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FOREWORD

This specification was prepared by the following Work Group members:

Zolani Ngqwala	Innovative hub

The Work Group was appointed by the Distribution Study Committee, which, at the time of approval,

Nolubabalo Makana	Metering
Masape Mokgadi Kahumba	Metering
Gavin Jardine	Planning
David Makoni	SDC
Hilda Nonkonyana	Planning
Thabiso Letaoana	Logistics & Warehouse
Mpho Molope	Logistics & Warehouse
Patrick Radebe	Public Light
Tiro Mokgosi	Quality Management

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

Innovation Hub
Senior Manager
City Power Johannesburg (SOC) Ltd
P O Box 38766
Booysens
2016

INTRODUCTION

The reliability of 11kV metal-enclosed ring main units can affect the overall quality of supply requirements of SANS 1816. To ensure that City Power's customers experience minimal power outages and planned interruptions for maintenance, ring main units offering the advantages of maintenance-free technology, as well as increased operator and public safety, and complying with SANS 1874, shall be purchased.

1 SCOPE

This specification covers City Power's requirements for free-standing 11kV metal-enclosed ring main units complying with SANS 1874.

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 1874, *Switchgear – metal-enclosed ring main units for rated A.C. voltages above*

1 kV and up to and including 24 kV.

SANS 876, *Cable terminations and live conductors within air insulated enclosures*

SANS 61243-5, *Live working – Voltage detectors. Part 5 – Voltage detecting systems (VDS).*

SANS 61598, *High-voltage prefabricated switchgear and control gear assemblies – Voltage presence indicating systems.*

SANS 1091 *National colour standard.*

SANS 1339*, Electric Cables-Cross linked polyethylene (XLPE) insulated cables for rated voltages 3.8/6.6 to 19/33 KV.*

SANS 1816 Electric Supply Quality of Supply

CP_TSSPEC_027, *Specification for concrete plinths for use with miniature substations and free-standing ring main units*

CP_TSSPEC_040, *Specification for Earth Fault Indicator*

CP_TSSPEC_260*, Specification, for access control and monitoring of protective enclosures*

3 DEFINITIONS AND ABBREVIATIONS

The definitions and abbreviations shall apply to the specification from the normative reference.

4 REQUIREMENTS

4.1 General

4.1.1 Nothing in this specification shall lessen the obligations of the supplier. The supplier shall be fully responsible for the design and satisfactory performance in service on the unit. Approval by City Power shall not relieve the supplier of the responsibility for the adequacy of the design.

4.1.2 This specification covers the requirements for free-standing 11 kV metal-enclosed ring main units to be used in City Power's distribution networks. The ring main units shall be manufactured in accordance with SANS 1874. The specific requirements for ring main units are specified below. Where conflicting requirements with SANS 1874 occur, this specification shall take precedence.

4.1.3 All ring main units shall comply with the requirements of SANS 1874.

4.1.4 All ring main units shall be either SF_6 or SF_6 Free insulated and sealed for a service life of 30 years. No oil insulated ring main units shall be considered.

4.2 Ratings

The rated voltage of the ring main unit shall be 12kV.

4.3 Design and construction

Both indoor and outdoor designed ring main units are required.

4.4 Extensibility

Non-extensible ring main units are required.

4.5 Configuration

The configuration of ring main units shall be as per table 1 below.

Note: Fuses shall not be accepted under any circumstances

Configuration
3SD
4SD
2SD & CB
3SD & CB
2SD & 2CB

Table 1 – Ring main unit configurations

4.6 Cable testing facility

4.6.1 Integral cable testing facilities that are independent of the cable boxes and accessible from the front of the ring main unit shall be provided. Ring main units in which all functions shall have cable test facilities are preferred.

4.6.2 All earthing copper bars shall be enclosed with separate metal covers, and they shall be secured to the ring main unit with a bracket or earth braid, to prevent the theft of these earthing bars.

4.6.3 The metal covers in 4.6.2 shall be independently interlocked with the earth switch of the switching device that the cable test is being performed on.

4.6.4 For operator safety, the cable testing procedures shall be visible displayed on the front and inside of the cable testing facility covers.

4.6.5 The procedure for apply testing leads, while main earth is still applied, shall be supplied.

4.7 Switch disconnectors

4.7.1 The rated current of all switch disconnectors shall be 630A.

4.7.2 The insulating medium shall be SF_6 or SF_6 Free.

4.7.3 The interrupting medium shall be SF_6 Free.

Note: Due to a commitment for City Power to migrate and continue to be a cleaner environment to its stakeholders (City of Johannesburg), the manufacture shall be required within 1 year after award to test and comply to the new SF6 free RMU.

4.8 Circuit Breakers for tee-offs

4.8.1 The rated current of the circuit breaker shall be 200A or 630A as specified. Note 630A units are for special applications.

4.8.2 The insulating medium shall be SF_6 or SF_6 Free.

4.8.3 The interrupting medium shall be either SF_6 Free or vacuum.

Note: Due to a commitment for City Power to migrate and continue to be a cleaner environment to its stakeholders (City of Johannesburg), the manufacture shall be required within 1 year after award to test and comply to the new SF_6 free RMU.

4.9 Protection

4.9.1 The protection tripping of the circuit breaker shall be through a self-powered protection relay. The protection relay shall be visible from the front of the ring main unit but shall have a clear cover to prevent settings from being changed.

4.9.2 Current sensor technology around the circuit breaker function Type C bushing is preferred. Where low voltage current transformers are provided in the cable box, an additional 200mm raising plinth is required to the cable height, to allow for the extended screened XLPE terminations. This is additional to the existing 800mm as per SANS 876.

4.9.3 The protection relay shall provide an over-current function with normal inverse, very inverse and extremely inverse protection elements. The over-current pick-up setting range shall be selectable from 50 % to 200 % of the nominal relay rating in a step size not greater than 10 %.

4.9.4 An earth-fault function shall be provided with:

a) normal inverse, very inverse and extremely inverse protection elements that have a pick-up setting range that is selectable from 5 % to 80 % of the nominal relay rating in a step size not greater than 5 %; and

b) a definite time protection element with a selectable time delay from 0 s to 5 s in a 0,05 s step size. The pick-up setting range shall be selectable from 5 % to 80 % of the nominal relay rating in a step size not greater than 5 %.

4.9.5 A portable hand held tester shall be provided to test the protection relay and associated tripping systems, which electrically simulates short circuit and zero sequence fault currents.

4.10 Scada system

A provision of scada monitoring sensors/devices in a ring main unit shall be required to monitor and inform the controller of the status of the equipmets within the unit.

4.11 Earth Fault Indication

Each outdoor RMU shall be supplied with a factory installed single battery-powered earth fault indicator (EFI) with remote indication in accordance with CP_TSSPEC_040. The onus is on the manufacturer to supply EFIs in accordance with this specification, and the documentation required in terms of CP_TSSPEC_040 (including the technical schedules) shall also be supplied with any RMU tender

4.12 Monitoring and control facilities

4.12.1 The hard-wired monitoring and control facilities detailed in Table 2 below shall be provided for all configurations of RMUs specified.

Device	Monitoring requirement	Interface requirements
All switch disconnect or devices (SD) and circuit breaker devices (CB)	SD/CB opened or closed status, double-bit per device.	An independent, galvanically isolated set of both 'a' and 'b' auxiliary contacts per MV switching device shall be provided.

Table 2 – Monitoring and control facilities

4.13 Busbar insulation

Busbars shall be SF_6 or SF_6 Free insulated

Note: Oil insulation shall not be accepted.

4.14 Cable boxes and terminations

4.14.1 All ring main units shall have air-filled internal arc vented cable boxes with interlocked front covers.

Note: For safety reasons, interlocks as detailed above are required such that the cable box covers can only be removed when the associated function is in the earth position.

4.14.2 Type 4 cable termination requirements are required in accordance with SANS 876.

4.14.3 The cable box shall be suitable for terminating 1 x 185 mm^2 3-core Copper or 300 mm^2 3-core XLPE Alluminium cable in accordance with SANS 1339.

4.14.4 The design of the cable box shall comply in all respects with the requirements of SANS 876.

4.15 Bushing and separable connectors

4.15.1 Type C bushings (with an M16 × 2 thread) in accordance with clause 4.7.4.2 of SANS 1874 shall be provided for all switching devices. No reducing studs shall be provided; however, each bushing shall be supplied with a suitable 35 mm M16 bolt of either brass or grade 304 (or better) stainless steel. All associated normal and spring washers shall be supplied.

4.15.2 The documentation accompanying the ring main unit shall specify the correct torque of the M16 bolt referred to in clause 4.12.1 above, in order to avoid over- or under-tightening of the bolt.

4.15.3 All cable termination bushings shall be located on the same horizontal line.

4.15.4 The minimum clearance dimensions shall be in accordance with SANS 876.

4.16 Cable clamps

Adjustable 3-core cable clamps complying with clause 4.3.1.11 of SANS 876 shall be provided for each of the SD and CB switching devices of the ring main unit.

4.17 Earthing

4.17.1 The maximum earth fault current shall be 20 kA for 1 second.

4.17.2 All earthing connections shall be provided with M12 nuts and bolts.

4.18 Live circuit-indication

4.18.1 A voltage detection system (VDS) in accordance with SANS 61243-5 shall be provided.

4.18.2 If required, suitable testing equipment shall be supplied.

4.19 Accessibility

4.19.1 To ensure operator safety, only front accessibility is permitted, in accordance with 4.2.1.4 of SANS 1874. Access to the side and rear of ring main units is not permitted due to the internal arc requirements of the ring main unit.

4.19.2 A 400 mm extended operating lever shall be provided with every ring main unit.

4.20 Mimic diagrams

In order to provide increased operator safety and minimise the chance of error, all ring main units shall be supplied with mimic indication on the front panel.

4.21 Raising plinths

4.21.1 Where free-standing RMUs are to be installed indoors, in addition to the standard cable boxes provided, a 300 mm high mild steel raising plinth is required to allow retrofitting in existing installations and adequate bending radius of medium voltage cables.

4.21.2 The metal raising plinth dimensions shall comply with the ring main unit foot print dimensions.

4.21.3 M12 mounting bolts and nuts shall be provided to bolt the ring main unit to the metal raising plinth. The plinth shall be supplied already bolted to the RMU (i.e. as one unit).

4.21.4 The metal raising plinth shall have a removable front panel for cable termination preparation.

4.21.5 The metal raising plinth shall be black in colour.

4.21.6 Provision shall be made to bolt the raising plinth to a concrete floor.

4.22 Concrete Plinths

4.22.1 The kiosks shall fit the relevant plinths described in CP_TSSPEC_027. Item 4 of CP_TSSPEC_027 is the plinth required for the 3 way RMU and Item 5 is the plinth for the 4 way RMU.

4.22.2 Concrete plinths shall be purchased separately from plinth suppliers

4.23 Kiosk

4.23.1 Three and four way kiosks shall be supplied if the ring main unit is to be installed outdoors.

4.23.2 The kiosk shall be made from mild-steel which is 6 mm thick and shall be manufactured from 3CR12 stainless steel, coated with anticorrosive material and painted Avocado (C12 of SANS 1091) in colour.

4.23.3 Where outdoor ring main units are required, the RMU shall be supplied with the kiosk i.e. the RMU shall be fitted by the manufacturer into the kiosk, and the assembly shall be supplied as one unit.

4.23.4 Lifting lugs shall be attached to the metal plinth of the kiosk. The lugs shall be designed to lift the kiosk with the ring main unit fitted inside.

4.23.5 Sign depicting “Treatment and Full First Aid Instructions” shall be permanently attached to the inside of the door that opens first. The concrete base shall be lifted separately.

4.23.6 External Chromadek electrical symbolic warning signs (warning-flash) with the words “No Unauthorized Entry Allowed” (in English, Afrikaans and Zulu) shall be permanently attached to all the doors. If pop-rivets are used to attach the signs to the kiosk doors, only aircraft pop-rivets will be acceptable. Normal pop-rivets are not acceptable.

4.23.7 The kiosk doors shall be fitted with a facility to enable them to be held open at an angle of at least 90°, to allow operation under windy conditions. The facility shall be robust to withstand the force of wind and weather under adverse conditions.

4.23.8 The kiosk and RMU shall be tested as an assembly in accordance with the requirements of clause 6 of this specification.

4.23.9 The kiosk shall have an IP 54 rating**.**

4.23.10 The enclosure shall make provision to accommodate the following:

4.23.11 The enclosure shall fit on the concrete plinth as per specification CP_TSSPEC_027.

4.24 Locking System

4.24.1 All doors shall be flush with the body of the ring main unit and the stainless steel door hinges shall be the concealed type. A door stop shall be provided to prevent the door from swinging. The door stop shall be strong enough to withstand the forces that might arise from wind on the open door.

4.24.2 Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm.

4.24.3 The three point locking mechanism on each door shall have an additional captive, 10mm allen cap screw, as per clause 4.14.5 and 4.14.6, of SANS 1874

4.24.4 Compartment lock protection facility (with welded mesh top with inside visibility)

5 MARKING, LABELING AND PACKAGING

Marking, labelling and packaging shall comply with the requirements of SANS 1874. In addition to the requirements of SANS 1874, the City Power SAP number and configuration (e.g. SAP 1690, 4SD) shall be marked on the right-hand side (when facing the front) of the ring main unit or ring main unit assembly/kiosk. The characters shall be black and not less than 50 mm in height.

6 TESTS

6.1.1 Testing shall comply with the type and routine tests requirements of clause 5 of SANS 1874, except as detailed in clause 6.1.2 below.

6.1.2 The internal arc requirements of SANS 1874 are hereby increased to 20 kA for 500 ms. The type tests showing compliance with this requirement must demonstrate compliance for all air-filled and gas-filled enclosures.

Note: The required IA classification for the indoor free-standing RMU is AFLR, as the RMU itself will be used within chambers. In the case of outdoor RMUs i.e. those supplied in kiosks, the required IA classification for the kiosk/RMU assembly is AF- BFLR, since the kiosk will be placed in locations accessible to members of the public.

6.1.3 The supplier shall prove the ability of the switchgear to pass the required type tests by supplying a summary of test certificates that have been issued by a laboratory accredited by a full member (MRA signatory) of ILAC (International Laboratory Accreditation Cooperation). Full details of the accrediting body as well as proof of such accreditation shall be supplied. If so, requested by City Power, copies of the full type test reports in addition to the summary shall be provided.

6.2 Routine Test

6.2.1 Routine Test shall be carried out in accordance with clause 5 of SANS 1874.

6.3 Type Test

6.3.1 Carry out type tests on the ring main unit in accordance with clause 5 of SANS 1874.

6.3.2 The type test report shall clearly identify the ring main unit and accessories in accordance with clause 5 of SANS 1874.

6.4 Factory Acceptance Test (FAT)

6.4.1 Factory Acceptance Test (FAT) shall be carried out as per SANS 1874, with the presence of City Power Personnel before the ring main unit is released from the manufacturer.

6.5 Site Acceptance Test (SAT)

6.5.1 On-site tests after installation shall be carried out as per clause 5 of SANS 1874.

7 DOCUMENTATION

7.1 Technical product catalogue and operating and installation manuals shall be provided.

7.2 Full detailed dimensions drawings of the ring main units, raising plinths and kiosks shall be provided.
7.3 Full detailed electrical circuit diagrams.
7.4 A certified copy of type test report shall be provided.
7.5 A certified copy of proposed factory routine test report shall be provided.
7.6 The ring main unit shall not be accepted unless the following with every unit is provided;

a) Factory routine test report,

b) Installation manual and

c) Operating manual.

7.7 Details of the training course(s) detailed in clause 8. Below,as well a plan of implementation, shall be provided.

8 TRAINING

8.1 The following certified training courses shall be offered for City Power's staff.

a) Operating,

b) Installation,

c) Network planning, and

d) Protection relays.

The associated costs for the certified training courses in 8.1 shall be given per person and shall be fixed for the period of the contract. In addition, full details of the course and an implementation

9 QUALITY MANAGEMENT

A quality management system shall be set up to assure the proper quality management of the Free standing 11KV ring main unit during design, development, production, installation and servicing phases. Guidance on the requirements for a quality management plan may be found in the ISO 9001:2015. The details shall be subject to agreement between City Power and the Supplier.

10 ENVIRONMENTAL MANAGEMENT

An environmental management system shall be set up to assure the proper environmental management of the Free standing 11KV ring main unit 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 may 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

11 HEALTH AND SAFETY

A health and safety systems shall be set up in order to ensure proper management of Free standing 11KV ring main unit and compliance of the queuing system during installation, operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety plan may 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.

Annex A - Bibliography

SCSSCABC0 rev 0, Eskom specification for free-standing metal-enclosed for 11 kV and 22 kV ring main units.

CP_TSSPEC_006, Specification for 11 kV metal-enclosed ring main units for Type B miniature substations

Annex B - Revision information

DATE	REV. NO.	NOTES
Dec 2002	0	First issue.
June 2006	1	Second issue General editing Update of format Revision of Annex D – Stock Items Clarification of constructional requirements Clarification of Protection and SCADA requirements Increased constructional requirements in line with SANS 876 Inclusion of Type 3 and 4 terminations and removal of Type 2 Increase of earth fault level to 13,1 kA Clarification of IAC rating Increase of internal arc requirements to 20 kA for 500 ms Training plan detail requirement included Increased service life from 25 to 30 years Annex C amended in accordance with SANS 1874 Included reference to SANS 61243-5 and 61958 for VDS and VPIS Include requirement of mimic diagrams Inclusion of raising plinth for indoor RMUs IA classification included as per SANS 62271-200 Clarification of test authority accreditation requirements Reference to CP_TSSPEC_027 included Provision of concrete plinths included Reference to CP_TSSPEC_040 included Provision of earth fault indicator included Kiosk IP rating increased to 54 Reference to SANS 1091 included Inclusion of marking requirements

Feb 2010	2	Third issue Requirements of SF6 Resin insulation Item added on 4.5 Cable test facilities requirements Torque value for earthing terminal to be specified Procedure to apply earthing leads Protection relay positioning LV CB raising plinths required Deleted most of section 4.9 concerning protection Added the 300mm^2 3 core XLPE Deleted the VPIS requirements Specified the material of the kiosk Specified the concrete plinth is not to be provided with the RMU Change the Minimum distance from top of cable clamp to bushing centre to 800mm Specified that the housing should be made from mild steel not stainless steel
FEB 2018	3	Manual locking system has changed to Motorised system. exclusion of Type 3 terminations NRS changed to SANS Added SF6 free RMU. Added new Work Group 4.9. Protection, added as a new heading 4.21. Locking System, added as a new heading
JULY 2024	4	General editing. Added new workgroup commette Three point locking mechanisim, cap screw and padlock locking system reinstated 4.10 Included provision for Scada system Electronic locking system removed Resin changed to SF6 Free

Annex C - Technical schedules A and B – Indoor Ring Main Units 3SD

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnections	A	630	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		3SD	
2.5	4.6	Type of cable testing facility offered		State	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnections		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnections		SF_6 Free	

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

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

Full name of company: _____

Annex C - Technical schedules A and B – Indoor Ring Main Units 4SD

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
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1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	6.	Internal arc classification		A-FLR	
1.7	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		4SD	
2.5	4.6	Type of cable testing facility offered		State	
2.6	4.10	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
F					

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Annex C -Technical schedules A and B –Indoor Ring Main Units 2SD & CB

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Schedule B: Guarantees and technical particulars of equipment offered

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1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		2SD & CB	
2.5	4.6	Type of cable testing facility offered		State	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	

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Annex C - Technical schedules A and B – Indoor Ring Main Units 3SD & CB

Schedule A: Purchaser's specific requirements
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2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		3SD & CB	
2.5	4.6	Type of cable testing facility offered		State	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	

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Annex C - Technical schedules A and B – Indoor Ring Main Units 2SD & 2CB

Schedule A: Purchaser's specific requirements
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Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
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1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
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1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		2SD & 2 CB	
2.5	4.6	Type of cable testing facility offered		State	
2.6	4.10	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

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Name in block letters Signature

Full name of company: _____

Annex C - Technical schedules A and B – Indoor Ring Main Units 1SD & 2CB

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		1SD & 2 CB	
2.5	4.6	Type of cable testing facility offered		State in schedule B	
2.6	4.10	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
2		**Construction (continued)**		**XXXX**	**XXXX**
2.11	4.22	Is a kiosk required	No	No	
2.12	4.22.2	Colour of kiosk		State in B	
2.13		Recommended types of tools to install and maintain unit		State in B	
2.14		Method used to attach rating plates		State in B	
2.15		Method used to attach labels		Required	
2.16	4.20	Is a raising plinth required for indoor RMUs?	No	No	
2.17		Is the RMU required for a corrosive or non-corrosive environment?		Corrosive	
2.18	4.10	Is earth fault indication required?	Yes	Yes	
2.19	4.10	Does EFI comply with the requirements of CP_TSSPEC_040?	Yes	Yes	
2.20		List of recommended spares attached	Yes	Yes	
2.21		Are remote tripping and closing required?	Yes	Yes	
2.22		Provision for future automation		Required	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
3		**Switch description**		**XXXX**	**XXXX**
3.1		Manufacturer's designation of RMU		Required	
3.2		Type of SF_6 ring main unit		Required	
		a) Manufacturer		Required	
		b) Country of manufacture		Required	
4		**Design**		**XXXX**	**XXXX**
4.1	4.1.3	Ring main units designed and constructed in accordance with SANS 1874		Required	
4.2		Provision of facilities for lifting or slinging		Required	
4.3		Type of provision for lifting and slinging		State in B	
4.4		Provision of SF_6 pressure gauge		Required	
4.5		SF_6 pressure gauge visible from the operating side of RMU (front of RMU)		Required	
4.6		Quantity of SF_6		Required	
4.7	4.12	Is a cable box required?	Yes	Yes	
4.8	4.12.1	Compound-filled or air-filled cable box		Air-filled	
4.9	4.16	Are VDS required for all circuits?	Yes	Yes	
4.10		Type of system offered		Required	
5		**Earthing**		**XXXX**	**XXXX**
5.1	4.15.1	Maximum earth fault current	kA	13,1	
5.2		Current density (maximum)	A/m	200	
5.3	4.15.2	Provision of reliable earthing terminal for each metal enclosure/tank (compatible with M12 lug-hole)		Required	
5.4		Each earth terminal to be indelibly marked		Required	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
6		**Cable termination requirements – ring main unit**		**XXXX**	**XXXX**
6.1		Incoming MV cable requirements:			
6.2	4.12.3	a) $1 \times 300mm^2$ 3 core XLPE Aluminium		Required	
6.3	4.14	b) Cable support (clamping) required		Required	
6.4	4.13.4	c) Minimum distance from top of cable clamp to bushing centres	mm	800	
6.5	4.12.2	d) Type of termination		screened	
6.6	4.12.4	Clearance requirements		As per SANS 876	
6.7	4.13.1	Are only Type C (630 A) bushings required?	Yes	Yes	
6.8	4.13.3	Bushings to be horizontally positioned		Required	
6.9	4.13.4	Bushing-centre spacing (minimum)	mm	105	
6.10	4.13.4	Distance between outer bushing-centres and earthed metal enclosure (minimum)	mm	55	
6.11		Provision for earthing of cables		Required	
6.12		Are the accessories for cable termination to be supplied by the RMU supplier?	No	No	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
7		**Materials and corrosion protection**		**XXXX**	**XXXX**
7.1	4.20.2	RMU material		3CR12	
7.2		Copper earth busbar		Required	
7.3		Final colour		Avocado Green	
8	5	**Marking and labelling**		**XXXX**	**XXXX**
8.1		Method of attachment of labels		Required	
8.2		Main circuit designation labels		Required	
8.3		RMU rating plate		Required	
8.4		ON, OFF and EARTH position labels		Required	
8.5		Additional marking system (i.e. mimics)		Required	
8.6		Instruction plates		Required	
9	**7**	**Documentation**		**XXXX**	**XXXX**
9.1	7.4	Type test certificates	Sets	1	
9.2	7.5	Proposed routine test certificates	Sets	1	
9.3	7.2	Drawings	Sets	2	
9.4	7.3	Circuit diagrams	Sets	2	
9.5	7.1	Installation, operating and maintenance instructions	Sets	2	
9.6		Details of special tools required	Sets	2	
9.7		Detailed spare-parts list provided	Sets	2	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description	Schedule A	Schedule B
10	**4.9**	**Protection**	**XXXX**	**XXXX**
10.1	4.91	Make of protection relay offered	State in B	
10.2		Model of protection relay offered	State in B	
10.3	4.9.3	Details of over current protection function	Required	
10.4	4.9.4	Details of earth fault protection function	Required	
10.5	4.9.2	Details of protection class current transformers	Required	
10.6	4.9.2	Details of metering class current transformers	Required	
10.6	4.9.2	Details of metering class current transformers	Required	

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Technical schedules A and B (Indoor Ring Main Units)

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_039**	**Proposed deviation**

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Annex C - Technical schedules A and B – Indoor Ring Main Units 3SD SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnections	A	630	
1.6	6.	Internal arc classification		A-FLR	
1.7	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		3SD	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnections		SF_6 Free	
2.8	4.7.3	Interrupting medium of switch disconnections		SF_6 Free	

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Annex C - Technical schedules A and B – Indoor Ring Main Units 4SD SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		4SD	
2.5	4.6	Type of cable testing facility offered		XXXX	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.8	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	

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Annex C -Technical schedules A and B –Indoor Ring Main Units 2SD &CB SF6 FREE

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		2SD & CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	

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Annex C - Technical schedules A and B – Indoor Ring Main Units 3SD & CB SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		3SD & CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	

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Annex C - Technical schedules A and B – Indoor Ring Main Units 2SD & 2CB SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		2SD & 2 CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	

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Annex C - Technical schedules A and B – Indoor Ring Main Units 1SD & 2CB SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		A-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Indoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		SD & 2 CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
2		**Construction (continued)**		**XXXX**	**XXXX**
2.11	4.22	Is a kiosk required	No	No	
2.12	4.20.2	Colour of kiosk		Avocado Green	XXXX
2.13		Recommended types of tools to install and maintain unit		State in B	
2.14		Method used to attach rating plates		State in B	
2.15		Method used to attach labels		Required	
2.16	4.20	Is a raising plinth required for indoor RMUs?	No	No	
2.17		Is the RMU required for a corrosive or non-corrosive environment?		Corrosive	
2.18	4.10	Is earth fault indication required?	Yes	Yes	
2.19	4.10	Does EFI comply with the requirements of CP_TSSPEC_040?	Yes	Yes	
2.20		List of recommended spares attached	Yes	Yes	
2.21	4.8	Are remote tripping and closing required?	Yes	Yes	
2.22		Provision for future automation		Required	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
3		**Switch description**		**XXXX**	**XXXX**
3.1		Manufacturer's designation of RMU		State in B	
3.2		Type of SF6 Free ring main unit		State in B	
		a) Manufacturer		State in B	
		b) Country of manufacture		State in B	
4		**Design**		**XXXX**	**XXXX**
4.1	4.1.3	Ring main units designed and constructed in accordance with SANS 1874		Required	
4.2		Provision of facilities for lifting or slinging		Required	
4.3		Type of provision for lifting and slinging		Required	
4.7	4.12	Is a cable box required?	Yes	Yes	
4.8	4.12.1	Compound-filled or air-filled cable box		Air-filled	
4.9	4.16	Are VDS required for all circuits?	Yes	Yes	
4.10		Type of system offered		Required	
5		**Earthing**		**XXXX**	**XXXX**
5.1	4.15.1	Maximum earth fault current	kA	13,1	
5.2		Current density (maximum)	A/m	200	
5.3	4.15.2	Provision of reliable earthing terminal for each metal enclosure/tank (compatible with M12 lug-hole)		Required	
5.4		Each earth terminal to be indelibly marked		Required	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
6		**Cable termination requirements – ring main unit**		**XXXX**	**XXXX**
6.1		Incoming MV cable requirements:		XXXX	
6.2	4.12.3	a) $1 \times 300mm^2$ 3 core XLPE Aluminium		Required	
6.3	4.14	b) Cable support (clamping) required		Required	
6.4	4.13.4	c) Minimum distance from top of cable clamp to bushing centres	mm	800	
6.5	4.12.2	d) Type of termination		screened	
6.6	4.12.4	Clearance requirements		As per SANS 876	
6.7	4.13.1	Are only Type C (630 A) bushings required?	Yes	Yes	
6.8	4.13.3	Bushings to be horizontally positioned		Required	
6.9	4.13.4	Bushing-centre spacing (minimum)	mm	105	
6.10	4.13.4	Distance between outer bushing-centres and earthed metal enclosure (minimum)	mm	55	
6.11	4.15	Provision for earthing of cables		Required	
6.12		Are the accessories for cable termination to be supplied by the RMU supplier?	Yes	No	

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

Tenderer's Authorised Signatory: _____
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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
7		**Materials and corrosion protection**		**XXXX**	**XXXX**
7.1	4.20.2	RMU material		3CR12	
7.2	4.11	Copper earth busbar		Required	
7.3	4.20.2	Final colour		Avocado	
8	**5**	**Marking and labelling**		**XXXX**	**XXXX**
8.1		Method of attachment of labels		Required	
8.2		Main circuit designation labels		Required	
8.3		RMU rating plate		Required	
8.4		ON, OFF and EARTH position labels		Required	
8.5		Additional marking system (i.e. mimics)		Required	
8.6		Instruction plates		Required	
9		**Documentation**		**XXXX**	**XXXX**
9.1	7.4	Type test certificates	Sets	1	
9.2	7.5	Proposed routine test certificates	Sets	1	
9.3	7.2	Drawings	Sets	2	
9.4	7.3	Circuit diagrams	Sets	2	
9.5	7.1	Installation, operating and maintenance instructions	Sets	2	
9.6		Details of special tools required	Sets	2	
9.7		Detailed spare-parts list provided	Sets	2	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description	Schedule A	Schedule B
10	**4.9**	**Protection**	**XXXX**	**XXXX**
10.1		Make of protection relay offered	State in B	
10.2		Model of protection relay offered	State in B	
10.3	4.9.3	Details of over current protection function	Required	
10.4	4.9.4	Details of earth fault protection function	Required	
10.5	4.9.2	Details of protection class current transformers	Required	
10.6	4.9.2	Details of metering class current transformers	Required	

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

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Technical schedules A and B
(Indoor Ring Main Units SF6 Free)

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_039**	**Proposed deviation**

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Annex C - Technical schedules A and B – Outdoor Ring Main Units 3SD

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		Required	
2.4	4.5	Configuration		3SD	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

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

Full name of company: _____

Annex C - Technical schedules A and B – Outdoor Ring Main Units 4SD

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		4SD	
2.5	4.6	Type of cable testing facility offered		State in B	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Tender Number: _____

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Name in block letters Signature

Full name of company: _____

Annex C - Technical schedules A and B – Outdoor Ring Main Units 2SD &CB

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		Required	
2.4	4.5	Configuration		2SD & CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Full name of company: _____

Annex C - Technical schedules A and B – Outdoor Ring Main Units 3SD & CB

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		3SD & CB	
2.5	4.6	Type of cable testing facility offered		State in B	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Annex C - Technical schedules A and B – Outdoor Ring Main Units 2SD & 2CB

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		2SD & 2 CB	
2.5	4.6	Type of cable testing facility offered		State in B	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Annex C - Technical schedules A and B – Outdoor Ring Main Units 1SD & 2CB

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		1SD & 2 CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
2		**Construction (continued)**		**XXXX**	**XXXX**
2.11	4.22	Is a kiosk required	Yes	Yes	
2.12	4.22.2	Colour of kiosk		Avocado (C12)	
2.13		Recommended types of tools to install and maintain unit		Required	
2.14		Method used to attach rating plates		Required	
2.15		Method used to attach labels		Required	
2.16	4.20	Is a raising plinth required for outdoor RMUs?	No	No	
2.17	4.21	Is a concrete plinth complying with CP_TSSPEC_027 required for outdoor RMUs?	Yes	Yes	
2.18		Is the RMU required for a corrosive or non-corrosive environment?		Corrosive	
2.19	4.10	Is earth fault indication required?	Yes	Yes	
2.20	4.10	Does EFI comply with the requirements of CP_TSSPEC_040?	Yes	Yes	
2.21		List of recommended spares attached	Yes	Yes	
2.22		Are remote tripping and closing required?	Yes	Yes	
2.23	4.11.1	Details of preferred auxiliary supply:		State in B	XXXX
2.24		a) Voltage	Vdc	12 – 48	
2.25		b) Current	mA	0 – 10	
2.26		Provision for future automation		Required	
2.27					

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
3		**Switch description**		**XXXX**	**XXXX**
3.1		Manufacturer's designation of RMU		State in B	
3.2		Type of insulation ring main unit		State in B	
		a) Manufacturer		State in B	
		b) Country of manufacture		State in B	
4		**Design**		**XXXX**	**XXXX**
4.1	4.1.3	Ring main units designed and constructed in accordance with SANS 1874		Required	
4.2		Provision of facilities for lifting or slinging		Required	
4.3		Type of provision for lifting and slinging		Required	
4.4		Provision of SF_6 pressure gauge		Required	
4.5		SF_6 pressure gauge visible from the operating side of RMU (front of RMU)		Required	
4.6		Quantity of SF_6		State in B	
4.7	4.12	Is a cable box required?	Yes	Yes	
4.8	4.12.1	Compound-filled or air-filled cable box		Air-filled	
4.9	4.16.1	Are VDS required for all circuits?	Yes	Yes	
4.10	4.16	Type of system offered		Required	
5		**Earthing**		**XXXX**	**XXXX**
5.1	4.15.1	Maximum earth fault current	kA	13,1	
5.2		Current density (maximum)	A/m	200	
5.3	4.15.2	Provision of reliable earthing terminal for each metal enclosure/tank (compatible with M12 lug-hole)		Required	
5.4		Each earth terminal to be indelibly marked		Required	

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Full name of company: _____

Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
6		**Cable termination requirements – ring main unit**		**XXXX**	**XXXX**
6.1		Incoming MV cable requirements:		XXXX	
6.2	4.12.3	a) 1×300 mm^2 3 core XLPE AL		Required	
6.3	4.14	b) Cable support (clamping) required		Required	
6.4	4.13.4	c) Minimum distance from top of cable clamp to bushing centres	mm	800	
6.5	4.12.2	d) Type of termination		Required-Screened	
6.6	4.12.4	Clearance requirements		As per SANS 876	
6.7	4.13.1	Are only Type C (630 A) bushings required?	Yes	Yes	
6.8	4.13.3	Bushings to be horizontally positioned		Required	
6.9	4.13.4	Bushing-centre spacing (minimum)	mm	105	
6.10	4.13.4	Distance between outer bushing-centres and earthed metal enclosure (minimum)	mm	55	
6.11	4.15	Provision for earthing of cables		Required	
6.12		Are the accessories for cable termination to be supplied by the RMU supplier?	No	No	

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

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Name in block letters Signature

Full name of company: _____

Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
7		**Materials and corrosion protection**		**XXXX**	**XXXX**
7.1	4.20	RMU material		3CR12	
7.2		Copper earth busbar		Required	
7.3	4.20	Final colour		Avocdo	
8	**5**	**Marking and labelling**		**XXXX**	**XXXX**
8.1		Method of attachment of labels		Required	
8.2		Main circuit designation labels		Required	
8.3		RMU rating plate		Required	
8.4		ON, OFF and EARTH position labels		Required	
8.5		Additional marking system (i.e. mimics)		Required	
8.6		Instruction plates		Required	
9	**7**	**Documentation**		**XXXX**	**XXXX**
9.1	7.4	Type test certificates	Sets	1	
9.2	7.5	Routine test certificates	Sets	1	
9.3	7.2	Drawings	Sets	2	
9.4	7.3	Circuit diagrams	Sets	2	
9.5	7.1	Installation, operating and maintenance instructions	Sets	2	
9.6		Details of special tools required	Sets	2	
9.7		Detailed spare-parts list provided	Sets	2	

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Full name of company: _____

Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description	Schedule A	Schedule B
10	**4.9**	**Protection**	**XXXX**	**XXXX**
10.1	4.91	Make of protection relay offered	State in B	
10.2		Model of protection relay offered	State in B	
10.3	4.9.3	Details of over current protection function	Required	
10.4	4.9.4	Details of earth fault protection function	Required	
10.5	4.9.2	Details of protection class current transformers	Required	
10.6		Details of metering class current transformers	Required	
10.6	4.9.2	Details of metering class current transformers	Required	

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Tender Number: _____

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

Full name of company: _____

Technical schedules A and B
(Outdoor Ring Main Units)

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_039**	**Proposed deviation**

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

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

Full name of company: _____

Annex C - Technical schedules A and B – Outdoor Ring Main Units 3SD SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.8	6.2	Internal arc classification		B-FLR	
1.9	6.2	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		3SD	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Tender Number: _____

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

Full name of company: _____

Annex C - Technical schedules A and B – Outdoor Ring Main Units 4SD SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.7	6.2	Internal arc classification		B-FLR	
1.8	6.2	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		4SD	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

Note: Ticks, Cross [√, X], Asterick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number: _____

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

Full name of company: _____

Annex C - Technical schedules A and B – Outdoor Ring Main Units 2SD &CB SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.2	Internal arc classification		B-FLR	
1.9	6.2	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		2SD & CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Annex C - Technical schedules A and B – Outdoor Ring Main Units

3SD & CB SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		3SD & CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6 Free	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6 Free	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6 Free	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Annex C - Technical schedules A and B – Outdoor Ring Main Units 2SD & 2CB

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch disconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		2SD & 2 CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Annex C - Technical schedules A and B – Outdoor Ring Main Units 1SD & 2CB

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
1		**Ratings**		**XXXX**	**XXXX**
1.1	4.2	Rated power-frequency voltage	kV	12	
1.2		Rated lightning impulse withstand voltage	kV	95	
1.3		Rated short-duration power frequency withstand voltage [50Hz: 1 min]	kV	28	
1.4		Rated normal current of ring-main busbars	A	630	
1.5	4.7	Rated normal current of switch sdisconnectors	A	630	
1.6	4.8	Rated normal current of circuit breaker	A	200	
1.7		Rated short-circuit breaking current of circuit breaker (3 second)	kA	20	
1.8	6.	Internal arc classification		B-FLR	
1.9	6.	Internal arc current and duration		20 kA/500 ms	
2		**Construction**		**XXXX**	**XXXX**
2.1	4.3	Is an indoor or outdoor unit required?		Outdoor	
2.2	4.4	Is an extensible or non-extensible unit required?		Non-extensible	
2.3		Degree of protection of unit offered		IP54	
2.4	4.5	Configuration		1SD & 2 CB	
2.5	4.6	Type of cable testing facility offered		Required	
2.6	4.11	Insulating medium of busbars		SF_6	
2.7	4.7.2	Insulating medium of switch disconnectors		SF_6	
2.8	4.8.2	Insulating medium of circuit breaker		SF_6	
2.9	4.7.3	Interrupting medium of switch disconnectors		SF_6 Free	
2.10	4.8.3	Interrupting medium of circuit breaker		SF_6 Free	
	4.23.4	Each door shall be a manual three point locking mechanism, capable of being secured by a padlock, having a shackle diameter of 8mm..		Required Required	
	4.23	Compartment lock protection facility (with welded mesh top with inside visibility)		Required	

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Annex C - Technical schedules A and B SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
2		**Construction (continued)**		**XXXX**	**XXXX**
2.11	4.20	Is a kiosk required	Yes	Yes	
2.12	4.20.2	Colour of kiosk		Avocado (C12)	
2.13		Recommended types of tools to install and maintain unit		Required	
2.14		Method used to attach rating plates		Required	
2.15		Method used to attach labels		Required	
2.16	4.20	Is a raising plinth required for outdoor RMUs?	No	No	
2.17	4.21	Is a concrete plinth complying with CP_TSSPEC_027 required for outdoor RMUs?	Yes	Yes	
2.18		Is the RMU required for a corrosive or non-corrosive environment?		Corrosive	
2.19	4.10	Is earth fault indication required?	Yes	Yes	
2.20	4.10	Does EFI comply with the requirements of CP_TSSPEC_040?	Yes	Yes	
2.21		List of recommended spares attached	Yes	Yes	
2.22		Are remote tripping and closing required?	Yes	Yes	
2.23	4.10.1	Details of preferred auxiliary supply:		XXXX	XXXX
2.24		a) Voltage	Vdc	12 – 48	
2.25		b) Current	mA	0 – 10	
2.26		Provision for future automation		Required	

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Annex C - Technical schedules A and B SF6 FREE

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
3		**Switch description**		**XXXX**	**XXXX**
3.1		Manufacturer's designation of RMU		State in B	
3.2		Type of insulation ring main unit		State in B	
		a) Manufacturer		State in B	
		b) Country of manufacture		State in B	
4		**Design**		**XXXX**	**XXXX**
4.1	4.1.3	Ring main units designed and constructed in accordance with SANS 1874		Required	
4.2	4.20.6	Provision of facilities for lifting or slinging		Required	
4.3		Type of provision for lifting and slinging		State in B	
4.7	4.12	Is a cable box required?	Yes	Yes	
4.8	4.12.1	Compound-filled or air-filled cable box		Air-filled	
4.9	4.16	Are VDS required for all circuits?	Yes	Yes	
4.10		Type of system offered		Required	
5	**4.14**	**Earthing**		**XXXX**	**XXXX**
5.1	4.15.1	Maximum earth fault current	kA	13,1	
5.2		Current density (maximum)	A/m	200	
5.3	4.15.2	Provision of reliable earthing terminal for each metal enclosure/tank (compatible with M12 lug-hole)		Required	
5.4		Each earth terminal to be indelibly marked		Required	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
6		**Cable termination requirements – ring main unit**		**XXXX**	**XXXX**
6.1		Incoming MV cable requirements:		XXXX	
6.2	4.12.3	a) 1×300 mm^2 3 core XLPE		Required	
6.3	4.14	b) Cable support (clamping) required		Required	
6.4	4.13.4	c) Minimum distance from top of cable clamp to bushing centres	mm	800	
6.5	4.12.2	d) Type of termination		Required-Screened	
6.6	4.13.4	Clearance requirements		As per SANS 876	
6.7	4.13.1	Are only Type C (630 A) bushings required?	Yes	Yes	
6.8	4.13.3	Bushings to be horizontally positioned		Required	
6.9	4.13.4	Bushing-centre spacing (minimum)	mm	105	
6.10	4.13.4	Distance between outer bushing-centres and earthed metal enclosure (minimum)	mm	55	
6.11	4.14	Provision for earthing of cables		Required	
6.12		Are the accessories for cable termination to be supplied by the RMU supplier?	No	No	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description		Schedule A	Schedule B
7		**Materials and corrosion protection**		**XXXX**	**XXXX**
7.1	4.20.2	RMU material		3CR12	
7.2		Copper earth busbar		Required	
7.3		Final colour		Required	
8	**5**	**Marking and labelling**		**XXXX**	**XXXX**
8.1		Method of attachment of labels		Required	
8.2		Main circuit designation labels		Required	
8.3		RMU rating plate		Required	
8.4		ON, OFF and EARTH position labels		Required	
8.5		Additional marking system (i.e. mimics)		Required	
8.6		Instruction plates		Required	
9	**7**	**Documentation**		**XXXX**	**XXXX**
9.1	7.4	Type test certificates	Sets	1	
9.2	7.5	Proposed routine test certificates	Sets	1	
9.3	7.2	Drawings	Sets	2	
9.4	7.3	Circuit diagrams	Sets	2	
9.5	7.1	Installation, operating and maintenance instructions	Sets	2	
9.6		Details of special tools required	Sets	2	
9.7		Detailed spare-parts list provided	Sets	2	

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Annex C - Technical schedules A and B

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_039	Description	Schedule A	Schedule B
10	**4.9**	**Protection**	**XXXX**	**XXXX**
10.1	4..9.1	Make of protection relay offered	State in B	
10.2	4.9.1	Model of protection relay offered	State in B	
10.3	4.9.3	Details of over current protection function	Required	
10.4	4.9.4	Details of earth fault protection function	Required	
10.5	4.9.2	Details of protection class current transformers	Required	
10.6	4.9.2	Details of metering class current transformers	Required	

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Technical schedules A and B
(Outdoor Ring Main Units SF6 FREE)

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_039**	**Proposed deviation**

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Annex D - Stock Items

Material Group: SWG-MV-UG

Item	SAP No.	SAP Short Description	SAP Long Description
1	1690	RMU 11 SF6 3SD (INDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 3 X 630 A SWITCH DISCONNECTORS COMBINED IN A COMPACT SINGLE UNIT (3SD), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
2	1691	RMU 11 SF6 3SD (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 3 X 630 A SWITCH DISCONNECTORS COMBINED IN A COMPACT SINGLE UNIT (3SD), OUTDOOR, COMPLETE WITH KIOSK. ITEM SPECIFICATION NO. CP_TSSPEC_039.
3	1692	RMU 11 SF6 4SD (INDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 4 X 630 A SWITCH DISCONNECTORS COMBINED IN A COMPACT SINGLE UNIT (4SD), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
4	1693	RMU 11 SF6 4SD (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 4 X 630 A SWITCH DISCONNECTORS COMBINED IN A COMPACT SINGLE UNIT (4SD), OUTDOOR, COMPLETE WITH KIOSK ITEM SPECIFICATION NO. CP_TSSPEC_039.
5	1694	RMU 11 SF6 2SD & CB (INDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 2 X 630 A SWITCH DISCONNECTORS AND A 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (2SD & CB), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
6	1695	RMU 11 SF6 2SD & CB (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 2 X 630 A SWITCH DISCONNECTORS AND A 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (2SD & CB), OUTDOOR, COMPLETE WITH KIOSK. ITEM SPECIFICATION NO. CP_TSSPEC_039.
7	1696	RMU 11 SF6 3SD & CB (INDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 3 X 630 A SWITCH DISCONNECTORS AND A 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (3SD & CB), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
8	1697	RMU 11 SF6 3SD & CB (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 3 X 630 A SWITCH DISCONNECTORS AND A 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (3SD & CB), OUTDOOR, COMPLETE WITH KIOSK. ITEM SPECIFICATION NO. CP_TSSPEC_039.

9	1698	RMU 11 SF6 2SD & 2CB (INDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 2 X 630 A SWITCH DISCONNECTORS AND 2 X 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (2SD & 2CB), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
10	1699	RMU 11 SF6 2SD & 2CB (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 2 X 630 A SWITCH DISCONNECTORS AND 2 X 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (2SD & 2CB), OUTDOOR, COMPLETE WITH KIOSK.. ITEM SPECIFICATION NO. CP_TSSPEC_039.
11	2701	RMU 11 SF6 1SD & 2CB (INDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 1 X 630 A SWITCH DISCONNECTORS AND 2 X 630 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (1SD & 2CB), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
12	2702	RMU 11 SF6 1SD & 2CB (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 INSULATED, NON-EXTENSIBLE, COMPRISING OF 1 X 630 A SWITCH DISCONNECTORS AND 2 X 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (1SD & 2CB), OUTDOOR, COMPLETE WITH KIOSK. ITEM SPECIFICATION NO. CP_TSSPEC_039.
13	4101	RMU 11 SF6 FREE 3SD (INDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 3 X 630 A SWITCH DISCONNECTORS COMBINED IN A COMPACT SINGLE UNIT (3SD), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
14	4153	RMU 11 SF6 FREE 3SD (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 3 X 630 A SWITCH DISCONNECTORS COMBINED IN A COMPACT SINGLE UNIT (3SD), OUTDOOR, COMPLETE WITH KIOSK. ITEM SPECIFICATION NO. CP_TSSPEC_039.
15	4154	RMU 11 SF6 FREE 4SD (INDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 4 X 630 A SWITCH DISCONNECTORS COMBINED IN A COMPACT SINGLE UNIT (4SD), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
16	4156	RMU 11 SF6 FREE 4SD (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 4 X 630 A SWITCH DISCONNECTORS COMBINED IN A COMPACT SINGLE UNIT (4SD), OUTDOOR, COMPLETE WITH KIOSK ITEM SPECIFICATION NO. CP_TSSPEC_039.
17	4155	RMU 11 SF6 FREE 2SD & CB (INDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 2 X 630 A SWITCH DISCONNECTORS AND A 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (2SD & CB), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
18	4157	RMU 11 SF6 FREE 2SD & CB (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 2 X 630 A SWITCH DISCONNECTORS AND A 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (2SD & CB), OUTDOOR, COMPLETE WITH KIOSK. ITEM SPECIFICATION NO. CP_TSSPEC_039.
19	4158	RMU 11 SF6 FREE 3SD & CB (INDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 3 X 630 A SWITCH DISCONNECTORS AND A 200 A CIRCUIT BREAKER

			COMBINED IN A COMPACT SINGLE UNIT (3SD & CB), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
20	4159	RMU 11 SF6 FREE 3SD & CB (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 3 X 630 A SWITCH DISCONNECTORS AND A 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (3SD & CB), OUTDOOR, COMPLETE WITH KIOSK. ITEM SPECIFICATION NO. CP_TSSPEC_039.
21	4160	RMU 11 SF6 FREE 2SD & 2CB (INDOOR)	RING MAIN UNIT, 11 KV SF6 FREE, NON-EXTENSIBLE, COMPRISING OF 2 X 630 A SWITCH DISCONNECTORS AND 2 X 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (2SD & 2CB), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
22	4161	RMU 11 SF6 FREE 2SD & 2CB (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 2 X 630 A SWITCH DISCONNECTORS AND 2 X 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (2SD & 2CB), OUTDOOR, COMPLETE WITH KIOSK.. ITEM SPECIFICATION NO. CP_TSSPEC_039.
23	4162	RMU 11 SF6 FREE 1SD & 2CB (INDOOR)	RING MAIN UNIT, 11 KV SF6 FREE INSULATED, NON-EXTENSIBLE, COMPRISING OF 1 X 630 A SWITCH DISCONNECTORS AND 2 X 630 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (1SD & 2CB), INDOOR, COMPLETE WITH RAISING PLINTH. ITEM SPECIFICATION NO. CP_TSSPEC_039.
24	4163	RMU 11 SF6 FREE 1SD & 2CB (OUTDOOR)	RING MAIN UNIT, 11 KV SF6 FREE, NON-EXTENSIBLE, COMPRISING OF 1 X 630 A SWITCH DISCONNECTORS AND 2 X 200 A CIRCUIT BREAKER COMBINED IN A COMPACT SINGLE UNIT (1SD & 2CB), OUTDOOR, COMPLETE WITH KIOSK. ITEM SPECIFICATION NO. CP_TSSPEC_039.