

# **Agilent G6696A Oil Free IDP-3 Scroll Pump for Turbo 597X**

## **Installation Guide**



**Agilent Technologies**

# Notices

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## Safety Notices

### CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

### WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

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# 1

## Introduction

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This guide describes how to replace an Edwards, Pfeiffer, or Agilent Rotary Vane Pump, or Pfeiffer Diaphragm pump, with the Agilent G6696A Oil Free IDP-3 Scroll Pump for Turbo 597X on Agilent Technologies Series 5973/75/77 MSD instruments.



## General Information

Model 597X MSD instruments with the Oil Free IDP-3 Scroll Pump for Turbo 597X upgrade installed meet all safety and compliance standards specified for the original instruments. Refer to the original instrument instruction manuals for details.

### Information

Oil Free IDP-3 Scroll Pump for Turbo 597X has been designed and tested in accordance with recognized safety standards, and is designed for use indoors. If it is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired. Whenever the safety protection of the Oil Free IDP-3 Scroll Pump for Turbo 597X has been compromised, disconnect it from all power sources and secure it against unintended operation.

Refer servicing to qualified service personnel. Substituting parts or performing any unauthorized modification to the pump may result in a safety hazard.

### Safety symbols

Warnings and cautions in this guide or on the instrument must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions violates safety standards of design and the intended use of the instrument. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.



**WARNING:**  
**Burn hazard**

Indicates parts that may cause burns when touched.

## Important Safety Warnings

Safety cautions and warnings must be observed during all phases of operation, service, and repair of an Oil Free IDP-3 Scroll Pump for Turbo 597X. Failure to comply with these precautions violates safety standards of design, and may compromise the intended use of the Oil Free IDP-3 Scroll Pump for Turbo 597X. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

**WARNING**

**The pump is designed for operation with neutral or noncorrosive gases. It is not designed to pump corrosive, or particulate forming gases. Failure to adhere to this warning could result in personal injury or death.**

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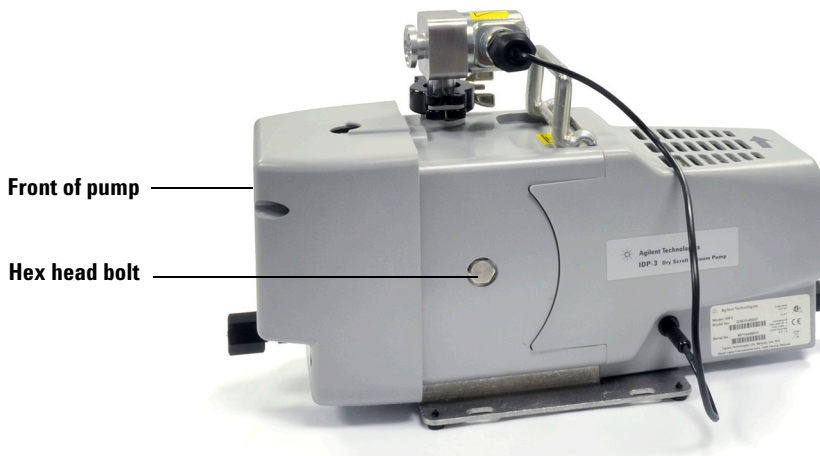
**WARNING**

**Install the pump in an area that is not exposed to liquids, steam, or excessive humidity. Failure to adhere to this warning may result in electric shock, short circuits, and severe bodily injury.**

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## General Safety Precautions

- While running Oil Free IDP-3 Scroll Pump for Turbo 597X:
  - Do not block air flow to the fan. Air flows into the front of the pump (Figure 1).



**Figure 1** IDP-3 pump

- Do not set items on top of Oil Free IDP-3 Scroll Pump for Turbo 597X.
- It is important that the Oil Free IDP-3 Scroll Pump for Turbo 597X does not recirculate hot air. Always position the front end of the Oil Free IDP-3 Scroll Pump for Turbo 597X where it can draw cool air.
- A pump exhibiting high surface temperature should be turned off and allowed to cool.
- Although the pump can pump trace particulates normally found in the atmosphere, it is not designed to process solids, chemicals, powders, liquid solvents, condensates, or other particulates. They can damage the equipment, degrade its performance, or shorten its useful life.
- Do not place the pump near any equipment that is sensitive to vibration.
- Never disturb the hex head bolts on either side of the pump. Disturbing these bolts will cause loss of performance or pump damage (Figure 1).



## Cleaning

To clean the Oil Free IDP-3 Scroll Pump for Turbo 597X:

- Clean the exterior surfaces of the IDP-3 with alcohol or mild detergents only.

## Recycling the Product

For recycling, contact your local Agilent sales office.

