GUJARAT ENERGY TRANSMISSION CORPORATION LTD.

SARADAR PATEL VIDYUT BHAVAN,
RACE COURSE, BARODA – 390 007.

TECHNICAL SPECIFICATION

FOR

220 V/***110V*** D.C. DISTRIBUTION BOARD

GETCO / E / TS- DCDB 033 / *R1 Aug, 2022*

SPECIFICATIONS

FOR

220/*110* V D.C. DISTRIBUTION BOARD

A. PREAMBLE:

The GETCO is maintaining 220/***110V*** volts battery backup system for the Control supply. The 220/***110V*** volts D.C. supply from the Float ***and Float*** cum Boost charger is brought to D.C. Distribution Board from where supply is catered to various control & Relay panels.

B. CONSTRUCTION:

1. The cubicle shall be constructed from good quality steel sheet. The cubicle shall be robust in construction. The cubicle shall be made of steel sheet of 3 mm size for front side & bottom and 2.5 mm size for other sides. It will be reinforced by steel frame and shall be mechanically strong. ***Base plate on which cable gland plate is provided shall be of 3 mm. Gland plates shall be of 3 mm HR sheet steel.*** It will be indoor, floor mounting and naturally air-cooled type designed for continuous operation in an ambient temperature of 50ºC. Necessary phosphating treatment shall be given to the cubicle and shall be painted with two coats of red oxide primer followed by a coat of gray synthetic enamel paint, shed No. 631, IS: 05 on external side and on internal side with glossy white colour.

2. The distribution board shall be of dust and vermin proof construction and shall be provided with a degree of protection of IP: 55. The cubicle shall have minimum dimensions of 1200mm (H) (including base frame of the size 50 x 50 x 4) x 1000mm (W) x 450mm (D) so that all the components shall be approached and replaced easily. It will be provided with the front side door with the handle and handle lock. It should be possible to erect the cubicle side by side. The replacement of the components and testing should be possible from front of cubicle. The cubicle shall be mounted on 'C' Type channel with opening for cable entry ***from front*** side.

3. The cubicle shall be designed to receive four single core 50 mm^2. Incoming copper cables (outside dia. 14 mm to 20 mm. approx.). Two cables shall be used as Main cables and two cables shall be used as standby. The punched holes shall be provided for above cable entries. The dimensional drawing of the cubicle with all mountings shall be furnished by the bidder. Necessary cable glands shall be supplied with the DCDB.

4. There will be 35/20 Nos. D.C. ***outgoing feeders*** each rated for 32 Amp. Each 32 Amp. D.C. ***outgoing feeder*** shall be controlled by MCBs of rating 32A dc. The cable gland for the cable size 2C x 4 mm^2

shall be provided at the bottom for all the ***outgoing feeder***. The LED type indicating lamps for incoming and each outgoing feeders indicating availability of supply shall be provided on the front panel of cubical.

5. There will be a Main copper bus bar of electrolytic copper confirming IS 8130/84, which will be liberally rated. It will receive D.C. input from incoming cables through TBs and Switch & HRC fuse of 63 A, for each +Ve and –Ve line of D.C Supply. The input to MCB of each outgoing feeder shall be extended from +Ve D.C and –Ve D.C bus. The thickness and width of bus bar shall not be less than 5 mm and 30 mm respectively or ***minimum 150sq mm***. The bus bar shall be of sufficient length to avoid congestion. The separation between connection points of +Ve lines of cable of two successive outgoing feeders on D.C +Ve Bus and –Ve lines of cable of two successive outgoing feeders on D.C –Ve Bus shall be 4 Cms. Bus bar shall be insulated to avoid accident while working inside D.C.D.B. Insulation on the bus bar may reduce the rate of dissipation of heat generated in bus bar. This will increase temperature of bus bar, which will affect the insulation. Therefore, bus bar design should take all these factors into account so that there is no temperature rise. Each MCB shall be then connected to Terminal Blocks by using insulated copper cable of not less than 6 mm^2. The design of DCDB shall be such that there shall be minimum voltage drop. Special care shall be taken to avoid voltage drop at every level.

6. The wiring shall be neat and clean without any congestion and shall be supported mechanically as well as tied up to withstand transit vibrations. More than two wires shall not be terminated at a point.

7. Digital D.C. Voltmeter with transducer having two separate O/Ps of 4 – 20 mA to read D.C. voltage upto ***150V for 110V DCDB and 300V for 220V DCDB*** shall be provided. Digital D.C. Ammeter with transducer having two separate O/Ps of 4 – 20 mA shall be provided to read current upto 60 A. The meters and shunts shall be of good quality suitable to give a long and satisfactory service.

