



TITLE SPECIFICATION FOR MEDIUM VOLTAGE FUSES

RE *Johannesburg* REV
CP_TSSPEC_070 6
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 PAGE: **1 OF 62**

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**SPECIFICATION FOR MEDIUM VOLTAGE
FUSES**

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**SPECIFICATION FOR MEDIUM VOLTAGE
FUSES**

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OF

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Recommendations for corrections, additions or deletions should be addressed to the:

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2016

INTRODUCTION

The effect of a medium-voltage loss of supply is generally severe in terms of customer inconvenience as well as repair cost to City Power. Fuses are used to timeously interrupt supply before damage can be done to medium voltage equipment. It is therefore important to ensure that MV equipment, such as fuses, complies with the required specifications and is of acceptable quality.

1 SCOPE

This specification covers City Power's requirements for medium voltage fuses in accordance with international and local specifications.

2 NORMATIVE REFERENCES

The following documents contain provisions that, through reference in the text, constitute requirements of this specification. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

SANS 60282 -1,2020: Current-limiting fuses for high voltage.

SANS 60282 – 2, 2008: High voltage – Expulsion fuses

SANS 62271-105,2022: High-voltage switchgear and control gear , alternating current switch-fuse combinations for rated voltages above 1kV up to and including 52kV

SANS 62271-107,2012: High-voltage switchgear and control gear , alternating current switch-fuse for rated voltages above 1kV up to and including 52Kv

IEC 62271-107, 2019: High-voltage switchgear and control gear, alternating current switch-fuse for rated voltages above 1kV up to and including 52Kv

3 DEFINITIONS AND ABBREVIATIONS

The definitions and abbreviations in the above documents shall apply to this specification.

4 REQUIREMENTS

4.1. General

4.1.1. Normal service conditions

Shall be in accordance to SANS 60282

4.1.2.Drop-out fuse-link assemblies or solid link assemblies - pole mounted types

4.1.2.1. A complete sample of the cut-out being offered and if fuse links are also required, copies of the fuse element's characteristics curves shall be required.

4.1.2.2.The cut-out shall be designed to allow full interchangeability of the cut-out base, the fuse-carrier and the fuse-link, both between units of the same manufacturer and between units of the different manufacturer.

4.1.2.3.The insulator material for the cut-out base shall be polymeric. Porcelain insulators shall not be accepted.

4.1.2.4.The fuse-link assembly shall conform to the limiting dimensions given in figures 1 to 9.

4.1.2.5.Water shall not be able to accumulate on any part of the equipment nor shall any feature introduce moisture into any component.

-
- 4.1.2.6.The design shall incorporate all reasonable precautions and provision for the safety of City Power personnel concerned with the operation and maintenance of the cut-outs.
 - 4.1.2.7.All electrical components of a cut-out shall comply with the rated requirements specified in schedule A of SANS 62271- 105& 107.
 - 4.1.2.8.Load current path shall be arranged to flow only through high conductivity materials such as copper and its alloys, e.g. brass, phosphor or bronze aluminum. Load current shall not be permitted to flow through ferrous components, springs or spring-load mechanisms.
 - 4.1.2.9.The design shall feature current paths that have a minimum number of joints and current transfer points as per SANS 62271- 105& 107.
 - 4.1.2.10.Fuse-carriers and solid links shall have eyes at both ends and an operating tongue (see figure 9) at the top end, to facilitate their opening, closing, removal and installation using an insulated operating stick.
 - 4.1.2.11.Insulator profile characteristics shall comply with the guidelines of annex D of SANS 60815.
 - 4.1.2.12.An integral nut and washer (or integral bolt and washer) as indicated in figure 6, shall be provided to secure the tail of the expulsion fuse link to the fuse carrier.
 - 4.1.2.13.The nuts and bolts of the conductor clamps shall be hot dipped galvanized steel. In order to prevent galling (i.e. seizing), fasteners made of stainless steel, aluminum, titanium or other alloys that naturally form an oxide film shall not be used.
 - 4.1.2.14.Load buster hooks, see figure 1 and 2, shall be provided at the upper contact arrangement of off-load cut-outs to facilitate the use of portable load-break tools. Those hooks shall also serve as a guide bracket, i.e. to guide the fuse-carrier or the solid link into the correct position on closing.

4.1.3.MV current limiting fuse links for use in oil insulated switchgear

- 4.1.3.1.The MV fuse-links required in this specification shall be equipped with a pyrotechnic striker pin suitable for use in MV oil-insulated switchgear applications. The fuses shall comply with the oil tightness test in accordance with SANS 60282-1.
- 4.1.3.2.Full particulars including drawings, characteristics of the fuse-links (class, switching voltages, time-current characteristics, cut-off characteristics, I^2t characteristic, Power dissipation, striker characteristics as well as test certificates of a recognized testing authority approved by City Power must be submitted with the tender.

4.2. Physical Characteristics

4.2.1 Markings

4.2.1.1 Each fuse shall be legibly and indelibly marked in accordance with SANS 60282-1

4.2.1.2 The following information shall be indelibly printed or stamped on each fuse:

- Name of manufacturer
- Manufacturer's type designation;
- Rated voltage;
- Rated current;
- Rated maximum breaking current;
- Class (Back-Up, General-Purpose, Full-Range);
- Rated minimum breaking current (for Back-Up fuses only);
- Maximum application temperature (for fuse-links designed for use in surrounding);
- Type of striker (light, medium or heavy);
- Location of the striker;
- Identifying date code (minimum of month and year).

4.2.2. Striker pin

4.2.2.1 The striker pin shall be of the pyrotechnic type and shall provide the maximum actual travel in accordance to SANS 60282.

4.2.2.2 The fuse-link shall be marked with the direction of installation required for correct striker operation. This mark shall be indelibly printed or stamped. Adhesive labels are not acceptable.

4.2.3 Dimensions

4.2.3.1 Fuses shall match the dimensions shown below:

Fuse Description	Dimension as per IEC 62271	Dimensions (mm)
Fuse 11 kV DIN type for use in air - 442 mm long with an end cap length of 34 mm and an end cap diameter of 45 mm, with striker.	-	442 mm long with an end cap length of 34 mm and an end cap diameter of 45 mm
Fuse 11kV DIN type for use in air - 292mm long with an end cap length of 34 mm, end cap diameter of 45mm, with striker.	-	292mm long with an end cap length of 34 mm and an end cap diameter of 45 mm
Fuse 11kV for use in air/oil- 359mm long with an end cap diameter of 64 mm, with striker.	FO2	359mm long with an end cap diameter of 64mm
Fuse 11kV for use in air/oil- 254mm long with an end cap diameter of 68 mm, with striker.	FO1	254mm long with an end cap diameter of 68 mm
Fuse 11kV for use in VT-195mm long without striker.	-	195mm long
Fuse 11kV expulsion- 533mm length	-	533mm long

Table 1 – Fuse dimensions

Note: No DIN type fuse with indentations, grooves or any other physical anomaly on the end cap shall be deemed acceptable. This is due to problems experienced with the insertion and removal of these fuses in certain types of switchgear on the City Power network.

