SLOVENSKI STANDARD

SIST EN 60534-8-4:2007

januar 2007

Regulacijski ventili za industrijske procese - 8-4. del: Šum - Predvidevanje šuma, ki ga proizvaja hidrodinamični pretok (IEC 60534-8-4:2005)

(istoveten EN 60534-8-4:2005)

Industrial-process control valves - Part 8-4: Noise considerations - Prediction of noise generated by hydrodynamic flow (IEC 60534-8-4:2005)

ICS 17.140.20; 23.060.40; 25.040.40

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EUROPEAN STANDARD **EN 60534-8-4**

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ICS 23.060.40; 17.140.20; 25.040.40 Supersedes EN 60534-8-4:1994

English version

Industrial-process control valves
Part 8-4: Noise considerations - Prediction of noise generated by hydrodynamic flow
(IEC 60534-8-4:2005)

Vannes de régulation des processus industriels
Partie 8-4: Considérations sur le bruit - Prévision du bruit généré par un écoulement hydrodynamique
(CEI 60534-8-4:2005)

Stellventile für die Prozessregelung
Teil 8-4: Geräuschbetrachtungen - Vorausberechnung der Geräuschemission für flüssigkeitsdurchströmte Stellventile
(IEC 60534-8-4:2005)

This European Standard was approved by CENELEC on 2005-11-01. 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
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

Ref. No. EN 60534-8-4:2005 E

Foreword

The text of document 65B/556/FDIS, future edition 2 of IEC 60534-8-4, 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 60534-8-4 on 2005-11-01.

This European Standard supersedes EN 60534-8-4:1994.

The noise prediction methods for hydrodynamic flow presented in this standard have been revised. The improvements are mainly in the acoustic efficiency factors for cavitating flow for single orifice, multi-stage and multi-hole trims and in the determination of transmission losses. This revised standard permits the prediction of the noise pressure levels by calculation without the need for coefficients determined by testing.

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)	2006-08-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2008-11-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60534-8-4:2005 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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

Publication	Year	Title	EN/HD	Year
IEC 60534-1	- [1)]	Industrial-process control valves Part 1: Control valve terminology and general considerations	EN 60534-1	2005 [2)]
IEC 60534-8-2	- [1)]	Part 8: Noise considerations Section 2: Laboratory measurement of noise generated by hydrodynamic flow through control valves	EN 60534-8-2	1993 [2)]
IEC 60534-8-3	- [1)]	Part 8-3: Noise considerations - Control valve aerodynamic noise prediction method	EN 60534-8-3	2000 [2)]

[1)] Undated reference.

[2)] Valid edition at date of issue.

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60534-8-4

Deuxième édition
Second edition
2005-08

Vannes de régulation des processus industriels –

Partie 8-4: Considérations sur le bruit – Prévision du bruit généré par un écoulement hydrodynamique

Industrial-process control valves –

Part 8-4: Noise considerations – Prediction of noise generated by hydrodynamic flow

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

INDUSTRIAL-PROCESS CONTROL VALVES –

Part 8-4: Noise considerations – Prediction of noise generated by hydrodynamic flow

FOREWORD

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International Standard IEC 60534-8-4 has been prepared by subcommittee 65B: Devices, of IEC technical committee 65: Industrial-process measurement and control.

This second edition cancels and replaces the first edition published in 1994. This edition constitutes a technical revision.

The noise prediction methods for hydrodynamic flow presented in this standard have been revised. The improvements are mainly in the acoustic efficiency factors for cavitating flow for single orifice, multi-stage and multi-hole trims and in the determination of transmission losses. This revised standard permits the prediction of the noise pressure levels by calculation without the need for coefficients determined by testing. This method is considered accurate within ± 5 dB(A) except in the range of $x_F = x_{Fz} \pm 0{,}1$ when x_{Fz} is calculated using equations 3(a) or (3b) for estimation. More accurate results are possible when x_{Fz} is determined from measurements according to IEC 60534-8-2.

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

FDIS	Report on voting
65B/556/FDIS	65B/560/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 2.

IEC 60534 comprises the following parts, under the general title *Industrial – process control valves*:

Part 1: Control valve terminology and general considerations

Part 2-1: Flow capacity – Sizing equations for fluid flow under installed conditions

Part 2-3: Flow capacity – Test procedures

Part 2-4: Part 2: Flow capacity – Inherent flow characteristics and rangeability

Part 2-5: Flow capacity – Sizing equations for fluid flow through multistage control valves with interstage recovery

Part 3-1: Dimensions – Face-to-face dimensions for flanged, two-way, globe-type, straight pattern and centre-to-face dimensions for flanged, two-way, globe-type, angle pattern control valves

Part 3-2: Dimensions – Face-to-face dimensions for rotary control valves except butterfly valves

Part 3-3: Dimensions – End-to-end dimensions for buttweld, two-way, globe-type, straight pattern control valves

Part 4: Inspection and routine testing

Part 5: Marking

Part 6-1: Mounting details for attachment of positioners to control valves – Positioner mounting on linear actuators

Part 6-2: Mounting details for attachment of positioners to control valves – Positioner mounting on rotary actuators

Part 7: Valve data sheet

Part 8-1: Noise considerations – Laboratory measurement of noise generated by aerodynamic flow through control valves

Part 8-2: Noise considerations – Laboratory measurement of noise generated by hydrodynamic flow through control valves

Part 8-3: Noise considerations – Control valve aerodynamic noise prediction method

Part 8-4: Noise considerations – Prediction of noise generated by hydrodynamic flow

Part 9: Test procedure for response measurements from step inputs

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

The contents of the corrigendum of February 2006 have been included in this copy.

INTRODUCTION

It is valuable to predict the noise levels that will be generated by valves. Safety requirements, such as occupational health standards, require that human exposure to noise be limited. There is also data indicating that noise levels above certain levels could lead to pipe failure or affect associated equipment (see IEC 60534-8-3). Earlier hydrodynamic noise standards relied on manufacturer test data and were neither generic nor as complete as desired.

A valve restricts flow by converting pressure energy into turbulence, heat and mechanical pressure waves in the containing valve body and piping. A small portion of this mechanical vibration is converted into acoustical energy. Most of the noise is retained within the piping system with only a small portion passing through the pipe wall downstream of the valve. Calculation of the energy involved is straightforward. The difficulties arise from determining first the acoustic efficiency of the mechanical energy to noise conversion and then the noise attenuation caused by the pipe wall.