ULVAC CRYOGENICS INC.

Head office and factory
1222-1 Yabata, Chigasaki, Kanagawa, 253-0085, JAPAN
TEL : +81-(0)467-85-0303
FAX : +81-(0)467-85-9356
Technical service division TEL : +81-(0)467-85-9366

Kyoto Factory
140-1, Megawa, Makishima-cho, Uji, Kyoto, 611-0041, JAPAN
TEL : +81-(0)774-28-5595
FAX : +81-(0)774-20-2201

Osaka branch office
3-3-31 Uemura Nissei bldg., Miyahara, Yodogawa-ku, Osaka 532-0003, JAPAN
TEL : +81-(0)6-6397-0112
FAX : +81-(0)6-6397-0126

Overseas group companies

Korea
ULVAC CRYOGENICS KOREA INC.
107, Hyeongokasndan-Ro, Cheongbuk-Myeon, Pyeongtaek-Si, Gyeonggi-Do, Korea, 451-831
TEL : +82-(0)31-683-2926
FAX : +82-(0)31-683-2956

China
ULVAC CRYOGENICS (NINGBO) INC.
3rd Floor, No.2 Building,No.1177 Lingyun Road, Ningbo National Hi-Tech Zone Lingyun Industry Park, