchgear.
  - 5. The thickness of insulation on the bus bars shall be sufficient to withstand 1.5 kV rms for one minute.
  - 6. Minimum phase to phase and phase to earth clearance shall be 25 mm.
  - 7. The material shall have low dielectric loss.
  - 8. It shall have good thermal conductivity to dissipate heat.
  - 9. If there is any de-rating of bus bars due to the above, the same shall be furnished.
- f) The bus bars and every tap off joints shall be colour coded.
- g) Silver plating of all bus bar joints shall be provided so that temperature rise of 55°C over 50 °C ambient temperature can be allowed as per ANSI C37.20

### **1.8 The CT and Cable Chamber:**

- a) A spacious cable chamber at the rear of the panel shall be provided. It shall be suitable for receiving number of cables of different size as mentioned in Cable schedule. The cable box shall be accessed through removable rear cover.
- b) The cable box shall be design for cable entry from top or bottom as mentioned in BOM.
- c) Sufficient distance between cable gland plate and terminal lug shall be provided for cable termination.
- d) For cable entry, a removable 2 mm MS gland plate shall be provided.
- e) Various Clearances shall be as per the standards and practices.

### **1.9 The Relay and Instrument Chamber:**

- a) Protective relays and indicating instruments shall be mounted on the door. Auxiliary relays should be projection mounted inside the cubicle.
- b) Control wiring shall be done using 650 V grade grey PVC stranded wire 1.5 sq.mm for control and 2.5 sq.mm for CT circuit.
- c) As a standard practice, all control cables shall be neatly bunched together with ferrules at either end of each wire. As per application colour ferrules shall be provided.
- d) The wire bunch shall be passed through PVC ducts.
- e) For safety and reliability, cable bunch shall be routed through flexible metallic conduit wherever it passes through HV compartments like breaker, PT chamber etc.
- f) Bus wiring shall be through grommets. Separate terminal stack shall be provided for inter-panel wiring.
- g) All wiring practices shall be as per IS-375.

### **1.10 MOLDED CASE CIRCUIT BREAKER (MCCB) :**

- a) Molded Case Circuit Breakers shall fully conform to IS: 13947 part II.
- b) MCCB's shall be designed for circuit protection of 415 V, three phase four wire AC distribution system. They shall be designed for use in panel boards as main breakers and for protection of feeder circuits and connecting equipment.
- c) The terminals of the MCCB's shall be designed to maintain adequate clearances and to accept Aluminium cables.
- d) The insulating case and cover shall be made of high strength, heat resistant, flame retardant thermosetting material, providing a very high dielectric strength, high withstand capability against thermal and mechanical stresses, protection against secondary fire hazards and enhanced safety of operating personnel.



- e) All MCCB's shall be provided with integrated static trip releases for overload, short circuit and earth fault with multiple characteristic curves and adjustable setting for each characteristic to ensure proper co-ordination.

#### **1.11 MINIATURE CIRCUIT BREAKER (MCB)**

- a) MCB shall fully conform to IS: 13032/IEC 60898
- b) MCBs shall be designed for circuit protection of 415 V (3 phase + neutral) and 230 V (1 phase + neutral), three phase four wire AC distribution system. They shall be designed for use in panel boards as outgoing breakers and for protection of feeder circuits and connecting equipment.
- c) The contact indication of MCB shall be Red-ON and Green-OFF.
- d) The MCB shall be of C type tripping curve.

#### **1.12 INDUSTRIAL PLUGS & SOCKETS:**

- a) The Industrial Plugs and socket shall fully conform to IS: 13032/IEC 60309
- b) The Industrial plugs and socket shall confirm to IP 44
- c) The Industrial panel socket shall be flush mount type, High grade thermoplastic material, 16A, 3 Pin socket, suitable for 230V 1 phase AC supply.
- d) Each Plug shall be supplied with the compatible industrial plug of the same rating.

