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# PORTABLE EARTHING EQUIPMENT

CATALOGUE B



# PORTABLE EARTHING EQUIPMENT

## INTRODUCTION

### MOSDORFER CCL - LEADERS IN ELECTRICAL EQUIPMENT AND ACCESSORIES

Providing personnel with efficient and approved safety equipment is one thing. Ensuring that they use it is another. Where electricity is concerned, failure to achieve the second objective can be fatal. That is why Mosdorfer CCL's range of L.V. and H.V. portable earthing equipment has been designed with the operator very much in mind. Whether he is a linesman working on overhead line equipment or a maintenance engineer in a substation or power plant, the operator will find Mosdorfer CCL earthing equipment:

- Quick and simple to install
- Light and easy to transport and handle.
- Competitively priced.

All Mosdorfer CCL equipment is designed and tested to withstand the maximum possible thermal and electromechanical forces of an installation short circuit AND all equipment complies with U.K. electricity supply industry (ESI) standards including ESI 43-81 and ESI 41-21. Short circuit tests confirm the rating of all standard equipment.

The Mosdorfer CCL's Systems factory, is stringently monitored to British Standard quality assurance specification BS 5750 - ISO 9000, and for over 50 years electrical equipment and electrical safety have been Mosdorfer CCL's business.

Mosdorfer CCL supply earthing equipment to customers worldwide - so we understand YOUR problems.

We recognise the need for versatility and flexibility in situations away from what might be called "standard" installations, and a glance at the comprehensive choice of clamps and other accessories available illustrates our range of customised assemblies. This is further reinforced by our unique snap-on and snap-on/screw-on clamps, which ensure a positive connection is achieved every time.

Versatility, flexibility - but above all **Safety**.

Always remember that safety rules concerning adequate temporary earthing of plant and equipment clearly state that protection should be via effective, purpose-made and designed portable earthing equipment of adequate short circuit rating for the prospective fault level.

## PORTABLE EARTHING AND SHORT CIRCUITING EQUIPMENT

Standard Kits Mosdorfer CCL portable earthing equipment standard kits are tested and approved for low voltage and high voltage applications including:

- Overhead transmission and distribution power lines.
- Sub-station bus bars - indoor and outdoor.
- Railway electrified traction systems.
- Electrostatic precipitator plant.
- Transformer and switchgear terminals.

**Customised equipment** Mosdorfer CCL can design and supply customised equipment based on customer information concerning the service application for example.

- Dimensions between points to be earthed.
- Any limiting dimensions including enclosed plant restricting access.
- Prospective fault level of plant or short circuit rating of earthing equipment required.

## FOR SAFETY'S SAKE

Regular maintenance programmes for portable earthing equipment are vital. Preventive maintenance is always preferable to accident risk. Guidance notes on equipment maintenance are freely available from Mosdorfer CCL Systems sales office.

## EARTHING EQUIPMENT - SEQUENCE OF USE

Standard practice requires operatives to observe the following sequence when using portable earthing equipment.

- Switch out and de-energise the apparatus or overhead line section to be worked on.
- Check the apparatus is de-energised by means of an approved device - usually a hand held voltage detection instrument with direct reading meter or audio/visual signal.

- After proving voltage absence, connect to a known earth point with a hard tightened clamp. To this clamp connect a cable with interconnections to similar clamps arranged to connect with phase or other potentially live apparatus terminals. Use insulated operating handles or rods.

This ensures that if the plant is accidentally re-energised the short circuit caused by the temporary connections will activate the back up protection and protect the personnel from electric shock.



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Product Improvement: - CCL reserve the right to make changes without notice



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# PRODUCT SELECTION

## GENERAL PURPOSE PORTABLE EARTHING EQUIPMENT

In the event of our standard equipment designs being unsuitable for specific field installations, CCL recommend that engineers refer to pages 1, 2, 3, and 4, and select the elements which combine to provide the preferred solution.

**ALL** applications for portable earthing require the following elements:

**CLAMPS** – Line and earth end, which can be speedily and effectively secured at the point of work.

**CABLES** – Short circuit tress to interconnect the clamps and sustain any fault or induced current levels between the point of work and final earth point connection.

**OPERATING RODS & ADAPTOR HEADS** – Insulated members, to ensure safe application and effective remote removal of clamps.

**EARTH ELECTRODE** – Point of final earth for connecting earth end clamp.

Carrying bags are always supplied by CCL to ensure equipment can be protected and effectively stored when not in use or in transit to site.

## TO ORDER EQUIPMENT

### SELECT THE FOLLOWING:-

- **TYPE OF STANDARD KIT** – i.e. EC3.1 – 0400(5) or EC1.1 – 1133 (Trident) etc., etc.
- **OPERATING ROD REQUIRED.**

### ALTERNATIVELY

- **CUSTOMISED KIT** – State type of line end clamp, earth end clamp, area and length of tress cables for phase and earth connections. Fault level required.
- **OPERATING ROD TYPE.**



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# CLAMPS LINE AND EARTH END

## DISTRIBUTION



**EC3.1** "Snap & Screw on" clamp with integral insulated 300mm long handle.  
Typical use L.V. O.H. line  
Capacity 28mm dia.  
TD Ref 272/31  
Tested 7.5kA/2 sec



**EC1.1D** "Snap on" clamp  
Typical use O.H. line 11/33kV circuits  
Capacity 22mm dia.  
TD Ref 272/30  
Tested 12.5kA/2 sec



**EC3.1** "Snap & Screw on" clamp.  
Typical use O.H. line 11/33kV circuits  
Capacity 28mm dia.  
TD Ref 272/31  
Tested 17.5kA/1 sec  
E Eyescrew also with:  
B Bayonet or



**EC4.1** "Screw on" clamp.  
Typical use General purpose earth end applications  
Capacity 25mm dia. x or flat 40mm section  
TD Ref 272/32  
Tested 21kA/2 sec  
Tommy bar hand apply also with:  
B Bayonet  
E Eyescrew or  
H Hexagon



