

**OMAN WASTEWATER
SERVICES COMPANY S.A.O.C**



**الشركة العمانية
لخدمات الصرف الصحي ش.م.ع.م**

OMAN WASTEWATER SERVICE COMPANY

ELECTRICAL STANDARD SPECIFICATION

SECTION 07

ELECTRICAL ALARM PANELS

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1-0 SCOPE

This specification covers basic requirements for design, manufacture and testing of factory assembled substation electrical alarm panels.

2-0 STANDARD SPECIFICATIONS

The Electrical alarm panels shall conform in design, materials and performance (except where otherwise specified) with all relevant Statutory Regulations, the latest editions (at time of order) of all relevant British and Harmonized European standards including:

- IEC 73 Colours of indication lights and pushbuttons,
- IEC 269 Low voltage fuses
- IEC 445 Identification of apparatus terminals and general rules for a uniform system of terminal marking.
- IEC 446 Identification of insulated and bar conductors by colour,
- IEC 529 classification of the degrees of protection for enclosures

3-0 SERVICE CONDITIONS

The Electrical alarm panels shall, in all respects, be suitable for operation under service conditions stated on Electrical Standard Specification Section-01.

4-0 PANEL ARRANGEMENT & CONSTRUCTION

- 4-1 Electrical alarm panels shall be designed for front access and suitable for wall mounting. They shall provide a degree of protection in accordance with IEC 529.

- 4-2 Access doors shall be sufficiently rigid and close fitting to exclude dust. Gaskets of approved material shall be used to provide a seal.
- 4-3 The panels shall be constructed from prime quality folded and welded mild steel sheet. Cable entry shall be from both the top and bottom via suitably sized removable undrilled gland plates
- 4-4 Alarm annunciator units shall be located on the panel front face. Particular attention shall be paid to ease of maintenance and cable installation.

5-0 ANNUNCIATORS

- 5-1 Electronic plug-in logic cards shall form an integral part of the panel mounted unit, facilitating front access for removal. All external wiring connections shall be via terminal connectors.
- 5-2 Annunciators shall provide a common alarm output.
- 5-3 The annunciators shall be of the “first up” indicating type, incorporating Accept, reset and Lamp Test facilities.
- 5-4 An adequately rated power pack shall be provided in each panel for annunciators dc requirements.

6-0 ISOLATOR

- 6-1 Main incoming isolators shall be provided, mounted internally within the panel, fully shrouded and segregated so that contact with live parts is not possible.
- 6-2 The isolation switches shall be of load breaking/fault making capacity, suitably rated for the panel power requirements. The switches shall be double pole with quick make, quick brake action, and making and breaking capacity to IEC 408. The operating handle shall have on/off indications and shall be padlockable in the “off” position.

7-0 HEATING

- 7-1 The panel shall be equipped with a thermostatically controlled anti-condensation heaters suitably rated for the environmental conditions specified.
- 7-2 Circuits shall be protected by fuses or MCB’s.

8-0 FUSES & LINKS

- 8-1 Each circuit within the panel shall be individually fused or MCB protected.
- 8-2 Fuses shall be of the HBC cartridge type. Carriers and bases shall be fully shrouded type and comply to the following colour code:
- Removable links coloured – white,
 - Fuses coloured – black
- 8-3 Protective devices and links shall be logically grouped and located in an easily accessible position. All protective devices shall be labeled with their function, rating and circuit voltage.

9-0 WIRING & TERMINALS

- 9-1 The internal wiring shall be carried out in a minimum of 1.0mm² flexible stranded copper conductor, PVC insulated cable. Solid conductors shall not be used. Wiring shall be configured so that its insulation shall not be subject to injurious temperature.
- 9-2 Internal wiring shall be adequately supported by either clamping of loomed runs or installed in PVC trunking. The support arrangement for wiring shall be such that they are not liable to cause permanent physical damage or deterioration to the conductor or insulation. Wiring shall not be bent to a radius less than the permissible value given by manufacturers.
- 9-3 Internal panel wiring shall be identified by ferrules at each end with number.
- 9-4 Terminal blocks shall be arranged and installed to facilitate accessibility for cable core termination and inspection of terminal identification numbers.
- 9-5 Terminal blocks shall be logically grouped per substation facility. Segregation of different voltage levels within terminal block groups shall be achieved by barriers. Voltage levels shall be clearly identified by labels.
- 9-6 Not than more one wire shall be inserted into any terminal.
- 9-7 Terminal blocks associated with external sources of supply shall be fully shrouded and fitted with a danger warning label.
- 9-8 Fifty per cent spare terminals shall be provided for terminating external cable spare cores.

10-0 CABLE TERMINATIONS

- 10-1 All external cables will have stranded copper conductors and be of the XLPE SPA PVC 600/1000V grade type.
- 10-2 Particular attention shall be paid to gland plate dimensions and adequate space for accommodation of cable cores.

11-0 EARTHING

- 11-1 An earth bar shall be provided along the full length of the panel, located on the inside front face. All metallic non-carrying parts shall be bonded together and connected to the earth bar.
- 11-2 All door(s) shall be bonded to the main structure by means of a flexible copper connection arranged so that it cannot be trapped as the door(s) is opened or closed.
- 11-3 An external M10 terminal shall be provided to facilitate connection of the panel to the installation earthing system.

12-0 LABELS

- 12-1 Panels components shall be identified by labels
- 12-2 An identification label shall be fitted in the central high position of each panel with an inscription as follows:

“ELECTRICAL ALARM PANEL”

- 12-3 All labels shall be secured with non-corrosive screws. Adhesive or self tapping are not acceptable.

13-0 FINISH

- 13-1 Painting shall be in accordance with the requirements of the painting specification.
- 13-2 The Vendor shall submit his proposed painting specification for review and approval.

14-0 SPARES

The Vendor shall provide a list of recommended commissioning and operating spares.

15-0 INSPECTION AND TESTING

The Panels shall be inspected and tested by the Supplier prior to delivery in accordance with the applicable specifications, standards and codes.

Tests shall comprise, but not be limited to, the following:


- § Insulation tests of all circuits,
- § Electrical function tests,
- § Simulating all alarms/indications.

16-0 SPECIAL TOOLS

A complete set of any special tools required for operation, commissioning and maintenance.

17-0 SHIPPING, HANDLING AND STORAGE

Preparation for shipment shall protect the Electrical Alarm Panels and auxiliary devices, against corrosion, high humidity, dampness, breakage or vibration injury during transportation and handling.

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18-0 DRAWINGS AND DATA

The Vendor shall provide drawings and data in accordance with international standards.

19-0 DEVIATIONS

Deviations from this specification are only acceptable where the vendor has listed in his quotation the requirements he cannot or does not wish to comply with and the purchaser has accepted, in writing.

In the absence of a list of deviations it will be assumed by the purchaser that the vendor complies fully with this specification.

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