



SLOVENSKI STANDARD
oSIST prEN IEC 61285:2024
01-november-2024

Nadzor industrijskih procesov - Varnost prostorov z napravami za analiziranje

Industrial-process control - Safety of analyser houses

Commande des processus industriels - Sécurité des bâtiments pour analyseurs

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TITLE:

Industrial-process control - Safety of analyser houses

PROPOSED STABILITY DATE: 2030

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INDUSTRIAL-PROCESS CONTROL – SAFETY OF ANALYSER HOUSES

95

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FOREWORD

97 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising
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129 IEC 61285 has been prepared by subcommittee 65B: Measurement and control devices, of IEC
130 technical committee 65: Industrial-process measurement, control and automation. It is an
131 International Standard.

132 This 4th edition cancels and replaces the 3rd edition published in 2015. This edition constitutes
133 a technical revision.

134 This edition includes the following significant technical changes with respect to the previous
135 edition:

136 a) incorporation of previously issued corrigendum;

137 b) adaption to latest version of standard IEC 60079-1-10:2020 for the classification of areas;

138 c) minor updates to several sections and references.

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

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

140 Full information on the voting for its approval can be found in the report on voting indicated in
141 the above table.
142

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

144 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in
145 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available
146 at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are
147 described in greater detail at www.iec.ch/standardsdev/publications.

148 The committee has decided that the contents of this document will remain unchanged until the
149 stability date indicated on the IEC website under webstore.iec.ch in the data related to the
150 specific document. At this date, the document will be

- 151 • reconfirmed,
- 152 • withdrawn,
- 153 • replaced by a revised edition, or
- 154 • amended.

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155 **INTRODUCTION**

156 Process analysers measure the characteristics of a process stream continuously and
157 automatically. The process sample is introduced automatically and the system is designed for
158 unattended operation and minimal maintenance.

159 The placement of devices for process analysis in analyser houses is beneficial for technical and
160 economic reasons:

- 161 – in order to facilitate appropriate environmental conditions;
- 162 – to simplify servicing and maintenance issues;
- 163 – to enable the use of a common infrastructure (see 3.6).

164 This document is designed to set forth minimum safety requirements for typical analyser houses
165 (AHs). It is superseded in all cases by national, local, or corporate requirements, if additional
166 or more stringent requirements will apply.

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167 INDUSTRIAL-PROCESS CONTROL – SAFETY OF ANALYSER HOUSES

168

169 **1 Scope**

170 This International Standard describes the physical requirements for the safe operation of the
171 process analyser measuring system installed in an analyser house (AH) in order to ensure its
172 protection against fire, explosion and health hazards. This standard applies for analyser houses
173 with inner and/or external potential explosive atmospheres and it applies to hazards caused by
174 toxic substances or asphyxiant gases. (Refer to national guidelines on toxic hazards.)

175 This standard does not address facilities where solids (dust, powder, fibres) are the hazard.

176 This standard does not seek to address all functional safety issues related to analyser houses.

177 Clause 4 addresses the location of the AH and connection within the process plant areas.

178 Clause 5 addresses the design, construction and layout of the AH.

179 Clause 6 addresses measures for reducing the danger of explosion for AHs while permitting
180 maintenance of equipment with the power on and the case open.

181 For most fluids, the major constraint is that the concentration of vapours, which are toxic for
182 personnel, is lower than the lower explosive (flammable) limit (LFL) (see Clause 7).

183 Using n-Pentane as an example, the LFL is 1,5 % or $15\,000 \times 10^{-6}$ [Source OSHA], the level
184 immediately dangerous to life or health (which is the maximum level from which a worker could
185 escape within 30 min without any escape-impairing symptoms or any irreversible health effects)
186 is only 0,1 % or $1\,000 \times 10^{-6}$.

187 Clause 7 addresses those measures for protecting personnel from materials in the atmosphere
188 of AHs that are hazardous to health.

189

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190 **2 Normative references**

191 The following documents, in whole or in part, are normatively referenced in this document and are
192 indispensable for its application. For dated references, only the edition cited applies. For undated
193 references, the latest edition of the referenced document (including any amendments) applies.

194 IEC 60079-0:2017, *Explosive atmospheres – Part 0: General requirements*

195 IEC 60079-10-1:2020, *Explosive atmospheres – Part 10-1: Classification of areas – Explosive gas
196 atmospheres*

197 ISO/IEC80079-20-1:2017, *Explosive atmospheres — Part 20-1: Material characteristics for gas and
198 vapour classification — Test methods and data*

199 3 Terms and definitions

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

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

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

205

206 3.1

207 analyser cabinet

208 housing in which analysers are installed individually or grouped together

209 Note 1 to entry: Maintenance is performed from outside the cabinet with the door(s) open.

210 3.2

211 analyser shelter

212 structure with one or more sides open and free from obstruction to the natural passage of air,
213 in which one or more analysers are installed

214 Note 1 to entry: The maintenance of the analysers is normally performed in the protection of the shelter.

215 3.3

216 analyser house (AH)

217 enclosed building or part of a building containing process analysers and associated equipment
218 where streams for analysis are brought in and which is regularly entered by authorized
219 personnel

220 Note 1 to entry: An AH is not a permanent workplace. Within the scope of this standard, the term AH is used
221 regardless of the structure configuration as either a room, a walk-in cabinet, an analyser container or an analyser
222 building and whether or not it is an integral part of, or attached to, another structure.

223 3.4

224 sample conditioning cabinet (SCC)

225 Cabinet in which sample conditioning systems are installed individually or grouped together.

226 Note 1 to entry: Maintenance is performed from outside the cabinet with the door(s) open.

227 3.5

228 sample conditioning room (SCR)

229 room that is separated from the AH and has modules for sample conditioning, auxiliary material,
230 or sample disposal equipment.

