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# INTERNATIONAL STANDARD

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**Industrial-process control systems - Methods of evaluating the performance of  
valve positioners with pneumatic outputs**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Methods of evaluating the performance  
of valve positioners with pneumatic outputs**

FOREWORD

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IEC 61514 has been prepared by subcommittee 65B: Devices, of IEC technical committee 65: Industrial-process measurement and control. It is an International Standard.

This second edition cancels and replaces the first edition published in 2000. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) in 6.6.8 and Table 5, the magnetic field has been changed from 100 A/m to of 30 A/m (Mean Root Square);
- b) 6.10.4 and Figure 9 have been modified for better understandability;

c) in 7.4, the reference to IEC 61187 has been deleted and replaced with a new Table 4: Document information.

The text of this International Standard is based on the following documents:

Draft	Report on voting
65B/1309/FDIS	65B/1321/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

## 1 Scope

This International Standard specifies tests designed to determine the static and dynamic performance of single-acting or double-acting analogue positioners. The tests apply to positioners which receive standard analogue input signals (as specified in IEC 60381-1, IEC 60381-2 and IEC 60382) and have a pneumatic output.

Positioners with pulsed or digital input signals, positioners with digital controllers and positioners with pulsed outputs are outside the scope of this document.

Testing is conducted either on a positioner alone, independently of an actuator, or on a positioner mounted and connected to a specific actuator, as a combined unit. The text makes clear where different approaches are required.

The methods of evaluation given in this document are intended for use by manufacturers to determine the performance of their products, and by users, or independent testing establishments, to verify manufacturers' performance specifications.

The closest liaison between the evaluating body and the manufacturer is indispensable during the tests, including the possibility for the manufacturer to influence the test programme based on the manufacturer's specifications for the instrument and comment on both the test programme and the results.

This document is intended to provide definitions of positioner elements, actions, and characteristics, to specify uniform methods of measuring performance errors and effects of influence quantities on those characteristics, and to describe methods of reporting and evaluating the results of the measurement data obtained.

The test conditions described in this publication (for example range of ambient temperatures and power supply) relate to conditions which commonly arise in use. Consequently, the values specified are used where no other values are specified by the manufacturer or user. If other values are used, they will be stated. It is recognized that the manufacturer's specifications and instructions for installation and operation apply during all steps.

The tests specified in this document are not necessarily sufficient for instruments specifically designed for unusually arduous conditions. Conversely, a reduced series of tests can serve adequately for instruments designed to perform within a more limited range of conditions.

When a full evaluation, in accordance with this document, is not required or possible, only the tests which are required are performed and the results reported in accordance with the relevant parts of this document. In such cases, the test report will state that it does not cover the full number of tests specified herein.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-311, *International electrotechnical vocabulary - Electrical and electronic measurements - Part 311: General terms relating to electrical measurements*

IEC 60050-351, *International electrotechnical vocabulary - Part 351: Control technology*

IEC 60068-2-1, *Environmental testing - Part 2-1: Tests - Test A: Cold*

## Bibliography

IEC 60079 (all parts), *Explosive atmospheres*

IEC 60534-1, *Industrial-process control valves - Part 1: Control valve terminology and general considerations*

IEC 60534-6-1, *Industrial-process control valves - Part 6: Mounting details for attachment of positioners to control valves - Section 1: Positioner mounting on linear actuators*

IEC 60534-6-2, *Industrial-process control valves - Part 6-2: Mounting details for attachment of positioners to control valves - Positioner mounting on rotary actuators*

IEC 60534-9, *Industrial process control valves - Part 9: Test procedure for response measurements from step inputs*

IEC 61987-24-1, *Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 24-1: List of Properties (LOPs) of positioners and I/P converters for electronic data exchange*

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