SLOVENSKI STANDARD
SIST EN 61514:2002

01-september-2002

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

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

Systeme der industriellen Prozesstechnik - Methoden der Beurteilung des Betriebsverhaltens von Ventilstellungsreglern mit pneumatischen Ausgängen

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Systèmes de commande des processus industriels - Méthodes d'évaluation des performances des positionneurs de vannes à sorties pneumatiques

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Ta slovenski standard je istoveten z: **EN 61514:2002**

ICS:

23.060.40	Tlaļ ni regulatorji	Pressure regulators
25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control

SIST EN 61514:2002 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD **EN 61514**

NORME EUROPÉENNE

EUROPÄISCHE NORM April 2002

ICS 23.060;25.040.40

English version

Industrial-process control systems - Methods of evaluating the performance of valve positioners with pneumatic outputs
(IEC 61514:2000, modified)

Systèmes de commande des processus industriels - Méthodes d'évaluation des performances des positionneurs de vannes à sorties pneumatiques (CEI 61514:2000, modifiée)

Systeme der industriellen Prozesstechnik - Methoden der Beurteilung des Betriebsverhaltens von Ventilstellungsreglern mit pneumatischen Ausgängen (IEC 61514:2000, modifiziert)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Ref. No. EN 61514:2002 E

SIST EN 61514:2002

Foreword

The text of the International Standard IEC 61514:2000, prepared by SC 65B, Devices, of IEC TC 65, Industrial-process measurement and control, together with the common modifications prepared by SR 65B, was submitted to the formal vote and was approved by CENELEC as EN 61514 on 2001-12-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2002-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2004-12-01

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Endorsement notice

The text of the International Standard IEC 61514:2000 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

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1 Scope and object

Replace the first paragraph by :

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This European Standard specifies tests designed to determine the static and dynamic performance of single-acting or double-acting analogue positioners. The tests may be applied to positioners, which receive standard analogue input signals (as specified in IEC 60381 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 standard.

Delete the note.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-161	1990	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
IEC 60068-2-1	1990	Environmental testing Part 2: Tests - Tests A: Cold	EN 60068-2-1	1993
IEC 60068-2-2	1974	Part 2: Tests - Test B: Dry heat	EN 60068-2-2 [1)]	1993
IEC 60068-2-6 + corr. March	1995 1995	Part 2: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	1995
IEC 60068-2-31	1969	Part 2: Tests - Test Ec: Drop and topple, primarily for equipment-type specimens	EN 60068-2-31 [2)]	1993
IEC 60068-2-56	1988	Part 2: Tests - Test Cb: Damp heat, steady state, primarily for equipment	HD 323.2.56 S1	1990
IEC 60381-1	1982	Analogue signals for process control systems Part 1: Direct current signals	HD 452.1 S1	1984
IEC 60382	1991	Analogue pneumatic signal for process control systems	EN 60382	1993
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 60902	1987	Industrial-process measurement and control - Terms and definitions	-	-
IEC 61000-4-3 (mod)	1995	Electromagnetic compatibility (EMC) Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3 [3)]	1996

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[1)] EN 60068-2-2 includes supplement A:1976 to IEC 60068-2-2.
[2)] EN 60068-2-31 includes A1:1982 to IEC 60068-2-31.
[3)] EN 61000-4-3:1996 is superseded by EN 61000-4-3:2002 which is based on IEC 61000-4-3:2002.

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Publication	Year	Title	EN/HD	Year
IEC 61000-4-4	1995	Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	1995
IEC 61000-4-5	1995	Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995
IEC 61000-4-8	1993	Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	1993
IEC 61010-1 (mod)	1990	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements	EN 61010-1 [4)]	1993
IEC 61032	1997	Protection of persons and equipment by enclosures - Probes for verification	EN 61032	1998
IEC 61187 (mod)	1993	Electrical and electronic measuring equipment - Documentation	EN 61187 + corr. March	1994 1995
IEC 61298-4	1995	Process measurement and control devices - General methods and procedures for evaluating performance Part 4: Evaluation report content	EN 61298-4	1995

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[4)] EN 61010-1:1993 is superseded by EN 61010-1:2001 which is based on IEC 61010-1:2001.

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CEI
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Première édition
First edition
2000-04

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INDUSTRIAL-PROCESS CONTROL SYSTEMS –

Methods of evaluating the performance of valve positioners with pneumatic outputs

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

The text of this standard is based on the following documents:

FDIS	Report on voting
65B/394/FDIS	65B/403/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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INDUSTRIAL-PROCESS CONTROL SYSTEMS –

Methods of evaluating the performance of valve positioners with pneumatic outputs

1 Scope and object

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

NOTE For positioners with pulsed or digital input signals, equivalent criteria may be applied. The methods described may not fully apply to positioners with digital controllers or positioners with pulsed outputs.

Testing may be 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 standard 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 should be maintained between the evaluating body and the manufacturer. Note should be taken of the manufacturer's specifications for the instrument when the test programme is being decided, and the manufacturer should be invited to comment on both the test programme and the results. His comments on the results should be included in any report produced by the testing organization.

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This standard 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 shall be used where no other values are specified by the manufacturer or user. If other values are used, they should be stated. It is recognized that the manufacturer's specifications and instructions for installation and operation should apply during all steps.

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

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

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2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of IEC 61514. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on IEC 61514 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(161):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 60068-2-1:1990, *Environmental testing – Part 2: Tests. Test A: Cold*

IEC 60068-2-2:1974, *Environmental testing – Part 2: Tests. Test B: Dry heat*

IEC 60068-2-6:1995, *Environmental testing – Part 2: Tests. Test Fc: Vibration (sinusoidal)*

IEC 60068-2-31:1969, *Environmental testing – Part 2: Tests. Test Ec: Drop and topple, primarily for equipment-type specimens*

IEC 60068-2-56:1988, *Environmental testing – Part 2: Tests. Test Cb: Damp heat, steady state, primarily for equipment*

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IEC 60381-1:1982, *Analogue signals for process control systems – Part 1: Direct current signals*

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IEC 60382:1991, *Analogue pneumatic signal for process control systems*

IEC 60529:1989, *Degree of protection provided by enclosures (IP Code)*

IEC 60902:1987, *Industrial-process measurement and control – Terms and definitions*

IEC 61000-4-3:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency electromagnetic field immunity test*

IEC 61000-4-4:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test*

IEC 61000-4-5:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 5: Surge immunity test*

IEC 61000-4-8:1993, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 8: Power frequency magnetic field immunity test*

IEC 61010-1:1990, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61187:1993, *Electrical and electronic measuring equipment – Documentation*

IEC 61298-4:1995, *Process measurement and control devices – General methods and procedures for evaluating performance – Part 4: Evaluation report content*

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3 Definitions

For the purpose of this standard, the definitions given in IEC 60902 and IEC 60050(161) shall be applied, in addition to the following definitions.

3.1
positioner
position controller connected to the moving part of a final control element or its actuator; automatically adjusts its output signal *Y* to the actuator in order to maintain a desired travel signal *X* that bears a predetermined relationship to the input signal *W*

NOTE In this standard, only positioners with pneumatic output signals *Y* are considered. The input signal *W* may be an air pressure (pneumatic positioner), or an electric current or voltage (electro-pneumatic positioner), or a pulse or digital signal.

3.1.1
single-acting positioner
positioner (see figure 1a) having one output signal *Y* which acts on one side of the actuator. The returning force for the actuator is usually provided by springs

3.1.2
double-acting positioner
positioner (see figure 1b) providing two output signals Y_D and Y_R connected to opposite sides of the actuator diaphragm or piston

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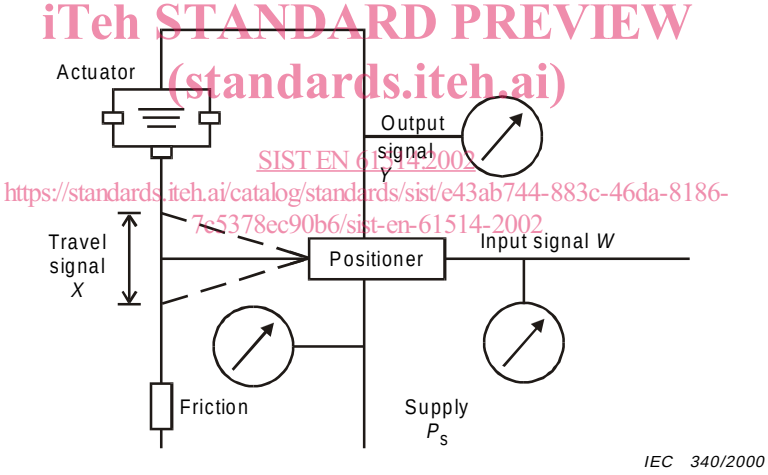

Figure 1a – Single-acting positioner/actuator

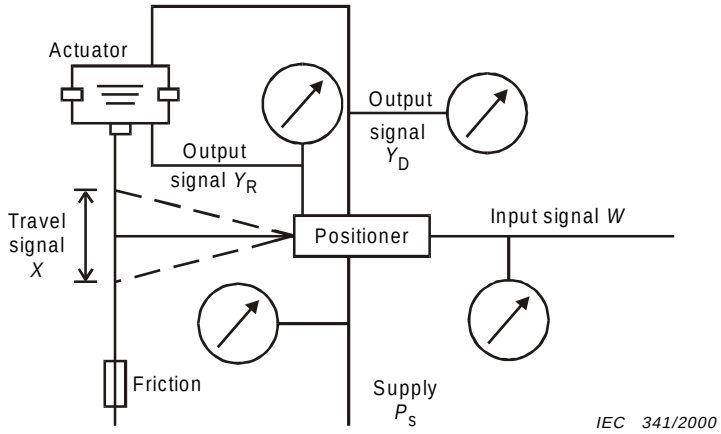

Figure 1b – Double-acting positioner/actuator

Figure 1 – Single- and double-acting positioner/actuator