4100-1 OPERATING SPECIFICATIONS

The following are the operating specifications for the HEATPULSE 4100 system.

- **Wafer handling:** automatic, serial processing using standard cassettes.
- **Throughput:** Process dependent, approximately 80 wafers per hour (in a null cycle) without flat finder.
- **Wafer sizes:** 4", 5", and 6" standard; 3" optional.
- **Ramp up rate:** Programmable, 10°C to 200°C per second.
- **Steady-state duration:** 1-600 seconds per step.
- **Ramp-down rate:** Programmable, 10˚C to 250˚C per second. Ramp-down rate is temperature-and-radiation-dependent and the maximum is 150˚C per second.
- **Recommended steady-state temperature range:** 400 - 1300˚C.
- **ERP temperature accuracy:** ±3.5°C (typical) to ±7.0°C (maximum), when calibrated against an instrumented thermocouple wafer (ITC).
- **Temperature repeatability:** ≦ 3°C or better at 1150°C wafer-to-wafer. (Repetition specifications are based on a 100-wafer set.)
- **Temperature uniformity:** ± 5°C across a 6" (150 mm) wafer at 1150°C. (This is a one-sigma deviation from 100 angstrom oxide-uniformity.) For a titanium-silicidation process, no more than 1.5% increase to uniformity during the first anneal at 650°C to 700°C.

4100-2 PHYSICAL DIMENSIONS

- **Width** 40 in. (102 cm)
- **Depth** 42 in. (107 cm)
- **Height** 82 in. (208 cm)
- **Weight** 1500 lb (680 kg)
- **Shipping weight** 1800 lb (816 kg)

4100-3 UTILITY REQUIREMENTS

Utility requirements include:

- **Power**

  Standard: 200, 208, 220, 240 VAC; 50 or 60 Hz; 70 A maximum; three-phase plus neutral plus ground

  Optional: 200, 208 VAC; 40 A maximum; three-phase plus ground

  380, 415 VAC; 50 Hz; 40 A; three-phase plus neutral and ground

- **Water Type**

  Pre-filtered with conventional particulate filter **(No DI Water);** Closed-loop recirculator highly recommended

4100-4 FACILITY CONNECTIONS

The following table is a summary of the facility connections for the HEATPULSE 4100 system:

Table A-1. *Facility Connections*

UTILITY	SERVICE SIZE	CONN. TYPE
CDA or Utility N2	1/2" 1/4"	Swagelok Swagelok
Cooling-Water Supply **Cooling-Water Return**	5/8" 5/8"	Swagelok Swagelok
Gas-Box Exhaust	4" OD	Duct
Cooling Exhaust **Scavenger-Hood Exhaust** **Containment Exhaust (Optional)** **OR** **Exhaust-Manifold Outlet**	2" OD 2" OD 2" OD 3" OD	Duct Duct Duct Duct
Process-Gas Exhaust (Scrubber)	3/8"	VCR, Male
Process-Gas Supply	1/4"	VCR, Female
Oven-Recirculator Water Supply **Oven-Recirculator Water Return**	5/8" 5/8"	Swagelok Swagelok

4100-5 UTILITY SPECIFICATIONS

The following table is a summary of the utility specifications for the HEATPULSE 4100 system:

Table A-2. *Utility Specifications*

UTILITY	FLOW RATE			PRESSURE		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
CDA or Utility N2 (Cooling) **CDA or Utility N2 (Valve Act.)**	8 SCFM <1 SCFM	10 SCFM <1 SCFM	15 SCFM <1 SCFM	30 PSIG 70 PSIG	60 PSIG 80 PSIG	100 PSIG 100 PSIG
Cooling-Water Supply **Cooling-Water Return**	1.6 GPM 1.6 GPM	2 GPM 2 GPM	2.5 GPM 2.5 GPM	30 PSIG 20 PSIG	40 PSIG 30 PSIG	100 PSIG 40 PSIG
Gas-Box Exhaust	0 SCFM	150 SCFM	>200 SCFM	.5" H_2O	.75" H_2O	--------
Cooling Exhaust **Scavenger-Hood Exhaust** **Containment Exhaust (Optional)** **OR** **Exhaust-Manifold Outlet**	8 SCFM 20 SCFM 0 SCFM 28 SCFM	10 SCFM 25 SCFM 0 SCFM 35 SCFM	15 SCFM 30 SCFM 2 SCFM 45 SCFM	.5" H_2O .5" H_2O .5" H_2O .5" H_2O	.75" H_2O .75" H_2O .75" H_2O .75" H_2O	-------- -------- -------- --------
Process-Gas Exhaust (Scrubber)	10 SLPM	10 SLPM	10 SLPM	.5" H_2O	.75" H_2O	2.5" H_2O
Process-Gas Supply	10 SLPM	10 SLPM	10 SLPM	30 PSI	60 PSI	100 PSI
Oven-Recirculator Water Supply **Oven-Recirculator Water Return**	3 GPM 3 GPM	5 GPM 5 GPM	7 GPM 7 GPM	30 PSI 10 PSI	40 PSI 20 PSI	60 PSI 40 PSI

