



Fire Protection Association

IPCRes **guidance**

InFiReS
Insurers' Fire Research Strategy funding scheme

Intruder Alarms and a Harmonised European Standard



Fire Protection Association
Protecting people and property

London Road
Moreton-in-Marsh
Gloucestershire GL56 0RH

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Insurers Property Crime Research (IPCRes) working group

This guidance document has been developed by the IPCRes working group of InFiReS. IPCRes publications continue the tradition of providing authoritative guidance on crime prevention topics which was established by the Crime Panel of the Association of British Insurers.

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The Fire Protection Association

London Road

Moreton-in-Marsh

Gloucestershire GL56 0RH

Tel: 01608 812 500, Fax: 01608 812 501

E-mail: fpa@thefpa.co.uk, Website: www.thefpa.co.uk

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Introduction

This guidance document reviews the progress that has been made in pursuit of a harmonised European Standard for the design and installation of intruder alarms; it offers practical advice for those who are uncertain about their choice of intruder alarm.

In the United Kingdom several British Standards have applied to the design and installation of intruder alarm systems, principally:

BS 4737: *Intruder alarm systems: Part 1: 1986: Specification for installed systems with local audible and/or remote signalling.*

BS 6799: 1986: *Code of practice for wire-free intruder alarm systems.*

BS 7042: 1988: *Specification for high security intruder alarm systems in buildings.*

The British Standards Institution lists these three standards as having been withdrawn and replaced on 1 March 2004 by BS EN 50131: Part 1: 1997: *Alarm systems. Intrusion systems. General requirements.* However not all of the European Standards necessary to design and install intruder alarm systems have yet been published (see Appendix 1) and some elements of the old British Standards have needed to be retained in a new document (PD6662: 2004 – see below).

The way forward

To ensure a smooth transition from the old British Standards to the new European Standard, the various stakeholders (security industry manufacturers and installers, alarm inspectorate bodies, the Association of Chief Police Officers (ACPO) and the Association of British Insurers (ABI)) agreed that there would be a dual running period until 1 October 2005 during which installers could fit systems to either Standard (but not a mixture of both). After 1 October 2005, all new systems must be designed and installed to the European Standards. Existing intruder alarm systems and upgrades to existing systems will be unaffected.

Because not all the necessary European Standards are yet available (see Appendix 1) it was necessary for the British Standards Institution to introduce PD 6662: 2004: *Scheme for the application of European Standards for intruder and hold up alarm systems* (The Scheme), to plug the gaps. This will enable the published European Standards and mature draft Standards to be introduced in a controlled and consistent way across the industry and enable end users, insurance companies and others to specify, and security companies to install, intruder and hold-up alarm systems to European Standards.

The Scheme applies to wire-free intruder and hold-up alarm systems in addition to conventional (hard-wired) intruder alarm systems.

The Scheme does not apply to exterior intruder alarm systems, which should continue to be installed in accordance with BS 4737: 4.3: 1988 nor to exterior deterrent systems, which should continue to be installed in accordance with BS 7992: 2002: *Code of practice for exterior deterrent systems.* Remotely monitored detector activated CCTV systems should continue to be installed to BS 8418: 2003: *Installation and remote monitoring of detector activated CCTV systems. Code of practice*

Because EN 50131: Part 1: 1997 is under revision, and will probably be released as a changed EN around the turn of 2005/2006, PD 6662: 2004 calls up a fairly well advanced version of the revision (prEN 50131: Part 1: 2004, the title and contents of which include hold-up (duress) alarms), since it would have been a retrograde step to base PD 6662 : 2004 on an outgoing standard.

BS 4737 and BS EN 50131: the differences

There are considerable differences between the old BS 4737 and the new EN 50131. The most significant are:

1. The new EN Standard incorporates the principle of grading systems from 1 to 4 in terms of their security provision and the extent of the detection the system provides.

2. The performance and resilience of the equipment is enhanced with each Grade and each piece of equipment must be marked with the Grade with which it complies.
3. The European Standard document DD CLC/TS 50131-7:2003: *Alarm systems – Intrusion systems: Part 7: Application guidelines* provides guidance to installers on a Grade by Grade basis on the likely possible points of intrusion that should be considered when designing a system and also requires installers to undertake and record a risk assessment before designing the system.
4. The maintenance requirements for remote signalling systems which are introduced by PD 6662: 2004 are more flexible than those prescribed by current British standards. For systems In Grades 2 and 3 it is possible to replace one of the two annual maintenance visits with a remote system check.

Risk assessment

As mentioned above, the Application Guidelines (DD CLC/TS 50131-7: 2003) require the installer to carry out a risk assessment before a system is designed. In PD 6662: 2004 the term risk assessment is clarified to show that the purpose of the assessment is solely to determine the Grade and design of system.

