

Electricity Specification 319

Issue 6 August 2022

LV Distribution Fusegear



Amendment Summary

| ISSUE NO. DATE | DESCRIPTION |
|--------------------------------------|---|
| Issue 6 August 2022 | <p>New template applied and ENA TS 37-2 added into the Scope. Parts 2 and 3 added for ENA TS 35-1 in section 1 and 9. Section 5.3.3 updated to state that all PENDINGAs shall accept all fault finding equipment and on PENDINGA-TMO all doors must shut and lock fully.</p> <p>Prepared by: Matthew Kayes Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, DSO Director</p> |

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1 Scope

This Electricity Specification describes the requirements of Electricity North West Limited, hereinafter referred to as Electricity North West, for LV distribution fusegear to be connected to distribution transformers to Energy Networks Association Technical Specification (ENA TS) 35-1 Parts 2 and 3. The LV distribution fusegear includes fuse-cabinets (PENDA-TMO), fuse-pillars (PENDA-CCO) and fuseboards (PENDA-I) in compliance with ENA TS 37-2 Public Electricity Network Distribution Assemblies.

2 Definitions

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| | |
|-----------------------|--|
| Approval | Sanction by the Electricity North West Plant Policy Manager that specified criteria have been satisfied |
| Contract | The agreement between Electricity North West and the Contractor for the execution of the Works including therein all documents to which reference may properly be made in order to ascertain the rights and obligations of the parties under the said agreement. |
| Contractor | The person or person's firm or company, including personal representatives, successors and permitted assigns, who's Tender has been accepted by Electricity North West. |
| Specification | The Specifications and schedules (if any) agreed by the parties for the purpose of the Contract. |
| Sub-Contractor | Any person (other than the Contractor) named in the Contract for any part of the Works or any person to whom any part of the Contract has been sub-let with the consent in writing of the Electricity North West Plant Policy Manager, and the legal representatives, successors and assigns of such person. |
| Supplier | Any person or person's firm or company who supplies goods to Electricity North West or to its Contractor. |
| Tender | An offer in writing to execute work or supply goods at a fixed price. |
| Tenderer | The person or person's firm or company, including personal representatives, successors and permitted assigns, invited by Electricity North West to submit a Tender. |
| PENDA-I | Public Electricity Network Distribution Assemblies - Indoor (formerly fuseboard and Substation Cable Distribution Board SCDB-I). |
| PENDA-CCO | Public Electricity Network Distribution Assemblies – Outdoor Ground Mounted Pillar (formerly fuse-pillar and Substation Cable Distribution Board SCDB-CCO). |
| PENDA-TMO | Public Electricity Network Distribution Assemblies – Outdoor Transformer Mounted Fuse Cabinet (formerly fuse-cabinet and Substation Cable Distribution Board SCDB-TMO). |

3 General Requirements for Approvals and Testing

3.1 Product not to be Changed

No change in the product, packaging or labelling shall be made after Approval has been granted without prior notice to the Electricity North West Plant Policy Manager, and receipt of a written agreement to the proposed change from the Electricity North West Plant Policy Manager.

3.2 Electricity North West Technical Approval

The Tenderer shall submit, with this Tender, proposals for testing which will demonstrate, to the satisfaction of the Electricity North West Plant Policy Manager, compliance with this Specification. Such tests shall be carried out without expense to Electricity North West.

Alternatively, technical reports and other data may be submitted that the Tenderer considers will demonstrate, to the satisfaction of the Electricity North West Plant Policy Manager, compliance with this Specification. Acceptance of this evidence shall be at the discretion of the Electricity North West Plant Policy Manager but will not be unreasonably withheld.

Approval shall be 'factory specific' and is not transferable to another factory without the written Approval of the Electricity North West Plant Policy Manager.

The Supplier and product shall comply with all the relevant requirements of Electricity North West document CP311.

3.3 Quality Assurance

The Tenderer shall confirm whether or not Approval is held in accordance with a quality assurance scheme accredited under ISO 9000. If not, the Tenderer shall submit a statement of the quality assurance procedures employed to control the quality of the product, including the performance of Suppliers and Sub-Contractors.

The right is reserved for the repeat of such tests, from time to time, that the Electricity North West Plant Policy Manager may deem to be reasonably necessary to demonstrate continued compliance with the Specification.

