a world class African city

TITLE	**SPECIFICATION FOR LOW VOLTAGE TESTERS**	REFERENCE	REV
		CP_TSSPEC_262	**1**
		DATE:	**JULY 2022**
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FOREWORD

This specification was prepared by the following Work Group members:

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The Work Group was appointed by the Underground Systems Study Committee, which, at the time of approval, comprised of the following members:

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INTRODUCTION

The importance of the safety and reliability of test equipment is crucial in terms of operator safety. It is therefore important to ensure that test equipment complies with the required specifications and is of acceptable quality. In all cases, preference shall be given to the utilisation of voltage detectors in accordance with SANS 61243-3. However, the need for low voltage testers in certain applications has been identified. The use of any tester shall be in accordance with the relevant standards and safe work procedures.

1. SCOPE

This specification covers City Power's requirements for low voltage testers.

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 61243-3*Live working – voltage detectors – Part 1: Capacitive type to be used for voltages not exceeding 1 kV AC*

SANS 61010-1, Safety requirements for electrical equipment for measurement, control and laboratory use

SANS 60309 *(all parts), Plugs, socket-outlets and couplers for industrial purposes*

SANS 60320 *(all parts), Appliance couplers for household and similar general purposes*

3. DEFINITIONS AND ABBREVIATIONS

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

4. REQUIREMENTS

4.1 General

4.1.1 The low voltage testers shall *generally* comply with SANS 61243-3.

- Voltmeter 2 Prong tester 750 V
- Multimeter 1000V AC/DC
- Clamp On Multimeter 1000v AC/DC 1000A AC/DC
- Insulation Resistance 1000V

4.1.2 The low voltage testers shall be of digital type

4.1.3 The safety requirements for the following types of electrical equipment and their accessories, wherever they are intended to be used shall be according to SANS 61010-1.

4.1.4 They shall have a safety rating of category 3, as they measure up to 1000V.

4.1.5 The low voltage testers shall be suitable for detecting and indicating the presence of nominal voltages of up to 1000V, shall be rated for use at 1000 V. The testers shall be supplied as a single device (i.e. one detector to test the full range of voltages required).

4.1.6 The testers shall have a voltage range selector.

4.1.7 The testers shall indicate the presence of voltage and shall have visual indication of the presence of voltage.

4.1.8 The voltage testers shall be battery-operated and have a self-diagnostic facility to check the status of the battery as well as correct operation of the unit.

4.1.9 If required, a test unit shall be supplied so that the correct operation of the unit can be verified.

4.1.10 The testers shall be physically small as the testers shall be used as personal testers. They shall preferably be of a size that enables them to be carried on a worker's belt.

4.1.11 The battery used shall be a standard cell which is readily and commercially available.

5. TESTS

The testers shall have been tested in accordance with the requirements of SANS 61243-3

Saftey ratings according to SANS 61010-1 for category 111 installation up to 1000V shall be provided

Manufacturer's warranty and manual guide shall be provided upon delivery of the equipment.

6. MARKING AND PACKAGING

6.1 In addition to the requirements of SANS 61243-3 the live testers shall be marked with the nominal voltage(s) for which they are designed.

6.2 All units shall be supplied with a protective carrying case to ensure mechanical protection of the device during transport.

6.3 Each unit shall be supplied with a comprehensive user manual.

7. DOCUMENTATION

7.1 Detailed test reports confirming compliance with SANS 61243-3 shall be provided.

7.2 In addition to the documentation required above, full technical information relating to the performance, construction, operation, etc of the testers shall be supplied.

8. TRAINING

8.1 The following certified training course shall be offered for City Power's staff:

a) Operating and use of the testers.

8.2 The associated costs for the certified training course in 8.1 shall be given per person and shall be fixed for the period of the contract.

9. QUALITY MANAGEMENT

A quality management plan shall be set up in order to assure the proper quality management of the low voltage testers 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 plan shall be set up in order to assure the proper environmental management of the low voltage testers 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 plan shall be set up in order to ensure proper management and compliance of the low voltage testers 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.

ANNEXURE A - BIBLIOGRAPHY

None

ANNEXURE B - REVISION INFORMATION

JUNE 2018	0	First issue
JULY 2022	1	Added new work group committee
		Added item No. 3 Clamp On Meter

TECHNICAL SCHEDULE A and B

ITEM 1- VOLTMETER: 110V-750V, 0.15A, 2 PRONG SAP (5578)

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

Item	Sub-clause of CP_TSSPEC_262	Description		Schedule A	Schedule B
1		Name of manufacturer		Required	
2		Place of manufacture		Required	
3		Manufacturer's identification reference		Required	
4	4.1.1	Specification to which Voltmeter 2 Prong testers comply		SANS 61243-3	
5	4.1.2	Nominal system voltage	V	110 - 750, 2 Prong	
6	4.1.2	Rated voltage of testers	V	750	
7	4.1.3	Voltage range selector	Yes/No	Yes	
8	4.1.4	Insulating testing leads attachment	Yes/No	Yes	
9	4.1.5	Application suitability	Yes/No	Yes	
10	4.1.5	Voltage indication		Visual	
11	4.1.7	Functionality check		Self-diagnostic	
12	7	Documentation supplied?	Yes/No	Yes	
13	6	Marking as per clause 6	Yes/No	Yes	
14	6	Packing as per clause 6	Yes/No	Yes	

Note: Ticks, Cross [√, X], Astrick [*], 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: _____

TECHNICAL SCHEDULE A and B

ITEM 1- VOLTMETER: 110-750, 0.15A, 2 PRONG SAP (5578)

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	Clause	Proposed deviation

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

Tender Number: _____

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Full name of company: _____

TECHNICAL SCHEDULE A and B

ITEM 2- MULTIMETER: 1000V AC/DC VOLTAGE, 10A AC/DC CURRENT TESTER SAP (4071)

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

Item	Sub-clause of CP_TSSPEC_262	Description		Schedule A	Schedule B
1		Name of manufacturer		Required	
2		Type of Meter required		Digital	
3		Place of manufacture		Required	
4		Manufacturer's identification reference		Required	
5	4.1.1	Specification to which Multimeter 2 leads testers comply		SANS 61243-3	
6	4.1.2	Nominal system voltage Norminal system current	V	1000 AC/DC, 10A AC/DC	
7	4.1.2	Rated voltage of testers	V	1000	
8	4.1.3	Voltage range selector	Yes/No	Yes	
9	4.1.4	Insulating testing leads attachment	Yes/No	Yes	
10	4.1.5	Application suitability	Yes/No	Yes	
11	4.1.5	Voltage indication		Visual	
12	4.1.7	Functionality check		Self-diagnostic	
13	7	Documentation supplied?	Yes/No	Yes	
14	6	Marking as per clause 6	Yes/No	Yes	
15	6	Packing as per clause 6	Yes/No	Yes	

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TECHNICAL SCHEDULE A and B

ITEM 2- MULTIMETER: 1000V AC/DC VOLTAGE, 10A AC/DC CURRENT TESTER SAP (4071)

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Name in block letters Signature

Full name of company: _____

ITEM 3- CLAMP ON MULTIMETER: 1000V AC/DC VOLTAGE, 1000A AC/DC CURRENT TESTER SAP (xxx)

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

Item	Sub-clause of CP_TSSPEC_262	Description		Schedule A	Schedule B
1		Name of manufacturer		Required	
2		Type of Meter required		Digital	
3		Place of manufacture		Required	
4		Manufacturer's identification reference		Required	
5	4.1.1	Specification to which Clamp Meter 2 leads testers comply		SANS 61243-3	
6	4.1.2	Nominal system voltage Norminal system current	V	1000 AC/DC, 1000A AC/DC	
7	4.1.2	Rated voltage of testers	V	1000	
8	4.1.3	Voltage range selector	Yes/No	Yes	
9	4.1.4	Insulating testing leads attachment	Yes/No	Yes	
10	4.1.5	Application suitability	Yes/No	Yes	
11	4.1.5	Voltage/Current indication		Visual digital	
12	4.1.7	Functionality check		Self-diagnostic	
13	7	Documentation supplied?	Yes/No	Yes	
14	6	Marking as per clause 6	Yes/No	Yes	
15	6	Packing as per clause 6	Yes/No	Yes	

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

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

Full name of company: _____

TECHNICAL SCHEDULE A and B

ITEM 3- CLAMP ON MULTIMETER: 1000V AC/DC VOLTAGE, 1000A AC/DC CURRENT TESTER SAP (xxx)

DEVIATION SCHEDULE

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Item	Clause	Proposed deviation

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Tender Number: _____

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Name in block letters Signature

Full name of company: _____

TECHNICAL SCHEDULE A and BITEM 4- 1 KV DIGITAL INSULATION TESTER SAP (4072)

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

Item	Sub-clause of CP_TSSPEC_262	Description		Schedule A	Schedule B
1		Name of manufacturer		Required	
2		Type of test meter required		Digital	
3		Place of manufacture		Required	
4		Manufacturer's identification reference		Required	
5	4.1.1	Specification to which Insulation comply		SANS 61243-3	
6	4.1.2	Nominal test voltage	V	250,500, 1000 (ac/d.c.)	
		Measuring Range		10 kΩ -999 MΩ	
		Short Circuit Current		1.5mA	
		Test current on load		1 mA	
		Accuracy (at 20 °C):			
		±3%, ±2 digits up to 10 MΩ,		10 MΩ	
		±5% up to 100 MΩ, ±30% up to full scale		100 MΩ	
7	4.1.2	Continuity to 100 Ω		100 Ω	
		Continuity buzzer		YES	
8	4.1.3	Adjustable buzzer		1 to 20 Ω	
9	4.1.4	Voltage Measurement AC/DC:		1000	
10	4.1.5	Default voltmeter		Required	
		Backlit display	Yes/No	Yes	
		Backlight selector ranges	Yes/No	Yes	
		Locking test button	Yes/No	Yes	
		Auto powerdown	Yes/No	Yes	
		IP weatherproof		54	
		Accepts rechargeable batteries		Required	
11	4.1.5	Voltage indication		Visual	
12	4.1.7	Functionality check		Self-diagnostic	
13	7	Documentation supplied?	Yes/No	Yes	
14	6	Marking as per clause 6	Yes/No	Yes	
15	6	Packing as per clause 6	Yes/No	Yes	

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

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TECHNICAL SCHEDULE A and B

ITEM 4- 1 KV DIGITAL INSULATION TESTER SAP (4072)

DEVIATION SCHEDULE

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Tenderer's Authorised Signatory: _____

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Full name of company: _____

ANNEXURE D – STOCK ITEMS

Material Group: Test Equipment

Item	SAP No.	SAP Short Description	SAP Long Description
1	5578	VOLTMETER:110-750,0.15A, 2 PRONG	VOLTMETER; MEASUREMETS RANGE: 110 – 750V; CIRCUIT CURRENT FOR WHICH DESIGNED: 0.15A;Type/Model DESIGNATION: 2 PRONG.ITEMSPECIFICATION. CP_TSSPEC_262
2	4071	MULTIMETER:1000V AC/DC V, 10A AC/DC A	MULTITMETER; MEASUREMETS RANGE: MAXIMUM 1000V; CIRCUIT CURRENT FOR WHICH DESIGNED:10A ITEM SPECIFICATION. CP_TSSPEC_262
3	XXX	CLAMP ON METER:1KV AC/DC 1KA AC/DC.	CLAMP ON MULTIMETER MEASUREMENT RANGE 1KV AC/DC 1KA AC/DCWHICH DESINGNED: ITEM SPECIFICATION. CP_TSSPEC_262
4	4072	1 KV INSULATION CONTI TESTER 10 kΩ - 999 MΩ	1 KV INSULATION MEASUREMENT RANGE, CIRCUIT RESISTANCE FOR WHICH DESIGNED: 10 KILO OHM - 999 MEGA OHM: ITEM SPECIFICATION. CP_TSSPEC_262