

Super-Clean™

Gas Filters from Restek

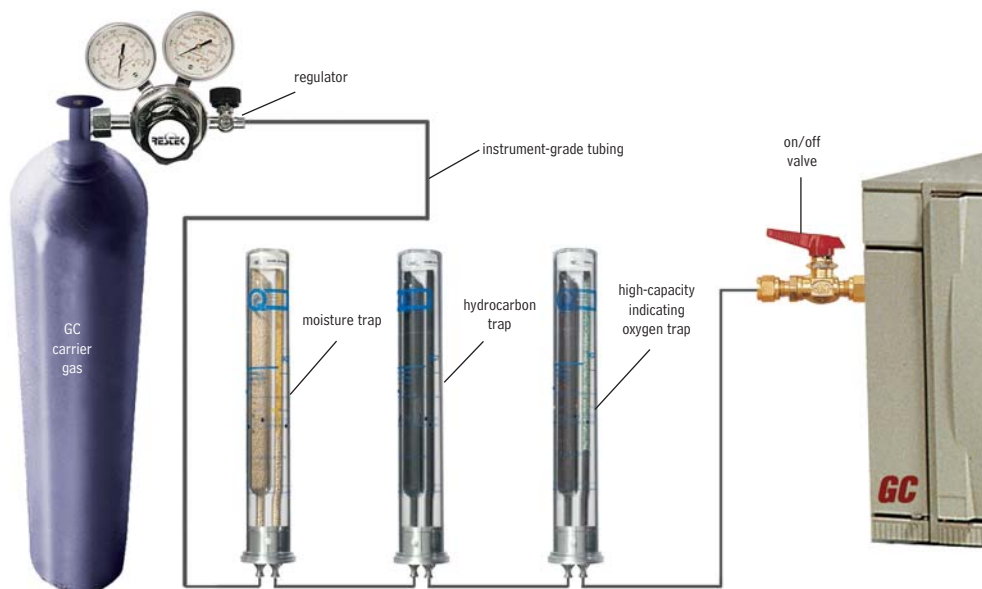


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Why do I need to use traps and where should I install them?

Carrier gas must contain less than 1ppm of oxygen, water vapor, or any other trace contaminant, to prevent column degradation, shortened column lifetime, and increased stationary phase bleed. Contaminants cause ghost peaks to appear during temperature programming and degrade the validity of analytical data. Make-up gas also should be contaminant-free, or baseline fluctuations and excessive detector noise can occur; detector gases should be free of water and hydrocarbons, or excessive baseline noise can result. Gas purifiers remove these contaminants from gas sources, thereby improving system performance.

tech tip

Carrier Gas Purity

Carrier gas should contain less than 1ppm of oxygen, moisture, or other trace contaminants, to prevent column degradation, increase column lifetime, and decrease stationary phase bleed.

The expense of using high-purity gases in combination with carrier gas line purifiers will be offset by longer column lifetime and less GC maintenance.

Moisture Removal

Moisture in carrier gas lines will prematurely degrade oxygen and hydrocarbon traps and increase detector noise (particularly with ECDs). As a precaution, we highly recommend installing a moisture trap before the hydrocarbon and oxygen traps on all carrier gas lines. Our favorite trap is the Super-Clean™ Ultra-High Capacity Moisture Filter (cat.# 22028).

Hydrocarbon Removal

Use a hydrocarbon trap if your gas has a potential source of hydrocarbon contaminants (e.g., an oil pump in an air compressor) or if you suspect you are observing carrier gas ghost peaks. Install the hydrocarbon trap after the moisture trap, to prevent moisture from degrading the hydrocarbon-trapping ability of the activated carbon in the hydrocarbon trap. We recommend the Super-Clean™ Ultra-High Capacity Hydrocarbon Filter (cat.# 22030).

Oxygen Removal

Oxygen is a column killer. It is present even in UHP gases, as minute leaks at fittings allow oxygen to influx against the concentration gradient. There are many choices for oxygen removal—the Super-Clean™ Ultra-High Capacity Oxygen Filter (cat.# 22029) is popular with Restek chemists. Because oxygen can enter a gas line at any fitting, the oxygen trap should be the last connection before the gas line enters the chromatograph.

did you know?

Trap replacement made simple!

Try the Super-Clean™ Triple Filter Carrier Gas Cleaning Kit (cat.# 22019) that removes moisture, hydrocarbons, and oxygen in one easy-to-change, economical cartridge.

