SECTION 26 27 16
DISTRIBUTION BOARDS

PART 1 - GENERAL

1.01 GENERAL REFERENCE

A. The work of this Section is integral with the whole of the Contract Documents and is not intended to be interpreted outside that context.

B. Co-ordinate the work with all other services affecting the work of this Section.

1.02 DESCRIPTION OF WORK

A. This Section to include all labour, materials and accessories for the complete performance of all distribution boards in accordance with the Specifications and Drawings.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Basic Electrical Materials and Methods

B. Electrical Identification

C. Grounding and Bonding

D. Wire and Cables

E. Raceway and Boxes

1.04 APPLICABLE STANDARDS REFERRED TO IN THIS SECTION

A. BS 5486 Pt.11 : Particular Requirements for HRC Pt.12
Fuses, Miniature Circuit BreakerBoards.

B. BS 3871 Pt.1 :Miniature Circuit Breaker IEC 157-1A

C. BS 4293 :Current Operated Earth Leakage Circuit Breaker

D. BS 6231 :PVC Insulated Cable for Switchgear andControl Gear Wiring.

E. BS 5420,IEC 144 : Degree of Protection forEnclosures.

1.05 SUBMITTALS

A.Submit fully detailed specifications for the enclosures and components of distribution boards with relevant sheets of manufacturer's catalogues.

B.Submit confirmation that boards offered comply with the relevant specifications, Drawings and Schedule of Points.

1.06MANUFACTUERS OF COMPONENTS

A. Subject to compliance with requirements, provide products by the following:

1. Schneider (Europe)
2. Siemens Europe
3. EATON(Europe, USA)
4. ABB Europe
5. Square D. Europe

Or approved by engineer

B. DISTRIBUTION BOARDE / PANEL MANUFACTURERS

- SALEM BEN NISF (Schneider) - KUWAIT
- GENERAL CONTROL GROUP (Siemens) - KUWAIT
- EBOMAC (ABB) - KUWAIT
- SAHARA (EATON) - KUWAIT

Or equal approved by engineer

PART 2 - PRODUCTS

2.01 GENERAL

A. Distribution Boards shall be provided to serve lighting, fans, socket outlets and other appliances. Boards shall be arranged in banks of ways as indicated on the schedule of points.

B. Distribution boards shall be flush mounting type unless specifically mentioned otherwise. The boards shall be totally enclosed, dust protected, verminproof type. Enclosure shall be fabricated from robust galvanized sheet fully rust-protected, stove enamelled, of minimum thickness of 1.5mm. The enclosure shall be protected to IP42 for internal use with neoprene gaskets for the doorsFor outdoor installation, The enclosure shall be protected to DB's IP 54 with canopy.

C. The distribution boards shall be provided with fixed cover and a hinged door with padlock which can be opened without any obstruction about 180 Degree and conduit knockouts from the top and bottom. The hinged door with a lock and key shall be integral part of the fixed cover.

D. The cabinet shall be constructed so that it is necessary to open the door to operate Miniature Circuit Breakers or E/L.C.B. Access to interior components and internal wiring shall be gained by removing a separate barrier within the enclosure.

E. All distribution boards shall be controlled by an adequately rated ON load type isolator to interrupt the supply to the entire distribution board.

F.A circuit label shall be provided to indicate the area served by M.C.B.

2.02 BUS - BARS

A. To be of appropriate current carrying capacity at least equal to the rating of the main incoming isolator.

B. To be of high electrical conductivity copper.

2.03 MOULDED CIRCUIT NEUTRAL CONNECTOR BLOCK

A. To be of ample size to ensure a separate way is available on the connector block for the neutral conductor of each circuit.

2.04 MINIATURE CIRCUIT BREAKERS (MCB)

A. The M.C.B. shall comply with BS 3871 Part 1 and amendments and shall be of category M6 Type 3.

B. The M.C.B. shall be of the trip free pattern to prevent closing the breaker on a faulty circuit, and shall be engraved to indicate 'ON/OFF' position and rated current.

C. Trip Settings : As indicated on schedule of points.

D. To have a minimum symmetrical RMS interrupting capacity of 6 KA.

E. To have thermal overload trips to operate at 125% rated current and instantaneous magnetic trips to operate at:

a. 500% rated current for single pole breakers.

b. 800% rated current for triple pole breakers.