**EC2.1** "Screw on" hand apply clamp. (Heavy duty)  
Typical use Railway or steelwork connection earth end:  
Capacity 40mm x 25mm flat section  
TD Ref 272/50  
Tested 21kA/2 sec

## TRANSMISSION



**ECS9/1-B** "Screw on" clamp  
Typical use H.V. O/H. line  
Capacity 6mm to 38mm dia.  
TD Ref 272/51  
Tested 17.5kA/2 sec



**ECS9/2-B** "Screw on" clamp  
Typical use H.V. O/H. line  
Capacity 38mm to 76mm dia.  
TD Ref 272/52  
Tested 17.5kA/2 sec



**ECS9/3-B** "Screw on" clamp  
Typical use Outdoor sub-station  
Capacity 90mm dia.  
TD Ref 272/53  
Tested 17.5kA/2 sec



**EC 3.3B** "Snap & Screw on" clamp  
Typical use H.V. O/H. line  
Capacity 12mm to 38mm dia.  
TD Ref 295/84  
Tested 17.5kA/2 sec



**EC2.2** "Screw on" hand apply clamp  
Typical use Steel work connection earth end  
Capacity 11mm thick max  
TD Ref 272/56  
Tested 17.5kA/2 sec



**EC2.3** "Screw on" hand apply clamp  
Typical use Copper or aluminium strip on sub-station earths  
Capacity 3mm x 7mm thick 38mm x 50mm wide  
TD Ref 272/57  
Tested 17.5kA/2 sec



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# CABLES SHORT CIRCUIT TRESS

## Single Bond

Standard sizes:

**ALUMINIUM**

- 50mm<sup>2</sup> x 3m long
- 50mm<sup>2</sup> x 15m long
- 120mm<sup>2</sup> x 3m long
- 120mm<sup>2</sup> x 15m long
- 150mm<sup>2</sup> x 6m long

**COPPER**

Special to order per customer specification

## Series Bond

Standard sizes:

**ALUMINIUM**

- 50mm<sup>2</sup> x 15m earth cable with 3m long phase link cables

**COPPER**

Special to order per customer specification

## Convergent Bond

Standard sizes:

**ALUMINIUM**

- 50mm<sup>2</sup> x 15m earth cable with 3m long phase cables - 50mm or 120mm<sup>2</sup>

**COPPER**

Special to order per customer specification



- Aluminium cables 50mm<sup>2</sup> & 120mm<sup>2</sup> are supplied with "Arctic Grade" P.V.C. sheathed (bright orange finish) and 150mm<sup>2</sup> (transmission) with non arctic clear P.V.C. sheathed finish.
- All copper cables are clear P.V.C. sheathed.
- Tresses are fitted with compression terminals and strain damper gaiters to ensure efficient short circuit performance and service life.

## Table of Stock Sizes

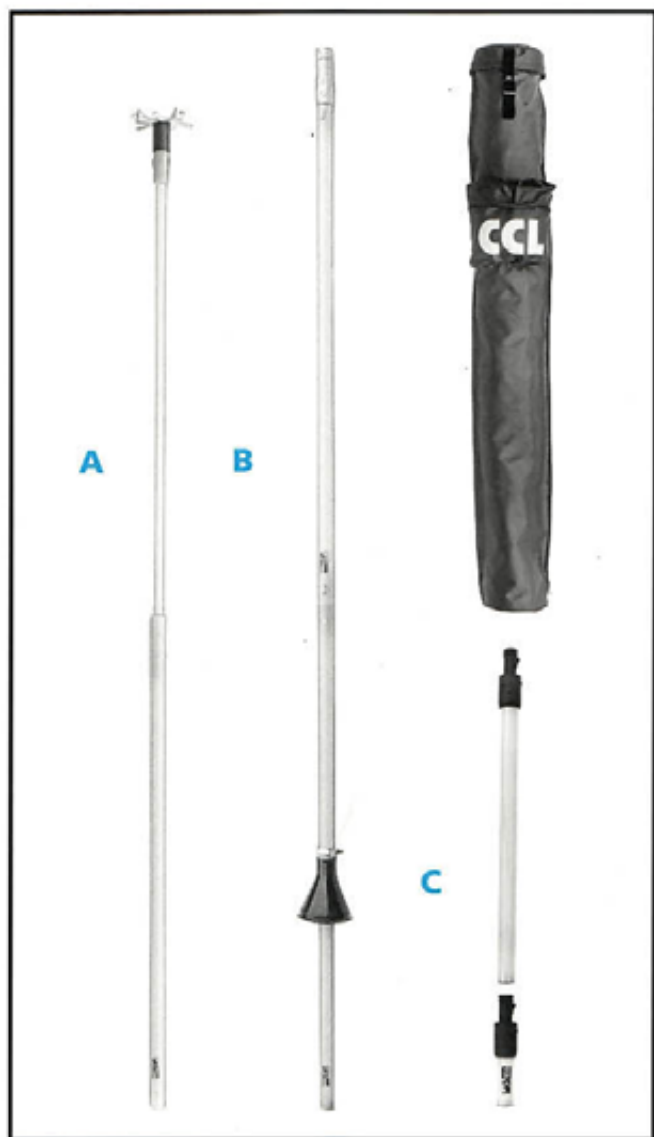
Nominal Cable Area (mm²)	Strand Detail	Nominal Continuous Current Rating (amps)	Short Circuit Rating (kA/sec)	Insulation Sheath	Length of Cable Metres
50	312/0.45	120	7.5	P.V.C. "Arctic Grade" Colour Bright Orange	Per Standard or Supplied to Customers Specifications
120	755/0.45	205	17.5		
150	925/0.45	235	23.0		
16	16/32/0.2	90	4.5	P.V.C. Clear Self Colour	
25	12/65/0.2	110	7.5		
35	16/70/0.2	145	10.0		
70	3/32/24/0.2	225	19.5		
95	4/32/24/0.2	275	27.5		



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# OPERATING RODS AND ADAPTOR HEADS



## INSULATED RODS

**A** **GF2-2.4T** Heavy duty glass fibre re-inforced telescopic tubular rod. - OUTDOOR USE  
Closed length 1.2M  
Full extended 2.4M  
Extra 1.2M length can be added by fitting extra butt end.

