

Electricity Specification 417

Issue 3 November 2021

Cable Spiking Equipment



Amendment Summary

ISSUE NO. DATE	DESCRIPTION
Issue 3 November 2021	<p>The new template for Engineering Specification Documents has been applied. All information has been reviewed and updated where appropriate. Minimum length of lanyard changed to 7metres to synchronise with CP606, B12 Details of supplier after sales service and technical support added.</p> <p>Prepared by: Philip Howell Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, Engineering and Technical Director</p>

Contents

1	Introduction	5
2	Scope	5
3	Definitions	5
4	General Requirements for Approvals and Testing	6
	4.1 Product not to be Changed	6
	4.2 Electricity North West Technical Approval	6
	4.3 Quality Assurance	6
	4.4 Formulation	7
	4.5 Identification Markings	7
	4.6 Minimum Life Expectancy	7
	4.7 Product Conformity	7
	4.8 Confirmation of Conformance	7
5	Requirements for Type and Routine Testing	7
	5.1 Requirement for Type Tests at Suppliers Premises	8
	5.2 Requirement for Routine Tests at the Supplier's Premises	8
6	Technical Particulars	8
	6.1 Compliance with Specification	8
	6.2 Size of Cables	8
	6.3 Method of Operation	8
	6.4 Standard of Construction	9
	6.5 Identification Markings	9
	6.6 Carrying Case	9
	6.7 User's Manuals / Documentation	9
7	Spare Parts, Technical Support and After Sales Service	9
8	Documents Referenced	10
9	Keywords	11
	Appendix A – Scope of Materials	12
	Appendix B – Conformance Declaration	13

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1 Introduction

This specification sets out the requirements for cable spiking equipment used on the electricity distribution network (Network) owned by Electricity North West Limited, as Distribution Licensee, herein referred to as Electricity North West

2 Scope

This specification covers portable cable spiking equipment to be used on any armoured and unarmoured three core and single core cables operating at system voltages up to, and including 132kV.

The equipment is to be used solely for proving cables are dead to allow safe works on the cable circuits under procedures laid out in CP606, Procedure B12.

The Cable Spiking Equipment is an explosive cartridge driven equipment that is used to force a steel spike into a cable and can be operated remotely at a safe distance from the cartridge firing point away from any potential explosion resulting from inadvertently spiking a live LV or HV Cable.

The specification covers the spiking equipment, any ancillary clamps and jacks needed for specific cable types and the range of explosive cartridges required to cover the cable types used in Electricity North West network.

3 Definitions

Approval	Sanction by the Electricity North West Circuits 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.
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.

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 10 years. As part of the supply scope, the supplier should provide an inspection, servicing and repair operation to ensure the equipment's life expectancy is achieved and extended by ensuring the equipment is in a safe and reliable condition at all times.

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 A](#). 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 Compliance with Specification

Equipment shall meet this specification together with all the operational requirements specified in CP606, Procedure B12.

6.2 Size of Cables

The equipment shall be capable of safely spiking any cable with overall diameters in the range 20 to 150mm which may or may not be energised, with constructions of tape armouring, wire armouring, unarmoured wire screens, Aluminium or Lead sheaths, paper or polymeric insulation, and with working voltages up to, and including, 132kV.

Cables may be solid insulation or oil or gas pressurised design.

Cables may be three cores, single core or triplex (three single cores in a tight twisted trefoil arrangement).

In the case of smaller diameter cables, it is an acceptable requirement that they be wrapped with Lead sheet or tape to stabilise the cable position in the operating jaws of the device.

6.3 Method of Operation

The equipment shall be operated by means of an explosive cartridge. It is an acceptable requirement that different cartridge charge strengths are required for different types and/or sizes of cable. The user manual shall provide clear guidance on the appropriate identification and charge strength of cartridges to use for different sizes and types of cable.

When assembled on the cable, the equipment shall stand firm on its base and be stable in position before, during and after operation. On operation, the equipment shall drive a chisel shaped spike into the cable for a sufficient distance such that the spike reliably contacts all three conductors (for three phase cables) or the single conductor (for single-phase cables). The user shall be able to remotely operate the equipment from a minimum distance of 7 metres by means of a lanyard.

After operation, the equipment shall be easily dismantled and removed from the spiked cable.

6.4 Standard of Construction

The equipment shall be sufficiently robust and heavily constructed, that it is able to withstand without damage or danger of distortion or separation of its constituent parts, the effects of arcing energy and gas pressure from a 1000MVA short circuit level source, generated within the spiked cable for 3 seconds. Metal parts shall be resistant to corrosion either inherently by the material of construction or by an applied coating.

The equipment shall be capable of assembly onto the cable without the need to completely detach any of its fasteners (for example the nuts closing the jaw). Assembly onto the cable shall be made either without the need for a tool, or by use of a spanner suitable for use in a confined space (which if required shall be supplied).

6.5 Identification Markings

The equipment shall be indelibly and securely marked with a unique serial number and the year of manufacture.

The same unique serial number shall be marked on all the critical components of the equipment to reduce risk of cross contamination of fitting components from other units during dismantling. Typically the key components to be marked with the same serial number would be the barrel, barrel base and the breech cap.

