

Компрессоры ON-BOARD IS-2000V, ON-BOARD IS-1000, 9700A, 9600, 8200, криодиновые холодильные системы 350 CRYODYNE, 1020 CRYODYNE, 1050 CRYODYNE

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Казахстан +7(727)345-47-04

Беларусь +(375)257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: ewc@nt-rt.ru || сайт: <https://edwards.nt-rt.ru/>

CTI CRYOGENICS® ON-BOARD® IS-2000V COMPRESSOR

The most energy-efficient compressor in the industry. The On-Board® IS-2000V Compressor meets process engineers' demands for improved performance, greater energy efficiency, lower energy costs and design flexibility. Not only does it support up to 10 cryopumps in half the footprint of other compressors, the IS-2000V provides the highest energy efficiency in the industry.

The IS-2000V lowers cost of ownership with greater efficiency, higher cryopump capacity and optimal helium management.

Edwards provides the answer to industry demands for greater efficiency and sustainable operations¹. The IS-2000V reduces energy consumption by more than 20% and the thermal load on facility cooling water by 40%.

Our compressor features design refinements resulting in adaptable helium output and fault-tolerant operation. Variable speed operation enables dramatic power savings while the compressor runs at more efficient and higher pressures to optimise the helium output.

The IS-2000V supports new and existing On-Board® IS Cryopump applications. It leverages proven On-Board® IS technology: intelligent system controls, cryopump solution integration, robust electronics and software. Like the rest of our range, it enables multiple pump configurations with the most efficient and cost-effective helium management solution.

¹The IS-2000V aligns with the energy reduction objectives associated with SEMI Standard S23 (Guide for Conservation of Energy, Utilities and Materials Used by Semiconductor Manufacturing Equipment), and is compliant with the RoHS (Restriction of Hazardous Substances) directive.



Features and benefits

IS-2000V Offers Lower Cost of Ownership:

- Highest energy efficiency – variable speed increases cooling capacity and reduces energy costs by at least 20%
- Single compressor solution – one IS-2000V will support up to 10 cryopumps
- Smaller footprint – stacked design halves compressor footprint in your facility

- Lower thermal load – cooling water load is reduced by approximately 40%
- Fault-tolerant operation – designed to minimise operational downtime and send alerts

On-Board® IS Benefits

- Proven reliability and operational life

- Increased tool availability for higher productivity
- Intelligent cryopumping solution to maximise pump efficiency
- Optimal helium management and power savings
- Global rapid response teams

Compressor Specifications

Dimensions

518 mm w x 686 mm d x 1481 mm h
(20.4" w x 27.0" d x 58.3" h)

Weight

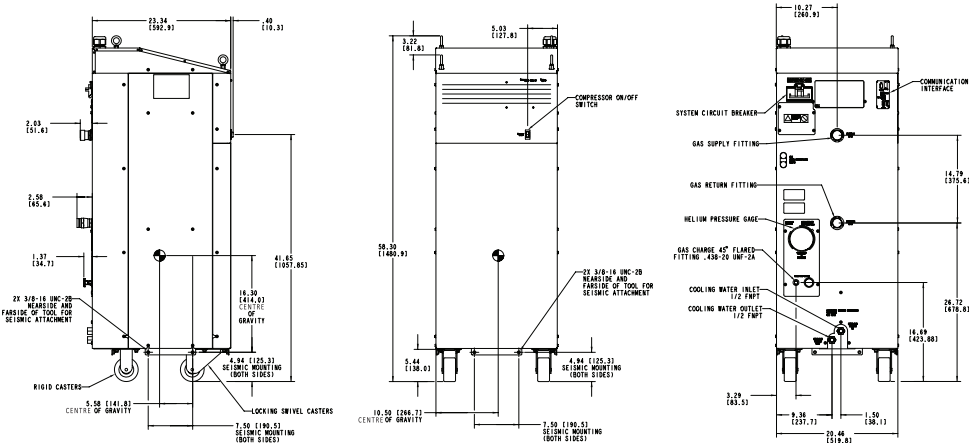
Low-Voltage Model 250 kg (550 lbs)
High-Voltage Model 261 kg (575 lbs)

