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AGILENT ROTARY VANE PUMPS FEATURES AND BENEFITS

A reliable line of pumps to cover the most demanding industrial and scientific applications

- Thanks to a very simple and highly reliable design, these field proven rotary vane pumps provide excellent vacuum performance. Agilent's quality and manufacturing standards ensure that the DS Rotary Vane Pumps provide high pumping stability for light gases, low noise, minimal oil backstreaming, and a long operating life.
- Agilent's DS Rotary Vane Pumps conform with CE and RoHS requirements, and all pumps are UL and CSA approved. Agilent's world class technical support organization makes the DS Rotary Vane Pump cost-effective and well suited for a wide range of applications.

The new MS 40+ Mono Stage Rotary Vane Pump

- High capacity pumping speed with the smallest footprint
- Proven inverter technology
- Ideal for mass spectrometry and electron microscopy
- Lowest noise, highest throughput

HS Series "smart" pumps with green technology

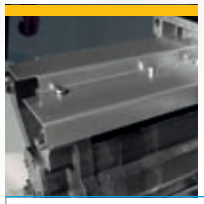
- In 2004 Varian, now Agilent, introduced the first rotary vane pumps with truly "smart" capabilities
- Employ an innovative frequency inverter technology to deliver optimal and consistent performance
- Encompasse the worldwide range of voltage and frequency conditions
- Enviromentally friendly thanks to reduced power requirements and low start up current

Anti-suckback Valve and Vent Device

- This valve isolates the pump should it stop or be idle
- Prevents inadequate venting and oil contamination of the vacuum system when the pump is switched off, or in case of power fail

Forced Oil Circulation

- The dedicated oil circulation gear pump ensures efficient and reliable lubrication of the pump from atmospheric pressure throughout the entire vacuum operating range



Built-in Oil Shield

- This feature minimizes the oil mist at the pump exhaust
- Drastically reduces the oil consumption over long periods of operation
- Reduction of air pollution limiting the impact on the environment

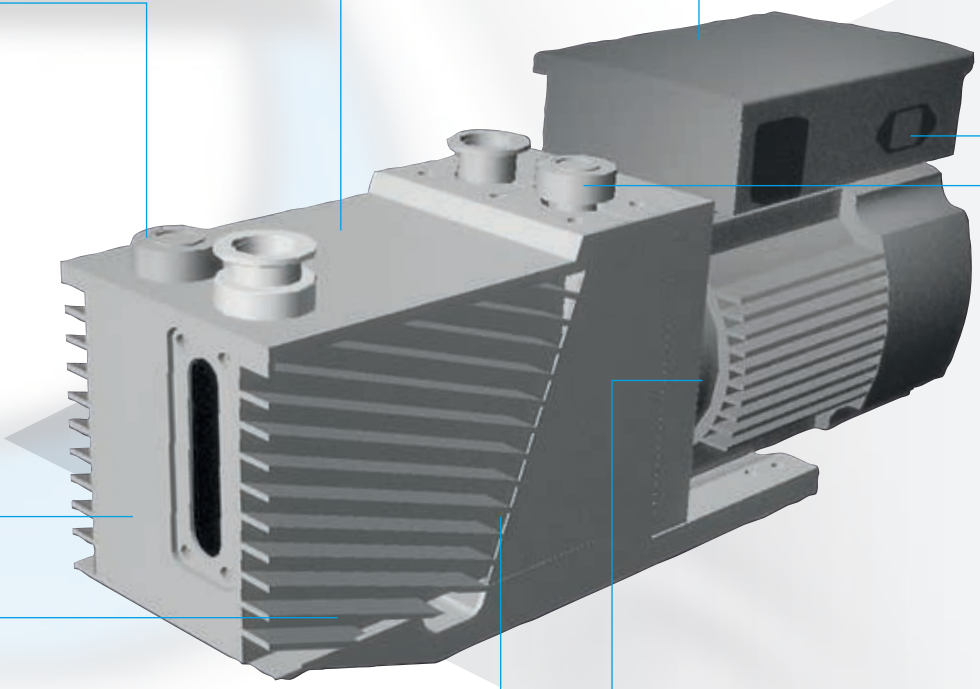
ROTARY VANE PUMPS

Dual Stage Pumps
DS Series: the two stage design allows:

- Low 10^{-3} mbar operation
- Low operating temperature
- Minimal backstreaming at low pressure
- Good pumping efficiency and gas ballast in the low 10^{-2} mbar region

Worldwide Motors

- Pump motors, available as 1-phase or 3-phase, are suitable for all voltages and frequencies worldwide
- Operational voltages are easily selectable, allowing greater flexibility, easy planning and inventory reduction

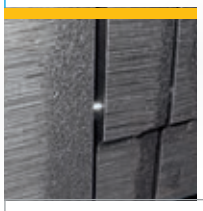


Socket Type IEC320

- Permits use of standard power cable
- Eliminates the need to open box and wire the motor

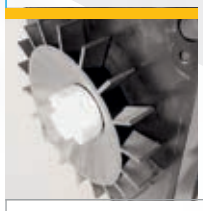
Gas Ballast Valve

- The opening of this valve injects dry air into the second stage of the pump
- This action increases the temperature of the module which facilitates the outgassing and clean up of water vapor or other condensable gases from the oil



Alignment Pins on Pump Module

- The pump module components are assembled and positioned by built-in alignment pins
- These speed up the assembling and maintenance process, avoiding any error



Forced Air Ventilation
The cooling fan between the motor and the pump:

- Reduces the pump operating temperature
- Lowers the oil vapor partial pressure
- Minimizes oil backstreaming and vacuum system contamination

AGILENT ROTARY VANE PUMPS TYPICAL APPLICATIONS

ICP-MS. Photo courtesy Agilent Scientific Instruments.

Analytical Instruments and Mass Spectrometry

Rotary Vane Pumps are the most common primary vacuum pumps used on GC-MS, LC-MS, ICP-MS, and MALDI-TOF Instruments.
GC-MS typically uses our smallest pump, the DS42; the pump is needed to rough the system and back the high vacuum Turbo or Diffusion pump.
LC-MS and ICP-MS use a medium capacity pump on the sample injection/system interface, typically a DS402 or a DS602, and a smaller pump to back the system Turbo pumps.
MALDI-TOF depending on system size, uses the DS102 to the DS602 as roughing or interface pumps.
Nowadays high-end instruments, such as LC-MS and ICP-MS, can take advantage of the benefits of HS 452, HS 652 and MS 40+:

- Large pumping capacity
- Consistent worldwide performance thanks to universal voltage and frequency
- Single phase
- Low power requirements and start up current
- Remote control and diagnostic
- Adjustable performance, low noise
- Green technology

Electron Microscopes

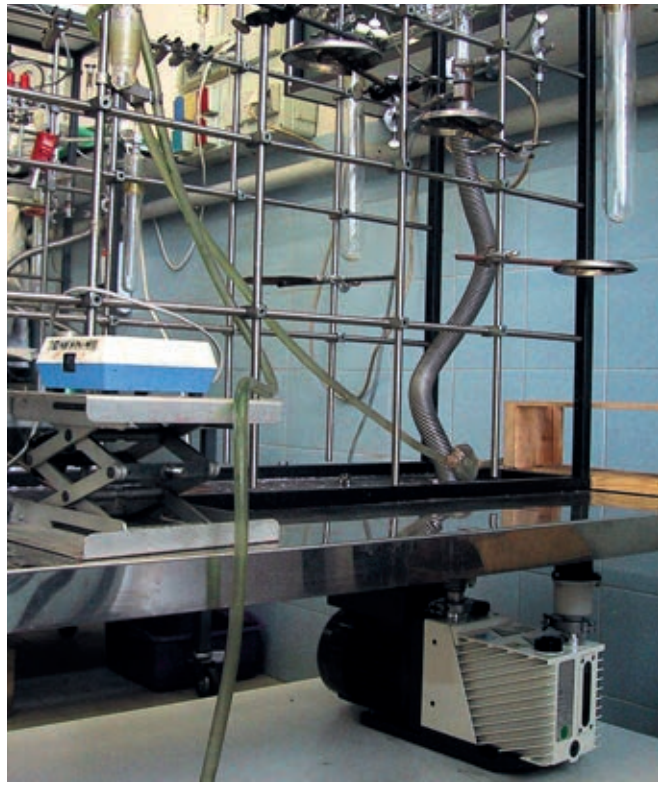
Small pumps, typically the DS202 and the DS302, are still used in competition with dry pumps to rough the system and the high vacuum Turbo or Diffusion pump. condensable vapor.

Leak Detection

Pumps in the DS102, DS202 and DS302 range are typically used to back the Helium Mass Spectrometer Turbo or Diffusion pump.
The roughing pump is usually bigger, typically up to the DS402/DS602, and can still be installed on the Leak Detector itself, while bigger pumps can be used to pump down high throughput Leak Detection systems.

ROTARY VANE PUMPS

Freeze Drying equipment.



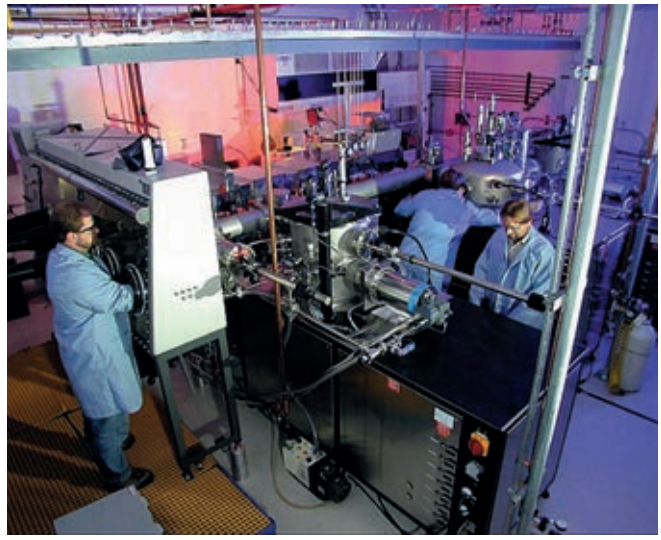
Distillation apparatus. Photo courtesy University of Torino, Italy.

Industrial Vacuum Processes

Vacuum coatings, Metallurgy Vacuum Furnaces, Lamps and TV Tube manufacture, Sterilizers, Freeze Dryers, Glove Boxes, High Speed Centrifuges, and Flywheels (for energy storage) represent the main Industrial applications for Dual Stage Rotary Vane pumps. In the first four fields of application the Rotary Pumps are used as roughing and backing pumps for High Vacuum Turbo or Diffusion pumps, while in the others the Rotary Pumps are typically the only vacuum pumps on the system.

High Energy Physics and Research Laboratories

In these applications the Rotary Vane pumps are mainly used in combination with Turbo pumps. The combination is typically used to rough and pump High Vacuum experimental chambers or to start Ion Pumps in ultra high vacuum systems.



OLED-Lab. Photo courtesy PNNL.

AGILENT ROTARY VANE PUMP MODELS

		DS 40M	DS 102	DS 202
Free air displacement	60 Hz l/min (cfm) 50 Hz l/min (m^3/h)	36 (1.27) 43 (2.58)	114 (4) 95 (5.7)	192 (6.8) 160 (9.6)
Pumping speed*	60 Hz (cfm) 50 Hz (m^3/h)	1.27 1.8	3.5 5	5.8 8.3
Ultimate partial pressure* (mbar)		–	10^{-4}	10^{-4}
Ultimate total pressure* (mbar)		6.7×10^{-3}	2×10^{-3}	2×10^{-3}
Ultimate total pressure with gas ballast* (mbar)		–	2×10^{-2}	2×10^{-2}
Water vapor tolerance (mbar)		–	15	15
Water vapor capacity (g/h)		–	60	100
Oil capacity min/max (l)		0.37 (max)	0.2/0.5	0.2/0.6
Motor rating 1 ph	60 Hz (kW) 50 Hz (kW)	0.1 0.1	0.45 0.38	0.45 0.38
Motor rating 3 ph	60 Hz (kW) 50 Hz (kW)			
Nominal rotation speed	60 Hz (rpm) 50 Hz (rpm)	3300 2600	1800 1500	1800 1500
Weight kg (lbs)		9.3 (20.5)	22 (48)	25 (55)
Inlet flange		16KF DN	25KF DN	25KF DN
Exhaust flange		16KF DN	25KF DN	25KF DN

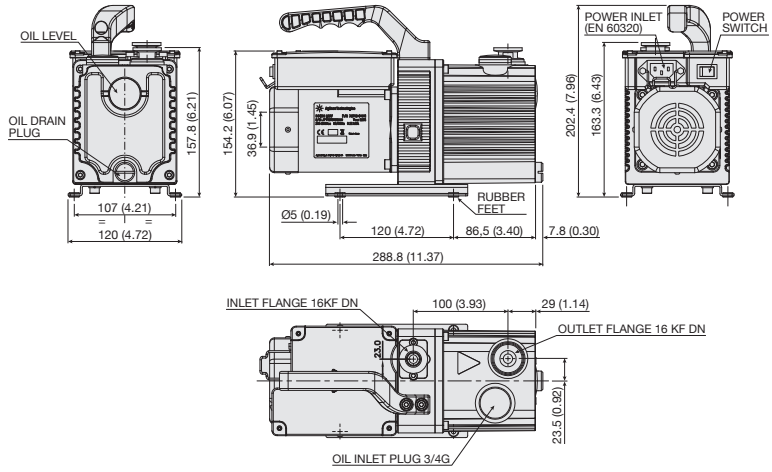
*According to PNEUROP 6602

ROTARY VANE PUMPS

DS 302	DS 402	DS 602	HS 452	HS 652	MS 40+
285 (10) 237 (14.2)	410 (14.5) 342 (20.5)	605 (21.4) 504 (30.2)	456 (16.1) 456 (27.3)	672 (23.8) 672 (40.3)	828 (29.2) 828 (49.7)
8.2 11.6	12.3 17.4	17.6 25	13 22	19 32	23.5 40
10^{-4}	10^{-4}	10^{-4}	10^{-4}	10^{-4}	N/A
2×10^{-3}	2×10^{-3}	2×10^{-3}	2×10^{-3}	2×10^{-3}	5×10^{-2}
2×10^{-2}	1×10^{-2}	1×10^{-2}	1×10^{-2}	1×10^{-2}	N/A No gas ballast port
20	30	30	30	30	N/A No gas ballast port
160	350	550	350	550	N/A No gas ballast port
0.25/0.6	0.5/1	0.5/1	0.5/1	0.5/1	1
0.45 0.38	0.90 0.75	0.90 0.75			
	0.90 0.75	0.90 0.75	0.50	0.50	0.75
1800 1500	1800 1500	1800 1500	2000	2000	1450
25 (55)	35 (77)	35 (77)	33 (73)	33 (73)	33 (73)
25KF DN	25KF DN	25KF DN	25KF DN	25KF DN	25KF DN - 40KF DN
25KF DN	25KF DN	25KF DN	25KF DN	25KF DN	25KF DN

AGILENT ROTARY VANE PUMP MODELS

Agilent DS 40M



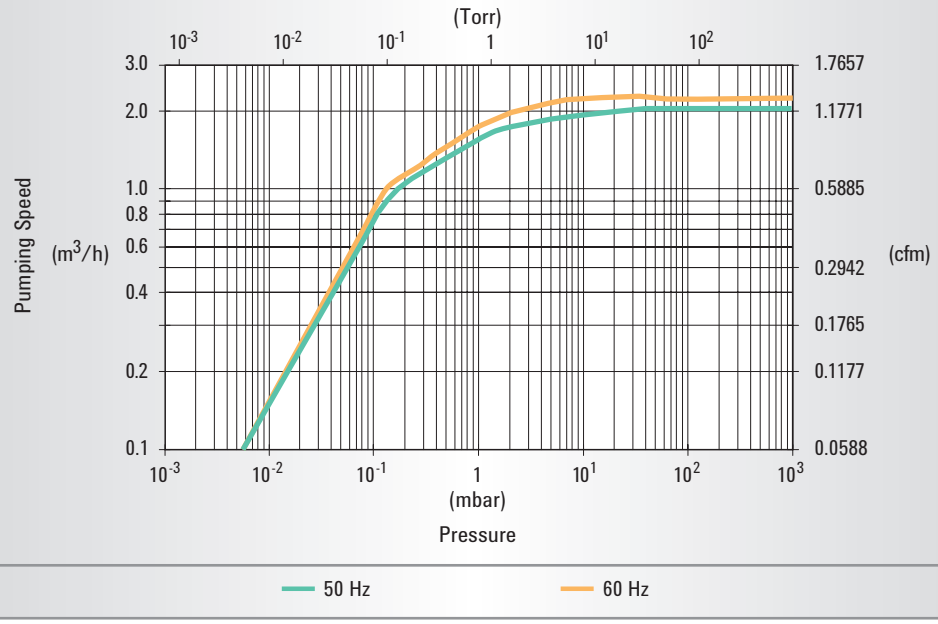
Dimensions: millimeters (inches)

Technical Specifications

Free air displacement	60 Hz: 36 l/min (1.27 cfm)	50 Hz: 43 l/min (2.58 m^3/h)
Pumping speed*	60 Hz: 1.27 cfm	50 Hz: 1.8 m^3/h
Ultimate partial pressure*	–	
Ultimate total pressure*	6.7 x 10^{-3} mbar	
Ultimate total pressure with gas ballast*	–	
Water vapor tolerance	–	
Water vapor capacity	–	
Oil capacity max	0.37 l	
Motor rating 1ph	60 Hz: 0.1 kW	50 Hz: 0.1 kW
Nominal rotation speed	60 Hz: 3300 rpm	50 Hz: 2600 rpm
Weight	9.3 kg (20.5 lbs)	
Inlet flange	16KF DN	
Exhaust flange	16KF DN	

* According to PNEUROP 6602

DS 40M - Pumping Speed Curve



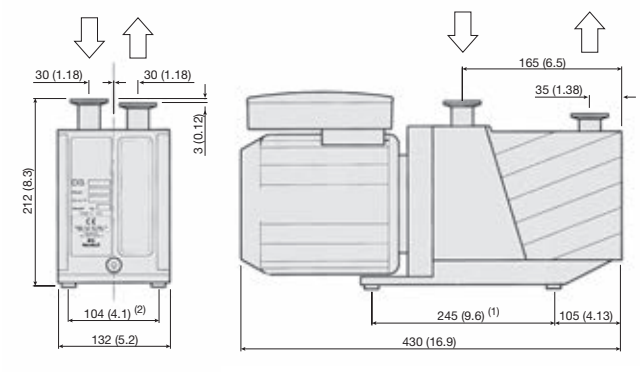
Ordering Information

Dual Stage Rotary Vane Pump	Part Number
DS 40M 100-120 Vac - 50/60Hz	X3703-64000
DS 40M 200-240 Vac - 50/60Hz	X3703-64001

Oil and Accessories	Part Number
Rotary vane fluid, AVF 20S type, 0.5 liter	X3703-64006
DS 40M oil mist trap 3/4 G	X3703-64003
DS 40M oil mist trap cartdrige (pkg. of 2)	X3703-64004
DS 40M maintenance kit	X3703-64005
European plug power cable 2 meters 1 ph	9499396
USA plug power cable 2 meters 1 ph	9499397
UK plug power cable 2 meters 1 ph	9499398
NW 16 centering ring viton	KC16AV
NW 16 aluminum clamp	KQ16AWP

AGILENT ROTARY VANE PUMP MODELS

Agilent DS 102



Alternative mounting holes are also available,
with (1) = 226 (8.9) and (2) = 98 (3.8), with hole Ø = 7 (0.3)

