



SLOVENSKI STANDARD
SIST EN 50131-6:1999
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Alarm systems - Intrusion systems - Part 6: Power supplies

Alarm systems - Intrusion systems -- Part 6: Power supplies

Alarmanlagen - Einbruchmeldeanlagen -- Teil 6: Energieversorgungen

Systèmes d'alarme - Systèmes d'alarme intrusion -- Partie 6: Alimentation

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13.310	Varstvo pred kriminalom	Protection against crime
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Alarm systems - Intrusion systems Part 6: Power supplies

Systèmes d'alarme - Systèmes d'alarme
intrusion
Partie 6: Alimentation

Alarmanlagen - Einbruchmeldeanlagen
Teil 6: Energieversorgungen

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by the Technical Committee TC 79, Alarm Systems.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50131-6 on 1996-12-09.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) -

EN 50131 will consist of the following parts under the general title "Alarm systems - Intrusion systems":

- Part 1 General Requirements
- Part 2-x Intrusion detectors
- Part 3 Control and indicating equipment
- Part 4 Warning devices
- Part 6 Power supplies
- Part 7 Application guidelines

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Table of contents

	Introduction	5
1	Scope	5
2	Normative references	5
3	Definitions and abbreviations	6
	3.1 Definitions	6
	3.2 Abbreviations	8
4	Functional requirements	8
	4.1 General	8
	4.2 Monitoring of PS	8
	4.3 Standby period	9
	4.4 Recharging for PS type A	9
5	Design	10
	5.1 Overvoltage protection	10
	5.2 Short circuit and overload protection	10
	5.3 Deep discharge protection	10
	5.4 Ripple	10
	5.5 Environmental conditions: Selection of severity	10
	5.6 Tamper security	11
6	Product documentation	12
7	Marking and labelling	12
8	Test	13
	8.1 Requirements	13
	8.2 Functional, design and performance tests	14
	8.3 Environmental tests	25
	8.4 Test section	26
	Figures	35
	Annex A (normative): Charging function of PUs for lead acid batteries	38

Tables

Table 1 : Monitoring type A & B PS	9
Table 2 : Standby periods.....	9
Table 3 : Recharge periods	10
Table 4 : Tamper protection	11
Table 5 : Tamper detection.....	11
Table 6 : Opening of the enclosure	11
Table 7 : Functional, design and performance tests.....	14
Table 8 : Charging, test conditions	15
Table 9 : Maintenance of charge, test conditions	19
Table 10 : Ripple value, test conditions.....	19
Table 11 : Environmental test selection.....	25
Table 12 : Dry heat (Op), severity of conditioning	26
Table 13 : Dry heat (En), severity of conditioning.....	27
Table 14 : Cold (Op), severity of conditioning.....	28
Table 15 : Damp heat steady state (Op), severity of conditioning	29
Table 16 : Damp heat steady state (En), severity of conditioning.....	30
Table 17 : Damp heat cyclic (Op), severity of conditioning	30
Table 18 : Damp heat cyclic (En), severity of conditioning	31
Table 19 : Water (Op), severity of conditioning	32
Table 20 : Salt mist cyclic (En), severity of conditioning	33
Table 21 : Vibration sinusoidal (Op), severity of conditioning.....	34

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SIST EN 50131-6:1999

<https://standards.iteh.ai/catalog/standards/sist/dc66b85f-faa5-43c3-82d1-671a3843ab94/sist-en-50131-6-1999>

Introduction

This Standard stands for power supplies (PS) of intruder alarm systems (IAS) installed in buildings. It also includes requirements for externally mounted PS, related to those components of a system installed in a building which are normally mounted on the external structure of a building.

EXAMPLE: ancillary control equipments or warning devices.

1 Scope

This Standard specifies requirements, testing procedures and performance criteria for PS for use in intrusion detection and hold-up-alarm systems in buildings.

This standard covers mandatory functions which shall be provided on all PS and optional functions with requirements which may be provided.