4.3 Electrical Characteristics

4.3.1. Rated current of a fuse-base

The rated current of a fuse-base should be selected from the following values:
10 A; 25 A; 63 A; 100 A; 200 A; 400 A; 630 A; 1 000 A.

4.3.2. Rated current of a fuse-link (*I_r*)

The rated current in amperes of the fuse-link should be selected from the R10 series in accordance to SANS 60282

4.3.3. Time delay characteristics

Fuses must have time delay capabilities in order to allow for transformer inrush currents and motor starting.

4.3.4. Curves

The current-time characteristic curves for the fuses shall be required.

4.3.5. Breaking capacity and current ratings

The rated maximum breaking current in kA of a fuse-link shall be selected from the R10 in accordance to SANS 60282

By design fuses shall have breaking capacities in excess of any fault condition likely to be found in service. All fuses shall be of the high rupturing capacity (HRC) type. Breaking capacity shall be 40kA.

Fuse Description	Current Rating (A)
Fuse 11 kV DIN type for use in air - 442 mm long with an end cap length of 34 mm and an end cap diameter of 45 mm, with striker.	200 80 31,5
Fuse 11kV DIN type for use in air - 292 mm long with an end cap length of 34 mm and an end cap diameter of 45 mm, with striker.	80 31,5
Fuse 11kV for use in air/oil- 359mm long with an end cap diameter of 68 mm, with striker.	80 31,5
Fuse 11kV for use in air/oil- 254mm long with an end cap diameter of 68 mm, with striker.	80 31,5
Fuse 11kV for use in VT-195mm long without striker.	1 3
Fuse 11kV expulsion- 533mm length	5 10 15 25 30 40

Table 2 – Fuse current ratings

5 TESTS

5.1 Type tests

The following type test shall be carried out as per SANS 60282.

- 5.1.1 Conditions for performing the tests
- 5.1.2 Breaking capacity test.
- 5.1.3 Dielectric tests.
- 5.1.4 Lightning impulse test
- 5.1.5 Temperature rise test and power dissipation measurement
- 5.1.6 Mechanical strength (endurance) test on the cut-out base and fuse-carrier.
- 5.1.7 Artificial pollution tests
- 5.1.8 Time-current characteristics tests

5.1.9 Striker test

5.1.10. Liquid-tightness test

5.1.11. Thermal shock test (for fuses intended to be used outdoors) (8.4.1);

5.1.12. Waterproof test (ingress of moisture) for fuses intended to be used outdoors (8.4.2).

5.2 Routine tests

5.2.1 Verification of dimension.

5.2.2 Mechanical operational test.

5.2.3 General inspection

5.2.4 Resistance test.

6 LABELING AND PACKAGING

6.1 Packaging shall prevent damage or deterioration of the product during transport, handling and storage.

6.2 The box shall be labelled with the contract number, City Power SAP number, supplier name, and basic fuse details.

7 DOCUMENTATION

7.1 Full technical and descriptive details, shall be required.

7.2 The information shall include:

- a) Products catalogue
- b) Name of the manufacturer
- c) Type test report

8 QUALITY MANAGEMENT

A quality management certificate shall be set up in order to assure the proper quality management of the medium voltage fuses during design, development, production, installation and servicing phases. Guidance on the requirements for a quality management certificate shall be found in the ISO 9001:2015. The details shall be subject to agreement between City Power and the Supplier.

9 HEALTH AND SAFETY

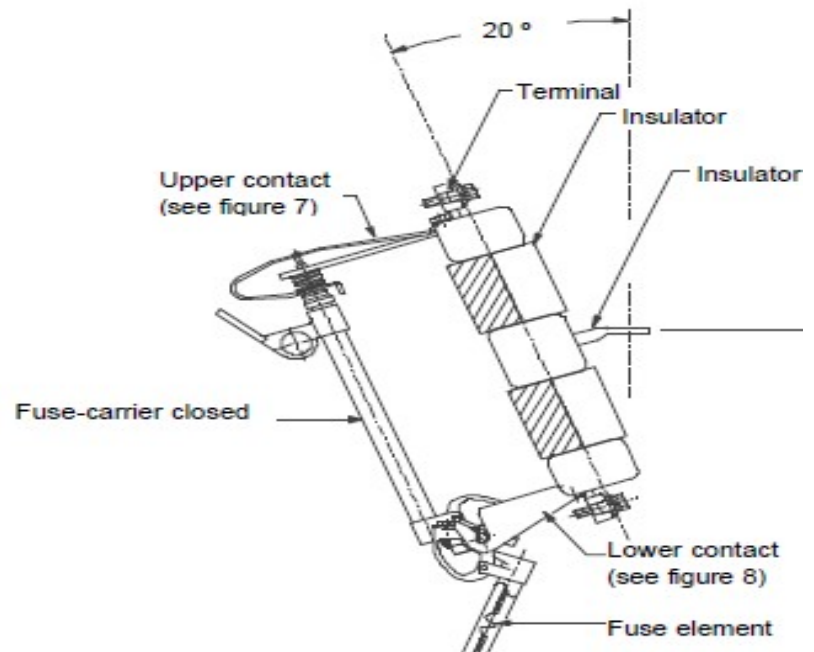
A health and safety certificate shall be set up in order to ensure proper management and compliance of the medium voltage fuses during installation operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety certificate shall be found in ISO 45001:2018 standards. This is to ensure that the asset conforms to standard operating procedures and City Power SHERQ Policy. The details shall be subject to agreement between City Power and the Supplier.

10 ENVIRONMENTAL MANAGEMENT

An environmental management certificate shall be set up in order to assure the proper environmental management of the medium voltage fuses throughout its entire life cycle (i.e. during design, development, production, installation, operation and maintenance, decommissioning and disposal phases). Guidance on the requirements for an environmental management system shall be found in ISO 14001:2015 standards. The details shall be subject to agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHERQ Policy

ANNEXURE A - DRAWINGS

Dim mm	11 kV	22 kV	33 kV
A max	650	700	900



NOTE: FOR CRITICAL DIMENSIONS OF INDIVIDUAL ITEMS, REFER TO THE DETAILED ITEM DRAWINGS IN FIGURES 2 TO 9

Figure 1 – Cut-out assembly

Dim mm	11kV	22kV	33kV
B max	290	371	469
B min	288	369	467

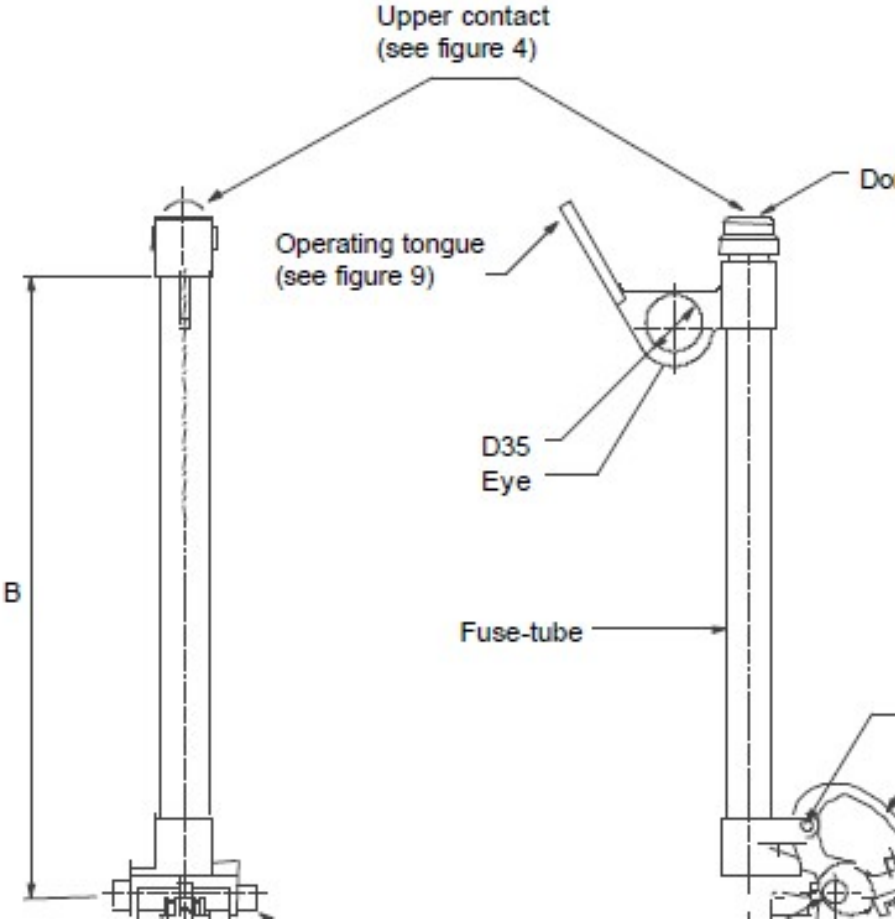


Figure 2 – Fuse-carrier details

Dim mm	11 kV	22 kV	33 kV
B max	290	371	469
B min	288	369	467

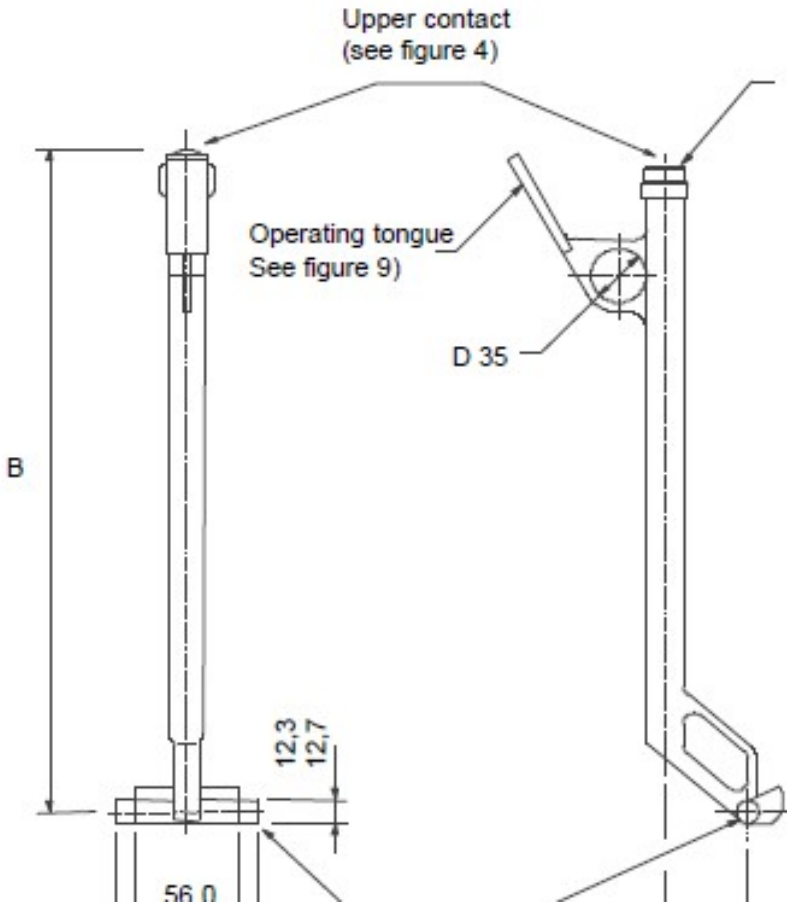


Figure 3 - Solid-link detail

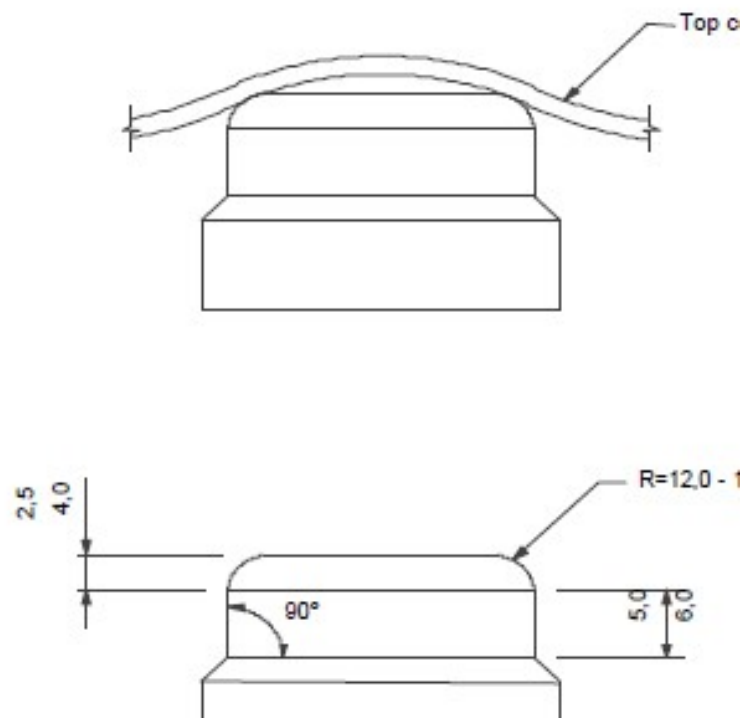


Figure 4 – Fuse-carrier and solid-link upper contact (dome nut) details

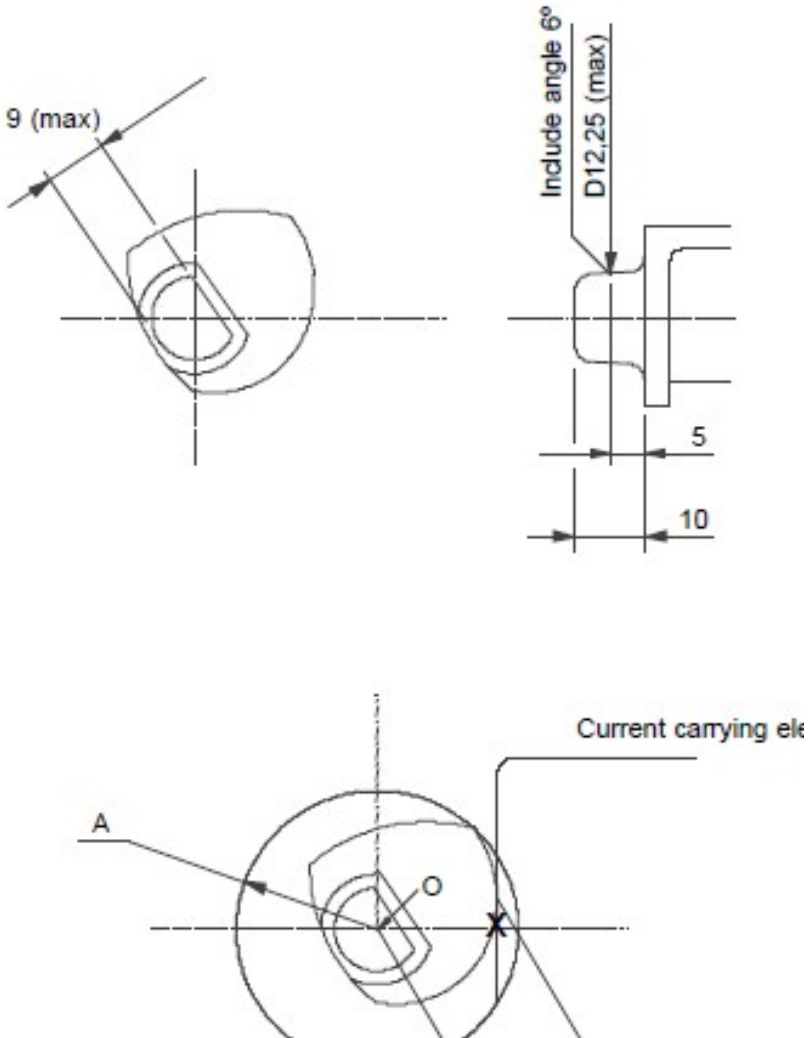
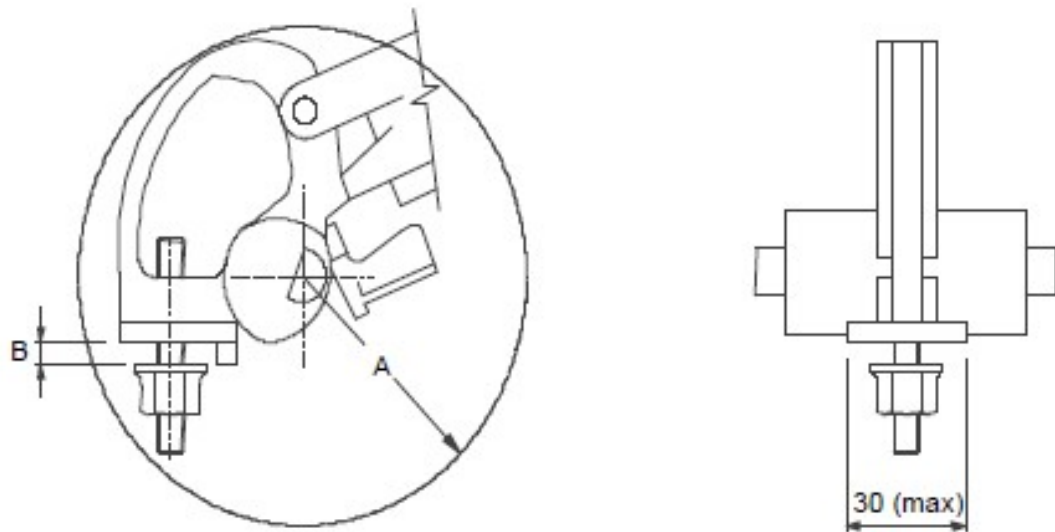


Figure 5 – Fuse-carrier and solid-link lower contact (cam) details



NOTE A = R52 (max): The portion of the trunnion that travels through the hinge elbow shall not exceed A.

