

# Electricity Specification 503

Issue 4      October 2021

## Specification for Metered Service Units



## Amendment Summary

ISSUE NO. DATE	DESCRIPTION
<b>Issue 4</b>	Document updated into the new template.
<b>October 2021</b>	Prepared by: Peter Twomey Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, Engineering and Technical Director

## Contents

1	Scope	5
2	Definitions	5
3	General Requirements for Approvals and Testing	6
3.1	Product not to be Changed	6
3.2	Electricity North West Technical Approval	6
3.3	Quality Assurance	6
3.4	Formulation	7
3.5	Identification Markings	7
3.6	Minimum Life Expectancy	7
3.7	Product Conformity	7
4	Requirements for Type and Routine Testing	7
4.1	Requirement for Type Tests at Suppliers Premises	7
4.2	Requirement for Routine Tests at the Supplier's Premises	7
5	Relevance of Standards	8
6	Rated Current of the MSU	8
7	Information to be Given Regarding the MSU	8
8	Service Conditions	8
9	Construction	8
9.1	General Arrangement	8
9.2	Protection by Total Insulation	9
9.3	Incoming Cable Box	9
9.4	Main Fuse Chamber	10
9.5	Upper Chamber	10
9.6	Metering Current Transformers	11
9.7	Enclosure Protection	11
9.8	Impact Resistance	12
9.9	Security	12
9.10	Clearance and Creepage Distances	12
9.11	Corrosion Protection	12
9.12	Resistance to Abnormal Heat and Flame	12
9.13	Labelling	13
10	Tests	13

10.1	Type Tests	13
10.2	Routine Tests	14
11	Documents Referenced	15
12	Keywords	16
	Appendix A – Example Layout	17
	Appendix B – Schedules	20
	Schedule A	20
	Schedule B	21
	Schedule C	22
	Schedule D	23
	Schedule E	24
	Schedule F	25
	Appendix C – Current Transformer Test Certificate	26
	Appendix D – Conformance Declaration	27

All Rights Reserved

The copyright of this document, which contains information of a proprietary nature, is vested in Electricity North West Limited. The contents of this document may not be used for purposes other than that for which it has been supplied and may not be reproduced, either wholly or in part, in any way whatsoever. It may not be used by, or its contents divulged to, any other person whatsoever without the prior written permission of Electricity North West Limited.

## 1 Scope

This specification details the requirements for Metered Service Units (MSUs) to be installed on the Electricity North West Limited's (hereinafter referred to as Electricity North West) network for electricity services in the range 100A to 600A, inclusive.

### NOTE:

MSUs with a rated current greater than 400A are intended for use in special circumstances, which require careful assessment of the incoming feeder cable arrangement and discrimination of the MSU fuse links with the source protection device.

The minimum operational ( $U_e$ ) shall be 400V and insulation voltage ( $U_i$ ) shall be 600/1000V. All MSU's shall comply with this specification, the tariff meter shall be supplied by others.

## 2 Definitions

<b>Approval</b>	Sanction by the Electricity North West Plant Policy Manager that specified criteria have been satisfied
<b>Contract</b>	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.
<b>Contractor</b>	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.
<b>Specification</b>	The Specifications and schedules (if any) agreed by the parties for the purpose of the Contract.
<b>Sub-Contractor</b>	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.
<b>Supplier</b>	Any person or person's firm or company who supplies goods to Electricity North West or to its Contractor.
<b>Tender</b>	An offer in writing to execute work or supply goods at a fixed price.
<b>Tenderer</b>	The person or person's firm or company, including personal representatives, successors and permitted assigns, invited by Electricity North West to submit a Tender.

## 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.

## 5 Relevance of Standards

MSUs shall comply with BS EN 60439-1, noting that any specific requirements in this specification shall take precedence. In addition, as there are many similarities between the equipment specified herein and substation cable distribution boards, the requirements of Energy Networks Association Technical Specification (ENA TS) 37-2 Issue 5 are applicable, as and when specified.

ENA TS 37-2, sub-clause 2 is applicable.

## 6 Rated Current of the MSU

When equipped with 600A fuse links the MSU shall have a continuous current rating of 600A under the conditions defined in this specification.

## 7 Information to be Given Regarding the MSU

Each MSU shall include a nameplate giving the following:

- (a) Manufacturers name or trademark.
- (b) Serial number, which shall be unique.
- (c) Year of manufacture.
- (d) Normal current rating of the MSU.
- (e) Rated operational voltage of the MSU.
- (f) Gross weight of the MSU.
- (g) Reference to this specification.

The nameplate may be positioned on the outside of the MSU or inside the door of the Upper Chamber.