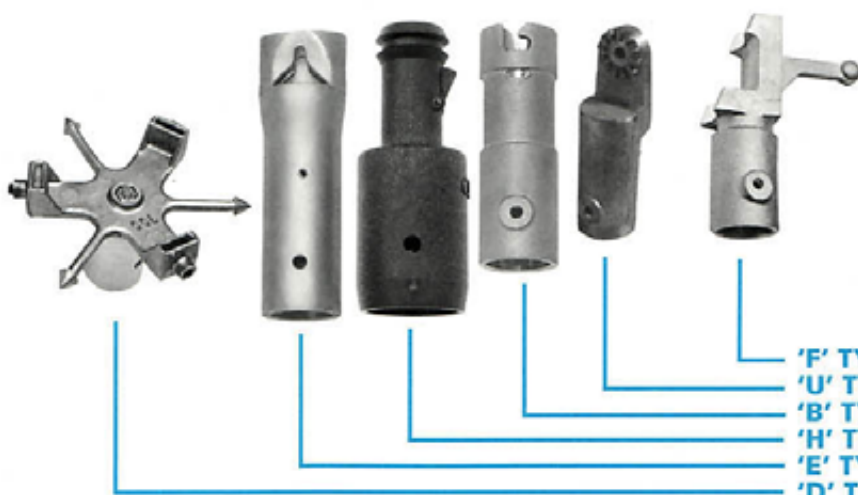
**GF2-1.4T**  
Closed length 0.8M  
Fully extended 1.2M  
Extra 1.2M length can be added by fitting extra butt end  
TD Ref. 272/15

**B** **GF1-1.2** Heavy duty glass fibre re-inforced multi section construction with spring loaded button couplers on each section. - OUTDOOR USE  
Length 1.2M  
Recommended for H.V. live line tapping and switching operations per ESI standards. Also remote application of voltage detection instruments.  
TD Ref. 272/6

**C** **GF3-0.5H** Re-inforced plastic tubular handle for application of 'H' hexagon stem clamps to INDOOR APPARATUS  
Length 0.5M  
TD Ref. 272/16

**GF3-0.2H** For applying bond lead clamps to earth electrodes etc. when short insulated handle is preferred to hand application.  
Length 0.2M  
TD Ref. 272/16

## STANDARD OPERATING ROD ADAPTORS



**'F' TYPE** Fuse pull adaptor TD272/23  
**'U' TYPE** Universal adaptor TD272/22  
**'B' TYPE** For bayonet clamps TD272/28  
**'H' TYPE** For hexagon clamps TD272/25  
**'E' TYPE** For eyering clamps TD272/29  
**'D' TYPE** For EC1.1 clamps TD272/27



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# EARTH ELECTRODES AND BOND LEADS



## Earth Rods

CCL recommend outdoor H.V. portable overhead line earth kit series

**EC1.1** - 1133 (Trident)

**EC3.1** - 1133 (Triplex)

**EC3.1** - 1133 (Polepark)

Should have the tress earth cable EC4.1 clamp securely tightened to a ground driven earth electrode (earth rod) (A) or earth rod cluster (B)

A = 16mm dia x 1.2M long rod

B = 4 - 16mm dia x 0.8M long rods interconnected by 50mm<sup>2</sup> cable TD Ref. 272/5B

## Typical Earth Rod Cluster 'B'

## Bond Leads

Compression terminals have M8 fixing holes for ensuring effective current carrying contact with clamps and apparatus.

Protective strain relief damper gaiter



Size mm <sup>2</sup>	Length	Materials
50	As required	Aluminium
120		Aluminium
150		Aluminium
16		Copper
25		Copper
35		Copper
70		Copper
95		Copper



## Carrying Bag

Carrying bags with shoulder straps are provided as standard for all CCL earthing equipment.



# LOW VOLTAGE (L.V.) OVERHEAD DISTRIBUTION LINES



## EC3.1 - 0400(5)

Standard equipment is designed for application to 5 wire, bare conductor, low voltage networks comprising:

3 - Phase wires

1 - Neutral

1 - Control wire/switch wire (street lighting etc.)

The clamps are EC3.1 "snap on screw on" with 300mm insulated extension handles.

The standard set provides a shorting cable tress capable of attaching all clamps securely on conductors spaced 305mm (12") apart vertically. If used on 3 or 4 wire systems, the spare clamps should be parked on the lowest conductor. Should a 6th wire be present, it is recommended to apply a separate 2-clamp bond lead to complete the short circuit bond.



"0400" equipment is supplied contained in a heavy duty P.V.C. carrying bag with hand grip. Cable leads are flexible copper braid clear P.V.C. covered as standard.

Rating 7.5kA/1 sec

Tested by ECRC

Weight 2.8kg

TD Ref. 272/46

Available on request to sales office.

## OPTIONAL EXTRAS

1. 2 - clamp bond lead 610mm (22") long
2. Earth bond lead 15M long
3. Earth rod (electrode).



