



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 60393-3:2022**  
**01-maj-2022**

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**Potenciometri za elektronsko opremo - 3. del: Področna specifikacija: natančni rotacijski potenciometri**

Potentiometers for use in electronic equipment - Part 3: Sectional specification: Rotary precision potentiometers

**iTeh STANDARD**

**PREVIEW**

Potentiomètres utilisés dans les équipements électroniques - Partie 3: Spécification intermédiaire: Potentiomètres de précision rotatifs

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**Ta slovenski standard je istoveten z: prEN IEC 60393-3:2022**

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**ICS:**

31.040.20	Potenciometri, spremenljivi upori	Potentiometers, variable resistors
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40/2924/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:

IEC 60393-3 ED3

DATE OF CIRCULATION:

2022-03-18

CLOSING DATE FOR VOTING:

2022-06-10

SUPERSEDES DOCUMENTS:

40/2867/CD, 40/2900/CC

IEC TC 40 : CAPACITORS AND RESISTORS FOR ELECTRONIC EQUIPMENT	
SECRETARIAT: Netherlands	SECRETARY: Mr Ronald Drenthen
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.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input checked="" type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <b>Attention IEC-CENELEC parallel voting</b> 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.	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

**Potentiometers for use in electronic equipment - Part 3: Sectional specification: Rotary precision potentiometers**

PROPOSED STABILITY DATE: 2028

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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## POTENTIOMETERS FOR USE IN ELECTRONIC EQUIPMENT –

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**Part 3: Sectional specification:  
Rotary precision potentiometers**

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133 International Standard IEC 60393-3 has been prepared by IEC technical committee 40:  
134 Capacitors and resistors for electronic equipment.

135 This third edition cancels and replaces the second edition published in 1992 and constitutes a  
136 technical revision.

137 This edition includes the following significant technical changes with respect to the previous  
138 edition:

- 139 a) revised all parts of the document based on the ISO/IEC Directives, Part 2:2018 (eighth  
140 edition) and harmonized with other similar kinds of documents.
- 141 b) The document structure has been organized to follow new sectional specification structure  
142 decided in TC 40
- 143 c) revision of the information on the assessment level EZ (zero nonconforming);

144 The text of this International Standard is based on the following documents:

FDIS	Report on voting
40/XX/FDIS	40/XX/RVD

145

146 Full information on the voting for the approval of this International Standard can be found in the  
147 report on voting indicated in the above table.

148 A list of all parts in the IEC 60393 series, published under the general title *Potentiometers for*  
149 *use in electronic equipment*, can be found on the IEC website.

150 This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

151 The committee has decided that the contents of this document will remain unchanged until the  
152 stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to  
153 the specific document. At this date, the document will be

- 154 • reconfirmed,
- 155 • withdrawn,
- 156 • replaced by a revised edition, or
- 157 • amended.

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# POTENTIOMETERS FOR USE IN ELECTRONIC EQUIPMENT –

## Part 3: Sectional specification: Rotary precision potentiometers

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### 1 Scope

168 This part of IEC 60393 applies to rotary precision potentiometers for use in electronic equipment.

169 The object of this standard is to prescribe preferred ratings and characteristics and to select  
170 from IEC 60393-1, the appropriate quality assessment procedures, tests and measuring  
171 methods and to give general performance requirements for this type of potentiometer.

172 This standard gives the minimum performance requirements and test severities.

### 2 Normative references

174 The following documents are referred to in the text in such a way that some or all of their content  
175 constitutes requirements of this document. For dated references, only the edition cited applies.  
176 For undated references, the latest edition of the referenced document (including any  
177 amendments) applies.

178 IEC 60062, *Marking codes for resistors and capacitors*

179 IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

180 IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

181 IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

182 IEC 60393-1:2008, *Potentiometers for use in electronic equipment – Part 1: Generic specification*

183 IEC 60915, *Capacitors and resistors for use in electronic equipment – Preferred dimensions of shaft  
184 ends, bushes and for the mounting of single-hole, bush-mounted, shaft-operated electronic components*

185 IEC 61193-2, *Quality assessment systems – Part 2: Selection and use of sampling plans for  
186 inspection of electronic components and packages*

### 3 Terms and definitions

188 For the purposes of this document, the terms and definitions of IEC 60393-1:2008, and the  
189 following apply.

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

- 192 • IEC Electropedia: available at <http://www.electropedia.org/>
- 193 • ISO Online browsing platform: available at <http://www.iso.org/obp>

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197 **4 Preferred characteristics**

