Division 28 16 00– Electric Safety and Security

- Intrusion detection -

#

#

# The intrusion alarm system shall be in accordance with EN 50131-3 for surveillance of medium-to-large projects.

* The system shall be easily extensible up to 1016 devices by supporting addressable point bus technology.
* The system shall be a high security intrusion alarm system that makes use of fault-tolerant and redundant bus technology to continue even in case of failure.
* Automatic addressing and set up of the devices shall be possible.
* The system shall support an open, IP-based interface that allows for full access to and control of all parts of the system and the integration into a management system.

Table of Contents

[**PART 1** **GENERAL** 3](#_Toc448243807)

[1.01 Quality Assurance 3](#_Toc448243808)

[1.02 Certifications 3](#_Toc448243811)

[**PART 2** **PRODUCTS** 4](#_Toc448243813)

[2.01 General 4](#_Toc448243814)

[2.02 Control Panel 7](#_Toc448243820)

[2.03 Keypad 10](#_Toc448243828)

[2.04 Point Bus Extension Module 13](#_Toc448243835)

[2.05 Interface Module 15](#_Toc448243843)

[2.06 Optional CAN Bus Splitter Module 17](#_Toc448243850)

[2.07 Optional Expansion Module 18](#_Toc448243856)

[2.08 Optional Arming Device 18](#_Toc448243861)

[2.09 Panel Enclosure 19](#_Toc448243864)

[2.010 Optional Power Enclosure 19](#_Toc448243870)

[2.011 Optional Expansion Enclosure 20](#_Toc448243875)

[2.012 Power Supply 21](#_Toc448243879)

[2.013 Manufactured units 24](#_Toc448243885)

[**PART 3** **EXECUTION** 25](#_Toc448243899)

[3.01 Installation 25](#_Toc448243900)

[3.02 Training and Support 25](#_Toc448243904)

[**PART 4** **Other** 26](#_Toc448243906)

[4.01 Attachments (optional) 26](#_Toc448243907)

[4.02 Further applicable documents (optional) 26](#_Toc448243908)

[4.03 List of abbreviations (optional) 26](#_Toc448243909)

[4.04 Revision History 26](#_Toc448243910)

# **GENERAL**

## Quality Assurance

### Installation, programming and maintenance of the intrusion alarm system shall be performed by qualified installers fully trained by the manufacturer.

### Manufacturer’s warranty shall cover at least 3 years.

## Certifications

### The intrusion alarm system shall be featured to obtain the following certifications:

#### EN 50131–1 Grade 3

#### EN 50131–3

####  EN 50131–6

#### SES-EMA-RL-T2

#### VdS 2311 Class C

#### VdS 2344

#### VdS 2110

#### VdS 2469

#### VdS 2203

####  VdS 2115

####  VdS 2252

####  AFNOR – NF&A2P Grade 3

# **PRODUCTS**

## General

### The system shall be a scalable intrusion alarm system for medium to large applications and shall be equipped with and support the following features:

#### Certified for EN 50131-1 Grade 3, AFNOR – NF&A2P Grade 3, SES-EM-RL-T2 and VdS 2311 Class C.

#### Support up to 1016 devices by using addressable point bus technology.

#### Support up to 500 areas.

#### Support up to 996 users.

#### Support up to 1500 addresses.

#### Support up to 32 touch keypads, which can be operated in multiple languages (DE, EN, FR, NL, HU, PL, RU, IT, ES, CZ, PT, LV).

#### Equipped with an open, IP-based interface that allows for the following functions:

##### Integration into a management system.

##### Full access to and control of all parts of the system.

##### Fast and easy integration via state of the art web technologies (REST, JSON).

##### Customizable event notification mechanism for instant notification of alarms or state changes.

##### Direct connection to the interface of the panel without an extra server application needed in between.

#### Remote programming via Ethernet (RJ45) connection.

#### It shall be possible to upgrade the firmware of all devices of the intrusion alarm system via remote programming software.