Operating Voltage
(3-phase, 50 Hz or 60 Hz)

Low-Voltage Model 180-253 VAC
High-Voltage Model 342-528 VAC

Input power 13.5 KW

Cooling water 3.0 to 4.0 GPM

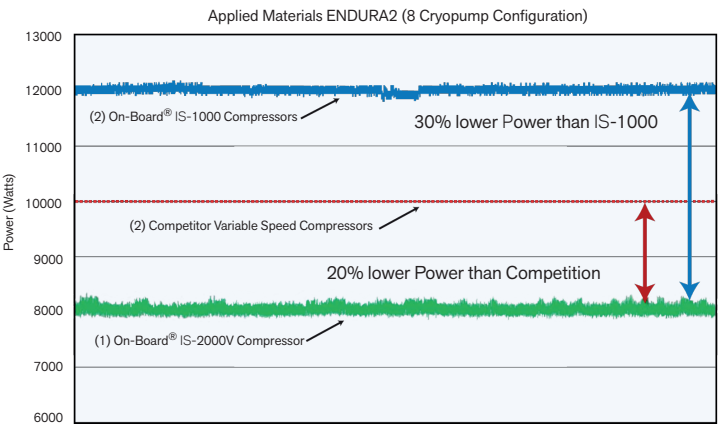


On-Board® IS-2000V Compressor

Crypumps consume up to 22% of a tool's energy during process and up to 50% when idle. The IS-2000V substantially reduces these values, lowering the cost of ownership over the life of your tool.

20% Power Savings Over Competition

Demonstrated Energy Reduction by Large End-user.
On-Board® IS-2000V Compressor Power Consumption

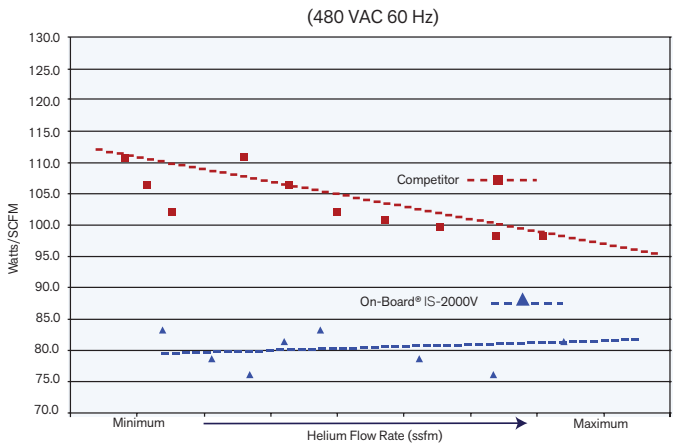


The IS-2000V offers 30% lower power consumption than the IS-1000 and 20% over competing compressors.

Edwards continually updates its products to match the evolving needs of the semiconductor industry and any specifications given here are subject to change without notice.

Variable Speed Compressor Increases Efficiency

On-Board® IS-2000V vs (2) Competitor Compressors
Watts/SCFM (480 VAC 60 Hz)



CTI CRYOGENICS® ON-BOARD® *IS*-1000 AND *IS*-2000V COMPRESSORS

The On-Board® *IS*-1000 and *IS*-2000V compressors support new and existing On-Board® *IS* Cryopump applications. They leverage proven On-Board® *IS* technology: intelligent system controls, cryopump solution integration, robust electronics and software. Like the rest of our range, they enable multiple pump configurations with the most efficient and cost-effective helium management solution.

The On-Board® *IS*-1000 and *IS*-2000V Compressors meet process engineers' demands for improved performance, greater energy efficiency, lower energy costs and design flexibility. Both compressors support multiple On-Board® *IS* cryopumps (up to five cryopumps for one *IS*-1000 and up to ten cryopumps for one *IS*-2000V), enabling their high vacuum performances by providing optimal helium management. *IS*-1000 is the standard compressor for multiple On-Board® *IS* cryopumps system for a lower price while *IS*-2000V is the premium compressor that, on top of all the *IS*-1000 advantages, provides the highest energy efficiency in the industry hence lowering the cost of ownership.

