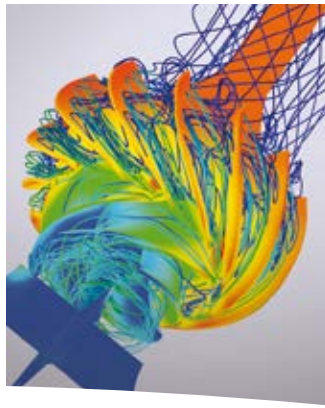


***SIHI® Dry
Dry Running Vacuum Pumps
for General Industries***





Pump Supplier to the World

Flowserve is the driving force in the global industrial pump marketplace. No other pump company in the world has the depth or breadth of expertise in the successful application of pre-engineered, engineered, and special purpose pumps and systems.

Life Cycle Cost Solutions

Flowserve provides pumping solutions that permit customers to reduce total life cycle costs and improve productivity, profitability and pumping system reliability.

Market-Focused Customer Support

Product and industry specialists develop effective proposals and solutions directed toward market and customer preferences. They offer technical advice and assistance throughout each stage of the product life cycle, beginning with the initial inquiry.

Broad Product Lines

Flowserve offers a wide range of complementary pump types, from pre-engineered process pumps to highly engineered and special purpose pumps and systems. Pumps are built to recognized global standards and customer specifications.

Pump designs include:

- Single-stage process
- Between bearings single-stage
- Between bearings multistage
- Vertical
- Submersible motor
- Positive displacement
- Vacuum & Compressor
- Nuclear
- Specialty

Product Brands of Distinction

ACEC™ Centrifugal Pumps

Aldrich™ Pumps

Byron Jackson® Pumps

Calder™ Energy Recovery Devices

Cameron™ Pumps

Durco® Process Pumps

Flowserve® Pumps

IDP® Pumps

INNOMAG® Sealless Pumps

Lawrence Pumps®

Niigata Worthington™ Pumps

Pacific® Pumps

Pleuger® Pumps

Scienco™ Pumps

Sier-Bath® Rotary Pumps

SIHI® Pumps

TKL™ Pumps

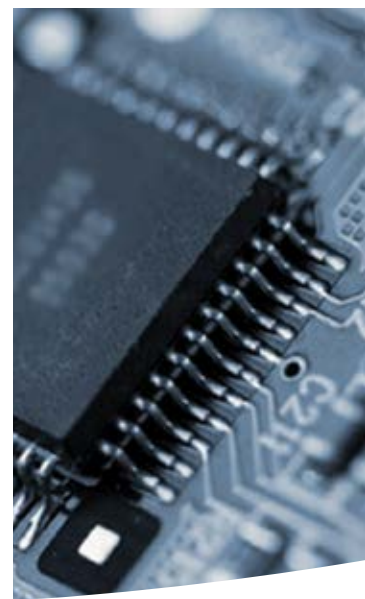
United Centrifugal® Pumps

Western Land Roller™ Irrigation Pumps

Wilson-Snyder® Pumps

Worthington® Pumps

Worthington Simpson™ Pumps



SIHI® Dry – Simple, Dry and Reliable...

Vertically oriented, and self-draining, makes the SIHI® Dry ideal for industrial process where there is a high possibility of liquids or solids being carried-over into the pump. Stand alone capacity ranges from 100 up to 1500 m³/h (59 up to 883 cfm), and can be increased dramatically by combining lobular type blowers.

Integrated within the pump is the intelligent drive system that performs ongoing rotor diagnostics, while giving an energy-efficient platform for variable speed/pressure control.

Moreover, this method of rotor synchronisation permits gearbox-free operation in which to run extremely quietly, and without any lubrication. Continual torque monitoring is another feature of the SIHI® Dry design, whereby speed can be automatically adjusted in which to accommodate liquid and solids carry-over.



Reducing Life-Cycle Costs...

