



# SICERA<sup>®</sup> CRYOPUMP

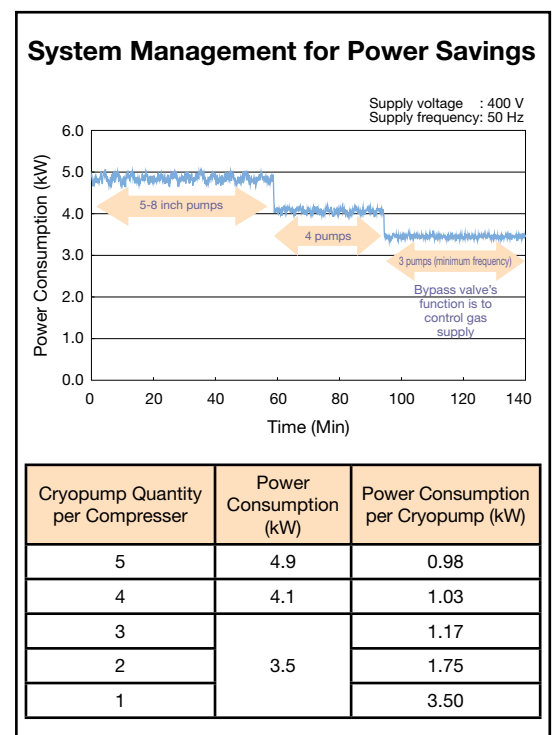
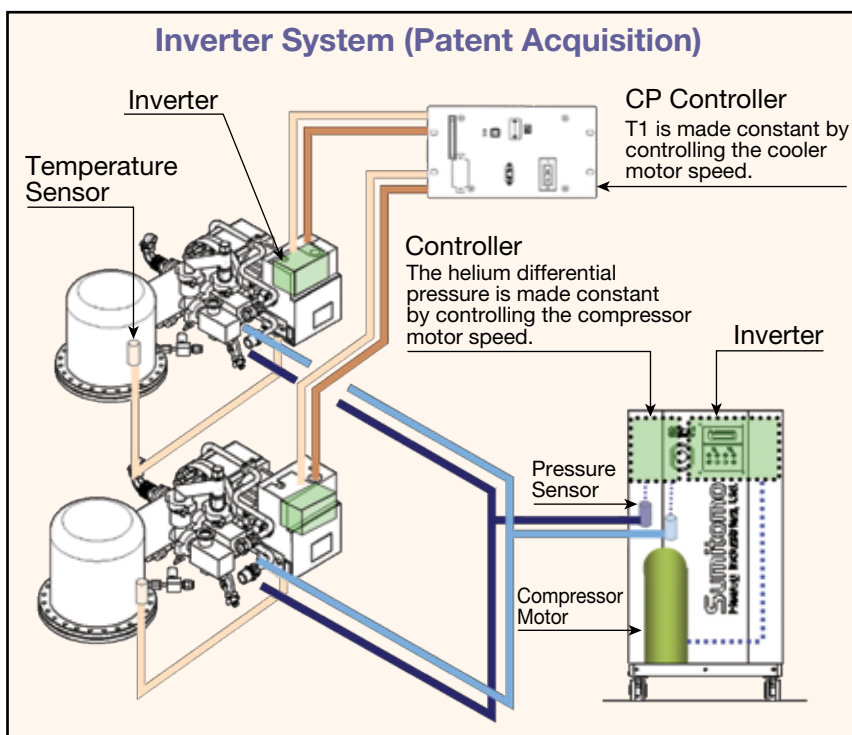
# SICERA

strikes a balance  
between higher  
productivity and  
energy savings.

Electronic devices using integrated circuit (IC) technology are found in all facets of our daily lives. Their stable supply, robust quality and increasing affordability are the result of improved process reliability and manufacturing efficiencies in semiconductor fabs around the world.

