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Технические характеристики

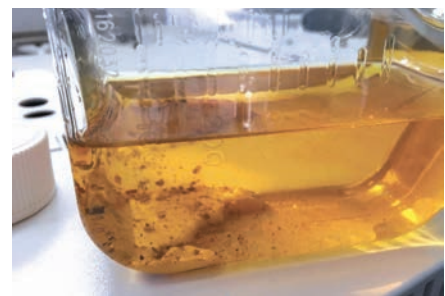
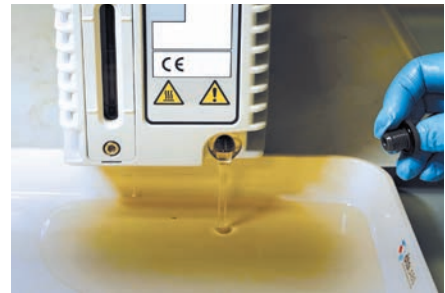
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Loud Noise, Oil Leaks, and Pump Breakdowns Don't Have to Be a Fact of Life

Oil-sealed rotary vane pumps are a major source of frustration, excess costs, and lost productivity. For starters, the oil must be changed and disposed of whenever it becomes discolored—typically every 6 to 12 months. Even worse, the cost of disposing the used oil can be more expensive per liter than the original purchase price.

Rotary vane pumps also tend to fail due to oil starvation, or from blocked internal lubrication passages. This can result in costly service calls—and hours of unexpected downtime.



Now there's a clean, compact, and cost-effective alternative to conventional oil-sealed pumps:

Agilent IDP-3 and IDP-10 oil-free vacuum pumps

These innovative scroll pumps are an affordable way to make GC/MS productivity happen, and put the hassles of oil-sealed pumps behind you once and for all. They feature:

- **Lower cost of ownership**, since scroll pumps operate *without oil*. Even better, you won't have to worry about MS source contamination, oil leaks/spills, or hazardous waste disposal of used oil.
- **Better vacuum performance** than other pumps of similar size.
- **Innovative scroll design**, which reduces the distractions of noise and vibration. Plus, there's no hydrocarbon exhaust and no oil mist filter required.
- **Small footprint and lightweight construction**, which are ideal for any instrument configuration—even inside cabinets.

Agilent IDP-3 vacuum pump

The IDP-3 vacuum pump is MSD qualified and compatible with Agilent 5973, 5975, and 5977 GC/MSD systems.



Agilent IDP-10 vacuum pump

The Agilent IDP-10 vacuum pump is compatible with Agilent 7000 and 7010 Series triple quadrupole GC/MS systems.



Oil-Free Vacuum Pumps Are a Wise Choice

Better performance than pumps of similar size

Oil-free IDP vacuum pumps rapidly pump down to low base pressures, which ensures optimal turbo pump performance and greater system reliability.

A cleaner environment inside—and outside—of your lab

IDP scroll pumps do not use oil, eliminating the risk of spills, leaks, and hydrocarbon contamination in the vacuum system and reducing the amount of hazardous waste in our air, water, and soil.

Less downtime, lower ownership costs

Unlike traditional pumps that demand hours of scheduled maintenance, IDP scroll pumps require a simple seal replacement that takes less than 30 minutes. Scroll pump technology also eliminates expensive oil topping, changing, disposal, and the risk of pump seizure.

Easy installation and integration

With their small footprint, lighter weight, and minimal power requirements, IDP pumps place little burden on utilities, require no special voltage, and are suitable for use inside cabinet enclosures. Best of all, their low noise and minimal vibration—without a Quiet Cover—make the workday more pleasant for everyone in your lab.

Longer service life between maintenance activities

Replacing the tip seal on IDP-3 and IDP-10 scroll pumps can be completed in less than 30 minutes. Compare that to several hours spent rebuilding the diaphragm on membrane pumps.

Protection for your quadrupoles and turbo

All Agilent oil-free IDP vacuum pumps feature an automatic isolation valve. During a power failure, the valve instantaneously shuts the foreline, protecting your quadrupoles and turbo from air inrush. Once the power is back up, the valve opening is delayed until the pump goes under vacuum again.



Innovative hermetic design

IDP pumps fully isolate the bearings and motor from the vacuum space. This allows the safe recovery of precious process gases and prevents the leakage of toxic gases.



Integrated isolation valve

This valve protects your quadrupoles and turbo during a power failure.

See how IDP oil-free vacuum pumps are lowering operating costs for real-world laboratories

The following examples illustrate typical maintenance scenarios in which Agilent IDP oil-free vacuum pumps saved customers time and money, compared with a traditional RVP oil pump.

Case Study 1: Agilent 5973 GC/MSD

A chromatography laboratory in Germany that performs its own pump maintenance dramatically lowered its annual consumables costs using the IDP-3 scroll pump.

The IDP-3 scroll pump eliminated the cost of:

- Oil bottle
- Oil mist filter
- Hazardous waste disposal

Total annual consumables savings: 66%



Case Study 2: Agilent 5977 GC/MSD

In this example, we compared internal shipping and logistics costs. Once again, the savings with the IDP-3 scroll pump are significant—even if the pump is replaced every 5 years.

The IDP-3 scroll pump eliminated the cost of:

- Hazardous materials shipping (pump oil)
- Logistics (per item)

Total annual logistics savings: 62%



A Closer Look at the Technology Behind the Pumps

Agilent oil-free vacuum pumps employ an innovative hermetic design in which the motor and bearings are located outside the vacuum space—completely isolating all pumped gases.

This elegantly simple design offers many benefits, including lower noise and vibration levels; simple, infrequent maintenance; and the elimination of catastrophic failure modes. In addition, dry pump technology is environmentally friendly, as it eliminates the need for oil disposal—and the risk of handling contaminated oil.



How does the scroll mechanism work?



Gas enters scroll set



Gas is displaced and...



...compressed toward center hub



Gas exhausted at center hub

IDP pumps generate vacuum using a simple dual-scroll mechanism in which one nested scroll orbits the other, creating moving zones of captured gas. After the gas enters the scroll set at the perimeter, it is displaced and compressed toward the center hub, where it is exhausted.

Robust performance for demanding applications

By incorporating the latest scroll technology and tip seal design, Agilent IDP-3 and IDP-10 scroll pumps deliver:

- Fast pumping speeds:
 - IDP-3: 60 L/m (3.6 m³/hr)
 - IDP-10: 170 L/m (10.2 m³/hr)
- Very low base pressures: less than 250 mTorr (0.3 mbar)—that's four times lower than equivalently sized membrane/diaphragm pumps
- Optimal vacuum and operating conditions (current, power, and temperature) for turbomolecular pumps at equivalent gas loads



Side-by-side comparison: Traditional pumps vs. IDP oil-free vacuum pumps

Rotary vane pumps	IDP scroll pumps	Membrane diaphragm pumps	IDP scroll pumps
Oil can leak into the vacuum system, or spill into your work environment	Oil-free: No contamination, spills, or leaks	Large, bulky design wastes precious lab space	Compact size: • IDP-3: 358 mm x 181 mm x 140 mm • IDP-10: 297 mm x 260 mm x 420 mm
Frequent oil checks, changes, and disposals	Easy maintenance: Simply change the tip seal	Excess power consumption	Less power consumption and lower bearing temperature
Can seize when there is insufficient oil	No oil needed. No risk of seizing	High base pressure can cause membrane rupture and sudden pump failure	Lower base pressure minimizes the risk of catastrophic vacuum loss
		Loud noise, excess vibration	Promotes a quiet, pleasant work environment

Agilent 5977B HES GC/MSD system

High Efficiency, High Capability

Built on a long tradition of trusted single quadrupole GC/MS systems, the 5977 HES GC/MSD breaks new ground with a High Efficiency Ion Source (HES).

The HES increases sensitivity by maximizing the number of ions that are created and transferred out of the source body and into the quadrupole analyzer. This novel design revolutionizes single quadrupole MS performance, offering these distinct advantages:

- **10x greater sensitivity:** Bring yesterday's triple quadrupole performance into your single quadrupole lab with detection limits as low as 1.5 fg IDL.
- **10x less sample required:** You'll spend less time performing sample preparation and maintenance, while reducing your shipping costs.
- **Seamless integration** with the Agilent IDP-3 oil-free vacuum pump for ultimate confidence in your investment and results.



Part number: G6696A

Agilent 7000 and 7010 Series triple quadrupole GC/MS systems

Resolve Your Search for Precision, Reliability, and the Lowest Detection Limits

Take your lab to a higher plane of productivity and confidence. The 7000 and 7010 Series triple quadrupole GC/MS systems deliver low detection limits, robustness, and software tools that simplify method optimization and lower your operating costs. They also integrate seamlessly with the Agilent 7890B GC. Other advantages include:

- Best MS sensitivity
- Efficient and flexible MRM optimization
- Eco-friendly resource management
- Easy integration with the Agilent IDP-10 oil-free vacuum pump

What's more, every 7000 and 7010 system conforms to strict quality standards. So, you can be sure you're getting the most reliable data—both today and in the future.



Part number: G6697A

With Agilent Inert Flow Path Solutions, You Won't Miss a Thing in Your GC and GC/MS Analysis



Ultra Inert gold seals

Only Agilent combines the best mechanical sealing with an inert surface. Unlike traditional machined seals, Ultra Inert gold inlet seals are manufactured using metal injection molding, followed by gold plating to ensure a smooth, consistent surface. We then apply our Ultra Inert chemistry on top of the gold plating to produce a leak-free seal that reduces active analyte adsorption.



Ultra Inert liners

With or without deactivated glass wool, Ultra Inert liners are certified to provide both low surface activity and highly reproducible sample vaporization, facilitating best-in-class delivery for active analytes.



Inert Flow Path split/splitless inlet

The hot metal surfaces of each weldment are treated to prevent adsorption and degradation.



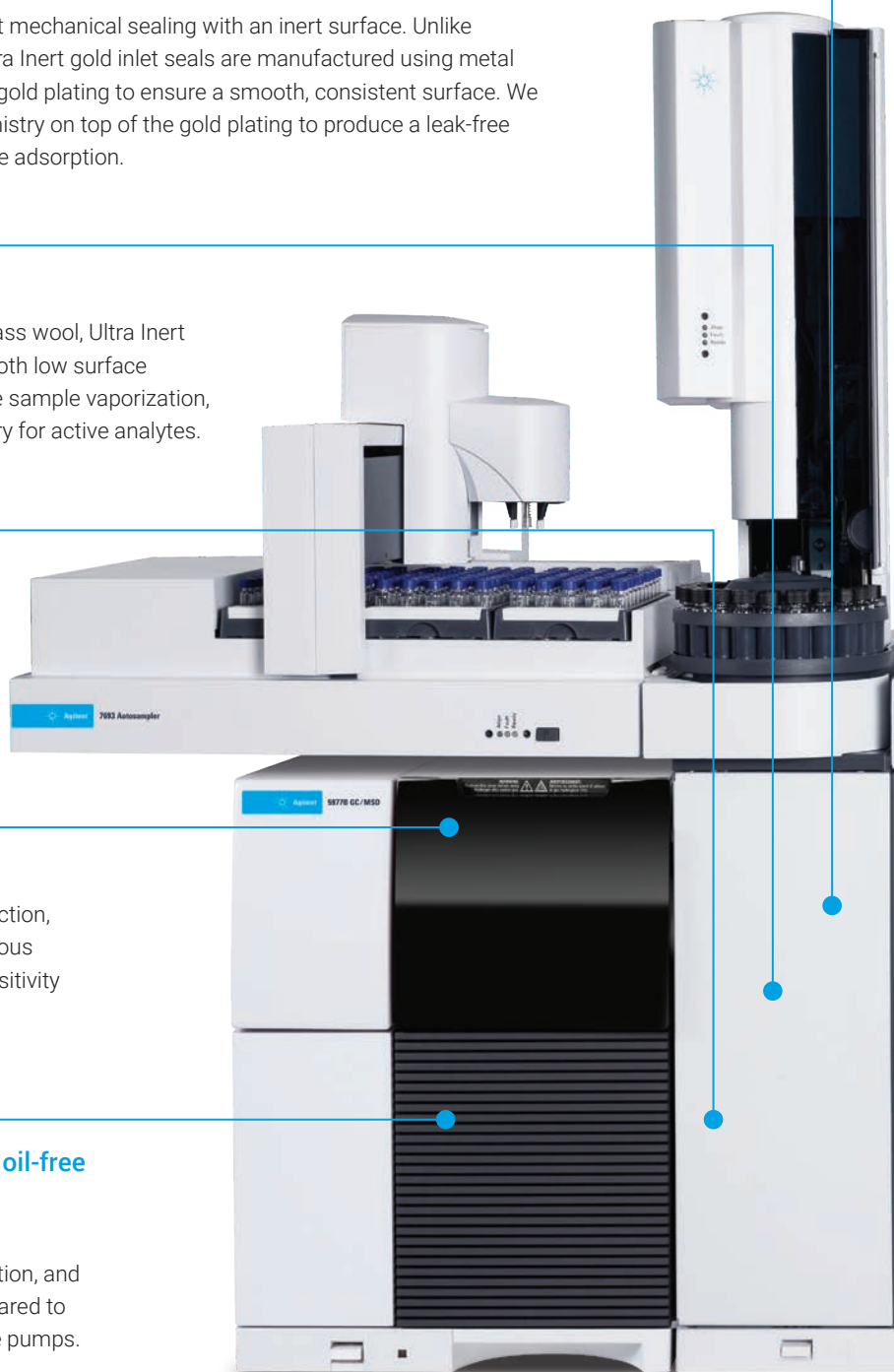
Inert MS source

Precision design, material selection, surface deactivation, and rigorous testing ensure unmatched sensitivity when analytes reach the mass spectrometer.



Go green, go dry with the oil-free IDP vacuum pumps

They offer a quieter laboratory environment, no oil contamination, and lower cost of ownership compared to standard oil-sealed rotary vane pumps.





Agilent J&W Ultra Inert GC column and Ultimate Plus deactivated fused silica tubing

Each column is rigorously tested to ensure exceptionally low bleed and consistently high inertness for optimal active analyte delivery to the GC or MS detector. Available in a variety of phases to support environmental, food safety, and toxicology applications.

For applications of complex or heavy matrices where guard columns are typically used, Ultimate Plus deactivated fused silica tubing is designed for the best inertness.



UltiMetal Plus Flexible Metal ferrules

With their proprietary surface deactivation, Agilent NEW UltiMetal Plus Flexible Metal ferrules are the only ferrules that won't introduce active sites into the flow path. Unlike graphite/Vespel ferrules, our inert flexible metal ferrules don't have to be retightened. Their flexible metal construction also solves the problem of column breakage (or leakage) associated with standard metal ferrules. Compatible with Capillary Flow Technology and inlet/detector fittings. (Note: Color variations between ferrules are a normal result of the UltiMetal coating).

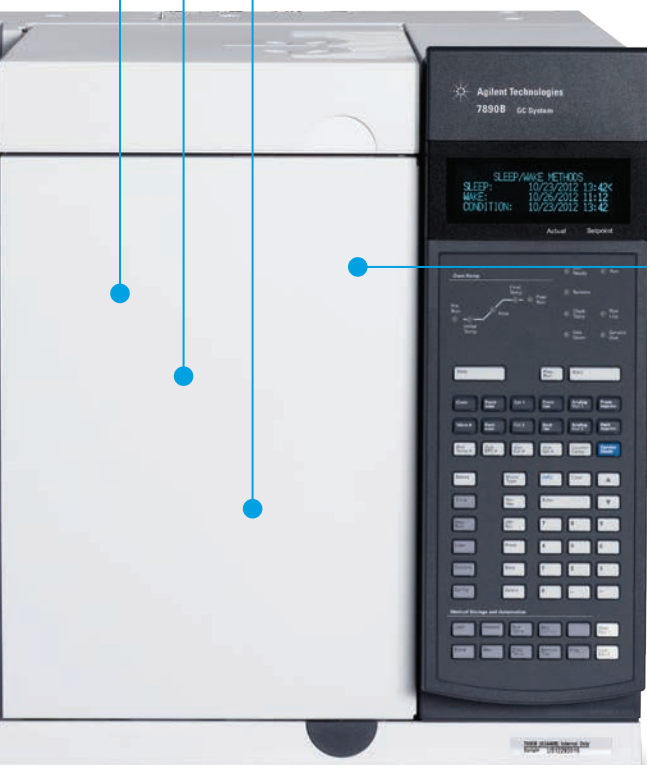
Inert Capillary Flow Technology devices, including UltiMetal Plus 3-way splitter

With their highly inert surfaces, Capillary Flow Technology tools extend your GC capabilities by modifying the flow path without the risk of sample loss. The purged union allows you to backflush high boilers in heavy-matrix samples, increasing column lifetime and system productivity.



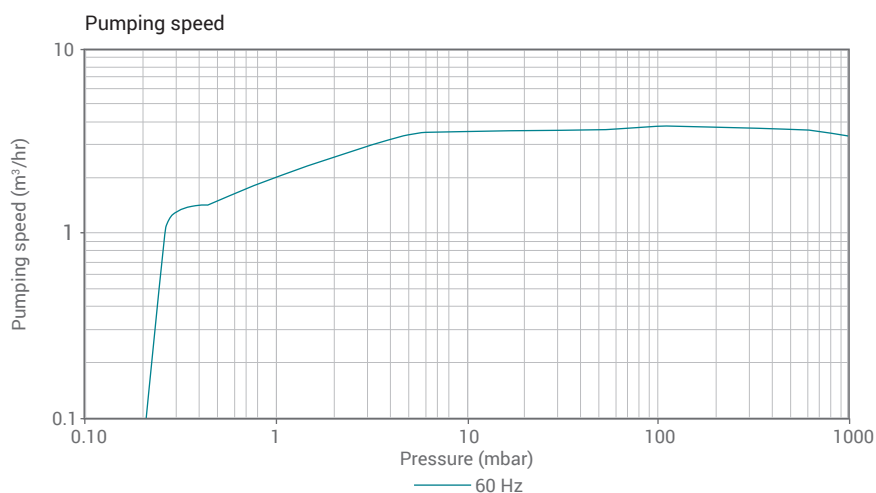
Gas Clean purifier

Contaminants such as oxygen, moisture, and hydrocarbons can increase the risk of column damage, sensitivity loss, and instrument downtime. Installing an Agilent Gas Clean purifier in your carrier gas line removes these contaminants, which helps maintain flow path inertness, ensure the highest quality gas, and keep your gas lines clean and leak-free. Sensitive indicators protect your instrument and GC column, while fast stabilization enhances productivity and reduces helium gas consumption.



Technical specifications

Agilent IDP-3 Dry Scroll Pump



Technical specifications

Peak pumping speed	60 L/m, 3.6 m³/hr, 2.1 cfm
Ultimate pressure	2.5×10^{-1} torr (3.3×10^{-1} mbar, 33 Pa)
Maximum inlet pressure	1 atmosphere (1.0 bar, 101 kPa)
Maximum outlet pressure	1.4 atmospheres (1.4 bar, 142 kPa)
Inlet connection	NW16 KF flange
Exhaust connection	Female 3/8 inch NPT
Gas ballast connection	Female 1/8 inch NPT
Ambient operating temperature	5 to 40 °C (41 to 108 °F)
Storage temperature	-20 to 60 °C (-4 to 140 °F)
Motor rating	0.16 HP (0.12 kW; peak rating: 0.27 HP (0.20 kW))
Supply power	24V DC, +/-10%, 7 FLA
Motor thermal protection	Automatic
Rotation speed	3200 RPM
Cooling	Air-cooled
Weight	9.5 kg (21 lbs); shipping weight: 10.5 kg (23 lbs)
Restrictions	No corrosive, explosive, or particulate-forming gases
Leak rate	$<1 \times 10^{-6}$ std-cc/sec helium
Noise level (per ISO 11201)	55 dB(A)
Vibration level at inlet (per ISO 10816-1)	1.5 mm/second
Compliance	Conforms with CE, CSA, CSA/CUS, Semi S2-703, and RoHS

Ordering information

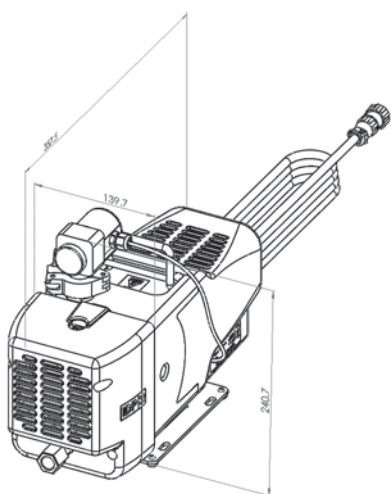
Description	Part no.
Oil-free IDP-3 vacuum pump for 5973, 5975, and 5977 Includes IDP-3 pump, power supply, new foreline hose, and fittings	G6696A
IDP-3 tip seal replacement kit	G7077-67018
IDP-3 tip seal only	5190-9561
Quiet Cover and modification kit	
Quiet Cover (optional) for GC/MSD	G6014B
Quiet Cover (required) for IDP-3 upgrade kit	G6014-68000

Important:

IDP oil-free vacuum pump upgrade kits are **not** compatible with the following GC/MS instruments:

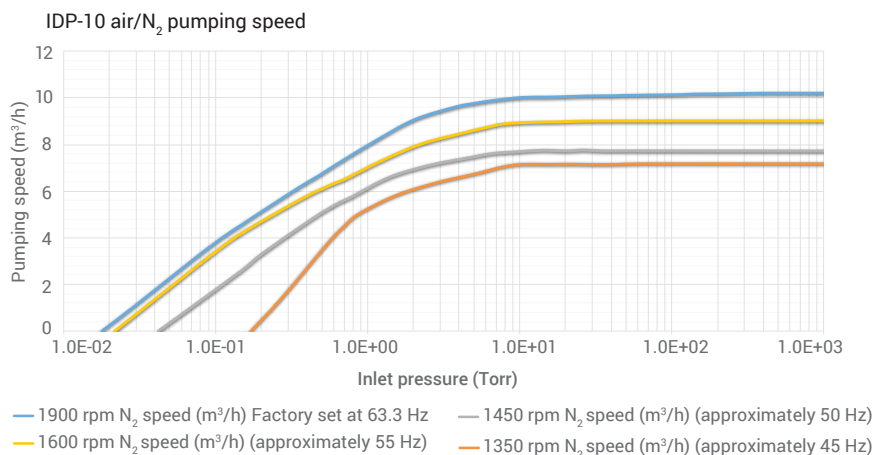
- Diffusion pump equipped instruments
- CI instruments using NH_3 reagent gas

IDP-3 oil-free vacuum pump for Agilent 5973, 5975, and 5977 Series GC/MSD



Technical specifications

Agilent IDP-10 Dry Scroll Pump



Technical specifications

Peak pumping speed	170 L/min (10.2 m ³ /h) at full speed
Media	No corrosive, explosive or particulate forming gases
Ultimate pressure	2.0 x 10 ⁻² mbar (1.5 x 10 ⁻² Torr)
Max. inlet pressure	1.0 atmosphere (0 psig)
Max. recommended continuous inlet pressure	2.0 x 10 ⁻² mbar (1.5 x 10 ⁻² Torr)
Max. outlet pressure at nom voltage	1.34 atmosphere (5 psig)
Inlet connection	NW25
Exhaust connection	NW16
Gas ballast	Female 0.25 inch NPT (20 µm sintered plug provided) SAE-2 5/16-24
Water vapor handling per Pneurop 6602	120 grams/hr maximum
Ambient operating temperature	5 to 40 °C (41 to 104 °F)
Storage temperature	-20 to 60 °C (-4 to 140 °F)
Motor rating	0.5 HP (350 W); 3ø inverter driven
Operating voltages	100-127; 200-240 VAC, 50/60 Hz
Motor thermal protection	Automatic thermal protection
Operating speed	63.33 Hz: 1900 rpm; 45 Hz: 1350 rpm
Cooling system	Air-cooled
Weight	Pump only: 24.74 kg (54.5 lbs); shipping weight: 28.1 kg (62 lbs)
Dimensions (H x W x L mm)	297 x 260 x 420
Leak rate (with exhaust sealed)	<1 x 10 ⁻⁶ sccs (1 x 10 ⁻⁶ mbar.l/s)
Noise level	53 +/- 2 dB (A)
Vibration level at inlet	7 mms ⁻¹ rms
Hour meter	Integral hour meter provided
Emissions and immunity	EN 61236-1:2013 as a Class A device
Safety	EN/IEC 61010 3rd Edition certified

Ordering information

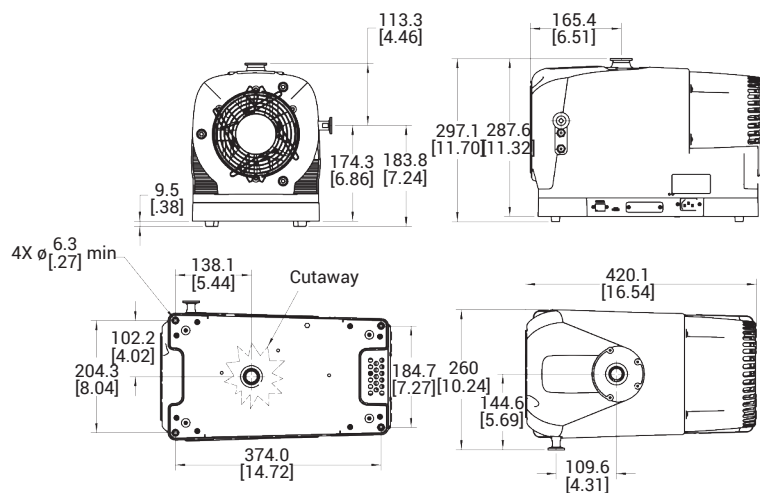
Description	Part no.
Oil-free IDP-10 vacuum pump for 7000 or 7010 Includes IDP-10 pump, new foreline hose, and fittings	G6697A
IDP-10 tip seal kit	G7004-67023

Important:

IDP oil-free vacuum pump upgrade kits are **not** compatible with the following GC/MS instruments:

- Diffusion pump equipped instruments
- CI instruments using NH₃ reagent gas

IDP-10 oil-free vacuum pump for Agilent 7000 and 7010 Series triple quadrupole GC/MS



Quiet That Loud Rough Pump Once and for All

Agilent Quiet Covers for GC/MS, ICP-MS, and LC/MS systems



Tranquility can be hard to come by while your noisy rough pump is running. But with a high-quality Agilent Quiet Cover, you and your pump can coexist peacefully with:

- *Reliable noise control.* Sound-absorbing cabinet with resistant foam insulation effectively reduces pump noise, while cushioned mounts minimize vibration.
- *Less risk of pump overheating.* Integrated fans maintain temperatures inside the cover; if the temperature exceeds 35 °C, an alarm will sound.
- *Easier pump maintenance.* A built-in kickstand, no-mess drip pan, and lift-and-tilt kickstand simplify oil changes and other routine tasks. In addition, a sectioned cover gives you fast pump access without tools.
- *Confident operation.* Each cover is protected by Agilent's standard one-year warranty. Installation and familiarization are included with new instrument orders.

