SLOVENSKI STANDARD
SIST ISO 12238:2002

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Fluidna tehnika - Pnevmatika - Potni ventili - Merjenje odzivnega ļ asa

Pneumatic fluid power -- Directional control valves -- Measurement of shifting time

Transmissions pneumatiques -- Distributeurs de commande directionnels -- Mesure du temps de commutation

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INTERNATIONAL STANDARD

ISO 12238

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Pneumatic fluid power — Directional control valves — Measurement of shifting time

Transmissions pneumatiques — Distributeurs de commande directionnels — Mesure du temps de commutation

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12238 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 5, *Control products and components*.

Annexes A and B of this International Standard are for information only.

Introduction

In pneumatic fluid power systems, power is transmitted and controlled through a gas under pressure circulating within a circuit. In some applications, the designer of a fluid power system needs to know the time required to cause the valving elements in a pneumatic directional control valve to move and to generate an output signal.

Pneumatic fluid power — Directional control valves — Measurement of shifting time

1 Scope

This International Standard

— specifies test procedures for measuring the shifting times of electrically- or pneumatically-operated directional control valves and moving-part logic elements,

— establishes a definition for shifting time, and

— is intended to improve the application of pneumatic fluid power by providing users and manufacturers of pneumatic valves with a standardized test procedure for measuring the shifting time it defines.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard 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 1000, *SI units and recommendations for the use of their multiples and of certain other units*.

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

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

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

3 Terms and definitions

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

3.1

shifting time

time lapse measured from a change in the control signal (electrical or pneumatic) until the time at which the pressure in the associated outlet port changes by 10 % between specified pressure levels, with only a pressure transducer connected to the outlet

NOTE This definition is very similar to that of “dead time” in ISO 5598:1985, 4.0.7.1.1 and 4.0.7.1.2. The only difference between the two definitions is the specification of the outlet pressure change. Many national standards, as well as ISO 5598, give additional (and sometimes conflicting) definitions for other terms related to the shifting characteristics of valves. A number of these are given in annex A.

3.2
shifting on-time
shifting time when the control signal is applied

3.3
shifting off-time
shifting time when the control signal is removed

4 Symbols and units

4.1 The symbols and units for parameters used in this International Standard shall be as given in Table 1.

Table 1 — Symbols and units

Symbol	Parameter	Unit (in accordance with ISO 1000)
d	Inside diameter of pressure measuring tube	mm
p_1	Supply reservoir pressure	kPa (bar)[a]
p_3	Control pressure	kPa (bar)
t_o	Base for time measurement	ms
t_E	Exhaust shifting time	ms
t_F	Fill shifting time	ms
θ_1	Supply reservoir temperature	°C

[a] 1 bar = 10^5Pa = 100 kPa = 0,1 MPa; 1 Pa = 1 N/m^2.

4.2 Graphic symbols used in this International Standard conform to the requirements of ISO 1219-1.

5 Test equipment

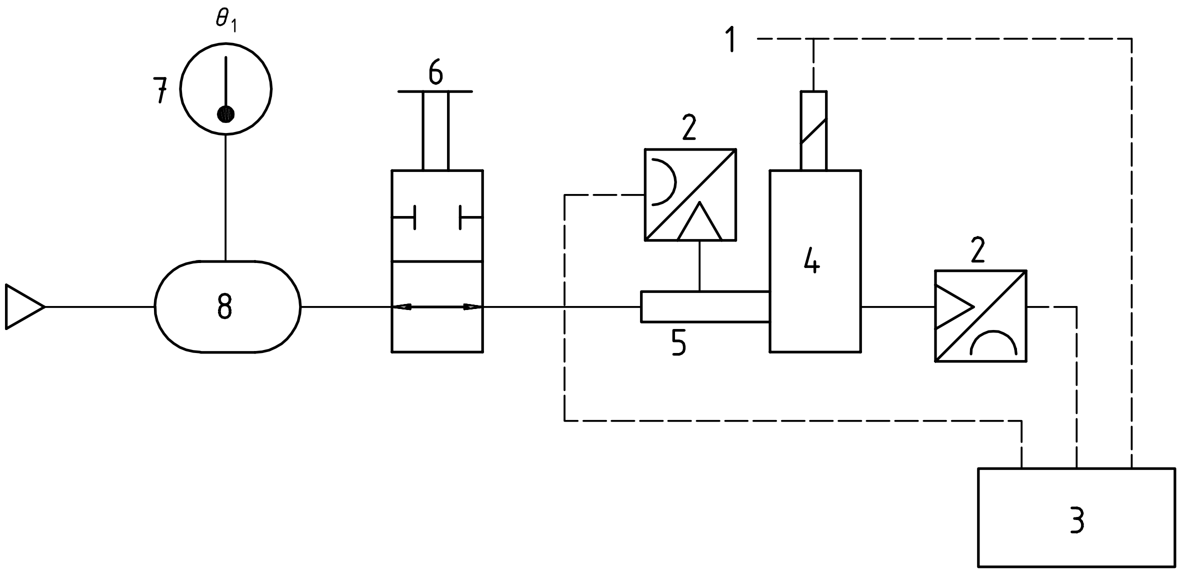
5.1 Basic test equipment

The basic test equipment shall be as shown in Figures 1 and 2.

5.2 Pressure measuring tubes

5.2.1 A straight pressure measuring tube shall be made to thread into the valve inlet port, as well as into the valve pilot port when applicable, and shall be made in accordance with 5.5 of ISO 6358:1989.

5.2.2 Select and attach pressure measuring tubes to the test valve whose threads correspond to each port size of the valve flow path, and to the valve pilot port when applicable.



Key

1 Control signal
2 Pressure transducers
3 Output recording device(s)
4 Valve under test
5 Pressure measuring tube in accordance with ISO 6358
6 Shut-off valve (optional)
7 Thermometer
8 Supply reservoir

Figure 1 — Test equipment for electrically-operated valves