The Tenderer shall submit, with the Tender, a list of tests and inspections which are carried out on the product prior to despatch which shall demonstrate, to the satisfaction of the Electricity North West Plant Policy Manager, fitness for installation and service.

The Tenderer shall provide free of charge to Electricity North West such samples as may, in the opinion of the Electricity North West Plant Policy Manager, be reasonably required for inspection and/or retention as quality control samples. The Electricity North West Plant Policy Manager will confirm the requirement for samples at the time of Tendering.

The right is reserved for inspections to be made of Tenderer's facilities, from time to time, as deemed reasonably necessary by the Electricity North West Plant Policy Manager to ensure compliance with this Specification and any Contract of which it forms a part.

The Tenderer shall submit, with the Tender, such details of product packaging disposal, as will enable Electricity North West to comply with the requirements of BS EN ISO 14001 - Environmental Management Systems.

3.4 Formulation

The Tenderer shall submit, with the Tender, such details of the formulation and use of the product and associated substances as will enable Electricity North West to comply with the obligations of the Health and Safety at Work Act 1974 and the Control of Substances Hazardous to Health Regulations 2002, in the use, storage and disposal of the product. The Tenderer may stipulate, prior to submission of such information, that it is to remain confidential, and the Electricity North West Plant Policy Manager will, if requested, confirm agreement to this prior to receipt of the information.

3.5 Identification Markings

The Tenderer shall submit, with the Tender, details of markings which it is proposed to apply to the product or packaging to identify manufacturing batches or items. The forms and content of such markings shall be subject to the Approval of the Electricity North West Plant Policy Manager and shall in all cases include the Electricity North West approved description and commodity code number.

The Tenderer shall submit, with the Tender, such details of marking gross weight on components, assemblies and packages, as will enable Electricity North West to comply with the Health and Safety Manual Handling Operation Regulations 1992, for components, assemblies and packages supplied with a gross weight over 1kg. The forms and content of such markings shall be subject to the Approval of the Electricity North West Plant Policy Manager.

3.6 Minimum Life Expectancy

The minimum life expectancy of all products covered by this Specification is 40 years.

3.7 Product Conformity

Preference will be given to those Suppliers who can provide suitable product conformity certification to a recognised or specified standard, or an equivalent certification.

4 Requirements for Type and Routine Testing

The Electricity North West Plant Policy Manager shall set out the requirement of the following tests to be carried out by the Supplier at the Supplier's cost.

4.1 Requirement for Type Tests at Suppliers Premises

These are a series of one-off type tests, which are carried out to ensure the satisfactory performance of the product design, under extremes of operating stresses, and of endurance, as may be appropriate, to be determined by the Electricity North West Plant Policy Manager.

These may or may not be destructive tests.

4.2 Requirement for Routine Tests at the Supplier's Premises

These tests may be required to be carried out on every individual unit or component, as specified, or at some regular frequency to be determined by the Electricity North West Plant Policy Manager.

The results of these tests may be required to be supplied to Electricity North West with each unit purchased or retained for inspection, at a period to be determined by the Electricity North West Plant Policy Manager.

4.3 Requirement for On Site Tests

These will normally be included within the scope of on site commissioning but may be included if appropriate.

5 Technical Requirements

5.1 Compliance with Technical Specifications

Equipment shall comply with ENA TS 37-2 (Issue 5) subject to the selection of options from that specification as detailed in the following clauses. In addition, certain items not covered by the ENA TS 37-2 may be called for. References in brackets are to the clause numbers of ENA TS 37-2.

Tenderers shall complete the clause conformance declaration in [Appendix D](#).

5.2 Selection of Options

PENDA-TMO, PENDA-CCO and PENDA-I shall be of the shielded pattern design. (8.4).

All incoming transformer units (8.5.3.b) shall be provided with either pole operated disconnectors or disconnectors with insulated integral operating handles.

Provision for locking open is preferably by a single safety padlock for the three-phase set. (8.201.c) Padlocks are not to be supplied.

Busbars (8.201.a) shall be made of copper with a surface finish to the approval of the purchaser.

Distributor units (8.5.3.a.a) shall be of the type shown in Figure 2b of ENA TS 37-2. The material and finish of the spacers to be the subject of the approval of the purchaser.

