

ICS 25.040.40; 35.240.50
CCS N 10



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

GB/T 20730.1-2024

Replacing GB/T 20730.1-2006

**Instruments with analogue inputs and two-or multi-state
outputs for use in industrial-process control systems - Part 1:
Methods for evaluating performance
(English Translation)**

Issued on: September 29, 2024

Implemented on: April 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 General test conditions	
4.1 File Information	
4.2 Electrical safety	
4.3 Installation	
4.4 Supply conditions	
5 General test procedures and precautions	
5.1 Verification of calibration performed prior to delivery	
5.2 Set point	
5.3 Switching Difference	
6 Test methods and procedures	
6.1 Tests under reference conditions	
6.2 Tests on the influence of influence quantities	
6.3 Other tests	
7 Multi-bit output	
7.1 Function	
7.2 Test	
8 General Observations	11
8.1 Protective coating	
8.2 Tools and Equipment	
9 Test Report and Test Summary Table	
10 Partial Assessment	
References	

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 is Part 1 of GB/T 20730 "Instruments with analog input and two or more digit output for industrial process control systems".

GB/T 20730 has published the following parts.

- Part 1: Performance evaluation method;
- Part 2: Inspection and routine test guidance.

This document replaces GB/T 20730.1-2006 "Analog input two-digit or multi-digit output instruments for industrial process control systems Part 1 Compared with GB/T 20730.1-2006, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Changed the terms and definitions (see 3.2, 3.3, 3.2, 3.3 of the 2006 edition);
- Added "General Reference Documents" (see 4.1.1);
- Changed the titles of 4.1.2, 4.2, and 6.2.10 (see 4.1.2, 4.2, 6.2.10, 4.1, 4.2, 6.2.10 of the 2006 edition);
- Added "General requirements" (see 6.1.1.1);
- Deleted the common mode interference and series mode interference content (see 6.2.12, 6.2.13 of the 2006 edition);
- Changed "radiated electromagnetic field interference" to "electromagnetic field" and changed the corresponding test requirements (see 6.2.16, 2006 edition 6.2.16);
- Deleted the design characteristics content (see 8.2 of the 2006 edition);
- Changed the test items, test methods and report content examples (see Table 1, Chapter 9 of the 2006 edition);
- Deleted the contents of daily maintenance, adjustment and repair (see 10.1 and 10.2 of the 2006 edition).

This document is equivalent to IEC 61003-1:2016 "Industrial process control system analog input two or more output instruments Part 1 Performance evaluation method.

The following minimal editorial changes were made to this document.

- In order to coordinate with the existing standards, the name of the standard is changed to "Analog Input Two-Bit or Multi-Bit Output Instruments for Industrial Process Control Systems Part 1: Performance evaluation methods.

Introduction

GB/T 20730 "Analog input two-digit or multi-digit output instruments for industrial process control systems" consists of two parts.

--- Part 1: Performance evaluation method. The purpose is to give industrial process instruments using analog measured values and two or more output Uniform terminology and test methods for performance evaluation of process control system devices.

--- Part 2: Inspection and routine test guidelines. The purpose is to give inspection and routine test guidelines for electric and pneumatic instruments with two or more outputs.

Guidelines for inspection and routine testing.

Industrial process control systems use analog input two or Multi-digit output instruments
Part 1: Performance evaluation methods

1 Scope

This document is applicable to pneumatic and electric industrial process instruments whose measured values are continuous signals such as mechanical signals (position, force, etc.) or standard electrical signals.

meter or control device.

These instruments or process control system devices can act as controllers or switching devices for alarms and other similar functions.

Electronic product safety issues may only affect a small number of the products covered by this document and therefore are not addressed in this document.

This document is intended for the performance evaluation of industrial process instrumentation or process control system devices that use analog measured values and two or more bit outputs.

Uniform terminology and test methods.

Considerations beyond performance are discussed in Chapter 10.

2 Normative references

The contents of the following documents constitute 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 18271.1-2017 General performance evaluation methods and procedures for process measurement and control devices Part 1: General (IEC 61298-1:2008, 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 18271.3-2017 General performance evaluation methods and procedures for process measurement and control devices Part 3: Influence of influencing quantities Test (IEC 61298-3:2008, IDT) IEC 60050 (300-311) International Electrotechnical Vocabulary Electrical and Electronic Measurement and Instrumentation Part 311: General Terms for Measurement Note. GB/T 2900.77-2008 Electrical terminology Electrical and electronic measurements and instrumentation Part 1: General terminology for measurement [IEC 60050 (300-

311).2001, IDT]

IEC 60050 (300-312) International Electrotechnical Vocabulary Electrical and Electronic Measurements and Instrumentation Part 312: General Techniques for Electrical Measurements Note. GB/T 2900.89-2012 Electrical terminology Electrical and electronic measurements and instrumentation Part 2: General terminology for electrical measurements [IEC 60050 (300-

312).2001, IDT]

IEC 60050 (300-313) International Electrotechnical Vocabulary Electrical and Electronic Measurement and Instrumentation Part 313: Types of Electrical Measuring Instruments Note. GB/T 2900.79-2008 Electrical terminology Electrical and electronic measurement and instrumentation Part 3: Types of electrical measuring instruments [IEC 60050 (300-313).2001, IDT]