####  Schedules that allow for automated arming and disarming.

### Wiring considerations for devices on the external bus:

#### 0.6 mm – 1.0 mm d, recommended 0.8 mm.

#### Solid or stranded.

#### Twisted or untwisted.

#### Shielded or unshielded.

#### Cable length up to 1000 m.

#### Each peripheral device has two sets of bus terminals for daisy chain in/out wiring.

#### Peripheral devices are grounded through the bus cable.

### Electrical

|  |  |
| --- | --- |
| Maximum operating voltage in VAC | 230 (-15%, +10%)  |
| Minimum AC line frequency in Hz | 47 |
| Maximum AC line frequency in Hz | 63 |
| Maximum power consumption in W per power supply | 150  |
| Minimum battery capacity in Ah per power supply | 18  |
| Maximum battery capacity in Ah per power supply | 80 |
| Back-up time  | Determined by battery capacity and system load. Consider time or capacity limits for recharging the batteries regarding local regulations or EN standards if needed.  |

### Mechanical

|  |  |
| --- | --- |
| **Panel enclosure** |  |
| Dimension in cm (H x W x D) | 65.8 x 44.3 x 19.35  |
| Weight in g | 1566 |
| **Power enclosure** |  |
| Dimension in cm (H x W x D) | 65.8 x 44.3 x 19.35  |
| Weight in g | 1566 |
| **Expansion enclosure** |  |
| Dimension in cm (H x W x D) | 43.6 x 44.3 x 11.2 |
| Weight in g | 780 |
| **System parameters** |  |
| Number of addresses | 1500 |
| Number of areas  | 500  |
| Number of users | 996 |
| Number of PINs | 996 (with 9 digits, supporting a3-digit user ID (004 - 999) and a6-digit passcode) |
| Number of possible combination per PINs | 1 million |
| Validity of PINs | Permanent validity, time-limitedvalidity or one-time useconfigurable |
| **Number of devices** |  |
| Point bus extension modules | 8  |
| Keypads | 32 |
| Power supplies 150 W  | 32 |
| Printers | 1 |
| CAN Bus splitter modules  | 8 |
| **Number of inputs** |  |
| Programmable inputs on addressable point bus  | Limited to maximum number of available addresses system wide |
| Number of inputs (on control panel) | 8 |
| **Number of outputs** |  |
| Programmable outputs on addressable point bus  | Limited to maximum number of available addresses system wide |
| Power drive (on control panel) | 2 |
| Dry contact (on control panel) | 2 |
| Auxiliary power (on control panel)  | 1 |
| Supervised output (on interface module) | 3 |
| Open-collector output (on interface module) | 2 |

###  Environmental

|  |  |
| --- | --- |
| Minimum operating temperature in °C  | -10 |
| Maximum operating temperature in °C  | 55 |
| Minimum storage temperature in °C  | -20  |
| Maximum storage temperature in °C  | 60 |
| Minimum relative humidity in % | 5 |
| Maximum relative humidity in % | 95 |
| Protection class | IP30IP31 (with an edge protection profile)  |
| Security level | IK06 |
| Environmental class | II:EN60950-1 ; EN50130-4 ;EN50131-1 ; VdS 2110 |
| Usage  | Indoor  |

## Control Panel

### The control panel shall support:

#### 1500 addresses.

#### 500 areas.

#### 996 users.

### The control panel shall be equipped with and support:

#### 8 supervised inputs and 1 unsupervised tamper input.

#### 2 programmable outputs for optical and acoustical signaling devices as well as for other local notification devices.

#### 2 programmable relay outputs and 1 auxiliary output.

#### 2 bus interfaces and 1 Ethernet port.

#### An open, IP-based interface that allows for the following functions:

##### Integration into a management system.

##### Full access to and control of all parts of the system.

##### Fast and easy integration via state of the art web technologies (REST, JSON).

##### Customizable event notification mechanism for instant notification of alarms or state changes.

##### Direct connection to the interface of the panel without an extra server application needed in between.

### Firmware Upgrades:

#### It shall be possible to upgrade the control panel via remote programming software.

### Electrical:

|  |  |
| --- | --- |
| Minimum operating voltage in VDC | 19 |
| Maximum operating voltage in VDC | 29 |
| Rated voltage in VDC | 28 |
| Minimum current consumption in mA | 250 |
| Maximum current consumption in mA | 500 |
| **Outputs** |  |
| Maximum current consumption in mA per output | 1000 |
|  |  |
| **Relay outputs** |  |
| Maximum operating voltage in VDC | 30  |
| Maximum operating voltage in VAC | 30 |
| Back-up time | Determined by battery capacity and system load. Consider time or capacity limits for recharging the batteries regarding local regulations or EN standards if needed. |

### Mechanical:

|  |  |
| --- | --- |
| Dimension in cm (H x W x D) | 14.6 x 21.6 x 5.5  |
| Weight in g | 450 |
| Indicators  | Green LED for operating status |
| **Number of output modules** |  |
| Auxiliary output | 1 |
| Power output | 2 |
| Form C dry-contact relay output | 2 |

