

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Explosive atmospheres –
Part 19: Equipment repair, overhaul and reclamation**

**Atmosphères explosives –
Partie 19: Réparation, révision et remise en état de l'appareil**



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.260.20

ISBN 978-2-8322-7527-6

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CONTENTS

FOREWORD.....	8
INTRODUCTION.....	13
1 Scope.....	14
2 Normative references	14
3 Terms and definitions	15
4 General	20
4.1 General principles.....	20
4.2 Instructions for the user	20
4.2.1 Ex Equipment Certificates and schedule drawings	20
4.2.2 Records and work instructions	21
4.2.3 Re-installation of repaired equipment.....	21
4.2.4 Service facilities	21
4.3 Instructions for the service facility	21
4.3.1 Statutory requirements	21
4.3.2 Repair and overhaul	21
4.3.3 Reclamations.....	26
4.3.4 Alterations and modifications	29
4.3.5 Temporary repairs	30
4.3.6 Electric machines	30
4.3.7 Control equipment.....	32
5 Additional requirements for the repair and overhaul of equipment with Type of Protection "d"	32
5.1 Application.....	32
5.2 Repair and overhaul.....	33
5.2.1 Enclosures	33
5.2.2 Water jackets.....	34
5.2.3 Entries into enclosure.....	34
5.2.4 Terminations.....	34
5.2.5 Insulation.....	34
5.2.6 Internal connections	34
5.2.7 Electric machines	34
5.2.8 Auxiliary equipment	35
5.3 Renovation.....	36
5.3.1 General	36
5.3.2 Enclosures	36
5.3.3 Sleeving	38
5.3.4 Shafts and housings	38
5.3.5 Sleeve bearings.....	38
5.3.6 Rotors and stators	38
5.4 Alterations and modifications	38
5.4.1 Enclosures	38
5.4.2 Entries into enclosures	38
5.4.3 Terminations.....	39
5.4.4 Windings	39
5.4.5 Auxiliary equipment	39

6	Additional requirements for the repair and overhaul of equipment with Type of Protection "i"	39
6.1	Application	39
6.2	Repair and overhaul.....	40
6.2.1	Enclosures	40
6.2.2	Cable glands	40
6.2.3	Terminations.....	40
6.2.4	Soldered connections	40
6.2.5	Fuses	41
6.2.6	Relays	41
6.2.7	Shunt diode safety barriers and galvanic isolators	41
6.2.8	Printed circuit boards.....	41
6.2.9	Optocouplers and piezoelectric components	42
6.2.10	Electrical components.....	42
6.2.11	Batteries.....	42
6.2.12	Internal wiring.....	42
6.2.13	Transformers	43
6.2.14	Encapsulated components.....	43
6.2.15	Non-electrical parts	43
6.2.16	Testing	43
6.3	Reclamation.....	43
6.4	Modifications.....	43
7	Additional requirements for the repair and overhaul of equipment with Type of Protection "p"	43
7.1	Application	43
7.2	Repair and overhaul.....	44
7.2.1	Enclosures	44
7.2.2	Entries into enclosures	44
7.2.3	Terminations.....	44
7.2.4	Insulation.....	44
7.2.5	Internal connections	44
7.2.6	Electric machines	45
7.2.7	Auxiliary devices.....	46
7.2.8	Light transmitting parts	46
7.2.9	Encapsulated parts	46
7.2.10	Batteries.....	46
7.2.11	Lamps	46
7.2.12	Lampholders.....	46
7.2.13	Ballasts	46
7.3	Reclamation.....	46
7.3.1	General	46
7.3.2	Enclosures	46
7.3.3	Shafts and housings	47
7.3.4	Sleeve bearings.....	47
7.3.5	Rotors and stators	47
7.4	Alterations and modifications	47
7.4.1	Enclosures	47
7.4.2	Entries into enclosures	47
7.4.3	Terminations.....	47