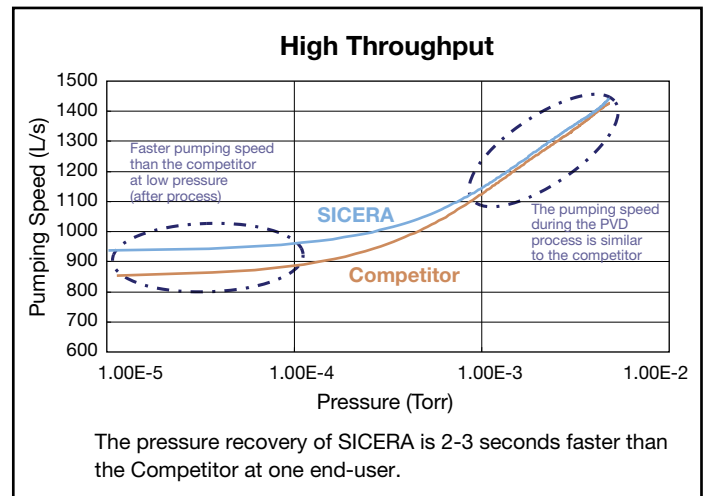
These improvements have resulted in increased demands on cryopump systems, a key component in wafer manufacturing tools, leading to a growth in energy consumption and CO<sub>2</sub> emissions. To balance these effects, manufacturers require innovative, eco-friendly cryopumps that also meet stringent technical requirements. Sumitomo Heavy Industries, Ltd. (SHI) developed the SICERA Cryopump to meet this demand in the high-volume production of semiconductor wafers, flat panel displays and other semiconductor-related products.

SHI is one of the world's largest manufacturers of cryogenic equipment, including 4K and 10K Cryocoolers for MRI and other low-temperature applications. The newly redesigned SICERA Cryopump combines our proven cryocooler technology with proprietary inverter technology to reduce energy costs by industry-leading levels.

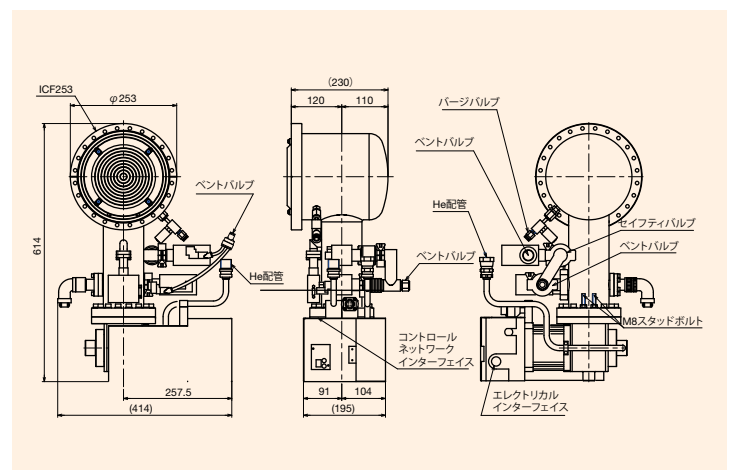


# SICERA FOR PHYSICAL VAPOR DEPOSITION (PVD) TOOLS

- Stable pumping speed performance is maintained through independent operation of each cryopump
- Fast pressure recovery and larger gas capacity are achieved with SICERA's innovative structural design
- Highly efficient and unique warm up sequence utilizing adiabatic heating eliminates the need for internal heaters
- Shortened regeneration times realized with patented regeneration sequence
- Independent relief and safety valves increase reliability, while reducing the potential for valve seat leakage
- Self-diagnosis function allows the user to predict the need for preventative maintenance
- The SICERA cryopump system is easily integrated into the Fab's FDC system



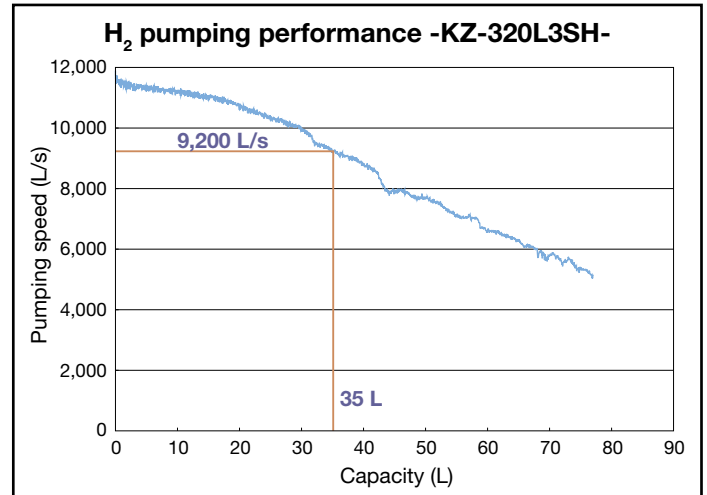
Model	KZ-8L3C	KZ-8L3S
Flange Type	ICF 253	
Nitrogen liters/second	1,500	270
Argon liters/second	1,200	230
Hydrogen liters/second	2,200	900
Water liters/second	4,000	
Argon Throughput Pa · m <sup>3</sup> /s (sccm)	1.2 (700)	
Argon Capacity Pa · m <sup>3</sup> /s (standard liters)	100,000 (1,000)	
Hydrogen Capacity Pa · m <sup>3</sup> /s (standard liters)	1,600 (16)	
Crossover Rating Pa · m <sup>3</sup> /s (torr-liters)	20 (150)	
Cooldown Time Minutes	70	
Warmup Time Minutes	30	
Weight kg	32	
Electrical Supply	1 phase AC 208 VAC ±10%, 50/60 Hz, 0.2 kVA	