### Environmental:

|  |  |
| --- | --- |
| Minimum operating temperature in °C  | -10 |
| Maximum operating temperature in °C  | 55 |
| Minimum storage temperature in °C  | -20  |
| Maximum storage temperature in °C  | 60 |
| Minimum relative humidity in % | 5  |
| Maximum relative humidity in % | 95 |
| Protection class | IP30IP31 (built into the panel enclosure with an edge protection profile)  |
| Security level | IK04IK06 (built into the panel enclosure with an edge protection profile) |
| Environmental Class | II: EN50130-5, VdS 2110 |
| Usage | Indoor |

## Keypad

### It shall be possible to connect up to 32 keypads to the system.

###  The keypad shall support the following functions:

#### Touch screen – 14 cm LCD with adjustable LED backlight.

#### Graphic interface:

##### 16-bit vivid color.

##### 320 x 240 pixel resolution.

#####  Intuitive icons and menus.

#### Built-in speaker with adjustable volume supporting the following audible tones:

##### Accepted button press tone.

##### Invalid tone.

##### Entry delay tone.

##### Exit delay tone.

##### Intrusion alarm tone.

##### Intrusion supervisory tone.

##### Intrusion trouble tone.

##### Chime tone.

##### System trouble tone.

#### Language option, individually selectable by user:

##### DE, EN, FR, NL, HU, PL, RU, IT, ES, CZ, PT, LV.

#### Arming/disarming either the whole system or a subset of the system.

#### If the system is not ready to arm, the keypad shall immediately show the cause.

#### User configuration:

##### Add user.

##### Delete user.

##### Edit user.

##### Change password.

#### Built-in tamper switch.

####  Terminal blocks and system connectors attached to the base.

####  The menu structure shall be adaptable to the authorizations of different users.

### Firmware Upgrades:

#### It shall be possible to upgrade the keypad via remote programming software.

### Electrical:

|  |  |
| --- | --- |
| Minimum operating voltage in VDC | 16 |
| Maximum operating voltage in VDC | 29 |
| Rated voltage in VDC | 28 |
| **Rated current in mA** |  |
| Start-up | 800 |
| Alarm | 175 |
| Idle screen | 100  |
| Dark idle screen | 60 |

### Mechanical:

|  |  |
| --- | --- |
| Dimension in cm (H x W x D) | 15.6 x 17.1 x 3.9  |
| Weight in g | 363 |
| Housing material  | ABS plastic  |
| Color | White textured  |
| **Touchscreen**  |   |
| Type | TFT-LCD |
| Diagonal in cm | 14 |
| Aspect ratio | 4:3 |
| Resolution in pixels  | 320 x 240  |
| Color depth | 16-bit color  |
| Backlight | White LED with adjustable brightness (active and idle)  |
| Indicators | 3 LEDs:* Green: Power
* Yellow: Fault
* Red: Alarm
 |
| Connection type | 4-wire bus, 2 sets of terminals for daisy chain in/out wiring  |

### Environmental:

|  |  |
| --- | --- |
| Minimum operating temperature in °C  | -10  |
| Maximum operating temperature in °C  | 55 |
| Minimum storage temperature in °C  | -20 |
| Maximum storage temperature in °C  | 60 |
| Minimum relative humidity in % | 5  |
| Maximum relative humidity in % | 95 |
| Protection class | IP31 |
| Security level | IK06 |
| Design type as per EN 50131  | B |
| Environmental Class | II:EN50130-5, VdS 2110 |
| Usage | Indoor |

## Point Bus Extension Module

### The intrusion alarm system shall support up to 8 point bus extension modules.

### Each point bus extension module shall support the following functions:

#### Connect addressable point bus network with support of 1 loop or 2 stubs at maximum output current of 300 mA.

#### Support up to 127 addressable point bus network devices on either 1 loop or 2 stubs.

#### Support 2 auxiliary power outputs (500 mA each).

#### Provide single fault redundancy on loop configuration.

#### Provide automatic addressing and automatic set up.

### Firmware Upgrades:

#### It shall be possible to upgrade the point bus extension module via remote programming software.

### The point bus extension module shall support a range of:

#### Motion detectors.

#### Contacts.

#### Glassbreak detectors.

#### Seismic detectors.

#### Panic buttons.

#### Arming/Blocking devices.

#### Fire devices.

#### Sirens and LED lamps.

#### In/Out expansion modules to connect conventional devices to the system.

### Electrical:

|  |  |
| --- | --- |
| Minimum operating voltage in VDC | 16 |
| Maximum operating voltage in VDC | 29 |
| Rated voltage in VDC | 28 |
| Rated current in mA | 1600 |
| Standby current consumption | Dependent on addressable point bus network device load |
| Maximum addressable point bus network AUX output current in mA | 2 x 500 |

