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**Fluidna tehnika - Pnevmatika - Regulatorji tlaka in regulatorji tlaka s filtri - 2. del:  
Postopki preskušanja za določitev glavnih značilnosti, ki morajo biti navedene v  
dokumentaciji dobaviteljev**

Pneumatic fluid power -- Compressed air pressure regulators and filter-regulators -- Part  
2: Test methods to determine the main characteristics to be included in literature from  
suppliers

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Transmissions pneumatiques -- Régulateurs de pression et filtre-régulateurs pour air  
comprimé -- Partie 2: Méthodes d'essai pour déterminer les principales caractéristiques  
à inclure dans la documentation des fournisseurs

**Ta slovenski standard je istoveten z: ISO 6953-2:2000**

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| 23.060.40 | Tlačni regulatorji                | Pressure regulators                |
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# INTERNATIONAL STANDARD

# ISO 6953-2

First edition  
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## Pneumatic fluid power — Compressed air pressure regulators and filter-regulators —

Part 2:

### Test methods to determine the main characteristics to be included in literature from suppliers

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*Transmissions pneumatiques — Régulateurs de pression  
et filtre-régulateurs pour air comprimé —*

*Partie 2: Méthodes d'essai pour déterminer les principales caractéristiques  
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Tel. + 41 22 749 01 11  
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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 3.

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.

Attention is drawn to the possibility that some of the elements of this part of ISO 6953 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6953-2 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 5, *Control products and components*.

ISO 6953 consists of the following parts, under the general title *Pneumatic fluid power — Compressed air pressure regulators and filter-regulators*:

- *Part 1: Main characteristics to be included in literature from suppliers and product-marking requirements*
- *Part 2: Test methods to determine the main characteristics to be included in literature from suppliers*

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## Introduction

In pneumatic fluid power systems, power is transmitted and controlled through air under pressure circulating within a circuit. Where reduction and regulation of the pressure is desired, the regulators and filter-regulators are components designed to maintain the compressed air pressure approximately constant.

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# Pneumatic fluid power — Compressed air pressure regulators and filter-regulators —

## Part 2:

# Test methods to determine the main characteristics to be included in literature from suppliers

## 1 Scope

This part of ISO 6953 specifies tests, test procedures and a method of presenting the results concerning the parameters which define the main characteristics to be included in literature from suppliers of regulators and filter-regulators conforming to ISO 6953-1.

The aim of this part of ISO 6953 is

- to facilitate the comparison of pressure regulators and filter-regulators by standardizing test methods and presentation of test data;
- to assist in the proper application of pressure regulators and filter-regulators in compressed air systems.

The tests specified are intended to allow comparison between the different type of regulators and filter-regulators; they are not production tests to be carried out on each pressure regulator or filter-regulator manufactured.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 6953. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 6953 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3:1973, *Preferred numbers — Series of preferred numbers*.

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

ISO 2944:2000, *Fluid power systems and components — Nominal pressures*.

ISO 3448:1992, *Industrial liquid lubricants — ISO viscosity classification*.

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

ISO 6358:1989, *Pneumatic fluid power — Components using compressible fluids — Determination of flow-rate characteristics*.

ISO 6953-1:2000, *Pneumatic fluid power — Compressed air pressure regulators and filter-regulators — Part 1: Main characteristics to be included in literature from suppliers and product-marking requirements*.

**ISO 6953-2:2000(E)****3 Terms and definitions**

For the purposes of this part of ISO 6953, the terms and definitions given in ISO 5598 and ISO 6953-1 apply.

**4 Units**

Units from ISO 1000 are generally used in pneumatic fluid power systems, in particular:

- gauge pressure, expressed in kilopascals (in bars, between parentheses) [kPa (bar)];
- temperature, expressed in degrees Celsius (°C);
- flow rate, expressed in cubic decimetres per second [dm<sup>3</sup>/s (ANR)].

**5 Test conditions****5.1 Temperature**

For all tests, maintain the temperature of the process air, the equipment and the ambient air temperature at 25 °C ± 10 °C.

**5.2 Pressures**

The specified pressures shall be held to within ± 2 %. The preferred test pressures are those given in clause 4.3.2 of ISO 6953-1:2000, from Table 1 below, or from ISO 2944. Where other test pressures are required, the values shall be chosen from series R5 of preferred numbers, according to ISO 3.

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**6 Test procedure to verify rated pressure**

**6.1** Perform this test on three random samples if a single rated pressure is proposed for the entire product, or on six random samples if separate ratings are proposed for the inlet and outlet sections. If the product uses a diaphragm, modify or replace it to withstand the pressure applied (diaphragms are excluded from the test criteria, but not the diaphragm support plates or any pistons). Other product sealing means may be modified to prevent leakage and allow structural failure to occur during the test, but modifications may not increase the structural strength of the pressure-containing envelope.

