

EA D 22-03

Electrical Tools and Test Equipment

This Engineering Advice is produced for information and guidance. Adherence to the information in this Advice is recommended but not mandatory.

Date in Force: 02-11-2022

Date of Review: 02-11-2023

Approved by:

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Audience:

- Authorised Persons Electrical

Main Points:

- SP D 79039 updated to reference operation manuals, and SWI's
- Low Voltage non-contact detectors update

Reference Document: SP D 79039 Electrical Tools and Test Equipment

Scope

This document advises of the update to the Electrical Tools and Test Equipment Approved for use on the TAHE Electrical Network operated by Sydney Trains.

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Background

The development of new work methods and tools for a safer, more efficient workplace is a dynamic and structured process.

This process to propose, assess and approve electrical tools and test equipment has been documented in *GL D 79106 Selection and Approval of Tools and Test Equipment* for Sydney Trains use, and is published on the EDU Guidelines page at:


<https://intranet.sydneytrains.nsw.gov.au/branches/engineering-and-maintenance/engineering-system-integrity/engineering-information/electrical-distribution-unit/guidelines>

To reflect these advances, SP D 79039 has been updated to show Approved Safety Related Electrical Tools and Test Equipment for use on the TAHE Electrical Network operated by Sydney Trains.

Operation manuals and SWI's of the equipment have also been referenced within SP D 79039.

Action required

- Electrically authorised persons are reminded that only approved safety-related tools and equipment may be used on the TAHE electrical network operated by Sydney Trains.
- Electrically authorised persons are reminded that the operator's manuals and tool SWI's are for the operation of the tool as a safety item. It is the responsibility of the operator to ensure that the work has been risk assessed with the appropriate SWI's and tools to carry out the task.
- As the previous Low Voltage Detectors are ageing and no longer available, the purchase and distribution of the newer models is to be encouraged. The use of the previous models, being the Hioki 3120 and the Greenlee GT-11 may continue until 30 December 2023.

	
Equipment Name	LV Tester
Make & Model	Hioki 3120
Source(s)	No Longer Available
Application	Non-Contact LV Proximity Detection
Documentation	<i>PR D 78402 Work on the Low Voltage Distribution System</i>
Limitations	-

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Equipment Name	Greenlee Non-Contact LV Proximity Detector
Make & Model	Greenlee GT-11
Source(s)	No Longer Available
Application	
Documentation	PR D 78402 Work on the Low Voltage Distribution System
Limitations	-

Contact

RailElectricalSafety@transport.nsw.gov.au

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**Engineering System Integrity
Electrical Network Safety Rules**

**Engineering Specification
Electrical Distribution Unit**

One Method of Safe Working

SP D 79039

**Electrical Tools and Test
Equipment**

Version 1.5

Date in Force: 1 November 2022

Approved by: Associate Director
 Electrical Distribution Unit
 Engineering System Integrity

Authorised by: Engineering Technical
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 System Integrity

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Document control

Version	Date	Author/ Prin. Eng.	Summary of change
1.0	10 September 2020	Nick Loveday	First issue
1.1	25 September 2020	Nick Loveday	Detailed procedure for operating the Hivotech OHW Tester inserted
1.2	1 February 2020	Nick Loveday	Revised approved 11 - 66kV HV Testers
1.3	17 February 2020	Nick Loveday	Revised approved HV Testers at 5.1-5.3
1.4	1 February 2022	ENSR Project Team	Reviewed as part of the ENSR Project.
1.5	1 November 2022	Wayne Halls	Remove detail procedure for hivotech. Reference to SWI's hivotech, catu775 Catu CM46 Range. Emphasised special insulated apparatus, not accessories. Update LV non-contact detectors. Update HV and insulated sticks.

Summary of changes from previous version

Summary of change	Section
Addition of substantiation documentation location (RM8) added throughout doc	4
Reference documentation removal of duplicated information	5.1
Reference documentation Hivotech use transferred to SWI and removed	6.3
Limitations added	6.7
LV non-contact testers updated	6.8
Special Insulated apparatus – amalgamation of insulated tools and rope insulators. Accessories removed from doc	7
Requirements expanded to include a summary of requirements of EP15000001SP and IEC61243-1 for non-linear loads with Auto-reclose enabled	7.1
Catu CM46 Range added	7.4
Altered to generic to suit spec A-842	7.5
Altered for emphasis on line rope insulators	7.7

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1 Introduction

This document describes the tools and test equipment approved by Sydney Trains per *GL D 79106 Selection and Approval of Tools and Test Equipment* for use by persons holding an electrical authorisation in accordance with *PR D 78701 Personnel Certifications – Electrical* when performing electrical work on low-voltage, 1500 Volt DC or high voltage equipment.

2 Definitions

Refer to the **Electrical Safety Definitions** page available on the **RailSafe** site.

3 Scope

Where the Electricity Network Safety Rules require approved equipment to be used, that means an item nominated in this specification.

Where the Electricity Network Safety Rules do not require approved equipment to be used, an authorised person may choose commercially available equipment suitable for the task.

Equipment that loses approval status will be removed from this document.

4 Information

The following information is provided:

Equipment Name – the short name of the item.

Make & Model – the original equipment manufacturer (OEM) and model number, including the version (if relevant).

Source(s) – the preferred supplier of the equipment (if not the OEM).