Edwards provides the answer to industry demands for greater efficiency and sustainable operations¹. *IS*-2000V reduces energy consumption by more than 20% and the thermal load on facility cooling water by 40% compared to *IS*-1000.

IS-2000V features design refinements resulting in adaptable helium output and fault-tolerant operation. Variable speed operation enables dramatic power savings while the compressor runs at more efficient and higher pressures to optimise the helium output.

¹*IS*-2000V aligns with the energy reduction objectives associated with SEMI Standard S23 (Guide for Conservation of Energy, Utilities and Materials Used by Semiconductor Manufacturing Equipment), and is compliant with the RoHS (Restriction of Hazardous Substances) directive.



Features and benefits

IS-1000 and *IS*-2000V Advantages:

- High Efficiency, Intelligent Compressors
 - Higher pressures deliver more Helium per kW input power
 - Embedded sensors provide new diagnostic capabilities

IS-2000V Offers Even Lower Cost of Ownership:

- Highest energy efficiency – variable speed increases cooling capacity and reduces energy costs by at least 20%
- Single compressor solution – one *IS*-2000V will support up to 10 cryopumps
- Smaller footprint
- Lower thermal load – cooling water load is reduced by approximately 40%
- Fault-tolerant operation – designed to minimise operational downtime and send alerts

On-Board® *IS* Benefits

- Proven reliability and operational life
- Increased tool availability for higher productivity
- Intelligent cryopumping solution to maximise pump efficiency
- Optimal helium management and power savings
- Global rapid response teams

On-Board® *IS*-1000 and *IS*-2000V Compressor Installation Specs

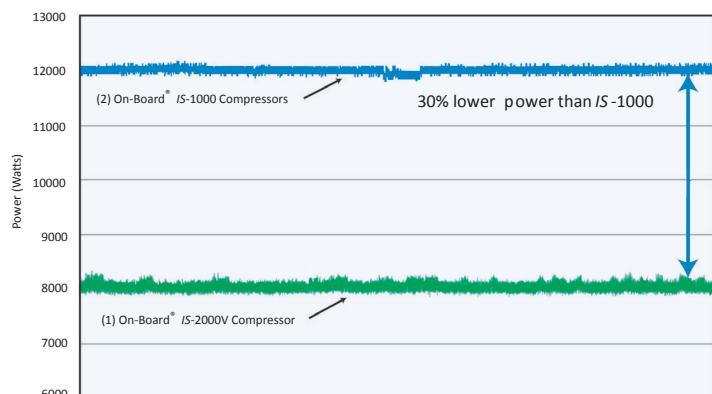
	⁽²⁾ <i>IS</i> -1000s		⁽¹⁾ <i>IS</i> -2000V	
	Low Voltage	High Voltage	Low Voltage	High Voltage
Electrical Supply	3 Phase 200/230 V 50/60 Hz	3 Phase 380/480 V 50/60 Hz	3 Phase 200/230 V 50/60 Hz	3 Phase 380/480 V 50/60 Hz
Electrical Service	⁽²⁾ Circuit Breakers		Single Circuit Breaker	
Rated Full Load	2 x 19 Amp	2 x 10 Amp	41 Amp	25 Amp
Locked Rotor Current	2 x 85 Amp	2 x 42 Amp	170 Amp	85 Amp
Input Circuit Breaker	2 x 25 Amp	2 x 15 Amp	60 Amp	35 Amp
Cooling Water (Inlet)¹	3.0 to 8.0 GPM 10° to 32°C (50° to 90°F)		3.0 to 4.0 GPM 10° to 32°C (50° to 90°F)	
Ambient Temperature	10° to 38°C (50° to 100°F)		10° to 38°C (50° to 100°F)	
Dimensions (W x D x H)²	1,036 x 577 x 665 mm (40.8 x 22.7 x 26.2 in)		518 x 686 x 1481 mm (20.4 x 27.0 x 58.3 in)	
Weight¹	190 kg (420 lbs)	204 kg (444 lbs)	250 kg (550 lbs)	261 kg (575 lbs)

¹Cooling Water and weight are for (2) *IS*-1000 compressors

²Height dimension includes caster wheels (78mm / 3.1 inches for each *IS*-1000 and 138mm / 5.4 inches for the *IS*-2000V)

30% Power Savings Over *IS*-1000

Demonstrated Energy Reduction by Large End-user.
On-Board® *IS*-2000V Compressor Power Consumption.



