PROJECT SPECIFICATION FOR FIXED PATTERN SECONDARY DISTRIBUTION MV SWITCHGEAR AND ACCESSORIES

- **SITE CONDITIONS:**
  - **Altitude:** 1 738 meters above sea level.
  - **Temperature:**

    Max: 35°C
    Min: -6°C
  - **Humidity:**

    During the night: 100 % relative humidity
    During the day: 25 % relative humidity
  - **Lightning:**

    Severe lightning storms prevail.

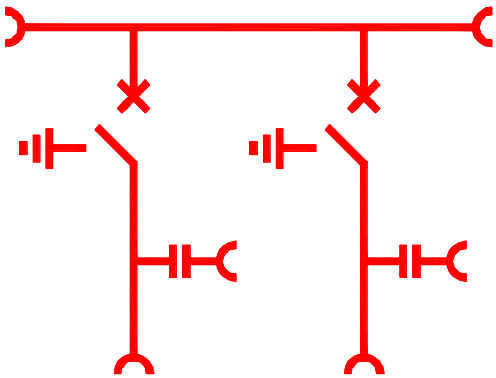
1. SCOPE

This specification covers the minimum requirements for the manufacture, testing and supply of fixed pattern secondary distribution switchgear, suitable for use indoors. The switchgear supplied shall be new in all respects and shall comply with the requirements of SANS 1874 / NRS 006 as well as this specification.

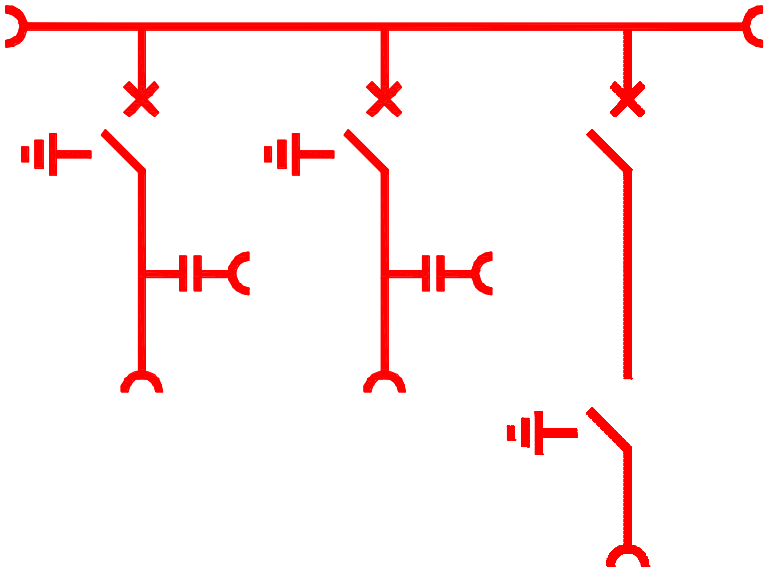
****NB! All new orders must include one set of switching tools additional sets can be ordered separately.****

The switchgear is intended to be extensible and modular, with the following modules/functions to be provided:

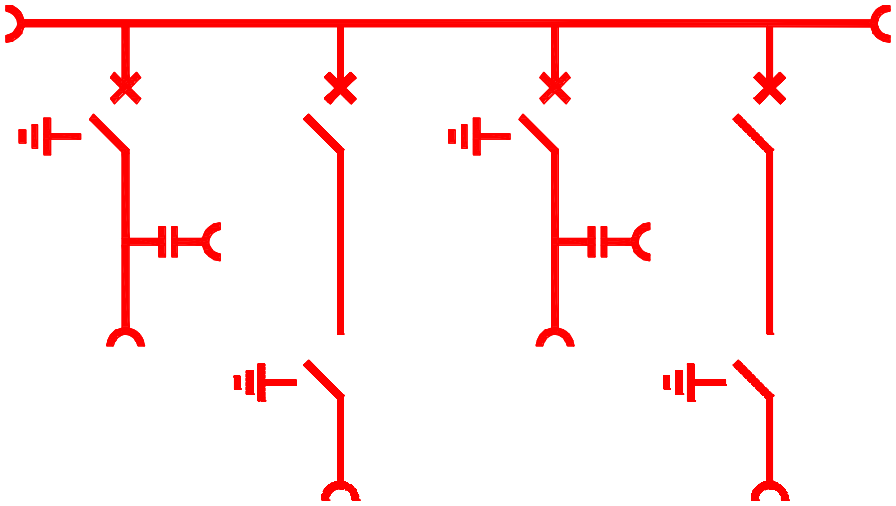
ITEM 1 – 11 kV 630 A 20 kA 2 x switch-disconnector (SD-SD).
ITEM 2 – 11 kV 630 A 20 kA 2 x switch-disconnector and 1 x circuit breaker (SD-SD CB).
ITEM 3 – 11 kV 630 A 20 kA 2 x switch-disconnector and 2 x circuit breaker (SD-CB SD-CB).
ITEM 4 – 11 kV 630 A 20 kA 2 x circuit breaker (CB-CB).
ITEM 5 – 11 kV 630 A 20 kA 1 x circuit breaker (CB).
ITEM 6 – 11kV 630 A 20 kA circuit breaker with MV Metering
ITEM 7 – 11kV 630 A 20 kA Bus Coupler
ITEM 8 – Steel Plinth suitable for extending individual switchgear ±400 mm² from ground level
ITEM 9 – 11kV 630 Switching Tools (Set)



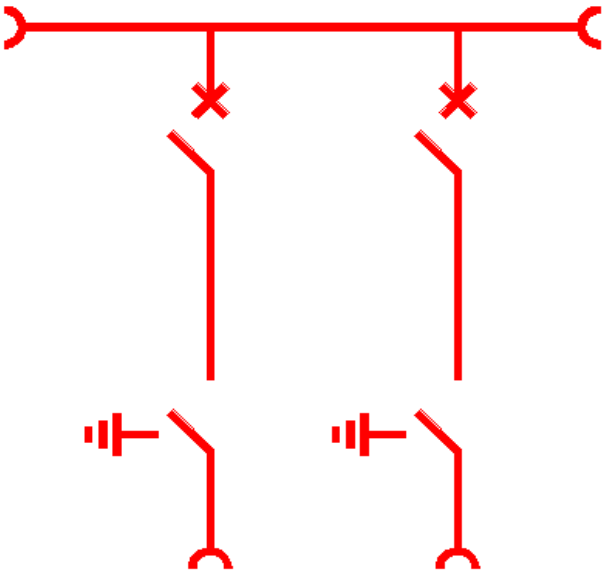
ITEM 1 ： SD-SD LINE DIAGRAM



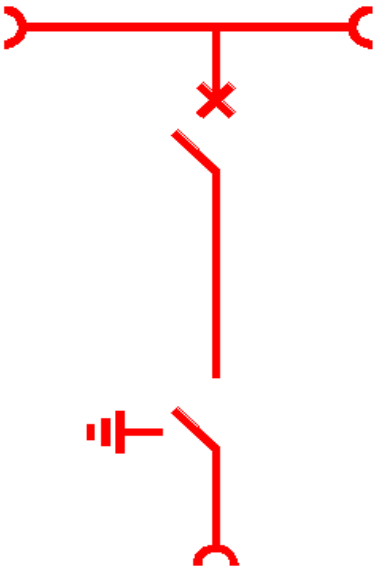
ITEM 2 ： SD-SD-CB LINE DIAGRAM



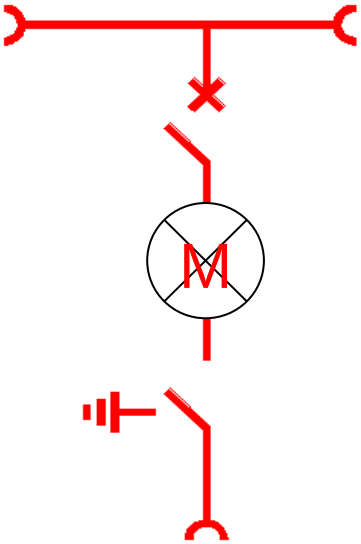
ITEM 3 ： SD-CB-SD-CB LINE DIAGRAM



ITEM 4 ： CB-CB LINE DIAGRAM



ITEM 5 ： CB LINE DIAGRAM



ITEM 6 ： METERING CB LINE DIAGRAM

ITEM 7: 11kV 630 A 20 kA Bus Coupler

2. NORMATIVE REFERENCES

SANS 1874 / NRS 006 Edition 2, Switchgear – Metal-enclosed ring main units for rated A.C. voltages above 1 kV and up to and including 36 kV.

3. DEFINITIONS AND ABBREVIATIONS

For the purposes of this specification the definitions given in SANS 1874 / NRS 006 shall apply.

4. ADDITIONAL REQUIREMENTS IN TERMS OF SANS 1874 / NRS 006

4.1 Rated insulation level

The rated insulation level of the switchgear shall be 12 kV with a basic insulation level of 95 kV.

4.2 Cable test facility

Integral cable test facility is not required on SD's and CB's.

4.3 Internal arc classification (IAC)

4.3.1 Internal arc classification shall be AFL 20 kA 1 second in accordance with SANS 62271-200, i.e. restricted accessibility to the front and lateral sides of the ring main unit.

4.3.2 Items shall be provided complete with a pedestal and arc duct that ensures internal arc gasses are controlled under internal arc conditions. No venting of arc gases into cable trenches shall be permitted.

4.3.3 The pedestal shall make provision for fixing to the floor using 4 x M12 set screws.

4.3.4 Suitable external lifting eyes shall be provided to lift the entire ITEM with pedestal and duct.

4.4 Extensibility & busbars

4.4.1 All ITEMS shall be extensible to the left and right.

7.2.5 All ITEMS shall be supplied with one set of busbars for extending in either direction as well as one busbar terminating arrangement.

4.5 Cable termination enclosures and terminations

4.5.1 Cable termination enclosures of SD and CB functions shall be fitted with 630 A Type C bushings having minimum phase to phase centres of 95 mm and minimum phase to earth centres of 55 mm.

4.5.2 Circuit live indication shall be provided on all SD and CB functions by means of a voltage detection system (VDS) in accordance with SANS 61243-5.

4.5.3 *Each Unit shall be supplied with: a complete set of separable connectors (Equivalent to *RICCS*) suitable for connecting 3-core medium-voltage PILCSTDA cable terminations to 630 A Type C bushings in all compartments.*

4.6 Additional requirements for sulfur hexafluoride (SF6)-filled switchgear

An absolute or temperature compensated pressure gauge shall be provided for checking the SF6 pressure on each tank, even in service, with indication of the minimum permissible pressure level for safe operation.

MOGALE CITY
RMU SCHEDULES A & B

Schedule A: Purchaser's specific requirements based upon NRS 003 / SANS 1885 (information required from tenderer in Schedule B)
Schedule B: Guarantees and technical particulars of equipment offered (to be completed by tenderer)

Item	NRS 006 clause	Description		Schedule A	Schedule B
C.1	4.1.2 (b)	The ambient air pollution level		Level IV	_____
C.2	4.2.1	Rated voltage	kV	12	_____
C.3	4.3.1.5	Is an indoor or outdoor unit required?		Indoor	_____
	4.3.1.6	Is a padlock facility required?		N/A	_____
	4.3.2	Is an extensible or non-extensible unit offered?		Extensible	_____
	4.3.3.2	Degree of protection if an outdoor kiosk is offered		N/A	_____
	4.3.3.3	Degree of protection of the ring main unit and the kiosk (if applicable) offered		xxxxx	_____
	4.3.4	Specify the configuration of the ring main unit		See ITEMS 1 to 5	_____
	4.3.5.1	Separate cable test facilities required for switch-disconnectors	Yes/No	No	_____
	4.3.5.1	Separate cable test facilities required for switch-fuse combinations	Yes/No	N/A	_____
	4.3.5.1	Separate cable test facilities required for circuit-breakers	Yes/No	No	_____
	4.3.5.3	Type of cable test facility offered		xxxxx	_____
	4.3.5.4	Cable test facilities to be interlocked with associated earth switch	Yes/No	N/A	_____
	4.3.9.1	Are interlocks with remote equipment required?	Yes/No	No	_____
		If yes, state:		N/A	_____
		a) type required		N/A	_____
		b) auxiliary supply details		N/A	_____
		c) interfacing details of remote equipment		N/A	_____
	4.3.9.2	State details of interlocks with remote equipment offered		N/A	_____
	4.3.10.2	Specify insulating medium		xxxxx	_____
	4.3.10.3	Specify the insulating and/or interrupting medium of switch disconnectors		xxxxx	_____
	4.3.14.1	Indoor IAC		AFL 20 kA 1 s	_____
C.4	4.4.1.3	Rated normal current of a switch disconnector	A	630	_____

ELECTRICITY DISTRIBUTION SERVICES

MOGALE CITY

RMU SCHEDULES A & B (continued)

Item	NRS 006 clause	Description		Schedule A	Schedule B
	4.4.2.2	Is remote tripping and closing of the switch disconnector required?	Yes/No	No	
		If yes, provide details of preferred auxiliary supply:		N/A	
		Voltage	V	N/A	
	4.4.2.3	Method of remote tripping and closing of the switch disconnector offered		xxxxx	
		Auxiliary supply details:			
		Voltage	V	xxxxx	
C.5	4.5.2.1	Transformer load to be protected	kVA	N/A	
	4.5.3.3	Type of fuse links offered		N/A	
	4.5.3.3	Dimension of fuse links offered	mm	N/A	
	4.5.3.4	Rated current of fuse-link		N/A	
	4.5.3.5	The maximum permissible fuse-link rating		xxxxx	
	4.5.3.6	Type of striker required		xxxxx	
	4.5.5.2	Is remote tripping and closing of the switch of a switch-fuse combination required		N/A	
		If yes, provide details of preferred auxiliary supply:		N/A	
		Voltage	V	N/A	
	4.5.5.3	Method of remote tripping and closing of the switch of a switch-fuse combination offered		xxxxx	
		Auxiliary supply details:		N/A	
		Voltage	V	xxxxx	
C.6	4.6.1.3	Rated normal current of a circuit-breaker	A	630	
	4.6.2.2	Alternative CT ratios for 200 A circuit-breaker		N/A	
	4.6.2.3	Alternative CT ratios for 630 A circuit-breaker		N/A	
	4.6.2.4	Specify protection CT type and class		xxxxx	
	4.6.2.7	Details of protection relays		xxxxx	
	4.6.2.12	Specify details of how the minimum earth fault pick-up current shall be independent of the CT ratio selected		N/A cable network	

ELECTRICITY DISTRIBUTION SERVICES

MOGALE CITY

RMU SCHEDULES A & B (continued)

Item	NRS 006 clause	Description		Schedule A	Schedule B
	4.6.3.3	Is remote tripping and closing required?	Yes/No	No	_____
		If yes, state preferred auxiliary supply details:			_____
		Voltage	V	N/A	_____
		Current	A	N/A	_____
	4.6.3.4	Method of remote tripping and closing offered		N/A	_____
		Auxiliary supply specifications:			_____
		Voltage	V	xxxxx	_____
		Current	A	xxxxx	_____
C.7	4.7.2	Busbars extensible on which side?		Both	_____
	4.7.3	Method used to extend busbars		xxxxx	_____
	4.7.5	Insulation medium of the busbar chamber?		Xxxxx	_____
C.8	4.8.2	Type and size of cable(s)		3-core PILC	_____
	4.8.6	Type and number of cable (s)		185 mm2	_____
C.9	4.9.1.1	Are load monitoring facilities required?		No	_____
	4.9.1.4	Accuracy class and burden (VA) of the current transformer offered		xxxxx	_____
	4.9.1.6	Does electronic ammeter make provision for communication with the remote terminal unit (RTU) for telecontrol (SCADA) purposes?	Yes/No	N/A	_____
	4.9.1.7	Type of ammeter (or multi-meter) offered		xxxxx	_____
	4.9.2.1	Is ring main unit equipped with a remote terminal unit (RTU)	Yes/No	N/A	_____
	4.9.2.2	Is the ring main unit equipped with a white indication lamp	Yes/No	N/A	_____
	4.9.2.3.2	DC voltage		N/A	_____
C.10	4.10.5	Quantity of SF_6		xxxxx	_____
	4.10.6	Details of SF_6 gas recovery and replenishing		xxxxx	_____
C.11	4.11.1	Maximum earth fault current	kA	20	_____
C.12	4.12.1	Details of voltage presence identification systems (VPIS), if applicable		VDS	_____
	4.12.4	Voltage detection system details, if applicable. State type of live circuit indication		xxxxx	_____

ELECTRICITY DISTRIBUTION SERVICES

MOGALE CITY

RMU SCHEDULES A & B (continued)

Item	NRS 006 clause	Description		Schedule A	Schedule B
C.13	4.13.1	Is earth fault indication required?	Yes/No	No	_____
	4.13.1	Type of earth fault indication offered?		Xxxxx	_____
C.14	4.14.1	Is a kiosk required?	Yes/No	No	_____
	4.14.6	Padlock protection facility required?	Yes/No	N/A	_____
C.15	4.15.1	Is a steel raising base required?		Yes – IAC	_____
	4.15.2	Is a gland plate required?		Yes – IAC	_____
	4.15.3	Height of the additional raising base		xxxxx	_____
C.16	4.16.3	Type of waterproofing sealant offered		N/A	_____
	4.16.4	Recommended types of tools to install and maintain unit		xxxxx	_____
C.17	4.17.1	State method used for attaching the rating plates		xxxxx	_____
C.18	4.18.1.1	State method used for attaching the labels		xxxxx	_____
	4.18.2.1	Colour of circuit designation label		N/A	_____
	4.18.2.1	Method used for the fixing and removal of the main circuit designation labels		xxxxx	_____
	4.18.4.4	Supply ring main units with mimic indication?	Yes/No	Yes	_____
		If yes, state details		xxxxx	_____
	4.18.5.6	Details of information to be included on warning sign		N/A	_____
C.19	4.19.6	Is a special coating system required	Yes/No	N/A	_____
	4.19.9	State type of material offered for the RMU, kiosk and raising base (where applicable		xxxxx	_____
C.20	5.1.3	Quantity already installed in South Africa?		Xxxxx	_____
	5.1.4	State details of accrediting body and proof of certification		xxxxx	_____
C.21	5.2.3	Room dimensions and cable trench requirements		xxxxx	_____
C.22	6.1	List of recommended spares		xxxxx	_____
C.23	7.2(g)	Completed type tests with report numbers and relevant test standard numbers required?	Yes/No	Yes	_____
	7.2(h)	Full set of type test reports required?	Yes/No	Yes	_____

ELECTRICITY DISTRIBUTION SERVICES

MOGALE CITY

RMU SCHEDULES A & B (continued)

Item	NRS 006 clause	Description		Schedule A	Schedule B
	7.2(i)	Proof of the test laboratory's accreditation required?	Yes/No	Yes	_____
	7.2(j)	Copy of the RMU factory routine test certificate required?	Yes/No	Yes	_____
	7.2(k)	Copy of the current transformer factory routine test certificate required?	Yes/No	Yes	_____
	7.2(l)	Copies of the latest available technical catalogue(s) required?	Yes/No	Yes	_____
	7.2(m)	Number of sets of installation, operation and maintenance manuals, if more than one set is required.		One only	_____