8. A cubicle light with fuse and switch shall be provided inside the cubicle operating on D.C.

9. ***A copper earthing bus of 25X3 mm tinned Cu shall be provided having 5mm Φ holes drilled at regular intervals of 50 mm with M4 BRASS bolts & nut. The hinged doors shall be earthed through flexible copper braid.***

10. ***Name plate with required details like Type of DCDB, Project name, Order/AT No, Mfg. details, Property of GETCO etc. shall be provided at the front. Name plates shall be of Aluminium anodized having black background with white engraved letters.***

B. *GENERAL* REQUIREMENTS**:**

1. The D.C. D.B. shall be scientifically designed to avoid temperature rise and voltage drop. The vermin proofing shall be given due importance and it will be carried out positively. All labels shall be revetted. Stickers shall not be accepted. Proper earthing arrangements shall be provided on the cubicle.

2. ***Terminal Blocks disconnecting, M4 stud type 800V, 41A rating suitable for connecting 4 sq. mm copper cable shall be provided with mounting arrangement, channels, end plates, end locks, PVC wire ways etc. for outgoing feeders.***

3. ***The bidder shall have to submit Quality Assurance Plan adopted for manufacturing DCDB specifying detailed manufacturing process right from raw material to finished product testing. Precaution taken for ensuring usage of quality raw materials and sub- components shall be stated in the quality assurance plan.***

4. ***The bidder shall submit drawing of General Arrangement showing all dimensions - Internal view showing mounting arrangement - Side view & top view, Constructional details, Wiring diagram, Name plate details, Foundation plan, Bill of material etc. with all relevant details for approval. All the drawings submitted in soft form shall be in pdf format. However, requirement in AutoCAD form shall be at the discretion of GETCO.***

5. ***Inspection of the material shall be offered only after successful completion of routine testing at the works. The inspection may be carried out by the purchaser at any stage of manufacture. The successful bidder shall grant free access to the purchaser's representative at a reasonable time when the work is in progress. The purchaser reserves the right to insist for witnessing the acceptance routine testing of bought out items.***

C. TYPE TEST:

The following tests from NABL accredited laboratory shall be carried out in accordance with IS:2147 or the latest / amended / up to date IS/IEC. The bidder has to submit the all type test reports as stated hereunder for the offered item along with the technical bid. The type test reports from NABL approved laboratory shall not be older than seven years. Type test reports shall be valid as on the last date of submission of bid.

Type test:

Degree of Protection IP-55

Note:

1. ***In case of non-submission /partial submission or type test reports of which validity is over, bidder shall submit pending type test report/s from NABL accredited laboratory, in the event of an order, before commencement of supply without affecting delivery schedule, free of cost to GETCO. Confirmation for above shall be invariably submitted along with technical bid.***

2. ***Type test report shall invariably indicate details like type and size of Gasket material, Door and Gasket profile, GA drawing etc.***

D. SCOPE OF SUPPLY:

1. Design, fabricate and supply 220/***110V*** volts D.C. Distribution Board with 60 Amp. Capacity and 35/20 outlets of 32 Amp. each.

2. 4 Nos. of Cable glands for 50 mm^2 Incoming Main and Stand by cables, 35/20 Nos. of glands for 4 mm^2, 2 Core X 35/20 cables of Outgoing feeders and 4 Nos. of 50mm^2 copper lugs for incoming cables shall be in the scope of the supplier.

D.C. DISTRIBUTION BOARD

GUARANTEED TECHNICAL PARTICULARS

The bidder must fill up all the point of GTP for offered item/s. Instead of indicating "refer drawing, or as per IS/IEC", the exact value/s must be filled in.

Manufacturer :-					
Rating / Type :-					
Sr. No.		**Parameters**	**Acceptable Design Data**	**Verification status**	**Remarks**
		Manufacturer			
		Type & Designation if any			
A		**Product Specification Sheet**			
	1	Constructional details			
		Structural requirement			
		- Indoor type			
		- Floor mounting			
		- Fixed standing			
		- Metal enclosed			
		-Naturally Air cooled			
		- Rigid			
		-Self supporting			
		-Free from flows/ Twists& bends			
		-Thickness of sheet steel			
		- All sides & cover (mm)	2.5		

		-Doors(mm)- Front	3		
		- Base Plate (mm)	3		
		Gland Plates			
		- Material	HR steel		
		-Thickness (mm)	3		
	2	Continuous Operation in Ambient Temperature	50°C		
	3	Colour Shade & Process & Paint Thickness	Powder coating. & paint thickness shall be of 60 to 100 microns.		
		- Outside	Light Grey as per 631 of IS:5		
		- Inside	Glossy White		
		- Base	Black		
	4	Vermin proofing/Protection against Water & Dust			
		- Degree of Protection	IP 55 As per IS 2147/IEC60947		
		- Gaskets			
		- Material	Neoprene / Synthetic Rubber		
		- Size			
		-Gasket Profile drawing			
	5	Dimensions			
		- Height (mm) including the base frame structure height	1200		
		- Width (mm)	1000		
		- Depth (mm)	450		

