



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 60079-29-0:2024**  
**01-september-2024**

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**Eksplzivne atmosfere - 29-0. del: Javljalniki plina - Splošne zahteve in preskusne metode, in morebitni dodatni deli**

Explosive atmospheres - Part 29-0: Gas detectors - General requirements and test methods, and possible supplementary parts

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**Ta slovenski standard je istoveten z: prEN IEC 60079-29-0:2024**

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**ICS:**

13.320	Alarmni in opozorilni sistemi	Alarm and warning systems
29.260.20	Električni aparati za eksplozivna ozračja	Electrical apparatus for explosive atmospheres

**oSIST prEN IEC 60079-29-0:2024**                      **en**





# 31/1784/CDV

## COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:  
**IEC 60079-29-0 ED1**

DATE OF CIRCULATION:  
**2024-07-12**

CLOSING DATE FOR VOTING:  
**2024-10-04**

SUPERSEDES DOCUMENTS:  
**31/1757/CD, 31/1765B/CC**

IEC TC 31 : EQUIPMENT FOR EXPLOSIVE ATMOSPHERES	
SECRETARIAT: United Kingdom	SECRETARY: Mr Tom Stack
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:

**Explosive atmospheres - Part 29-0: Gas detectors - General requirements and test methods, and possible supplementary parts.**

PROPOSED STABILITY DATE: 2029

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**EXPLOSIVE ATMOSPHERES - Part 29-0: Gas detection equipment –  
General requirements and test methods**

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164 International Standard IEC 60079-29-0 has been prepared by the IEC technical committee 31:  
165 Equipment for explosive atmospheres.

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

FDIS	Report on voting

167

168 Full information on the voting for its approval can be found in the report on voting indicated in  
169 the above table.

170 The language used for the development of this International Standard is English.

171 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in  
172 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available

173 at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are  
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176 document can be published. Interpretation sheets are available from the IEC webstore and can  
177 be found in the “history” tab of the page for each document.

178 A list of all parts in the IEC 60079-29 series can be found on the IEC website.

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- 183 • withdrawn,
- 184 • replaced by a revised edition, or
- 185 • amended.

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## INTRODUCTION

190

191 This part of IEC 60079-29 is prepared for combining the requirements for flammable, oxygen  
192 and toxic gas detection equipment to be used in industrial or commercial applications and  
193 intended to measure the concentration or the integral concentration of gases and vapours to  
194 provide an indication, alarm or other output functions for personnel safety or property protection.  
195 This document also includes test methods and acceptance criteria for performance of gas  
196 detection equipment whose primary purpose is to provide an indication, alarm or other output  
197 function.

198 Because a wide range of conditions can be encountered in practice, this part specifies  
199 requirements to be fulfilled by gas detection equipment when tested under prescribed laboratory  
200 conditions.

201 General and performance requirements for toxic gas detection equipment intended for  
202 occupational exposure measurement in the region of Occupational Exposure Limit Values is set  
203 out in IEC 62990-1 as for Type HM gas detection equipment.

204 Consideration should also be given to the following relevant standards:

205 IEC 60079-29-2: *Explosive atmospheres – Part 29-2, Gas detectors – Selection, installation,  
206 use and maintenance of detectors for flammable gases and oxygen.*

207 IEC 62990-2: *Workplace atmospheres — Part 2: Gas detectors — Selection, installation, use  
208 and maintenance of detectors for toxic gases and vapours.*

209 IEC 60079-29-3: *Explosive atmospheres – Part 29-3, Gas detectors – Guidance on functional  
210 safety of fixed gas detection systems.*

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## Part 29-0: Gas detection equipment – General requirements and test methods

### 219 1 Scope

220 This part of IEC 60079-29 specifies general requirements, test methods and acceptance criteria  
221 that apply to flammable, oxygen and toxic gas detection equipment intended to detect gases  
222 and vapours and to provide an indication, alarm or other output function for personnel or  
223 property protection in industrial and commercial applications.

224 NOTE 1 The term Gas Detection Equipment is often referred to as the term Gas Detector.

225 NOTE 2 The term 'gas' and 'gases' used in this document are also intended to include 'vapour' and 'vapours'.

226 This document applies to the following gas detection equipment:

- 227 • Gas detection equipment Type "FL" intended for the detection of flammable gases:
  - 228 – Group I, in mines susceptible to firedamp;
  - 229 – Group II, in locations other than mines susceptible to firedamp; and
  - 230 – Type FL-OP, open path gas detection equipment for flammable gases.
- 231 • Gas detection equipment Type "O2" intended for the detection of Oxygen:
  - 232 – Type O2-DE, detection of oxygen deficiency or oxygen enrichment; and
  - 233 – Type O2-IN, inertisation as measuring function for explosion protection.

234 NOTE 3 Inertisation is an explosion protection technique where an explosive atmosphere is purged with  
235 inert gas.

