



Fire detection and alarm systems

Part 4: Power supply equipment (ISO 7240-4:2003, MOD)



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 - Australasian Fire Authorities Council
 - Australian Building Codes Board
 - Australian Chamber of Commerce and Industry
 - Australian Electrical and Electronic Manufacturers Association
 - Australian Government Analytical Laboratories, Scientific Services Laboratory
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 - Australian Institute of Building Surveyors
 - Deafness Forum of Australia
 - Department of Defence (Australia)
 - Fire Protection Association Australia
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Australian Standard[®]

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Part 4: Power supply equipment (ISO 7240-4:2003, MOD)

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PREFACE

This Standard was prepared by the Standards Australia Committee FP-002, Fire Detection, Warning, Control and Intercom Systems, to supersede AS 4428.5—1998, *Fire detection, warning, control and intercom systems, Part 5: Power supply units*. The Committee intends to withdraw AS 4428.5—1998 five years after the publication of this Standard.

This Standard incorporates Amendment No. 1 (October 2016). 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.

This Standard has been adopted with national modifications and has been reproduced from ISO 7240-4:2003, *Fire detection and fire alarm systems, Part 4: Power supply equipment*. The national modifications are specified in Annex ZA. Annex ZB has been added to specify marking requirements that apply in addition to those in Clause 8 of the source text. Annex ZC provides an optional test for p.s.e. required to operate outside the range of 0°C to +40°C.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text ‘this International Standard’ should read ‘this Australian Standard’.
- (c) A full point should be substituted for a comma when referring to a decimal marker.
- (d) p.s.e should be read as PSE and c.i.e should be read as CIE.

All optional functions specified in this Standard may be included in p.s.e. installed in Australia.

References to International standards should be replaced by references to Australian or Australian/New Zealand Standards as follows:

References to International Standard or other Publication		Australian/New Zealand Standard	
ISO		AS	
7240	Fire detection and alarm systems	7240	Fire detection and alarm systems
7240-2	Part 2: Control and indicating equipment	7240.2	Part 2: Control and indicating equipment (ISO 7240-2:2003,MOD)
IEC		AS	
60068	Environmental testing	60068	Environmental testing
60068-1	Part 1: General and guidance	60068.1	General and guidance
60068-2-1	Part 2: Tests. Test A: Cold	60068.2.1	Tests — Test A: Cold
60068-2-6	Part 2: Tests. Test Fc: Vibration (sinusoidal)	60068.2.6	Tests — Test Fc: Vibration (sinusoidal)
60068-2-47	Part 2: Test methods—Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests	60068.2.47	Test methods — Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests
60068-2-75	Part 2: Tests. Test Eh: Hammer tests	60068.2.75	Tests — Test Eh: Hammer tests
IEC		AS/NZS	
60950	Information technology equipment—Safety		
60950-1	Part 1: General requirements	60950.1	Information technology equipment — Safety — General requirements

The term ‘normative’ and ‘informative’ are used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a standard, whereas an ‘informative’ annex is only for information and guidance.

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INTRODUCTION

This part of ISO 7240 is drafted on the basis of mandatory functions, which are to be provided on all equipment, and optional (each with its own requirements). It is intended that the options be used for specific applications, as recommended in application guidelines.

Each optional function is included as a separate entity, with its own set of associated requirements, in order to permit equipment with many different combinations of functions to comply with this part of ISO 7240.

Other functions associated with fire detection and alarm can also be provided, even if not specified in this part of ISO 7240.

AUSTRALIAN STANDARD

Fire detection and alarm systems

Part 4: Power supply equipment (ISO 7240-4:2003, MOD)

1 Scope

This part of ISO 7240 specifies requirements, test methods and performance criteria for power supply equipment (p.s.e.) for use in fire detection and alarm systems installed in buildings.

It is not necessarily applicable to power supply equipment with special characteristics, developed for particular applications, which could require further tests.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7240-1:1988, *Fire detection and alarm systems — Part 1: General and definitions*

ISO 7240-2:—¹⁾, *Fire detection and alarm systems — Part 2: Control and indicating equipment*

IEC 60068-1, *Environmental testing — Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing — Part 2: Tests. Tests A: cold*

IEC 60068-2-3, *Environmental testing — Part 2: Tests. Test Ca: damp heat, steady state*

IEC 60068-2-6, *Environmental testing — Part 2: Tests. Test Fc: vibration (sinusoidal)*

IEC 60068-2-47, *Environmental testing — Part 2: Test methods — Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests*

IEC 60068-2-75, *Environmental testing — Part 2: Tests — Test Eh: Hammer tests*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-3-3, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 3: Stationary use and weather protected locations*

IEC 60950-1, *Information technology equipment — Safety — Part 1: General requirements*

EN 50130-4, *Alarm systems — Part 4: Electromagnetic compatibility — Product family standard: Immunity requirements for components of fire, intruder and social alarm systems*

1) To be published.

3 Terms, definitions and symbols

For the purposes of this part of ISO 7240, the terms and definitions given in ISO 7240-1 and the following terms, definitions and symbols apply. See also Figure 1 of ISO 7240-1:1988.

3.1 Terms and definitions

3.1.1

float voltage

voltage that when applied to the battery will maintain the battery in a fully charged state

NOTE The float voltage is specified by the battery manufacturer.

3.1.2

final voltage

lowest recommended voltage to which a battery should be discharged

NOTE The final voltage is specified by the battery manufacturer.

