



## SIHI<sup>dry</sup> - Dry Running Vacuum Pump



SIHI Pumps  
[www.sterlingamericas.com](http://www.sterlingamericas.com)

# SIHI<sup>dry</sup> Your Application....

## SIHI<sup>dry</sup> Dry Running Vacuum Pumps



Your Operations and Maintenance people will tell you that process plant applications are **tough**. To meet your company's production goals, you need equipment **tough** enough to stay running under adverse, unplanned and upset conditions.

### Common problems with other existing technology include:

- Rotary vane vacuum pumps - failure resulting from contamination of lubricating oil by condensed vapors and solvents, **plus** problematic disposal of contaminated lubricating oil
- High temperature operation of other dry pump technology in combination with the presence of flammable vapors in the gas stream - leading to the risk of auto-ignition and possible explosion
- Catastrophic failure resulting from carry-over of particulate and liquid slugs with rotary vane and other dry pump technology
- Condensation of vapors in liquid ring pumps & condensate contamination in steam ejector systems - leading to environmental waste issues
- Liquid ring pump seal liquid vapor pressure limitations leading to cavitation and inability to meet design flows at deeper vacuum levels
- Complex construction of other dry pump technology - difficult to disassemble and clean in the event of product buildup
- Continual maintenance on mechanical shaft seals
- Failure of rotor coatings in other dry pump technology

# Dry running vacuum pumps for chemical, pharmaceutical and other process industries

**SIHI<sup>dry</sup>** is a vertical twin-rotor machine that is completely dry, has no mechanical shaft seals, timing gears, or lubricating fluids, that meets the need for a simple, robust and reliable vacuum pump that can handle liquid and solid carry-over as well as rapidly changing operating conditions.

## The Benefits of SIHI<sup>dry</sup> at a Glance

- **Totally dry operation** – No lubricating oil or sealing liquid in the compression chamber to become contaminated. No oil or oil filters to change, no contaminated waste fluids to deal with.
- **Optimized control of process vacuum levels** improve production rates and product quality. This is accomplished through **Integral VFD**, eliminating the need for control valves.
- **Control of internal operating temperatures** - safe for application with flammable vapors.
- **Vertical flow, self draining design** - can handle liquid carry-over without damage to the pump system, and also allows for cleaning with automatic liquid flushing during operations.
- **Non-sparking, non-contact stainless steel rotating elements** with ductile iron boundary parts. No internal coating to wear or fail.
- **No wearing shaft seals** - eliminates the highest source of vacuum pump maintenance.
- **Low maintenance** - Up to 20,000 hours operation between routine maintenance checks.
- **Quiet** - No gear box, low noise: 64 - 75 dB(A), meets OSHA standards.



SIHI<sup>dry</sup> AS160



SIHI<sup>dry</sup> AS250/AS400



SIHI<sup>dry</sup> H631/H1000

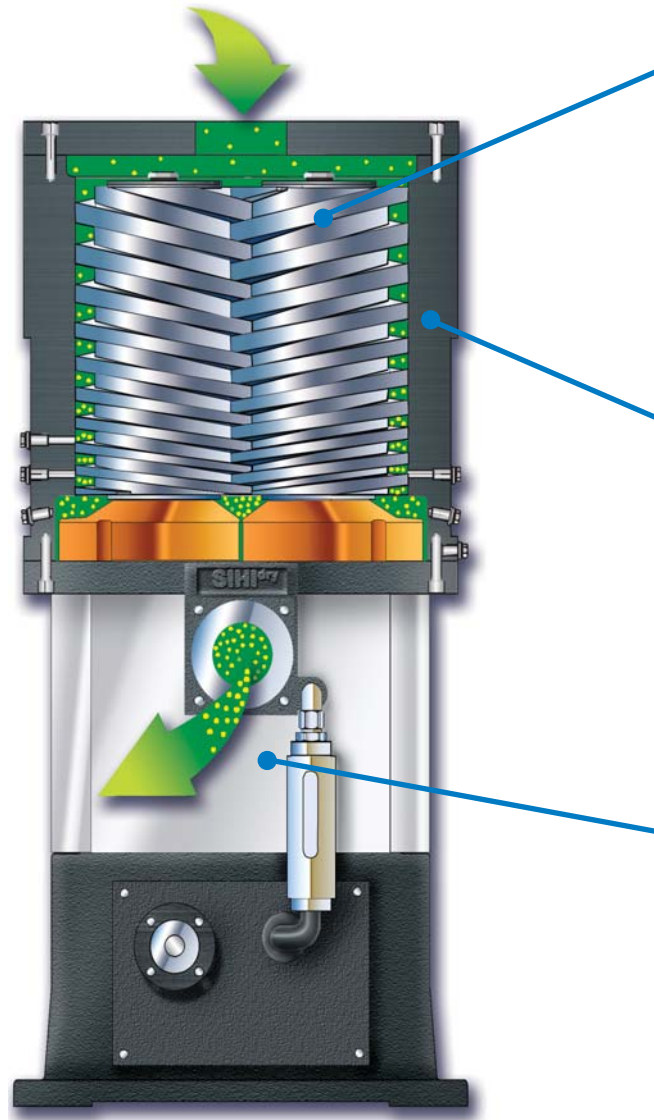
# SIHI<sup>dry</sup> Dry Running Vacuum Pumps

