

Pumps - Rotodynamic pumps - Glandless circulators having a rated power input not exceeding 200 W for heating installations and domestic hot water installations - Noise test code (vibro-acoustics) for measuring structure- and fluid-borne noise

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 16644:2014 sisaldab Euroopa standardi EN 16644:2014 ingliskeelset teksti.	This Estonian standard EVS-EN 16644:2014 consists of the English text of the European standard EN 16644:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.12.2014.	Date of Availability of the European standard is 10.12.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 23.080

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Pumps - Rotodynamic pumps - Glandless circulators having a rated power input not exceeding 200 W for heating installations and domestic hot water installations - Noise test code (vibro-acoustics) for measuring structure- and fluid-borne noise

Pompes - Pompes rotodynamiques - Circulateurs sans presse-étoupe de puissance absorbée n'excédant pas 200 W, destinés au chauffage central et à la distribution d'eau chaude sanitaire domestique - Code d'essai acoustique (vibro-acoustique) pour le mesurage des bruits de structure et hydrauliques

Pumpen - Kreiselpumpen - Umwälzpumpen in Nassläuferbauart mit elektrischer Leistungsaufnahme bis 200 W für Heizungsanlagen und Brauchwassererwärmungsanlagen für den Hausgebrauch - Geräuschprüfvorschrift (vibro-akustisch) zur Messung von Körperschall und Flüssigkeitsschall

This European Standard was approved by CEN on 2 November 2014.

CEN 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 CEN-CENELEC Management Centre or to any CEN 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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Symbols and units	8
5 Test rig	8
5.1 General.....	8
5.2 Main components of test rig.....	8
5.3 Specification of test rig components.....	10
5.4 Assembly	13
5.5 Foundation	13
5.6 Qualifications	13
5.7 Instrumentation.....	13
5.7.1 Measurement of pressure fluctuations.....	13
5.7.2 Measurement of vibration	13
5.8 Calibration	14
5.8.1 Accelerometers.....	14
5.8.2 Pressure transducers.....	14
5.8.3 Calibration of accelerometers and pressure transducers.....	14
5.9 Propagation coefficients.....	14
6 Installation and operation	15
6.1 Installation	15
6.2 Operating parameters	16
6.2.1 General.....	16
6.2.2 Test conditions	16
6.3 Initial operation time.....	17
7 Factors influencing measurements	17
7.1 Electromagnetic surroundings.....	17
7.2 Earth loops	17
7.3 Vibration surroundings	18
8 Determination of fluid- and structure-borne powers	18
8.1 Frequency range.....	18
8.2 Measurement parameters	18
8.2.1 Pressure fluctuation measurement parameters	18
8.2.2 Vibration measurement parameters	18
8.3 Sense of power propagation	19
8.4 Fluid-borne power determination.....	19
8.4.1 General.....	19
8.4.2 Fluid-borne intensity	19
8.4.3 Fluid-borne power.....	20
8.5 Structure-borne power determination	20
8.5.1 General.....	20
8.5.2 Structure-borne intensity.....	20
8.5.3 Structure-borne power	21

8.6	Overall values of power	21
8.7	Coefficients of energy propagation and power levels.....	21
8.7.1	Coefficient of fluid-borne energy propagation	21
8.7.2	Coefficient of structure-borne energy propagation	21
8.7.3	Fluid-borne power level	22
8.7.4	Structure-borne power level.....	22
9	Information to be reported.....	22
Annex A (informative) Bending wave number and intensity dimensional constant		23
Bibliography.....		25

This document is a preview generated by EVS

Foreword

This document (EN 16644:2014) has been prepared by Technical Committee CEN/TC 197 "Pumps", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2015 and conflicting national standards shall be withdrawn at the latest by June 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1151-2:2006.

This standard replaces EN 1151-2:2006 as a result of the withdrawal of EN 1151-1 and the issuing of the EN 16297 series as its replacement and is expanded to include cooling systems.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document covers the measurement of fluid and structure-borne noise as induced by small glandless circulators having a rated input of ≤ 200 W. It has been prepared in response to the need of having uniform procedures as requirements for noise levels especially in residential housing, tightened by national and European regulations. The issue of airborne noise is covered by other standards.

This document is a preview generated by EVS

1 Scope

This European Standard specifies a test code for the vibro-acoustic characterization of glandless circulators with pump housing having a rated power input $P_1 \leq 200\text{W}$, intended to be used in heating installations, domestic hot water service installations and cooling systems, and is limited to glandless circulators with threaded connections of 1 1/2 inch. The test code comprises the test rig, the measurement method and the test conditions.

This European Standard applies to glandless circulators, which are manufactured after the date of issue of this European Standard.

The characterization principle is based on measuring the structure-borne and the fluid-borne power transmitted respectively by vibration and pressure fluctuations in the pipe connected to a glandless circulator.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16297-1:2012, *Pumps — Rotodynamic pumps — Glandless circulators — Part 1: General requirements and procedures for testing and calculation of energy efficiency index (EEI)*

EN 50160, *Voltage characteristics of electricity supplied by public distribution networks*

ISO 2016, *Capillary solder fittings for copper tubes — Assembly dimensions and tests*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16297-1:2012 and the following apply.

3.1

speed setting

setting attained (for pumps with different settings) when the speed of the electric motor is changed

3.2

fluid-borne intensity

I_{fb}
time averaged rate of flow of the acoustic energy per cross section of fluid transmitted lengthways the straight pipe by internal pressure fluctuations

Note 1 to entry: Its sign can be positive or negative indicating the sense of energy propagation.

Note 2 to entry: Fluid-borne intensity is expressed in W/m^2 .