



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 61812-1:2022**  
**01-marec-2022**

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**Časovni in spojni releji za uporabo v industriji in bivališčih - 1. del: Zahteve in preskusi**

Time relays and coupling relays for industrial and residential use - Part 1: Requirements and tests

Zeitrelais (Relais mit festgelegtem Zeitverhalten) für industrielle Anwendungen und für den Hausgebrauch - Teil 1: Anforderungen und Prüfungen

Relais à temps spécifié pour applications industrielles et résidentielles - Partie 1: Exigences et essais

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**Ta slovenski standard je istoveten z: prEN IEC 61812-1:2022**

**ICS:**

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94/596/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: <b>IEC 61812-1 ED3</b>	
DATE OF CIRCULATION: <b>2022-01-14</b>	CLOSING DATE FOR VOTING: <b>2022-04-08</b>
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IEC TC 94 : ALL-OR-NOTHING ELECTRICAL RELAYS	
SECRETARIAT: Austria	SECRETARY: Mr Bernhard Spalt
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 121A	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 type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING	
<p><b>Attention IEC-CENELEC parallel voting</b></p> <p>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.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

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TITLE:

**Time relays and coupling relays for industrial and residential use - Part 1: Requirements and tests**

PROPOSED STABILITY DATE: 2024

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175 INTERNATIONAL ELECTROTECHNICAL COMMISSION

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178 **TIME RELAYS AND COUPLING RELAYS FOR INDUSTRIAL AND**  
 179 **RESIDENTIAL USE –**

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**Part 1: Requirements and tests**

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**FOREWORD**

185 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising  
 186 all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international  
 187 co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and  
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216 International Standard IEC 61812-1 has been prepared by IEC technical committee 94: All-or-  
 217 nothing electrical relays.

218 This third edition cancels and replaces the second edition published in 2011. This edition  
 219 constitutes a technical revision.

220 This edition includes the following significant technical changes with respect to the previous  
 221 edition:

- 222 – update of references;
- 223 – addition of requirements for risk assessment;
- 224 – addition of requirements for routine test;
- 225 – renumbering of clauses to bring them into a more logical order;
- 226 – clarification of the requirement for shock;
- 227 – addition of cybersecurity requirement for industrial automation and control systems;
- 228 – addition of environmentally conscious design requirement;



- 229 – addition of common data dictionary reference;  
 230 – addition of terms and definitions of relay types;  
 231 – addition of coupling relays in title temporarily;  
 232 – addition of coupling relays in scope temporarily;

233 The text of this document is based on the following documents:

4CD	Report on voting
94/519/CD	94/568/CC

234  
 235 Full information on the voting for the approval of this International Standard can be found in the  
 236 report on voting indicated in the above table.

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

238 A list of all parts of the IEC 61812 series can be found, under the general title *TIME RELAYS*  
 239 *AND COUPLING RELAYS FOR INDUSTRIAL AND RESIDENTIAL USE*, on the IEC website.

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

- 243 • reconfirmed,
- 244 • withdrawn,
- 245 • replaced by a revised edition, or
- 246 • amended.

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250 **TIME RELAYS AND COUPLING RELAYS FOR INDUSTRIAL AND**  
 251 **RESIDENTIAL USE –**

252  
 253 **Part 1: Requirements and tests**  
 254

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 256

257 **1 Scope**

258 This part of the IEC 61812 series applies to time relays and coupling relays for industrial  
 259 applications (e.g. control, automation, signal and industrial equipment) and for automatic  
 260 electrical controls for use in, on, or in association with equipment for residential and similar use.

261 The term “relay” as used in this document comprises all types of relays with specified time  
 262 functions and coupling relays, other than measuring relays.

263 This document defines type test and routine test to confirm the service condition.

264 **2 Normative references**

265 The following referenced documents are indispensable for the application of this document. For  
 266 dated references, only the edition cited applies. For undated references, the latest edition of  
 267 the referenced document (including any amendments) applies.