## SIHI<sup>dry</sup> The Intelligent Choice

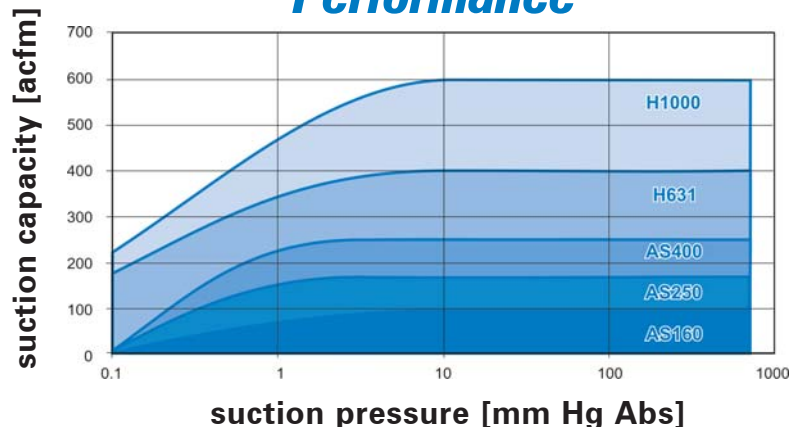
The **SIHI<sup>dry</sup>** range consists of five different packages utilizing the same design concept and features. Several modular packages allow easy adaptation to any process requirements.

- **Cooling Water Module**  
pre-engineered external water cooling module for easy system integration
- **“Ex” Module**  
for explosive atmospheres
- **Suction Line Module**  
for start up, shut down, cleaning and purging
- **Gas Cooling Module**  
for temperature control and acid applications
- **Electronic Module**  
for enhanced system control

All mechanical components are arranged on a common baseplate. The drive control systems protect the mechanical components as well as the motor against overload. Under extremely difficult operating conditions such as liquid carry-over, the system automatically reduces its speed so that the maximum permissible motor load will not be exceeded. The required operating point is regained once the liquid has been pumped away.



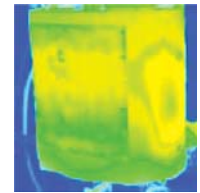
### Performance



**Note:** Final pump size is selected based on gas characteristics and temperature limitations. Variable speed drives allow operation at any point within the field. Higher capacities can be achieved by staging with rotary lobe blowers.

## Optimized 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 their dewpoint. Conversely, many gases polymerize or “crack” at elevated temperatures. This can lead to deposits in the pumping chamber and seriously compromise pump performance. For reliable pump operation it is necessary to have a stable temperature profile within the operating chamber, avoiding both “hot spots” and quenched zones.



The **SIHI<sup>dry</sup>** achieves this by cooling both the pump casing and the rotors.

## Simple to Service and Maintain

Cleaning of the pumping casing can be undertaken by plant operating & maintenance personnel. Moreover, removal of the pump casing can be done without disturbing the bearings. Hence a basic service can be achieved on site 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 maximize “uptime”.

## Optional Drive Capabilities

The innovative drive concept of **SIHI<sup>dry</sup>** and its modular design enable it to be supplied as a basic unit for stand-alone operations, or as an “intelligent” pump system fully integrated to specific process needs.

### Basic

This option contains “intelligent” features such as rotor diagnosis, electronic overload protection and fault codes (should problems occur). Rapid fault analysis is available via a simple serial interface.