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# EC3.1 - 0400 (5) STANDARD SET COMPRISES:



## Line End Clamp

Type EC3.1-300  
Part No. 272313  
Range 3 - 28mm dia  
Rating 7.5kA/1 sec  
TD Ref. 272/31



## Cable Tress

Type Flexible Copper  
Clear P.V.C. sheathed  
Self Colour  
Complete with  
Compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Part No. 272150  
Size 25mm<sup>2</sup>  
Rating 7.5kA/1 sec



## (Optional Extra) Earth Bond Lead

Type Flexible Aluminium  
"Arctic Grade"  
P.V.C. sheathed (bright orange)  
Complete with  
Compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Line end clamp EC3.1-300  
Earth end clamp EC4.1



## Carrying Bag

Carrying Bags are supplied  
as standard with all CCL  
earthing equipment



# LOW VOLTAGE (L.V.) OVERHEAD DISTRIBUTION LINES



## EC3.1 - 0400(5)

Standard equipment is designed for application to 5 wire, bare conductor, low voltage networks comprising:

3 - Phase wires

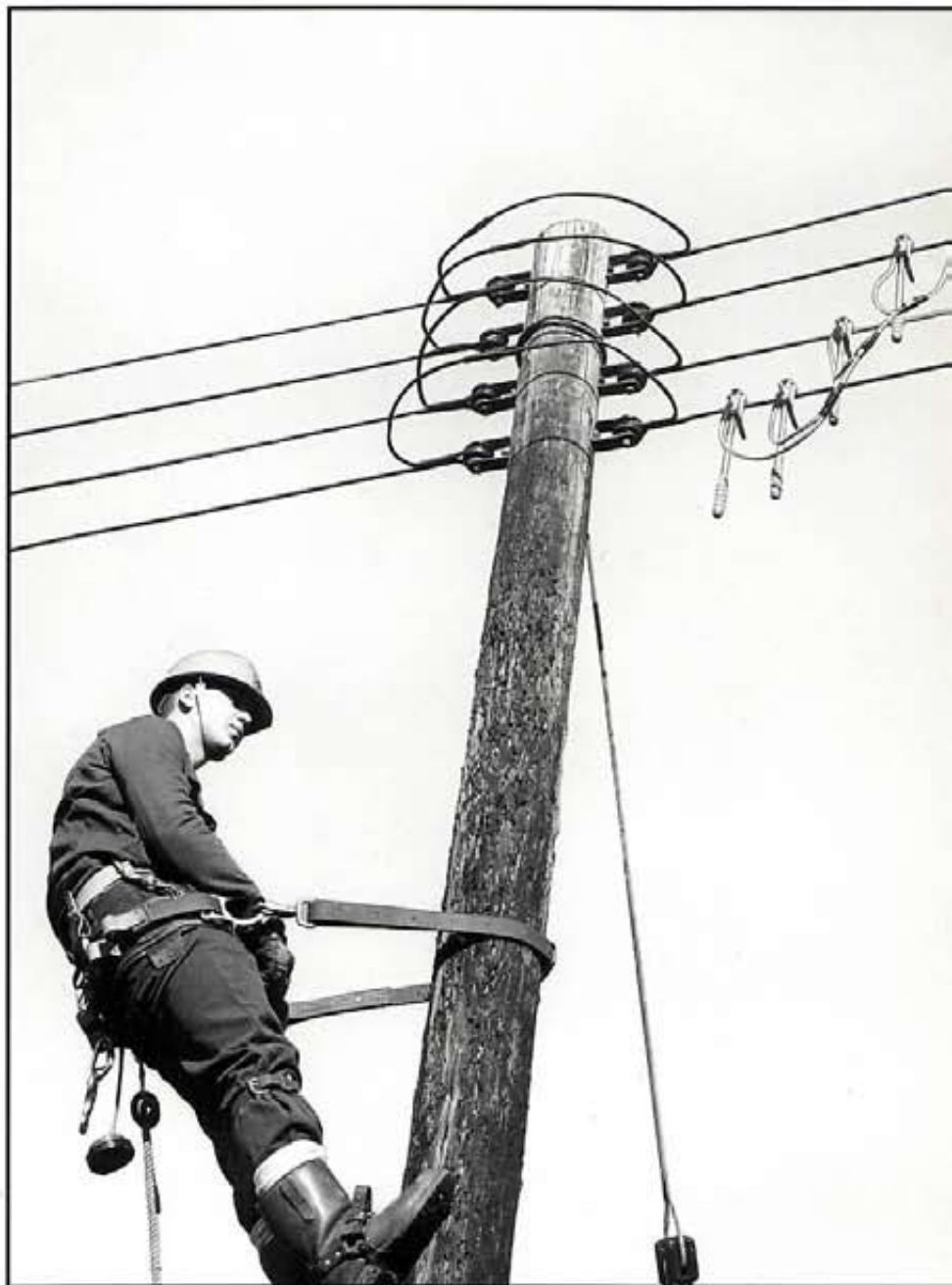
1 - Neutral

1 - Control wire/switch wire (street lighting etc.)

The clamps are EC3.1 "snap on screw on" with 300mm insulated extension handles.

The standard set provides a shorting cable tress capable of attaching all clamps securely on conductors spaced 305mm (12") apart vertically.

If used on 3 or 4 wire systems, the spare clamps should be parked on the lowest conductor. Should a 6th wire be present, it is recommended to apply a separate 2-clamp bond lead to complete the short circuit bond.



"0400" equipment is supplied contained in a heavy duty P.V.C. carrying bag with hand grip. Cable leads are flexible copper braid clear P.V.C. covered as standard.

Rating 7.5kA/1 sec

Tested by ECRC

Weight 2.8kg

TD Ref. 272/46

Available on request to sales office.

## OPTIONAL EXTRAS

1. 2 - clamp bond lead 610mm (22") long
2. Earth bond lead 15M long
3. Earth rod (electrode).



