

GROUP – F

TECHNICAL SPECIFICATION

SERVICE DISTRIBUTION BOX FOR 16KVA SINGLE PHASE 11/0.250KV DISTRIBUTION TRANSFORMER

1.0 SCOPE

The service distribution boxes shall be suitable for mounting on PSC poles of different sizes,. Three sizes of service distribution boxes shall be provided,
Four way for upto four single phase service connections;
Eight way for up to eight single phase service connection;
Twelve way for up to twelve single phase service connections or four three phase service connections or suitable combination of both single phase and three phase service connection.

2.0 GENERAL REQUIREMENTS:

The outer housing shall be made of black insulated material and of a strong vandal proof construction. The material shall be resistant to ultra violet light degradation and have flame retarding properties. Alternatively the housing shall be made of cold rolled mild steel sheet of not less than 2 mm thickness. It shall provide protection of the internal parts in accordance with category IP55.

The box shall incorporate a cover which shall be removable at pole top, or a door, to enable work to be done. The cover or door shall be retained in such a way that it cannot fall to the ground and it shall include an integral locking device which facilitates the application of security seals.

The boxes will provide fuse protection for the services using rewirable type fuse carriers and bases complying with the requirements of IS: 2086:1993. -Carriers and Bases in rewirable Type Electric Fuses for Voltages up to 650 Volts—Specification. Dimensions will conform to Type A of the referred standard..

The internal connections shall be made with self sealing greased terminals having the capacity to accommodate the conductor combinations specified in the table of requirements. Heavy duty cable glands shall be provided for mains cable entries. Service cables shall be securely restrained by cable clamps and shall be suitably protected at the entry to ensure they are snugly fitting and not subject to abrasion or cutting over time.

The phase terminal blocks and neutral bar shall be designed with sufficient shrouding and shall be so located that services can be added or removed at pole top under live line conditions. The bus bars and terminals shall be tinned and suitable for connection of copper or aluminum conductors.

The front external surface of the box shall have a suitable legend, legibly and indelibly marked bearing the words -DANGER in English and Oriya and a suitable logo indicating danger or presence of voltage. This inscription shall be approved by the Purchaser before delivery of the distribution boxes. (See the Indian Electricity Rule and REC Specification 57, 1993)

Internally there shall be a notice in a prominent location in large letters stating -warning for live work only on terminal block to be exposed at one timell.

3.0 Table of requirements for Service Distribution Boxes.

Sl. No	Description	Four Way Services	Eight Way Services Box	Twelve Way Service
1	Material of Box	Back insulating Material or Cold rolled	Back insulating Material or Cold rolled	Black insulating Material or Cold rolled
2.	Corrosion Protection.	Steel to be painted as specified in the clause on surface	Steel to be painted as specified in the clause on surface	Steel to be painted as specified in the clause on surface
3.	Degree of Protection of Enclosure (IP rating) IS:13947	IP 55	IP 55	IP 55
4.	Mains Cable (incomer)	2 x 50 mm ² AB Cable	2 x 50 mm ² AB Cable	2 x 50 mm ² AB Cable
5.	Service Cable (outgoing)	4 number of Phase and Neutral service cables; Minimum size 2.5 mm ² Al pvc wire Maximum size	8 number of Phase and Neutral service cables; Minimum size 2.5 mm ² Maximum size 10mm ²	12 number of Phase and Neutral service cable or 4 number of 3 phase and neutral cables or combinations of these: Minimum size 2.5 mm ²
6.	Number of Fuses	4 in a row	8 in two rows	12 in three rows
7	Type of Fuses	Rewirable.	Rewirable. IS:2086	Rewirable:IS:2086
8..	Voltage rating of Fuse. Bus bars and terminations.	500 Volts	500 Volts	500 Volts
9.	Current Rating of Fuse carriers and service	32 Amp	32 Amp	32 Amp
10	One second Short Circuit rating of Fuses and Busbars	4 KA	4 KA	4 KA
11.	Maximum Current Rating of Mains Cable terminals Busbars and	30 Amps	63 Amps	150 Amps
12.	Phase Bus material	Aluminum not less that 20x5 mm	Aluminum not less that 20x5 mm cross	Aluminum not less that 30x5 mm cross
13.	Neutral Bus material	Aluminum not less that 20x5 mm cross	Aluminum not less that 20x5 mm cross section.	Aluminum not less that 30x5 mm cross section.
14.	Cable Access	From Bottom to Box	From Bottom to Box	From Bottom to Box
15.	Cable Glands	Suitable DC cable glands of	Suitable DC cable glands of	Suitable DC cable glands of

