

Tees, Crosses, Bellows, Hose Clamps and Centering Rings  
NW 16 to NW 50



Inlet Trap with NW-40 Flanges



Rotary Vane Pumps from 3 to 64 CFM; 6 to 108 m³/hr.



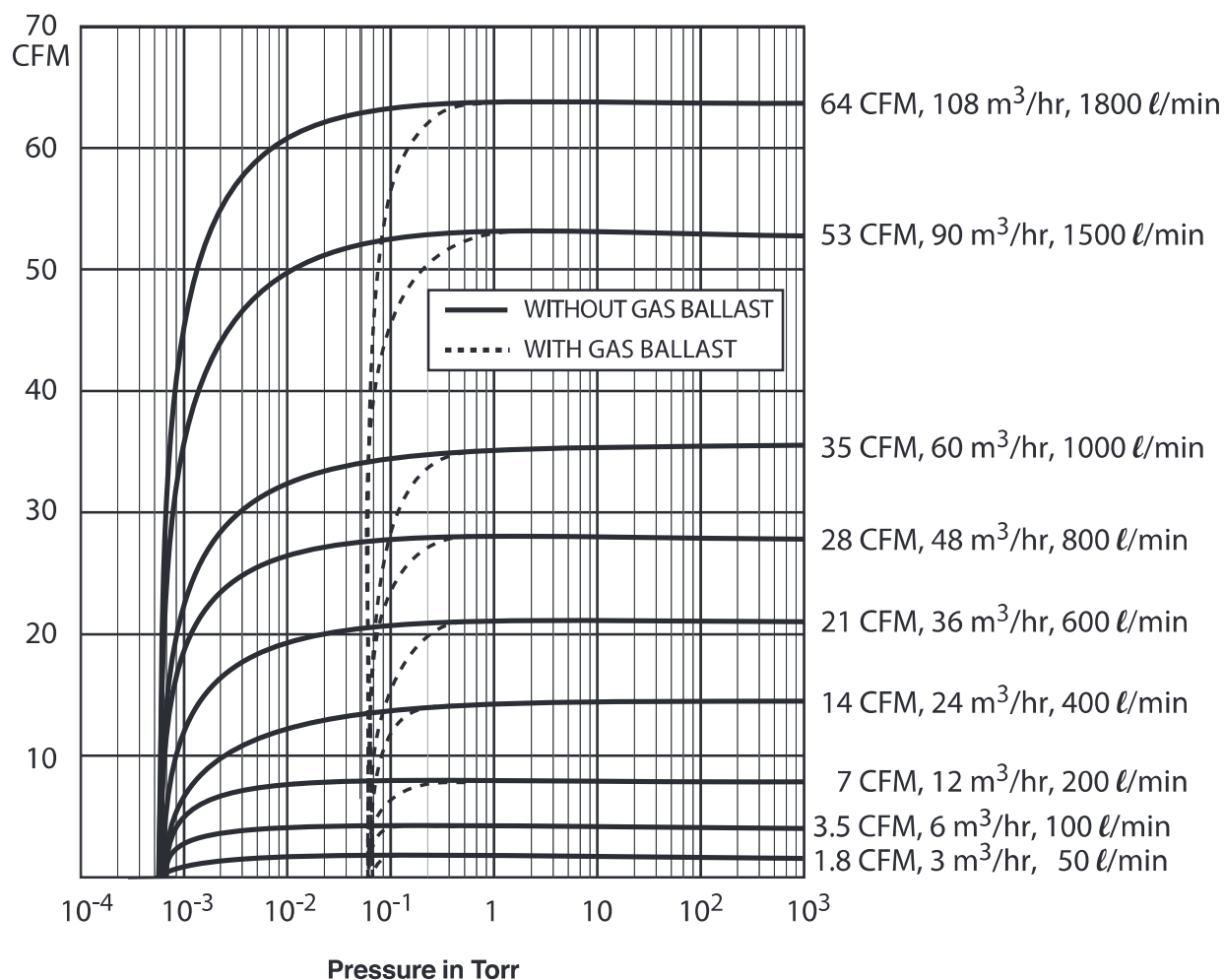
Soft Start and Pressure  
Control for Rotary Vane  
Vacuum Pumps



VPO-3000 Vacuum Pump Fluid



## 9 Sizes to Choose From



- Ultimate Vacuum Better Than  $5 \times 10^{-4}$  Torr
- Motors Are Available for Every Voltage
- Full Two Year Warranty on All Parts & Labor
- Your Complete Satisfaction is Guaranteed



## Ultimate Vacuum $5 \times 10^{-4}$ Torr, 6.7 Pascal, .0006 mbar



**Capacity Control  
for Vacuum Pumps**  
Page 4



**1.8 CFM  
50 l/min, 3 m<sup>3</sup>/hr**  
Page 5



**3.5 CFM  
100 l/min, 6 m<sup>3</sup>/hr**  
Page 6



**7 CFM  
200 l/min, 12 m<sup>3</sup>/hr**  
Page 7



**14 CFM  
400 l/min, 24 m<sup>3</sup>/hr**  
Page 8



**21 CFM  
600 l/min, 36 m<sup>3</sup>/hr**  
Page 9



**28 CFM  
800 l/min, 48 m<sup>3</sup>/hr**  
Page 10



**35 CFM  
1000 l/min, 60 m<sup>3</sup>/hr**  
Page 11



**53 CFM  
1500 l/min, 90 m<sup>3</sup>/hr**  
Page 12



**64 CFM  
1800 l/min, 108 m<sup>3</sup>/hr**  
Page 13



**Intermittent Duty  
5 CFM, 8.5 m<sup>3</sup>/hr.**  
Page 14



**Pump Inlet Traps**  
Page 15



**Foreline Traps Keep  
Vapor Out of System**  
Pages 15



**Pump Repair Guides;  
Major & Minor Kits**  
Pages 16, 17



**Vacuum Pump Fluid,  
Flushing Fluid & Exhaust  
Mist Eliminators**  
Page 18



**NW (KF) Clamps, Hose,  
Tees, Elbows, Reducers,  
Adapters, Bellows**  
Pages 19, 20, 21

## Complete Specs & Ordering Information for Valve and Gauge Catalogs on Our Website



**Aluminum Cylinders  
and Base Plates**  
See VRC Valve Catalog



**Feedthroughs  
Rotary & Push-Pull Motion**  
See VRC Valve Catalog



**NW (KF) Angle Valves  
3 Way Valves & Small  
Valve Accessories**  
See VRC Valve Catalog



**Diaphragm Manometer  
1 mTorr to 1500 Torr**  
See VRC Gauge Catalog



**Digital Convection Gauge  
1 X 10<sup>-3</sup> Torr to Atmosphere**  
See VRC Gauge Catalog



**Vacuum-Pressure Gauges  
30 In. Hg to 150 PSIG**  
See VRC Gauge Catalog



**Pirani Gauge  
1 mTorr to 2000 mTorr  
.01 Torr to 20 Torr**  
See VRC Gauge Catalog



**Gauges Using 24 VDC  
10<sup>-5</sup> Torr to 1500 Torr**  
See VRC Gauge Catalog



**Active Pirani; 1 to  
2000 mT, 2000 Microns,  
2,000 mbar, 2,000 Pa**  
See VRC Gauge Catalog



**Thermocouple Gauges  
1 mTorr to 1000 mTorr  
1 mTorr to 2000 mTorr**  
See VRC Gauge Catalog



**Portable Micron Gauge  
1 to 20,000 Microns**  
See VRC Gauge Catalog



**3 & 5 Sensor Gauges,  
10 mTorr to 150 PSIG  
Low Cost Gauges**  
See VRC Gauge Catalog



**Explosive & Hazardous  
Area Gauges  
UL, CSA, FM Approved**  
See VRC Gauge Catalog



**IP-65 Water  
& Dust Proof  
Convection & Pirani**  
See VRC Gauge Catalog



**Battery Powered  
Gauges Pirani &  
Diaphragm Type**  
See VRC Gauge Catalog



**Self Contained  
Gauge/Sensor  
1 mTorr to 1500 Torr**  
See VRC Valve Catalog



**Cables, LED Displays, Couplings,  
Cabinets, Switches, Water Proof  
& Airborne Sensors**  
See VRC Gauge Catalog



**NIST Traceable  
Calibration Certification;  
Calibration Manifolds**  
See VRC Gauge Catalog



## Soft Start & Speed Control



Photo shows Model 800-28 and Model 200-7 Pumps with the Soft Start Variable Frequency Drive (VFD) Unit

- **Soft Start Roughing to Limit Turbulence**
- **No Moving Parts; No Conductance Limiting**
- **Control Pressure by Adjusting Pump Speed**

### The Soft Start

To minimize turbulence and particles during evacuation, you may “Soft Start” your pump down and then switch to maximum speed to give the ultimate vacuum you need.

### Pressure Control

Adjust the set point on your vacuum gauge to the vacuum level that is best for your process. The pump will then run at maximum speed until that pressure is reached and will then slow its speed to maintain the vacuum you have selected.

### Roughing for Cryo or Ion Pumps

With this system you can operate your mechanical pump at maximum speed. When the high vacuum pump takes over, slow the mechanical pump or turn it off when roughing is complete.

### Backing of Turbo and Diffusion Pumps

Use a single mechanical pump for roughing and backing for turbo or diffusion pumps. For roughing, ramp the pump speed up slowly to minimize turbulence in the chamber. For backing slow the mechanical pump to 25% of capacity.

### Install Remote From Pump

The Soft Start Control can be located up to 300 feet from the pump and it will accept 4-20 mA or serial inputs or contact closures for start, stop, speed and ramp.

When the Soft Start is ordered with a new vane pump it is shipped with a 6 ft. (2 m) cord wired from the VFD to the pump motor. Cords available up to 100 ft.

### Soft Start Ordering Information

P/N	Soft-220-1/2 HP	price each	.....\$541
	or pump models 100-3.5 and 200-7		
P/N	Soft-220-1 to 2 HP	price each	.....\$760
	for pump models 400-14, 600-21, 800-28, and 1000-35		
P/N	Soft-220-3 to 5 HP	price each	.....\$1087
	for pump models 1500-53 and 1800-64		

## High-Low Vacuum Control



Photo shows the High-Low controller with standard NW-25 isolation valve

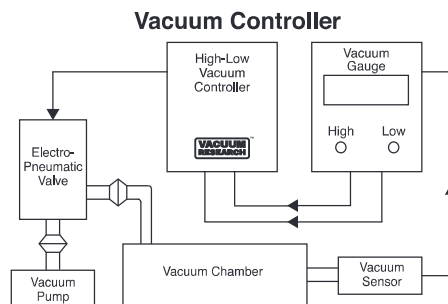
- **Works with Your Existing 2 Set Point Gauge**
- **Pressure Control for Your Vacuum Chamber**
- **Directly Control Pump Isolation Valve**

### Pressure Control

This inexpensive device allows your existing vacuum gauge with high and low set points to directly control your vacuum pump isolation valve to keep the vacuum in your system between the high and low limits that you select. The High-Low vacuum control will work with any pump of any size and any vacuum gauge with 2 setpoints. An electropneumatic valve is required.

The contacts in this controller can directly switch the current needed to operate the solenoid on any size electropneumatic vacuum valve.

If the vacuum gets too low the valve will close, when rising pressure reaches your upper limit the valve will open and your system will be pumped back down to the pressure you have selected.



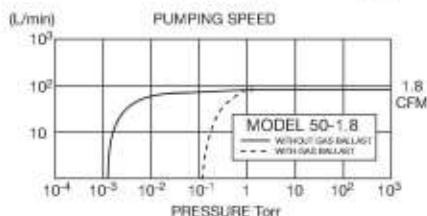
### High-Low Controller Ordering Information

The High-Low Controller includes NW-25 Aluminum Vacuum Valve (fail safe, close on power failure). Select proper voltage: 24VDC, 120 VAC or 220 VAC. Vacuum Gauge is available at additional cost as are NW-16, NW-40, and NW-50 valves.

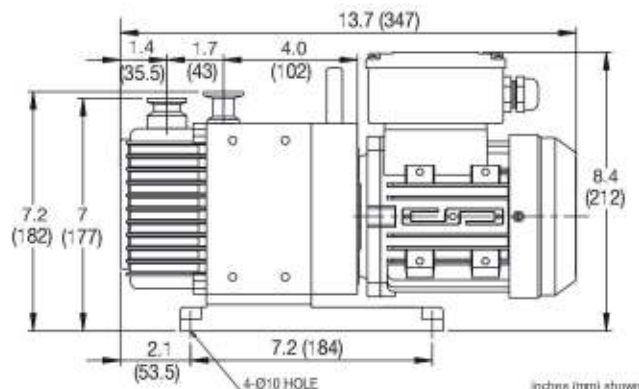
P/N	RV801005-24VDC	for 24 VDC solenoid	.....\$618
P/N	RV801005-120VAC	for 120 VAC solenoid	.....\$618
P/N	RV801005-220VAC	for 220 VAC solenoid	.....\$618



Photo shows Pump with optional inlet trap installed and exhaust mist eliminator. See pages 15 and 18 to order these accessories. Power on/off switch, resettable circuit breaker and line cord are standard on pumps shipped with single phase motors.



Pumping Speed @ 60 Hz	50 l/min, 1.8 CFM, 3 m <sup>3</sup> /hr.
Pumping Speed @ 50 Hz	42 l/min, 1.5 CFM, 2.5 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	2x10 <sup>-3</sup> Torr, 0.27 Pa, 0.01 mbar
Ultimate Pressure Gas Ballast Open	2x10 <sup>-1</sup> Torr, 27 Pa, 0.27 mbar
Standard Motor, On/Off Switch, Circuit Breaker, & Thermal Protection	115/230V, 1 phase, 1/5 hp, 50/60 Hz
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	contact factory
Power Connection	6 ft. (2 m) 3 conductor cord
Motor speed @ 60 Hz	1680 r.p.m.
Noise Level	50 dB
Oil capacity	200 cc; 0.21 Qt.
Weight Net: 32 lbs., 14.4 kg	Shipping: 35 lbs., 16 kg
Intake & exhaust type/diameter	NW-16
Ambient operating temperature	7° to 40°C, 45° to 104°F



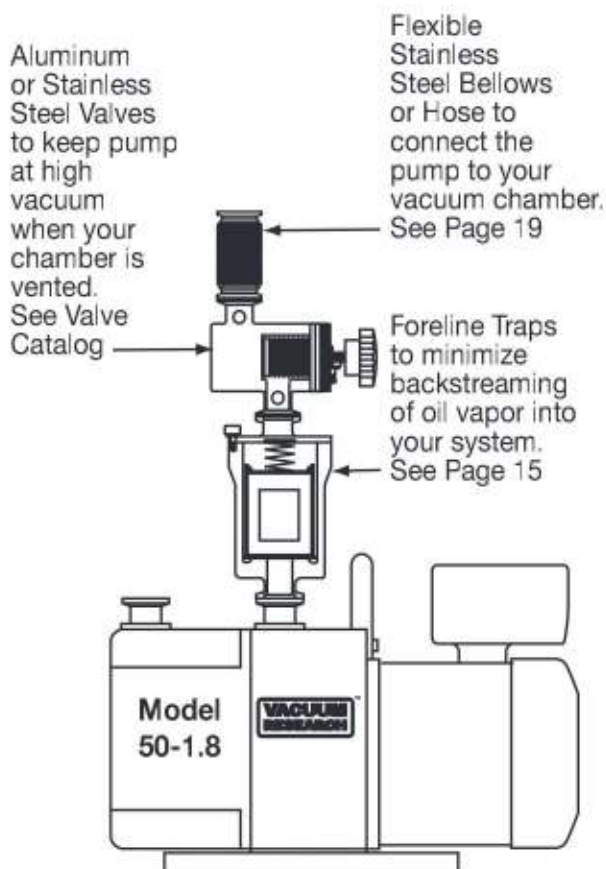
### Features

- Extremely Quiet • Anti Suck Back Design
- Satisfaction Guaranteed • Two Year Warranty
- Virtually Vibration Free • Motors for Any Voltage
- Complies with Machinery Directive 98/37/EC

### Applications

- Backing Turbo Pumps • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Sputter & Deposition Systems

### Typical Installation



### Ordering Information

#### MODEL 50-1.8 Vacuum Pump With Motor:

Note: Tolerance is ± 10% of nominal value for all voltages.

115 or 230V, 50 or 60 Hz, 1 phase, 0.15 kw (1/5 hp)

Full load amps @ 60 Hz: 2.6 or 1.8 amps

Full load amps @ 50 Hz: 2.43 or 1.8 amps

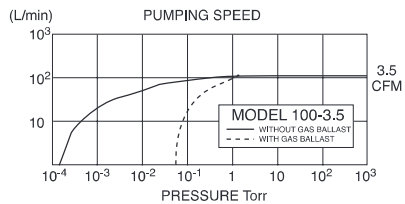
p/n 50-115/230..... \$1966

Exhaust Mist Eliminators..... See Page 18

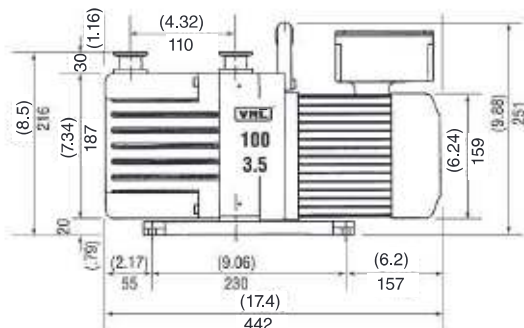
Fomblin: For pumps filled with Fomblin PFPE fluid YL VAC 16/6 add to p/n "Fomblin" and increase the price to..... \$2595



Photo shows Pump with optional inlet trap and exhaust mist eliminator installed. See pages 15 and 18 to order these accessories. Power on/off switch, resettable circuit breaker and line cord are standard on pumps shipped with single phase motors.



Pumping Speed @ 60 Hz	100 l/min, 3.5 CFM, 6 m <sup>3</sup> /hr.
Pumping Speed @ 50 Hz	83 l/min, 3 CFM, 5 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-4</sup> Torr, 6.7x10 <sup>-2</sup> Pa, .0006 mbar
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, 6.7 Pascal, .06 mbar
Standard Motor, On/Off Switch, Circuit Breaker, & Thermal Protection	115/208-230V, 1 phase, 1/2 hp, 60 Hz (50Hz Avail)
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	See ordering information
Power Connection	6 ft. (2 m) 3 conductor cord
Motor speed @ 60 Hz	1700 r.p.m.
Noise Level	50 dB
Water Vapor Tolerance	25 mbar, 19 Torr
Oil capacity	500 cc; 0.53 Qt.
Weight Net: 50 lbs., 23 kg	Shipping: 54 lbs., 24 kg
Intake & exhaust type/diameter	NW-25 standard (NW-16 or 26 mm O.D. Tube optional)
Ambient operating temperature	7° to 40°C, 45° to 104°F



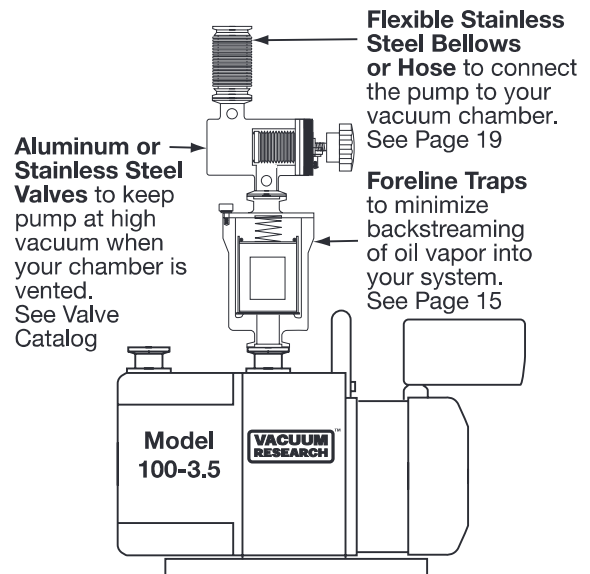
## Features

- Extremely Quiet • Anti Suck Back Design
- Satisfaction Guaranteed • Two Year Warranty
- Virtually Vibration Free • Motors for Any Voltage
- Complies with Machinery Directive 98/37/EC

## Applications

- Backing Turbo Pumps • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Sputter & Deposition Systems

## Typical Installation



## Ordering Information

### MODEL 100-3.5 Vacuum Pump With Motor:

Note: Tolerance is ± 10% of nominal value for all voltages.

100 or 200V, 50 or 60 Hz, 1 phase, 0.4 kw (1/2 hp)  
**p/n 100-100/200-50/60 or 100-100/200-50/60-NW16.....\$2075**

115 or 208 to 230V, 60 Hz, 1phase, 0.4 kw (1/2 hp)  
 Full load amps: 8.5 or 4.5 to 4.0 amps  
**p/n 100-115/230-60 or 100-115/230-60-NW16.....\$2075**

115 or 230V, 50 or 60 Hz, 1 phase, 0.4 kw (1/2 hp)  
 Full load amps @ 50 Hz; 8.8 or 4.4 A @ 60 Hz; 7.2 or 3.6 A  
**p/n 100-115/230-50/60 or 100-115/230-50/60-NW16.....\$2075**

230 or 380V, 50 or 60 Hz, 3 phase, 0.4 kw (1/2 hp)  
 Full load current: 1.82 or 1.3 A  
**p/n 100-OPT-380-50/60 or 100-OPT-380-50/60-NW16.....\$2075**

230 or 460V, 60 Hz, 3 phase, 0.4 kw (1/2 hp)  
 Full load current: 1.8 or 0.9 A  
**p/n 100-230-/460-60 or 100-230-/460-60-NW16 .....\$2075**

**Exhaust Mist Eliminators .....See Page 18**

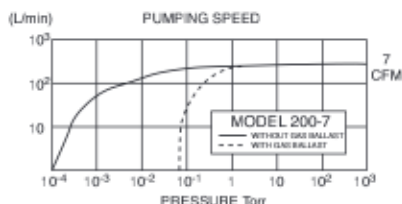
**Optional NW-16 Inlet & Outlet..... \$57**

**Fomblin:** For pumps filled with Fomblin PFPE fluid YL VAC 16/6 add to p/n “Fomblin” and increase the price to.....**\$2683**

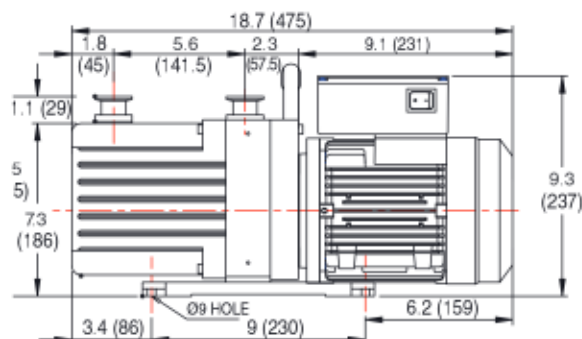




Photo shows Pump with optional inlet trap and exhaust mist eliminator installed. See pages 15 and 18 to order these accessories. Power on/off switch, resettable circuit breaker and line cord are standard on pumps shipped with single phase motors.



Pumping Speed @ 60 Hz	200 l/min, 7.0 CFM, 12 m <sup>3</sup> /hr.
Pumping Speed @ 50 Hz	166 l/min, 5.8 CFM, 10 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-4</sup> Torr, 6.7x10 <sup>-2</sup> Pa, .0006 mbar
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, 6.7 Pascal, .06 mbar
Standard Motor, On/Off Switch, Circuit Breaker, & Thermal Protection	115/208-230V, 1 phase, 1/2 hp, 60 Hz (50Hz Avail)
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	See ordering information
Power Connection	6 ft. (2 m) 3 conductor cord
Motor speed @ 60 Hz	1700 r.p.m.
Noise Level	50 dB
Water Vapor Tolerance	25 mbar, 19 Torr
Oil capacity	600 cc; 0.63 Qt.
Weight Net: 50 lbs., 23 kg	Shipping: 54 lbs., 24 kg
Intake & exhaust type/diameter	NW-25 standard (NW-16 or 26 mm O.D. Tube optional)
Ambient operating temperature	7° to 40°C, 45° to 104°F



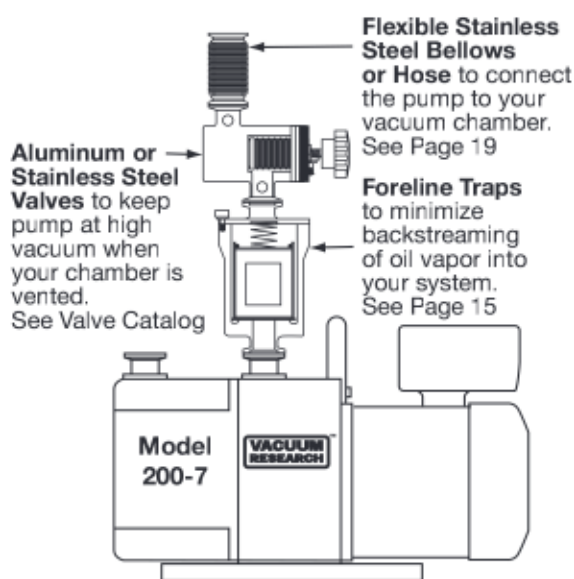
### Features

- Extremely Quiet • Anti Suck Back Design
- Satisfaction Guaranteed • Two Year Warranty
- Virtually Vibration Free • Motors for Any Voltage
- Complies with Machinery Directive 98/37/EC

### Applications

- Backing Turbo Pumps • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Sputter & Deposition Systems

### Typical Installation



### Ordering Information

#### MODEL 200-7 Vacuum Pump With Motor:

Note: Tolerance is  $\pm 10\%$  of nominal value for all voltages.

100 or 200V, 50 or 60 Hz, 1 phase, 0.4 kw (1/2 hp)  
**p/n 200-100/200-50/60 or 200-100/200-50/60-NW16 ..... \$2162**

115 or 208 to 230V, 60 Hz, 1 phase, 0.4 kw (1/2 hp)  
 Full load amps: 8.5 or 4.5 to 4.0 amps  
**p/n 200-115/230-60 or 200-115/230-60-NW16 ..... \$2162**

115 or 230V, 50 or 60 Hz, 1 phase, 0.4 kw (1/2 hp)  
 Full load amps @ 50 Hz; 8.8 or 4.4 A @ 60 Hz; 7.2 or 3.6 A  
**p/n 200-115/230-50/60 or 200-115/230-50/60-NW16 ..... \$2162**

230 or 380V, 50 or 60 Hz, 3 phase, 0.4 kw (1/2 hp)  
 Full load current: 1.82 or 1.3 A  
**p/n 200-OPT-380-50/60 or 200-OPT-380-50/60-NW16 ..... \$2162**

230 or 460V, 60 Hz, 3 phase, 0.4 kw (1/2 hp) Full load  
 current: 1.8 or 0.9 A  
**p/n 200-230-/460-60 or 200-230-/460-60-NW16 ..... \$2162**

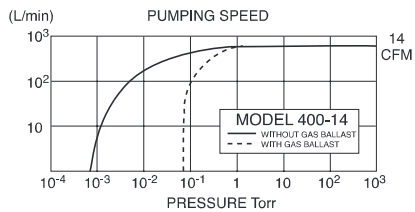
**Exhaust Mist Eliminators ..... See Page 18**

**Optional NW-16 Inlet & Outlet ..... \$57**

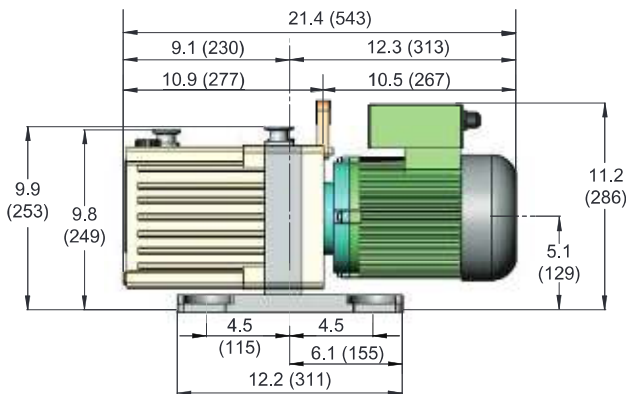
**Fomblin:** For pumps filled with Fomblin PFPE fluid YL VAC 16/6  
 add to p/n "Fomblin" and increase the price to ..... **\$2831**



Photo shows Pump with optional inlet trap and exhaust mist eliminator installed. See pages 15 and 18 to order these accessories.



Pumping Speed @ 60 Hz	400 l/min, 14 CFM, 6 m <sup>3</sup> /hr.
Pumping Speed @ 50 Hz	333 l/min, 11.6 CFM, 5 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-4</sup> Torr, 6.7x10 <sup>-2</sup> Pa, .0006 mbar
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, 6.7 Pascal, .06 mbar
Standard Motor, On/Off Switch, Circuit	115/230V, 1 phase, 50/60 Hz, 1 hp
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	See ordering information
Power Connection	Junction Box
Motor speed @ 60 Hz	1700 r.p.m.
Noise Level	52 dB
Water Vapor Tolerance	30 mbar, 22 Torr
Oil capacity	1500 cc; 1.5 Qt.
Weight Net: 70 lbs., 32 kg	Shipping: 75 lbs., 34 kg
Intake & exhaust type/diameter	NW-25 or 26 mm O.D. tube
Ambient operating temperature	7° to 40°C, 45° to 104°F



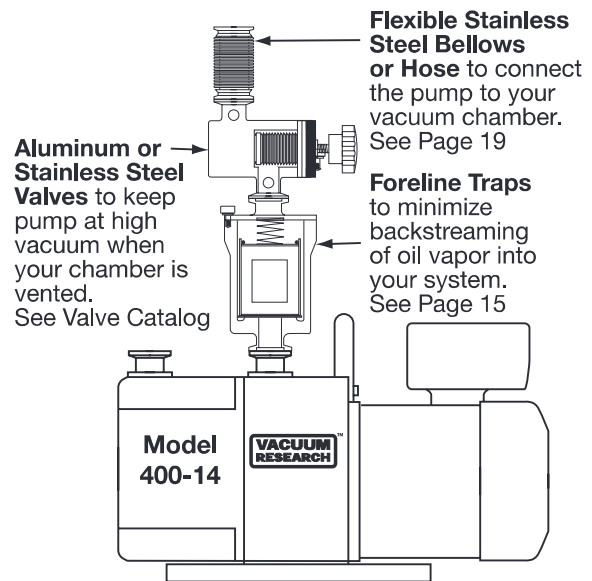
## Features

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## Applications

- Backing Turbo Pumps • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Sputter & Deposition Systems

## Typical Installation



## Ordering Information

### MODEL 400-14 Vacuum Pump With Motor:

Note: Tolerance is ± 10% of nominal value for all voltages.

100 or 200V, 50 or 60 Hz, 1 phase, 0.75 kw (1 hp)

**p/n 400-100/200-50/60 ..... \$2949**

115 or 230V, 50 or 60 Hz, 1 phase, 0.75 kw (1 hp)

Full load amps @ 50 Hz; 14.7 or 8.5 A @ 60 Hz; 13 or 7.5 A

**p/n 400-115/230-50/60 ..... \$2949**

220 or 380V, 50 or 60 Hz, 3 phase, 0.75 kw (1 hp)

Full load current: @50 Hz; 3.6 or 2.1 A

@60 Hz; 3.1 or 1.8 A

**p/n 400-OPT-380-50/60 ..... \$2949**

230 or 460V, 60 Hz, 3 phase, 0.75 kw (1 hp) Full load

current: 3.2 or 1.6 A

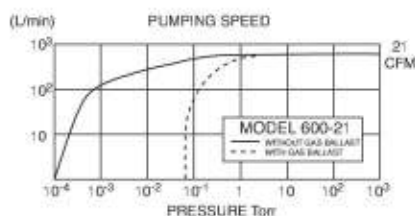
**p/n 400-230/460-60 ..... \$2949**

**Exhaust Mist Eliminators ..... See Page 18**

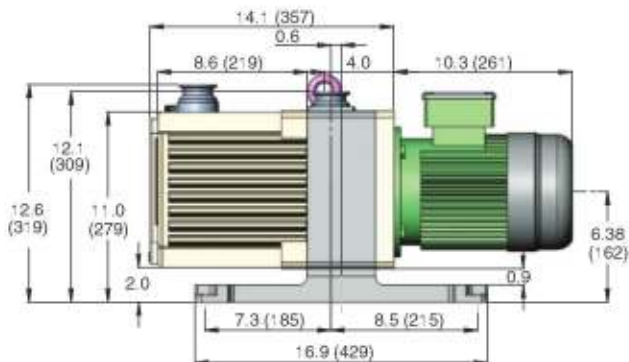
**Fomblin:** For pumps filled with Fomblin PFPE fluid YL VAC 16/6  
add to p/n "Fomblin" and increase the price to..... **\$4400**



Photo shows Pump with optional inlet trap and exhaust mist eliminator installed. See pages 15 and 18 to order these accessories.



Pumping Speed @ 60 Hz	600 l/min, 21 CFM, 36 m <sup>3</sup> /hr.
Pumping Speed @ 50 Hz	500 l/min, 17.5 CFM, 30 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-4</sup> Torr, 6.7x10 <sup>-2</sup> Pa, .0006 mbar
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, 6.7 Pascal, .06 mbar
Standard Motor, On/Off Switch, Circuit	230/380V, 1 phase, 50/60 Hz, 2 hp
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	See ordering information
Power Connection	Junction Box
Motor speed @ 60 Hz	1700 r.p.m.
Noise Level	54 dB
Water Vapor Tolerance	30 mbar, 22 Torr
Oil capacity	2300 cc; 2.4 Qt.
Weight Net: 117 lbs., 53 kg	Shipping: 133 lbs., 60 kg
Intake & exhaust type/diameter	NW-40 or 36 mm O.D. tube
Ambient operating temperature	7° to 40°C, 45° to 104°F



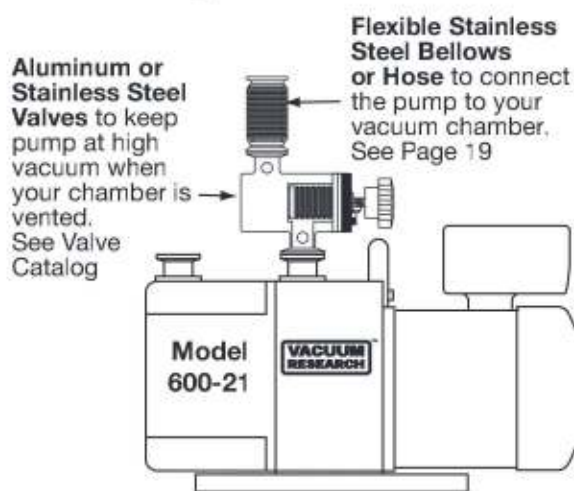
### Features

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### Applications

- Backing Turbo Pumps • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Sputter & Deposition Systems

### Typical Installation



### Ordering Information

#### MODEL 600-21 Vacuum Pump With Motor:

Note: Tolerance is ± 10% of nominal value for all voltages.

200V, 50 or 60 Hz, 3 phase, 1.5 kw (2 hp)  
p/n 600-CE-100/200-50/60.....\$4368

230 or 460V, 60 Hz, 3 phase, 1.5 kw (2 hp)  
Full load current 6.0 or 3.0 Amps  
p/n 600-CE-230-460-60.....\$4368

220 or 380V, 50/60 Hz, 3 phase, 1.5 kw (2 hp)  
Full load Current @ 50 Hz; 6.5 or 4 A @60 Hz; 6.0 or 3.6 A  
p/n 600-CE-380-50/60.....\$4368

208 or 380V, 50 Hz, 3 phase, 1.5 kw (2 hp)  
Full load current: 7.2 or 4.0 Amps  
p/n 600-CE-380-50.....\$4368

Pumps with motors for other voltages and single phase power also available. Please contact the factory for price and availability.

**Exhaust Mist Eliminators**.....See Page 18  
Exhaust Filter Coalescing filter for exhaust mist elimination.  
99.97% removal efficiency of droplets down to 0.3 micron diameter.  
Model EX.FIL, NW-40, 21 cfm

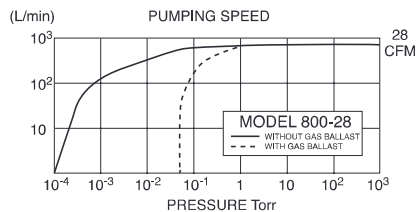
p/n RV810240.....\$408

**Fomblin:** For pumps filled with Fomblin PFPE fluid YL VAC 16/6  
add to p/n "Fomblin" and increase the price to.....\$6361

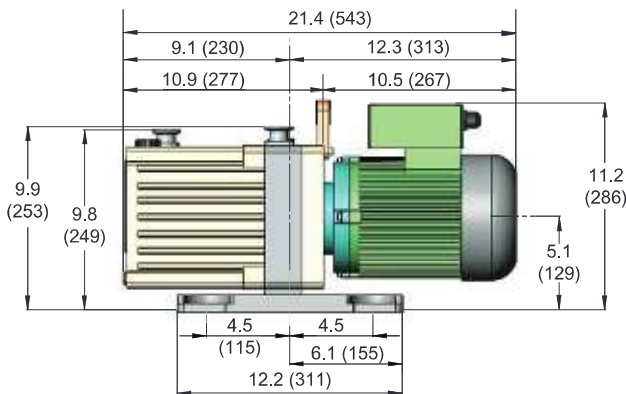




Photo shows Pump with optional inlet trap and exhaust mist eliminator installed. See pages 15 and 18 to order these accessories.



Pumping Speed @ 60 Hz	800 l/min, 28 CFM, 48 m <sup>3</sup> /hr.
Pumping Speed @ 50 Hz	666 l/min, 23 CFM, 40 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-4</sup> Torr, 6.7x10 <sup>-2</sup> Pa, .0006 mbar
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, 6.7 Pascal, .06 mbar
Standard Motor, On/Off Switch, Circuit	230/380V, 3 phase, 50/60 Hz, 2 hp
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	See ordering information
Power Connection	Junction Box
Motor speed @ 60 Hz	1700 r.p.m.
Noise Level	54 dB
Water Vapor Tolerance	40 mbar, 30 Torr
Oil capacity	2700 cc; 2.9 Qt.
Weight Net: 117 lbs., 53 kg	Shipping: 133 lbs., 60 kg
Intake & exhaust type/diameter	NW-40 or 36 mm O.D. tube
Ambient operating temperature	7° to 40°C, 45° to 104°F



## Features

- Extremely Quiet • Anti Suck Back Design
- Satisfaction Guaranteed • Two Year Warranty
- Virtually Vibration Free • Motors for Any Voltage
- Complies with Machinery Directive 98/37/EC

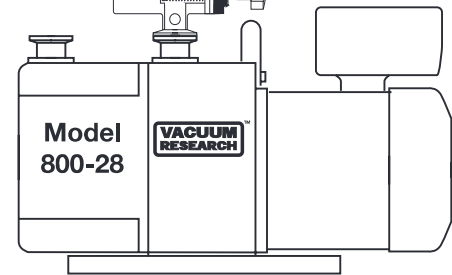
## Applications

- Backing Turbo Pumps • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Sputter & Deposition Systems

## Typical Installation

**Aluminum or Stainless Steel Valves** to keep pump at high vacuum when your chamber is vented. See Valve Catalog

**Flexible Stainless Steel Bellows or Hose** to connect the pump to your vacuum chamber. See Page 19



## Ordering Information

### MODEL 800-28 Vacuum Pump With Motor:

Note: Tolerance is  $\pm 10\%$  of nominal value for all voltages.

200V, 50 or 60 Hz, 3 phase, 1.5 kw (2 hp)  
**p/n 800-CE-100/200-50/60.....\$5952**

30 or 460V, 60 Hz, 3 phase, 1.5 kw (2 hp)  
 Full load current 6.0 or 3.0 Amps  
**p/n 800-CE-230-460-60.....\$5952**

220 or 380V, 50/60 Hz, 3 phase, 1.5 kw (2 hp)  
 Full load current @ 50 Hz; 6.5 or 4 A @60 Hz; 6.0 or 3.6 A  
**p/n 800-CE-380-50/60 .....\$5952**

208 or 380V, 50 Hz, 3 phase, 1.5 kw (2 hp)  
 Full load current: 7.2 or 4.0 Amps  
**p/n 800-CE-380-50.....\$5952**

Pumps with motors for other voltages and single phase power also available. Please contact the factory for price and availability.  
**Exhaust Mist Eliminators .....See Page 18**

**Exhaust Filter** Coalescing filter for exhaust mist elimination. 99.97% removal efficiency of droplets down to 0.3 micron diameter.

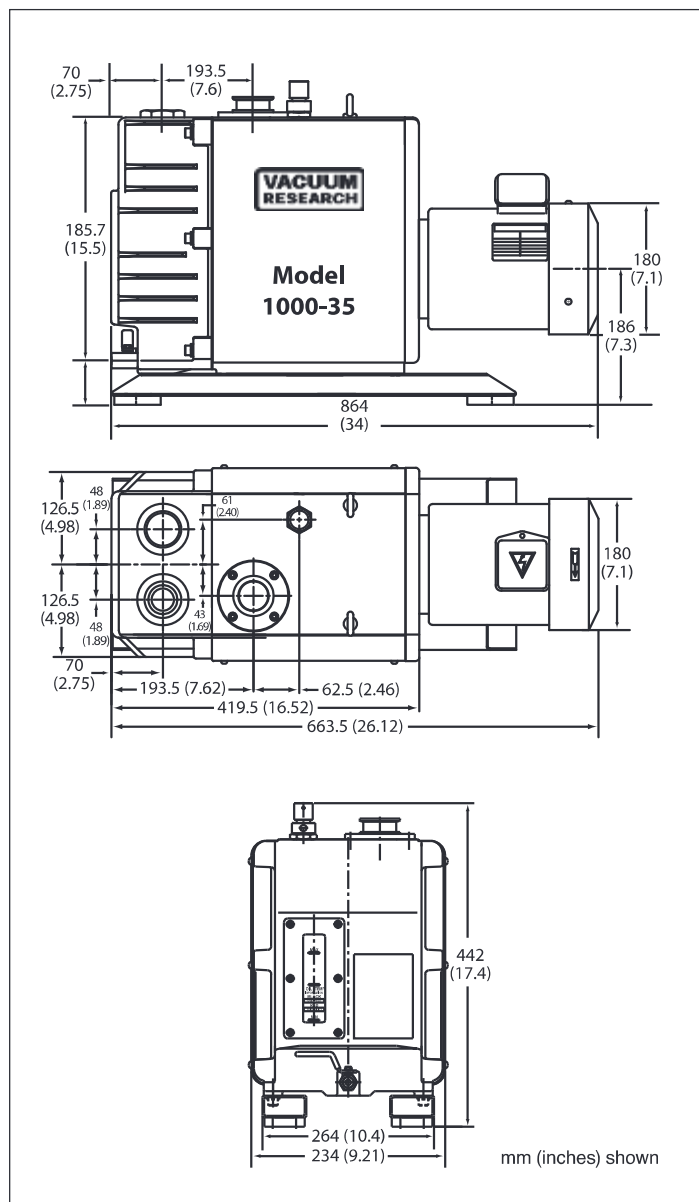
Model EX.FIL, NW-40, 28 cfm  
**p/n RV810240.....\$408**

**Fomblin:** For pumps filled with Fomblin PFPE fluid YL VAC 16/6 add to p/n **"Fomblin"** and increase the price to.....**\$8660**





Model 1000-35 has NW-40 flanges for inlet and exhaust ports

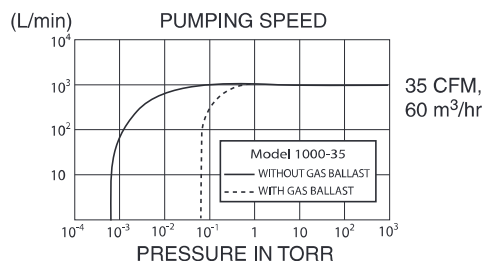


## Features

- Extremely Quiet • Anti Suck Back Design
- Satisfaction Guaranteed • Two Year Warranty
- Virtually Vibration Free • Motors for Any Voltage
- Complies with Machinery Directive 98/37/EC

## Applications

- Plasma Systems • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Backing TurboPumps
- Sputter & Deposition Systems



Pumping Speed @ 60 Hz	1000 l/min, 35 CFM, 60 m <sup>3</sup> /hr.
Pumping Speed @ 50 Hz	833 l/min, 29 CFM, 50 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-4</sup> Torr, 6.7x10 <sup>-2</sup> Pa, .0006 mbar
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, 6.7 Pascal, .06 mbar
Standard Motor, On/Off Switch, Circuit	230/380V, 3 phase, 2 hp, 50/60 Hz,
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	See ordering information
Power Connection	Junction Box
Motor speed @ 60 Hz	1700 r.p.m.
Noise Level	56 dB
Water Vapor Tolerance	40 mbar, 30 Torr
Oil capacity	4500 cc; 4.75 Qt.
Lifting Lugs (on center of gravity)	2 Rings, 3/4" (19 mm) ID, M8 Thread
Holes in Base for Lag Bolts	4 Holes, 0.5" (12 mm) 20"x7" (508x178)
Weight Net: 176 lbs., 80 kg	Shipping: 276 lbs., 125 kg
Intake & exhaust type/diameter	NW-40 standard (Contact factory for more options)
Inlet Screen	Cone Shaped Removable Screen
Ambient operating temperature	7° to 40°C, 45° to 104°F

## Ordering Information

### MODEL 1000-35 Vacuum Pump With Motor:

Note: Tolerance is ± 10% of nominal value for all voltages.

