Variable Speed Drives: A Way to Lower Life Cycle Costs

The most complete, authoritative VSD guide includes:

- Overview of pumping system hydraulic characteristics
- Types of pumping systems
- Introduction to variable speed pumping
- Complete guide to pumps, pumping systems, control applications and effects of VSDs
- How to estimate pumping energy costs
- All about motors - types, application and control
- All about variable speed drives - VSDs for induction motors, ac motors, dc motors, control algorithms, integrated motors and drives
- Control Principles for Variable Speed Pumping
- How to select and specify VSDs for retrofitting or new installations
- Benefits, drawbacks, operational considerations
- Integrated diagnostics and protection to help reduce and identify faults
- Financial justification - including Life Cycle Cost analysis
- VSD Case Studies
- Plus an extensive Appendix and Glossary

Written by Europump and Hydraulic Institute
How many ways can you save with variable speed pumping?
Applying speed control can save energy, reduce equipment and maintenance costs, increase reliability and optimize pumping system performance by utilizing the most cost-effective variable-speed pump for a given application. The key is to design all elements of the pumping system to function optimally together, for lowest life cycle cost.

Variable Speed Pumping, A Guide to Successful Applications brings together everything you need to know to design, specify and operate successful variable-speed pumping systems - all in one amazingly comprehensive volume. It shows you, step-by-step, how to take a system approach to incorporating VSDs in your applications. If there’s a viable way for variable speed control to help generate savings on your pumping costs while improving system performance and reliability, Variable Speed Pumping, A Guide to Successful Applications will show you how.

Everything you need to know in one comprehensive volume.
In over 150 information-packed pages, Variable Speed Pumping, A Guide to Successful Applications covers various types of pumps, types of variable-speed and variable-frequency drives and multiple applications. Information is presented clearly and concisely, with a helpful abundance of system and performance curves, tables, illustrations, color photographs, case studies and flow charts that help you choose the appropriate specification methodology.

Compiled, written edited and critiqued by pump, motor and drive experts in academia and industries the world over, Variable Speed Pumping, A Guide to Successful Applications from Europump and the Hydraulic Institute provides authoritative, accurate, comprehensive and completely up-to-date information.

Variable Speed Pumping, A Guide to Successful Applications
Condensed Table of Contents
1. Introduction
2. Pumping System Hydraulic Characteristics
3. System and Process Requirements
4. Pumps - Classification, Types, Effects of Speed Variation
6. Motors
7. Variable Speed Drives
8. Control Principles for Variable Speed Pumping
9. Selection Process - New Systems
10. Selection Process - Retrofitting to Existing Equipment
11. Benefits, Drawbacks and Operational Issues
12. Financial Justification - Including Life Cycle Cost Analysis
13. Case Studies - Eight examples show how VSDs reduced costs
14. Appendix
   · Electric Motors: Energy Efficiency and Labeling, (Europe and North America), Motor Sizing
   · Frequency Converters: Design and Sizing
   · Legal Obligations on Manufacturers and Users
   · Frequently Asked Questions
   · Effects of Pump Speed and Impeller Diameter on Magnetically Driven Pumps
   · Efficiency of Variable Speed Drive Systems
   · Abbreviations and Glossary

This authoritative reference to variable speed pumping is available from Europump and Hydraulic institute.

“... The form of this guide is a brilliant idea and, to my knowledge, unique. Theory - well balanced sections, amalgamating technical disciplines (pumps, electric motors and controls), which are normally distinct and not easily accessible to non-specialists; the structure is well organized and focused on problem solving.”
Professor Pietro Girobone
Chair of Industrial System Engineering
Department
Genoa University, Italy
**Why Should You Consider Variable Speed Drives?**

Traditional flow-control methods - using throttling valves or bypass lines - waste energy and frequently increase operating and maintenance costs. However, when properly applied, VSDs have the potential to significantly lower energy costs, improve overall system reliability and minimize pumping system life cycle costs.

Here’s just one example of many from the Guide. In systems with only friction head, reduction in pump speed results in a substantial reduction in power consumption, while the pump continues to operate near its Best Efficiency Point (BEP).

You can consult the Guide for detailed, immediately usable information like this for various types of pumps, motors and drives in a variety of pumping applications.

**Making the right choice.**

*Variable Speed Pumping, A Guide to Successful Applications* is the only reference you need for comprehensive guidance in making the right specifications for various types of pumps and pumping systems.

**Top Level:** You can make informed decisions with flow charts that take you step-by-step through the selection process, whether you’re retrofitting an existing installation or designing a new one.

**Specification and Selection:** You have at your fingertips the most current, the most accurate, most detailed information for matching pump, drive and motor, application and economic characteristics to your application.


**How to Order...ORDER TODAY!**

Simply tear off, fill out and mail the Order Form to the address for Hydraulic Institute or Europump. You can also order online from Hydraulic Institute at www.pumps.org, or from Europump at www.europump.org. Price is $95 or €95. For shipping costs, see the table on the Order Form. Also order the 200 page *Pump LCC Guide*, at $125 or €125 to help you specify, design and operate pumping systems for minimum life cycle cost.

