International Standard

ISO 18623-1

First edition
2026-07

Air compressors and compressed air systems — Safety —

Part 1: Air compressors

Compresseurs à air et systèmes à air comprimé — Sécurité —

Partie 1: Compresseurs à air

Reference number
ISO 18623-1:2026(en)

© ISO 2026



COPYRIGHT PROTECTED DOCUMENT

© ISO 2026

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**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **3**
3.1 General terms 3
3.2 Specific terms 4

4 Safety requirements and/or protective measures **4**
4.1 General 4
4.2 Mechanical safety 5
4.2.1 Guards 5
4.2.2 Fluid injection 6
4.2.3 Loss of stability 6
4.2.4 Slip, trip and fall 6
4.3 Electrical safety 7
4.3.1 Generally applicable 7
4.3.2 Protection from overload 7
4.3.3 Protection from live parts 7
4.3.4 Portable and skid-mounted compressor units 7
4.4 Control systems 7
4.4.1 General 7
4.4.2 Failure of safety related control system energy supply 8
4.4.3 Start/restart 8
4.4.4 Manual suspension of safety functions 8
4.4.5 Emergency stop function 8
4.4.6 Safety-related stop function 8
4.4.7 Manual reset 9
4.4.8 External influences on electrical equipment 9
4.4.9 Electromagnetic phenomena 9
4.4.10 Pneumatic and/or hydraulic control systems 9
4.5 Thermal safety 10
4.6 Noise 10
4.7 Materials and substances processed, used or exhausted 10
4.7.1 Micro-organisms, biological and microbiological substances 10
4.7.2 Breathing difficulties 11
4.8 Fire and explosion 11
4.8.1 Electrostatic phenomena 11
4.8.2 Oil-flooded rotary air compressor units 11
4.8.3 Oil-lubricated reciprocating air compressor units 12
4.8.4 Oil-lubricated reciprocating compressor units operating above 5 000 kPa 12
4.8.5 Compressor units driven by combustion engines 12
4.9 Ergonomic principles 12
4.9.1 General 12
4.9.2 Manual handling of compressor units 13
4.9.3 Portable and skid-mounted compressor units 13
4.10 Failure of machinery parts and other functional disorders 13
4.10.1 Break-up during operation 13
4.10.2 Low temperature operation 14
4.10.3 Liquid shock 14
4.10.4 Coolant system 14
4.11 Pressure relief – fragmentation 15
4.11.1 General 15
4.11.2 Design specifications of pressure relief devices 15
4.11.3 Turbo compressor units 15

© ISO 2026 – All rights reserved

4.11.4 Multi-stage compressor units 15
4.12 Information and warning devices 16
5 Verification of safety requirements and/or protective measures 16
5.1 Pressure testing 16
5.2 Noise 16
5.2.1 General 16
5.2.2 Sound power level of compressor units for use outdoors 16
5.3 Stability of portable compressor units 16
5.4 Structure of verification 16
6 Information for use 18
6.1 General requirements 18
6.2 Accompanying documents (in particular instruction handbook) 19
6.2.1 Instruction handbook 19
6.2.2 Information relating to the use of the compressor/compressor unit 20
6.3 Specific types of compressors 21
6.3.1 General 21
6.3.2 Portable and skid-mounted air compressor units 21
6.3.3 Entry to inlet ducts and enclosures 22
6.4 Service instructions 22
6.4.1 General 22
6.4.2 Precautions for service/maintenance 23
6.5 Markings, signs and written warnings 23
6.5.1 Generally applicable 23
6.5.2 Compressor unit enclosures 23
6.5.3 Off-road portable and skid-mounted air compressor units 23
6.5.4 Markings (in particular data plate) 24
6.6 Noise 25
6.6.1 A-weighted emission sound pressure level and A-weighted sound power level declaration 25
6.6.2 Hearing protection 25
6.7 Dismantling 25
Annex A (informative) **List of significant hazards 26**
Annex B (informative) **Control systems 28**
Annex C (normative) **Labels, signs and tags 30**
Bibliography 33

© ISO 2026 – All rights reserved

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 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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 118, *Compressors and pneumatic tools, machines and equipment*, Subcommittee SC 6, *Air compressors and compressed air systems.*

A list of all parts in the ISO 18623 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.

© ISO 2026 – All rights reserved

Introduction

This document is a type-C standard as stated in ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organisations, market surveillance, etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (e.g. small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

© ISO 2026 – All rights reserved

Air compressors and compressed air systems — Safety —

Part 1: Air compressors

1 Scope

This document is applicable to compressors, partially completed compressor units and compressor units having an operating pressure greater than 50 kPa and designed to compress air, nitrogen or inert gases. This document deals with all significant hazards, hazardous situations and events relevant to the design, installation, operation, maintenance, dismantling and disposal of compressors and compressor units when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

This document includes under the general term compressor units those machines which comprise

— the compressor,

— a drive system, and

— any component or device which is necessary for operation.