	6	Base frame structure			
		- Type of Channel	"C" Type Channel		
		- Dimensions	50*50*4		
	7	Drawing Details			
		Front View with & W/o Door			
		Rear View			
		Top View			
		Side View			
		Gland plates			
		Foundation Drawing			
		- Cable cutouts			
		- Foundation Bolt pockets			
	7	Provision of Front side door with handle & Handle lock.			
		No Rear side Opening/ Louvers			
	9	Main Copper Bus bar			
		- Grade			
		- The Size of Bus bar (for +Ve & -Ve Bus)	Min 30* 5 mm or 150Sq.mm		
		-The Length of Bus bar	Throughout the length of cubicle		
		-Conical Fiber Glass support			
		-Mounting with Hylem sheet & PVC channel supports			
		- Incoming cable through TBs & HRC Fuse(63A)			

		- The Separation distance Between +Ve & -Ve lines of cables point connections.	Min. 4 Cm		
		-The Bus bar shall be insulated.			
	10	Earthing Bus			
		- Material	Cu		
		- Size	25*3 mm strip having 12mmΦ holes drilled at each end & 4 nos. of 5mmΦ holes		
		-The Length of Earth bus	-Throughout the length of cubicle		
		-Connection to the Bus with Green , 4 sq. mm flexible copper wire			
		- Door Earthing through Flexible Cu braid.			
	11	Feeder Details			
	a	-Nos. of Incoming Feeders	- 4 Nos. (2 Main +2 Standby)		
	b	Incoming Feeder Ratings (Each)	63A		
	c	- Make of incoming Switch/HRC Fuse	Make		
	d	-Incoming Feeder Cable	Copper 2x1Cx50 sq.mm (Outside dia.14 to 20 mm.)		
	e	-Incoming Terminal Block Details - Make - Nos. - Size -Ratings	 6 50Sq.mm 800V		

		-Type			
	F	-Lugs for I/C Feeders -Make -Size -Material -No.	 50Sq.mm Copper 4 Nos.		
	a	-Nos. of Outgoing Feeders	20/35		
	b	- Outgoing Feeder Rating(Each)	32A		
	c	- MCB rating for each feeder (20 Nos. of 32 A DC MCB) or (35 Nos. of 32A DC MCB)			
	d	-Outgoing Terminal Block Details - Make - Nos. - Size -Ratings -Type	 4Sq.mm 800V, 41A		
	12	Flexible Copper Wires			
		- FRLSH Type			
		-Make	Make		
		-Colour	Grey		
		- For 63A Min. 25 Sq.mm			
		- For 32 A Min 6 Sq. mm			
	13	Voltmeter with Transducer having 2 Separate O/Ps of 4-20 mA			
		- Nos - Size - Mounting Method -Type -Range	96x96 Flush Mounted Digital 0-150/300V		

		- Make			
	14	DC Ammeter with Transducer having 2 Separate O/Ps of 4-20 mA			
		- Nos - Size - Mounting Method -Type -Range - Make	96x96 Flush Mounted Digital 0-60A		
	15	Voltage Transducer -Output Range -Accuracy Class - Make	 4-20 mA Class -1.0		
	16	Current Transducer - Output Range - Accuracy Class - Make	 4-20 mA Class -1.0		
	17	Indicating Lamp			
		- Type - Colour - Make -Diameter	LED Red 22.5 sq.mm		
		- Nos. of Lamps	21/36 (1 I/C +20/35OG)		
	18	Cubicle Auxiliary supply - 1 No 12 W, 220/110V DC Light, - 2 Nos. Door Limit Switches			
	19	Cable Entry details			
		- Punch holes for Incoming Cables with cutout (Min. 100x100)	4 Nos.		
		- Nos of Gland for incoming cables	4 Nos.		

		- Punch holes for outgoing Cables with cutout - (Min. 250x100)* 2 Nos.	20/35 Nos.		
		- Nos of Gland for Outgoing cables	20/35 Nos.		
	20	General			
		- MCB to Terminal block connection using Insulated Copper Cable size not less than 6 Sq. mm.			
		Nameplate for each component - Aluminum Anodized - Engraved White Letter on Black background Fixing			
C		**TYPE TESTS**			
	1	Degree of protection	IP 55 As per IS 2147 & Type test report from NABL lab Not older than 7 years.		