## Parts Identification

**Table 1** lists the contents of the Oil Free IDP-3 Scroll Pump for Turbo 597X kit.

**Table 1** Agilent G6696A Oil Free IDP-3 Scroll Pump for Turbo 597X contents list

Part	Quantity	Part number
IDP-3 24V Dry scroll vacuum pump with Isolation valve	1	G3870-80057
IDP-3 24V Power supply	1	G3870-60600
Foreline hose	1	05971-60119
KF16 Hose adapter	2	G1099-20531
KF25 Flange × 5/8 in. ID Hose barb adapter	1	G1099-20532
KF16 Elbow - 45 degree	1	G2589-20141
KF16 Flange × 5/8 in. ID Hose barb elbow	1	G2589-20041
Clamp, Hose .437 in. DIA .56 in. WD SST	2	1400-3241
NW25 Centering ring with O-ring	1	0100-1551
Seal, CNTR RING, NW16, ALUM, Viton	2	KC16AV
NW 10/16 Hinged Clamp with Wing nut, Al	2	KQ16AWP
Exhaust filter cartridge	1	G7077-67017
Breather vent and Adapter	1	G7077-67016
IDP-3 Installation Guide	1	G6696-90010

## Site Preparation

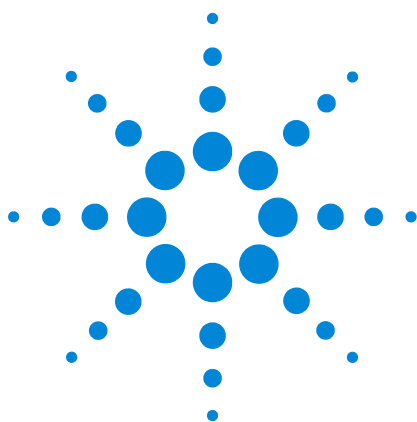
Prepare the installation site in accordance with the site preparation specifications associated with the MSD. Additionally, ensure that the site also supports the criteria specific to the Oil Free IDP-3 Scroll Pump for Turbo 597X, as listed in [Table 2](#).

**NOTE**

Where conflicts exist between these criteria and those of any co-located equipment, the equipment with the tighter tolerances takes precedence.

**Table 2** Site prep information

Criteria	Description
<b>Physical dimensions</b>	
Weight	9.5 kg (21 lbs)
Dimensions	358 × 140 × 181 cm (14.09 × 5.5 × 7.13 inches) (L × W × H)
<b>Temperature and humidity ranges</b>	
Operating ambient temperature	5 to 40 °C (41 to 108 °F)
Relative humidity	0 to 95 % (non-condensing)



## 2 Installation

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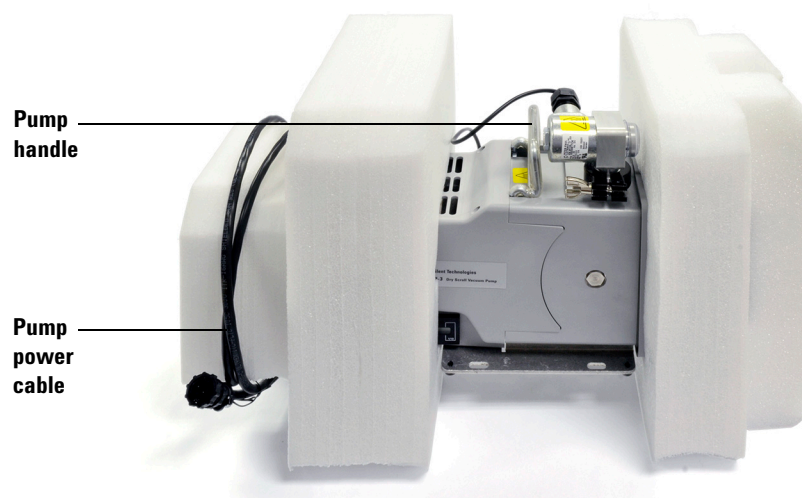
This chapter describes how to replace an Edwards, Pfeiffer, or Agilent Rotary Vane Pump, or Pfeiffer Diaphragm pump, with the Agilent G6696A Oil Free IDP-3 Scroll Pump for Turbo 597X on Agilent Technologies Series 5973/75/77 MSD instruments.



### Unpacking the IDP-3 Pump

To unpack the Agilent G6696A Oil Free IDP-3 Scroll Pump for Turbo 597X:

- 1 Orient the shipping container with *This End Up* on top.
- 2 Open the shipping container. All supplied components are in smaller boxes or bags within the shipping container.
- 3 Remove the boxed and bagged items from the shipping container.
- 4 Open boxes and bags, and then remove all of the supplied components. When removing the pump from its box, do the following:
  - a Have a helper hold the box containing the pump.
  - b Lifting the pump by the pump handle, carefully remove the pump from the box along with the foam packaging surrounding the pump (Figure 2).



**Figure 2** IDP-3 pump with packing material

- c Uncoil the pump power cable.
  - d Remove the foam packaging from the pump. The pump power cable passes through a slot in the bottom of the foam packaging.
- 5 Retain the shipping container and all packing materials.
- 6 Inspect the pump, power supply, and other components for damage. If there is shipping damage, contact the freight carrier and your local Agilent sales office immediately.

