

# Electricity Specification 400C5

Issue 3      February 2023

## Heavy Duty Cut-outs



## Amendment Summary

ISSUE NO. DATE	DESCRIPTION
<b>Issue 3</b> <b>February 2023</b>	Review of document to bring up to date to reflect current specifications and standards. The new template for Engineering Specification Documents has been applied.  Prepared by: Philip Howell Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, Engineering and Technical Director

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## 1 Introduction

This specification covers Electricity North West Limited requirements for Heavy Duty cut-outs for power supplies to premises with loads in excess of 100 Amps, used on the electricity distribution network (Network) owned by Electricity North West Limited, as Distribution Licensee.

## 2 Scope

Heavy-duty cut-outs described in this specification shall be suitable for providing power supplies to commercial and industrial premises with loads in excess of 100 Amps per phase. Where appropriate cut-outs shall be fixed vertically to walls or metal frames in customers' premises or they may be installed within compartments in customer's switchboards.

Current transformers are used to meter the supply which are housed in separate cubicles.

This specification does not cover pole mounted 400A cut outs used on overhead line applications – refer to Electricity North West Limited specification document ES400 L6 for this product.

This specification does not cover Metered Service Units (MSU) which integrate a heavy-duty cut-out and CT metering cubicle – refer to Electricity North West Limited specification document ES503 for this product.

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## 3 Definitions

<b>Approval</b>	Sanction by the Electricity North West Circuits Policy Manager that specified criteria have been satisfied
<b>CNE</b>	Combined Neutral and Earth
<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>SNE</b>	Separate Neutral and Earth
<b>Specification</b>	The Specifications and schedules (if any) agreed by the parties for the purpose of the Contract.
<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.

**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.

## 4 General Requirements for Approvals and Testing

### 4.1 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 Circuits Policy Manager, and receipt of a written agreement to the proposed change from the Electricity North West Circuits Policy Manager.

### 4.2 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 Circuits 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 Circuits Policy Manager, compliance with this Specification. Acceptance of this evidence shall be at the discretion of the Electricity North West Circuits 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 Circuits Policy Manager.

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

### 4.3 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 Circuits 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 Circuits 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 Circuits Policy Manager, be reasonably required for inspection and/or retention as quality control samples. The Electricity North West Circuits 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 Circuits 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.

#### **4.4 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 Circuits Policy Manager will, if requested, confirm agreement to this prior to receipt of the information.

#### **4.5 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 Circuits 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 Circuits Policy Manager.

#### **4.6 Minimum Life Expectancy**

The minimum life expectancy of all products covered by this Specification is 60 years.

#### **4.7 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.

#### **4.8 Confirmation of Conformance**

The Tenderer shall complete the conformance declaration sheets in [Appendix B](#). Failure to complete these declaration sheets may result in an unacceptable bid.

### **5 Requirements for Type and Routine Testing**

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

## 5.1 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 Circuits Policy Manager.

These may or may not be destructive tests.

## 5.2 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 Circuits 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 Circuits Policy Manager.

# 6 Technical Particulars

## 6.1 Conditions of Operation

All cut-outs shall be designed for use on three-phase 400V, 50Hz, CNE and SNE networks.

## 6.2 Classification

The cut-out type shall be classified in terms of rating, as follows:

- Type 1 Rated at up to 200A.
- Type 2 Rated at up to 400A.

## 6.3 Constructional Requirements

The design of the cut-out shall conform to ENA TS 37-2.

The main fuse compartment case shall have a one-piece lid, retained in the closed position by screw fixings and capable of being sealed with sealing wire.

The cut-outs shall be provided complete with fuse carriers with 82mm fixing centres suitable for type "J" fuses to BS HD 60269-2:2013/BS 88-2:2013.

Fuse carriers shall be of wedge type and shall be equipped with two thumbscrews for tightening in situ. The design of these thumbscrews must be such that, when in position, the whole fuse assembly cannot be fortuitously dismantled when the thumbscrews are released to their full extremities. The thumbscrews shall be of insulating material with the same electrical performance as the fuse carrier.

A fuse link **shall not** be supplied with the fuse carrier.

The cut-out shall have four poles, three fused phases, one non-disconnectable neutral and an external earth terminal. Each pole shall be separated in the main case by insulating material matching the electrical and mechanical performance of the case.



## 6.4 Incoming Cable Terminations

The cable termination enclosure shall be of two-piece construction and shall be manufactured from the same material as the cut-out case.

The outer part shall be removable for cable jointing with the inner part in place. No part of the cable termination enclosure shall be removable without the prior removal of the fuse compartment lid. The cable termination enclosure must have cable entries to enable a cable to enter at an angle from either the left or right of the cut-out, or from directly below.

Rubber or plastic cone shaped grommets that are only removable by entry to the cable termination enclosure shall be used to prevent penetration of the enclosure through unused cable entries.

Cable termination boxes shall be suitable for the termination of waveform cables to ES400C11.

The Type 1 cut-out shall have range taking shear bolt connectors to terminate solid aluminium conductors on 3core CNE or 4core SNE sector shaped cores between 95mm<sup>2</sup> and 185mm<sup>2</sup> cables.

