

Industrial-process control valves —

Part 4: Inspection and routine testing

The European Standard EN 60534-4:2006 has the status of a British Standard

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National foreword

This British Standard was published by BSI. It is the UK implementation of EN 60534-4:2006. It is identical with IEC 60534-4:2006. It supersedes BS 5793-4:1987 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee GEL/65, Measurement and control, to Subcommittee GEL/65/2, Elements of systems.

A list of organizations represented on GEL/65/2 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Industrial-process control valves
Part 4: Inspection and routine testing
(IEC 60534-4:2006)**

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(IEC 60534-4:2006)

This European Standard was approved by CENELEC on 2006-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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.

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CENELEC

European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 65B/588/FDIS, future edition 3 of IEC 60534-4, prepared by SC 65B, Devices, of IEC TC 65, Industrial-process measurement and control, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60534-4 on 2006-09-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
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- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-09-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60534-4:2006 was approved by CENELEC as a European Standard without any modification.

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INDUSTRIAL-PROCESS CONTROL VALVES –

Part 4: Inspection and routine testing

1 Scope

This part of IEC 60534 specifies the requirements for the inspection and routine testing of control valves manufactured in conformity with the other parts of IEC 60534.

This standard is applicable to valves with pressure ratings not exceeding Class 2500. The requirements for actuators apply only to pneumatic actuators.

This standard does not apply to the types of control valves where radioactive service, fire safety testing, or other hazardous service conditions are encountered. If a standard for hazardous service conflicts with the requirements of this standard, the standard for hazardous service should take precedence.

NOTE This standard can be extended to higher pressure ratings by agreement between purchaser and manufacturer.

2 Normative references

The following referenced documents are indispensable for the application 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 60534 (all parts), *Industrial-process control valves*

IEC 61298 (all parts), *Process measurement and control devices – General methods and procedures for evaluating performance*

3 Terms and definitions

For the purposes of this document, the following definitions, as well as those given in IEC 60534-1 and other parts of IEC 60534, apply.

3.1

bench range

range of pressures to the actuator within which the nominal travel is performed in both directions, with no pressure in the valve, but including friction forces

NOTE The actuator operating range, i.e. when the valve is installed under actual process conditions, will be different from the bench range.

3.2

dead band

finite range of values within which reversal of the input variable does not produce any noticeable change in the output variable (see Figure 1)