## Assembling the Foreline Hose

### CAUTION

**Do Not** use any existing vacuum hoses or fittings. Any retained oil or contamination from previously used hoses or fittings will damage the pump, and result in permanent pump failure.

To assemble the foreline hose:

- 1 Use [Table 3](#) to determine which fittings are required for your installation.

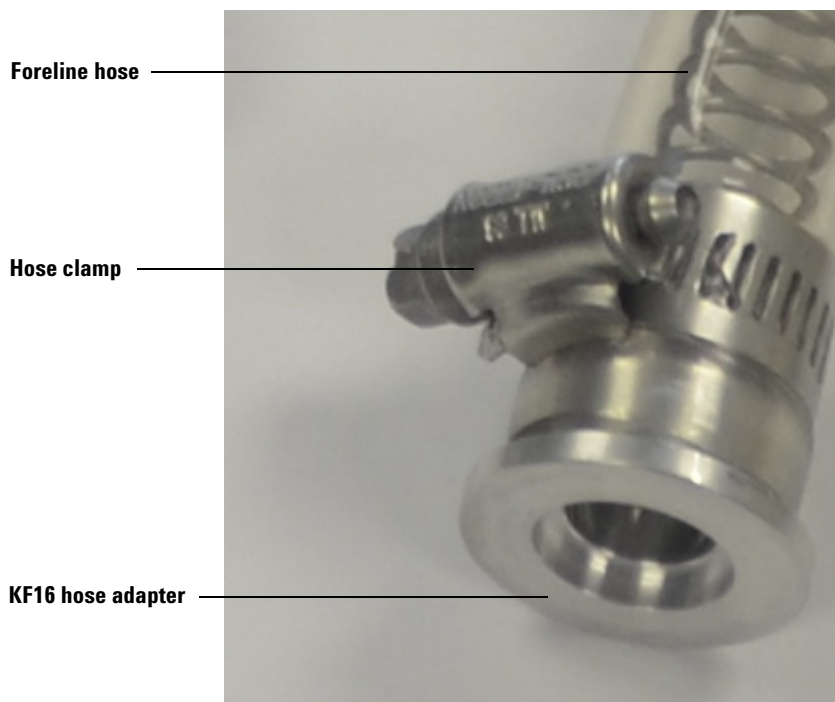
**Table 3** Turbo pump outlet foreline vacuum hose fittings

Configuration	Part number	Part description	Quantity
5973 with Edwards Standard Turbo	G1099-20531	KF16 Hose adapter	1
	G2589-20041	KF16 Flange × 5/8 in ID Hose barb elbow	1
	1400-3241	Clamp-Hose .437 in DIA .56 in WD SST	2
5973 with Edwards Performance Turbo	G1099-20531	KF16 Hose adapter	1
	G1099-20532	KF25 Flange × 5/8 in. ID Hose barb adapter	1
	1400-3241	Clamp-Hose .437 in DIA .56 in WD SST	2
5975 with Pfeiffer TMH 071	G1099-20531	KF16 Hose adapter	1
	G2589-20041	KF16 Flange × 5/8 in ID Hose barb elbow	1
	1400-3241	Clamp-Hose .437 in DIA .56 in WD SST	2
5975 with Pfeiffer TMH 262	G1099-20531	KF16 Hose adapter	1
	G1099-20532	KF25 Flange × 5/8 in. ID Hose barb adapter	1
	1400-3241	Clamp-Hose .437 in DIA .56 in WD SST	2
5973 or 5975 with Pfeiffer HiPace 80	G1099-20531	KF16 Hose adapter	2
	1400-3241	Clamp-Hose .437 in DIA .56 in WD SST	2

**Table 3** Turbo pump outlet foreline vacuum hose fittings

Configuration	Part number	Part description	Quantity
5973 or 5975 with Pfeiffer HiPace 300	G1099-20531	KF16 Hose adapter	1
	G2589-20141	KF16 Elbow - 45 degree	1
	1400-3241	Clamp-Hose .437 in DIA .56 in WD SST	2
5977A with Agilent V304	G1099-20531	KF16 Hose adapter	2
	1400-3241	Clamp-Hose .437 in DIA .56 in WD SST	2
5977A or 5977B with Pfeiffer HiPace 300	G1099-20531	KF16 Hose adapter	1
	G2589-20141	KF16 Elbow - 45 degree	1
	1400-3241	Clamp-Hose .437 in DIA .56 in WD SST	2

- 2 Place a clean cloth on your work surface.
- 3 Assemble the IDP-3 pump side of the foreline hose as follows (Figure 3):



**Figure 3** Foreline hose (IDP-3 pump side)

- a Slide the hose clamp (p/n 1400-3241) over the foreline hose (p/n 05971-60119).

**CAUTION**

Be careful not to scratch the face of the hose adapter. Deep grooves or scratches may prevent a leak-free installation.

- b Spray the KF16 hose adapter (p/n G1099-20531) with isopropyl alcohol (IPA) solvent.
  - c Place the KF16 hose adapter connector face on the cloth on your work surface.
  - d Slide the end of the foreline hose over the KF16 hose adapter.
  - e Secure the KF16 hose adapter in the foreline hose by positioning the hose clamp over the inserted portion of the adapter, and then using a hand tool to tighten hand tight.
- 4 Assemble the turbomolecular pump side of the foreline hose as follows:
- a Slide the hose clamp (p/n 1400-3241) over the foreline hose (p/n 05971-60119).
  - b Locate the correct hose adapter or elbow flange (per [Table 3](#)) for use with the foreline hose.
  - c Spray the hose adapter or elbow flange with IPA solvent.
  - d Place the hose adapter or elbow flange connector face on the cloth on your work surface.
  - e Slide the end of the foreline hose over the hose adapter or elbow flange.
  - f Secure the hose adapter or elbow flange in the foreline hose by positioning the hose clamp over the inserted portion of the adapter or flange, and then using a hand tool to tighten hand tight.

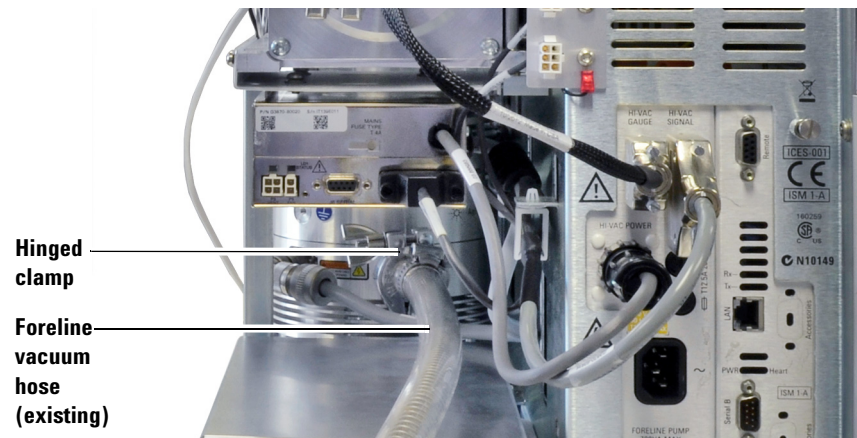
## Removing the Existing Foreline Pump from the MSD

### WARNING

The existing foreline pump may be hot. The foreline pump can cause burns if touched when operating. It has a safety shield to prevent the user from touching it.

To remove the existing foreline pump from the MSD:

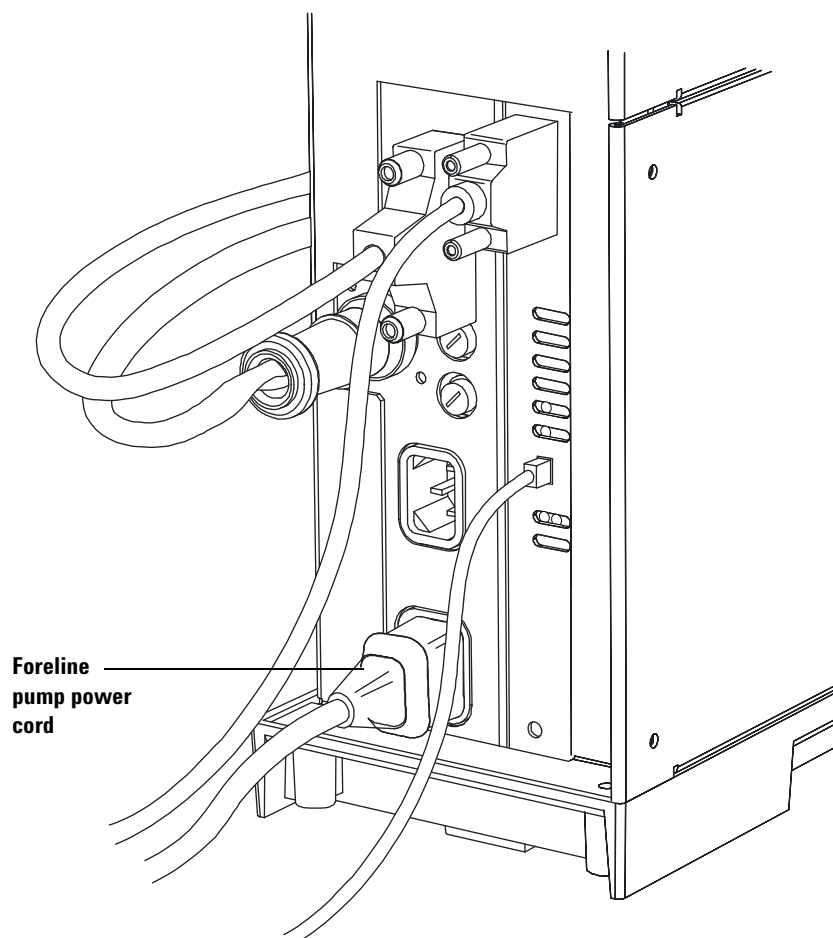
- 1 Vent and shut down the MSD. Venting begins the automated shut down of the MSD. Refer to the *5973, 5975, 5977A or 5977B Operation Manual* for details, as applicable.
- 2 Turn off the MSD.
- 3 Disconnect the MSD from its power outlet.
- 4 On the MSD turbomolecular pump, loosen and remove the hinged clamp securing the hose to the pump ([Figure 4](#)).



**Figure 4** Foreline hose removal, existing pump (typical)

- 5 Retain the removed clamp for use when installing the IDP-3.
- 6 Remove the hose and the Viton centering ring seal from the pump.
- 7 Disconnect the power cord for the existing foreline pump from the MSD electronics module ([Figure 5](#)).





**Figure 5** MSD electronics module, foreline pump power cord

**WARNING**

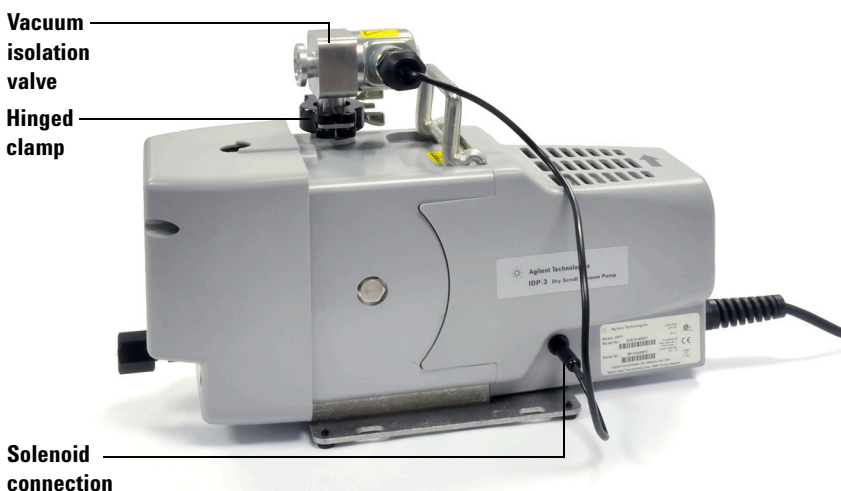
**The old pump oil may contain toxic chemicals. Treat it as hazardous waste.**

- 8** Remove the existing foreline pump and foreline hose from the MSD.
- 9** Dispose of the existing pump, foreline hose, and fittings in accordance with all local regulations. Contact your local recycler for specific instructions.

## Installing the IDP-3 Pump

To install the Agilent G6696A Oil Free IDP-3 Scroll Pump for Turbo 597X:

- 1 The vacuum isolation valve is shipped installed on the pump (Figure 6). If necessary, orient the vacuum isolation valve as follows:
  - a Loosen the hinged clamp.
  - b Rotate the vacuum isolation valve so that it is oriented as shown.
  - c Tighten the hinged clamp securing the valve to the pump hand tight.



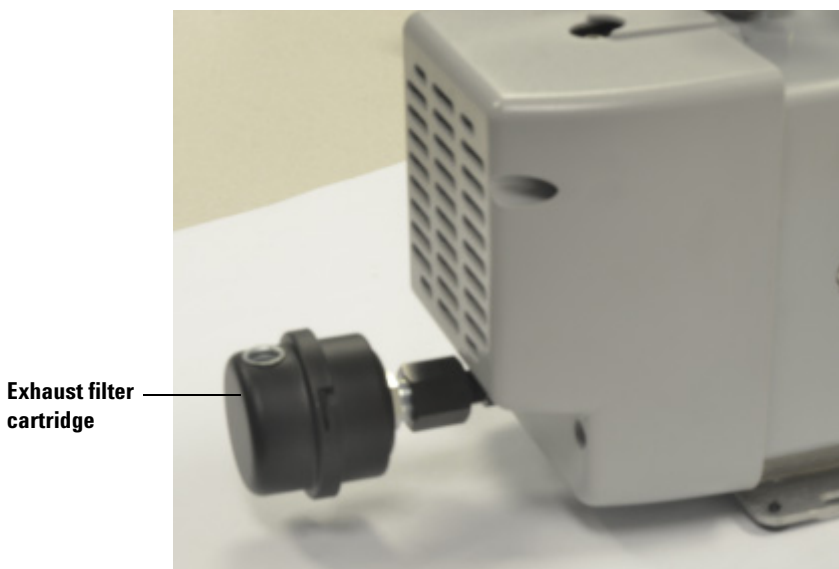
**Figure 6** Vacuum isolation valve orientation

- 2 Ensure that the connector from the vacuum isolation valve solenoid is securely inserted into the socket on the side of the pump (Figure 6).

**WARNING**

**Do not use the exhaust filter cartridge if the application requires capture or containment of gases being pumped. Instead, route the pump exhaust to an appropriate collection system.**

- 3 Install the exhaust filter cartridge on the threaded stem at the front of the pump and tighten hand tight (Figure 7).

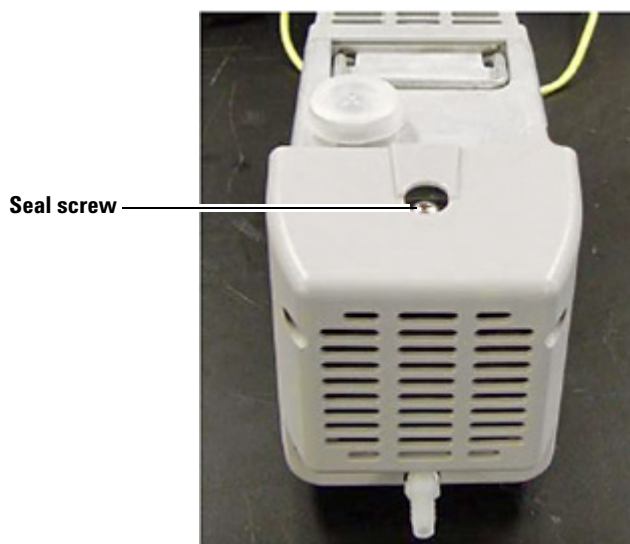


**Figure 7** Exhaust filter cartridge installation

**CAUTION**

The gas ballast of the IDP-3 pump should be left open for approximately 2 hours as a part of system conditioning, to help remove any appreciable amounts of water from the system. Failure to do so can result in a high vacuum pump failure rate.

- 4 Open the gas ballast by removing the seal screw (Phillips head screw on the top of the pump) (Figure 8).



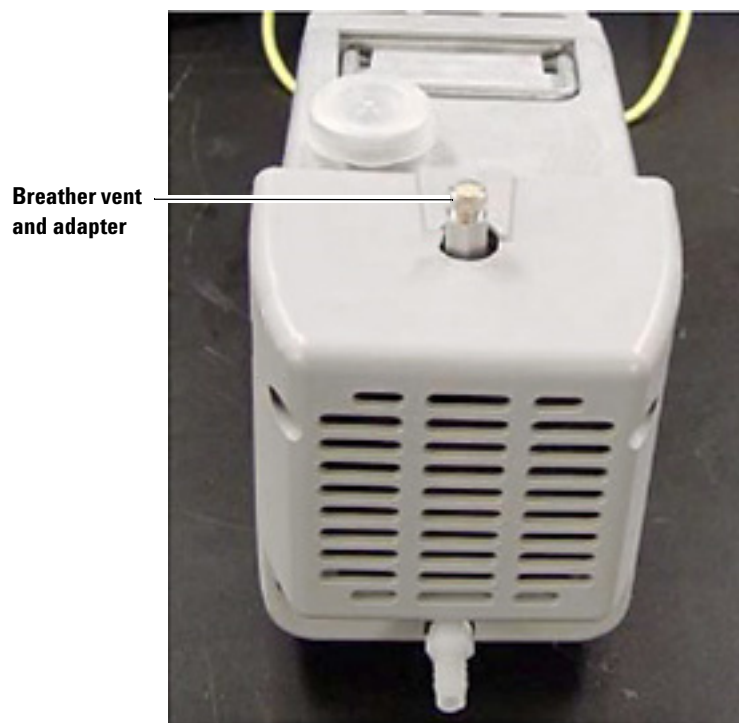
**Figure 8** Seal screw

- 5 Retain the seal screw for re-installation later in this procedure.

### CAUTION

Do not use excessive torque when installing the breather vent and adapter into the gas ballast as this could cause damage to the threads. Install the breather vent and adapter finger tight.

- 6 Insert breather vent and adapter (p/n G7077-67016) where the seal screw was installed ([Figure 9](#)).

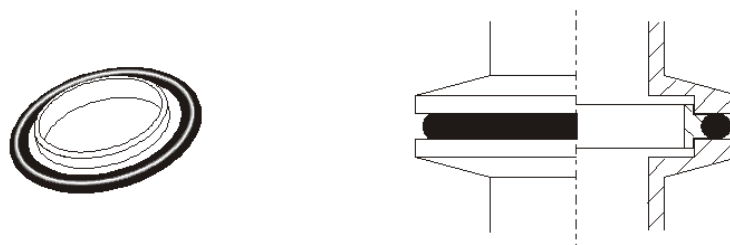


**Figure 9** Breather vent and adapter

### CAUTION

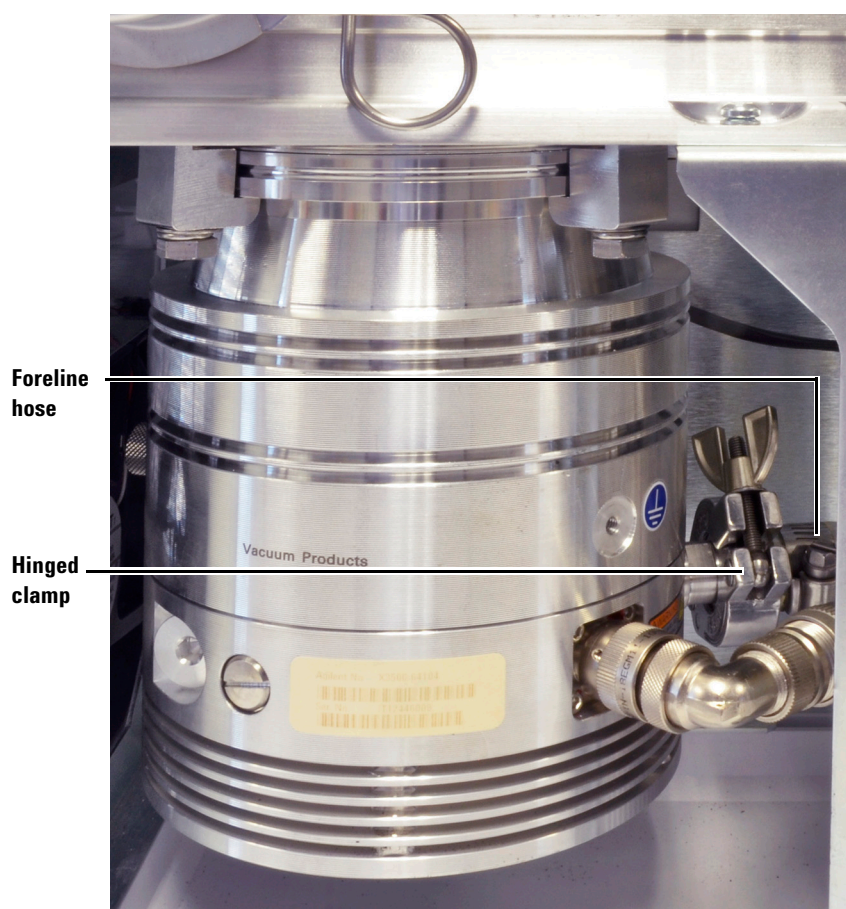
**Do Not** use any existing vacuum hoses or fittings. Doing so will damage the pump.

- 7 On the MSD turbomolecular pump, do the following:
  - a Insert the appropriate centering ring seal at the pump KF seal connection ([Figure 10](#)). For 5973 with Edwards Performance Turbo or 5975 with Pfeiffer TMH 262 use an NW25 Centering Ring with O-ring (0100-1551). For all other 597X pump configurations, use Seal, CNTR RING, NW16, ALUM, Viton (KC16AV).



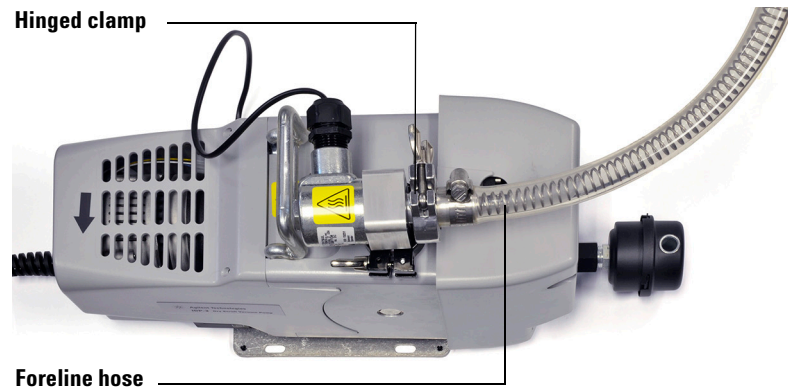
**Figure 10** KF seal with centering ring (hinged clamp not shown)

- b** Connect the appropriate end of the foreline hose over the new centering ring seal ([Figure 11](#)).
- c** Secure using the retained hinged clamp.



**Figure 11** Installing foreline hose at turbomolecular pump (typical)

- 8 At the IDP-3 pump, do the following:
  - a Insert the new Viton centering ring seal at the pump KF seal connection on the vacuum isolation valve ([Figure 12](#)).
  - b Connect the opposite end of the foreline hose to the vacuum isolation valve on the pump, over the new Viton centering ring seal.
  - c Secure using the hinged clamp.



**Figure 12** Installing foreline hose at vacuum isolation valve

- 9 Install the IDP-3 power supply behind the turbomolecular pump so that its mounting clip ([Figure 13](#)) attaches the power supply to the instrument tray ([Figure 14](#)).

