



Fire detection, warning, control and intercom systems—System design, installation and commissioning

Part 1: Fire



AS 1670.1:2018

This Australian Standard® was prepared by FP-002, Fire Detection, Warning, Control and Intercom Systems. It was approved on behalf of the Council of Standards Australia on 29 November 2018.

This Standard was published on 21 December 2018.

The following are represented on Committee FP-002:

- Association of Hydraulic Services Consultants Australia
- Australasian Fire and Emergency Service Authorities Council
- Australian Building Codes Board
- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Australian Institute of Building Surveyors
- CSIRO
- Deafness Forum of Australia
- Department of Health and Human Services, Vic.
- Engineers Australia
- Fire Protection Association Australia
- National Electrical and Communications Association
- National Fire Industry Association
- Property Council of Australia
- Society of Fire Safety

This Standard was issued in draft form for comment as DR AS 1670.1:2017.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

www.saiglobal.com (sales and distribution)

ISBN 978 1 76072 321 7

This is a preview. [Click here to purchase the full publication.](#)



Fire detection, warning, control and intercom systems—System design, installation and commissioning

Part 1: Fire

Originated as part of AS CA15—1961.
Previous edition AS 1670.1—1995.
AS 1670.1—1995 and AS 1670.2—1997 revised, amalgamated and designated as AS 1670.1—2004.
Second edition AS 1670.1:2015.
This edition 2018.

COPYRIGHT

© Standards Australia Limited 2018

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Standards Australia Committee FP-002, Fire Detection, Warning, Control and Intercom Systems, to supersede AS 1670.1:2015.

The objective of this revision is to remove many of the legacy Standards superseded by a number of AS 7240 Standards which have been published since 2004 as well as incorporating some corrections and clarifications.

It has also introduced AS ISO 7240.17 for short circuit isolators and AS ISO 7240.18 for input/output devices to replace the requirements for distributed CIE used with AS 4428.1 systems.

All references to smoke alarms and heat alarms have been removed.

This edition also permits the use of two editions of relevant Standards relating to components. See [Table 1.8](#) for the list of relevant editions of the Standards which apply throughout this document. Notes to clauses in this Standard do not form a mandatory part for conformance with this Standard. They are of an advisory nature only and are used to give explanation or guidance to the user on recommended considerations or technical procedures, or to provide an informative cross-reference to other documents or publications.

Statements expressed in mandatory terms in notes to figures and tables are deemed to be requirements of this Standard.

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

This Standard incorporates commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by “C” preceding the clause number and appears in italics in a box. The commentary is for information and does not need to be followed for conformance with the Standard.

Contents

Preface	ii
Section 1 Scope and general	1
1.1 Scope	1
1.2 Application	1
1.3 Normative references	1
1.4 Definitions	3
1.5 Abbreviations	10
1.6 Measurements	11
1.6.1 Tolerances	11
1.6.2 Spacing	11
1.7 System design	11
1.7.1 General	11
1.7.2 Baseline data	12
1.7.3 Alterations to existing system	13
1.8 Application of normative references	14
Section 2 System configuration	15
2.1 Components	15
2.1.1 General	15
2.1.2 Components	15
2.1.3 Connectable devices	16
2.2 Designated entry point	16
2.2.1 Designated building entry point (DBEP)	16
2.2.2 Designated site entry point (DSEP)	17
2.3 Detection zone limitations	17
2.4 Networked FDCIE	20
2.5 Distributed parts of CIE	20
2.6 Transmission paths faults	20
Section 3 Installation requirements	22
3.1 General	22
3.2 Alarm mitigation methods	22
3.2.1 General	22
3.2.2 Alarm acknowledgement facility (AAF)	23
3.2.3 Alarm delay facility (ADF)	24
3.2.4 Alarm investigation facility (AIF)	25
3.2.5 Alarm verification facility (AVF) Type A dependency	26
3.2.6 Type B dependency	26
3.2.7 Type C dependency	27
3.3 This has been left blank intentionally	27
3.4 This has been left blank intentionally	27
3.5 This has been left blank intentionally	27
3.6 Control of connectable devices	27
3.6.1 General	27
3.6.2 Supervision	27
3.7 Detector alarm indication	27
3.8 External alarm	28
3.9 Control and indicating equipment (CIE)	28
3.9.1 Location	28
3.9.2 Covering door	28
3.9.3 Clearance	29
3.10 Zone block plan	29
3.11 Carbon monoxide (CO) fire detector labelling	29
3.12 Fire suppression system alarms	30
3.12.1 Alarm output to FDCIE	30
3.12.2 Consultation between parties	30