The Type 2 cut-out shall have range taking shear bolt connectors to terminate solid aluminium cores on 3core CNE or 4core SNE sector shaped conductors between 185mm<sup>2</sup> and 300mm<sup>2</sup> cables.

Cable termination boxes shall have sufficient air space to conform to the HV test requirements as detailed in [Section 7.1](#) below.

An additional single piece temporary insulating shield shall be available. This shield will be fitted over the live incoming terminations, with the main fuses removed, to permit safe working on the outgoing circuit. The shield shall maintain IP2X protection under reasonable mechanical stress arising from the work. It shall be readily and securely fixed without conductive fittings and the use of tools.

## 6.5 Outgoing Cable Terminations

The outgoing phase and neutral terminals shall be a M12 stud or bolt to allow approved cable lugs to be connected. Suitable nuts, flat washers and spring washers for the bolt or stud shall be supplied with the cut-out.

The cut-out shall have an external earth connection which shall be either CNE or SNE by means of a removable link between the neutral and earth busbar.

The external earth connection shall be removable to provide no external earth by means of a blanking plate or insulated cover.

## 6.6 Mounting Arrangement

Equipment must be able to be mounted to a wall using conventional fixings to which access cannot be gained when the cut-out fuse case lid is closed.

The case of the cut-out shall bear directly on the wall. When used on a wall subject to damp, any mounting frame used shall be of non-deteriorating material. Wooden frames are not acceptable.

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## 6.7 Shielding

The cut-outs shall have protection of IP 4X to BS EN 60529 with the fuse cover closed, and IP 2X when the fuse cover is open, and all fuse carriers are in the service position.

## 6.8 Materials

Item	Material	Specification	Notes
Cut Out Casing	Moulded Insulating Material	ENA TS 37-2	Insulation coated metallic cases are not acceptable
Fuse Carriers	Moulded Insulating Material	ENA TS 37-2	
Components forming main current carrying path	Hard Drawn High Conductivity Copper or Brass		May be electroplated with tin, cadmium or silver, if required
All ferrous parts	Stainless Steel		Other metal may be used if it is adequately plated to prevent corrosion

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## 7 Test Requirements

### 7.1 High Voltage (HV) Tests

The complete equipment shall be proven to have successfully completed relevant tests described in ENA TS 37-2, clause 10.9.

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### 7.2 Temperature Rise Test

The temperature rise performance of the equipment shall match that described in ENA TS 37-2, clause 10.10.

## 8 Packaging

Supplied equipment shall be appropriately packaged to prevent damage in both transit and during stores handling.

Any requirements regarding handling or stacking shall be clearly marked on the packaging. All components forming the cut-out assembly shall be contained within the packaging of each unit.

## 9 Documents Referenced

DOCUMENTS REFERENCED	
Health and Safety at Work Etc Act 1974.	
Control of Substances Hazardous to Health Regulations 2002.	
Manual Handling Operations Regulation 1992.	
BS EN ISO 9000	Quality management systems.
BS EN ISO 14001	Environmental Management Systems.
BS EN 60269-2 BS 88-2	Low-voltage fuses - Part 2: Supplementary requirements for fuses for use by authorized persons.
BS EN 60947-1:	Specification for low voltage switchgear and control gear.
BS EN 60529	Specification for degrees of protection provided by enclosures (IP code).
ENA TS 37-2	Public Electricity Network Distribution Assemblies
ES400C11	Specification for Low Voltage Mains Cables
ES400L6	Specification for Pole-Mounted Fuse Cut-Outs, Distribution Boxes, Fuse Boxes and Connection Boxes for LV Overhead Lines and Mural Wiring
ES503	Specification for Metered Service Units (MSU)
CP311	Equipment Approval Policy and Process

## 10 Keywords

Cut-out; Heavy Duty

## Appendix A – Scope of Materials

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The following heavy-duty cut-outs are currently approved for use on Electricity North West Network.

ITEM NO.	ORDERING SPECIFICATION	COMMODITY CODE
1	WT Henley (Sicame) Heavy Duty Cut Out 200A Part Number 54427-17	069044
2	WT Henley (Sicame) Heavy Duty Cut Out 400A Part Number 54426-04	069045

## Appendix B – 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)
1	Introduction		
2	Scope		
4.1	Product not to be Changed		
4.2	Electricity North West Technical Approval		
4.3	Quality Assurance		
4.4	Formulation		
4.5	Identification Markings		
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5.1	Requirements for Type Tests at the Supplier's Premises		
5.2	Requirement for Routine Tests at the Supplier's Premises		
6.1	Conditions of Operation		
6.2	Classification		

6.3	Constructional Requirements		
6.4	Incoming Cable Terminations		
6.5	Outgoing Cable Termination		
6.6	Mounting Arrangement		
6.7	Shielding		
6.8	Materials		
7.1	High Voltage Tests		
7.2	Temperature Rise Test		
8	Packaging		

\* Applicable specifications shall be stated in the Remarks column where alternatives are quoted within a section. The Remarks column shall also be used to indicate cases where the products or services exceed the quoted specifications.

**Additional Notes:**