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# EC3.1 - 0400 (5) STANDARD SET COMPRISES:



## Line End Clamp

Type EC3.1-300  
Part No. 272313  
Range 3 - 28mm dia  
Rating 7.5kA/1 sec  
TD Ref. 272/31



## Cable Tress

Type Flexible Copper  
Clear P.V.C. sheathed  
Self Colour  
Complete with  
Compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Part No. 272150  
Size 25mm<sup>2</sup>  
Rating 7.5kA/1 sec



## (Optional Extra) Earth Bond Lead

Type Flexible Aluminium  
"Artic Grade"  
P.V.C. sheathed (bright orange)  
Complete with  
Compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Line end clamp EC3.1-300  
Earth end clamp EC4.1



## Carrying Bag

Carrying Bags are supplied  
as standard with all CCL  
earthing equipment



# HIGH VOLTAGE (H.V.) OVERHEAD DISTRIBUTION LINES



## EC1.1 - 1133 (TRIDENT)

Standard equipment used by many electricity supply companies who prefer the simple "snap on" action, lightweight and rapid deployment of the EC1.1 clamp. Particularly useful where the conductor to be earthed is in tension, or where a rigid terminal point is available EC1.1.D must be applied using type D dispenser head fitted to the operating rod.

"Trident" equipment is supplied contained in a heavy duty P.V.C. carrying bag with shoulder strap, for easy handling. Cable leads to inter-connecting clamps are flexible aluminium cable, arctic grade P.V.C. sheathed - (bright orange) as standard.

Rating 12.4kA/2 sec  
Tested to ESI 43 - 81 Specification  
Weight 10kg  
TD Ref. 272/20  
Available on request to sales office.

Recommended operating rod  
GF2-2.4 tel. with 'D' Type adaptor.



## OPTIONAL EXTRAS

1. Steelwork ('X' arm) bond lead
2. Earth rod (electrode)



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# EC1.1 - 1133 (TRIDENT) STANDARD SET COMPRISES:



## Line End Clamp

Type EC1.1.D  
Part No. 272300  
Range 4 - 22mm dia.  
Rating 12.4kA/2 sec  
TD Ref. 272/30



## Earth End Clamp

Type EC4.1T  
Part No. 272362  
Range 4 - 25mm dia.  
6 - 40mm section  
Rating 17.5kA/1 sec  
TD Ref. 272/32



## Cable Tress

Type Flexible Aluminium  
"Arctic Grade"  
P.V.C. sheathed (bright orange)  
Complete with  
Compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Size 3 - 120mm<sup>2</sup> x 3m long phase leads  
1 - 50mm<sup>2</sup> x 15m long earth lead  
Rating 12.4kA/2 sec



## Operating Rod

Type GF2-2.4T 2-piece telescopic  
Closed length 1.2m  
Extended 2.4m



## Adaptor Head

Type D (dispenser)  
Part No. 272811



## (Optional Extra) Steelwork Bond

Type As cable tress  
Specification 50mm<sup>2</sup> x 2m long



# HIGH VOLTAGE (H.V.) OVERHEAD DISTRIBUTION LINES



## EC3.1 - 1133 (TRIPLEX)

Standard equipment used by electricity supply companies who require clamps able to be "snapped" onto the overhead conductor and then screw tightened for extra contact and security. The equipment is lightweight incorporating a parking bar for location on the centre phase conductor from which the remaining phase connections are easily deployed.

It is recommended that the parking bar connection be located on a tensioned conductor.

EC3.1 clamps are fitted with "eyering" application stems requiring the operating rod to be equipped with a Type E adaptor. Alternative bayonet stems may be fitted if customers prefer, in which case Type B adaptor is required.

"Triplex" equipment is supplied contained in a heavy duty P.V.C. carrying bag with shoulder strap, for easy handling. Cable leads to inter-connecting clamps are flexible aluminium cable, arctic grade P.V.C. sheathed - (bright orange) as standard.

Rating 17.5kA/1 sec  
Tested to ESI 43 - 81 specification  
Weight 9kg  
TD Ref. 272/5  
Available on request to sales office.



## OPTIONAL EXTRAS

1. Steelwork ('X' arm) bond lead
2. Earth rod (electrode)

Recommended operating rod  
GF2-2.4T with 'E' Type adaptor.



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# EC3.1 - 1133 (TRIPLEX) STANDARD SET COMPRISES:



## Line End Clamp

Type EC3.1E  
Part No. 272317  
Range 3 - 28mm dia.  
Rating 17.5kA/1 sec  
TD Ref. 272/31



## Earth End Clamp

Type EC4.1T  
Part No. 272362  
Range 4 - 25mm dia.  
6 - 40mm section  
Rating 17.5kA/1 sec  
TD Ref. 272/32



## Cable Tress

Type Flexible Aluminium  
"Arctic Grade"  
P.V.C. sheathed (bright orange)  
Complete with  
Parking bar,  
Compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Size 2 - 120mm<sup>2</sup> x 3m long phase leads  
1 - 50mm<sup>2</sup> x 15m long earth lead  
Rating 17.5kA/1 sec

## Operating Rod

Type GF1.2  
Extendable section  
ESI Standard  
see TD Ref. 272/15  
Length to customers requirement



## Adaptor Head

Type "E" eyesstem  
Part No. 229016

## (Optional Extra) Steelwork Bond

Type As cable tress  
Specification 50mm<sup>2</sup> x 2m long





# HIGH VOLTAGE (H.V.) OVERHEAD DISTRIBUTION LINES



## EC3.1 - 1133 (POLEPARK)

Standard equipment used by electricity supply companies who have a preference for the "snap on screw on" clamp design, but with the parking bar arrangement secured at a convenient working height on the overhead line pole.

This equipment is particularly suitable for situations where conductors are not tensioned, such as down leads or jumper connections to pole mounted transformers, isolators, fuses etc. The parking bar is ratchet tightened onto the wood or steel pole for maximum rigid positioning. EC3.1 clamps are fitted with bayonet application stems requiring the operating rod to be equipped with a Type 'B' adaptor. Alternative "eyering" stems may be fitted if customers prefer, in which case a Type 'E' adaptor is required.

"Polepark" equipment is supplied contained in a heavy duty P.V.C. carrying bag with shoulder strap, for easy handling. Cable leads to inter-connecting clamps are flexible aluminium cable, arctic grade P.V.C. sheathed - (bright orange) as standard.

