

This is a preview of "BS EN 61362:2012". [Click here to purchase the full version from the ANSI store.](#)

BS EN 61362:2012



BSI Standards Publication

Guide to specification of hydraulic turbine governing systems

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™



This is a preview of "BS EN 61362:2012". [Click here to purchase the full version from the ANSI store.](#)

This British Standard is the UK implementation of EN 61362:2012. It is identical to IEC 61362:2012. It supersedes BS EN 61362:1998 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/15, Hydraulic turbines.

A list of organizations represented on this committee 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.

© The British Standards Institution 2012

Published by BSI Standards Limited 2012

ISBN 978 0 580 72947 8

ICS 27.140

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2012.

Amendments issued since publication

Amd. No.	Date	Text affected
-----------------	-------------	----------------------

This is a preview of "BS EN 61362:2012". [Click here to purchase the full version from the ANSI store.](#)

NORME EUROPÉENNE
EUROPÄISCHE NORM

August 2012

ICS 27.140

Supersedes EN 61362:1998

English version

Guide to specification of hydraulic turbine governing systems (IEC 61362:2012)

Guide pour la spécification des systèmes
de régulation des turbines hydrauliques
(CEI 61362:2012)

Leitfaden zur Spezifikation der
Regeleinrichtung von Wasserturbinen
(IEC 61362:2012)

This European Standard was approved by CENELEC on 2012-05-25. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

This is a preview of "BS EN 61362:2012". [Click here to purchase the full version from the ANSI store.](#)

The text of document 4/270/FDIS, future edition 2 of IEC 61362, prepared by IEC/TC 4 "Hydraulic turbines" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61362:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-02-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-05-25

This document supersedes EN 61362:1998.

EN 61362:2012 includes the following significant technical changes with respect to EN 61362:1998:

This technical revision takes into account the experience with the guide during the last decade as well as the progress in the state of the art of the underlying technologies.

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

Endorsement notice

The text of the International Standard IEC 61362:2012 was approved by CENELEC as a European Standard without any modification.

This is a preview of "BS EN 61362:2012". [Click here to purchase the full version from the ANSI store.](#)

(normative)

Normative references to international publications with their corresponding European publications

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-351	2006	International Electrotechnical Vocabulary (IEV) - Part 351: Control technology	-	-
IEC 60068-2-6	2007	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	2008
IEC 60068-2-27	2008	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	2009
IEC 60308	2005	Hydraulic turbines - Testing of control systems	EN 60308	2005
IEC 61000-4-1	2006	Electromagnetic compatibility (EMC) - Part 4-1: Testing and measurement techniques - Overview of IEC 61000-4 series	EN 61000-4-1	2007
CISPR 11 (mod)	2009	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	2009
ISO 3448	1992	Industrial liquid lubricants - ISO viscosity classification	-	-

This is a preview of "BS EN 61362:2012". [Click here to purchase the full version from the ANSI store.](#)

CONTENTS

INTRODUCTION	7
1 Scope	8
2 Normative references	8
3 Terms, definitions, symbols and units	9
3.1 General terms and definitions	9
3.2 Terms and definitions related to control levels and control modes	9
3.3 Terms and definitions from control theory	9
3.4 Subscripts and prefixes	10
3.5 Terms and definitions related to the plant and the machines	10
3.6 Terms and definitions relating to the governing system	11
4 Control structure	18
4.1 General	18
4.2 Main control functions	18
4.2.1 General	18
4.2.2 Speed control	19
4.2.3 Power output control	19
4.2.4 Opening control	19
4.2.5 Water level control	19
4.2.6 Flow control	20
4.3 Configurations of combined control systems	20
4.3.1 General	20
4.3.2 Parallel structure	20
4.3.3 Series structures	21
4.3.4 Other configurations	22
4.4 Configurations of servo-positioners	23
4.5 Multiple control	23
4.5.1 General	23
4.5.2 Parallel structure	24
4.5.3 Series structure	24
5 Performance and components of governing systems	24
5.1 General	24
5.2 Modeling and digital simulation	25
5.3 Characteristic parameters for PID-controllers	26
5.3.1 General	26
5.3.2 Permanent droop b_p	27
5.3.3 Proportional action coefficient K_p , integral action time T_I , and derivative action time T_D	27
5.4 Other parameters of the governing systems	28
5.4.1 Command signal adjustments for controlled variables (speed, power output, etc.) and load limiter	28
5.4.2 Governor insensitivity $i_x/2$	28
5.4.3 Parameters of servo-positioner	29
5.5 Functional relationship between servo-positioners	30
5.5.1 Dual regulation of turbines with controllable guide vane and runner blade angles	30