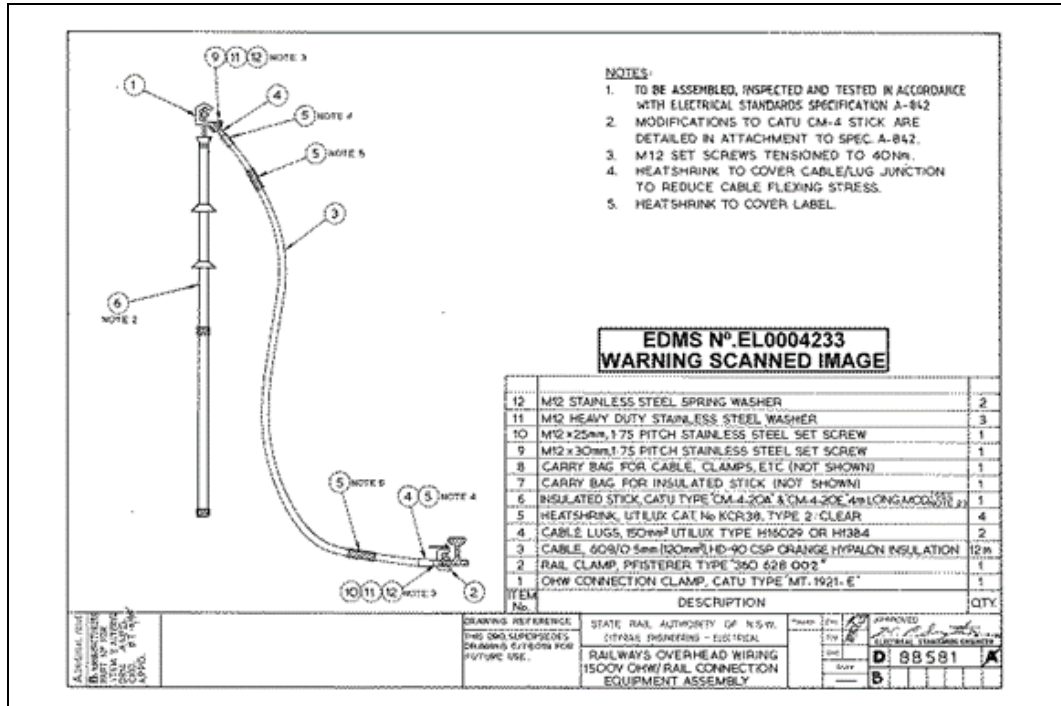
Applications – its intended purpose(s).

Documentation – List of the available documentation such assembly, instructions, SWMS and SWIs etc.
RM8 Document storage location.

Limitations – any constraints or known issues with the use of the equipment.

5 Portable Connections

5.1 1500 Volt portable rail connection



Equipment Name	1500 Volt Portable Rail Connection
Make & Model	Thew & McCann
Source(s)	TMAC
Application	For making a temporary connection between 1500 Volt DC equipment (usually overhead wire) and the traction return rail
Documentation	Assembly drawing EL0004233 <i>SP D 79045 Portable Rail Connecting Equipment for 1500 Volt Overhead Wiring</i>
Limitations	Portable bridging equipment shall not be used at feeding air gaps, to provide continuity of rail connection between sections. If this were done, the equipment could be inadvertently left in place at the end of the job, resulting in pantograph damage and preventing the protection system from operating effectively.

The 1500 Volt portable rail connection equipment consists of an OHW connection clamp, a rail clamp and approximately 12m of 120mm² flexible insulated cable for connection between the two clamps.

The cable and clamps are used in conjunction with a 4m fibreglass two-piece stick fitted with a bayonet socket for attachment and detachment of the OHW connection clamp to the stick. The OHW connection clamp is a screw type, operated by rotating the insulated stick.

A second OHW connection clamp may be connected to the first by a short length of 120mm² insulated cable to allow two sections of overhead wiring over the same track to be rail connected via the one rail clamp. Two sets of fibreglass sticks will be required.



Portable Rail Connecting Clamp

5.2 HVAC overhead line star-connected earthing equipment

Equipment Name	HVAC Overhead Line Star Connected Earthing Equipment
Make & Model	Thew & McCann
Source(s)	TMAC
Application	For making a temporary connection between high-voltage equipment and earth
Documentation	EL0027468 and <i>SP D 79047 Earthing High Voltage Equipment using Portable Earthing Equipment Appendix B Overhead Line Star Connected Earthing Equipment</i> <i>SP D 79033 Requirements for Portable Earthing Equipment for the High Voltage System</i>
Limitations	–

