

## Safety PN 07 | Residential Fire Safety Systems

### Audience

The audience/s for this Practice Note include/s:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Architects/ Designers             | <input checked="" type="checkbox"/> Owner Builders                             |
| <input checked="" type="checkbox"/> Builders                          | <input checked="" type="checkbox"/> Plumbers                                   |
| <input checked="" type="checkbox"/> Building Surveyors/ Inspectors    | <input type="checkbox"/> Real estate management agents                         |
| <input checked="" type="checkbox"/> Engineers                         | <input checked="" type="checkbox"/> Trades and Maintenance (inc. Electricians) |
| <input checked="" type="checkbox"/> Home Owners / Residential Tenants |  |

### Purpose

This Practice Note provides guidance on the requirements for residential fire safety systems referenced in the Victoria Appendix (clause Vic H103.1) to the Building Code of Australia (BCA) Volume One 2016 – Amendment 1. This Practice Note covers two separate issues.

Part A covers installation requirements for local fire indicator panels (or alarm panels) that provide information to staff when a fire alarm is activated for Class 3 residential care buildings.

Part B describes requirements for connecting residential sprinkler systems in Class 2 and 3 buildings or a residential care building, to a fire station or other approved monitoring service.

The content below provides guidance on:

- Definitions
- PART A – Residential Local Fire Alarm Systems
  - General requirements
  - Local fire indicator panel
  - Signal Isolation Interface Units
  - Wiring
  - System Testing
  - Maintenance
  - Training for Building Occupants
- PART B: Connection of Residential Sprinkler system to a fire station or other approved monitoring service
  - System design
  - Connection to monitoring service
  - Indication at the fire indicator panel
  - Certificate of Acceptance



## Abbreviations & Definitions

The abbreviations and definitions set out below are for guidance only. They are not intended to vary those set out in the Building Act 1993, the Building Regulations 2018, or the National Construction Code.

- **Act** – Building Act 1993
- **ActivFire listed** – a product approved and listed in the ActivFire Scheme Register of Fire Protection Equipment maintained by the Commonwealth Scientific and Industrial Research Organisation, Division of Materials Science and Engineering (CSIRO-MSE)
- **Alarm zone** - an area of a building approved by the relevant building surveyor (RBS), protected by one or more smoke alarms connected to one alarm circuit.
- **BCA** - Building Code of Australia Volume One 2016 – Amendment 1
- **BCA** - Building Code of Australia Volume One 2019 – Amendment 1
- **Extra-low voltage**
  - Voltage not exceeding 50 V a.c. or 120 V ripple-free d.c.
- **FRV**- Fire Rescue Victoria
- **Fixed wired** - a system of electrical wiring (either a.c. or d.c.), in which cables are fixed or supported in position in accordance with the appropriate requirements of AS/NZS 3000.
- **Low voltage**
  - Voltage exceeding extra-low voltage, but not exceeding 1000 Va.c. or 1500 V
- **RBS** – Relevant Building Surveyor
- **Regulations** – Building Regulations 2018
- **Regulations** – Plumbing Regulations 2018
- **Smoke alarm** - a device containing a smoke detector and an integral alarm sounding device complying with AS 3786.
- **Sprinkler alarm switch** - a device capable of sending an electrical signal to activate an alarm when a residential sprinkler head is activated (e.g. a flow switch).
- **Voltage** - a difference of potential, measured in Volts (V), as follows:



Please refer to Practice Note **FS-01 Monitoring of Sprinkler Systems in Class 9a Healthcare Buildings for buildings using NCC 2022.**



## PART A – Residential Local Fire Alarm Systems

### General requirements

The installation must consist of a system of smoke alarms powered either directly from the low voltage supply mains, or from an extra-low voltage power source originating at a local fire indicator panel with a battery back-up facility. A smoke detector complying with AS 1603.2 may be substituted for a smoke alarm, provided an external warning device is associated with each detector.

The sound pressure level provided by a warning device must be equivalent to that required in Clause 3.22 of AS 1670.1, except that the sound pressure level need not be measured inside a sole-occupancy unit, provided that a level of not less than 85 dB(A) is attained at the access door to the unit.

The alarm system must be wired in accordance with the relevant requirements of AS/NZS 3000 for low or extra-low voltage wiring.