G. Triple pole miniature circuit breakers shall have inherent characteristics to prevent single phasing and shall be fully suitable for motor duty.

2.05 CURRENT OPERATED EARTH LEAKAGE CIRCUIT BREAKERS (C.O.E/L.C.B)

A. Current operated earth leakage circuit breakers shall provide accident protection by interrupting dangerous contact with voltages which may be present in faulty electrical appliances as a result of frame faults, insufficient insulation or misuse.

B. The E/L.C.B. shall also provide a high degree of protection against earth leakage, fires and electric shock and suitable for short cut circuit at least 10 KA. The breakers shall generally comply with BS 4293, 1983 and the recommended specification CEE 227 of the IEC on Rules for the approval of electrical equipment.

B. The breaker shall consist of a core balance transformer, a tripping coil with contact assembly, main supply contacts, ON/OFF switch, a test button and a trip free mechanism all enclosed in a robust body of all insulated material.

D. Degree of Protection against earth leakage throughout the electrical installation shall be as indicated on the drawings and as follows :

10 mA.trip rating - for underwater lighting.

30 mA.trip rating - for all socket outlets and domestic apparatus.

300mA trip rating - lighting circuits and all other apparatus and equipments.

E.The breaker protecting lighting and power circuits shall be mounted in the panel board enclosure.

2.051 **RESIDUAL CURRENT CIRCUIT BREAKERS WITH OVER CURRENT PROTECTION (RCBO)**

A. The RCBO shall comply with IEC 1009, BS EN 61009 and BS EN60898.

B. The RCBO dollies shall be trip free to prevent closing of the breaker of the faulty circuit and shall be engraved to indicate ON & OFF positions and rated currents.

C. The frame size shall be 100A.

D. Trip setting shall be as indicated on the drawing.

E. Symmetrical RMS breaking and making capacity shall be 6 kA

2.06 CONTACTORS

A. Lighting Contactors

1.The lighting contactors shall have minimum making and breaking capacity in accordance with utilization category AC3 and shall be suitable for intermittent duty Class 1.

2. The mechanical rated life of the contactor shall not be less than 3 million operations.

3. The contactors shall be single coil, electrically operated, mechanically held (latch type) and shall be rated for Tungsten, Fluorescent or discharge lighting load.

4.Contactors rating and number of poles : as indicated in the Schedule of Points.

5.Operating coil : suitable for 240 V, 50 Hz. Supply, not accepted DC VOLTAGE.

6.Main contacts : double break silver to silver type protected by arcing contacts.

7.Contacts :self aligning, renewable from the front panel.

8.Solenoids : shaded pole pattern of such construction that lamination noise is eliminated.

9.Control of contactor : by local and remote pushbuttons as indicated. A manual operating level shall also be included.

10. Lighting contactors controlling lighting circuits of distribution boards shall be mounted in the board enclosure.

11. Should have auxiliary contact to interface with B.A.S.

2.07 DISTRIBUTION BOARDS CONTROLLED BY CONTACTOR AND PUSHBUTTON

A. These distribution boards shall be same as specified above except that the contactors shall also be installed within the enclosure of the boards.

C. Where there exists multi contactor, number of bus sections shall be referred from schedule of points. Adequate space shall be provided to accommodate all the contactors and other contents of distribution boards. The construction of Contactor shall be such that it is not possible to come into contact with live parts. The operating coil of Contactor shall be suitable for operation at 240 Volts, 50 Hz, single phase.

C. These distribution boards shall be of special design and shall consist of all components including E/L.C.B., as shown on the schedule of points. The details shall be submitted and approved by the Engineer, before placing the order.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Distribution boards shall be supplied and installed as indicated on the Drawings.

B. Distribution boards shall be installed in electrical rooms or electrical closets as indicated on the Drawings. The proposed distribution panel construction and layout, including a diagram of all internal connections on which the proposed identification markings for all cables and terminals is shown, shall be submitted to the Engineer for approval before construction commences.

3.02 TESTS AND INSPECTION

Test shall be performed at the manufacturer's plant in accordance with BS 5486.

The manufacturer shall submit the test report to the purchaser for approval.

END OF SECTION