5.3 HVAC overhead line series-connected earthing equipment

<p>NOTES: 1. TO BE MANUFACTURED, INSPECTED AND TESTED IN ACCORDANCE WITH ELECTRICAL STANDARDS SPECIFICATION A-841. 2. REFER TO DRAWING D/88587 SHEET 2 FOR LOCATION OF LABELS ON EARTHING STICKS & CABLES. 3. STICK 'E' REQUIRED FOR EARTHING OVERHEAD EARTH WIRE, WHERE INSTALLED.</p> <table border="1"> <thead> <tr> <th>ITEM No.</th> <th>DESCRIPTION</th> <th>QTY.</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>CARRY BAG (NOT SHOWN)</td> <td>1</td> </tr> <tr> <td>9</td> <td>PARKING BAR (NOT SHOWN)</td> <td>1</td> </tr> <tr> <td>8</td> <td>SET SCREWS, NUTS, WASHERS, SPRING WASHERS, ETC.</td> <td>200.0</td> </tr> <tr> <td>7</td> <td>EARTHING STICK (DEDICATED)</td> <td>4</td> </tr> <tr> <td>6</td> <td>CABLE (5 metres) WITH LUGS</td> <td>1</td> </tr> <tr> <td>5</td> <td>CABLE (4 metres) WITH LUGS</td> <td>2</td> </tr> <tr> <td>4</td> <td>CABLE (20 metres) WITH LUGS</td> <td>1</td> </tr> <tr> <td>3</td> <td>EARTH SPIKE (PREFERRED SPIKE TO DRAWING E/53982)</td> <td>1</td> </tr> <tr> <td>2</td> <td>EARTH SPIKE CLAMP</td> <td>1</td> </tr> <tr> <td>1</td> <td>LINE CLAMP</td> <td>4</td> </tr> </tbody> </table> <p>EDMS E10004239 WARNING SCANNED IMAGE</p> <p>DRAWING REFERENCE: EARTH SPIKE DRAWING E/53982</p> <p>STATE RAIL AUTHORITY OF NSW ELECTRICAL ENGINEERING - ELECTRICAL TRANSMISSION LINES PORTABLE EARTHING EQUIPMENT GENERAL ARRANGEMENT</p> <p>APPROVED: [Signature] ELECTRICAL STANDARDS ENGINEER D 88587 Rev 1 A B</p>		ITEM No.	DESCRIPTION	QTY.	10	CARRY BAG (NOT SHOWN)	1	9	PARKING BAR (NOT SHOWN)	1	8	SET SCREWS, NUTS, WASHERS, SPRING WASHERS, ETC.	200.0	7	EARTHING STICK (DEDICATED)	4	6	CABLE (5 metres) WITH LUGS	1	5	CABLE (4 metres) WITH LUGS	2	4	CABLE (20 metres) WITH LUGS	1	3	EARTH SPIKE (PREFERRED SPIKE TO DRAWING E/53982)	1	2	EARTH SPIKE CLAMP	1	1	LINE CLAMP	4
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3	EARTH SPIKE (PREFERRED SPIKE TO DRAWING E/53982)	1																																
2	EARTH SPIKE CLAMP	1																																
1	LINE CLAMP	4																																
Equipment Name	HVAC Overhead Line Series Connected Earthing Equipment																																	
Make & Model	Thew & McCann																																	
Source(s)	TMAC																																	
Application	For making a temporary connection between high-voltage equipment and earth.																																	
Documentation	EL0004239 and <i>SP D 79047 Earthing High Voltage Equipment using Portable Earthing Equipment Appendix A Overhead Line Series Connected Earthing Equipment</i> <i>SP D 79033 Requirements for Portable Earthing Equipment for the High Voltage System</i>																																	
Limitations	–																																	


6 Test equipment


6.1 TAPLIN D225/M 11kV – 132kV High Voltage Tester



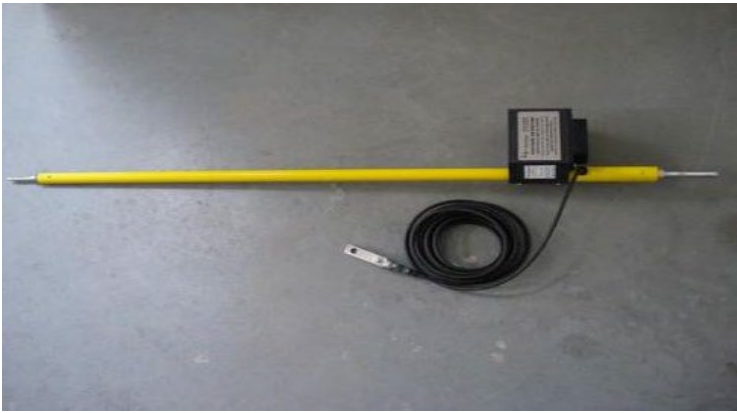
Equipment Name	11kV – 132kV High Voltage Tester
Make & Model	ABB TAPLIN D225/M
Source(s)	GTR Electrics (Gary Rogers) - No longer Available
Application	Testing for live HV equipment.
Documentation	<i>DSYD2022/61355 D225/M Electronic HV Line Tester- Operators Instructions</i> <i>PR D 78203 High Voltage Operating Procedure</i> <i>FSYD2022/6404 High Voltage AC Tester ABB D225/M</i>
Limitations	-

6.2 11kV – 66kV High Voltage Detectors


	
Equipment Name	11-66kV High Voltage Tester
Make & Model	Fameca Tag2020
Source(s)	Hylec Energy Solutions
Application	Testing for live HV equipment.
Documentation	<p><i>D2021/6520 Use of approved High Voltage Contact Detectors – FAMECA TAG2020</i></p> <p><i>PR D 78203 High Voltage Operating Procedure</i></p> <p>TfNSW standard <i>EP 15 00 00 01 SP High Voltage AC Voltage Detector (Nominal Voltage of 11kV - 66kV)</i></p> <p>FSYD2022/6271 High Voltage AC Tester Famica Tag 2020</p>
Limitations	Nominal Voltage of 11kV - 66kV

	
Equipment Name	11kV - 66kV High Voltage Tester
Make & Model	CATU 775
Source(s)	Sicame Australia Pty Ltd
Application	Testing for live HV equipment.
Documentation	<p><i>D2022/4477 Use of Approved High Voltage AC Contact Voltage Detectors – CATU CC775</i></p> <p><i>PR D 78203 High Voltage Operating Procedure</i></p> <p>TfNSW standard <i>EP 15 00 00 01 SP High Voltage AC Voltage Detector (Nominal Voltage of 11kV - 66kV)</i></p> <p>FSYD2022/6271 High Voltage AC Detector Catu CC775</p>
Limitations	Nominal Voltage of 11kV - 66kV

6.3 Hivotech 1500V DC OHW tester

	
Equipment Name	Hivotech 1500 Volt DC Tester
Make & Model	Hivotech DE-300/1
Source(s)	IPD
Application	Testing for 1500 Volt DC outside substations.
Documentation	<i>D2022/4012 Hivotech 1500V DC OHW Tester application and functions</i> <i>PR D 78305 1500 Volt Operating Procedures</i> <i>SP E 79030 Voltage Detector for use on 1500V DC Overhead Wiring</i> <i>FSYD2022/717 1500V DC OHW Tester Hivotech 300-1</i>
Limitations	Not suitable for use within or on substation equipment with the exception of the OHW side of a point of isolation