Other functions associated with intrusion detection and hold-up-alarm not specified in this standard may be provided. Such functions shall not effect the requirements of any mandatory or optional functions.

2 Normative references

This Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 50081-1	1992	Electromagnetic compatibility - Generic emission standard Part 1: Residential, commercial and light industry
EN 50102	1995	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
EN 50130-4	1995	Alarm systems -- Part 4: Electromagnetic compatibility - Product family standard Immunity requirements for components of fire, intruder and social alarm systems.
EN 50131-1	1997	Alarm systems - Intrusion systems -- Part 1: General requirements
EN 60086		Primary batteries
EN 60086-1	1997	Part 1: General (IEC 60086-1:1996)
EN 60086-2	1997	Part 2: Specification sheet (IEC 60086-2:1997)
EN 60529	1991	Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)
EN 60950	1992	Safety of information technology equipment (IEC 60950:1991, modified)

IEC 60068-1 + A1	1988 1992	Environmental testing -- Part 1: General and guidance (harmonized as EN 60068-1:1994)
IEC 60068-2-1 + A1 + A2	1990 1993 1994	Part 2: Tests - Tests A: Cold (harmonized as EN 60068-2-1:1993 + A1:1993 + A2:1994)
IEC 60068-2-2 + IEC 60068-2-2A	1974 1976	Part 2: Tests - Tests B: Dry heat (harmonized as EN 60068-2-2:1993)
IEC 60068-2-3 + A1	1969 1984	Part 2: Tests - Test Ca: Damp heat, steady state (harmonized as HD 323.2.3 S2:1987)
IEC 60068-2-6 + A1 + A2	1982 1983 1985	Part 2: Tests - Test Fc and guidance: Vibration (sinusoidal) (harmonized as HD 323.2.6 S2:1988)
IEC 60068-2-18	1989	Part 2: Tests - Test R and guidance: Water
IEC 60068-2-30 + A1	1980 1985	Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12 hours) (harmonized as HD 323.2.30 S3:1988)
IEC 60068-2-52	1984	Part 2: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution) (harmonized as HD 323.2.52 S1:1987)
IEC 60068-2-56	1988	Part 2: Tests - Test Cb: Damp heat, steady state, primarily for equipment (harmonized as HD 323.2.56 S1:1990)

SIST EN 50131-6:1999

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3 Definitions and abbreviations

3.1 Definitions

For the purpose of this standard, the following definitions apply:

3.1.1 alternative power source (APS): A power source capable of powering the system for a predetermined time when a PPS is unavailable.

3.1.2 deep discharge protection: Protection which avoids damage to the storage device when the level of discharge is beyond the level defined in the manufacturer's specification for storage devices.

3.1.3 external power source (EPS): An energy supply external to the intruder alarm system, which may be non-continuous, used as the prime power source in type A and type B power supplies.

3.1.4 independent power outputs: A power supply having more than one power output, each output having its own protection against short circuit and overload (e.g. fuses). Each output may have multiple terminals.

3.1.5 low output voltage: A voltage below the minimum power output voltage.

3.1.6 low voltage from storage device: The voltage specified by the manufacturer which indicates the storage device is nearly discharged.

3.1.7 maximum power output voltage: The maximum rated output voltage of the PS as specified by the manufacturer under normal operating conditions.

3.1.8 minimum power output voltage: The minimum rated output voltage of the PS as specified by the manufacturer under normal operating conditions.

3.1.9 normal operative condition: Conditions applying when the PS is mounted according to the manufacture instructions, within the range of the designated environmental class.

The applied PS and the load shall be within the manufacture specified range and the SD shall be at no less than 80% capacity.

3.1.10 over-voltage protection: Protection of the power supply and/or connected equipment against excessive output voltage, including the open circuit voltage.

3.1.11 power output: The output of the power supply which supplies energy to the intruder alarm system.

3.1.12 power unit (PU): A device that provides and also modifies or isolates (electrical) power for an intruder alarm system or part thereof, and for the storage device if required.

