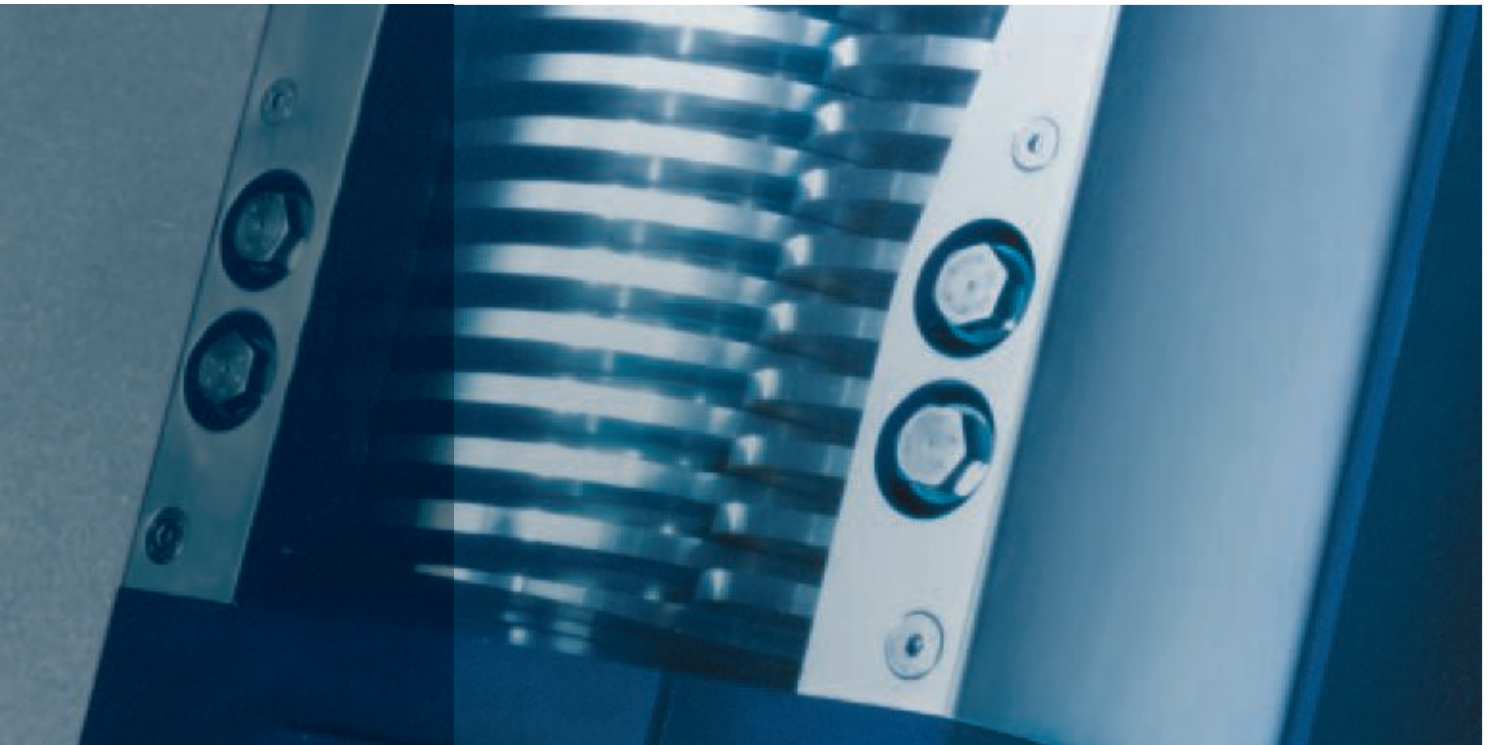


SIHI^{dry}


Dry Running Vacuum Pumps for the Chemical and Pharmaceutical Industry



SIHI^{dry} Simple, Dry and Reliable ...

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 ...