AG Associates Heatpulse 8108 Specifications

SemiStar Corp – Your Trusted Partner for AG Associates Heatpulse RTP Systems

Looking for a reliable source for your aging AG Associates Heatpulse 4100, 4108, 8108, 8800, or 8800i Rapid Thermal Processors? SemiStar Corp is the go-to expert for refurbished equipment, genuine OEM spare parts, and professional service.
We maintain extensive inventory of used RTP systems and original parts, and our engineers have over 25 years of hands-on experience servicing AG Associates Heatpulse tools. Still relying on non-specialized vendors? Frustrated by unstable equipment or inconsistent processes caused by second-source parts? Stop chasing problems on your own.

Contact us today at sales@semistarcorp.com and let us handle the issues for you—so you can focus on more important work… or simply enjoy your coffee.

8108.1 OPERATING SPECIFICATIONS

The following are the operating specifications for the Heatpulse® 8108 system.

- **Wafer handling:** automatic serial processing, using standard cassettes.
- **Throughput:** Process dependent, approximately 80 wafers per hour (in a null cycle) without flat-finder.
- **Wafer sizes:** 5 inches, 6 inches, and 8 inches (standard).
- **Ramp-up rate:** Programmable, 1 - 180°C per second.
- **Steady-state duration:** 1 - 600 seconds per step.
- **Ramp-down rate:** Programmable, 1 - 180˚C per second. Ramp-down rate is temperature and radiation dependent, maximum 150˚C per second.
- **Recommended steady-state temperature range:** 400 - 1200˚C.
- **ERP temperature accuracy:** +3°C to -7°C, when calibrated against an instrumented thermocouple wafer (ITC).
- **Temperature repeatability:** $\pm$ 3°C or better at 1150°C wafer to wafer. (Repetition specifications are based on a 100-wafer set.)
- **Temperature uniformity:** $\pm$ 5°C across an 8-inch wafer at 1150°C. (This is a 1-sigma deviation from 100-angstrom oxide uniformity.) For a titanium silicidation process, no more than 1.5 percent increase to uniformity during the first anneal at 650 - 700°C.

8108.2 PHYSICAL DIMENSIONS

- **Width** — Monitor-Fab-Wall configurations: 40 in. (102 cm)
  Monitor-Side-Panel configurations: 60 in. (152 cm)
- **Depth** — 42 in. (107 cm)
- **Height** — 82 in. (208 cm)
- **Weight** — Monitor-Fab-Wall configurations: 1800 lbs (816 kg);
  Monitor-Side-Panel configurations: 1840 lbs (835 kg)
- **Shipping weight** — Monitor-Fab-Wall configurations: 2000 lbs (907 kg);
  Monitor-Side-Panel configurations: 2040 lbs (925 kg)

8108.3 UTILITY REQUIREMENTS

Utility requirements include:

- **Power**
  - Standard Domestic: 208 VAC, 60 Hz; 125 A maximum; 3-phase plus ground and neutral
  - European: 400 VAC, 50 Hz; 90 A maximum; 3-phase plus ground and neutral
  - Japanese: 200 VAC, 50/60 Hz, 125 A maximum; 3-phase plus ground
- **Water Type (Recirculator)** — Refer to the 8108 facility manual

8108.4 FACILITY CONNECTIONS

The following table is a summary of the facility connections for the Heatpulse 8108 system:

Table A-1. *Facility Connections*

UTILITY	SERVICE SIZE	CONN. TYPE
Tube Cooling CDA or Utility N2 **Valve Actuation CDA or Utility N2**	1/2 inch 1/4 inch	Swagelok Swagelok
Cooling Water Supply **Cooling Water Return**	1/2 inch 1/2 inch	Swagelok Swagelok
Gas Box Exhaust	4-inch OD	Duct
Cooling Exhaust **Scavenger Hood Exhaust** **Containment Exhaust (Optional)** **OR** **Exhaust Manifold Outlet**	2-inch OD 2-inch OD 2-inch OD 3-inch OD	Duct Duct Duct Duct
Process Gas Exhaust (Scrubber)	3/8 inch	VCR, Male
Process Gas Supply	1/4 inch	VCR, Female
Recirculator Water Supply **Recirculator Water Return**	1/2 inch 1/2 inch	Swagelok Swagelok

