

Gas Chromatography (GC & GC/MS)



Checking for the right fit is easy!

“Large-horn” multipliers have a diameter about the size of a dime; whereas “small-horn” multipliers are noticeably thinner.

CPI offers only the highest quality Electron Multipliers from OEM suppliers. In addition to product excellence, we are also concerned about the ease of your buying experience.

For example, Hewlett Packard 5972 and earlier instrumentation typically have one of two mounting bracket formats. You can use the “dime-diameter” check shown here to ensure the perfect size and fit of your next Multiplier.



CPI offers both “small size” and “large size” replacement elements.

Electron Multipliers

CPI offers a complete selection of continuous dynode electron multipliers for use in a variety of analytical instruments and applications, including GC/MS, LC/MS, residual gas analyzers and other instrumentation. These high performance, long life electron multipliers are engineered for maximum reliability, from low gain analog amplification to high gain pulse counting requirements.

All multipliers are manufactured in an ISO 9002 compliant environment and are tested for multiple QC parameters prior to shipping, guaranteeing dependability and performance. These multipliers are air-stable and have an indefinite shelf life in their original packaging. Many models are now original equipment on popular OEM instrumentation. All multipliers are backed by a total customer service philosophy and guarantee.

CPI electron multipliers for HP®/Agilent® GC/MS are designed to give you several performance benefits over the standard element...

Vented Anode – CPI multipliers have vent holes to the anode of the detector. These vent holes allow for residual gases in the detector channel and anode to be removed during pumping, improving performance and life of the detector.

Grid – CPI multipliers have a grid on the front of the horn causing all secondary electrons to travel down the detector channel. This increases the signal-to-noise ratio and overall performance of the detector.

Lower Operating Voltage – CPI multipliers operate at a lower voltage than the standard HP®/Agilent® element, increasing overall lifetime.

Increased Signal-to-Noise Ratio – In an HP/Agilent instrument the signal-to-noise of the instrument is increased approximately 25%, due to the mechanical design changes incorporated into the product, including the vented anode and grid.

Robust Design – CPI multipliers have a robust stainless steel frame to protect the glass detector from damage.

Hewlett-Packard®/ Agilent® Type Multipliers

Description	CPI P/N	Replaces HP® P/N	
HP/Agilent 5972/71/71A MSD & GCD			
Replacement Horn only, Small size	4200-010200	05971-80103	
Replacement Horn only, Large size	4200-010201		
Small size horn with mount	4200-010221	05971-80102	
HP/Agilent 5973			
Replacement Horn only, Small size	4200-010200	05971-80103	
Complete assembly, ETP Type	4200-010180		
HP/Agilent 5970/5993B MSD			
One-piece multiplier	4200-010202	05970-20097	
Replacement Horn only, Small size	4200-010200	05970-80103	
Replacement Horn only, Large size	4200-010201		
HP/Agilent 5989 MS Engine			
One-piece multiplier (includes conversion dynode)	4200-010203		
Replacement Horn only, Small size	4200-010200	05971-80103	
Replacement Horn only, Large size	4200-010201	G1099-80001	
HP/Agilent 5988/88A & 5985/87 - 4 lead	4200-08	05985-60180	
HP/Agilent 5988/88A & 5985/87 - 3 lead	4200-010065	1970-0063	
HP/Agilent 5930/80/81/82/83/84/85/	4200-010065	1970-0063	
HP/Agilent 4500 & 7500 ICP-MS See page 54 for these multipliers.			

Electron Multipliers

Thermo-Finnigan® Type Multipliers

Description	CPI P/N	Replaces Thermo P/N
TSQ70 w/20kv dynode, TSQ700, ITD700, 800, ITS40, Magnum		
Replacement glass element, unmounted	4200-010206	
Replacement element, Mounted	4200-010204	94022-98049/94011-60052
Replacement element, for K and M Mount	4200-010205	94022-98047
TSQ70 & PPINICI Multipliers		
TSQ70, ITMS, PPINICI Incos 50	4200-010207	
PPINICI 4000, 4500, 4600	4200-010208	
PPINICI 5100	4200-010209	
1015 on axis, 3000, & OWA (pre 8/81)	4200-010077	30004-60160
1015 off axis, 3000, 3100, 3200, 4000,	4200-010078	01504-60110
4500, 4600 OWA post 8/81	4200-010076	40007-98020/30004-60050
Finnigan MAT95-organic mass spec, 8400 series	4200-010116	
CH7, CH8	4200-010260	
PolarisQ, GCQ, LCQ deca/duo, Trace MSQ, LTQ		
Replacement element only	4200-010205	94022-98047
Mount assembly and replacement element	4200-010241	
SSQ, TSQ7000, TSQ Quantum (element only)	4200-010205	94022-98047
TRACE DSQ		
Replacement element only	4200-010244	
Mount assembly and replacement element	4200-010245	
SOLA ICP	4200-010079	

Look Familiar?

Pictured below are popular multipliers for Thermo-Finnigan® instrumentation:



Multiplier for PPINICI 4000, 4500, 4600. All PPINICI Multipliers include the conversion dynodes. CPI P/N 4200-010208



Mount Assembly, including multiplier for Polaris Q, GCQ, LCQ DECA/DUO, Trace MSQ, LTQ. CPI P/N 4200-010241



Replacement Element for Polaris Q, GCQ, LCQ DECA/DUO, Trace MSQ, LTQ. CPI P/N 4200-010205



Mount Assembly, including multiplier for Trace DSQ. CPI P/N 4200-010245



Replacement Element for Trace DSQ. CPI P/N 4200-010244

► CPI Multiplier Performance Point Multiplier Pre-Conditioning

To maximize the lifetime of a multiplier it should be pre-conditioned. During this process, loosely bonded water molecules are released from the surface. To perform pre-conditioning, a multiplier should be placed under vacuum. It is recommended that a vacuum of 10^6 Torr or better be used. Once the appropriate vacuum is reached a small input should be applied to the multiplier. In counting mode approximately 15,000 counts/second is desirable. In current mode approximately .1uAmp is needed. The multiplier voltage should be slowly raised to reach an appropriate gain level. In counting this should be approximately 10^7 . In current mode this should be approximately 10^5 . The multiplier should be run in this state for several hours. This should be done in order to avoid a rapid release of water molecules. If the water molecules release rapidly then the multiplier surface can be permanently damaged, thus shortening the life of the detector.

Gas Chromatography (GC & GC/MS)



Replacement Element for K and M Type Multipliers, for TSQ70 (20 kv dynode), TSQ700, ITD700/800, ITS40, Magnum, SSQ, TSQ7000 and TSQ Quantum. CPI P/N 4200-010205



Replacement Glass Element, Unmounted for TSQ70 (20 kv dynode), TSQ700, ITD700/800, ITS40, Magnum, SSQ, TSQ7000 and TSQ Quantum. CPI P/N 4200-010206



CPI P/N 4200-010206 Mounted In Frame, complete unit CPI P/N 4200-010204.

Ask About CPI Quantity Purchase And Standing Order Discounts On Electron Multipliers!

Gas Chromatography (GC & GC/MS)



Multiplier for Varian® Saturn 2000 Series.
CPI P/N 4200-010211



Multiplier for Varian® Saturn I, II, & III, Mounted.
CPI P/N 4200-010204

Electron Multipliers

Varian® Type Multipliers

Description	CPI P/N	Replaces Varian® P/N
Saturn 2000, 2100, 2200	4200-010211	
Saturn I & II (unmounted)	4200-010206	
Saturn I, II & III (mounted)	4200-010204	03-920490-00
1200, Triple Quad	4200-010246	
Auger Analyzer	4200-010247	
Ultramass		
<i>See page 54 for this multiplier.</i>		



Replacement Element for above Saturn I & II Multiplier.
CPI P/N 4200-010206



Multiplier for Varian® Auger Analyzer.
CPI P/N 4200-010247

PerkinElmer®/ Sciex®/ API® Type Multipliers

Description	CPI P/N	Replaces PE®/Sciex®/API P/N
Ion Trap	4200-010204	N621-2429
Qmass	4200-010212	N633-1320
API III LC/MS	4200-010219	014032A
API 4000/3000 & 100, 200, 300 series	4200-010218	020048B
API 2000	4200-010243	
ELAN ICP-MS Multipliers		
<i>See page 54 for these multipliers.</i>		

► CPI Multiplier Performance Point

Multiplier Cleaning

In the event that a multiplier becomes contaminated with lint, dust, or other particulate the multiplier should be flushed with either isopropyl or methanol. The unit can then be blown with dry nitrogen and baked at 150°C until dry. Multipliers should not be cleaned in any acid, this would have a detrimental effect on its lifetime and performance.



Multiplier for PE® Ion Trap.
CPI P/N 4200-010204



Multiplier for PE® Qmass.
CPI P/N 4200-010212



Multiplier for API® III LC/MS.
Includes Sciex® Leads.
CPI P/N 4200-010219



Multiplier for API® 4000/3000 & 100, 200, 300 Series.
CPI P/N 4200-010218



Multiplier for API® 2000.
CPI P/N 4200-010243

Multipliers for Other MS Systems

Description	CPI P/N	Replaces OEM P/N
Amptek		
Ampetektron MD501	4200-010248	
Ampetektron MD502	4200-010249	
Balzers		
QMG 511	4200-010088	
Prizma	4200-010250	
ABB Extrel		
Quad - Analog only	4200-010089	U-1150
Quad - Pulse & Analog	4200-010087	U-1149
ELQ400-Analog, Benchmark LCMS, Questor	4200-010091	U-411
MEXM / EXM System, ELQ400 - Pulse, C50	4200-010216	Y-61
Finnigan MAT/Varian MAT		
CH5	4200-010093	422097
111,112,112S, 212,311, 312, 711, 8020	4200-010094	422097
CH3, CH4, CH4B	4200-010095	422093
Hitachi		
RMU-6D	4200-010100	
Inficon RGA		
XPRII	4200-010251	
Mass Analyzer Products		
MAP215-50	4200-010252	
Shimadzu		
ICPM8500	4200-010253	
QP5050	4200-010254	
2010/QP8000/QP5000	4200-010255	
Stanford Research Systems		
RGA	4200-010256	
Thermo Onix (VG Gas Analysis)		
RGA Analog	4200-010257	
UTI		
Analog (mounted) - 100C	4200-010214	
Discrete Dynode (Cube) - 100C	4200-010215	
Vacuum Technologies		
Aerovac RGA	4200-010258	
V&F Gas Analysis		
CIMS 500	4200-010230	
VG Microtech		
Clam IV Analyzer	4200-010259	
Waters		
Integrity Mass Spectrometer	4200-010217	

Contact CPI for information on multipliers not listed here - many more models available.

► CPI Multiplier Performance Point

Multiplier Vacuum Baking

Vacuum baking is used as a method of decreasing water molecule adsorption on the emissive surface of channel electron multipliers. When water molecules are on the emissive surface they are released during multiplier use. If the molecules are released too quickly permanent damage may occur to the emissive surface.

When vacuum baking CPI recommends baking at no hotter than 250°C for 12-15 hours. During this time period water molecules are slowly released from the emissive surface in a safe manner. It is important to vacuum bake in a clean environment. If other materials in the vacuum bake outgas, the channel electron multiplier may absorb these gases and the emissive surface could be adversely effected.

CPI recommends that all units be vacuum baked. This helps pre-condition the unit and increase lifetime.

Gas Chromatography (GC & GC/MS)



Ampetektron MD 501 Multiplier.
CPI P/N 4200-010248



ABB Extrel MEXM/EXM, ELQ400, C50 Multiplier.
CPI P/N 4200-010216



Inficon XPRII Multiplier.
CPI P/N 4200-010251



Balzers Prizma Multiplier.
CPI P/N 4200-010250

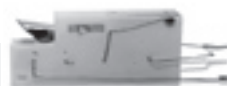


MAP215-50 Multiplier.
CPI P/N 4200-010252

► CPI Multiplier Performance Point

Multiplier Shelf Life

It is ideal to store the multiplier in vacuum, but not required. These lead glass multipliers are air stable devices that can be stored indefinitely, as long as the units are kept out of direct sunlight, dry and kept in their original sealed bags prior to use. CPI fully warranties all multipliers for shelf life.



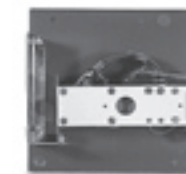
UTI (MKS) Analog 100C.
CPI P/N 4200-010214



CIMS 500 Multiplier.
CPI P/N 4200-010230



UTI (MKS) Discrete Dynode (cube) 100C.
CPI P/N 4200-010215



Waters LC/MS Integrity Multiplier.
CPI P/N 4200-010217

Gas Chromatography (GC & GC/MS)

PID Lamps & Accessories

As the nation's largest supplier of PID lamps, we are determined to be the highest value source in today's market.

CPI offers a complete selection of high quality, long life, low pressure gas discharge lamps for use in photoionization detectors and trace gas analyzers. These PID lamps are direct OEM replacements.

These lamps incorporate a unique high temperature seal design which allows them to be processed at high temperatures. This process results in higher lamp to lamp consistency, enhanced performance and long life.

CPI ensures unsurpassed performance due to only the highest purity metals, window materials and gases. Every lamp must pass a series of stringent tests and measurements prior to shipment to your laboratory.

Only CPI can offer today's best PID lamp value, best warranty terms, and technical service to support your application.



CPI offers a complete selection of PID lamps to meet your needs.

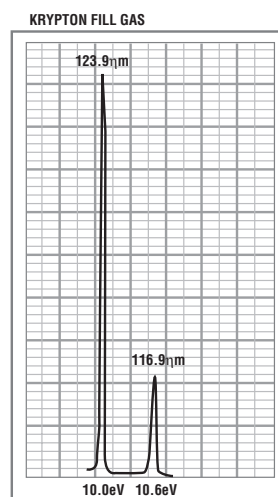
Save up to 35% on PID lamps with a CPI Annual Savings Contract. Standing Order Programs are also available for efficiency and additional cost savings.

Spectral Output and Relative Intensity

The eV rating of the lamp is determined by the lamp's spectral output. The spectral output of the lamp is determined by the fill gas and the transmission characteristics of the window material. The spectral output of the gas used most frequently is shown the graph opposite. The eV rating and wavelength are associated through Planck's Constant: $\lambda(m) = 1.2395(10^{-6})/eV$

As seen from the graph showing krypton, both the 123.9nm and 116.9nm lines are present. Because of this the 10.0eV and 10.6 eV lamps are interchangeable.

Other fill gases such as hydrogen and oxygen have been tested and found to result in shortened lamp life, thus they are not used.



Buy your next PID lamp from CPI and we'll Guarantee:

Competitive Pricing

Let us know your annual usage and we will provide a competitive quotation. Our prices are significantly lower than the OEM's and other suppliers.

Next-Day Delivery

Our Next-Day Delivery Service ensures you don't have instrument down time. Lamps are always in stock and never sit on our shelf for more than 10 days.

Lamp Performance

We warrant that lamps will light, stabilize and meet manufacturer's life expectancy in your instrumentation. CPI's pro-rated PID lamp warranty is the most comprehensive available in the industry today!

Savings on other CPI Supplies

Select CPI as your PID lamp supplier and you'll earn discounts on other products for Organics and Inorganics. Call for additional information.

PID Lamps & Accessories

Small Outline PID Lamps

Description	CPI P/N	OEM P/N
Lamp for Varian®, HP®, OI®, Tremetrics® (Tracor®), Finnigan®, SRI® 10.0 eV, small outline	4080-02	00-997396-06/ 76497-0012/ 181180/ 5182-0506
Lamp for Photovac® 10.6 eV, for Microtip®	4080-15	390011

Call for pricing and availability of 9.6eV, 10.6eV and 11.8eV lamps.

New!



PID lamp for portable Photovac®, Microtip®, 10.6 eV.
CPI P/N 4080-15

Count on CPI for OEM direct replacement lamps for your Photovac® Microtip® hand held PID. These lamps are 10.6 eV and designed for maximum life and sensitivity in your Photovac® instrumentation.



Gas Chromatography (GC & GC/MS)



Small Outline Lamp for Varian® HP®, OI®, SRI® and Tremetrics® (Tracor®).
CPI P/N 4080-02

New!

Improved Linearity and Lifetime!

Our OEM manufacturer of CPI PID lamp P/N 4080-02 has improved the optic path, lens seal and base shape to provide better linearity and lifetime! You will automatically receive this improved product on your next order of CPI P/N 4080-02!

Large Outline PID Lamps

Description	CPI P/N	OEM P/N
Lamps for PerkinElmer®, hnu®, and older models of SRI® & HP® 10.2 eV, large outline	4080-12	0330-3599 81-101-102
11.7 eV, large outline <i>11.7 eV Lamps are for use with hnu® PI101 portables.</i>	4080-13	81-101-117



CPI offers both 10.2 eV and 11.7 eV large outline PID lamps for hnu® PI101 Photoionizers.

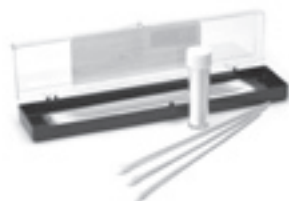


Large outline 10.2 eV PID lamp, for PE®, SRI®, hnu®.
CPI P/N 4080-12

Gas Chromatography (GC & GC/MS)



Viton® and Kalrez® O-Rings.
CPI P/N's 4080-21 and 4080-23



PID lamp cleaning kit.
CPI P/N 4080-20

PID Accessories

To help improve PID lamp performance and life, we recommend our Lamp Cleaning Kit and O-Rings, including our new Kalrez® O-Ring for maximum sealing potential and durability.

Description	CPI P/N	OEM P/N
PID Lamp Cleaning Kit Maximize lamp sensitivity and life with periodic cleaning. <i>The normal operation of a PID Lamp results in a UV absorbing deposit condensing on the lamp window. This kit includes supplies needed to perform proper cleaning of PID lamps.</i>	4080-20	00-997396-98
Viton® O-Rings, Small Outline, 5/pk	4080-21	255679
Kalrez® O-Ring, Small Outline, 1/pk <i>These high-performance Kalrez® O-Rings are recommended for PID systems due to low out gassing potential, long life, and excellent sealing capabilities under thermal conditions.</i>	4080-23	00-997396-45
1/8" Graphite Ferrule, 10/pk	4200-109	76458-0002

Maximizing life from your PID lamps

Cleaning Procedures

Frequent proper cleaning is the best way to improve lamp life and maintain maximum sensitivity. Note that not all UV absorbing deposits which cause lower sensitivity can be seen on the window. Thus, a lamp may need cleaning even if no deposit is visible. Allow sufficient time for your PID detector to cool prior to removing the lamp. If the lamp is removed while still hot, it can increase the chance of cracks developing in the window or seals. **Never touch the magnesium fluoride window with your bare fingers**

1. Pour distilled water into two petri dishes. Pour methanol into 3rd petri dish.
2. Immerse base of lamp to be cleaned momentarily into first dish of distilled water.
3. Place a wet swab into polishing compound, allowing of the material to adhere to the cotton tip.
4. Using small circular motions, rub polishing compound onto magnesium fluoride window. The proper ratio of polishing compound to water will produce a slurry mixture. NOTE: Do not exert excessive force onto the magnesium fluoride window. Window material can be permanently damaged by misuse.
5. Continue working polishing compound around window for approx. one minute. It may be necessary to add polishing compound and/or water to maintain proper consistency.
6. Dip lamp base into first petri dish of distilled water and with a gentle lapping motion remove all excess polishing compound from around window and base.
7. Next dip lamp base into second dish of distilled water. With a CLEAN wet cotton swab, remove any trace amounts of polishing material.
8. Remove excess water from base with kimwipe. Immerse clean base into dish containing methanol.
9. Quickly dry window with another clean kimwipe. Do not allow methanol to air dry as this will leave a film on magnesium fluoride window and greatly reduce the transmittal of the window.
10. Hold the lamp up to a light source, with the window at an acute angle to the light so that the window surface appears reflective. This will allow you to easily spot any visible UV absorbing deposit remaining.
11. Distilled water and methanol should be changed after cleaning 2-3 lamps. Petri dishes should be cleaned prior to adding fresh water and methanol.
12. When reinstalling the lamp in the detector, inspect the lamp sealing o-ring. O-rings should be replaced with every lamp or every 3 months. Also take great care when tightening the lamp housing. Over tightening the housing will cause the lamp window to crack.

