



SLOVENSKI STANDARD
oSIST prEN IEC 60730-2-23:2024
01-julij-2024

Avtomatske električne krmilne naprave - 2-23. del: Posebne zahteve za električne senzorje in njihove elemente

Automatic electrical controls - Part 2-23: Particular requirements for electrical sensors and sensor elements

Dispositifs de commande électriques automatiques - Partie 2-23: Exigences particulières pour les capteurs électriques et les éléments sensibles

Ta slovenski standard je istoveten z: prEN IEC 60730-2-23:2024

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ICS:

97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use
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SECRETARIAT: United States of America	SECRETARY: Ms Grace Roh
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
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TITLE:

Automatic electrical controls - Part 2-23: Particular requirements for electrical sensors and sensor elements

PROPOSED STABILITY DATE: 2028

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AUTOMATIC ELECTRICAL CONTROLS –

Part 2-23: Particular requirements for electrical sensors and sensing elements

127

FOREWORD

128 This draft International Standard IEC 60730-2-23 has been prepared by WG12, Electrical
129 sensors, of IEC technical Committee 72: Automatic electrical controls.

130 This part 2-23 is intended to be used in conjunction with IEC 60730-1. It was established on the
131 basis of the publication of Edition 6.0.

132 This part 2-23 supplements or modifies the corresponding clauses in 60730-1, Ed 6.0, so as to
133 convert that publication into the IEC standards: Safety requirements for electrical sensors and
134 sensing elements.

135 Where this part 2-23 states “addition”, “modification”, or “replacement”, the relevant requirement,
136 test specification or explanatory matter in Part 1 should be adapted accordingly.

137 Where no change is necessary, this part 2-23 indicates that the relevant clause or subclass in
138 the Part 1 applies.

139 Sensor manufacturers may refer to this Part 2 as a template to understand how to apply the
140 relevant clauses in the Part 1 and to begin designing sensors and sensing elements and apply
141 these requirements for their devices.

142 <https://standards.iteh.ai/catalog/standards/sist/f50db1da-b3a9-4c5b-8b50-95ccd0271e3a/osist-pren-iec-60730-2-23-2024>

143

144 **1 Scope**

145 *Replacement:*

146 This part of IEC 60730 applies to the safety of electrical, electro-mechanical and electronic sensors
147 including sensing elements and any conditioning circuitry. Sensors covered under the scope of this
148 document serve only to transform an activating quantity into a usable output and do not perform a control
149 **operation** as defined in the part 1.

150 This document applies to sensors in so far as defining the reliability and accuracy of its inherent operating
151 characteristics and corresponding response under normal and abnormal conditions within the sensor.
152 Sensors, as defined herein, are used in conjunction within the scope of automatic electrical controls or
153 as independent devices used in connection with controls and control systems.

154 The use of this document for other applications in which sensors are used is possible provided that the
155 appropriate safety is maintained as defined by the end product standard. This document applies to
156 discrete sensors constructed of, but not limited to, conductor, semi-conductor, or substrate, for the
157 detection of activating quantities such as voltage, current, temperature, pressure, humidity, light (e.g.
158 optical), gasoline vapours, and the like.

159 Note 1: Future consideration will be given to other sensors technologies constructed of other materials such as, chemical,
160 mechanical and Micro-Electromechanical Systems (MEMS), along with other activating quantities like mass flow, liquid,
161 movement, weight, vibration, or other as needed.

162 This document applies to sensing element(s) as well as any electronic hardware, software, or other
163 conditioning circuits that are inherent to the sensor and relied upon to reliably transform the input signal
164 into a useable response signal (output) for functional safety purposes. Conditioning circuits that are
165 inseparable from the control for which the sensing element relies upon to perform its desired function are
166 evaluated by the requirements of the relevant control Part 2 standard and/or the Part 1, IEC 60730-1.

167 Note 2: Additional requirements may be also applied by the application standard in which the sensor is used.

168 Throughout this document, whenever it is indicated that the Part 1 requirements are applicable, the term
169 “control(s)”, is replaced by the term “sensor(s)”, and the term “equipment” is replaced by the term
170 “control”, as they are used in the Part 1, respectively, unless otherwise specified herein.

171 This document does not apply to sensors explicitly described in another relevant part 2 of the IEC 60730
172 series.

173 Note 3: For example, a flame sensor as described in IEC 60730-2-5
174

174

175 **2 Normative references**

176 This clause of Part 1 is applicable except as follows:

177 *Addition:*

178 IEC 60539-2, *Directly heated negative temperature coefficient thermistors – Part 2: Sectional specification*
179 – *Surface mount negative temperature coefficient thermistors*

180 IEC 60730-1, *Automatic electrical controls – Part 1: General requirements*

181 IEC 60738-1, *Thermistors - Directly heated positive temperature coefficient - Part 1: Generic specification*

182 IEC 60738-1-1, *Thermistors - Directly heated positive step-function temperature coefficient - Part 1-1: Blank detail*
183 *specification – Current limiting application – Assessment level EZ*

