

# INTERNATIONAL STANDARD

**ISO**  
**7183-2**

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## **Compressed air dryers —**

### **Part 2:**

Performance ratings

**iTeh STANDARD PREVIEW**

*Sécheurs d'air comprimé —*  
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*Partie 2: Caractéristiques nominales de fonctionnement*

ISO 7183-2:1996

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Reference number  
ISO 7183-2:1996(E)

## 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.

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International Standard ISO 7183-2 was prepared by Technical Committee ISO/TC 118, *Compressors, pneumatic tools and pneumatic machines*.

ISO 7183 consists of the following parts, under the general title *Compressed air dryers*:

- *Part 2: Performance ratings*

Annexes A, B and C of this part of ISO 7183 are for information only.

ISO 7183:1986 will be reissued as ISO 7183-1 at a future revision.

# Compressed air dryers —

## Part 2: Performance ratings

### 1 Scope

This part of ISO 7183 provides general information to assist users and specifying engineers in the selection of the type of compressed air dryer which will best serve their needs.

This part of ISO 7183 does not cover safety requirements.

NOTE 1 Data sheets which are useful when selecting or specifying dryer design parameters are contained in annex A.

### 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 7183. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7183 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7183:1986<sup>1)</sup>, *Compressed air dryers — Specifications and testing*.

### 3 Definitions

For the purposes of this part of ISO 7183, the definitions, symbols and units given in ISO 7183:1986 apply.

### 4 Comparison of compressed air dryer types

#### 4.1 Pressure drop

Pressure drop across the dryer should be kept to a practical minimum, since increasing the dryer size to reduce pressure drop further may lead to an unacceptable increase in capital cost.

Conversely, the pressure drop should be held below an acceptable maximum in order to restrict power losses and system running costs. Table 1 shows typical pressure losses considered as the practical maximum acceptable level for compressed air dryers rated at 7 bar effective (gauge) inlet air pressure and maximum recommended flowrate when delivering the specified dew-point class and when tested at the reference conditions of ISO 7183:1986, table 2.

1) Will be reissued as ISO 7183-1 at a future revision.

**Table 1 — Maximum acceptable pressure drop**

Dryer type	Maximum pressure drop <sup>1)</sup> bar
Refrigeration	0,35
Adsorption	0,21
1) Exclusive of inlet and outlet filters.	

For inlet pressures other than 7 bar, a maximum acceptable pressure drop at maximum flowrate not exceeding 5 % of inlet air pressure is typical for refrigeration dryers (3 % for other types).

**4.2 Dew point**

Generally the maximum acceptable dew point is specified by quoting the dew-point quality class from table 2. Where a specific dew point is required this

shall be stated, in degrees Celsius, with a suitable tolerance (see ISO 7183:1986, table 6).

**Table 2 — Pressure dew-point classes**

Dew-point class	Pressure dew point, °C, max.
1	-70
2	-40
3	-20
4	+3
5	+7
6	+10

The suitability of the dryer for achieving the dew-point class as specified in table 2 is shown in table 3.

The relative effect of pressure drop, dew point and other parameters on cost is shown in annex B.

**Table 3 — Suitability of major compressed air dryer types for pressure dew-point classes**

Dryer type	Dew-point class <sup>1)</sup>						Remarks
	1	2	3	4	5	6	
Adsorption	S	S	S	—	—	—	Not normally employed for dew points higher than class 3
Refrigeration	—	—	—	S	S	S	Not practicable for dew points lower than class 4
1) S = Suitable.							

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**Annex A**  
(informative)

**Dryer specification sheet**

**A.1 Part 1 (to be completed by user)**

Type of dryer preferred: .....

Air compressor type:            Reciprocating             Rotary             Maker:.....

   Lubricated             Non-lubricated             Model:.....

Compressor lubricant            Mineral             Synthetic             Lubricant brand: .....

**A.1.1 Conditions at dryer inlet**

Air flowrate<sup>1)</sup>, l/s: Normal: ..... Max.: .....

Compressed air temperature, °C: Normal: ..... Max.: .....

Relative vapour pressure (humidity %): ..... (100 % assumed if value not known)

Design pressure, bar: .....

Pressure, bar: Min.: ..... Max.: .....

Air quality class: ..... (See ISO 8573-1)

**A.1.2 Conditions at dryer outlet**

Dew point required (see table 2), °C: ..... or Class:.....

Allowable pressure drop (see table 1), bar: .....

**A.1.3 Site conditions**

Ambient temperature, °C: Max.: ..... Min.: .....

Cooling water available (if required):

Flowrate, l/s: ..... Supply temperature, °C:.....

1) Given at reference conditions of 20 °C and 1 bar dry air.

Dryer location (if known): Before air receiver  After air receiver

Electrical details:

Voltage, V:..... Phases:..... Frequency, Hz:.....

