

Fire Service System Monitoring

First issued: March 2004
Review date: May 2024
Revision frequency: Triennially
Version number: 5

Guideline No. 24

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1. PURPOSE

The purpose of this guideline is to provide industry with the Fire Rescue Commissioner's interpretation and advice relating to the specification and use of system monitoring devices that are affixed to isolating valves and pump equipment, which serve automatic fire sprinkler systems, fire hydrant systems and combined sprinkler and hydrant systems.

2. SCOPE

This guideline is applicable to isolating vales and fire hydrant pump equipment that require continuous system monitoring and are installed to serve:

- a. Fire hydrant systems within buildings in excess of 25 metres in effective height in accordance with Australian Standard AS 2419.1-2021 *Fire hydrant installations, Part 1: System design, installation and commissioning* [1];
- b. Combined sprinkler and hydrant systems complying with Australian Standard AS 2118.6-2012 *Automatic fire sprinkler systems, Part 6: Combined sprinkler and hydrant systems in multistorey buildings* [2], where pressure zone isolating valves, sprinkler floor-isolating valves, isolating valves provided either side of pressure reducing valves, or any other valves capable of isolating water supply to the system, are required to be installed; and
- c. Automatic fire sprinkler systems complying with Australian Standard AS 2118.1-2017 *Automatic fire sprinkler systems, Part 1: General systems* [3] that utilise isolating valves, where one or more of the following circumstances exist:
 - (i) High hazard installations serving areas greater than 300m²; or
 - (ii) Buildings in excess of 25 metres in effective height; or
 - (iii) Where routine monthly testing is required under AS 1851- 2012 [4].

For the purpose of this guideline and Regulation 129 of the Building Regulations 2018 [5], the term 'isolating valve' is synonymous with the term 'control valve' and 'stop valve'. These terms are used interchangeably within this document.

3. TYPES OF SYSTEM MONITORING DEVICES

The two system monitoring device categories that are applicable to automatic fire sprinkler systems, fire hydrant systems and combined systems installations are Class A and Class B monitoring devices.

A Class A monitoring devices detect changes in status of system components and protects against deliberate actions to tamper with the monitoring device. They are tested to meet the tamper resistance performance requirements of AS 4118.1.4-1994 [6] and are also subject to supplementary electrical, environmental, vibration, impact and endurance performance testing. Class A monitoring devices are expected to transmit a signal upon a change of status of the monitored component, any attempt to tamper with or bypass the monitoring device and any attempt to tamper with or bypass the connection back to the Fire Detection Control and Indicating Equipment (FDCIE).

Class B monitoring devices provide similar monitoring of system components however the device does not contain tamper resistance features. Unlike Class A monitoring devices, the relevant Australian Standards do not require Class B monitoring devices to be in accordance with the requirements of AS 4118.1.4. Class B monitoring devices are expected to transmit a signal upon a change of status of the monitored component and any attempt to tamper with or bypass the connection back to the FDCIE.

4. ACCREDITATION OF SYSTEM MONITORING DEVICES

Class A monitoring devices are assessed for compliance against AS 4118.1.4-1994. Accredited Class A monitoring devices are issued with reports from an accredited testing laboratory, which concurrently satisfies the evidence of suitability requirements of Part A5 of the National Construction Code 2022 (NCC) [7].

Where evidence of suitability is provided by a professional engineer or other appropriately qualified person, as outlined in Clause A5G3 (1)(e) of the NCC, it must be documented on a site specific and case by case basis.

Whilst there is no Australian Standard that assesses the performance of Class B monitoring devices, the Fire Rescue Commissioner believes that the performance of Class B monitoring devices can be assessed for limited compliance under AS 4118.1.4-1994. Specifically, Class B monitoring devices can be assessed by an accredited testing laboratory as meeting the following aspects of AS 4118.1.4-1994:

1. The normal operation requirements under Clause 3.3;
2. The electrical requirements under Clause 3.4;
3. The environmental requirements under Clause 3.5; and
4. The vibration, impact and endurance requirements under Clause 3.6.