### Mechanical:

|  |  |
| --- | --- |
| Dimension in cm (H x W x D) | 15.88 x 8.26 x 6.35  |
| Weight in g | 365 |
| Housing material  | ABS plastic |
| Color | Off-white  |

### Environmental:

|  |  |
| --- | --- |
| Minimum operating temperature in °C  | -10  |
| Maximum operating temperature in °C  | 55 |
| Minimum storage temperature in °C  | -20 |
| Maximum storage temperature in °C  | 60 |
| Minimum relative humidity in % | 5 (non-condensing) |
| Maximum relative humidity in % | 95 (non-condensing) |
| Protection class | IP30IP31 (built into the panel enclosure with an edge protection profile) |
| Security level | IK04IK06 (built into the panel enclosure with an edge protection profile)  |
| Environmental Class | II: EN50130-5, VdS 2110 |
| Usage | Indoor |

## Interface Module

### The intruder alarm system shall support 1 interface module, which is the primary communication interface between the control panel and the communicator.

### The interface module shall support:

#### RS-232 COM 1 port: Interface to wireless GSM module or teleservice interface.

#### RS-232 COM 2 port: Shared with the 20 mA current loop on the terminal strip that supports connection to 1 printer through a 6-position terminal block.

#### 3 polarity-reversing supervised (12.1 kΩ EOL resistor) programmable outputs.

#### 2 unsupervised and programmable open-collector outputs.

### Firmware upgrades:

#### It shall be possible to upgrade the interface module via remote programming software.

### Electrical:

|  |  |
| --- | --- |
| Minimum operating voltage in VDC | 16  |
| Maximum operating voltage in VDC | 29 |
| Rated voltage in VDC | 28 |
| Minimum current consumption in mA | 100  |
| Maximum current consumption in mA | 150 |
| Outputs  | * Unsupervised and programmable open-collector outputs able to sink up to a combined current of 0.5 A at 28 VDC.
* Supervised and programmable outputs rated at 1 A each.
 |

### Mechanical:

|  |  |
| --- | --- |
| Dimension in cm (H x W x D) | 14.6 x 15.9 x 7.6  |
| Weight in g | 440 |
| Indicator  | Green LED for device status |
| **Number of output modules**  |  |
| Unsupervised and programmable open-collector  | 2 |
| Supervised and programmable outputs rated  | 3 |

### Environmental:

|  |  |
| --- | --- |
| Minimum operating temperature in °C  | -10  |
| Maximum operating temperature in °C  | 55 |
| Minimum storage temperature in °C  | -20  |
| Maximum storage temperature in °C  | 60 |
| Minimum relative humidity in % | 5 (non-condensing) |
| Maximum relative humidity in % | 95 (non-condensing) |
| Protection class | IP30IP31 (built into the panel enclosure with an edge protection profile)  |
| Enclosure Protection  | IK04IK06 (built into the panel enclosure with an edge protection profile) |
| Environmental Class | II: EN50130-5, VdS 2110 |
| Usage | Indoor |

## Optional CAN Bus Splitter Module

### It shall be possible to connect up to 8 CAN Bus splitter modules to the system to enable flexible wiring into different directions.

### The installation of each CAN Bus splitter module shall enable 2 independent and isolated stubs to connect keypads, point bus extension modules and power supplies to the system.

### The maximum wire length for each stub shall be 500 m.

### Electrical:

|  |  |
| --- | --- |
| Minimum operating voltage in VDC | 16  |
| Maximum operating voltage in VDC | 29 |
| Rated voltage in VDC | 28 |
| Rated current in mA | 50  |
| Maximum output current in mA per stub | 900 |

### Mechanical:

|  |  |
| --- | --- |
| Dimensions in cm (H x W x D) | 15.9 x 8.3 x 6.4  |
| Weight in g | 168  |
| Housing material  | ABS plastic  |
| Color  | Off-white  |

### Environmental:

|  |  |
| --- | --- |
| Minimum operating temperature in °C  | -10 |
| Maximum operating temperature in °C  | 55 |
| Minimum storage temperature in °C  | -20 |
| Maximum storage temperature in °C  | 60 |
| Minimum relative humidity in % | 5  |
| Maximum relative humidity in % | 95 |
| Protection class | IP30 |
| Security level  | IK04 |
| Environmental Class | II |

## Optional Expansion Module

### The optional expansion module shall provide the possibility to connect additional conventional devices to the system.

