

Varian, Inc.  
Vacuum Technologies

Variable Speed Dry Pumps  
for Mass Spectrometers



*Inspiring Excellence*



**VARIAN**

# Variable Speed Pumps for Mass Spectrometers



## APPLICATIONS

### MASS SPECTROMETERS

ELECTRON MICROSCOPES

CRYOGENICS

GLOVE BOXES

GAS TRANSFER

LOAD LOCKS AND TRANSFER CHAMBERS

DRYING OVENS

PRIMARY PUMP FOR TURBO SYSTEMS

GENERAL PURPOSE LABORATORY

MALDI/TOF LC/MS/MS ICP/MS GC/MS

## Mass Spectrometers In the Laboratory

Mass spectrometers with Atmospheric Pressure Ionization (API) systems characterized by high gas flows, such as LC/MS/MS, can benefit from the variable speed selection feature of TriScroll™ inverter pumps. The pumping speed can be fine-tuned and adjusted to deliver the optimum working pressure for the mass spectrometer's inlet system. This makes it possible to easily match the pumping characteristics of your existing rotary vane pump and simplify system retrofit.



## Atmospheric Ionization System

*Sensitive*

**API S**

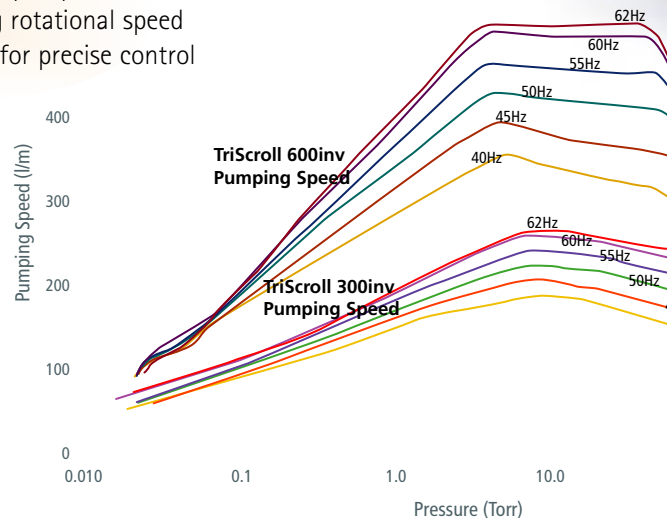
Gas plus  
Ions

### Variable Speed Tuning

Atmospheric Ionization Systems with high flows, such as LC/MS/MS, benefit from the enhanced sensitivity available with the variable speed tuning feature of Varian's TriScroll Inverter pumps.

### Variable Rotational Speed

The TriScroll Inverter pumps are capable of adjusting rotational speed to the nearest 1 Hz for precise control of pumping speed



## Varian's TriScroll Pumps

Varian's Inverter-driven pumps with their unique, patented TriScroll design are multi-stage, dry vacuum pumps designed and manufactured by Varian for the highest reliability and durability.

### Benefits of the dry TriScroll

- High pumping speed and low ultimate pressure
- Consistent performance resulting in superior cost of ownership – the pump's long-life tip seals routinely last over a year between replacements
- Oil-free vacuum environments that eliminate the costs associated with the frequent maintenance and oil

disposal costs required by oil-sealed rotary vane pumps

- Simplification of regulatory compliance and elimination of negative environmental impact

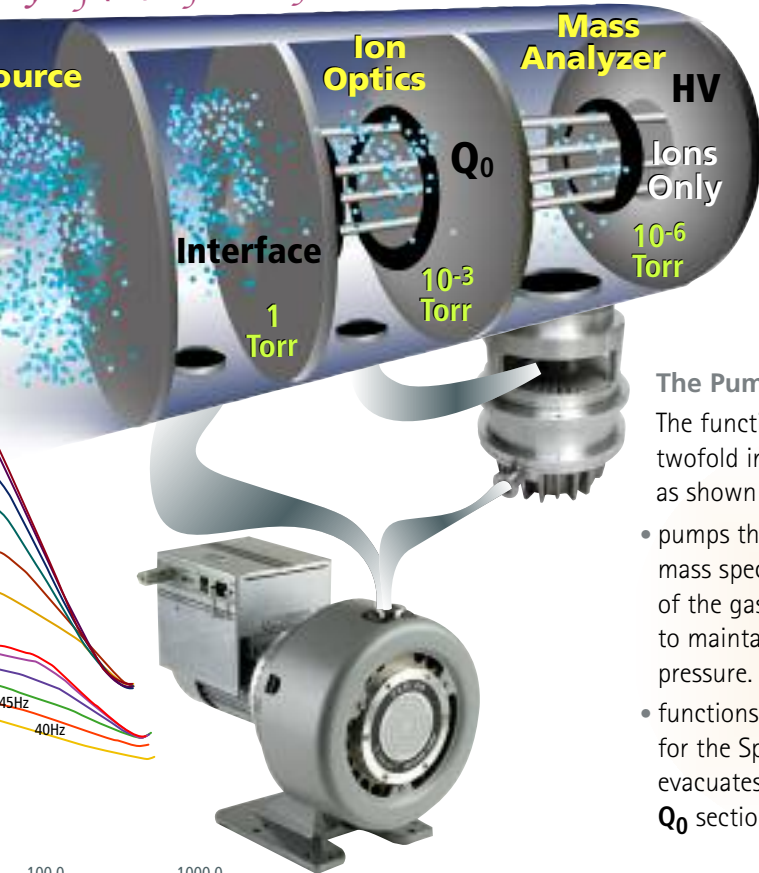
### Added benefits of Inverter Driven Pumps

- *Constant pumping speed worldwide* regardless of line frequency
- *Optimal pumping speed selection* for any application with the adjustment of the nominal rotational speed of the pump
- *Remote start and stop* with a contact closure made possible with a standard D-shell connector



- *Monitoring of pump parameters* via serial interface
- *Significant decrease in noise levels* in the work area resulting from pump's operation at lower rotational speeds with little loss in base pressure performance of the pump.