7.4.4	Windings	48
7.4.5	Auxiliary equipment	48
7.5	Pressurization system	48
8	Additional requirements for the repair and overhaul of equipment with Type of Protection "e"	48
8.1	Application	48
8.2	Repair and overhaul	49
8.2.1	Enclosures	49
8.2.2	Entries into enclosures	49
8.2.3	Terminations	49
8.2.4	Insulation	49
8.2.5	Internal connections	49
8.2.6	Electric machines	50
8.2.7	Light-transmitting parts	52
8.2.8	Encapsulated parts	52
8.2.9	Batteries	53
8.2.10	Lamps	53
8.2.11	Lampholders	53
8.2.12	Ballasts	53
8.2.13	Breathing devices	53
8.3	Reclamation	53
8.3.1	General	53
8.3.2	Enclosures	53
8.3.3	Sleeve bearings	54
8.3.4	Rotors and stators	54
8.4	Alterations and modifications	54
8.4.1	Enclosures	54
8.4.2	Entries into enclosures	54
8.4.3	Terminations	54
8.4.4	Windings	54
8.4.5	Auxiliary equipment	55
9	Additional requirements for the repair and overhaul of equipment with Type of Protection "n"	55
9.1	Application	55
9.2	Repair and overhaul	55
9.2.1	Enclosures	55
9.2.2	Entries into enclosures	55
9.2.3	Terminations	56
9.2.4	Insulation	56
9.2.5	Internal connections	56
9.2.6	Electric machines	56
9.2.7	Light-transmitting parts	58
9.2.8	Encapsulated parts	58
9.2.9	Batteries	59
9.2.10	Lamps	59
9.2.11	Lampholders	59
9.2.12	Ballasts	59
9.2.13	Enclosed break devices	59
9.2.14	Breathing devices	59

9.3	Reclamation.....	59
9.3.1	General	59
9.3.2	Enclosures	59
9.3.3	Joints	59
9.3.4	Shafts and housings	60
9.3.5	Sleeve bearings.....	60
9.3.6	Rotors and stators	60
9.4	Alterations and modifications	60
9.4.1	Enclosures	60
9.4.2	Entries into enclosures	60
9.4.3	Terminations.....	60
9.4.4	Windings	60
9.4.5	Auxiliary equipment	61
10	Additional requirements for the repair and overhaul of equipment covered by IEC 60079-26	61
11	Additional requirements for the repair and overhaul of equipment with Type of Protection “t” (formerly “tD” or DIP).....	61
11.1	Application	61
11.2	Repair and overhaul.....	61
11.2.1	Enclosures	61
11.2.2	Entries into enclosures	62
11.2.3	Terminations.....	62
11.2.4	Insulation.....	62
11.2.5	Internal connections	62
11.2.6	Electric machines	62
11.2.7	Light-transmitting parts	63
11.2.8	Batteries.....	63
11.2.9	Lamps	63
11.2.10	Lamp holders.....	64
11.2.11	Ballasts	64
11.2.12	Breathing devices	64
11.3	Reclamation.....	64
11.3.1	General	64
11.3.2	Enclosures	64
11.3.3	Joints	64
11.3.4	Shafts and housings	64
11.3.5	Sleeve bearings.....	65
11.3.6	Rotors and stators	65
11.4	Alterations and modifications	65
11.4.1	Enclosures	65
11.4.2	Entries into enclosures	65
11.4.3	Windings	65
11.4.4	Auxiliary equipment	65
12	Requirements for the repair and overhaul of equipment with Type of Protection “o”.....	65
12.1	Application.....	65
12.2	Repair and overhaul.....	66
12.2.1	Associated Types of Protection.....	66
12.2.2	Removal of protective liquid.....	66

