

Purifiers – Trace Oxygen Removal

Spec Sheet

This purifier is a proven solution to control your plants vital lifeline on critical gaseous supply of Inert gases. The purifier once installed will provide reassurance that the gas meets your needs. In conjunction with inhouse monitoring ensures reliable gas impurity control.

DeOxo^{4.0}

DeOxo 4.0 Purifier, Trace Oxygen Removal, **15,000 SCFH inert gas capacity at 3000 PSI** maximum working pressure. Includes the following:

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- Stainless Steel Coiled Catalyst Chamber
- Control Valves (GasFlo packless) – Inlet, Outlet and Bypass
- Pressure Gauge – 2-1/2", 5000 psi
- Piping and fittings – all stainless steel
- Frame assembled with removable side panels for easy access to perform maintenance
- Regeneration Kit pre-installed to allow field regeneration (regeneration requires a single 120V 20-amp) circuit and regeneration gas of 10% CO in N2)
- Flow orifice by gas type
- Can be used in series with DeHydro to remove both H2O and O2
- Recommended to be downstream of the Moisture Purifier (DeHydro)

Operation: The Purifier contains a metal catalyst, primarily copper, which reacts with oxygen to form an oxide. The Purifier is normally piped in series in a typical cylinder filling system. A bypass valve is available to allow purifier to be placed offline if needed.



Regeneration: Once all the catalyst is oxidized it must be regenerated (reduced) using a gas mixture of 10% carbon monoxide (CO) in a balance nitrogen mixture. The reduction reaction occurs efficiently at approximately 400° F. Under the standard conditions, approximately 300,000 SCF of gas can be purified before regeneration is necessary. Regeneration of the Purifier will need approximately 100 SCF of the carbon monoxide/nitrogen mixture.

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DeHydro^{4.0}

DeHydro 4.0 Purifier, Trace Moisture Removal, **15,000 SCFH inert gas capacity at 3000 PSI** maximum working pressure. The CryoVation DeHydro Purifier has been designed to remove moisture from inert gas not exceeding 10 PPM to less than 1 PPM. Lower levels can be achieved based on raw material H₂O impurity and flow rate.

Includes the following:

- Stainless Steel Coiled Purification Chamber
- Flow orifice by gas type
- Control Valves (GasFlo packless) – Inlet, Outlet and Bypass
- Pressure Gauge – 2-1/2", 5000 psi
- Piping and fittings – all stainless steel
- Frame assembled with removable side panels for easy access to perform maintenance
- Regeneration Kit pre-installed to allow field regeneration (regeneration requires a single 120V 20-amp circuit)
- Can be used in series with DeOxo to control both H₂O and O₂
- Recommended to be upstream of the Oxygen Purifier (DeOxo)

Operation: The Purifier is normally piped in series in a typical cylinder filling system.



Bypass valve is available to allow purifier to be placed offline if not needed. The moisture purifier is designed for inert gas. Oxygen contents exceeding 23.5 % should never be allowed to enter the purifier. The purifier has been designed to remove moisture from an inert gas not exceeding 10 ppm to less than 1 ppm. Total capacity depends on incoming moisture content but should easily last for 1,000,000 SCFH total before needing to be regenerated.

Regeneration: A regeneration process gas heater is provided with purifier. This allow field regeneration to be done in place. Regeneration is required when the purifier becomes saturated and is no longer removing moisture at desired levels. Optional regeneration may be performed by evacuation of the heated vessel.

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Purifiers – Cryogenic Purifier

Spec Sheet

Cryo Purifier, Trace contaminant removal, 5,000 SCFH (140 M3/hr) inert gas capacity. The Cryogenic Purifier is designed to remove trace impurities from Helium and can be adapted to remove impurities from Hydrogen (H₂). The CryoVation Cryo Purifier can be sold by itself or as the third part of the TRIDENT Purification System.

Includes the following:

- Purifier, Cryogenic - Liquid nitrogen with internal purifying coil assembly
- Isolation valves
- Pressure Gauges
- Inter-connecting piping (1/2" stainless steel tube)
- Sample Ports, (2) each, with pack-less valves and 1/8" tube connection to analyzers.
- Outlet gas ambient heater.
- Regeneration Heater – heated, vacuum regeneration
- Skid with all inter-connecting piping, fittings and supports
- Maximum Allowable Flow Rate: 5,000 SCFH

- Maximum Recommended Inlet Impurity: Grade 5.0 specification (PPM)
 - H₂O 0.5
 - O₂ 1.0
 - THC 0.1
 - Ar 1.0
 - N₂ 1.0
 - CH₄ 1.0
 - CO 1.0
 - CO₂ 1.0