This document covers compressors driven by any power media, including battery powered and which are fitted in or used with motor vehicles.

The significant hazards dealt with in this document are identified in Annex A.

This document does not cover requirements for compressors and compressor units used in potentially explosive atmospheres.

This document is not applicable to compressors and compressor units which are manufactured before the date of publication of this document.

This document does not cover compressors and compressor units for processing petroleum, petrochemicals, or chemicals within the scope of ISO/TC 67.

This document does not give performance levels or safety integrity levels for safety related parts of control systems.

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 2151, *Acoustics — Noise test code for compressors and vacuum pumps — Engineering method (Grade 2)*

ISO 3857-1, *Compressors, pneumatic tools and machines — Vocabulary — Part 1: General*

ISO 3857-2, *Compressors, pneumatic tools and machines — Vocabulary — Part 2: Compressors*

ISO 4126-1, *Safety devices for protection against excessive pressure — Part 1: Safety valves*

ISO 4413, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

© ISO 2026 – All rights reserved

ISO 4414, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

ISO 8573-1, *Compressed air — Part 1: Contaminants and purity classes*

ISO 8573-2, *Compressed air — Contaminant measurement — Part 2: Oil aerosol content*

ISO 8573-3, *Compressed air — Part 3: Test methods for measurement of humidity*

ISO 8573-4, *Compressed air — Contaminant measurement — Part 4: Particle content*

ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13766-1, *Earth-moving and building construction machinery — Electromagnetic compatibility (EMC) of machines with internal electrical power supply — Part 1: General EMC requirements under typical electromagnetic environmental conditions*

ISO 13766-2, *Earth-moving and building construction machinery — Electromagnetic compatibility (EMC) of machines with internal electrical power supply — Part 2: Additional EMC requirements for functional safety*

ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 13850, *Safety of machinery — Emergency stop function — Principles for design*

ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 14120, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means and general requirements of access*

ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways*

ISO 14122-3, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails*

ISO 14122-4, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders*

ISO 14123-1, *Safety of machinery — Reduction of risks to health resulting from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*

ISO 15534-1, *Ergonomic design for the safety of machinery — Part 1: Principles for determining the dimensions required for openings for whole-body access into machinery*

IEC 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 60204-11, *Safety of machinery — Electrical equipment of machines — Part 11: Requirements for equipment for voltages above 1 000 V AC or 1 500 V DC and not exceeding 36 kV*

IEC 60417-DB-12M, *Graphical Symbols For Use On Equipment — 12-Month Subscription To Online Database Comprising All Graphical Symbols Published In IEC 60417*

IEC 61000-6-1, *Electromagnetic compatibility (EMC) — Part 6-1: Generic standards — Immunity standard for equipment in residential environments*

IEC 61000-6-2, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity standard for industrial environments*

IEC 61000-6-3, *Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for equipment in residential environments*

© ISO 2026 – All rights reserved

IEC 61000-6-4, *Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments*

IEC 61310-2, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking*

IEC 61310-3, *Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators*

IEC 62061, *Safety of machinery — Functional safety of safety-related control systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100, ISO 3857-1, ISO 3857-2 and the following 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 General terms

3.1.1
compressor
part of a *compressor unit* (3.1.3) that compresses a gas or vapour media to a pressure higher than that at the inlet

3.1.2
partially completed compressor unit
unit that comprises the *compressor* (3.1.1), components and sub-assemblies that is almost a compressor unit but cannot perform function on its own

3.1.3
compressor unit
unit that comprises the *compressor* (3.1.1), a *drive system* (3.1.4) and any component or device which is necessary for operation

3.1.4
drive system
system that consists of a prime mover and coupling mechanism

Note 1 to entry: Prime mover may be an electric motor, steam engine (turbine), etc.

Note 2 to entry: Coupling mechanism may be a drive belt, shaft, gears, etc.

3.1.5
inert gas
chemically inactive gas which retains this characteristic even at elevated pressures

3.1.6
pressure
pressure relative to atmospheric pressure, i.e. gauge pressure

Note 1 to entry: In many cases, this is referred to as effective pressure.

Note 2 to entry: The unit kPa for pressure is used 100 kPa = 1 bar.

3.1.7
liquid shock
excessive force resulting from an attempt to compress incompressible medium

© ISO 2026 – All rights reserved