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Part 13: Equipment protection by pressurized room "p" and artificially ventilated room "v"

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- i) has any issues related to 3rd party IPR, patent or copyright
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- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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UK Vote

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



31J/373/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:

IEC 60079-13 ED3

DATE OF CIRCULATION:

2024-08-16

CLOSING DATE FOR COMMENTS:

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SUPERSEDES DOCUMENTS:

31J/336/CD, 31J/372/CC

IEC SC 31J : CLASSIFICATION OF HAZARDOUS AREAS AND INSTALLATION REQUIREMENTS

SECRETARIAT:

Croatia

SECRETARY:

Mr Marino Kelava

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 18, SC 65B

HORIZONTAL FUNCTION(S):

ASPECTS CONCERNED:

Environment, Safety

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Explosive atmospheres - Part 13: Equipment protection by pressurized room "p" and artificially ventilated room "v"

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –

Part 13: Equipment protection by pressurized room "p" and artificially ventilated room "v"

FOREWORD

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International Standard IEC 60079-13 has been prepared by IEC technical subcommittee SC 31J: Equipment for explosive atmospheres Classification of Hazardous Areas and Installation Requirements.

This second-third edition cancels and replaces the first-second edition published in 2010-2017 and also replaces IEC 79-16. This edition constitutes a technical revision.

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

- a) additional requirements for rooms located in a hazardous area modification of the title of this document to include artificially ventilated room "v" in addition to pressurized room "p";
- b) addition of details for mechanical strength of rooms to consider external forces and not only room pressure addition of types of protection "pb", "pc", and "vc" and removal of types of protection "px", "py", "pz" and "pv";
- c) clarification of requirements for purging of enclosures in a room definition of the differences between pressurization and artificial ventilation types of protection;



- d) ~~adding consideration of variations in operating and ambient temperature when assessing removal of protection of rooms with an inert gas or a flammable gas from the scope of this document~~ pressurisation;
- e) ~~expanding and prioritising allowable actions on loss of addition~~ pressurisation
- e)f) ~~revising testing to recognise modelling as alternative to physical testing of purging and ventilation performance of an informative annex to include examples of applications where types of protection pressurization or artificial ventilation or pressurization and artificial ventilation can be used and associated guidelines.~~

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

FDIS	Report on voting
31/1309/FDIS	31/1317/RVD

Full information on the voting for the approval of this document can be found in the report on voting indicated in the above table.

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

This document is to be used in conjunction with the principles of hazardous area classification from IEC 60079-10-1. ~~For analyser houses, this document should also be used in conjunction with IEC 61285, and artificial ventilation for the protection of analyser(s) houses from IEC 60079-16.~~ Additional information on the design, construction, operation and the safety of analyser houses can be found in IEC 61285 and IEC TR 61831.

A list of all parts in the IEC 60079 series, published under the general title *Explosive atmospheres*, can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

201

INTRODUCTION

202 This part of IEC 60079 gives requirements for the design, construction, assessment, verification
203 and marking of rooms used to protect internal equipment by pressurization or artificial
204 ventilation or both as applicable when located in an explosive gas atmosphere or combustible
205 dust atmosphere hazardous area with or without an internal source of a flammable gas or
206 vapour. It also includes a room located in a non-hazardous area that has an internal source of
207 release of a flammable gas or vapour.

208 This document deals with rooms that are ~~partially~~ constructed in a manufacturer's facility and
209 intended to have the final installation completed on-site, as well as rooms that are constructed
210 completely on-site. Rooms ~~partially~~ constructed in a manufacturer's facility may include third-
211 party verification. For rooms built on-site, this document can be used by plant operators as a
212 guide for assessment of those facilities.

213 ~~This document represents a major technical revision of the requirements for equipment~~
214 ~~protection by pressurized room "p" and artificially ventilated room "v" and should be considered~~
215 ~~as introducing all new requirements.~~

216 After the initial installation, a room constructed in a manufacture's facility is considered as part
217 of the site installation in accordance with other parts of the ISO 80079 and IEC 60079 series.

218

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EXPLOSIVE ATMOSPHERES –

Part 13: Equipment protection by pressurized room "p" and artificially ventilated room "v"

1 Scope

This part of IEC 60079 gives requirements for the design, construction, assessment, verification and marking of rooms used to protect internal equipment as either:

g) located in a Zone 1 or Zone 2 or Zone 21 or Zone 22 explosive atmosphere (an area normally requiring an equipment protection level (EPL) Gb, Gc, Db or Dc) without an internal source of gas or vapour release and protected by pressurization;

–h) located in a Zone 1 or Zone 2 or Zone 21 or Zone 22 explosive atmosphere (an area normally requiring EPL Gb, Gc, Db or Dc), containing an internal source of gas or vapour release and protected by both pressurization and artificial ventilation;

–i) located in a Zone 2 explosive atmosphere (an area normally requiring EPL Gc) with or without an internal source of gas or vapour release and protected by artificial ventilation;
Drafting note: MT is considering deleting level of protection vc and would like to hear back if there are any applications where it is used in practice

–j) located in a non-hazardous area, containing an internal source of gas or vapour release and protected by artificial ventilation;

— located in a Zone 1 or Zone 2 or Zone 21 or Zone 22 explosive atmosphere (an area normally requiring EPL Gb, Gc, Db or Dc), containing an internal source of gas or vapour release and protected by both pressurization and artificial ventilation.

NOTE 1 Internal releases of combustible dust are not considered as neither protection by ventilation or protection by pressurization can prevent hazardous areas from such releases.

NOTE 2 See Annex C for examples of applications.

The term "room" used in this document includes single rooms, multiple rooms, a complete building or a room contained within a building. A room is intended to facilitate the entry of personnel. The term "room" also ~~and~~ includes inlet and outlet ducts. The term "room" can also be applied to part of a room where protection is provided by local ventilation, for example ventilation hood. An acoustic hood and other like eEnclosures designed to permit the entry of personnel to completely enter can also be considered as a room, for example a larger acoustic enclosure. This document is not intended to apply to temporary structures, for example, to enable hot work to be completed in an operating plant.

Limitations in the use of protection by ventilation are described in 7.1.1

NOTE 3 Notwithstanding the above intent for permanent structures, this document could be used as guidance for temporary structures.

This document also includes requirements for related safety devices and controls necessary to ensure that artificial ventilation, purging and pressurization is established and maintained.

A room assembled or constructed on site, can be either on-land-based or off-shore. The room is primarily intended for installation by an end-user but could be constructed and assessed at a manufacturer's facility, where the final construction such as ducting can be completed on site.

Rooms can be located in an explosive gas atmosphere requiring EPL Gb or Gc, or a combustible dust atmosphere requiring EPL Db, or Dc.

This document does not specify the methods that may be required to ensure adequate air quality for personnel ~~with regard to such as; asphyxiation,~~ toxicity and temperature within the room. Additional guidance on analyser houses and asphyxiation and toxicity hazards can be found in IEC 61285. National or other regulations and requirements may ~~-also exist to ensure for~~ the safety of personnel ~~in this regard.~~

Protection of rooms by using an inert gas or a flammable gas is outside of the scope of this document. It is recognized that such applications are special cases, ~~which in part may be addressed using the principles from IEC 60079-2,~~ but in all probability will also be the subject of additional, stringent engineering standards, procedures and practices. Pressurized enclosures for equipment that are not intended to facilitate the entry of personnel are addressed in IEC 60079-2, and are not in the scope of this document.

NOTE Maintenance recommendations are contained in Annex A ~~until they can be included in IEC 60079-17.~~

This document supplements and modifies the general requirements of IEC 60079-0, except ~~exclusions~~ as indicated in Table 1. Where a requirement of this document conflicts with a requirement of IEC 60079-0, the requirement of this document takes precedence.

Table 1 – ~~Exclusion Applicability~~ of specific clauses ~~or subclauses~~ of IEC 60079-0

Drafting note: this table will be updated to the latest edition of IEC 60079-0 at later drafting stages

Clause of IEC 60079-0		IEC 60079-0 application to IEC 60079-13
Ed. 6.0 (2011) (Informative)	Clause / subclause title (Normative)	
4	Equipment grouping	Applies
4.1	Group I	Excluded
4.2	Group II	Applies
4.3	Group III	Applies
4.4	Equipment for a particular explosive atmosphere	Applies
5.1	Environmental influences	Applies
5.1.1	Ambient temperature	Applies
5.1.2	External source of heating or cooling	Applies
5.2	Service temperature	Applies
5.3.1	Determination of maximum surface temperature	Applies
5.3.2.1	Group I electrical equipment	Excluded
5.3.2.2	Group II electrical equipment	Applies
5.3.2.3	Group III electrical equipment	Applies
5.3.3	Small component temperature for Group I and Group II electrical equipment	Excluded
6.1	General	Applies
6.2	Mechanical strength	Excluded
6.3	Opening times	Excluded
6.4	Circulating currents	Excluded
6.5	Gasket retention	Excluded
6.6	Electromagnetic and ultrasonic radiating equipment	Applies
7.1	General	Excluded
7.2	Thermal endurance	Excluded
7.3	Resistance to light	Modified
7.4	Electrostatic charges on external non-metallic materials	-Excluded
7.5	Accessible metal parts	Excluded
8	Metallic enclosures and metallic parts of enclosures	Excluded
9	Fasteners	Excluded

Clause of IEC 60079-0		IEC 60079-0 application to IEC 60079-13
Ed. 6.0 (2011) (Informative)	Clause / subclause title (Normative)	
10	Interlocking devices	Excluded
11	Bushings	Excluded
12	Materials used for cementing	Excluded
13	Ex components	Excluded
14	Connection facilities and termination compartments	Excluded
15	Connection facilities for earthing and bonding conductors	Excluded
16	Entries into enclosures	Excluded
17	Supplementary requirements for rotating electrical machines	Excluded
18	Supplementary requirements for switchgear	Excluded
19	Supplementary requirements for fuses	Excluded
20	Supplementary requirements for plugs and sockets	Excluded
21	Supplementary requirements for luminaires	Excluded
22	Supplementary requirements for caplights and handlights	Excluded
23	Equipment incorporating cells and batteries	Excluded
24	Documentation	Applies
25	Compliance of prototype or sample with documents	Applies
26.1	General	Applies
26.2	Test configuration	Applies
26.3	Tests in explosive test mixtures	Excluded
26.4	Tests of enclosures	Excluded
26.5	Thermal tests	Excluded
26.6	Torque test for bushings	Excluded
26.7	Non-metallic enclosures or non-metallic parts of enclosures	Excluded
26.8	Thermal endurance to heat	Excluded
26.9	Thermal endurance to cold	Excluded
26.10	Resistance to light	Applies
26.11	Resistance to chemical agents for Group I electrical equipment	Excluded
26.12	Earth continuity	Excluded
26.13	Surface resistance test of parts of enclosures of non-metallic materials	Excluded
26.14	Measurement of capacitance	Excluded
26.15	Verification of ratings of ventilating fans	Excluded
26.16	Alternative qualification of elastomeric sealing O-rings	Excluded
27	Routine tests	Applies
28	Manufacturers responsibility	Applies
29.1	Applicability	Applies
29.2	Location	Modified
29.3	General	Modified
29.4	Ex marking for explosive gas atmospheres	Modified
29.5	Ex marking for explosive dust atmospheres	Applies
29.6	Combined types of protection	Applies
29.7	Multiple types of protection	Excluded
29.8	Ga using two independent Gb types of protection	Excluded
29.9	Ex components	Excluded
29.10	Small equipment and small Ex components	Excluded
29.11	Extremely small equipment and extremely small Ex components	Modified
29.12	Warning markings	Applies
29.13	Alternate marking of equipment protection levels (EPLs)	Excluded

Clause of IEC 60079-0		IEC 60079-0 application to IEC 60079-13
Ed. 6.0 (2011) (Informative)	Clause / subclause title (Normative)	
29.14	Cells and batteries	Applies
30	Instructions	Modified
Annex A	Supplementary requirements for Ex cable glands	Excluded
Annex B	Requirements for Ex components	Excluded
Annex C	Example of rig for resistance to impact test	Excluded
Annex D	Introduction to an alternative risk assessment method encompassing "equipment protection levels" for Ex equipment	Applies
Applies: ~~This~~ this Clause/Subclause requirement of IEC 60079-0 is applied without change. Excluded: ~~This~~ this Clause/Subclause requirement of IEC 60079-0 does not apply. Modified: ~~this~~ This Clause/Subclause requirement of IEC 60079-0 is modified as detailed in this document. NOTE The applicable requirements of IEC 60079-0 are identified by the clause title which is normative. This table was written against the specific requirements of IEC 60079-0, Ed 6.0.		

2 Normative references

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

IEC 60050-426, *International Electrotechnical Vocabulary – Part 426: Equipment for explosive atmospheres*

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

[IEC 60079-2, Explosive atmospheres – Part 2: Equipment protection by pressurized enclosure "p"](#)

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

IEC 60079-29 (all parts), *Explosive atmospheres – Gas detectors*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-426, IEC 60079-0 and the following apply.

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

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

NOTE Unless otherwise specified, the terms "voltage" and "current" mean the RMS values of an alternating, direct or composite voltage or current.

3.1**airlock**

means of egress, consisting of two interdependent doors designed to maintain the internal pressure of the room in order to prevent or significantly reduce the entry of a surrounding explosive atmosphere

3.2**alarm**

piece of apparatus that generates a visual or audible signal that is intended to attract attention

[SOURCE: IEC 60050-426:2008, 426-09-05]

3.3**clean air**

air that is essentially free of combustible dust, and contains no more than trace amounts of flammable vapour or gas

3.4**dilution**

mixing of flammable vapour or gas with air which, over time, will reduce the flammable concentration

Note 1 to entry: For safety reasons, dilution to a level lower than the lower ~~explosive-flammable~~ limit (L~~FEL~~) ~~can~~ might be required ~~where if associated with~~ the potential release ~~has there is~~ an additional toxic or asphyxiant ~~risk hazard~~. Further guidance can be found in IEC 61285.

[SOURCE: IEC 60079-10-1:20152020, 3.5.2, modified – The note to entry has been added.]

3.5**internal source of release**

~~point or location indoors from which a gas, vapour, mist or liquid may be released into the atmosphere such that an explosive gas atmosphere could be formed~~ source of release

point or location from which a flammable gas, vapour, mist or liquid may be released into the atmosphere in such a way that an explosive gas atmosphere could be formed

Note 1 to entry: IEC 60079-10-1, Explosive atmospheres - Part 10-1: Classification of areas - Explosive gas atmospheres, gives a classification of sources of release.

[SOURCE: IEC 60050-426:2020, 426-03-06]

3.6**limiting ~~value~~ LFL**

lowest concentration value of the lower flammable limit (LFL) ~~of considering~~ each ~~component~~ source of release involved, ~~taking account of the most onerous conditions of concentration that may occur from every internal source of release within the room~~

3.7**lower flammable limit****LFL**

volume fraction of flammable gas or vapour in air below which an explosive gas atmosphere will not form, expressed as a percentage

Note 1 to entry: Although the lower explosive limit (LEL) is often used in place of the lower flammable limit (LFL), it should be recognized that the LFL is often slightly lower than the LEL.

Note 2 to entry: See ISO/IEC 860079-20-1.

[SOURCE: IEC 60079-2:2014, 3.24, modified – In the definition, the parentheses have been moved to a second note to entry, and the existing note has been replaced by a new one.]

3.8**opening**

inlet, outlet, door or non-airtight fixed panel

3.9**pressurization “p”**

technique of guarding against the ingress of the external atmosphere into a room by maintaining clean air therein at a pressure above that of the external atmosphere

3.10**pressurization system**

complete installation required to produce pressurisation

NOTE 1 to entry: The pressurization system could include the grouping of safety devices and other components used to pressurize and monitor or control a pressurized room.

3.11

~~restricted access door~~

~~door with controlled or limited use or alarmed when open~~

~~**3.12**~~~~**3.13 safety device**~~

~~item used to implement or maintain the integrity of the type of protection~~

3.12**safety device**

device intended for use inside or outside explosive atmospheres but required for or contributing to the safe functioning of Ex Equipment and protective systems with respect to the risks of explosion

[SOURCE: IEC 60050:2020, 426-04-42]

~~**3.143.13**~~**pressurized room**

room volume protected by pressurization and of sufficient size to permit the entry of a person who may occupy the room

~~**3.153.14**~~**artificially ventilated room**

room volume protected by artificial ventilation and of sufficient size to permit the entry of a person who may occupy the room

Note 1 to entry: The room volume can be an entire room (general) or part of a room (local ventilation).

~~**3.163.15**~~**purging**

operation of passing a quantity of clean air through the room and ducts in a pressurized or artificially ventilated room, so that the concentration of the explosive gas atmosphere is brought to a safe level

~~**3.173.16**~~**room volume**

<of the pressurized or artificially ventilated room> volume of the empty room and including any associated ducting without internal equipment

~~**3.183.17**~~**pressurization “pb”**

pressurized room that provides an equipment protection level Gb or Db

3.193.18**pressurization "pc"**

pressurized room that provides an equipment protection level Gc or Dc

3.203.19**artificial ventilation "vc"**

artificial ventilation of a room with or without an internal source of release, such that the room provides an equipment protection level Gc

3.213.20**artificial ventilation "v"**

technique of guarding against an explosive atmosphere by the use of mechanical means to provide for the movement of air

Note 1 to entry: IEC 60079-10-1 has additional guidance on the principles of artificial ventilation.

3.223.21**ventilation system**

complete installation required to produce artificial ventilation

NOTE 1 to entry: The ventilation system could include the safety devices and other components used to ventilate and monitor or control a ventilated room.

3.22**4 Requirements for all rooms****4.1 General**

Protection by pressurization and protection by artificial ventilation are separately described but may be combined to protect against hazards where required. Where both techniques are combined, then requirements for both shall apply. Unless otherwise identified in Clauses 6 or 7, the requirements in 4.2 to 4.10 apply to both protection techniques.

NOTE 1 Annex C provides examples of applications and associated guidelines.

NOTE 2 IEC 60079-14 has the requirements for the selection and installation of electrical equipment for the different EPLs.

4.2 Type and level of protection**4.2.1 Pressurization "p"**

Rooms with pressurization "p" and located in a hazardous area shall be one of the following:

a) Level of protection "pb" (EPL Gb or Db). The pressurized room maintains an internal overpressure reducing the risk of ingress of an explosive atmosphere and is suitable for use in an area requiring EPL Gb or Db, permitting unprotected equipment to be installed within the pressurized room except for pressurization safety devices (see 6.3.1).

~~f) Level of protection "pby" (EPL Gb or Db). The pressurized room maintains an internal overpressure reducing the risk of the ingress of an explosive atmosphere and is suitable for use in an area requiring EPL Gb or Db, permitting equipment to with EPL Gc or Dc as applicable to be installed within the pressurized room except for pressurization safety devices (see 6.3.1).~~

b) Level of protection "pc" (EPL Gc or Dc). The pressurized room maintains an internal overpressure reducing the risk of the ingress of an explosive atmosphere and is suitable for use in an area requiring EPL Gc or Dc, permitting unprotected equipment to be installed within the pressurized room except for pressurization safety devices (see 6.3.1).

NOTE A level of protection in an area requiring EPL Gb or Db, permitting EPL Gc or Dc in the room is not presented in this standard as it is considered not practical in the context of rooms and the equipment that might be required.

4.2.2 Artificial ventilation "v"

The artificial ventilated room maintains artificial ventilation to either:

- a) dilute a release of flammable substance within the room, or, when the room is located in a non-hazardous area or a zone 2 area to permit equipment with a lower EPL. The allowable ranges are from Gb to non-hazardous, or Gb to Gc, or Gc to non-hazardous, or
- b) dilute an ingress of flammable substance from outside the room, room when the room is located in a hazardous area to permit equipment with a lower EPL from Gc to non-hazardous. Rooms with artificial ventilation "v" and located in a hazardous area shall be limited to a zone 2 hazardous area to provide a Level of Protection "vc" (EPL Gc), in which case the artificially ventilated room shall dilute any ingress of flammable substance and prevent any accumulation of flammable substance.