Figure 6 – Fuse-carrier and solid-link lower contact (trunnion) details

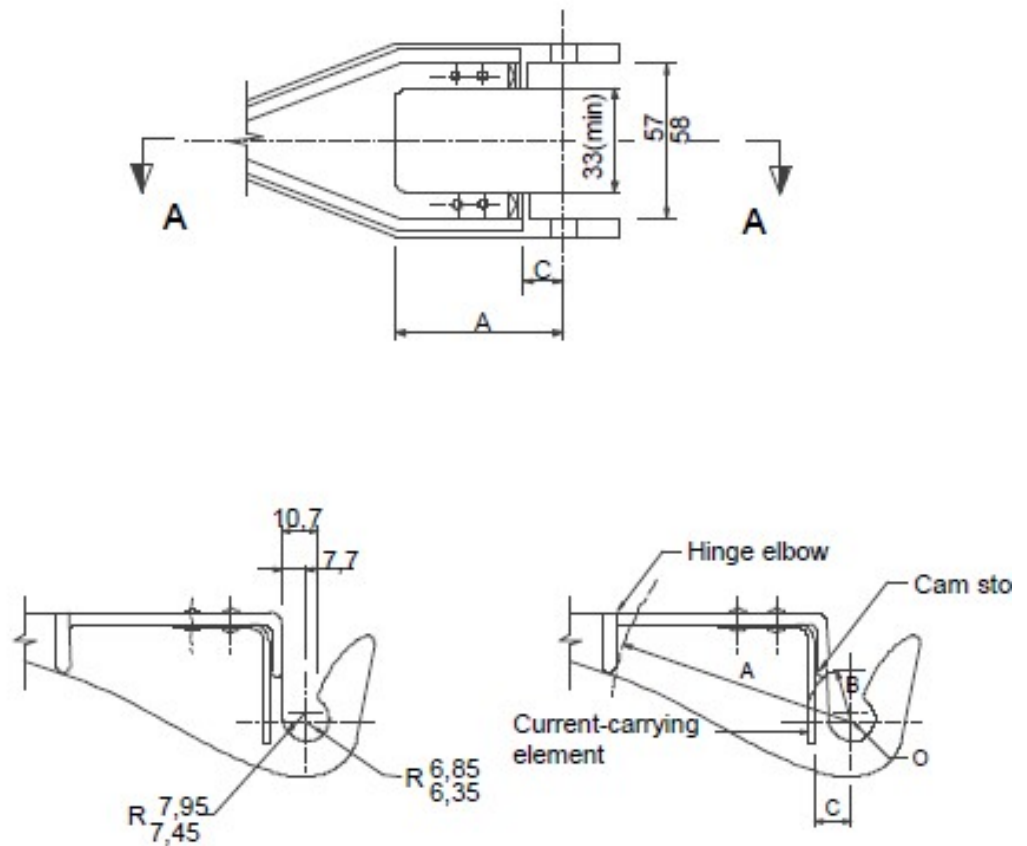


Figure 7 – Cut-out base lower contact (hinger) details

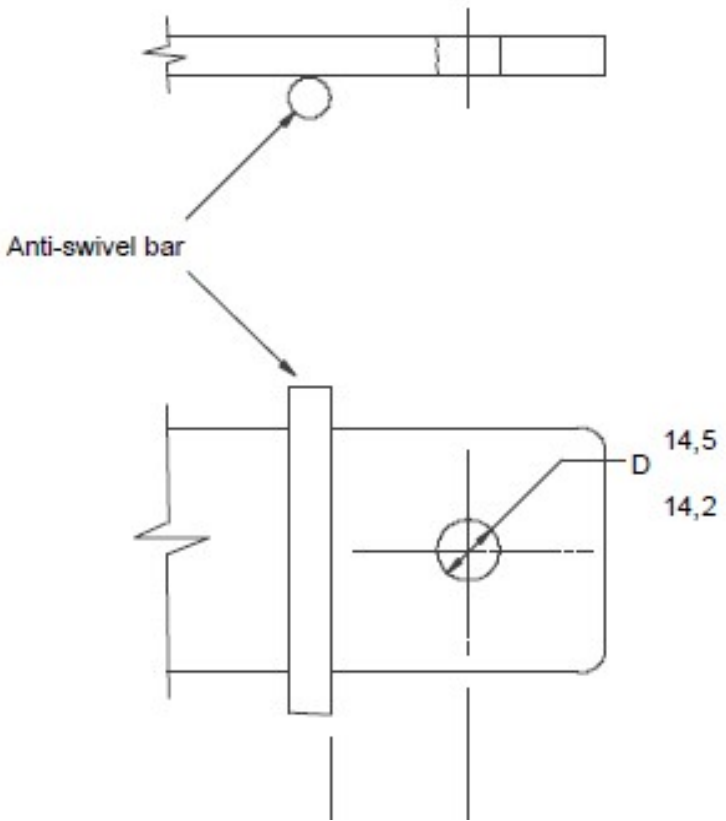


Figure 8 – Insulator fixing stem

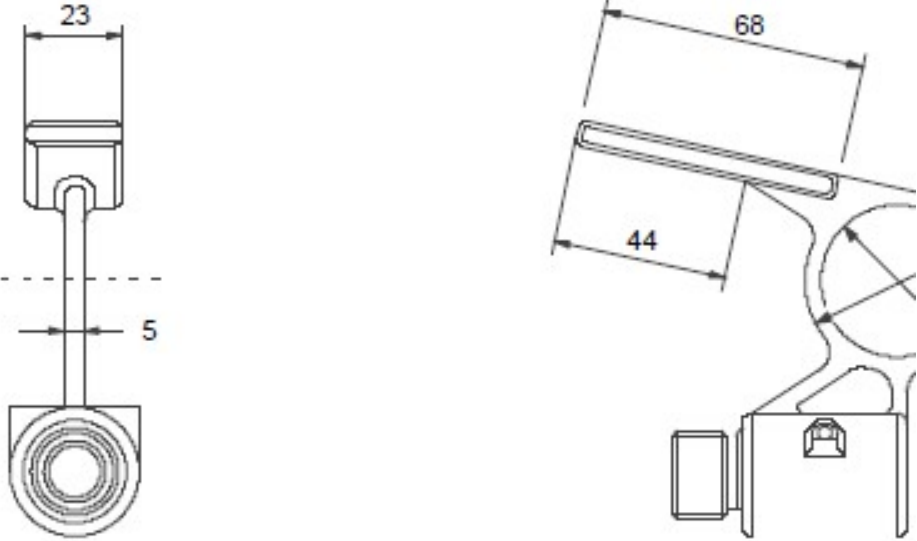


Figure 9 – Typical dimensions of the operating tongue

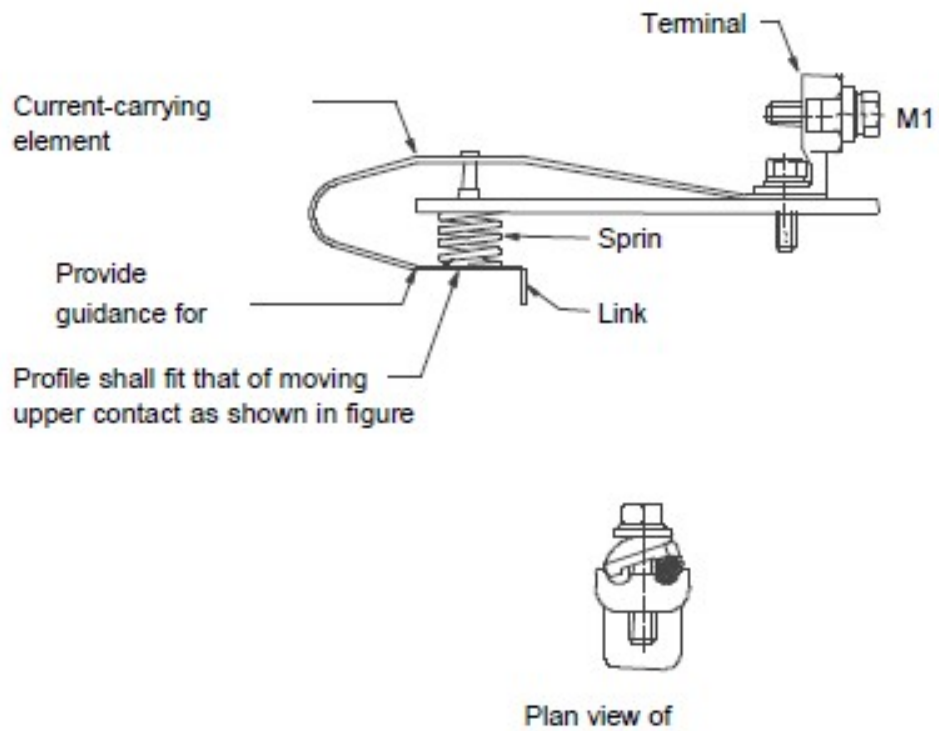


Figure 10 – Typical cut-out base upper contact arrangement

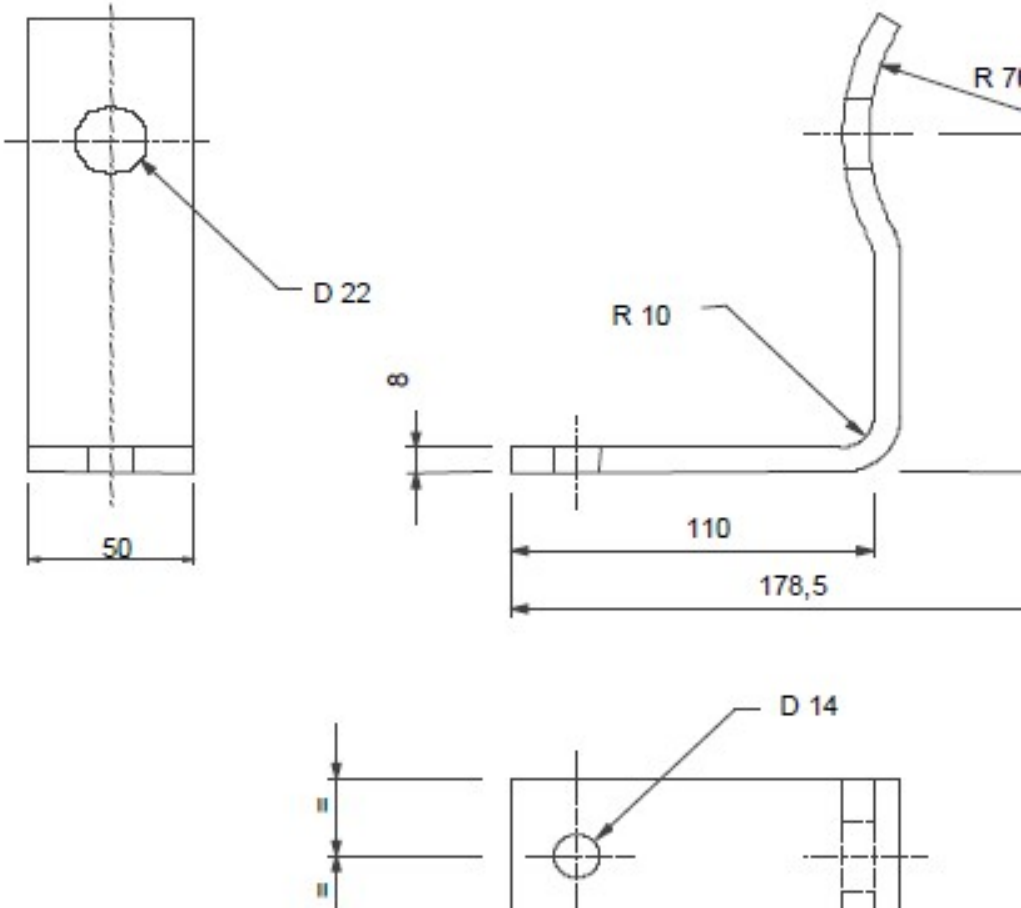


Figure 11 – Typical L-bracket for wooden cross-arm

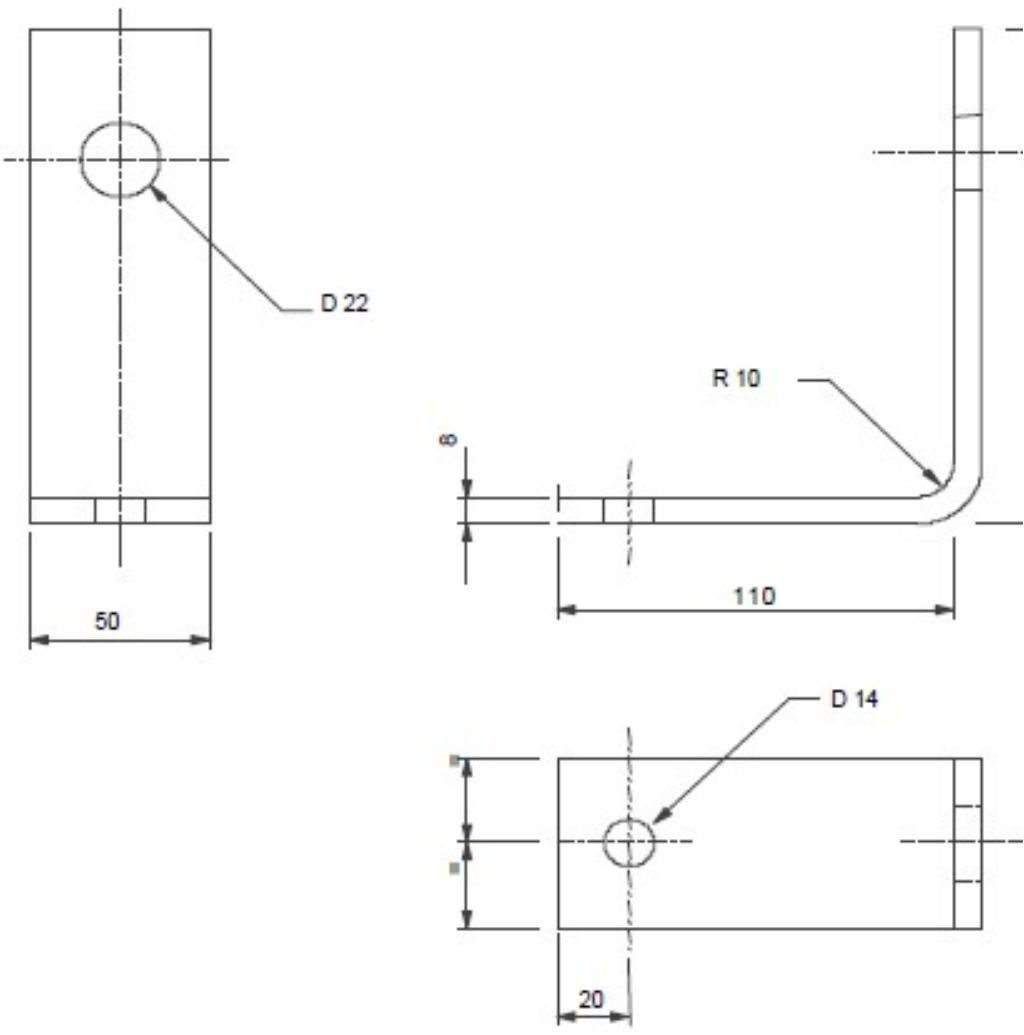


Figure 12- Typical L-bracket for steel cross-arm

ANNEXURE B - BIBLIOGRAPHY

Technical specification 139: City Power Johannesburg specification for MV fuses.
 Specification for Fuses and Fuse elements: City of Tshwane.
 Outdoor, pole-mounted, Distribution cut-outs with Fuse-link or Solid-link assemblies for nominal A.C voltages of 22 kV and 33 kV: Eskom

ANNEXURE C - REVISION INFORMATION

Date	REV No.	NOTES
May 2003	0	First Issue
May 2006	1	<p>Note: No DIN type fuse with indentations, grooves or any other physical anomaly on the end cap shall be deemed acceptable. This is due to problems experienced with the insertion and removal of these fuses in certain types of switchgear on the City Power network</p> <p>Addition of SAP 821 – 200A fuse for RMU Addition of SAP 1381 – 3A VT fuse as used in BMK Addition of SAP 5357 – 15A expulsion fuse Addition of section 8 – Quality Assurance</p>
Jan 2008	2	<p>Update of format Addition of SAP 6454 – FUSE CUT OUT ASSEMBLY 22KV as described in 4.4</p>
March 2014	3	<p>Inclusion of paragraph 4.1.1 Inclusion of paragraph 4.1.2 Inclusion of clause 4.2.2.2 Inclusion of Annex A: Drawings Inclusion of Environmental Management Annex B, edited.</p>
June 2017	4	Type Tests edited, and technical schedules updated
March 2019	5	<p>Inclusion of the Technical Committee under foreword Amendment of clause 8 to Quality Management for SHERQ Addition of clause 9, Health and Safety for SHERG Environmental management SHERQ amended Addition of stock item No.19 on Annexure E Replaced NRS 035-1&2 and BS 2692 with SANS 60292 1-2</p>
March 2023	6	<p>General editing :Work group Update on Normative references Update on clause 8-10</p> <p>Inclusion of clause 4.1.1. Inclusion of clause 4.2.1.2 Inclusion of clause 4.3.1. Inclusion of clause 4.3.2. Inclusion of clause 5.1.1. Update Table 1 Update 4.1.3.2 Update 4.3.5.</p>

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 1 MEDIUM VOLTAGE FUSES SAP 821

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 1 MEDIUM VOLTAGE FUSES SAP 821

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 2 FUSE 11 KV 80A DIN IN AIR 442 MM WS SAP 5734

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	11KV	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided w	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 2 FUSE 11 KV 80A DIN IN AIR 442 MM WS SAP 5734

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 3 FUSE 11 KV 80A DIN IN AIR 292 MM WS SAP 5314

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 3 FUSE 11 KV 80A DIN IN AIR 292 MM WS SAP 5314

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 4 FUSE 11KV 31.5 A DIN IN AIR 292 MM WS SAP 5618

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 4 FUSE 11KV 31.5 A DIN IN AIR 292 MM WS SAP 5618

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 5 FUSE 11KV 80 A IN AIR/OIL- 359MM WS SAP 7131

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters
Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

I ITEM 5 FUSE 11KV 80 A IN AIR/OIL- 359MM WS SAP 7131

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 6 FUSE 11 KV 80A 31.5 IN AIR/OIL 359 MM WS SAP 5238

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided with tender documentation	Required	
4	7	Catalogue to be provided with tender Documentation	Required	
5.	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 6 FUSE 11 KV 31.5 A DIN IN AIR/OIL 359MM WS SAP 5238