6.4 1500 Volt DC rail clamp


	
Equipment Name	1500 Volt DC Rail Clamp (Magnetic)
Make & Model	Welder's Magnetic Clamp assembly
Source(s)	
Application	For use with both the LR Tester and/or Hivotech 1500 Volt DC OHW Tester. Provides a temporary connection to a rail.
Documentation	<i>PR D 78305 1500 Volt Operating Procedures</i>
Limitations	Requires a clean contact - Cannot be applied to painted or heavily corroded surfaces



Equipment Name	1500V DC rail clamp (screw)
Make & Model	Thew & McCann Type No. 360 628 002
Source(s)	Pfisterer, TMAC
Application	Provides a temporary connection to a rail.
Documentation	<p><i>PR D 78305 1500 Volt Operating Procedures</i></p> <p>The cable used to attach above clamps onto the LR Tester is specified as follows:</p> <ul style="list-style-type: none"> • Cable type – 25 mm², Olex Versolex HD s/c power/welding cable, 0.6/1kV, flexible XLPE insulated and TPE sheathed to AS/NZS 5000.1 and AS/NZS 1995, preferably with the clear and transparent cable sheath. • Cable lug – 25 mm², Utilux copper crimp lugs, M12 stud size, Catalogue No. H1416B/50, Tooling #20 38-77CU. • Cable length -sufficient length to allow the use of the LR Tester from ground level and suitable for easy storage.
Limitations	–

6.5 1500V DC Substation Testers

	
Equipment Name	1500 Volt DC Substation Tester
Make & Model	DEHN
Source(s)	IPD
Application	For testing 1500 Volt equipment inside substations
Documentation	DSYD2022/78734 DEHN 1500V DC Substation Tester – Operators Instructions PR D 78305 1500 Volt Operating Procedures FSYD2022/6457 1500V Substation Tester - DEHN
Limitations	-

	
Equipment Name	Substation 1500 Volt DC 2-Pole
Make & Model	Hollow Tube Conduit (HTC) Tester
Source(s)	PTC - Not Available
Application	For testing 1500V equipment inside substations
Documentation	<i>PR D 78305 1500 Volt Operating Procedures</i> FSYD2022/6458 DC Substation Tester - HTC
Limitations	

6.6 LR tester




Equipment Name	Line to Rail (LR) Tester
Make & Model	PTC -
Source(s)	PTC - Not Available
Application	Continuity testing of rail-connecting cables at 1500 Volt field switches.
Documentation	<i>PR D 78305 1500 Volt Operating Procedures</i>
Limitations	Not to be used for testing dead


6.7 OHW structure-to-rail voltage test kit



Equipment Name	OHW structure to rail voltage test kit
Make & Model	<p>Kit comprised of:</p> <ol style="list-style-type: none"> 1. Fluke series 170 digital multimeter 2. Fluke C70Y yellow holster 3. Fluke 80K-6 high voltage probe (earth lead lengthened to 5m) 4. 5m extension earth lead 5. Rail clip with 300mm earth lead tail 6. 300mm earth lead tail with 10mm termination eye for attachment to rail vehicles 7. An uncontrolled copy of PR D 78306 8. 9 Volt Battery (Eveready No. 216 6F22 or similar) 9. Plastic tool box for storage of the test equipment.
Source(s)	Fluke where indicated, and commercially available suppliers.
Application	
Documentation	<i>PR D 78306 1500 Volt DC Overhead Wiring Structure to Rail Voltage Test</i>
Limitations	–

6.8 Low Voltage Non-Contact Detectors

	
Equipment Name	LV non-contact Proximity Detector
Make & Model	Hioki 3481-20
Source(s)	Commercially available – e.g. Rexel, Blackwoods, etc.
Application	Non-contact LV proximity detection
Documentation	<i>DSYD2022/97528 3481D980-01 Instruction Manual</i> <i>PR D 78402 Work on the Low Voltage Distribution System</i> FSYD2022/97528 Hioki 3481-20 LV non-contact detector
Limitations	–

	
Equipment Name	Non-contact LV Proximity Detector
Make & Model	Greenlee GT-13
Source(s)	Commercially available – e.g. Rexel, Blackwoods, etc.
Application	Non-contact LV proximity detection
Documentation	<i>DSYD2022/97520 52087541 rev3 Instruction Manual</i> <i>PR D 78402 Work on the Low Voltage Distribution System</i> FSYD2022/97520 Greenlee GT13 LV non-contact detector
Limitations	–

6.9 Phase-test lamps

Equipment Name	Various
Make & Model	Various
Source(s)	Commercially available – e.g. TMAC, TEN Group, etc. Non-contact types are preferred.
Application	Phase identification of 3-phase low voltage services.
Documentation	<i>PR D 78402 Work on the Low Voltage Distribution System</i>
Limitations	–