#### **1.13 CURRENT TRANSFORMERS:**

- a) Current transformers shall comply with IS: 2705.
- b) Construction of CT's shall be bar type, separately mounted type.
- c) CT's shall be provided with two ( 2 ) nos. of cores, one for metering and another one for protection. Each core shall carry its own secondary winding.
- d) Protection CT core are intended for Over load, Short circuit current and Earth fault protection, the design should be based on the information provided below.

#### **1.14 PROTECTION, METERING AND INDICATION:**

#### **1.15 Protection & Control:**

- a) MCCB shall be provided with Static trip releases for overload, short circuit and earth fault protection (LSIG Protection).
- b) The relays should feature inherent high accuracy, high reliability and stable characteristics for both current and time setting functions.

- c) The relays should provide guaranteed performance in the specified operating conditions at specified ambient conditions without any need for specific ventilation or air conditioning.
- d) Adequate number of relay auxiliary contacts should be available for direct interface with breaker, monitoring and interlocking.
- e) MCCB incoming feeder control switch shall be provided for local operation in panel itself.
- f) Flexible settings on protection relays and releases shall be provided as follows :
  - 4) Over load setting: 0.4 to 1.0 times the rated current.
  - ii) Over load time delay: 3 to 40 sec.
  - ii) Short circuit pick up level setting: 1.5 to 14 times the rated current.
  - iii) Short circuit time delay: Inst., 30 to 300 msec.
  - iv) Earth fault settings: 0.2 to 0.8 times the rated current
  - v) Earth fault time delay: Inst., 100 to 300 msec.

### **1.16 Metering:**

- a) As per BOM Incoming feeder shall be provided with Digital Multifunction Meter/Voltmeter/Ammeter. Ammeter range will be same as CT primary rating.
- b) All above meter shall be Panel mounting type and digital, 96 mm<sup>2</sup>size for all feeders.
- c) Protective fuses/MCBs of 4 A rating associated with voltage measurement and protection shall be provided.

### **1.17 Indication:**

- a) A set of indicating lamps of reputed make like Siemens or Teknic showing breaker status (ON, OFF & TRIP) shall be provided for MCCB Incomer.
- b) Protective fuses/MCBs of 4 A rating associated with all indicating lamps shall be provided.

### **1.18 ACCESSORIES:**

All breaker panels shall be provided with following accessories –

- a) Earth fault relay for all MCCB Incomers.
- b) CTs of rating specified in BOM for all the feeders.
- c) PTs of rating specified in BOM for all incoming feeders.
- d) Door Operating Mechanism with handle for MCCBs

### 1.19 EARTHING:

- A copper earth bus of size not less than 25 x 6 mm<sup>2</sup> continuously runs at the bottom of the panel shall be provided.
- The earth bus shall be robust and capable of carrying full short circuit current for 1 sec.
- 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.
- The earth bus shall have provisions for terminals at each end for connecting to grid earthing.

### 1.20 BILL OF MATERIAL

Distribution Board	Configuration	Incomer			Outgoing		
		Device	Rating	Protection & Metering	Device rating	Device rating	Qty
<b>3 Phase MDB, 8 Nos.</b>	(Horizontal/Vertical tier arrangement) Stand Mount, Top & Bottom Cable Entry	MCCB	3P, 250A, 25kA	Static OL/SC/EF, MFM Meter	MCB	TPN, 63A, 10kA	6
					MCB	TPN, 40A, 10kA	6
					MCB	TPN, 20A, 10kA	6
<b>1 Phase MDB, 8 Nos.</b>	(Horizontal/Vertical tier arrangement) Stand Mount, Top & Bottom Cable Entry	MCB	TPN, 63A, 25kA	RCCB 100 mA, MFM Meter	R Phase DP MCB 63 A, 10 kA	16A SP MCB, 10 kA with 16 A Industrial Socket & Plug	10
					Y Phase DP MCB 63 A, 10 kA	16A SP MCB, 10 kA with 16 A Industrial Socket & Plug	10
					B Phase DP MCB 63 A, 10 kA	16A SP MCB, 10 kA with 16 A Industrial Socket & Plug	10

### 1.21 DRAWING:

Detailed Power and Control circuit drawing along with fabrication drawings showing breaker 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.