The system must be designed so that:

- an audible alarm is given in the area in which the smoke alarm activates;
- visible and audible indication of an alarm is provided at the local fire indicator panel;
- an audible alarm is given in any area (including sleeping quarters and staff outbuildings) set aside for staff use.

The maximum number of smoke alarms on any one alarm zone must be determined by the maximum current output rating of the system source. It should not generally exceed ten (10).

Each zone must be located around a single central access passageway, corridor, or similar thoroughfare, to enable staff to readily identify the source of the alarm.

Where the smoke alarm is functionally dependent on an external power source, an audible fault signal must sound at the local fire indicator panel if that power source fails. The local fire indicator panel must be permanently connected to a reliable 240 V supply.

Separate low voltage final sub-circuit. Sourced power must be protected by a separate circuit breaker, or fuse, supplied from the live side of the main switch.

The smoke alarm system is not required to be connected to a fire station (see Clause Vic H103.1 of the BCA Volume One).

### Local fire indicator panel

**Location:** The local fire indicator panel must be located in a central area — such as a reception area or manager's office — readily accessible by staff at all times.

**Facilities:** The local fire indicator panel must be fixed and wired in accordance with the relevant requirements of AS/NZS 3000. It must incorporate the following:

- a) A suitable mains power supply with battery back-up (capable of operating the system for 12 hours) for the local fire indicator panel and extra-low voltage smoke alarms supplied directly from the local fire indicator panel.
- b) Suitable terminals for input signal conductors from the smoke alarm and residential sprinkler system. If the signal source is from a low voltage smoke alarm, suitable external isolation must be provided.



- c) Visible indication of the alarm zone in which the actuating device is located.
- d) Automatic audible and visible indication of the following faults:
  - A break in the wiring of any circuit between smoke alarms or sprinkler alarm switch and the local fire indicator panel.
  - Low battery condition.
- e) Automatic audible and visible indication of the following faults:
  - A break in the wiring of any circuit between smoke alarms or sprinkler alarm switch and the local fire indicator panel.
  - Low battery condition.
- f) Automatic visible indication of mains power failure.
- g) Initiation of any ancillary control facilities, as required by the RBS (e.g. smoke door release, air conditioning shut-down).
- h) Local operation of individual smoke alarms, in the event of alarm zone isolation at the local fire indicator panel.

If the local fire indicator panel is also used for other purposes (e.g. security), then these functions must be on separate and distinct circuits.

When disabled or isolated, these functions must not interfere with the operation of fire alarm circuitry.

The local fire indicator panel must be ActivFire listed.

The local fire indicator panel must have the capacity to incorporate AS 1603.1 approved heat detectors on either the same or separate alarm zones as the smoke alarms.

### Smoke alarms

Extra-low voltage smoke alarms must be:

- ActivFire listed;
- Compatible with the local fire indicator panel.

Low voltage smoke alarms must be:

- ActivFire listed;
- Accepted by the electricity supply authority; and
- Configured to send an output alarm signal to the local fire indicator panel.



Note: Unless evidence indicates internal isolation of the signal output conductors, they must at all times be treated as low voltage conductors.

### Signal Isolation Interface Units

Signal isolation interface units must isolate any low voltage connected to the smoke alarms, from the local fire indicator panel. They must be certified by the CSIRO as compatible with the specific types of smoke alarms used in the system.

They must also be accepted by the electricity supply authority, to ensure the isolation provided is in accordance with the requirements of AS 3100. Units must be marked in a clearly visible location, with the following information.



## Wiring

Smoke alarms and associated equipment must be fixed and wired in accordance with the relevant requirements of AS/NZS 3000 for low voltage and extra low voltage wiring systems, as applicable.

All extra-low voltage wiring must be red sheathed 0.6/1 kV stranded, with conductors having a cross sectional area of not less than 0.75 mm<sup>2</sup>.

Clear and concise “as-installed” single line drawings to a suitable scale, showing rooms, external and internal walls, fixed partitions, doorways etc., are to be provided for each installation at the local fire indicator panel.

