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Vodni stroji, radialni in aksialni - Metodologija prenosa uspešnosti z modela na prototip (IEC 62097:2019)

Hydraulic machines, radial and axial - Methodology for performance transposition from model to prototype (IEC 62097:2019)

Hydraulische Maschinen, radial und axial - Leistungsumrechnung vom Modell zum Prototyp (IEC 62097:2019)

Machines hydrauliques, radiales et axiales - Méthode de conversion des performances du modèle au prototype (IEC 62097:2019)

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Hydraulic machines, radial and axial - Methodology for performance transposition from model to prototype (IEC 62097:2019)

Machines hydrauliques, radiales et axiales - Méthodologie de transposition des performances du modèle au prototype
(IEC 62097:2019)

Hydraulische Maschinen, radial und axial - Leistungsumrechnung vom Modell zum Prototyp
(IEC 62097:2019)

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EN IEC 62097:2019 (E)**European foreword**

The text of document 4/359/FDIS, future edition 2 of IEC 62097, prepared by IEC/TC 4 "Hydraulic turbines" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62097:2019.

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

ISO 4287	NOTE	Harmonized as EN ISO 4287
ISO 4288	NOTE	Harmonized as EN ISO 4288

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60193	-	Hydraulic turbines, storage pumps and pump-turbines - Model acceptance tests	EN 60193	-

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Hydraulic machines, radial and axial – Methodology for performance
transposition from model to prototype

Machines hydrauliques, radiales et axiales – Méthodologie de transposition des
performances du modèle au prototype

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HYDRAULIC MACHINES, RADIAL AND AXIAL – METHODOLOGY FOR PERFORMANCE TRANSPOSITION FROM MODEL TO PROTOTYPE

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62097 has been prepared by IEC technical committee 4: Hydraulic turbines.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes an editorial and technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) In introduction, clarifications have been brought such as addition of a sentence which declares the precedence of IEC 62097 over IEC 60193 if any mismatch is found between them
- b) In Clauses 3 and 4, corrections of the typographical errors
- c) In Clause 3: changes to be in accordance with presentation of the terms and structure of IEC 60193 (except for the water temperature)
- d) In Clause 4:
 - Deletion of the clause providing the direct step-up procedures for a whole turbine

- Introduction of a global view by using turbine A and turbine B instead of model turbine, reference model turbine and prototype turbine
 - Move of section dealing with “surface roughness of model and prototype” in a new Clause 5
- e) In Clause 5:
- Introduction of additional chapters to answer comments raised at the CDV stage and to clarify the subject of surface roughness of model and prototype
 - Introduction of new tables for minimum recommended prototype roughness for new radial or diagonal machines and for new axial turbines
 - Addition of the explanation about roughness measurement of heavily rusted surface
- f) In Clause 7 (former Clause 6):
- Introduction of a new subclause for clarifications about the assumed maximum hydraulic efficiency, η_{hAmax}
 - Deletion of the requirement of mutual agreement for the application of the step-up formula for very high efficiency machines exceeding η_{hAmax}
 - Clarifications of the equations from 22 to 33 by doubling the equations for suiting the “two step method”
- g) In Clauses 6 and 7, correction of typographical errors
- h) In Clause 8 (former Clause 7), introduction of new figures for clarifying the “2 step method” and the alternative method
- i) In Annex A, modification of the flux diagram to be in compliance with IEC 60193
- j) In Annex B:
- Correction of the equation to obtain Δ_{ECO}
 - Deletion of the clause which describes the direct step-up procedures for radial flow machines <https://standards.iteh.ai/catalog/standards/sist/0aa45d98-b313-40b8-80de-c06d0eb2b58f/sist-en-iec-62097-2019>
- k) In Annex C, deletion of the clause which describes the direct step-up procedures for axial flow machines
- l) In Annex D:
- notes become main text
 - change of variable names in Subclause D.1 for clarifications
- m) Addition of Annex E, about comparison of IEC standards dealing with models: 60193 and 62097
- n) In Annex F, clarifications of equations by adding more subscripts
- o) The Excel sheets attached to the standard are revised as itemized below
- Deletion of the routine regarding the direct step-up procedures for a whole turbine
 - Deletion of the notice which requires mutual agreement when the step-up is applied to high efficiency machines exceeding η_{hAmax}
 - Addition of the routine to process the normalization of test data obtained at optimum test conditions
- p) Simplification of structure, calculation of optimum and individual point, step up calculation with η_{hAmax}

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

FDIS	Report of voting
4/359/FDIS	4/364/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.

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

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