3.1.13 power supply (PS): A device that stores, provides and also modifies or isolates (electrical) power for an alarm system or part thereof. The two basic parts of a PS are the Power Unit (PU) and the storage device (e.g. battery).

3.1.14 power supply fault: Any event in the power supply which interrupts or degrades the energy supplied to the intruder alarm system or degrades the performance of the PS to bring it outside the requirements of this standard (e.g. Low voltage, high voltage, battery disconnected, battery short circuited).

3.1.15 prime power source (PPS): The power source used to support the Intruder alarm system or part thereof under normal operating conditions.

3.1.16 ripple: Periodic voltage superimposed onto the DC output voltage at mains power frequency or inverter frequency and related harmonics.

3.1.17 stand-by period: The defined time for which a power supply shall supply energy to the components of the Intruder alarm system in the event of failure of the EPS.

3.1.18 storage device (SD): A device which stores energy (e.g. a battery).

3.1.19 storage failure: The inability of the storage device to maintain the output voltage above the minimum value, in the event of a failure of the EPS.

3.2 Abbreviations

In this European Standard the following abbreviations are used:

APS	Alternative Power Source
CIE	Control and Indicating Equipment
EPS	External Power Source
IAS	Intruder Alarm System
PPS	Prime Power Source
PS	Power Supply
PU	Power Unit
SD	Storage Device

4 Functional requirements

4.1 General

The PS shall supply power to the CIE and other components of an IAS continuously. The requirements of a PS are divided into four security grades. A PS fulfils the requirements, if it includes all mandatory functions of the respective grade. The manufacturer is free to provide the defined options. However, if specified options are included the PS shall meet the functional requirements. The mandatory and optional functions shall comply with the environmental tests of chapter 8. The power supply shall be either an integral part of a system component or stand alone. There are three types of PS which are independent of the grade. These are shown in Figure 1.

a) Type A

The power is supplied by an EPS (e.g. main power) and in default of that, by a rechargeable storage device (e.g. battery) that is automatically recharged from the EPS.

b) Type B

The power is supplied by an EPS (e.g. main power) and in default of that by a storage device that is not automatically recharged from the EPS (e.g. Lithium cell).

c) Type C

The power is supplied only by a storage device, which is the PPS in this case.

In PS types A and B, no current shall be drawn from the storage device under normal operating conditions when the EPS is present, except during a battery test operation, where present.

4.2 Monitoring of PS

Monitoring shall be provided to indicate the continuity of energy provided by the power supply.

4.2.1 Monitoring of PS type A and type B

PS monitoring signals shall be provided which give an indication at the CIE. Monitoring signals shall be fail-safe, such that total loss of function in the PS will generate a fault condition.

Table 1: Monitoring type A & B PS

Monitoring signal	Condition	Grade 1	Grade 2	Grade 3	Grade 4
EPS fault	Failure of EPS	M	M	M	M
APS fault	Low voltage storage device	M	M	M	M
	Storage device failure	OP	OP	M	M
Power output fault	Low output voltage	OP	OP	M	M

M = Mandatory OP = Optional

An EPS fault signal shall be generated within 10 seconds after the disconnection of the EPS. When the EPS is reconnected the fault signal shall be restored within 10 seconds.

An APS fault signal shall be generated within 10 seconds if one of the following conditions occurs (according with Table 1):

- i) low voltage storage device: the storage device voltage falls below the value indicated by the manufacturer
- ii) storage device failure

4.2.2 Monitoring of PS type C

In PS type C the storage device shall be monitored for low voltage. Primary cells used in type C PS shall comply with the requirements of EN 60086, except where technically different types are specified.

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A "low voltage storage device" signal shall be provided when the storage device voltage falls below a voltage level specified by the manufacturer. This voltage shall be greater than the minimum power output voltage.

