

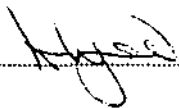
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Business Process Document

Specification for prefabricated and modular steel housings for electrical distribution equipment

Endorsement & Authorisation

Endorsed by:



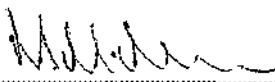
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Summary

This specification states the Directorate's requirements for secure and weatherproof prefabricated and modular housings of steel construction for indoor electrical distribution equipment for D.C. Electrified Lines. The specification states requirements for overall performance and technical details including construction and testing.

Issue record

Issue	Date	Comments
2	December 2005	Re-issued as a SAF3 Business Process Document

Implementation

3 December 2005

Compliance

This Network Rail specification is mandatory and must be complied with by Network Rail and its contractors from 3 December 2005.

When this specification is implemented, it is permissible for all projects, which have formally completed GRIP Level 4, to continue to comply with the Issue of any relevant Network Rail standards current when GRIP Level 4 was reached and not to comply with requirements contained herein unless the head of electrification and fixed plant has stipulated otherwise in the accompanying briefing note.

Where the head of electrification and fixed plant has specified that all projects will comply with the requirements, specific authority not to comply can be sought in the usual manner using the appropriate non-compliance authority processes described in Network Rail standard, [NR/SP/STP/045](#) Managing the process for non-compliance authority (formerly RT/LS/P/045).

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I Purpose

This specification states the requirements for the design, manufacture and testing of prefabricated and modular housings of steel construction used to provide secure and weatherproof protection for indoor electrical distribution equipment.

The requirements include for items of major electrical distribution equipment which are to be built into the housing and for the ancillary installation (comprising a domestic electrical installation, an intruder detection alarm installation and, when specified in the procurement specification, a fire detection alarm system) with which the housing is to be equipped.

The document is to be read in conjunction with the relevant procurement specification.

2 Scope

This specification applies to all new prefabricated and modular steel housings installed on A.C. or D.C. Electrified Lines.

3 Reference documentation

RT/E/S/21028	Network Rail standard for ancillary wiring of electrical distribution equipment
RT/E/S/21032	Network Rail specification for earthing systems for d.c. traction substations, track paralleling huts and similar locations
RT/E/S/21131	Network Rail specification for warning and other signs for A.C. and D.C. Electrified Lines
EN 60529	Specification for degrees of protection provided by enclosures (IP code)
BS 7671	Requirements for electrical installations : IEE Wiring Regulations
IEC 364	
BS 8206	Code of practice for lighting in buildings
EN 60598-1	Luminaires Part 101 Specification for general requirements & tests
EN 60598-2-22	Luminaires Part 102 Particular requirements
BS 4533	Section 102.22 Specification for luminaires for emergency lighting
BS 5266	Code of practice for emergency lighting
EN 54	Components for automatic fire detection systems
BS 5445	
BS 5839	Fire detection and alarm systems for buildings
EN 60269-1	Low-voltage fuses
BS 88	
EN 60439	Low-voltage switchgear and controlgear assemblies
BS 5378	Safety signs and colours
EN 60947	Specification for low voltage switchgear and controlgear
BS 3535	Safety isolating transformers for industrial and domestic purposes.

EN 61008	Residual current operated circuit breakers, for households and similar
EN 61009	uses
BS 4293	
BS 5135	Process of arc welding of carbon and carbon manganese steels
BS 5289	Code of practice for visual inspection of fusion welded points

4 Definitions

For the purpose of this specification the following definitions shall apply:

British Standard	A standard published by the British Standards Institution. Its alphanumeric identity is prefixed by BS.
Equipment	Equipment including all component parts and accessories.
European Standard	A standard published by the European Committee for Standardisation or by the European Committee for Electrotechnical Standardisation. Its alphanumeric identity is prefixed by EN.
International Standard	A standard published by the International Electrotechnical Commission. Its alphanumeric identity is prefixed by IEC.
Modular Housing	A form of housing complete with an ancillary installation capable of being fitted with electrical distribution equipment and of being transported as a single complete unit for positioning on a prepared base. This form of housing permits site installation work to be minimised, and subsequent re-siting complete with contents.
Network Rail Company Standards	A collective term for a specification or procedure published by a directorate of Network Rail.
Prefabricated Housing	A form of housing employed where size or other reasons preclude delivery as a fully fitted single unit. This form is built up on a prepared base from a number of smaller units.
Procurement Specification	The contract specific Network Rail documentation, such as, Invitation to Tender or Technical Worksopce.
SCADA	Supervisory control and data acquisition.

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5 General clauses

5.1 Safety

At all times the housing including its ancillary installation shall be safe. Measures shall be taken to ensure the safety of persons concerned in its installation, operation, maintenance, repair and its eventual disposal. All apparatus and connections for the safe and satisfactory operation, control and protection of the equipment concerned, shall be provided whether or not specifically mentioned.

