



Agilent Technologies

Vacuum Products Division

TriScroll™ 610
Dry Scroll
Vacuum Pump

*INSTALLATION AND
OPERATION MANUAL*

Manual No.699904295

Revision F

February 2005

TriScroll™ 610

Dry Scroll Vacuum Pump



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Declaration of Conformity
Konformitätserklärung
Déclaration de Conformité
Declaración de Conformidad
Verklaring de Overeenstemming
Dichiarazione di Conformità



Agilent Technologies

We
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Nosotros
Wij
Noi

Agilent, Inc.
Vacuum Products Division
121 Hartwell Avenue
Lexington, MA, 02421-3133 USA

declare under our sole responsibility that the product,
erklären, in alleniniger Verantwortung, daß dieses Produkt,
déclarons sous notre seule responsabilité que le produit,
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verklaren onder onze verantwoordelijkheid, dat het product,
dichiariamo sotto nostra unica responsabilità, che il prodotto,

TriScroll Series Vacuum Pump

to which this declaration relates is in conformity with the following standard(s) or other normative documents.
auf das sich diese Erklärung bezieht, mit der/den flogenden Norm(en) oder Richtlinie(n) übereinstimmt.
auquel se réfère cette déclaration est conforme à la (auz) norme(s) ou au(x) document(s) normatif(s).
al que se refiere esta declaración es conforme a la(s) norma(s) u otro(s) documento(s) normativo(s).
waamaar deze verklaring verwijst, aan de volende norm(en) of richtlijn(en) beantwoordt.
a cui se riferisce questa dichiarazione è conforme alla/e sequente/I norma/o documento/I normativo/i.

98/37/EEC, Machinery Directive

EN 1012-2:1996	Compressors and Vacuum Pumps Safety Requirements; Part 2 Vacuum Pumps
EN 1050:1996	Safety of machinery - principles for risk assessment
EN 60204-1	Electrical equipment of industrial machines; general requirements

73/023/EEC, Low Voltage Directive

EN 60034 part 1	Rotating electrical machines - Part 1: Rating and performance
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89/336/EEC, Electromagnetic Compatibility Directive

EN 61000-4-2	Testing and Measurement Techniques - Electrostatic Discharge Immunity Test
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John Ehmann
Operations Manager
Agilent, Inc.
Agilent, Inc.
Lexington, Massachusetts, USA

March 2003

Contacting Agilent

In the United States, you can contact Agilent Customer Service at 1-800-882-7426. See the back cover of this manual for a listing of our sales and service offices.

Visit our web site at:

<http://www.chem.agilent.com/en-US/Products/Instruments/vacuum/pages/default.aspx>.

TriScroll 610 Dry Scroll Vacuum Pump

Table 1 Specifications (Continued)

Item	Specification
Motor rating	
Single phase model PIN - PTS06001 UNIV	1.00 HP (0.75 kW) 1 phase/50-60 HZ/1 00-115:200-230 VAC
Three phase model PIN - PTS06003UNIV	1.00 HP (0.75 kW) 3 phase/50 Hz/200-230:380-415 VAC 3 Phase/60 Hz/200-230:460 VAC
Motor full load currents	See Table 2
Motor thermal protection	Type N automatic
Operating speed	1725 RPM; 60 Hz 1425 RPM; 50 Hz
Cooling system	Air-cooled
Weight	31 kg (69 lbs).
Media	Clean air. No toxic, corrosive, explosive or particulate forming gases.

TriScroll 610 Dry Scroll Vacuum Pump

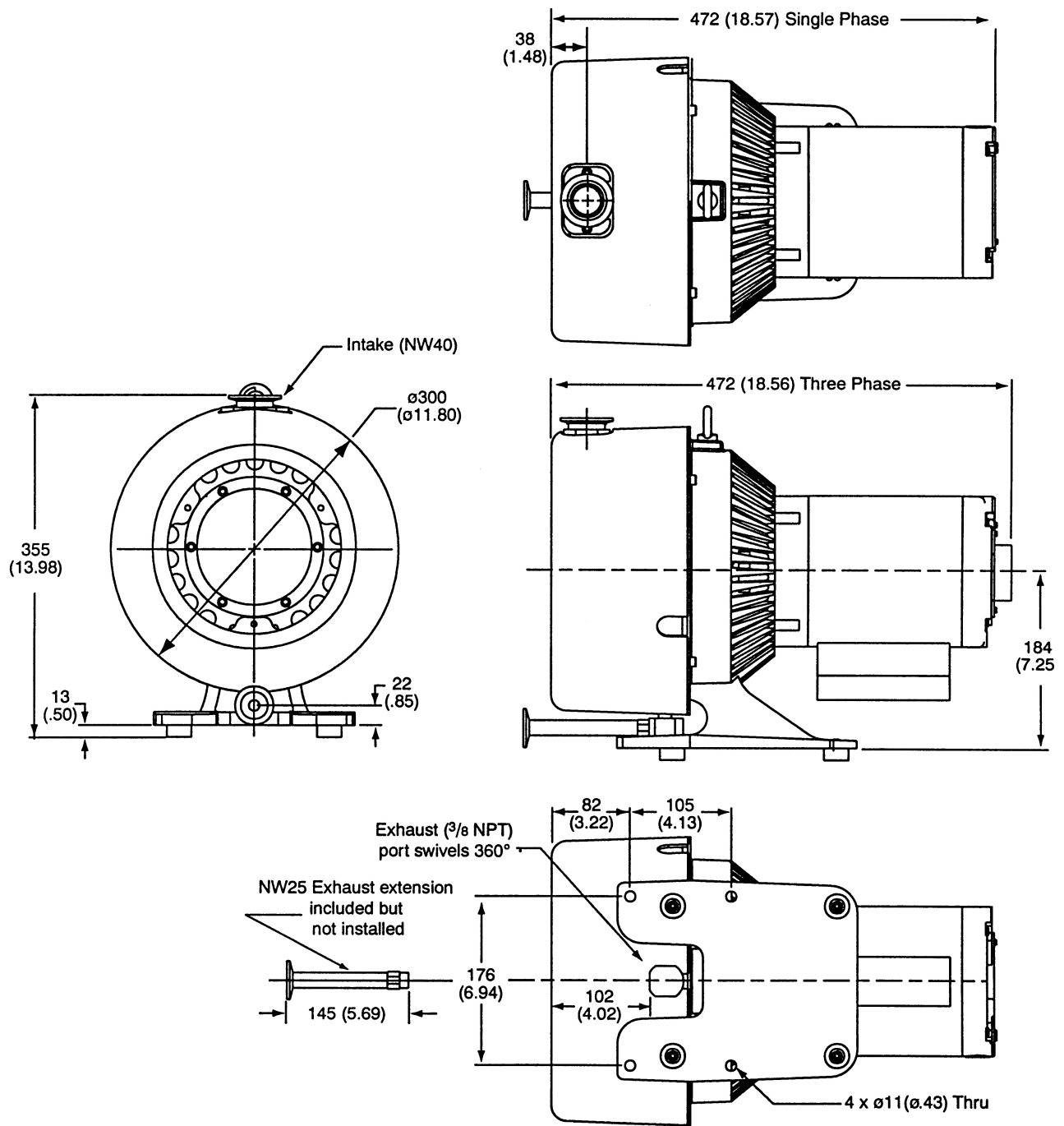


Figure 2 TriScroll 610 Vacuum Pump Interface Drawing

TriScroll 610 Dry Scroll Vacuum Pump

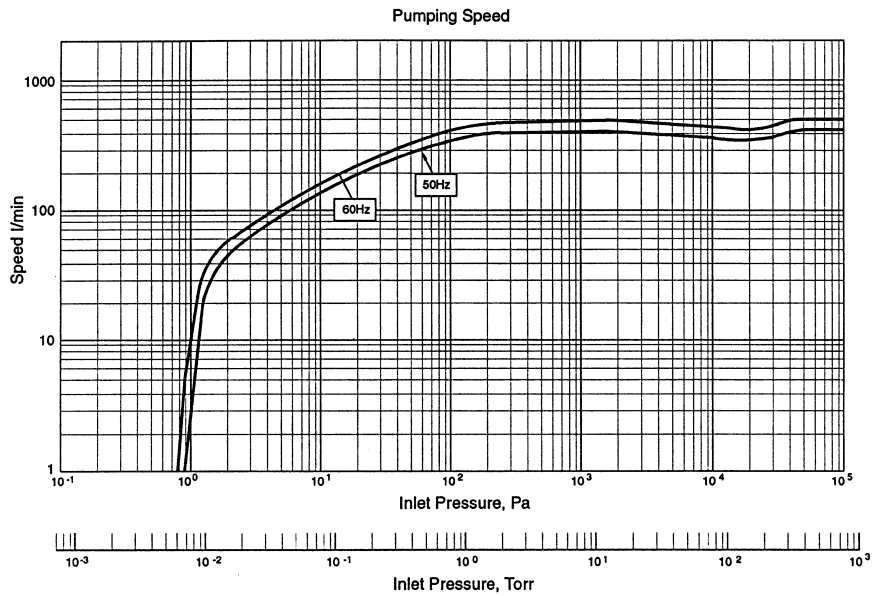


Figure 3 TriScroll 610 Vacuum Pump Speed Curves

Unpacking and Inspection

The shipping container is a double carton. After opening the outer box, removing the foam packing and this manual, slit open the inner box. Lift the pump, with plywood base, out of the inner box. Remove the four bolts securing the pump frame to the plywood base. Locate the NW25 exhaust fitting and set aside. Inspect the pump for damage. If there is shipping damage, contact the freight carrier immediately and be sure to save the carton and packing materials.

Installation

Safety

Installation

WARNING



Do not remove or modify any safety or insulating equipment from the pump. To do so may create a serious safety hazard and may void the warranty.

This pump is designed to pump air only; it is not designed to pump explosive, flammable, toxic, or corrosive gases. They can cause bodily injury, explosion, or fire.

Although the pump can pump trace particulates normally found in the atmosphere, it is not designed for process solids, chemicals, powders, solvents, condensates, or particulates. They can damage the equipment, degrade its performance, or shorten its useful life.

This pump is designed to pump air only; it is not designed to pump explosive, flammable, toxic, or corrosive gases. They can cause bodily injury, explosion, or fire.

Although the pump can pump trace particulates normally found in the atmosphere, it is not designed for process solids, chemicals, powders, solvents, condensates, or particulates. They can damage the equipment, degrade its performance, or shorten its useful life.

Install in an area that is not exposed to rain, steam, or excessive humidity. They can cause electric shock, short circuits, and severe bodily injury.

WARNING



Before inspecting or servicing the pump, be sure the electrical supply is disconnected.

Consult a qualified electrician whenever changing wiring on the pump.

Protect against short circuits by installing a circuit breaker of the proper capacity.

CAUTION



Consult a qualified electrician whenever changing wiring on the pump.

The pump operates in a clockwise direction when viewed from the motor end. (Note the arrow on the pump frame.) Improper rotation can cause permanent damage to the pump.

Startup

NOTE



Check that the inlet screen is installed in each pump model before beginning operation.

WARNING



Do not insert a finger or foreign object in the path of the fan; serious personal injury may result or the pump may be damaged.

CAUTION



Do not block the fan ducts because the pump can become overheated. A pump surface temperature in excess of 55 °C (131 °F) is potentially damaging. If such conditions are observed, turn the pump off and allow it to cool. Disassemble, inspect for damage, and repair if necessary.

Operate the pump at the ambient temperature of 5 °C to 40 °C (41 °F to 104 °F), otherwise damage to the pump or shortened operating life may result.

Close the isolation valve between the vacuum pump and the vacuum chamber before startup or shutdown; debris may be sucked back into the vacuum chamber.

TriScroll 610 Dry Scroll Vacuum Pump

Electrical Connections

Wire the motor and electrical interlocks (if applicable) in accordance with local electrical codes and the relevant electrical component manufacturer's instructions. Table 2 lists the full load motor currents in Amps at various voltages.

Table 2 TriScroll 610 Full Load Motor Currents

	VAC				
	100	115	200	230	
1 phase motor 50 Hz	14.0	13.6	7.0	6.8	
1 phase motor 60 Hz	15.2	12.6	7.6	6.3	
	VAC				
	200	230	380	415	460
3 phase motor 50 Hz	4.4	4.4	2.2	2.2	-
3 phase motor 60 Hz	4.4	4.4	-	-	2.2

TriScroll 610 Dry Scroll Vacuum Pump

Single Phase Motor Connection

1. Remove the motor cover (item 13 in Figure 1 on page 1) by removing three screws (items 12 in Figure 1 on page 1).
2. Check the electrical supply voltage. The motor can be wired for low (100-115) or high (200-230) voltage.
3. As supplied from the factory, the single phase motor is wired for low voltage. Refer to Figure 4 to configure the motor circuit to match your supply voltage.
4. Two options are available to strain relieve the electrical supply cable. The cable can be mechanically held under the electrical cover in the groove provided. The groove is sized for a 14 gauge cable. A 1/2 -14 NPSM hole is also provided next to the motor cover. (The clamp fitting is not provided.)
5. Wire L 1 and L2 per Figure 4 using right angle flag connectors or ring connectors. Make certain that no exposed wiring is in proximity to the electrical cover or to other terminals on the board.
6. Secure the ground wire under the ground screw using a ring connector.
7. Install the motor electrical cover with three (3) screws.