184 IEC 60751, *Industrial platinum resistance thermometers and platinum temperature sensors*
185

185

186 **3 Terms and definitions**

187 This clause of Part 1 is applicable except as follows:

188 **3.1 Definitions relating to ratings, voltages, currents, frequencies and wattages**

189 *Addition:*

190 **3.1.101**

191 **signal**

192 physical variable quantity, one or more parameters of which carry information about one or more variable
193 quantities

194 Note 1 to entry: These parameters are designated “information parameters”.

195 Note 2 to entry: This entry was numbered 351-21-51 in IEC 60050-351:2006.

196 [SOURCE: IEC 60050-351:2011, 351-41-17]

197 **3.2 Definitions of types of control according to purpose**

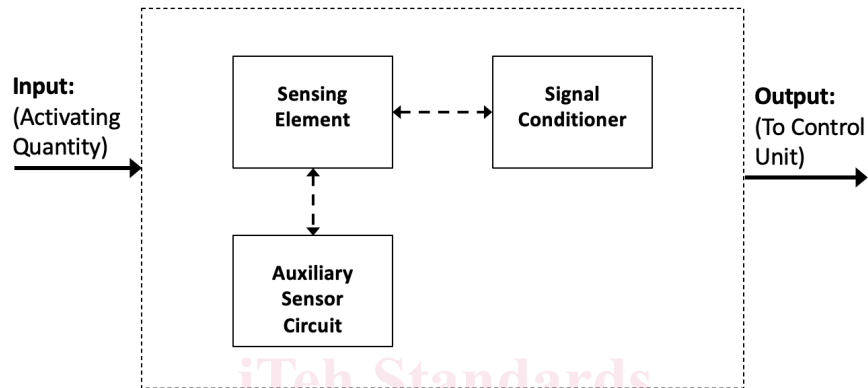
198 *Addition:*

199 **3.2.101**

200 **sensor**

201 device that embodies a **sensing element**, which is directly affected by the activating quantity, and which
 202 generates a signal related to the value of the activating quantity and may also include an **auxiliary**
 203 **sensor** circuit, and/or **signal conditioner**

204 Note to entry: when the term “sensor” is used throughout this document in a general way, it refers to all types of sensors unless
 205 otherwise noted. See example in Figure 1.



206
 207 **Figure 1. Schematic diagram of a typical sensor**

208 **3.2.102**

209 temperature sensor device designed to respond to temperature providing a usable signal

210 [SOURCE: IEC 60050-426:2020, 426-20-44]

211 Note to entry: Example include thermocouples, resistance temperature detector (RTD), etc.

212 **3.2.103**

213 **gasoline vapour sensor**

214 device designed to respond to the presence of a specific concentration of gasoline vapour(s) providing
 215 a usable signal

216 Note to entry: Gasoline vapour sensors can detect flammable or non-flammable gasoline vapours.

217 **3.2.104**

218 **pressure sensor**

219 device designed to respond to pressure of gas(es) or liquid(s) providing a usable signal

220 **3.2.105**

221 **optical sensor**

222 device designed to respond to light providing a usable signal

223 **3.2.106**

224 **humidity sensor**

225 device designed to respond to **humidity** providing a usable signal

226 Note to entry: Humidity sensors usually have two sensing elements within the sensor. One to measure the moisture and the
 227 other temperature.

- 228 **3.2.107**
 229 **current sensor**
 230 device designed to respond to the electrical current providing a usable signal
- 231 **3.2.108**
 232 **voltage sensor**
 233 device designed to respond to voltage providing a usable signal
- 234 Note to entry: A voltage sensor may perform other integral functions as part of the output signal such as to calculate and/or
 235 monitor the voltage of an object.
- 236
- 237 **3.3 Definitions relating to the function of controls**
- 238 **3.3.4 – 3.3.9** Not applicable
- 239 **3.3.15** Not applicable
- 240 **3.3.24** Not applicable
- 241 **3.3.29** Replace “switch head” by “sensing element or sensor”
- 242 **3.3.31** Not applicable
- 243 **3.4 Definitions relating to disconnection and interruption**
- 244 Not applicable.
- 245 **3.5 Definitions of types of control according to construction**
- 246 **3.5.3 and 3.5.4** Not applicable
- 247 **3.5.6 – 3.5.12** Not applicable
- 248 **3.8 Definitions relating to component parts of controls**
- 249 *Replacement:*
- 250 **3.8.1**
 251 **sensing element**
 252 functional device that senses the effect of a measurand at its input and places a corresponding
 253 measurement (electrical) signal at its output
- 254 [SOURCE: IEC 60050-351:2013, 351-56-26]
- 255 Note to entry: In general, a sensing element does not include an enclosure, or any signal conditioning circuits.
- 256 *Addition:*
- 257 **3.8.101**
 258 **auxiliary sensor circuit**
 259 circuit that provides additional functions in order to ensure correct functioning of the sensor (e.g. heating
 260 the sensing element, power supply, etc.)
- 261 **3.8.102**
 262 **signal conditioner**
 263 part of a sensor that either transforms the signal from the sensing element or conditions the signal into
 264 the desired signal type
- 265 **3.13 Miscellaneous definitions**
- 266 *Addition:*