



Technical Specification 09-23

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LV link boxes

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Amendments since publication

Issue	Date	Amendment
Issue 2	January, 2018	<p>This issue includes the following principal technical changes.</p> <p>New definitions added to Clause 3.</p> <p>Amendments to requirements for components (Clause 4), including clarifications for connectors, addition of stalk and link assembly, addition of requirements for link box lid, and addition of requirements for link box frame pit lid.</p> <p>Amendments to requirements for electrical characteristics (Clause 5).</p> <p>Design considerations (Clause 6) amended, including update to the applicable cable types, and addition of phase identification requirements.</p> <p>Modified testing requirement in Clause 7 and Clause 8 including, an optional long-term soak test, a new impact and cantilever loading type tests along with acceptance criteria.</p> <p>Routine tests added in Clause 9.</p> <p>Details of all other technical, general and editorial amendments are included in the associated Document Amendment Summary for this Issue (available on request from the Operations Directorate of ENA).</p>

Contents

Foreword	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions.....	7
4 Components	8
4.1 Link box shell.....	8
4.2 Link box lid (bell housing)	8
4.3 Connectors	8
4.4 Stalk and link assembly	9
4.5 Fuses.....	9
4.6 Solid links	9
4.7 Metallic components.....	10
4.8 Labelling	10
4.9 Link box frame pit cover	10
5 Electrical characteristics	10
5.1 Rated voltage	10
5.2 Current rating.....	10
6 Design considerations.....	10
6.1 General.....	10
6.2 Cables	11
6.3 Connectors for link boxes	11
6.4 Water immersion depth and pressure	12
6.5 Phase identification	12
6.6 Nameplate	13
6.7 Other design parameters.....	13
7 Type tests requirements and sequence.....	14
7.1 General.....	14
7.2 Test samples	14
7.3 Sequence of tests.....	15
7.4 Type test for resin.....	17
8 Type test methods	17
8.1 General.....	17
8.1.1 Test conditions	17
8.1.2 Temperature calibration of cable	18
8.1.2.1 Application	18
8.1.2.2 Test procedure.....	18
8.2 Impact test at ambient temperature	18
8.3 Cantilever load withstand test.....	18
8.4 AC voltage withstand test.....	19
8.4.1 Test installation.....	19
8.4.2 Test procedure	19

- 8.5 Insulation resistance test procedure 20
- 8.6 Heating cycle test 20
 - 8.6.1 Test installation..... 20
 - 8.6.2 Test procedure 21
- 8.7 Live make/break tests..... 21
- 8.8 Temperature rise tests..... 22
- 8.9 Long-term soak test..... 22
- 8.10 Examination..... 22
 - 8.10.1 General..... 22
 - 8.10.2 Procedure 23
- 9 Routine tests 23
- 10 Lifting and installation 23
- Annex A (normative) Identification of test cable 25
- Annex B (informative) Identification of accessory test samples 26
- Annex C (informative) Identification of connector..... 27
- Annex D (normative) Self-Certification Conformance Declaration 28
- Bibliography..... 32

Figures

- Figure 1 — Cantilever load withstand type test..... 19

Tables

- Table 1 – Summary of compliance with different cable insulations..... 11
- Table 2 – Compliance extension for conductor connectors in link boxes (based on geometrical considerations)..... 12
- Table 3 – Test sequence for link boxes designed for use with solid links 15
- Table 4 – Test sequence to extend compliance for link boxes designed for use with fuses and other circuit protective devices 16
- Table 5 – Live make/break and temperature rise test..... 16
- Table 6 – Optional long-term soak test 17

Foreword

This Technical Specification (TS) is published by the Energy Networks Association (ENA) and comes into effect from November, 2017. It has been prepared under the authority of the ENA Engineering Policy and Standards Manager and has been approved for publication by the ENA Electricity Networks and Futures Group (ENFG). The approved abbreviated title of this engineering document is “ENA TS 09-23”.

This Specification replaces and supersedes ENA TS 09-23 Issue 1 2014.

Following a number of link box failures, an ENA Working Group instigated a revision of TS 09-23 Issue 1, to ensure learnings from the failures are captured in the design of link boxes. This Specification includes details of enhanced testing of link boxes.

This Specification has been issued for use by ENA Member Companies (ENAMCs). It may be incorporated without modification into Enquiry Documents issued by purchasers for the supply, delivery and installation of the relevant types of link boxes on LV systems owned and operated by ENAMCs.

The use of this Specification in conjunction with model forms of contract, or where conditions outside the scope of the Specification apply, should not be undertaken without additional professional advice.

Annex D of the Specification includes ‘Self Certification Conformance Declaration’ sheets to enable manufacturers to declare conformance or otherwise, clause by clause, with the relevant parts of the document.

Where the term “shall” or “must” is used in this document it means the requirement is mandatory. The term “should” is used to express a recommendation. The term “may” is used to express permission.

NOTE: Commentary, explanation and general informative material is presented in smaller type, and does not constitute a normative element.

1 Scope

This Specification details the performance requirements and the test methods for routine testing and type testing of underground link boxes for use with LV cables of rated voltage 0,6/1,0 (1,2) kV as defined in BS 7870-3.40 or other relevant cable standards.

NOTE 1: Link boxes typically have 2 or 4 cable entry points, but other models are not excluded from this Specification.

Link boxes covered by this Specification are suitable for use with extruded solid dielectric insulated cables and, for use between extruded solid dielectric insulated and impregnated paper insulated cables.

NOTE 2: Link boxes for use only with impregnated paper insulated cables are not covered by this Specification but may be based on this Specification, with appropriate modification agreed between the manufacturer/supplier and purchaser.

The service operating conditions of the link boxes shall be compatible with the service operating conditions of BS 7870-3.40 cables with which they are to be installed.

NOTE 3: Cable systems associated with the link boxes are installed using backfill material in accordance with ENA TS 97-1 [N1].

The link boxes designed to this Specification are for installation in underground pits. The pit may or may not be part of the structure of a link box assembly. Frames and manhole covers where requested should comply with the requirements of BS EN 124-1 (Class B125) when installed in footpaths and occasional parking areas.

2 Normative references

The following referenced documents, in whole or part, are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS EN 124-1, *Gully tops and manhole tops for vehicular and pedestrian areas. Definitions, classification, general principles of design, performance requirements and test methods*

BS EN 50393, *Test methods and requirements for accessories for use on distribution cables of rated voltage 0,6/1,0 (1,2) kV*

BS HD 60269-2, BS 88-2:2013, *Low-voltage fuses. Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application). Examples of standardized systems of fuses A to J*

BS EN 60282-1, *High-voltage fuses. Current-limiting fuses*

BS EN 60445, *Basic and safety principles for man-machine interface, marking and identification. Identification of equipment terminals, conductor terminations and conductors*

BS EN 60529, *Degrees of protection provided by enclosures (IP code)*

BS EN 60947-1, *Low-voltage switchgear and controlgear. General rules*

BS EN 61180, *High-voltage test techniques for low-voltage equipment. Definitions, test and procedure requirements, test equipment*

BS EN 61238-1, *Compression and mechanical connectors for power cables for rated voltages up to 36 kV. Test methods and requirements*

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*

IEC 60050-461, *International Electrotechnical Vocabulary - Part 461: Electric cables*

Other publications

[N1] ENA TS 97-1, *Special backfill material for cable installations*

[N2] ENA TS 09-2, *Specification for the supply, delivery & installation of power cables with operating voltages in the range 11 kV to 400 kV and associated auxiliary cables*

[N3] Statutory Instrument 2002 No. 2665, *The Electricity Safety, Quality and Continuity Regulations 2002 (as amended)*

3 Terms and definitions

For the purposes of this document, the definitions in IEC 60050-461 apply together with the following terms and definitions.

3.1

ENAMC

ENA Member Company

NOTE: In the context of this document, an ENAMC is typically an electricity network operator who is a member of the ENA.

3.2

link box

underground shell and phase pockets with removable links, fuses or other circuit protection devices (either manually or automatically operated), suitable for live operation

3.3

phase pockets

insulation barrier between phase stalks

3.4

routine test

conformity test made on each completed factory assembly