The Gross weight of the MSU shall also be clearly displayed on the MSU packaging for manual handling requirements.

## 8 Service Conditions

MSUs shall be suitable for normal indoor service conditions with a pollution degree 3, as specified in BS EN 60439-1, sub-clause 6.1.

## 9 Construction

### 9.1 General Arrangement

MSUs shall comprise 3 separately sealable elements:



- (a) Lower Chamber, for termination of the incoming cable.
- (b) Main Fuse Chamber.
- (c) Upper Chamber, incorporating internal accommodations for current transformers and voltage supplies, isolation links and fuses as required and space for the termination of outgoing (customer) cables. Externally it shall also accommodate surface mounted CT secondary and Voltage connection test terminal block and sufficient area to allow surface mounting of “X” polyphase meters.

Normally the MSUs will be arranged suitably for the incoming cable entry from below and the outgoing cables exiting from the top of the unit, as shown in [Appendix A Figure 1](#). However, to cater for occasions when the incoming cable approaches from above and the outgoing cable from below, the MSU must be capable of being readily dismantled and re-assembled, so as to provide an arrangement with incoming cable box at the top and the Upper Chamber at the bottom. This shall be achieved without the need for additional or alternative parts.

The incoming cable may approach the MSU vertically, or from the left or right hand side at floor or ceiling level. Preferably, all these alternative directions of approach shall be accommodated within one standard cable box. However, if this is not practical, the manufacturer may offer alternative cable boxes.

The 3 basic elements shall be close coupled, supplied as a complete unit and mounted on a fabricated steel frame or fire retardant backboard. The steel frame shall be of a robust construction and suitable for ‘free standing’ or back against a wall. The steel frame and backboards shall have the fixing points clearly marked and pre-drilled.

Internal connections shall be as shown in [Appendix A Figure 2](#). Wires connecting to the meter shall be loomed and left suitable for being readily terminated to the meter by others.

## 9.2 Protection by Total Insulation

In some installations the distribution system earth cannot be solidly bonded to the customer’s earth. Consequently, there is a possibility that the safe touch voltage may be exceeded between the two earths, under fault conditions, if the MSU includes an enclosure that is manufactured from conducting material. To overcome this issue the MSU shall be constructed such that the cable termination chamber and fuse disconnecter chamber are bonded together but are adequately insulated from the upper chamber. See BS EN 60439-1, sub-clause 7.4.3.2.2.

Particular attention is drawn to the need to avoid exposed conducting parts piercing the wall of the enclosure(s).

## 9.3 Incoming Cable Box

The incoming cable box shall be adequate for the termination of the incoming cable, with provision for a phase core cross within the cable box where required. The cable used shall be 95mm<sup>2</sup>, 185mm<sup>2</sup> or 300mm<sup>2</sup>, 600/1000V three core Combined Neutral/Earth (CNE) or four core Separate Neutral/Earth (SNE) conductor cable, polymeric insulated, with solid aluminium phase conductors and concentric copper wire waveform CNE conductor or earth. Cable terminating distances shall not be less than specified in BS 5372. All cables shall comply with the requirements of Electricity North West’ specification ES400C11.

A PME link shall be supplied in the Incoming cable box. A PME Link shall be supplied, fitted and clearly labelled. A solid earth bar shall be fitted through the unit to the Upper Chamber for user connection. The label shall state Neutral/Earth Link. See [Appendix A Figure 2](#) for the line diagram.

The incoming cable shall enter the cable box via cone shaped grommets that can be cut to suit the overall diameter of the incoming cable. The cable box shall be fitted with a cable clamp suitable for all cable sizes and strong enough to cater for cable manipulation during connection. Cables shall be terminated using Sicame Electrical Developments mechanical connectors type Double Shear UMT300E or equal. Where the design permits, the connector may be mounted directly on the terminals of the fuse disconnecter and within the fuse disconnecter enclosure.

## 9.4 Main Fuse Chamber

The Main Fuse Chamber shall comprise three single phase fuse holders and a 250A neutral link, arranged side-by-side, in an insulated enclosure. The fuse holders shall be rated for either 200A, 400A or 600A, as specified by Electricity North West. The Main Fuse shall be of the fuse handle type, (see ENA TS 37-2, sub-clause 2.1.206). The handles shall be suitable for accommodating fuse links type J, with wedge tightening contacts and having 82mm centres for 200A and 400 rated fuseholders and 92mm centres for 600A rated fuse holders, in accordance with BS 88 Part 2. Fuse links will be supplied by the purchaser.

Access to the fuse handles shall be by means of a bolted cover.

