



Varian, Inc.  
Vacuum Technologies

## Dry Scroll Pumps

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# Scroll Pumps Features and Benefits

**Varian dry scroll pumps** create vacuum using a dual scroll mechanism where one nested scroll orbits the other creating moving zones of captured gas. Gas enters the scroll set at the perimeter and is displaced and compressed toward the center hub where it is exhausted. This design offers many benefits such as low noise and vibration, simple and infrequent maintenance, and elimination of catastrophic failure modes.



Gas enters scroll set      Gas is displaced and...      ...compressed toward center hub      Gas exhausted at center hub

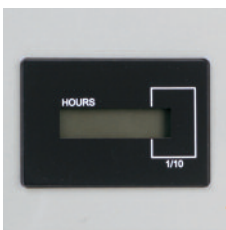
**Our smaller scroll pumps** – the IDP-3 and SH-110 – employ a single stage design that delivers dry vacuum in a small, economical, reliable package making these pumps ideally suited for many applications including Analytical Instruments and Research and Development. This simple design utilizes proven seal technology for longer demonstrated maintenance intervals.



**Single-sided Scroll**  
*SH-110 and IDP-3*  
Enables quick and easy tip seal change.



**Built-In Vacuum Pump Isolation Valve** – *SH-110 only*  
Isolates the pump during vacuum system fault conditions and power loss; prevents contamination of the vacuum system.



**Hour Meter**  
*SH-110 standard, IDP-3 optional*  
Gives an accurate measurement of total run time which facilitates maintenance planning.



**Fuse Holder and Voltage Changeover Tab** – *SH-110 only*  
Easy and quick voltage selection.  
**On/Off Switch**  
Easily accessible.  
**IEC 320 Power Connection**  
Flexible electrical connections for easy installation worldwide. (For power cord selection, see page 13)



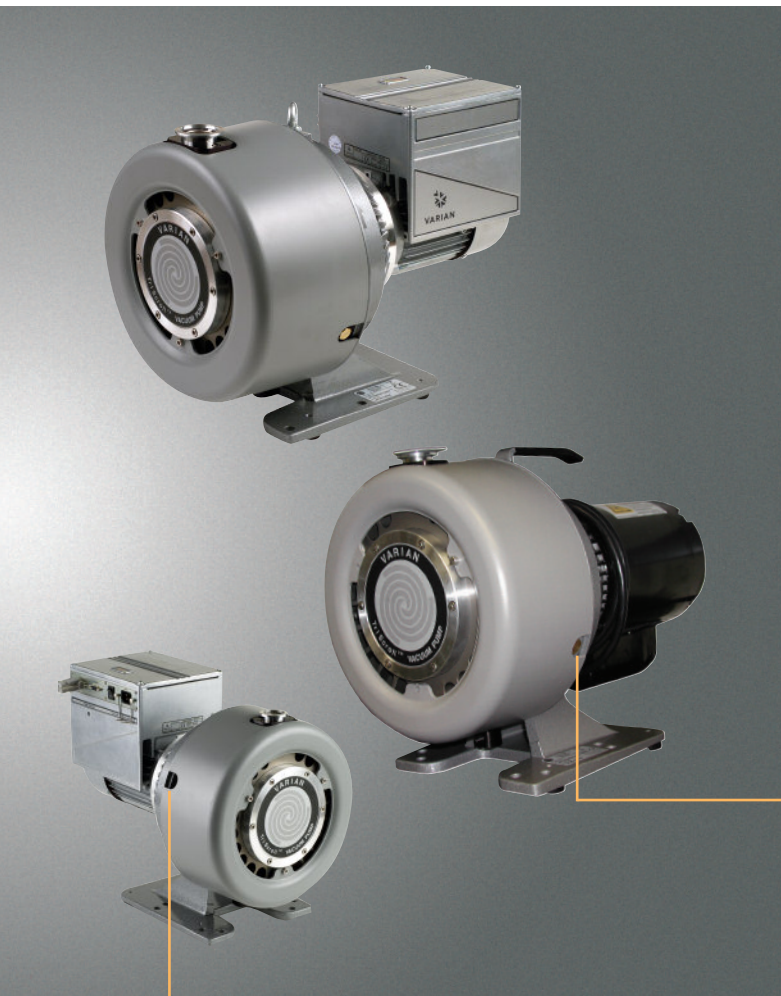


Varian TriScroll and TriScroll Inverter Pumps are two-stage scroll pumps that achieve the lowest ultimate pressure of any dry pump technology on the market today.



**Inverter-driven TriScroll Pumps** deliver constant pumping speed worldwide regardless of line frequency. Inverters allow selection of the optimal pumping speed for any application by adjusting the rotational speed of the pump.

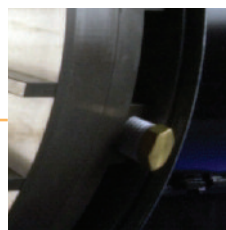
A 9 pin D-shell connector allows remote start and stop with a contact closure, and the serial interface enables monitoring of the pump parameters and remote start capability. For more information, see page 22.



**Proven Reliability**  
With over 20,000 Varian manufactured scroll pumps operating worldwide, the Varian scroll technology has demonstrated exceptional reliability.



**Unique TriScroll™ Design**  
Delivers high pumping speed and achieves low ultimate pressure, within a compact design.



**Bearing Purge Port**  
*TriScrolls only*  
Improved tolerance for condensable gases by purging the shaft bearings with dry gas.



**Automatic Ballast Port**  
*All scrolls*  
Improves tolerance for water vapor and handling of condensable gases for consistent performance.

Scroll Pumps

# Typical Applications



## Load Locks and Transfer Chambers

Scroll pumps are proven as a highly reliable and low maintenance choice for clean dry pumping in production equipment on load locks and transfer chambers.

## Beam Lines

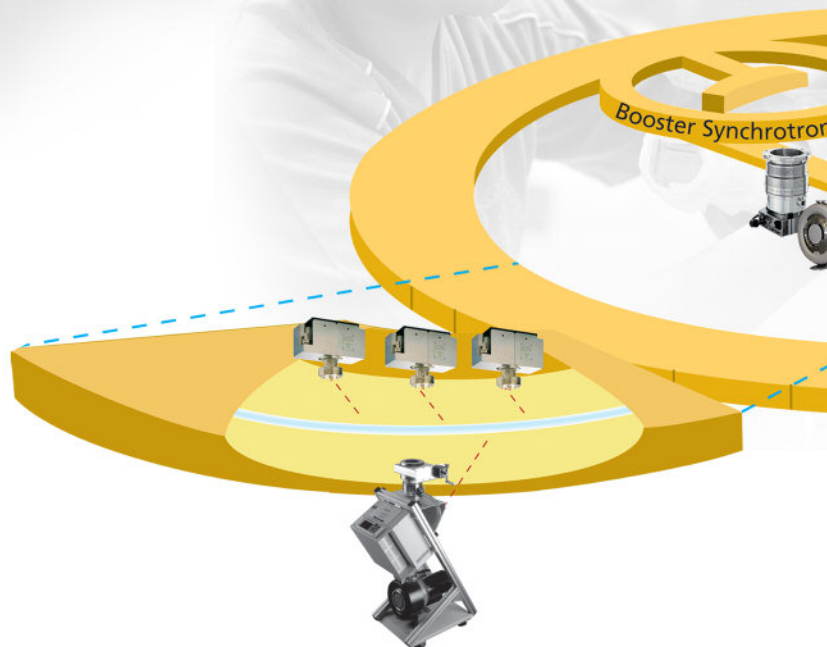
Fast and oil-free pump down in combination with turbomolecular pumps and ion pumps. Scroll pumps are part of a total Varian Vacuum Technologies dry product offering, including turbo pumps and ion pumps.

## Scanning Electron Microscopes

Varian scroll pumps provide clean and reliable dry vacuum, ideal for maintaining the critical condition of instrument columns.

## General Purpose Laboratory Applications

Proven scroll technology provides predictable dry vacuum at low base pressure for long periods of time. Scroll design eliminates all possibility of sudden and catastrophic failure associated with technologies such as diaphragm pumps. The IDP-3 and the SH-110 are light in weight – the IDP-3 weighs in at 21 pounds – and are equipped with handles for easy mobility around the lab.





**Drying Ovens**

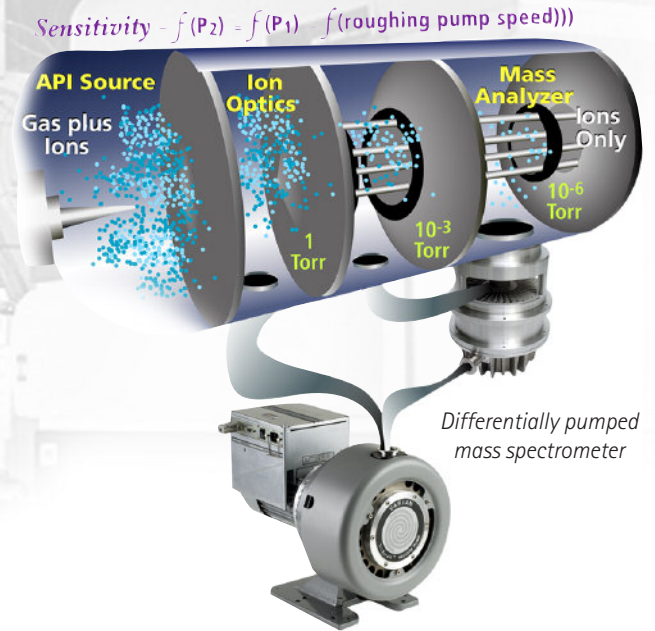
Scroll pumps eliminate the risk of backstreaming rotary vane pump oil vapors into the oven system. The gas ballast feature guarantees reliable operation where water vapor is to be pumped.

**Cryogenics**

Scroll pumps are commonly used for regeneration of cryogenic pumps. Use of the inert gas purge kit accessory is recommended for this application to enhance pumping of condensable vapor.

**Manufacturing/Glove Box Enclosures**

Scroll pumps are an economical choice for critical manufacturing, eliminating the risk of oil contamination, and costly waste disposal. Varian scroll pumps keep the manufacturing environment hydrocarbon free.



