



SLOVENSKI STANDARD

SIST IEC 60839-1-2:1995

01-september-1995

Alarm systems - Part 1: General requirements - Section Two: Power units, test methods and performance criteria

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Systèmes d'alarme. Première partie: Prescriptions générales. Section deux: Dispositifs d'alimentation, méthodes d'essai et caractéristiques de fonctionnement

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Ta slovenski standard je istoveten z: **IEC 60839-1-2**

ICS:

13.320 Alarmni in opozorilni sistemi Alarm and warning systems

SIST IEC 60839-1-2:1995

en

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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

60839-1-2

Première édition
First edition
1987-12

Systemes d'alarme

Première partie: Prescriptions générales
Section deux – Dispositifs d'alimentation, méthodes
d'essai et caractéristiques de fonctionnement

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Part 1: General requirements
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CODE PRIX
PRICE CODE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ALARM SYSTEMS

Part 1: General requirements

Section Two – Power units,
test methods and performance criteria

FOREWORD

- 1) The formal decisions of agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

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PREFACE

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This standard has been prepared by IEC Technical Committee No. 79: Alarm systems.

The text of this standard is based on the following documents:

Six Months' Rule	Report on Voting
79(CO)5	79(CO)10

Full information on the voting for the approval of this standard can be found in the Voting Report indicated in the above table.

ALARM SYSTEMS

Part 1: General requirements

Section Two – Power units, test methods and performance criteria

1. Scope

This standard specifies the requirements, test methods and performance criteria for power supply units for alarm systems. The specific requirements for particular system components are specified in separate standards, which shall be used in conjunction with this standard. The configuration of the power supply will depend upon the available sources of power and the requirements of the alarm systems and shall consist of one or more of the following:

- a) Primary batteries.
- b) Secondary batteries (with or without a built-in charger from an external safety extra low voltage source (SELV)).
- c) Power units with mains supply via safety isolating transformer,
 - i) with no other components;
 - ii) with a rectifier for supplying direct current;
 - iii) with a secondary battery and charger as back-up supply;
 - iv) with a primary battery as a back-up supply;
 - v) incorporating an inverter or "switching mode" unit.
- d) A combination of the types indicated in a), b) and c) to form a composite power supply unit.

Certain central stations use higher voltages which are not considered in this standard.

2. Object

The object of this standard is to specify requirements, test methods and performance criteria for electrical power units for use as part of an alarm system.

3. Reference documents

IEC publications quoted in this standard:

Publications Nos. 65 (1985):	Safety requirements for mains operated electronic and related apparatus for household and similar general use.
86:	Primary batteries.
271 (1974):	List of basic terms, definitions and related mathematics for reliability.
285 (1983):	Sealed nickel-cadmium cylindrical rechargeable single cells.

300 (1984):	Reliability and maintainability management.
509 (1976):	Sealed nickel-cadmium button rechargeable single cells.
622 (1978):	Sealed nickel-cadmium prismatic rechargeable single cells.
623 (1983):	Open nickel-cadmium prismatic rechargeable cells.
742 (1983):	Isolating transformer and safety isolating transformers. Requirements.
839-1-1:	Alarm systems. Part 1: General requirements. Section One — General (under consideration).
839-1-3 (1987):	Section Three — Environmental testing.

Other publication:

ISO Standard 532-1975:	Acoustics — Method for calculating loudness level.
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4. Definitions

For the purpose of this standard the following definitions apply.

4.1 Final voltage

The voltage to which a battery falls when discharged under specified conditions.

4.2 Power unit

A device that modifies, stores or isolates electrical power for an alarm system, either as a separate unit or as an integral part of control and indicating equipment, and provides power for an alarm and for the system under normal, alarm and fault conditions.

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5. Requirements**5.1 Primary cells**

Primary cells shall comply with the requirements of IEC Publication 86, except that where technically more advanced types are specified (e.g. lithium cells), these may be specified as long as they cannot cause a hazard or substantial loss of performance of the alarm system.

5.2 Secondary cells

5.2.1 Any type of secondary cells may be used. If nickel-cadmium cells are used they shall comply with the relevant standard:

- IEC Publication 285.
- IEC Publication 509.
- IEC Publication 622.
- IEC Publication 623.

Other types of cells shall comply with the relevant IEC standards (when available).

5.2.2 Where the power supply includes a secondary battery and charger, the required minimum capacity C of the battery is calculated using the following equation:

$$C_{\min} = 1.25 (A_1 \times t_1 + A_2 \times t_2) \text{ ampere hours}$$

where:

t_1 and t_2 are the standby and alarm load times, in hours, given in the specific standards for particular alarm systems and/or components.

A_1 is the total current, in amperes, consumed by the alarm system in the case of mains failure as long as no alarm signal or fault signal (other than "mains failure" signal) is indicated.

A_2 is the total current, in amperes, consumed by the alarm system when in the alarm condition.

5.3 Power units with mains supply

The types of power units covered by this standard are listed below.

- a) Where the power unit is a transformer supplying alternating current.
- b) Where the power unit includes a transformer and a rectifier for supplying direct current.
- c) Where the power unit includes a secondary battery and a charger.
- d) Where the power unit includes an inverter.

These types of power supply may be used in combination to form a composite power supply unit, the requirements for which will be specified in the appropriate Code(s) of Practice or Standard.

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5.3.1 Mains transformers

Mains transformers shall be safety isolating transformers complying with IEC Publication 742. The transformer shall be suitably derated if there are capacitive loads.

5.4 Container temperature

No part of the outside of the power supply container shall exceed a temperature of 80 °C when subjected to an ambient temperature of 40 °C when steady-state conditions are reached at full load.

5.5 Environmental requirements

The environmental requirements are given in the specific standards for particular alarm systems and/or components.

5.6 Information and marking

The manufacturer or supplier of the power unit shall provide sufficient information to allow the correct utilization of the unit. The information will depend upon the type of unit but shall include at least that listed below.

a) For all mains powered units

The voltage figures shall be those obtained at mid-frequency unless the total frequency range exceeds 20% of the minimum frequency stated, in which case they shall be obtained at both maximum and minimum frequencies.

- i) Input voltage range.
- ii) Maximum output current.
- iii) Output voltage at minimum input voltage, for no load and full load.
- iv) Output voltage at maximum input voltage, for no load and full load.
- v) Designed frequency range of operation.

b) For power units including a transformer and rectifier for the supply of direct current

In addition to *a)*, the worst case output ripple voltage within the full range of input voltage and output current shall be stated including supply line.

c) For d.c. to a.c. inverters

In addition to *a)*, the following information shall be stated:

- i) the worst case form factor or other definition of the output waveform over the full range of input voltage and output load current;
- ii) the maximum limits of load power factor or other limits of reactive loading;
- iii) output frequency range at minimum and maximum loads;
- iv) highest peak output voltage over the full range of input voltage and output loads.

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d) For d.c. to d.c. converters

In addition to *a)*, the worst case output ripple voltage within the full range of input voltage and output current.

e) When the whole or part of the power supply unit is integral with the control and indicating equipment

In addition to *a)*, the following shall be stated:

- i) the output voltage at the power supply interface to the rest of the alarm system at maximum and minimum input voltage;
- ii) maximum continuous current that shall flow to the rest of the alarm system.

f) For power units utilizing a primary battery for standby power

Under consideration.

g) For dual power supplies

For power supplies incorporating a combination of those previously described to form a dual power supply, in addition to *a)*, the time taken to switch from one power supply to the other in the event of failure of one shall be stated.