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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 22107-2025

Replacing GB/T 22107-2008

**Pneumatic fluid power - Directional control valves -
Measurement of shifting time
(English Translation)**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 22107-2008 "Measurement of switching time of pneumatic directional control valves" and is consistent with GB/T 22107-2008.

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Increased the scope of application of the standard (see Chapter 1);
- Added the terms and definitions "exhaust switching time", "filling switching time" and "non-exhaust switching time" (see 3.4 to 3.6);
- Changed the symbols and units and the standards they comply with (see Chapter 4, Chapter 4 of the 2008 edition);
- "Throttle valve" and "flow sensor" were added to the basic test device to measure the switching time (non-exhaust), and "gas control" was added.

Requirements for basic test equipment for "valve" (see 5.1);

- Changed the requirements for "pressure sensor" (see 5.3, 2008 edition 5.3);
- Increased the temperature requirements for air in the gas tank (see 5.4.2);
- Changed the steady-state voltage of DC solenoid valve and AC solenoid valve (see 5.5.2, 5.5.3, 5.5.2, 5.5.3 of the 2008 edition);
- Added the requirements for switching time changes caused by the reverse electromotive force of the test device (see 5.5.4);
- Added test requirements for bistable valves (see 5.5.5);
- Added specific requirements for the use of data recording systems (see 5.6.1);
- Changed the time tolerance value (see Table 2, Table 2 of the 2008 edition);
- Changed the test procedure for switching time of pneumatic directional control valves (see Chapter 7, Chapter 7 of the 2008 edition);
- Added the calculation method of non-exhaust switching time (see 8.5).

This document is modified to adopt ISO 12238:2023 "Measurement of switching times of pneumatic directional control valves".

This document has the following structural adjustments compared to ISO 12238:2023.

- 7.4 a)~c) correspond to 7.4.1~7.4.3 of ISO 12238:2023 respectively;
- 7.5 a)~c) correspond to 7.5.1~7.5.3 of ISO 12238:2023 respectively;
- 7.6 a) and b) correspond to 7.6.1 and 7.6.2 of ISO 12238:2023 respectively;
- 7.7 a)~c) correspond to 7.7.1~7.7.3 of ISO 12238:2023 respectively.

The technical differences between this document and ISO 12238:2023 and their reasons are as follows.

--- ISO 5598 (see Chapter 3) has been replaced by the normative reference GB/T 17446 to adapt to my country's technical conditions and improve the reliability of the product.

Operability;

--- ISO 1219-1 (see 4.2) has been replaced by the normative reference GB/T 786.1 to adapt to my country's technical conditions and improve operability.

Sexuality;

--- Replaced ISO 6358-1 (see 5.2.1) with the normative reference GB/T 14513.1 to adapt to my country's technical conditions and improve Operability.

--- Changed the specific requirements for the use of data recording systems (see 5.6.1) to

adapt to my country's technical conditions and improve operability.

The following editorial changes were made to this document.

- Change the title of Chapter 4 to "Symbols and Units";
- Deleted the unit "bar";
- Changed the description of Figure 1 and Figure 2, Caption 6.

1 Scope

This document establishes the measurement of electrically controlled directional control valves (hereinafter referred to as "electrically controlled valves") and pneumatically controlled directional control valves (hereinafter referred to as "pneumatic Test procedure for switching time of "control valve").

This document applies to the measurement of monostable and bistable pneumatic directional control valves with 2 or 3 working positions.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 786.1 Fluid power systems and components Graphical symbols and circuit diagrams Part 1: Graphical symbols (GB/T 786.1-2021, ISO 1219-1:2012, IDT) GB/T 14513.1 Determination of flow characteristics of compressible fluid components for pneumatic use Part 1: General rules and regulations for steady-state flow Test method (GB/T 14513.1-2017, ISO 6358-1:2013, IDT) GB/T 17446 Fluid power systems and components vocabulary (GB/T 17446-2024, ISO 5598:2020, MOD) ISO 80000-1 Quantities and units - Part 1: General

3 Terms and definitions

The terms and definitions defined in GB/T 17446 and the following apply to this document.

Switching time shifting time the time interval from when the control signal (electrical or pneumatic) of the tested valve changes to when the corresponding outlet pressure changes as required.

NOTE: Depending on the type of valve, the "opening switching time" or "reset switching time" refers to the time it takes to switch to the exhaust position or the non-exhaust position.

In this document, the terms "exhaust switching time", "fill switching time" and "non-exhaust switching time" are used. Depending on the type of valve, the corresponding the start switching time or reset switching time.

shiftingon-time

Switching time when a control signal is applied to the valve under test.

Reset switching time shiftingoff-time Switching time when the control signal of the tested valve is cancelled.

The time required for the test valve to switch to the working port exhaust position and change the outlet pressure by 10%.

Inflating switching time shifting time (fil) the time required for the tested valve to switch to the working port position to inflate the connected component or system and change the outlet pressure by 10%.