## **1.22 UNLOADING AND STORAGE:**

VENDOR has to take the complete responsibility of the unloading of the MDBs at proper location at the site. The accessories shall be unloaded and store at vendor's responsibility at the site. Vendor will be fully responsible for timely unloading of equipment and accessories. IPR will not bear any expenses for the delay in unloading the equipment in the scope of this specification.

## TECHNICAL SPECIFICATIONS FOR L.T. CIRCUIT BREAKER PANELS

Sr. No.	Parameters	Data	
<b>1</b>	<b>General :</b>		
	Type of L. T. Panel	MCCB/MCB Panel	
	Application	For Distribution	
	Installation	Indoor	
	Type of panel mounting	Stand mounted	
	Ambient temperature	as per Proj. Inf - I	
<b>2</b>	<b>System Data :</b>		
	Rated Voltage	230 V / 415 V	
	Rated Frequency	50 Hz	
	No. of Phases	3 ph, 4 wire	
	Fault Level	As per BOM	
	Grounding	Effective	
<b>3</b>	<b>Ratings :</b>	<b>MCCB</b>	<b>MCB</b>
	Rated normal current	as per BOM	as per BOM
	No. of Poles	3 P	3 P + N
	Rated Voltage	415 V	415 V
	Rated Frequency	50 Hz	50 Hz
	Rated insulation voltage	690 V	690 V
	Rated impulse voltage	8 kV	8 kV
	Rated short circuit breaking capacity	as per BOM	as per BOM
	Rated short circuit making capacity (peak)	2.5 times	2.5 times
	Type of Mounting	Fixed	Fixed
	Releases	Static/Microprocessor	Thermal
	Operating Mechanism	Trip Free	Trip Free
	Operating time:	$\leq 70$ ms	$\leq 70$ ms
	Opening time	$\leq 70$ ms	$\leq 70$ ms
	Closing time		
	Method of operation	Local	Local
	Auxiliary supply Voltage	230VAC	N.A.
	Industrial Plug & Socket	Flush mount type panel socket, 16A, IP 44, High grade thermoplastic material	
<b>4</b>	<b>Bus Bar :</b>		
	Rated normal current	as per BOM	
	Rated voltage	415 V	
	Rated Frequency	50 Hz	

	No. of phases	TPN
	Rated insulation test voltage	2.5 kV
	Rated short circuit current	As per SLD
	Rated peak short circuit current	2.5 times short ckt. Current
	Max. rise in temperature above ambient	55 °C
	Insulation	Heat shrinkable PVC sleeves
	Internal Wiring for looping	Copper flexible insulated wire (Min. 4 sqmm)
<b>5</b>	<b>Terminal Connections :</b>	as per BOM
	Incoming Feeders	By XLPE Cables
	Outgoing Feeders	By XLPE Cables
<b>6</b>	<b>CT :</b>	
	Type	Cast resin
	Ratio	as per BOM
	Accuracy Class :	
	a) Measuring core	1
	b) Protective core	5P
	Rated Burden :	
	a) Measuring core	10 VA
	b) Protective core	15 VA
	Accuracy limit factor :	
	a) Measuring core	1
	b) Protective core	10
	Short time current rating	of breaker rating with which it is associated as per BOM
	Rated insulation test voltage	2.5 kV
<b>7</b>	<b>Accessories :</b>	
	Earth fault relay	1) with Trip contacts required 2) Local/Remote
	Shunt trip	1) with contacts required 2) Local/Remote
	Closing coil	1) with contacts required 2) Local/Remote
	Auxiliary contacts	4 NO + 4 NC – for ACB 2 NO + 2 NC – for MCCB
	Visual indicating lamp	ON, OFF & TRIP -230V 1ph AC
	Ammeters and Voltmeter	as per BOQ digital type
	Door lock	1) with contacts required 2) Local/Remote
<b>8</b>	<b>Enclosure :</b>	Cubical pattern, stand mount type, sheet steel, dust and vermin proof suitable for indoor installation with IP-52 degree of protection.

9	<b>Clearances :</b>	Various electrical clearances like phase to phase & phase to earth on poles, busbars, cable & busduct terminating boxes etc. shall be in accordance with applicable standards and Indian Electricity Rules.
---	---------------------	---

## **INSPECTION/TESTING**

The vendor shall arrange all the testing facilities for below mentioned factory acceptance tests and inspection in presence of purchaser's representatives, at factory on his own cost.

The factory acceptance test certificates shall be furnished to the purchaser for prior approval before dispatch of any equipment from the works and the approval in writing from the purchaser to affect the dispatch of the equipment.

The test reports shall be submitted completed with identification data including serial number of equipment.

Test shall be performed in presence of purchaser's representative, if so desired by the purchaser.

The successful bidder should give at least two weeks advance notice of the date when the tests are to be carried out.

Following Factory Acceptance Tests shall be carried out at on the complete panel at factory:

- Physical inspection of MDBs.
- Verification of BOM
- High Voltage Test at 2500 V for one minute.
- Insulation Resistance Test at 1000 V Megger.
- Phase Sequence Test.
- Continuity Test.

### REFERENCE STANDARDS:

<b>Sr. No.</b>	<b>Description</b>	<b>Standard No.</b>
1.	L.T. Panels	IS - 8623
2.	MCB boards	IS - 13032
3.	MCCB	IS - 13947 part 2
4.	Current Transformer	IS - 2705
5.	Potential Transformer	IS - 3156
6.	Distribution Board	IS - 13032 / 8623
9.	Bus bars and bus bars connection	IS - 159
10.	Bus bar supporting insulators	IS - 2544



## **INSTALLATION AND COMMISSIONING**

The vendor shall be responsible for the site mobilization to install and commissioning of the MDBs.

Fixing the panel at the desired location in the IPR is in the scope of the Vendor. This includes grouting, fixing bolts; foundation bolts etc. along with supply of required hardware for fixing of distribution boards. The Vendor shall take the approval of the Engineer-in-charge before the commencement of the work.

All the installation tools and commissioning spares are to be provided by Vendor. This includes crane of suitable capacity, trailer, megger (1 kV) and any other instruments or tools required during the erection and commissioning.

The installation work should be carried out immediately after receipt of intimation from IPR in that regard.

During commissioning the successful Vendor has to perform all the required operational tests mentioned in the scope.

Following acceptance tests should be carried out at site:

- Physical inspection of LV Distribution Boards.
- Insulation Resistance Test at 1000 V / 500 V Megger.
- Phase Sequence Test.
- Continuity Test.
- Interlocks and Operation test

### **1. DRAWINGS, OPERATION/INSTRUCTION MANUALS :**

1. Drawing shall be submitted to IPR for approval after placement of the purchase order before commencing the manufacture and construction. The drawing and data to be submitted after Purchase Order should include the following:
  - a) Assembly drawing of the switchgear showing plan, elevation and typical sectional views and locations of breaker compartment, cable terminations, busbar chamber, metering and relay compartment and terminal blocks for external wiring connections. Marshalling panel GA drawing showing the layout of the terminal block and cabling etc.
  - b) Schematic diagrams for control and protection of circuit breakers.
  - c) Foundation plan showing location of foundation channels, anchor bolts and anchors, floor plans and openings for cables/bus ducts etc.  
Foundation plan showing location of foundation channels, anchor bolts and anchors, floor plans etc.



2. Along with the delivery of MDBs the Vendor shall supply operation/instruction manuals/catalogs for all the equipment, drawings of accessories and circuit diagram.
3. Three sets of final drawings shall be provided along with the delivery of the Panels.
4. Reproducible for all drawings shall be supplied.

**Important Notes :**

1. Bidders or its authorized agencies must have valid electrical contractor's license, photocopies of the same shall be submitted along with offer.
2. Bidders are requested to complete the technical particulars in the data sheets enclosed and submit them with their offer.
3. Bidders are also required to offer price details in the format enclosed.

**A - TECHNICAL PARTICULARS TO BE SUBMITTED ALONGWITH THE TENDER**

(Bidders are requested to complete the data sheets and submit the same with their bids)

**(Please fill the Data separately for individual type and size of breaker offered)**

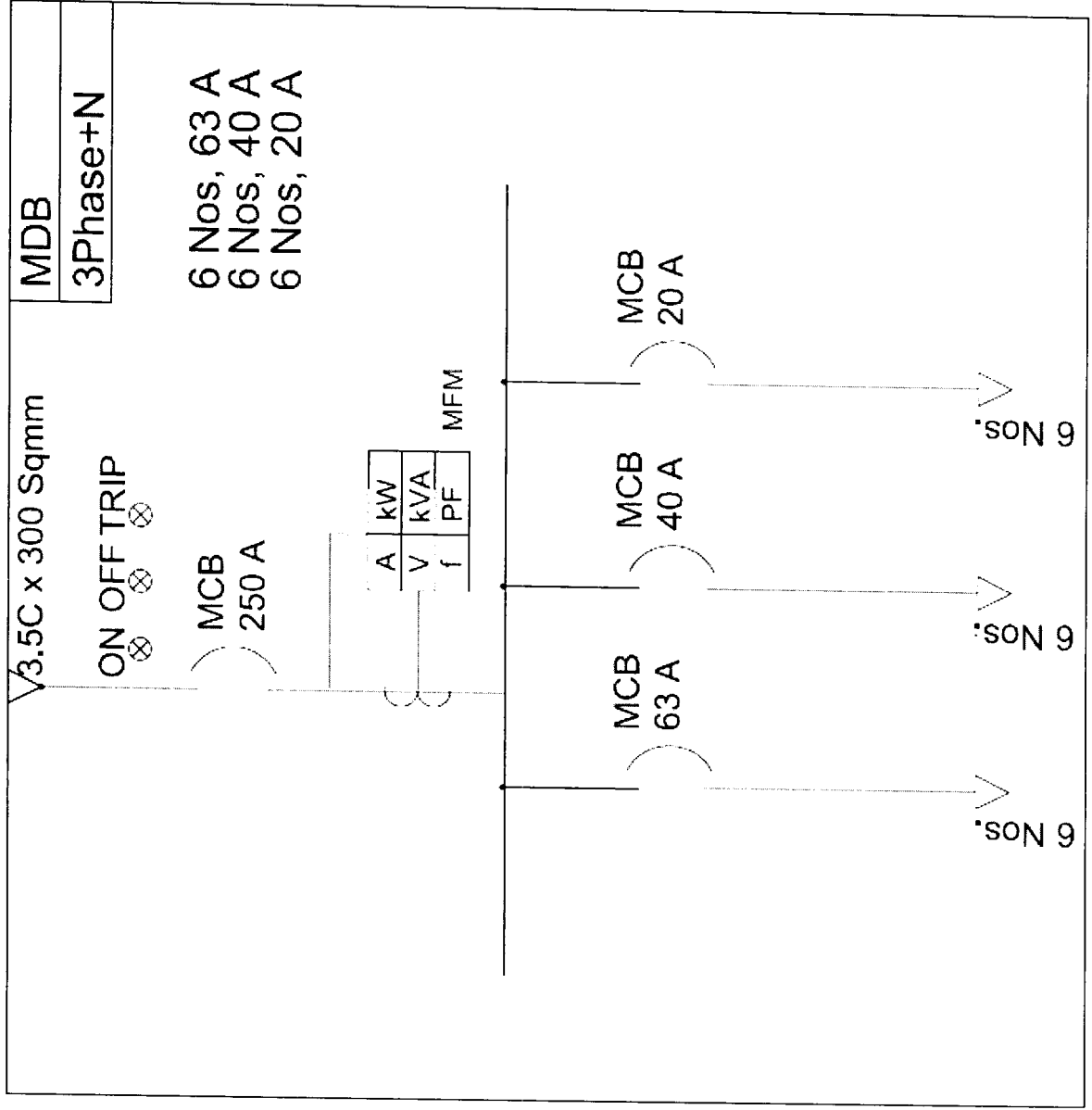
Sr. No.	Parameter Description	IPR Specifications	Data	
			MCCB	MCB
<b>1</b>	<b>General :</b>			
	Name of the manufacturer	-		
	Manufacturer's type	-		
	Type of construction	Floor Mounted with Stand		
	Suitable for indoor/outdoor application	Indoor		
	Design ambient temperature	max 47°C, average 35°C		°C
	Meters (Voltmeter, Ammeter, MFM)	96x96 mm, Digital (Schneider/LT)		
	Indicating Lamps	LED type , 230 V AC Siemens, ABB, Teknic		
	Control wire size and make	1.5 sq. mm Cu; Finolex, Havells, Polycab		
	Auxiliary Contactors/Push Buttons/TNC/Selector Switch	230 VAC L&T, Siemens, Schneider, ABB		
<b>2</b>	<b>Breaker :</b>			
	Name of the Manufacturer	Schneider, L&T, ABB,		
	Number of Poles	As Per BOM		
	Rated Current	As Per BOM	A	A
	Rated Voltage	415 V		
	Frequency	50 Hz		
	Rated insulation Voltage	1.0 kV(ACB) ≥690 V (MCCB)	Hz	Hz
			V	V