198 **4.1 General**

199 The values given in detail specifications shall preferably be selected from the following.

200 **4.2 Style and dimensions**

201 **4.2.1 Style**

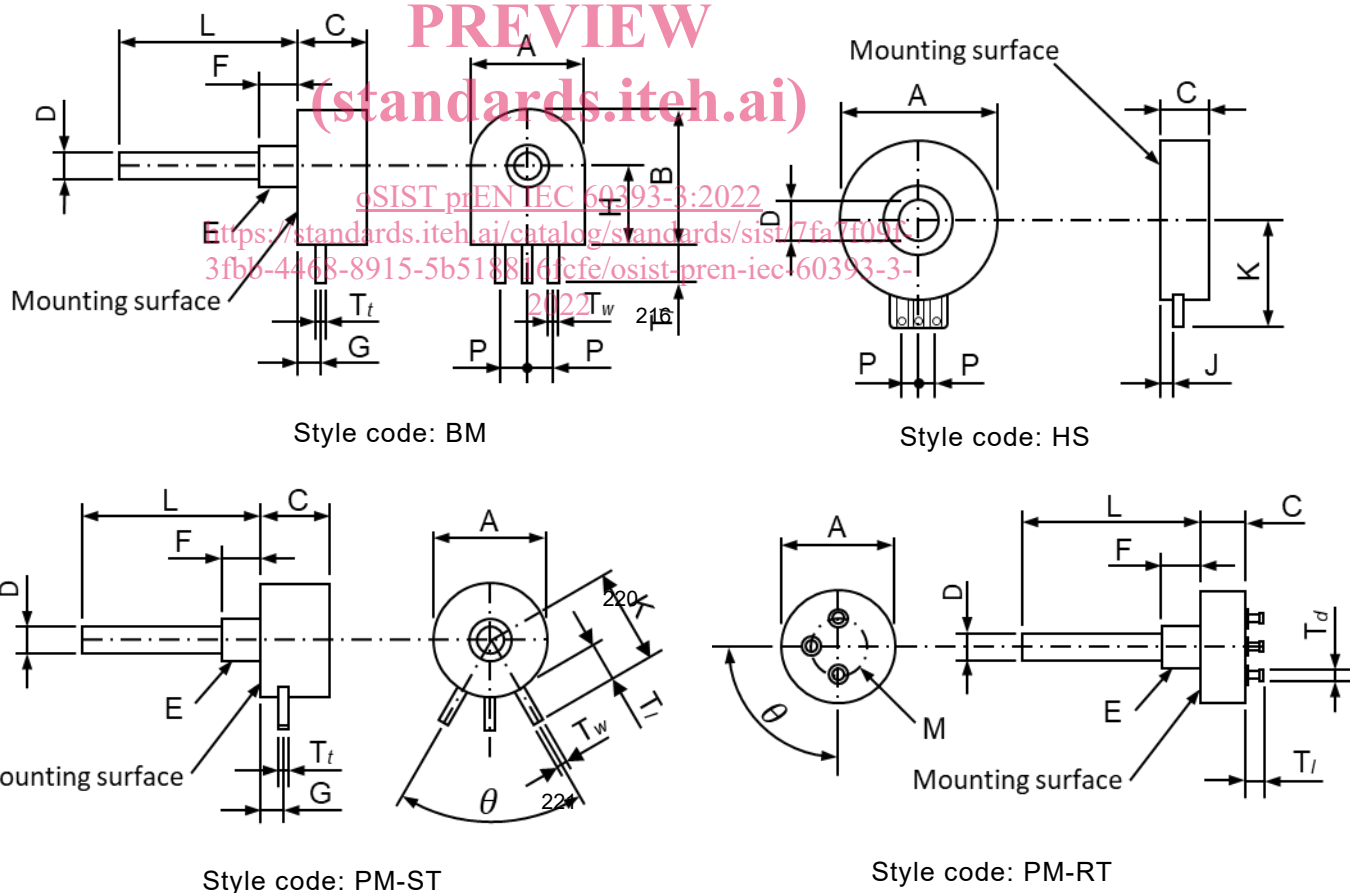
202 See IEC 60393-1:2008, 2.2.2.

203 The style shall be presented by a double-letter code, e.g. AB, which is arbitrarily chosen for  
204 each detail specification.

205 The style designation, therefore, has no meaning unless the number of the detail specification  
206 is also given.

207 **4.2.2 Outline drawing and dimensions**

208 The detail specification shall incorporate an illustration of the potentiometer being specified.  
209 Where space is insufficient to show the detail dimensions required for inspection purposes,  
210 such dimensions shall appear on a drawing forming an annex to the detail specification, as  
211 shown in Figure 1.



