
**Refrigerating systems and heat
pumps — Safety and environmental
requirements —**

**Part 4:
Operation, maintenance, repair and
recovery**

*Systèmes frigorifiques et pompes à chaleur — Exigences de sécurité et
d'environnement —*

Partie 4: Fonctionnement, maintenance, réparation et récupération



This document is a preview generated by ELS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 General requirements	2
4.1 Operation instructions.....	2
4.2 Instruction of operating personnel.....	2
4.3 Documentation.....	2
5 Maintenance and repair	2
5.1 General.....	2
5.2 Maintenance.....	3
5.3 Repair.....	4
5.4 Change of refrigerant type.....	5
5.4.1 General.....	5
5.4.2 Planning the change of refrigerant type.....	5
5.4.3 Execution of the change of refrigerant type.....	5
6 Requirements for recovery, reuse and disposal	6
6.1 General requirements.....	6
6.1.1 Disposal.....	6
6.1.2 Personnel.....	6
6.1.3 Parts of refrigerating systems.....	6
6.1.4 Refrigerants.....	6
6.1.5 Handling.....	7
6.2 Requirements for recovery and reuse of refrigerant.....	7
6.2.1 General.....	7
6.2.2 Tests for reuse of refrigerants.....	8
6.2.3 Recovery for reuse.....	9
6.2.4 Recovery for recycling.....	9
6.2.5 Reclaim.....	9
6.3 Requirements for disposal.....	10
6.3.1 Refrigerant intended for further processing.....	10
6.3.2 Refrigerant not intended for further processing.....	10
6.3.3 Absorbed R-717 (ammonia).....	10
6.3.4 Refrigerating machine oil.....	10
6.3.5 Other components.....	10
6.4 Requirements for documentation.....	10
6.5 Requirements for refrigerant transfer, transport and storage.....	10
6.5.1 General.....	10
6.5.2 Refrigerant transfer.....	10
6.5.3 Transport.....	12
6.5.4 Storage.....	12
6.6 Requirements for recovery equipment.....	12
6.6.1 General.....	12
6.6.2 Operation in respect to the environment.....	12
6.6.3 Performance.....	13
6.6.4 Operation and maintenance.....	13
Annex A (normative) Draining the oil from a refrigerating system	14
Annex B (informative) Guide specification for recycled refrigerant	15
Annex C (informative) Handling and storage of refrigerants	16
Annex D (informative) In-service inspection	21

Annex E (informative) Guidelines for repairs of equipment using flammable refrigerants	24
Bibliography	27

This document is a preview generated by EVS

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 86, *Refrigeration and air-conditioning*, Subcommittee SC 1, *Safety and environmental requirements for refrigerating systems*.

This second edition cancels and replaces the first edition (ISO 5149-4:2014), which has been technically revised.

The main changes are as follows:

- revision of [Figure 2](#);
- addition of guidelines for repairs of equipment using flammable refrigerants in [Annex E](#).

A list of all parts in the ISO 5149 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Refrigerating systems and heat pumps — Safety and environmental requirements —

Part 4:

Operation, maintenance, repair and recovery

1 Scope

This document specifies requirements for safety and environmental aspects in relation to operation, maintenance and repair of refrigerating systems and the recovery, reuse and disposal of all types of refrigerant, refrigerant oil, heat transfer fluid, refrigerating system and part thereof.

This document does not cover "motor vehicle air conditioners" constructed according to the product standards such as ISO 13043.

These requirements are intended to minimize risks of injury to persons and damage to property and the environment resulting from improper handling of the refrigerants or from contaminants leading to system breakdown and resultant emission of the refrigerant.

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.

ISO 5149-1, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 1: Definitions, classification and selection criteria*

ISO 5149-2, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, construction, testing, marking and documentation*

ISO 5149-3, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 3: Installation site*

ISO 11650, *Performance of refrigerant recovery and/or recycling equipment*

IEC 60335-2-104, *Household and similar electrical appliances — Safety — Part 2-104: Particular requirements for appliances to recover and/or recycle refrigerant from air conditioning and refrigeration equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5149-1 apply.

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

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