12.2.3	Replacement of components.....	66
12.2.4	Preparation for replacing protective liquid.....	66
12.2.5	Protective liquid.....	66
12.2.6	Closure of container.....	66
12.3	Reclamation.....	66
12.4	Modifications.....	67
13	Requirements for the repair and overhaul of equipment with Type of Protection “q”.....	67
13.1	Application.....	67
13.2	Repair and overhaul.....	67
13.2.1	Associated Types of Protection.....	67
13.2.2	Removal of protective materials.....	67
13.2.3	Replacement of components.....	67
13.2.4	Preparation for replacing protective materials.....	67
13.2.5	Protective materials.....	67
13.2.6	Closure of container.....	67
13.3	Reclamation.....	68
13.4	Modifications.....	68
14	Requirements for the repair and overhaul of equipment with Type of Protection “s”.....	68
15	Electrical resistance trace heating.....	68
Annex A	(normative) Identification of repaired equipment by marking.....	69
A.1	Marking information.....	69
A.2	Symbols.....	69
A.2.1	Repair in accordance with schedule drawings or manufacturer's specification.....	69
A.2.2	Repair in accordance with the Type of Protection standards but not the schedule drawings.....	69
A.2.3	Other situations.....	70
Annex B	(normative) Knowledge, skills and competence of responsible persons and operatives.....	71
B.1	General.....	71
B.2	Knowledge and skills.....	71
B.2.1	Responsible persons.....	71
B.2.2	Operatives.....	71
B.3	Competence.....	71
B.3.1	General.....	71
B.3.2	Responsible persons.....	72
B.3.3	Operatives.....	72
B.4	Assessment.....	72
B.5	Qualification of reclamation operatives.....	72
Annex C	(normative) Requirements for measurements in flameproof equipment during overhaul, repair and reclamation (including guidance on tolerances).....	73
Annex D	(informative) Evaluation of best practice during rewinding and repair.....	76
Annex E	(informative) Additional requirements relating to Ex control equipment.....	77
E.1	General.....	77
E.2	Common items.....	77
E.3	Isolators and circuit interrupters.....	77
E.4	Interlocks and mechanical linkages.....	78
E.5	Earth fault devices.....	78
E.6	Other devices.....	78

E.7 Transformers 78

Bibliography..... 80

Figure A.1 – Repair in accordance with IEC 60079-19 and schedule drawings or manufacturer's specification..... 69

Figure A.2 – Repair in accordance with the Type of Protection standards but with insufficient evidence of full compliance with the schedule drawings 70

Figure C.1 – Determination of maximum gap of reclaimed parts..... 75

Table C.1 – Determination of maximum gap of reclaimed parts 73

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –**Part 19: Equipment repair, overhaul and reclamation**

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International Standard IEC 60079-19 has been prepared by subcommittee 31J: Classification of hazardous areas and installation requirements, of IEC technical committee 31: Equipment for explosive atmospheres.

This fourth edition cancels and replaces the third edition published in 2010 together with Amendment 1:2015. This edition constitutes a technical revision.

The significance of the changes between IEC 60079-19, Edition 3 (2010), including Amendment 1 (2015), and IEC 60079-19, Edition 4 (2019) are as listed below:

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Relationship between IEC 60034-23 and IEC 60079-19	Introduction	X		
Document applicable to Type(s) of Protection "o" and "q"	1		X	
Standard for electrical resistance trace heating added	2		X	
Terms "repair facility" and "service facility" are considered equivalent. Changed "repair facility" to "service facility"	3 to 15	X		
Terms and definitions aligned alphabetically	3	X		
Clarification of definition "certificate"	3.2	X		
Addition of definition "Component Certificate"	3.2.1		X	
Addition of definition "Ex Equipment Certificate"	3.2.2		X	
Addition of definition "schedule drawing"	3.2.3		X	
Change in terms used from "certificate documents" to "schedule drawing"	4 Annex E	X		
Change in terms used from "certificate documents" to "Ex Equipment Certificates" and "schedule drawings"	4.2.1	X		
Change in terms used from "motor", "rotating machine", "rotating electrical machine" to "electric machine"	All	X		
Addition of specific operating requirements	4.3.2.1		X	
Clarification of requirements for repair of components	4.3.2.3		X	
Addition of a requirement to review "X" conditions	4.3.2.4.2		X	
Change in terms from "bolt" to "fastener"	4.3.2.5.2	X		
Addition of bullet point for marking of repairs to certification documentation	4.3.2.6 a)		X	
Addition of bullet point for fitness for purpose assessment to IEC 60079-17	4.3.2.6 e)		X	
Additional actions to be taken in case of uncertainty of a reclamation	4.3.3.1		X	
Change of "subject to repair" to "repairable"	4.3.3.2	X		
Elimination of duplication of requirements	4.3.3.3.1	X		
Addition of bullet point including other welding techniques to ISO 4063	4.3.3.4.5		X	
Addition of requirement for threaded hole verification using GO, NO-GO gauges and threaded hole reclamation test	4.3.3.4.7		X	
The role of a service facility clarified to exclude the role of a manufacturer when making alterations	4.3.4.1		X	
Addition of requirement that the Ex report following equipment modification shall not have an attestation of compliance	4.3.4.2		X	
Clarification of repairer's duty to confirm service condition following any reclamation	4.3.6.2	X		
Restructuring of requirements relating to testing of electric machines as subclauses of 4.3.6 from Type of Protection clauses 5, 7, 8, 9, 10 and 11 in previous editions.	4.3.6.3.1 and 4.3.6.3.2	X		
Addition of a requirement for greases with non-evaporating solvents for joint corrosion protection materials	5.2.1.1		X	
Revised a recommendation to a requirement "should" to "shall"	5.2.4		X	
Revised a recommendation to a requirement. "is necessary" to "shall be taken"	5.2.7.2		X	
Text amended to make requirement clearer	5.2.8.1	X		