224 **Key:**

- 225 A Body wide or diameter
- 226 B Body height
- 227 C Body length
- 228 D Shaft diameter
- 229 E Bushing diameter or thread size

230	F	Bushing length
231	G	Distance from the mounting surface to the terminal center
232	H	Distance from shaft center to the board surface
233	J	Distance from mounting surface to terminal board
234	K	Distance from shaft center to terminal tip
235	L	Shaft length
236	M	Pitch circle diameter of terminals
237	P	Distance between terminals
238	$T_d$	Terminal diameter
239	$T_l$	Terminal length
240	$T_t$	Terminal thickness
241	$T_w$	Terminal width
242	$\theta$	Terminal mounting angle

243

244

### Figure 1 – Outline drawing and dimensions

245 The drawing shall give the following details:

- 246 – the dimensions of the shaft and bush. These may be given either on the outline drawing or by
- 247 reference to IEC 60915;
- 248 – any locating devices;
- 249 – the total mechanical travel;
- 250 – the effective electrical travel;
- 251 – the angle of ineffective mechanical travel;
- 252 – the dimensions and the location of terminals;
- 253 – the dimensions which shall be measured in accordance with IEC 60393-1:2008, 4.4.2;
- 254 – any other dimensional information which will adequately describe the potentiometer.

255 All dimensions shall preferably be stated in millimetres, however, when the original dimensions  
 256 are given in inches, the converted metric dimensions in millimetres shall be added.

257 When the potentiometer is not designed for use on printed boards, this shall be clearly indicated  
 258 in the detail specification.

#### 259 4.3 Preferred climatic categories

260 The potentiometers covered by this specification are classified into climatic categories  
 261 according to the general rules given in IEC 60068-1:2013, Annex A.

262 The lower and upper category temperature and the duration of the damp heat, steady state test  
 263 shall be chosen from the following:

264 Lower category temperature: -55 °C, -40 °C and -10 °C.

265 Upper category temperature: +85 °C, +100 °C and +125 °C.

266 Duration of the damp heat, steady state test: 21 and 56 days.

267 The severities for the cold and dry heat tests are the lower and upper category temperatures  
 268 respectively. Because of the construction of some potentiometers these temperatures will occur  
 269 between two of the preferred temperatures given in IEC 60068-2-1:2007 and IEC 60068-2-  
 270 2:2007. In this case the nearest preferred temperature within the actual temperature range of  
 271 the potentiometer shall be chosen for this severity.

272 **4.4 Resistance law**

273 See 6.5.

274 **4.5 Nominal total resistance**

275 IEC 60393-1:2008, 2.3.2.

276 **4.6 Tolerances on nominal total resistance**

277 The preferred tolerances on nominal total resistance are:

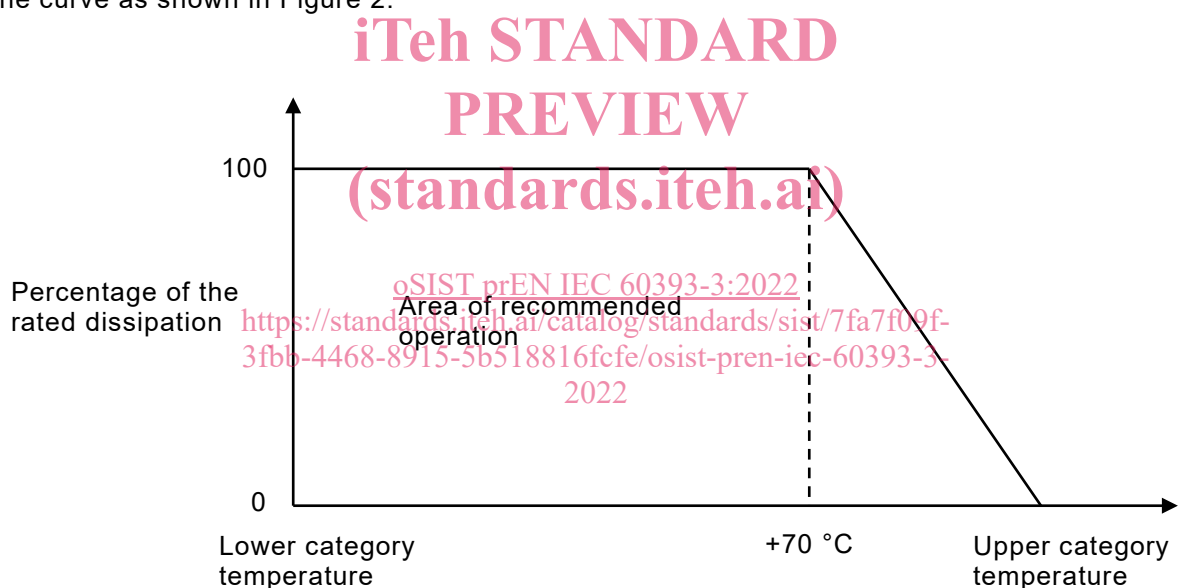
278  $\pm 10\%$ ,  $\pm 5\%$ ,  $\pm 3\%$ ,  $\pm 2\%$ ,  $\pm 1\%$  and  $\pm 0,5\%$ .279 **4.7 Rated dissipation**

280 The preferred values of rated dissipation at 70 °C, are:

281 0,1 W, 0,125 W, 0,25 W, 0,5 W, 0,75 W, 1 W, 1,5 W, 2,0 W, 2,5 W, 4 W, and 6,3 W.

