



American National Standard for

# Rotodynamic (Centrifugal) Pumps

for Manuals Describing Installation,  
Operation, and Maintenance

ANSI/HI 1.4-2010



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## Contents

	Page
Foreword .....	vii
1.4 Manuals describing installation, operation, and maintenance .....	1
1.4.1 Introduction .....	1
1.4.2 Scope .....	1
1.4.3 Standard outline for IOM manuals .....	2
Appendix A Installation, Operation, and Maintenance Manual Reference Information .....	5
A.1 Introduction and safety .....	5
A.1.1 Marking and approvals (CE, ATEX, etc.) .....	5
A.1.2 Safety .....	5
A.1.2.1 Explanation of designations (safety terminology and symbols) .....	5
A.1.2.2 General guidelines .....	6
A.1.2.3 Safety labels .....	7
A.1.2.4 Material safety data sheet (MSDS) .....	12
A.1.2.5 Noise level data .....	12
A.1.2.6 Rigging and lifting .....	13
A.2 Transport and storage .....	13
A.2.1 Transport and handling requirements .....	13
A.2.2 Rigging and lifting .....	13
A.2.3 Receipt, inspection, and damage reporting .....	13
A.2.4 Unpacking .....	14
A.2.5 Storage .....	14
A.2.5.1 Recommended storage environment .....	14
A.2.5.2 Uncontrolled storage moisture protection .....	14
A.2.5.3 Short-term storage .....	15
A.2.5.4 Long-term storage .....	15
A.2.6 Disposal of packaging materials .....	16
A.3 Product description .....	16
A.3.1 Configuration .....	16
A.3.2 Nomenclature .....	16
A.3.2.1 Nameplate information .....	16
A.3.2.2 Pump .....	16
A.3.2.3 Parts .....	16
A.3.3 Auxiliaries .....	17
A.3.4 Support systems .....	17
A.4 Installation .....	17
A.4.1 Factory support requirements .....	17
A.4.2 Location .....	17

A.4.3	Foundation . . . . .	17
A.4.3.1	Seismic analysis . . . . .	17
A.4.4	Rigging and lifting . . . . .	18
A.4.5	Baseplate . . . . .	19
A.4.5.1	Leveling . . . . .	19
A.4.5.2	Grouting . . . . .	19
A.4.6	Piping and connections . . . . .	19
A.4.6.1	Piping, general guidelines . . . . .	19
A.4.6.2	Nozzle loads . . . . .	22
A.4.6.3	Check valves . . . . .	22
A.4.6.4	Strainers . . . . .	22
A.4.7	Clearance setting . . . . .	22
A.4.8	Alignment . . . . .	22
A.4.8.1	Installation – horizontal pumps . . . . .	22
A.4.8.2	Motor selection . . . . .	26
A.4.8.3	Hot alignment considerations . . . . .	26
A.4.9	Lubrication, priming, and cooling systems . . . . .	26
A.4.10	Electrical . . . . .	27
A.4.11	Control, monitoring, and alarm equipment . . . . .	27
A.4.11.1	Stopping unit/reverse runaway speed . . . . .	27
A.5	Commissioning, start-up, operation, and shut-down . . . . .	29
A.5.1	Lubrication . . . . .	29
A.5.2	Rotation . . . . .	29
A.5.3	Guarding . . . . .	29
A.5.4	Checklist – start-up . . . . .	29
A.5.4.1	System flushing . . . . .	29
A.5.4.2	Priming and filling . . . . .	29
A.5.4.3	Shaft sealing settings and adjustments (mechanical seals, packing, etc.) . . . . .	30
A.5.5	Start-up, operation, and shut-down . . . . .	31
A.5.5.1	Minimum continuous flow . . . . .	31
A.5.5.2	Minimum thermal flow . . . . .	31
A.5.5.3	Lubrication system settings . . . . .	31
A.5.5.4	Drive system settings . . . . .	31
A.5.5.5	Valve settings and operation . . . . .	31
A.5.5.6	Condition monitoring . . . . .	32
A.5.5.7	Vibration (alarms and trip points) . . . . .	32
A.5.5.8	Performance testing/verification . . . . .	33
A.5.5.9	Bearing temperature . . . . .	33
A.6	Maintenance . . . . .	33
A.6.1	Schedule . . . . .	33
A.6.1.1	Cold weather maintenance . . . . .	34

A.6.1.2	Wear/parts replacements . . . . .	34
A.6.2	Recommended spare parts for pumping units . . . . .	34
A.6.3	Consumables . . . . .	35
A.6.4	Required tools and fixtures . . . . .	35
A.6.5	Fastener torques, rotation direction, and sequence . . . . .	35
A.6.6	Pump decontamination . . . . .	36
A.6.7	Disassembly . . . . .	36
A.6.8	Inspection . . . . .	36
A.6.8.1	Acceptance criteria and dimensions . . . . .	36
A.6.8.2	Shaft straightening . . . . .	36
A.6.9	Assembly . . . . .	37
A.6.9.1	Clearances . . . . .	37
A.6.10	Auxiliary equipment. . . . .	37
A.7	Troubleshooting guide . . . . .	37
A.7.1	Hydraulic performance . . . . .	37
A.7.1.1	Pressure . . . . .	37
A.7.1.2	Flow . . . . .	38
A.7.1.3	Power . . . . .	39
A.7.2	Mechanical . . . . .	39
A.7.2.1	Vibration . . . . .	39
A.7.2.2	Measurement of operating temperature of ball bearings . . . . .	39
A.7.2.3	Noise. . . . .	40
A.7.3	Electrical . . . . .	40
A.8	Cross-sectional drawings . . . . .	40
A.9	Certification . . . . .	73
A.9.1	Why product certification matters . . . . .	73
A.9.2	UL and CSA-US acceptance . . . . .	73
A.9.3	Authorized testing locations . . . . .	73
A.9.3.1	Underwriters Laboratories, Inc . . . . .	74
A.9.3.2	Canadian Standards Association . . . . .	75
A.10	Other relevant documentation and manuals . . . . .	75
Appendix B	Index . . . . .	76
Figures		
A.1	— Identification plate . . . . .	16
A.2	— Typical foundation bolt design . . . . .	18
A.3	— Discharge valve expansion joint . . . . .	21
A.4	— Checking angular alignment . . . . .	23
A.5	— Checking parallel alignment . . . . .	24
A.6	— Dial indicator method of alignment . . . . .	24

A.7 — Alignment of gear type coupling . . . . .	25
A.8 — Alignment of spacer type couplings . . . . .	26
A.9 — Reverse runaway speed ratio versus specific speed when head equals pump head at BEP (metric) . . . . .	28
A.10 — Reverse runaway speed ratio versus specific speed when head equals pump head at BEP (US customary units) . . . . .	28
A.11 — Instrument locations . . . . .	40
A.12 — Rotodynamic pump types - overhung . . . . .	41
A.13 — Overhung impeller – flexibly coupled – single stage – axial flow – horizontal. . . . .	42
A.14 — Overhung impeller – flexibly coupled – single stage – frame mounted. . . . .	43
A.15 — Overhung impeller – flexibly coupled – single stage – frame mounted – lined pump . . . . .	44
A.16 — Stock pump – flexibly coupled – single stage – foot mounted . . . . .	45
A.17 — Overhung impeller – flexibly coupled – single stage – foot mounted – mixed flow. . . . .	46
A.18 — Overhung impeller – flexibly coupled – single stage – foot mounted – ASME B73.1 . . . . .	47
A.19 — Overhung impeller – flexibly coupled – single stage – foot mounted – self-priming . . . . .	48
A.20 — Overhung impeller – flexibly coupled – single stage – centerline mounted – API 610 . . . . .	49
A.21 — Overhung impeller – integral bearing frame – single stage – in-line – flexible coupling . . . . .	50
A.22 — Vertical end suction OH3A . . . . .	51
A.23 — Overhung impeller – rigidly coupled – single stage – vertical in-line. . . . .	52
A.24 — Overhung impeller – close coupled – single stage – in-line (showing seal and packing) . . . . .	53
A.25 — Vertical end suction OH5A – close coupled – built together . . . . .	54
A.26 — High speed – integral gear – close coupled – single stage. . . . .	55
A.27 — Overhung impeller – close coupled – single stage – end suction. . . . .	56
A.28 — Overhung impeller – close coupled – single stage – diffuser style – end suction – submersible . . . . .	57
A.29 — Overhung impeller – close coupled – single stage – volute style – end suction submersible. . . . .	58
A.30 — Pitot pump – flexibly coupled – single stage – frame mounted. . . . .	59
A.31 — Rotodynamic pump types - between bearings . . . . .	60
A.32 — Impeller between bearings – flexibly coupled – single stage – axial (horizontal) split case . . . . .	61
A.33 — Impeller between bearings – flexibly coupled – single stage – radial split case . . . . .	62
A.34 — Impeller between bearings – flexibly coupled – multistage – axial (horizontal) split case . . . . .	63
A.35 — Impeller between bearings – flexibly coupled – multistage – radial split case . . . . .	64
A.36 — Impeller between bearings – flexibly coupled – multistage – radial split double casing . . . . .	65
A.37 — Rotodynamic pump types - vertically suspended . . . . .	66
A.38 — Lineshaft design sump pump . . . . .	67
A.39 — Cantilever shaft design sump pump . . . . .	68
A.40 — Rotodynamic pump types - regenerative turbine . . . . .	69
A.41 — Regenerative turbine – side channel single stage . . . . .	70
A.42 — Regenerative turbine – peripheral single stage . . . . .	71
A.43 — Regenerative turbine – impeller between bearings – two stages . . . . .	72