### Dynamic

In addition to the basic model, the DYNAMIC version is available for variable speed in order to match specific process requirements. This allows energy to be conserved during times of low vacuum demand. Furthermore, the pump can run at standby speed when there is no demand in order to provide instantaneous vacuum without the need for a warm-up cycle. The **SIHI<sup>dry</sup>** can simply be controlled and monitored by Distributed Control Systems (DCS).

### Control

The CONTROL version provides additional process and operating features to the DYNAMIC version. This integrated pump control provides warm-up, standby and cleaning protocols without the need for additional logic. Additionally, the vacuum level can be regulated between 0 to 100%. Moreover, the unit incorporates valves and sensors in order to save further integration costs.

## **AS160**

The **SIHI<sup>dry</sup>** family provides high quality solutions at competitive prices. The **SIHI<sup>dry</sup>** AS160 Suction capacity and ultimate pressure are optimized for smaller packages in the chemical and pharmaceutical industries.

The performance of this compact unit, combined with its inherent safety features and relatively low operating temperature, make the **SIHI<sup>dry</sup>** AS160 the first choice when safety and reliability are required.

The **SIHI<sup>dry</sup>** AS160 with its electronic drive system offers a flexible control interface while being as easy to connect as a conventional motor.

With this interface the pump offers flexibility of installation with minimal installation costs.

## **AS250/AS400**

The **SIHI<sup>dry</sup>** AS250/AS400 vacuum package is a compact design for intermediate volume applications. The complete electronic drive control is integral with the pump unit. Like the rest of the **SIHI<sup>dry</sup>** family, relatively low operating temperature ensures safety and reliability.

The local control system complete with operating panel and indicators provides complete operational flexibility. Additionally, as with all **SIHI<sup>dry</sup>** units, the AS250/AS400 may be remotely controlled via the process control system.

With the integrated automatic control functions, operation is simple and reliable.

## **H631/H1000**

The **SIHI<sup>dry</sup>** H631/H1000 is "tailor made" for high capacity process applications. Parameters such as working temperature, operating pressure and suction capacity can be custom set to meet process needs.

The complete vacuum package includes fully integrated electronics with digital and analog outputs to control and monitor pump and process operations.

The proven **SIHI<sup>dry</sup>** safety systems simplify the task of the project engineer. Our vacuum package with complete electronic control, offers accurate and identifiable installation cost savings.

**SIHI<sup>dry</sup>** H631/H1000 is particularly suitable for many applications including: handling acidic gases, for applications with T4 temperature limitations or processes with particulate and liquid carry-over.

## Characteristics

Pump	AS160
Nominal suction capacity	100 ACFM
Ultimate pressure	< 1 mm Hg Abs
Maximum operating speed	12,000 rpm
Maximum internal temperature	395° F (200° C)
Power consumption, max.	7 HP (5 kW)
Purge gas consumption	approx. 1.0 SCFM
Discharge pressure, max.	1.5 PSIG
Sound level	< 65 dB(A)
Weight of the bare pump	approx. 575 lbs



## Characteristics

Pump	AS250	AS400
Nominal suction capacity	170 ACFM	250 ACFM
Ultimate pressure	< 1 mm Hg Abs	< 1 mm Hg Abs
Maximum operating speed	4,500 rpm	5,500 rpm
Maximum internal temperature	300° F (150° C)	395° F (200° C)
Power consumption, max.	10 HP (8 kW)	13HP (10 kW)
Purge gas consumption	approx. 1.0 SCFM	approx. 1.0 SCFM
Discharge pressure, max.	1.5 PSIG	1.5 PSIG
Sound level	< 64 dB(A)	< 64 dB(A)
Weight of the bare pump	approx. 1280 lbs	approx. 1280 lbs



## Characteristics

Pump	H631	H1000
Nominal suction capacity	400 ACFM	600 ACFM
Ultimate pressure	<0.1mm Hg Abs	<0.1mm Hg Abs
Maximum operating speed	8000 rpm	8000 rpm
Maximum internal temperature	395° F (200° C)	395° F (200° C)
Power consumption, max.	30 HP (22 kW)	43 HP (32 kW)
Purge gas consumption	approx. 1.0 SCFM	approx. 1.0 SCFM
Discharge pressure, max.	3 PSIG	1.5 PSIG
Sound level	< 75 dB(A)	< 75 dB(A)
Weight of the bare pump	approx. 1100 lbs.	approx. 1100 lbs.