8108.5 UTILITY SPECIFICATIONS

The following table is a summary of the utility specifications for the Heatpulse 8108 system:

Table A-2. *Utility Specifications*

UTILITY	FLOW RATE MIN.	FLOW RATE TYP.	FLOW RATE MAX.	PRESSURE MIN.	PRESSURE TYP.	PRESSURE MAX.
CDA or Utility N2 (Cooling) **CDA or Utility N2 (Valve Act.)**	35 SCFM <1 SCFM	40 SCFM <1 SCFM	45 SCFM <1 SCFM	80 psi 80 psi	90 psi 90 psi	100 psi 100 psi
Cooling Water Supply **Cooling Water Return**	3 GPM 2.5 GPM	3.5 GPM 3 GPM	4 GPM 3.5 GPM	30 psi 20 psi	40 psi 30 psi	60 psi 40 psi
Gas Box Exhaust	0 SCFM	100 SCFM	150 SCFM	.5" H_2O	.75" H_2O	--------
Cooling Exhaust **Scavenger Hood Exhaust** **Containment Exhaust (Optional)** **OR** **Exhaust Manifold Outlet**	25 SCFM 20 SCFM 0 SCFM 45 SCFM	30 SCFM 25 SCFM 0 SCFM 55 SCFM	40 SCFM 30 SCFM 2 SCFM 72 SCFM	.5" H_2O .5" H_2O .5" H_2O .5" H_2O	.75" H_2O .75" H_2O .75" H_2O .75" H_2O	-------- -------- -------- --------
Process Gas Exhaust (Scrubber)	20 SCFM	20 SCFM	20 SCFM	1" H_2O	2" H_2O	2.5" H_2O
Process Gas Supply	20 SCFM	20 SCFM	20 SCFM	20 psi	30 psi	55 psi
Recirculator Water Supply	3 GPM	5 GPM	7 GPM	40 psi	50 psi	60 psi

AG Associates Heatpulse 8800 Specifications

SemiStar Corp – Your Trusted Partner for AG Associates Heatpulse RTP Systems

Looking for a reliable source for your aging AG Associates Heatpulse 4100, 4108, 8108, 8800, or 8800i Rapid Thermal Processors? SemiStar Corp is the go-to expert for refurbished equipment, genuine OEM spare parts, and professional-service.
We maintain extensive inventory of used RTP systems and original parts, and our engineers have over 25 years of hands-on experience servicing AG Associates Heatpulse tools. Still relying on non-specialized vendors? Frustrated by unstable equipment or inconsistent processes caused by second-source parts? Stop chasing problems on your own.

Contact us today at sales@semistarcorp.com and let us handle the issues for you—so you can focus on more important work… or simply enjoy your coffee.

8800.1 OPERATING SPECIFICATIONS

The following are the operating specifications for the Heatpulse® 8800 system.

- **Wafer handling:** automatic serial processing, using standard cassettes.
- **Throughput:** Process dependent, approximately 80 wafers per hour (in a null cycle) without flat-finder.
- **Wafer sizes:** 5 inches, 6 inches, and 8 inches (standard).
- **Ramp-up rate:** Programmable,up to 100°C per second with Ceramic Shield; up to 150°C per second without Ceramic Shield.
- **Steady-state duration:** 1 - 600 seconds per step.
- **Ramp-down rate:** Programmable, 1 - 250˚C per second. Ramp-down rate is temperature and radiation dependent, maximum 150˚C per second.
- **Recommended steady-state temperature range:** 400 - 1200˚C.
- **ERP temperature accuracy:** ±2.9°C, when calibrated against an instrumented thermocouple wafer (ITC).
- **Temperature repeatability:** ±2.3°C or better at 1150°C wafer to wafer. (Repetition specifications are based on a 100-wafer set.)
  RTO = ±0.75%, RTA = 0.75%, RTS = ±0.75%, expressed in percentage deviations (Max.-Min)/2xMean
- **Temperature uniformity:** ±3°C across an 8-inch wafer at 1150°C. (This is a 1-sigma deviation from 100-angstrom oxide uniformity.) For a titanium silicidation process, no more than 1.5 percent increase to uniformity during the first anneal at 650 - 700°C.
  RTO = ±1.0%, RTA = 1.0%, RTS = ± 1.5%.