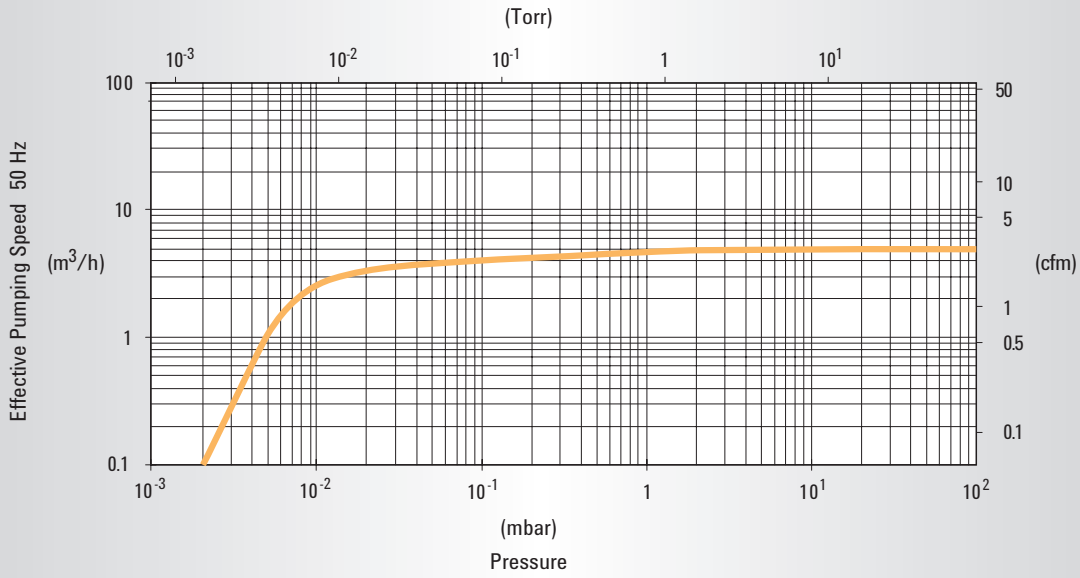
Dimensions: millimeters (inches)

Technical Specifications

Free air displacement	60 Hz: 114 l/min (4 cfm)	50 Hz: 95 l/min (5.7 m^3/h)
Pumping speed*	60 Hz: 3.5 cfm	50 Hz: 5 m^3/h
Ultimate partial pressure*	10^{-4} mbar	
Ultimate total pressure*	2 x 10^{-3} mbar	
Ultimate total pressure with gas ballast*	2 x 10^{-2} mbar	
Water vapor tolerance	15 mbar	
Water vapor capacity	60 g/h	
Oil capacity min/max	0.2/0.5 l	
Motor rating 1ph	60 Hz: 0.55 kW	50 Hz: 0.45 kW
Nominal rotation speed	60 Hz: 1800 rpm	50 Hz: 1500 rpm
Weight	22 kg (48 lbs)	
Inlet flange	25KF DN	
Exhaust flange	25KF DN	

* According to PNEUROP 6602

DS 102 - Pumping Speed Curve



Ordering Information

Dual Stage Rotary Vane Pump	Part Number
DS 102 with 1 phase worldwide motor*	9499315

* 1 phase motors (100-120 / 200-230) V ±10%, 50/60 Hz.
All motors comply with CE and UL/CSA standards.

Minor Maintenance Kit	Part Number
Contains all the valves, O-rings and seals to refurbish the pump to vacuum integrity	9499370

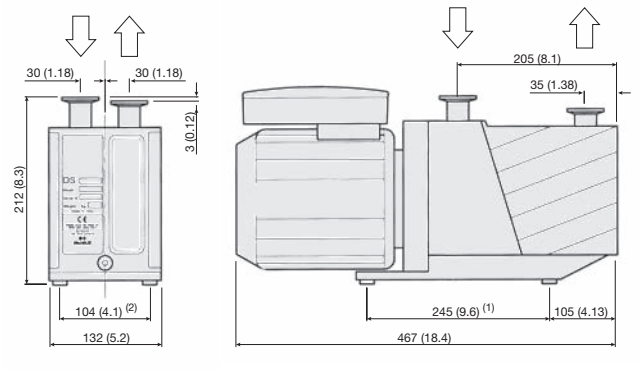
Major Maintenance Kit	Part Number
Includes all the items of the minor kit plus the vanes	9499380

Oil and Accessories	Part Number
Rotary vane fluid, DS19 type, 1 liter	9499390
Rotary vane fluid, DS19 type, 1 liter (USA)*	K7516301
Rotary vane fluid, DS19 type, 1 gallon (USA)	K7516302
Oil mist eliminator	9499395
Oil mist replacement cartridge (pkg. of 2)	9499394
NW 25 oil exhaust filter	9499392
NW 25 oil exhaust replacement cartridge	9499342
Oil return kit	9499376
Oil drain extension	9499375
European plug power cable 2 meters 1 ph	9499396
USA plug power cable 2 meters 1 ph	9499397
UK plug power cable 2 meters 1 ph	9499398
NW 25 centering ring Viton	KC25AV
NW 25 aluminum clamp	KQ25AWP

* When these pumps are used in Leak Detectors applications, we recommend the use of Rotary Vane Fluid (Elite-Z mechanical), P/N 695409005 as it features a lower vapor pressure.

AGILENT ROTARY VANE PUMP MODELS

Agilent DS 202



Alternative mounting holes are also available,
with (1) = 226 (8.9) and (2) = 98 (3.8), with hole Ø = 7 (0.3)

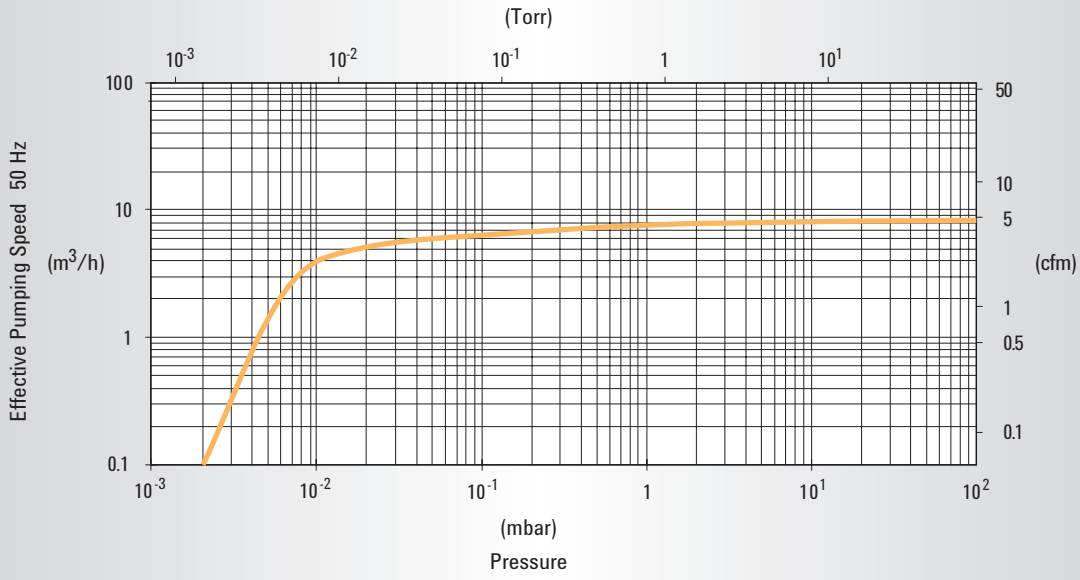
Dimensions: millimeters (inches)

Technical Specifications

Free air displacement	60 Hz: 192 l/min (6.8 cfm)	50 Hz: 160 l/min (9.6 m^3/h)
Pumping speed*	60 Hz: 5.8 cfm	50 Hz: 8.3 m^3/h
Ultimate partial pressure*	10^{-4} mbar	
Ultimate total pressure*	2 x 10^{-3} mbar	
Ultimate total pressure with gas ballast*	2 x 10^{-2} mbar	
Water vapor tolerance	15 mbar	
Water vapor capacity	100 g/h	
Oil capacity min/max	0.25/0.6 l	
Motor rating 1ph	60 Hz: 0.55 kW	50 Hz: 0.45 kW
Nominal rotation speed	60 Hz: 1800 rpm	50 Hz: 1500 rpm
Weight	25 kg (55 lbs)	
Inlet flange	25KF DN	
Exhaust flange	25KF DN	

* According to PNEUROP 6602

DS 202 - Pumping Speed Curve



Ordering Information

Dual Stage Rotary Vane Pump	Part Number
DS 202 with 1 phase worldwide motor*	9499320

* 1 phase motors (100-120 / 200-230) V ±10%, 50/60 Hz.
All motors comply with CE and UL/CSA standards.

Minor Maintenance Kit	Part Number
Contains all the valves, O-rings and seals to refurbish the pump to vacuum integrity	9499370

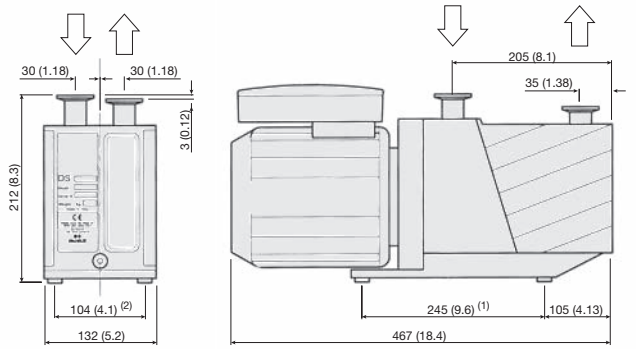
Major Maintenance Kit	Part Number
Includes all the items of the minor kit plus the vanes	9499381

Oil and Accessories	Part Number
Rotary vane fluid, DS19 type, 1 liter	9499390
Rotary vane fluid, DS19 type, 1 liter (USA)*	K7516301
Rotary vane fluid, DS19 type, 1 gallon (USA)	K7516302
Oil mist eliminator	9499395
Oil mist replacement cartridge (pkg. of 2)	9499394
NW 25 oil exhaust filter	9499392
NW 25 oil exhaust replacement cartridge	9499342
Oil return kit	9499376
Oil drain extension	9499375
European plug power cable 2 meters 1 ph	9499396
USA plug power cable 2 meters 1 ph	9499397
UK plug power cable 2 meters 1 ph	9499398
NW 25 centering ring Viton	KC25AV
NW 25 aluminum clamp	KQ25AWP

* When these pumps are used in Leak Detectors applications, we recommend the use of Rotary Vane Fluid (Elite-Z mechanical), P/N 695409005 as it features a lower vapor pressure.

AGILENT ROTARY VANE PUMP MODELS

Agilent DS 302



Alternative mounting holes are also available,
with (1) = 226 (8.9) and (2) = 98 (3.8), with hole Ø = 7 (0.3)

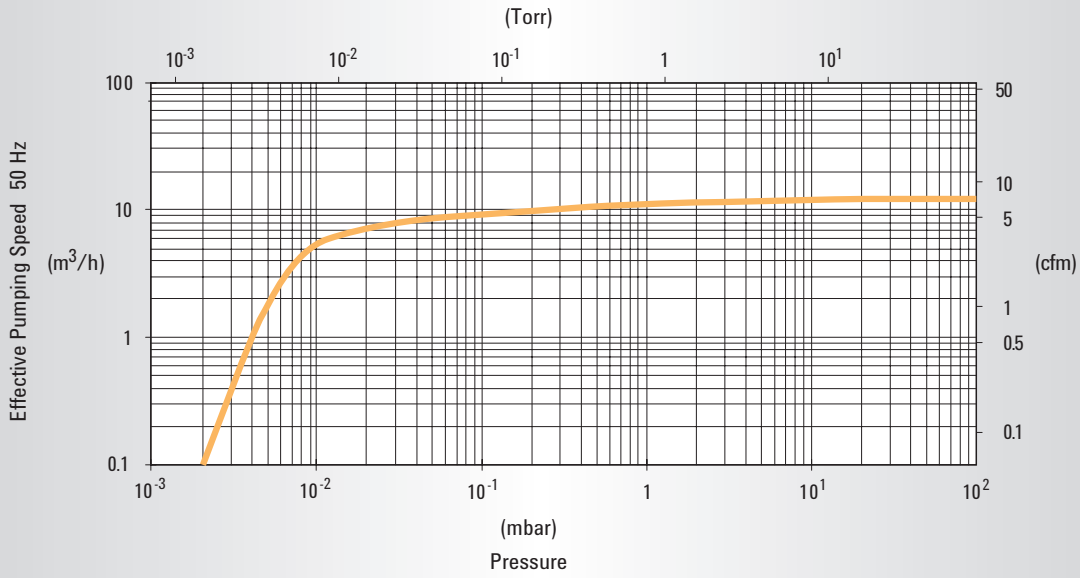
Dimensions: millimeters (inches)

Technical Specifications

Free air displacement	60 Hz: 285 l/min (10 cfm)	50 Hz: 237 l/min (14.2 m^3/h)
Pumping speed*	60 Hz: 8.2 cfm	50 Hz: 11.6 m^3/h
Ultimate partial pressure*	10^{-4} mbar	
Ultimate total pressure*	2 x 10^{-3} mbar	
Ultimate total pressure with gas ballast*	2 x 10^{-2} mbar	
Water vapor tolerance	20 mbar	
Water vapor capacity	160 g/h	
Oil capacity min/max	0.25/0.6 l	
Motor rating 1ph	60 Hz: 0.55 kW	50 Hz: 0.45 kW
Nominal rotation speed	60 Hz: 1800 rpm	50 Hz: 1500 rpm
Weight	25 kg (55 lbs)	
Inlet flange	25KF DN	
Exhaust flange	25KF DN	

* According to PNEUROP 6602

DS 302 - Pumping Speed Curve



Ordering Information

Dual Stage Rotary Vane Pump	Part Number
DS 302 with 1 phase worldwide motor*	9499325

* 1 phase motors (100-120 / 200-230) V ±10%, 50/60 Hz.
All motors comply with CE and UL/CSA standards.

Minor Maintenance Kit	Part Number
Contains all the valves, O-rings and seals to refurbish the pump to vacuum integrity	9499370

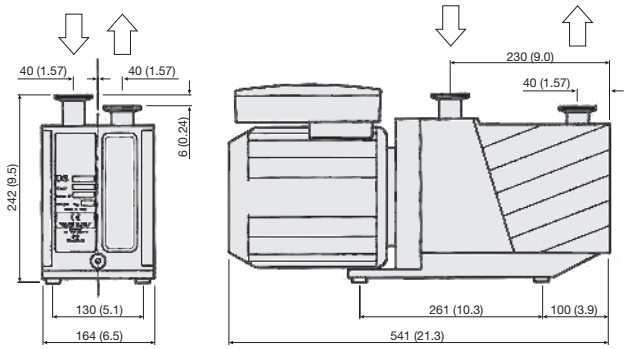
Major Maintenance Kit	Part Number
Includes all the items of the minor kit plus the vanes	9499381

Oil and Accessories	Part Number
Rotary vane fluid, DS19 type, 1 liter	9499390
Rotary vane fluid, DS19 type, 1 liter (USA)*	K7516301
Rotary vane fluid, DS19 type, 1 gallon (USA)	K7516302
Oil mist eliminator	9499395
Oil mist replacement cartridge (pkg. of 2)	9499394
NW 25 oil exhaust filter	9499392
NW 25 oil exhaust replacement cartridge	9499342
Oil return kit	9499376
Oil drain extension	9499375
European plug power cable 2 meters 1 ph	9499396
USA plug power cable 2 meters 1 ph	9499397
UK plug power cable 2 meters 1 ph	9499398
NW 25 centering ring Viton	KC25AV
NW 25 aluminum clamp	KQ25AWP

* When these pumps are used in Leak Detectors applications, we recommend the use of Rotary Vane Fluid (Elite-Z mechanical), P/N 695409005 as it features a lower vapor pressure.

AGILENT ROTARY VANE PUMP MODELS

Agilent DS 402

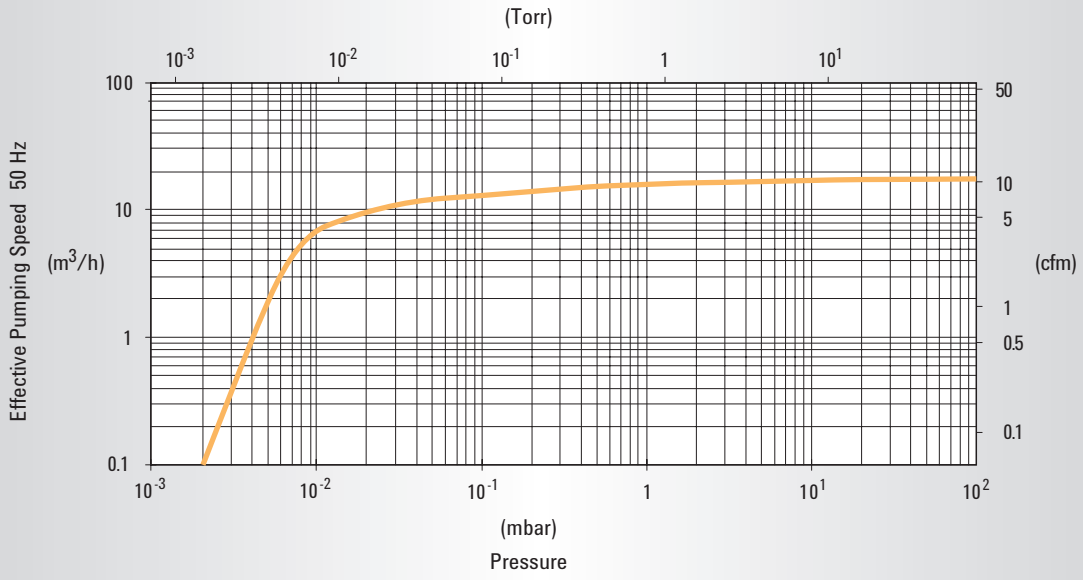


Technical Specifications

Free air displacement	60 Hz: 410 l/min (14.5 cfm)	50 Hz: 342 l/min (20.5 m^3/h)
Pumping speed*	60 Hz: 12.3 cfm	50 Hz: 17.4 m^3/h
Ultimate partial pressure*	10^{-4} mbar	
Ultimate total pressure*	2 x 10^{-3} mbar	
Ultimate total pressure with gas ballast*	1 x 10^{-2} mbar	
Water vapor tolerance	30 mbar	
Water vapor capacity	350 g/h	
Oil capacity min/max	0.5/1 l	
Motor rating 1ph	60 Hz: 0.55 kW	50 Hz: 0.75 kW
Motor rating 3ph	60 Hz: 0.90 kW	50 Hz: 0.75 kW
Nominal rotation speed	60 Hz: 1800 rpm	50 Hz: 1500 rpm
Weight	35 kg (77 lbs)	
Inlet flange	25KF DN	
Exhaust flange	25KF DN	

* According to PNEUROP 6602

DS 402 - Pumping Speed Curve



Ordering Information

Dual Stage Rotary Vane Pump	Part Number
DS 402 with 1 phase worldwide motor*	9499330
DS 402 with 3 phase worldwide motor**	9499331

* 1 phase motors (100-120 / 200-230) V ±10%, 50/60 Hz.
** 3 phase motors (200-220 / 380-415) V ±10% at 50 Hz or (200-230 / 460) V ±10% at 60 Hz.
All motors comply with CE and UL/CSA standards.