The *IS*-2000V offers 30% lower power consumption than the *IS*-1000.

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CTI-CRYOGENICS® 9700A COMPRESSOR

The 9700A Compressor is based on CTI-Cryogenics® 9600 Compressor platform for highest reliability in cryopump compressor technology. With increased helium output, the 9700A Compressor is ideal for operating multiple cryopumps.

In many multiple cryopump and waterpump applications, one 9700A Compressor provides a single compressor solution. The 9700A Compressor reduces power consumption, water distribution and footprint when compared to multiple compressor applications. The 9700A Compressor is compatible with Cryo-Torr® and On-Board® Cryopumps.

An integrated cryopump power frequency converter assures maximum cryopump performance in both 50 and 60Hz applications for all CTI vacuum pumps.

The 9700A Compressor includes a robust, all welded construction for high helium circuit reliability.



Features and benefits

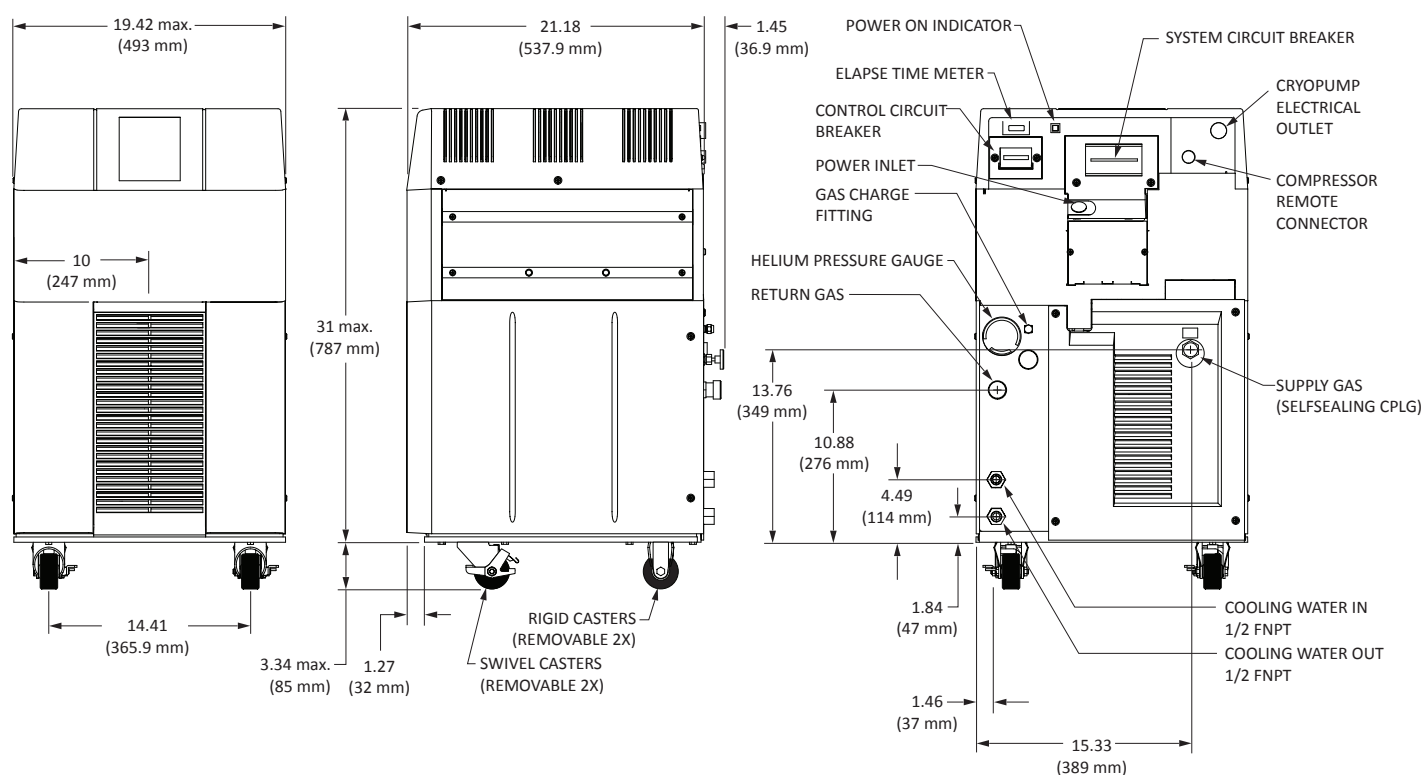
- Single and Multiple Pump Capability
- Supports Remote Control for Ease of Operation in Remote Compressor Installations
- Ease of Use, with Three-year Maintenance-free Operation Between Adsorber Changes

