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

GB/T 18271.1-2017

Replacing GB/T 18271.1-2000

**Process measurement and control devices -- General methods
and procedures for evaluating performance -- Part 1: General
considerations**

过程测量和控制装置 通用性能评定方法和程序 第1部分：总则

(English Translation)

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Foreword

GB/T 18271 "Universal Performance Evaluation Methods and Procedures for Process Measurement and Control Devices" currently plans to release the following parts.

- Part 1. General Provisions;
- Part 2. Test under reference conditions;
- Part 3. Experiments on the influence of the quantity;
- Part 4. The content of the assessment report.

This part is Part 1 of GB/T 18271.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 18271.1-2000 "General performance evaluation methods and procedures for process measurement and control devices. Part 1.

General Principles, compared with GB/T 18271.1-2000, the main technical changes are as follows.

- Updated normative references, replacing GB/T 17212-1998 with GB/T 2900.56-2008 (see Chapter 2, 2000) Chapter 2 of the edition);
- Removed the terms "tested device" "setpoint" "inconsistency" "adjustability" "time lag" "rise time" "settling time" "stepping Time", "time constant" and "instantaneous overshoot" and definitions (see 3.1, 3.6, 3.15 ~ 3.21 of the 2000 edition);
- Adjust the term "maximum measurement error" to "measurement error" (see 3.7; 3.9 in the 2000 edition);

- Modified the definition of the term "non-repeatability" (see 3.9; 3.12 in the 2000 edition);
- Added the term "type test" and definition (see 3.14);
- Added an overview of the reproducibility of the test and the comparability of the test results (see 5.3);
- Removed the content of rated value in the load condition (see 6.3.1 of the 2000 edition);
- Increased the requirements for pressure limits in the load content of pneumatic devices (see 6.3);
- Removed the requirement in the test sequence that the calibration value of the device under test should be verified before each test and included in the report (See 7.7 in the 2000 version);
- Removed references (see Appendix A of the 2000 edition).

The translation method used in this part is equivalent to the use of IEC 61298-1.:2008 "General performance evaluation methods and procedures for process measurement and control devices Part 1. General Provisions.

The Chinese documents that have a consistent correspondence with the normatively cited international documents in this section are as follows.

- GB/T 2900.79-2008 Electrotechnical terminology Electrical and electronic measurement and instrumentation Part 3: Electrical measurement instrumentation Type [IEC 60050 (300-313)..2001, IDT]
- GB/T 2900.89-2012 Electrotechnical terminology Electrical and electronic measurement and instrumentation Part 2: General terminology for electrical measurement [IEC 60050 (300-312)..2001, IDT]
- GB/T 2900.90-2012 Electrotechnical terminology Electrical and electronic measurement and instrumentation Part 4: Special techniques for various types of instruments Language [IEC 60050 (300-314)..2001, IDT]
- GB/T 3101-1993 General principles on quantities, units and symbols (ISO 31-0.:1992, EQV)
- GB/T 3102 (all parts) quantity and unit [ISO 31 (all parts)].

1 Scope

GB/T 18271 stipulates a general method for performing functional and performance characteristics tests of process measurement and control devices and preparing test reports Laws and procedures. The test methods and procedures specified in GB/T 18271 apply to any kind of test or any type of process measurement and control equipment Set. These experiments are applicable to any process with specific input and output variables

and a specific relationship (transfer function) between input and output variables.

Process measurement and control devices, including analog devices and digital devices. For devices that require special test items, it should be in accordance with GB/T 18271 Combined with the product standards specifically stipulated for such special test items, the test is conducted.

This part of GB/T 18271 discusses the general principles applicable to all parts of GB/T 18271.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this article Pieces. For the cited documents without date, the latest version (including all amendments) applies to this document.

GB/T 2900.56-2008 Electrical engineering terminology control technology (IEC 60050-351.:2006, IDT)

GB/T 2900.77-2008 Electrotechnical terminology Electrical and electronic measurement and instrumentation Part 1: General terminology for measurement [IEC 60050 (300-311)..2001, IDT]

GB/T 18271.2-2017 General performance evaluation methods and procedures for process measurement and control devices Part 2: Under reference conditions Test (IEC 61298-2.:2008, IDT)

GB/T 18271.4-2017 Process measurement and control device general performance assessment methods and procedures Part 4: Evaluation report Content (IEC 61298-4.:2008, IDT)

ISO 31 (all parts) Quantities and units

3 Terms and definitions

GB/T 2900.56-2008, GB/T 2900.77-2008 and IEC 60050 (300) and the following terms and definitions apply In this document.

3.1 Variable

The quantity or state whose value is variable and usually measurable (eg temperature, flow, speed, signal, etc.).

Note: Rewrite GB/T 2900.56-2008, definition 351-21-01.

3.2 Signal

Use one or more parameters to represent one or more physical variables of variable information.

Note: Rewrite GB/T 2900.56-2008, definition 351-21-51.

3.3 Range

The numerical interval defined by the upper and lower limits of the quantity studied.

Note: Rewrite GB/T 2900.56-2008, definition 351-27-11.

3.4 Span

The algebraic difference between the upper and lower limits of the measurement range.
[GB/T 2900.77-2008, definition 311-03-13]

3.5 Inaccuracy

Under the specified conditions, the maximum positive deviation and negative deviation from the specified characteristic curve observed when testing a device according to the specified procedure deviation.

Note: For the definition of accuracy, see GB/T 2900.77-2008, definition 311-06-08.

3.6 Error

The algebraic difference between the displayed value of the measured variable and the comparison value.

Note 1: Rewrite GB/T 2900.56-2008, definition 351-27-04.

Note 2: When the indicated value is greater than the comparison value, the error is positive. The error is generally expressed as a percentage of the corresponding ideal range.

3.7 Measured error

The maximum positive or negative error of the average value of the upstroke or downstroke at each measurement point.

3.8 Non-linearity

Linearity deviation.

Note 1: For the definition of linearity, see GB/T 2900.77-2008, definition 311-06-05.

Note 2: Non-linearity does not include hysteresis.