~~to reduce a hazardous area inside such that the required EPL inside the room is reduced from either Gb or Gc to non-hazardous or from Gb to Gc.~~

~~Rooms with artificial ventilation "v" and located in a hazardous area shall be either:~~

~~limited to Zone 2 hazardous areas to provide a Level of Protection "vc" (EPL Gc), in which case the artificially ventilated room shall dilute any ingress of flammable substance and prevent any accumulation of flammable substance. The ventilated room shall maintain artificial ventilation to dilute any release ingress of flammable substance to prevent any accumulation and avoid reduce a hazardous area such that unprotected equipment can be installed within the artificially ventilated room, and is suitable for use in an area requiring EPL Gc or ventilated to control an internal source of release and not provide a level of protection "vc".~~

NOTE 1 This permits equipment with a lower EPL to be installed within the artificially ventilated room except for ventilation safety devices (see 7.3.1).

Rooms may be protected by either general or local artificial ventilation. General artificial ventilation applies to an entire room or a significant portion of a room and local artificial ventilation applies to restricted regions, for example an extraction hood.

The resultant classification inside the room with artificial ventilation shall be assessed in accordance with IEC 60079-10-1, see 7.1.3.1.

NOTE 2 A hazardous area classification per according to IEC 60079-10-1 with artificial ventilation applied could still result in a dilution volume that is hazardous near the source of release, which would require the use of Ex Equipment within the dilution volume, for example, a high pressure gas release.

4.2.3 Combined protection techniques

Protection techniques or combination of protection techniques are indicated in Table 2 below. Table 2 identifies the minimum requirements to permit the use of unprotected equipment within the room. Combinations of the protection techniques are indicated in Table 2 below.

Table 2 – Types of protection for pressurisation and artificial ventilation of rooms

Scope Reference	Exterior Area Classification [See Note 1]	Minimum Interior EPL Without Protection [See Note 2]	Internal Source of Gas/Vapour Release	Minimum Level of Protection	Clean Air Source (see 5.2) [See Note 3]	Ventilation Test Options (see 7.5.7.3)
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1a)	Zone 1	Gb	No	"Ex pb"	Non-Hazardous or Zone 2	N/A
1a)	Zone 2	Gc	No	"Ex pc"	Non-Hazardous or Zone 2	N/A
1a)	Zone 21	Db	No	"Ex pb"	Non-Hazardous	N/A
1a)	Zone 22	Dc	No	"Ex pc"	Non-Hazardous	N/A
1b)	Zone 1	Gb	Yes	"Ex pb vc"	Non-Hazardous or Zone 2	Testing or modelling
1b)	Zone 2	Gc	Yes	"Ex pc vc"	Non-Hazardous or Zone 2	May use calculation or modelling
1b)	Zone 21	Db & Gb	Yes	"Ex pb vc"	Non-Hazardous	Testing or modelling
1b)	Zone 21	Db & Gc	Yes	"Ex pb vc"	Non-Hazardous	May use calculation or modelling
1b)	Zone 22	Dc & Gb	Yes	"Ex pc vc"	Non-Hazardous	Testing or modelling
1b)	Zone 22	Dc & Gc	Yes	"Ex pc vc"	Non-Hazardous	May use calculation or modelling
1c)	Zone 2	Gc	No	"Ex vc"	Non-Hazardous or Zone 2	May use calculation or modelling
1c)	Zone 2	Gb	Yes	"Ex vc"	Non-Hazardous or Zone 2	Testing or modelling
1d)	Non-Hazardous	Gb	Yes	"Ex vb"	Non-Hazardous	Testing or modelling
1d)	Non-Hazardous	Gc	Yes	"Ex vc"	Non-Hazardous	May use calculation or modelling
NOTE 1 The term "Exterior Area Classification" applies to the area classification in which the room is located, as to differentiate from the area classification inside the room.						
NOTE 2 Determination of the minimum EPL without a IEC 60079-13 Level of Protection is dependent upon the grade of the internal source of release. See IEC-60079-10-1.						
NOTE 3 The clean air source can only be from a Zone 2 or a non-hazardous area, as indicated. Clean air sources from Zone 0, 1, 20, 21 and 22 areas are not permitted, (see 5.2).						

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Room location	Internal Source of Release	Minimum EPL of equipment inside the room	Protective air source location	Protection Method(s) to be used	Classification Inside room—See note
Zone 1 (Gb)	Yes	None	Non-hazardous	pb+v	NH
		Gc	zone 2	pb+v	Zone 2
	No	None	Non-hazardous	pb	NH