



SLOVENSKI STANDARD

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Električne naprave za eksplozivne plinske atmosfere - 19. del: Popravilo in remont naprav, ki se uporabljajo v eksplozivnih atmosferah (razen v rudnikih ali pri eksplozivih)

Explosive atmospheres - Part 19: Equipment repair, overhaul and reclamation

iTeh STANDARD PREVIEW

Atmosphères explosives - Partie 19: Réparation, révision et remise en état du matériel
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29.260.20	Električni aparati za eksplozivna ozračja	Electrical apparatus for explosive atmospheres
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Matériel électrique pour atmosphères explosives gazeuses

Partie 19:

Réparation et révision du matériel utilisé en atmosphères explosives (autre que celui utilisé dans les mines ou pour la fabrication des explosifs)

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Electrical apparatus for explosive gas atmospheres

Part 19:

Repair and overhaul for apparatus used in explosive atmospheres (other than mines or explosives)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL APPARATUS FOR
EXPLOSIVE GAS ATMOSPHERESPart 19: Repair and overhaul for apparatus used
in explosive atmospheres (other than mines or explosives)

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

International Standard IEC 79-19 has been prepared by sub-committee 31J: Classification of hazardous areas and installation requirements, of IEC technical committee 31: Electrical apparatus for explosive atmospheres.

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

DIS	Report on Voting
31J(CO)7	31J(CO)9

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

IEC 79 consists of the following parts presented under the general title: Electrical apparatus for explosive gas atmospheres:

- General requirements (IEC 79-0 (1983)).
Amendment 1 (1987).
Amendment 2 (1991).
- Construction and verification test of flameproof enclosures of electrical apparatus (IEC 79-1 (1990)).
- Method of test for ascertainment of maximum experimental safe gap (IEC 79-1A (1975)).
- Electrical apparatus – type of protection "p" (IEC 79-2 (1983)).
- Spark-test apparatus for intrinsically-safe circuits (IEC 79-3 (1990)).
- Method of test for ignition temperature (IEC 79-4 (1975) and 79-4A (1970)).
- Sand-filled apparatus (IEC 79-5 (1967) with Supplement A (1969)).
- Oil-immersed apparatus (IEC 79-6 (1968)).
- Increased safety "e" (IEC 79-7 (1990)).
- Classification of hazardous areas (IEC 79-10 (1986)).
- Intrinsic safety "i" (IEC 79-11 (1991)).
- Classification of mixtures of gases or vapours with air according to their maximum experimental safe gaps and minimum igniting currents (IEC 79-12 (1978)).
- Construction and use of rooms or buildings protected by pressurization (IEC 79-13 (1982)).
- Electrical installations in explosive gas atmospheres (other than mines) (IEC 79-14 (1984)).
- Electrical apparatus with type of protection "n" (IEC 79-15 (1987)).
- Artificial ventilation for the protection of analyser(s) houses (IEC 79-16 (1990)).
- Recommendations for inspection and maintenance of electrical installations in hazardous areas (other than mines) (IEC 79-17 (1990)).
- Encapsulation "m" (IEC 79-18 (1992)).

Annex A forms an integral part of this standard.

INTRODUCTION

When an electrical apparatus is installed in areas where dangerous concentrations and quantities of flammable gases, vapours or mists may be present in the atmosphere, protective measures are to be applied to reduce the likelihood of explosion due to ignition by arcs, sparks or hot surfaces produced either in normal operation or under specified fault conditions.

This part of IEC 79 is supplementary to other relevant IEC standards, for example IEC 364 as regards installation requirements, and also refers to IEC 79 and its appropriate parts for the design requirements of suitable electrical apparatus.

Clause 2 of this part of IEC 79 contains general requirements for the repair and overhaul of an apparatus and should be read in conjunction with the other relevant clauses of this standard dealing with the detailed requirements for individual types of protection.

In cases where a protection apparatus incorporates more than one type of protection, reference should be made to all clauses involved.

This part not only gives guidance on the practical means of maintaining the electrical safety and performance requirements of repaired apparatus, but also defines procedures for maintaining, after repair, compliance of the apparatus with the provisions of the certificate of conformity or with the provisions of the appropriate explosion protection standard where a certificate is not available.

The nature of the explosion protection offered by each type of protection varies according to its unique features. Reference should be made to the appropriate standard(s) for details.

Users will utilize the most appropriate repair facilities for any particular item of equipment, whether they be the facilities of the manufacturer or a suitably competent and equipped repairer (see note 1).

This part recognizes the necessity of a required level of competence for the repair of the apparatus. Some manufacturers may recommend that the apparatus be repaired only by them.

In the case of the repair or overhaul of an apparatus which has been the subject of third-party certification, it may be necessary to clarify the position of the continued conformity of the apparatus with the certificate.

NOTES

- 1 Whilst some manufacturers recommend that certain equipment be returned to them for repair and some nominate repairers, there are also competent independent repair organizations who have the facilities to carry out this class of work.
- 2 Third-party certification is generally not a legal requirement, but may be in specific areas of application.

Assuming that repairs and overhauls are carried out using good engineering practices then:

- a) if manufacturers' specified parts or parts as specified in the certification documentation are used in a repair or overhaul, the apparatus is presumed to be in conformity with the certificate;
- b) if repairs or modifications are carried out on the apparatus specifically as detailed in the certification documents, the apparatus should still conform with the certificate;
- c) if repair or overhaul is carried out on the apparatus in accordance with this standard and other relevant standard(s), although not in compliance with a) and b) above, then it is unlikely that the apparatus will be unsafe although it may not conform fully with the certificate;
- d) if other repair or modification techniques are used, then it will be necessary to ascertain, from the manufacturers, and/or the certification authority, the suitability of the apparatus for continued use in a potentially explosive atmosphere.

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ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES

Part 19: Repair and overhaul for apparatus used in explosive atmospheres (other than mines or explosives)

1 Scope

This part of IEC 79:

- gives instructions, principally of a technical nature, on the repair, overhaul, reclamation and modification of a certified apparatus designed for use in explosive atmospheres (other than mining applications or explosive processing and manufacture);
- is not applicable to maintenance, other than when repair and overhaul cannot be disassociated from maintenance, neither does it give advice on cable entry systems which may require renewal when the apparatus is re-installed;
- assumes that good engineering practices are adopted throughout.

NOTE - Much of the content of this standard is concerned with the repair and overhaul of electrical rotating machines. This is not because they are the most important items of explosion-protected equipment but rather because they are often major items of repairable capital equipment in which, whatever type of protection is involved, sufficient commonality of construction exists as to make possible more detailed instructions for their repair, overhaul, reclamation or modification.

[SIST IEC 60079-19:1996](https://standards.iteh.ai/catalog/standards/sist/dbf43e75-e562-455c-8def-35b237ee0d63/sist-iec-60079-19-1996)

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2 General requirements [35b237ee0d63/sist-iec-60079-19-1996](https://standards.iteh.ai/catalog/standards/sist/dbf43e75-e562-455c-8def-35b237ee0d63/sist-iec-60079-19-1996)

This clause covers those aspects of repair, overhaul, reclamation and modification which are common to all explosion-protected apparatus. Subsequent clauses provide instructions for the additional requirements relevant to specific types of protection. When an apparatus incorporates more than one type of protection, reference shall be made to the appropriate clauses.

NOTE - Additional requirements for types of protection "o" and "q" have not been defined.

2.1 Normative references

The following normative documents contain provisions which, through reference in the text, constitute provisions of this part of IEC 79. At the time of publication, the editions were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 79 are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 34: *Rotating electrical machines*

IEC 79: *Electrical apparatus for explosive gas atmospheres*

IEC 79-0: 1983, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements.*

IEC 79-1: 1990, *Electrical apparatus for explosive gas atmospheres – Part 1: Construction and verification test of flameproof enclosures of electrical apparatus*

IEC 79-1A: 1975, *Electrical apparatus for explosive gas atmospheres – First supplement: Appendix D: Method of test for ascertainment of maximum experimental safe gap*

IEC 79-2: 1983, *Electrical apparatus for explosive gas atmospheres – Part 2: Electrical apparatus – type of protection "p"*

IEC 79-7: 1990, *Electrical apparatus for explosive gas atmospheres – Part 7: Increased safety "e"*

IEC 79-11: 1991, *Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety "i"*

IEC 79-14: 1984, *Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in explosive gas atmospheres (other than mines)*

IEC 79-15: 1987, *Electrical apparatus for explosive gas atmospheres – Part 15: Electrical apparatus with type of protection "n"*

IEC 85: 1984, *Thermal evaluation and classification of electrical insulation*

IEC 364: 1989, *Electrical installations of buildings*

IEC 529: 1989, *Degrees of protection provided by enclosures (IP Code)*

ISO 4526: 1984, *Metallic coatings – Electroplated coatings of nickel for engineering purposes*

ISO 6158: 1984, *Metallic coatings – Electroplated coatings of chromium for engineering purposes*

ISO 9000: 1987, *Quality management and quality assurance standards – Guidance for selection and use*

2.2 Definitions and terms

For the purpose of this part of IEC 79, the following definitions apply.

2.2.1 serviceable condition: Condition which permits a replacement or reclaimed component part to be used without prejudice to the performance or explosion protection aspects of the apparatus, with due regard to the certification requirements as applicable, in which such a component part is used.

2.2.2 repair: Action to restore a faulty apparatus to its fully serviceable condition and in compliance with the relevant standard.

NOTE - The relevant standard means the standard to which the apparatus was originally designed.

2.2.3 overhaul: Action to restore to a fully serviceable condition an apparatus which has been in use or in storage for a period of time but which is not faulty.

2.2.4 maintenance: Routine actions taken to preserve the fully serviceable condition of the installed apparatus.

2.2.5 component part: An indivisible item.

NOTE - The assembly of such items may form an apparatus.

2.2.6 reclamation: Means of repair involving, for example, the removal or addition of material to reclaim component parts which have sustained damage, in order to restore such parts to a serviceable condition in accordance with the relevant standard.