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters

Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 7 FUSE 11KV 80 A IN AIR/OIL- 254MM WS SAP 5617

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 7 FUSE 11KV 80 A IN AIR/OIL- 254MM WS SAP 5617

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 8 FUSE 11KV 31.5 A IN AIR/OIL- 254MM WS SAP 5403

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 8 FUSE 11KV 31.5 A IN AIR/OIL- 254MM WS SAP 5403

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 9 FUSE 11KV 1A FOR VT- 195MM SAP 5242

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Manufacturers name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 9 FUSE 11KV 1A FOR VT- 195MM SAP 5242

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 10 FUSE 11KV 3A FOR VT- 195MM SAP 1381

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided with tender documentation	Required	
4	7	Catalogue to be provided with tender Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 10 FUSE 11KV 3A FOR VT- 195MM SAP 1381

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 11 FUSE 11KV EXPULSION 5A 533MM LENGTH SAP 6380

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided with tender documentation	Required	
4	7	Catalogue to be provided with tender Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 11 FUSE 11KV EXPULSION 5A 533MM LENGTH SAP 6380

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 12 FUSE 11KV EXPULSION 10A 533MM LENGTH SAP 6381

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 12 FUSE 11KV EXPULSION 10A 533MM LENGTH SAP 6381

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 13 FUSE 11KV EXPULSION 15A 533MM LENGTH SAP 5357

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 13 FUSE 11KV EXPULSION 15A 533MM LENGTH SAP 5357

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 14 FUSE 11KV EXPULSION 25A 533MM LENGTH SAP 5359

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 14 FUSE 11KV EXPULSION 25A 533MM LENGTH SAP 5359