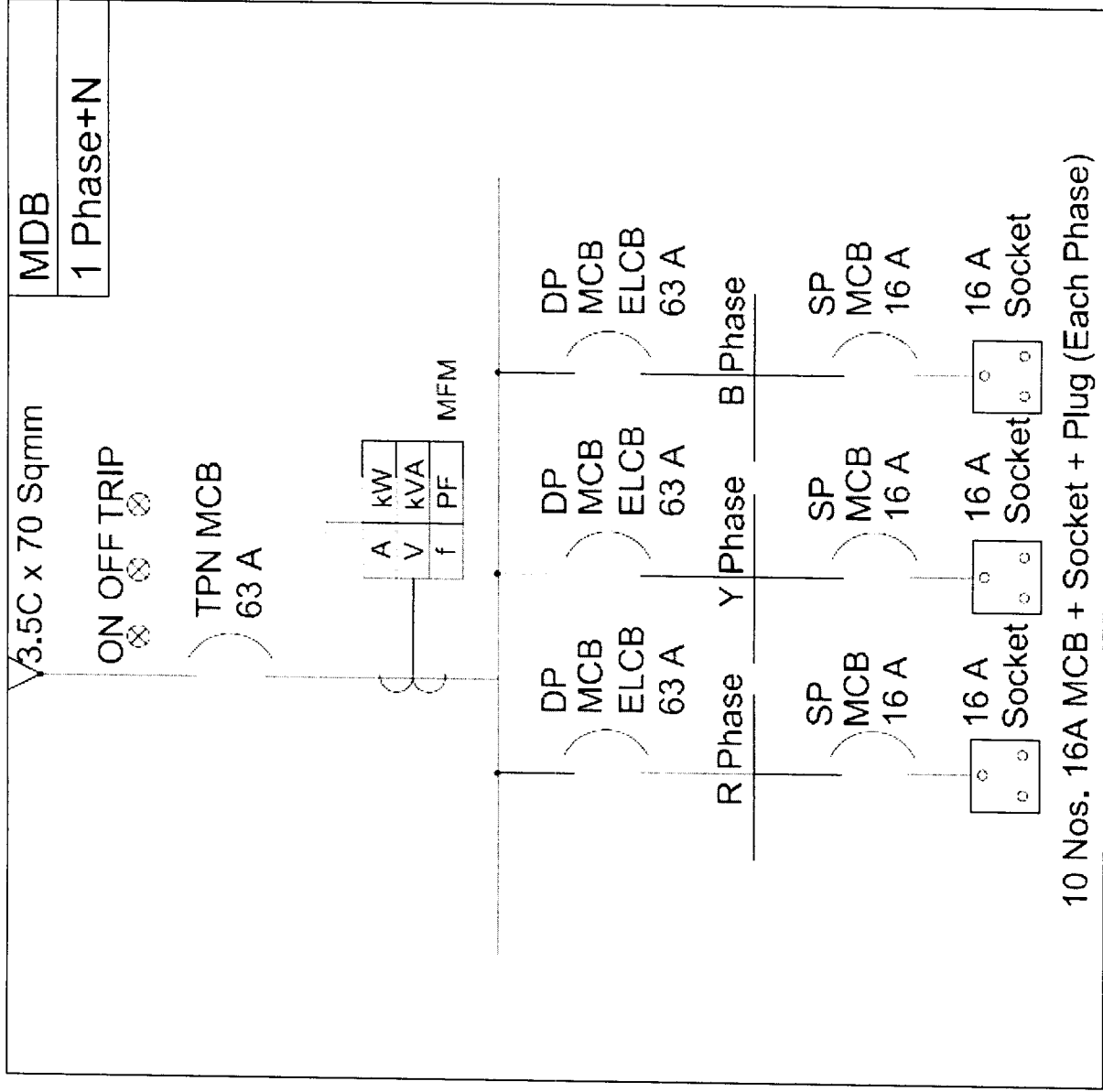
Sr. No.	Parameter Description	IPR Specifications		Data	
	Rated impulse withstand Voltage	8 kV		kV	kV
	Power frequency withstand Voltage	2.5 kV		kV	kV
	Rated short time withstand current for 1 sec.	25 kA (MCCB) / 10 kA (MCB)		kA	kA
	Releases : Microprocessor / Static	Static (MCCB) /Thermal (MCB)			
	Operating Mechanism	Manual fixed type MCCB with Door Operating Mechanism			
	Protection available for • Overload • Short circuit • Earth Fault	YES YES YES	YES YES NO		
<b>3</b>	<b><u>Bus bar :</u></b>				
	Material& Size	Copper, size as per current density 1.6A/ sq. mm			
	Rated continuous current	As per BOM			A
	Rated short circuit withstand current	As per BOM			kA
	Rated peak short circuit withstand current	105 kA			kA
	Temperature rise at rated current over design ambient temperature	55 °C			°C
	Insulation	Heat Shrinkable PVC Sleeves			
	Earth Bus: Material & size	25 x 6 sq. mm Copper			
<b>4</b>	<b><u>Current Transformer :</u></b>				
	Make and type	AE / Kappa			
	Current ratio	As per BoM			A/A
	Insulation withstand level	2.5 kV			kV
	CT wiring	2.5 sq. mm Cu			
	CT terminals	Short link type			