### The usage of expansion modules is limited by power consumption and the maximal amount of addresses.

### The expansion module shall support the following functions:

#### Connect 6 detector zones (conventional detector or monitoring contact inputs).

#### Connect 4 free control outputs.

#### Connect arming devices with associated system components.

#### Monitor the primary lines for alarms, short circuits or wire interruptions.

### An optional wall tamper contact shall be available.

## Optional Arming Device

### It shall be possible to arm/disarm the system via code keypad/reader or code keypad.

### The control unit of the arming device shall support the following elements:

#### Blocking element in combination with magnetic contact.

#### Bolt contact for monitoring perimeter door closed and locked.

#### Smart key.

#### Code keypad with integrated reader or as autonomous code keypad.

#### Reader.

#### Door opener relay or blocking element for vault doors.

## Panel Enclosure

### The panel enclosure shall be certified for VdS-S, EN and AFNOR.

### The panel enclosure shall be suitable for: 1 control panel, 1 interface module, 1 power supply, 2 x 40 Ah batteries and 4 point bus extension modules.

### The control panel enclosure shall be equipped with:

####  A hinged and removable mounting plate.

#### A removable cover.

#### Pre-configured cables.

#### A cable funnel.

### Mechanical:

|  |  |
| --- | --- |
| Dimension in cm (H x W x D) | 65.8 x 44.3 x 19.35  |
| Weight in g | 1566  |
| Material | 1.5 mm cold rolled steel  |
| Color | White  |

### Environmental:

|  |  |
| --- | --- |
| Protection class | IP30 IP31 (with an edge protection profile)  |
| Security level | IK06 |
| Environmental class | II: EN50130-5, VdS 2110  |
| Usage | Indoor  |

## Optional Power Enclosure

### It shall be possible to add an optional power enclosure to the panel enclosure to increase the back-up time.

### The optional power enclosure shall be suitable for 1 power supply and 4 x 40 Ah batteries.

### Mechanical:

|  |  |
| --- | --- |
| Dimensions in cm (H x W x D) | 65.8 x 44.3 x 19.35  |
| Weight in g | 1566 |
| Material | 1.5 mm cold rolled steel  |
| Color | White  |

### Environmental:

|  |  |
| --- | --- |
| Protection class | IP30  |
| Security level | IK06 |
| Environmental class | II: EN50130-5, VdS 2110  |
| Usage | Indoor  |

## Optional Expansion Enclosure

### An optional expansion enclosure shall be suitable for 1 power supply and up to 2 x 18 Ah batteries or 4 point bus extension modules.

### Mechanical:

|  |  |
| --- | --- |
| Dimension in cm (H x W x D) | 43.6 x 44.3 x 11.2  |
| Weight in g | 780  |
| Material | 1.5 mm cold rolled steel  |
| Color | White  |

### Environmental:

|  |  |
| --- | --- |
| Protection class | IP30  |
| Security level | IK06 |
| Environmental class | II: EN50130-5, VdS 2110  |
| Usage | Indoor  |