How quiet is quiet?



Compare for yourself

- Air conditioner: 60 dB
- Rough pump without Quiet Cover MS: 58 dB
- Rough pump with Quiet Cover MS: Only 48 dB

G6011B Quiet Cover MS



Minimal vibration



Kickstand

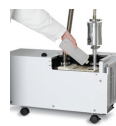


Easy access to pump, with a removable oil tray

G6012A Quiet Cover DS



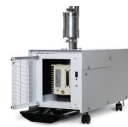
Minimal vibration



Easy access to pump



Kickstand



Removable oil tray

G6014B Quiet Cover GC/MS



Floating oil/drip pan with deep basin



Open-access cover



Lift-and-tilt kickstand



LED internal light

Use this chart to determine which Agilent Quiet Cover is right for your system

Due to constantly evolving instrumentation, the best way to ensure that you are ordering the correct Quiet Cover is to select it based on the pump you are using.

Part Number	Compatible with These Agilent Systems		Pump Model	
G6011B Quiet Cover MS	7800 ICP-MS	6420 TQ LC/MS	Agilent MS40+	
	7900 ICP-MS	6460 TQ LC/MS*		
	8900 ICP-QQQ	6465 Ultivo TQ LC/MS		
	325-MS LC/TQ	6490 TQ LC/MS (x2 MS40+ pumps)		
	500 Ion Trap LC/MS	6495A/B TQ LC/MS (x2 MS40+ pumps)		
	6100A Series SQ LC/MS*	6530 LC/Q-TOF*		
	6100B Series SQ LC/MS	6540 LC/Q-TOF*		
	InfinityLab LC/MSD Series	G6015A/B Flex Bench MS		
	6230 TOF LC/MS			
G6012A Quiet Cover DS	7700 ICP-MS		Agilent DS 202	Agilent DS 402
	7200 GC/Q-TOF**		Agilent DS 302	Agilent DS 602
	8800 ICP-QQQ			
G3199C Quiet Cover 2.0	6530 LC/Q-TOF*	6430 TQ LC/MS	BOC Edwards E2M28	
	6540 LC/Q-TOF*	6460 TQ LC/MS*	BOC Edwards E2M18	
	7000 TQ GC/MS		BOC Edwards E1M18	
	7010 GC/TQ		BOC Edwards E3M30	
	8355 SCD Dual Plasma system		Edwards RV3	
	8255 NCD Dual Plasma system		Edwards RV5	
	255 NCD Dual Plasma system		Edwards RV8	
	355 SCD Dual Plasma system		Edwards RV12	
G6014B Quiet Cover GC/MS	5977 GC/MSD		Pfeiffer Duo 2.5	Agilent DS42
	5975 GC/MSD		Edwards E2M1.5	Agilent DS42i
	5973 GC/MS			Agilent IDP-3***

*Instrument is compatible with both MS40+ and Edwards pump. Check which pump is shipped with order.

**Requires extra filter extension and seal. Please also order 5188-1181, 0100-0549, and 0100-1597.

***Requires a G6014-68000 install kit and IDP-3 for G6014 Quiet Cover.

Agilent columns and supplies provide you with analytical control and confidence

Agilent offers end-to-end solutions from sample prep to reporting for any type of analysis across the full spectrum of instrumentation for GC, LC, GC/MS, and LC/MS. All supplies undergo a rigorous manufacturing, selection, and testing process.

You also have access to Agilent's extensive applications library for faster method development, plus worldwide technical support, speedy problem resolution, and our global infrastructure and delivery network.

Agilent's meticulous production oversight ensures that your columns and supplies perform consistently. With more than 70 years of experience in instruments, polymers, and silica chemistries, our team is committed to continuously developing new advances that make you most productive.

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