

Gas Purification uHP Helium

... for GC & [GC/MS] see FlipPAGE Catalog Restek; VICI Valco

Improved Performance
TEE Ball Valve VENT V1



Helium Gas
Supply
Industrial
99.95% MIN

GasCon UltraHigh Purity Helium Regulator
(SS Diaphragm Nickel-plated Brass)

22605

VICI

22600
HCs
moisture
O2

22475

Click-on

22468

22479

22020

HCs
moisture
O2

22025

Super Clean System

20623 (O2)

High Capacity
Ind. OxyTrap
replaceable cartridge

Indicator
OXYTrap

22010

moisture
O2

22474

"self-piercing" Air-free connection

Improved Performance
2-Way Ball Valve V2

Click-on System

GC/MS

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Simple Helium Gas Purifier System Options for GC/MS

99.95% Start He Gas > <<1ppM O2 hopefully

1 VICI-Matsen Helium Purifier (High Capacity ~4 Cylinders) #22600
In-line Indicating OxyTrap #22019

2 Click-On System (self-piercing connectors - minimum Air ingress)
#22475 Click-on End-Connector
High Capacity Click-On OxyTrap #22468
#22479 Click-on Double Trap Connector
Click-On Indicator Trap #22474

3 Super-Clean System
3x Adsorbent Replacement Cartridge #22020
Fixed Base Plate #22025

4 High Capacity Oxytrap #20623
(replacement Cartridges #20625 are self-piercing - minimum Air ingress)

Ultra High Purity Gascon Helium Regulator HD5S-A-700-GGP-T10-F/A-He

A10 Bottle spigot Fitting
Option (but redundant Diaphragm or Needle Valve)

SS Ball Valve Improved design
(MAX 0.1cc/min N2 @1000psi leak tested / certified)
2-Way Gas Isolation > when GC/MS Off- V1 line
Tee-Valve > for venting V2

Assumptions : for a Basic Capillary GC /MS

Single column 5cc./min He Max operating, "spasmodic" Splitter operation
@ 50ml/min
NO leaks >220cubft cylinder should last 400 days if left running 24/7

Changing of cylinder and venting will help preserve Oxytraps
Indicator trap on outlet of Main OxyTrap (non-see thru') is essential
Assume Commercial Helium is suspect and 99.95% purity is OK but triple traps recommended to ensure <1ppM moisture, HCs clean up

High Purity Helium assumed 10-100ppM impurities
but NO guarantees commercially in practice

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Some Hints

Re Installation :

Use a High Purity Gas Regulator - Ni-plated brass body is OK

- SS diaphragm is essential.

Optional : On/off Valve allows isolation of the Regulator during trap replacement etc.

Mount Traps in a vertical position (or at an angle) packing settles in time .

and channelling can occur where Helium may tend to by pass the absorbent.

Always use Chromatography Grade (heat-cleaned) SS tubing for transfer lines.

- *When leak checking > Human Nature is to over-tighten adfinitum.*
- DON'T—eventually the cone on Swagelok will "bell out" and seal will be compromised
- *Do Not mix and match different brands of fittings and ferrules Swagelok and Parker maybe*
> but NOT good practice.
- *NEVER use Sulfinert/Silcosteel ferrules in similarly treated fittings they just do NOT seal at all*
— like sand paper on sand paper !
- *Teflon Thread sealing Tape can be of marginal use Teflon tends to be air porous at trace levels.*
Ultra High Purity threads generally use industrial thread "goo" wax such fittings can be very difficult to disassemble without proper tools (WE don't do it due to risk of damaging scoring expensive fittings regulators etc DO IT AT YOUR OWN RISK !
- *Use old fittings ferrules tubing sets at YOUR RISK !*
You can ruin expensive Oxytraps and GC columns and Mass Spec filament if ANY leaks.
- *Never use industrial Regulators these have rubber diaphragms and infuse air badly (albeit at "trace" levels but disastrous long term for Oxytraps columns etc.*
- *An Oxytrap properly used will absorb up to 1000cc of O2 depending on size of trap etc.*
Manually changing traps etc can easily ingress 10cc of Air if you are not careful.
- *Regulators can have a dead volume of 100 to 500ul and should be sensibly purged when changing cylinders and traps.*
- *For both GC and particularly GC/MS use an isolation valve on inlet of GC.*
On standby/closedown the GC System can back diffuse air throughout the system.
Any dead pockets in fittings, Tees gauges can act as exponential dilution flask and take "hours" to slowly diffuse air out.
- *Of course any rubber diaphragm, O-rings Teflon Components will slowly release absorbed air/O2.*
 - *30mins purge time from start-up is recommended before heating columns or activating a Mass Spec*
- *NEVER EVER use water or SNOOP Leak Detector solution on ANY fitting columns connectors etc*
Even against positive pressure this "contamination can diffuse in.
- *Use a Electronic Leak Detector.*
MORE > Use a bit of "common sense" !
- *DON'T Let a "bean counter" or "bush mechanic" anywhere near your GC/MS with a 24" Shifter spanner.*
"False Economy" by skimping on maintenance and old parts - you are dealing with expensive delicate instrument (100's of 1000's of \$\$\$'s maybe " think of the consequence due to ANY down time !
- *ALWAYS use a secondary Indicator Trap DON'T rely on Unsight(ly) manifold systems mounted Traps*
- *Install Oxytrap (preferably an Indicating type) close to the GC AND actually look at the indicator as they get used Change the "Main" Trap on the first change in color.*

despite the high cost they can be still ultimately COST EFFECTIVE !

Capillary GC

FERRULES

Graphite : Whilst 100% Graphite are perfectly satisfactory for conventional GC and the "crushed semi laminated" structure can diffuse "trace" amounts of air in a much more sensitive GC/Mass system.

for GC/MS use **15%Graphite/Vespel(polyimide)** for ALL column connections.

MAX recommended temperature (320degC) > they tend to shrink/crack/leak etc

or column High Temperature Application use MXT Columns (as inert as fused silica) use graphite ferrules in a

"Capture-type" fitting configuration (custom).

- precondition at maximum Column Temperature in the GC oven - to minimise any potential bleed finger-handling contamination

100% Vespel tends to shrink on heating and the harder material requires more finesse in tightening onto fused silica columns

For glass (packed) GC Columns 100% Graphite is the preferred material (re softness/malleability

- minimise columns breakage etc or with care **15%Graphite/Polyimide) -**

- **never use Teflon** (transition point at about room temperature columns can even actually fall out on cooling if mounted in a vertical position.

Inlet Liners

- **Siltek Deactivated Liners** : highly inert ! ... similar to Restek column deactivation Rxu-1m Rxu-5 etc

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UHP Gas Regulator

HD5S-A-700-GGP-T10-F/A-He \$780

SS Diaphragm Ni-plated Brass Body

A10 Spigot Helium Australian

1/8 Swagelok Fitting Outlet

300psig Max

Outlet 100psi(or optional)