- 236 • Gas detection equipment Type "TX" intended for the detection of toxic gases:
  - 237 – Type TX-SM, detection in areas for general applications (for example, safety monitoring,  
238 leak detection), and typically using alarm signalling;
  - 239 – Type TX-HM, occupational exposure measurement in the region of occupational  
240 exposure limit values; and

241 NOTE 4 Type TX-HM gas detection equipment performance requirements reside in IEC 62990-1.

- 242 – Type TX-OP, open path gas detection equipment for toxic gases.

243 NOTE 5 This standard addresses equipment giving a level of performance suitable for general purpose applications.  
244 Specific applications might additionally require equipment to be submitted for particular tests or approval. Such tests  
245 or approval are regarded as additional to and separate from the compliance with this document.

246 This document is not applicable to equipment:

- 247 – used for medical applications;
- 248 – used only in laboratories for analysis or measurement;
- 249 – used only for process monitoring or control purposes (such as a gas analyser);
- 250 – used in the domestic environment;
- 251 – used in environmental air pollution monitoring;
- 252 – used for flue gas analysis;
- 253 – used for sampling systems external to the gas detection equipment;
- 254 – with samplers and concentrators such as sorbents or paper tape having an irreversible  
255 indication;

256 – consisting of a passive optical receiver without a dedicated optical source.

## 257 **2 Normative references**

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

262 IEC 62990-1, *Workplace atmospheres - Part 1: Gas detectors - Performance requirements of*  
263 *detectors for toxic gases*

264 IEC 62990-2, *Workplace atmospheres – Part 2: Gas detectors – Selection, installation, use and*  
265 *maintenance of detectors for toxic gases and vapours*

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

267 IEC 60079-0, *Explosive atmospheres – Part 0: Equipment – General requirements*

268 IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

269 IEC 61000-4-29, *Electromagnetic compatibility (EMC) – Part 4-29: Testing and measurement*  
270 *techniques – Voltage dips, short interruptions and voltage variations on d.c. input power port*  
271 *immunity tests*

272 IEC 61326-1:2020, *Electrical equipment for measurement, control and laboratory use – EMC*  
273 *requirements – Part 1: General requirements*

274 IEC 80079-20-1, *Explosive atmospheres – Part 20: Material characteristics for gas and vapour*  
275 *classification, Section 1: Test methods and data*

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## 276 **3 Terms and definitions**

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

278 ISO and IEC maintain terminology databases for use in standardization at the following  
279 addresses:

- 280 • IEC Electropedia: available at <https://www.electropedia.org/>
- 281 • ISO Online browsing platform: available at <https://www.iso.org/obp>

### 282 **3.1** 283 **gas properties**

284 **3.1.1**  
285 **ambient air, <gas detection>**  
286 normal atmosphere surrounding the equipment

287 **3.1.2**  
288 **clean air, <gas detection>**  
289 air that is free of gases or vapours to which the sensor is sensitive or which influence the  
290 performance of the sensor

291 **3.1.3**  
292 **reference air, <gas detection>**  
293 air with an oxygen volume fraction of  $(21 \pm 0,4) \%$

294 **3.1.4**  
295 **zero test gas, <gas detection>**  
296 gas, that is free of the gas(es) to be measured and interfering and contaminating substances,  
297 the purpose of which is calibration/adjustment of the equipment zero

298 **3.1.5**  
299 **standard test gas, <gas detection>**  
300 test gas with a composition specified to be used for all tests unless otherwise stated

301 **3.1.6**  
302 **flammable gas, <gas detection>**  
303 DEPRECATED: combustible gas  
304 gas or vapour which, when mixed with air in a certain proportion, will form an explosive  
305 atmosphere

306 Note 1 to entry: For the purposes of this part of IEC 60079-29, the term "flammable gas" includes flammable  
307 vapours.

308 [SOURCE: IEC 60079-10-1:2020 with "or vapour" dropped from term and one note to entry added. Admitted and  
309 deprecated terms also added]

310 **3.1.7**  
311 **toxic gas, <gas detection>**  
312 gas or vapour that can be harmful to human health and/or the performance of persons due to  
313 its physical or physico-chemical properties

314 **3.1.8**  
315 **poisons, <gas detection>**  
316 <for sensing elements> substances that lead to temporary or permanent change of  
317 performance, particularly loss of sensitivity of the sensing element

318 **3.1.9**  
319 **volume fraction (V/V)**  
320 quotient of the volume of a specified component and the sum of the volumes of all components  
321 of a gas mixture before mixing

322 Note 1 to entry: The volume fraction and volume concentration take the same value if, at the same state conditions,  
323 the sum of the component volumes before mixing and the volume of the mixture are equal. However, because the  
324 mixing of two or more gases at the same state conditions is usually accompanied by a slight contraction or, less  
325 frequently, a slight expansion, this is not generally the case.