- Expected Outlet Impurity: Grade 6.0 specification (PPM)
 - H₂O 0.2
 - O₂ 0.1
 - THC 0.1
 - Ar 0.1
 - N₂ 0.4
 - CH₄ 0.1
 - CO 0.1
 - CO₂ 0.1

Mean Flow Between Regenerations: 150,000 SCF



Purifiers – Grade 6+ Helium “Trident”

Spec Sheet

Capable of producing grade 6 Helium, skid mounted, with the following 3 major components:

TRIDENT

HELIUM PURIFIER SYSTEM

- **DeHydro 4.0** Moisture Purifier - with bypass valve, regeneration kit and temperature monitoring purifier

- **DeOxo 4.0** Trace Oxygen - with bypass valve, regeneration kit and temperature monitoring purifier

- **Helium Purifier, Cryogenic** - Liquid nitrogen bath with internal purifying coil assembly, regeneration kit and temperature monitoring purifier



Purifiers – Grade 6+ Helium “Trident”

The CryoVation Grade 6.0 Helium Purification System **TRIDENT** is designed to purify inert gases utilizing three unique Purifiers either individually or in series. The Purifier System is comprised of the following:

DeOxo 4.0 Purifier, Trace Oxygen Removal, 15,000 SCFH inert gas capacity at 3000 PSI maximum working pressure. Includes the following: but is recommended to be downstream of the Moisture Purifier. Includes the following:

- Coiled Catalyst Chamber, SS
- Back-pressure Regulator (N2 and Ar only)
- Control Valves (CPV) – Inlet, Outlet and Bypass
- Pressure Gauge – 2-1/2”, 4000 PSI
- Piping and fittings – all stainless steel
- Frame Assembly with removable side panels
- Regeneration Kit installed (regeneration requires 2 separate 20 amp / 120V circuits and regeneration gas of 10% CO / in N2). Optional voltages available.

DeHydro 4.0 Purifier, Trace Moisture Removal, 15,000 SCFH inert gas capacity at 3000 PSI MAWP. Includes the following:

- Coiled Chamber with Molecular Sieve
- Back-pressure Regulator (N2 and Ar only)
- Control Valves (CPV) – Inlet, Outlet and Bypass
- Pressure Gauge – 2-1/2”, 4000 PSI
- Piping and fittings – all stainless steel
- Frame Assembly with removable side panels
- Regeneration Kit installed (regeneration requires 2 separate 20 amp / 120V circuits)

Cryogenic Purifier, Helium Purifier System, improving purity on a scale of 10 to 1, will turn grade 5 into grade 6 helium, 3000 PSI, skid mounted, with the following major components. Includes the following:

- Purifier, Cryogenic Liquid nitrogen with internal purifying coil assembly and regeneration kit
- 5000 SCFH flow
- Full Cylinder Pressure, 3000 psi
- Isolation valves
- Pressure Gauges
- Inter-connecting piping (1/2" tube)
- Sample Ports, (3) each, with pack-less valves and 1/8" tube connection to analyzers
- Line Heater – purifier outlet gas
- Skid with all inter-connecting piping, fittings and supports
- Vacuum pump for regeneration of Cryo and DeHydro purifiers (Optional)

Purifiers – Grade 6+ Argon

Spec Sheet

Argon Purifier System – Ar6

- Heated Getter based technology
- Service pressure 2900 @ 900° F
- Flow rate 5 SCFM
- Stainless Steel construction
- Purifier cartridge exchange program – Cartridge life approx. 150,000 SCF



Features:

- Small footprint 32" W X 72" H X 48" L
- Inline installation to existing high purity manifold
- Built in Purifier bypass for easy user interface when Grade 6 is not required
- Power requirements 240 Volt, 3 Phase, 30 AMPs (5 SCFM Model)
- Inlet / outlet fittings 1/4" MVCR
- Vessel meets ASME standards
- Solid state temperature controlled with independent over-temp protection

Operation: The Purifier is normally piped in series in a typical high purity cylinder filling system. A bypass valve is available to allow purifier to be placed offline if not needed. The Grade 6 purifier is designed to remove trace impurities from an Argon stream of 99.9995% to PPB levels including Nitrogen. Total capacity depends on incoming impurity, but should easily last for 150,000 SCFH total before needing to be regenerated.

An internal, back-pressure regulator allows system to reach pre-set 1500 psi before flow begins to control upstream pressure surges. The system operates at 900° F at a maximum pressure of 2900 PSIG.



Regeneration: The purifier is not re-generable and requires a factory exchange of the purifier cartridge/vessel.