6.10 Multimeter – phase identification

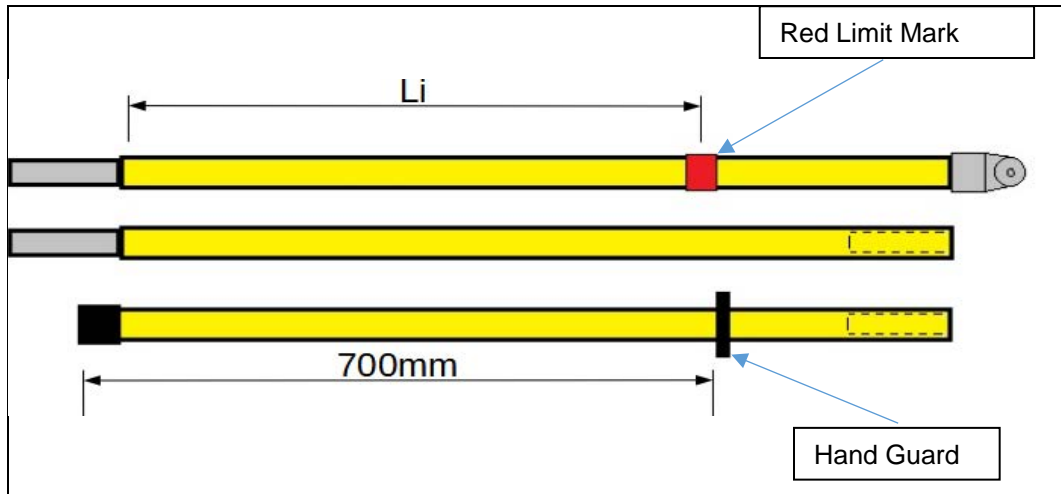
Equipment Name	Various
Make & Model	Various
Source(s)	Commercially available – e.g. Blackwoods, Rexel, etc.
Application	Phase identification of 3-phase low voltage services.
Documentation	<i>PR D 78402 Work on the Low Voltage Distribution System</i>
Limitations	–

7 Specially Insulated Apparatus

Specially insulated apparatus per the ENSRs provide the safety medium to ensure the operator does not encroach the SAD.

Accessories for the tools shall be risk assessed for suitability for the task by the operator and therefore do not require inclusion in this document

7.1 HV insulated stick



Equipment Name	HV insulated stick
Make & Model	Various
Source(s)	Various
Application	Electrically insulated tools and equipment for use near or on/within of LIVE HV equipment.
Documentation	<i>PR D 78203 High Voltage Operating Procedure</i> Sydney Trains ESI Electrical Manual <i>EP 15 00 00 01 SP High Voltage AC Voltage Detector (Nominal Voltage of 11kV - 66kV)</i> <i>IEC 61243-1 Live Working-Voltage Detectors Pt1</i>
Limitations	To suit high non-linear resonance systems with auto reclose operation.

HV insulated sticks shall have a solid or foam-filled insulating element.

The insulating element may be of multiple portions to a length (Li), to suit the required 3 phase system voltage, conductive portions excluded.

The length of the insulating element is indicated by a Red Limit Mark.


Note: When the Limit Mark is absent, the limit shall be at the extent of the insulating element.

System Voltage	Insulating Element (Li)
≤66 kV	830mm
132 kV	1700mm

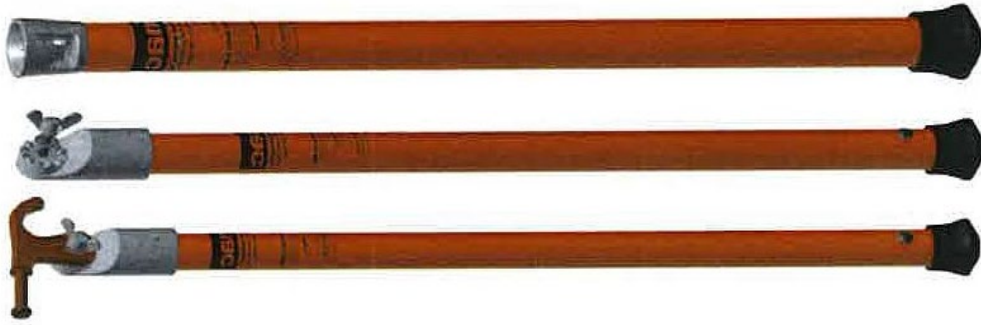
The assembled insulating stick shall be of a length, which ensures that a minimum distance of 1500mm is achieved between the Limit Mark and the Hand Guard (multiple sections allowed).

The Hand Guard to base shall be >700mm.


7.2 Round measuring telescopic stick

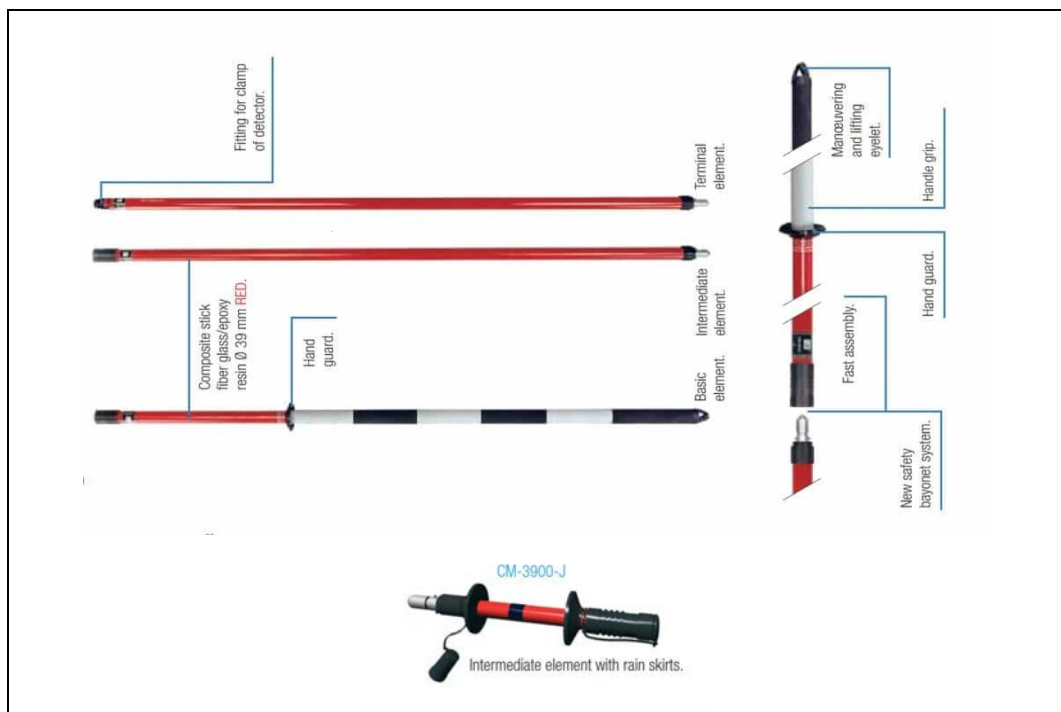
	
Equipment Name	Round Measuring Telescopic Stick with foam-filled tip section – M Series
Make & Model	Hastings TEL-O-POLE M - series
Source(s)	Hastings/TEN Group
Application	Electrically insulated tools and equipment for use near or on/within of LIVE 1500 Volt equipment.
Documentation	<i>D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment</i>
Limitations	–