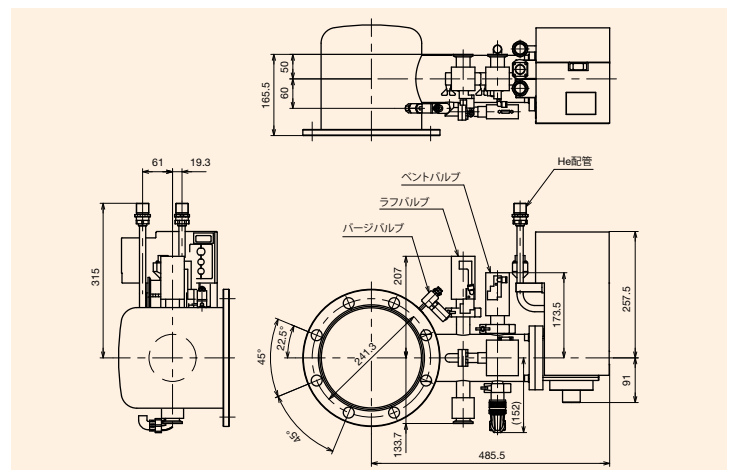


# SICERA FOR ION IMPLANTATION SYSTEMS

- Several cryopump configurations available to accommodate H<sub>2</sub> high-speed pumping requirements
- Unique second stage panel design ensures:
  - Higher pumping speed and larger gas capacity
  - Direct exposure of charcoal to contaminants is eliminated, resulting in maintained pumping performance
- Highly efficient and unique warm up sequence utilizing adiabatic heating:
  - Eliminates the need for internal heaters
  - Ensures H<sub>2</sub> pumping speed is maintained throughout the life of the cryopump
- Independent relief and safety valves increase reliability, while reducing the potential for valve seat leakage
- Self-diagnosis function allows the user to predict the need for preventative maintenance
- The SICERA cryopump system is easily integrated into the Fab's FDC system



Model	KZ-8L3N
Flange Type	ANSI 6
Nitrogen liters/second	1,500
Argon liters/second	1,200
Hydrogen liters/second	2,200
Water liters/second	4,000
Argon Throughput Pa · m <sup>3</sup> /s (sccm)	1.2 (700)
Argon Capacity Pa · m <sup>3</sup> /s (standard liters)	100,000 (1,000)
Hydrogen Capacity Pa · m <sup>3</sup> /s (standard liters)	1,600 (16)
Crossover Rating Pa · m <sup>3</sup> /s (torr-liters)	20 (150)
Cooldown Time Minutes	80
Warmup Time Minutes	30
Weight kg	32
Electrical Supply	1 phase AC 200 VAC ±10%, 50/60 Hz, 0.2 kVA

