
**Pneumatic fluid power — General rules
relating to systems**

Transmissions pneumatiques — Règles générales relatives aux systèmes



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Printed in Switzerland

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4414 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 9, *Installations and systems*.

This second edition cancels and replaces the first edition (ISO 4414:1982), which has been technically revised.

Annexes A to F of this International Standard are for information only.

Introduction

In pneumatic fluid power systems, power is transmitted and controlled through air or a neutral gas under pressure within a circuit.

The application of pneumatic fluid power systems requires a thorough understanding and precise communication between the supplier and purchaser. This International Standard was prepared to assist that understanding and communication and to document many of the good practices learned from experience with pneumatic systems.

Use of this International Standard assists:

- a) the identification and specification of the requirements for pneumatic systems and components;
- b) the identification of the respective areas of responsibility;
- c) the design of systems and their components to comply with specific requirements;
- d) understanding of the safety requirements of a pneumatic system.

General rules given in this International Standard have no legal status except those paragraphs that are included in contractual agreements between purchasers and suppliers. Deviation from those parts of this International Standard included in contractual agreements shall also be agreed to in writing by the purchaser and supplier. Attention shall be drawn by the purchaser and/or the supplier to applicable national and local codes or laws.

General rules which contain the verb "shall" are counsels of good engineering practice, universally applicable with rare exceptions. Use of the word "should" in the document is not an indication of choice but an indication that the desirable engineering practices described may have to be modified due to the peculiarities of certain processes, environmental conditions, or equipment size.

Titles or parts of the text which are marked with an asterisk (*) indicate subclauses that discussion is needed between the supplier and purchaser to define the requirements and/or responsibilities. These are also listed in annex A.

Pneumatic fluid power — General rules relating to systems

1 Scope

This International Standard provides general rules relating to pneumatic systems used in industrial manufacturing processes. It is intended as a guide for both suppliers and purchasers, with a view to ensuring:

- a) safety;
- b) uninterrupted system operation;
- c) ease and economy of maintenance;
- d) long life of the system.

This International Standard does not apply to air compressors and the systems associated with air distribution as typically installed in a factory.

2 Normative references

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

ISO 65:1981, *Carbon steel tubes suitable for screwing in accordance with ISO 7-1*.

ISO 1219-1:1991, *Fluid power systems and components — Graphic symbols and circuit diagrams — Part 1: Graphic symbols*.

ISO 1219-2:1995, *Fluid power systems and components — Graphic symbols and circuit diagrams — Part 2: Circuit diagrams*.

ISO 5598:1985, *Fluid power systems and components — Vocabulary*.

ISO 5782-1:1997, *Pneumatic fluid power — Compressed air filters — Part 1: Main characteristics to be included in suppliers' literature and product marking requirements.*

ISO 6301-1:1997, *Pneumatic fluid power — Compressed air lubricators — Part 1: Main characteristics to be included in suppliers' literature and product marking requirements.*

ISO 6953-1:1990, *Pneumatic fluid power — Air line pressure regulators — Part 1: Main characteristics to be included in commercial literature and specific requirements.*

ISO 8778:1990, *Pneumatic fluid power — Standard reference atmosphere.*

IEC 204-1:1997, *Electrical equipment of industrial machines — Part 1: General requirements.*

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

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 5598 and the following definitions apply.

3.1 actuator: Component (e.g. motor or cylinder) that transforms fluid energy into mechanical energy.

3.2 commissioning: Procedure by which a system is formally accepted by the purchaser.

3.3 component: Individual unit (e.g. cylinder, motor, valve or filter, but excluding piping) comprising one or more parts designed to be a functional part of a fluid power system.

3.4 control mechanism: Device that provides an input signal to a component (e.g. lever, solenoid).

3.5 emergency control: Control function that brings a system to a safe condition.

3.6 function plate: Surface that contains information describing either the performance of a manually operated device (e.g. on/off, up/down) or the status of a function performed by the system (e.g. clamp, lift, advance).

3.7 neutral gas: Gas that has properties similar to air and does not react to the effects of pressure and/or temperature in a manner different to air.

3.8 operating device: Device that provides an input signal to a control mechanism (e.g. cam, electrical switch).

3.9 piping: Any combination of fittings, couplings or connectors with pipes, hoses or tubes which allow fluid flow between components.