7.3 Operating stick – dense foam filled

	
Equipment Name	Operating Stick – Dense Foam Filled
Make & Model	
Source(s)	TMAC
Application	Electrically insulated tools and equipment for use near or on/within of LIVE 1500 Volt equipment.
Documentation	<i>D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment</i>
Limitations	–


7.4 OHW/Rail connection insulated sticks

	
Equipment Name	OHW/Rail Connection Insulated Stick
Make & Model	CATU CM-4-20A, CM-4-20E modified to A-SPEC A842
Source(s)	CATU
Application	Electrically insulated tools and equipment for use near or on/within of LIVE 1500 Volt equipment.
Documentation	<i>A-SPEC A842</i> <i>D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment</i>
Limitations	–

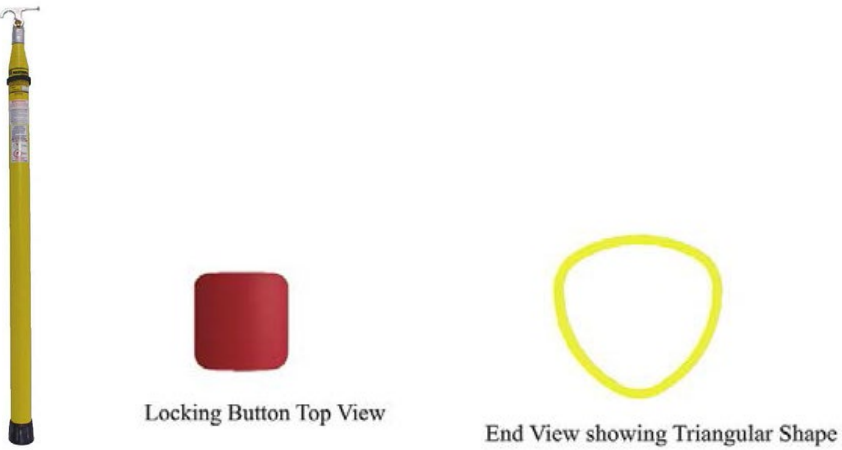


Equipment Name	OHW/Rail Connection Insulated Stick
Make & Model	CATU CM-46 range, Bayonet Head fitting (E), Rain Skirt
Source(s)	
Application	Electrically insulated tools and equipment for use near or on/within of LIVE 1500 Volt equipment.
Documentation	<i>D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment</i> <i>FSYD2022/7637 1500V insulated stick catu-CM46 range</i>
Limitations	Rain Skirt must be fitted above the basic element when used in damp conditions.