		sizes shall be provided for all incoming and outgoing wires at the bottom of the box.	sizes shall be provided for all incoming and outgoing wires at the bottom of the box.	sizes shall be provided for all incoming and outgoing wires at the bottom of the box.
16	Pole clamp	One set / 1 pair of suitable pole clamp made of 25 x6 MS painted flat with nut & bolts shall be	Two sets/2 pair of suitable pole clamps with nuts & bolts made of 25x6 MS painted flat shall be	Two sets/2 pair of suitable pole clamps with nuts & bolts made of 25x6 MS painted flat shall be
9	Minimum size of box	350 (H)X350(W)x150(D)	600 (H)X350(W)x300(D)	700 (H)X400(W)x300(D)
10	Locking facility	Both pad lock & panel locks to be provided	Both pad lock & panel locks to be provided	Both pad lock & panel locks to be provided

4.0 PAINTING

All paints shall be applied on clean, dry surfaces under suitable atmospheric and other conditions in accordance with the paint manufacturer's instructions. All paints used shall be compatible with each other and capable of being used as a system. The system shall be capable of performance for minimum of five years in the environment specified without any need for maintenance.

No consecutive coats of paint shall be of the same

shade. The minimum standards acceptable are:

Cleaning by shot blasting to Grade Sa 2.5 of ISO 8501-1

All sheet steel surfaces shall be degreased, pickled and phosphated in accordance with IS6005.

-Code of Practice for phosphating of iron and steel

All rough surfaces of coatings shall be filled with approved two pack filler and rubbed down to a smooth finish.

Before pickling, all welding, drilling, cutting, grinding and other finishing operations must be

completed and all grease, paint, varnish, oil, welding slag, and foreign bodies completely removed. All protuberances which would affect the life of painting shall also be removed. Interior surfaces after preparation, cleaning and priming shall be painted with one coat of zinc

chromate primer, one coat of phenolic based undercoating, followed by one coat of phenolic based finishing paint to grey colour followed by a final coat of anti-condensation paint of grey colour with shade slightly lighter than the exterior paint shade and of a type and make to the approval of the Purchaser. A minimum over all paint film thickness of 150 microns shall be maintained throughout. Exterior steel and metal surfaces, after preparation and priming shall be painted with one coat of zinc chromate primer, one coat of phenolic based under coating and two coats of micaceous iron oxide paint, then painted with a final coat of phenolic based hard glass finishing paint of the DA as per IS:5, to provide an overall minimum paint thickness of 200 microns.

The first coat of primer shall be applied within four hours of shot blasting.

5.0 Acceptance tests

The performance characteristics of the distribution boxes shall be verified by passing the following range of tests:

- 1) Visual & dimensional test
- 2) High voltage withstand test.

This shall be carried out on the unit that has just satisfactorily completed the dielectric properties test. A 50Hz, 4kV, voltage shall be applied between phase and neutral terminals. No flashover shall occur within five minutes, although a glow is acceptable.

6.0 Fuse Carries and Bases

The performance characteristics of fuse carries and bases shall be verified by passing the type tests acceptance tests and routine tests specified in IS: 2086 1993