Optional On/OFF Valve



UltraHigh Purity Helium

(UHP) Multi GC/MS

System Purifier - **High(er) Capacity**

Use a "getter" System

VICI-Valco see FlipPAGE Catalog

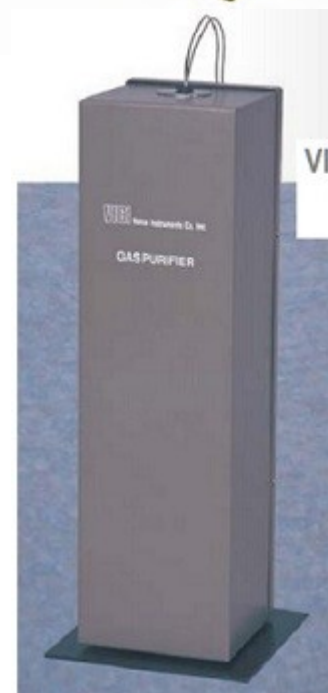
Standard Helium HP2-220 \$1750

mini Helium Purifier HPM-220 \$1230

UltraHighPurity **2-stage for High Purity** Gas Analysers

LDetek LDP1000 ~\$7500

see PDF inc APP Note

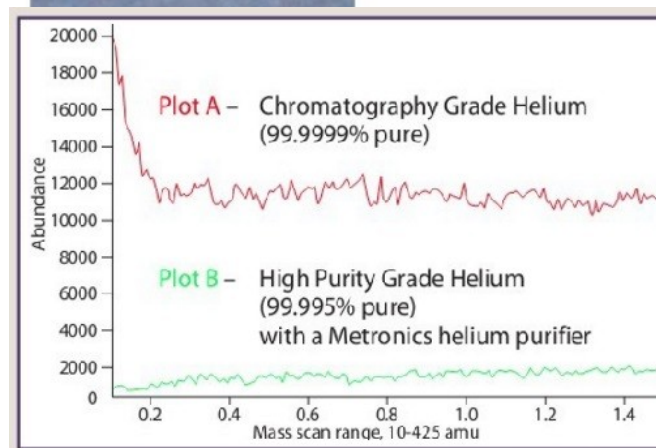


VICI Gas Purifier
He (& N2)
HP2-220 (NP2-220)

mini Gas Purifier
HPM-220 (& NPM-220)



Gas purifier : perfect !
for any trace gas
analysis system



Ball Valve Isolation & Venting

To be advised Standard Industrial Ball are **ABSOLUTELY USELESS !**

Even most Precision Engineered versions have Teflon Ball CTFE Seats or Teflon-coated internal components whilst the better ones are certified to MAX N2 leak test of 0.1cc/min at 1000psi.

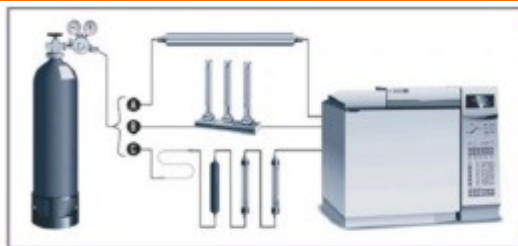
Few if ANY OEMS are "game enough" to rate them for GC/MS use re Air in-diffusion.

Chromtech is independantly "sourcing" similarly Valves with PEEK innards to absolutely Minimise these potential problems
ASK for more details !

INVEST IN PROPERLY DESIGNED Quick-Connect Traps such as Click-on or Easy-Clean . . .

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Some Pricing : Ex GST etc July 2017 USD/AUD 0.72) Indicative ONLY Call or ASK for QUOTATION
see details / more Restek FlipPAGE Catalog Gas Management Systems

22600 Purifier Module Helium 1/4in Fittings : \$610 see also VICValco FlipPAGE MS-P100-1 \$575 minimises number of fittings but use with an Indicating Trap as well

22010 Trap Oxygen Indicating 1/8in Fittings \$337

22019 Super-Clean Gas Filters Complete Carrier Gas Filter Kit. Baseplate and Triple Filter. Oxygen, Moisture and Hydrocarbon trap (1/8in) :\$932

22468 Super-Clean Click-on Trap Replacement Oxygen Trap Ultra High Capacity : \$295

22479 Click-On Trap Connectors Double Connector : \$535

22474 Super-Clean Click-on Trap Indicating Cartridge : \$306

22020 Super-Clean Gas Filters Replacement Triple Trap for Carrier Gas. Filters Oxygen, Moisture & Hydrocarbons :\$395

22025 Super-Clean Baseplate Single Position Baseplate for One Cartridge Filter 1/8in Brass Fittings : \$547

20623 Trap Oxygen Indicating High Capacity 1/4" Fittings : \$747

20625 Trap Oxygen Indicating High Capacity Refill Cartridge For Cat #'s 20624/20623 Only : \$569

UHP Gas Regulator

HD5S-A-700-GGP-T10-F/A-He \$780

SS Diaphragm Ni-plated Brass Body Helium Australian A10 Spiggot On/OFF Valve 1/8 Swagelok Fitting Outlet

UltraHigh Purity Helium (UHP) Multi GC/MS System Purifier - **High(er) Capacity**

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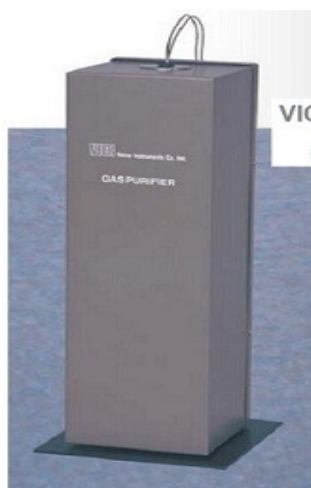
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see PDF inc **APP Note**



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mini Gas Purifier
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V1
V2