8800.2 PHYSICAL DIMENSIONS

- **Width** 40 in. (102 cm): Monitor-Fab-Wall Configuration
  60 in. (102 cm): Monitor-Side-Panel Configuration
- **Depth** 42 in. (107 cm)
- **Height** 82 in. (208 cm)
- **Weight** 2035 lbs (923 kg): Monitor-Fab-Wall Configuration
  2075 lbs (941 kg): Monitor-Side-Panel Configuration
- **Shipping weight** 2235 lbs (1123 kg): Monitor-Fab-Wall Configuration
  2275 lbs (1141 kg): Monitor-Side-Panel Configuration

8800.3 UTILITY REQUIREMENTS

Utility requirements include:

- **Power**
  - Standard Domestic: 208 VAC, 60 Hz ±3 Hz; 125 A maximum; 3-phase plus ground and neutral
  - European: 400 VAC, 50 Hz ±3 Hz; 90 A maximum; 3-phase plus ground and neutral
  - Japanese: 200 VAC, 50/60 Hz ±3 Hz, 125 A maximum; 3-phase plus ground
- **Water Type** Refer to the 8800 facility manual**(Recirculator)**

8800.4 FACILITY CONNECTIONS

The following table is a summary of the facility connections for the Heatpulse 8800 system:

Table A-1. *Facility Connections*

UTILITY	SERVICE SIZE	CONN. TYPE
Tube Cooling CDA or Utility N2 **Valve Actuation CDA or Utility N2**	1/2 inch 1/4 inch	Swagelok Swagelok
Cooling Water Supply **Cooling Water Return**	1/2 inch 1/2 inch	Swagelok Swagelok
Gas Box Exhaust	4-inch OD	Duct
Cooling Exhaust **Scavenger Hood Exhaust** **Containment Exhaust (Optional)** **OR** **Exhaust Manifold Outlet**	2-inch OD 2-inch OD 2-inch OD 4-inch OD	Duct Duct Duct Duct
Process Gas Exhaust (Scrubber)	3/8 inch	VCR, Male
Process Gas Supply **Nitrogen Curtain Gas Supply**	1/4 inch 1/4 inch	VCR, Female VCR, Female
Recirculator Water Supply **Recirculator Water Return**	1/2 inch 1/2 inch	Swagelok Swagelok

8800.5 UTILITY SPECIFICATIONS

The following table is a summary of the utility specifications for the Heatpulse 8800 system:

Table A-2. *Utility Specifications*

UTILITY	FLOW RATE MIN.	FLOW RATE TYP.	FLOW RATE MAX.	PRESSURE MIN.	PRESSURE TYP.	PRESSURE MAX.
CDA or Utility N2 (Cooling)	35 SCFM (990 SLM)	40 SCFM (1130 SLM)	60 SCFM (1700 SLM)	80 psig (5.6 kg/cm^2)	90 psig (6.3 kg/cm^2)	100 psig (7 kg/cm2)
CDA or Utility N2 (Valve Act.)	<1 SCFM (<27 SLM)	<1 SCFM (<27 SLM)	<1 SCFM (<27 SLM)	80 psig (5.6 kg/cm^2) Dynamic	90 psig (6.3 kg/cm^2) Dynamic	100 psig (7 kg/cm^2) Dynamic
Cooling Water Supply	3.0 GPM (11.6 SLM)	4.0 GPM (15.4 SLM)	5.5 GPM (21.2 SLM)	30 psig (2.1 kg/cm^2)	40 psig (2.8 kg/cm^2)	60 psig (4.2 kg/cm^2)
Cooling Water Return	3.0 GPM (11.6 SLM)	4.0 GPM (15.4 SLM)	5.5 GPM (21.2 SLM)	20 psig (1.4 kg/cm^2)	30 psig (2.1 kg/cm^2)	40 psig (2.8 kg/cm^2)
Gas Box Exhaust	0 SCFM (0 SLM)	100 SCFM (2825 SLM)	150 SCFM (4240 SLM)	.5" H_2O (12.7 mm)	.75" H_2O (19 mm)	--------
Cooling Exhaust	40 SCFM (1130 SLM)	44 SCFM (1250 SLM)	60 SCFM (1700 SLM)	1.5" H_2O (38.1 mm)	2" H_2O (50.8 mm)	3" H_2O (76.2 mm)
Scavenger Hood Exhaust	20 SCFM (540 SLM)	25 SCFM (675 SLM)	30 SCFM (810 SLM)	.75" H_2O (19 mm)	1.5" H_2O (38.1 mm)	1.5" H_2O (38.1 mm)
Containment Exhaust	0 SCFM (0 SLM)	0 SCFM (0 SLM)	2 SCFM (54 SLM)	.75" H_2O (19 mm)	1" H_2O (25.4 mm)	1.5" H_2O (38.1 mm)
OR						
Exhaust Manifold Outlet	60 SCFM (1700 SLM)	70 SCFM (2000 SLM)	92 SCFM (2600 SLM)	1.5" H_2O (38.1 mm)	2" H_2O (50.8 mm)	3" H_2O (76.2 mm)
Process Gas Exhaust (Scrubber)	-------	-------	-------	.75" H_2O (19 mm)	1.5" H_2O (38.1 mm)	2.5" H_2O (63.5 mm)
Process Gas Supply Nitrogen Curtain Gas Supply	-------	-------	-------	55 psig (3.9 kg/cm^2) Dynamic	60 psig (4.2 kg/cm^2) Dynamic	65 psig (4.6 kg/cm^2) Dynamic
Recirculator Water Supply	7 GPM (27 SLM)	8 GPM (30.8 SLM)	9 GPM (34.65 SLM)	40 psig (2.8 kg/cm^2)	50 psig (3.5 kg/cm^2)	60 psig (4.2 kg/cm^2)