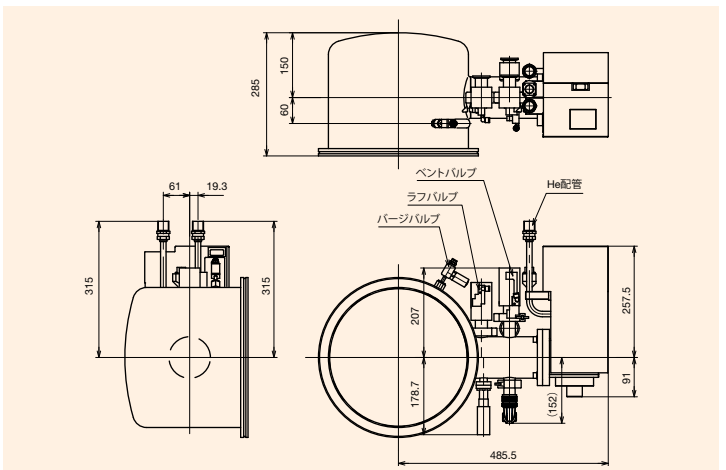
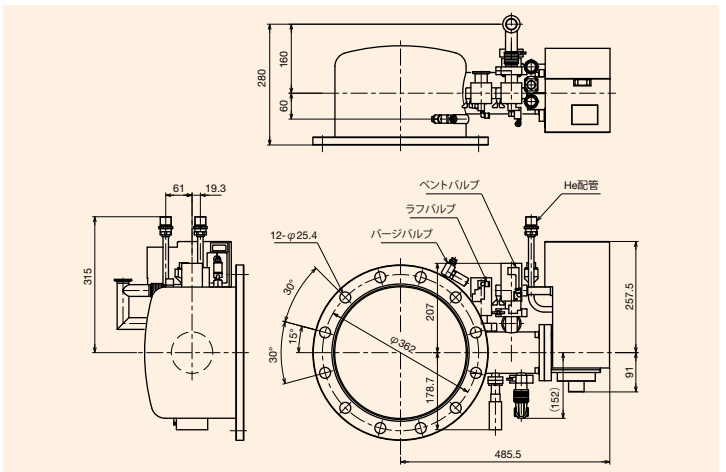
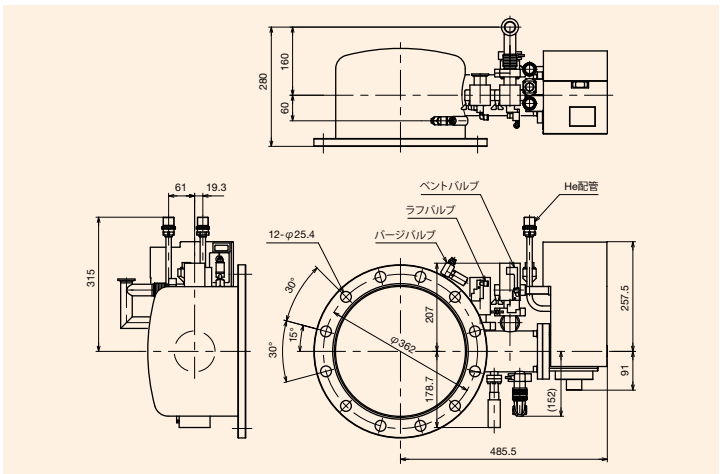
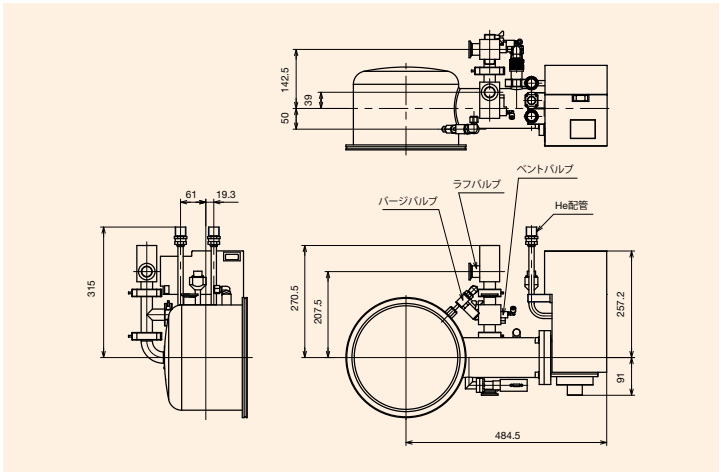


<b>Model</b>	<b>KZ-250L3SH</b>
<b>Flange Type</b>	ISO 250
<b>Nitrogen liters/second</b>	2,650
<b>Argon liters/second</b>	1,990
<b>Hydrogen liters/second</b>	6,360
<b>Water liters/second</b>	6,500
<b>Argon Throughput Pa · m<sup>3</sup>/s (sccm)</b>	1.0 (600)
<b>Argon Capacity Pa · m<sup>3</sup>/s (standard liters)</b>	N/A
<b>Hydrogen Capacity Pa · m<sup>3</sup>/s (standard liters)</b>	2,400 (24)
<b>Crossover Rating Pa · m<sup>3</sup>/s (torr-liters)</b>	20 (150)
<b>Cooldown Time Minutes</b>	130
<b>Warmup Time Minutes</b>	35
<b>Weight kg</b>	30
<b>Electrical Supply</b>	1 phase AC 200 VAC ±10%, 50/60 Hz, 0.2 kVA