Fuse disconnectors shall meet the requirements of ENA TS 37-2, sub-clause 7.6.1.a.a.1, noting that; (i) paragraph 5 relating to cable terminal arrangements is excluded, and, (ii) the protection arrangements specified apply when the fuse disconnecter front cover is removed.

## 9.5 Upper Chamber

The Upper Chamber shall include a hinged door and be suitable for direct coupling to the fuse disconnecter. Any Meters shall be fitted directly to the Upper Chamber door. The Upper Chamber shall have adequate provision for mounting the meter and holes for the wiring loom to pass through for connection to the meter. The IP rating shall be maintained when the meter is both fitted and removed.

Located within the Upper Chamber there shall be:

- (a) 3 metering current transformers which shall be mounted directly around the busbars between the fuse disconnecter and the customers outgoing terminals.
- (b) 4 voltage fuses holders (3 phase plus neutral link) for size F1 fuse links in accordance with BS 88-2. Fuse holders connected in phases and neutral shall be fitted with a 4A fuse link and a solid link, respectively.
- (c) Solid copper phase and neutral connections extending from the Main Fuse Chamber, through the current transformers to the outgoing cable terminals. A solid copper earth bar from the Lower Chamber shall also be provided.
- (d) Three phase, neutral and earth outgoing cable terminals suitable for the termination of single core copper cable, up to and including 300mm<sup>2</sup>, with compression lug having dimension in accordance with IEC/TR2 61238. The cable lugs shall be supplied with the unit.

The Upper Chamber door shall:

- (a) Be hinged down one side.

- (b) Have either a Campbell and York Ltd. test terminal block with rear connected terminals or equal mounted on the outside or Wago 282 CT Switching devices or equal mounted onto the inside of the Upper Chamber door.
- (c) Drilling as shown in [Appendix A Figure 3](#), for a tariff meter supplied others.

In addition:

- (a) The top/bottom of the Upper Chamber, as applicable, shall include a slot approximately 280mm x 60mm for the entry of the outgoing single core cables. This slot shall be closed with a non-ferrous gland plate. Where wood is used it shall be a 12mm thick marine plywood cover.
- (b) Each side of the Upper Chamber shall include a 20mm diameter hole suitable for a modem plug. These holes shall be closed with a suitable blanking plug.
- (c) The door shall have CT name plate labels for each CT attached to the inside of the door, clearly stating the CT serial number, Ratio, Accuracy Class, Burden (VA), voltage, frequency and BS Number.

With the Upper Chamber door open all live conductors shall be screened to provide protection against accidental contact with hazardous live parts in accordance with IP XXB of BS EN 60529. This level of protection shall apply when removing the voltage fuse links.

The Upper Chamber small wiring shall comply with BS7671 2008+A1:2011.

## 9.6 Metering Current Transformers

Metering current transformers shall be in accordance with BS EN 60044 – 1.

The ratio, burden and class of metering current transformer shall be as follows.

Rated Current of the MSU	200A	400A	600A
Ratio	200/5	400/5	600/5
Burden	15VA	15VA	15VA
Class	0.5S	0.5S	0.5S

Test certificates that meet the requirements of Electricity North West specification ES501, detailing the accuracy of the individual CTs shall be provided with each MSU in paper format within the unit and electronic copies shall be emailed in either PDF, Word or Excel formats to the Electricity North West P283 commissioning mailbox (P283commissioning@enwl.co.uk). An example CT Test Certificate is detailed in [Appendix C](#).

## 9.7 Enclosure Protection

In normal service (all covers in place and doors closed) the MSU shall provide protection in accordance with IP4X of BS EN 60529.

## 9.8 Impact Resistance

Excluding the test block and meter, the MSU shall provide protection against external mechanical impacts in accordance with IK09 (10 Joules) of BS EN 62262.

## 9.9 Security

The Upper Chamber door shall be lockable using either a security padlock as detailed in ENA TS 37-2, sub-clause 7.1.1.c.2 or a meter box key. The padlock will be supplied by the purchaser. The Upper Chamber shall be sealable in addition to the locking mechanism as detailed below.

In addition, facilities shall be provided for the installation of security wires and seals at the following locations:

- (a) A minimum of one to ensure the Upper Chamber door is sealed closed.
- (b) Four seals, (one close to each corner) on the fuse disconnectors' bolted front cover.
- (c) Four seals (one close to each corner) on the incoming cable box.
- (d) A minimum of two seals on opposite corners of any other removable cover.

When installed the sealing wire shall prevent doors/covers being opened without breaking the seal. The holes for the sealing wire shall be suitable for meter sealing wire ropes of a maximum overall diameter of 0.914mm.

## 9.10 Clearance and Creepage Distances

Clearance and creepage distance shall be in accordance with ENATS 37-2, sub-clause 7.1.2.1.

## 9.11 Corrosion Protection

The main current carrying components (other than those made of aluminium or aluminium alloy) shall be electro-tin or electro-silver plated. All fastening, nuts bolts etc. shall be plated to BS 3382 and shall have corrosion proof locking features.

The steel frame and any other structural steel part shall be protected against corrosion in order to meet the requirements of BS EN 50300, sub-clause 8.2.103.1.

## 9.12 Resistance to Abnormal Heat and Flame

Part made of insulating material shall not be adversely affected by abnormal heat and flame in accordance with the following requirements.

### 9.12.1 Glow Wire

Glow withstand capability as specified in BS EN 60439-1, sub-clause 7.1.4.

### 9.12.2 Flammability

Resistance to burning in accordance with BS EN 50300, sub-clause 8.2.102.2.

### 9.12.3 Identification

The requirements of ENA TS 37-2, sub-clause 7.6.5 shall apply.

## 9.13 Labelling

Every MSU shall be supplied to Electricity North West with the following labelling:-

- (a) Danger of Death labels fitted to all removable covers including internal removable shrouding.
- (b) All removable covers which expose live parts shall have a label stating:-
- (c) "Live parts are exposed when this cover is removed. Isolate the supply before removing this cover."
- (d) Loose adhesive Phase labels shall be supplied to mark the incoming cable box both internally and externally and on the customer's terminals.
- (e) CT name plate labels for each CT attached to the inside of the door, clearly stating the CT serial number, Ratio, Accuracy Class, Burden (VA), voltage, frequency and BS Number attached to the inside of the Upper Chamber door.
- (f) The cover to the CTs shall have a label stating where the CTs and associated fuses are located where it is not sufficiently apparent.

## 10 Tests

### 10.1 Type Tests

#### 10.1.1 Temperature Rise Test

A temperature rise test shall be carried out on each differently rated complete MSU with its rated fuse links at its rated current, i.e. 200A, 400A or 600A, in accordance with BS EN 60439-1, sub-clause 8.2.1, noting that:

- (a) The incoming supply shall be connected with test cable having solid aluminium conductors with a cross section of 95mm<sup>2</sup> for the 200A rated MSU, 185mm<sup>2</sup> for the 400A rated MSU and 300mm<sup>2</sup> for the 600A rated MSU.
- (b) Temperature rise limits are as given in ENA TS 37-2, sub-clause 8.2.17.

#### 10.1.2 Dielectric Properties

##### 10.1.2.1 Complete MSU

Power frequency dielectric and impulse tests shall be carried out on each differently rated complete MSU in accordance with BS EN 60439-1, sub-clause 8.2.2, noting that the power frequency test voltage shall be applied for one minute.

**NOTE:** as the MSU is providing protection by total insulation the requirement of BS EN 60439-1, sub-clause 8.2.2.2 is applicable.

##### 10.1.2.2 Fuse Carriers

Fuse carriers for type gU fuse links shall be tested in accordance with ENA TS 37-2, sub-clause 8.2.2.

### 10.1.3 Short-Circuit Performance

For each differently rated complete MSU when fitted with its rated fuse links, the fuse disconnectors shall have satisfactorily completed a through-fault, short circuit test in accordance with BS EN 60439-1, sub-clause 8.2.3 with a minimum prospective short circuit current at its incoming terminals of 35.5kA.

### 10.1.4 Clearance and Creepage Distances

Measurements shall be made to ensure the clearance and creepage distances specified in sub-clause 8.10 are met.

### 10.1.5 Mechanical Operation

Torque tests shall be carried out on fuse handle thumb screw shafts in accordance with ENA TS 37-2, sub-clause 8.2.9a.

### 10.1.6 Degree of Protection

Tests shall be made in accordance with BS EN 60529 to confirm the external and internal protection is provided in accordance with this specification.

### 10.1.7 Impact Resistance

Tests shall confirm that in the normal service condition, each differently rated complete MSU, excluding the test block and meter has a resistance to mechanical impact in accordance with IK09 of BS EN 62262.

### 10.1.8 Fuse Disconnector

Tests shall be carried out to confirm that the basic fuse disconnector meets the performance requirements detailed ENA TS 37-2, sub-clause 7.6.1.a.a.1, paragraph 1.

## 10.2 Routine Tests

### 10.2.1 General

Routine tests shall be carried out in accordance with BS EN 60439-1, sub-clause 8.1.2. In addition fuse handle wedge operating mechanisms shall be tested in accordance with ENA TS 37-2, sub-clause 8.3.2c.