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 15 FUSE 11KV EXPULSION 30A 533MM LENGTH SAP 5378

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 15 FUSE 11KV EXPULSION 30A 533MM LENGTH SAP 5378

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE D - TECHNICAL SCHEDULES A AND B

ITEM 16 FUSE 11KV EXPULSION 40A 533MM LENGTH SAP 6419

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with Documentation	Required	
5	7.2	Documentation	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 16 FUSE 11KV EXPULSION 40A 533MM LENGTH SAP 6419

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 17 FUSE CUT OUT ASSEMBLY 22KV SAP 6454

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 22 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided with tender documentation	Required	
4	7	Catalogue to be provided with tender Documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 17 FUSE CUT OUT ASSEMBLY 22KV SAP 6454

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 18 FUSE: 20A, 11KV, 533MM, EXPULS SAP 5358

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 11 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 18 FUSE: 20A, 11KV, 533MM, EXPULS SAP 5358

DEVIATION SCHEDULE

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

SPECIFICATION FOR MEDIUM VOLTAGE FUSES

REFERENCE REV
CP_TSSPEC_070 **6**
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TECHNICAL SCHEDULES A AND B
ITEM 19 SOLID LINK TO BE USED ON 22KV COMPLETE SAP 6462
Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_070	Description	Schedule A	Schedule B
1	N/A	System operating voltage 22 kV	Required	
2	4.2.1	Marking requirements	Required	
3	5.1	Certified copy of type test to be provided	Required	
4	7	Catalogue to be provided with documentation	Required	
5	7.2	Manufacturer's name	Required	

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

**SPECIFICATION FOR MEDIUM VOLTAGE
FUSES**

REFERENCE REV
CP_TSSPEC_070 **6**
PAGE 61 OF 62

**TECHNICAL SCHEDULES A AND B
ITEM 19 SOLID LINK TO BE USED ON 22KV COMPLETE SAP 6462
DEVIATION SCHEDULE**

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_070	Proposed deviation

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block letters Signature

Full name of company: _____

ANNEXURE E-STOCK ITEMS

Material Group: FUSES MV

Item	SAP	SAP Short Description	SAP Long Description
1	821	FUSE 11 KV 200A DIN IN AIR 442 MM WS	FUSE 11 KV 200 A DIN TYPE FOR USE IN AIR - 442 MM LONG WITH AN END CAP LENGTH OF 34 MM AND AN END CAP DIAMETER OF 45 MM WITH STRIKER CP_TSSPEC_070
2	5734	FUSE 11 KV 80A DIN IN AIR 442 MM WS	FUSE 11 KV 80 A DIN TYPE FOR USE IN AIR - 442 MM LONG WITH AN END CAP LENGTH OF 34 MM AND AN END CAP DIAMETER OF 45 MM WITH STRIKER CP_TSSPEC_070
3	5314	FUSE 11 KV 80A DIN IN AIR 292 MM WS	FUSE 11KV 80 A DIN TYPE FOR USE IN AIR - 292 MM LONG WITH AN END CAP LENGTH OF 34 MM AND AN END CAP DIAMETER OF 45 MM WITH STRIKER CP_TSSPEC_070
4	5618	FUSE 11KV 31.5 A DIN IN AIR 292 MM WS	FUSE 11KV 31.5 A DIN TYPE FOR USE IN AIR - 292 MM LONG WITH AN END CAP LENGTH OF 34 MM AND AN END CAP DIAMETER OF 45 MM WITH STRIKER CP_TSSPEC_070
5	7131	FUSE 11KV 80 A IN AIR/OIL- 359MM WS	FUSE 11KV 80 A FOR USE IN AIR/OIL- 359MM LONG WITH AN END CAP DIAMETER OF 68 MM WITH STRIKER CP_TSSPEC_070
6	5238	FUSE 11KV 31.5 A IN AIR/OIL- 359MM WS	FUSE 11KV 31.5 A FOR USE IN AIR/OIL- 359MM LONG WITH AN END CAP DIAMETER OF 68 MM WITH STRIKER CP_TSSPEC_070
7	5617	FUSE 11KV 80 A IN AIR/OIL- 254MM WS	FUSE 11KV 80 A FOR USE IN AIR/OIL- 254MM LONG WITH AN END CAP DIAMETER OF 68 MM WITH STRIKER CP_TSSPEC_070
8	5403	FUSE 11KV 31.5 A IN AIR/OIL- 254MM WS	FUSE 11KV FOR USE IN AIR/OIL- 31.5 A 254MM LONG WITH AN END CAP DIAMETER OF 68 MM WITH STRIKER CP_TSSPEC_070
9	5242	FUSE 11KV 1A FOR VT- 195MM	FUSE 11KV FOR USE IN VT-1A 195MM LONG WITH AN END CAP DIAMETER OF 20 MM NO STRIKER CP_TSSPEC_070
10	1381	FUSE 11KV 3A FOR VT- 195MM	FUSE 11KV FOR USE IN VT-3A 195MM LONG WITH AN END CAP DIAMETER OF 20 MM NO STRIKER CP_TSSPEC_070
11	6380	FUSE 11KV EXPULSION 5A 533MM LENGTH	FUSE 11KV EXPULSION 5A 533MM LENGTH CP_TSSPEC_070
12	6381	FUSE 11KV EXPULSION 10A 533MM LENGTH	FUSE 11KV EXPULSION 10A 533MM LENGTH CP_TSSPEC_070
13	5357	FUSE 11KV EXPULSION 15A 533MM LENGTH	FUSE 11KV EXPULSION 15A 533MM LENGTH CP_TSSPEC_070
14	5359	FUSE 11KV EXPULSION 25A 533MM LENGTH	FUSE 11KV EXPULSION 25A 533MM LENGTH CP_TSSPEC_070
15	5378	FUSE 11KV EXPULSION 30A 533MM LENGTH	FUSE 11KV EXPULSION 30A 533MM LENGTH CP_TSSPEC_070
16	6419	FUSE 11KV EXPULSION 40A 533MM LENGTH	FUSE 11KV EXPULSION 40A 533MM LENGTH CP_TSSPEC_070
17	6454	FUSE CUT OUT ASSEMBLY 22KV	FUSE CUT OUT ASSEMBLY 22KV COMPLETE CP_TSSPEC_070
18	5358	FUSE:20A,11KV,533MM,EXPULS	FUSE:20A,11KV,533MM,EXPULS
19	6462	SOLID LINK	SOLID LINK TO BE USED ON 22KV COMPLETE CP_TSSPEC_070