Evidence of type tests (10) shall be available for inspection.

Porcelain is not acceptable for fuse carriers (8.5.3.a.a.1).

All labels associated with neutral and earth connections (8.201.d.1) shall be weather resistant.

Tenderers shall submit with their Tender return options for utilising Digital Ammeters both with and without remote communication functionality.

5.3 Additional to ENA Technical Specification 37-2

5.3.1 Incoming Transformer Units (8.5.3.b)

Phase markers shall read left to right L3, L2, L1,N for PENDA-TMO etc, connected direct to a transformer and N, L1, L2, L3 for free-standing PENDA-I where connection is normally made by overhead cables from the transformer.

Termination of cable cores will be by a shearhead type connector tested to the requirement of ENA Engineering Recommendation (ER) C79 or by a BS2562 connector where proven by long service. 4 hole M10 fixings are required.

Alternatively in special cases compression lugs may be used.

See [Appendix A](#) of this ES, Cable Terminations and Methods.

Facilities to test primary conductors on incomers, busbars and outgoing ways shall be provided for test lamps/probes in accordance with ENA ER M15/4 (4mm maximum diameter and 15mm reach).

5.3.2 Distributor Units (8.5.3.a.a)

The design shall allow jointing of a distributor unit safely without making adjacent distributor units, incoming transformer ways, or the busbars dead.

See [Appendix A](#) Cable Terminations and Methods.

5.3.3 General Construction of PENDA-TMO

PENDA-TMO mounting flanges are preferably non-detachable and shall be drilled as shown in Figure 3a of ENA TS 37-2.

PENDA-TMO cable cleats shall be of hardwood with overlapping rebates drilled with blind pilot holes at cable centres. If the Tenderer wishes to use an alternative details shall be submitted for approval by the Electricity North West Plant Policy Manager.

PENDA-TMO and PENDA-CCO doors shall open 180 degrees and be fitted with internally mounted hinges. A door stay shall be provided to allow the door to be held open in the 90^o, 135^o and 180^o positions.

All PENDA-TMO and PENDA-CCO shall be designed to accept all fault finding equipment such as Weezaps and Didoyngs without any modifications being required. All doors on PENDA-TMOs shall be designed to close and lock fully with the fault finding equipment fitted.

5.3.4 Current Transformers

Three dual-ratio current transformers shall be provided on the incoming circuit, suitable for the operation of bi-metallic ammeters. They shall comply with BS 3938, with 5VA output and accuracy Class 5.

The ratios shall be:

| INCOMING CIRCUIT RATING | CURRENT TRANSFORMER RATIO |
|-------------------------|---------------------------|
| 1600A | 1600/800/5 |
| 1250A | 1200/600/5 |
| 800A | 800/400/5 |

A ratio of 400/200/5 may be called for when connecting ground mounted distribution transformers below 315kVA.

The three secondary connections of the current transformers shall be brought out to an instrument panel or otherwise made accessible to facilitate reselection of the ratio safely, via appropriate use of shorting links, with the busbars and incoming transformer connection live. The required degree of personal protection shall be maintained when carrying out this operation. Alternative tapping connections shall be clearly marked to indicate the ratio.

5.3.5 Insulating Shrouds

Sufficient self supporting insulating shrouds to insulate connectors on at least two complete distributor ways shall be provided with each unit.

5.3.6 Test Sockets

To allow measurements to be made, generators to be synchronised and phasing out across the transformer LV links fused connections shall be brought out for all three phases on both sides of the transformer links (ie 6 connections). These are 'red spot' fused connections off the LV busbars and terminated as 4mm 'banana plugs'. The area around the test socket shall be suitably insulated for a minimum distance of 13mm from the outside edge of the socket to reduce the risk of a short circuit during lead insertion/removal.

5.3.7 Connection of Mobile Generators

Electricity North West may wish to connect a mobile generator to support the loading on the LV board when the transformer is not available for service. This is currently achieved via Litton Veam Connectors that use one of the following options:

- Fixed connections from the busbars to colour coded, insulated, waterproof connectors
- LV fuse carriers with in-built colour coded, insulated, waterproof connectors.

Such connectors should be in accordance with BS EN 60309, be rated at 600A and be individually keyed to prevent incorrect connection. The LV board door shall be closed and locked, still maintaining suitable IP protection, whilst these temporary leads are connected and manufacturers shall detail any extra cost involved on the pricing schedule.