---

**Complimentary Executive Summary at www.pumps.org or at www.europump.org**
Avoiding the Pitfalls.

Traditional control methods such as throttling or use of bypass valves can be wasteful. Inappropriate application of VSDs can unnecessarily increase energy usage and costs, or generate wasted expenditures.

The use of variable speed drives in pumping systems is now an accepted practice for reducing costs and improving reliability ... if the technology is applied appropriately for each application.

HI/Europump’s Variable Speed Pumping: A Guide to Successful Applications covers both the basic principles of pump, motor and drive technology as well as more advanced, specific and detailed concepts. The Guide encourages the use of variable speed pumping in appropriate applications, helping to avoid design, specification and application errors. Use of the information in the Guide can lead to cost savings from reduced energy consumption as well as from increased pump system reliability.

The most complete, authoritative VSD guide.

Only Variable Speed Pumping: A Guide to Successful Applications brings together all the concepts, metrics and step-by-step decision-making support that can help you decide which VSD strategies are appropriate for your specific application requirements and which specific systems will yield the greatest Life Cycle Cost benefits. Make sure that your pump resource library also includes the Pump LCC Guide, a companion, for minimizing pump life cycle costs.

“The Appendices give a view on the regulatory mechanisms in both Europe and the US, which are difficult to find in one place.”

Geoff Brown, Drive Application Consultant ABB Ltd

Available now, from Europump or Hydraulic Institute.

PRICE $95 or €95.

Use the attached order form, or order online directly from Europump at www.europump.org or Hydraulic Institute at www.pumps.org.

Available now, only from Europump or Hydraulic Institute.

Price $125 or €125.

Use the attached order form, or order online directly from Europump at www.europump.org or Hydraulic Institute at www.pumps.org.

Learn how to reduce pumping costs & improve reliability.

“Variable Speed Drives are widely acknowledged as having a key role in saving energy in pumping systems, but without an understanding of the pump systems that they control, much of this potential will remain untapped. This much needed book at last bridges the gap between the worlds of variable speed drives and pumps, and is essential reading for everyone with a responsibility for pumping systems. Based on the combined knowledge of leading VSD and pump experts, it presents highly practical information on both the opportunities and the pitfalls to consider when contemplating the installation of a VSD.”

Dr Hugh Falkner, Future Energy Solutions, UK
YES! SEND ME:

- Variable Speed Pumping, A Guide to Successful Applications
  Payment is enclosed for ____ copies at $95 each (payable to HI) or €95 each (payable to Europump).

  Payment is enclosed for ____ copies at $125 each (payable to HI) or €125 each (payable to Europump).

Qty ______ x 95 = ______________
Qty ______ x 125 = ______________
6% sales tax NJ only ______________
Plus Shipping* ______________
Total Enclosed ______________

SOLD TO
Name __________________________________________________
Title ___________________________________________________
Company _______________________________________________
Address ________________________________________________
City/State/Postal Code _____________________________________
Country _________________________________________________
Phone ______________________ Fax ______________________
Email __________________________________________________

SHIP TO (Leave blank if same as sold to address)
Name __________________________________________________
Title ___________________________________________________
Company _______________________________________________
Address ________________________________________________
City/State/Postal Code _____________________________________
Country _________________________________________________
Phone ______________________ Fax ______________________
Email __________________________________________________

PAYMENT METHOD (Pre Payment Required)
- Check enclosed, made payable to HI or Europump
- Charge my: ✔ VISA ✔ Mastercard ✔ AMEX

Acct # _________________________________________________
Exp date ________________________________________________
Name on Card ___________________________________________
Signature _______________________________________________
Authorization Number _______________________________________

All checks to HI must be in US currency and drawn on a US bank

*SHIPPING COSTS
Orders Placed with Hydraulic Institute
- US Regular add 5% of subtotal
- US Next Day add 20% of subtotal
- Canada/Mexico add 30% of subtotal
- Canada/Mexico Rush add 40% of subtotal
- Other Countries add 40% of subtotal
- Other Countries Rush add 50% of subtotal
Orders Placed with Europump
- Regular add 5% of subtotal;
- Priority add 10% of subtotal
- Express courier at cost
(allow 2-3 weeks for regular delivery)
Order online at www.pumps.org or www.europump.org

ABOUT HYDRAULIC INSTITUTE
The Hydraulic Institute, established in 1917, is the largest association of pump producers in North America. HI serves member companies and pump users by providing product standards and valuable forums for the exchange of industry information. HI has been developing pump standards for over 80 years. For information on membership, organization structure, member and user services and energy and life cycle costs visit the HI website at www.pumps.org or email: publications@pumps.org

Hydraulic Institute
9 Sylvan Way, Parsippany, NJ 07054 USA
Phone: 973-267-9700; Fax: 973-267-9055

ABOUT EUROPUMP
Europump, established in 1960, acts as spokesman for 16 national pump manufacturing associations in Europe and represents more than 450 enterprises. Europump serves and promotes the European pump industry. It provides information on technical and other pump related matters. For information regarding Europump work in the field of life cycle cost issues, please email: secretariat@europump.org

For information on Europump, visit www.europump.org
Europump, Diamant Building, Fifth Floor
Boulevard A, Reyers 80 B1030
Brussels, Belgium
Phone: +32 2 706 82 30; Fax: +32 2 706 82 50