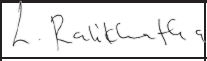


PERFORMANCE SPECIFICATION: OCCUPANCY SENSORS

Signatures						
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Date	Rev.	Status	Prepared By	Reviewed By	Approved By	Authorised By

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1.0 SCOPE

- 1.1 This specification defines the performance and technical requirements for occupancy sensors used in TNPA facilities for lighting and environmental control.
- 1.2 It includes standalone and networked sensors using PIR, microwave, and dual technologies for indoor and outdoor applications.

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

IEC/SANS 60669-1 / 60669-2-1 - Switches and Electronic Controls

Enclosures & Protection

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

Charging & Connectivity

IEC 62684 - USB Interface and Charging Standard

Data & Communication

ISO/IEC 11801 - Generic Cabling for Customer Premises

EN 50173 - Information Technology Cabling Systems

ANSI/TIA 568 - Telecommunications Cabling Standards

Quality & Compliance

RoHS / REACh - Environmental Compliance

Cybersecurity

IEC 62443 - Cybersecurity for Industrial Automation

ISO/IEC 27001 - Information Security Management

3.0 SERVICE CONDITIONS

- 3.1 Sensors shall operate reliably in environments with high humidity, temperature fluctuations, and potential air movement.

- 3.2 Outdoor sensors shall withstand water projection and harsh weather conditions (IP55/IP65).

4.0 STANDARD OF EQUIPMENT

- 4.1 Sensors shall be of high-quality design and manufacture, suitable for commercial, industrial, and port-side environments.
- 4.2 All units shall incorporate safety features and comply with applicable standards.

5.0 MATERIALS AND FINISHES

- 5.1 Enclosures shall be made of impact-resistant, UV-stable thermoplastic or metal alloy.
- 5.2 Finish shall be neutral or metallic, resistant to corrosion and surface degradation.
- 5.3 All materials shall meet flammability rating V-0 or V-1 per UL 94.

6.0 SYSTEM DESCRIPTION

- 6.1 Sensors shall be modular and compatible with flush or surface mounting.
- 6.2 Mounting height shall range from 2.5 m to 3 m.
- 6.3 Detection coverage shall be 360° with a minimum range of 7 m.
- 6.4 Sensors shall support standalone operation or integration with DALI/KNX systems.

7.0 FUNCTIONAL AND PERFORMANCE REQUIREMENTS

- 7.1 Occupancy sensors shall incorporate detection technologies such as Passive Infrared (PIR), Microwave (MV), or a combination of both in Dual Technology configurations, ensuring reliable presence detection across various environments.
- 7.2 Sensors shall support both occupancy mode, where lighting is automatically switched on and off based on presence, and vacancy mode, where lighting is manually switched on and automatically switched off when the area becomes unoccupied. Additionally, sensors shall include daylight sensing functionality, with an adjustable lux threshold ranging from 10 to 2000 lux, to prevent unnecessary activation when sufficient natural light is available.
- 7.3 Time delay settings shall be adjustable from 5 seconds to 20 minutes, allowing flexibility in configuring the duration for which lighting remains active after the last detected

movement. Sensors shall also support walk test mode for commissioning and staircase timer mode for specific applications.

- 7.4 Mounting options shall include flush mounting using spring clips or junction boxes, surface mounting with junction boxes, and ceiling or wall mounting configurations. All mounting methods must ensure secure installation and optimal detection coverage.
- 7.5 Environmental ratings shall be appropriate for the intended installation location. Indoor sensors shall have a minimum rating of IP40 for flush mounting and IP44 for surface mounting. Outdoor sensors shall be rated IP55 or higher. All sensors shall operate reliably within a temperature range of -20 °C to +45 °C.
- 7.6 Sensors shall provide control capabilities including ON/OFF switching, dimming via 1–10V or DALI protocols, and auxiliary outputs for HVAC and blind control. Manual override functionality shall be available via push-button interfaces.
- 7.7 Smart integration shall be supported through DALI or KNX bus communication protocols. Sensors shall be configurable via software tools and support energy monitoring, scenario control, and automation functions. All smart systems shall comply with cybersecurity standards IEC 62443 and ISO/IEC 27001 to ensure secure operation and data protection.

8.0 WARRANTY AND DOCUMENTATION

- 8.1 All occupancy sensor products shall be warranted for a minimum period of 18 months from the date of practical completion. The warranty shall cover defects in materials and workmanship under normal operating conditions.
- 8.2 The contractor shall be responsible for submitting comprehensive documentation for all installed devices. This documentation shall include product datasheets detailing technical specifications and compliance standards, circuit diagrams illustrating wiring and connection layouts, and operation and maintenance manuals providing guidance on configuration, troubleshooting, and servicing procedures.
- 8.3 These documents shall be submitted prior to handover and shall form part of the final project close-out package.

9.0 QUALITY ASSURANCE

- 9.1 All sensors shall be factory tested and certified to ISO 9001.
- 9.2 Sample units shall be submitted for inspection prior to bulk delivery.

- 9.3 Devices shall operate without perceptible delay or false triggering under normal conditions.