General Technical Particulars for LT Distribution Boxes:-

- 1) The LT distribution boxes should be of the dimensions as per the drawing & details in the table furnished.
- 2) The Bidders can quote with their own design suitably accommodating the components as indicated in this bid in conforming to the approved clearances and technical requirements. The dimensions are only illustrative. Tolerances of dimensions are 10% over & above the dimension specified. The bidder may specify their own dimensions and quote accordingly. The drawing and dimension should be submitted with the bidding document.
- 3) The distribution boxes shall be duly wired with suitable size of PVC insulated single core copper cable or equivalent section copper/ aluminium flat.
- 4) Terminal connectors the earth connections to be provided in the box.
- 5) The distribution cabinet should be preferably of IP-55 protective category, with provision for lighting inside the cabinet. NESCO & SI. No. Punching Marks should be given on any one of the side walls of each box as an identification of NESCO property, besides furnishing a non-detachable Nameplate, which should exhibit the details of LT Distribution Cabinet.
- 6) **TESTS:** - The 4 pole & three poles M.C.C.Bs to be mounted with Distribution Boxes shall have been fully type tested as per relevant standard at CPRI/ Govt. Approved laboratory/NABL accredited laboratory. The bid shall be accompanying with type-test reports conducted at Central Power Research Institute / Govt. Approved laboratory

for the offered materials conducted within five years before the date of opening of the tender. Copies of type test reports in respect of impulse and short circuit tests must be enclosed with the tender failing, which the Bid is liable for rejection. Purchaser reserves the right to demand repetition of the tests without any extra cost.

Bids not accompanied with type test reports conducted within five years shall not be considered for evaluation.

7) INSPECTION:-

- a) 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. Inspection and acceptance of any equipment under this specification by the Purchaser shall not relieve the supplier or his obligation of furnishing equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment is found to be defective.
- b) The supplier shall keep the Purchaser informed in advance about the manufacturing programme so that arrangement can be made for inspection.
- c) The purchaser reserves the right to insist for witnessing the acceptance/routine testing of the bought out items.

8) ACCEPTANCE AND ROUTINE TEST:-

- a) All acceptance and routine tests as stipulated in the relevant standards shall be carried out by the supplier in presence of owner's representative.
- b) Immediately after finalization of the programme of type/acceptance/routine testing, the supplier shall give fifteen days advance intimation to the Purchaser to enable him to depute his representative for witnessing the tests.

9) DOCUMENTATION:-

The bidder shall furnish the following drawings along with offer.

1. General outline and assembly drawing of the LT Distribution Box.
2. Cross sectional view.
3. Arrangement of terminals & details of connection studs provided.

4. Name Plate.
5. Schematic Drawing.
6. Type test reports, in case MCCB has already been type tested.
7. Test reports, literature of the bought out items and raw materials.
8. Testing facilities available at the works.
9. List of customers with detailed address/purchase reference, quantity and year of supply with user certificate for such items.

10) COMPLETENESS OF EQUIPMENTS:-

Any fittings accessories or apparatus which may not have been specifically mentioned in this specification but which are usually necessary in equipment of similar plant shall be deemed to be included in the specification and shall be supplied by Bidder without extra charge. All plant and equipment shall be complete in all details whether such details are mentioned in the specification or not.

11) GENERAL TECHNICAL PARTICULARS:-

The Bidders are required to furnish the Guaranteed Technical Particulars duly filled in the format given as per Annexure-I.

12) INSPECTION & TESTING :-

The Purchaser shall have free entry at all times, while work on the contract is being performed, to all parts of the manufacturer's works which concern the processing of the equipment ordered. The manufacturer shall afford the Purchaser without charge, all reasonable facilities to assure that the equipment being furnished is in accordance with this specification.

The equipment shall successfully pass all the type tests and routine tests referred to and those listed in the most recent edition of the standards given in this specification.

The Purchaser reserves the right to reject an item of equipment if the test results do not comply with the values specified or with the data given in the technical data schedule.

Type tests shall have been/shall be carried out at CPRI/ National Govt. Approved

Laboratory and be witnessed by a representative of such Laboratory or some other representative acceptable to the Purchaser. Routine tests shall be carried out by the Supplier at no extra charge at their works.

Adequate facility with calibrated testing equipment must be provided by the manufacturer free of cost to carry out the tests. Type test certificates must be furnished along with the tender for reference of the Purchaser.

All cost in connection with the testing, including any necessary re-testing shall be borne by the Supplier who shall provide the Purchaser with all the test facilities which the later may require, free of charge. The Purchaser shall have the right to select the samples for the test and shall also have the right to assure that the testing apparatus is duly calibrated at the expense of the supplier at an approved laboratory and shall be approved by the Purchaser.