## Foreword (Not part of Standard)

### Scope

The purpose and aims of the Institute are to promote the continued growth of pump knowledge for the interest of pump manufacturers and to further the interests of the public in such matters as are involved in manufacturing, engineering, distribution, safety, transportation and other problems of the industry, and to this end, among other things:

- a) To develop and publish standards for pumps;
- b) To collect and disseminate information of value to its members and to the public;
- c) To appear for its members before governmental departments and agencies and other bodies in regard to matters affecting the industry;
- d) To increase the amount and to improve the quality of pump service to the public;
- e) To support educational and research activities;
- f) To promote the business interests of its members but not to engage in business of the kind ordinarily carried on for profit or to perform particular services for its members or individual persons as distinguished from activities to improve the business conditions and lawful interests of all of its members.

### Purpose of Standards

- 1) Hydraulic Institute Standards are adopted in the public interest and are designed to help eliminate misunderstandings between the manufacturer, the purchaser and/or the user and to assist the purchaser in selecting and obtaining the proper product for a particular need.
- 2) Use of Hydraulic Institute Standards is completely voluntary. Existence of Hydraulic Institute Standards does not in any respect preclude a member from manufacturing or selling products not conforming to the Standards.

### Definition of a Standard of the Hydraulic Institute

Quoting from Article XV, Standards, of the By-Laws of the Institute, Section B:

"An Institute Standard defines the product, material, process or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, quality, rating, testing and service for which designed."

### Comments from users

Comments from users of this standard will be appreciated, to help the Hydraulic Institute prepare even more useful future editions. Questions arising from the content of this standard may be directed to the Hydraulic Institute. It will direct all such questions to the appropriate technical committee for provision of a suitable answer.

If a dispute arises regarding contents of an Institute Standard or an answer provided by the Institute to a question such as indicated above, the point in question shall be sent in writing to the Technical Director of the Hydraulic Institute, who shall initiate the appeals process.

### Revisions

The Standards of the Hydraulic Institute are subject to constant review, and revisions are undertaken whenever it is found necessary because of new developments and progress in the art. If no revisions are made for five years, the standards are reaffirmed using the ANSI canvass procedure.

## Units of measurement

Metric units of measurement are used; and corresponding US customary units appear in brackets. Charts, graphs, and sample calculations are also shown in both metric and US customary units. Since values given in metric units are not exact equivalents to values given in US customary units, it is important that the selected units of measure to be applied be stated in reference to this standard. If no such statement is provided, metric units shall govern.