Super-Clean™ Gas Filters

- High-purity output ensures 99.9999% pure gas.
- “Quick connect” fittings for easy, leak-tight cartridge changes.
- Glass inside to prevent diffusion; plastic outside for safety.

Designed for fast, simple cartridge changing

Cartridge systems make changing gas filters quick and easy, and Super-Clean™ gas filters are the latest in cartridge-style gas filtration. A baseplate allows cartridges to be exchanged without introducing oxygen. Spring-loaded check valves seal when a filter is removed and open only when a new filter has been locked in place. There is no longer a need for loosening and tightening fittings every time a trap is changed, and your system will not become contaminated during the process.

With available 2- or 3-position baseplates, you can purify all GC gas streams at one location. Figure 1 shows some possible filter cartridge combinations using these baseplates. Any combination is possible because any Super-Clean™ filter cartridge can be used with any baseplate.

High-purity output for improved sensitivity (Table I)

The Triple Filter cartridge (cat.# 22020) is ideal for purifying carrier gas. This trap contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge. The purity of your carrier gas after flowing through the Triple Filter is better than six-9s (99.9999% pure), which is ideal for sensitive mass spectrometry (MS) or ECD analyses, and for protecting your analytical columns against damage from contaminated carrier gas.

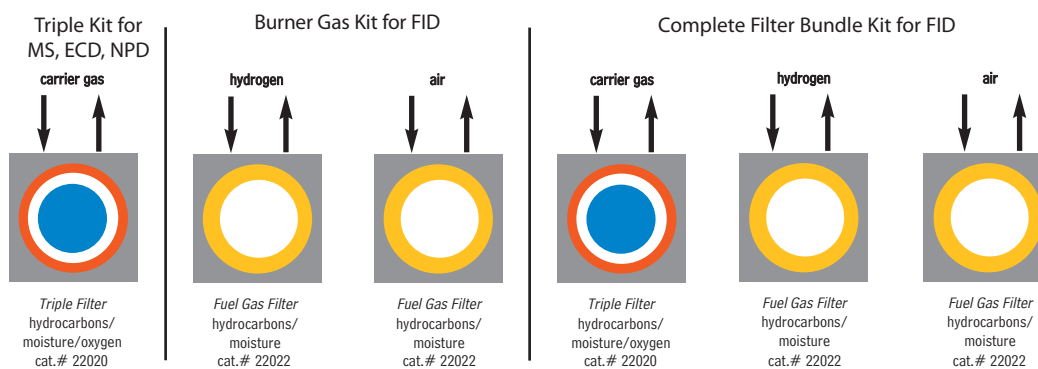
The Fuel Gas Filter cartridge (cat.# 22022) is perfect for purifying flame ionization detector (FID) fuel gases, removing both moisture and hydrocarbons. Using the Fuel Gas Filter for FID hydrogen and air will produce a stable baseline, improving overall reproducibility and sensitivity.



did you know?

All Super-Clean™ filter cartridges (except hydrocarbon filter cat.# 22030) feature easy-to-read indicators. The indicator code is shown on every trap so there is no confusion about when to replace it.

Figure 1 Filter cartridges can be configured for different applications.



tech tip

Oxygen and Moisture Traps

We highly recommend oxygen and moisture traps for make-up gas when operating sensitive detectors such as electron capture detectors (ECD). The hydrogen reaction gas for sensitive electrolytic conductivity detectors (ELCD) also requires a hydrocarbon trap, to remove trace impurities.

Table I Each Super-Clean™ filter provides high-purity outlet gas.

| Type of Filter | Outlet Gas Quality (%) | Maximum Pressure/ Maximum Flow Rates | Use for: | Indicator Color Change | Capacity | | | Estimated Lifetime (years) |
|--|------------------------|--------------------------------------|--------------------------------------|----------------------------------|----------------------|---------------------|------------------|----------------------------|
| | | | | | H ₂ O (g) | O ₂ (mL) | Hydrocarbons (g) | |
| Moisture cat.# 22028 | >99.9999 | 11 bar 159psi/ 7 L/min. | Inert carrier gas Air Hydrogen | Yellow to clear | 7.2 | — | — | >2 |
| Oxygen cat.# 22029 | >99.9999 | 11 bar 159psi/ 7 L/min. | Inert carrier gas | Green to grey | NA | 1000 | — | >2 |
| Hydrocarbons cat.# 22030 | >99.9999 | 11 bar 159psi/ 7L/min. | Inert carrier gas Air Hydrogen | No indicator | NA | — | 12 ³ | >2 |
| Fuel Gas ¹ cat.# 22022 | >99.9999 | 11 bar 159psi/ 7L/min. | Inert carrier gas Air Hydrogen | Yellow to clear | 3.5 | — | 24 ³ | >1.5 |
| Triple ² cat.# 22020 | >99.9999 | 11 bar 159psi/ 7L/min. | Inert carrier gas | Yellow to clear Green to grey | 1.8 | 500 | 4 ³ | >1 |
| Helium Specific ² cat.# 21982 | >99.9999 | 11 bar 159psi/ 7L/min. | Helium | Yellow to clear Green to grey | 1.8 | 500 | — | >1 |