3.1.3

integrated p.s.e.

equipment for which it is not possible for the manufacturer to specify its output voltage range(s) or power supply input voltage range(s) and, if in the case of a defective p.s.e., where the repair by replacement of the p.s.e. involves replacement of a part or the whole of the other equipment

3.2 Symbols

3.2.1

$I_{a, \max}$

rated maximum output current that can be supplied continuously

3.2.2

$I_{b, \max}$

rated maximum output current that can be supplied for a short duration in which battery charging is not required

3.2.3

$I_{\min}$

(integrated p.s.e.) minimum output current specified by the manufacturer

3.2.4

V_n

nominal voltage of the public electricity supply

4 General requirements

4.1 Compliance

In order to comply with this part of ISO 7240, the p.s.e. (Item L in Figure 1 of ISO 7240-1:1988) shall meet the requirements of Clauses 4, 5, 6, 7 and 8, shall be tested in accordance with Clause 9 and shall meet the requirements of the tests.

4.2 Power sources

4.2.1 There shall be at least two power sources for the power supply of a fire detection and alarm system: the main power source and the standby power source.

4.2.2 The main power source shall be designed to operate from the public electricity supply or equivalent system.

4.2.3 Where a battery is used, the p.s.e. shall include charging equipment to charge the battery and maintain it in a fully charged state.

4.2.4 Each power source, on its own, shall be capable of meeting the p.s.e. manufacturer's output specification or, in the case of an integrated p.s.e., shall be capable of operating the equipment in which it is integrated within its specifications.

4.2.5 When the main power source is available, it shall be the exclusive source of power to the fire detection and alarm system, except for currents associated with battery monitoring.

4.2.6 If the main power source fails, then the p.s.e. shall be automatically switched over to a standby power source. When the main power source is restored, the p.s.e. shall be automatically switched back to the main power source.

4.2.7 If the p.s.e. is integrated within other equipment of the fire detection and fire alarm system, then the switching from one power source to the other shall not cause any change in status or indications, other than those relating to the power supply.

4.2.8 If the p.s.e. is separated from other equipment of the fire detection and alarm system and the switching from one power source to the other causes an interruption in supply of power, then the duration of the interruption shall be specified in the manufacturer's data.

4.2.9 Failure of one of the power sources shall not cause the failure of any other power source or the failure of the supply of power to the system.

NOTE The compatibility of the separated p.s.e. with the other equipment, for example the c.i.e. (control and indicating equipment — Item B in Figure 1 of ISO 7240-1:1988), is intended to be dealt with in a future part 13, system requirements.

5 Functions

5.1 Power supply from main power source

When operated from the main power source, the following applies.

- a) The p.s.e. shall be capable of operating in accordance with its specification given in the manufacturer's data, irrespective of the condition of the standby power source. This includes any charge condition of the standby power source, or open circuit or short circuit of the connection to the standby power source.
- b) The p.s.e. shall be capable of continuously supplying $I_{a, \max}$ and simultaneously charging a battery discharged to its final voltage.
- c) It may allow battery charging to be limited or interrupted when delivering a current greater than $I_{a, \max}$ (see note to Table 1).

5.2 Power supply from standby power source

5.2.1 When operated from the standby power source, the p.s.e. shall be capable of operating in accordance with the specification given in the manufacturer's data, irrespective of the condition of the main power source.

It is intended that the standby and alarm periods required in any specific application should comply with a future part 14, application guidelines.

5.2.2 When the standby power source consists of a battery it shall

- be rechargeable,
- be suitable to be maintained in a fully charged state,
- be constructed for stationary use,
- be marked with its type designation and code or number identifying the production period, and
- have a safety mechanism to prevent explosion.

5.2.3 If the battery is mounted in a cabinet which houses other fire detection and alarm system equipment, then it shall be of the sealed type and shall be mounted in accordance with the manufacturer's data.

5.2.4 When operating from a battery standby power source and where the battery is subject to damage from over-discharge, the p.s.e. shall have a facility to switch off the p.s.e. output or outputs if the output voltage or voltages, or the voltage of the battery, falls below a value specified by the battery manufacturer.

5.3 Charger

5.3.1 The charger shall be designed and rated so that

- the battery can be charged automatically,
- a battery discharged to its final voltage can be recharged to at least 80 % of its rated capacity within 24 h and to its rated capacity within another 48 h, and
- the charging characteristics are within the battery manufacturer's specification over the ambient temperature range of the battery.

5.3.2 Except for currents associated with battery monitoring, the battery shall not discharge through the charger when the charging voltage is below the battery voltage.

5.4 Faults

The p.s.e. shall be capable of recognizing and signalling the following faults within 100 s of their occurrence:

- a) a reduction in the main power source voltage to a level less than the minimum required to maintain the output voltage within the specification;
- b) loss of the standby power source;
- c) reduction of the battery voltage to less than 0,9 of the final voltage when the primary power source is unavailable;
- d) reduction of the charger output to a level of less than 0,9 of the float voltage, except under the conditions specified in 5.1 c).

5.4.1 If the p.s.e. is separately housed from the c.i.e., then at least a fault output common to the above-mentioned faults shall be provided.

5.4.2 If the p.s.e. is housed within the cabinet of the c.i.e., then the above-mentioned faults shall be indicated in accordance with Clause 9 of ISO 7240-2:—²⁾, either on the c.i.e. or on the p.s.e. itself.

2) To be published.