Capital Costs

- No Booster
- No Acoustic Cover
- Simple Integration
- No Suction Filter
- No pressure-control valve

Energy Cost

- Low Power Consumption

Maintenance Cost

- No Routine Maintenance

Effluent Cost

- None
- Safe Handling of Toxic Media
- Oil-free Operation
- No Process Contamination

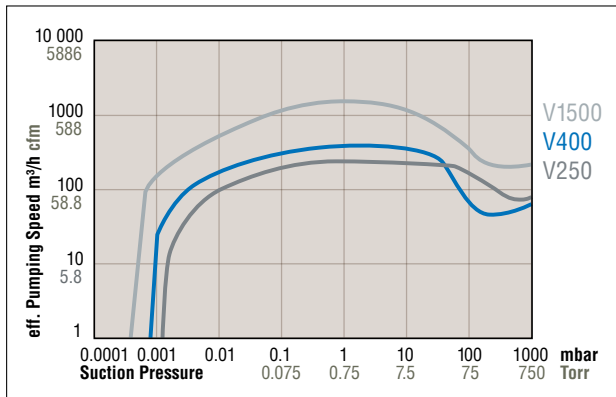
Down Time Costs

- High Reliability
- Simple Internal Cleaning
- Quick Overhaul
- Self Diagnostics

**SIHI® Dry –
Simple, Dry
and Reliable**



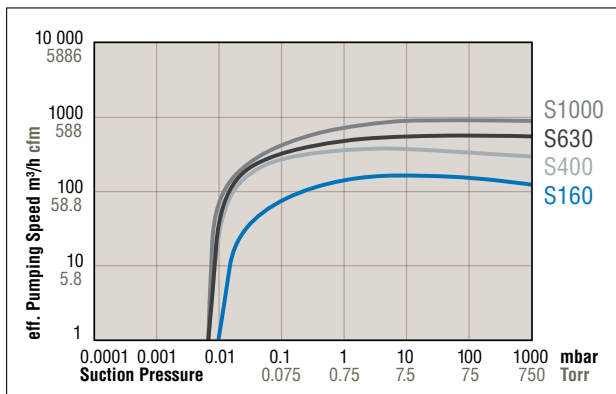
Performance range SIHI® Dry V-Version



Cantilever Shaft Design

*Free access to pump chamber
without removing bearings*

Performance range SIHI® Dry S-Version



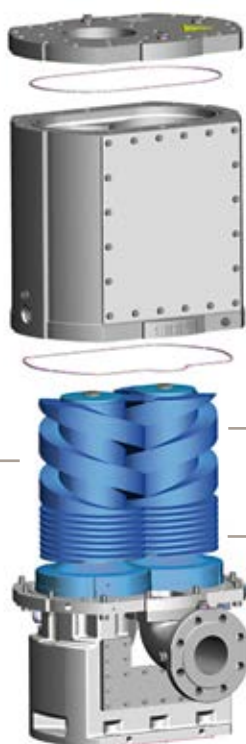
*Easy handling of particles
due to vertical design*

Wear free shaft seal

| SIHI® Dry Size | V1500 | V400 | V250 | S160 | S400 | S630 | S1000 |
|--|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|
| Suction capacity m³/h cfm | 1400 824 | 400 235 | 250 147 | 160 94 | 400 235 | 630 371 | 1000 589 |
| Ultimate pressure mbar Torr | <0.001 <0.0007 | <0.001 <0.0007 | <0.005 <0.0037 | <0.01 <0.0075 | <0.01 <0.0075 | <0.01 <0.0075 | <0.01 <0.0075 |
| Power consumption at ultimate pressure kW hp | 10.0 13.4 | 2.5 3.4 | 2.3 3.1 | 3.5 4.7 | 7.0 9.4 | 10.0 13.4 | 18.0 24 |
| Noise level as per DIN dB(A) | 75 | 54 | 54 | 54 | 64 | 70 | 74 |



Oil free Electronic Gear



No risk for process contamination with oil

Pre-failure detection due to separate data logging for each shaft

Electronic gear does not require oil

Integrated motors, no shaft seal to atmosphere

On site cleaning within 3 hours



*Award Winning
Vacuum Technology*



Simple operation and long-term reliability are at the centre of the SIHI® Dry design. Completely free from oil lubrication, no mechanical seals, and wide internal clearances, underpin the robust nature of this completely dry running vacuum pump.

The result...