<b>Sr. No.</b>	<b>Parameter Description</b>	<b>IPR Specifications</b>	<b>Data</b>
<b>5</b>	<b><u>Industrial Plugs &amp; Sockets :</u></b>		
	Make	ABB /L&T/ C&S	
	Rating	230V, 16A, 3 Pin	
	Type	Flush mount	
<b>6</b>	<b><u>Enclosure :</u></b>		
	Suitable for indoor/outdoor application	Indoor	
	Thickness of sheet steel	2mm	mm
	Sheet metal cold rolled/hot rolled	CRCA	
	Degree of protection ( as per IS:2147)	IP 52	
	Colour of finish paint : a) Outside b) Inside	RAL 7032	

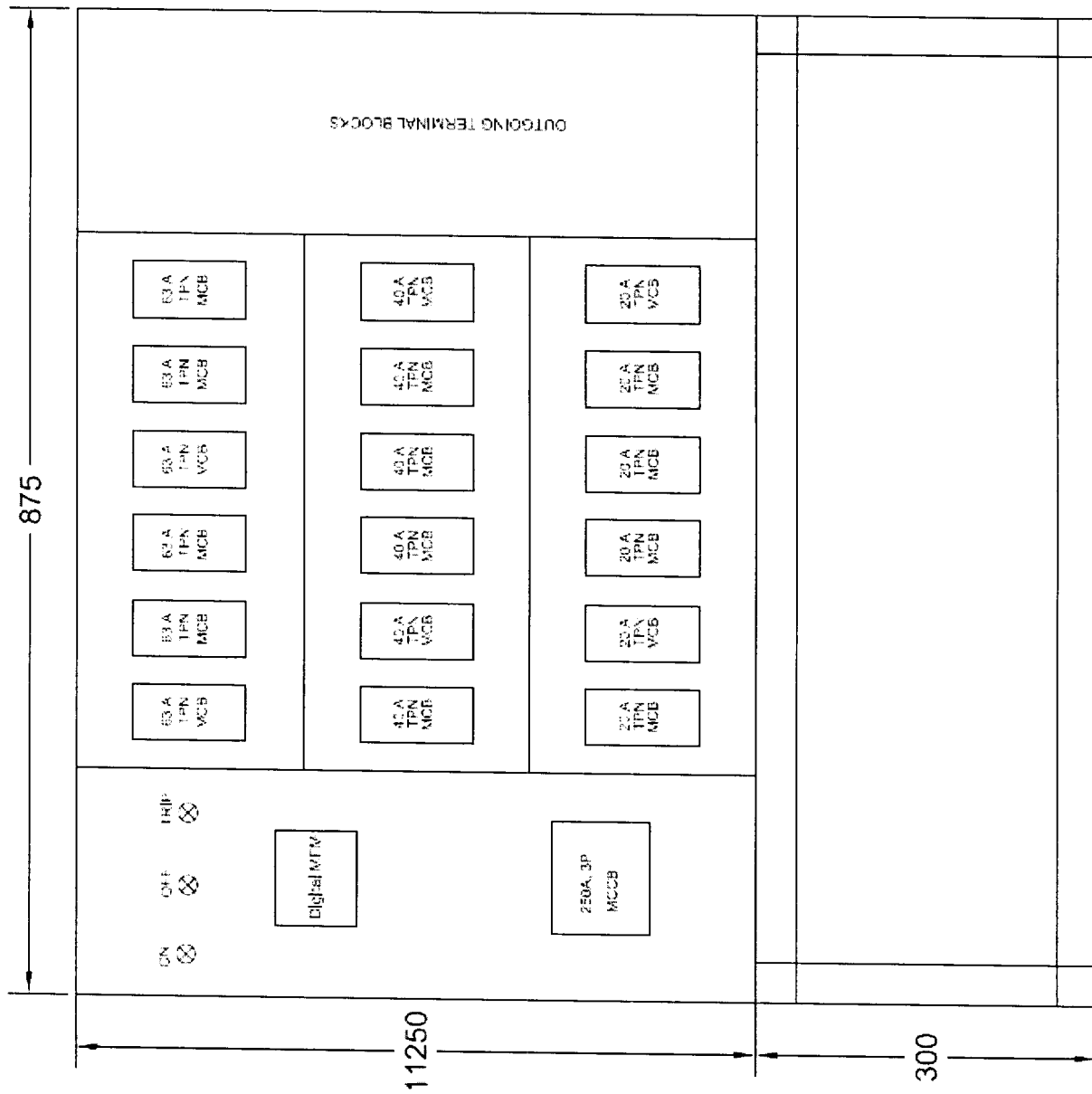
**SINGLE LINE DIAGRAM & TYPICAL GA DRAWING**











**Price Bid Format:**

(Bidders are requested to offer their price bids in the following format)

Sr. No	Description	Qty	Basic Rate (In ₹)	Packing and Forwarding (P&F)	Applicable GST	Rate (Incl. P&F and GST)	Total Amount (In ₹)
		units	(a)	(b)	(c)	(d)	e= b+c+d
1.	Design, fabrication, inspection, testing & Supply of Low Voltage Distribution Panel (3 Phase MDB), with all accessories	08 Nos					
2.	Design, fabrication, inspection, testing & Supply of Low Voltage Distribution Panel (Single Phase MDB), with all accessories	08 Nos					
3.	Erection, Testing & commissioning of Low Voltage Distribution Panel (3 phase and single phase DB) at site.	016 Job		NA			