Easy to Set Up and Use

The 9700A Compressor has been designed for fast unpacking, fast setup, and ease of use. Its power, helium, and water hookups are all easily accessible for fast installation. Circuit protection is provided by a single row of resettable breakers conveniently located on the rear panel.

9700A Compressor Specifications

Dimensions	871mm h x 493mm w x 537.9mm d (34.34" h x 19.42" w x 21.18" d)
Weight	159 kg (350 lbs)
Operating Voltage	50 Hz Input 180-253 Vac (3 phase) 60 Hz Input 190-253 Vac (3 phase)
Input power	5.8kW
Cooling water	2 GPM to 4 GPM



CTI-CRYOGENICS® 9600 COMPRESSOR

Designed expressly for long usable life, high reliability, and easy use, the 9600 compressor provides outstanding performance with all Cryo-Torr® Cryopumps, On-Board® Cryopumps, On-Board® Waterpumps. It supports both single and grouped-pump configurations, and it is compatible with new and existing CTI-Cryogenics® pumping installations worldwide.

Designed for reliability and long usable life.

The 9600's design is simple and efficient, and its components and materials have been selected and tested for high reliability to support long usable compressor life.

Easy to set up and use.

The 9600 has been designed for fast unpacking, fast setup, and ease of use. It is a lightweight design, with large casters for easy handling, and its power, helium, and water hookups are all easily accessible for fast installation.

The 9600 requires no maintenance beyond a recommended adsorber change once every three years. Circuit protection is provided by a single row of breakers which are easily accessible at the rear panel. The adsorber is easy to reach with the simple removal of a single side panel, and is designed for instant removal and replacement. Remote controls are supported, giving you the flexibility of remote compressor location.



Features and benefits

- Long-term reliability, through efficient modular system design and high-reliability components
- Supports remote controls for easy operation in remotecompressor installations
- Extremely high capacity and efficient design for improved pump performance and fast regenerations
- Ease of use, with three year maintenance-free operation between adsorber changes
- Fast installation anywhere in the world, with global power compatibility, easy handling and hookup, and self-setting coldhead power control
- Single and multiple pump capability
- Full compatibility with new and existing CTI-Cryogenics® pumping systems