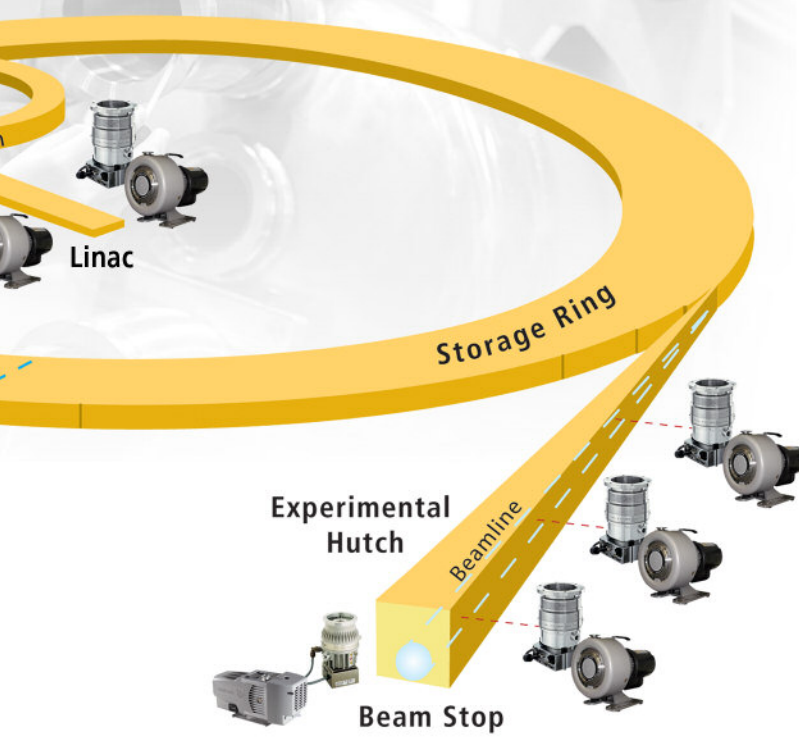
Scroll Pumps

**Primary Backing Pump for Turbo Systems**

The scroll pump is the ideal selection for backing high vacuum turbo pumps, such as in the mass spectrometer shown above, eliminating the risk of system contamination.

**Leak Detection**

The TriScroll modules used in Helium Mass Spectrometer Leak Detection have been specifically optimized for this application, improving the compression ratio for Helium.



# Pump Specifications

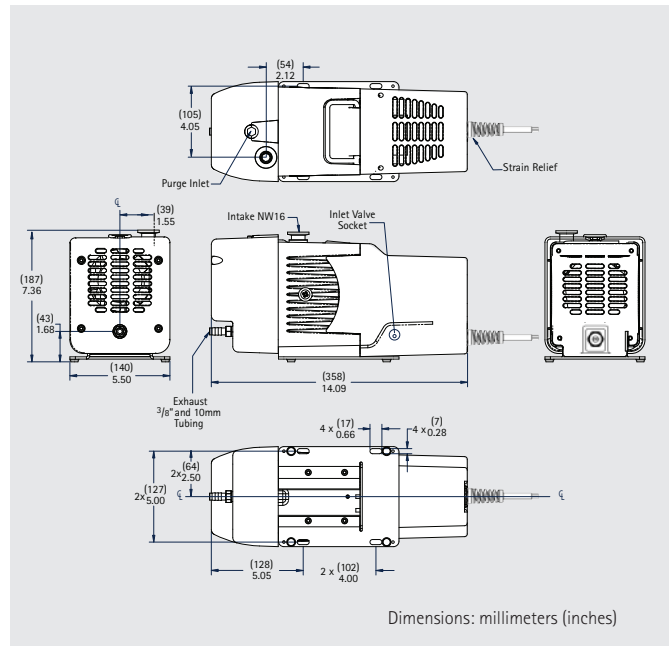
		IDP-2	IDP-3	SH-110
Pumping speed	60 Hz l/min, m <sup>3</sup> /h, cfm	35, 2.1, 1.2	60, 3.6, 2.1	110, 6.6, 4.0
	50 Hz l/min, m <sup>3</sup> /h, cfm	30, 1.8, 1.1	50, 3.0, 1.8	90, 5.4, 3.3
Ultimate pressure	mbar (Torr)	1.0 (7.5 x 10 <sup>-1</sup> )	3.3 x 10 <sup>-1</sup> (2.5 x 10 <sup>-1</sup> )	6.6 x 10 <sup>-2</sup> (5 x 10 <sup>-2</sup> )
Maximum inlet pressure	atm (psig)	1.0 (0)	1.0 (0)	1.0 (0)
Maximum outlet pressure	atm (psig)	1.4 (6.5)	1.4 (6.5)	1.5 (7.5)
Inlet connection		NW16	NW16	NW25
Exhaust connection		1/4" Female NPT (10 mm hose barb provided)	1/4" Female NPT (10 mm hose barb provided)	1/4" Female NPT (NW16 adapter provided)
Gas ballast		1/8" Female NPT (20 micron sintered plug provided)	1/8" Female NPT (20 micron sintered plug provided)	1/8" Female NPT (20 micron sintered plug provided)
Motor rating (1 phase)	HP (kW)	0.16 (0.12)	0.16 (0.12)	0.25 (0.19)
Operating voltages (± 10%)	1Ø 60 Hz	100, 115, 220-230V	100, 115, 220-230V	100-115, 200-230V
	50 Hz	100, 220-230V	100, 220-230V	100-115, 200-230V
	3Ø 60 Hz	-	-	-
	50 Hz	-	-	-
Motor thermal protection		Type U automatic	Type U automatic	Type U automatic
Operating speed	60 Hz (rpm)	3200	3200	1725
	50 Hz (rpm)	2600	2600	1425
Cooling system		Air-cooled	Air-cooled	Air-cooled
Ambient operating temperature	°C (°F)	5 to 40 (41 to 108)	5 to 40 (41 to 108)	5 to 40 (41 to 104)
Storage temperature	°C (°F)	-20 to 60 (-4 to 140)	-20 to 60 (-4 to 140)	-20 to 60 (-4 to 140)
Weight pump only	kg (lbs)	9.5 (21)	9.5 (21)	19 (43)
Shipping weight	kg (lbs)	10.5 (23)	10.5 (23)	20 (44)
Noise level (per ISO 11201)	dB(A)	55	55	56
Vibration level (per ISO 10816-1)		1.5 mm/sec	1.5 mm/sec	1.5 mm/sec



TriScroll 300	TriScroll 600	TriScroll 300 Inverter	TriScroll 600 Inverter
250, 15, 8.8 210, 12.6, 7.4	500, 30, 17.7 420, 25.2, 14.8	250, 15, 8.8	500, 30, 17.7
1.3 x 10 <sup>-2</sup> (1 x 10 <sup>-2</sup> )	9.3 x 10 <sup>-3</sup> (7 x 10 <sup>-3</sup> )	1.3 x 10 <sup>-2</sup> (1 x 10 <sup>-2</sup> )	9.3 x 10 <sup>-3</sup> (7 x 10 <sup>-3</sup> )
1.0 (0)	1.0 (0)	1.0 (0)	1.0 (0)
1.1 (1.5)	1.1 (1.5)	1.1 (1.5)	1.1 (1.5)
NW25	NW40	NW25	NW40
1/4" Female NPT with swivel (NW16 adapter provided)	3/8" Female NPT with swivel (NW25 adapter provided)	1/4" Female NPT with swivel (NW16 adapter provided)	3/8" Female NPT with swivel (NW25 adapter provided)
1/4" Female NPT (40 micron sintered filter provided)	1/4" Female NPT (40 micron sintered filter provided)	1/4" Female NPT (40 micron sintered filter provided)	1/4" Female NPT (40 micron sintered filter provided)
0.75 (0.56)	1.0 (0.76)	0.67 (0.5)	0.67 (0.5)
100-115, 200-230V 100-115, 200-230V 200-230, 460V 200-230, 380-415V	100-115, 200-230V 100-115, 200-230V 200-230, 460V 200-230, 380-415V	100-115, 200-240V 100-115, 200-240V - -	200-240V 200-240V - -
Type U automatic	Type U automatic	Automatic	Automatic
1725 1425	1725 1425	1800 @ 62Hz	1800 @ 62Hz
Air-cooled	Air-cooled	Air-cooled	Air-cooled
5 to 40 (41 to 104)	5 to 40 (41 to 104)	5 to 40 (41 to 104)	5 to 40 (41 to 104)
-20 to 60 (-4 to 140)	-20 to 60 (-4 to 140)	-20 to 60 (-4 to 140)	-20 to 60 (-4 to 140)
26.4 (57)	32 (70)	26 (57)	31 (68)
34.2 (75)	40 (87)	34 (74)	39 (85)
68	68	Variable with frequency 55 – 68	Variable with frequency 55 – 68
6.3 mm/sec	6.3 mm/sec	Variable with frequency	Variable with frequency



*New*



The Varian IDP-2 Dry Scroll Pump is an innovative, compact, high-performance, oil-free vacuum pump that is suitable for a wide variety of applications. It is the smallest scroll pump made for general vacuum applications, which makes it easy to integrate into OEM systems, and it weighs only 21 pounds (9.5 kg). Yet with a pumping speed of 35 l/m and a very low base pressure of 750 milliTorr, it is the highest-performing dry pump in its class.

- Oil-free - no contamination of the vacuum system
- Hermetic design with fully isolated motor and bearings
- Low noise and vibration
- No mechanisms subject to catastrophic failure
- Speed control on 24 VDC motor with 0-10V control signal

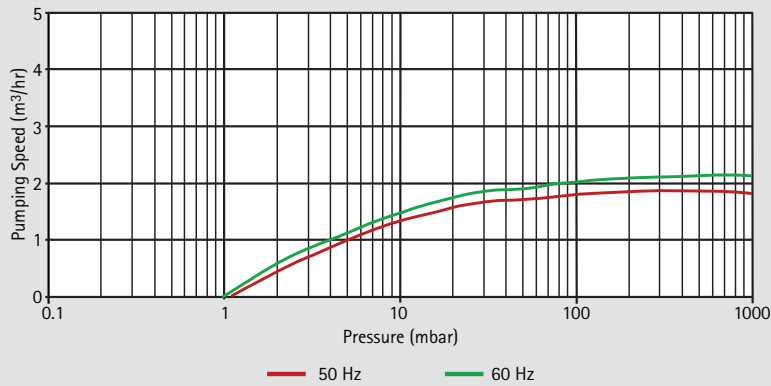
**Technical Specifications**

Pumping speed	60 Hz: 35 l/m, 2.1 m <sup>3</sup> /hr, 1.2 cfm 50 Hz: 30 l/m, 1.8 m <sup>3</sup> /hr, 1.1 cfm
Ultimate pressure	7.5 x 10 <sup>-1</sup> torr (1.0 mbar)
Maximum inlet pressure	1 atmosphere (0 psig)
Maximum outlet pressure	1.4 atmosphere (6.5 psig)
Inlet connection	NW16 flange
Exhaust connection	1/4" Female NPT (10 mm hose barb provided)
Gas ballast	1/8" Female NPT (shipped with gas ballast port plug installed; 20 micron sintered filter provided)
Weight	Pump only: 9.5 kg (21 lbs.) Shipping weight: 10.5 kg (23 lbs.)
Leak rate	<1 x 10 <sup>-6</sup> std-cc/sec helium
Certification	Conforms with CE, CSA, CSA/CUS, Semi S2-703, and RoHS

*Note: Scroll pumps are not suitable for pumping corrosive, explosive or particulate-forming gases.*



IDP-3 Pumping Speed - Air/N<sub>2</sub>

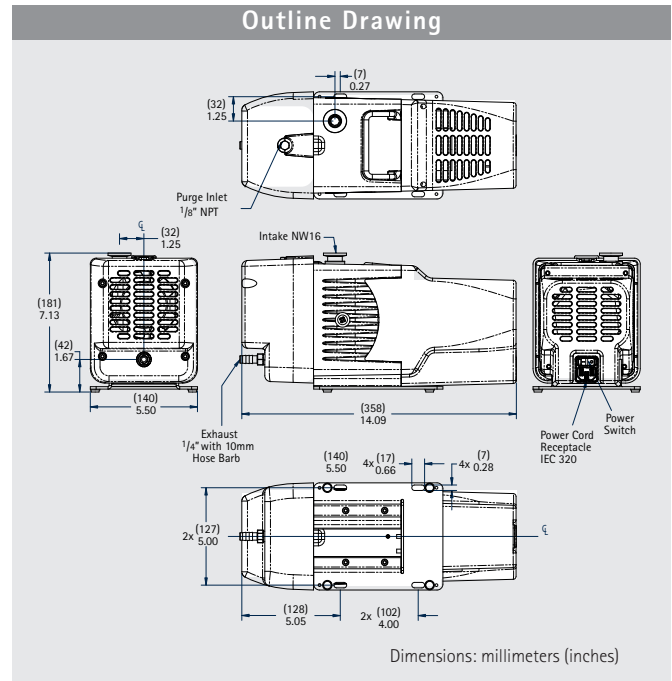


Ordering Information

Description	Part Number
IDP-2 Dry Vacuum Pump, 1Ø, 220V, 50/60 Hz	IDP2A01
IDP-2 Dry Vacuum Pump, 1Ø, 115V, 60 Hz	IDP2B01
IDP-2 Dry Vacuum Pump, 1Ø, 100V, 50/60 Hz	IDP2C01
IDP-2 Dry Vacuum Pump, 24 VDC	IDP2D01
<b>with Hour Meter</b>	
IDP-2 Dry Vacuum Pump with hour meter, 1Ø, 220V, 50/60 Hz	IDP2A11
IDP-2 Dry Vacuum Pump with hour meter, 1Ø, 115V, 60 Hz	IDP2B11
IDP-2 Dry Vacuum Pump with hour meter, 1Ø, 100V, 50/60 Hz	IDP2C11
IDP-2 Dry Vacuum Pump with hour meter, 24 VDC	IDP2D11
<b>with Isolation Valve</b>	
IDP-2 Dry Vacuum Pump with isolation valve, 1Ø, 220-230V, 50/60 Hz	IDP2A21
IDP-2 Dry Vacuum Pump with isolation valve, 1Ø, 115V, 60 Hz	IDP2B21
IDP-2 Dry Vacuum Pump with isolation valve, 1Ø, 100V, 50/60 Hz	IDP2C21
IDP-2 Dry Vacuum Pump with isolation valve, 24 VDC	IDP2D21
<b>with Hour Meter and Isolation Valve</b>	
IDP-2 Dry Vacuum Pump with hour meter and isolation valve, 1Ø, 220-230V, 50/60 Hz	IDP2A31
IDP-2 Dry Vacuum Pump with hour meter and isolation valve, 1Ø, 115V, 60 Hz	IDP2B31
IDP-2 Dry Vacuum Pump with hour meter and isolation valve, 1Ø, 100V, 50/60 Hz	IDP2C31
IDP-2 Dry Vacuum Pump with hour meter and isolation valve, 24 VDC	IDP2D31
<b>Power Cord Selection</b>	
Europe, 10A/220-230V, 2.5 Meter	656494220
Denmark, 10A/220-230V, 2.5 Meter	656494225
Switzerland, 10A/230V, 2.5 Meter	656494235
UK/Ireland, 13A/230V, 2.5 Meter	656494250
India, 10A/220-250V, 2.5 Meter	656494245
Israel, 10A/230V, 2.5 Meter	656494230
Japan, 12A/100V, 2.3 Meter	656494240
North America, 15A/125V, 2.0 Meter	656458203
North America, 10A/230V, 2.5 Meter	656494255

**Accessories** – Refer to the Scroll Accessories section beginning on page 23

# IDP-3



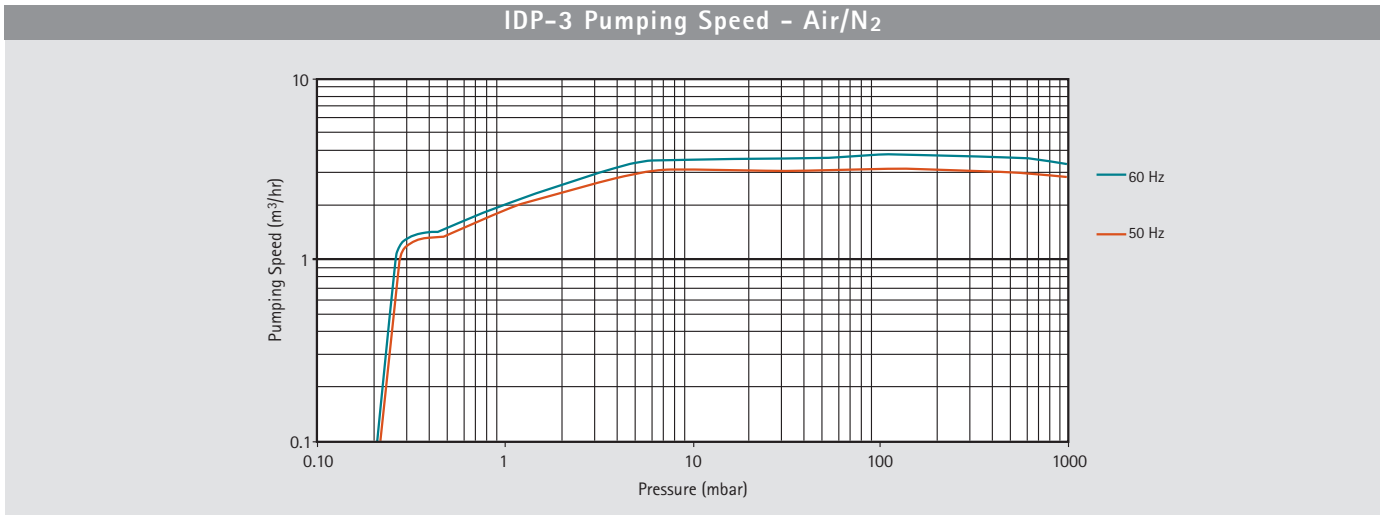
The Varian IDP-3 Dry Scroll Pump is an innovative, compact, high-performance, oil-free vacuum pump that is suitable for a wide variety of applications. It is the smallest scroll pump made for general vacuum applications, which makes it easy to integrate into OEM systems, and it weighs only 21 pounds (9.5 kg). Yet with a pumping speed of 60 l/m and a very low base pressure of 250 milliTorr, it is the highest-performing dry pump in its class.

- Oil-free - no contamination of the vacuum system
- Hermetic design with fully isolated motor and bearings
- Low noise and vibration
- No mechanisms subject to catastrophic failure
- Lower base pressure than diaphragm pumps
- Speed control on 24 VDC motor with 0-10V control signal

## Technical Specifications

Pumping speed	60 Hz: 60 l/m, 3.6 m <sup>3</sup> /hr, 2.1 cfm 50 Hz: 50 l/m, 3.0 m <sup>3</sup> /hr, 1.8 cfm
Ultimate pressure	2.5 x 10 <sup>-1</sup> torr (3.3 x 10 <sup>-1</sup> mbar)
Maximum inlet pressure	1 atmosphere (0 psig)
Maximum outlet pressure	1.4 atmosphere (6.5 psig)
Inlet connection	NW16 flange
Exhaust connection	1/4" Female NPT (10 mm hose barb provided)
Gas ballast	1/8" Female NPT (shipped with gas ballast port plug installed; 20 micron sintered filter provided)
Weight	Pump only: 9.5 kg (21 lbs.) Shipping weight: 10.5 kg (23 lbs.)
Leak rate	<1 x 10 <sup>-6</sup> std-cc/sec helium
Certification	Conforms with CE, CSA, CSA/CUS, Semi S2-703, and RoHS

*Note: Scroll pumps are not suitable for pumping corrosive, explosive or particulate-forming gases.*



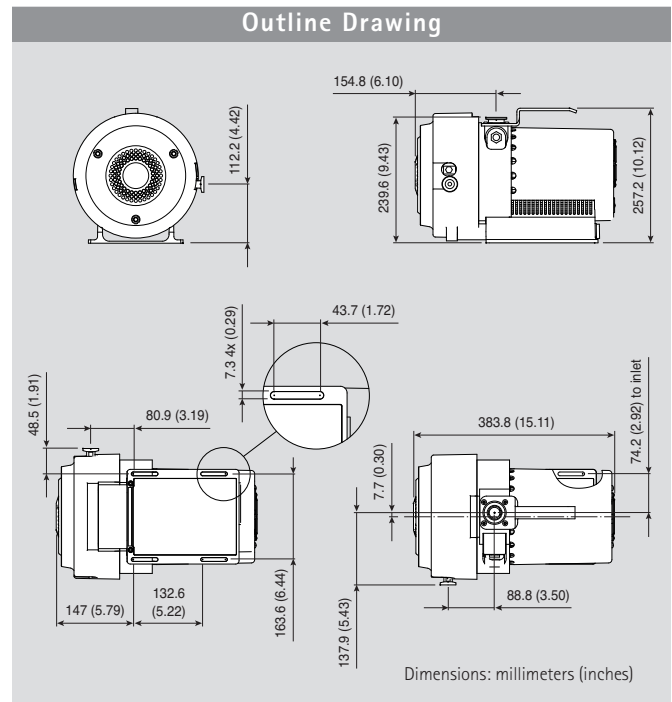
**Ordering Information**

Description	Part Number
IDP-3 Dry Vacuum Pump, 1Ø, 220V, 50/60 Hz	IDP3A01
IDP-3 Dry Vacuum Pump, 1Ø, 115V, 60 Hz	IDP3B01
IDP-3 Dry Vacuum Pump, 1Ø, 100V, 50/60 Hz	IDP3C01
IDP-3 Dry Vacuum Pump, 24 VDC	IDP3D01
<b>with Hour Meter</b>	
IDP-3 Dry Vacuum Pump with hour meter, 1Ø, 220V, 50/60 Hz	IDP3A11
IDP-3 Dry Vacuum Pump with hour meter, 1Ø, 115V, 60 Hz	IDP3B11
IDP-3 Dry Vacuum Pump with hour meter, 1Ø, 100V, 50/60 Hz	IDP3C11
IDP-3 Dry Vacuum Pump with hour meter, 24 VDC	IDP3D11
<b>with Isolation Valve</b>	
IDP-3 Dry Vacuum Pump with isolation valve, 1Ø, 220-230V, 50/60 Hz	IDP3A21
IDP-3 Dry Vacuum Pump with isolation valve, 1Ø, 115V, 60 Hz	IDP3B21
IDP-3 Dry Vacuum Pump with isolation valve, 1Ø, 100V, 50/60 Hz	IDP3C21
IDP-3 Dry Vacuum Pump with isolation valve, 24 VDC	IDP3D21
<b>with Hour Meter and Isolation Valve</b>	
IDP-3 Dry Vacuum Pump with hour meter and isolation valve, 1Ø, 220-230V, 50/60 Hz	IDP3A31
IDP-3 Dry Vacuum Pump with hour meter and isolation valve, 1Ø, 115V, 60 Hz	IDP3B31
IDP-3 Dry Vacuum Pump with hour meter and isolation valve, 1Ø, 100V, 50/60 Hz	IDP3C31
IDP-3 Dry Vacuum Pump with hour meter and isolation valve, 24 VDC	IDP3D31
<b>Power Cord Selection</b>	
Europe, 10A/220-230V, 2.5 Meter	656494220
Denmark, 10A/220-230V, 2.5 Meter	656494225
Switzerland, 10A/230V, 2.5 Meter	656494235
UK/Ireland, 13A/230V, 2.5 Meter	656494250
India, 10A/220-250V, 2.5 Meter	656494245
Israel, 10A/230V, 2.5 Meter	656494230
Japan, 12A/100V, 2.3 Meter	656494240
North America, 15A/125V, 2.0 Meter	656458203
North America, 10A/230V, 2.5 Meter	656494255

**Accessories** – Refer to the Scroll Accessories section beginning on page 23



# SH-110



The Varian SH-110 is a dry, hermetic scroll pump that provides industry-leading features designed for easy integration into original-equipment manufacturer (OEM) systems. This single-stage pump produces a pumping speed of 110 l/m and achieves an ultimate pressure of 50 mTorr (0.07 mbar) in a compact package that is also ideally suited to end-user applications.

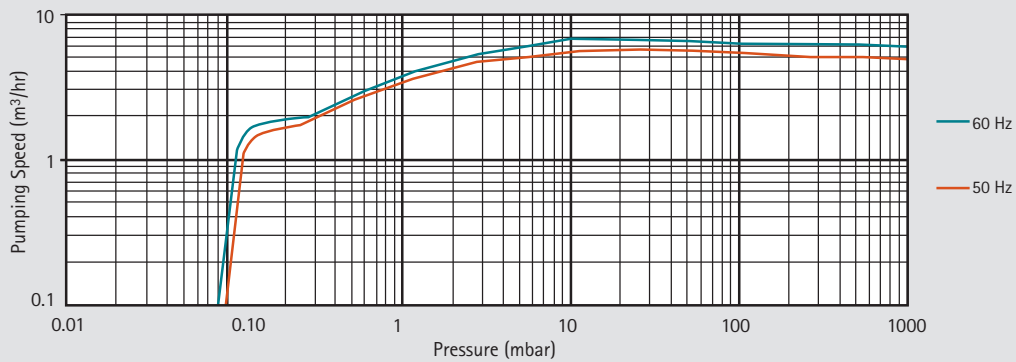
- Low-temperature operation
- 1/4-horsepower motor for low power consumption
- Automatic air ballast for effective handling of water vapor
- Built-in fail-safe isolation valve protects the vacuum system
- Universal 100-230 VAC power for easy installation worldwide
- Quick tip-seal replacement for low cost of ownership

## Technical Specifications

Pumping speed	60 Hz: 110 l/m, 6.6 m <sup>3</sup> /hr, 4.0 cfm 50 Hz: 90 l/m, 5.4 m <sup>3</sup> /hr, 3.3 cfm
Ultimate pressure	6.6 x 10 <sup>-2</sup> mbar (5.0 x 10 <sup>-2</sup> Torr)
Maximum inlet pressure	1.0 atmosphere (0 psig)
Maximum outlet pressure	1.5 atmosphere (7.5 psig)
Inlet Connection	NW25
Exhaust Connection	1/4" Female NPT (NW16 adapter provided)
Gas ballast	1/8" Female NPT (shipped with gas ballast port plug installed; 20 micron sintered filter provided)
Weight	Pump only: 19 kg (43 lbs) Shipping weight: 20 kg (44 lbs)
Leak rate (with exhaust sealed)	<1 x 10 <sup>-7</sup> cc/sec Helium
Certification	Conforms with CE, CSA and Semi S2-2000

*Note: Scroll pumps are not suitable for pumping corrosive, explosive or particulate-forming gases.*

SH-110 Pumping Speed - Air/N<sub>2</sub>



Ordering Information

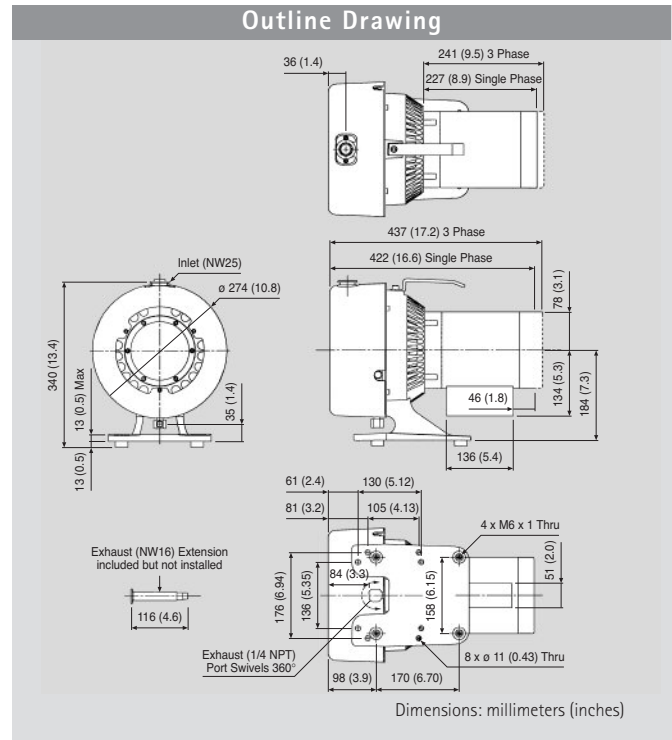
Description	Part Number
SH-110 Dry Vacuum Pump, 1Ø, 100V-230V, 50/60 Hz	SH01101UNIV

Power Cord Selection	Part Number
Europe, 10A /220-230V, 2.5 Meter	656494220
Denmark, 10A/220-230V, 2.5 Meter	656494225
Switzerland, 10A/230V, 2.5 Meter	656494235
UK/Ireland, 13A/230V, 2.5 Meter	656494250
India, 10A/220-250V, 2.5 Meter	656494245
Israel, 10A/230V, 2.5 Meter	656494230
Japan, 12A/100V, 2.3 Meter	656494240
North America, 15A/125V, 2.0 Meter	656458203
North America, 10A/230V, 2.5 Meter	656494255

**Accessories** – Refer to the Scroll Accessories section beginning on page 23

Scroll  
Pumps

# TriScroll 300



The TriScroll series are two-stage dry scroll pumps that have high pumping speeds and low base pressure. TriScroll pumps eliminate the frequent maintenance requirements of oil-sealed rotary vane pumps, simplifying regulatory and environmental compliance, and eliminating oil disposal costs. The unique, patented TriScroll features proven reliability and durability, delivering consistent performance and superior cost of ownership.

- High pumping speed and low ultimate pressure provide clean, dry vacuum
- Long-life tip seals routinely last more than a year before replacement
- Bearing purge port permits simple maintenance and delivers long bearing life
- Automatic air ballast manages water vapor without reducing pumping speed

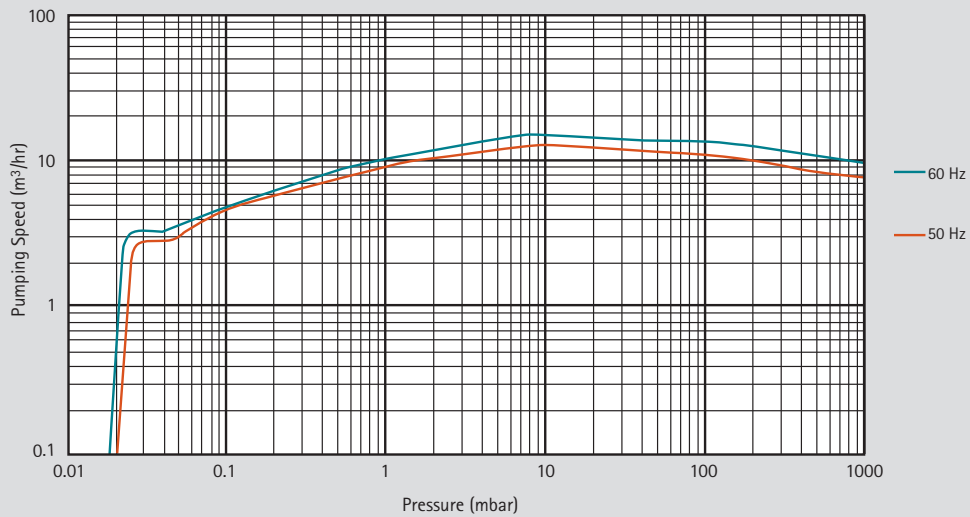
## Technical Specifications

Pumping speed	60 Hz: 250 l/m, 15 m <sup>3</sup> /hr, 8.8 cfm 50 Hz: 210 l/m, 12.6 m <sup>3</sup> /hr, 7.4 cfm
Ultimate pressure	1.3 x 10 <sup>-2</sup> mbar (1 x 10 <sup>-2</sup> Torr)
Maximum inlet pressure	1.0 atmosphere (1.0 psig)
Maximum outlet pressure	1.1 atmosphere (1.5 psig)
Inlet Connection	NW25
Exhaust Connection	1/4" Female NPT with swivel (NW16 adapter provided)
Gas ballast	1/4" Female NPT (shipped with 40 micron filter installed; port plug also provided)
Operating Voltages	1Ø models: 50-60 Hz/100-115:200-230 VAC 3Ø models: 50 Hz/200-230, 380-415 VAC; 60 Hz/200-230, 460 VAC
Weight	Pump only: 26.4 kg (58 lbs) Shipping weight: 34.2 kg (75 lbs)
Certification	CE, CSA/CUS

*Note: Scroll pumps are not suitable for pumping corrosive, explosive or particulate-forming gases.*



TriScroll 300 Pumping Speed – Air/N<sub>2</sub>



Ordering Information

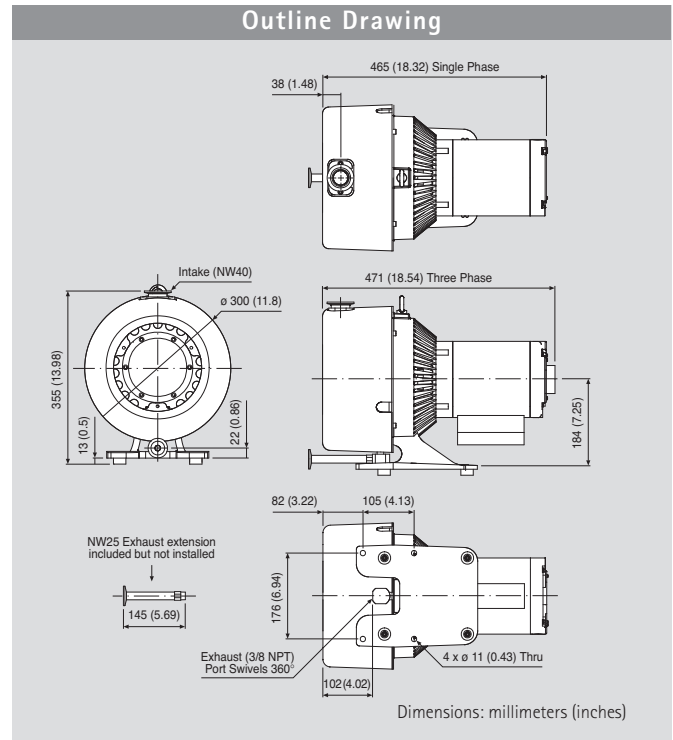
Description	Part Number
TriScroll 300 Dry Vacuum Pump, 1Ø motor, US cord	PTS03001UNIV
TriScroll 300 Dry Vacuum Pump, 1Ø motor, Euro cord	PTS03001UNIVEU
TriScroll 300 Dry Vacuum Pump, 1Ø motor, UK cord	PTS03001UNIVUK
TriScroll 300 Dry Vacuum Pump, 3Ø motor	PTS03003UNIV
TriScroll 300, 1Ø, with Vacuum Isolation Valve (VPI), 120V	PTS03001UVPI*
TriScroll 300, 1Ø, with VPI, 220V, EU power cord	PTS03001UVPIEU
TriScroll 300, 3Ø, with VPI, 200V	PTS03003200VPI
TriScroll 300, 3Ø, with VPI, 230V	PTS03003230VPI
TriScroll 300, 3Ø, with VPI, 380/415V	PTS03003380415VPI
TriScroll 300, 3Ø, with VPI, 460V	PTS03003460VPI
TriScroll 300 Exhaust Extension	S4707002

**Maintenance/Service Parts** – Refer to the Scroll Service Parts section beginning on page 30

**Accessories** – Refer to the Scroll Accessories section beginning on page 23

\*Contact Varian for other voltages.

# TriScroll 600



The TriScroll series are two-stage dry scroll pumps that have high pumping speeds and low base pressure. TriScroll pumps eliminate the frequent maintenance requirements of oil-sealed rotary vane pumps, simplifying regulatory and environmental compliance, and eliminating oil disposal costs. The unique, patented TriScroll features proven reliability and durability, delivering consistent performance and superior cost of ownership.

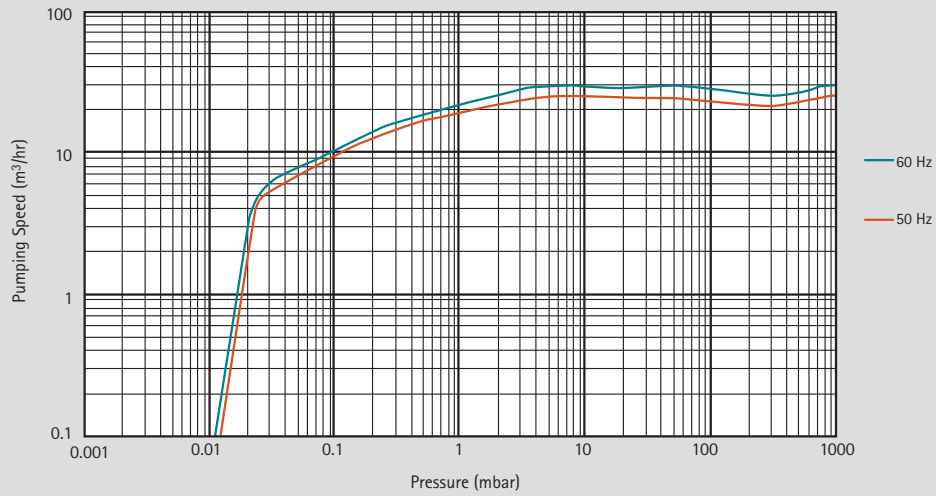
- High pumping speed and low ultimate pressure provide clean, dry vacuum
- Long-life tip seals routinely last more than a year before replacement
- Bearing purge port permits simple maintenance and delivers long bearing life
- Automatic air ballast manages water vapor without reducing pumping speed

## Technical Specifications

Pumping speed	60 Hz: 500 l/m 30 m <sup>3</sup> /hr, 17.7 cfm 50 Hz: 420 l/m, 25.2 m <sup>3</sup> /hr, 14.8 cfm
Ultimate pressure	9.3 x 10 <sup>-3</sup> mbar (7.0 x 10 <sup>-3</sup> Torr)
Maximum inlet pressure	1.0 atmosphere (0 psig)
Maximum outlet pressure	1.1 atmosphere (1.5 psig)
Inlet Connection	NW40
Exhaust Connection	3/8" Female NPT with swivel (NW25 adapter provided)
Gas ballast	1/4" Female NPT (shipped with 40 micron filter installed; port plug also provided)
Operating Voltages	1Ø models: 50-60 Hz/100-115, 200-230 VAC 3Ø models: 50 Hz/200-230, 380-415 VAC; 60 Hz/200-230, 460 VAC
Weight	Pump only: 32 kg (70 lbs) Shipping weight: 40 kg (87 lbs)
Certification	CE marked; Motor: UL, CSA

*Note: Scroll pumps are not suitable for pumping corrosive, explosive or particulate-forming gases.*

TriScroll 600 Pumping Speed – Air/N<sub>2</sub>



Ordering Information

Description	Part Number
TriScroll 600 Dry Vacuum Pump, 1Ø motor	PTS06001UNIV
TriScroll 600 Dry Vacuum Pump, 1Ø motor, Euro cord	PTS06001UNIVEU
TriScroll 600 Dry Vacuum Pump, 1Ø motor, UK cord	PTS06001UNIVUK
TriScroll 600 Dry Vacuum Pump, three phase motor	PTS06003UNIV
TriScroll 600, 1Ø, with Vacuum Isolation Valve (VPI), 120V	PTS06001UVPI*
TriScroll 600, 1Ø, with VPI, 220V, EU power cord	PTS06001UVPIEU
TriScroll 600, 3Ø, with VPI, 200V	PTS06003200VPI
TriScroll 600, 3Ø, with VPI, 230V	PTS06003230VPI
TriScroll 600, 3Ø, with VPI, 380/415V	PTS06003380415VPI
TriScroll 600, 3Ø, with VPI, 460V	PTS06003460VPI
TriScroll 600 Exhaust Extension	S4807001

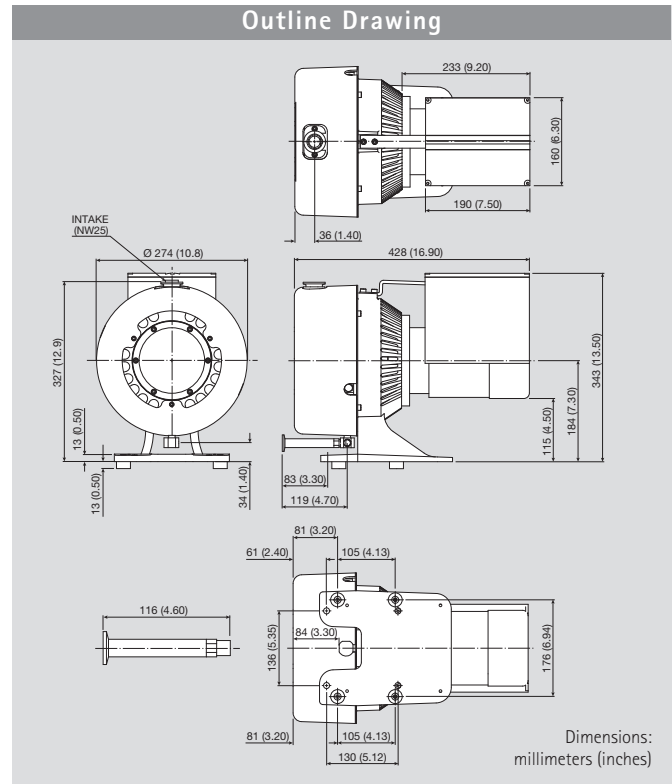
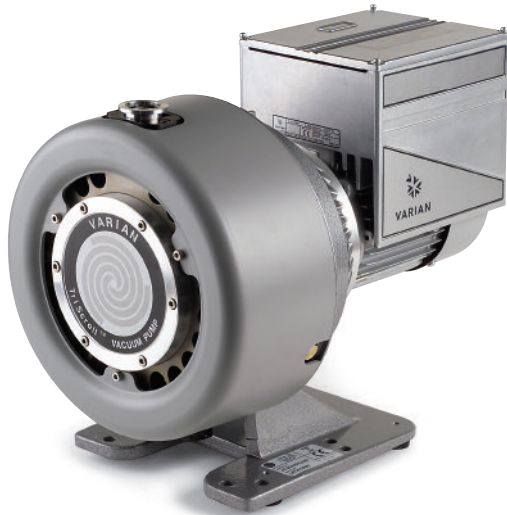
**Maintenance/Service Parts** – Refer to the Scroll Service Parts section beginning on page 30

**Accessories** – Refer to the Scroll Accessories section beginning on page 23

\*Contact Varian for other voltages.



# TriScroll 300 Inverter



TriScroll Inverter pumps apply the benefits of frequency inverter technology to the performance of Varian TriScroll dry primary vacuum pumps. TriScroll Pumps eliminate the frequent maintenance requirements of oil-sealed rotary vane pumps, simplifying regulatory and environmental compliance, and eliminating oil disposal costs. Inverter-driven TriScroll 300 pumps also deliver:

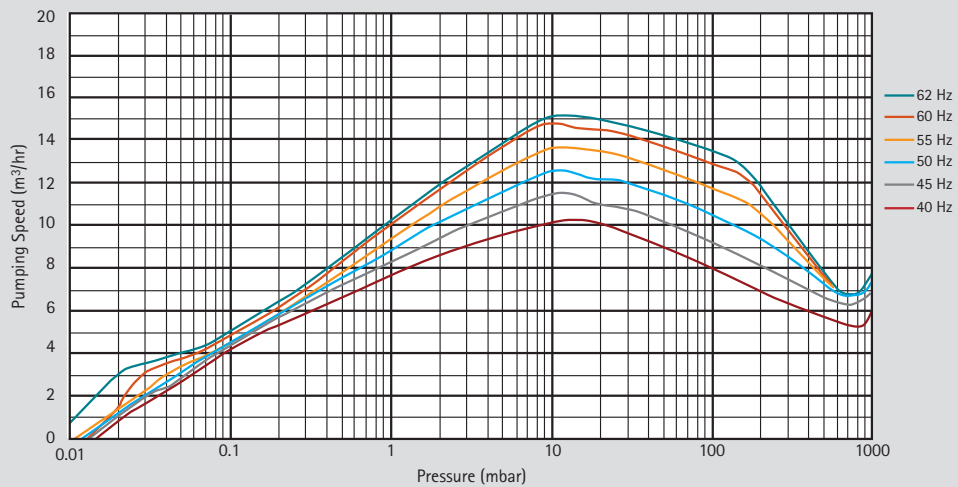
- Constant pumping speed worldwide regardless of line frequency
- Optimal pumping speed selection by adjustment of the rotational speed of the pump via RS232 or 0–10V control signal
- Monitoring of pump parameters via serial interface
- Remote start/stop with a contact closure made possible by a standard D-shell connector
- Optimal rotational speed selection reduces noise and vibration levels in the work area with little loss in base pressure performance of the pump

## Technical Specifications

Pumping speed @ 60Hz	250 l/m, 15 m <sup>3</sup> /hr, 8.8 cfm (at 60 Hz drive frequency, variable)
Ultimate pressure	1.3 x 10 <sup>-2</sup> mbar (1.0 x 10 <sup>-2</sup> Torr)
Maximum inlet pressure	1.0 atmosphere (0 psig)
Maximum outlet pressure	1.1 atmosphere (1.5 psig)
Inlet connection	NW25
Exhaust connection	1/4" Female NPT with swivel (NW16 adapter provided)
Gas ballast	1/4" Female NPT (shipped with 40 micron filter installed; port plug also provided)
Operating Voltages	100–115V, 200–240V, 1Ø, 50/60Hz
Maximum line current	200V; 5 A 240V; 4.2 A
Weight	Pump only: 26 kg (57 lbs) Shipping weight: 34 kg (74 lbs)
Certification	CE, CSA/CUS

*Note: Scroll pumps are not suitable for pumping corrosive, explosive or particulate-forming gases.*

TriScroll 300 Inverter Pumping Speed – Air/N<sub>2</sub>



Scroll Pumps

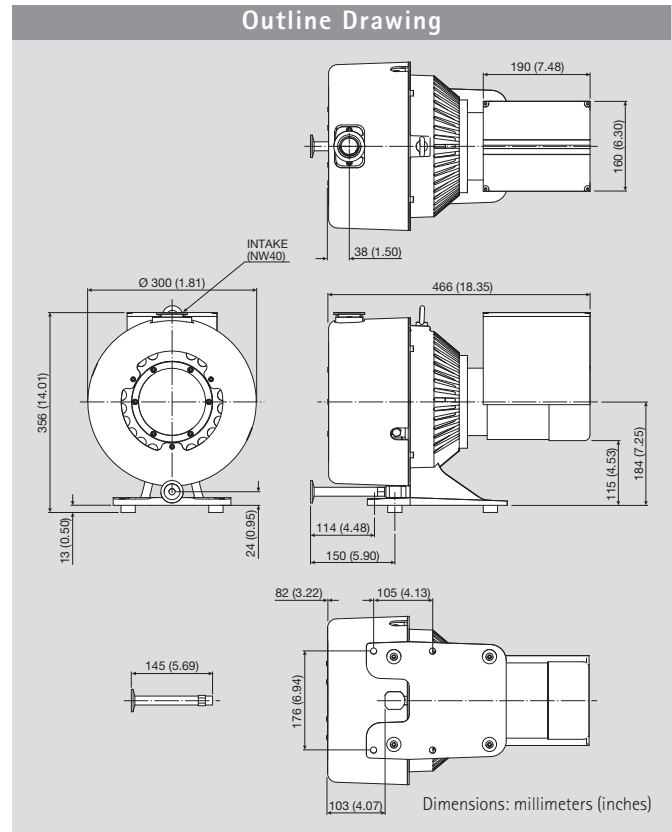
Ordering Information

Description	Part Number
TriScroll 300 Dry Vacuum Pump, 1Ø motor, 100-240V	PTS03001INV
<b>Power Cord Selection</b>	
Europe, 10A/220-230V, 2.5 Meter	656494220
Denmark, 10A/220-230V, 2.5 Meter	656494225
Switzerland, 10A/230V, 2.5 Meter	656494235
UK/Ireland, 13A/230V, 2.5 Meter	656494250
India, 10A/220-250V, 2.5 Meter	656494245
Israel, 10A/230V, 2.5 Meter	656494230
Japan, 12A/100V, 2.3 Meter	656494240
North America, 15A/125V, 2.0 Meter	656458203
North America, 10A/230V, 2.5 Meter	656494255

**Maintenance/Service Parts** – Refer to the Scroll Service Parts section beginning on page 30

**Accessories** – Refer to the Scroll Accessories section beginning on page 23

# TriScroll 600 Inverter



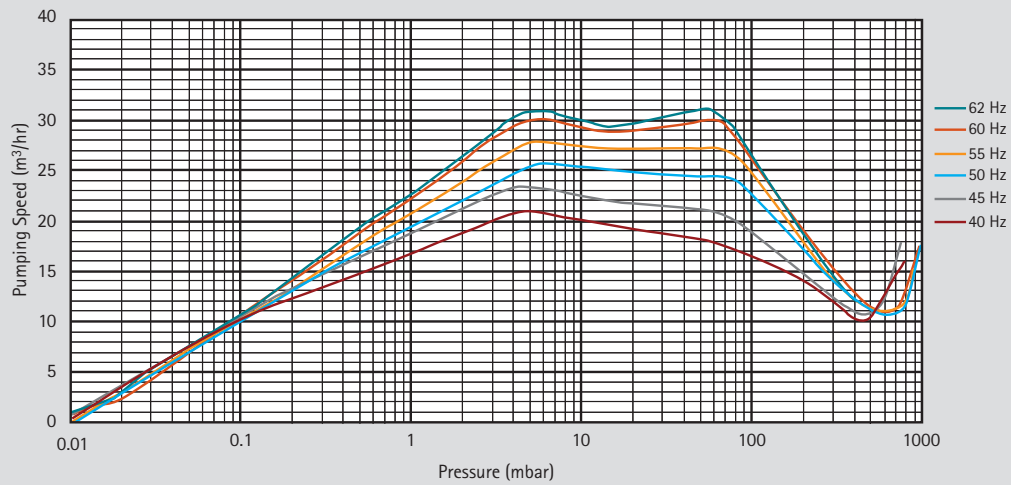
TriScroll Inverter pumps apply the benefits of frequency inverter technology to the performance of Varian TriScroll dry primary vacuum pumps. TriScroll Pumps eliminate the frequent maintenance requirements of oil-sealed rotary vane pumps, simplifying regulatory and environmental compliance, and eliminating oil disposal costs. Inverter-driven TriScroll 600 pumps also deliver:

- Constant pumping speed worldwide regardless of line frequency
- Optimal pumping speed selection by adjustment of the rotational speed of the pump via RS232 or 0–10V control signal
- Monitoring of pump parameters via serial interface
- Remote start/stop with a contact closure made possible by a standard D-shell connector
- Optimal rotational speed selection reduces noise and vibration levels in the work area with little loss in base pressure performance of the pump

## Technical Specifications

Pumping speed @ 60Hz	500 l/m, 30 m <sup>3</sup> /hr, 17.7 cfm (at 60 Hz drive frequency, variable)
Ultimate pressure	9.3 x 10 <sup>-3</sup> mbar (7.0 x 10 <sup>-3</sup> Torr)
Maximum inlet pressure	1.0 atmosphere (0 psig)
Maximum outlet pressure	1.1 atmosphere (1.5 psig)
Inlet connection	NW40
Exhaust connection	3/8" Female NPT with swivel (NW25 adapter provided)
Gas ballast	1/4" Female NPT (shipped with 40 micron filter installed; port plug also provided)
Operating Voltages	200–240V, 1Ø, 50/60Hz
Maximum line current	200V; 5 A 240V; 4.2A
Weight	Pump only: 31 kg (68 lbs) Shipping weight: 39 kg (85 lbs)
Certification	CE, CSA/CUS

TriScroll 600 Inverter Pumping Speed – Air/N<sub>2</sub>



Ordering Information

Description	Part Number
TriScroll 600 Dry Vacuum Pump, 1Ø, 200-240V	PTS06001INV

Power Cord Selection	Part Number
Europe, 10A/220-230V, 2.5 Meter	656494220
Denmark, 10A/220-230V, 2.5 Meter	656494225
Switzerland, 10A/230V, 2.5 Meter	656494235
UK/Ireland, 13A/230V, 2.5 Meter	656494250
India, 10A/220-250V, 2.5 Meter	656494245
Israel, 10A/230V, 2.5 Meter	656494230
Japan, 12A/100V, 2.3 Meter	656494240
North America, 15A/125V, 2.0 Meter	656458203
North America, 10A/230V, 2.5 Meter	656494255

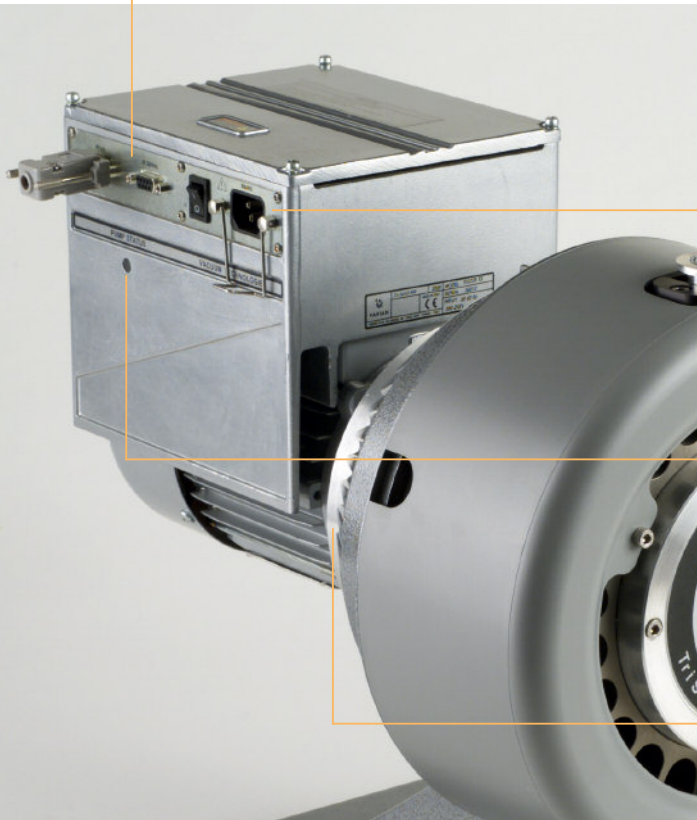
**Maintenance/Service Parts** – Refer to the Scroll Service Parts section beginning on page 30

**Accessories** – Refer to the Scroll Accessories section beginning on page 23



# About Frequency Inverter-driven TriScroll Pumps

The application of innovative variable frequency inverter technology to TriScroll Dry Scroll Pumps provides significant advantages over conventional vacuum pumps. Inverter-driven TriScroll 300 and 600 pumps deliver optimal and consistent performance throughout the worldwide range of voltage and frequency conditions. Operating with low power requirements, the microprocessor-controlled frequency inverter is an efficient driving unit capable of delivering high starting torque and constant pump performance.



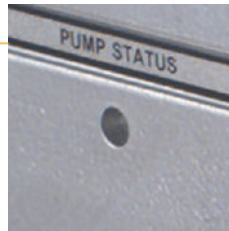
### I/O and RS232/RS485 Communication

Adjustable motor speed from 35 to 65 Hz permits easy matching of pumping speed required and reduces noise levels. Pump performance can be tailored to specific applications to optimize system performance.



### Universal Input Voltage

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



### Remote Diagnostics

Fully compatible with Varian TPlus Software, the RS232/485 interface allows data acquisition and control of the pump operation, including pumping speed



### Reduced Power Requirements

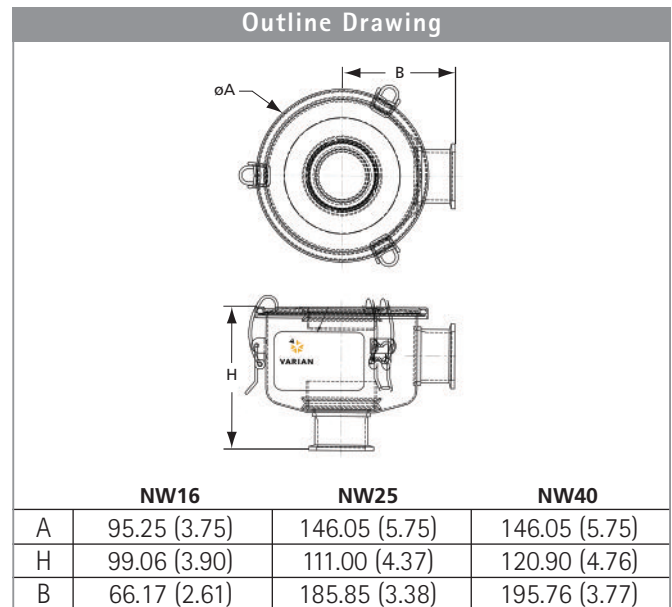
Inverter technology reduces the power required compared to traditional single phase motors.

## Filters and Filter Kits

### HEPA Inlet Filters



Varian Inlet HEPA Filters for Scroll Pumps protect the pump from ingested particles and prevent particles from migrating out of the pump. These HEPA filters trap particles > 0.3 microns at a rated 99.97% efficiency.



Scroll Pumps

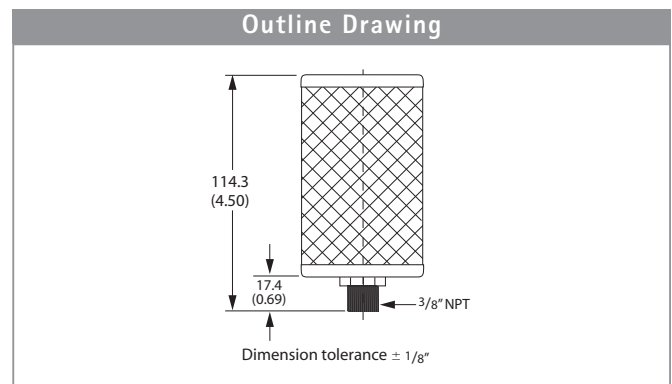
#### Ordering Information

Description	Part Number
NW40 Inlet Trap with HEPA filter insert	SCRINTRPNW40
NW25 Inlet Trap with HEPA filter insert	SCRINTRPNW25
NW16 Inlet Trap with HEPA filter insert	SCRINTRPNW16
Replacement HEPA filter element (NW25 or NW40)	REPLHEPAFILTER1
Replacement HEPA filter element (NW16)	REPLHEPAFILTER2

### Exhaust Filter Kits for TriScroll Pumps



These HEPA filters trap particles and dust that emanate from the vacuum system and prevent discharge into the room. Kits include one HEPA filter, flange adapter, centering ring seal, and clamp. These HEPA filters trap particles > 0.3 microns at a rated 99.97% efficiency. Replacement filters are also available.



#### Ordering Information

Description	Part Number
Exhaust Filter Kit, TriScroll 300	PTS300EXFIL
Exhaust Filter Kit, TriScroll 600	PTS600EXFIL
Replacement HEPA Filter	110420110

# Exhaust Silencer Kits

Exhaust Silencer Kits are designed for those applications in which it is desirable to diminish the sound level produced by the work of gas compression.

An exhaust silencer is not necessary in situations where exhaust is carried away in a ducted manifold, because in that case, the noise level is typically at the same level as when a local silencer is used.

Exhaust Silencers work by breaking up noise pulsation in the discharge line. The kits contain two basic components, as well as installation hardware.

1. The exhaust/muffler filter provides the majority of the actual noise reduction.
2. An optional silencer can be connected to the exhaust of the pump as well. It attenuates certain frequencies associated with the exhaust gas pulsation noise. The silencer is then plumbed to the exhaust muffler.



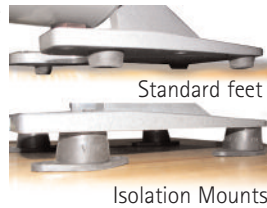
## Ordering Information

Description	Part Number
Exhaust Silencer Kit for IDP Series	EXSLRIDP3
Exhaust Silencer Kit for SH-110	EXSLRSH110
Exhaust Silencer Kit for TriScroll	EXSLRTRISCROLL
<b>Replacement Filter Element</b>	
for IDP Series Silencer	REPLSLRFILTER2
for SH-110 Silencer	REPLSLRFILTER1
for TriScrolls	REPLSLRFILTER

## Vibration Isolation Kits

Vibration Isolation Kits are designed to reduce the vibration level transmitted at the base of the scroll pump. The set of vibration isolation mounts provided in the kit will be most beneficial in those applications that require minimal vibration transmission from the pump to the installation. The isolation mounts replace the standard feet installed on the pump and can be used alone or with flexible bellows at the pump inlet to enhance pump isolation.

Please note, the mounts will increase the height of the TriScroll pumps by 0.75 inches compared to the standard mounting feet supplied with the pump.



### Ordering Information

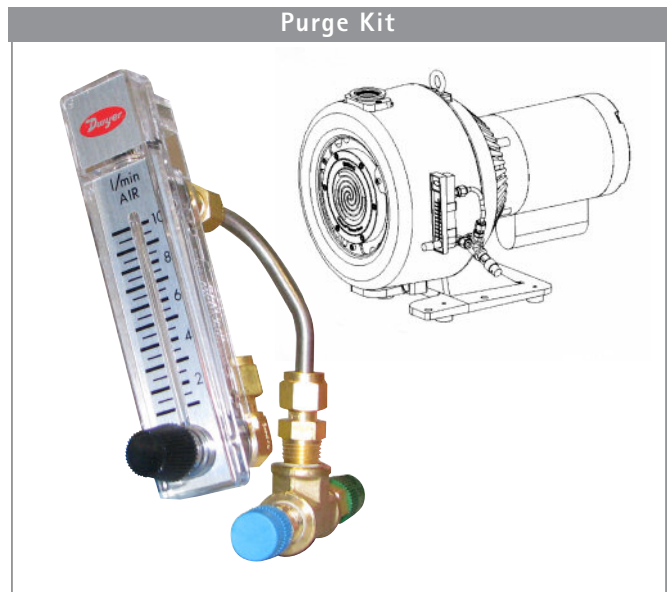
Description	Part Number
Vibration Isolation Kit for IDP Series	IDP3VIBISOKIT
Vibration Isolation Kit for SH-110	SH110VIBISOKIT
Vibration Isolation Kit for TriScroll	PTSVIBISOKIT



## Purge Kits for TriScroll Pumps

This kit enables safe, proper purging of either the main bearings through the TriScroll bearing purge port, or the pump exhaust region through the gas ballast port. Use of a gas ballast purge is indicated where it is desirable to dilute the pumped gases, and is always recommended when pumping condensable gases.

The kit includes a flow meter with manual throttle valve, a 5-psig relief valve, necessary tubing and fittings, and instructions. The flow meter assembly mounts directly onto the TriScroll pump. The recommended flow rate for both the gas ballast and bearing purge port is 5 liters/minute.



### Ordering Information

Description	Part Number
Purge Kit for TriScrolls	PTSPURGEKIT

# CT-100 Speed Control Kit for TriScroll Inverter Pumps

The CT-100 Speed Control Kit allows automatic switching from full pumping speed to a lower speed. Operation at lower speed reduces noise and can extend maintenance levels.

The speed control kit consists of a CT-100 active rough vacuum gauge, a communication cable, a 24 VDC power supply, a power splitter cord, a tee, a centering ring and a quick clamp.

Setpoints are set by the user. When pressure is...

- over the high setpoint (SP1) -> the inverter drives the pump at full speed\*
- below the lower setpoint (SP2) -> the scroll is driven at minimum speed

\*Full speed: customized frequency setting via Varian T-plus software, if used. Factory setting is 62Hz.