The housing and its ancillary installation shall be adequately provided with interlocking and padlocking facilities, earthed, insulated, screened, enclosed etc.. Safe and appropriate access shall be provided for operation and maintenance purposes.

The supplier shall provide recommendations for training in safe operation and maintenance of the equipment.

5.2 Design, manufacture and workmanship

All material shall be of the quality and of the type most suitable for working under the conditions specified for the full service life of the equipment.

The supplier shall provide a safety case for equipment with novel or innovative features not previously used within the railway environment. The safety case shall quantify any additional risks and indicate how these risks are controlled.

5.3 Spare parts and consumables

The supplier shall make recommendations to the purchaser for holdings of spare parts and consumables based on estimated replacement rates and delivery periods to ensure that the equipment complies with this specification throughout its specified service life. The supplier shall indicate the extent of commonality with equipment previously supplied.

5.4 Drawings

Drawings of the equipment covering each of the following aspects shall be submitted to the purchaser for scrutiny:

- a) general arrangement (internal and external);
- b) static and dynamic loadings and foundation and fixing requirements;
- c) schematic/circuit diagrams;
- d) diagram and rating plates;
- e) details of cable entries and terminations;
- f) detailed wiring diagram or schedules.

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All drawings shall be of good, legible quality. Four copies of each drawing or as varied by the procurement specification shall be provided.

Where it is essential for clear understanding of the circuits, block or circuit diagrams shall include details of components which are existing or are not being provided by the supplier. Wiring diagrams shall include any unused wires, contacts, plugs, sockets, terminals and the like.

As an alternative to separate circuit and wiring diagrams, combined diagrams may be provided. In this case, the position of each wire termination shall be indicated either on the drawing or by means of a schedule of terminations.

A short description of each revision shall be provided under consecutive revision letters or numbers together with the date.

Wherever feasible, some means shall be used to identify the location of the most recent revision, for instance by circling the locations.

All drawings shall be brought up to date as necessary, to provide a permanent as-fitted record and shall be supplied in the software format specified in the procurement specification.

5.5 Instruction manual

The supplier shall produce a comprehensive and specific instruction manual covering all aspects of installation, operation and maintenance and eventual disposal, and shall supply the number of copies stated in the procurement specification. The manual shall provide guidance to enable all work to be carried out safely and efficiently. The manual shall contain only relevant information and shall include:

- a) a description of the construction, installation, functioning and rating of the equipment;
- b) operating instructions, including safety and isolation procedure;
- c) routine maintenance including any special precautions, fault finding and major overhaul procedures and periodicity;
- d) full details of recommended adjustments and settings for the equipment and its protective devices where appropriate;
- e) instructions for eventual disposal including safety and handling precautions and recommendations;
- f) drawings, illustrations and data enabling all component parts to be readily identified and to allow procurement for replacement purposes;
- g) the drawings listed in clause entitled 'Drawings';
- h) a list of locations and associated serial numbers.

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The manual shall be of loose leaf design with at least four retaining rings and with oil resistant hard covers. It shall be of A4 size and include drawings reduced to A3 or A4 size. Drawings reduced in size shall remain clearly legible. The purchaser may accept drawings larger than A3 subject to suitable, clearly labelled protective drawing storage folders being provided for inclusion in the manual.

Three copies of the draft manual shall be submitted to the purchaser not later than the end of the third quarter of the period between the contract date and scheduled delivery date and in sufficient time to enable any modifications to be incorporated and the full quantity of final copies to be available prior to delivery of the equipment.

Before the purchaser takes over full responsibility for the equipment, for example, at the expiry of the maintenance period, any necessary modifications shall be made and sufficient copies provided to the purchaser for incorporating into the full quantity of manuals supplied.

5.6 Delivery

The housing and the installed equipment shall be suitably prepared to withstand, without damage or deterioration, the method of transport to site, cramage, storage and positioning stated in the procurement specification. Internal equipment shall be protected, as necessary, against the weather. The destination for delivery shall be as stated in the procurement specification.

Any factor that may affect the onward delivery to a final site (e.g. dimensions and weight limits) shall be subject to agreement between the supplier and the purchaser.

6 Compliance with standards

6.1 European, International and British Standards etc.

The housing including its ancillary installation shall comply with relevant European Standards whether or not reference is made to them.

In the absence of European Standards, International Standards or national standards having currency within the European Community shall apply subject to the prior agreement of the purchaser.

The editions of standards current at the date of tender shall apply.

6.2 Specific equipment standards

The housing shall be designed, manufactured, tested at works in accordance with [EN 60529](#) and all other relevant standards.