4.3 Standby period

Power Supply type A and B shall be capable of supplying its rated output to the IAS in all operating conditions in case of interruption of the EPS, for the minimum periods indicated in Table 2:

Table 2: Standby periods

	Grade 1	Grade 2	Grade 3	Grade 4
Minimum standby period	8h	15h	24h	24h

NOTE: The standby limits indicated in Table 2 are the minimum periods relating to the power supply. When installed in an IAS as part of an IAS the loading on the PS will need to comply with the system standby periods shown in EN 50131-1.

4.4 Recharging for PS type A

The power supply shall be capable of recharging the storage device after discharge (as specified by the device manufacturer) or to the level when the cut-off occurs (when deep discharge protection is provided).

The storage device shall be automatically recharged from the EPS in the specified recharge period, listed in Table 3.

Table 3: Recharge periods

	Grade 1	Grade 2	Grade 3	Grade 4
Maximum recharge period	72h	72h	24h	24h

5 Design

The PS shall comply with the requirements of EN 60950:1992, EN 50081-1:1992 and EN 50130-4:1994.

5.1 Overvoltage protection

In grades 3 and 4 PS protection shall be provided to prevent the continuous output voltage exceeding the maximum power output voltage, to prevent damage being caused to other system components.

5.2 Short circuit and overload protection

Each independent output of the PS shall be protected

5.3 Deep discharge protection

When deep discharge of the SD may cause damage to the SD, deep discharge protection shall be provided in grades 3 and 4.

5.4 Ripple

For PS with DC outputs, the ripple content of the nominal output voltage shall be as specified by the manufacturer and shall not exceed 5% of the nominal DC output voltage.

5.5 Environmental conditions: Selection of severity

The PS shall be tested to the environmental class as specified in the product documentation:

- i) **Indoor** : the PS shall operate correctly when exposed to environmental influences normally experienced indoor, when the temperature is expected to be well maintained.
- ii) **Indoor-general**: the PS shall operate correctly when exposed to environmental influences normally experienced indoor, when heating could be intermittent.
- iii) **Outdoor-sheltered**: the PS shall operate correctly when exposed to environmental influences normally experienced out of doors when the PS is not fully exposed to the weather.
- iv) **Outdoor-general**: the PS shall operate correctly when exposed to environmental influences normally experienced out of doors when the PS is fully exposed to the weather.

The "Environmental test selection" is reported in 8.3.2.

5.6 Tamper security

5.6.1 Tamper protection

Where the PS is housed with one or more other equipments of an alarm system, the tamper protection requirement of the PS shall be that of the other equipment.

Where the PS is housed in a separate housing, it shall be sufficiently robust to prevent undetected access to internal components without visible damage.

Normal access shall require the use of an appropriate tool.

The tests specified in EN 50102:1995 shall be applied at the severity specified in Table 4.

Table 4: Tamper protection

	Grade 1	Grade 2	Grade 3	Grade 4
Severity level (IK code)	07	07	07	08
Impact energy (Joule)	2	2	5	5

5.6.2 Tamper detection

Where the PS equipment is housed in a separate container from the alarm systems equipment it supplies, tamper detection monitoring signals shall be provided as listed in Table 5.

Table 5: Tamper detection

	Grade 1	Grade 2	Grade 3	Grade 4
Opening by normal means	M	M	M	M
Removal from mounting	OP	OP	M	M
Penetration of the housing	OP	OP	OP	M

M = Mandatory OP = Optional

5.6.2.1 Opening of the housing

Opening the PS housing by normal means shall not permit the introduction of a tool to overcome tamper detection. The type is specified in EN 60529:1991, the dimension of the tool is specified in Table 6.

Table 6: Opening of the enclosure

	Grade 1	Grade 2	Grade 3	Grade 4
Steel rod diameter, mm ($\pm 0,05$ mm)	2,5	2,5	1	1

5.6.2.2 Removal from mounting

Depending on the grade it shall not be possible to remove the PS from its mounting by more than 10 mm without generating a tamper signal.