The Application Guidelines include Annex A and B which emphasise factors and areas that should be considered:

Annex A: Contents

The design of the system should be consistent with the risk of an attack on the supervised (protected) premises. The level of risk will depend, among other issues, on the type of contents. Examples of issues which should be considered are:

- type of contents
- value
- bulk or size
- theft history
- danger
- damage

Annex B: Building

When considering the element of risk in the design of an intruder alarm system the structure of the premises to be supervised (protected) will be a major determining factor. Issues which should be considered are:

- construction
- openings (e.g. doors, windows, rooflights)
- occupancy
- keyholding
- locality
- existing security
- theft history
- local legislation or regulation
- security environment

The adoption of a risk assessment approach should lead to a better designed system that is commensurate with the risk and meets the customer's and insurer's requirements.

There is no requirement in the European Standard for the risk assessment to be shown to the customer or their insurer, but some installers may choose to enclose a copy of the risk assessment with the alarm specification (now called 'system design proposal').

The Grades

The European Standards incorporate the principle of grading systems in terms of their security provision and classifies systems into four Grades (Grade 1 being the lowest), based on the skills, resources and determination likely to be brought to bear by criminals at each level of risk.

These Grades are based on operational requirements concerning matters such as resistance to compromise, performance and resilience necessary to defend the risk against the expected severity of attack. They influence the design of all the important components – detectors, control equipment, connections, power supply and signalling. The Grade of the system overall is governed by the rating of the lowest graded component.

The following table highlights some of the differences between the Grades. In addition to Grades 1-4 of the European Standards an extra Grade 2X is introduced by PD 6662: 2004 to enable Grade 2 systems to be installed without remote signalling.

Feature	Security Grade			
	1	2	3	4
Signalling warning devices	Choice of audible warning device or low grade remote signalling	Warning device and remote signalling (2X permits audible only)	Warning device and enhanced remote signalling	Warning device and high security signalling
Movement detectors	Tamper detection optional	Tamper detection mandatory	As Grade 2 + anti-masking detection	As Grade 3 + range reduction detection
Level of supervision (guide to the method of intrusion to be considered)	Opening of external doors + trap	Opening of external doors and windows etc + trap	Opening of and penetration through external doors and windows etc + trap and special consideration to high risk items	As Grade 3 + penetration of walls, ceilings, roof and floor
Tamper	Control and indicating equipment + signalling equipment + warning devices + power supplies	As Grade 1 + detectors + junction boxes	As Grade 2 + anti-masking and adjustment of orientation of detectors	As Grade 3 + penetration of controls and signalling equipment + penetration of warning devices
Event recording	Not required	250 events	500 events + user ID	1000 events + user ID
Maintenance required per year – as required by	1 site visit	2 site visits OR 1 site visit + remote diagnostic check (Option 2X – audible only – 1 site visit)	As Grade 2	2 site visits

Grade selection

Grade 1 offers significantly lower protection than that demanded by BS 4737 and is thus unlikely to be acceptable to protect risks where an alarm is a requirement for insurance purposes.

Grade 2 is similar in some respects to intruder alarms installed to BS 4737, but does not require certain features that have become expected in systems installed in the UK, such as a 500 event memory in the control panel, user identification in the memory and prevention of change of orientation of detectors (that is, moving a detector when the system is unset to prevent detection when the systems is set). Because of these shortcomings insurers are expected to accept Grade 2 systems for (i) most household risks and (ii) some low risk commercial premises only.

Grade 3 equates in most respects to the majority of systems that are currently installed in commercial premises in the UK, but requires enhanced movement detectors that have the ability to determine that they have been ‘masked’, that is, the detector has been covered or sprayed with a substance to prevent its correct operation. It does not require the detector to recognise a reduction in range (for example, something blocking the field of detection but not actually on or extremely close to the detector). It is considered likely that Grade 3 will be the grade of choice for intruder alarms in commercial premises and will be the safe default for installers uncertain of insurance requirements

Grade 4 equates to high security systems and is appropriate for commercial premises that would previously have justified the installation of a BS 7042 alarm. It is unlikely that a full range of graded equipment necessary to install a system to Grade 4 will be available in the near future, and it will therefore be necessary to use Grade 3 components and then upgrade when the Grade 4 components become available. The system will of course only be a Grade 3 system until all of its components comply with Grade 4. It is expected that very few Grade 4 systems will be required to be installed by insurers.

Note: It may be difficult and expensive to upgrade an intruder alarm system once it is installed, and therefore if the intruder alarm is likely to be a requirement of insurance every effort should be made to check with the insurer concerned.

Signalling

This term is replaced by 'notification' in EN 50131 which gives various combinations of 'warning device' (formerly bells, sounders and sirens) and 'alarm transmission systems' (remote signalling) permitted in each of the four Grades of system.

It is important to understand that not all the signalling options available for each Grade under EN 50131-1 will be suitable for a particular installation. In some cases, none of the relevant signalling options will be acceptable to an insurer and an improved form of signalling will be required.