Rating 17.5kA/1 sec  
Tested to ESI 43 - 81 specification  
Weight 12kg  
TD Ref. 272/10  
Available on request to sales office.

Recommended operating rod  
GF2-2.4T with 'B' Type adaptor.

## OPTIONAL EXTRAS

1. Steelwork ('X' arm) bond lead
2. Earth rod (electorde)



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# EC3.1 - 1133 (POLEPARK) STANDARD SET COMPRISES:



## Line End Clamp

Type EC3.1  
Part No. 272318  
Range 3 - 28mm dia.  
Rating 17.5kA/1 sec  
TD Ref. 272/31



## Earth End Clamp

Type EC4.1T  
Part No. 272362  
Range 4 - 25mm dia.  
6 - 40mm section  
Rating 17.5kA/1 sec  
TD Ref. 272/32



## Cable Tress

Type Flexible Aluminium  
"Arctic Grade"  
P.V.C. sheathed (bright orange)  
Complete with  
Parking bar,  
ratchet tensioning strap,  
compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Size 2 - 120mm<sup>2</sup> x 3m long phase leads  
1 - 50mm<sup>2</sup> x 15m long earth lead  
Rating 17.5kA/1 sec

## Operating Rod

Type GF1-1.2  
Extendable section  
ESI Standard  
see TD Ref. 272/16  
Length to customers requirement



## Adaptor Head

Type "B" bayonet  
Part No. 272812

## (Optional Extra) Steelwork Bond

Type As cable tress  
Specification 50mm<sup>2</sup> x 2m long





# HIGH VOLTAGE (H.V.) OVERHEAD TRANSMISSION LINES & BARS



## EC S9 - 33400

Standard equipment used by electricity supply companies who require to apply earth bonds to overhead power lines and outdoor sub-station bars of large diameter, generally exceeding 25mm.

System voltage 33 to 400 kV. The equipment is lightweight commensurate with fault level rating and designed to comply with both British Electricity Board Standard (B.E.B.S.) S9 - 1967 and Electricity Supply Industry (ESI) Standard 41-21 - 1985. Reference to National Grid Co. (NGC) Standard 439201 T.P.S. 1/113 (overhead lines) has also been considered.

EC S9 clamps are fitted with "bayonet" application stems requiring the operating rod to be equipped with a Type B adaptor.

Kits are supplied in a heavy duty P.V.C. carrying bag with shoulder strap for easy handling. Cable leads to inter-connecting clamps are flexible aluminium braid.

Circuit main earths (C.M.E.) 150mm<sup>2</sup> clear P.V.C. sheath  
Drain earths (D.E.) 50mm<sup>2</sup> "arctic grade" P.V.C. sheath - (bright orange)

Rating 17.5kA/2 sec (main circuit earths)  
Tested to ESI 41 - 21  
Weight (Dependent on customers requirements)  
TD Ref. 295/6  
Available on request to sales office.

Recommended operating rod  
GF1-1.2 with 'B' Type adaptor.

## OPTIONAL EXTRAS

Customised design to users special requirements.



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# ECS9 - 33400 STANDARD SET COMPRISES



## Line End Clamp

Type ECS9/1B  
Part No. 272040  
Range 6.5 - 38mm dia.  
Rating 17.5kA/2 sec  
TD Ref. 272/51

Note ECS.9/2B = 38 - 76mm dia  
ECS.9/3B = 76 - 90mm dia.  
ECS.9/4B = 90 - 102mm dia.



## Earth End Clamp

Type EC2.3  
Part No. 295083  
Range 3mm x 7mm thick  
38mm x 50mm wide  
Rating 17.5kA/2  
TD Ref. 272/57

Note EC4.1 clamp is used  
for drain earth leads



## Cable Tress

Type Flexible Aluminium Clear or  
bright orange P.V.C. sheathed  
C/W compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Part No. 272055 (150mm<sup>2</sup> C.M.E.)  
Part No. 272051 (50mm<sup>2</sup> D.E.)  
Rating 17.5kA/2 sec (C.M.E.)

## Operating Rod

Type GF1-1.2  
Extendable section comprise  
1-top section  
3-intermediate sections  
1-bottom section  
Total Assembled Length 6m



## Adaptor Head

Type "B" bayonet  
Part No. 272812



# PORTABLE EARTHING EQUIPMENT



## EC9.5 - 33400

Standard equipment is designed for use by electrical supply companies who require to apply additional earth bonds to protect against induced voltage when erection or maintaining overhead transmission lines.

This equipment is lightweight and supplied with push/screw-on line end clamp and hand applied tower earth which penetrates through painted, weathered or non conductive surfaces.