200V, 50/60 Hz, 3 phase, 1.5 kw (2 hp)	
<b>p/n 1000-CE-200 50/60.....</b>	<b>\$8200</b>
220/380V, 50/60 Hz, 3 phase, 1.5 kw (2 hp)	
<b>p/n 1000-CE-380 50/60.....</b>	<b>\$8200</b>
230/460V, 50/60 Hz, 3 phase, 1.5 kw (2 hp)	
<b>p/n 1000-CE-230-460 50/60.....</b>	<b>\$8200</b>

**Fomblin:** For pumps filled with Fomblin PFPE fluid YL VAC 16/6 add to p/n "Fomblin" and increase the price to..... **\$11,032**



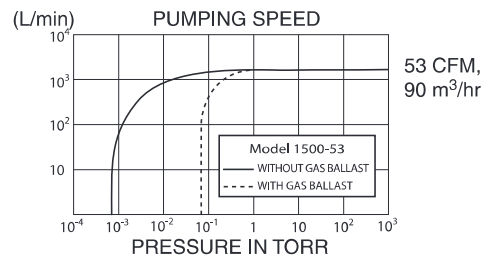
Model 1500-53 has NW-40 flanges for inlet and exhaust ports

### Features

- Extremely Quiet • Anti Suck Back Design
- Satisfaction Guaranteed • Two Year Warranty
- Virtually Vibration Free • Motors for Any Voltage
- Complies with Machinery Directive 98/37/EC

### Applications

- Plasma Systems • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Backing Turbo Pumps
- Sputter & Deposition Systems



Pumping Speed @ 60 Hz	1500 l/min, 53 CFM, 90 m <sup>3</sup> /hr.
Pumping Speed @ 50 Hz	1250 l/min, 44 CFM, 75 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-4</sup> Torr, 6.7x10 <sup>-2</sup> Pa, .0006 mbar
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, 6.7 Pascal, .06 mbar
Standard Motor, On/Off Switch, Circuit	230/380V, 3 phase, 5 hp, 50/60 Hz
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	See ordering information
Power Connection	Junction Box
Motor speed @ 60 Hz	1700 r.p.m.
Noise Level	56 dB
Water Vapor Tolerance	40 mbar, 30 Torr
Oil capacity	6200 cc; 6.5 Qt.
Lifting Lugs (on center of gravity)	2 Rings, 3/4" (19 mm) ID, M8 Thread
Holes in Base for Lag Bolts	4 Holes, 0.5" (12 mm) 22"x7" (550x178)
Weight Net: 242 lbs., 110 kg	Shipping: 367 lbs., 167 kg
Intake & exhaust type/diameter	NW-40 standard (Contact factory for more options)
Inlet Screen	Cone Shaped Removable Screen
Ambient operating temperature	7° to 40°C, 45° to 104°F

### Ordering Information

#### MODEL 1500-35 Vacuum Pump With Motor:

Note: Tolerance is ± 10% of nominal value for all voltages.

200V, 50/60 Hz, 3 phase, 3.7 kw (5 hp)

**p/n 1500-CE-200 50/60.....\$8692**

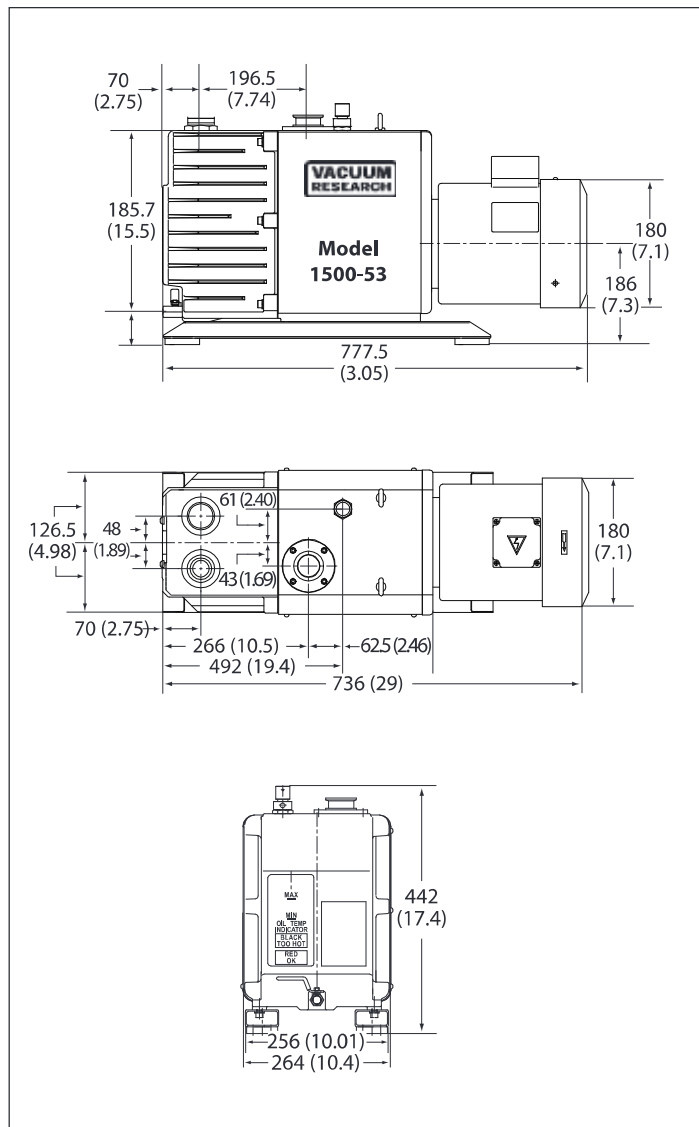
220/380V, 50/60 Hz, 3 phase, 3.7 kw (5 hp)

**p/n 1500-CE-380 50/60.....\$8692**

230/460V, 50/60 Hz, 3 phase, 3.7 kw (5 hp)

**p/n 1500-CE-230-460 50/60.....\$8692**

**Fomblin:** For pumps filled with Fomblin PFPE fluid YL VAC 16/6  
add to p/n **"Fomblin"** and increase the price to.....**\$13,087**





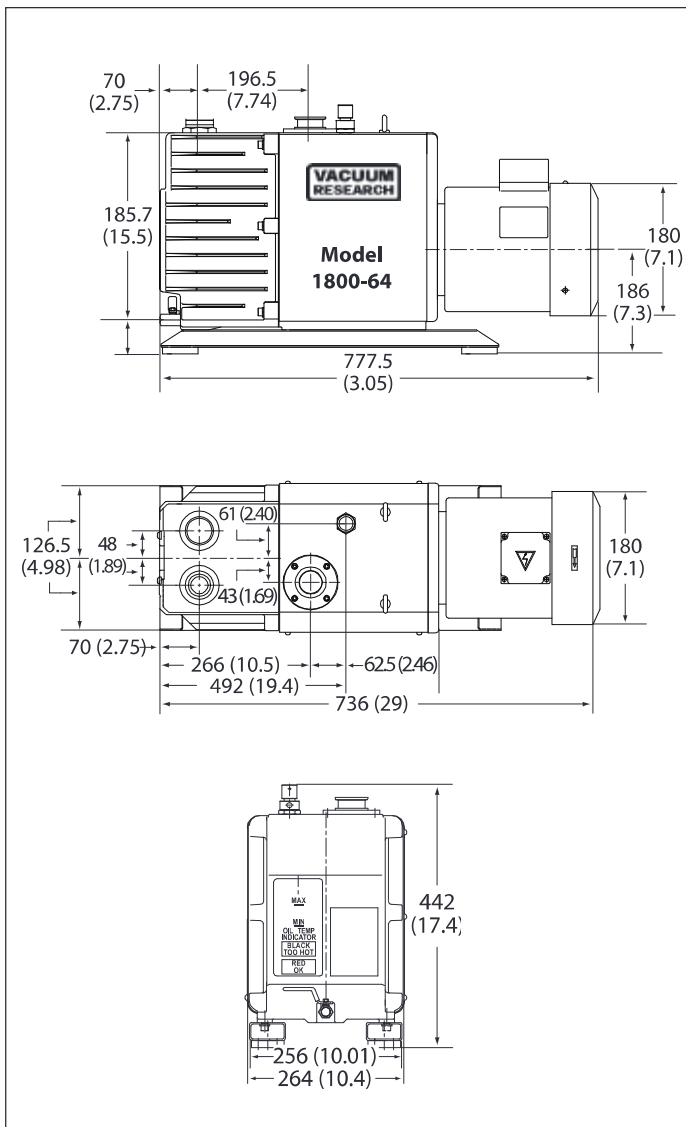
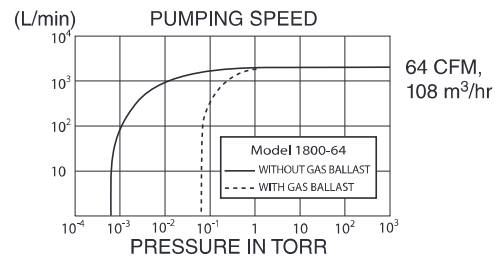
Model 1800-64 has NW-40 flanges for inlet and exhaust ports

### Features

- Extremely Quiet • Anti Suck Back Design
- Satisfaction Guaranteed • Two Year Warranty
- Virtually Vibration Free • Motors for Any Voltage
- Complies with Machinery Directive 98/37/EC

### Applications

- Plasma Systems • Electron Microscopes
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Backing Turbo Pumps
- Sputter & Deposition Systems



Pumping Speed @ 60 Hz	1800 l/min, 64 CFM, 108 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-4</sup> Torr, 6.7x10 <sup>-2</sup> Pa, .0006 mbar
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, 6.7 Pascal, .06 mbar
Standard Motor, On/Off Switch, Circuit	220/380V, 3 phase, 5 hp, 50/60 Hz
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motors	See ordering information
Power Connection	Junction Box
Motor speed @ 60 Hz	1700 r.p.m.
Noise Level	57 dB
Water Vapor Tolerance	40 mbar, 30 Torr
Oil capacity	6200 cc; 6.5 Qt.
Lifting Lugs (on center of gravity)	2 Rings, 3/4" (19 mm) ID, M8 Thread
Holes in Base for Lag Bolts	4 Holes, 0.5" (12 mm) 22"x7" (550x178)
Weight Net: 265 lbs., 120 kg	Shipping: 410 lbs., 186 kg
Intake & exhaust type/diameter	NW-40 standard (Contact factory for more options)
Inlet Screen	Cone Shaped Removable Screen
Ambient operating temperature	7° to 40°C, 45° to 104°F

### Ordering Information

#### MODEL 1800-35 Vacuum Pump With Motor:

Note: Tolerance is ± 10% of nominal value for all voltages.

200V, 50/60 Hz, 3 phase, 3.7 kw (5 hp)

p/n 1800-CE-200 50/60.....\$9566

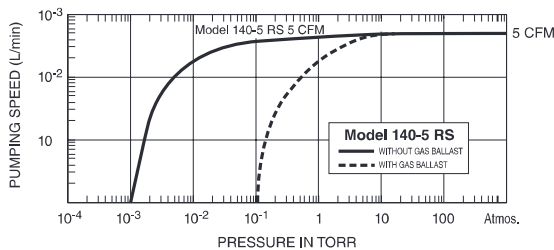
220/380V, 50/60 Hz, 3 phase, 3.7 kw (5 hp)

p/n 1800-CE-380 50/60.....\$9566

230/460V, 50/60 Hz, 3 phase, 3.7 kw (5 hp)

p/n 1800-CE-230-460 50/60.....\$9566

**Fomblin:** For pumps filled with Fomblin PFPE fluid YL VAC 16/6  
add to p/n "Fomblin" and increase the price to.....\$13,569



Pumping Speed @ 60 Hz	140 l/min, 5 CFM, 8.5 m <sup>3</sup> /hr.
Ultimate Pressure Gas Ballast Closed	5x10 <sup>-3</sup> Torr, .007 mbar, 5 Microns
Ultimate Pressure Gas Ballast Open	5x10 <sup>-2</sup> Torr, .07 mbar, 50 Microns
Standard Motor, Includes On/Off	115V, 1 phase, 60 Hz, 1/2 hp
Switch & Circuit Breaker	
CE Mark, complies with	Machinery Directive 98/37/EC
Optional Motor	230V, 1 phase, 50 Hz, 1/2 hp
Power Connection	6 ft. (2 m) 3 conductor cord
Motor speed @ 60 Hz	1700 r.p.m.
Oil capacity	500 cc; 0.53 Qt.
Weight Net: 40 lbs., 18 kg	Shipping: 45 lbs., 21 kg
Intake & exhaust type/diameter	Tee with 1 of 3/8 & 1 of 1/4 in. fittings NW-16 or NW-25 optional
Exhaust	Through Handle
Ambient operating temperature	7° to 40°C, 45° to 104°F

## Ordering Information

### MODEL 140-5 Rotary Vane Vacuum Pump.

p/n 140-115-60 115V, 60 Hz, 1 phase, 1/2 hp.....\$983

p/n 140-230-60 230V, 50 Hz, 1 phase, 1/2 hp.....\$983

NW-16 or NW-25 Intake instead of tube tee described in specifications.

Order as a separate item: P/N 140-16 or P/N 140-25.....\$77

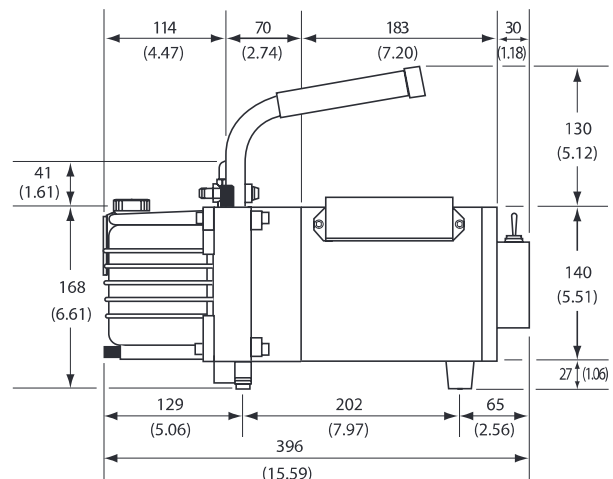
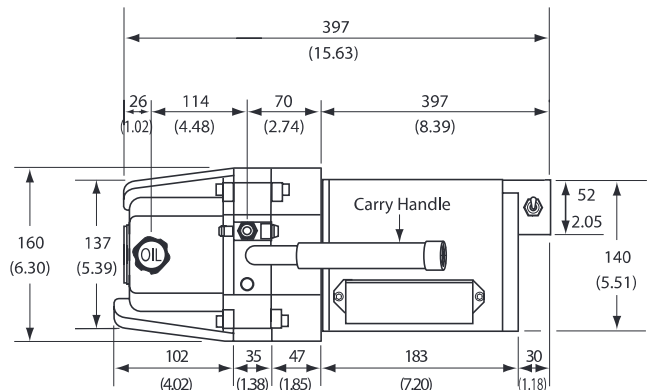
NW-16 and NW-25 intake flanges face the side of the pump.

## Features

- Extremely Quiet
- Virtually Vibration Free
- Two Year Warranty
- Anti Suck Back Design
- Corrosion Resistant
- Motors for Any Voltage
- Satisfaction Guaranteed
- Complies with Machinery Directive 98/37/EC

## Applications

- Refrigeration and A/C Service
- Vacuum Ovens and Furnaces
- Electron Microscopes
- Freeze Dryers
- Cluster Tool Load Locks
- Sputter and Deposition Systems
- Vacuum Ovens & Furnaces • Freeze Dryers
- Cluster Tool Load Locks • Backing Turbo Pumps
- Sputter & Deposition Systems



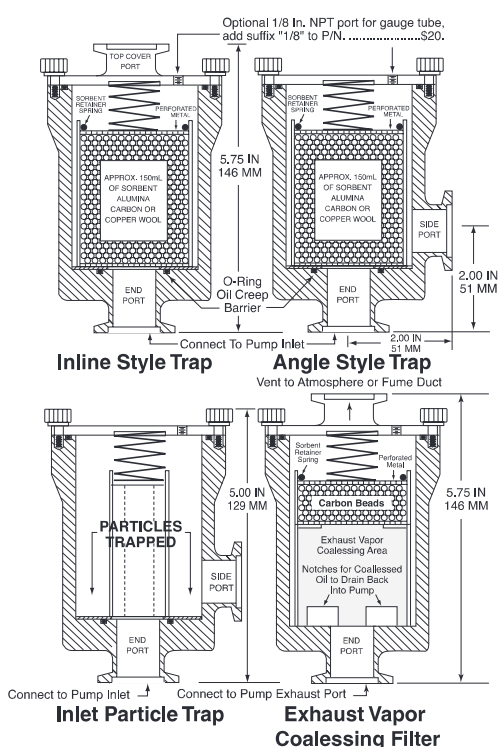


# Foreline Traps to Keep Pump Vapor Out of Your System



Photo shows Inline style and Angle style with NW-25 flanges. NW-16, NW-40, and connections for 3/4" and 1" rubber hose also available.

- Select Copper Wool, Activated Alumina or Carbon
- Available in Both Right Angle and Inline Styles
- Orient in Any Direction, Spring Loaded Sorbent Bed
- Positive Creep Proof Design with O-Ring Seal
- Fits Pumps up to 21 CFM, 36 m<sup>3</sup>/Hr, 600 l/min.
- Leak Tested to Better than 2 X 10<sup>-9</sup> scc/sec
- Any Mix of Ports for Rubber Hose or NW Flanges
- No Tools Needed For Easy Sorbent Replacement
- Aluminum Body and Sorbent Basket; 316 SS Spring



Inline Trap		Exhaust Vapor Coalescing Filter		Port Size & Flange Style
Part Number	Price	Any Angle or Inline P/N.... \$433		
INLINE TRAP 16.....	\$411	ANG EX COALES 16	INL EX COALES 16	NW-16 Flange
INLINE TRAP 25.....	\$411	ANG EX COALES 25	INL EX COALES 25	NW-25 Flange
INLINE TRAP 3/4.....	\$411	ANG EX COALES 3/4	INL EX COALES 3/4	3/4" Outside Diam.
INLINE TRAP 1.0.....	\$411	ANG EX COALES 1.0	INL EX COALES 1.0	1" Outside Diam.
INLINE TRAP 40.....	\$584	NOT AVAILABLE	NOT AVAILABLE	NW-40 Flange

Angle Trap		Inlet Particle Trap		Port Size & Flange Style
Part Number	Price	Part Number	Price	
ANGLE TRAP 16 ....	\$411	ANG TRAP PART 16.....	\$389	NW-16 Flange
ANGLE TRAP 25 ....	\$411	ANG TRAP PART 25.....	\$389	NW-25 Flange
ANGLE TRAP 3/4 ...	\$411	ANG TRAP PART 3/4.....	\$389	3/4" Outside Diam.
ANGLE TRAP 1.0 ...	\$411	ANG TRAP PART 1.0.....	\$389	1" Outside Diam.
ANGLE TRAP 40 ...	\$584	ANG TRAP PART 40.....	\$595	NW-40 Flange

Also available with mixed flanges, such as: NW-16 on one port and NW-25 on the other. Specify Alumina, Carbon, Copper Wool Sorbent.

## Replacement Sorbent and Spare Parts

Description	Part#	Price	Description	Part#	Price
Active Alumina Sorbent, approximately 300 ml (two charges)	V801163	\$28	Sorbent Basket Assembly (without sorbent)	V801160	\$95
Activated Carbon Sorbent, V801164		\$27	Particle Trap Standpipe	V74050	\$73
approximately 300 ml (two charges)			Top Cover O-Ring	V206141	\$4
Copper Wool Sorbent, V801165		\$38	Sorbent Basket O-Ring	V206142	\$5
approximately 300 ml (two charges)			Spring	V308654	\$11
One container of two sorbent charges is included with each trap.			Thumb Screws, set of 4	V801162	\$4



Inlet Trap with NW-40 Flanges

## Pump Inlet Traps Keep Process Debris out of Pump

- Use with Vane, Piston & Scroll Vacuum Pumps
- Safeguard From Particles and Contamination
- Protect Vacuum System from Backstreaming

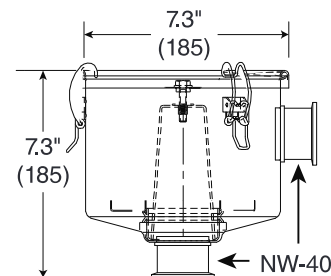
VRC's low cost inlet traps protect your pump from damage due to process debris entering the pump. Easy to change fiberglass, alumina or paper element and high flow NW-40 ports. Install in any orientation.

P/N: INLET TRAP 40 FIBERGLASS .....\$754  
P/N: INLET TRAP 40 ALUMINA .....\$754  
P/N: INLET TRAP 40 PP (PAPER) .....\$754

**Replacement Fiberglass Element**  
P/N: RV801268.....\$27

**Replacement Alumina Element**  
P/N: RV810266.....\$27

**Replacement Paper Element**  
P/N: RV810267.....\$27



VRC Vane Pumps are extremely reliable and will give years of service in almost any application. This long service life is the reason for our 2 Year Warranty for both parts and labor. But also important is the ease with which the pumps can be repaired in the field if eventually repairs are needed. Virtually any mechanic using common hand tools and without special training can completely overhaul our pumps and, with the appropriate replacement parts, restore the pump to like new performance levels.

When provided with the proper replacement parts, your inhouse technicians or local pump repair contractor can easily repair your VRC Pump. Part numbers, prices and complete ordering information for both minor and major parts kits are included in our paper catalog and at [www.vacuumresearch.com](http://www.vacuumresearch.com). Exploded view drawings similar to the example below are available for all of our pumps. Minor and major kits for all models are in stock in Pittsburgh, and individual parts are also available.

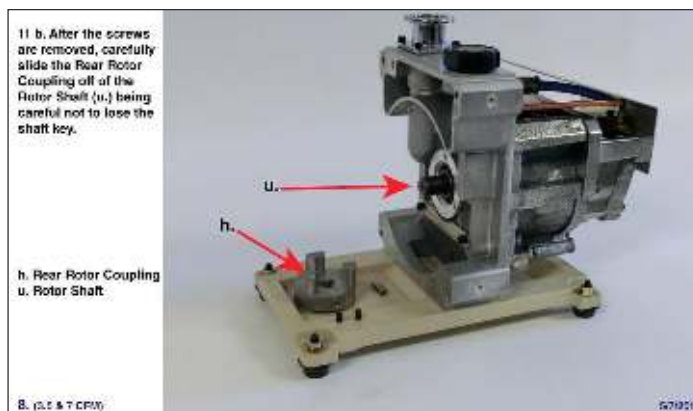
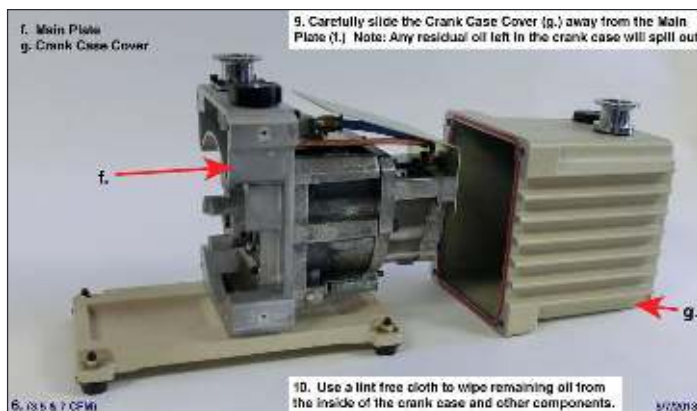
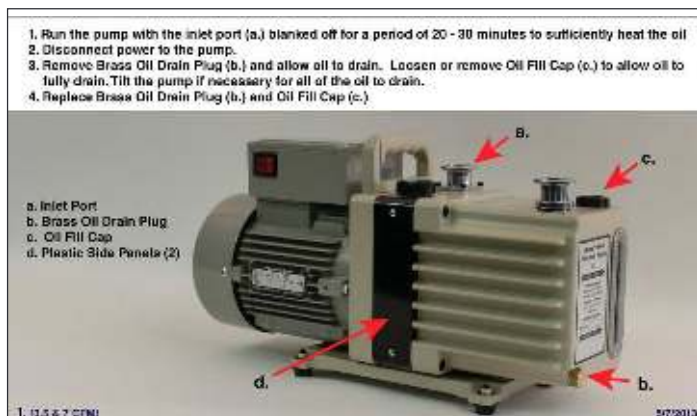
With regard to getting the best performance from your Vacuum Pump, it is important to pay careful attention to the pump oil. Most obvious is to keep the oil level where it is supposed to be. Just as important is the color of the oil, and any change will tell you to change the oil, or at least run the pump with the gas ballast open. Unfortunately such monitoring is often easier said than done, because the pumps are typically installed on the floor, and in areas that are not so accessible. Best practice when installing your pump is to keep in mind the need to regularly monitor the sight glass and to periodically change the pump oil.



### **Complete Rebuilds, Kits, or Individual Parts are Available**

Exploded view drawings like this one are available for all VRC pumps to help your technicians or pump repair contractor quickly return your pump to service.

An experienced pump repair technician with the correct replacement parts can rebuild any VRC pump using common hand tools and his personal experience with similar rotary vane pumps. As an aid to less experienced technicians and even those with no experience at all VRC provides for all pump models online repair guides with photographs and detailed instructions. Samples of the guides for our model 100-35 and 200-70 pumps are shown below. If during your attempt to rebuild your VRC pump you encounter some difficulty or have questions not covered by the guide you should not hesitate to call or email our factory in Pittsburgh. Naturally there is no charge for such questions.



Minor Parts Kits		
Minor kits include all O-Rings, seals, check valves, and coupling inserts for the particular model of pump.		
Model/Capacity L/min - CFM	Part Number	Price
Model 50-1.8	RV 9000005-A	\$178
Model 100-3.5	RV 900001-A	\$254
Model 200-7	RV 900002-A	\$256
Model 400-14	RV 900004-A	\$272
Model 600-21	RV 900006-A	\$335
Model 800-28	RV 900008-A	\$371
Model 1000-35	RV 900010-A	\$586
Model 1500-53	RV 900015-A	\$611
Model 1800-64	RV 900018-A	\$636

Major Parts Kits		
Major kits include all the O-Rings and seals found in the Minor Kits plus a complete set of valves, valve springs and spring guides.		
Model/Capacity L/min - CFM	Part Number	Price
Model 50-1.8	RV 9000050-A	\$597
Model 100-3.5	RV 900100-A	\$639
Model 200-7	RV 900200-A	\$700
Model 400-14	RV 900400-A	\$828
Model 600-21	RV 900600-A	\$959
Model 800-28	RV 900800-A	\$1,170
Model 1000-35	RV 901000-A	\$1,499
Model 1500-53	RV 901500-A	\$1,707
Model 1800-64	RV 901800-A	\$1,766



## VPO-3000 Vacuum Pump Fluid

This hydrocarbon vacuum pump fluid is intended for use in VRC Rotary Vane Pumps. Our VPO-3000 fluid is a narrow cut distillation fraction that gives good ultimate vacuum with low backstreaming yet it provides the excellent lubrication needed for long pump life.



VPO-3000 is a good choice in a wide variety of general and special vacuum services that require frequent pumpdown cycles including optical film coating, heat treating furnaces, vacuum ovens, decorative coatings by evaporation, sputtering and LPCVD.

### Specifications VPO-3000

Vapor Pressure (Torr) @ 25°C ..... $1 \times 10^{-6}$	Viscosity (cSt/SUS) @40°C/100°F ..... 63.9/320
Boiling Point @ 0.01 Torr ..... 130°C	@100°C/210°F ..... 8.5/54
Pour Point ..... -13°C	Form ..... Clear amber liquid
Flash Point ..... 241°C	Hazardous
Fire Point ..... 253°C	Decomposition ..... None
Specific Gravity (g/cc) ..... 0.872	Incompatibility ..... Flame
	Hazardous Ingredients ..... None

Size/Volume	Part Number	Price
1 gallon (3.8 liter)	VPO-3000GAL	\$31.00
5 gallon (18.9 liter)	VPO-30005GAL	\$154.00

## VPF-1000 Vacuum Pump Flushing Fluid

This flushing fluid was developed to improve and simplify cleaning procedures for VRC Rotary Vane Pumps. This low viscosity fluid will flush out particulates and residuals that usually settle in the bottom of pumps.



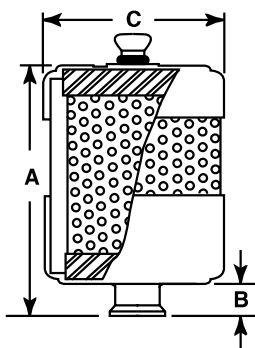
Flushing with VPF-1000 is recommended during oil changes before the addition of the new fluid as part of a regular preventive maintenance program. Such regular use improves the service life of all mechanical pumps. It is recommended that the pump be drained while hot, filled with flushing fluid and run for about 10 minutes to properly flush. The pump is then immediately drained again and refilled with our VPO-3000.

### Specifications VPO-3000

Vapor Pressure (Torr) @ 25°C ..... $1 \times 10^{-5}$	Viscosity (cSt/SUS) @40°C/100°F ..... 28/150
Boiling Point @ 0.01 Torr ..... 112°C	@100°C/210°F ..... 4.5/41
Pour Point ..... -15°C	Form ..... Clear amber liquid
Flash Point ..... 218°C	Hazardous
Fire Point ..... 244°C	Decomposition ..... None
Specific Gravity (g/cc) ..... 0.860	Incompatibility ..... Flame
	Hazardous Ingredients ..... None

Size/Volume	Part Number	Price
1 gallon (3.8 liter)	VPF-1000GAL	\$27.00
5 gallon (18.9 liter)	VPF-10005GAL	\$126.00

## Exhaust Mist Eliminators



For 100-3.5 & 200-7 Pumps  
Model **Ex. Fil. NW-25 7 cfm**, P/N RV810220 ..... \$230

For 400-14 Pumps  
Model **Ex. Fil. NW-25 14 cfm**, P/N RV810230 ..... \$290

For Applications with High Flow  
Model **Ex. Fil. NW-25**, P/N RV810250 ..... \$372

For 600-21, 800-28, 1000-35, 1500-53 & 1800-64 Pumps  
Model **Ex. Fil. NW-40 64 cfm**, P/N RV810240 ..... \$525

### Replacement Fiberglass Elements

Model RPL. Elem. 7 cfm P/N RV810221 (4.0 in. high X 2.2 in. O.D.) ..... \$47

Model RPL. Elem. 14 cfm P/N RV810231 (3.8 in. high X 4.0 in. O.D.) ..... \$74

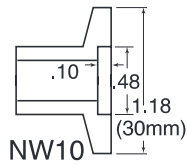
Model RPL. Elem. 64 cfm P/N RV810241 (4.75 in. high X 9.2 in. O.D.) ..... \$193

Model RPL. Elem. Hi Flo P/N RV810251 (6.15 in. high X 4.0 in. O.D.) ..... \$74

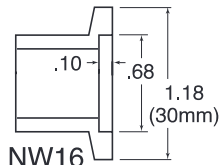
Dimensions					
P/N	A Height	B	C Diameter	Flanges	Flow
RV 810220	5.5	0.88	2.5	NW-25	3.5 or 7 cfm pumps
RV 810230	5.25	0.88	5.13	NW-25	10-14 cfm pumps High Flow Applications
RV 810240	7.13	2.13	10.25	NW-40	20 to 64 cfm pumps
RV 810250	9.25	0.88	5.13	NW-25	High Flow Applications



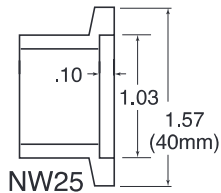
## NW Style Flange Dimensions



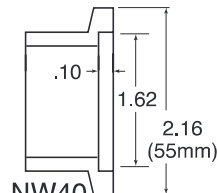
NW10



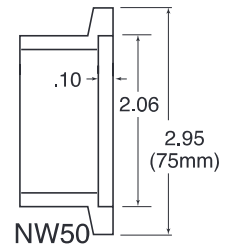
NW16



NW25

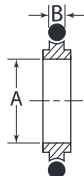


NW40



NW50

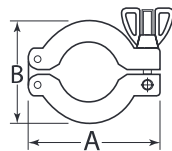
## Centering Rings, SS, Viton O-Ring



Flange	A	B	Part No.	Price
NW-16	0.63 (16)	0.21 (53)	CTR-RING-16	\$5.00
NW-25	0.984 (25)	0.21 (53)	CTR-RING-25	\$6.00
NW-40	1.575 (40)	0.21 (53)	CTR-RING-40	\$8.00
NW-50	1.969 (50)	0.21 (53)	CTR-RING-50	\$10.00

Replacement O-Rings			
Buna-N		Viton	
Part No.	Pack of 5	Part No.	Pack of 5
X701314B	\$5.00	X701314V	\$9.00
X701320B	\$6.00	X701320V	\$15.00
X701326B	\$7.00	X701326V	\$19.00
X701330B	\$8.00	X701330V	\$21.00

## Clamps, Cast Aluminum



Flange	A	B	Thickness	Part No.	Price
NW-16	2.24 (57)	1.69 (43)	0.63 (16)	AL-CLAMP-16	\$5.00
NW-25	2.76 (70)	2.17 (55)	0.63 (16)	AL-CLAMP-25	\$6.00
NW-40	3.39 (88)	2.76 (70)	0.63 (16)	AL-CLAMP-40	\$7.00
NW-50	4.33 (110)	3.70 (94)	0.79 (20)	AL-CLAMP-50	\$9.00

## Rubber and PVC Vacuum Hose



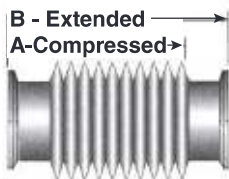
Hose Material	Hose I.D.	Hose O.D.	Part No.	Price
Rubber	.188"	.563"	HOSE-RUB-3/16"	\$9.00/Foot
Rubber	.25"	.625"	HOSE-RUB-1/4"	\$16.00/Foot
Rubber	.75"	1.5"	HOSE-RUB-3/4"	\$15.00/Foot
Rubber	1"	2"	HOSE-RUB-1"	\$25.00/Foot
Reinforced PVC	1.5"	1.8125"	HOSE-RUB-1.5"	\$15.00/Foot
Reinforced PVC	2"	2.375"	HOSE-RUB-2"	\$18.00/Foot



### Stainless Steel Hose Clamps

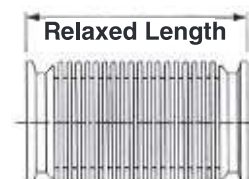
Hose I.D.	Price	Price
For 1.5" O.D. Rubber Hose	HOSE CLAMP 1.5	\$4.00
For 2" O.D. Rubber Hose	HOSE CLAMP 2.0	\$3.00
For 1.8" O.D. PVC Hose	HOSE CLAMP 2.0	\$3.00
For 2.4" O.D. PVC Hose	HOSE CLAMP 2.5	\$3.50

## Compressible/ Formed Bellows



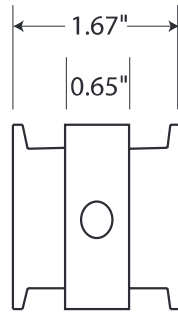
Flange	Material	A mm	B mm	Part No.	Price
NW-16	304 S.S.	80	100	COMP-BEL-16-100	\$231.00
NW-25	304 S.S.	80	100	COMP-BEL-25-100	\$142.00
NW-40	304 S.S.	80	100	COMP-BEL-40-100	\$154.00
NW-50	304 S.S.	80	100	COMP-BEL-50-100	\$175.00

## Formed Stainless Steel Bellows



250 mm (10 inches)		500 mm (19 inches)		1000 mm (38 inches)	
PART NO.	PRICE	PART NO.	PRICE	PART NO.	PRICE
BEL-16-250	\$66.00	BEL-16-500	\$108.00	BEL-16-1000	\$129.00
BEL-25-250	\$82.00	BEL-25-500	\$108.00	BEL-25-1000	\$134.00
BEL-40-250	\$104.00	BEL-40-500	\$146.00	BEL-40-1000	\$208.00
BEL-50-250	\$137.00	BEL-50-500	\$157.00	BEL-50-1000	\$221.00

## Gauge Tube Spool Piece



These small aluminum spool pieces make it easy to install 1/8 NPT or VCR-4 vacuum sensors into any system using NW style flanges. Otherspecial connections can be provided. Two (2) ports are standard with upto four (4) available.