Minor Maintenance Kit	Part Number
Contains all the valves, O-rings and seals to refurbish the pump to vacuum integrity	9499371

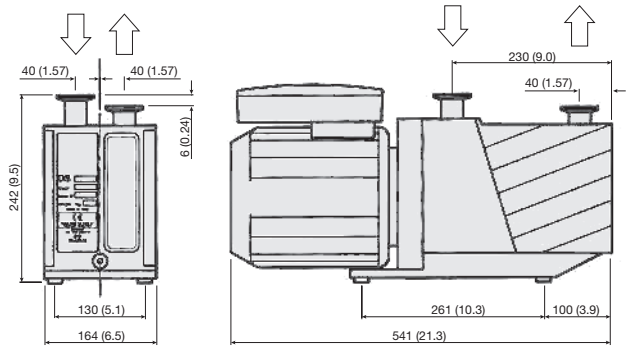
Major Maintenance Kit	Part Number
Includes all the items of the minor kit plus the vanes	9499382

Oil and Accessories	Part Number
Rotary vane fluid, DS19 type, 1 liter	9499390
Rotary vane fluid, DS19 type, 1 liter (USA)*	K7516301
Rotary vane fluid, DS19 type, 1 gallon (USA)	K7516302
Oil mist eliminator	9499395
Oil mist replacement cartridge (pkg. of 2)	9499394
NW 25 oil exhaust filter	9499392
NW 25 oil exhaust replacement cartridge	9499342
Oil return kit	9499376
Oil drain extension	9499375
European plug power cable 2 meters 1 ph	9499396
USA plug power cable 2 meters 1 ph	9499397
UK plug power cable 2 meters 1 ph	9499398
NW 25 centering ring Viton	KC25AV
NW 25 aluminum clamp	KQ25AWP

* When these pumps are used in Leak Detectors applications, we recommend the use of Rotary Vane Fluid (Elite-Z mechanical), P/N 695409005 as it features a lower vapor pressure.

AGILENT ROTARY VANE PUMP MODELS

Agilent DS 602



Alternative mounting holes are also available, with thread 1/4-20UNC

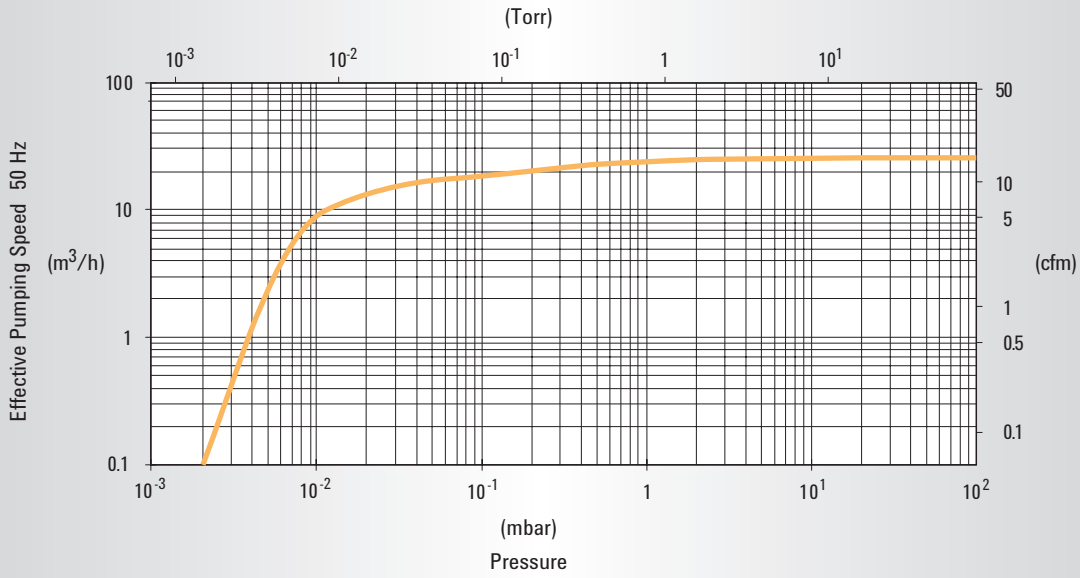
Dimensions: millimeters (inches)

Technical Specifications

Free air displacement	60 Hz: 605 l/min (21.4 cfm)	50 Hz: 504 l/min (30.2 m^3/h)
Pumping speed*	60 Hz: 17.6 cfm	50 Hz: 25 m^3/h
Ultimate partial pressure*	10^{-4} mbar	
Ultimate total pressure*	2 x 10^{-3} mbar	
Ultimate total pressure with gas ballast*	1 x 10^{-2} mbar	
Water vapor tolerance	30 mbar	
Water vapor capacity	550 g/h	
Oil capacity min/max	0.5/1 l	
Motor rating 1ph	60 Hz: 0.90 kW	50 Hz: 0.75 kW
Motor rating 3ph	60 Hz: 0.90 kW	50 Hz: 0.75 kW
Nominal rotation speed	60 Hz: 1800 rpm	50 Hz: 1500 rpm
Weight	35 kg (77 lbs)	
Inlet flange	25KF DN	
Exhaust flange	25KF DN	

* According to PNEUROP 6602

DS 602 - Pumping Speed Curve



Ordering Information

Dual Stage Rotary Vane Pump	Part Number
DS 602 with 1 phase worldwide motor*	9499335
DS 602 with 3 phase worldwide motor**	9499336

* 1 phase motors (100-120 / 200-230) V ±10%, 50/60 Hz.
** 3 phase motors (200-220 / 380-415) V ±10% at 50 Hz or (200-230 / 460) V ±10% at 60 Hz.
All motors comply with CE and UL/CSA standards.

Minor Maintenance Kit	Part Number
Contains all the valves, O-rings and seals to refurbish the pump to vacuum integrity	9499371

Major Maintenance Kit	Part Number
Includes all the items of the minor kit plus the vanes	9499382

Oil and Accessories	Part Number
Rotary vane fluid, DS19 type, 1 liter	9499390
Rotary vane fluid, DS19 type, 1 liter (USA)*	K7516301
Rotary vane fluid, DS19 type, 1 gallon (USA)	K7516302
Oil mist eliminator	9499395
Oil mist replacement cartridge (pkg. of 2)	9499394
NW 25 oil exhaust filter	9499392
NW 25 oil exhaust replacement cartridge	9499342
Oil return kit	9499376
Oil drain extension	9499375
European plug power cable 2 meters 1 ph	9499396
USA plug power cable 2 meters 1 ph	9499397
UK plug power cable 2 meters 1 ph	9499398
NW 25 centering ring Viton	KC25AV
NW 25 aluminum clamp	KQ25AWP

* When these pumps are used in Leak Detectors applications, we recommend the use of Rotary Vane Fluid (Elite-Z mechanical), P/N 695409005 as it features a lower vapor pressure.

AGILENT ROTARY VANE PUMP ACCESSORIES

Exhaust Filters - Oil Mist Eliminator

The exhaust filters (below, left) and the oil mist eliminator (right), retain the oil vapors which would otherwise be expelled into the atmosphere during pumpdown and gas ballast operation.

Some models feature an oil return line to allow condensed oil or fluid to return to the pump reservoir.

Ordering Information

NW25 oil exhaust filter (left)	PN 9499392
Oil mist eliminator DS 102 - DS 602 (right)	PN 9499395

Foreline Roughing Traps

Agilent's new traps are designed to prevent the backstreaming of mechanical pump fluids. Copper and stainless steel gauze inserts are designed to reduce oil backstreaming. Molecular sieve inserts are available for applications where it is desirable to increase water vapor pumping speed while eliminating backstreaming above the trap.

Ordering Information

Foreline/Roughing Traps: please call Agilent for ordering information

For any further details on our rotary vane pump accessories, please contact Agilent Vacuum Products.

Agilent Oil, GP Type Mechanical Pump Fluid

Agilent GP Type Fluid is a mechanical pump fluid recommended for use in non-corrosive applications. As a result of molecular distillation, it has low vapor pressure and, therefore, backstreams less than undistilled refinery products.

Ordering Information

Description	**Part Number**	**Shipping Weight** lbs (kg)
1 liter bottle	K7516301	3.5 (1.6)
1 gallon bottle	K7516302	14.0 (6.4)

ROTARY VANE PUMPS

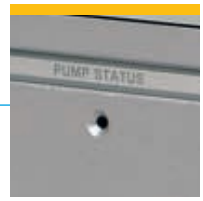
- Agilent's HS 452 and HS 652 rotary vane pumps employ an innovative frequency inverter technology that delivers optimal and consistent performance throughout the worldwide range of voltage and frequency conditions.
- Operating with low power requirements, the microprocessor-controlled frequency inverter, combined with a 3-phase motor, is an efficient driving unit capable of delivering the high starting torque required for a dual-stage oil pump.
- Green technology: environmentally friendly thanks to reduced power requirements, low start up current, minimum oil mist at pump exhaust.

I/O and RS232/RS485 Communication

- Adjustable pumping speed from 45 to 68 Hz permits easy integration and reduces noise levels.
- Pump performance can be tailored o specific applications to reduces system costs.

Universal Input Voltage

- Truly universal single-phase voltage and frequency provide worldwide compatibility.
- Constant performance at different input frequencies.



Remote Diagnostics

- Remote monitoring and control of oil consumption, power and current.
- Reduces maintenance costs, improves uptime and offers higher reliability.

Reduced Power Requirements

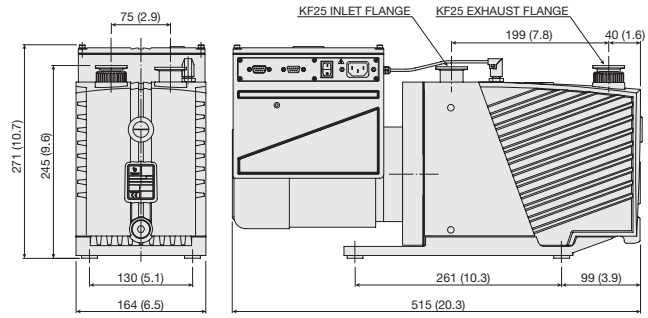
- Inverter technology reduces the power required compared to traditional single phase motors.
- Circuit-breakers are no longer required, resulting in reduced system costs.

Higher Nominal Rotational Speed (2000 rpm)

- The pump is ideally suited for steady and high gas-load applications.

AGILENT ROTARY VANE PUMP MODELS

Agilent HS 452



Dimensions: millimeters (inches)

The first rotary vane pumps with truly "smart" capabilities.

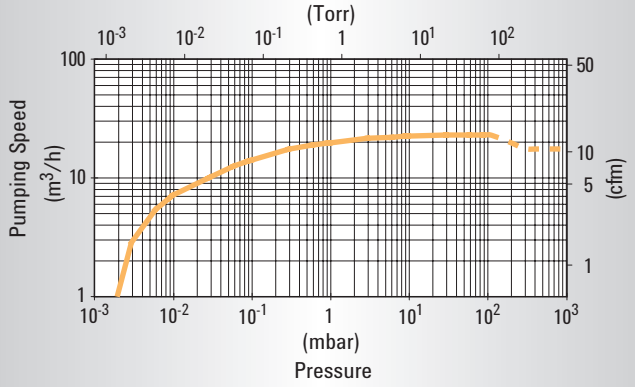
- Agilent's HS 452 and HS 652 pumps employ an innovative frequency inverter technology that delivers optimal and consistent performance while encompassing the worldwide range of voltage and frequency conditions.
- Operating with low power requirements, the microprocessor controlled frequency inverter, combined with a 3-phase motor, is an efficient driving unit capable of delivering the high starting torque required of a dual-stage oil pump.
- HS 452 and HS 652 technology solves the common problems inherent in traditional single-phase motors. Smart Pumps start with inrush current about 7 times lower than that of equivalent traditional pumps.
- Unlike traditional pumps, Smart Pump's software driven startup procedure recognizes faulty pumps within seconds, and so avoids uncontrolled load conditions. The result is very easy pump integration.
- The 3-phase inverter output is constant and independent of single-phase input frequencies and voltages. Motor efficiency and power factors remain optimal and as a result motor and pump wo asy to drive the pump. Pump performance can be tailored by setting the rotational speed for specific applications. The software monitors and logs pump parameters making it possible to perform pump and system diagnostics.

Technical Specifications

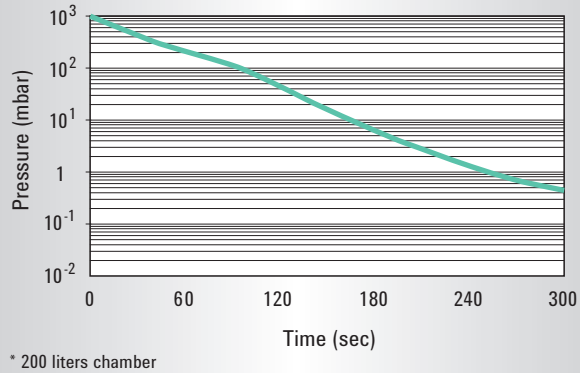
Free air displacement	27 m^3/h (16 cfm)
Pumping speed*	22 m^3/h (13 cfm)
Ultimate total pressure*	2 x 10^{-3} mbar
Ultimate total pressure with gas ballast*	1 x 10^{-2} mbar
Operating voltage	100-120/200-240 V ±10%, 50/60 Hz
Inverter maximum output power	780 W
Nominal rotation speed	2000 rpm
Weight	33 kg (73 lbs)

* According to PNEUROP 6602

HS 452 - Pumping Speed Curve



HS 452 - Pump Down Curve



* 200 liters chamber

Ordering Information

Pump	Part Number
HS 452 Smart Pump 1 phase worldwide motor	9499360
IP44 accessory connector Kit	9499367

Accessories	Part Number
NW25 oil exhaust filter	9499392
Oil return kit	9499376
Oil drain extension	9499375
Rotary vane fluid, DS19 type, 1 liter	9499390
European plug power cable 2 meters 1 ph	9499396
USA plug power cable 2 meters 1 ph	9499397
UK plug power cable 2 meters 1 ph	9499398
Minor maintenance kit	9499371
Major maintenance kit	9499382

Application Note

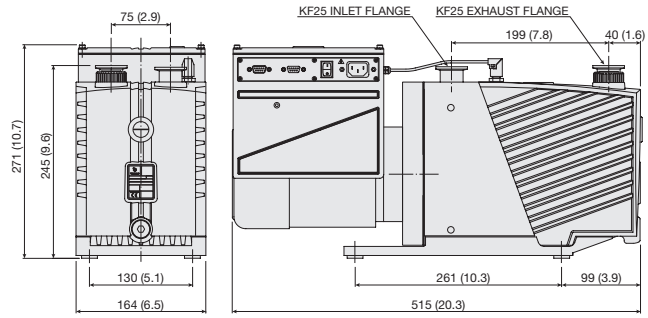
Steady state high gas load applications exploit the major benefits of the smart technologies. When operated at pressures lower than the auto-tuning pressure, the HS 452 and HS 652 outperform the equivalent traditional DS 402 and DS 602 pumps by 10% at 60 Hz and by 30% at 50 Hz.

The Smart Pumps can run below auto-tuning pressure at their full speed of 2000 rpm. As shown in the pumping speed curve at top right, the HS 452 has an auto-tuning pressure of 100 mbar while the HS 652 has an auto-tuning pressure of 40 mbar.

Despite the lower power requirements of 780 W max, the Smart Pumps deliver good performance in the roughing phase. Fast cycling or inrush applications need to be evaluated on a case by case basis with our application engineers.

AGILENT ROTARY VANE PUMP MODELS

Agilent HS 652



Dimensions: millimeters (inches)

The first rotary vane pumps with truly "smart" capabilities.

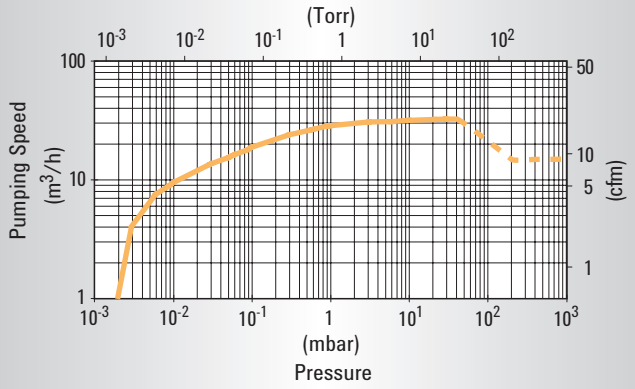
- Agilent's HS 452 and HS 652 pumps employ an innovative frequency inverter technology that delivers optimal and consistent performance while encompassing the worldwide range of voltage and frequency conditions.
- Operating with low power requirements, the microprocessor controlled frequency inverter, combined with a 3-phase motor, is an efficient driving unit capable of delivering the high starting torque required of a dual-stage oil pump.
- HS 452 and HS 652 technology solves the common problems inherent in traditional single-phase motors. Smart Pumps start with inrush current about 7 times lower than that of equivalent traditional pumps.
- Unlike traditional pumps, Smart Pump's software driven startup procedure recognizes faulty pumps within seconds, and so avoids uncontrolled load conditions. The result is very easy pump integration.
- The 3-phase inverter output is constant and independent of single-phase input frequencies and voltages. Motor efficiency and power factors remain optimal and as a result motor and pump working temperatures remain low and constant worldwide.
- Smart Pumps can be remotely driven via discrete I/O or RS232/RS485 interfaces. Agilent's T-plus Navigator Software facilitates communication making it very easy to drive the pump. Pump performance can be tailored by setting the rotational speed for specific applications. The software monitors and logs pump parameters making it possible to perform pump and system diagnostics.

Technical Specifications

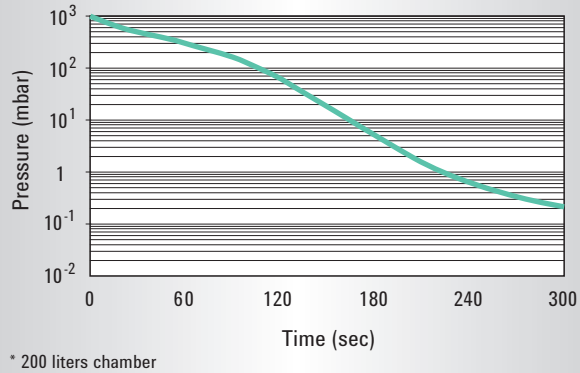
Free air displacement	40.3 m^3/h (23.8 cfm)
Pumping speed*	32 m^3/h (19 cfm)
Ultimate total pressure*	2 x 10^{-3} mbar
Ultimate total pressure with gas ballast*	1 x 10^{-2} mbar
Operating voltage	100-120/200-240 V ±10%, 50/60 Hz
Inverter maximum output power	780 W
Nominal rotation speed	2000 rpm
Weight	33 kg (73 lbs)

* According to PNEUROP 6602

HS 652 - Pumping Speed Curve



HS 652 - Pump Down Curve



* 200 liters chamber

Ordering Information

Pump	Part Number
HS 652 Smart Pump 1 phase worldwide motor	9499365
IP44 accessory connector Kit	9499367

Accessories	Part Number
NW25 oil exhaust filter	9499392
Oil return kit	9499376
Oil drain extension	9499375
Rotary vane fluid, DS19 type, 1 liter	9499390
European plug power cable 2 meters 1 ph	9499396
USA plug power cable 2 meters 1 ph	9499397
UK plug power cable 2 meters 1 ph	9499398
Minor maintenance kit	9499371
Major maintenance kit	9499382

Application Note

Steady state high gas load applications exploit the major benefits of the smart technologies. When operated at pressures lower than the auto-tuning pressure, the HS 452 and HS 652 outperform the equivalent traditional DS402 and DS602 pumps by 10% at 60 Hz and by 30% at 50 Hz.

The Smart Pumps can run below auto-tuning pressure at their full speed of 2000 rpm. As shown in the pumping speed curve at top right, the HS 452 has an auto-tuning pressure of 100 mbar while the HS 652 has an auto-tuning pressure of 40 mbar.

Despite the lower power requirements of 780 W max, the Smart Pumps deliver good performance in the roughing phase. Fast cycling or inrush applications need to be evaluated on a case by case basis with our application engineers.

MS 40+ FEATURES AND BENEFITS

Mono Stage Rotary Vane Pump
Small Footprint, High Pumping Capacity

- Sophisticated Electronics and excellent mechanical design allow high pumping capacity and reduced dimensions.
- Suitable for steady and high gas throughput conditions at pressures below 10 Torr, in applications like Mass Spectrometry (including LC-MS, ICP-MS, GC-TOF-MS, etc.), Electron Microscopy, and other Scientific Instrumentation.

Please contact Agilent to qualify use in cyclic applications.

Interface Capabilities

- I/O and RS232/RS485 enable adjustment of operating parameters simplifying system integration
- Remote diagnostic allow the control of:
  - Oil level
  - Temperature
  - Power
  - Current

T-Plus Software

- T-Plus software allows control of pump parameters via PC, improving uptime and reliability, and reducing maintenance costs

Worldwide Service Capability

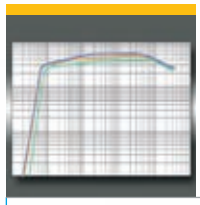
- Three levels of Product Support
  - 24h Advance Exchange
  - Factory Repair
  - Upgrade Program

  allow global coverage of service needs to maximize productivity and uptime

ROTARY VANE PUMPS

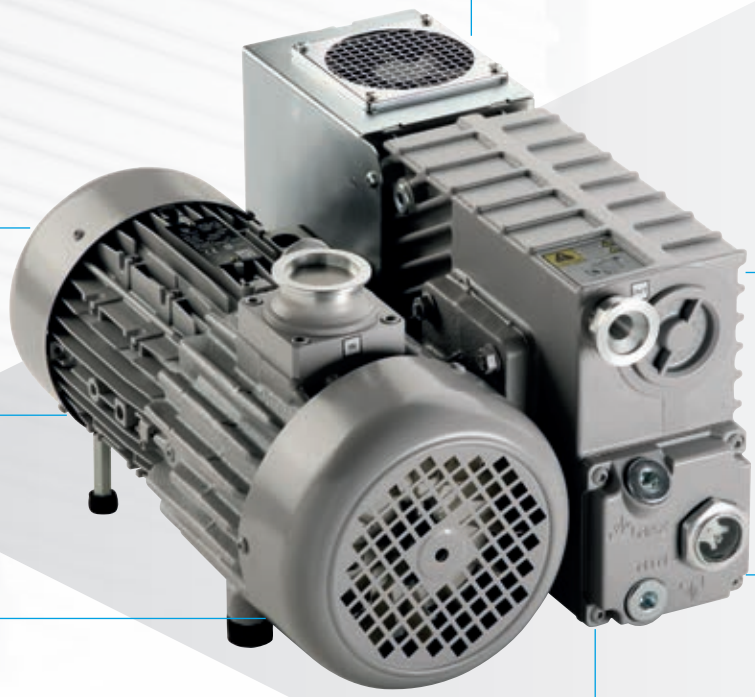
Inverter Technology

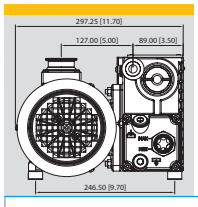
- Proven on-board electronics allows constant performance worldwide
- Truly universal voltage and frequency
- Single phase
- Inverter electronics enable tailoring pumping speed to each application



Highest Performances / Size Ratio

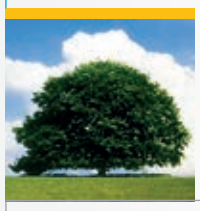
- Base pressure below 5 x 10^{-2} mbar (3.75 x 10^{-2} Torr)
- High pumping speed over a wide range, from atmosphere to 1 mbar (0.75 Torr)
- Inverter technology allows to manage pumping speed to more than 45 m^3/h (26.5 cfm)
- Best noise level, with the highest throughput





Smallest Dimensions

- The smallest single stage 40 m^3/h pump in the market. 297 x 418 x 225 mm (11.69 x 16.46 x 8.86 inches)
- Including on-board electronics, anti suck-back valve, integrated exhaust filter and oil return kit
- Easier system integration
- Simple maintenance
- Allows smaller overall instrument design, therefore reducing costs

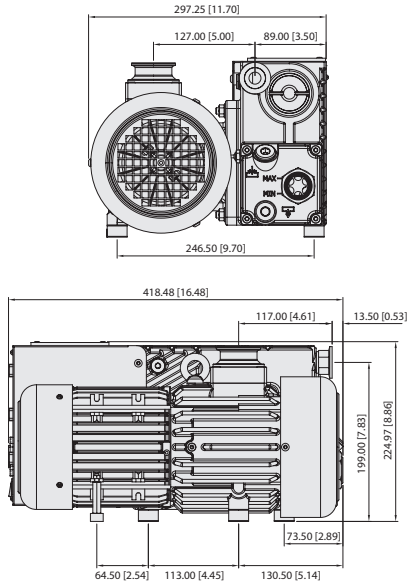


Green Technology

- Environmentally friendly and cost-effective due to reduced power requirements, low start up current (< 10 A) and stand by mode

AGILENT ROTARY VANE PUMP MODELS

Agilent MS 40+



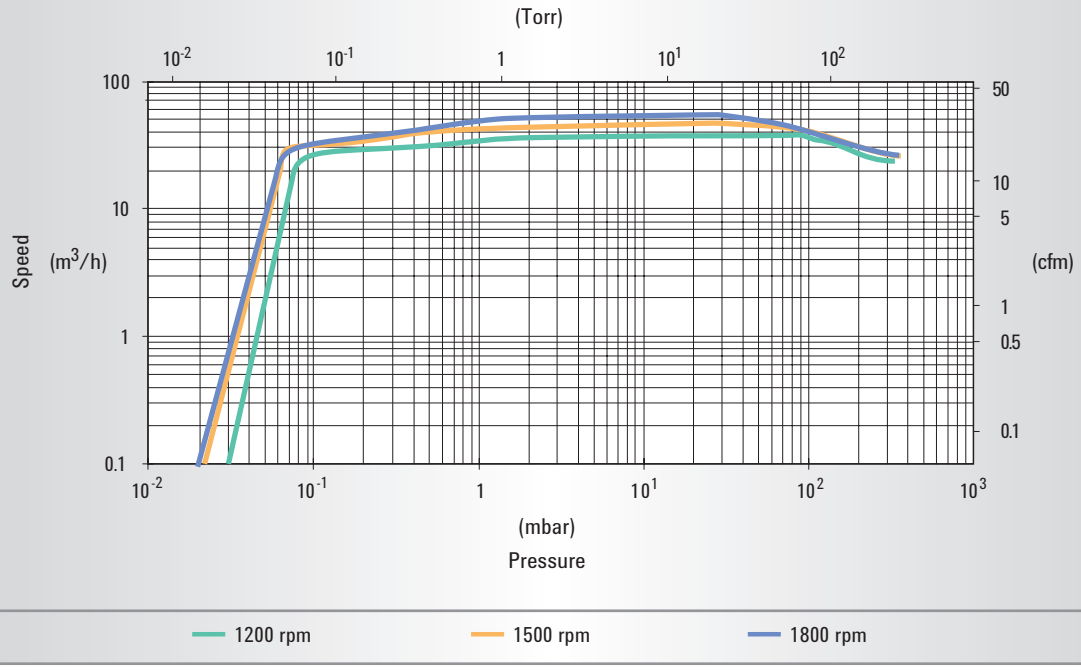
Dimensions: millimeters (inches)

Technical Specifications

	9499225	9499240	9499241
Free air displacement	828 l/min (29.2 cfm; 49.7 m^3/h)	828 l/min (29.2 cfm; 49.7 m^3/h)	828 l/min (29.2 cfm; 49.7 m^3/h)
Pumping speed (at 5 mbar inlet pressure)	40 m^3/h	40 m^3/h	40 m^3/h
Ultimate total pressure*	$5x10^{-2}$ mbar	$5x10^{-2}$ mbar	$5x10^{-2}$ mbar
Oil capacity min/max	1 l	1 l	1 l
Motor rating 1ph	0.75 kW	0.75 kW	0.75 kW
Noise level with gas ballast closed	≤ 62 dB(A)	≤ 62 dB(A)	≤ 62 dB(A)
Oil temperature (pump operating)	60 °C	60 °C	60 °C
	140 °F	140 °F	140 °F
IP Value		20	
Installation category		II	
Pollution degree		2	
Operating temperature range	12-40 °C	12-40 °C	12-40 °C
Nominal rotation speed	1450 rpm	1450 rpm	1450 rpm
Weight	33 kg (73 lbs)	33 kg (73 lbs)	33 kg (73 lbs)
Inlet flange	25KF DN	40KF DN	40KF DN
Exhaust flange	25KF DN	25KF DN	25KF DN
Dimensions: - length	418 mm	418 mm	418 mm
- width	297 mm	297 mm	297 mm
- height	228 mm	228 mm	228 mm
Nominal Input Voltage	200-240 V	200-240 V	200-240 V
Input frequency	50/60 Hz	50/60 Hz	50/60 Hz
Max input power	1200 VA	1200 VA	1200 VA
Internal Main Fuse (TT type)	12.5 A	12.5 A	12.5 A

* According to PNEUROP 6602 - No gas ballast port

MS 40+ Pumping Speed Curve



Ordering Information

Dual Stage Rotary Vane Pump	Part Number
MS 40+ RVP, 25KF Inlet Flange, with I/O and RS232/485 Interface, without Oil Level Sensor	9499225
MS 40+ RVP, 40KF Inlet Flange, Full Optional with I/O and RS232/485 Interface, with Oil Level Sensor	9499240
MS 40+ RVP, 40KF Inlet Flange, Base Version	9499241

Oil and Accessories	Part Number
MS 40+ Exhaust filter	9499201
MS 40+ 1 Litre Oil Tank	9499202
MS 40+ Maintenance Kit	9499203
Power cable EU	9499396
208Vac US Power cable	9499400
Power cable UK	9499398
Power cable IEC320	9499399
T-PLUS Navigator SW (w/serial cable)	9699883

Data Sheet

Agilent
Trusted Answers

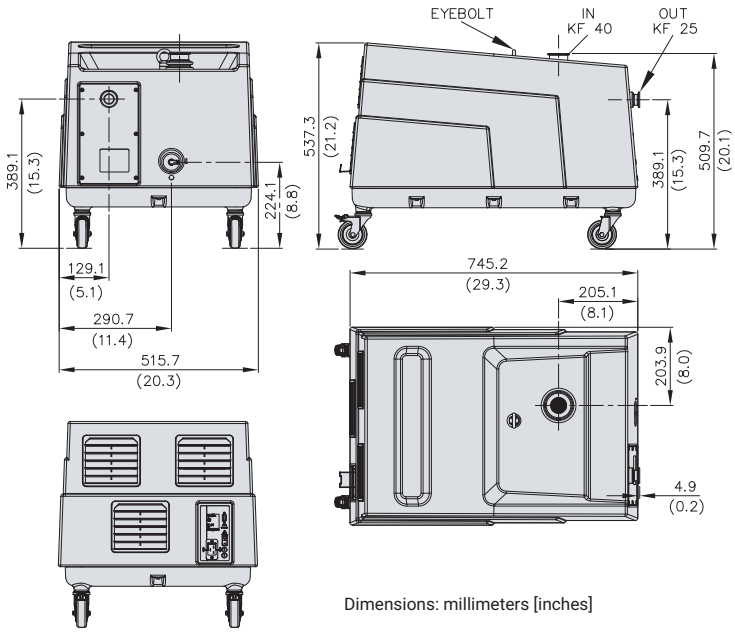
Agilent MS 120 Single Stage Rotary Vane Pump

The MS 120 sets a new state-of-the-art standard in roughing pumps designed to equip the next generation of analytical instruments.

Designed for Mass Spectrometry

The Agilent MS 120 is a new high capacity, single stage, inverter driven rotary vane pump.
Designed for high pumping speeds, low power consumption and high stability in the 10^{-2} mbar pressure range, the MS 120 is especially suited for Mass Spectrometry applications.
Due to the outstanding performance of the MS 120, there is no need for multiple roughing pumps operating in parallel.
The packaging and cart like design allow for a quick and easy installation, and for a significant noise reduction.

Outline Drawings



Dimensions: millimeters [inches]

MS 120 Rotary Vane Pump

Technical Specifications

Feature	Unit of measure	Value
Nominal speed (at 1500 rpm) (according to PNEUROP standard 6602)	m^3/h [cfm]	156 [92]
Effective capacity at 5 mbar abs. (3.75 torr)	m^3/h [cfm]	≥120 [≥71]
Ultimate total pressure with gas ballast valve open	mbar [torr]	≤0.2 [≤0.150]
Ultimate total pressure with gas ballast valve closed	mbar [torr]	≤0.07 [≤0.0525]
Oil capacity	L [Gal US]	1.8 [0.47]
Motor power (temperatures up to 40°C and altitudes lower than 1000m)	kW [Hp]	1.8 [2.4]
Nominal input voltage and frequency (~1ph)	V	200 - 240
	Hz	50 - 60
Internal main fuse (T type)	A	15
Touch current	mA	3.0 maximum
Operating temperature range	°C [°F]	+12° to +35° [+54° to +95°]
Sound pressure level (at 50Hz without gas ballast valve)	dB(A)	60±1
Water vapour tolerance	mbar [torr]	15 [11.25]
Water vapour pumping capacity	kg/h [lbs/h]	1 [2.2]
Inlet flange		ISO KF DN40
Outlet flange		ISO KF DN25
Main dimensions:		
- width	mm [inch]	516 [20.3]
- length	mm [inch]	750 [29.5]
- height	mm [inch]	539 [21.2]
Total weight	kg [lbs]	100 [220]
IP value		20
Installation category		II
Pollution degree		2
Max altitude	m	2000

Certifications
CE Marks EN61326-1 2013 Electrical equipment for measurement control and laboratory use EMC requirements Emission: EN55011 Class B; EN61000-3-2; EN61000-3-3 Immunity Industrial Levels EN61010-1, 2010 (Safety requirements for electrical equipment for measurement control laboratory use) CSA Mark

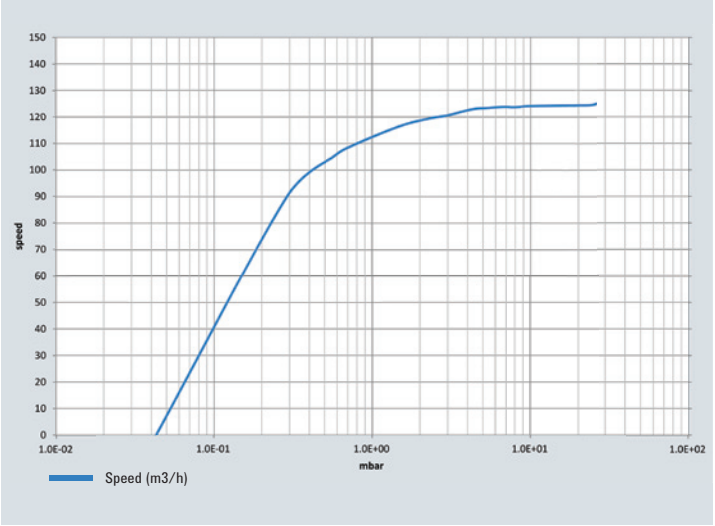
Ordering Information

Single Stage Rotary Vane Pump	Part Number
MS120 Single Stage RV*	X3702-64000

**2 bottles of fluid are required for each pump*

Oil and Accessories	Part Number
AVF 60 Gold Lubricant Fluid	X3760-64005
MS120 – Minor Spare Part Kit	X3702-68201
MS120 – Major Spare Part Kit	X3702-68202
Power Cord US Plug IEC320	X3702-64001
Power Cord UK Plug IEC320	X3702-64003
Power Cord EU Plug IEC320	X3702-64006

Pumping speed curve at 1500rpm



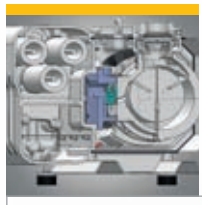
MS-SERIES ROTARY VANE PUMPS FEATURES AND BENEFITS

Agilent: a complete solution provider for the industrial vacuum equipment

Agilent MS-Series high capacity mono stage oil lubricated rotary vane pumps, from 95 to 680 m^3/h.

- MS-Series pumps are robust, easy to install, and are ideal for use in many different applications
- Because of their compact size, MS-Series pumps can easily replace other pumps of equivalent pumping speed

Industry leading vacuum performance; more than 20,000 RV pumps in operation!

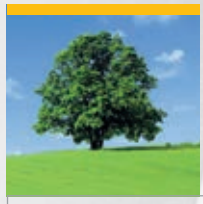


Shorter Cycle Times

- Smooth continuous operation, from atmospheric to base pressure
- High pumping speed even at low pressure

Highly Robust for Stringent Applications

- Steel rotor
- Cast iron stator and cover
- Special design carbon fiber vanes
- Viton seals
- Gas ballast valve, for pumping high water vapor content
- Anti-suckback isolation inlet valve eliminates oil backstreaming and holds vacuum in case of power loss



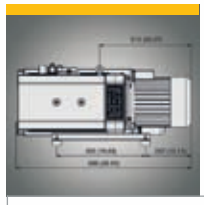
Environmentally Friendly

- A demister system limits oil exhaust over the entire range of working pressures
- Floating valve for oil recovery

HIGH CAPACITY MS-RPS SERIES

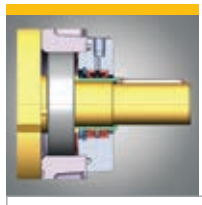
Industry Leading Vacuum Performance

- Pump design allows lowest base partial pressure: 8 x 10^{-2} mbar (6 x 10^{-2} Torr)



Compact and Easy to Install

- Air cooling
  - cover design optimizes cooling air channels
  - integrated heat exchanger carries excess heat away
- Smaller than pumps of equivalent pumping speed



Highly Reliable

- Highly efficient oil circulation system ensures perfect lubrication and sealing in all critical areas of the pump
- Low noise and vibration

RPS-SERIES ROOTS PUMPS & PUMPING SYSTEMS (FEATURES AND BENEFITS)

RP-Series Roots Pumps

State-of-the-art, high performance Agilent Roots Pumps are ideal for use in demanding industrial applications.

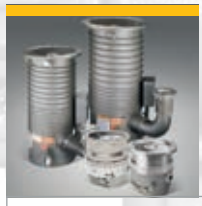
RPS-Series Roots Pumping Systems

Agilent's RPS Systems combine the ruggedness and reliability of High Capacity MS-Series RVPs with wide range Roots Pumps.

More than 15,000 Roots Pumps in Operation!

Compact and Easy to Use

- Agilent Roots Pumps are simple to use and to install
- Air cooling



Designed for Optimum System Integration

- Ideal combination for roughing down and backing Diffusion Pumps, Turbomolecular Pumps, and other HV pumps
- Optional electronics for continuous operation and monitoring of Vacuum Systems

Clean

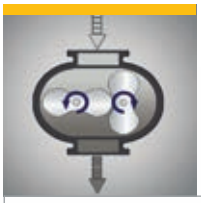
Ideal for use in applications demanding the highest levels of cleanliness:

- Special labyrinth seal prevents contamination
- A high capacity trap chamber captures condensation

VFD Roots

- Inverter driven Roots to improve performance and minimize power consumption
- Constant performance at different input frequencies

HIGH CAPACITY MS-RPS SERIES



High Performance Roots Pumps

- Agilent Roots Pumps can withstand high mechanical loads reducing pumpdown cycles
- Lowest base pressure: 5 x 10^{-3} mbar (4 x 10^{-3} Torr)

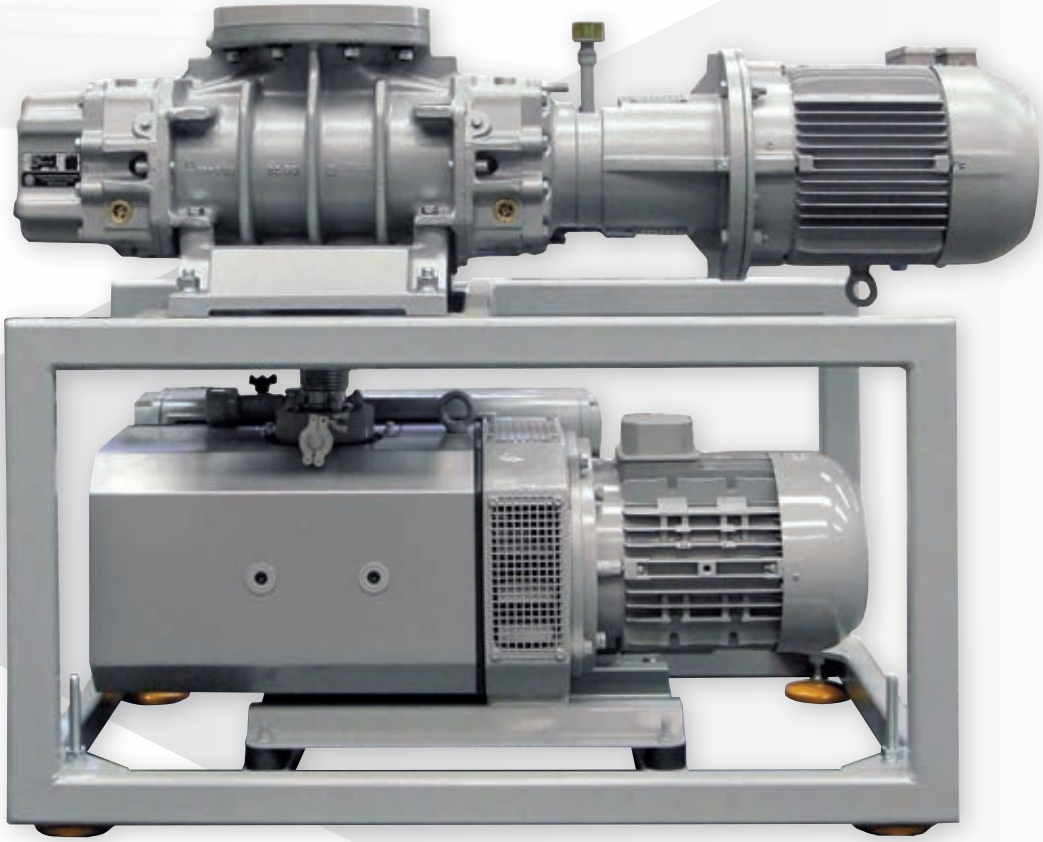
Rugged and Reliable

- Low noise and vibration, thanks to dynamically balanced rotors and precision ground gears
- Long maintenance intervals
- Air cooling

Popular Sizes Available

- Combining MS-Series RVPs (from 95 to 680 m^3/h) and Roots Pumps (from 250 to 4000 m^3/h) allows tailored solutions optimizing performances, cost and power consumption

Other combinations are available on request.

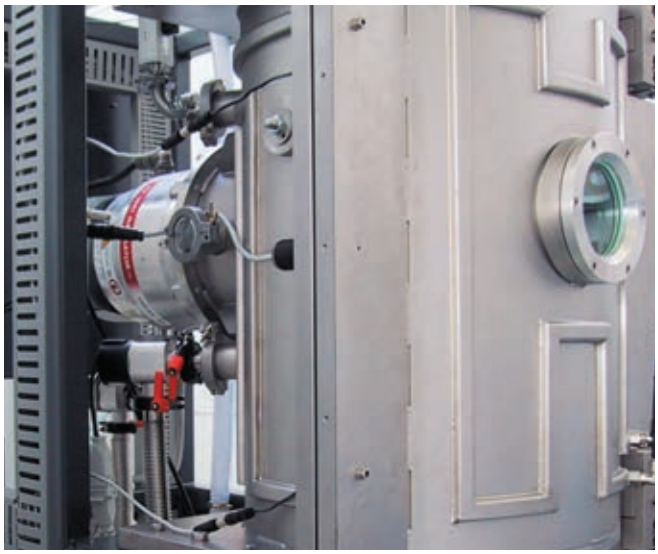


TYPICAL APPLICATIONS

Roughing and Backing High Vacuum Pumps

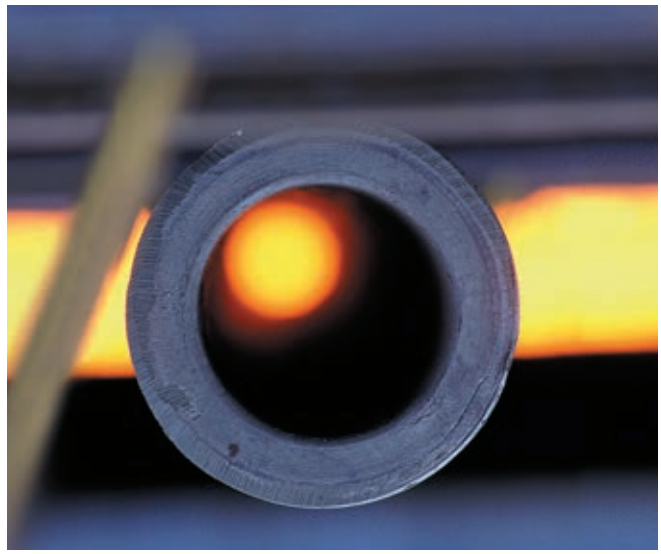
The new MS Pumps and RPS Systems are ideally suited for use in combination with Turbomolecular and Diffusion pumps or with HV pumps of any other manufacturer.

Agilent is a leading solution provider for the industrial high and medium vacuum marketplace.



Vacuum Coating Systems

The most common application where the RPS are used are coaters of different dimensions, from small ones used in research fields to the very large ones used in industrial applications, including for instance glass coaters or coaters where large automotive or aircraft parts are treated. The ability to offer large RV pumps, up to 680 m^3/h and Roots pumps up to 4000 m^3/h make the Agilent offer in this range particularly interesting and able to satisfy different needs.



Metallurgy and Heat Treatment

In this field Agilent has offered so far a very large number of Diffusion pumps, with sizes ranging up to 35,000 l/s.
The availability now to provide the full vacuum system up to the atmospheric pressure is rapidly bringing this offer to satisfy most of the users, who are particularly interested in rapid cycle times and the excellent overall reliability of the Agilent solution.

HIGH CAPACITY MS-RPS SERIES

Helium Leak Detection

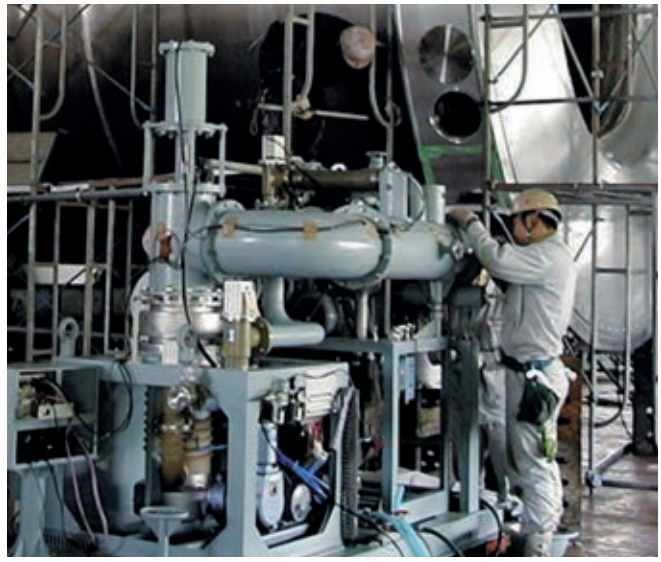
When large volumes or short cycle times are required for a process involving leak detection, typically but not only using helium, the Agilent RV pumps alone or in combination with the Roots pumps are an ideal solution to reach the parameters necessary for industrial applications. Agilent is well aware of technical aspects of this technology having been a pioneer in leak detection for several decades.

Electron Beam Welding

EBW equipment requires the use of both High Vacuum Pumps, during generation and running of the welding beam, and Medium Vacuum Pumps for the rest of the process taking place in the chamber where the parts to be welded are positioned. Thanks to the introduction of the new Roots Pumping Systems, today Agilent is in a position to offer the entire vacuum system, as a single supply source in this important industry.

LNG

Liquefied Natural Gas (LNG) is natural gas converted to liquid form for ease of storage or transport. LNG must be kept cold to remain a liquid, independent of pressure. For this reason it must be stored in vacuum-jacketed, cryogenic tanks pressure vessels. These tanks may be at pressures anywhere from less than 50 kPa to over 1,700 kPa (7 psig to 250 psig).
Agilent Roots Pumping Systems, in combination with Agilent Diffusion Pumps, are ideal to create vacuum in the annular space of the cryogenic tanks.

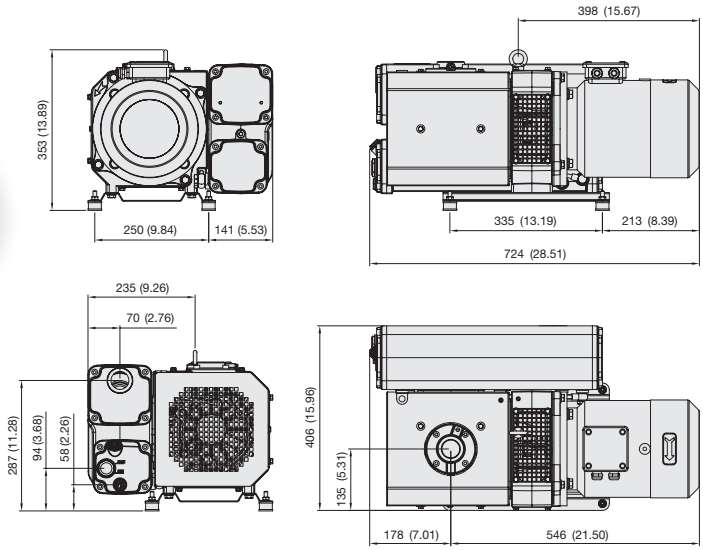


Other Industrial Applications

Agilent RV pumps and Roots Systems are suitable for use in many other applications, including lamps manufacturing, vacuum drying and degassing, gas recovery, packing industry, chemistry and process technology, PET processing, pharmaceutical industry, vacuum distillation, cryogenic vessel evacuation, and many others.

PUMP MODELS

Agilent MS-101



Dimensions: millimeters (inches)

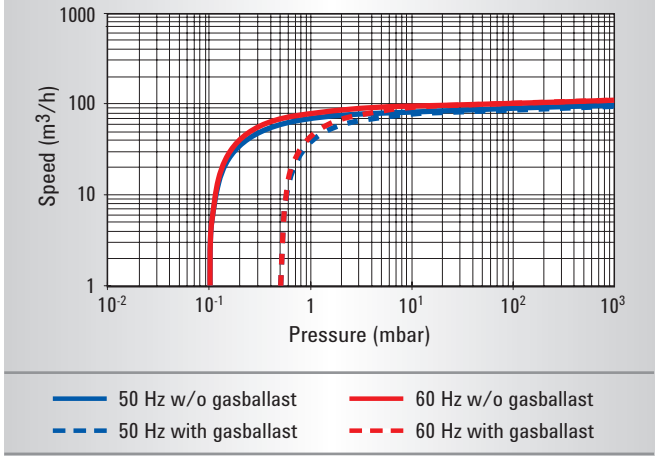
Technical Specifications

Free air displacement	60 Hz: 130 m^3/hr, 76 cfm 50 Hz: 110 m^3/hr, 65 cfm
Pumping speed*	60 Hz: 109 m^3/hr, 64 cfm 50 Hz: 95 m^3/hr, 56 cfm
Ultimate partial pressure (with gas ballast closed)	≤ 0.1 mbar (≤ 8 x 10^{-2} Torr)
Ultimate total pressure (with gas ballast open)	≤ 0.5 mbar (≤ 0.4 Torr)
Power	60 Hz: 3.0 kW (4.0 HP) 50 Hz: 2.2 kW (3.0 HP)
Electrical motor characteristics	IM B5 Δ230/Y400 V at 50 Hz IM B5 YY230/Y460 V at 60 Hz IM B5 Δ220/Y380 V at 60 Hz
Revolutions number	60 Hz: 1800 RPM 50 Hz: 1500 RPM
Water vapor tolerance	60 Hz/50 Hz: 40/30 mbar (30/23 Torr)
Water vapor capacity	60 Hz/50 Hz: 3/2.2 kg/h (3.3/2.4 qt/hr)
Noise level**	60 Hz/50 Hz: 68/66 dB(A)
Inlet port	1¼" gas / 1¼" NPT/ DN40KF using adapter flanges
Exhaust port	1¼" gas / 1¼" NPT
Oil	type MS-01, charge 3 liter (3.1 qt)
Working ambient temperature range	+12 +40 °C (+54 +105 F)
Storage temperature	-15 +70 °C (+5 +158 F)
Dimensions	60 Hz: 750 x 405 x 349 mm (20.5 x 15.9 x 13.7 in.) 50 Hz: 718 x 405 x 349 mm (28.3 x 15.9 x 13.7 in.)
Weight	
with 2.2 kW motor	85 kg (187 lbs)
with 3.0 kW motor	89 kg (196 lbs)
without motor	62 kg (137 lbs)

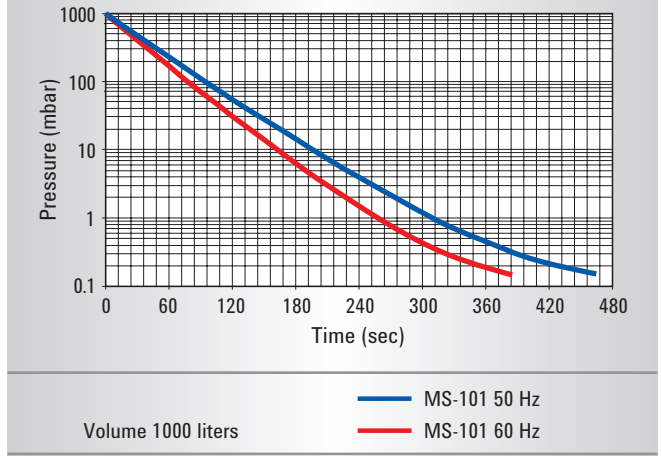
* *According to PNEUROP 6602*
** *According to EN ISO 2151 (50/60 Hz)*

HIGH CAPACITY MS-RPS SERIES

Single Stage Pump MS-101 - Pumping Speed



Single Stage Pump MS-101 - Pump Down



Ordering Information

High Capacity Rotary Vane Pumps *	Part Number
MS-101 2.2 kW Δ230/Y400 V, 50 Hz; IE2; inlet 1¼" gas	X3751-60019
MS-101 3.0 kW Δ230/Y400 V, 50 Hz; 460 V, 60 Hz; inlet 1¼" gas	X3751-64008
MS-101 3.0 kW Δ230/Y380 V, 60 Hz; IE2; inlet 1¼" gas	X3751-60026
MS-101 3.0 kW YY230/Y460 V, 60 Hz; IE2; inlet 1¼" NPT (US version)	X3751-60021

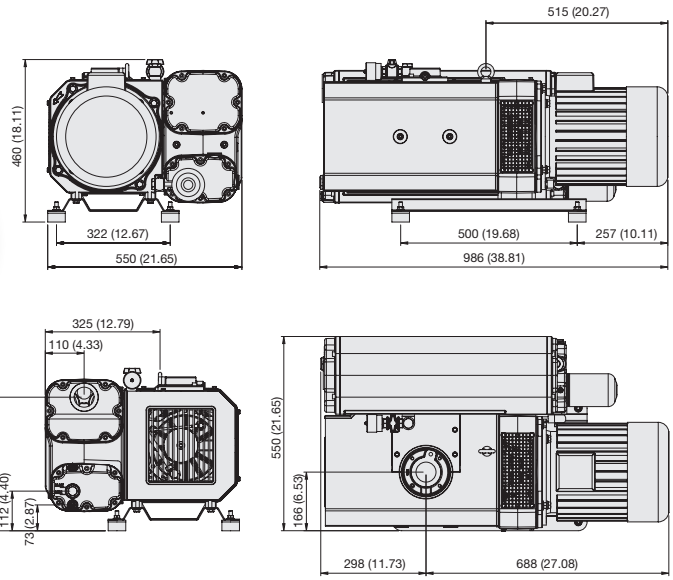
* *Oil charge not included*

Oil and Accessories	Part Number
MS-01 Oil charge for MS-101 (3 liters)	X3760-64001
Inlet air filter with polyester cartridge, for DN40 KF	X3751-60014
Inlet air filter with polyester cartridge, for 1¼" gas	X3751-60013
Inlet air filter with polyester cartridge, for 1¼" NPT	X3751-60030
Connection fitting kit, for DN40 KF	X3751-60016
Connection fitting kit, for for 1¼" gas	X3751-60015
Connection fitting kit, for 1¼" NPT	X3751-60031
Exhaust filter control pressure switch	9495077
1¼" gas to DN40 KF adapter	X3751-64009
1¼" NPT to DN40 KF adapter	X3751-64010

Spare Parts	Part Number
MS-101 minor spare part kit	X3751-60010
MS-101 major spare part kit	X3751-60011
MS-101 inlet air filter polyester cartridge	X3751-60017
MS-101 exhaust coalescent filter kit	X3751-60018

PUMP MODELS

Agilent MS-301



Dimensions: millimeters (inches)