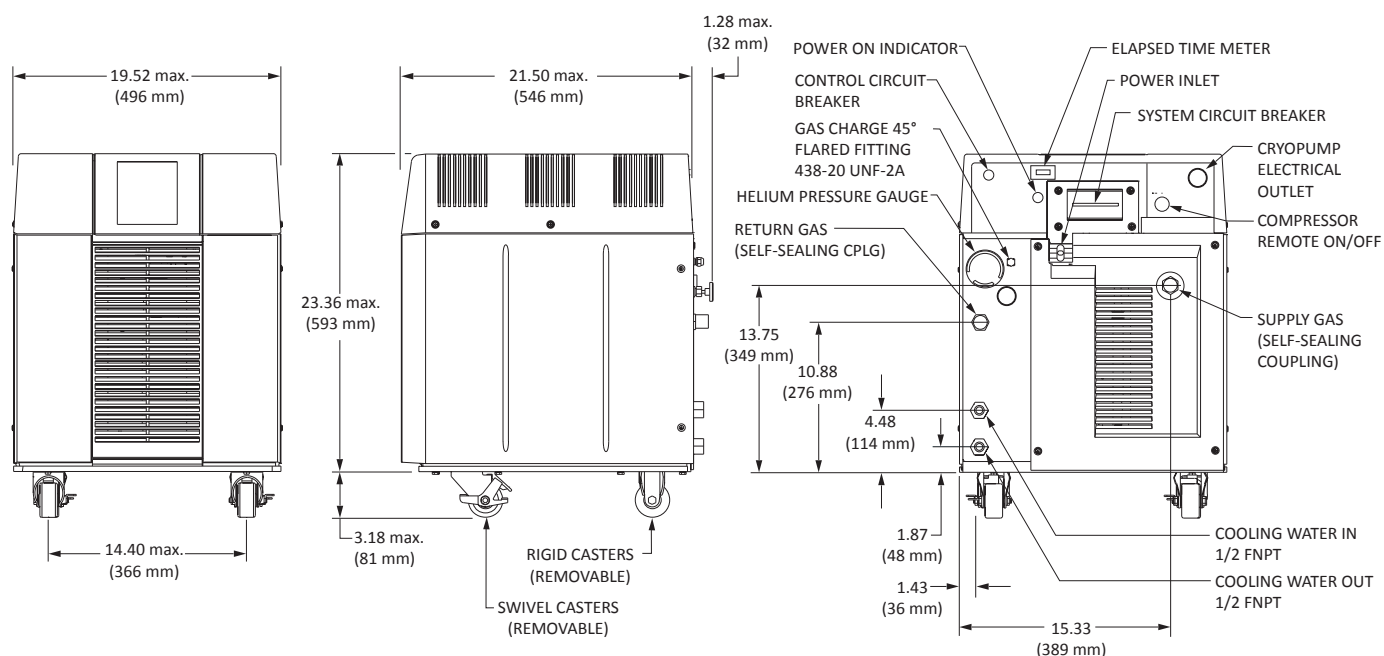
Global Power Compatibility

The 9600 features global power compatibility, with both low-and high voltage models available. Each model operates on both 50 Hz and 60 Hz power, and the allowable voltage range for each is substantial. The cryopump power supply automatically sets coldhead voltages so manual settings of power taps is not needed. Instead, cold head voltages are automatically controlled for reliable performance throughout the entire specified range of compressor supply voltage.

9600 Compressor Specifications

Dimensions	674mm h x 496mm w x 546 mm d (26.54" h x 19.52" w x 21.50" d)
Weight	Low-Voltage Model 114 kg (250 lbs) High-Voltage Model 120 kg (265 lbs)
Operating Voltage (3-phase, 50 Hz or 60Hz)	Low-Voltage Model 180-253 VAC High-Voltage Model 360-506 VAC
Input power	5.5 KW
Cooling water	2.75 GPM

When ordering, please specify single or multiple pump operation, and specify whether the compressor will power Cryo-Torr® or On-Board® pumps.



CTI-CRYOGENICS® 8200 COMPRESSOR

The 8200 compressor is designed to provide optimum performance with On-Board® Cryopumps, On-Board® Waterpumps and Cryo-Torr® Cryopumps.

The 8200 compressor supports all pumps up to eight inches in size and is designed for flexibility, allowing you to locate the compressor wherever it's most convenient for your system operation.



