

Australian Standard™

**Fire detection, warning, control and
intercom systems—Control and
indicating equipment**

Part 1: Fire



This Australian Standard was prepared by Committee FP-002, Fire Detection, Warning, Control and Intercom System. It was approved on behalf of the Council of Standards Australia on 30 January 1998 and published on 5 November 1998.

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Australasian Fire Authorities Council
Australian Building Codes Board
Australian Chamber of Commerce and Industry
Australian Chamber of Manufactures
Australian Electrical and Electronic Manufacturers Association
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STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 4428.1—1998

**Fire detection, warning, control and intercom systems—Control and indicating
equipment**

Part 1: Fire

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NOTES

Australian Standard™

Fire detection, warning, control and intercom systems—Control and indicating equipment

Part 1: Fire

Originated in part as AS CA15—1961.
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee FP/2, Fire Detection, Warning, Control and Intercom Systems, to supersede AS 1603.4—1987, *Automatic fire detection and alarm systems, Part 4: Control and indicating equipment*, and is the result of a consensus among representatives on the Committee to produce it as an Australian Standard.

This Standard incorporates Amendment No. 1 (April 2004). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The edition of this Standard has incorporated, in tabular form, the requirements for control and indicating equipment (CIE) in three grades. The grades of CIE are as follows:

- (a) *Grade I* Complete equipment for an installation that fully complies with the requirements of AS 1670.1, *Fire detection, warning, control and intercom systems—System design, installation and commissioning, Part 1: Fire*.
- (b) *Grade II* Typical of the type of equipment for installations that partially comply with AS 1670.1 or fully comply with AS 1670.2, *Fire detection, warning, control and intercom systems—System design, installation and commissioning, Part 2: Local fire*.
- (c) *Grade III* Typical of the type of equipment that complies with AS 1670.2.

The Standard also provides for the testing and certification of CIE to be performed without reliance on interpretation of the Standard, which reduces the difficulties experienced in such testing. The Standard also includes changes to requirements which were found to be inappropriate for application in the field.

The general requirements and test methods for CIE have been removed for this edition and published as AS 4428.0.

The power supply requirements have also been removed and published as AS 4428.5.

The firefighter facility (FF) has been incorporated into this edition of the Standard.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

This Standard incorporates commentary on some of the Clauses. Commentary directly follows the relevant Clause, is designated by ‘C’ preceding the clause number and is printed in italics in a box. Commentary is for information only and does not need to be followed for compliance with the Standard.

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STANDARDS AUSTRALIA**Australian Standard****Fire detection, warning, control and intercom systems—Control and indicating equipment****Part 1: Fire****SECTION 1 SCOPE AND GENERAL****1.1 SCOPE**

This Standard specifies the functional requirements and the performance criteria for control and indicating equipment (CIE) used in automatic fire detection and alarm systems.

1.2 APPLICATION

The requirements of this Standard apply to the CIE forming part of any fire detection and alarm system installed in accordance with AS 1670.1 and 1670.2. This includes but is not limited to fire indicator panels (FIPs), subindicator panels (SIPs), repeater panels (RPs), mimic panels (MPs) and remote control equipment (RCE).

This Standard will be referenced in the Building Code of Australia by way of BCA Amendment 4 to be published by 1 January 1999, thereby superseding AS 1603.4—1987, which will be withdrawn 12 months from the date of publication of this Standard.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|--------|--|
| 1670 | Fire detection, warning, control and intercom systems—System design, installation, and commissioning |
| 1670.1 | Part 1: Fire |
| 1670.2 | Part 2: Local fire |
| 2484 | Fire—Glossary of terms |
| 2484.2 | Part 2: Fire protection and firefighting equipment |
| 2706 | Numeric values—Rounding and interpretation of limiting values |

AS/NZS

- | | |
|--------|--|
| 3000 | Electrical installations—Buildings, structures and premises |
| 3100 | Approval and test specification—General requirements for electrical equipment |
| 4428 | Fire detection, warning, control and intercom systems—Control and indicating equipment |
| 4428.0 | Part 0: General requirements and test methods |
| 4428.5 | Part 5: Power supply units |
| 4428.6 | Part 6: Alarm signalling equipment |

1.4 DEFINITIONS

For the purpose of this Standard the definitions given in AS 1670.1, AS 2484.2 and those below apply.

NOTE: The application of the definitions is illustrated in Figure 1.1.

1.4.1 Acknowledge

To initiate an action, as a user of the system, to accept an indicated condition.

1.4.2 Alarm signalling equipment (ASE)

Equipment designed to communicate alarm and fault signals and other information between a fire alarm system and a monitoring service.

1.4.3 Alarm verification facility (AVF)

That function of the control and indicating equipment that verifies an alarm signal so that a spurious signal does not initiate an alarm signal to the monitoring service, ACF functions and alarm warning systems.

1.4.4 Ancillary control facility (ACF)

That portion of control and indicating equipment which, on receipt of a signal, initiates predetermined actions in external ancillary devices.

1.4.5 Firmware

The basic operating program which is not intended to be field changeable.

1.4.6 Interface

An interconnection between equipment which permits the transfer of information.

1.4.7 Monitoring service

A remote controlling station which receives fire alarm signals and transfers the signals to a firefighting service.

1.4.8 Power supply

That portion of control and indicating equipment which provides a common source of power for operation of the control and indicating equipment.

1.4.9 Software

The combination of firmware and site-specific data which controls the overall operation of the control and indicating equipment.

1.5 GENERAL REQUIREMENTS

Operations or functions required by this Standard shall be independent of and not rely on the operation of, or be affected by, the malfunction of any other equipment or system. Devices which do not form part of CIE shall not be contained within the CIE enclosure(s). Circuits external to the fire detection and alarm system shall be protected such that short circuits cannot impair the normal operation of the fire detection and alarm system.

Externally energized circuits at voltages in excess of extra low voltage (ELV) as defined in AS 3000, except the power source for CIE, are not permitted to enter the CIE enclosures.

All functions required in Section 2 shall be available to authorized operators without the use of passwords, codes or the like.

The individual parts of the fire detection and alarm system shall be compatible with each other.

Parts of the CIE capable of operating as a distributed system of SIPs or RCE and FIP, to monitor more than 10 alarm zones (1 alarm zone for RCE) using a common signal path, shall have provision for at least two signal paths to allow an alarm transmission that is independent of any single signal path fault.

A single open circuit in the power supply cables external to the power supply unit (PSU) enclosure shall not prevent alarm transmission from more than one zone, and a single short circuit shall not prevent the alarm transmission from more than 10 zones or 250 devices.

C1.5 Where the PSU has its own enclosure (primary) and is located within the enclosure of another CIE (secondary), the open circuit and short circuit fault tolerance is only applicable external to the secondary enclosure.

1.6 COMPLIANCE WITH OTHER STANDARDS

1.6.1 General requirements

AS 3100 shall be read in conjunction with this Standard.

1.6.2 Requirements of other Standards

All components incorporated in the CIE shall comply with the applicable requirements of the Standards listed in Clause 1.3.

Where functional components of CIE physically form part of an actuating device or its base, for which there is a separate Standard, and conflict exists between the two Standards, the requirements of the device Standard shall prevail.

1.7 INTERPRETATION OF SPECIFIED LIMITING VALUES

For the purpose of assessing compliance with this Standard, the specified values herein shall be interpreted in accordance with the 'rounding method' described in AS 2706, i.e. the observed or calculated value shall be rounded to the same number of figures as in the specified limiting value and then compared with the specified limiting value. For example, for specified limiting values of 2.5, 2.50 and 2.500, the observed or calculated value would be rounded respectively to the nearest 0.1, 0.01 or 0.001. For examples of interpolation of specific values in accordance with the rounding method, see AS 2706.

1.8 NEW DESIGNS AND INNOVATIONS

Any alternative materials, designs, methods of assembly and procedures that do not comply with specific requirements for this Standard, or are not mentioned in it, but give equivalent results to those specified are not necessarily prohibited. The specific approval remains the prerogative of the regulatory authority.