The Supplier shall be responsible for the proper testing of the plant or materials supplied by sub-suppliers to the same extent as if the work, plant or materials were completed or supplied by the Supplier.

Any cost incurred by the Purchaser in connection with the inspection and re-testing as a result of failure of the equipment under test or damage during transport or offloading shall be to the account of the Supplier.

The supplier shall submit to the Purchaser five signed copies of the test certificates, giving the results of the tests as required. No materials shall be dispatched until the test certificates have been received by the Purchaser and the Supplier has been informed that they are acceptable.

The test certificates must show the actual values obtained from the tests in the units used in this specification and not merely confirm that the requirements have been met.

In case of components for which specific type tests or routine tests are not given in this specification. The Supplier shall include a list of the tests normally required for these components. All materials used in the Contract shall withstand and shall be certified to have satisfactorily passed such tests.

The Purchaser at his discretion may re-confirm the Test Results in his own laboratory of his choice.

No inspection or lack of inspection or passing by the Purchaser's Representative of equipment or materials whether supplied by the Supplier or sub-supplier, shall relieve the Supplier from his liability to complete the contract works in accordance with the contract or exonerate him from any of his guarantees.

13. SUBMITTALS:

Submittals required with the bid

The following shall be required with each copy of the bid:

Completed technical data schedule;

Descriptive literature giving full technical details of equipment offered;

Outline dimensions drawing for each major component, general arrangement drawing showing component layout and general schematic diagram;

Type test certificates of the offered material conducted at CPRI/or any National Govt. approved Laboratory

Sample routine test reports;

Detailed reference list of customers already using equipment offered along with performance certificates of such equipment, during the last 3 (three) years with particular emphasis on unit of similar design and rating ;

Details of manufacturer's quality assurance standard and programme and ISO 9000 series or equivalent national certification ;

Deviations from this specification. Only deviations approved in writing before award of contract shall be accepted ;

14.) NON COMPLIANCE SCHEDULE

On the schedule the bidder shall provide a list of noncompliance with this specification, documenting the effects that such noncompliance is likely to have on the equipment's life and operating characteristics. Each noncompliance shall refer to the relevant clause of the specification. Where there are no deviations from specifications, the bidder shall so indicate by starting -No deviations|| in this schedule,

Clause No.	Non Compliance

15. TEST CERTIFICATES SCHEDULE

On this schedule a list of the test certificates included with the bid shall be provided . The list should include type test certificates and sample routine test reports. Each certificates listed shall be referred to the relevant specification clause and item of equipment to the test applies.

Clause No.	Type Test Certificate or Routine test

**GUARANTEED TECHNICAL PARTICULARS FOR SERVICE DISTRIBUTION BOX (4WAY, 8 WAY
& 12 WAY)**

(To be furnished by the
Manufacturer)

**(Separate Sheets should be filled up for 4 Way / 8 Way / 12 Way Service
Distribution Boxes)**

Sl. No.	Description	Unit	Bidder's Offer
1	Name of the Manufacturer		
2	Place of manufacturer		
3	Manufacture's Part Number		
4	International Standard it complies with		
5	Maximum Mains Conductors it is suitable for	mm ²	
6	Range of Service Conductor Sizes	mm ²	
7	Max. number of single phase (P-N) services	No	
8	Max. number of three phase (3P+N) Services.	No.	
9	Location of Conductor Entries		
10	Cable Glands for Mains Cable		
11	Integral Sealable door lock on Enclosure		
12	Degree of protection (IP rating)		
13	Type of Open door/open cover retention		
14	Current Rating of Busbars	A	
15	Material of Busbars		
16	Minimum Cross Section of Busbars (P and N)	Mm	
17	Terminals suitable for copper and aluminum		
18	Type and Grade Housing Material		
19	Corrosion Protection of Housing Thickness of coating	Micron	
20	Fuse carrier and Base Standard		
21	Fuse Type		
22	Fuse Carrier and Base Rated Voltage	Volts	
23	Fuse Carrier and Base Current Rating	A	
24	Fuse Carrier and Base Rated Breaking	KA	
25	Makings		
26	Colour of Housing		
27	Dimensions	Mm	
28	Net Weight	Kg	
29	Whether drawing submitted along with Bid		