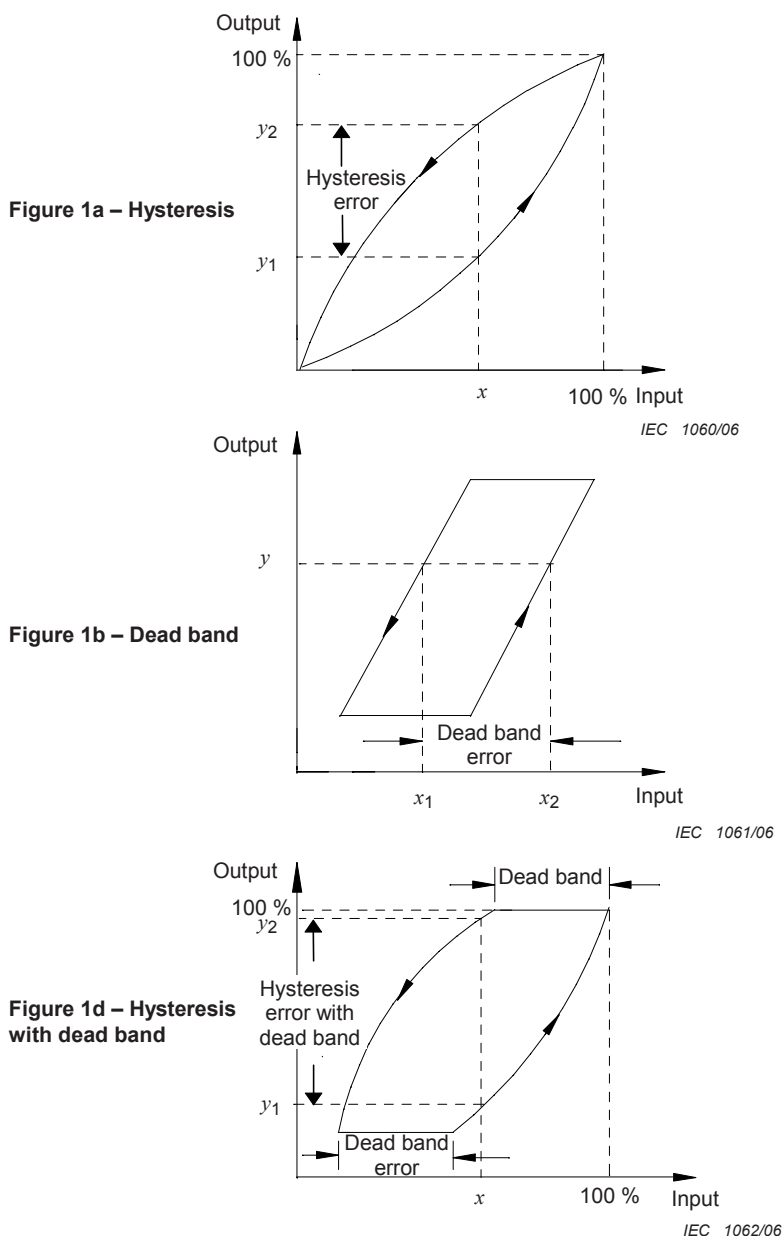


Figure 1 – Hysteresis and dead band

3.3

dead band error

maximum value of the span of the dead band (over the measuring range)

3.4

hysteresis

property of a device or instrument whereby it gives different output values in relation to its input values depending on the directional sequence in which the input values have been applied (see Figure 1)

3.5

hysteresis error

maximum deviation between the two calibration curves of the measured variable as obtained by an upscale going traverse and a downscale going traverse over the full range and subtracting the value of the dead band

3.6**type inspection and testing**

inspection and testing carried out by the manufacturer in accordance with its own procedures to assess whether products made by the same manufacturing process meet the requirements of the purchase order. The products inspected and tested need not necessarily be the products actually supplied

3.7**actual inspection and testing**

inspection and testing carried out, before delivery, according to the technical requirements of the purchase order, on the products to be supplied or on test units of which the product supplied is part, in order to verify whether these products comply with the requirements of the purchase order

4 Requirements

Each valve shall be submitted to the mandatory tests specified in Table 1.
Supplementary tests given are subject to agreement between manufacturer and purchaser.

Table 1 – Tests

Test	Category	Reference
Shell hydrostatic test	M	4.1 and 5.4
Seat leakage test	M	4.2 and 5.5
Packing test	S	4.3 and 5.6
Rated valve travel (note 1)	M	4.4 and 5.7
Dead band (note 1)	S	4.5 and 5.8
Flow capacity	S	4.6 and IEC 60534-2-3
Flow characteristic	S	4.6 and IEC 60534-2-4
M = Mandatory S = Supplementary NOTE 1 The results of tests of a valve under static conditions in a factory generally do not correspond to performance under working conditions. This standard is intended only to provide guidance for negotiations between manufacturer and purchaser relative to tests of a specific valve.		

4.1 Hydrostatic test

All control valve assemblies, excluding welded on fittings (see 5.4.5), with or without the actuator fitted, shall be subject to a hydrostatic test at the pressure stated in 5.4.

4.2 Seat leakage test

The manufacturer shall advise the minimum achievable leak rate.

Leakage shall be specified by the following code :

X
↓
Leakage class
as shown in Table 3:
I to VI

X
↓
Test fluid
G: air or nitrogen
L: water

X
↓
Test procedure
1 or 2