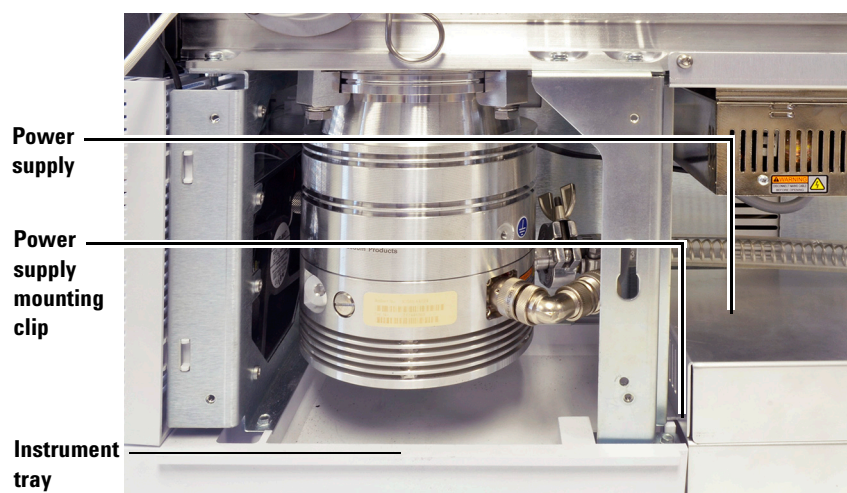
### NOTE

On some 5973 systems, depending on the turbo pump that is installed, the power supply will not be able to clip to the instrument tray. In these cases, orient the power supply behind the turbo pump in the same location without the mounting clip latched to the instrument tray.





**Figure 13** IDP-3 power supply



**Figure 14** IDP-3 power supply, installed

- 10 Connect the power supply power cable to the FORELINE POWER 700 VA MAX connector on the rear of the MSD (Figure 15).



**Figure 15** IDP-3 power supply cabling

- 11 Connect the pump power cable to the Output to Pump: 24 V connector on the power supply (Figure 15).

**NOTE**

The supply of power to the IDP-3 pump is controlled by the MSD. The pump will power up automatically as part of the overall MSD start process.

- 12 Turn on the MSD.
- 13 Allow the MSD to run continuously for approximately 2 hours to remove any potential excess moisture from the system.

**NOTE**

High or increasing foreline pressure, up to 2 Torr or more, may be observed when pumping out moisture. This is normal behavior, and will decrease over time. The high foreline pressure will not compromise turbo pump performance, as long as typical manifold vacuum is observed.

**NOTE**

The pump does not need to be turned off for the following steps to be performed.

- 14 Remove the breather vent and adapter from the IDP-3 pump (Figure 9 on page 20).



**WARNING**

**The gas ballast must be sealed whenever pumping any gas not intended to be vented to the atmosphere.**

---

**CAUTION**

Do not use excessive torque when installing the seal screw into the gas ballast as this could cause damage to the threads. Install the seal screw hand tight.

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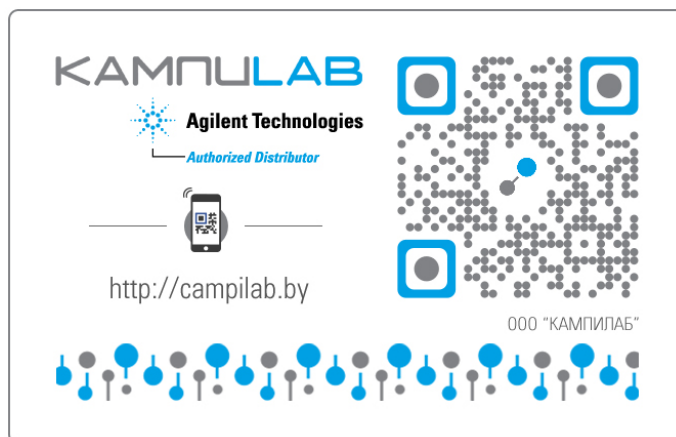
**NOTE**

The IDP-3 pump incorporates an automatic gas ballast to prevent water and other condensates from accumulating within the pump. The standard configuration has a seal screw installed in the 1/4-20 thread in the top of the exhaust manifold ([Figure 8](#) on page 19). This configuration can be used for relatively dry applications. When appreciable amounts of water, solvents, and so on, are being pumped, remove the seal screw and replace it with the provided breather vent (sintered filter) and adapter.

For applications where the ingress of atmospheric air is undesirable, dry nitrogen at a flow rate of approximately 5 L/min can be provided to the gas ballast port. Remove the 1/8 in NPT breather vent (sintered filter) from the adapter and replace it with an appropriate, customer supplied fitting to adapt to the dry nitrogen supply connector.

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- 15** Replace the seal screw on the IDP-3 pump ([Figure 8](#) on page 19).



### Warranty

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