268 IEC 60050-444:2002, *International Electrotechnical Vocabulary – Part 444: Elementary relays*

269 IEC 60050-445:2010, *International Electrotechnical Vocabulary – Part 445: Time relays*

270 IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

271 IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

272 IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

273 IEC 60085:2007, *Electrical insulation – Thermal evaluation and designation*

274 IEC 60112:2020, *Method for the determination of the proof and the comparative tracking indices*  
 275 *of solid insulating materials*

276 IEC 60529:1989 +AMD1:1999+AMD2:2013, *Degrees of protection provided by enclosures (IP*  
 277 *Code)*

278 IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage systems – Part 1:*  
 279 *Principles, requirements and tests*

280 IEC 60664-3:2016, *Insulation coordination for equipment within low-voltage systems – Part 3:*  
 281 *Use of coating, potting or moulding for protection against pollution*

282 IEC 60664-4:2005, *Insulation coordination for equipment within low-voltage systems – Part 4:*  
 283 *Consideration of high-frequency voltage stress*

284 IEC 60695-2-11:2014, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods –*  
 285 *Glow-wire flammability test method for end-products*

- 286 IEC 60695-10-2:2014, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test*
- 287 IEC 60947-5-1:2016, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices*  
288 *and switching elements – Electromechanical control circuit devices*
- 289 IEC 60947-5-4:2002, *Low-voltage switchgear and controlgear – Part 5-4: Control circuit devices*  
290 *and switching elements – Method of assessing the performance of low-energy contacts –*  
291 *Special tests*
- 292 IEC 60999-1:1999, *Connecting devices – Electrical copper conductors – Safety requirements*  
293 *for screw-type and screwless-type clamping units – Part 1: General requirements and particular*  
294 *requirements for clamping units for conductors from 0,2 mm<sup>2</sup> up to 35 mm<sup>2</sup> (included)*
- 295 IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and*  
296 *measurement techniques – Electrostatic discharge immunity test*
- 297 IEC 61000-4-3:2020, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and*  
298 *measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
- 299 IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and*  
300 *measurement techniques – Electrical fast transient/burst immunity test*
- 301 IEC 61000-4-5:2014 + AMD1:2017, *Electromagnetic compatibility (EMC) – Part 4-5: Testing*  
302 *and measurement techniques – Surge immunity test*
- 303 IEC 61000-4-6:2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and*  
304 *measurement techniques – Immunity to conducted disturbances, induced by radio-frequency*  
305 *fields*
- 306 IEC 61000-4-8:2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and*  
307 *measurement techniques – Power frequency magnetic field immunity test*
- 308 IEC 61000-4-11:2020, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and*  
309 *measurement techniques – Voltage dips, short interruptions and voltage variations immunity*  
310 *tests for equipment with input current up to 16 A per phase*
- 311 IEC 61210:2010, *Connecting devices – Flat quick-connect terminations for electrical copper*  
312 *conductors – Safety requirements*
- 313 IEC 61810-1:2015, *Electromechanical elementary relays – Part 1: General requirements*
- 314 IEC 61984:2008, *Connectors – Safety requirements and tests*
- 315 IEC 62314:2021, *Solid-state relays*
- 316 IEC 62430:2019, *Environmentally conscious design (ECD) - Principles, requirements and*  
317 *guidance*
- 318 IEC 62474:2018 + AMD1:2020; *Material declaration for products of and for the electrotechnical*  
319 *industry*
- 320 ISO 9223:2012, *Corrosion of metals and alloys — Corrosivity of atmospheres — Classification,*  
321 *determination and estimation*

322 CISPR 11:2015 + AMD1:2016 + AMD2:2019, *Industrial, scientific and medical equipment –*  
323 *Radio-frequency disturbance characteristics – Limits and methods of measurement*  
324 Amendment 1 (2010)

### 325 **3 Terms and definitions**

326 For the purposes of this document, the terms and definitions given in IEC 60050-444 and  
327 IEC 60050-445, as well as the following apply.

328 NOTE Terms having the same or nearly the same meaning are printed in boldface on separate lines and can be  
329 used as an alternative.