Because of the variations available in each Grade it is recommended that installers and specifiers identify the signalling by proprietary name, for example, BT Redcare GSM, Dualcom Plus, Web Way 2424T etc., and state the numbers and types of sounders to be installed, for example, '2 self actuating sirens'.

Specifying an intruder alarm system

It is not sufficient simply to specify the Grade of alarm required. In addition to nominating the Grade needed for a particular risk, insurers and other specifiers should continue to specify the extent and nature of alarm protection required, particularly in relation to detection and signalling arrangements. It should be borne in mind that EN 50131-1 and PD 6662 do NOT cover the disciplines necessary to design and install a system that provides confirmed activations to which the police will respond – these requirements are detailed in DD243: 2004 (see below).

DD243: installation and configuration of systems

BSI Document DD243: 2004: *Installation and configuration of intruder alarm systems designed to generate confirmed alarm conditions. Code of practice* deals with the design, installation and operational features of a system that will generate a confirmed alarm activation to which the police will respond. This document is for application only in the UK.

Documentation and claims of compliance

In future the document known as the 'specification' will become the 'system design proposal' and a new document known as the 'As Fitted' document will be produced after the intruder alarm system has been installed. The 'As Fitted' document will give details of the system as actually installed. For systems requiring a police response fuller details of information to be included in these documents is given in Appendix F of DD 243: 2004.

Any claim that the scheme described in PD 6662: 2004 has been followed should state that the intruder and hold-up alarm system conforms to PD 6662 for a Grade 1, 2, 2X, 3 or 4 system, with notification (formerly signalling) option A, B, C or D or X.

Note: It is not possible for any equipment to be cited as meeting the requirements of EN 50131: Part 1 since that is an installation standard. Note also that BS EN 50131: Part 1: 1997 has been superseded by the prEN 50131-1 of 2004 introduced by PD 6662.

Appendix 1: Work towards European harmonisation: BS EN 50131

EN 50131 is the successor to most British Standards for intruder alarms. EN 50131 is made up of the seven parts listed below, some of the parts being subdivided into standards that cover specific types of equipment, for example, EN 50131-2-2 covers requirements for passive infrared detectors.

Part 1: General requirements

2: Intrusion detectors

3: Control and indicating equipment

4: Warning devices (bells, sounders)

5: Interconnections (links from detectors to control and indicating equipment)

6: Power supplies

7: Applications guidelines (installation and maintenance)

The European Committee for Electrotechnical Standardisation (CENELEC) has been working for some considerable time on EN 50131: *Alarm systems – intrusion systems* and in 1997 produced Part 1, *General requirements* and Part 6, *Power supplies*. CENELEC specified the date of 1 March 2004 as the date from which national standards (e.g. British Standards) which covered the same ground as BS EN 50131 should be withdrawn. The transition from BS to BS EN has been complicated, however, as many parts have not advanced beyond the form of drafts.

Because of the loss of impetus in production of the parts, CENELEC needed to adopt other means of publishing relevant documents. A number of the EN 50131 parts were issued as Technical Specifications (TS), a device which enables such documents to be used as if they were European Standards, which they would then become after a couple of years in operation and with subsequent review. Table 2 shows the state of preparation of BS EN 50131.

Table 2. Progress in publishing parts of EN 50131 as at 1 May 2005.

Reference: date	Title
BS EN 50131-1:1997 (Note: this is not the document called up by PD 6662 : 2004 – see above)	Alarm systems - Intrusion systems: Part 1: General requirements
prEN 50131-1:2004	Alarm systems - Intrusion and hold-up systems: Part 1: System requirements
TS 50131-2-2:2004	Alarm systems - Intrusion systems: Part 2-2: Requirements for passive infrared detectors
TS 50131-2-3:2004	Alarm systems - Intrusion systems: Part 2-3: Requirements for microwave detectors
TS 50131-2-4:2004	Alarm systems - Intrusion systems: Part 2-4: Requirements for combined passive infrared and microwave detectors
TS 50131-2-5:2004	Alarm systems - Intrusion systems: Part 2-5: Requirements for combined passive infrared and ultrasonic detectors
TS 50131-2-6:2004	Alarm systems - Intrusion systems: Part 2-6: Requirements for opening contacts (magnetic)
prTS 50131-2-7	Alarm systems - Intrusion systems: Part 2-7: Intrusion detectors - Glass break detectors acoustic or seismic
TS 50131-3:2003	Alarm systems - Intrusion systems: Part 3: Control and indicating equipment
prTS 50131-4	Alarm systems - Intrusion systems: Part 4: Warning devices
prEN 50131-5-3:2004	Alarm systems - Intrusion systems: Part 5-3: Requirements for interconnections equipment using radio frequency techniques
BS EN 50131-6:1997	Alarm systems - Intrusion systems: Part 6: Power supplies
TS 50131-7:2003	Alarm systems - Intrusion systems: Part 7: Application guidelines

Progress has been better in the publication of parts of EN 50136, related to alarm transmission systems, eight of which have been issued.



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