The number of Litton Veam Connectors shall be such that they can support the entire LV Board Rating.

5.3.8 HV Steelwork Earth

The HV steelwork earth marshalling bar shall be extended and fitted with an additional 3 off M12 studs/nuts/washers.

5.3.9 Ancillary Equipment

Ancillary equipment must include:

- (a) 3 Maximum Demand Indicators with direct current reading to match the busbar rating. These shall have either reversible or dual ratio scales to provide readings from dual ratio CTs.
- (b) 13A RCD Socket outlet to BS 1363
- (c) Fused connection point for 30A supply (used for substation lighting, heating, etc).

5.3.10 Testing

On completion of the unit, a micro-ohm meter shall be used to measure the resistance between the incoming busbars and the busbar LV fuse contacts. All values shall be recorded.

The Tenderer shall supply details of acceptable resistance values with the Tender.

6 Items not Covered by ENA Technical Specification 37-2

6.1 Industrial Service Units

Details of a range of metered, dedicated customer supplies up to a nominal 1MVA are set out in [Appendix B](#) of this specification.

6.2 Special Indoor PENDA-I

The successful Tenderer may be called upon to supply special requirements such as bus-section disconnectors, outgoing 1600 amp disconnectors with seven single core cables, additional distributor units. These will be the subject of a separate enquiry but general details shall be supplied with Tenders to this enquiry to indicate that the special requirements can be met.

6.3 PENDA-CCO

The successful Tenderer may be called upon to supply cable connected PENDA-CCO. These will be the subject of a separate enquiry but general details shall be supplied with Tenders to this enquiry to indicate that these special requirements can be met.

6.4 Intruder Resistance

The Tenderer shall demonstrate the level of intruder resistance that the offered housing presents and how this was determined. For example by reference to BRE Certification Ltd – Loss Prevention Standard: LPS 1175-5. Electricity North West require that outdoor equipment be a minimum of Security Rating 3 to this standard.

6.5 Labelling

The Tenderer shall demonstrate the method of retaining the circuit labels so that they cannot be inadvertently swapped around.

7 Tests

A copy of type test results should be forwarded with the Tender.

A copy of the routine tests shall be supplied with each piece of equipment. This shall include a listing of the results of the micro-ohm meter test as described in [section 5.3.9](#) of this specification.

8 Drawings and Manuals

One copy of the manual(s), in pdf format, relating to the Installation, Commissioning and Maintenance and associated drawings of each type of fusegear offered shall be provided with the Tender documents.

Drawings shall be provided as per [Schedule C, Appendix C](#).

These drawings shall be to scale and fully detailed and the dimensions shall be in metric units. General arrangement drawings submitted shall be to a scale not less than 1 to 50 and all detailed drawings not less than 1 to 20. The drawings shall have minimum dimensions 210mm x 297mm (A4) ISO size, and shall not exceed in one direction 841mm for ISO sizes of sheets. All drawings shall provide a clear margin 25mm wide along bottom.

The drawings shall be in electronic format Autocad or Adobe Acrobat compatible, supplied to the Electricity North West Plant Policy Manager.

9 Documents Referenced

| DOCUMENTS REFERENCED | |
|---|---|
| BRE Certification Ltd – Loss Prevention Standard: LPS 1175-5 | |
| BS 1363 | 13 A plugs, socket-outlets and adaptors. Specification for rewirable and non-rewirable 13 A fused plugs |
| BS 2562 | Cable boxes for transformers and reactors. |
| BS 3938 | Specification for current transformers. |
| BS 5467:1997 | Cables with thermosetting insulation for electricity supply for rated voltages of up to and including 600/1000V and up to and including 1900/3300V. |
| BS 6346:1997 | PVC insulated cables for electricity supply. |
| BS 7870-3.40 | LV and MV polymeric insulated cables for use by distribution and generation utilities. Specification for distribution cables of rated voltage 0.6/1 kV. XLPE insulated, copper wire waveform concentric cables with solid aluminium conductors. |
| BS EN 60309 | Plugs, socket outlets and couplers for industrial purposes. |
| BS EN ISO 14001:1996 | Environmental management systems. |
| ISO 9000 | Quality system requirements. |
| BEBS S12 | Specification for standard numbering for small wiring for switchgear and transformers together with their associated relay panels |
| ENA TS 35-1 Part 2 | Distribution transformers – Part 2 Ground mounted transformers – not close coupled. |