3.12.3	Fire suppression system control.....	30
3.13	Equipment cabinets.....	30
3.13.1	Fire isolation and mechanical protection.....	30
3.13.2	Labelling.....	30
3.14	Manual call point (MCP).....	31
3.14.1	General.....	31
3.14.2	MCP for fire alarm.....	31
3.14.3	MCP for emergency evacuation.....	31
3.14.4	MCP for non-evacuation emergencies.....	31
3.14.5	MCP for electric lock release.....	31
3.14.6	MCP for operation or inhibition of other function.....	31
3.14.7	Operation of MCP for fire alarm and emergency.....	32
3.15	Power supply equipment (PSE).....	32
3.15.1	General.....	32
3.15.2	Main power source.....	32
3.15.3	Standby power source.....	32
3.15.4	Power supply equipment rating.....	32
3.15.5	Standby power source capacity.....	33
3.15.6	Battery capacity calculation.....	33
3.15.7	PSE selection.....	34
3.15.8	Batteries.....	34
3.16	Remote indicators for fire detectors.....	34
3.16.1	General.....	34
3.16.2	Concealed spaces.....	35
3.16.3	Restricted emergency service access.....	35
3.16.4	Air-handling system.....	35
3.17	This has been left blank intentionally.....	35
3.18	This has been left blank intentionally.....	35
3.19	Smoke and fire door control.....	36
3.19.1	General.....	36
3.19.2	Sliding fire doors and fire shutters.....	36
3.20	Electric lock release.....	37
3.21	Suppression system monitoring devices.....	37
3.22	Building occupant warning systems.....	37
3.22.1	General.....	37
3.22.2	Evacuation signals.....	37
3.22.3	Audibility of signals.....	38
3.22.4	Visual alarm signals.....	38
3.22.5	Intelligibility.....	39
3.23	Components using radio transmission paths.....	39
3.24	Cabling systems.....	39
3.24.1	General.....	39
3.24.2	Conductors.....	40
3.24.3	Cable marking.....	40
3.24.4	Terminations.....	40
3.24.5	Stress on conductors.....	40
3.24.6	Joints.....	40
3.25	Transmission path supervision.....	41
3.26	Transmission path protection.....	41
3.27	Location of detectors.....	42
3.27.1	General.....	42
3.27.2	Accessible service tunnels.....	43
3.27.3	Air-handling systems.....	43
3.27.4	Concealed spaces.....	44
3.27.5	Cupboards.....	45
3.27.6	Intermediate horizontal surfaces.....	45
3.27.7	Open grid ceilings.....	45
3.27.8	Sole occupancy units (SOUs).....	45