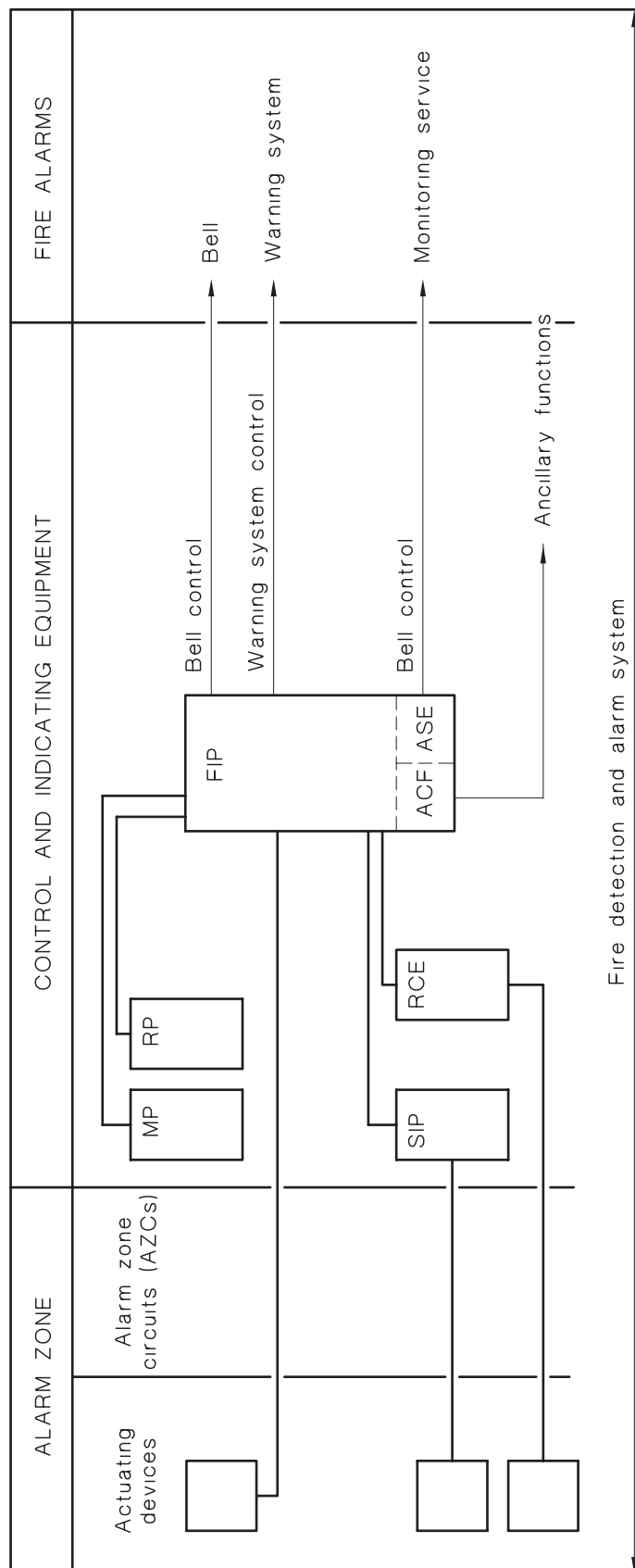


FIGURE 1.1 APPLICATION OF TERMS USED IN THIS STANDARD

SECTION 2 FUNCTIONS

2.1 GENERAL REQUIREMENTS

2.1.1 General

The functions specified in this Standard provide the minimum requirements for Grades I, II and III CIE as set out in Table 2.1.

NOTE: See representative schematics in Appendix A.

Other functions may be included provided that such additional functions do not prejudice the operation of the functions specified herein. Each additional function shall also comply with the requirements of this Standard. CIE shall perform the following functions:

- (a) Indicate the alarm zone in which the actuating device was initiated.
- (b) Indicate fault conditions. A common visual 'fault' indicator is permissible where the nature of the fault can be readily determined.
- (c) Indicate isolated conditions as required. A common visual 'isolated' indicator is permissible for other isolated conditions where the nature of the isolated condition can be readily determined.

Required audible and visual indication shall be as set out in Table 2.2.

TABLE 2.1
CIE GRADES, APPLICATIONS AND OPTIONAL FUNCTIONS

Functions	Clause	CIE grade		
		I	II	III
		Typical applications		
		AS 1670.1 system	AS 1670.1 or AS 1670.2 system	AS 1670.2 system
Limited to a maximum 10 zones	—	N	N	Y
Individual alarm zone indicator	2.3.3.1	O	O	Y
Warning system isolate control	2.5.2	Y	Y	O
External bell	2.6	Y	O	O
External bell isolate control	2.6.2	Y	O	O
Ancillary control	2.7	Y	Y	O
Alarm/fault test control	2.9	Y	Y	O
Signal path fault indication	2.10	Y	Y	O
AVF	2.11	Y	Y	O
FF	2.13	O	O	O
ASE	2.14	Y	O	O

Legend:

O = optional

Y = yes

N = no

C2.1.1 *The use of common indicators is acceptable provided that there is a means of readily determining the fault or isolated condition. In this context ‘readily determining’ would include observing the position of a switch or a message on an alphanumeric display. The use of a display would not satisfy this requirement if a complex sequence of operations was needed to obtain the necessary information.*

TABLE 2.2
AUDIBLE AND VISUAL INDICATION

Condition	Indication	
	Aural	Visual
Sounder silenced	Sounder inhibited unless new condition occurs	Nil
Power supply main power on	None	Green
Power supply fault	Sounder	Yellow/amber
Zone alarm	Warning system, external bell and sounder	Red
Zone isolated	Sounder within 8 h of isolation	Yellow/amber
Zone fault	Sounder	Yellow/amber
Warning system isolated	Sounder within 8 h of isolation	Yellow/amber
Warning system fault (includes both aural and visual device circuits)	Sounder	Yellow/amber
External bell isolated	Sounder within 8 h of isolation	Yellow/amber
External bell fault	Sounder	Yellow/amber
Ancillary control function isolated*	Sounder within 8 h of isolation	Yellow/amber
Ancillary control function fault*	Sounder	Yellow/amber
Signal path fault	Sounder	Yellow/amber

* Only where ancillary control functions are fitted.

2.1.2 Transient-induced alarm suppression

The FIP shall neither indicate nor initiate any action for momentary signals with a duration of less than 0.5 s.

2.1.3 Alphanumeric displays

Alphanumeric displays used for the purpose of indicating alarm zone status shall comply with the following requirements:

- (a) They shall have a display service life expectancy of not less than 10 years.
- (b) The height of characters for alphanumeric displays shall be not less than 3 mm and shall satisfy the legibility requirements of Appendix B.

NOTE: A character height of 3 mm min was calculated using ergonomic principles based on an angle subtended by the eye of 18 min. of arc at a nominal viewing distance of 600 mm.

- (c) With the CIE illuminated at any light level between 0 and 3000 lux the legibility of the displayed event shall be such that 99% of characters can be correctly identified using the test method given in Appendix B.