### 10.2.2 Commissioning Tests

Commissioning tests shall be carried out in accordance with Electricity North West Electricity Specification ES510 on each complete MSU following completion of routine tests. Where any commissioning test/check required by ES510 has already been carried out as a routine test then there is no requirement to repeat that test/check.

The results of commissioning tests/checks and any relevant routine tests shall be recorded on the LV Metering Equipment Commissioning Record Form in Appendix A of Electricity North West Code of Practice CP510. For the avoidance of doubt, the Commissioning Record Form is intended to supplement not replace the Supplier's routine test form to facilitate compliance with CP510.

Completed Commissioning Record Forms shall be emailed in either PDF or Word formats to the Electricity North West P283 commissioning mailbox ([P283commissioning@enwl.co.uk](mailto:P283commissioning@enwl.co.uk)).

## 11 Documents Referenced

DOCUMENTS REFERENCED	
<b>ENA TS 37-2 Issue 5</b>	Public Electricity Network Distribution Assemblies.
<b>BS EN 50300</b>	Low-voltage switchgear and controlgear assemblies – General requirements for low-voltage substation cable distribution boards.
<b>BS EN 60044-1</b>	Instrument transformers – Part 1: Current transformers.
<b>BS EN 60439-1</b>	Low-voltage switchgear and controlgear assemblies – Part 1: Type-tested and partially type tested assemblies.
<b>BS EN 60529</b>	Specification for the degrees of protection provided by enclosures (IP code).
<b>BS EN 62262</b>	Degrees of protection provided by enclosures for electrical equipment against external impacts (IK code)
<b>BS 88 Part 2.</b>	Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial applications) – Examples of standardized systems of fuses A to I.
<b>BS 3382</b>	Specification for electroplated coating on threaded components.
<b>BS 5372</b>	Dimensions of cable terminations for multi-core extruded solid dielectric insulated distribution cables of rated voltage 600/1000V and 1900/3300V having copper and aluminium conductors.
<b>BS7671 2008+A1:2011</b>	Requirements for electrical installations. IET Wiring Regulations. Seventeenth edition.
<b>IEC/TR2 61238-2</b>	Compression and mechanical connectors for power cables with copper and aluminium conductors. Part 2: Terminal lugs for power cables to fit equipment up to and including 1kV – Overall dimensions.
<b>ES400C11</b>	Low Voltage Mains Cables.

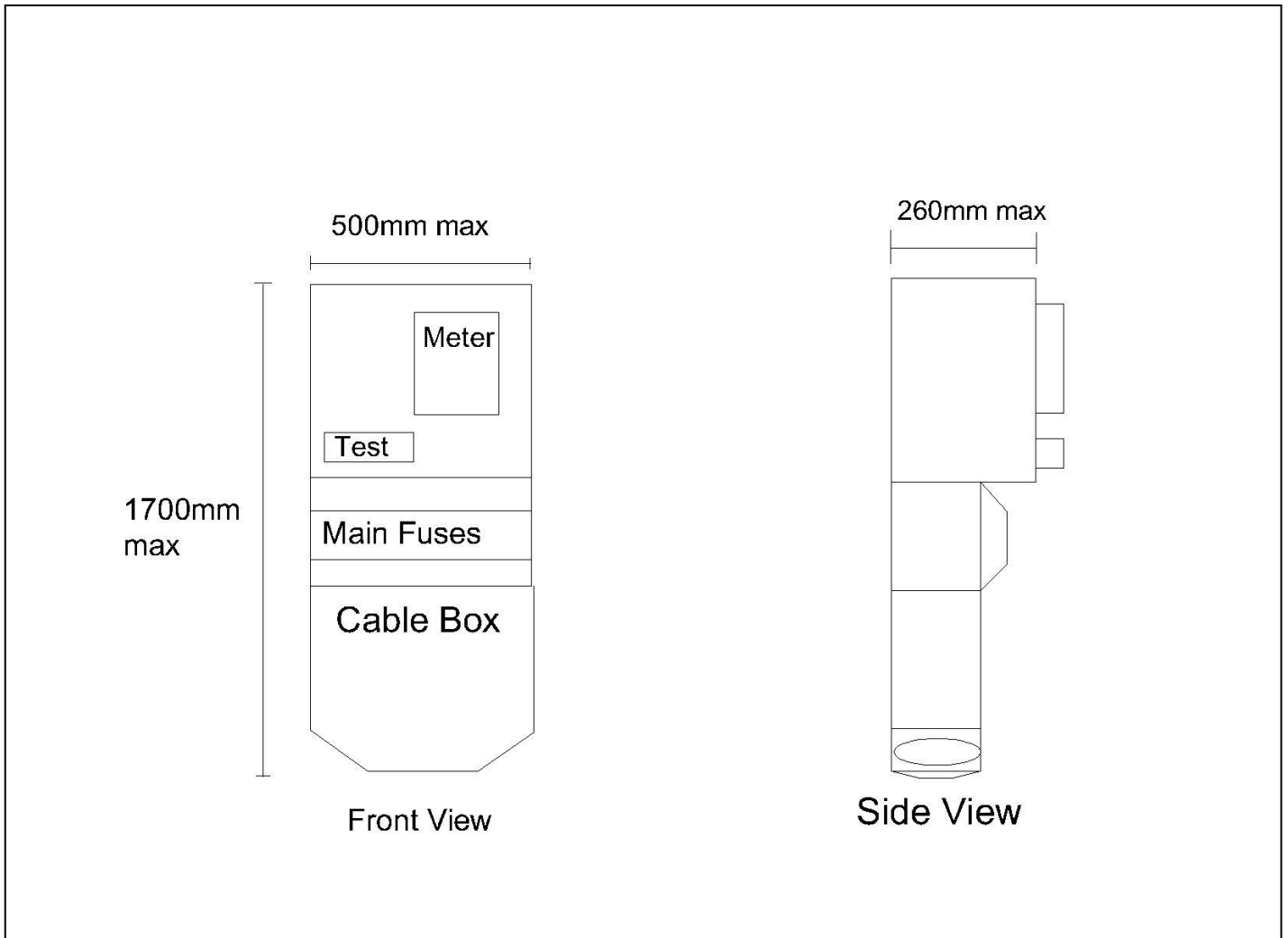
<b>ES501</b>	Metering Current and Voltage Transformers.
<b>ES510</b>	Procedure for Commissioning Measurement Transformers Connected to Settlement Metering Equipment.
<b>CP510</b>	Commissioning of Measurement Transformers connected to Tariff Metering Equipment.