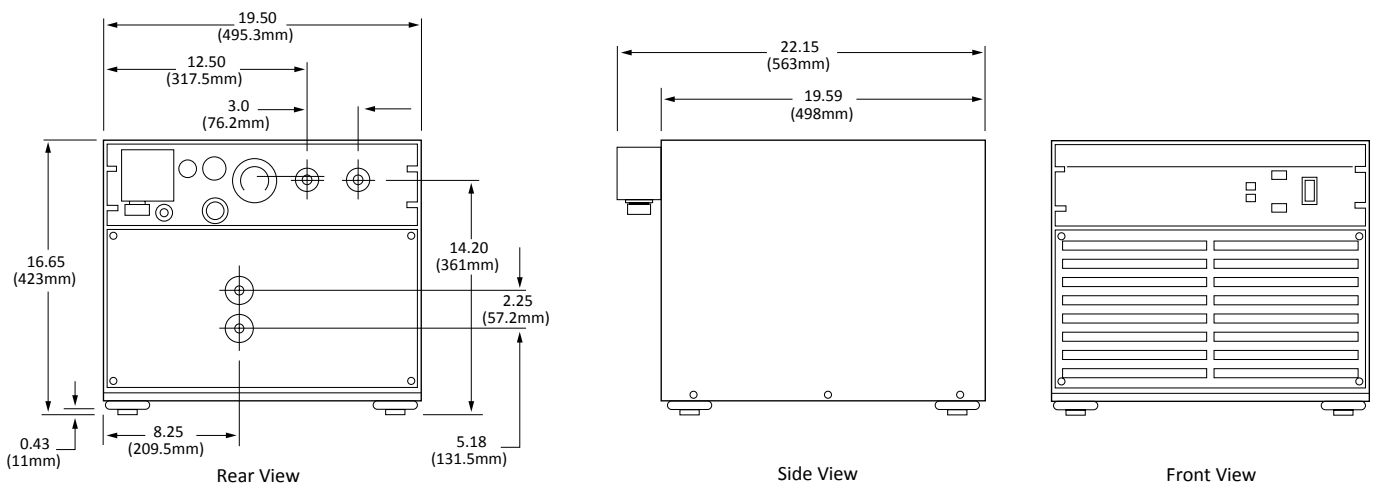
Features and benefits

- Outstanding Performance with all Four-inch, Six-inch and Eight-inch On-Board® or Cryo-Torr® Cryopumps and On-Board® Waterpumps
- Three phase power for Low Vibration Applications (single phase power available)
- Choice of Air- and Water- Cooled Models
- Low Profile and Small Footprint Enabling Effective Use of Space

8200 Performance Specifications

Dimensions	423mm h x 495.3mm w x 498mm d) (16.65" h x 19.50"w x 19.59"d)
Weight	64 kg (140 lbs)
Operating Voltage (3-phase, 200/230 VAC 50/60 Hz, 2.2KW)	60 Hz Input 198-250 Vac 50 Hz Input 180-220 Vac
(single phase option available)	

Dimensions



CTI-CRYOGENICS® REFRIGERATION SYSTEM

MODEL 350, 1020, 1050 (CRYODYNE®)



CTI-CRYOGENICS® REFRIGERATION SYSTEM

MODEL 350, 1020, 1050 (CRYODYNE®)

CTI offers a family of single and two stage, closed-cycle refrigeration systems based on the Gifford-McMahon thermodynamic Cycle. They provide usable refrigeration from <10 K to >80 K for a variety of commercial and research applications. CTI has the most thoroughly proven closed-cycle helium refrigeration systems on the market today.

CTI Refrigeration systems consist of a refrigeration assembly, compressor assembly and customized installation kit, which includes flexible interconnecting Helium lines and refrigerator cable ranging from the standard 10 foot separation length up to 300 foot length.

Applications and Markets

R&D

Superconductor Cooling

Cryopumps

Optical Systems

Materials Research

Spectroscopy

Radio Astronomy

NMR Systems

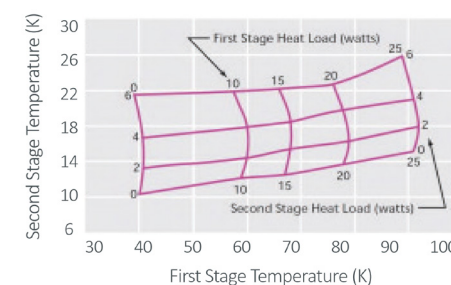
FEATURES & BENEFITS

- The most thoroughly proven closed-cycle helium refrigeration systems on the market
- Ultra pure helium gas as the refrigerant which is environmentally safe and nonflammable
- Long life