Flange	Part No. for 1/8 NPT Ports	Price
NW-16	SPOOL PC-16-1/8 NPT	\$72
NW-25	SPOOL PC-25-1/8 NPT	\$88
NW-40	SPOOL PC-40-1/8 NPT	\$104
NW-50	SPOOL PC-50-1/8 NPT	\$115

Flange	Part No. for 1/8 VCR Ports	Price
NW-16	SPOOL PC-16-VRC 4 MALE	\$132
NW-25	SPOOL PC-25-VRC 4 MALE	\$147
NW-40	SPOOL PC-40-VRC 4 MALE	\$163
NW-50	SPOOL PC-50-VRC 4 MALE	\$174

## NW-NW Conical Reducers



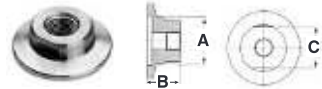
Flange	Material	A	B	C	Part No.	Price
NW25 / NW16	Aluminum	40	30	40	CONRED-NW-25-16	\$48
NW40 / NW16	Aluminum	55	30	40	CONRED-NW-40-16	\$54
NW40 / NW25	Aluminum	55	40	40	CONRED-NW-40-25	\$57
NW50 / NW16	Aluminum	75	30	40	CONRED-NW-50-16	\$63
NW50 / NW 25	Aluminum	75	40	40	CONRED-NW-50-25	\$68
NW50 / NW40	Aluminum	75	55	40	CONRED-NW-50-40	\$71

## NW-NW Conical Reducers



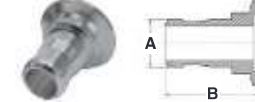
Flange	Material	A	B	C	Part No.	Price
ISO80/NW40	Aluminum	110	55	63	CONRED-80/NW40	\$164
ISO100/NW40	Aluminum	130	55	63	CONRED-100/NW40	\$192
ISO80/NW50	Aluminum	110	75	63	CONRED-80/NW50	\$175
ISO100/NW50	Aluminum	130	75	63	CONRED-100/NW50	\$208
ISO63/NW25	Aluminum	95	40	63	CONRED-63/NW25	\$132
ISO63/NW40	Aluminum	95	55	63	CONRED-63/NW40	\$142
ISO63/NW50	Aluminum	95	75	63	CONRED-80/NW50	\$154

## NW Female Pipe Adaptors



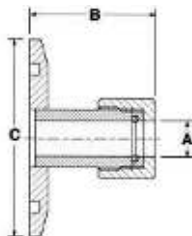
Flange	Material	A	B	C	Part No.	Price
NW16/1/8" FNPT	Aluminum	19.05	25	17	NW16/1/8"FNPT-ADP	\$26
NW16/1/4" FNPT	Aluminum	19.05	25	17	NW16/1/4"FNPT-ADP	\$26
NW25/1/8" FNPT	Aluminum	25.4	25	19	NW25/1/8"FNPT-ADP	\$28
NW25/1/4" FNPT	Aluminum	25.4	25	19	NW25/1/4"FNPT-ADP	\$28
NW40/1/8" FNPT	Aluminum	38.1	25	32	NW40/1/8"FNPT-ADP	\$31
NW40/1/4" FNPT	Aluminum	38.1	25	32	NW40/1/4"FNPT-ADP	\$31
NW40/1/2" FNPT	Aluminum	38.1	25	32	NW40/1/2"FNPT-ADP	\$31
NW50/1/8" FNPT	Aluminum	50.8	25	46	NW50/1/8"FNPT-ADP	\$42
NW50/1/4" FNPT	Aluminum	50.8	25	46	NW50/1/4"FNPT-ADP	\$42
NW50/2" FNPT	304 SS	75	79	63	NW50/2"FNPTSS-ADP	\$284

## NW Rubber Hose Adaptor



Flange	Material	A (inch)	B (inch)	Part No.	Price
NW 16	Aluminum	6.4 (.25)	19 (.75)	NW16-HOSE-0.25	\$20
NW 16	Aluminum	9.6 (.38)	19 (.75)	NW16-HOSE-0.38	\$20
NW 16	Aluminum	12.5 (.50)	19 (.75)	NW16-HOSE-0.50	\$20
NW 16	Aluminum	19 (.75)	40 (1.57)	NW16-HOSE-.75	\$20
NW 25	Aluminum	6.35 (.25)	19 (.75)	NW25-HOSE-.25	\$23
NW 25	Aluminum	9.5 (.38)	19 (.75)	NW25-HOSE-0.38	\$23
NW 25	Aluminum	12.7 (.50)	19 (.75)	NW25-HOSE-.50	\$23
NW 25	Aluminum	15.9 (.625)	57 (2.25)	NW25-HOSE-.625	\$23
NW 25	Aluminum	19 (.75)	40 (1.57)	NW25-HOSE-.75	\$23
NW 25	Aluminum	22.2 (.875)	40 (1.57)	NW25-HOSE-.875	\$23
NW 25	Aluminum	26.7 (1.05)	40.6 (1.6)	NW25-HOSE-1.0	\$23
NW 40	Aluminum	39 (1.55)	40 (1.57)	NW40-HOSE-1.55	\$30
NW 40	Aluminum	41.3 (1.625)	40 (1.57)	NW40-HOSE-1.6	\$30
NW 50	Aluminum	47.7 (1.875)	40 (1.57)	NW50-HOSE-1.9	\$40
NW 50	Aluminum	50.8 (2.00)	50.8 (2.00)	NW50-HOSE-2.0	\$50

## NW Quick-Connect Adaptors



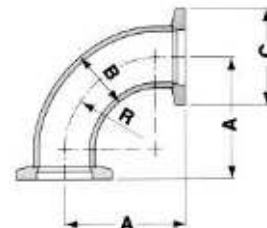
Flange	Material	A	B	C		Part No.	Price
NW16 to 1/4" Tube	304 S.S.	6.5	33.4	30	1/4 inch	QUICK-NW16-1/4	\$53
NW16 to 1/2" Tube	304 S.S.	13	36.5	30	1/2 inch	QUICK-NW16-1/2	\$58
NW16 to 3/4" Tube	304 S.S.	19.3	44.5	30	3/4 inch	QUICK-NW16-3/4	\$63
NW25 to 1/2" Tube	304 S.S.	13	36.5	40	1/2 inch	QUICK-NW25-1/2	\$63
NW25 to 3/4" Tube	304 S.S.	19.3	44.5	40	3/4 inch	QUICK-NW25-3/4	\$69
NW25 to 1" Tube	304 S.S.	25.7	50.8	40	1 inch	QUICK-NW25-1	\$81
NW40 to 1/2" Tube	304 S.S.	13	36.5	55	1/2 inch	QUICK-NW40-1/2	\$70
NW40 to 3/4" Tube	304 S.S.	19.3	44.5	55	3/4 inch	QUICK-NW40-3/4	\$74
NW40 to 1" Tube	304 S.S.	25.7	50.8	55	1 inch	QUICK-NW40-1	\$84
NW40 to 1 1/2" Tube	304 S.S.	38.4	60.3	55	1 1/2 inch	QUICK-NW40-1.5	\$158
NW50 to 1 1/2" Tube	304 S.S.	38.4	60.3	75	1 1/2 inch	QUICK-NW50-1.5	\$179
NW50 to 2" Tube	304 S.S.	51	60.3	75	2 inch	QUICK-NW50-2	\$189

## NW 45° Elbows



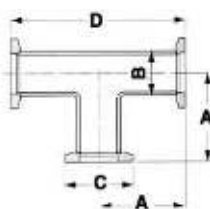
Flange	Material	A	Part No.	Price
NW-16	304 S.S.	23	NW-16-45-ELBOW	\$42
NW-25	304 S.S.	28	NW-25-45-ELBOW	\$51
NW-40	304 S.S.	43	NW-40-45-ELBOW	\$63
NW-50	304 S.S.	51	NW-50-45-ELBOW	\$84

## NW 90° Elbows



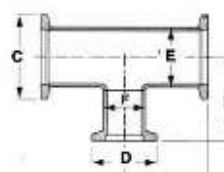
Flange	Material	A	B	C	R	Part No.	Price
NW-16	304 S.S.	40	19.05	30	28.6	NW-16-90-ELBOW	\$42
NW-25	304 S.S.	50	25.4	40	38.1	NW-25-90-ELBOW	\$51
NW-40	304 S.S.	65	38.1	55	57.2	NW-40-90-ELBOW	\$63
NW-50	304 S.S.	80	50.8	75	76.2	NW-50-90-ELBOW	\$84

## NW Tees



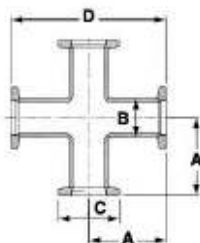
Flange	Material	A	B	C	D	Part No.	Price
NW-16	304 S.S.	40	19.05	30	80	NW-16-TEE	\$60
NW-25	304 S.S.	50	25.4	40	100	NW-25-TEE	\$66
NW-40	304 S.S.	65	38.1	55	130	NW-40-TEE	\$82
NW-50	304 S.S.	70	50.8	75	140	NW-50-TEE	\$120

## NW Unequal Tees



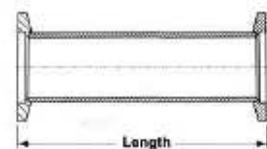
Flange	Material	A	B	C	D	E	F	Part No.	Price
NW25 to NW16	304 S.S.	50	40	40	30	25.4	19.05	NW-25-UT-16	\$66
NW40 to NW16	304 S.S.	65	40	40	100	38.1	19.05	NW-40-UT-16	\$79
NW50 to NW25	304 S.S.	70	50	75	140	50.8	19.05	NW-50-UT-16	\$120
NW40 to NW40	304 S.S.	65	50	55	130	38.1	25.4	NW-40-UT-25	\$88
NW50 to NW50	304 S.S.	70	65	75	140	50.8	38.1	NW-50-UT-25	\$126

## NW 4-Way Crosses



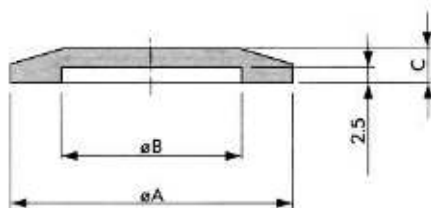
Flange	Material	A	B	C	D	Part No.	Price
NW-16	304 S.S.	40	19.05	30	80	NW-16-CROSS	\$93
NW-25	304 S.S.	50	25.4	40	100	NW-25-CROSS	\$104
NW-40	304 S.S.	65	38.1	55	130	NW-40-CROSS	\$137
NW-50	304 S.S.	70	50.8	75	140	NW-50-CROSS	\$186

## NW Full Nipples



Flange	Length	Part No.	Price
NW-16	80 mm	NW-16-NIPPLE-S	\$38
NW-16	320 mm	NW-16-NIPPLE-L	\$58
NW-25	100 mm	NW-25-NIPPLE-S	\$80
NW-25	320 mm	NW-25-NIPPLE-L	\$92
NW-40	130 mm	NW-40-NIPPLE-S	\$59
NW-40	320 mm	NW-40-NIPPLE-L	\$103
NW-50	140 mm	NW-50-NIPPLE-S	\$77
NW-50	320 mm	NW-50-NIPPLE-L	\$128

## Blank Caps



Flange	Outside Diam.	Material	Part No.	Price
NW-16	1.18 (30 mm)	Aluminum	Blank-16	\$7.00
NW-25	1.57 (40 mm)	Aluminum	Blank-25	\$8.00
NW-40	2.16 (55 mm)	Aluminum	Blank-40	\$9.00
NW-50	2.95 (75 mm)	Aluminum	Blank-50	\$11.00

Flange	Outside Diam.	Material	Part No.	Price
NW-16	1.18 (30 mm)	304 SS	Blank-16 SS	\$9.00
NW-25	1.57 (40 mm)	304 SS	Blank-25 SS	\$10.00
NW-40	2.16 (55 mm)	304 SS	Blank-40 SS	\$11.00
NW-50	2.95 (75 mm)	304 SS	Blank-50 SS	\$13.00



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