Current & Temperature Settings

To maximize lamp life, ensure that the PID detector temperature is kept at 250°C or lower. Higher temperatures, or fluxuating temperatures, stress the lamp. If your instrumentation allows you to adjust the lamp current, always start a new lamp at the lowest possible setting to achieve your MDL. If a drop in sensitivity occurs, clean the lamp before resorting to increasing the current.

Storage

CPI ensures that our PID lamps stay in our warehouse for only 10 days before shipment to your lab. We recommend that you not store PID lamps more than 60 days, to ensure the lamps maintain maximum fill gas.

NitroVap Sample Concentrator

Introducing the NitroVap - the sample concentrator/evaporator that ACCELERATES your sample preparation process!

- 48 Sample capacity - ideal for running 2 complete batches including blanks and QC
- Heated nitrogen for maximum speed of evaporation
- Small footprint (12"x 20") conserves bench space
- Gas flow and heater control allows user to set any gas temperature
- Hydraulic lift system for ease of use



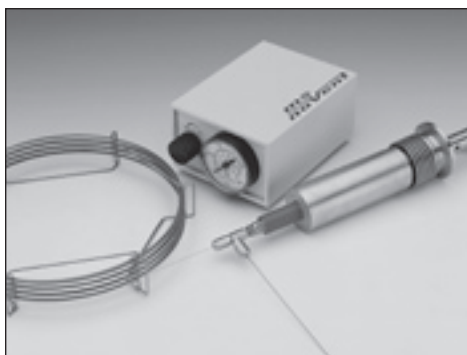
Today's Chromatographs offer high levels of automation allowing for rapid, unattended sample analysis. Until now the bottleneck has been the laboratory's ability to prepare samples fast enough. Now your lab personnel can keep pace with the instruments. The NitroVap uses warmed nitrogen to gently evaporate solvent. This allows for fast, effective concentration of samples without the dangers of direct heat. The NitroVap is up to twice as fast as a standard nitrogen evaporator, and no direct heat means virtually no analytic loss!

Gas Chromatography (GC & GC/MS)

MS-NoVent™ GC/MS Column System

Reliable GC Column Changing in Minutes- without Breaking MS Vacuum...

The specialized design of the MS-NoVent system from CPI allows you to reliably change a GC column or perform GC maintenance without bringing down the mass spectrometer. Eliminating the time-consuming process of venting the MS during a column change also ensures that the integrity of the system is maintained. Because the MS-NoVent system uses a moderate helium purge and special fused silica flow valve to guarantee an air-free environment within the MS, there is no risk of water or other contaminants entering is present. With the MS-NoVent, the mass spectrometer can be operational in minutes after a column change or routine GC maintenance, avoiding the time-consuming and variable process of restoring vacuum and desired MS sensitivity levels.



Change GC Columns in Minutes without Breaking the MS System Vacuum!

- Save Hours of Down Time
- Maintain an Inert Environment
- No Risk of Damaging Ion Source

MS-NoVent™ GC/MS Column System

Description	CPI P/N
MS-NoVent	
MS-NoVent System, for HP® 6890 GC	4200-010030
MS-NoVent System, for HP® 5890 and earlier GC's	4200-010029

Note: A restrictor (below) corresponding to the MS model must also be ordered.

Restrictors	
Restrictor, for HP® 5970 MS	4200-010027
Restrictor, for HP® 5972/5971 MS	4200-010028
Restrictor, for HP® 5973 MS	4200-010026

MS- NoVent Systems are available for Hewlett-Packard® 5890 and newer 6890 GC/MS Systems with EPC