7.5 1500 Volt DC insulated stick – foam filled

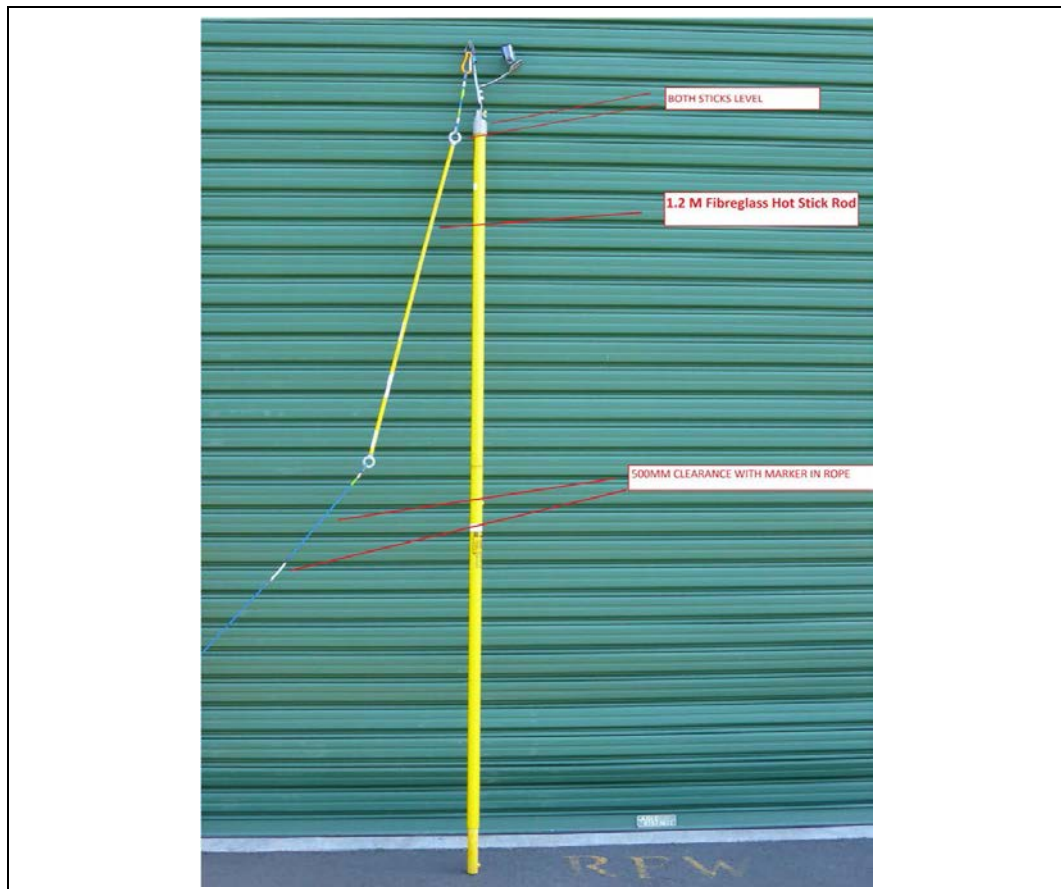
	
Equipment Name	Insulated Stick – Foam Filled
Make & Model	Various
Source(s)	Various
Application	Electrically insulated tools and equipment for use near or on/within LIVE 1500 Volt equipment.
Documentation	<i>D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment</i> <i>SRA spec A-842</i>
Limitations	Insulated section to hand guard to be > 500mm.

7.6 1500 Volt DC operating and measuring telescopic sticks

	
Equipment Name	Triangular Operating and Measuring Telescopic Sticks with Foam-filled Top Section – HV and MV Series
Make & Model	Hastings TEL-O-POLE HV - series
Source(s)	Hastings/TEN Group
Application	Electrically insulated tools and equipment for use near or on/within of LIVE 1500 Volt equipment.
Documentation	<i>D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment</i>
Limitations	–

7.7 Live line rope insulator

	
Equipment Name	Live line rope accessory with composite insulator
Make & Model	
Source(s)	<p>Cutting Head from Hastings FTG 453/17 (S/C: 001874239, EL015095) from W560 Clyde Warehouse (Distributed by DULHUNTY POWER (AUST) PTY LTD).</p> <p>Rope pulley arrangement assembled by Network Base personnel.</p>
Application	Electrically insulated tools and equipment for use near or on/within LIVE 1500 Volt equipment.
Documentation	<p><i>D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment</i></p> <p>Rope pull type cutter with composite insulator fitting No 453/17, drawing No EL015095 installed within the rope 1.4 metres from the insulated tool accessory.</p> <hr/> <p>NOTE: The operator is to ensure that the rope below the insulator is to remain outside the required SAD (0.5M for Authorised Persons)</p> <hr/>
Limitations	–



Equipment Name	Live line rope accessory with insulating fibre glass rod insulator
Make & Model	Rope pull type measuring device Hastings 546 Series with 12.7mm (1/2") thick 1.2 metre long rod fibreglass installed within the rope, in line with the main hot stick pole. There is to be a 500mm distance between the bottom of the insulator and the operator's hands and a marker placed in the rope as a visual aid.
Source(s)	Hastings/TEN Group (stick and fittings) Assembly rigged by network base personnel.
Application	Electrically insulated tools and equipment for use near or on/within of LIVE 1500 Volt equipment.
Documentation	<i>D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment</i>
Limitations	<p>NOTE: The operator is to ensure that the rope below the insulator is to remain outside the required SAD (0.5m for Authorised Persons).</p> <p>Persons operating this piece of equipment must be qualified to AES 15 and AES 16.</p>


8 Assemblies and Kits

8.1 Live low-voltage rescue kit




Equipment Name	Live Low-voltage Rescue Kit, comprising of: <ul style="list-style-type: none"> • torch • emergency isolation tag • low voltage retrieval aid (insulated crook) • trauma dressing • rescue kit bag • fire blanket • insulated gloves • list of contents for kit.
Make & Model	NA
Source(s)	TMAC and other suppliers
Application	
Documentation	SP D 79032 Live Low Voltage Rescue Kit D2013/80870 Rescue from Live Low Voltage - Including Rescue Kit Care)
Limitations	–

8.2 Pole-top rescue kit

	
Equipment Name	Pole Top Rescue Kit
Make & Model	
Source(s)	Commercially available – e.g. TMAC, TEN Group, Balmoral Engineering, Safety Supply Solutions etc.
Application	
Documentation	PR D 78109 Pole Top Rescue SP D 79040 Pole Top Rescue Kits
Limitations	–Only to be used for rescue

