

# NIKOLA 3K/5K

Energy Efficient Temperature Control for Plasma Etch



## Optimized for Plasma Etch Control

- Up to 5500 Watts of cooling capacity
- -10 °C to 80 °C operating range
- $\pm 0.05^{\circ}\text{C}$  repeatability
- ~ 60% less power consumption than compressor-based chillers
- Improves wafer to wafer repeatability
- Lam, AMAT CHX or TEL Unity interfaces

# The Right Temperature Without Fail

## Solid State Cooling Systems



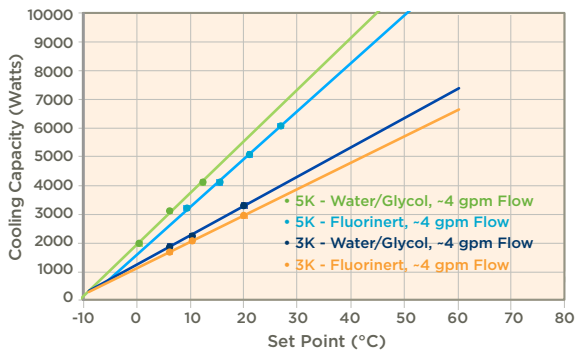
### Precise Reliable Temperature Control

Providing up to 5500 Watts of cooling capacity with  $\pm 0.05^{\circ}\text{C}$  stability at constant load, Nikola 3K/5K provides precise temperature control while using 60% less electrical power. With only two moving parts and no compressor, this thermoelectric-based chiller is known for high reliability and long life. The Nikola 3K/5K reduces environmental impacts by consuming less power, reducing air conditioning load by ~50% and not requiring any Freon or other chemical refrigerants.

### SPECIFICATIONS

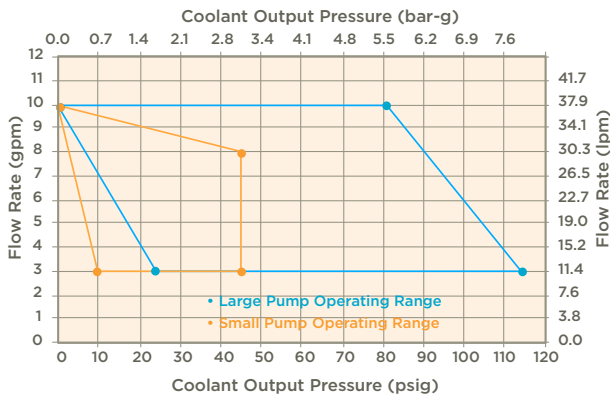
Operating Range	-10 °C to 80 °C
Ambient Temperature	10°C to 40°C non-condensing
Repeatability	$\pm 0.05^{\circ}\text{C}$
Cooling Capacity (Typical)	Nikola 3K: 3000 Watts @ 20°C Nikola 5K: 5000 Watts @ 20°C
Coolant/Process Fluid	Set up for Fluorinert / Galden or HFE fluids Optional Glycol / water mix available
Process Fluid Fittings	3/4" Swagelok (316 stainless steel)
Pump	Magnetically coupled turbine (2 types)
Tank Volume	10 liter (2.6 gal) with 2 level sensors
Facility Water	25 lpm (6 gpm) @ 7-25°C filtered, treated recirculating facility cooling water, pH 6.5 to 8.2
Facility Water Fittings	3/4" Swagelok (316 stainless steel)
N <sub>2</sub> /CDA (required)	500 sccm -30°C dew point or lower CDA or N <sub>2</sub> , 30-60 psig (2-4 bar) for low temperature operation
Wetted Materials	Process: Aluminum, stainless steel and polymers Facility: Teflon impregnated anodized aluminum and stainless steel
Size (W x D x H)	22" x 28" x 35" (56 x 71 x 89 cm)
Weight	~300 lbs (136 kg) dry
Power Input	200-240 VAC 3 phase, 50/60 Hz, 20/30 amp max
Circuit Breaker	20/30 amp 480 VAC 3-pole with GFCI
Remote EMO	External dry contact
Communications	Lam analog, AMAT CHX or analog and Tel Unity
Alarms	Temperature, fluid level, system or component failure
Standards	Semi S2-0200, F47 compliant, CE
Warranty	2 years

### NIKOLA 3K/5K COOLING CAPACITY CURVES 20°C FACILITY COOLING WATER @ 6 GPM



Note: Configurations using the large pump at high pressure and flow can reduce cooling capacity as much as 1200 Watts

### NIKOLA 3K/5K PUMP OPERATION RANGES



Note: Pump curves were generated using water/glycol. Operating window will vary with other fluids

### SOLID STATE COOLING SYSTEMS