- No effluent or waste disposal costs of any service liquid
- Uncontaminated vacuum - free from lubricant and service liquid
- Flexible operation for batch process operations
- Ease of maintenance together with integrated self diagnostics
- Extremely Quiet
- Low life-cycle costs

SIHI® Dry satisfies the demand for a robust high-vacuum pump, which can adapt to rapidly changing process conditions which could include explosive, corrosive, and/or thermally sensitive media.

Modern communication

All components within the vacuum system have the option to be controlled and assessed using modern field-bus technology.

Should problems arise, the integrated data storage unit permits rapid fault diagnosis.

Additionally, all operating parameters can be viewed and monitored from a personal computer via a local area network (LAN) or Internet. Moreover, this information is available through standard Internet web browser software.

Industries/Markets

- Solar & Photovoltaic
- Semi-conductor
- Vacuum Induction Melting
- Food & Beverage
- Healthcare
- Lighting
- Aerospace
- Electronics

Applications

- Vacuum coating
- Crystal pulling
- Metallurgy furnaces
- Central vacuum
- Sterilisation
- Freeze-drying
- Degassing
- Product transfer



**Global Service
and Technical
Support**



Life Cycle Cost Solutions

Typically, 90 % of the total life cycle cost (LCC) of a pumping system is accumulated after the equipment is purchased and installed. Flowserve has developed a comprehensive suite of solutions aimed at providing customers with unprecedented value and cost savings throughout the life span of the pumping system. These solutions account for every facet of life cycle cost, including:

Capital Expenses

- Initial purchase
- Installation

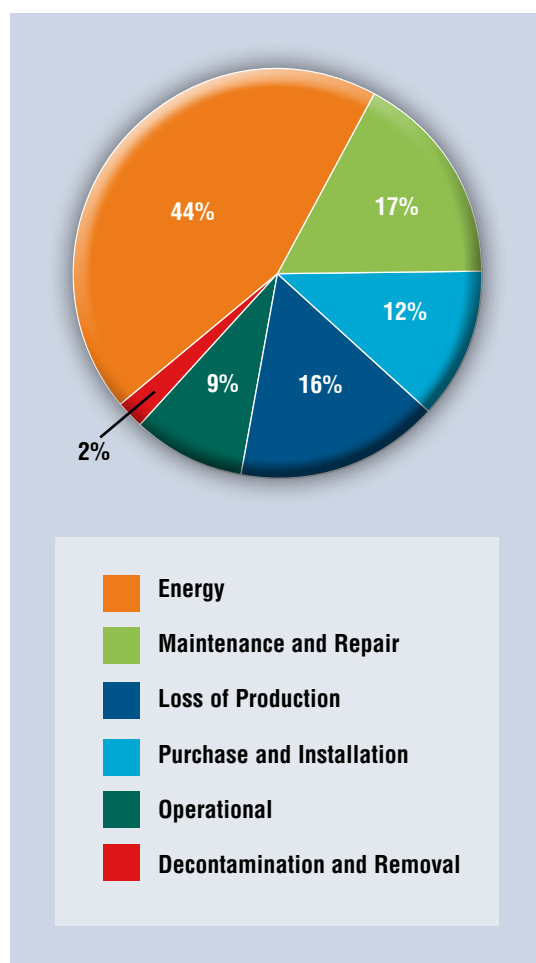
Operating Expenses

- Energy consumption
- Maintenance
- Production losses
- Environmental
- Inventory
- Operating
- Removal

