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

GB/T 18271.2-2017

**Process measurement and control devices -- General methods
and procedures for evaluating performance -- Part 2: Tests
under reference conditions**

(English Translation)

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Foreword

GB/T 18271 "Process measurement and control devices - General methods and procedures for evaluating performance" is currently planned to be issued as follows.

- Part 1.General considerations;
- Part 2.Tests under reference conditions;
- Part 3.Tests for the effects of influence quantities;
- Part 4.Evaluation report content.

This Part is Part 2 of GB/T 18271.

This Part is drafted in accordance with the rules given in GB/T 1.1-2009.

This Part replaces GB/T 18271.2-2000 "Process measurement and control devices - General methods and procedures for evaluating performance - Part

2 Tests under reference conditions". Compared with GB/T 18271.2-2000, the

main technical changes of this Part are as follows.

- UPDATE normative references; replace GB/T 17212-1998 with GB/T 2900.56-2008 (see Clause 2; Clause 2 of the 2000 edition);
- Delete the terms "device under test", "set point", "adjustability", "transient overshoot", and "expected event" and definitions (3.1, 3.6, 3.15, 3.21, 3.22

of the 2000 edition);

- Adjust the term "maximum measured error" to "measured error" (see 3.7;

3.9 of the 2000 edition);

- Modify the definitions of the terms "non-repeatability" and "step response time" (see 3.10, 3.16; 3.12, 3.19 of the 2000 edition);
- ADD the terms "type test", "performance evaluation", "routine test", and "sample test" and definitions (see 3.19~3.22);
- ADD the categories of "complete tests" and "simplified tests" to Tables 1 and 2 (see Tables 1 and 2);
- Modify the typical air flow characteristic curve of Figure 6 (see Figure 6 of the 2000 edition);
- ADD the requirement to verify one-directional drift or random drift to long-term drift (see 7.2).

This Part, using translation method, is identical to IEC 61298-2:2008 "Process measurement and control devices - General methods and procedures for evaluating performance - Part 2. Tests under reference conditions".

China's documents which have a consistent correspondence with the international documents normatively referenced in this Part are as follows.

- GB/T 2900.79-2008 Electrotechnical terminology - Electrical and electronic measurements and measuring instruments - Part 3. Types of electrical measuring instruments [IEC 60050(300-313):2001, IDT]
- GB/T 2900.89-2012 Electrotechnical terminology - Electrical and electronic measurements and measuring instruments - Part 2. General terms relating to electrical measurements [IEC 60050(300-312):2001, IDT]
- GB/T 2900.90-2012 Electrotechnical terminology - Electrical and electronic measurements and measuring instruments - Part 4. Specific terms according to the type of instruments [IEC 60050(300-314):2001, IDT]
- GB 4793.1-2007 Safety requirements for electrical equipment for

measurement, control, and laboratory use - Part 1.General requirements
(IEC 61010-1:2001, IDT)

This Part was proposed by China Machinery Industry Federation.

This Part shall be under the jurisdiction of National TC 124 on Industrial Process Measurement, Control and Automation of SAC (SAC/TC 124).

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The previous editions of the standard replaced by this Part were released as follows.

- GB/T 18271.2-2000.

Process measurement and control devices - General
methods and procedures for evaluating performance -
Part 2.Tests under reference conditions

1 Scope

GB/T 18271 specifies general methods and procedures for conducting tests and reporting on the functional and performance characteristics of process measurement and control devices. The tests are applicable to any such devices characterized by their own specific input and output variables, and by the specific relationship (transfer function) between the inputs and outputs, and include analogue and digital devices. For devices that require special tests, GB/T 18271 should be used, together with any product specific standard specifying special tests.

2 Normative references

The following documents are indispensable for the application of this document.

For the dated references, only the editions with the dates indicated are

applicable to this document. For the undated references, the latest edition (including all the amendments) are applicable to this document.

GB/T 2900.56-2008 Electrotechnical terminology - Control technology (IEC 60050-351.2006, IDT)

3 Terms and definitions

The terms and definitions defined in GB/T 2900.56-2008, GB/T 2900.77-2008, and IEC 60050 (300) and the following ones apply to this document.

Algebraic difference between the values of the upper and lower limits of the measuring range.

4 Accuracy related factors

Generally, unless otherwise specified in the test programme, the test for accuracy related factors shall be carried out with the adjustments set at the settings A, B, C, D, listed below, and in accordance with Table 1 whenever the span and/or the lower range value adjustments are adjustable further than the adjustments for the manufacturing tolerances.

5 Dynamic behaviour

Step tests permit the measurement of the dead time, and give a qualitative evaluation of the non-linearity of the DUT.

Testing shall be carried out with the span adjusted to the approximate mean of the maximum and minimum span, and with the lower range value set approximately at the mid-point of its permissible range of adjustment.

6 Functional characteristic

These tests are simple electrical safety checks. Their inclusion is not intended as a formal assessment of the safety of the equipment, nor are the required test results intended as a design specification.

The DUT shall be set up for normal operation. The insulation resistance of each input and output circuit shall be measured if it is insulated from earth.