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Addition of requirement for threaded hole verification using GO, NO-GO gauge and threaded hole reclamation tests	5.3.2.3		X	
Addition of requirements for Type of Protection “i” requiring repair to manufacturer’s documentation and certificate requirements only Repair of multilayer boards or any board with surface mounted devices are excluded	6.1			C1
Addition of “thermal property” requirement for terminations	6.2.3		X	
Change in text of requirements for soldered connections	6.2.4	X		
Revised a recommendation to a requirement for fuses, “inappropriate” to “not permitted”	6.2.5		X	
Addition of requirement for printed circuit board repair	6.2.8		X	
Change in text of requirement for electrical components replacing “certification” by “assessment by a suitable competent person”	6.2.10	X		
Elimination of duplication of text	6.2.11	X		
Change in text for internal wiring replacing “certification” by “assessment by a suitable competent person”	6.2.12	X		
Addition of Type(s) of Protection marks with Explosion Protection Levels	7		X	
Addition of new subclause detailing requirements for verification of pressurization system	7.5		X	
Addition of “Level of Protection” to clarify “eb”	8	X		
Change in requirements for copy winding as introduced in IEC 60079-19:2010/AMD 1:2015	8.2.6.1.2		X	
Elimination of duplication of note and text and correction of bullet point letters	8.2.6.1.2			
Change in text to clarify the requirements for windings with voltage > 1 000 V	8.2.6.1.3	X		
Change in text to clarify the requirements relating to “light transmitting parts”	8.2.7	X		
Addition of Type of Protection “e” with Level of Protection “ec”	9	X	X	
Change in text to clarify the requirements for windings with voltage > 1 000 V	9.2.6.1.4	X		
Text moved from body of text in 9.2.6.1.3 to a new subclause to clarify that copy winding requirements apply to all voltages	9.2.6.1.5		X	
Addition of requirement from IEC 60079-19:2010/AMD 1:2015 that core losses after stripping shall not exceed 110 % of core losses before stripping	9.2.6.1.5 j) – s)		X	
Elimination of duplication of requirement in 4.3.6.2.1	9.2.6.1.5 t)	X		
Addition of Type of Protection standard numbers	11.1	X		
Addition of new Level of Protection marks “pxb”, “pyb” and “pzc”	7.1	X		
Addition of new clause with requirements for Type of Protection “o”	12		X	
Addition of new clause with requirements for Type of Protection “q”	13		X	
Addition of new clause with requirements for Type of Protection “s”	14		X	

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Addition of new clause with requirements for electric resistance trace heating"	15		X	
Addition of new Figure 1 description to clarify the intent of R in a square	A.2.1	X		
Addition of new Figure 2 description to clarify the intent of R in an inverted triangle	A.2.2	X		

NOTE 1 The technical changes referred to include the significance of technical changes in the revised IEC standard, but they do not form an exhaustive list of all modifications from the previous version. More guidance can be found by referring to the Redline version of the standard.