Scroll Pumps

ORDERING INFORMATION	
Description	Part Number
CT-100 Speed Control Kit – NW25	PTSCNTRLKIT1
CT-100 Speed Control Kit – NW40	PTSCNTRLKIT2

## CT-100 Speed Control Kits with Vacuum Pump Isolation (VPI) Valves

For those applications that require a vacuum pump isolation valve to protect the vacuum system in the event of power loss, Varian offers speed control kits with the VPI valve included. These kits also include cables that accommodate both the CT-100 and the VPI valve.

For more information on VPI valves, please refer to page 29.

ORDERING INFORMATION	
Description	Part Number
CT-100 Speed Control and VPI Kit – NW25	PTSCNTRLKIT3
CT-100 Speed Control and VPI Kit – NW40	PTSCNTRLKIT4

# Vacuum Isolation Valves for Scroll Pumps

Varian offers a range of isolation valves that are used with the scroll pump to ensure proper vacuum isolation and eliminate turbulence into the pump foreline. For applications where the process is sensitive to particulate or

The SH-110 has an integral solenoid valve at the inlet that provides isolation of the pump in case of power failure and when shut off. At restart there is a 10 second time delay before the valve opens. This time allows a good level of vacuum to be established between the valve and the pump before the pump is exposed to the system vacuum line. This eliminates turbulence that can cause back migration of particulate.

Isolation Valve Retrofit Kits are available for the IDP Series. These kits employ the same valve as used on the SH-110 and operate as described above.

requires the best vacuum isolation, the installation of a fast acting, automatic, normally closed valve is recommended to maintain vacuum and prevent backstreaming of debris which may have accumulated inside the pump.

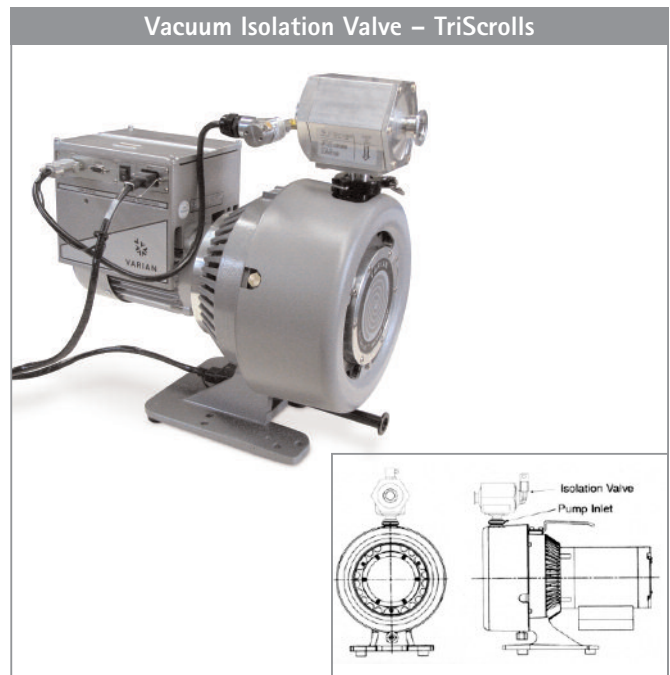


## ORDERING INFORMATION

Description	Part Number
Isolation Valve Retrofit Kit for IDP Series, 200 VAC	VPI16IDP200
Isolation Valve Retrofit Kit for IDP Series, 115 VAC	VPI16IDP115
Isolation Valve Retrofit Kit for IDP Series, 100 VAC	VPI16IDP100

## Vacuum Isolation Valves for TriScroll Pumps

VPI (vacuum pump isolation) valves eliminate turbulence that can cause back migration of particulate. TriScroll pumps have an optional VPI valve that functions in case of power shutdown or power loss to ensure isolation of the pump from the system and provide a controlled venting of the pump. When power is restored, the pump evacuates the valve and only when low pressure is obtained does the valve open. This operation ensures a turbulence free restart when power is restored.



Scroll  
Pumps

### ORDERING INFORMATION

Description	Part Number
<b>TriScroll 300 Series</b>	
VPI Valve, 1Ø, 100-120 VAC, NW25	VPI251205060
VPI Valve, 3Ø, 230 VAC, NW25	VPI251335060
VPI Valve, 3Ø, 380 VAC, NW25	VPI252205060
VPI Valve, 3Ø, 460 VAC, NW25	VPI252665060
VPI Valve, 24 VDC, NW25	VPI25INV24DC
<b>TriScroll 600 Series</b>	
VPI Valve, 1Ø, 100-120 VAC, NW40	VPI401205060
VPI Valve, 3Ø, 230 VAC, NW40	VPI401335060
VPI Valve, 3Ø, 380 VAC, NW40	VPI402205060
VPI Valve, 3Ø, 380 VAC, NW40	VPI402665060
VPI Valve, 24 VDC, NW40	VPI40INV24DC



# Scroll Pump Service and Support Plans

Varian's service and support offering is one of the most comprehensive in the industry with an emphasis on quick response time and hassle-free service. The following pages detail the standard sections of our Scroll Pump Service and Support Plan. For more information, or if you have a need for customized solutions, please contact your Varian representative.

- Product Support**
- **Exchange/Repair Program**
  - **Upgrade Program**
  - **Extended Warranty**
  - **Cleaning Service**
  - **Worldwide Sourcing**

- Technical Assistance**
- **Customer Support**
  - **Application Support**
  - **Application Training**

## Product Support

### Exchange/Repair Program

*The Exchange Program* maximizes uptime for those occasions where fast response is essential, offering exchange units for advance shipment. Our exchange units are fully reconditioned to the same strict standards as new products. They are kept in stock in North America, Europe, Japan, Korea, Singapore and Taiwan. If requested, your exchange unit can be shipped for overnight delivery.

*The Repair Program* is available for those situations where the traceability of assets is important and when the customer must retain possession of the original pump.

Both the Exchange and Repair Programs are available worldwide and provide global OEMs and end-users consistent delivery time, value pricing, and simple order processing procedures.

To order an exchange unit, add the letters "EX" before the product part number you need to exchange. After receipt of the exchange unit, you have up to 20 days to return the original unit to Varian.

To request repair of your unit, contact the closest Varian location.

For more information, or if you have a need for customized solutions, please contact your Varian representative.

## Upgrade Program

*The Upgrade Program* is designed for customers who need to replace a Varian product at the end of its life, or wish to upgrade to the newer technology of a more current product. For example, a customer might wish to replace a TriScroll 300 scroll pump with the newer TriScroll 300 inverter scroll pump with the more advanced inverter technology.

The Upgrade Program includes proactive technical installation support by telephone and full 12-month warranty.

## Technical Assistance

### Customer Support

Our toll-free lines with mother tongue Technical Support Engineers at worldwide locations, allow us to provide you with quick, corrective responses to your needs. When a new problem is identified and solved by our support personnel, it is entered into our technical support system and becomes available to our network of Varian technical support centers.

This system allows all Varian locations to provide excellent first and second level technical support to customers worldwide. In addition, the technical support centers are in daily contact with our R&D departments for a third level support.

### Application Support – Application Training

Varian has a leadership position in vacuum technology and maintains this position by continuously search for innovative solutions through research and development. To meet the most demanding needs, our Application Engineering Team can bring our knowledge into your factory.

*Application Support* is a project-based activity where our experts assist you towards the solution of your application issues that might arise pre-sales or post-sales. By designing solutions that meet customer needs, Varian aims to create a positive and synergetic relationship with customers. Our experts can keep you well informed and up-to-date on industrial and scientific applications with the goal of optimizing the use of our products on your system as well as the development of new vacuum techniques.

**Varian's industry leading service programs maximize your system uptime and productivity.**

Varian offers several scroll pump service and maintenance options depending on your in-house capability and maintenance approach. From "do it yourself" to exchange of the entire pump, we accommodate your maintenance needs.

Routine maintenance of Varian scroll pumps consists of simple tip seal replacement. The IDP Series and SH110 require only the Tip Seal Kit and common tools for tip seal replacement; for TriScroll pumps a Tip Seal Tool Kit is recommended along with the Replacement Tip Seal Kit.

Major maintenance involves bearing and seals replacement in addition to tip seal replacement and is required much less frequently. Major maintenance on the Triscroll 300 and TriScroll 600 pumps is most frequently accomplished

through Varian's Advance Exchange Program where the used scroll module is exchanged with a factory rebuilt module. Alternatively, a new replacement scroll module may be installed, or the maintenance on the TriScroll pumps can even be accomplished on-site by qualified personnel.

Major maintenance kits contain all bearings, bearing seals, bearing lubricant, o-rings and tip seals required to rebuild TriScroll pumps. Maintenance tool kits are also available and contain all fixtures and tools required to perform any maintenance on TriScroll pumps.

Major maintenance of the SH-110 is done through Varian's Advance Exchange program to exchange the entire pump. Your IDP-3 is maintained using a replacement scroll module.

For many models of Varian's scroll pumps, Advance Exchange of the entire pump is available.

**Ordering Information**

Description	Part Number
<b>IDP Series</b>	
Tip Seal Kit	IDP3TS
Replacement Module	IDP3
<b>SH-110/SH-100</b>	
Tip Seal Replacement Kit	SH0110TS
<b>TriScroll 300/600 and Triscroll Inverter Pumps</b>	
Triscroll 300 Exhaust Extension	S4707002
Triscroll 300 Maintenance Kit	PTSS0300MK
Triscroll 600 Maintenance Kit	PTSS0600MK
Triscroll 300/600 Maintenance Tool Kit	PTSS0600TK
Triscroll 300 Replacement Tip Seal Kit	PTSS0300TS
Triscroll 600 Replacement Tip Seal Kit	PTSS0600TS
Triscroll 300/600 Tip Seal Tool Kit	PTSTSTKIT
Triscroll 300/600 Three Phase Cable Kit	S478900
<b>Exchange and Replacement Pumps</b>	
Exchange SH-110 Scroll Pump	EXSH01101UNIV
Exchange SH-100 Scroll Pump	EXSH01001UNIV
Exchange Triscroll 300 Pump Module	EXPTS0300SC
Replacement TriScroll 300 Pump Module	S4700304
Exchange TriScroll 600 Pump Module	EXPTS0600SC
Replacement TriScroll 600 Pump Module	S4800304
Exchange TriScroll 300 Pump 300 Pump, 1Ø	EXPPTS03001
Exchange TriScroll 300 Pump 300 Pump, 3Ø	EXPPTS03003
Exchange TriScroll 300 Pump 600 Pump, 1Ø	EXPPTS06001
Exchange TriScroll 300 Pump 600 Pump, 3Ø	EXPPTS06003