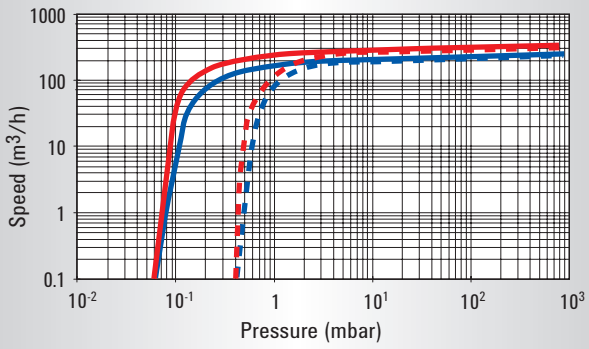
Technical Specifications

Free air displacement	60 Hz: 350 m^3/hr, 210 cfm 50 Hz: 290 m^3/hr, 170 cfm
Pumping speed*	60 Hz: 290 m^3/hr, 170 cfm 50 Hz: 250 m^3/hr, 150 cfm
Ultimate partial pressure (with gas ballast closed)	≤ 8 x 10^{-2} mbar (≤ 6 x 10^{-2} Torr)
Ultimate total pressure (with gas ballast open)	≤ 0.5 mbar (≤ 0.37 Torr)
Power	60 Hz: 7.5 kW (10.0 HP) 50 Hz: 5.5 kW (7.4 HP)
Electrical motor characteristics	IM B5 Δ230/Y400 V at 50 Hz, Y460 V at 60 Hz IM B5 Δ400/Y690 V at 50 Hz, Δ460 V at 60 Hz IM B5 Δ220/Y380 V at 60 Hz IM B5 YY230/Y460 V at 60 Hz
Revolutions number	60 Hz: 1750 RPM 50 Hz: 1450 RPM
Water vapor tolerance	60 Hz/50 Hz: 40/30 mbar (30/23 Torr)
Water vapor capacity	60 Hz/50 Hz: 7/5 kg/h (7.7/5.5 qt/hr)
Noise level**	60 Hz/50 Hz: 76/72 dB(A)
Inlet port	Flange DN 63 ISO-K / 2" gas / 2" NPT
Exhaust port	2" gas / 2" NPT
Oil	type MS-01, charge 7 liter (7.4 qt)
Working ambient temperature range	+12 +40 °C (+54 +105 F)
Storage temperature	-20 +70 °C (+4 +158 F)
Dimensions	60 Hz: 1015 x 550 x 460 mm (40.3 x 21.6 x 18.1 in.) 50 Hz: 986 x 550 x 460 mm (38.8 x 21.6 x 18.1 in.)
Weight	
with 5.5 kW motor	188 kg (414 lbs)
with 7.5 kW motor	192 kg (423 lbs)
without motor	141 kg (310 lbs)

* *According to PNEUROP 6602*
** *According to EN ISO 2151 (50/60 Hz)*

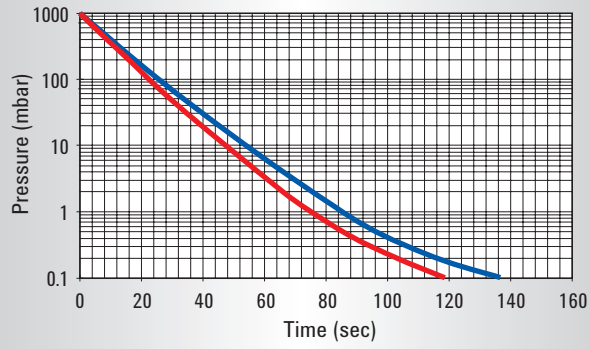
HIGH CAPACITY MS-RPS SERIES

Single Stage Pump MS-301 - Pumping Speed



50 Hz w/o gasballast
60 Hz w/o gasballast
50 Hz with gasballast
60 Hz with gasballast

Single Stage Pump MS-301 - Pump Down



Volume 750 liters

MS-301 50 Hz
MS-301 60 Hz

Ordering Information

High Capacity Rotary Vane Pumps *	Part Number
MS-301 5.5 kW, Δ230/Y400 V, 50 Hz; IE2; inlet 2" gas	X3752-64016
MS-301 5.5 kW, Δ230/Y400 V, 50 Hz; IE2; DN 63 ISO-K	X3752-64017
MS-301 5.5 kW, Δ400/Y690 V, 50 Hz; IE2; inlet 2" gas	X3752-64018
MS-301 5.5 kW, Δ400/Y690 V, 50 Hz; IE2; DN 63 ISO-K	X3752-64019
MS-301 7.5 kW, Δ230/Y400 V, 50 Hz - Y460 V 60 Hz; inlet 2" gas	X3752-64020
MS-301 7.5 kW, Δ230/Y400 V, 50 Hz - Y460 V 60 Hz; DN 63 ISO-K	X3752-64021
MS-301 7.5 kW, Δ230/Y380 V, 60 Hz; inlet 2" gas	X3752-64024
MS-301 7.5 kW, Δ230/Y380 V, 60 Hz; inlet DN 63 ISO-K	X3752-64025
MS-301 7.5 kW, YY230/Y460 V, 60Hz; inlet 2" NPT (US version)	X3752-64022
MS-301 7.5 kW, YY230/Y460 V, 60Hz; inlet DN 63 ISO-K (US version)	X3752-64023

* *Oil charge not included*

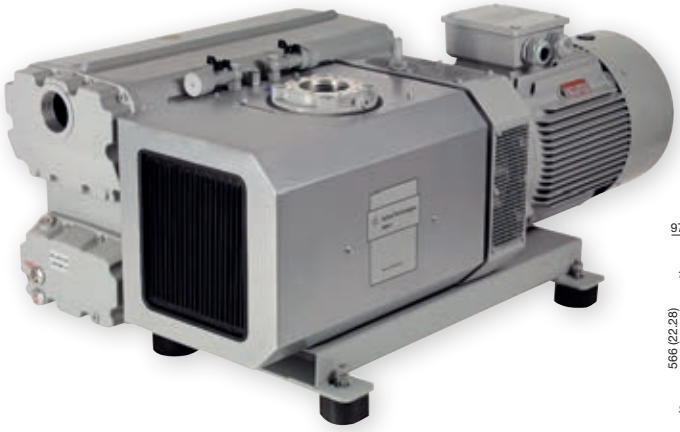
Oil and Accessories	Part Number
MS-01 Oil charge for MS-301 (7 liters)	X3760-64002
Inlet air filter with polyester cartridge, for 2" gas connection	9495059
Inlet air filter with polyester cartridge with DN 63 ISO-K flange	9495159
Connection fitting kit, for 2" gas connection	9495065
Connection fitting kit, for DN 63 ISO-K flange connection	9495165

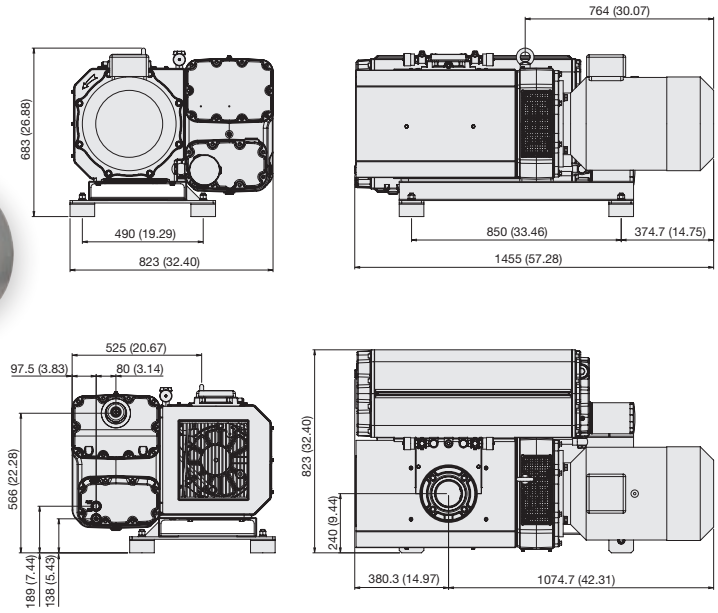
Protective Accessories	Part Number
Pump thermal protection switch (to be ordered together with the pump)	9495076
Oil separator control pressure switch (to be ordered together with the pump)	9495077
MS-301 oil level protection switch (to be ordered together with the pump)	9495078

Spare Parts	Part Number
MS-301 minor spare part kit	9495020
MS-301 major spare part kit	9495021
Oil filter (type A)	9495070
MS-301 inlet air filter polyester cartridge	9495083
MS-301 exhaust coalescent filter kit	SR03706308

PUMP MODELS

Agilent MS-631





Dimensions: millimeters (inches)

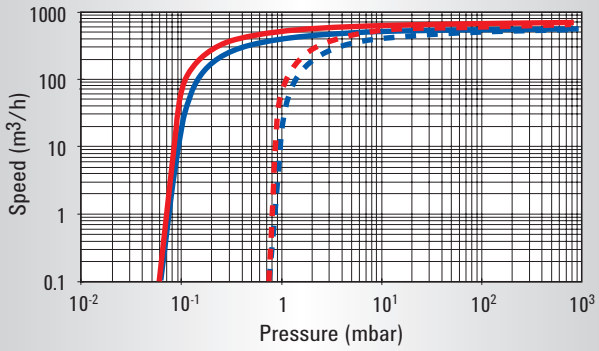
Technical Specifications

Free air displacement	60 Hz: 790 m^3/hr, 465 cfm 50 Hz: 660 m^3/hr, 390 cfm
Pumping speed*	60 Hz: 680 m^3/hr, 400 cfm 50 Hz: 590 m^3/hr, 350 cfm
Ultimate partial pressure (with gas ballast closed)	≤ 8 x 10^{-2} mbar (≤ 6 x 10^{-2} Torr)
Ultimate total pressure (with gas ballast open)	≤ 0.5 mbar (≤ 0.37 Torr)
Power	60 Hz: 18.5 kW (24.8 HP) 50 Hz: 15 kW (20.1 HP)
Electrical motor characteristics	IM B5 Δ400/Y690 V at 50 Hz, Δ460 V at 60 Hz IM B5 Δ220/Y380 V at 60 Hz IM B5 YY230/Y460 V at 60 Hz
Revolutions number	60 Hz: 1200 RPM 50 Hz: 1000 RPM
Water vapor tolerance	60 Hz/50 Hz: 40/30 mbar (30/23 Torr)
Water vapor capacity	60 Hz/50 Hz: 30/20 kg/h (33.1/22.0 qt/hr)
Noise level**	60 Hz/50 Hz: 73/71 dB(A)
Inlet port	Flange DN 100 ISO-K / 4" gas / 4" NPT
Exhaust port	3" gas / 3" NPT
Oil	type MS-01, charge 22 liter (23.2 qt)
Working ambient temperature range	+12 +40 °C (+54 +105 F)
Storage temperature	-20 +70 °C (+4 +158 F)
Dimensions	60 Hz: 1480 x 823 x 683 mm (58.2 x 32.4 x 26.9 in.) 50 Hz: 1455 x 823 x 683 mm (57.3 x 32.4 x 26.9 in.)
Weight	
with 15.0 kW motor	582 kg (1283 lbs)
with 18.5 kW motor	612 kg (1349 lbs)
without motor	392 kg (864 lbs)

* *According to PNEUROP 6602*
** *According to EN ISO 2151 (50/60 Hz)*

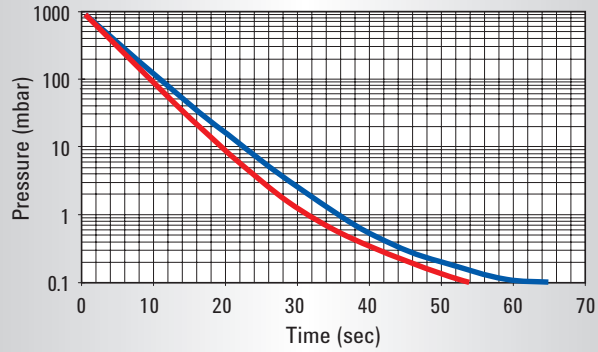
HIGH CAPACITY MS-RPS SERIES

Single Stage Pump MS-631 - Pumping Speed



50 Hz w/o gasballast
60 Hz w/o gasballast
50 Hz with gasballast
60 Hz with gasballast

Single Stage Pump MS-631 - Pump Down



Volume 750 liters

MS-631 50 Hz
MS-631 60 Hz

Ordering Information

High Capacity Rotary Vane Pumps *	Part Number
MS-631 15.0 kW, Δ400/Y690 V, 50 Hz; IE2; inlet 4" gas	X3753-64073
MS-631 15.0 kW, Δ400/Y690 V, 50 Hz; IE2 DN 100 ISO-K	X3753-64074
MS-631 15.0 kW, Δ400/Y690 V, 50 Hz - Δ460 V, 60 Hz; inlet 4" gas	X3753-64075
MS-631 18.5 kW, Δ400/Y690 V, 50 Hz - Δ460 V, 60 Hz; DN 100 ISO-K	X3753-64076
MS-631 18.5 kW, Δ220/Y380 V, 60 Hz; IE2; inlet 4" gas	X3753-64079
MS-631 18.5 kW, Δ220/Y380 V, 60 Hz; IE2; DN 100 ISO-K	X3753-64080
MS-631 18.5 kW, YY230/Y460 V, 60 Hz; IE2; inlet 4" gas	X3753-64077
MS-631 18.5 kW, YY230/Y460 V, 60 Hz; IE2; DN 100 ISO-K	X3753-64078

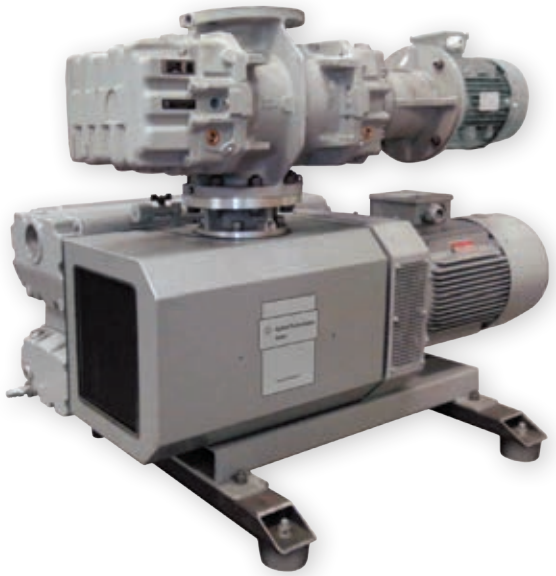
* *Oil charge not included*

Oil and Accessories	Part Number
MS-01 Oil charge for MS-631 (22 liters)	X3760-64003
Inlet air filter with polyester cartridge, for 4" gas connection	9495062
Inlet air filter with polyester cartridge with DN 100 ISO-K flange	9495162
Connection fitting kit, for 4" gas connection	9495066
Connection fitting kit, for DN 100 ISO-K flange connection	9495166

Protective Accessories	Part Number
Pump thermal protection switch (to be ordered together with the pump)	9495076
Oil separator control pressure switch (to be ordered together with the pump)	9495077
MS-631 oil level protection switch (to be ordered together with the pump)	9495079

Spare Parts	Part Number
MS-631 minor spare part kit	9495087
MS-631 major spare part kit	9495088
Oil filter (type B)	9495090
MS-631 inlet air filter polyester cartridge	9495089
MS-631 exhaust coalescent filter kit	SR03706207

Agilent MS-631 FL (Frameless)



The Agilent MS-631 Frameless (FL) is a high capacity, single stage, oil lubricated rotary vane pump, that can be directly coupled to an Agilent Roots Pump (up to RP-3001 size) without the need of a frame.

The Roots Pump can be mounted directly on the MS-631 FL, through an appropriate flange that can sustain the weight of the Roots Pump. The Roots Pump can be ordered separately. Please contact Agilent for technical specifications and ordering information.

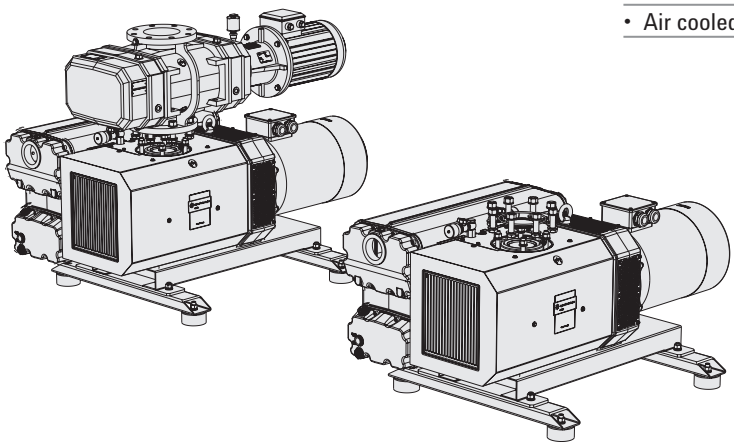
The two pumps are shipped separately.

Applications

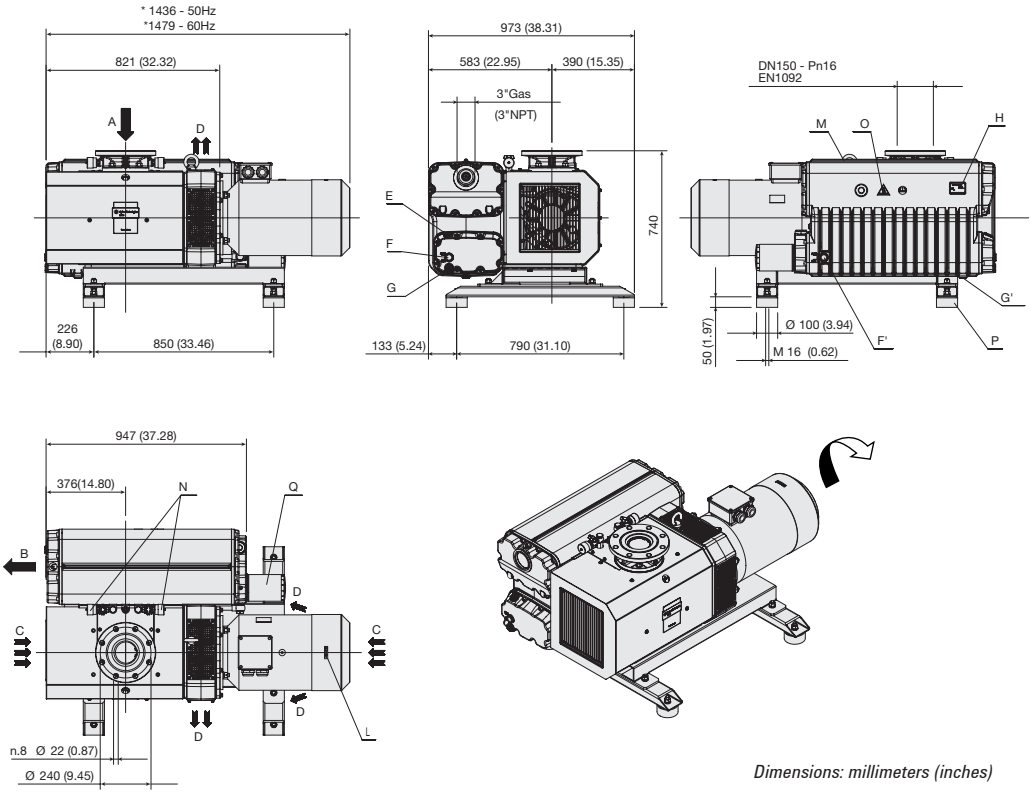
The rugged design, high performance and reliability, and compact size make the MS-631 FL ideal for demanding industrial applications such as thin film coatings, vacuum metallurgy, helium leak detection, and electron beam welding.