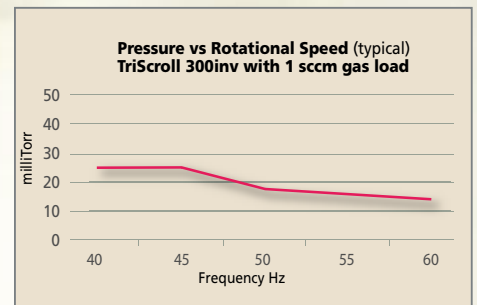
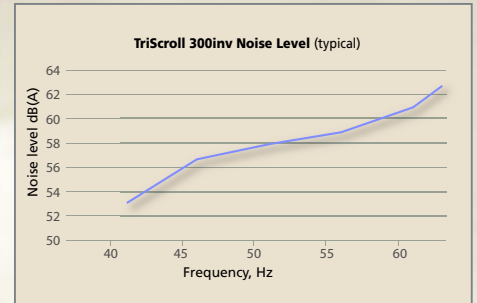
$$P_2 = f(P_1) = f(\text{roughing pump speed})$$



### The Pumps

The function of the Scroll Pump is twofold in a Mass Spectrometer, as shown in the illustration. It:

- pumps the **Interface** region of the mass spec, evacuating over 99.7% of the gas from the inlet system to maintain the desired interface pressure.
- functions as the backing pump for the Split Flow Turbopump, which evacuates the **HV** section and the **Q<sub>0</sub>** section of the Mass Spectrometer.



# Dry Scroll Primary Pumps for Mass Spectrometers

## TRISCROLL INVERTER – FEATURES AND BENEFITS

- No oil changes Reduce maintenance time, eliminate quarterly PM
- No oil leaks Eliminate disposal costs  
Maintain lab cleanliness
- Variable speed control Delivers optimal working pressure  
Decreases significantly work area noise levels  
Extended service interval
- Low power consuming inverter Eliminates tripping of circuit breakers caused by high starting current

## INTEGRATED SUPPORT

- Our toll free telephone hotlines provide you with the easiest live front-end support
- Native language representatives will assist you with Technical/Application /Order Processing/Engineering support
- Comprehensive Service programs can be tailored to meet your most demanding needs



## TRISCROLL INVERTER – TECHNICAL SPECIFICATION

	TS300inv	TS600inv
Peak pumping speed	250 l/m, 15 m <sup>3</sup> /hr (8.8 cfm)	500 l/m, 30m <sup>3</sup> /h (17.7 cfm)
Ultimate pressure	1.3 x 10 <sup>-2</sup> mbar (10 mTorr)	9.3 x 10 <sup>-3</sup> mbar (7 mTorr)
Inlet connection	NW25	NW40
Exhaust connection	1/4" Female NPT with swivel NW16 (adapter provided)	3/8" Female NPT with swivel NW25 (adapter provided)
Gas ballast	1/4" Female NPT	
Weight – pump only	26 kg (57 lb.)	31 kg (68 lbs)
Power requirements	Single phase 200-240 VAC, 50-60 Hz, 5 amps (max)	
Operating speed	40-62 Hz (factory setting) : 1800 RPM	
Noise level per ISO 11201, variable with frequency	55-68 dBA	

## TRISCROLL INVERTER – ORDERING INFORMATION

TriScroll 300 Dry Scroll Primary Pump, single phase, 200-240 VAC, 50/60 Hz	PTS03001INV
TriScroll 600 Dry Scroll Primary Pump, single phase, 200-240 VAC, 50/60 Hz	PTS06001INV

### Power Cord Selection

Europe, 10A/220-230 VAC, 2.5 Meter	656494220	India, 10A/220-250 VAC, 2.5 Meter	656494245
Denmark, 10A/220-230 VAC, 2.5 Meter	656494225	Israel, 10A/230 VAC, 2.5 Meter	656494230
Switzerland, 10A/230 VAC, 2.5 Meter	656494235	North America, 10A/230 VAC, 2.5 Meter	656494255
UK/Ireland, 13A/230 VAC, 2.5 Meter	656494250		

UNITED STATES  
 Varian, Inc.  
 121 Hartwell Avenue  
 Lexington, MA  
 Tel: (781) 861 7200  
 Toll free: 1 800 882 7426

EUROPE AND OTHER COUNTRIES  
 Varian, Inc.  
 via F.lli Varian 54  
 10040 Leini, Torino  
 Tel: (39) 011 997 9 111  
 Toll free: 00 800 234 234 00



**VARIAN**

VARIANINC.COM