| | |
|---------------------------|---|
| ENA TS 35-1 Part 3 | Distribution transformers – Part 2 Ground mounted transformers – close coupled. |
| ENA TS 37-2 | Public Electricity Network Distribution Assemblies. |
| ENA TS 50-18 | Design and application of ancillary electrical equipment. |
| ENA ER C79 | Type approval tests for connectors and terminations for aluminium conductors of insulated power cables. |
| ENA ER C93 | Type approval tests for mechanical connections to metallic sheaths of cables. |
| ENA ER M15/4 | Fused flexible leads for use with portable voltage measuring instruments at voltages up to 600 volts AC/DC. |
| ES501 | Metering Current and Voltage Transformers |

10 Keywords

Board; Cable; Fuse; Generator; Industrial; LV; Testing; Transformer;

Appendix A

A1 Cable Termination Methods

The preferred method of cable termination is by the use of double headed "Shearscrew" type mechanical cable connectors (lugs with two retaining screws or range taking connector), for all conductors combined with heat shrink sealing as necessary. Terminal arrangements should otherwise be in accordance with ENA TS 37-2.

A2 Cable Terminations

A2.1 Distributor Ways

The distributor way shall be suitable without modification for the connection of cable conforming with BS7870-3.40 (Waveform) up to a maximum conductor size of 300mm².

A2.2 Transformer Ways

The transformer disconnector shall be suitable for the connection of cables made up of single core, circular stranded copper 400mm² conductor with aluminium strip or wire armour, PVC or XLPE insulation and PVC oversheath, rated 0.6/1.0kV, cable to BS6346 or BS5467. Provision shall be made for earthing the cable sheaths.

A2.3 Termination Methods

Termination of conductors including sheaths shall be by means of suitable connectors which have fulfilled the Type Approval requirements of ENA ER C79 (C93) or which can be demonstrated, to the satisfaction of the Electricity North West Plant Policy Manager, to have had a satisfactory performance in general service.

Preference will be given to cable terminating methods which can be shown to aid productivity, safety and reliability by the simplification of installation techniques.

All studs or holes for bolt fixings should be for mechanical lugs with M16 hole size except for incoming transformer cable connectors, which should be 4 hole M10 fixings.

Further advice will be offered on request.

Appendix B – Supplementary Specification for Metered Industrial Service Units for Customer Supplies up to 1 MVA from Transformer Mounted Cabinets or Distribution Boards

B1 Introduction

This Appendix to Electricity North West ES319 sets out the requirements for providing customers with metered supplies up to 1MVA at low voltage from a transformer mounted cabinet, wall mounted distribution board or pillar.

It is preferred that the arrangements can be fitted into a standard cabinet or distribution board and, if required, supplied in kit form to be fitted to existing units.

The means by which the supply is to be provided should be clearly stated in the offer together with the number of standard distributor ways required to accommodate the arrangement.

B2 Standards

Equipment will comply with ENA TS 37-2 (Issue 5) and Electricity North West ES319 as far as practicable.

B3 Alternative Requirements

The maximum metered supply which can be provided from a single three phase set of fuses.

A metered supply for a nominal 500kVA demand. (The offer should state clearly how many distributor ways are required to be displaced and the cabling should be contained within this width).

A metered supply for a nominal 1 MVA demand. (The offer should state clearly how many distributor ways are required to be displaced and the cabling should be contained within this width).

If circuit breakers are to be used then it should be noted that it is Electricity North West policy to use ACBs only. Moulded Case Circuit Breakers (MCCBs) are not permitted because of discrimination problems with their instantaneous magnetic trips.

The manufacturer shall provide details of ACBs to be used including specification and routine and post fault maintenance requirements.

B4 Metering

B4.1 General

Metering voltage and current transformer secondary wiring shall be marshalled in a padlockable external compartment so that it is accessible without approach to bare live primary conductors. This compartment should be situated high enough to facilitate multicore cable entry and not obstruct or be obstructed by any LV terminations or by any HV switchgear when used in a unit substation configuration.