¹Removes hydrocarbons, moisture.

²Removes hydrocarbons, moisture, oxygen.

³As *n*-butane.



Super-Clean™ Filter and Baseplate Kits

All traps measure: 10⁵/₈" x 1³/₄"
(27 x 4.4 cm)

Each baseplate unit measures:
4" x 4" x 1⁷/₈"
(10.2 x 10.2 x 4.8 cm)

| Description | qty. | cat.# |
|---|------|-------|
| Carrier Gas Cleaning Kit (includes mounting baseplate, 1/8" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Triple Filter) | kit | 22019 |
| Fuel Gas Purification Kit (includes mounting baseplate, 1/8" inlet/outlet fittings, and hydrocarbon/moisture Fuel Gas Filter) | kit | 22021 |



Replacement Filters

| Description | qty. | cat.# |
|---|------|-------|
| Replacement Triple Filter (removes oxygen, moisture and hydrocarbons) | ea. | 22020 |
| Replacement Fuel Gas Filter (removes moisture and hydrocarbons) | ea. | 22022 |



Filter Bundle Kit

- Kit includes two Fuel Gas Filters for FID fuel gases and one Triple Filter for carrier gas.

| Description | qty. | cat.# |
|-------------------|------|-------|
| Filter Bundle Kit | kit | 22031 |



Super-Clean™ Ultra-High Capacity Filters

| Description | qty. | cat.# |
|--|------|-------|
| Ultra-High Capacity Hydrocarbon Filter | ea. | 22030 |
| Ultra-High Capacity Moisture Filter | ea. | 22028 |
| Ultra-High Capacity Oxygen Filter | ea. | 22029 |



Helium-Specific Super-Clean™ Filter and Kit

- Specifically designed for purification of helium in GC/MS systems.
- Traps are packed and conditioned using helium.
- Uses standard single-position baseplate.

| Description | qty. | cat.# |
|--|------|-------|
| Helium-Specific Carrier Gas Cleaning Kit (includes mounting baseplate, 1/8" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Helium-Specific Filter) | kit | 21983 |
| Replacement Helium-Specific Filter (removes oxygen, moisture and hydrocarbons) | ea. | 21982 |



Baseplates

- Standard baseplate fittings are 1/8". To adapt to 1/4", order 1/8" to 1/4" tube-end unions (cat. # 21833, next page).

| Description | qty. | cat.# |
|---------------------------|------|-------|
| Single-Position Baseplate | ea. | 22025 |
| 2-Position Baseplate | ea. | 22026 |
| 3-Position Baseplate | ea. | 22027 |

Wall Mounting Bracket

Baseplates can be mounted by using screws and the mounting holes on the baseplate, or by using this optional wall mounting bracket.

| Description | qty. | cat.# |
|---|------|-------|
| Wall Mounting Bracket for Super-Clean™ Baseplates | ea. | 21984 |



Replacement O-Rings for Cartridge Baseplates

Pack includes 10 large O-rings and 10 small O-rings.

| Description | qty. | cat.# |
|--|--------|-------|
| Replacement O-Rings for Cartridge Baseplates | 20-pk. | 22023 |



1/8-Inch to 1/4-Inch Tube-End Unions

To adapt 1/8" Super-Clean™ baseplate fittings to 1/4", use 1/8" to 1/4" tube-end unions.

| Description | qty. | cat.# |
|------------------------------|-------|-------|
| 1/8" to 1/4" Tube-End Unions | 5-pk. | 21833 |



Super-Clean™ Gas Trapping System for LC/MS

Quick-change cartridge system for removing hydrocarbon impurities from nitrogen

- Changing filters is quick and easy.
- Up to 20L of hydrocarbon-free nitrogen per minute.

The Super-Clean™ Gas Trapping System is the latest technology in cartridge-style gas filtration for purifying nitrogen, and is ideal for use in LC/MS systems. The two-position baseplate (installed in the gas line) allows cartridges to be exchanged without introducing oxygen into the system. Spring-loaded check valves seal when a cartridge is removed and open only when a new cartridge has been locked in place. There is no need for loosening and tightening fittings every time you change cartridges, and your system cannot become contaminated during the changing process.

To meet the high flow needs of the LC/MS system, the charcoal-filled cartridges are positioned and connected in parallel. The incoming gas stream is split equally between the cartridges, and the two streams are rejoined after purification but before the gas exits the baseplate. This approach allows longer contact between the nitrogen and the adsorbent, ensuring higher gas purity and eliminating a potential source of contaminants to your analyses.

A handy date wheel, included with the system, indicates the cartridge installation date and the recommended replacement date.

Table I Super-Clean™ Filters provide high-purity outlet gas

| Type of filter | Max. Flow | Outlet Gas Quality % | Maximum Pressure | Estimated Lifetime |
|------------------------|-----------|----------------------|------------------|--------------------|
| Hydrocarbon (charcoal) | 20L/min. | 99.9999% | 11 bar/159psi | 3 to 6 months |

| Description | qty. | cat.# |
|---|-------|-------|
| Super-Clean™ Gas-Trapping System (2-position baseplate, 2 charcoal filters) | ea. | 22062 |
| 2-Position Baseplate (1/4" Fittings) | ea. | 22060 |
| Replacement Hydrocarbon (Charcoal) Filters | 2-pk. | 22061 |



20L of purified nitrogen per minute!



Click-On Inline Super-Clean™ Traps

- High-purity output ensures 99.9999% pure gas.
- Click-On fittings for easy, leak-tight cartridge changes; brass or stainless steel, 1/4" or 1/8".
- Helium-Specific Triple Trap is ideal for GC/MS.

Using the same features and benefits as the Super-Clean™ base-plates and filters, SGT designed an inline trap. Click-On adaptor connectors allow cartridges to be exchanged without introducing oxygen. Spring-loaded check valves seal when a filter is removed and open only when a new filter has been locked in place. There is no need for loosening and tightening fittings every time a trap is changed, and your system will not become contaminated during the process.

The Triple Trap is ideal for purifying carrier gas—it contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.

The Fuel Gas Trap is ideal for purifying flame ionization detector (FID) fuel gases, removing both moisture and hydrocarbons.

The Helium-Specific Triple Trap is ideal for purifying helium in GC/MS systems. This trap is packed and purged under helium and contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.

Trap replacement depends on the quality of the incoming gas. Use the double connector and install an indicating cartridge after a trap to indicate when the trap should be replaced.

please note

NOTE: Super-Clean™ Gas Filters are recommended for purifying non-corrosive gases with low concentrations of contaminants. The maximum concentration of oxygen in the incoming gas stream for oxygen purifiers is 0.5%.

| Filter Type | Gas Quality at Outlet | Maximum Pressure | Maximum Flow (L/min.) | Use For | H ₂ O (g) | Capacity O ₂ (mL) | Hydrocarbons (g) | Estimated Lifetime (years) |
|-------------------------------------|-----------------------|------------------|-----------------------|---|----------------------|------------------------------|------------------|----------------------------|
| Moisture cat.#22467 | >99.9999 | 11 bar 160psi | 25 | Inert carrier gas, helium, air, H ₂ | 21 | NA | NA | >3 |
| Oxygen cat.#22468 | >99.9999 | 11 bar 160psi | 25 | Inert carrier gas | NA | 3000 | NA | >3 |
| Hydrocarbon cat.#22466 | >99.9999 | 11 bar 160psi | 25 | Inert carrier gas, helium, air, H ₂ | NA | NA | 36 ³ | >3 |
| Fuel Gas ¹ cat.#22465 | >99.9999 | 11 bar 160psi | 25 | Inert carrier gas, helium, air, H ₂ | 10 | NA | 18 ³ | >2 |
| Triple ² cat.#22464 | >99.9999 | 11 bar 160psi | 25 | Inert carrier gas | 6 | 1000 | 12 ³ | >2 |

¹Removes hydrocarbons, moisture.