3.27.9	Stairways and horizontal passageways.....	45
3.27.10	Transportable buildings.....	46
3.27.11	Vertical shafts and openings.....	46
3.28	Locations where detectors are not required.....	46
3.29	Combination detectors.....	47
3.30	Commissioning of system.....	47
Section 4	Heat detectors.....	48
4.1	Point-type heat detectors.....	48
4.1.1	General.....	48
4.1.2	Spacing between detectors for level surfaces.....	50
4.1.3	Spacing of detectors for sloping surfaces.....	50
4.1.4	Spacing from walls, partitions, or air supply openings.....	52
4.1.5	Reduced spacing.....	53
4.1.6	Spacing in concealed spaces requiring protection.....	53
4.2	Line-type heat detectors.....	53
Section 5	Smoke and carbon monoxide (CO) fire detectors.....	54
5.1	Spacing and location.....	54
5.1.1	General.....	54
5.1.2	Spacing between detectors for level surfaces.....	54
5.1.3	Spacing between detectors for sloping surfaces.....	60
5.1.4	Spacing from walls, partitions, and air supply openings.....	60
5.1.5	Areas of high air exchange rates.....	61
5.1.6	Location of detectors on level surfaces with deep beams.....	61
5.1.7	Spacing in concealed spaces requiring protection.....	62
5.2	Aspirating smoke detectors.....	62
5.2.1	General.....	62
5.2.2	Design.....	62
5.2.3	Installation requirements.....	63
Section 6	Flame detectors.....	64
6.1	Location.....	64
6.2	Spacing.....	64
Section 7	Smoke control systems.....	65
7.1	General.....	65
7.2	System objectives.....	65
7.3	Consultation between parties.....	65
7.4	Automatic initiation of smoke control systems.....	65
7.4.1	General.....	65
7.4.2	Other fire safety systems and system control.....	66
7.5	Automatic smoke detection for system control.....	67
7.5.1	General.....	67
7.5.2	Detector location.....	67
7.5.3	Relative sensitivity of detectors.....	71
7.5.4	Location of detectors at doors to pressurized exits and lift landing doors.....	72
7.6	Miscellaneous systems.....	73
7.6.1	Scope.....	73
7.6.2	General.....	73
7.6.3	Special purpose systems.....	73
7.6.4	Single enclosures.....	73
7.6.5	Exhaust systems.....	73
7.6.6	Supply air systems.....	74
7.6.7	Exhaust duct heat detectors.....	74
7.6.8	Car park ventilation systems.....	74
7.7	Supply air systems.....	75
7.8	Kitchen exhaust hood systems.....	77
7.8.1	General.....	77
7.8.2	Operation under fire conditions.....	77

7.8.3	Override control	77
7.9	Shutdown systems — Operation in fire mode	77
7.10	Zone pressurization systems	77
7.10.1	Operation in fire mode	77
7.10.2	Override control	77
7.11	Hot layer smoke control systems	78
7.11.1	System arrangement	78
7.11.2	Operation in fire mode	78
7.11.3	Override control	78
7.12	Ancillary smoke/fire control equipment operation	78
7.13	Fire isolated exit pressurization systems	79
7.13.1	Operation in fire mode	79
7.13.2	Override control	79
7.14	Lift shaft pressurization system	79
7.14.1	General	79
7.14.2	Supply air smoke detectors in fans	81
7.14.3	Operation in fire mode	81
7.14.4	Override control	82
7.15	Fire fan control panel (FFCP)	82
7.15.1	Location	82
7.15.2	Function	82
7.15.3	Manual controls	83
7.15.4	Fire mode reset	84
7.15.5	Fan status indicators	85
7.15.6	Fault indication	85
7.15.7	Notices and labels	86
7.15.8	Operating instructions	86
7.16	This has been left blank intentionally	86
7.17	System interface	86
7.17.1	General	86
7.17.2	Low level interface	86
7.17.3	High level interface equipment	87
7.17.4	Interface cabinet	87
7.18	Transmission paths	87
7.19	Documentation	88
7.19.1	Design documentation	88
7.19.2	Operating and maintenance instructions (as-installed documentation)	88
7.19.3	Smoke control operating instructions	88
Appendix A (informative) Commissioning		89
Appendix B (informative) Wiring systems		96
Appendix C (informative) Power source calculation examples		100
Appendix D (normative) Drawings and symbols		102
Appendix E (informative) Designer's statement		104
Appendix F (informative) Installer's statement		106
Appendix G (informative) Commissioning statement		107
Appendix H (normative) Sound pressure level measurements		108
Appendix I (normative) Measurement of speech intelligibility		110
Appendix J (informative) Methods of measuring speech intelligibility		112
Appendix K (informative) Lettering checklist		115
Appendix L (informative) Recommended orientation of duct sampling smoke detector probes		117
Appendix M (informative) Guidance for the selection of detectors		119

Appendix N (informative) ASD sensitivity classes	138
Bibliography	139

NOTES