**6.2** Prepare the test samples as follows:

**6.2.1** If a single pressure rating is proposed for the entire product, remove the control spring and replace it with a solid spacer whose length will maintain the poppet in its half-open position. Close the gauge ports and the inlet port with plugs, and perform all testing by applying pressure to the outlet port.

**6.2.2** If a separate pressure rating is proposed for the inlet and outlet sections of the regulator, relieve the control spring force on three of the samples. Using a proposed pressure rating for the inlet, perform testing on the inlet port, allowing the poppet to be closed and keeping the outlet port open. Prepare the other three samples as described in 6.2.1 and test them using a proposed pressure rating for the outlet port.

**6.3** Fill samples with a liquid that does not exceed ISO VG 32, according to ISO 3448, and maintain the temperatures given in 5.1.

**6.4** After stabilization of the temperature, pressurize slowly to a level of 1,5 times the proposed rated pressure. Hold at this level for 2 min and observe for leakage or failure, as defined in 6.6.



Table 1 — Chart for outlet pressure set points

Values in kilopascals (bars)

| Maximum of the adjustable pressure range | Inlet test pressure levels  |              |               |               |               |
|--|---|--------------|---------------|---------------|---------------|
|  | 250<br>(2,5)  | 630<br>(6,3) | 1 000<br>(10) | 1 600<br>(16) | 2 500<br>(25) |
| less than 100<br>(less than 1)           | Values of approximately 25 %, 40 %, 63 % and 80 % of the maximal adjustable pressure range. |              |               |               |               |
| 100 to < 125<br>(1 to < 1,25)            | 25 - 40 - 63 - 80 _____ →<br>(0,25 - 0,4 - 0,63 - 0,8)                                      |              |               |               |               |
| 125 to < 160<br>(1,25 to < 1,6)          | 40 - 63 - 80 - 100 _____ →<br>(0,4 - 0,63 - 0,8 - 1)  |              |               |               |               |
| 160 to < 200<br>(1,6 to < 2)             | 40 - 63 - 100 - 125 _____ →<br>(0,4 - 0,63 - 1 - 1,25)                                      |              |               |               |               |
| 200 to < 250<br>(2 to < 2,5)             | 63 - 100 - 125 - 160 _____ →<br>(0,63 - 1 - 1,25 - 1,6)                                     |              |               |               |               |
| 250 to < 315<br>(2,5 to < 3,15)          | 63 - 100 - 160 - 200 _____ →<br>(0,63 - 1 - 1,6 - 2)  |              |               |               |               |
| 315 to < 400<br>(3,15 to < 4)            | 100 - 160 - 200 - 250 _____ →<br>(1 - 1,6 - 2 - 2,5)  |              |               |               |               |
| 400 to < 500<br>(4 to < 5)               | 100 - 160 - 250 - 315 _____ →<br>(1 - 1,6 - 2,5 - 3,15)                                     |              |               |               |               |
| 500 to < 630<br>(5 to < 6,3)             | 125 - 200 - 315 - 400 _____ →<br>(1,25 - 2 - 3,15 - 4)                                      |              |               |               |               |
| 630 to < 800<br>(6,3 to < 8)             | 160 - 250 - 400 - 500 _____ →<br>(1,6 - 2,5 - 4 - 5)  |              |               |               |               |
| 800 to < 1 000<br>(8 to < 10)            | 200 - 315 - 500 - 630 _____ →<br>(2,5 - 3,15 - 5 - 6,3)                                     |              |               |               |               |
| 1 000 to < 1 250<br>(10 to < 12,5)       | 250 - 400 - 630 - 800 _____ →<br>(2,5 - 4 - 6,3 - 8)  |              |               |               |               |
| 1 250 to < 1 600<br>(12,5 to < 16)       | 315 - 500 - 800 - 1 000 _____ →<br>(3,15 - 5 - 8 - 10)                                      |              |               |               |               |
| 1 600<br>(16)                            | 400 - 630 - 1 000 - 1 250 _____ →<br>(4 - 6,3 - 10 - 12,5)                                  |              |               |               |               |

NOTE Wherever the pressure rating allows, an inlet test pressure of 630 kPa (6,3 bar) should be used for adjustable pressure ranges of up to 800 kPa (8 bar). For adjustable pressure ranges greater than 800 kPa (8 bar), and up to 1 250 kPa (12,5 bar), an inlet test pressure of 1 000 kPa (10 bar) should be used.