- + Ability to handle highly corrosive gasses and vapours
- + No effluent or waste disposal costs of any service liquid
- + Suitable for explosive  areas
- + Low operating pressures
- + Flexible operation for batch process operations
- + Ease of maintenance and cleaning together with integrated self diagnostics
- + Extremely Quiet
- + Low life-cycle costs

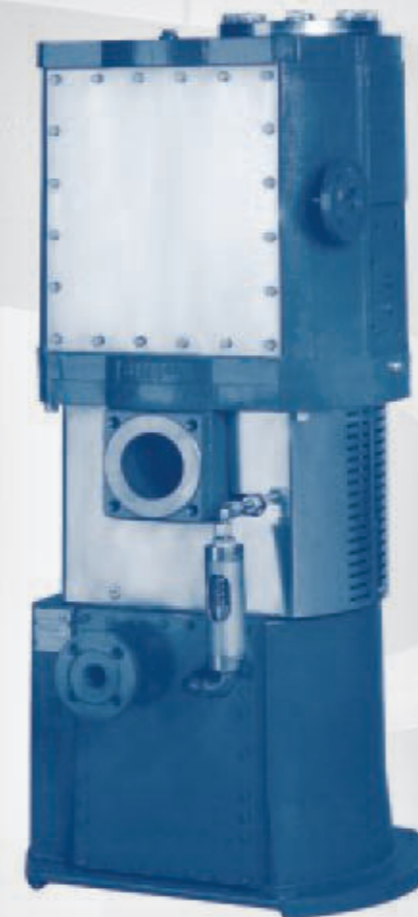
SIHI^{dry} satisfies the demand for a robust high-vacuum pump, which can adapt to rapidly changing process conditions which could include explosive, corrosive, and/or thermally sensitive media.

Applications

Drying
 Reactor charging
 Vacuum distillation
 Inert gas blanketing
 Product transfer
 General process vacuum
 Central vacuum
 ... and many more

Capabilities

Corrosive gases & vapours
 Toxic and odorous gases
 Explosive gases & vapours
 Dust and liquid carry-over
 ... and many more

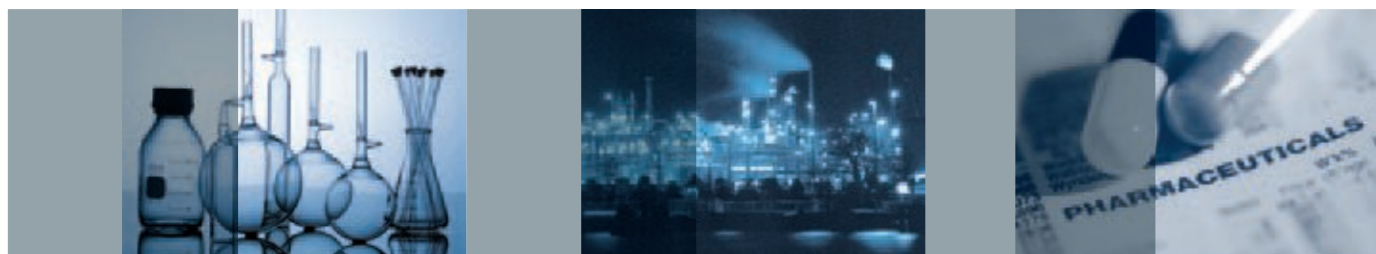


SIHI^{dry} is a vertically oriented and self draining vacuum pump with no mechanical shaft seals. It is an ideal choice for chemically related processes where there is a high possibility of liquids or solids carry-over. This award winning solution can accommodate corrosive gases and vapours, and has superior resistance to heat-accelerated deposition.

The Basic layout provides the platform for an extensive range of intelligent modules which can be incorporated in order to match dynamic process requirements, simple DCS integration, and remote monitoring.

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.

Eight sizes of SIHI^{dry} were developed for operation with explosive media, both internally and externally, and offer volumetric flow rates up to 1,000 m³/h. Dramatic increases to flow and pressure are available with integrated lobular blowers.



Low Life Cycle Costs

- No need for service liquids
- + Totally dry principle of operation
- + No gears for rotor synchronisation
- + No waste disposal
- Low energy costs
- + Reduced power consumption
- Wear free
- + Non contacting rotors
- + No mechanical shaft seals
- + Electronic rotor synchronisation
- + No rotor coatings