## Consensus for this standard was achieved by use of the Canvass Method

The following organizations, recognized as having an interest in the standardization of centrifugal pumps, were contacted prior to the approval of this revision of the standard. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

Baldor Electric Company  
ekwestrel corp  
Flow Solutions Group  
Fluid Sealing Association  
GIW Industries, Inc.  
Healy Engineering, Inc.  
J.A.S. Solutions Ltd.  
John Anspach Consulting  
KBR, Inc.  
Kemet Inc.  
Las Vegas Valley Water District

Lovejoy, Inc.  
Malcolm Pirnie, Inc.  
Mechanical Solutions, Inc.  
Patterson Pump Company  
Pentair Water - Engineered Flow GBU  
Southern Company  
Sulzer Pumps (US) Inc.  
The Conservation Fund  
Weir Floway, Inc.  
Weir Minerals North America  
Whitley Burchett & Associates

## Committee List

Although this standard was processed and approved for submittal to ANSI by the canvass method, a working committee met many times to facilitate its development. At the time the standard was approved, the committee had the following members:

**Chair** – Roger Turley, Flowserve Pump Division

**Vice-chair** – Fred Walker, Weir Floway, Inc.

### Committee Members

Edward Allis  
James Bonifas  
Charles Cappellino  
Michael Cropper  
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### Company

Peerless Pump Company  
Emerson Motors / US Motors  
ITT - Industrial Process  
Sulzer Pumps (US) Inc.  
Afton Pumps  
John Crane Inc.  
National Pump Company, LLC  
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### Company

Peerless Pump Company  
Weir Floway, Inc.  
Flowserve Pump Division  
Peerless Pump Company  
Flowserve Pump Division

## 1.4 Manuals describing installation, operation, and maintenance

### 1.4.1 Introduction

The normative portion of this standard is prescriptive in nature and thereby mandatory for compliance to this standard; it includes a standard outline for manufacturers' installation, operation, and maintenance (IOM) manuals.

Appendix A, a collection of IOM reference information arranged per the new standard outline, is informative and not mandatory for compliance to this standard. Pump users should refer to the manufacturers' IOM manuals for IOM information specific to their equipment.

The objective of this standard is to establish a standard outline for IOM manuals in order to help pump users locate IOM information.

### 1.4.2 Scope

This standard applies to IOM manuals for rotodynamic (centrifugal) pumps, including the following:

- a) Overhung impeller, rigidly-coupled pumps (OH4, OH5, OH5A, OH6, OH7, OH8A, and OH8B).
- b) Horizontal, flexibly coupled, axial flow, single stage, overhung design (OH00).
- c) Overhung impeller, separately coupled pumps (OH0, OH1, OH1A, OH2, OH3, and OH3A).
- d) Sealless centrifugal pumps (OH9, OH10, OH11, and OH12).
- e) Between-bearing, separately coupled, single-stage pumps (BB1 and BB2).
- f) Between-bearing, separately coupled, multistage pumps (BB3, BB4, and BB5).
- g) Vertically suspended, separate discharge (sump), volute style (VS4 and VS5).
- h) Regenerative turbine pumps (RT1, RT2, RT3, and RT4).
- i) Special-effects pumps (Pitot tube, etc.)

For instructions on sealless rotodynamic pumps, see ANSI/HI 5.1-5.6 *Sealless Rotodynamic Pumps for Nomenclature, Definitions, Application, Operation and Test*.

The standard outline shall be used when writing IOM manuals. The subtopics within each section shall be addressed when appropriate for the specific pump.

Installation, operation, and maintenance manuals shall be comprised of 10 sections. Each section must appear in the IOM manual in the sequence shown. The topics that appear under each section may be combined and/or arranged to meet the specific needs of the product being addressed, although every effort shall be made to remain logical and consistent. For example, in Section A.1, the explanation of safety designations should precede specific safety warnings for a product. Not all of the topics listed need to be included in the IOM manual for all products; the manufacturer will be given the latitude to decide if a particular topic is applicable.