6.6 Carrying Case

Cable spiking equipment shall be supplied in a robust and rigid carrying case, complete with lifting handles and a hinged lid. Space within the case shall be provided for the storage of ancillaries (for example cartridges), assembly spanner (if required) and the user manual. The container shall be painted red with the legend "Cable Spiking Gun No Unauthorised Operation" in white on the lid. All cases shall have a suitable locking facility (hasp and staple are suitable) to allow a padlock to be applied. The padlock does not form part of the supply of this equipment and will be supplied by Electricity North West.

6.7 User's Manuals / Documentation

The manufacturer shall supply a comprehensive user's manual or handbook with each unit. This shall describe all the possible modes of operation of the equipment, selection of optimum settings and the precautions to be taken to ensure safe use of the equipment.

The documentation should detail the recommended instructions for maintenance operations to be carried out after every operation and the frequency and support available for servicing and repair.

7 Spare Parts, Technical Support and After Sales Service

The equipment supplier shall provide full details of the availability and procedure to source cartridges and replacement parts for the equipment. This is to enable Electricity North West to continuously operate and maintain the equipment as specified in CP684.

The delivery of cartridges to Electricity North West depots shall only be made by road in suitably packaged and labelled containers to comply fully with any legislation covering transportation and handling of hazardous materials.

The equipment supplier should ensure Electricity North West is notified if they become aware of any future change to UK legislation, regulations or licencing (such as “The Firearms Act”) covering the transportation, operation and storage of explosive cartridges used with the equipment that could affect the ability to use the equipment.

The equipment supplier shall provide a full repair and inspection service for equipment to ensure all equipment is regularly serviced and certificated. Details shall include the recommended frequency of inspection and servicing, locations and procedure for requesting such services.

The equipment supplier shall provide a “return to base” service for any equipment which is damaged or faulty. Details shall include timescales for producing a report on the recommended actions (i.e. repair or scrap), and any replacement equipment loan facility available.

8 Documents Referenced

All references to documents listed below are to the latest versions, unless stated otherwise

DOCUMENTS REFERENCED	
Health and Safety at Work Etc Act 1974.	
Control of Substances Hazardous to Health Regulations 2002.	
Manual Handling Operations Regulation 1992.	
Firearms Act 1937 and 1968. The Firearms Acts (Amendment) Regulations 1992	
BS EN ISO 9000	Quality management systems.
BS EN ISO 14001: 2004	Environmental Management Systems.
CP606	Electricity North West Operations Manual Procedure B12: Procedure for Spiking Cables and Specification for Cable Spiking guns.
CP684	The Use, Inspection and Maintenance of Ancillary Engineering Equipment
CP311	Approval Policy and Process

9 Keywords

Cable spiking

Appendix A – Scope of Materials

The following equipment is currently approved for use on Electricity North West Network.

ITEM NO.	ORDERING SPECIFICATION	SUPPLIER REF
1	Standard Gun for cables up to 4½ inch (115mm) overall diameter.	2233
2	Heavy Duty Gun for cables in excess of 4½ inch. (115mm) overall diameter up to 6 inch (150mm) overall diameter.	2234
3	Modified gun (standard gun with jacking assembly) for use on both cables up to 4½ inch. overall diameter and 11kV polymeric cables or 11kV Triplex cables.	2235
4	Conversion kit - silver clamp for modified gun for use on 11kV CAS cables up to 300sq mm.	2191
5	Purple clamp ref FA2241 for modified gun for use on Triplex cables up to 300 sq mm. Adaptor Shall be used for 95 sq mm Triplex cables.	2241
6	Explosive Cartridge Red - Heavy Strength - for armoured cables over 3 ¾ inch (84mm) overall diameter with standard spiking gun. - armoured cables up to 6 inch (Heavy duty spiking gun)	7900
7	Explosive Cartridge Green - Medium Strength - for all plain lead cables and all armoured cables up to 3 ¾ inch (84mm) overall diameter.	7900
8	Explosive Cartridge Silver - Light Strength - for aluminium sheathed cables up to 300 sq. mm and Triplex cable over 185 sq mm.	7920
9	Explosive Cartridge Yellow - Extra Light Strength - for small polymeric cables with no outer metallic sheath or Triplex cable up to 185 sq mm size.	7925

Supplier/Manufacturer:

Frontmatec Accles & Shelvoke Ltd

Unit 5A, Maybrook Road, Maybrook Business Park

Minworth,

Sutton Coldfield

Birmingham,

West Midlands

UK B76 1 AL

Phone: 0121 313 3564

Fax: 0121 313 0282

www.accles-shelvoke.com

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		
4.6	Minimum Life Expectancy		
4.7	Product Conformity		
4.8	Confirmation of Conformance		
5.1	Requirements for Type Tests at the Supplier's Premises		
5.2	Requirement for Routine Tests at the Supplier's Premises		
6.1	Compliance with Specification		
6.2	Size of Cables		
6.3	Method of Operation		
6.4	Standard of Construction		

6.5	Identification Markings		
6.6	Carrying case		
6.7	User's Manuals / Documentation		
7	Spare Parts, Technical Support and After Sales Service		

* 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: