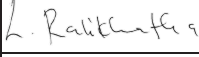


PERFORMANCE SPECIFICATION: SOCKET OUTLETS, LIGHT SWITCHES AND ISOLATORS

Signatures						
22/07/2026	0	Authorised for use	Sifiso Dlamini	Phila Mkhize	Livhalani Ralikhwatha	Malibongwe Mlonzi
Date	Rev.	Status	Prepared By	Reviewed By	Approved By	Authorised By

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REVISION CONTROL

Date	Rev No	Description	Revised By
14/07/2026	A	Internal Review	Sifiso Dlamini
22/07/2026	0	Authorised for use	M.Mlonzi

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1.0 SCOPE

- 1.1 This specification defines the performance and technical requirements for the supply of socket outlets and light switches for TNPA facilities.
- 1.2 This includes mechanical switching devices, dimmers, motion sensors, USB charging outlets, thermostats, and smart automation systems for installation in socket outlets and light switches.

2.0 REFERENCES

All materials and manufacturing shall comply with the latest editions of the following standards, codes, and regulations, unless otherwise specified:

Electrical Safety & Wiring

SANS 10142-1 – The Wiring of Premises – Low Voltage Installations

SANS 164 – Plugs and Socket-Outlets

IEC/SANS 60669 Series – Switches and Dimmers for Household and Similar Installations

IEC/SANS 60669-2-1 – Electronic Switches (Dimmers)

IEC/SANS 60947-3 – Low-Voltage Switchgear and Control gear – Switches, Disconnectors, etc.

IEC 60950 / IEC 62368 – Safety of Electrical and Electronic Equipment

Enclosures & Protection

IEC 60529 – Degrees of Protection Provided by Enclosures (IP Code)

IEC 60670-1 – Boxes and Enclosures for Electrical Accessories

IEC 60670-23 – Floor Boxes for Electrical Installations

Charging & Connectivity

IEC 62684 – USB Interface and Charging Standard

Qi Wireless Power Consortium – Wireless Charging Standard

Data & Communication

ISO/IEC 11801 – Generic Cabling for Customer Premises

EN 50173 – Information Technology Cabling Systems

ANSI/TIA 568 – Telecommunications Cabling Standards

IEC 62443 – Industrial Communication Networks – IT Security

ISO/IEC 27001 – Information Security Management Systems

Quality & Compliance

ISO 9001 – Quality Management Systems

RoHS / CE – Environmental and Safety Compliance

3.0 SERVICE CONDITIONS

- 3.1 The equipment may be installed in areas where high humidity, high temperature and corrosive conditions prevail.
- 3.2 Equipment installed shall be suitable for efficient operation under these conditions.

4.0 STANDARD OF EQUIPMENT

- 4.1 Equipment shall be of a high quality design and manufacture, and shall comply with the relevant specifications and recommendations mentioned in this specification.
- 4.2 Every reasonable precaution and provision shall be incorporated in the design of the equipment for the safety and security of the system and of those concerned with its operation and maintenance.

5.0 MATERIALS AND FINISHES

- 5.1 All components shall be manufactured from high-quality, impact-resistant thermoplastic or metal alloy materials.
- 5.2 Finishes shall include neutral and metallic options, resistant to UV degradation and surface scratching.
- 5.3 Front plates and support frames shall be interchangeable to maintain a consistent modular aesthetic.
- 5.4 All thermoplastic materials shall have a minimum flammability rating of V-0 or V-1 when tested in accordance with UL 94 or an equivalent standard.

6.0 SYSTEM DESCRIPTION

- 6.1 The equipment shall be modular, interchangeable, and suitable for both new installations and retrofits.
- 6.2 The smart automation equipment shall include mechanical and intelligent components capable of integration with open automation networks.

- 6.3 All devices shall be compatible with standard South African wall boxes (minimum depth 40 mm).

7.0 FUNCTIONAL AND PERFORMANCE REQUIREMENTS

7.1 Mechanical Switching Devices

- 7.1.1 Light switches shall be provided at all locations indicated on the drawings or in the schedules.
- 7.1.2 Switches shall be rated not less than 10–20AX, 250V AC, complying with IEC/SANS 60669-1.
- 7.1.3 Configurations shall include 1-way, 2-way, intermediate, and double-pole types.
- 7.1.4 Switches with indicator lights shall include replaceable LED modules (230V AC).
- 7.1.5 Mechanisms shall be flush-mounted and interchangeable within the same modular system.

7.2 Dimmers

- 7.2.1 Light dimmers shall be universal electronic type suitable for dimmable LED, Compact Florescent (CFL), halogen, and incandescent luminaires.
- 7.2.2 Rated capacity shall be not less than 400 W / 400 VA.
- 7.2.3 Operation shall not require a neutral conductor and shall include soft-start and memory recall functions.
- 7.2.4 Compliance with **IEC/SANS 60669-2-1** is mandatory.