Key pump features

- Minimum footprint
- Easy to service
- Oil recirculation system
- Anti-suckback valve prevents system contamination
- Floating oil recovery valve
- Oil-level sight-glass allows quick visual check of pump status
- Carbon composite vanes extend pump life
- Air cooled



HIGH CAPACITY MS-RPS SERIES



Dimensions: millimeters (inches)

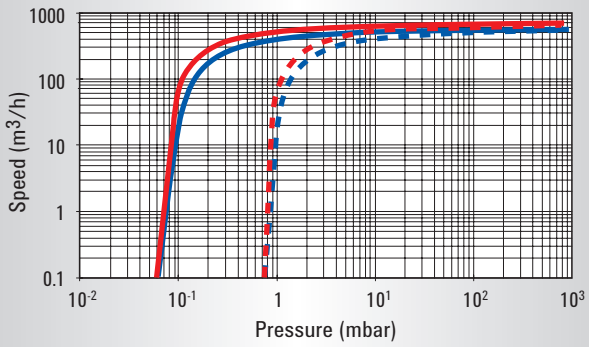
Technical Specifications

MS631FL can be directly coupled with RP-1401, RP-2001 and RP-3001.	
Nominal speed*	660 m^3 (at 50 Hz) 790 m^3 (at 60 Hz)
Ultimate partial pressure (with gas ballast valve closed)*	≤ 8 x 10^{-2} mbar (≤ 8 x 10^{-2} Torr)
Ultimate total pressure (with gas ballast valve open)*	≤ 0.5 mbar (≤ 0.37 Torr)
Motor power/rotational speed** (3ph)	15 (1000 min-1) kW (rpm) at 50 Hz 18.5 (1200 min-1) kW (rpm) at 60 Hz
Electrical motor characteristics	IM B5 Δ400/Y690 V at 50 Hz, Δ460 V at 60Hz IM B5 Δ220/Y380 V at 60 Hz IM B5 YY230/Y460 V at 60 Hz
Noise pressure level (without gas ballast valve)***	71 dB(A) at 50 Hz 73 dB(A) at 60 Hz
Water vapor tolerance	60 Hz / 50 Hz: 40/30 mbar (30/23 Torr)
Water vapor capacity	60 Hz / 50 Hz: 30/20 kg/h (33.1/22.0 qt/hr)
Oil capacity	min 19 l max 25 l nominal 22 l
Weight with 15.0 kW motor with 18.5 kW motor without motor	 591 kg (1301.79 lbs) 643 kg (1416.33 lbs) 419 kg (922.93 lbs)
Operating temperature range	12 – 40 °C

* *According to PNEUROP standard 6602*
** *Valid for temperatures up to 40 °C and altitudes lower than 1000 m*
*** *According to UNI EN ISO 2151 standard*

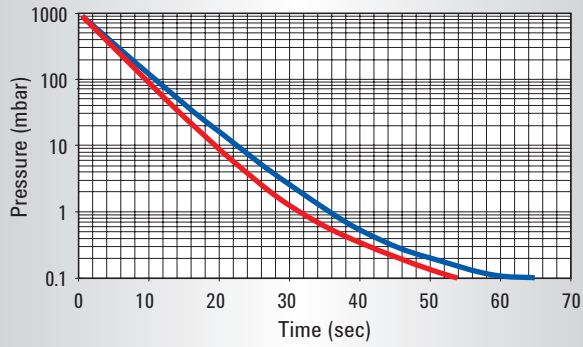
PUMP MODELS

Single Stage Pump MS-631 FL - Pumping Speed



50 Hz w/o gasballast
50 Hz with gasballast
60 Hz w/o gasballast
60 Hz with gasballast

Single Stage Pump MS-631 FL - Pump Down



Volume 750 liters

MS-631 FL 50 Hz
MS-631 FL 60 Hz

Ordering Information

High Capacity Rotary Vane Pumps *	**Part Number**
MS-631FL 15.0 kW, Δ400/Y690 V, 50 Hz; IE2; DN150 DIN2533	X3753-64000
MS-631FL 18.5 kW, Δ400/Y690 V, 50 Hz - Δ460 V, 60 Hz; DN150 DIN2533	X3753-64002
MS-631FL 18.5 kW, Δ220/Y380 V, 60 Hz; IE2; DN150 DIN2533	X3753-64006
MS-631FL 18.5 kW, YY230/Y460 V, 60 Hz; IE2; DN150 DIN2533	X3753-64004

Full Optional **	**Part Number**
MS-631FL 15.0 kW, Δ400/Y690 V, 50 Hz; IE2; DN150 DIN2533	X3753-64091
MS-631FL 18.5 kW, Δ400/Y690 V, 50 Hz - Δ460 V, 60 Hz; DN150 DIN2533	X3753-64092
MS-631FL 18.5 kW, Δ220/Y380 V, 60 Hz; IE2; DN150 DIN2533	X3753-64094
MS-631FL 18.5 kW, YY230/Y460 V, 60 Hz; IE2; DN150 DIN2533	X3753-64093

Oil and Spare Parts	**Part Number**
MS-01 oil 22 lt	X3760-64003
MS-631 minor spare part kit	9495087
MS-631 major spare part kit	9495088
Oil filter (Type B)	9495090
Frameless upgrade kit for standard MS-631	X3753-64089

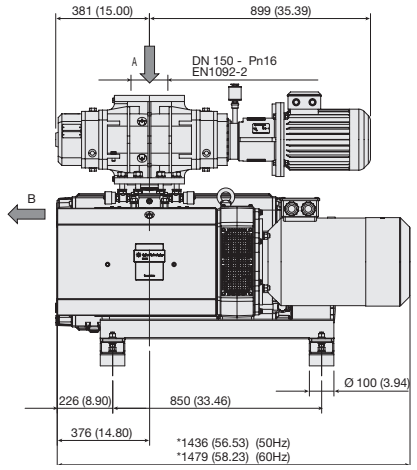
* *Oil charge not included*

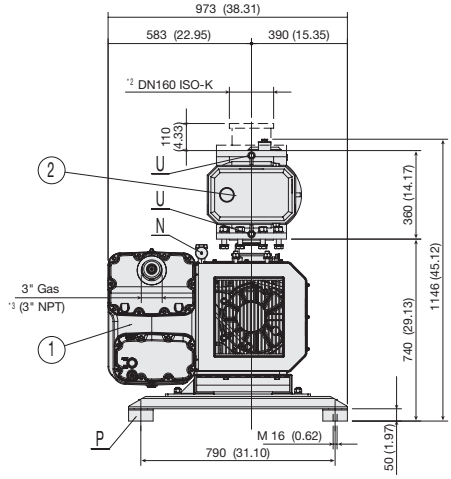
** *Full optional version include:*

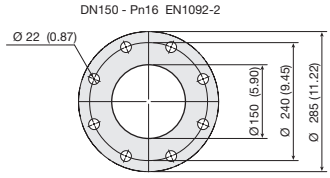
- *Pump thermal protection switch*
- *Exhaust filter control pressure switch*
- *Oil level protection switch*

HIGH CAPACITY MS-RPS SERIES

RPS-1401 / MS-631 FL System

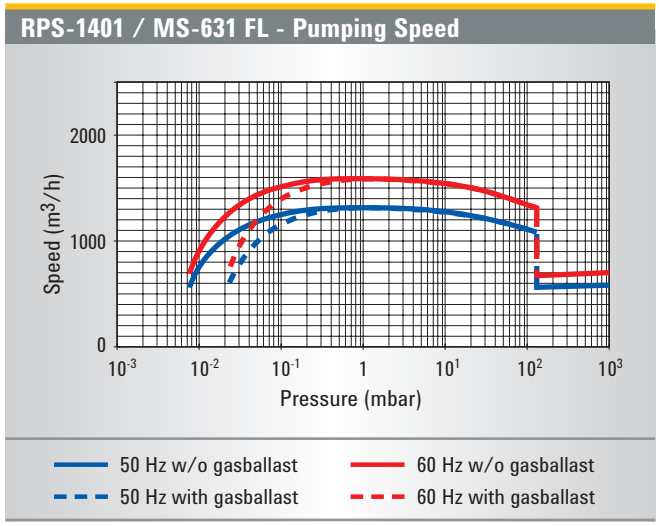






Dimensions: millimeters (inches)

RPS-1401 / MS-631 FL - Pumping Speed

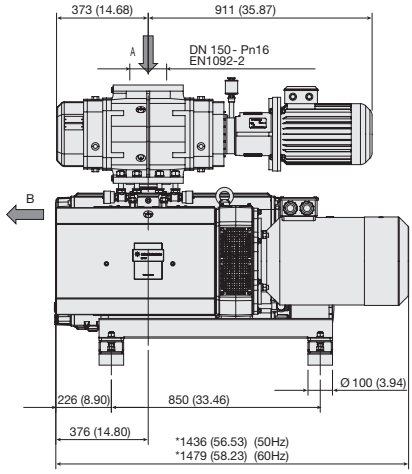


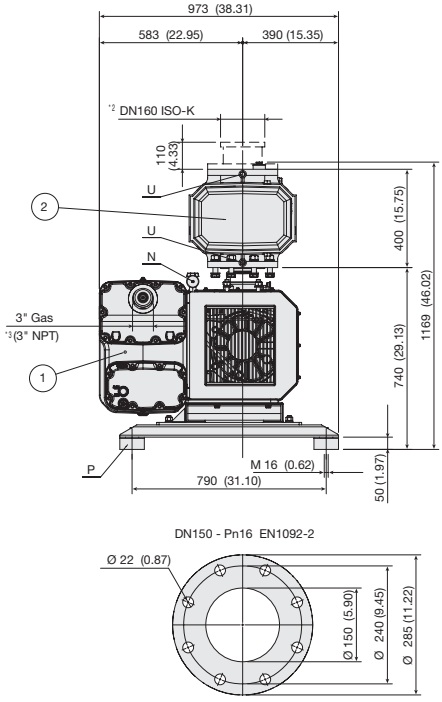
Technical Specifications

Nominal speed*	1430 m^3/h (at 50 Hz) 1720 m^3/h (at 60 Hz)
Ultimate partial pressure (with gas ballast valve closed)* (absolute)	≤ 0.007 mbar (≤ 0.005 Torr)
Ultimate total pressure (with gas ballast valve open)* (absolute)	≤ 0.02 mbar (≤ 0.015 Torr)
Start up pressure RP1401 (absolute)	≤ 130 mbar (≤ 97 Torr)
Fitted motor power (MS + RP)**	15 + 5.5 (400 V) kW at 50 Hz 18.5 + 5.5 (460 V) kW at 50 Hz
Noise pressure level**	75 dB(A) at 50 Hz 76.5 dB(A) at 60 Hz
Oil capacity (MS + RP) nominal	22 + 1.5 l
Weight	
with 3 ph 50 Hz motor	868 (1911.94) kg (lb)
with 3 ph 60 Hz motor	937 (2063.92) kg (lb)

* *According to PNEUROP standard 6602*
** *Valid for temperatures up to 40 °C and altitudes lower than 1000 m*
*** *According to UNI EN ISO 2151 standard*

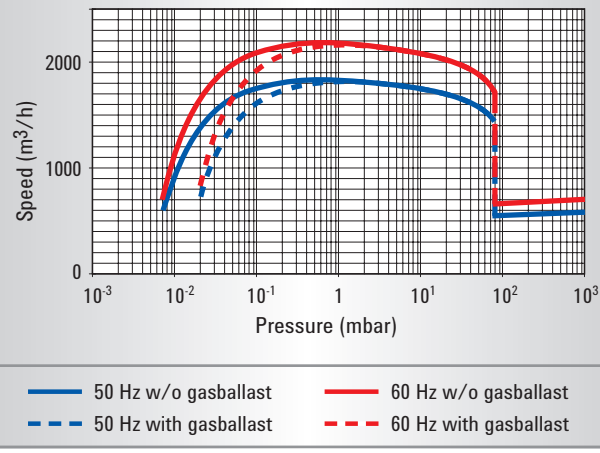
RPS-2001 / MS-631 FL System





Dimensions: millimeters (inches)

RPS-2001 / MS-631 FL - Pumping Speed



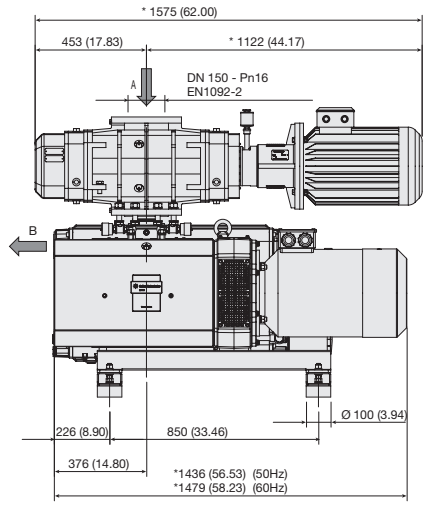
Technical Specifications

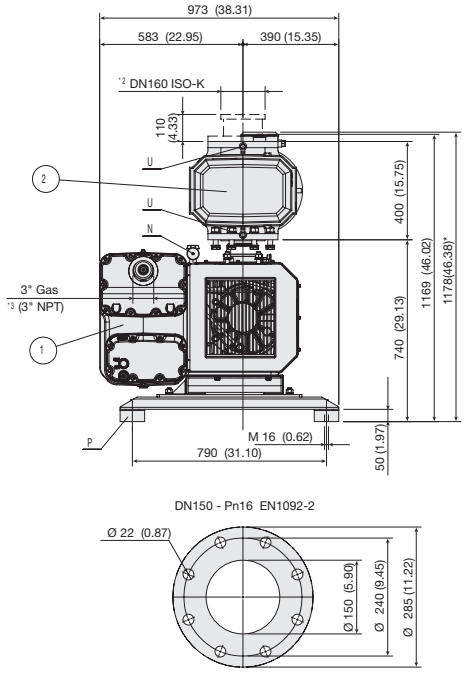
Nominal speed*	2045 m^3/h (at 50 Hz) 2444 m^3/h (at 60 Hz)
Ultimate total pressure (with gas ballast valve closed)* (absolute)	≤ 7 x 10^{-3} mbar (≤ 7 x 10^{-1} Pascal)
Ultimate total pressure (with gas ballast valve open)* (absolute)	≤ 2 x 10^{-2} mbar (≤ 2 Pascal)
Start up pressure RP2001 (absolute)	≤ 80 mbar (≤ 60 Torr)
Fitted motor power (MS + RP)**	15 + 7.5 (400 V) kW at 50 Hz 18.5 + 7.5 (460 V) kW at 50 Hz
Noise pressure level**	77 dB(A) at 50 Hz 78 dB(A) at 60 Hz
Oil capacity (MS + RP) nominal	22 + 2.5 l
Weight	
with 3 ph 50 Hz motor	920 (2026.48) kg (lb)
with 3 ph 60 Hz motor	986 (2171.85) kg (lb)

* *According to PNEUROP standard 6602*
** *Valid for temperatures up to 40 °C and altitudes lower than 1000 m*
*** *According to UNI EN ISO 2151 standard*

HIGH CAPACITY MS-RPS SERIES

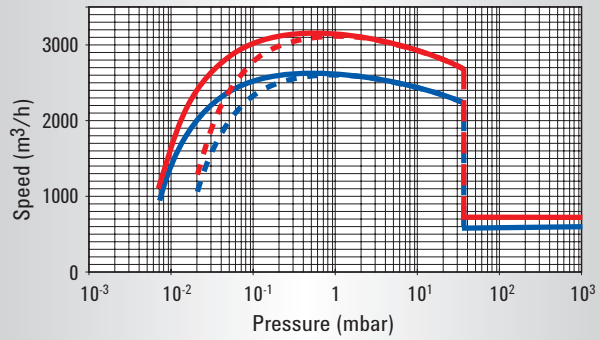
RPS-3001 / MS-631 FL System





Dimensions: millimeters (inches)

RPS-3001 / MS-631 FL - Pumping Speed



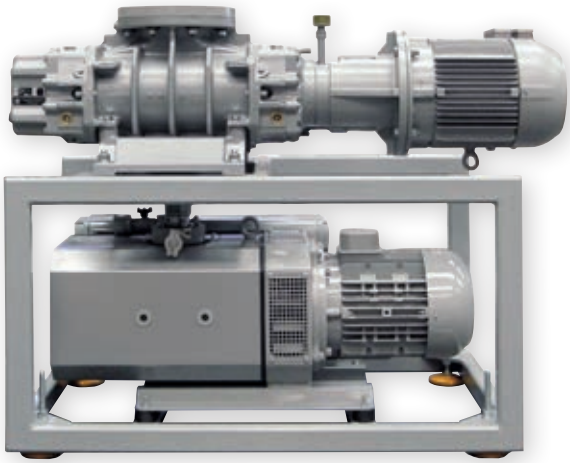
Technical Specifications

Nominal speed*	2890 m^3/h (at 50 Hz) 3465 m^3/h (at 60 Hz)
Ultimate total pressure (with gas ballast valve closed)* (absolute)	≤ 7 x 10^{-3} mbar (≤ 7 x 10^{-1} Pascal)
Ultimate total pressure (with gas ballast valve open)* (absolute)	≤ 2 x 10^{-2} mbar (≤ 2 Pascal)
Start up pressure RP3001 (absolute)	< 36 mbar (< 27 Torr)
Fitted motor power (MS + RP)**	15 + 11 (400 V) kW at 50 Hz 18.5 + 11 (460 V) kW at 50 Hz
Noise pressure level***	77.5 dB(A) at 50 Hz 78.5 dB(A) at 60 Hz
Oil capacity (MS + RP) nominal	22 + 2.5 l
Weight	
with 3 ph 50 Hz motor	1052 (2317.23) kg (lb)
with 3 ph 60 Hz motor	1140 (2511.07) kg (lb)

* *According to PNEUROP standard 6602*
** *Valid for temperatures up to 40 °C and altitudes lower than 1000 m*
*** *According to UNI EN ISO 2151 standard*

RPS PUMPING SYSTEMS MODELS

Agilent RPS-Series Roots Pumping Systems



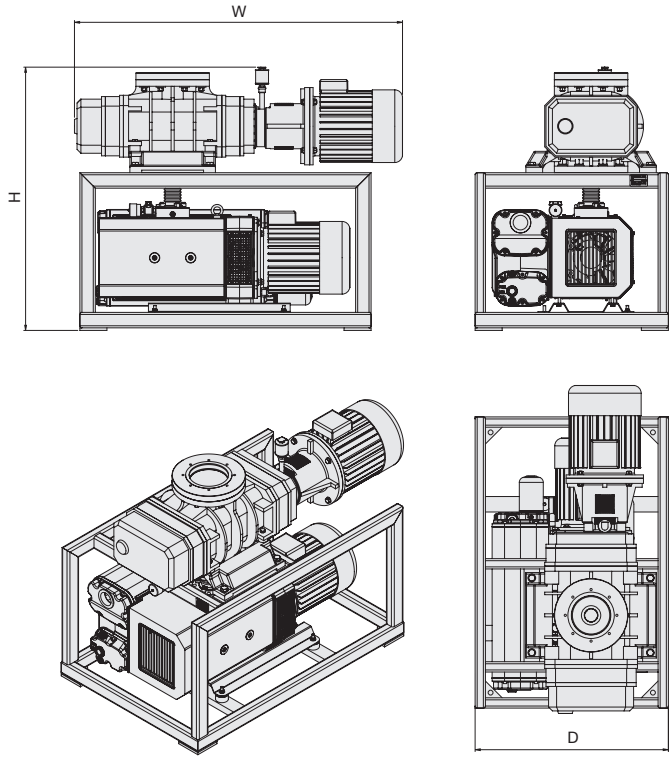
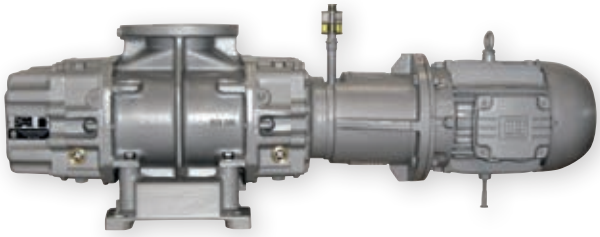


Photo and Outline Drawing: RPS-1401/301

Roots Pumping Systems (RPS) consist of one MS Rotary Vane Pump and one RP Roots Pump, assembled on a dedicated frame, and connected in series with a flexible hose. This assembly is shipped with the pumps mounted on the frame and leak checked. Both pumps are equipped with motor.

