



**International
Standard**

ISO 18483

**Performance rating of centrifugal
refrigerant compressor**

First edition

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Rating requirements	3
4.1 General requirements.....	3
4.2 Rating methods.....	4
4.3 Rating conditions.....	4
4.4 Power supply requirements.....	5
5 Published rating	5
5.1 Reference rating.....	5
5.2 Performance data.....	5
5.3 Application envelope.....	5
5.4 Published data.....	6
5.5 Tolerance.....	6
6 Marking provisions	8
Annex A (informative) Example for the performance data	9
Bibliography	10

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Foreword

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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 document 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).

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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 4, *Testing and rating of refrigerant compressors*.

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.

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Performance rating of centrifugal refrigerant compressor

1 Scope

This document specifies the rating requirements, published ratings and marking provisions of centrifugal refrigerant compressors. This document applies to centrifugal compressors and their performance in heating, ventilation and air-conditioning applications.

This document provides guidance and requirements for the industry, including manufacturers, engineers, installers and contractors. It defines the minimum amount of information in a standardized form to enable the evaluation and comparison of different compressors for use in an application and suggests a method to be used to guarantee the accuracy of that information.

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 18976, *Testing of refrigerant compressors*

IEC 60038, *IEC standard voltages*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/>

3.1

centrifugal refrigerant compressor

compressor relying on the impeller to increase the pressure and kinetic energy of the refrigerant vapour before a portion of the kinetic energy is converted into pressure in the diffuser

Note 1 to entry: In this document, the term compressor implies centrifugal refrigerant compressor.

3.2

refrigerating capacity

product of the refrigerant mass flow at the compressor inlet port and the difference between the specific refrigerant enthalpy at the compressor inlet port and the specific enthalpy of fluid entering the evaporator expansion device

3.3

economizer

heat exchanger or flash tank that is used to lower the liquid specific enthalpy of the refrigerant entering the evaporator while producing vapour that is reintroduced to the compression process

3.4

head factor

HF

ratio of isentropic enthalpy rise at each stage of the compressor to the square of suction sonic velocity

Note 1 to entry: This is a dimensionless parameter.

3.5

heating capacity

product of the refrigerant mass flow leaving the compressor discharge port and the difference of the specific refrigerant enthalpy at the discharge port and the outlet of the condenser or gas cooler

3.6

heating coefficient of performance

C_{OPh}

ratio of heating thermal capacity to the power input

Note 1 to entry: This is a dimensionless parameter.

3.7

application envelope

allowable operation range of the compressor based on the suction dew-point and discharge dew-point

3.8

overall compressor efficiency

η_{all}

ratio of the isentropic enthalpy rise multiplied by the mass flow to the power input of the compressor

Note 1 to entry: This is a dimensionless parameter.

3.9

power input

time rate of energy usage of the compressor plus any accessories required to sustain operation of the compressor at the rating condition

3.10

pressure ratio

π

ratio of the absolute discharge pressure to the absolute suction pressure of the compressor or compression stage

Note 1 to entry: This is a dimensionless parameter.

3.11

refrigerating coefficient of performance

C_{OPr}

ratio of refrigerating capacity to the power input

3.12

refrigerant flow factor

FF

ratio of suction volumetric flow of the compressor to the suction sonic velocity

Note 1 to entry: The flow coefficient excludes an impeller diameter squared term in the denominator to avoid exposing proprietary dimensional information, therefore the units of measure are area (expressed in m²).

Note 2 to entry: This is a dimensionless parameter.

3.13

stage

basic unit of centrifugal compressor, which is composed of an impeller and its matching fixed elements that works on the gas and realizes an energy increase