7.3 Motion Sensors

- 7.3.1 Sensors installed on 4x2 or 4x4 boxes shall use passive infrared detection with adjustable lux threshold (5–1 275 lux) and time delay (5 seconds to 30 minutes).
- 7.3.2 Detection range shall be minimum 8 m at 180°.
- 7.3.3 Standby consumption shall not exceed 0.6 W.

7.4 Socket Outlets and USB Charging

- 7.4.1 Socket outlets and USB charging points shall be provided at all locations indicated on the drawings or in the schedules.
- 7.4.2 Socket outlets shall comply with SANS 164 and be equipped with automatic, self-closing shutters for enhanced safety.

- 7.4.3 USB outlets shall comply with IEC 62684, with dual Type-A and Type-C ports. The combined output shall be a minimum of 5V DC, 3A (15 W), and shall support at least one common fast-charging protocol (e.g., USB Power Delivery, Qualcomm Quick Charge). Wireless chargers shall comply with Qi wireless charging standards and provide ≥ 10 W output.

- 7.4.4 Weatherproof outlets shall be IK08 impact rated and IP66 or higher.

7.5 Thermostats and Environmental Control

- 7.5.1 Electronic thermostats shall offer adjustable temperature range 5 °C – 30 °C (± 0.5 °C).

- 7.5.2 Connected thermostats shall include:

- a. Wi-Fi communication;
- b. Manual and remote control;
- c. Temperature and humidity display;
- d. Potential-free output contact, minimum 5 A rating.

7.6 Lighting and Scene Control

- 7.6.1 Push-button dimmers and scene controllers shall allow programmable lighting levels and pre-set scenes..

- 7.6.2 Each controller shall include LED indication and be configurable through commissioning software or mobile application.

7.7 Smart Control Systems

- 7.7.1 The system shall utilise an open 2.4 GHz protocol (ZigBee, Bluetooth LE, or equivalent).

- 7.7.2 The system shall include:

- a. A gateway unit connected to the local Wi-Fi network.
- b. Connected light and socket controllers (230V AC).
- c. Wireless control switches for lighting, blinds, or scenario activation.

- 7.7.3 Control shall be available via:

- a. A mobile application (Android/iOS).
- b. Voice assistants supporting standard open integration.
- c. Local wall-mounted controls.

- 7.7.4 The system shall support::

- a. Remote switching and dimming.
- b. Real-time and historical energy monitoring.
- c. Configurable scenarios.

- 7.7.5 In the event of communication loss, all functions shall remain locally operable.
- 7.7.6 In the event of power loss, all controlled devices shall return to their last known setting upon restoration of power.
- 7.7.7 The smart control system and associated gateway shall be designed with cybersecurity in mind. This shall include, at a minimum, unique user passwords, regular security patch availability, and encrypted data transmission over the network. The system shall comply with relevant cybersecurity standards such as IEC 62443 or ISO/IEC 27001 to ensure robust protection against cyber threats.
- 7.7.8 Core automation functions (scheduling, local control, scene activation) shall be executable without reliance on an external internet connection or cloud service. The local gateway must retain all programming and schedules independently

7.8 Smart Control Systems

- 7.8.1 A two-wire bus communication system shall allow control of lighting, blinds, HVAC, and audio.
- 7.8.2 The system shall provide:
 - a. Zonal temperature management.
 - b. Energy monitoring and load shedding control.
 - c. Central control via a touch screen or wall-mounted interface.
 - d. Remote monitoring through a mobile or web-based application.
- 7.8.3 Integration with third-party systems shall be supported through open communication protocols such as KNX, Modbus, or IP-based APIs.

7.9 Data and Communication Socket Modules

- 7.9.1 Cat6, RJ45 socket modules shall be provided where data and communication points are indicated on drawings or schedules.
- 7.9.2 Each module shall be supplied complete with rocker plates and support frames suitable for installation within the same modular system as the other wiring devices.
- 7.9.3 Modules shall be equipped with **tool-less quick-connect terminals** for conductor termination.
- 7.9.4 All Cat6 socket modules and related cabling shall comply with the following standards:
 - a. ISO/IEC 11801 – Information Technology – Generic Cabling for Customer Premises
 - b. EN 50173 – Information Technology Cabling Systems
 - c. ANSI/TIA 568 – Telecommunications Cabling Standards

- 7.9.5 The RJ45 socket modules shall be suitable for both **UTP and STP** terminations as specified in project drawings or data schedules, and shall be compatible with standard Cat6 patch cords and RJ45 plugs.