<b>Model</b>	<b>KZ-12L3NA</b>
<b>Flange Type</b>	ANSI 10
<b>Nitrogen liters/second</b>	4,500
<b>Argon liters/second</b>	3,500
<b>Hydrogen liters/second</b>	5,500
<b>Water liters/second</b>	9,500
<b>Argon Throughput Pa · m<sup>3</sup>/s (sccm)</b>	1.5 (900)
<b>Argon Capacity Pa · m<sup>3</sup>/s (standard liters)</b>	200,000 (2,000)
<b>Hydrogen Capacity Pa · m<sup>3</sup>/s (standard liters)</b>	3,000 (35)
<b>Crossover Rating Pa · m<sup>3</sup>/s (torr-liters)</b>	20 (150)
<b>Cooldown Time Minutes</b>	100
<b>Warmup Time Minutes</b>	30
<b>Weight kg</b>	40
<b>Electrical Supply</b>	1 phase AC 200 VAC ±10%, 50/60 Hz, 0.2 kVA

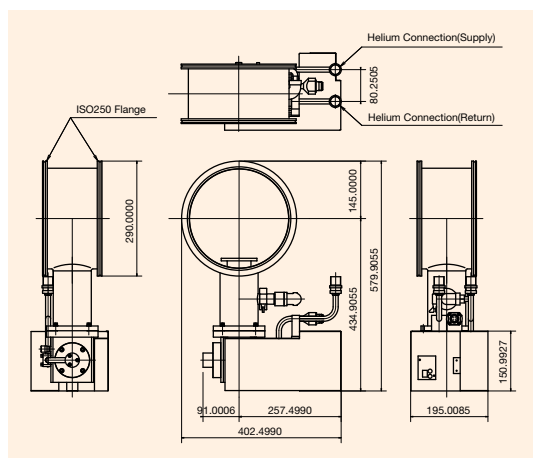
<b>Model</b>	<b>KZ-12L3NH</b>
<b>Flange Type</b>	ANSI 10
<b>Nitrogen liters/second</b>	3,800
<b>Argon liters/second</b>	2,900
<b>Hydrogen liters/second</b>	9,000
<b>Water liters/second</b>	9,500
<b>Argon Throughput Pa · m<sup>3</sup>/s (sccm)</b>	1.0 (600)
<b>Argon Capacity Pa · m<sup>3</sup>/s (standard liters)</b>	N/A
<b>Hydrogen Capacity Pa · m<sup>3</sup>/s (standard liters)</b>	3,500 (35)
<b>Crossover Rating Pa · m<sup>3</sup>/s (torr-liters)</b>	20 (150)
<b>Cooldown Time Minutes</b>	140
<b>Warmup Time Minutes</b>	30
<b>Weight kg</b>	37
<b>Electrical Supply</b>	1 phase AC 200 VAC ±10%, 50/60 Hz, 0.2 kVA

<b>Model</b>	<b>KZ-320L3SH</b>
<b>Flange Type</b>	ISO 320
<b>Nitrogen liters/second</b>	4,470
<b>Argon liters/second</b>	3,470
<b>Hydrogen liters/second</b>	11,330
<b>Water liters/second</b>	11,000
<b>Argon Throughput Pa · m<sup>3</sup>/s (sccm)</b>	1.5 (900)
<b>Argon Capacity Pa · m<sup>3</sup>/s (standard liters)</b>	N/A
<b>Hydrogen Capacity Pa · m<sup>3</sup>/s (standard liters)</b>	3,500 (35)
<b>Crossover Rating Pa · m<sup>3</sup>/s (torr-liters)</b>	20 (150)
<b>Cooldown Time Minutes</b>	170
<b>Warmup Time Minutes</b>	35
<b>Weight kg</b>	40
<b>Electrical Supply</b>	1 phase AC 200 VAC ±10%, 50/60 Hz, 0.2 kVA