Robust and Reliable

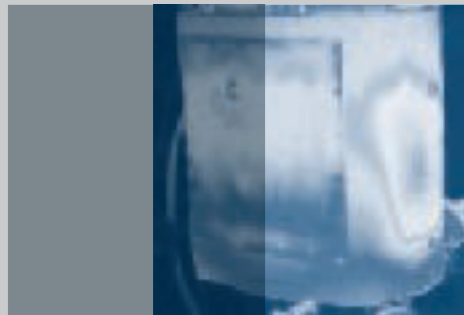
- For wet processes
- + Vertical, self-draining
- + No stagnant areas in pump casing
- + Liquid carry-over/flushing capability
- For tough operating conditions
- + Optimised rotor clearance
- + Torque monitoring
- + Liquid flushing during operation
- + Cleaning without dismantling pump
- For explosive gases
- + Low internal gas temperature

Quiet

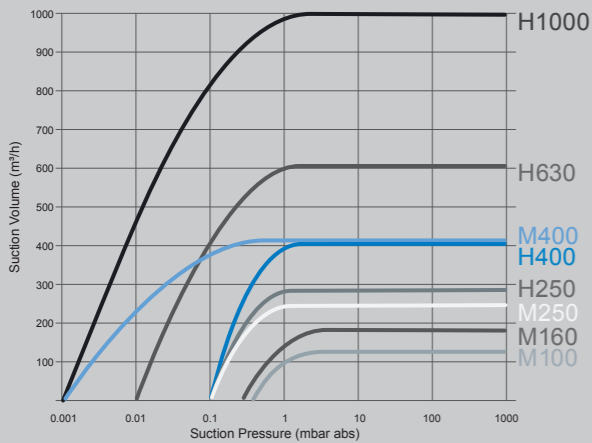
- + Ex-rating
- + Explosion proof design
- + ATEX certified
- For thermally sensitive substances
- + Optimum temperature/compression profile
- + Uniform temperature profile
- No gear box



SIHI^{dry} Simple, Dry and Reliable



Performance range SIHI^{dry}

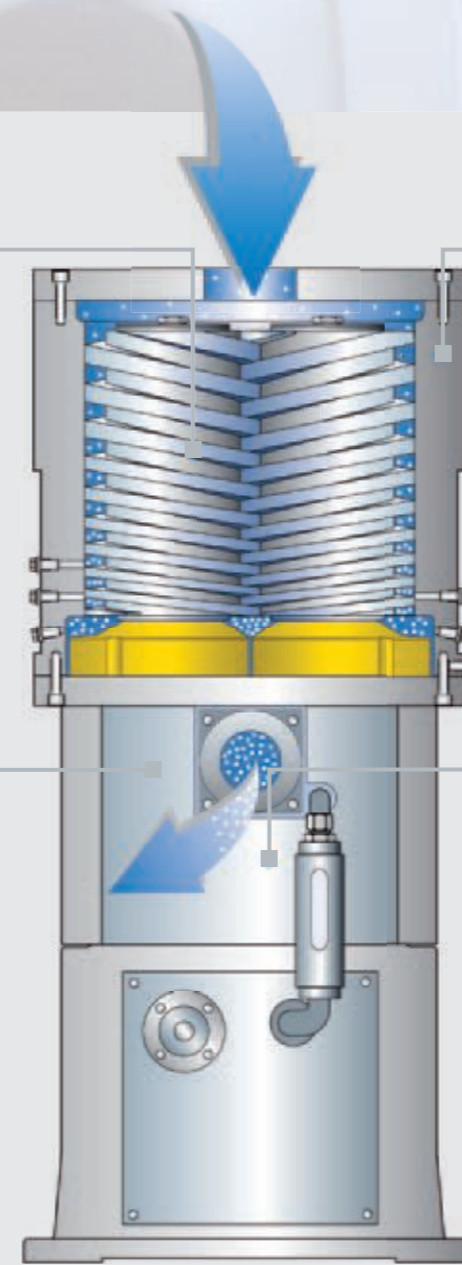


Optimised Gas Temperature

A key requirement for the effective and safe evacuation of corrosive media is the prevention of condensation in the pump. This requires the gas temperature to be maintained above its dew-point. Conversely, many gases polymerise or 'crack' at elevated temperatures. This can lead to deposition inside the pump, which seriously compromises pump performance. For reliable pump operation it is necessary to have a stable temperature profile within the operating chamber, avoiding both 'hot spots' and 'quench' zones. The SIHI^{dry} achieves this by cooling both the pump casing and the rotors.

ATEX Certified

The ATEX guidelines on risk assessment were a key element in the development of SIHI^{dry}. In contrast to typical dry running pumps, SIHI^{dry} was designed in order to eliminate any potential ignition sources in both normal operation and upset conditions. Certified as a Category 2 machine, the standard SIHI^{dry} can be used without flame arresters. Where potential sources of ignition must be eliminated for occasional upset conditions, Category 1 units are available with EC type-test certification.



Simple to Service and Easy to Schedule

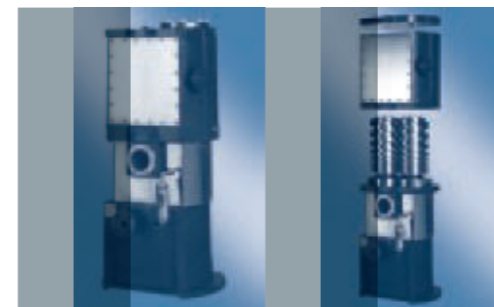
Cleaning the pumping chamber can be undertaken by plant operating personnel. Moreover, removal of the pump chamber can be done without disturbing the bearings. Hence a basic service can be achieved 'in situ' in just a few minutes. Early warning of any upset conditions is possible since the primary pump parameters are constantly monitored. This enables remedial actions such as automatic cleaning regimes to be incorporated into the process, thereby helping to maximise 'uptime'.

Optional Drive Capabilities

The innovative drive concept of SIHI^{dry} and its modularity enable it to be supplied as a basic unit for stand-alone operation or as an 'intelligent' unit in order to integrate with the customer's system.