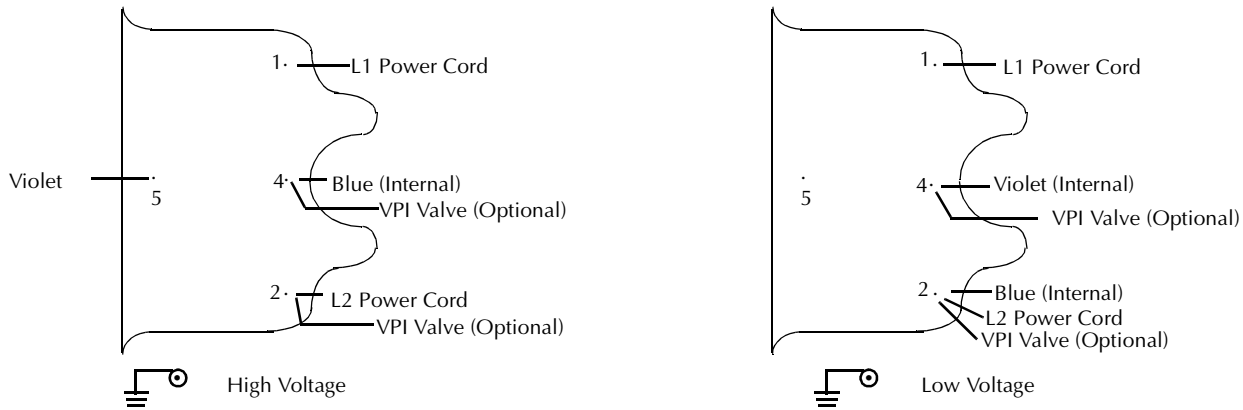


Figure 4 Motor Electrical Connections: 1 Phase Motor

TriScroll 610 Dry Scroll Vacuum Pump

Three Phase Motor Connection

1. Remove the motor cover (item 13 in Figure 1) by removing three screws (items 12 in Figure 1 on page 1).
2. Check the electrical supply voltage. The motor can be wired for low (200 - 230) or high (380 - 415, 460) voltage. As supplied from the factory, the three phase motor is wired for low voltage. Refer to Figure 5 on page 8 to configure the motor circuit to match your supply voltage.

Two options are available to strain relieve the electrical supply cable. The cable can be mechanically held under the electrical cover in the groove provided. The groove is sized for a 14 gauge cable. A 1/2 -14 NPSM hole is also provided next to the motor cover. (The clamp fitting is not provided.)

3. Wire L 1, L2 and L3 per Figure 5 using right angle flag connectors or ring connectors. Make certain that no exposed wiring is in proximity to the electrical cover or to other terminals on the board.
4. Secure the ground wire under the ground screw using a ring connector.
5. Install the motor electrical cover with three (3) screws.
6. Momentarily switch on the pump to verify proper rotation. With the intake uncovered, a large gas flow should come out the pump exhaust. If there is no flow out the exhaust, reverse any two of the leads (L 1, L2 or L3). Repeat the test to verify correct rotation.

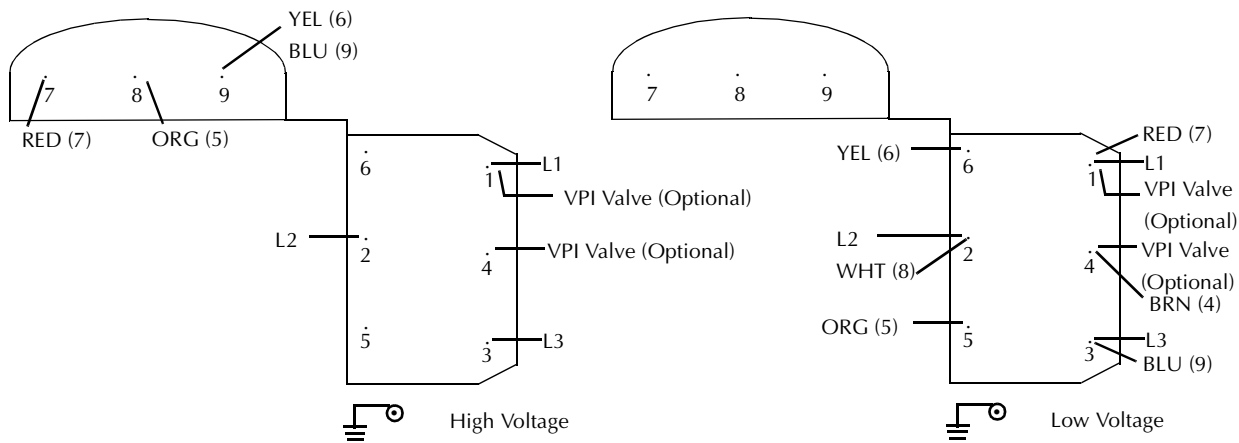


Figure 5 Motor Electrical Connections: 3 Phase Motor

Mechanical Connections

Pump Location

Locate the pump on a firm, level surface. Mounting holes provided in the frame can be used to provide permanent attachment. The rubber feet on the frame can be removed if desired.

Isolation Valve

Because scroll pumps return to atmospheric pressure quickly when shut off, the installation of a fast acting, automatic, normally closed isolation valve is strongly recommended to prevent pump debris from being transported back into the vacuum chamber when the pump is turned off. The opening of this valve should occur simultaneously with or after pump start up. Valve closing should occur before, simultaneously with, but no later than 250 milliseconds after pump shut off. This valve should be NW40 or larger and mounted as close as possible to the pump inlet. Mounting to the pump inlet is ideal (see Figure 6).

TriScroll 610 Dry Scroll Vacuum Pump

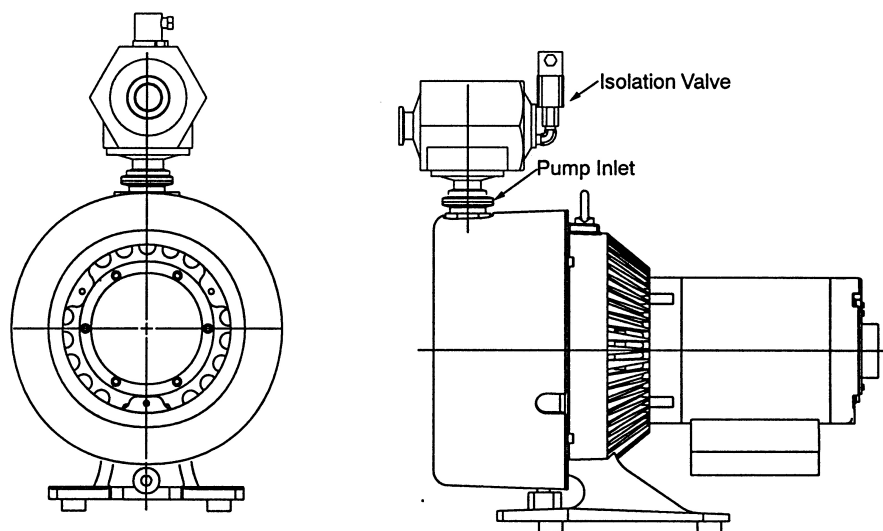


Figure 6 Isolation Valve Location

Agilent offers a variety of manual, electromagnetic and electro-pneumatic controlled vacuum valves for vacuum applications. The Agilent Vacuum Pump Isolation (VPI) Valve is highly recommended for vacuum pump isolation applications. The VPI valve application and installation information for use with TriScroll vacuum pumps has been included below. Consult your Agilent catalog or sales representative for the appropriate valve for your application.

Table 3 VPI Valve Installation Data

TriScroll Vacuum Pump	VPI Valve Part # NW25	VPI Valve Part # NW40	Solenoid Operating Volt- age Range	Wiring Diagram
100-120 V 50/60 Hz 1 Phase	VPI251205060	VPI401205060	90-132 V 50/60 Hz	Figure 4 on page 7 low voltage
200-230 V 50/60 Hz 1 Phase	VPI251205060	VPI401205060	90-132 V 50/60 Hz	Figure 4 on page 7 high voltage
200 V 50/60 Hz 3 Phase	VPI251205060	VPI401205060	90-132 V 50/60 Hz*	Figure 5 on page 8 low voltage
230 V 50/60 Hz 3 Phase	VPI251335060	VPI401335060	120-146 V 50/60 Hz*	Figure 5 on page 8 low voltage
380 V 50/60 Hz 3 Phase	VPI252205060	VPI402205060	180-264 V 50/60 Hz*	Figure 5 on page 8 high voltage
415 V 50/60 Hz 3 Phase	VPI252205060	VPI402205060	180-264 V 50/60 Hz*	Figure 5 on page 8 high voltage

TriScroll 610 Dry Scroll Vacuum Pump

Table 3 VPI Valve Installation Data (Continued)

TriScroll Vacuum Pump	VPI Valve Part # NW25	VPI Valve Part # NW40	Solenoid Operating Volt- age Range	Wiring Diagram
460 V 50/60 Hz 3 Phase	VPI252665060	VPI402665060	239-293 V 50/60 Hz*	Figure 5 on page 8 high voltage

* Solenoid operating voltages are lower than the TriScroll vacuum pump operating voltages in order to utilize the TriScroll motor's internal thermal switch to actuate the VPI Valve.

Overview

When installed correctly, the position of the VPI Valve is controlled by the TriScroll vacuum pump motor internal thermal switch and its electrical supply. The VPI Valve will open when the pump is running and close when it is stopped. It will also close if the TriScroll motor thermal overload protection switch shuts down the pump.

NOTE *To prevent damage to the VPI Valve it must be installed only as specified below.*



Wiring

Reference Table 3 to verify that the VPI Valve to be installed is compatible with the TriScroll Vacuum Pump supply voltage and frequency. Then, find the proper wiring diagram to use from Table 2. Remove the pump motor cover and connect the VPI Valve solenoid wire leads to the pump motor as shown in the diagram. Replace the pump motor cover, and verify that the valve is properly grounded prior to applying electrical power.

Rotation of Pump Module with Respect to Frame

The standard pump configuration is the intake fitting positioned vertically. If necessary for installation, the pump intake can be rotated 90° in either direction. (Installation at angles other than 0° and ± 90° is not possible.)

A.

1. Remove two (2) M5 screws (item 14 on figure 1) that secure the inlet fitting to the scroll module.
2. Remove the inlet fitting, complete with the inlet screen, inlet clamp and inlet O-ring.

3. Remove three (3) M5 screws (item 1 on Figure 1 on page 1) that secure the cowling to the scroll module. Remove the cowling.
4. Tilt the pump back so that the rear end of the motor touches the floor.
5. Remove four (4) M6 screws (item 8 on Figure 1 on page 1) holding the frame and scroll module together. 0 Axially separate the frame and scroll module.
6. Rotate the module 90° in either direction and realign the two (2) locating pins on the scroll module with the mating frame holes. Ensure that the rubber spider is still on the motor coupling and that the coupling teeth are properly aligned.
7. Rejoin the scroll module with the frame and install and tighten four (4) M6 screws.
8. Reinstall the cowling using three (3) M5 screws.

B.

- ☐ Reinstall the inlet fitting, inlet screen, inlet clamp and inlet O-ring using two (2) M5 screws.

Pump Inlet

Use NW40, or larger, clean vacuum hardware with as short a length as practical between the pump and vacuum chamber.

Use a bellows to provide both vibration isolation and strain relief between the pump and vacuum chamber.

Pump Exhaust

A female 3/8 National Pipe Thread exhaust fitting is located underneath the scroll module. This fitting swivels 360°. Additionally, a NW25 adapter is provided with a 3/8 National Pipe Thread male thread.

To avoid overheating the pump, do not restrict the exhaust flow with long lengths of small diameter tubing. Use as short as practical lengths of NW16, or larger, diameter hardware.

Gas Ballast

The pump incorporates an automatic gas ballast to prevent water and other condensates from accumulating within the pump. The standard configuration is a sintered filter installed in the 1/4 National Pipe Thread gas ballast port (item 9 on Figure 1 on page 1). This allows enough atmospheric air to enter the pump in order to purge condensates while not effecting pump ultimate pressure or pumping speed.

For applications where the ingress of atmospheric air is undesirable, dry nitrogen at a flow rate of -5 lpm can be bled into the gas ballast port. Blocking of the gas ballast port is not recommended.

Bearing Purge

A 1/4 **National Pipe Thread** bearing purge port (item 6 on Figure 1 on page 1) is provided to protect the main crankshaft bearings in applications where large amounts of water are being pumped. In the standard configuration, the port is sealed. Contact Agilent for further information.

Operation

Unlike conventional oil-sealed pumps, Agilent's dry scroll pumps contain no fluid to cleanse them of accumulated dust and debris. Therefore, it is good practice to run the pump periodically at atmosphere for a minute or two to flush out the pump. Until experience is gained on your specific process, flush the pump regularly and adjust according to your specific conditions.

Start Up Procedure

1. Ensure that the vacuum system isolation valve is closed.
2. Turn on pump.
3. Open the isolation valve.

Shutdown Procedure

1. Close the vacuum system isolation valve. This prevents debris in pump from being transported into the vacuum system.
2. Turn off pump.

Troubleshooting

Table 4 contains a list of possible problems, their probable causes, and corrective actions.

Table 4 Troubleshooting Chart, TriScroll 610 Pump

Problem	Possible Cause	Corrective Action
Pump won't start	Circuit breaker open	Close breaker. Identify cause of overload.
	Motor thermal protector open	Allow motor to cool. Identify cause of overload.
	Electrical short under motor electrical cover	Inspect and repair.
	Wiring loose or cut	Repair or replace.
	Excessive voltage drop	Check size and length of cable.
	Defective motor	Inspect. Contact Agilent.
Poor ultimate pressure	System leak	Locate and repair leak.
	Water in pump	Flush pump with air or dry nitrogen.
	Solvent in pump	Flush pump with air or dry nitrogen. Install trap or filter.
	Seals worn out	Rebuild pump.
	Poor conductance to pump	Replumb with shorter and/or larger diameter tubing.
Pump makes hammering noise	Pump overheated	Check ventilation to pump. Check ambient temperature.
	Debris in pump	Check intake screen. Flush pump. Disassemble pump and inspect.

TriScroll 600 Series Maintenance Manual

General Information

Agilent TriScroll 600 series pumps are designed to provide years of trouble-free service if maintenance procedures and intervals are observed. Cleaning, bearing grease replenishment and tip seal replacement is recommended when pump base pressure has risen to an unacceptably high level for your application. Bearings, rotary seals and o-rings should also be replaced if the pump exhibits humming or grinding noises from the bearings. Main bearing life may be shortened if your application requires the pumping of high quantities of water vapor. Use of the bearing purge described earlier will keep this water from impacting bearing life.

Maintenance should be performed in accordance with procedures, tooling and materials specified in the manuals listed below.

Related TriScroll Manuals

Other manuals related to the Installation and Operation, Tip Seal and Pump Module Replacement for TriScroll 600 series pumps are listed in Table 5.

Table 5 Related TriScroll Manuals

Part Number	Title	Applicable TriScroll Model
699904290	Installation and Operation Manual	All TriScroll 600 models
699904295	Installation and Operation Manual	All TriScroll 610 models
699904310	Tip Seal Replacement Manual	All TriScroll 600 and 610 models
699904300	Pump Module Replacement Manual	All TriScroll 600 and 610 models
699904305	Maintenance Manual	All TriScroll 600 and 610 models
699904300	Maintenance Manual	All TriScroll 600 and 610 models

Maintenance and Tooling Kits

Material and tooling required to perform maintenance on TriScroll pumps is provided in kit form. A description of each kit and ordering information is provided in Table 6.

Table 6 Maintenance and Troubleshooting Kits

Part Number	Description	Contents	Applicable TriScroll Model
PTSS0600MK	Maintenance Kit	All bearings, bearing seals, bearing lubricant, O-rings, and tip seals required to rebuild TriScroll 600 series pumps.	All TriScroll 600 and 610 models
PTSS0600TK	Maintenance Tool Kit	All fixtures and tools required to perform any maintenance on TriScroll 300 series and TriScroll 600 series pumps.	All TriScroll 300, 310, 600 and 610 models

TriScroll 610 Dry Scroll Vacuum Pump

Table 6 Maintenance and Troubleshooting Kits (Continued)

Part Number	Description	Contents	Applicable TriScroll Model
PTSS0600TS	Replacement Tip Seal Set	Replacement Tip Seals and static O-rings for TriScroll 600 series pumps. Note: Maintenance Tool Kit required for tip seal replacement.	All TriScroll 600 and 610 models.

Factory Service Options

Agilent offers factory-rebuild service or advance exchange of complete TriScroll Pumps or Factory Service Options (Table 7).

Table 7 Factory Service Options

Model	Factory Service Options
EXPPTS06001	Advance Exchange TriScroll 600 Single Phase Pump
EXPPTS06003	Advance Exchange TriScroll 600 Three Phase Pump
EXPPTS06101	Advance Exchange TriScroll 610 Single Phase Pump
EXPPTS06103	Advance Exchange TriScroll 610 Three Phase Pump
EXPTS0600SC	Advance Exchange TriScroll 600 Pump Module Only
EXPTS0610SC	Advance Exchange TriScroll 610 Pump Module Only
PTS0600KMA	Service/Rebuild TriScroll 600 Pump (Single, or Three Phase)
TS0610KMA	Service/Rebuild TriScroll 610 Pump (Single, or Three Phase)
PTS0600SCR	Service/Rebuild TriScroll 600 Pump Module Only
PTS0610SCR	Service/Rebuild TriScroll 610 Pump Module Only



Vacuum Products Division Instructions for returning products

Dear Customer:

Please follow these instructions whenever one of our products needs to be returned.

- 1) Complete the attached Request for Return form and send it to Agilent Technologies (see below), taking particular care to identify all products that have pumped or been exposed to any toxic or hazardous materials.
- 2) After evaluating the information, Agilent Technologies will provide you with a Return Authorization (RA) number via email or fax, as requested.

Note: Depending on the type of return, a Purchase Order may be required at the time the Request for Return is submitted. We will quote any necessary services (evaluation, repair, special cleaning, eg).

3) Important steps for the shipment of returning product:

- Remove all accessories from the core product (e.g. inlet screens, vent valves).
- Prior to shipment, drain any oils or other liquids, purge or flush all gasses, and wipe off any excess residue.
- If ordering an Advance Exchange product, **please use the packaging from the Advance Exchange to return the defective product.**
- Seal the product in a plastic bag, and package product carefully to avoid damage in transit. You are responsible for loss or damage in transit.
- Agilent Technologies is not responsible for returning customer provided packaging or containers.
- **Clearly label package with RA number.** Using the shipping label provided will ensure the proper address and RA number are on the package. Packages shipped to Agilent without a RA clearly written on the outside cannot be accepted and will be returned.

- 4) Return only products for which the RA was issued.
- 5) **Product being returned under a RA must be received within 15 business days.**
- 6) **Ship to the location specified on the printable label, which will be sent, along with the RA number, as soon as we have received all of the required information.** Customer is responsible for freight charges on returning product.
- 7) Return shipments must comply with all applicable **Shipping Regulations** (IATA, DOT, etc.) and carrier requirements.

RETURN THE COMPLETED **REQUEST FOR RETURN** FORM TO YOUR NEAREST LOCATION:

EUROPE:

Fax: 00 39 011 9979 330
Fax Free: 00 800 345 345 00
Toll Free: 00 800 234 234 00
vpt-customer care@agilent.com

NORTH AMERICA:

Fax: 1 781 860 9252
Toll Free: 800 882 7426, Option 3
vpl-ra@agilent.com

PACIFIC RIM:

please visit our website for individual office information
<http://www.agilent.com>



Vacuum Products Division
Request for Return Form
(Health and Safety Certification)

Please read important policy information on Page 3 that applies to all returns.

1) CUSTOMER INFORMATION

Company Name:		Contact Name:	
Tel:		Email:	
Fax:		Customer Ship To:	
Customer Bill To:			
Europe only: VAT reg. Number:		USA/Canada only: ☐ Taxable ☐ Non-taxable	

2) PRODUCT IDENTIFICATION

Product Description	Agilent P/N	Agilent S/N	Original Purchasing Reference

3) TYPE OF RETURN (Choose one from each row and supply Purchase Order if requesting a billable service)

- 3A. ☐ Non-Billable ☐ Billable ➡ New PO # (hard copy must be submitted with this form):
- 3B. ☐ Exchange ☐ Repair ☐ Upgrade ☐ Consignment/Demo ☐ Calibration ☐ Evaluation ☐ Return for Credit

4) HEALTH and SAFETY CERTIFICATION

AGILENT TECHNOLOGIES CANNOT ACCEPT ANY PRODUCTS CONTAMINATED WITH BIOLOGICAL OR EXPLOSIVE HAZARDS, RADIOACTIVE MATERIAL, OR MERCURY AT ITS FACILITY.

Call Agilent Technologies to discuss alternatives if this requirement presents a problem.

The equipment listed above (check one):

- ☐ **HAS NOT** pumped or been exposed to any toxic or hazardous materials. OR
- ☐ **HAS** pumped or been exposed to the following toxic or hazardous materials. If this box is checked, the following information must also be filled out. Check boxes for all materials to which product(s) pumped or was exposed:

☐ Toxic ☐ Corrosive ☐ Reactive ☐ Flammable ☐ Explosive ☐ Biological ☐ Radioactive

List all toxic/hazardous materials. Include product name, chemical name, and chemical symbol or formula:

NOTE: If a product is received at Agilent which is contaminated with a toxic or hazardous material that was not disclosed, **the customer will be held responsible** for all costs incurred to ensure the safe handling of the product, and **is liable** for any harm or injury to Agilent employees as well as to any third party occurring as a result of exposure to toxic or hazardous materials present in the product.

Print Name: _____ **Authorized Signature:** _____ **Date:** _____

5) FAILURE INFORMATION:

Failure Mode (REQUIRED FIELD. See next page for suggestions of failure terms):

Detailed Description of Malfunction: (Please provide the error message)

Application (system and model):

I understand and agree to the terms of Section 6, Page 3/3.

Print Name: _____ **Authorized Signature:** _____ **Date:** _____

**Vacuum Products Division
Request for Return Form
(Health and Safety Certification)**

Please use these Failure Mode to describe the concern about the product on Page 2.

TURBO PUMPS and TURBO CONTROLLERS

APPARENT DEFECT/MALFUNCTION	POSITION	PARAMETERS
- Does not start - Does not spin freely - Does not reach full speed - Mechanical Contact - Cooling defective	- Noise - Vibrations - Leak - Overtemperature - Clogging	- Vertical - Horizontal - Upside-down - Other:
		Power: Rotational Speed: Current: Inlet Pressure: Temp 1: Foreline Pressure: Temp 2: Purge flow: OPERATING TIME:

ION PUMPS/CONTROLLERS

- Bad feedthrough - Vacuum leak - Error code on display	- Poor vacuum - High voltage problem - Other
---	--

VALVES/COMPONENTS

- Main seal leak - Solenoid failure - Damaged sealing area	- Bellows leak - Damaged flange - Other
--	---

LEAK DETECTORS

- Cannot calibrate - Vacuum system unstable - Failed to start	- No zero/high background - Cannot reach test mode - Other
---	--

INSTRUMENTS

- Gauge tube not working - Communication failure - Error code on display	- Display problem - Degas not working - Other
--	---

SCROLL AND ROTARY VANE PUMPS

- Pump doesn't start - Doesn't reach vacuum - Pump seized	- Noisy pump (describe) - Over temperature - Other
---	--

DIFFUSION PUMPS

- Heater failure - Doesn't reach vacuum - Vacuum leak	- Electrical problem - Cooling coil damage - Other
---	--

Section 6) ADDITIONAL TERMS

Please read the terms and conditions below as they apply to all returns and are in addition to the Agilent Technologies Vacuum Product Division – Products and Services Terms of Sale.

- Customer is responsible for the freight charges for the returning product. Return shipments must comply with all applicable **Shipping Regulations** (IATA, DOT, etc.) and carrier requirements.
- Customers receiving an Advance Exchange product agree to return the defective, rebuildable part to Agilent Technologies **within 15 business days**. Failure to do so, or returning a non-rebuildable part (crashed), will result in an invoice for the non-returned/non-rebuildable part.
- Returns for credit toward the purchase of new or refurbished Products are subject to prior Agilent approval and may incur a restocking fee. Please reference the original purchase order number.
- Units returned for evaluation will be evaluated, and a quote for repair will be issued. If you choose to have the unit repaired, the cost of the evaluation will be deducted from the final repair pricing. A Purchase Order for the final repair price should be issued within 3 weeks of quotation date. Units without a Purchase Order for repair will be returned to the customer, and the evaluation fee will be invoiced.
- A Special Cleaning fee will apply to all exposed products per Section 4 of this document.
- If requesting a calibration service, units must be functionally capable of being calibrated.

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Agilent Technologies

Vacuum Product Division

United States & Canada

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