All terminal blocks shall be to ENA TS 50-18 Type "B" with dimension "C" not less than 11mm. (Typically Klippon type RSF-1 or equivalent).

All wiring shall be in 2.5mm² stranded cable and shall be ferruled and numbered in accordance with BEBS S12 as per the table below.

Table B1: Ferruling for Metering Circuits

| | CIRCUIT FUNCTION | FERRULING REQUIRED |
|-------------------------|-----------------------------|--------------------|
| CT CIRCUITS | L1 (Red) CT Circuit (S1) | D11 |
| | L1 (Red) CT Circuit (S2) | D10 |
| | L2 (Yellow) CT Circuit (S1) | D31 |
| | L2 (Yellow) CT Circuit (S2) | D30 |
| | L3 (Blue) CT Circuit (S1) | D51 |
| | L3 (Blue) CT Circuit (S2) | D50 |
| | CT Earth Connection | D90 |
| VOLTAGE CIRCUITS | L1 (Red) Volts | E10 |
| | L2 (Yellow) Volts | E30 |
| | L3 (Blue) Volts | E50 |
| | Neutral | E70 |

B4.2 Primary Current

A check on the primary current should be possible by either of the methods detailed below:-

- By means of a "clip-on" ammeter without the need to approach bare conductors
- By means of a three phase set of single ratio current transformers of 1000/5A ratio, fitted to the source side and secondary wiring brought to the marshalling compartment and shorted.

B4.3 Current Transformers

All metering CTs shall be 15VA Class 0.5s. The CTs shall have a ratio of either 800/5 or 1500/5 dependent on whether there is 2 or 3 ganged ways respectively.

The CT rating plate shall be fixed in a visible position either on the inside of the cabinet door or on the inside cover of the external marshalling compartment.

The secondary wiring of each CT shall be earthed on the S2 side. The earthing shall be applied via a removable earth link at the marshalling box where the CT wiring is terminated. The earth connection shall be on the CT side of the terminal block and not the multicore side of the block.

The CTs shall be tested in accordance with Electricity North West ES501 with the following additional tests when the CTs have been installed.

- A polarity test or 'flick' test to confirm the correct orientation of the installed CT.
- A primary injection test to confirm CT ratio and secondary circuit up to the marshalling box. Alternatively a wiring test shall be carried out to confirm the installed secondary circuit wiring.

The manufacturer shall provide two copies of the results, one with the equipment and one to Electricity North West as per Electricity North West ES501.

B4.4 Metering Fuses

Metering isolation fuses and a neutral link shall be provided. They shall be safely accessible with the primary system energised. The fuses shall have a rating of 16A and a breaking capacity of 80kA/415V. The fuse carriers shall be sea green and the neutral link carrier shall be white.

B5 LV Cable

The cables shall be consumer owned and meet either of the following preferred requirements:

- Single core 600/1000V cable, stranded copper conductor with aluminium wire armour. XLPE insulation, to BS 5467.
- Single core 600/1000V cable, solid aluminium conductor with aluminium strip armour. PVC insulated, to BS 6346.

As the cables will be consumer owned it may be that alternative cables of similar specification may have to be considered.

B6 Sheath Bonding

An additional earth marshalling bar and cable socket fixings with drilled hardwood cable cleats (41mm diameter) shall be fitted suitable for 4 cables on 800A units and for 7 cables on 1600A units. This is to enable the sheaths of all cables to be bonded and earthed at the Electricity North West fuse or LV ACB cabinet.

B7 Neutral Earthing

The LV neutral cable conductor shall be solidly connected to the transformer neutral and earthed at the Electricity North West PENDA-TMO.

B8 Emergency Trip Facility

For supplies of 300kVA (400A at LV) and above, an emergency trip facility to the controlling HV fuse switch of the transformer, or to any ACB will be required. Any ACB provided should be suitably equipped with a trip coil.