## Power Supply

### It shall be possible to connect up to 32 power supplies to the system.

### The power supply shall:

#### Provide 2 independent power ports with fixed 28 VDC regulated output.

#### Provide 150 W for battery charging and system power.

#### Provide controlled 500 mA, 24 VDC nominal auxiliary output.

#### Provide color-coded terminal for easy installation.

#### Provide 2 dry relay contacts for AC and DC trouble signaling.

#### Provide yellow and green LEDs and signal outputs to indicate AC, battery and bus communication status.

### Electrical:

|  |  |
| --- | --- |
| Maximum operating voltage in VAC  | 230 (-15%, +10%)  |
| Minimum AC line frequency in Hz | 47 |
| Maximum AC line frequency in Hz | 63 |
| Minimum output voltage in VDC | 16 |
| Maximum output voltage in VDC | 30 |
| Minimum current consumption in mA | 1070 at rated load and 230 VAC  |
| Maximum current consumption in mA | 100 at no-load and 24 VDC  |
| **Battery**  |  |
| Battery configuration in VDC | 12 |
| Battery type  | Lead battery, maintenance-free  |
| Minimum ampere hour rating in Ah | 18 |
| Maximum ampere hour rating in Ah | 80 |
| Battery charge voltage in VDC | 27.6 (with thermal compensation)  |
| Nominal battery charger output in A | 4.85 |
| Maximum battery charger output in A  | 5  |
| **Outputs**  |  |
| Maximum sum of output (field-accessible or user-accessible) power in W | ≤ 109  |
| Maximum ripple of all voltage outputs in mV | ≤ 250 |
| **A and B output**  |  |
| Type  | Supervised, independently short-circuit protected  |
| Minimum output voltage in VDC | 26  |
| Maximum output voltage in VDC | 30 |
| Rated voltage in VDC | 28 ± 1  |
| Rated current in mA (A or B) | 2000  |
| Rated current in mA (sum of A and B)  | 3000  |
| **Switched auxiliary output**  |  |
| Type  | Supervised  |
| Minimum output voltage in VDC | 24  |
| Maximum output voltage in VDC | 30 |
| Rated voltage in VDC | 24  |
| Rated current in mA | 500 |
| **Panel output**  |  |
| Type | Unsupervised  |
| Maximum output voltage in VDC | 27.6 |
| Rated voltage in VDC | 24  |
| Rated current in mA | 500 |
| **Trouble output dry contacts**  |  |
| Maximum operating voltage in VDC | 30 |
| Rated current in mA | 1000  |

### Mechanical:

|  |  |
| --- | --- |
| Dimensions in cm (H x W x D) | 11.43 x 22.23 x 6.67  |
| Weight in g | 590 |
| Indicators | Green LEDs indicate:* AC good
* Operation monitor

2 x yellow LEDs indicate: * BAT 1/2 (on = missing battery, blinking = low battery)
 |
| **Number of inputs**  |  |
| Tamper switch input | 1 |
| Thermal compensation circuit  | 1  |

### Environmental:

|  |  |
| --- | --- |
| Minimum operating temperature in °C  | -10 |
| Maximum operating temperature in °C  | 50 |
| Minimum storage temperature in °C  | -20  |
| Maximum storage temperature in °C  | 60 |
| Minimum temperature compensation (Trim) in °C  | -10  |
| Maximum temperature compensation (Trim) in °C  | 55 |
| Minimum relative humidity in % | 5 (non-condensing) |
| Maximum relative humidity in % | 95 (non-condensing) |
| Protection class | IP30IP31 (built into the panel enclosure with an edge protection profile)  |
| Security level  | IK04IK06 (built into the panel enclosure with an edge protection profile) |
| Environmental Class | II:EN50130‑5, VdS 2110 |
| Design type as per EN 50131 | A  |
| Usage | Indoor |

## Manufactured units

### The intrusion alarm system shall be a Bosch MAP 5000.

#### The remote programming software shall be Bosch RPS.

#### The open, IP based interface shall be the Open Intrusion Interface (OII).

### The control panel shall be a MAP 5000 Main Panel.

### The keypad shall be a Bosch MAP Control Center.

### The point bus extension module shall be a Bosch MAP LSN Gateway Module.

#### The addressable point bus network shall be Bosch Local Security Network (LSN)

### The interface module shall be a Bosch MAP DE Module.

### The optional CAN Bus splitter module shall be a Bosch MAP CAN Splitter Module.

### The optional expansion module shall be a Bosch ISP-EMIL-120 Expansion Module.

### The optional arming device shall be a Bosch SE xxx LSNi SmartKey Arming Device.

### The panel enclosure shall be a Bosch MAP Panel Enclosure Kit.

### The power enclosure shall be a Bosch MAP Power Enclosure Kit.

### The expansion enclosure shall be a Bosch MAP Expansion Enclosure Kit.

### The Power Supply shall be a Bosch MAP Power Supply 150 W.

### [Remove above article if this is to be a performance-based specification.]

# **EXECUTION**

## Installation

### The installation shall be executed in accordance with manufacturer’s instructions in documentation.

### The installation shall be executed by qualified and certified installers.

### Testing and configuration shall be done in accordance with instructions provided by the manufacturer.

## Training and Support

### The manufacturer shall provide a professional training and a technical support hotline.

# **Other**

## Attachments (optional)

## Further applicable documents (optional)

## List of abbreviations (optional)

## Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Issue** | **Date** | **Editor** | **Description of amendment** |
|  |  |  |  |
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