



# SLOVENSKI STANDARD

## SIST IEC 60839-2-4:1995

01-september-1995

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### Alarm systems - Part 2: Requirements for intruder alarm systems - Section Four: Ultrasonic doppler detectors for use in buildings

Alarm systems. Part 2: Requirements for intruder alarm systems. Section Four:  
Ultrasonic Doppler detectors for use in buildings

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Systèmes d'alarme. Deuxième partie: Prescriptions pour les systèmes d'alarme anti-intrusion. Section quatre: Détecteurs à ultrasons à effet Doppler-Fizeau utilisés dans les bâtiments

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Section 4 – Détecteurs à ultrasons à effet  
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**Alarm systems**

**Part 2:  
Requirements for intruder alarm systems  
Section 4 – Ultrasonic Doppler detectors  
for use in buildings**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## ALARM SYSTEMS

## Part 2: Requirements for intruder alarm systems

Section 4 - Ultrasonic Doppler detectors  
for use in buildings

## FOREWORD

- 1) The formal decisions or 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.

## PREFACE

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

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

Six Months' Rule	Report on Voting
79(C0)25	79(C0)35

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 2: Requirements for intruder alarm systems****Section 4 - Ultrasonic Doppler detectors  
for use in buildings****1. Scope**

This International Standard gives the specific requirements and test procedures for ultrasonic Doppler detectors for use in intruder alarm systems installed in buildings.

This standard is an addition to the general requirements for detectors for use in intruder alarm systems as specified in IEC Publication 839-2-2, and it shall also be used in conjunction with the standard for general requirements for alarm systems, IEC Publication 839-1-1.

The object of this standard is to specify those requirements for ultrasonic Doppler detectors which will ensure that they will perform satisfactorily and minimize false alarms.

**2. Normative references**

[SIST IEC 60839-2-4:1995](https://standards.iteh.ai/catalog/standards/sist/491a518c-ceb7-48da-abf0-6bfbbd83133/sist-iec-60839-2-4-1995)

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The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC Publications:

68-1 (1988): Environmental testing, Part 1: General and guidance.

839-1-1 (1988): Alarm systems, Part 1: General requirements. Section One - General.

839-1-3 (1988): Section Three - Environmental testing.

839-2-2 (1987): Part 2: Requirements for intruder alarm systems. Section Two - Requirements for detectors - General.

### 3. Definitions

For the purpose of this standard the following definitions apply in addition to those given in the general requirements.

#### 3.1 *Ultrasonic Doppler detector*

A detector which generates an alarm condition in response to the frequency shift of the reflection of ultrasonic radiation from a moving person.

#### 3.2 *Sensor*

The transmitting and receiving elements of the detector.

#### 3.3 *Ultrasonic radiation*

A sonic radiation with a frequency above 22 kHz.

#### 3.4 *Reference target*

A person weighing between 50 kg and 70 kg and between 165 cm and 180 cm in height, wearing a cotton overall.

#### 3.5 *Boundary of detection coverage*

The furthest radial distances in all directions at which a reference target moving towards the detector will generate an alarm condition.

#### 3.6 *Detection ranges*

The detection ranges for given directions are the radial distances from the detector to the boundary of detection coverage.

### 4. General considerations

The detector shall consist of one or more sensors and a processor. Each sensor shall be contained in one housing which may also include the processor. Where facilities are included to permit more than one sensor to be connected to the processor, the tests required under Clause 6 shall be carried out with one sensor only.

The detectors may have means incorporated to vary the shape of the boundary of coverage. Where such means are incorporated the tests required under Clause 6 shall be carried out with the normal equipment and setting but additional tests shall be carried out to prove the manufacturer's claims for the effects of these means.

## 5. Requirements

### 5.1 *Functional*

#### 5.1.1 *Frequency*

The operating frequency of the detector shall be not less than 22 kHz. Any radiation below 20 kHz shall be not more than 40 dBA at 0,5 m from the detector.

#### 5.1.2 *Boundary of detection coverage*

The boundary of detection coverage achieved for any detector at maximum range setting shall be at least equal to but not more than 25% greater than that given in the manufacturer's specifications.

#### 5.1.3 *Signal processing*

The detector shall generate an alarm condition as a result of the reference target moving towards the detector and within the boundary of detection coverage for a distance of 3 m or 30% of the initial separation, whichever is less. Movements of less than 0,2 m shall not cause an alarm condition.

#### 5.1.4 *Restoration following an alarm condition*

Following an alarm condition and the cessation of the movement which caused it, the detector shall restore to its normal non-alarm condition within 10 s.

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#### 5.1.5 *Intermittent movement*

The detector shall be capable of detecting intermittent movement of the reference target towards the detector with periods of movement within the detectable speed range of not less than 1 s and periods of no movement not more than 5 s. An alarm condition shall occur within a distance of 5 m or 50% of the initial separation, whichever is less.

#### 5.1.6 *Detectable speeds range*

The detector shall be capable of detecting movement of the reference target in the direction of the detector at any speed from 0,3 to 3 m/s.

#### 5.1.7 *Stability*

The range of the detector shall not vary by more than 10% during seven days of normal operation at a constant environment.

#### 5.1.8 *Tamper protection*

Tamper protection shall be fitted and shall generate an alarm condition whenever the container is opened sufficiently to give access to any controls or mechanical fixing.



### 5.1.9 *Cable protection*

Where a sensor and its processor are not located in the same housing, the cable connecting them shall be considered to be part of the detector. It shall be electrically monitored so that if a disconnection or short circuit of any conductors prevents alarm information or a tamper alarm being received by the processor, the processor itself shall generate an alarm condition within 10 s.

### 5.2 *Environmental*

No additional requirements.

### 5.3 *Safety*

No additional requirements.

### 5.4 *Reliability*

No additional requirements.

### 5.5 *Interface*

No additional requirements.

### 5.6 *Construction*

No additional requirements.

### 5.7 *Walk-test indicator*

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If a walk-test indicator is fitted it shall be possible to restrict its indication without opening the detector.

### 5.8 *Manufacturer's specifications*

In addition to the general requirements in IEC Publication 839-2-2 the manufacturer shall provide the following for each detector:

- a) The boundary of detection coverage in the horizontal and vertical planes for a speed of 1 m/s measured as determined by the test given in Sub-clause 6.2.1. This may be provided in the form of a polar diagram.
- b) The operating frequency.
- c) The detectable speed range if greater than that required by Sub-clause 5.1.6.

### 5.9 *Options*

Means may be provided to reduce the radiation of the detector when its associated system is unset.