Control voltage, V: .....

Neutral available:..... Yes  No  Enclosure (IEC 529): .....

Noise limitation and test method standard (if known): .....

Instrumentation required (pressure gauge, thermometer, dew-point indicator, etc.)

Documentation required (drawing, calculations, etc.)

Pressure vessel codes:..... Pressure vessel volume: .....

Other remarks:.....  
.....

**A.2 Part 2 (to be completed by supplier)**

Type of dryer (full description): .....

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Inlet air temperature used for capacity rating, °C: .....

Ambient temperature used for capacity rating, °C: .....

Maximum ambient temperature allowed, °C: .....

Cooling water flowrate (if applicable), l/s: .....

Inlet temperature, °C: ..... Outlet temperature, °C: .....

Dryer inlet air pressure, bar: ..... Inlet air flowrate<sup>1)</sup>, l/s: .....

Outlet air flowrate<sup>1)</sup>, l/s: ..... Purge air flowrate<sup>1)</sup>, l/s: .....

Outlet dew point (see table 2), °C: ..... or Class: .....

Design pressure, bar: ..... Pressure drop, bar: ..... (see table 1)

Air quality leaving dryer: ..... (See ISO 8573-1)

Electrical loading, current phase: Normal, A: ..... Max., A: .....

Noise level of dryer, dB(A): ..... Test method used: .....

Other comments: .....

1) Given at reference conditions of 20 °C and 1 bar dry air.

## Annex B (informative)

### General effects of various parameters on capital and running costs of major types of compressed air dryer

The capital and running costs (excluding depreciation) of each type of compressed air dryer may be altered by site conditions and user requirements, as shown below.

Relevant conditions	Parameter	Adsorption dryers				Refrigeration dryers	
		Heatless type		Heat-reactivated type		Capital cost	Running costs
		Capital cost	Running costs	Capital cost	Running costs		
Site conditions	Ambient temperature and humidity	No effect	Minimal effect	No effect except under extreme conditions	Increase with decreasing ambient temperature, increase with humidity	Increases with temperature; + 50 °C maximum	Increase with temperature
	Receiver/dryer relationship	Lower cost possible if before receiver	Lower cost possible if before receiver	Lower cost possible if before receiver	Lower cost possible if before receiver	Lower cost possible if before receiver	Negligible
Inlet conditions	Air purity	Increases if air purity is low	Negligible	Increases if air purity is low	Negligible	Increases if air purity is low	Negligible
	Air pressure	Increases above 16 bar	Decreases as pressure increases	Increases above 16 bar	Decrease as pressure increases	Increases considerably above 16 bar	Decrease as pressure increases
	Air temperature	Increases with temperature; normal upper limit + 50 °C	Increases with temperature	Increases with higher temperature	Increase with higher temperature	Increases with temperature; normal upper limit + 50 °C	Increase with temperature
	Humidity	Negligible	Increases with humidity	Increases with higher inlet humidity	Increase with higher inlet humidity	Negligible	Increase with humidity
Outlet conditions	Air purity level	Increases with air quality	Negligible	Increases with air quality	Negligible	Increases with air quality	Negligible
	Dryer pressure drop	Increases if low pressure drop required	System costs increase as pressure drop increases (see 4.1)	Increases if low pressure drop required	System costs increase as pressure drop increases (see 4.1)	Increases if low pressure drop required	System costs increase as pressure drop increases (see 4.1)
	Pressure dew point	Increases if very low dew points required	Increases with decreasing dew point	Increases with decreasing dew point	Increase with decreasing dew point	Negligible	Increase with decreasing dew point
	Flowrate	Increases with flowrate	Increases with flowrate	Increases with flowrate	Increase with flowrate	Increases with flowrate	Increase with flowrate
Services	Purge air requirements	Negligible	From < 3 % to > 15 % depending upon dryer design and required dew point	Negligible	Increase with increased purge (purge requirement less than heat less type)	Not relevant	Not relevant
	Heater loading	Not relevant	Not relevant	Increases with loading	Increase with loading	Not relevant	Not relevant
	Cooling water	Not relevant	Not relevant	Negligible	Increase with increased cooling water requirements	Increases with dryer size	Increase if needed
	Dew-point indication	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
	Automatic dew-point control	Substantial increase if fitted	Substantial savings	Substantial increase	Substantial savings	Substantial increase if fitted	Some decrease in costs
	Dew-point meter	Considerable	Negligible	Substantial increase	Negligible	Considerable	Negligible

**Annex C**  
(informative)

**Bibliography**

- [1] ISO 8573-1:1991, *Compressed air for general use — Part 1: Contaminants and quality classes*.
- [2] ISO 8778:1990, *Pneumatic fluid power — Standard reference atmosphere*.
- [3] IEC 529:1989, *Degrees of protection provided by enclosures (IP Code)*.

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