NOTE - The relevant standard means the standard to which the individual parts were originally manufactured.

2.2.7 modification: Change to the design of the apparatus which affects material, fit, form or function.

2.2.8 manufacturer: Maker of the apparatus (who may also be the supplier, the importer or the agent) in whose name usually the certification where appropriate of the apparatus was originally registered.

2.2.9 user: User of the apparatus.

2.2.10 repairer: Repairer of the apparatus who may be the manufacturer, the user or a third party (repair agency). (standards.iteh.ai)

2.2.11 certification: Certification leading to the issue of a certificate of conformity which refers primarily to assessments of apparatus carried out by a recognized testing authority.

This standard may also apply to apparatus certified by other certification authorities, or to apparatus which has been self-certified by manufacturers or users as complying with recognized standards.

2.2.12 certificate references: A certificate reference number may refer to a single design or a range of apparatus of similar design.

The suffix "X" when added to the certificate number indicates special conditions of use and that the certification documents need to be studied before such apparatus is installed, repaired, overhauled, reclaimed or modified.

NOTE - See 25.2 (9) of IEC 79-0.

2.2.13 copy winding: Process by which a winding is totally or partially replaced by another, the characteristics and properties of which are at least as good as those of the original.

2.2.14 type of protection "d": Type of protection in which parts which can ignite an explosive atmosphere are placed in an enclosure which can withstand the pressure developed during an explosion of an explosive mixture and which prevents the transmission of the explosion to the explosive atmosphere surrounding the enclosure.

2.2.15 type of protection "I": Circuit in which no spark or any thermal effect produced in the test conditions prescribed in the relevant standard(s) (which include normal operation and specific fault condition) is capable of causing ignition of a given explosive atmosphere.

2.2.16 type of protection "p": Type of protection by which the entry of a surrounding atmosphere into the enclosure of the electrical apparatus is prevented by maintaining, inside the said enclosure, a protective gas at a higher pressure than that of the surrounding atmosphere. The overpressure is maintained either with or without a continuous flow of the protective gas.

2.2.17 type of protection "e": Type of protection by which measures are applied so as to prevent, with a higher degree of security, the possibility of excessive temperatures and the occurrence of arcs or sparks in the interior and on the external parts of the electrical apparatus which would not produce them in normal service.

2.2.18 type of protection "n": Type of protection applied to the electrical apparatus such that, in normal operation, it is not capable of igniting the surrounding explosive atmosphere and that a fault capable of causing ignition is not likely to occur.

2.3 Statutory requirements

2.3.1 General

The repairer should be aware of certain specific requirements in the relevant national legislation which may govern the repair and overhaul operation.

2.3.2 The manufacturer

Even though there may be no legal requirement, it is recommended that the manufacturer should take such steps as are necessary to ensure that there will be available in connection with the use of the apparatus adequate information (see note) concerning:

- the use for which it is designed and has been tested;
- any conditions necessary to ensure that, when put to use, it will be safe and without risks to health.

NOTE - It is not reasonably practicable to assume that adequate information is, or can be so widely circulated that it is always available where and when it is needed. Sources of adequate information are users, manufacturers or certifying authorities.

2.3.3 The user

The user should ascertain that the repair organization concerned meets the relevant stipulations of the standards which particularly refer to quality control and quality assurance, requirements for the workshop equipment and the knowledge of the persons directly involved in the repair and/or overhaul.

The apparatus user should be aware of any relevant legislation should he wish to undertake the repair or overhaul of equipment himself. In addition, he should be aware of any changes in responsibility for health and safety should refurbishment and/or re-installation be carried out by a third party.

2.3.4 *The repairer*

The repair organization must have adequate repair and overhaul facilities as well as the appropriate equipment necessary to carry out the required checks and tests, taking into account the specific type of protection.

The apparatus repairer should be aware of any relevant legislation concerning health and safety especially where he is involved in the re-installation of the apparatus.

2.4 *Instructions for the manufacturer*

2.4.1 *Documents*

2.4.1.1 *General*

In addition to the certificate, other documents, e.g. the appropriate drawings, specifications, etc., suitable for the repair and/or overhaul should be available.

2.4.1.2 *Repair and overhaul data*

The data available for the repair and/or overhaul should generally include, but need not be limited to details of the:

- technical specification;
- performance and conditions of use;
- dismantling and assembly instructions;
- certification limitations, where specified;
- marking (including certification marking);
- recommended methods of repair/overhaul for the apparatus.

The information may be subject to amendments including those relative to certification.

2.4.1.3 *Spare parts*

A list of spare parts shall be included with the repair and/or overhaul data which shall identify those parts that particularly affect the means by which the apparatus complies with the appropriate standard or certificate.

2.5 *Instructions for the user*

2.5.1 *Certificates and documents*

The certificate and other related documents should be obtained as part of the original purchase contract.

2.5.2 *Records and work instructions*

Records of any previous repairs, overhauls or modifications should be kept by the user and made available to the repairer.

NOTE - It will be in the interests of the user that the repairer is notified, whenever possible, of the fault and/or nature of the work to be done.