A2 Schedule B – Technical Details

(A separate schedule should be complete for each design of PENDA-TMO, PENDA-I and PENDA-CCO).

| Item | | PENDA-I | PENDA-CCO | PENDA-TMO |
|------|--|---------|-----------|-----------|
| 1. | (a) Temperature rise test reference number and date | | | |
| | (b) Maximum temperature rise recorded | | | |
| | Location of maximum temperature rise | | | |
| 2. | (a) Short circuit type test reference number and date | | | |
| | (b) Was this single or three phase? | | | |
| | (c) Configuration tested | | | |
| 3. | Overall dimensions | | | |
| | H mm | | | |
| | W mm | | | |
| | D mm | | | |
| 4. | Thickness of metal enclosure mm | | | |
| 5. | Thickness of flange mm | | | |
| 6. | General arrangements drawing number (detailed to show plan view of cable centres, fixings, <u>additional insulation details</u> , anti-vandal measures of standard equipment). | | | |
| 7. | General arrangement drawing number of proposed multi-section PENDA-I(Clause 6) | | | |

A3 Schedule C – Drawings

The following is a list of Drawings which shall be submitted by the Tenderer with the Tender:

| Description (General arrangement drawings of:-) | Tenderer's Drawing No. |
|---|------------------------|
| PENDA-TMO PENDA-I PENDA-CCO | |

Appendix D – Conformance Declaration

SECTION-BY-SECTION CONFORMANCE WITH SPECIFICATION

The Tenderer shall declare conformance or otherwise for each product/service or range of products/services, section-by-section, using the following Conformance Declaration Codes.

Conformance Declaration Codes:

| | |
|--------------|--|
| N/A = | Clause is not applicable/appropriate to the product/service. |
| C1 = | The product/service conforms fully with the requirements of this clause. |
| C2 = | The product/service conforms partially with the requirements of this clause. |
| C3 = | The product/service does not conform to the requirements of this clause. |
| C4 = | The product/service does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform. |

Manufacturer:

Product/Service Description:

Product/Service Reference:

Name:

Company:

Signature:

SECTION-BY-SECTION CONFORMANCE

| Section | Section Topic | Conformance Declaration Code | Remarks * (must be completed if code is not C1) |
|---------|--|------------------------------|--|
| 3.1 | Product not to be Changed | | |
| 3.2 | Electricity North West Technical Approval | | |
| 3.3 | Quality Assurance | | |
| 3.4 | Formulation | | |
| 3.5 | Identification Markings | | |
| 3.6 | Minimum Life Expectancy | | |
| 3.7 | Product Conformity | | |
| 4.1 | Requirements for Type Tests at the Supplier's Premises | | |
| 4.2 | Requirement for Routine Tests at the Supplier's Premises | | |
| 4.3 | Requirement for On Site Tests | | |
| 5.1 | Compliance with Technical Specifications | | |
| 5.2 | Selection of Options | | |
| 5.3.1 | Incoming Transformer Units | | |
| 5.3.2 | Distributor Units | | |

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|--------|-----------------------------------|--|--|
| 5.3.3 | General Construction of PENDA-TMO | | |
| 5.3.4 | Current Transformers | | |
| 5.3.5 | Insulating Shrouds | | |
| 5.3.6 | Test Sockets | | |
| 5.3.7 | Connection of Mobile Generators | | |
| 5.3.8 | HV Steelwork Earth | | |
| 5.3.9 | Ancillary Equipment | | |
| 5.3.10 | Testing | | |
| 6.1 | Industrial Service Units | | |
| 6.2 | Special Indoor PENDA-I | | |
| 6.3 | PENDA-CCO | | |
| 6.4 | Intruder Resistance | | |
| 6.5 | Labelling | | |
| 7 | Tests | | |
| 8 | Drawings and Manuals | | |
| A1 | Cable Termination Methods | | |
| A2.1 | Distributor Ways | | |
| A2.2 | Transformer Ways | | |
| A2.3 | Termination Methods | | |
| B1 | Introduction | | |
| B2 | Standards | | |

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| B3 | Alternative Requirements | | |
| B4.1 | General | | |
| B4.2 | Primary Current | | |
| B4.3 | Current Transformers | | |
| B4.3 | Metering Fuses | | |
| B5 | LV Cable | | |
| B6 | Sheath Bonding | | |
| B7 | Neutral Earthing | | |
| B8 | Emergency Trip Facility | | |
| Schedule A | Manufacturers and Places of Manufacture, Testing and Inspection | | |
| Schedule B | Technical Details | | |
| Schedule C | Drawings | | |
| Schedule D | List of Special Tools and Equipment to be Provided | | |

Additional Notes: