SLOVENSKI STANDARD
oSIST prEN 63180:2019

01-september-2019

Metodologija za določanje funkcionalnosti javljalnikov - 1. del: Pasivni infrardeči javljalniki zaznavanja prisotnosti in gibanja

Methodology for determining the functionality of detectors - Part 1: Passive infra-red detectors for presence and motion detection

Ta slovenski standard je istoveten z: **prEN 63180:2019**

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IEC SC 23B : PLUGS, SOCKET-OUTLETS AND SWITCHES	
SECRETARIAT:	SECRETARY:
Italy	Mr Cristiano Masini
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD:
SC 3C	☐
	Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED:			
☐ EMC	☐ ENVIRONMENT	☐ QUALITY ASSURANCE	☒ SAFETY
☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting	
The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:
Methodology for determining the functionality of detectors – Part 1: Passive infra-red detectors for presence and motion detection

PROPOSED STABILITY DATE: 2023

NOTE FROM TC/SC OFFICERS:

CONTENTS

27　INTERNATIONAL ELECTROTECHNICAL COMMISSION

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29

30　**METHODS OF MEASUREMENT AND DECLARATION OF THE DETECTION**
31　**RANGE OF DETECTORS –**

32

33　**Passive infra-red detectors for major and minor motion detection**

34

INTRODUCTION

Passive Infra-red detectors are an important element in an energy efficient building. They allow switching on and off and controlling loads to achieve an optimum degree of comfort and energy efficiency.

The detectors covered in this document are motion detectors using passive infra-red (PIR) technology in switches and appliance switches whether stand-alone (direct control of one or more applications) or connected to home and building electronic systems or building automation control systems (HBES/BACS) infrastructure/networks or similar. In the latter case the resulting action depends on the programming of the HBES/BACS.

The purpose of these detectors is to detect the movement of persons.

Detectors linked to a system may also be assigned other tasks: state reporting, power consumption, event reporting, scenarios, etc. These additional functions are not part of this document.

In order to achieve the energy efficiency targets and comfort, the detectors should operate accurately. In addition, the detection area shall be provided with sufficient accuracy in order to allow integrators to choose the correct detectors for the needed action.

This document provides a methodology and test procedures for a manufacturer to declare and verify the detection for these devices with respect to the detection area.

METHODS OF MEASUREMENT AND DECLARATION OF THE DETECTION RANGE OF DETECTORS –

Passive infra-red detectors for major and minor motion detection

1   Scope

This document provides a methodology and test procedures to be able to declare and verify the detection area for motion detectors using Passive Infra-Red technology in switches and appliance switches whether stand-alone (direct control of one or more applications) or connected to home and building electronic systems or building automation control systems (HBES/BACS) infrastructure/networks or similar.

It also provides a uniform way to present the test results.

The purpose of these detectors is to detect the major and minor movements of persons.

Detectors may have the added aim of measuring a level of ambient natural light with respect to a reference level and triggering a number of other functions.

Safety and EMC requirements are not covered by this document.

2   Normative references

There are no normative references in this document.

3   Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/

- ISO Online browsing platform: available at http://www.iso.org/obp

Infrared (IR)
optical radiation for which the wavelengths in vacuum are longer than those for visible radiation, that is approximately between 780 nm and 1 mm

[SOURCE: IEV 731-01-05]

Passive infra-red detector
electronic detector that measures infrared (IR) light radiating from humans and animals in its field of view

Motion detector
unit detecting motion that can be an integral part of an electronic switch, an independent extension unit connected to an actuator, or an independent extension unit from a HBES/BACS or similar systems

Note 1 to entry: HBES/BACS systems are covered by IEC 63044 series.

Major motion
Movement of a person walking into an area or walking within an area

Radial motion
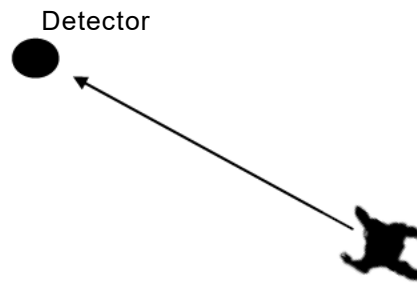motion directly toward the motion detector

99 EXAMPLE

100 Detector

101

102 **Figure 1 – Radial motion**

103

104 **Tangential motion**
105 motion laterally or obliquely to the motion detector

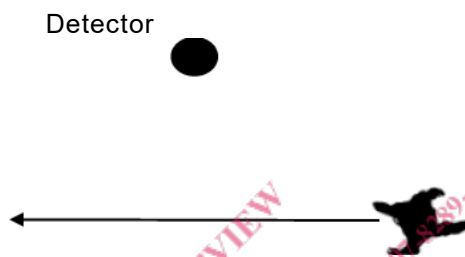106 EXAMPLE

107 Detector

108

109 **Figure 2 – Tangential motion**

110

111 **Minor motion**
112 small movements of a person or a part of a person within an area

113 Note 1 to entry: typical examples of minor motion are in working areas e.g. offices, classrooms, meeting rooms,
114 where the attendance time is long, and the motions of the persons are small (e.g. sitting activities with arm
115 movements).

116 Note 2 to entry: Minor motion detectors are also referred to as presence detectors or occupancy sensors.

117

118 **Detection Area**
119 surface area that the detector is specified to detect the motion of a person

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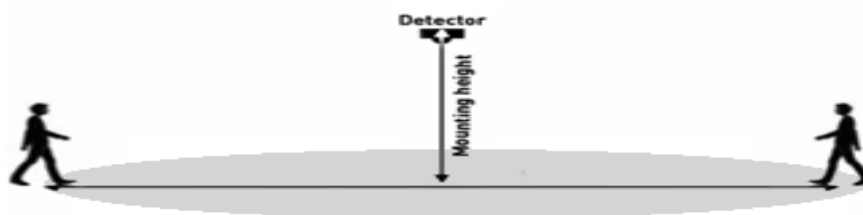123 **Figure 3 – Example of a major motion detector**

124

125 **Non-detection area**
126 surface area that the detector is specified not to detect the motion of a person

127 Note to entry: Although it becomes unlikely that detection of persons will occur, triggering of the detector is not
128 excluded in this area.

129

130

131 **Sensitivity**
132 degree of response of a detector to an incoming signal

133 Note to entry: Depending on the technology, sensitivity can be adjusted for certain parameters (e.g. range,
134 amplification of infrared signal).

135 ████

Delay-time
136
137 duration of time from the moment the motion was last detected until the status of the
138 controlled load is changed

139 ████

Dead time
140
141 duration of time in which the detector cannot detect after the delay-time and at start up

4 General requirements on tests
142

143 Detectors shall be mounted and installed according to the manufacturer's instructions.

144 Manufacturer's instructions regarding operation shall be applied to all tests, where applicable.

145 It is allowed to set the delay-time of detectors at minimum setting or in test mode. The
146 sensitivity is set at maximum.

147 Note: A modification of the detector software with a minimum value of 5 s for the delay-time may be necessary to
148 shorten the test time in total.

149 Detectors shall be able to activate the load independently of the light level in the test room.

150 The dead time of the detector shall be considered according to the manufacturer's
151 instructions. The timing of any persons (dummy) movement and any test arm movement shall
152 be adjusted accordingly.

153 Tests according to this standard are type tests.

154 For detectors installed in a HBES/BACS a minimum configuration is built to test the
155 performance of the detectors. The digital output signal is monitored to verify the activation of
156 the detectors or a load can be switched in the HBES/BACS. In the latter case the dead time of
157 the HBES/BACS shall be taken into consideration.

158 The major motion test can be executed via a human walking test or via an automated test
159 system as described in this standard.

5 Test environment
160

161 The general ambient conditions in the test room shall be as follows:

162 – Temperature 18 °C to 23 °C

163 – Relative humidity Maximum 70 % RH

164 The size of the room shall be large enough in order not to influence the test result.

165 The walls of the test room, if located within the coverage area of the detector, shall not
166 influence the result. Reflection shall be avoided. This can be achieved by covering the
167 detection area of the detector towards the wall or by covering the wall with a coating or a
168 curtain.

169 During the tests, air movement shall not affect the results, e.g. air-conditioning and the walls,
170 floor and ceilings shall have negligible effect on the reflection in the infrared range.

171 The room shall be a closed room and daylight entrance shall be limited. Direct sunlight on the
172 test area is not allowed.

173 The use of artificial light without IR component is allowed.

174 Note: an example of artificial light without IR component is LED lamps

175 The supply voltage to the detector shall meet the following requirements:

176 – Voltage stability ± 3 % max

177 – Frequency stability ± 2 % max

178 – Total harmonic distortion 5 % max

179 The temperature measurements shall be taken at 1,7 m ± 5 cm height from the floor. The
180 temperature testing shall be performed as close as possible to the center of the expected
181 detection area.

182 The temperature of walls, ceiling and floor of the test room shall be allowed to stabilize prior
183 to testing.

184 Note: It may be required to set the test room temperature several hours prior to testing.

185 The test room temperature and the temperature of the walls, ceiling and floor shall be stable
186 within a tolerance of ± 2 K during the tests.

187 When using test dummies and test arms to perform the tests, the difference between the
188 temperature of these tools and the test room shall be stable during the tests within a
189 tolerance of ± 2 K.

190 There shall be no other people or moving objects in the coverage area.

191 **6   Test equipment**

192 █████**Test person for major motion detection**

193 The test person shall meet the following criteria:

194 Height: 1,7 m ± 10 cm

195 Weight: 70 kg ± 10 kg

196 The test person shall be dressed in tight fitting clothes (e.g. bicycling clothes, running clothes)
197 in such a way that, when measured with infrared camera on one point of the body, in the
198 vicinity of the belly button, the test person achieves a temperature average of 7 K ± 2 K above
199 the ambient temperature of the room.

200 NOTE: The 7 K delta value was found to be the average surface temperature of people with only the head and
201 hands exposed.

202 █████**Test dummy for major motion detection when using automated test systems**

203 For testing the detection area, a test dummy as given in Figure 4 shall be used.

204 The size of the test dummy is dependent on the mounting height of the detector as given in
205 Figures 5, 6 and 7.

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207
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210
211 **Figure 4 – Test dummy perspective view**