

# Teknisk rapport

## SIS-ISO/TR 12942:2012

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### **Kompressorer – Klassificering – Kompletterande information till ISO 5390 (ISO/TR 12942:2012, IDT)**

### **Compressors – Classification – Complementary information to ISO 5390 (ISO/TR 12942:2012, IDT)**

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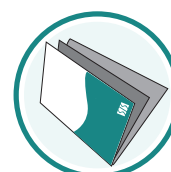
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## Foreword

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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.

ISO/TR 12942 was prepared by Technical Committee ISO/TC 118, *Compressors and pneumatic tools, machines and equipment*, Subcommittee SC 6, *Air compressors and compressed air systems*.

## Introduction

Classification and terminology standards are fundamental to the identification of a product for using in industrial and trade communications, education, information search, data processing, research, development, inventing, patenting, etc. It is intended that these standards be based on the latest technical achievements and classification theories, cover all viable modern equipment design types, exclude ambiguity, be adapted to easy translations into different languages by exact terms, and be flexible and open to new innovations. This Technical Report is intended to contribute essentially to obtaining these aims for a possible subsequent revision of ISO 5390.

The main modern problems in compressor classification and terminology are associated with rapid development and implementation of new design types. In addition, many manufacturers include in a single non-separable compressor package, not only an aftercooler, but also a receiver, dryer, etc.. In these conditions, it is important to establish and maintain unified patterns and principles for forming new derivative and composed terms by using a few basic original terms as well as using, as far as possible, established professional terms which have emerged spontaneously.

The problems related to the classification of compressor equipment are complicated by the wide spectrum and diversity of application fields, resulting in a great number of applicability and performance criteria, such as:

- compression principles;
- basic design features;
- energy forms used (electricity, fuel heat, etc.) and driver types;
- cooling agents (air, water, etc.) and methods;
- lubrication conditions (oil-free or contaminated with oil);
- mobility, transportability;
- prefabrication level (packaged and factory-assembled compressor, compressor plant, etc.);
- operation modes and service parameters;
- range of functions (compression, energy conversion, cooling, drying, etc.) and appropriate structural composition of the equipment.

Neither identification of the compressor equipment and its application fields nor selection of compressors for specific services and comparison of their technical and economical parameters are possible without knowledge of this information. That is why it is intended that the attributes listed in this Technical Report serve as a basis for the practical multi-dimensional classification system of compressor equipment.

Some explanatory notes and methodical approaches are presented in Annex A.





# Compressors — Classification — Complementary information to ISO 5390

## 1 Scope

This Technical Report gives a classification of modern compressor types and their definitions.

This Technical Report presents terms for use in technical and contractual specifications, manufacturer's literature, information searches and data processing systems, patent information, educational publications for students, service and maintenance instructions, industrial statistics and market surveys, as well as in design, quality, safety, testing and other standards, norms, regulations and codes.

It is intended that adequate technical and economical comparison and evaluation of compressor alternatives for specific application conditions be performed with identical functional, mobility, service pressures and service media classes, as well as with equal capacity ratings.

## 2 Design classes

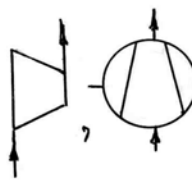
### 2.1 General

The general hierarchy of compressor design classes is given in Figure 1.

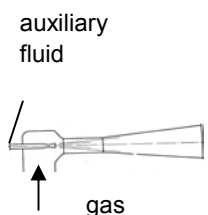
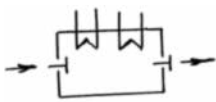
Design classes specify the basic working principles and conceptual engineering philosophy of modern compressors being operated, marketed, manufactured, developed, investigated or invented. The classification tables in 2.2 to 2.5 contain preferred terms of basic compressor classes, their definitions and graphical illustrations. Graphical materials are presented only as examples. Non-preferred synonyms are given in parentheses. Special definitions are not given for those subclasses where the wording of the terms characterizes sufficiently basic design features and attributes of the compressor types. More general high-level terms can be used in the technical documentation instead of low-level particular subclasses, such as "compressor", "compressor plant" and "compressor equipment" after the first full description of functional and design subclasses, and in all those cases where there is no possibility of confusion with other subclasses or there is no need to differentiate between specific subclasses.



## 2.2 Classification by equipment type

Class, term	Subclass and definition	Illustration (example only)
Compressor (generic term)	A machine or apparatus converting different types of energy into the potential energy of gas pressure for displacement and compression of gaseous media to any higher pressure values above atmospheric pressure with pressure-increase ratios exceeding 1,1.  NOTE 1 Similar equipment with pressure-increase ratio values of up to 1,1 is regarded as ventilator.	
	Compressor machine  A compressor in which conversion of different types of energy into the potential energy of gas pressure is effected by mechanical motions of solid working members.  NOTE 2 In some design types of compressor machine, intermediate liquid service media can be used for driving-force transmitting from one solid member to the other one (e.g. in electrically/hydraulically driven piston and diaphragm compressor).	See 2.3 to 2.5 for specific classes
	Compressor apparatus  A compressor in which conversion of different types of energy into the potential energy of gas pressure is effected by stationary positions of working members effecting basic energy conversion functions, mechanical motions being used only for auxiliary functions, such as gas inlet and outlet, and energy-agent supply and withdrawal.	See 2.3 to 2.5 for specific classes

## 2.3 Classification of compressor apparatuses by operation principles

Class, term	Subclass	Definition	Illustration (example only)
Compressor apparatus	Ejector	A compressor apparatus of dynamic type, comprising suction chamber, cylindrical throat and diffuser, in which the gas-pressure increase is obtained in continuous flow by initial increasing its kinetic energy by mechanical action of the motive high-velocity auxiliary fluid stream entraining the gas into the accelerating mixed stream, and successive conversion of the kinetic energy into the potential energy of the mixture pressure by deceleration of the mixture flow in the diffuser, the high velocity of the motive auxiliary-fluid stream being created by its expansion in the nozzle from pressurized state to the initial or lower pressure of the gas being compressed.	
	Thermo-compressor	A compressor apparatus of displacement type in which the gas pressure increase, its discharge and gas intake are obtained by cyclically heating and cooling of the closed volumes of the gas.	
	Adsorption compressor	A compressor apparatus of displacement type in which the gas pressure increase, its discharge and gas intake are obtained by cyclical adsorption of the gas by special adsorbents such as metal hydrides and its desorption at higher pressures by changing temperature conditions.	