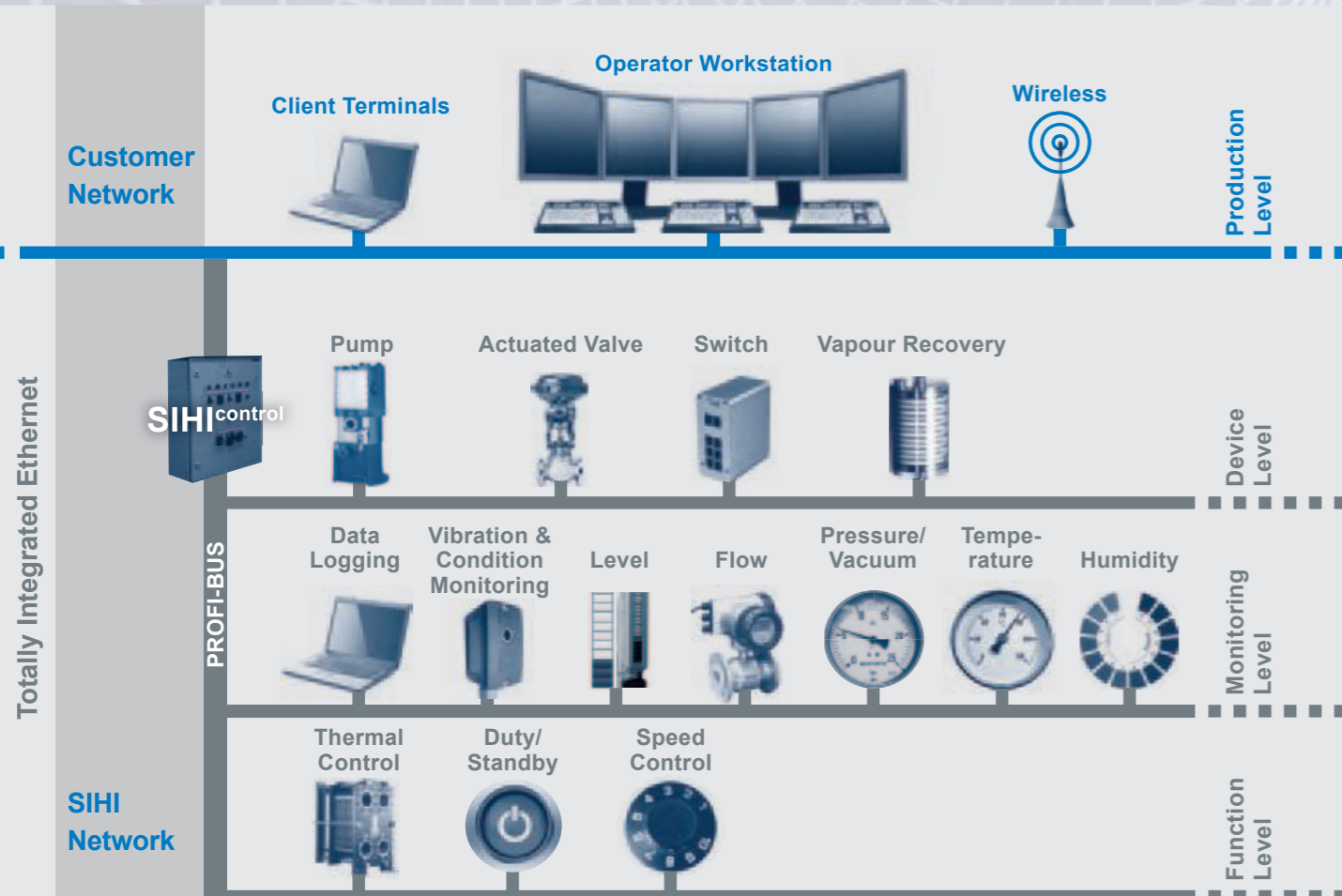
Technical data

SIHI ^{dry} Size	M100	M160	M250	M400	H250	H400	H630	H1000
Suction volume (m³/h)	100	160	250	400	290	400	600	1000
End pressure (mbar)	<0.7	<0.5	<0.1	<0.001	<0.1	<0.1	<0.01	<0.01
Power consumption at ultimate pressure (kW)	2.5	3.5	2.0	3.5	5.0	7.0	10.0	18.0
Sound level as per DIN (dB(A))	54	54	54	54	63	64	70	74



SIHI^{dry} Intelligent System Management (DCS)

Your Process Partner Committed to Engineering Excellence



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.

Understanding the process

- + 100 years of experience
- + Staff trained to communicate at all levels
- + Deep application knowledge

... Solutions with minimal customer effort

Testing & Documentation

- + Factory and Site Acceptance Tests
- + Certified documentation
- + Witnessed customised testing

... Reduced validation and commissioning costs

Optimum product range

- + Unique process can be treated with simplicity
- + Reduced cost of design, manufacture, and documentation
- + Predictable site testing and commissioning

... Customised solutions for standard capital costs

Quality assurance

- + Total Quality Management
- + ISO9000
- + Rigorous health and safety culture

... Long term security

Design

- + Advanced design tools
- + Highest level of machine efficiency
- + Long lasting reliability

... Reduced energy, maintenance, and environmental costs

Aftermarket – a local approach

- + Dedication to process uptime
- + Locally positioned service & technical centres
- + Easy access to support, on a worldwide level

... Highest level of customer care

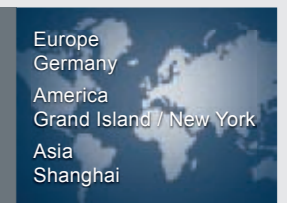
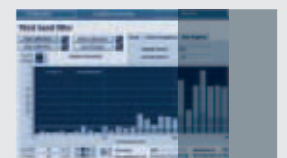
Manufacturing

- + Centre of excellence structure
- + High level of skill and competence
- + Ongoing people and process development

... Reduced integration costs

Competence Centre

- + Centralised design, purchasing, production, compliance, and local support
- + De-centralised (local) quotation and project management teams



Drive Options

The innovative drive concept of SIHI^{dry} enables it to be supplied as a basic unit for stand-alone operation, or as an "intelligent" unit for total system integration. Depending upon the level of automation required, there are three standard drive-modules:

Basic

The Basic version contains "intelligent" overload protection, and rapid fault diagnosis via an error coding platform. Deeper analysis is available via a simple serial interface.

Dynamic

Coupled to the facility supplied with the Basic variant, the Dynamic execution offers an additional variable speed function. This allows the suction capacity/pressure to be regulated in harmony with the process requirement. Speed can be set by the process PLC output signal of 4 – 20 mA.

Control

Coupled to the Basic and Dynamic platforms, the Control drive variant offers two additional benefits:

- (1) Independent speed variation in which to match a pressure-related setting that can be chosen by the operator, and/or
- (2) Logic control and DCS integration of the valves and other add-on devices without device programming.

Examples would include automatic start-up and shut-down sequencing, and/or Clean-In-Place functionality, without the need for external input.

For further address details please visit:
www.SIHI.com

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