Drawings must also include the actual location of fire alarms, smoke alarms, sprinkler flow switches (where installed), alarm connection points and local fire indicator panel, to enable easy identification of alarm system elements and their relationship to the building layout. Symbols to be used are:

FLOW SWITCH	
HEAT DETECTOR	
SMOKE DETECTOR	
END-OF-LINE DEVICE	
FIRE INDICATOR PANEL	
SMOKE ALARM	

**Figure 1 - Symbols**

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## System Testing

Inspection and testing of the complete system after installation must be as agreed with the RBS and arranged with an independent approved fire system inspector, to verify compliance with relevant requirements.

A comprehensive inspection and test report must be lodged with the RBS. Appendices B and C of AS 1603.2 give examples of a typical report and installation statements.

Guidance on selecting people capable of inspecting and testing this equipment can be obtained from the Chief Officer of the Fire Rescue Victoria (FRV).

## Maintenance

Part 15 of the Building Regulations 2018 requires maintenance of essential safety measures to be carried out by the owner. The following are additional requirements to those under Part 15:

A manual must be provided, containing all information necessary for the maintenance and operation of the system. The text must be in clear, concise English, and any other language appropriate to the building, and easily understood by staff members not familiar with the equipment.

A maintenance and testing agreement must be entered into, complying with the intent of AS 1851.8.



## Training for Building Occupants

A training system, at least to the standard of that described in Practice Note 08-2018 Emergency Communications Systems, should be introduced for the occupants and staff of the building.

## PART B: Connection of Residential Sprinkler system to a fire station or other approved monitoring service

### System design

The sprinkler installation must comply with the requirements of the BCA and AS 2118.4.

### Connection to monitoring service

Connection of a residential sprinkler system to a fire station or other approved monitoring service must be via a sprinkler alarm switch, connected to alarm signalling equipment complying with AS 4428.6. The connection from the alarm signalling equipment must be in accordance with AS1670.1 clause 3.18.3.

The alarm signalling equipment must be installed:

- In a secure accessible position.
- In a weatherproof housing, if located externally.
- Not more than 500 mm from the system flow switch, unless approved by the Chief Officer, FRV.

Flow switches must be ActivFire listed.

### Indication at the fire indicator panel

Any signal from the alarm signalling equipment must be mimicked by an audible and visible signal at the fire indicator panel.

### Certificate of Acceptance

A Certificate of Acceptance and report must be completed by the RBS responsible for issuing the building permit. The Certificate and report must be received by the Chief Officer of FRV (depending on where the building is located), before the final connection of the alarm is made to a fire station or other approved monitoring service.

The Certificate of Acceptance must be in accordance with the form provided in – Appendix 1 and must include the details of the person who has commissioned the residential sprinkler system.

### Related Documentation

- Building Act 1993
- Building Regulations 2018
- Building Code of Australia Volume One 2016 – Amendment 1
- Building Code of Australia Volume One 2019 – Amendment 1
- AS/NZS 3000 – Electrical installations – Buildings, structures and premises (SAA wiring rules)
- AS 3786 – Smoke Alarms using Scattered Light, Transmitted Light or Ionization



- AS 1603.2 - Automatic Fire Detection and Alarm System
- AS 1670.1 - Fire Detection Warning, Control and Intercom Systems – System Design, Installation and Commissioning - Fire
- AS 3100 – Approval and Test Specification
- AS 1851.8 - Maintenance of Fire Protection Equipment
- AS 2118.4 - Accommodations Automatic Fire Sprinklers
- AS 4428.6 - Fire Detection, Warning, Control and Intercom Systems - Control and Indicating Equipment Alarm Signalling Equipment
- Practice Note 08-2018 Emergency Communications Systems
- ActivFire Scheme Register of Fire Protection Equipment
- FS-01 Monitoring of Sprinkler Systems in Class 9a Healthcare Buildings for buildings using NCC 2022.

### List of Amendments

- Metropolitan Fire and Emergency Services Board (MFESB) amended to Fire Rescue Victoria (FRV).
- Reference to Practice Note FS-01 Monitoring of Sprinkler Systems in Class 9a Healthcare Buildings for buildings using NCC 2022.

### Document history

<b>Sector</b>	Building
<b>Category</b>	Safety
<b>Topic</b>	Residential Fire Safety Systems
<b>Document number</b>	07
<b>Version</b>	1.0
<b>Superseded</b>	<ul style="list-style-type: none"> <li>• Residential Fire Safety Systems Practice note 07-2018, published June 2018</li> </ul>
<b>Published</b>	6 December 2023

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