PS4-MT3/15-R/N SPECIFICATIONS

MonoTorr® Phase II, Rare Gas and Nitrogen Purifier, 50 and 75 slpm

General Description

The MonoTorr® Rare Gas and Nitrogen Purifier is a getter-based purifier designed specifically to provide ultra-high purity (UHP) gas for semiconductor applications. Outlet impurity levels for O_2, H_2O, CO, CO_2, H2, CH4 and N_2 (from Rare gas only) are reduced to low parts per billion (ppb) levels or below.

The patented getter alloy operated at elevated temperatures, removes impurities by forming irreversible chemical bonds. Impurities will not be released under any circumstances when the purifier is operated within specification.

The purifier will continuously supply ultra pure gas at rated flows provided that inlet impurities are within specified levels, until getter cartridge replacement is necessary.

PS4 Phase II Controller Features

- ***Life Status*** indicates the life status of the purifier. *Good* is normal, *Marginal* indicates approaching depletion and *Change* includes audible alarm to notify the operator that end-point is approaching and replacement will soon be required.
- ***Heater*** indicates status of heater.
- ***Temperature*** display heater mode while maintaining getter material at preset operating temperature.
- ***Valves*** indicate status of purifier as controlled by pneumatic valves.
- ***Alarms*** *Pneumatic* alarm caused by loss of adequate pressure for valves. *Power* alarm indicates that extended power failure has caused purifier to go into Standby condition. *Temperature* alarm indicates a high or low temperature condition in the purifier cartridge. High impurity levels (air) in the gas stream could cause the high temperature alarm. Alarm causes the purifier to go to *Bypass* mode. Additional error codes provide alarms for exhaust fan, heater or solid state relay failure.
- ***Heater On/Off*** activates heater only when no alarms exist.
- ***Valve Control*** positions valve to Purifier or Bypass mode.

- ***LED Check*** assures proper functioning of all LEDs and alarm buzzer.
- ***Acknowledge*** Silence audible alarm and restores operation if certain alarm conditions have been corrected.

Process Gas Specifications	
Specification	**SPG Standard**
Maximum Flow Rate:	MT3: 50 slpm MT15: 75 slpm
Nominal Flow Rate:	MT3: 5 slpm MT15: 15 slpm
Minimum Flow Rate: (for purity measurement)	MT3: 0.5 slpm MT15: 1.0 slpm
Maximum Inlet Pressure	10.3 bar (~150 psig)
Max. Pressure Drop @ 7 bar inlet pressure and maximum rated flow	< 1 bar (~14.5 psid)
Inlet Gas Temperature Range	0^{o} – 35° C (32° – 95° F)
Outlet Gas Temperature (maximum)	< 50° C (122° F)

Facilities Requirements – Electrical	
Specification	**SPG Standard**
Installed Power (customer to specify voltage at time of order)	Optional 120 VAC – MT3: 260W, MT15: 450W Optional 220 VAC – MT3: 260W, MT15: 600W
Note: The purifier is designed to operate with a 30mA GFI that will trip when a 30mA leakage current occurs.	

Facilities Requirements – General	
Specification	**SPG Standard**
Instrument Air Pressure: (clean dry air or nitrogen filtered to 10 μm)	5.5 bar (80 psig) - 6.9 bar (100 psig)
Ambient Temperature Range	0^{o} – 35° C (32° – 95° F)

Analytical Specifications (based on 99.999% pure inlet gas)					
SPG Standard Outlets - Phase II 3000			SPG Standard Outlets - Phase II 15000		
Outlet Impurity	0-20 slpm	20-50 slpm	Outlet Impurity	0-30 slpm	30-75 slpm
O_2	< 1 ppb	< 1 ppb	O_2	< 1 ppb	< 1 ppb
H_2O	< 1 ppb	< 1 ppb	H_2O	< 1 ppb	< 1 ppb
CO	< 1 ppb	< 1 ppb	CO	< 1 ppb	< 1 ppb
CO_2	< 1 ppb	< 1 ppb	CO_2	< 1 ppb	< 1 ppb
H_2	< 1 ppb	< 10 ppb	H_2	< 1 ppb	< 10 ppb
N_2 (Rare gas only)	< 1 ppb	< 10 ppb	N_2 (Rare gas only)	< 1 ppb	< 10 ppb
CH_4	< 1 ppb	< 10 ppb	CH_4	< 1 ppb	< 10 ppb

General Purifier Specifications	
Purifier Height (envelope)	86.4 cm (34 inches)
Purifier Width (envelope)	20.3 cm (8 inches)
Purifier Depth (envelope)	20.9 cm (8.25 inches)
Purifier Weight	MT3: 23 kg (50 pounds) MT15: 28 kg (61 pounds)
Feed Gas Inlet	¼ inch VCR Female
Purified Gas Outlet	¼ inch VCR Male
Getter Bed Operating Temperature	Rare Gas: 400° C (752° F) Nitrogen: 350° C (662° F)
Heater Power Consumption (watt) Nominal/Maximum	MT3: <125 / <260 MT15: <187 / <600
Outlet Particle Filter	0.003 μm absolute all metal type
Instrument Air Inlet	¼ inch FNPT
Valves	Three, ¼ inch diaphragm type, Air actuated
Thermocouple	Two, ungrounded, K type

Standard power cord length	244 cm (96 inches)
Gas Wetted Surface Finish	Up and Downstream of Getter Vessels = 316L SST, Electropolished, 12 Ra Maximum, 10 Ra Average for tubing and tube fittings
Control System	Discrete analog temperature controller with alarm and shut-down features
Accessories	2EA ¼ inch VCR gaskets MT3: 1EA 3 A fuse (120V), 1EA 2 A fuse (220V) MT15: 1EA 5 A fuse (120V), 1EA 4 A fuse (220V)
Applicable Codes & Standards	CE Marking