8.3 Pole marker

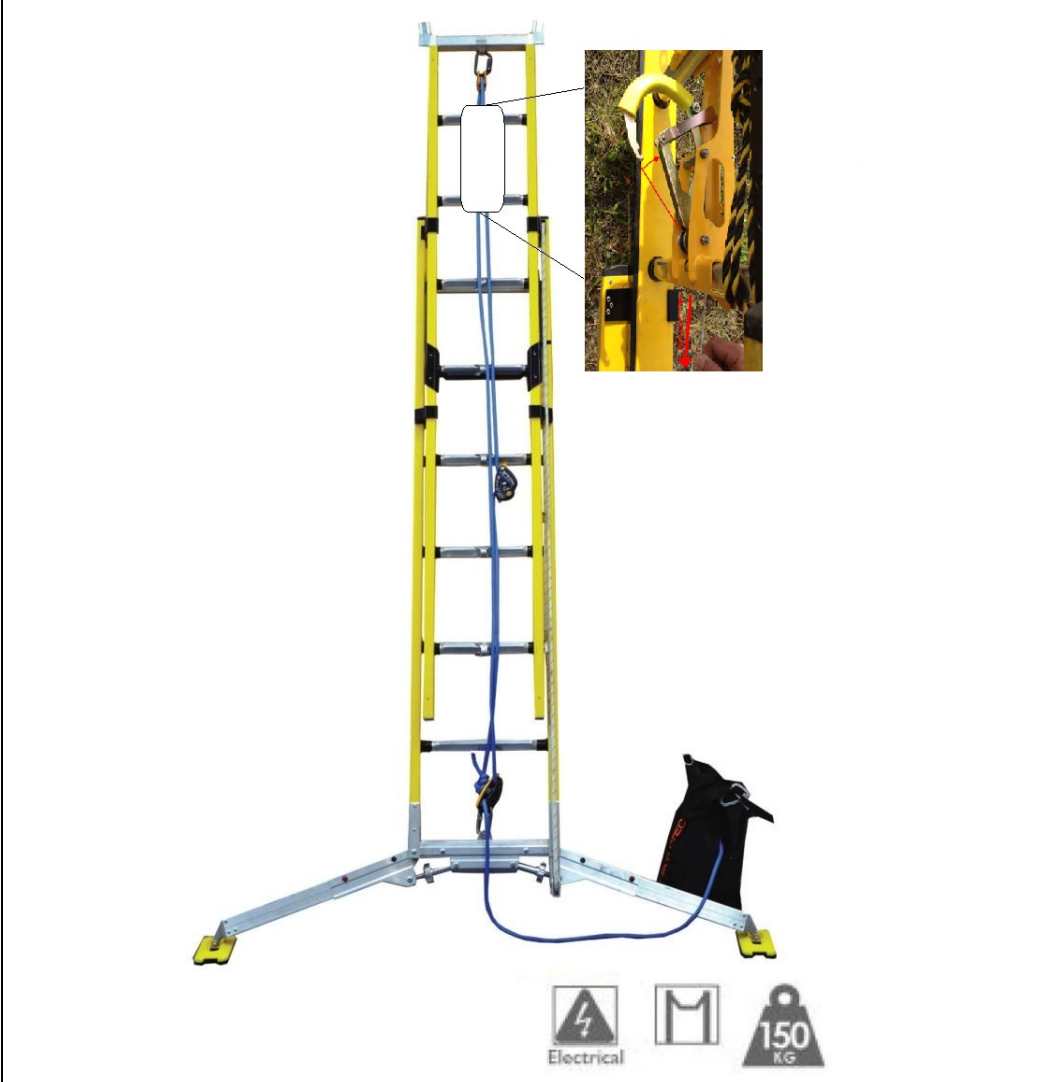
	
Equipment Name	
Make & Model	Bay Products
Source(s)	Nick Bult Bay Products P: 08 8356 5555 F: 08 8356 5544 E: bayproducts@optusnet.com.au M: 0418 843 730
Application	
Documentation	PR D 78108 Pre-work Hazard Assessment for Work on Poles with Live Exposed Equipment
Limitations	–

8.4 Substation demarcation taping equipment



Equipment Name	Substation Electrically Safe Work Area Demarcation Taping Equipment
Make & Model	
Source(s)	Refer to TfNSW specification for supplier details.
Application	For substation use: tape, tape stands, warning sign holder, tape stand weights, entrance bollards, warning signs.
Documentation	TfNSW standard <i>T HR EL 15001 SP Substation Electrically Safe Work Area Demarcation Taping Equipment</i> <i>PR D 78506 Substation – Demarcation Taping</i>
Limitations	–

8.5 1500 Volt OHW Attached Climbing Kit Assembly

	
Equipment Name	1500 Volt OHW Attached Climbing Kit Assembly – 1500 Volt OHW Attached Climbing Kit Assembly – attached climbing ladder, ladder hook and attachment point assembly, attached climbing kit, rescue kit.
Make & Model	Branach Extension Ladder with Fall Control System
Source(s)	EP 15 10 00 03 SP 1500V OHW Attached Climbing Kit Assembly
Application	Climbing 1500 Volt DC structures and overhead wiring
Documentation	TfNSW standard <i>EP 15 10 00 03 SP 1500V OHW Attached Climbing Kit Assembly</i> <i>D2013/80532 Using 1500V Overhead Wiring Attached Climbing Ladder</i> <i>D2013/80533 Working from 1500V Overhead Wiring Attached Climbing Ladder</i>
Limitations	–

9 Reference documents

D2013/80532 Using 1500V Overhead Wiring Attached Climbing Ladder

D2013/80533 Working from 1500V Overhead Wiring Attached Climbing Ladder

D2013/80870 Rescue from Live Low Voltage - Including Rescue Kit Care)

D2015/47063 Use of Electrically Insulated Tools and Equipment On, Near or in the Vicinity of LIVE 1500V DC equipment

D2022/4477 Use of Approved High Voltage AC Contact Voltage Detectors – CATU CC775

D2022/4012 Hivotech 1500V DC OHW Tester application and functions

EP 15 00 00 01 SP High Voltage AC Voltage Detector (Nominal Voltage of 11kV - 66kV)

EP 15 10 00 03 SP 1500V OHW Attached Climbing Kit Assembly

PR D 78108 Pre-work Hazard Assessment for Work on Poles with Live Exposed Equipment

PR D 78109 Pole Top Rescue

PR D 78203 High Voltage Operating Procedure

PR D 78305 1500 Volt Operating Procedures

PR D 78306 1500 Volt DC Overhead Wiring Structure to Rail Voltage Test

PR D 78402 Work on the Low Voltage Distribution System

PR D 78506 Substation – Demarcation Taping

PR D 78701 Personnel Certifications – Electrical

SP E 79030 Voltage Detector for use on 1500V DC Overhead Wiring

SP D 79032 Live Low Voltage Rescue Kit

SP D 79033 Requirements for Portable Earthing Equipment for the High Voltage System

SP D 79045 Inspection and Care of Portable Rail Connecting Equipment for 1500 Volt Overhead Wiring

SP D 79047 Earthing High Voltage Equipment using Portable Earthing Equipment

T HR EL 15001 SP Substation Electrically Safe Work Area Demarcation Taping Equipment

IEC 61243-1 Live Working-Voltage Detectors Pt1