7.10 Floor Boxes and Pop-Up Boxes

- 7.10.1 Floor boxes and pop-up boxes shall be provided where power and data outlets are required within floor areas, meeting rooms, or open-plan office spaces as indicated on the drawings.
- 7.10.2 Units shall be constructed of galvanised steel or stainless steel, designed for flush installation in concrete, screed, or raised floor systems, and fitted with a removable or hinged cover incorporating a cable outlet flap to allow access when in use.
- 7.10.3 Floor and pop-up boxes shall accommodate a combination of socket outlets, data modules, and multimedia connectors, compatible with the same modular system used for wall-mounted wiring devices.
- 7.10.4 Each unit shall be equipped with modular support frames and rocker-style plates, allowing easy interchange of mechanisms between wall and floor installations.
- 7.10.5 All electrical connections shall utilise tool-less, quick-connect terminals to facilitate maintenance and reduce installation time.
- 7.10.6 Floor boxes shall be rated IP40 minimum (closed position) and IK08 impact resistance, while pop-up boxes shall achieve minimum IP20 when open.
- 7.10.7 Covers shall be load-tested to a minimum of 3000 N (in accordance with IEC 60670-23) and shall be suitable for foot traffic in office environments.
- 7.10.8 Units installed in wet or cleaning-prone areas shall be of splash-resistant design, with appropriate gaskets and drainage provisions.
- 7.10.9 All assemblies shall comply with:
- a. IEC 60670-1 – Boxes and Enclosures for Electrical Accessories
 - b. IEC 60670-23 – Floor Boxes for Electrical Installations
 - c. SANS 10142-1 – The Wiring of Premises

7.11 Internal Isolators

- 7.11.1 Internal isolators shall be provided for fixed electrical appliances and equipment as indicated on the drawings or in the schedules (e.g., water heaters, air-conditioning units, hand dryers, and similar fixed appliances).
- 7.11.2 Isolators shall comply with IEC/SANS 60947-3 and be rated not less than 20 A, 250 V AC for single-phase circuits and not less than 32 A, 400 V AC for three-phase circuits.

- 7.11.3 Switching mechanisms shall be of the double-pole type for single-phase and four-pole type for three-phase applications, providing positive isolation of all live conductors.
- 7.11.4 Each isolator shall be equipped with an integral LED indication to provide a visible status display of circuit energisation. The LED indicator shall operate at 230 V AC and shall be replaceable without disturbing the isolator mechanism.
- 7.11.5 Isolators shall be flush-mounted and compatible with the same modular system as other wiring devices specified herein.
- 7.11.6 Units shall incorporate a clearly visible ON/OFF indication.
- 7.11.7 Enclosures shall be rated minimum IP20 and constructed from high-impact, heat-resistant thermoplastic suitable for indoor service conditions.

7.12 Cord-Grip Isolators

- 7.12.1 Cord-grip isolators shall be installed for appliances or equipment connected by flexible cord (e.g., instant water heaters, extraction fans, catering equipment) as shown on the drawings.
- 7.12.2 Each unit shall be surface-mounted, equipped with an integral cord-grip assembly providing mechanical strain relief for the flexible cord.
- 7.12.3 Isolators shall comply with IEC/SANS 60947-3 and be rated 20 A minimum, 250 V AC.
- 7.12.4 Switch operation shall be double-pole with a positive make-and-break action and clearly marked ON/OFF positions visible when installed.
- 7.12.5 Each isolator shall include a built-in LED power indicator to display circuit status. The indicator shall be permanently visible when the device is energised and shall not compromise IP rating or enclosure integrity.
- 7.12.6 Enclosures shall provide IP44 protection or higher where installed in damp or semi-exposed areas. For outdoor or marine locations, isolators shall be IP66 rated minimum.
- 7.12.7 Materials shall be impact-resistant, UV-stable, and corrosion-resistant, suitable for use in industrial or port-side environments.

8.0 WARRANTY AND DOCUMENTATION

- 8.1 All products shall be warranted for a minimum period of 12 months from date of practical completion.
- 8.2 The Contractor shall submit:
 - a. Product data sheets and catalogues.
 - b. Circuit diagrams and as-installed wiring layouts.

- c. Operation and maintenance manuals. Remote monitoring through a mobile or web-based application.

9.0 QUALITY ASSURANCE

- 9.1 All products shall be factory tested and quality-assured in accordance with ISO 9001.
- 9.2 All devices shall operate without perceptible delay, flicker, or interference under normal service conditions.
- 9.3 Prior to bulk delivery, the Contractor shall supply a full set of sample devices for inspection and approval by the Engineer.