Alpha
Consulting Engineers Pte Ltd

FEEDBACK REPORT FORM

Ref No: 124-080310(S)

To: LCT From: LFY

Job No./Project: ELECTRICAL MASTER SPECS *(where applicable)*
Section 7 – Distribution Boards

Source of feedback:

Scope of Feedback: * ☐ Quality ☐ Environmental ☐ Administrative ☐ Contractual ☐ Technical ☑ Specification ☐ Others

Section A : Problem & Cause

Specifications should not indicate preferred make of equipment or material in the main body of the specifications. Difficult to maintain spec. Manufacturing standard of MCB not updated; BS3871 withdrawn

Section B : Mitigating Action Taken, if any

Section C : Suggested Corrective Action

Delete preferred make of DB in main body of specifications. Delete BS3871, withdrawn.

Section D : Approved Corrective Action

Document Affected * : ☑ Yes ☐ No Affected Document : E/7-1 to E/7-2

Approved By : Date : 3/3

Section E : Action

Action By : NA RW

Targeted Completion : March 2010

Actual Completion : 3/3/10 Verified By :

** Mark [X] where appropriate*

Distribution:

SECTION 7 - DISTRIBUTION BOARDS

7.1 General

All distribution boards and consumer units shall be designed and constructed in compliance with relevant BS standards and shall be wall mounted, flush fronted, cubicle type with front access housing MCCBs, MCBs, RCCBs, contactors, electro-tinned busbars, fuses, fuse bases, time switches, indicating lamps etc. specified in the Specification Drawings or any other items of equipment as deemed necessary whether specifically mentioned herein or not. Consumer units shall be in moulded enclosures and all distribution boards shall be in metalclad enclosures.

It shall be suitable for indoor service in the environment conditions as specified elsewhere in this Specification at maximum continuous rating without exceeding the maximum temperature permitted by the relevant BS specification for operation on 400/230 volt 3 phase 50Hz system with solidly earthed neutral.

7.2 Rating

All distribution boards and consumer units shall be structurally suitable as a whole to withstand without damage the electrical, mechanical and thermal stresses produced by the prospective fault currents at the points of installation.

7.3 Degree of Protection

The minimum degree of protection of the enclosure shall be IP 42 for distribution boards and IP 30 for consumer units in compliance with IEC 60529. Cable entries opening shall be designed such that when cables are properly installed, the minimum degree of protection shall be maintained.

7.4 Design & Construction of Distribution Boards

Metal clad distribution boards shall be fabricated from 14/16 s.w.g. sheet steel and finished externally in grey stove enamel outside to colour 631 of BS 381C and internally to matt white complete with hinged covers to be secured by captive knurled thumb screws chrome-plated lockable handle, gaskets, concealed hinges, detachable top and bottom plates and external wall fixing lugs.

All components to be used shall be tropicalised including electro-tinning of non-ferrous parts and vacuum impregnation of operation coils.

Distribution boards shall be slim and compact standard sub-base assemblies and frames of standard dimensions shall be used.

The physical dimension of the distribution boards shall allow for an increase of at least 20% of circuit ways from the no. of circuit way as specified.

An integral manually operated incoming moulded case circuit breaker and/or earth- leakage circuit breaker shall enable all live parts to be made dead with the switch position at ‘off’ from the front. All live parts shall be suitably shrouded. The neutral shall be linked by means of a removable bolted HDHC copper link.

Fuse bases and carriers where used shall be of glazed porcelain or other non-hygroscopic insulant. Fuse carriers shall be so designed that it is impossible for ‘live’ metal parts to be touched when the carrier is being inserted or withdrawn regardless of how it is being held.

The line conductors shall comprise of rectangular section electro-tinned busbars fabricated from hard drawn high conductivity (HDHC) copper. The phases of the busbars shall be identified by colour PVC sleeve or perpex painting.

The neutral bar shall be of square or rectangular cross section having a two pinch grip screw terminal connections for each single phase way and for conductors larger than 2.5 sq. mm cross sectional area, cable sockets or four screw cable clamp pattern terminations shall be used. The neutral bar shall be sized to meet the number of terminations required plus 10% more.

Contactors and time switch where indicated shall be mounted in a separate compartment, with removable hinged covers, fixing screws within the same cabinet as the sub- circuits. Protection fuses for the contactors and/or time switch at the terminal strips for remote wiring shall be labelled for easy identification.

The earthing terminal shall be of brass material and complete with brass washers, brass nuts, and cable lug. The earthing terminal shall not be smaller than O.B.A. for incoming cable up to and including 100 amps, and not less than 3.5mm for incoming cables above 100 amp. A brass earthing bar similar to the neutral bar specified above shall be provided and linked to the earthing terminal.

Incoming cable terminals shall be provided at one end of the busbar or busbars, as required, and shall be of the pressure clamp type.

The distribution board shall be designed for all connections to be carried out from the front of the board and sufficient space allowance shall be provided for routing of all cabling between the back of the enclosure and the busbars/circuit breakers.

All cables shall be bundled by means of nylon self-locking cables ties and fixed in a neat and systematic manner and that no cable is subject to a bend of internal radius less than four times the overall diameter of the cable.

Each distribution board shall be provided with a label of laminated plastic, black, engraved in white with the words: DISTRIBUTION BOARD followed by the reference designation as the case may be in characters at least 6mm high, attached by screws or cemented to the outside of the cover.

A schedule of circuits shall be provided in printed form on paper or card and laminated and to be secured onto the inside of the hinged door.

Distribution boards shall be mounted generally at 1500mm from the centre line to the floor level.

7.5 Moulded Case Circuit Breakers (MCCBs)

Moulded case circuit breakers (MCCBs) where used shall be in accordance with the relevant clauses specified elsewhere in this Specification.

7.6 Miniature Circuit Breakers (MCBs)

Miniature circuit breakers (MCBs) shall comply with IEC 60898, IEC 60947-2 as appropriate. Other features of MCB shall be as specified elsewhere for MCCB. All MCBs protecting out-going circuits shall be the automatic type of the appropriate rupturing capacity and equipped with appropriate overload and short circuit protection to suit the particular applications. The short circuit breaking capacity of the circuit breakers shall not be less than