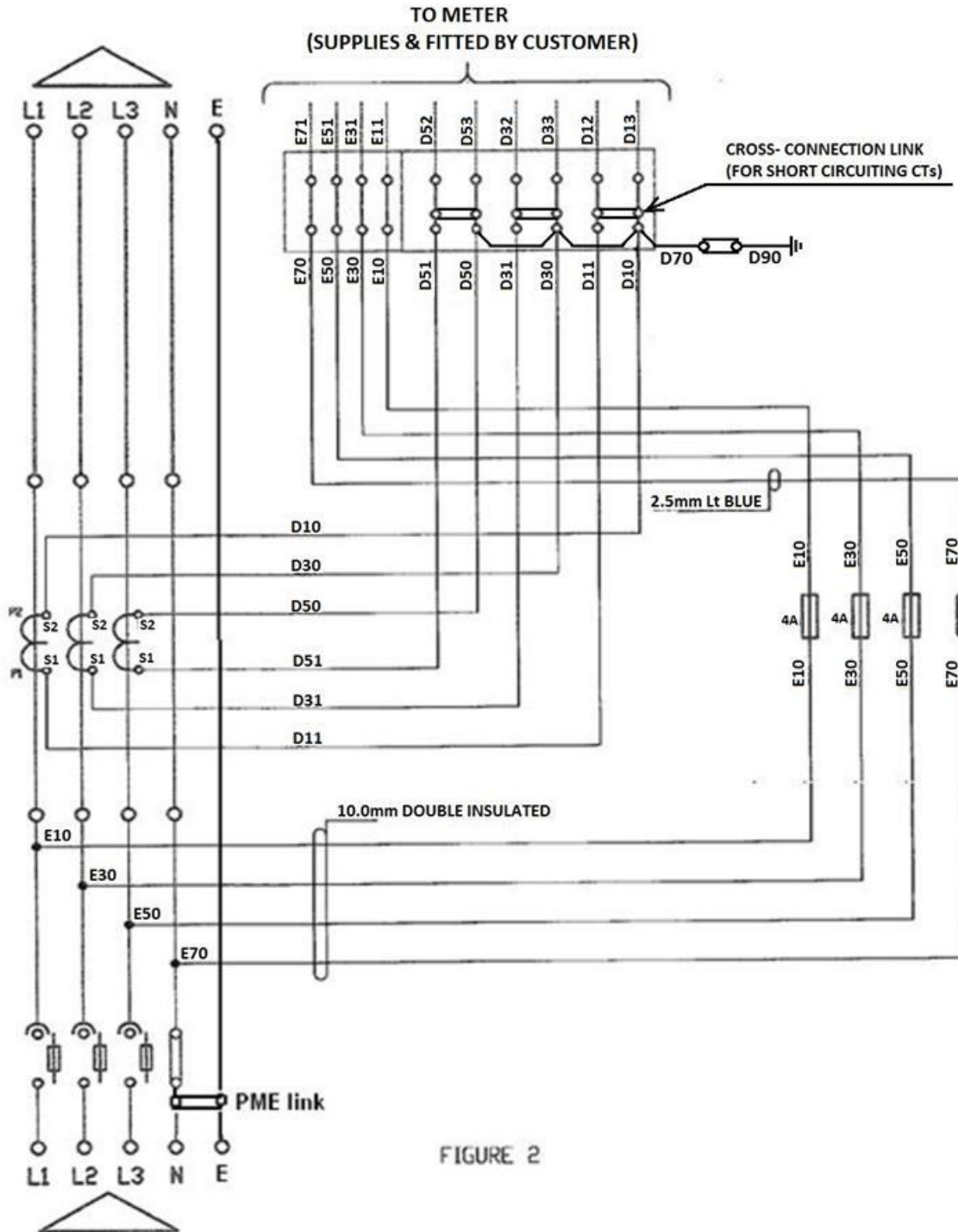
## 12 Keywords

Metering; Cut Out; MSU.