#### 330 **3.1 Terms and definitions related to general terms**

##### 331 **3.1.1**

##### 332 **time relay**

##### 333 **specified-time relay**

334 all-or-nothing relay (IEC 60050-444:2002, 444-01-02) with one or more time functions

335 [IEC 60050-445:2010, 445-01-01 modified]

##### 336 **3.1.2**

##### 337 **coupling relay**

338 All-or-nothing electrical relay incorporated into a housing or mounted on a socket (e.g. EN  
339 60715 mounting rail) with no specified time or logic function for industrial or residential use  
340 intended for incorporation into cabinets.

341 NOTE Typically this is a relay according to IEC 61810 series or IEC 62314 incorporated into a housing or mounted  
342 on a socket (e.g. EN 60715 mounting rail) for installation in industrial or residential cabinets.

##### 343 **3.1.3**

##### 344 **specified time**

345 specified characteristic of the time relay at given type of function, e.g. operate time, release  
346 time, pulse on time, interval time

347 [IEC 60050-445:2010, 445-05-01 modified]

##### 348 **3.1.4**

##### 349 **setting accuracy**

350 difference between the measured value of the specified time and the reference value set on the  
351 scale

352 NOTE For analogue setting this value relates to the maximum setting value.

353 [IEC 60050-445:2010, 445-06-07]

##### 354 **3.1.5**

##### 355 **effect of influence** (on specified time)

356 degree with which the influence quantity within its nominal range has an effect on the specified  
357 time

358 [IEC 60050-445:2010, 445-06-02]

##### 359 **3.1.6**

##### 360 **recovery time**

361 minimum time interval for which the power supply is removed or control signal is applied or  
362 removed before the specified function can be performed again

363 [IEC 60050-445:2010, 445-05-04]

- 364 **3.1.7**  
 365 **minimum control impulse time**  
 366 shortest duration of the power supply or control signal to fulfil the specified function
- 367 [IEC 60050-445:2010, 445-05-02]
- 368 **3.1.8**  
 369 **repeatability**  
 370 difference between the upper and lower limits of the specified confidence range determined  
 371 from several time measurements of the time relay under identical conditions
- 372 NOTE Preferably the repeatability is indicated as a percentage of the mean value of all measured values.  
 373 [IEC 60050-445:2010, 445-06-08]
- 374 **3.1.9**  
 375 **power supply**  
 376 electrical quantity (e.g. electric current, voltage) which has to be applied or removed from the  
 377 input circuit of the time relay or coupling relay in order to enable it to fulfil its purpose
- 378 [IEC 60050-445:2010, 445-03-01 modified]
- 379 **3.1.10**  
 380 **input voltage**  
 381 electrical quantity that can be applied (or removed) to the power supply and/or to the control  
 382 signal
- 383 **3.1.11**  
 384 **control signal**  
 385 trigger signal (deprecated)  
 386 input signal which has to be applied or removed in addition to the power supply in order to  
 387 ensure a function of the time relay
- 388 NOTE The control signal is provided by a separate device designed to close or open an electrical circuit.  
 389 [IEC 60050-445:2010, 445-02-05]
- 390 **3.1.12**  
 391 **conditional short-circuit current of an output circuit**  
 392 prospective electric current that a contact circuit, protected by a specified short-circuit  
 393 protective device, can satisfactorily withstand for the total breaking time of that protective  
 394 device under specified conditions of use and behaviour
- 395 [IEC 60050-445:2010, 445-04-03]
- 396 **3.1.13**  
 397 **on-state voltage drop of a solid-state output circuit**  
 398 voltage drop of a solid-state output circuit  
 399 voltage measured across the effectively conducting solid-state output of the time relay or  
 400 coupling relay, when carrying the given load current
- 401 [IEC 60050-445:2010, 445-04-04 modified]
- 402 **3.1.14**  
 403 **leakage current of a solid-state output**  
 404 off-state current of a solid-state output  
 405 electric current which flows through the effectively non-conducting solid-state output of the time  
 406 relay or coupling relay at a specified voltage
- 407 [IEC 60050-445:2010, 445-04-05 modified]

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408 **3.1.15**  
 409 **power port**  
 410 port at which the supply voltage (either AC. or DC) is connected to the time relay or coupling  
 411 relay

412 [IEC 60050-445:2010, 445-07-01 modified]

413 **3.1.16**  
 414 **control port**  
 415 additional port for the starting of functions whilst supply voltage is applied, or for the connection  
 416 of a remote potentiometer, control signal, etc.