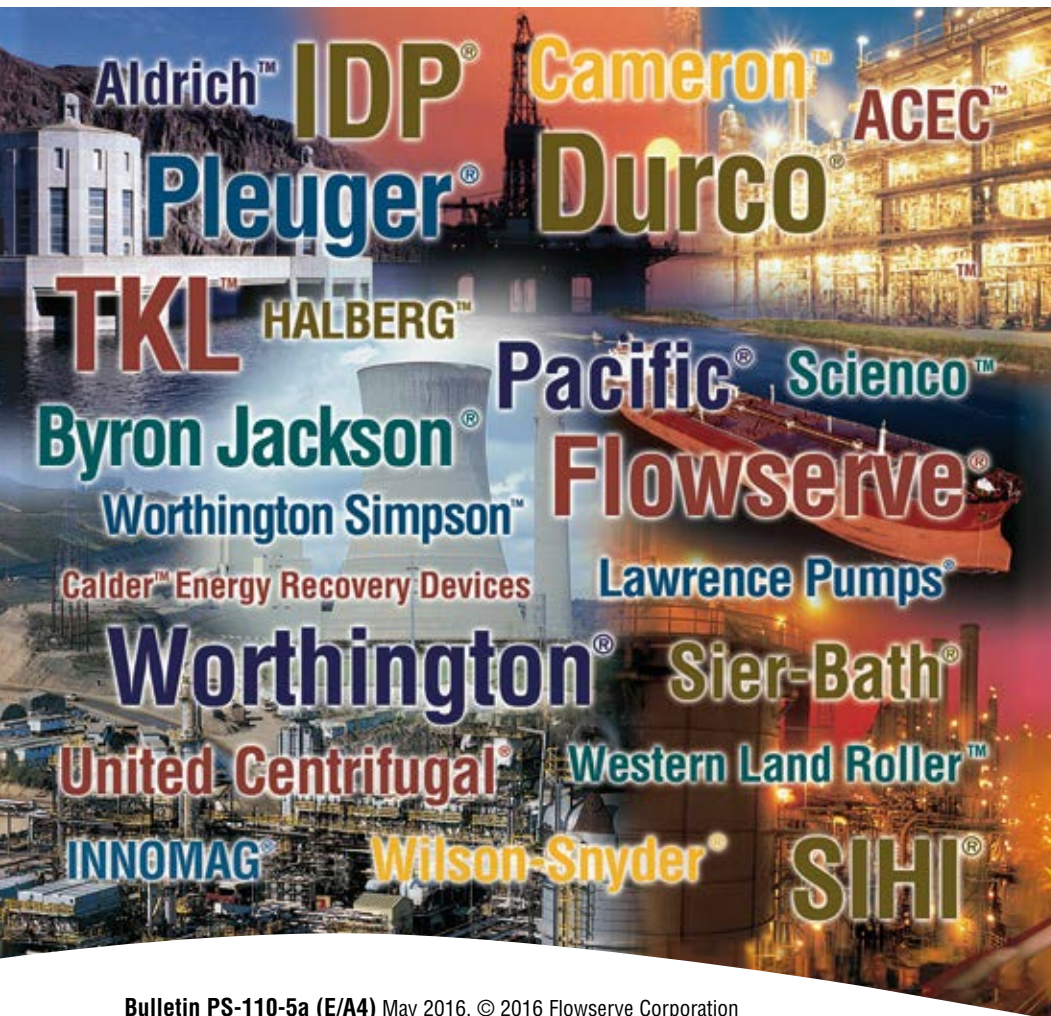
Innovative Life Cycle Cost Solutions

- New Pump Selection
- Turnkey Engineering and Field Service
- Energy Management
- Pump Availability
- Proactive Maintenance
- Inventory Management

Typical Pump Life Cycle Costs¹



¹ While exact values may differ, these percentages are consistent with those published by leading pump manufacturers and end users, as well as industry associations and government agencies worldwide.



Bulletin PS-110-5a (E/A4) May 2016. © 2016 Flowserve Corporation

To find your local Flowserve representative:

For more information about Flowserve Corporation,
visit www.flowserve.com or call +1 937 890 5839.

USA and Canada

Flowserve Corporation
5215 North O'Connor Blvd.
Suite 2300
Irving, Texas 75039-5421 USA
Telephone: +1 937 890 5839

Europe, Middle East, Africa

Flowserve Corporation
Parallelweg 13
4878 AH Etten-Leur
The Netherlands
Telephone: +31 76 502 8100

Latin America

Flowserve Corporation
Martín Rodríguez 4460
B1644CGN-Victoria-San Fernando
Buenos Aires, Argentina
Telephone: +54 11 4006 8700
Telefax: +54 11 4714 1610

Asia Pacific

Flowserve Pte. Ltd.
10 Tuas Loop
Singapore 637345
Telephone: +65 6771 0600
Telefax: +65 6862 2329