Explanations:

A) Definitions

Minor and editorial changes

- clarification
- decrease of technical requirements
- minor technical change
- editorial corrections

These are changes which modify requirements in an editorial or a minor technical way. They include changes of the wording to clarify technical requirements without any technical change, or a reduction in level of existing requirement.

Extension

- addition of technical options

These are changes which add new or modify existing technical requirements, in a way that new options are given, but without increasing requirements from the previous standard.

Major technical changes

- addition of technical requirements
- increase of technical requirements

These are changes to technical requirements (addition, increase of the level or removal) made in a way that an overhaul or repair of product to the preceding edition will not always be able to fulfil the requirements given in the later edition. For these changes additional information is provided in clause B) below.

NOTE These changes represent current technological knowledge. However, these changes do not normally have an influence on equipment already placed on the market.

B) Information about the background of 'major technical changes'

- C1 Due to the detailed nature of Type of Protection "i", repair to other than manufacturers schedule drawings risks violation of the Type of Protection. Some components such as multi-layer boards are not suitable for repair.

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

FDIS	Report on voting
31J/295/FDIS	31J/297/RVD

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

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

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 document will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

INTRODUCTION

When equipment is installed in areas where dangerous concentrations and quantities of flammable gases, vapours or dusts may be present in the atmosphere, protective measures are 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 60079 is supplementary to other relevant IEC standards, for example the IEC 60034 series, in particular IEC 60034-23, and also refers to the IEC 60079 series and its appropriate parts for the design requirements of suitable electrical equipment.

The nature of the explosion protection offered by each Type of Protection varies according to its unique features.

This document gives guidance on the practical means of maintaining the explosion protection of repaired equipment. This document also defines procedures for repair, overhaul or reclamation and verification of continued compliance of the equipment with the provisions of the Ex Equipment Certificate or with the provisions of the appropriate explosion protection standard where an Ex Equipment Certificate is not available.

It is intended that the users utilize the most appropriate service facilities for any particular item of equipment, whether they be the facilities of the manufacturer or a suitably competent and equipped repairer.

This document recognizes the necessity of a required level of competence for the repair, overhaul and reclamation of the equipment. Some manufacturers may recommend that the equipment be repaired only by them.

Much of the content of this document is concerned with the repair and overhaul of electric machines. This is because they are items of repairable Ex equipment in which, irrespective of the Type of Protection involved, sufficient commonality of construction exists as to make possible more detailed instructions for their repair, overhaul, reclamation or modification.

EXPLOSIVE ATMOSPHERES –

Part 19: Equipment repair, overhaul and reclamation

1 Scope

This part of IEC 60079:

- gives instructions, principally of a technical nature, on the repair, overhaul, reclamation and modification of Ex equipment designed for use in explosive atmospheres;
- applies to overhaul and repair which mitigates deficiencies identified during operation, inspection and maintenance;
- does not give advice on cable and wiring systems which can require a renewal when the equipment is re-installed; and
- is not applicable to Type of Protection “m”.

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 60034-23: Rotating electrical machines - Part 23: Repair, overhaul and reclamation

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

IEC 60079-1, *Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures “d”*

IEC 60079-2, *Explosive atmospheres – Part 2: Equipment protection by pressurized enclosure “p”*

IEC 60079-6, *Explosive atmospheres – Part 6 Equipment protection by liquid immersion “o”*

IEC 60079-7, *Explosive atmospheres – Part 7: Equipment protection by increased safety “e”*

IEC 60079-11:2011, *Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”*

IEC 60079-14, *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*

IEC 60079-15, *Explosive atmospheres – Part 15: Equipment protection by type of protection “n”*

IEC 60079-26, *Explosive atmospheres – Part 26: Equipment with equipment protection level (EPL) Ga*

IEC/IEEE 60079-30-1, *Explosive atmospheres – Part 30-1: Electrical resistance trace heating – General and testing requirements*