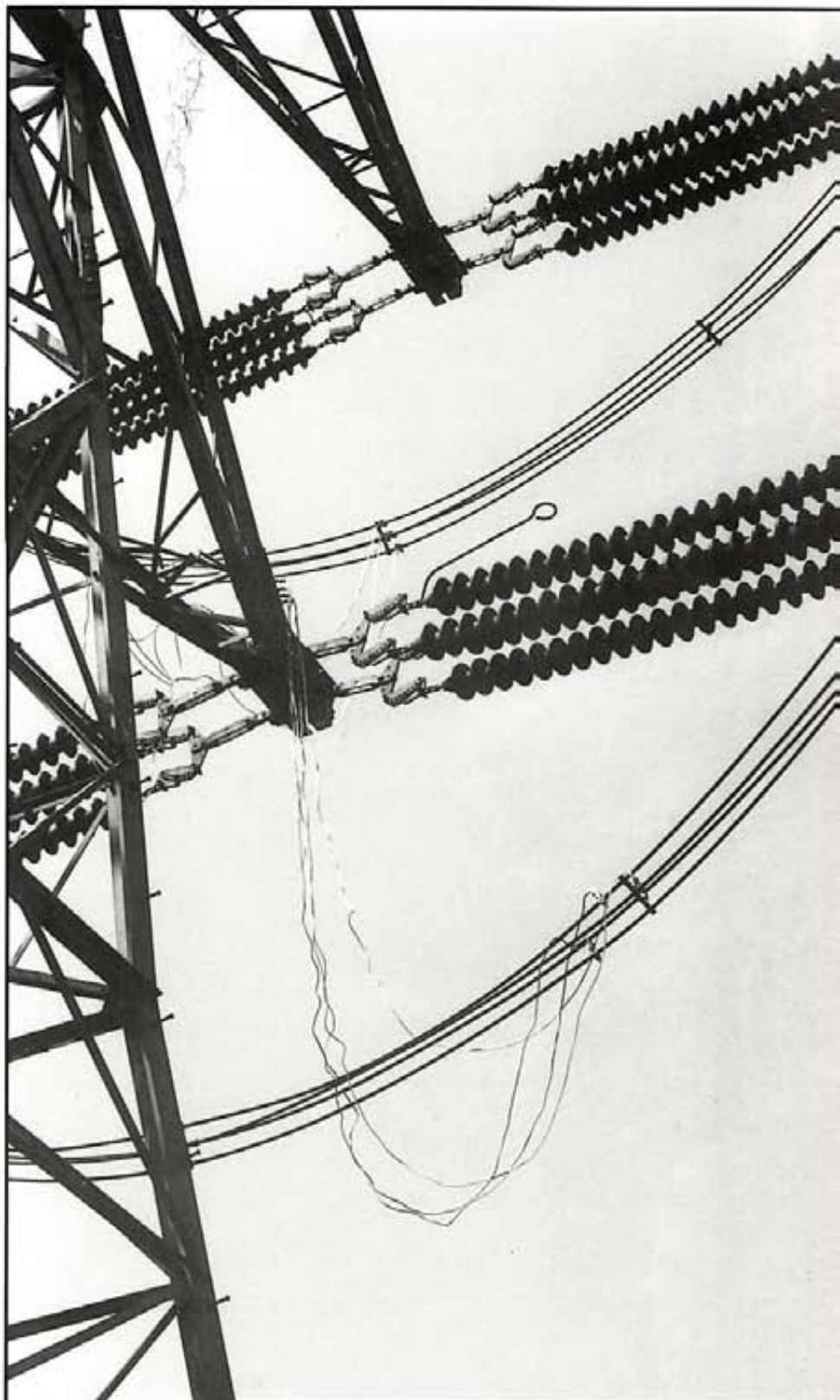
Kits are supplied in a heavy duty P.V.C. carrying bag comprising:-  
line end clamps  
earth end clamps  
down leads 50mm  
Aluflex, 8m long

Rating -7.5kA/1 sec  
TD Ref. 272/57

Recommended operating rod  
GF1-1.2 with 'B' adaptor.

## OPTIONAL EXTRAS

Customised design to users special requirements.



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# EC9.5 - 33400 STANDARD SET COMPRISES



## Line End Clamp

Type EC 3.3  
Part No. 295374  
Range 12 - 38mm  
Rating 17.5kA/2 sec



## Earth End Clamp

Type EC 2.2  
Part No. 295237  
Range 11mm thick max  
Rating 17.5kA/2 sec



## Cable Tress

Type Flexible Aluminium  
P.V.C. sheathed  
Part No. 272029  
Rating 7.5kA/1 sec

## Operating Rod

Type GF1-1.2  
Extendable sections comprise  
1 x top section  
1 x bottom section  
Total Assembled Length 2.4m