## SICERA WATER PUMP

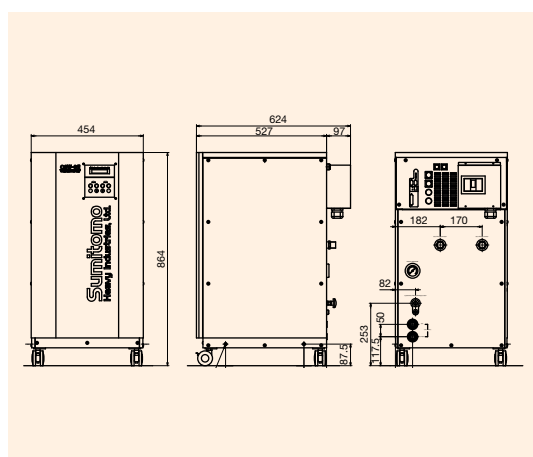
- Several sizes available
- Stable, long-lasting pumping speeds
- Unique regeneration sequence prevents ice from entering the turbo pump
- Mixed system configurations, including cryopumps and waterpumps, are available
- Self-diagnosis function allows the user to predict the need for preventative maintenance
- The SICERA cryopump system is easily integrated into the Fab's FDC system



Model	KZ-8LST	KZ-200LST	KZ-250LST	KZ-300LST
Size	ICF253	VG 200/ISO 200	VG 250/ISO 250	VG 300/ISO 320
Water liters/second	3,400	3,000	4,900	6,100
Cooldown Time Minutes	30	50		
Weight kg	32	N/A	30	N/A
Electrical Supply	1 phase AC 208 VAC $\pm$ 10%, 50/60 Hz, 0.2 kVA			

## CSW-61 SERIES COMPRESSOR

- One compressor operates up to five 8" SICERA cryopumps
- One compressor operates up to ten SICERA water-pumps
- High and low voltage versions available
- Compact design ensures small footprint
- Optional, specially-designed rack allows compressors to be stacked

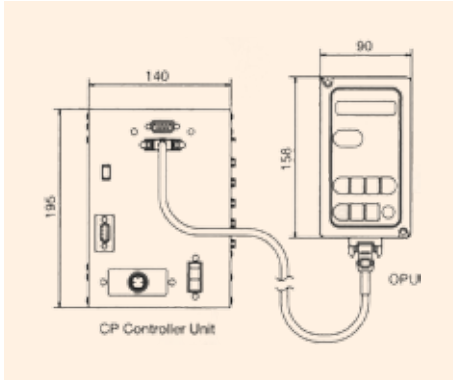


Model	CSW-61C	CSW-61D	CSW-61CN
Electrical Supply	3 Phase AC 200-230 VAC, 50/60 Hz, 13 kVA	3 Phase AC 378-528 VAC, 50/60 Hz, 13 kVA	3 Phase AC 200-230 VAC, 50/60 Hz, 13 kVA
Ambient Temperature (°C)	5-35		
Cooling Water Requirement at 28 °C (L/min)	7		
Cooling Water Temperature Range (°C)	4-28		
Weight kg	130		
Maintenance Interval (Adsorber Exchange) (Hours)	30,000		



## OPERATION PANEL UNIT (OPU)

Connecting the OPU to the CP Controller allows the customer fuller functionality, including the ability to monitor the status of the cryopumps and compressors and set up the parameters of the regeneration sequence.



## ADDITIONAL PRODUCTS FROM SHI CRYOGENICS GROUP

In addition to the SICERA products featured in this catalogue, SHI Cryogenics Group designs and manufactures 4K and 10K G-M Cryocoolers, Pulse Tubes, Marathon® CP Cryopumps and other low temperature cooling technology.



SHI Cryogenics Group's 10K Gifford-McMahon Cryocoolers are versatile, orientation-free, closed-cycle systems that feature the same Displex® technology found in the complete line of Marathon® CP Cryopumps and MRI coolers, proven the world over with millions of reliable operating hours.

SHI Cryogenics Group's 4K Gifford-McMahon Cryocoolers are recognized as the most reliable and versatile systems available in the marketplace. These Cryocoolers feature high cooling capacities, compact designs and are orientation-free.



SHI's 4K Pulse Tube Cryocoolers embody leading-edge technology and provide low vibration, high reliability and low maintenance requirements. They are uniquely designed with no moving parts inside the coldhead.



Marathon® CP Series Cryopumps are specifically designed to meet the needs of high vacuum processes. Manufacturers of semiconductor devices, flat panel displays, test equipment, solar manufacturing and a wide variety of coating and thermal vacuum systems require efficient, reliable and robust systems that offer a low cost of ownership.

For additional literature and information on any of these products, please contact your local SHI Cryogenics Group sales office.





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