## Appendix A – Example Layout





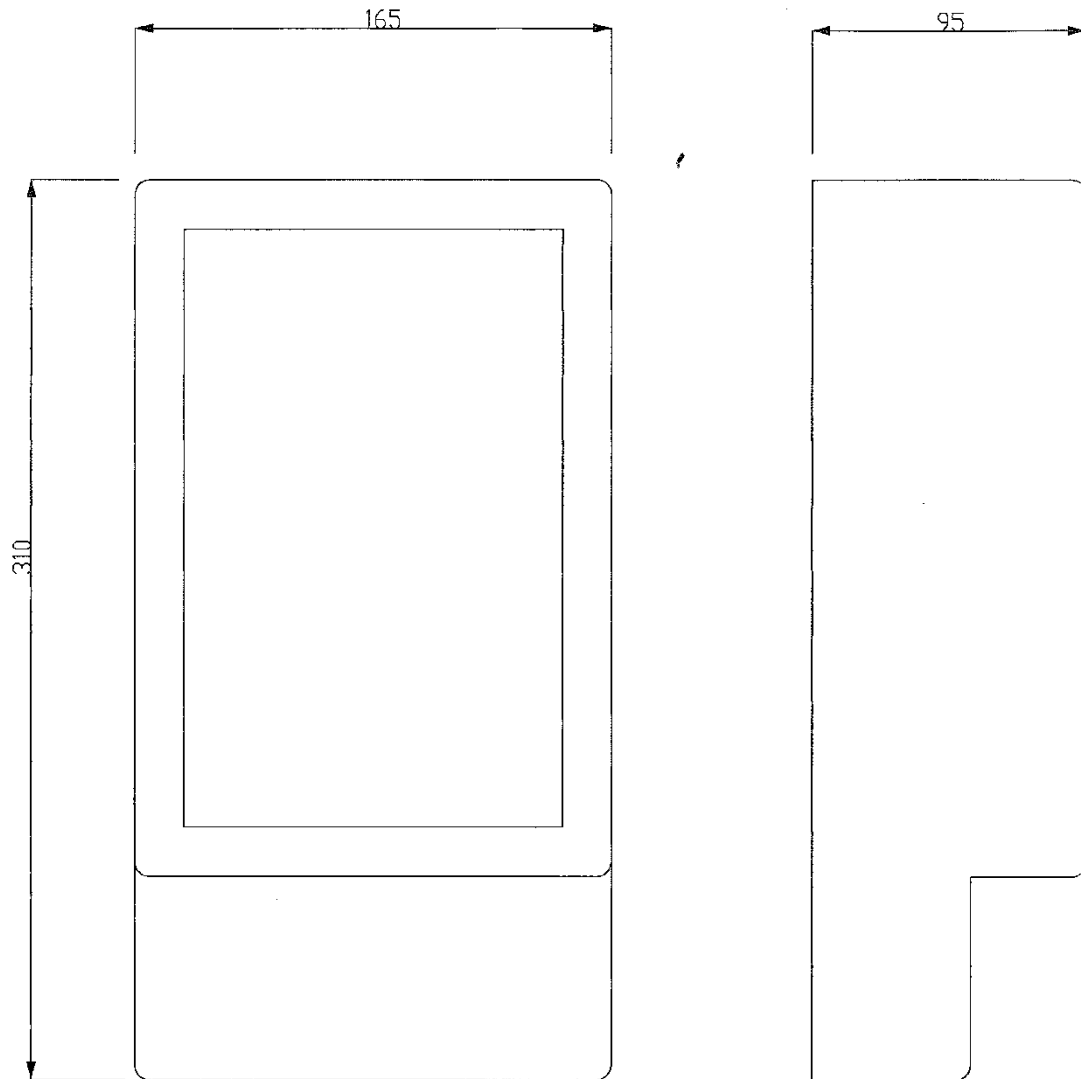


FIGURE 3

**Appendix B – Schedules**

**Schedule A**

**Sub-Contractors**

Item	Manufacturer	Place of Manufacture

## Schedule B

### Departures from Specification

Tenderer to state details of any departure from the requirements of this specification.

<b>Section and Clause No</b>	<b>Proposed departures from the requirements of this specification, with details of alternative proposals</b>

**Schedule C**

**List of Special Tools and Equipment to Be Provided**

(Relevant details to be completed by Tenderer)

Equipment	Special Tools and Equipment

## Schedule D

### Drawings

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

<b>Description</b> (General arrangement drawings of:-)	<b>Tenderer's Drawing No.</b>
MSU	

## Schedule E

### Manufacturers and Places of Manufacture, Testing and Inspection

(Relevant details to be completed by Tenderer)

Item	Manufacturer's Drawing Number and/or Type Designation	Manufacturer	Place of Manufacture	Place of Testing and/or Inspection
MSU				
<b>Subcontracted material or components:-</b>				



## Schedule F

### Technical Details

(A separate schedule should be complete for each design of MSU)

Item		MSU
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 MSU.	

\*Where appropriate, state MSU enclosure type reference instead of thickness details.

## Appendix C – Current Transformer Test Certificate

A separate certificate shall be complete for each MSU supplied to Electricity North West.

Job Reference \_\_\_\_\_ MSU Manufacturer \_\_\_\_\_ Type \_\_\_\_\_ / \_\_\_\_\_ Amps Ratio  
 Site Name \_\_\_\_\_ CT Manufacturer \_\_\_\_\_ CT Class \_\_\_\_\_  
 Rated Burden \_\_\_\_\_ VA  
 Terminal Markings \_\_\_\_\_

Test Burden		Secondary		CT Serial Number.			CT Serial Number.			CT Serial Number.		