AG Associates Heatpulse 8800i Specifications

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We maintain extensive inventory of used RTP systems and original parts, and our engineers have over 25 years of hands-on experience servicing AG Associates Heatpulse tools. Still relying on non-specialized vendors? Frustrated by unstable equipment or inconsistent processes caused by second-source parts? Stop chasing problems on your own.

Contact us today at sales@semistarcorp.com and let us handle the issues for you—so you can focus on more important work… or simply enjoy your coffee.

8800i.1 OPERATING SPECIFICATIONS

The following are the operating specifications for the Heatpulse® 8800i system.

- **Wafer handling:** automatic serial processing using SMIF-Pod™ cassettes.
- **Throughput:** Process dependent, approximately 80 wafers per hour (in a null cycle) without wafer aligner.
- **Wafer sizes:** 6 inches and 8 inches (standard).
- **Ramp-up rate:** Programmable,up to 100°C per second with Ceramic Shield; up to 150°C per second without Ceramic Shield.
- **Steady-state duration:** 1 - 600 seconds per step.
- **Ramp-down rate:** Programmable, 1 - 250˚C per second. Ramp-down rate is temperature and radiation dependent, maximum 150˚C per second.
- **Recommended steady-state temperature range:** 400 - 1200˚C.
- **ERP/SWP temperature accuracy:** ±2.9°C, when calibrated against an instrumented thermocouple wafer (ITC).
- **Temperature repeatability:** ±2.3°C or better at 1150°C wafer to wafer. (Repetition specifications are based on a 100-wafer set.) RTO = ±0.75%, RTA = 0.75%, RTS = ±0.75%, expressed in percentage deviations (Max.-Min)/2xMean
- **Temperature uniformity:** ±3°C across an 8-inch wafer at 1150°C. (This is a 1-sigma deviation from 100-angstrom oxide uniformity.) For a titanium silicidation process, no more than 1.5 percent increase to uniformity during the first anneal at 650 - 700°C. RTO = ±1.0%, RTA = 1.0%, RTS = ± 1.5%.

8800i.2 PHYSICAL DIMENSIONS

- **Width** 40 in. (102 cm)
- **Depth** 51.5 in. (131 cm)
- **Height** 85.75 in. (218 cm)
- **Weight** 2100 lbs (955 kg)
- **Shipping weight** 2540 lbs (1155 kg)

8800i.3 UTILITY REQUIREMENTS

Utility requirements include:

- **Power**
  - Standard Domestic: 208 VAC, 60 Hz ±3 Hz; 125 A maximum; 3-phase plus ground and neutral
  - European: 400 VAC, 50 Hz ±3 Hz; 90 A maximum; 3-phase plus ground and neutral
  - Japanese: 200 VAC, 50/60 Hz ±3 Hz, 125 A maximum; 3-phase plus ground
- **Water Type (Recirculator)** Refer to the 8800i facility manual

8800i.4 FACILITY CONNECTIONS

The following table is a summary of the facility connections for the Heatpulse 8800i system:

Table A-1. *Facility Connections*

UTILITY	SERVICE SIZE	CONN. TYPE
Tube Cooling CDA or Utility N2 **Valve Actuation CDA or Utility N2**	1/2 inch 1/4 inch	Swagelok Swagelok
Cooling Water Supply **Cooling Water Return**	1/2 inch 1/2 inch	Swagelok Swagelok
Gas Box Exhaust	4-inch OD	Duct
Cooling Exhaust **Scavenger Hood Exhaust** **Containment Exhaust (Optional)** **OR** **Exhaust Manifold Outlet**	2-inch OD 2-inch OD 2-inch OD 4-inch OD	Duct Duct Duct Duct
Process Gas Exhaust (Scrubber)	3/8 inch	VCR, Male
Process Gas Supply **Nitrogen Curtain Gas Supply**	1/4 inch 1/4 inch	VCR, Female VCR, Female
Recirculator Water Supply **Recirculator Water Return**	1/2 inch 1/2 inch	Swagelok Swagelok

8800i.5 UTILITY SPECIFICATIONS

The following table is a summary of the utility specifications for the Heatpulse 8800i system:

Table A-2. *Utility Specifications*

UTILITY	FLOW RATE MIN.	FLOW RATE TYP.	FLOW RATE MAX.	PRESSURE MIN.	PRESSURE TYP.	PRESSURE MAX.
CDA or Utility N2 (Cooling)	16 SCFM (432 SLM)	20 SCFM (540 SLM)	28 SCFM (756 SLM)	70 psig (5.0 kg/cm^2)	80 psig (5.6 kg/cm^2)	90 psig (6.4 kg/cm2)
CDA or Utility N2 (Valve Act.)	<1 SCFM (<27 SLM)	<1 SCFM (<27 SLM)	<1 SCFM (<27 SLM)	80 psig (5.6 kg/cm^2) Dynamic	90 psig (6.3 kg/cm^2) Dynamic	100 psig (7 kg/cm^2) Dynamic
Cooling Water Supply	3.0 GPM (11.6 SLM)	4.0 GPM (15.4 SLM)	5.5 GPM (21.2 SLM)	30 psig (2.1 kg/cm^2)	40 psig (2.8 kg/cm^2)	60 psig (4.2 kg/cm^2)
Cooling Water Return	3.0 GPM (11.6 SLM)	4.0 GPM (15.4 SLM)	5.5 GPM (21.2 SLM)	20 psig (1.4 kg/cm^2)	30 psig (2.1 kg/cm^2)	40 psig (2.8 kg/cm^2)
Gas Box Exhaust	0 SCFM (0 SLM)	100 SCFM (2700 SLM)	150 SCFM (4050 SLM)	.5" H_2O (12.7 mm)	.75" H_2O (19 mm)	--------
Cooling Exhaust	25 SCFM (1130 SLM)	30 SCFM (1250 SLM)	40 SCFM (1700 SLM)	1.0" H_2O (25.4 mm)	1.5" H_2O (38.1 mm)	2" H_2O (50.8 mm)
Scavenger Hood Exhaust	20 SCFM (540 SLM)	25 SCFM (675 SLM)	30 SCFM (810 SLM)	.75" H_2O (19 mm)	1.5" H_2O (38.1 mm)	1.5" H_2O (38.1 mm)
Containment Exhaust 0 SCFM SLM) (0 SLM) **OR**	0 SCFM (54 SLM)	2 SCFM (19 mm)	.75" H_2O (25.4 mm)	1" H_2O (38.1 mm)	1.5" H_2O	(0
Exhaust Manifold Outlet	45 SCFM (1700 SLM)	55 SCFM (2000 SLM)	72 SCFM (2600 SLM)	1.0" H_2O (25.4 mm)	1.5" H_2O (38.1 mm)	2" H_2O (50.8 mm)
Process Gas Exhaust (Scrubber)	-------	-------	-------	.75" H_2O (19 mm)	1.0" H_2O (38.1 mm)	1.5" H_2O (63.5 mm)
Process Gas Supply Nitrogen Curtain Gas Supply	-------	-------	-------	30 psig (2.1kg/cm^2) Dynamic	55 psig (3.9 kg/cm^2) Dynamic	90 psig (6.4 kg/cm^2) Dynamic
Recirculator Water Supply	7 GPM (27 SLM)	8 GPM (30.8 SLM)	9 GPM (34.65 SLM)	40 psig (2.8 kg/cm^2)	50 psig (3.5 kg/cm^2)	60 psig (4.2 kg/cm^2)