



# SIHI<sup>®</sup> Dry M, Mi and H Series

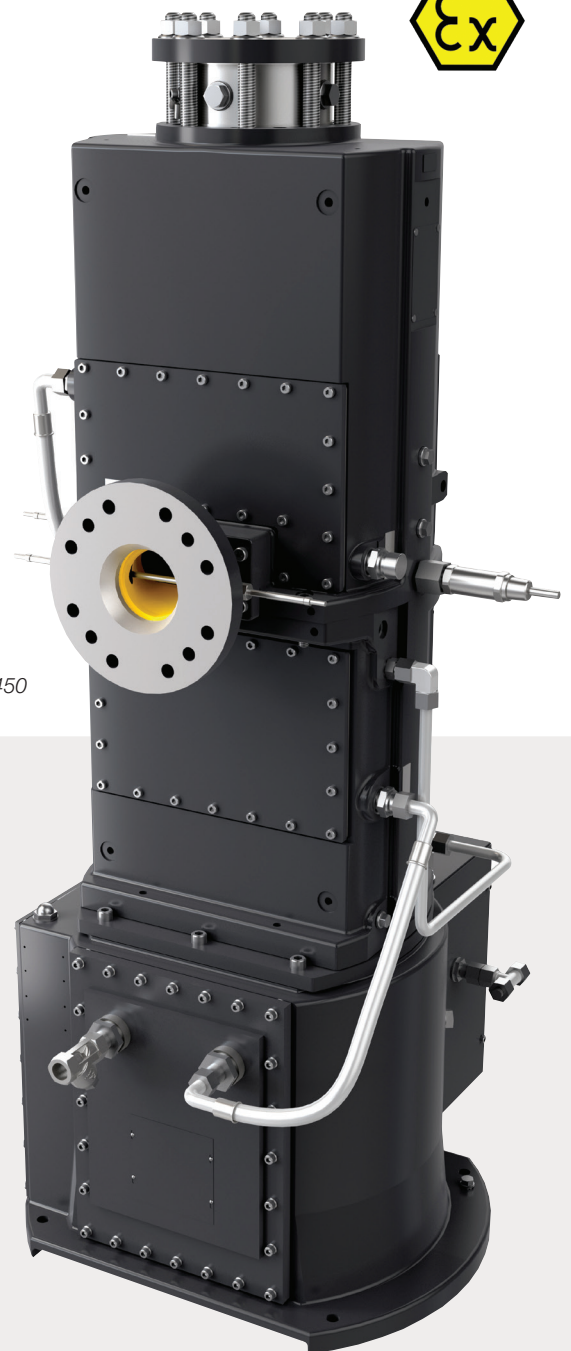
Dry-running vacuum pumps for the process industries

## Simple, dry and reliable

The SIHI Dry pump from Flowserve is a vertically oriented and self-draining vacuum pump with no mechanical contact shaft seals. Available in three models specifically designed for chemically related processes, it is ideal for applications where there is a high possibility of liquids or solids carryover. This award-winning solution can accommodate corrosive gases and vapors and has superior resistance to heat-accelerated deposition. An extensive range of intelligent modules which can be incorporated 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 synchronization permits gearbox-free operation which runs extremely quietly and without any lubrication.

Eleven SIHI Dry pump sizes were developed for operation with explosive media, both internally and externally, and offer volumetric flow rates up to 1,000 m<sup>3</sup>/h (589 cfm).



SIHI Dry  
model Mi450

### Benefits

- High-performance vacuum
- High efficiency and reliability
- Simple to clean and maintain
- Quiet operation
- Small footprint
- Self-draining
- No waste or effluent
- Easy integration and monitoring

### Key vacuum applications

- Distillation
- Drying
- Batch reactors
- Chemical deposition
- Reactor charging
- Inert gas blanketing



## Operational benefits

### Built for harsh processes

#### Tolerates particle and liquid carryover without any suction side filter

- Top-down flow avoids particle deposits inside of the pump
- No wear caused by particle carryover due to contact-free principle
- Optional integrated liquid cleaning by flushing module
- Particle carryover and pump drying by optional integrated gas flushing module

#### Handling of condensable and corrosive media

- Prevention of condensation inside of the pump by optional integrated gas dilution module
- Optional integrated liquid cleaning by flushing module
- Reduction of condensation by temperature-controlled operation

#### Safe handling of toxic media

- Hermetical, tight execution
- Pump internal secondary cooling loop, decoupled from customer cooling water

### Easy to clean and service

#### Only cleaning on demand

- Condition monitoring by independent data record of both shafts
- Pre-failure detection

#### Designed for in situ cleaning and on-site service

- Easy dismantling of the pump casing without bearing removal
- No high-tech workshop required
- Can be done on-site by own staff
- Independency on third party service

### Lower operating costs

#### Lower power consumption

- High-tech screws' design optimized for highest efficiency
- Frequency control improves operational energy efficiency

## Engineered for easy system integration

### Certified explosion protection

- ATEX-certified, even without flame arrestor in Category 2 systems
- No source of ignition due to consequential contact-free operation

### Customized vacuum system solutions

- Pre-engineered modules match all individual process needs

### No pressure control valve necessary

- Adjustable suction capacity due to variable rotational speed

### An integrated solution

- Pre-engineered modules are completely mounted and tested
- Small-footprint design saves useful space

## Improved product quality

### High pumping performance

- Remarkably high pump speed at low pressure allows higher flow rate of process gases
- Lower final pressure

### Zero process contamination

- Truly dry and contact-free principle free of any service liquids
- Absolutely free of gear oil due to electronically synchronized shafts

### No PLC control

- Self-controlled, pre-engineered modules
- Local control via human machine interface (HMI) panel
- Data access via Ethernet

### Easy communication

- Availability of bus standards as well as I/O interface
- Equipped with HMI

### Pre-configured systems

- Three different fully tested and documented pre-engineered systems available

## Fast installation and startup

### Self-controlled vacuum system

- Completely assembled, wired, tested and self-controlled vacuum system allows easiest commissioning

## Lower maintenance costs and downtime

### No oil checks, exchanges and disposals required

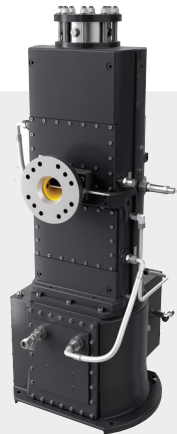
- Free of oil as service liquid
- No gear oil

### No wearing

- Consequent contact-free principle
- Long-life bearings
- Contact-free sealings

### Continuous condition analysis

- Data logging
- Online monitoring of pump status
- Simple failure codes



### Standard

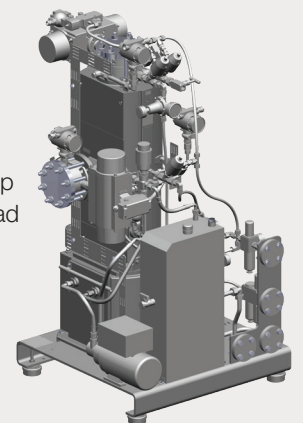
Dry screw vacuum pump:

- Variable-speed drive onboard
- Purge gas system with ex-certificate
- Temperature switch
- Pressure switch discharge
- Strainer with insert

### Configured

Standard plus:

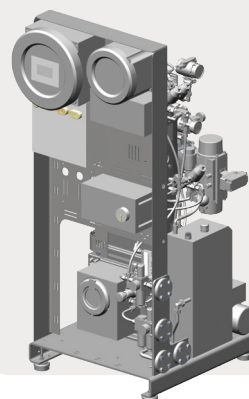
- Valves
- Pressure transmitter
- Gas dilution
- Coolant loop with overload protection
- Frame



### Premium

Configured plus:

- Advanced sensoric
- Fully controlled
- HMI display





## General technical data

Parameter	Unit	Model					
		M100	M160	M250	M400	Mi450	Mi650
<b>Max. suction capacity</b>	m <sup>3</sup> /h (cfm)	100 (59)	160 (95)	250 (147)	400 (235)	450 (265)	680 (383)
<b>Ultimate pressure</b>	mbar (Torr)	< 0.7 (0.52)	< 0.1 (0.07)	< 0.02 (0.015)	< 0.02 (0.015)	< 0.01 (0.007)	< 0.01 (0.007)
<b>Temperature class</b>	-	T4	T4	T4	T4 (T5/T6)	T3	T2
<b>Sound pressure level</b>	dB(A)	≤ 54	≤ 54	≤ 54	≤ 54	≤ 70	≤ 75
<b>Power consumption at ultimate pressure</b>	kW (hp)	2.5 (3.3)	3.5 (4.7)	2 (2.7)	2.5 (3.3)	4 (5.4)	6 (8)

Parameter	Unit	Model				
		H250	H400	H630	H750	H1000
<b>Max. suction capacity</b>	m <sup>3</sup> /h (cfm)	270 (159)	400 (235)	600 (353)	750 (441)	1,000 (585)
<b>Ultimate pressure</b>	mbar (Torr)	< 0.1 (0.07)	< 0.1 (0.07)	< 0.1 (0.07)	< 0.1 (0.07)	< 0.1 (0.07)
<b>Temperature class</b>	-	T4	T4	T3	T3	T3
<b>Sound pressure level</b>	dB(A)	≤ 63	≤ 64	≤ 70	≤ 74	≤ 74
<b>Power consumption at ultimate pressure</b>	kW (hp)	5 (6.7)	7 (9.4)	10 (13.4)	18 (24.1)	18 (24.1)

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