## Adaptor Head

Type "B" bayonet  
Part No. 272812



# DISTRIBUTION PLANT AND EQUIPMENT (H.V. AND L.V.)

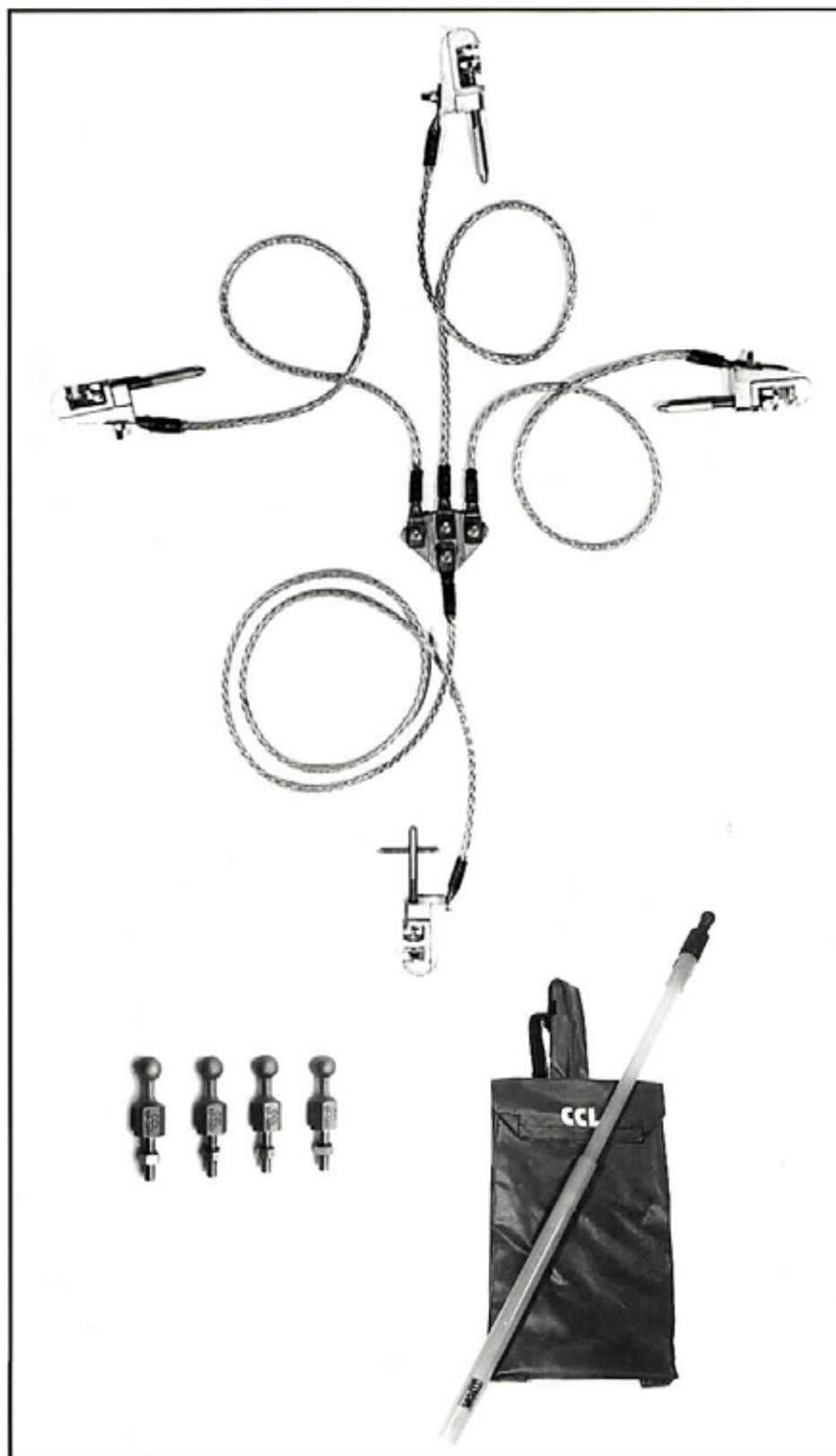


## EC4.1 - 1133 (TRIDENT)

Standard equipment is designed for installations where temporary earths have to be applied to bus-bars and a point of earth. The additional feature of the fixed earth point is particularly useful for original equipment manufacturers to design into switch gear, transformers, electro static precipitator plant etc.

This equipment is supplied in a heavy duty P.V.C. carrying bag complete with shoulder strap for easy handling.

TD Ref. 272/71  
Available on request to sales office.



## CUSTOMISED EQUIPMENT

The standard kit illustrated shows the concept, special equipment can be provided to suit specific installation requirements. Contact CCL Sales for more information.



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# EC4.1 - 1133 COMPRISES:



## Line End Clamp

Type EC4.1 - H  
Part No. 272365  
Range Round 6 - 25mm dia.  
Flat 6 - 40mm  
Rating 25kA/1 sec  
TD Ref. 272/32



## Earth End Clamp

Type EC4.1T  
Part No. 272362  
Range Round 6 - 25mm dia.  
Flat 6 - 40mm  
Rating 25kA/1 sec  
TD Ref. 272/32



## Permanent Earth Point

Type EP1.1  
Part No. 272378  
TD Ref. 272/35



## Operating Rod

Type GF2-1.4T telescopic  
Part No. 272211  
TD Ref. 272/15



## Adaptor Head

Type "H" clamp  
Part No. 272805  
TD Ref. 272/25



## Cable Tress

Type Flexible Copper Braid  
Clear P.V.C. covered  
Complete with  
Compressed terminal inter-connections  
See Table for alternatives

Cable Tress Section			
25mm <sup>2</sup>		50mm <sup>2</sup>	
Length	1m Phase 2m Earth	Length	1m Phase 2m Earth
Rating:-	7.5kA/1 sec	Rating:-	15kA/1 sec
Part No. 272900		Part No. 272901	



# HIGH VOLTAGE (H.V.) OVERHEAD ELECTRIC TRACTION LINES



## EC1.1 - 1525 (TRACTION) (Approved for 1.5 to 25kV systems)

Standard equipment used by many railway companies throughout the world, for providing temporary earth bonds between overhead catenary or contact conductors and the earthed rail line or designated earth points.

This equipment incorporates the EC1.1 'D' "snap-on" line clamp for rapid engagement and disengagement from the line conductor.

EC1.1 clamp must be applied using Type 'D' dispenser head fitted to the operating rod.

"Traction" equipment is supplied contained in a heavy duty P.V.C. carrying bag with shoulder strap, for easy handling. Cable leads to inter-connecting clamps are flexible aluminium braid, arctic grade P.V.C. sheathed - (bright orange) for maximum visibility when installed at the point of work.

Rating 7.5kA/1 sec (tested to British Rail Standard)  
TD Ref. 272/60  
Available on request to sales office.

Recommended operating rod  
GF1-1.2 with 'D' adaptor.

## OPTIONAL EXTRAS

EC1.1 adaptor plate to assist disengagement of overhead line clamp from ground level.



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# EC1.1 - 1525 (TRACTION) COMPRISES:



Optional Extra  
Adaptor plate  
Part No. 272309

## Line End Clamp

Type EC1.1.D  
Part No. 272300  
Range 3 - 25mm dia.  
Rating 7.5kA/1 sec  
TD Ref. 272/30



## Earth End Clamp

Type EC2.1  
Part No. 272380  
Range 40mm x 25mm flat  
Rating 7.5kA/1 sec  
TD Ref. 272/34



## Cable Tress

Type Flexible Aluminium  
"Arctic Grade"  
P.V.C. sheathed (bright orange)  
Complete with  
Compressed terminals,  
M8 stud fixing holes  
and protective gaiters  
Part No. 272291  
Size 50mm<sup>2</sup> x 15m long  
Rating 7.5kA/1 sec

## Operating Rod

(Extendable)  
Type GF1-1.2 (Extendable)  
Comprises  
1-Top Section  
2-Intermediate Sections  
1-Bottom Section  
Total Assembled Length 4.8m



## Adaptor Head

Type "D"  
Part No. 272811