

SECTION: 2.8

DISTRIBUTION BOARDS

1.0 **Scope**

1.1 The scope of work shall cover the supply, installation, testing and commissioning of lighting and power distribution boards including cable sleeves, anchor fasteners etc. Associated minor civil works required for the erection of the DB's such as opening in wall etc. are also included in the scope of this contract.

2.0 **Standards**

2.1 The following standards and rules shall be applicable:

- 1) IS:2675-1983 Enclosed distribution fuse boards and cutouts for Voltages not exceeding 1000V.
- 2) IS:375-1963 Marking and arrangement of Switchgear busbars main connections and auxiliary wiring.
- 3) IS:8828-1996 Miniature circuit Breakers
- 4) IS:2607-1976 Air break Isolators for voltages not exceeding 1000V.
- 5) IS:9926-1981 Fuse wire used in Rewirable type Electric fuses up to 650 volts.
- 6) Indian Electricity Act 1910 and rules issued there under.

2.2 All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Indian Standard Codes of Practice.

3.0 **Distribution Boards**

3.1 Distributions boards along with the controlling MCB's or Isolator as shown shall be fixed in a mild steel Box with hinged lockable door suitable for recessed mounting in wall. Distribution boards shall be made of 16 SWG sheet steel with hinged lockable spring loaded cover duly rust inhibited through a process of degreasing, acid pickling, phosphating and powder coated to an approved colour over a red oxide primer. The enclosure shall meet IP 52 rating.

- 3.2 All components shall be mounted on DIN rails and covered totally with a sheet steel cover rendering it finger-safe. Access to the internal connections shall be only through removing the cover sheet.
- 3.3 Three phase boards shall have phase to phase barriers and a wire channel for internal wiring. All DB's shall be internally prewired using copper insulated high temperature PVC wires brought to a terminal strip of appropriate rating for outgoing feeders.
- 3.4 Conduit knockouts shall be provided as required/shown on drawings and the entire board shall be rendered dust and vermin proof with necessary sealing gaskets.

The distribution board shall have one main neutral and 3 separate sub - neutral links, one for each phase of adequate capacity as per number of outgoing per phase. The DB shall have earth bar(s) of adequate capacity as per total numbers of outgoing of DBs. Two numbers separate earth terminals, (one on each side) shall be provided on the outer body of DB for its body earthing. The DB shall be supplied complete with cable ties, circuit identification labels and few spare blanking plates.

Indicating lamps shall be provided for each phase with fuse back up.

3.5 **Miniature Circuit Breaker (MCBs)**

Miniature Circuit Breaker shall comply with relevant IS / IEC standard i.e. IS-8828-1996 & IEC – 60898 and ISI marked on each MCB. MCBs shall be quick make and quick break type, suitable for 230 / 415V AC 50 Hz, breaking capacity should be 10kA and marked on MCB. MCB shall be classified as B, C, D curve type suitable marked on MCB. MCB's for Lighting & power sockets shall be C-curve, all MCBs used on UPS circuit shall be D-Curve only. MCB's shall have quick make can break non welding self wiping silver alloy contacts.

The housing shall be made from heat resistant thermoplastic material and shall have high impact strength. All 2P, 3P and 4P miniature circuit breakers shall have a common trip bar independent to the external operating handle to ensure opening of all the poles simultaneously on faults.

- 1) The MCB shall be current limiting type (Energy Limitation Class – 3) and it shall be clearly marked on the product and terminals shall comply to IP2X degree of protection.
2. MCBs terminals shall have provision for DUAL TERMINATION facility for mounting bus bar and cables separately on same side of the MCB & suitable accommodate accessories like Aux contact, Trip, under voltage & shunt trip.
3. MCBs shall have Positive Contact Indication and shall be suitable for Isolation.
4. MCBs shall have pad locking facility to lock it in ON or OFF

RCCBs

1. RCCBs shall comply to IS 12640 / IEC 61008 standards. RCCB shall be current operated type and shall be independent of the line voltage; current sensitivity shall be of 30 mA / 100mA / 300 mA at 240/415 volts AC as specified in BOQ.
 2. A test trip push button shall be provided on front face to check the integrity of the earth leakage detection system and the tripping mechanism healthiness.
 3. RCCBs shall have positive contact indication and earth leakage trip indication.
 4. All RCCBs used on UPS circuits shall be HIGH IMMUNITY type to protect against nuisance tripping.
- 3.6 Fuses shall be HRC link type or rewirable with necessary fuse carriers and with S.C rating of not less than 50 KA. Bottle type fuses are not acceptable. Fuse carrier terminals shall be suitably shrouded. Rewirable fuse carriers shall be porcelain.
- 3.7 Boards shall meet with the requirements of IS 2675 and marking arrangement of busbars shall be in accordance with IS 375. Bus Bars shall be of copper and rated for the incomer switch rating and sized for a temperature rise of 30 deg. C over the ambient. Neutral and earth bars shall be of copper and rated as follows:

	<u>Neutral</u>	<u>Earth Bar</u>
LDB's	Same as phase	Same as phase
PDB's	1.5 x phase bar	Same as neutral bar

There shall be one earth terminal for single phase boards and 2 for 3 phase boards. Circuit diagram indicating the load distribution shall be pasted on the inside of the DB as instructed.

- 3.8 In the case of MCB distribution boards, the backup fuses wherever shown shall be not less than 63A with a delayed characteristic and a minimum prearcing time of 0.5 sec. at 10 KA fault current.
- 3.9 All outgoing feeders shall terminate on a terminal strip which in turn is prewired to the MCB/Fuse base by means of insulated single conductor high temperature PVC copper wires as follows:

LDB's		2.5 sqmm
PDB's	Upto 15A	4.0 sqmm
	25A	6.0 sqmm

3.10 Each DB shall have indicating lamps preferably neon type denoting power availability in the board after the switch. Indicating lamps shall be complete with fuses.

3.11 In the case of Dimmer DB's, the DB's shall incorporate the Dimmer panels as a part of the DB generally as shown on drawing and as approved.

4.0 **Installation & Testing**

4.1 All distribution boards shall be mounted on wall or recessed, with necessary angle iron frame work. All mounting frames shall have one prime coat and two finish coats after the completion of the work. All distribution boards shall be touched up for damaged painting.

4.2 All boards shall be megged phase to phase and to neutral using 1000V megger with all switches in closed position. the megger value should not be less than 2.5 megohms between phases and 1.5 megohms between phase and neutral.

4.3 Fabrication drawings of all boards shall be approved by the Consultants before fabrication and the boards inspected before dispatch, unless waived in writing.

4.4 Aluminium anodized Engraved labels having white letters on black background shall be provided indicating the DB details.

5.0 **Mode of measurement**

5.1 The distribution board complete with the various components specified, indicating lamps, supporting frame, internal wiring, erection etc., will be treated as one unit for the purpose of measurement and payment.

5.2 DB's with dimmers shall be separately counted.