²Removes hydrocarbons, moisture, oxygen.

³As *n*-butane.

Click-On Inline Super-Clean™ Traps and Connector Kits



| Description | qty. | cat.# |
|---|------|-------|
| Carrier Gas Purification Kit, 1/8" Stainless Steel Includes (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon triple trap | kit | 22456 |
| Carrier Gas Purification Kit, 1/8" Brass Includes (2) 1/8" brass connectors and (1) oxygen/moisture/hydrocarbon triple trap | kit | 22457 |
| Carrier Gas Purification Kit, 1/4" Stainless Steel Includes (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon triple trap | kit | 22458 |
| Carrier Gas Purification Kit, 1/4" Brass Includes (2) 1/4" brass connectors and (1) oxygen/moisture/hydrocarbon triple trap | kit | 22459 |
| Fuel Gas Purification Kit, 1/8" Stainless Steel Includes (4) 1/8" SS connectors and (2) hydrocarbon/moisture traps | kit | 22460 |
| Fuel Gas Purification Kit, 1/8" Brass Includes (4) 1/8" brass connectors and (2) hydrocarbon/moisture traps | kit | 22461 |
| Fuel Gas Purification Kit, 1/4" Stainless Steel Includes (4) 1/4" SS connectors and (2) hydrocarbon/moisture traps | kit | 22462 |
| Fuel Gas Purification Kit, 1/4" Brass Includes (4) 1/4" brass connectors and (2) hydrocarbon/moisture traps | kit | 22463 |



Wall-Mounting Clamps for Click-On Inline Super-Clean™ Traps

| Description | qty. | cat.# |
|---|-------|-------|
| Wall-Mounting Clamps for Click-On Inline Super-Clean™ Traps | 4-pk. | 22480 |

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Click-On Inline Super-Clean™ Replacement Traps

| Description | qty. | cat.# |
|--|------|-------|
| Click-On Super-Clean™ Replacement Triple Trap (removes oxygen, moisture and hydrocarbons) | ea. | 22464 |
| Click-On Super-Clean™ Replacement Fuel Gas Trap (removes moisture and hydrocarbons) | ea. | 22465 |



Click-On Inline Super-Clean™ Ultra-High Capacity Traps

| Description | qty. | cat.# |
|--------------------------------------|------|-------|
| Ultra-High Capacity Hydrocarbon Trap | ea. | 22466 |
| Ultra-High Capacity Moisture Trap | ea. | 22467 |
| Ultra-High Capacity Oxygen Trap | ea. | 22468 |



Helium-Specific Click-On Inline Super-Clean™ Trap and Connector Kits

| Description | qty. | cat.# |
|---|------|-------|
| Kits | | |
| Helium-Specific Carrier Gas Cleaning Kit, 1/8" Stainless Steel Includes (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap | kit | 22469 |
| Helium-Specific Carrier Gas Cleaning Kit, 1/8" Brass Includes (2) 1/8" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap | kit | 22470 |
| Helium-Specific Carrier Gas Cleaning Kit, 1/4" Stainless Steel Includes (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap | kit | 22471 |
| Helium-Specific Carrier Gas Cleaning Kit, 1/4" Brass Includes (2) 1/4" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap | kit | 22472 |
| Replacement Trap | | |
| Helium-Specific Replacement Triple Trap (removes oxygen, moisture and hydrocarbons) | ea. | 22473 |

did you know?

Helium-Specific Click-On Inline Super-Clean™ Trap and Kits are designed specifically for purification of helium in GC/MS systems!



Click-On Inline Super-Clean™ Indicator

- Oxygen: Green to Grey
- Moisture: Beige to Clear

| Description | qty. | cat.# |
|---|------|-------|
| Click-On Inline Super-Clean™ Indicator (oxygen, moisture) | ea. | 22474 |

tech tip

Install an indicator after the Click-On inline filter so there is no confusion about when to replace the traps.