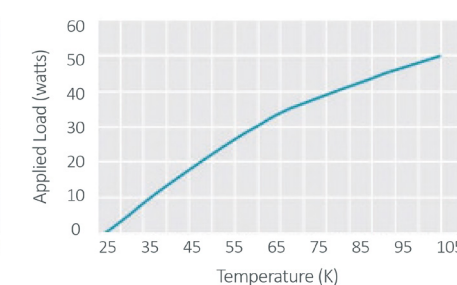
Model 350 Cryodyne® Refrigeration System

The Model 350 is used in many laboratory and commercial applications such as cooling low noise amplifiers for radar and radio astronomy. The M-350 is used in basic materials research, matrix isolation spectroscopy and cooling of superconductors. The single stage M-350 will provide 40 WATTS of refrigeration at 77 K. The two stage M-350 will provide a refrigeration of 4 WATTS at 20 K and 20 WATTS at 77 K simultaneously.

Model 350 Two Stage Cryodyne®
Refrigerator Typical Performance (60 Hz)



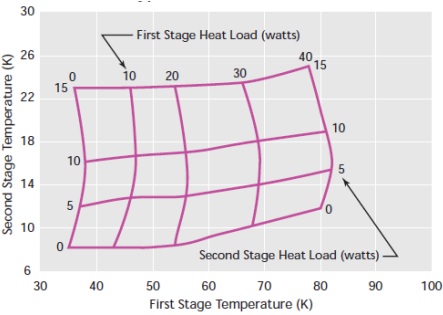
Model 350 Single Stage Cryodyne®
Refrigerator Typical Performance (60 Hz)



Model 1020 Cryodyne Refrigeration System

The Model 1020 is available in a two stage configuration only. Single stage performance is available from the M-1050. The M-1020 was designed for high capacity applications such as MRI magnet shield cooling and large cryopumps. The M-1020 will provide 12 WATTS of refrigeration at 20 K and 35 WATTS at 77 K simultaneously.

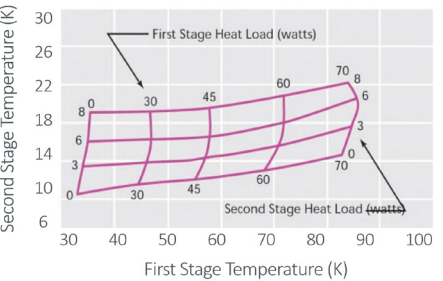
Model 1020 Two Stage Cryodyne® Refrigerator Typical Performance (60 Hz)



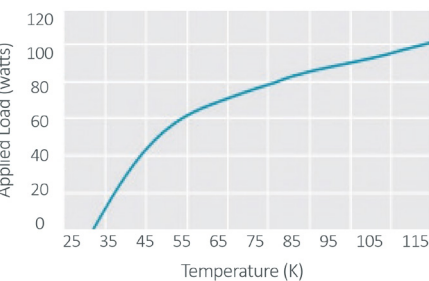
Model 1050 Cryodyne® Refrigeration System

The Model 1050 is available in both single and two stage configurations to meet a variety of high capacity cooling applications. The M-1050 is ideal for a number of high temperature semiconductor applications that require cooling from 20 K to 80 K. The M-1050 single stage system will provide 80 WATTS of refrigeration at 77 K. The M-1050 two stage system will provide 7 WATTS of refrigeration at 20 K and 65 WATTS at 77 K simultaneously.

Model 1050 Two Stage Cryodyne® Refrigerator Typical Performance (60 Hz)



Model 1050 Single Stage Cryodyne® Refrigerator Typical Performance (60 Hz)



CTI APPLICATIONS EXPERTISE

The CTI applications team listens carefully to customer perspectives and partners with them to address their issues. Leveraging our leadership in modern cryopump technology, we deliver the right solution, whether off the shelf or custom engineered. We are committed to helping you meet your process and manufacturing objectives.



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Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(727)345-47-04

Беларусь +(375)257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: ewc@nt-rt.ru || сайт: <https://edwards.nt-rt.ru/>