282 The derated values of dissipation at temperatures in excess of 70 °C shall be as indicated by  
283 the curve as shown in Figure 2.

284



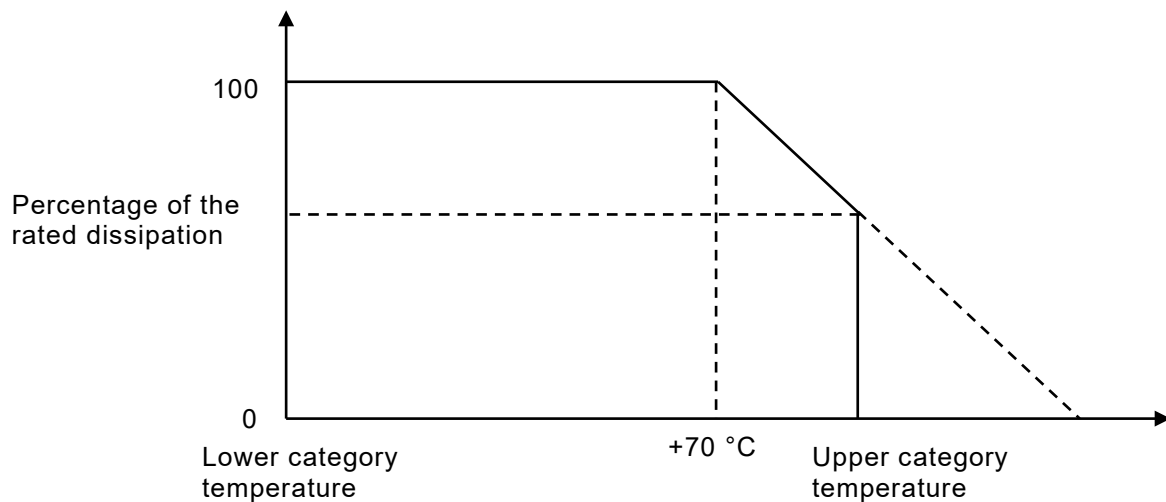
285

285 **Figure 2 – Rated dissipation curve**286 A larger area of operation may be given in the detail specification, provided it includes all the  
287 area given above. In this event the detail specification shall state the maximum allowable  
288 dissipation at temperatures other than 70 °C. All break points on the curve shall be verified by  
289 test.

290 An example of a derating curve having a larger area of operation is given in Figure 3.

291 In certain circumstances, the rated dissipation may continue up to the upper category  
292 temperature.

293



294

295

**Figure 3 – Rated dissipation curve (examples of larger area)**

#### 296 4.8 Limiting element voltage

297 The preferred values of DC or AC RMS limiting element voltage are taken from the R5 series  
298 of preferred numbers of ISO 3:

299 100 V, 160 V, 250 V, 400 V, 630 V and 1 000 V.

#### 300 4.9 Insulation voltage

301 The detail specification shall prescribe the value of the insulation voltage, rounded off to the  
302 nearest 10 V. The numerical value of the insulation voltage shall be:

- 303 – Normal air pressure:  $\geq 1,42$  times the limiting element voltage
- 304 – Low air pressure (at 8 kPa):  $\geq$  two-thirds the value at normal air pressure

#### 305 4.10 Resolution (when applicable)

306 The resolution shall be stated in the detail specification.

307

### 308 5 Test and test severities

#### 309 5.1 General

310 Test severities given in the detail specification shall preferably be selected from the following.

#### 311 5.2 Mounting

312 The detail specification shall specify the method of mounting to be applied for the voltage proof  
313 and the insulation resistance tests and for the application of the vibration and bump or shock  
314 tests. The potentiometers shall be mounted by their normal means, but the design may be such  
315 that special mounting fixtures are required. In this case, the detail specification shall describe  
316 the mounting fixtures that shall be used for the voltage proof and the insulation resistance tests  
317 and for the application of the vibration and bump or shock tests. For the latter tests the mounting  
318 shall be such that there shall be no parasitic vibration.