5. SYSTEM MONITORING EXPECTATIONS

5.1 Automatic Fire Sprinkler System Installations

The monitoring of system components within the automatic fire sprinkler code are expressly contained within Section 3.5 of AS 2118.1-2017. To summarise:

- Class A monitoring devices can be used in all circumstances; and
- Class B monitoring devices are permitted to be used where the monitored components are located within a ceiling space, a secure area or a room with access that is restricted by means of a security device or system.

Importantly, where Class B monitoring devices are proposed to be used, it is the location of the system component, which governs the use of Class B monitoring devices. If a system component, such as a water supply stop valve, a main stop valve or a subsidiary stop valve is located within a ceiling space, a secure area or a room with access restricted by means of a security device or system, only then does AS 2118.1-2017 and AS 2419.1-2021 permit the use of Class B monitoring devices.

In circumstances where the Fire Rescue Commissioner has consented to the location of the control valves, isolating valves or stop valves being in within areas that have limited or no access restrictions within a Regulation 129 Report, the Fire Rescue Commissioner expects that Class A monitoring devices will be used. It is unlikely that the Fire Rescue Commissioner will concurrently support the use of Class B monitoring devices in these circumstances.

5.2 Fire Hydrant Systems

The monitoring of fire hydrant system components is specified in Section 8.9.5 of AS 2419.1-2021. This includes isolation valves and various components of fire hydrant pump systems.

The Fire Rescue Commissioner expects that fire hydrant systems that serve buildings in excess of 25 metres in effective height will be provided with Class A monitoring devices that are affixed to the system components listed in Section 8.9.5 of AS 2419.1-2021. This is inclusive of the fire hydrant pump components set out in Section 8.9.5 (d) to (f).

5.3 Combined Sprinkler and Hydrant Systems

The system monitoring of sprinkler isolation valves, fire hydrant pump components, fire main isolation valves and any other valves that are capable of isolating the water supply to the combined system, are outlined within Section 2.13 of AS 2118.6-2012. Section 2.13 of AS 2118.6-2012 requires system monitoring to comply with AS 2118.1-2017 and AS 2419.1-2021 irrespective of a building's height, area or hazard category.

It is generally expected that the monitoring arrangements for combined systems will concurrently comply with the requirements of AS 2118.1-2017 and AS 2419.1-2021. Specifically, the system components to be monitored under AS 2419.1-2021 apply to a AS 2118.6-2012 system, inclusive of fire service pump components detailed in Section 8.9.5 of AS 2419.1-2021.

5.4 Secure Locations

With respect to Class B monitoring devices, the Fire Rescue Commissioner is of the opinion that a stair shaft or an enclosure fitted with a 003 locking device does not reasonably satisfy the 'secure area' or 'secure room' expectations of the AS 2419.1-2021, AS 2118.1-2017 and AS 2118.6-2012.

6. PERFORMANCE SOLUTIONS ADOPTING ALTERNATIVE SYSTEM MONITORING ARRANGEMENTS

Where a performance solution proposes to use Class B monitoring devices:

- In lieu of Class A monitoring devices within a fire main serving a sprinkler system, a fire hydrant system, fire hydrant pump equipment, combined sprinkler and hydrant system or a control valve assembly; or
- Within a fire main serving a sprinkler system, or the isolation valves of a sprinkler system, in a manner that is not consistent with the expectations of Clause 3.5.2.1 of AS 2118.1-2017 or Clause 2.13 of AS 2118.6-2012;

the Report and Consent of the Fire Rescue Commissioner is required to be obtained in relation to an application for a building permit, pursuant to Regulation 129 of the Building Regulations 2018.

7. REFERENCES

- [1] AS 2419.1-2021: Fire Hydrant Installations – Part 1: System Design, Installation and Commissioning, Standards Australia
- [2] AS 2118.6-2012: Combined Sprinkler and Hydrant Systems in Multistorey Buildings, Standards Australia
- [3] AS 2118.1-2017: Automatic Fire Sprinkler Systems – General Systems, Standards Australia
- [4] AS 1851-2012: Routine Service of Fire Protection Systems and Equipment, Standards Australia
- [5] Building Regulations 2018
- [6] AS 4118.1.4-1994: Fire Protection Systems – Components – Valve Monitors (Reconfirmed 2013), Standards Australia
- [7] National Construction Code, Volume One, Building Code of Australia, Australian Building Codes Board, 2022