VA	PF	%	Amps	Ratio Error %	Phase Error		Ratio Error %	Phase Error		Ratio Error %	Phase Error	
					mins	C/R		mins	C/R		mins	C/R
	0.8	120	6									
		100	5									
		20	1									
		5	0.25									
		1	0.05									
Polarity Check												

Tested By \_\_\_\_\_ Date \_\_\_\_\_  
 Witnessed By \_\_\_\_\_ Date \_\_\_\_\_

## 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:**

<b>N/A =</b>	Clause is not applicable/appropriate to the product/service.
<b>C1 =</b>	The product/service conforms fully with the requirements of this clause.
<b>C2 =</b>	The product/service conforms partially with the requirements of this clause.
<b>C3 =</b>	The product/service does not conform to the requirements of this clause.
<b>C4 =</b>	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	General Requirements for Approvals and Testing.		
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		
5	Relevance of Standards		
6	Rated Current of the MSU		
7	Information to be given regarding the MSU		
9	Service Conditions		
9.1	General Arrangement		

<b>9.2</b>	<b>Protection by Total Insulation</b>		
<b>9.3</b>	<b>Incoming Cable Box</b>		
<b>9.4</b>	<b>Fuse Disconnecter</b>		
<b>9.5</b>	<b>Upper Chamber</b>		
<b>9.6</b>	<b>Metering Current Transformers</b>		
<b>9.7</b>	<b>Enclosure Protection</b>		
<b>9.8</b>	<b>Impact Resistance</b>		
<b>9.9</b>	<b>Security</b>		
<b>9.10</b>	<b>Clearance and Creepage Distances</b>		
<b>9.11</b>	<b>Resistance to Abnormal Heat and Flame</b>		
<b>9.12</b>	<b>Labelling</b>		
<b>10.1</b>	<b>Type Tests</b>		
<b>10.2</b>	<b>Routine Tests</b>		
<b>Appendix A</b>	<b>Compliance with Drawings</b>		
<b>Appendix B</b>	<b>Schedules to be Completed by the Tenderer</b>		
<b>Appendix C</b>	<b>CT Test Certificate to be Completed by the Tenderer</b>		
<b>Appendix D</b>	<b>Technical Schedule to be Completed by the Tenderer</b>		

**Additional Notes:**