231 Note 1 to entry: A SCR is not a permanent workplace.

232

233 3.6

234 infrastructure

235 required means and supply with auxiliaries to operate an AH with all equipment therein, for
236 example, instrument air, nitrogen, water, power supply, incidental disposal of waste and
237 disposal of substances introduced to be analysed

238 Note 1 to entry: The infrastructure occasionally comprises the fundament of an AH, the positioning of gas bottles
239 and containers for gas supply and test gases. The infrastructure comprises in addition the ventilation and
240 climatisation of the AH and the needed alarm devices within and outside of the AH.

241 3.7

242 maintenance

243 servicing, inspection, repair, improvement and weakness analysis of process analyser devices
244 and infrastructure

245 **3.8**
246 **toxic substances**
247 gaseous or liquid substances that, if released in a room, will cause a health hazard by contact
248 with the skin or by inhalation from the surrounding atmosphere

249 **3.9**
250 **safety back-up**
251 additional personnel, in constant contact with a person or persons in hazardous working
252 condition, who could assist or call for additional help

253 **3.10**
254 **external explosion hazard**
255 hazard existing when the AH is erected at a location where flammable substances may ingress
256 from the outside resulting in dangerous concentrations of flammable gases and vapours inside
257 the AH

258 **3.11**
259 **internal explosion hazard**
260 hazard existing when a flammable mixture can result from release of samples or auxiliary
261 supplies inside the AH

262 **3.12**
263 **lower flammable limit (LFL)**
264 concentration of flammable gas or vapour in air below which an explosive gas atmosphere does
265 not form

266 Note 1 to entry: The term “lower explosive limit” is used especially in European standardization and regulations
267 interchangeably to describe this limit.

268 [SOURCE: ISO/IEC 80079-20-1:2017, 3.6.1]

269 **3.13**
270 **explosive gas atmosphere**
271 mixture with air, under atmospheric conditions, of flammable substances in the form of gas or
272 vapour, which, after ignition, permits self-sustaining flame propagation

273 [SOURCE: IEC 60079-10-1:2020, 3.40]

274 **3.14**
275 **hazardous area**
276 area in which an explosive gas atmosphere is present or can be expected to be present, in
277 quantities such that special precautions for the construction, installation and use of equipment
278 are required

279 [SOURCE: IEC 60079-10-1:2020, 3.3.1]

280 **3.15**
281 **non-hazardous area**
282 area in which an explosive gas atmosphere is not expected to be present in quantities such that
283 special precautions for the construction, installation and use of equipment are required

284 [SOURCE: IEC 60079-10-1:2020, 3.3.2]

285 **3.16**
286 **zone 0**
287 area in which an explosive gas atmosphere is present continuously or for long periods or
288 frequently

289 [SOURCE: IEC 60079-10-1:2020, 3.3.4]

290 **3.17**
291 **zone 1**
292 area in which an explosive gas atmosphere is likely to occur in normal operation occasionally

293 [SOURCE: IEC 60079-10-1:2020, 3.3.5]]

294 **3.18**
295 **zone 2**
296 area in which an explosive gas atmosphere is not likely to occur in normal operation but, if it
297 does occur, will persist for a short period only

298 [SOURCE: IEC 60050-426:2020, 426-03-05]

299 **3.19**
300 **source of release**
301 a point or location from which a gas, vapour, mist or liquid may be released into the atmosphere
302 so that an explosive gas atmosphere could be formed

303 [SOURCE: IEC 60050-426:2020, 426-03-06, modified (addition of "mist")]

304 **3.20**
305 **continuous grade of release**
306 release which is continuous or is expected to occur frequently or for long periods

307 Note 1 to entry: Both "frequently" and "long" are the terms which are intended to describe a very high likelihood of
308 a potential release. In that respect, those terms do not necessarily need to be quantified.

309 [SOURCE: IEC 60079-10-1:2020, 3.4.2]

310 **3.21**
311 **primary grade of release**
312 release which can be expected to occur periodically or occasionally during normal operation

313 [SOURCE: IEC 60079-10-1:2020, 3.4.3]

314 **3.22**
315 **secondary grade of release**
316 release which is not expected to occur in normal operation and, if it does occur, is likely to do
317 so only infrequently and for short periods

318 [SOURCE: IEC 60079-10-1:2020, 3.4.4]

319 **3.23**
320 **release rate**
321 quantity of flammable gas, vapour or mist emitted per unit time from the source of release

322 [SOURCE: IEC 60079-10-1:2020, 3.4.5]

323 **3.24**
324 **flashpoint**
325 lowest liquid temperature at which, under certain standardized conditions, a liquid gives off
326 vapours in a quantity such as to be capable of forming an ignitable vapour/air mixture

327 [SOURCE: IEC 60079-10-1:2020, 3.6.8]

328 **3.25**
329 **auto-ignition temperature (AIT)**
330 lowest temperature (of a surface) at which under specified test conditions an ignition of a
331 flammable gas or vapour in mixture with air or air-inert gas occurs

332 [SOURCE: ISO/IEC 80079-20-1:2017, 3.3]

333 **3.26**
334 **equipment protection level (EPL)**
335 level of protection assigned to equipment based on its likelihood of becoming a source of
336 ignition and distinguishing the differences between explosive gas atmospheres, explosive dust
337 atmospheres, and the explosive atmospheres in mines susceptible to firedamp

338 [SOURCE: IEC 60079-0:2017, 3.26]