Click-On Inline Super-Clean™ Connectors

- Click-On connectors allow you to change traps quickly, without introducing oxygen into your system.

| Description | qty. | cat.# |
|--|-------|-------|
| 1/8" Brass Click-On Inline Super-Clean™ Connectors | 2-pk. | 22475 |
| 1/8" Stainless Steel Click-On Inline Super-Clean™ Connectors | 2-pk. | 22476 |
| 1/4" Brass Click-On Inline Super-Clean™ Connectors | 2-pk. | 22477 |
| 1/4" Stainless Steel Click-On Inline Super-Clean™ Connectors | 2-pk. | 22478 |



Click-On Inline Super-Clean™ Double Connector

- Connects any Click-On trap to a Click-On indicator.

| Description | qty. | cat.# |
|--|------|-------|
| Click-On Inline Super-Clean™ Double Connector, stainless steel | ea. | 22479 |



Replacement O-Rings for Click-On Inline Super-Clean™ Connectors

- Pack includes 10 large o-rings and 10 small o-rings.

| Description | qty. | cat.# |
|---|--------|-------|
| Replacement O-Rings for Click-On Inline Super-Clean™ Connectors | 20-pk. | 22481 |



also available

We offer a complete line of gas purification and regulation products.

For more information, see our catalog or visit our website at www.restek.com



Specifications for dual-stage regulators:

Outlet pressure: 0 to 100psig
 Outlet gauge: 30"-0 to 200psig
 Inlet gauge: 0 to 4000psig
 Outlet assembly: diaphragm valve, 1/4" tube fitting



Inlet connections: 1/4" FPT
 Outlet assembly: 1/4" FPT port



Restek Brass and Stainless Steel Body Ultra-High-Purity Regulators

Restek regulators feature metal-to-metal seals throughout for long-term leak-tightness, and a metal diaphragm outlet valve ensures gas purity. Each regulator is helium leak-test-certifiable to 1x10⁻⁸ scc/sec. and is fully assembled and tested for your convenience. 100psig maximum delivery pressure supports EPC operation. Maximum inlet pressure is 3000psig. Brass bar stock construction minimizes dead volume. Stainless steel construction is more easily purged of atmospheric contaminants, and is more resistant to attack from dry corrosive gases. Use stainless steel regulators in all-stainless steel systems where welded tubing and special fittings are used, and rigorous cleaning and proper gas management are practiced.

Dual-Stage Ultra-High-Purity Brass Regulators

- Oxidation-resistant, chrome-plated.
- Most stable outlet pressure control throughout the life of a high-pressure gas cylinder.
- Secondary pressure regulation not needed.
- Most widely used regulator.
- Less internal volume than stainless steel regulators.

| Fitting | qty. | cat.# |
|--|------|-------|
| CGA 580 (N ₂ , He, Ar) | ea. | 21667 |
| CGA 350 (H ₂ , P ₂) | ea. | 21668 |
| CGA 590 (Air) | ea. | 21669 |

Dual-Stage Ultra-High-Purity Stainless Steel Regulators

- Most stable outlet pressure control throughout the life of a high-pressure gas cylinder.
- Secondary pressure regulation not needed.

| Fitting | qty. | cat.# |
|--|------|-------|
| CGA 580 (N ₂ , He, Ar) | ea. | 20662 |
| CGA 350 (H ₂ , P ₂) | ea. | 20663 |
| CGA 590 (Air) | ea. | 20664 |

Ultra-High-Purity Brass Line Regulator

- Oxidation-resistant, chrome-plated.
- Use where you need to reduce the line pressure by 20psi or more.
- Same purity protection as high-pressure cylinder regulators.

| Fitting | Outlet Gauge | Outlet Pressure | qty. | cat.# |
|------------------------|--------------------|-----------------|------|-------|
| 1/4" female NPT ports* | 30" - 0 to 100psig | 0-50psig | ea. | 21666 |
| 1/4" female NPT ports* | 30" - 0 to 200psig | 0-100psig | ea. | 22452 |

*Order appropriate male connector, pipe-to-tube fittings.

Male Connector, Pipe-to-Tube Fittings

| Fitting Type | Size (inches) | Parker # | Similar to Swagelok® | Brass | | Stainless Steel | |
|---------------------|-------------------|----------|----------------------|--------|-------|-----------------|-------|
| | | | | qty. | cat.# | qty. | cat.# |
| A) Male Connector | 1/4" to 1/4" NPT | 4 MSC 4N | 400-1-4 | 10-pk. | 21842 | 2-pk. | 21942 |
| A) Male Connector | 1/8" to 1/4" NPT | 2 MSC 4N | 200-1-4 | 10-pk. | 21844 | 2-pk. | 21944 |
| B) Tube End Reducer | 1/4" tube to 1/8" | 4 TUR 2 | 200-R-4 | 5-pk. | 21834 | 2-pk. | 21934 |



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