326 Note 2 to entry: All volumes are with respect to the pressure and the temperature of the gas mixture.

327 **3.2**  
328 **structure (or composition) of gas detection equipment**

329 **3.2.1**  
330 **alarm-only equipment, <gas detection>**  
331 equipment with an alarm but not having an indication of measured value

332 **3.2.2**  
333 **aspirated equipment, <gas detection>**  
334 equipment that samples the gas by drawing it to the gas sensor

335 Note 1 to entry: A hand operated or electric pump is often used to draw gas to the sensor.

336 **3.2.3**  
337 **automatically aspirated equipment, <gas detection>**  
338 aspirated equipment with an integral pump or separate pump, which is connected directly to the  
339 equipment

340 **3.2.4**  
341 **diffusion equipment, <gas detection>**  
342 equipment in which the transfer of gas from the atmosphere to the sensor takes place without  
343 aspirated flow

344 **3.2.5**  
345 **fixed equipment**  
346 equipment fastened to a support, or otherwise secured in a specific location when energized

347 [SOURCE: IEC 60079-0:2017]

348 **3.2.6**  
349 **portable equipment, <gas detection>**  
350 equipment intended to be carried by a person during its operation

351 Note 1 to entry: Portable equipment carried by a person during its operation is sometimes referred to as hand-held  
352 equipment.

353 Note 2 to entry: Hand-held gas detection equipment, typically less than 1 kg, requires use of only one hand to operate.  
354 Larger equipment that can be operated by the user while it is carried either by hand, by a shoulder strap or carrying  
355 harness, can be equipped with or without a hand directed probe.

356 [SOURCE: IEC 60079-0:2017 with addition of Note 2 to entry]

357 **3.2.7**  
358 **transportable equipment**  
359 equipment not intended to be carried by a person during operation, nor intended for fixed  
360 installation

361 [SOURCE: IEC 60079-0:2017]

362 **3.2.8**  
363 **gas detection transmitter**  
364 fixed gas detection equipment that provides a conditioned electronic signal or output indication  
365 to a generally accepted industry standard (such as 4-20 mA), intended to be utilized with  
366 separate gas detection control units or signal processing data acquisition, central monitoring  
367 and similar systems, which typically process information from various locations and sources  
368 including, but not limited to gas detection equipment

369 **3.2.9**  
370 **gas detection control unit**  
371 equipment intended to provide display indication, alarm functions, output contacts or alarm  
372 signal outputs or any combination when operated with remote sensor(s)

373 **3.2.10**  
374 **separate gas detection control unit**  
375 equipment intended to provide display indication, alarm functions, output contacts or alarm  
376 signal outputs or any combination when operated with gas detection transmitter(s)

377 **3.2.11**  
378 **equipment with integral sensor(s), <gas detection>**  
379 equipment that provides display indication, alarm functions, output contacts or alarm signal  
380 outputs using a sensor which is within or directly assembled to the equipment housing

381 **3.2.12**  
382 **accessory, <gas detection>**  
383 component which can be fitted to the equipment for a special purpose and that is referenced in  
384 the instructions

385 EXAMPLE: External gas pump, sampling probe, hoses, collecting cone, weather protection device.

386 **3.3**  
387 **sensors**

388 **3.3.1**  
389 **sensing element, <gas detection>**

390 part of the sensor that is sensitive to the gas or vapour to be measured

391 **3.3.2**  
392 **measuring principle, <gas detection>**

393 principle that makes the sensing element or the sensor sensitive to the gas or vapour to be  
394 measured

395 **3.3.3**  
396 **sensor, <gas detection>**

397 assembly in which the sensing element is housed and that may also contain associated circuit  
398 components

399 **3.3.4**  
400 **integral sensor, <gas detection>**

401 sensor that is within or directly assembled to the a gas detection control unit, gas, detection  
402 transmitter, or to transportable or portable equipment

403 **3.3.5**  
404 **remote sensor, <gas detection>**

405 sensor that is installed separately, but is connected to a gas detection control unit, gas detection  
406 transmitter, or to transportable or portable equipment

407 **3.4**  
408 **supply of gas to equipment**

409 **3.4.1**  
410 **sample line, <gas detection>**

411 means by which the gas being sampled is conveyed to the sensor

412 Note 1 to entry: Accessories such as filters or water traps are often included in the sample line.

413 **3.4.2**  
414 **sampling probe, <gas detection>**

415 separate accessory sample line that is optionally attached to the equipment

416 **3.4.3**  
417 **Adjustment, <gas detection>**

418 procedure carried out to minimize the deviation of the indication from the test gas concentration

419 Note 1 to entry: When the equipment is adjusted to give an indication of zero in zero test gas, the procedure is  
420 called 'zero adjustment'.

421 **3.4.4**  
422 **calibration, <gas detection>**

423 procedure that establishes the relationship between an indication and the concentration of a  
424 test gas

425 **3.4.5**  
426 **calibration kit, <gas detection>**

427 means of presenting test gas to the equipment for the purpose of calibrating, adjusting or  
428 verifying the operation of the equipment

429 Note 1 to entry: The calibration kit can be used for verifying the operation of the alarms if the concentration of the  
430 test gas is beyond the alarm set-point.