Agilent RP-Series Roots Pumps

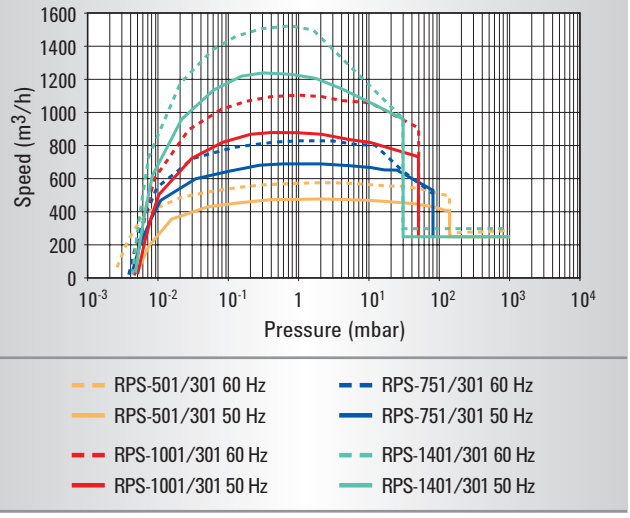


State-of-the-art, high performance Agilent Roots Pumps are ideal for use in demanding industrial applications:

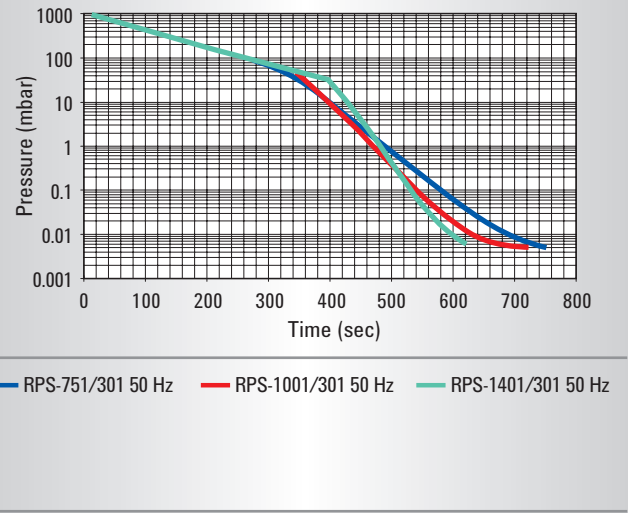
- Highest compression ratio
- Agilent Roots Pumps can withstand high mechanical loads reducing pumpdown cycles
- Lowest base pressure: 5 x 10^{-3} mbar (4 x 10^{-3} Torr)

HIGH CAPACITY MS-RPS SERIES

RPS Systems / MS-301 - Pumping Speed



RPS Systems / MS-301 - Pump Down



Technical Specifications

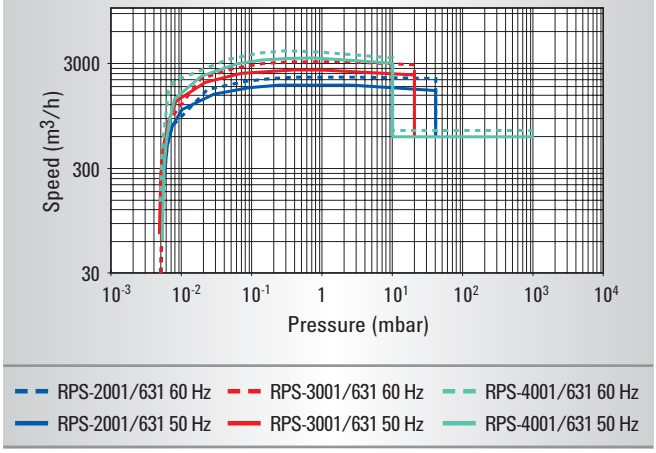
		RPS-501/301	RPS-751/301
Nominal pumping speed	60 Hz 50 Hz	600 m^3/h (350 cfm) 500 m^3/h (300 cfm)	900 m^3/h (530 cfm) 750 m^3/h (440 cfm)
Ultimate total pressure (gas ballast closed)		≤ 7 x 10^{-3} mbar (≤ 5 x 10^{-3} Torr)	≤ 5 x 10^{-3} mbar (≤ 4 x 10^{-3} Torr)
Roots pump start up pressure		≤ 200 mbar (≤ 152 Torr)	≤ 80 mbar (≤ 60 Torr)
Power	60 Hz 50 Hz	2.6 + 7.5 kW (3.5 + 10.0 HP) 2.2 + 5.5 kW (2.9 + 7.3 HP)	3.6 + 7.5 kW (4.8 + 10.0 HP) 3.0 + 5.5 kW (4.0 + 7.3 HP)
Power supply voltage		Δ230/Y400 V at 50 Hz Δ460 V at 60 Hz YY230/Y460 V at 60 Hz Δ220/Y380 V at 60 Hz	Δ230/Y400 V at 50 Hz Δ460 V at 60 Hz YY230/Y460 V at 60 Hz Δ220/Y380 V at 60 Hz
Noise level*		74 / 76 dB(A)	74 / 76 dB(A)
Oil charge		1.1 + 7.0 liter (1.16 + 7.4 qt)	1.5 + 7.0 liter (1.6 + 7.4 qt)
Working ambient temperature range		+12 +40 °C (+54 +105 F)	+12 +40 °C (+54 +105 F)
Storage temperature		-15 +50 °C (+5 +122 F)	-20 +70 °C (-4 +158 F)
Dimensions D x W x H		750 x 1048 x 1086 / 750 x 1088 x 1086 mm (29.5 x 41.3 x 42.8 / 29.5 x 42.8 x 42.8 in.)	750 x 1130 x 1175 mm (29.5 x 44.5 x 46.3 in.)
Total weight	60 Hz 50 Hz	445 kg (981 lbs) 430 kg (948 lbs)	470 kg (1040 lbs) 450 kg (1000 lbs)

		RPS-1001/301	RPS-1401/301
Nominal pumping speed	60 Hz 50 Hz	1200 m^3/h (710 cfm) 1000 m^3/h (590 cfm)	1700 m^3/h (1000 cfm) 1430 m^3/h (840 cfm)
Ultimate total pressure (gas ballast closed)		≤ 5 x 10^{-3} mbar (≤ 4 x 10^{-3} Torr)	≤ 5 x 10^{-3} mbar (≤ 4 x 10^{-3} Torr)
Roots pump start up pressure		≤ 50 mbar (≤ 38 Torr)	≤ 30 mbar (≤ 23 Torr)
Power	60 Hz 50 Hz	4.8 + 7.5 kW (6.4 + 10.0 HP) 4.0 + 5.5 kW (5.3 + 7.3 HP)	6.3 + 7.5 kW (8.4 + 10.0 HP) 5.5 + 5.5 kW (7.3 + 7.3 HP)
Power supply voltage		Δ230/Y400 V at 50 Hz Δ400/Y690 V at 50 Hz Δ460 V at 60 Hz YY230/Y460 V at 60 Hz Δ220/Y380 V at 60 Hz	Δ230/Y400 V at 50 Hz Δ400/Y690 V at 50 Hz Δ460 V at 60 Hz YY230/Y460 V at 60 Hz Δ220/Y380 V at 60 Hz
Noise level*		74 / 76 dB(A)	74 / 76 dB(A)
Oil charge		1.5 + 7.0 liter (1.6 + 7.4 qt)	1.5 + 7.0 liter (1.6 + 7.4 qt)
Working ambient temperature range		+12 +40 °C (+54 +105 F)	+12 +40 °C (+54 +105 F)
Storage temperature		-20 +70 °C (-4 +158 F)	-20 +70 °C (-4 +158 F)
Dimensions D x W x H		750 x 1153 x 1195 mm (29.5 x 45.4 x 47 in.)	750 x 1289 x 1195 mm (29.5 x 50.7 x 47 in.)
Total weight	60 Hz 50 Hz	530 kg (1170 lbs) 510 kg (1130 lbs)	590 kg (1300 lbs) 570 kg (1260 lbs)

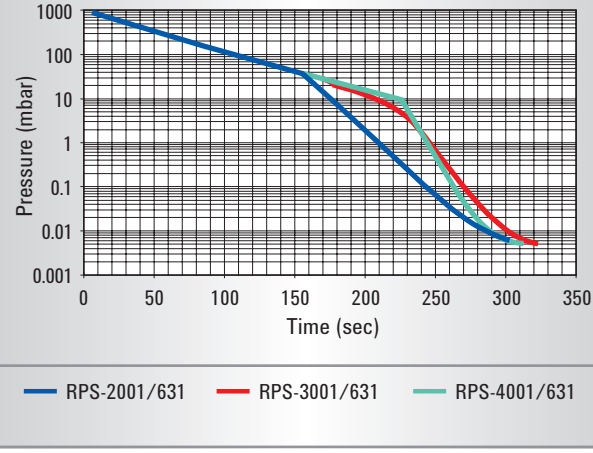
* *Measured according to EN ISO 2151 (50/60 Hz)*

RPS PUMPING SYSTEMS MODELS

RPS Systems / MS-631 - Pumping Speed



RPS Systems / MS-631 - Pump Down



Technical Specifications

		RPS-2001/631	RPS-3001/631
Nominal pumping speed	60 Hz 50 Hz	2400 m^3/h (1415 cfm) 2000 m^3/h (1180 cfm)	3450 m^3/h (2030 cfm) 2900 m^3/h (1710 cfm)
Ultimate total pressure (gas ballast closed)		≤ 5 x 10^{-3} mbar (≤ 4 x 10^{-3} Torr)	≤ 5 x 10^{-3} mbar (≤ 4 x 10^{-3} Torr)
Roots pump start up pressure		≤ 55 mbar (≤ 42 Torr)	≤ 30 mbar (≤ 23 Torr)
Power	60 Hz 50 Hz	8.8 + 18.5 kW (11.8 + 24.8 HP) 7.5 + 15.0 kW (10.0 + 20.1 HP)	12.5 + 18.5 kW (16.7 + 24.8 HP) 11.0 + 15.0 kW (14.7 + 20.1 HP)
Power supply voltage		Δ400/Y690 V at 50 Hz Δ460 V at 60 Hz YY230/Y460 V at 60 Hz Δ220/Y380 V at 60 Hz	Δ400/Y690 V at 50 Hz Δ460 V at 60 Hz YY230/Y460 V at 60 Hz Δ220/Y380 V at 60 Hz
Noise level*		78 / 80 dB(A)	78 / 80 dB(A)
Oil charge		2.5 + 22.0 liter (2.6 + 23.2 qt)	2.5 + 22.0 liter (2.6 + 23.2 qt)
Working ambient temperature range		+12 +40 °C (+54 +105 F)	+12 +40 °C (+54 +105 F)
Storage temperature		-20 +70 °C (-4 +158 F)	-20 +70 °C (-4 +158 F)
Dimensions D x W x H		1050 x 1575 [1605 version 60 Hz] x 1516 mm (41.3 x 62 [63.2 version 60 Hz] x 59.7 in.)	1050 x 1615 x 1516 mm (41.3 x 63.6 x 59.7 in.)
Total weight	60 Hz 50 Hz	1115 kg (2460 lbs) 1085 kg (2400 lbs)	1255 kg (2770 lbs) 1225 kg (2700 lbs)

		RPS-4001/631
Nominal pumping speed	60 Hz 50 Hz	4700 m^3/h (2770 cfm) 3900 m^3/h (2300 cfm)
Ultimate total pressure (gas ballast closed)		≤ 5 x 10^{-3} mbar (≤ 4 x 10^{-3} Torr)
Roots pump start up pressure		≤ 16 mbar (≤ 12 Torr)
Power	60 Hz 50 Hz	12.5 + 18.5 kW (16.7 + 24.8 HP) 11.0 + 15.0 kW (14.7 + 20.1 HP)
Power supply voltage		Δ400/Y690 V at 50 Hz Δ460 V at 60 Hz YY230/Y460 V at 60 Hz Δ220/Y380 V at 60 Hz
Noise level*		79 / 81 dB(A)
Oil charge		7.0 + 22.0 liter (7.4 + 23.2 qt)
Working ambient temperature range		+12 +40 °C (+54 +105 F)
Storage temperature		-20 +70 °C (-4 +158 F)
Dimensions D x W x H		1050 x 1636 x 1576 mm (41.3 x 64.4 x 62 in.)
Total weight	60 Hz 50 Hz	1380 kg (3050 lbs) 1340 kg (2960 lbs)

* *measured according to EN ISO 2151 (50/60 Hz)*

Ordering Information

Roots Pumping Systems including: Roots Pump, RV Pump, Frame, Flexible Hose, Roots Pump Oil, Assembly, Testing and Packaging. **MS PUMP OIL CHARGE NOT INCLUDED**.	**Part Number**
RPS-501/301, 230/400V, 50Hz	X3755-64000
RPS-501/301, 230/460V, 60Hz (US version)	X3755-64008
RPS-501/301, 220/380V, 60Hz	X3755-64012
RPS-751/301, 230/400V, 50Hz	X3755-64001
RPS-751/301, 230/460V, 60Hz (US version)	X3755-64009
RPS-751/301, 220/380V, 60Hz	X3755-64013
RPS-1001/301, 230/400V, 50Hz	X3755-64002
RPS-1001/301, 400/690V, 50Hz	X3755-64004
RPS-1001/301, 400/690V, 50Hz - 460V,60Hz	X3755-64006
RPS-1001/301, 230/460V, 60Hz (US version)	X3755-64010
RPS-1001/301, 220/380V, 60Hz	X3755-64014
RPS-1401/301, 230/400V, 50Hz	X3755-64003
RPS-1401/301, 400/690V, 50Hz	X3755-64005
RPS-1401/301, 400/690V, 50Hz - 460V,60Hz	X3755-64007
RPS-1401/301, 230/460V, 60Hz (US version)	X3755-64011
RPS-1401/301, 220/380V, 60Hz	X3755-64015
RPS-2001/631, 400/690V, 50Hz	X3756-64002
RPS-2001/631, 400/690V, 50Hz - 460V,60Hz	X3756-64007
RPS-2001/631, 230/460V, 60Hz (US version)	X3756-64012
RPS-2001/631, 220/380V, 60Hz	X3756-64017
RPS-3001/631, 400/690V, 50Hz	X3756-64003
RPS-3001/631, 400/690V, 50Hz - 460V,60Hz	X3756-64008
RPS-3001/631, 230/460V, 60Hz (US version)	X3756-64013
RPS-3001/631, 220/380V, 60Hz	X3756-64018
RPS-4001/631, 400/690V, 50Hz	X3756-64004
RPS-4001/631, 400/690V, 50Hz - 460V,60Hz	X3756-64009
RPS-4001/631, 230/460V, 60Hz (US version)	X3756-64014
RPS-4001/631, 220/380V, 60Hz	X3756-64019

** Other combinations available on request. Please contact Agilent for details*

RPS PUMPING SYSTEMS MODELS

Ordering Information

Roots Pumps / MS PUMP OIL CHARGE NOT INCLUDED	Part Number
RP-251,1.1kW, 230/400V, 50Hz-460V,60Hz	X3757-64251
RP-251, 1.1kW, 230/460V, 60Hz	X3757-64252
RP-251, 1.1kW, 220/380V, 60Hz	X3757-64253
RP-501, 2.2kW 230/400V, 50Hz - 460V, 60Hz	X3757-64501
RP-501, 2.2kW, 230/460V, 60Hz	X3757-64502
RP-501, 2.2kW, 220/380V, 60Hz	X3757-64503
RP-751, 3kW, 230/400V, 50Hz - 460V, 60Hz	X3758-64751
RP-751, 3kW, 230/460V, 60Hz	X3758-64752
RP-751, 3kW, 220/380V, 60Hz	X3758-64753
RP-1001, 4kW, 230/400V, 50Hz - 460V, 60Hz	X3758-64001
RP-1001, 4kW, 400/690V, 50Hz - 460V, 60Hz	X3758-64002
RP-1001, 4kW, 230/460V, 60Hz	X3758-64003
RP-1001, 4kW, 230/380V, 60Hz	X3758-64004
RP-1401, 4kW, 220/380V, 60Hz - To be used with VFD	X3758-64007
RP-1401, 4kW, 230/400V, 50Hz - 460V, 60Hz - To be used with VFD	X3758-64009
RP-1401, 4kW, 400/690V, 50Hz - 460V, 60Hz - To be used with VFD	X3758-64010
RP-1401, 5.5kW 230/400V, 50Hz-460V, 60Hz	X3758-64401
RP-1401, 5.5kW 400/690V, 50Hz-460V, 60Hz	X3758-64402
RP-1401, 5.5kW, 230/460V, 60Hz	X3758-64403
RP-1401, 5.5kW, 230/380V, 60Hz	X3758-64404
RP-2001, 5.5kW, 220/380V, 60Hz - To be used with VFD	X3759-64001
RP-2001, 5.5kW, 230/460V, 60Hz - To be used with VFD	X3759-64002
RP-2001, 5.5kW, 400/690V, 50Hz-460V,60Hz - To be used with VFD	X3759-64003
RP-2001, 7.5kW 400/690V, 50Hz-460V,60Hz	X3759-64201
RP-2001, 7.5kW, 230/460V, 60Hz	X3759-64202
RP-2001, 7.5kW, 230/380V, 60Hz	X3759-64203
RP-3001, 11kW 400/690V, 50Hz-460V, 60Hz	X3759-64301
RP-3001, 11kW, 230/460V, 60Hz	X3759-64302
RP-3001, 11kW, 230/380V, 60Hz	X3759-64303
RP-4001, 11kW 400/690V, 50Hz-460V, 60Hz	X3759-64401
RP-4001, 11kW, 230/460V, 60Hz	X3759-64402
RP-4001, 11kW, 230/380V, 60Hz	X3759-64403
Inverter 4kW, three-phase, 380-480V, IP20, plus software suitable for RP-1401 paired with MS-631	X3761-64012
Inverter 4kW, three-phase, 380-480V, IP66, plus software suitable for RP-1401 paired with MS-631	X3761-64013
Inverter 5.5kW, three-phase, 380-480V, IP20, plus software suitable for RP-2001 paired with MS-631	X3761-64014
Inverter 5.5kW, three-phase, 380-480V, IP66, plus software suitable for RP-2001 paired with MS-631	X3761-64015
Support Mounting Kit, for 4kW inverter	X3761-64016
Support Mounting Kit, for 5.5kW inverter	X3761-64017

Ordering Information

Spare Part Kits & Accessories	Part Number
RP-1001 Minor Spare Part Kit	9497020
RP-751 Minor Spare Part Kit	9497021
RP-1401 Minor Spare Part Kit	9497022
RP-2001 Minor Spare Part Kit	9497023
RP-3001 Minor Spare Part Kit	9497024
RP-4001 Minor Spare Part Kit	9497025
RP-1001 Major Spare Part Kit	9497026
RP-751 Major Spare Part Kit	9497027
RP-1401 Major Spare Part Kit	9497028
RP-2001 Major Spare Part Kit	9497029
RP-3001 Major Spare Part Kit	9497030
RP-4001 Major Spare Part Kit	9497031
DN80Pn16 to DN63ISO-K Adapter Flange Kit	X3761-64000
DN100Pn16 to DN63ISO-K Adapter Flange Kit	X3761-64001
DN100Pn16 to DN100ISO-K Adapter Flange Kit	X3761-64002
DN150Pn16 to DN100ISO-K Adapter Flange Kit	X3761-64003
DN150Pn16 to DN160ISO-K Adapter Flange Kit	X3761-64004
DN63 ISO-K Inlet Mesh Kit	X3761-64005
DN100 ISO-K Inlet Mesh Kit	X3761-64006
DN160 ISO-K Inlet Mesh Kit	X3761-64007

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