417 NOTE There are control ports for floating (potential-free) and non-floating control.

418 [IEC 60050-445:2010, 445-07-02]

419 **3.1.17**  
 420 **output port**  
 421 port at which a load is connected to the time relay or coupling relay

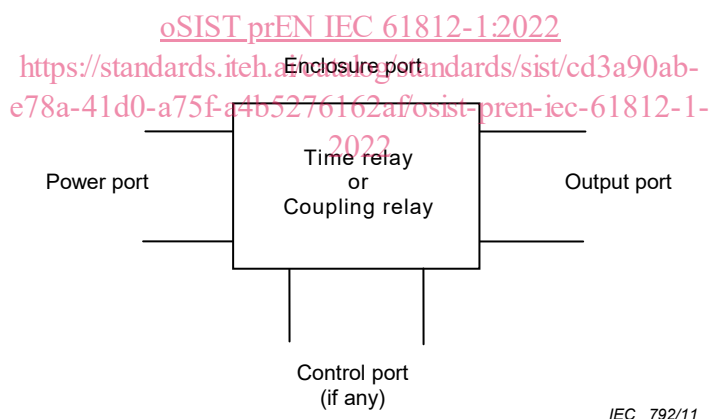
422 NOTE The output port could consist of electromechanical contacts or be a solid-state output.

423 [IEC 60050-445:2010, 445-07-03]

424 **3.1.18**  
 425 **enclosure port**  
 426 physical boundary of the time relay or coupling relay through which electromagnetic fields can  
 427 radiate or impinge

428 [IEC 60050-445:2010, 445-07-04]

429 NOTE See Figure 1.



430

431 **Figure 1 – Definition of ports**

432 **3.1.19**  
 433 **type test**  
 434 test of one or more devices made to a certain design to show that the design meets certain  
 435 specifications

436 [IEC 61810-1:2015, 3.1.7]

437

438 **3.1.20**  
 439 **routine test**  
 440 test to which each individual device is subjected during and/or after manufacture to ascertain  
 441 whether it complies with certain criteria

442 [IEC 61810-1:2015, 3.1.8]

443 **3.1.21**  
444 **sampling test**  
445 test on a number of devices taken at random from a batch

446 [IEC 61810-1:2015, 3.1.9]

447 **3.1.22**  
448 **operative range**  
449 range of values of power supply for which the time relay or coupling relay is able to perform its  
450 specified function

451 [IEC 61810-1:2015, 3.4.5 modified]

452 **3.1.23**  
453 **rated input voltage range**  
454 range of input voltages used for specification purposes, established for a specified set of  
455 operating conditions

## 456 **3.2 Terms and definitions of time relay types**

457 See Annex A.

## 458 **4 Classification**

### 459 **4.1 Switching element**

460 Time relays and coupling relays may be classified according to the switching element, e.g.  
461 electromechanical output circuit or solid-state output circuit.

### 462 **4.2 Mechanical construction** [oSIST prEN IEC 61812-1:2022](https://standards.iteh.ai/catalog/standards/sist/cd3a90ab-e78a-41d0-a75f-a4b5276162a1/osist-pr-en-iec-61812-1-2022)

463 Time relays and coupling relays may be classified according to the mechanical construction,  
464 e.g. monobloc (non modular) relay or plug-in (modular) relay.

### 465 **4.3 Device mounting**

466 Time relays and coupling relays may be classified according to the mounting capabilities, e.g.  
467 DIN rail or panel mounting.

### 468 **4.4 Connection**

469 Time relays and coupling relays may be classified according to the connection facilities, e.g.  
470 screw type or spring type.

### 471 **4.5 Environment**

472 Time relays and coupling relays may be classified according to the application environment,  
473 e.g. industrial or residential, commercial and light-industrial.

## 474 **5 Influence quantities**

475 The specified performance of the time relay or coupling relay shall be given with respect to the  
476 reference conditions, i.e. the set of reference values of all influence quantities.

477 The values and tolerance ranges listed in Table 1 apply unless otherwise specified.

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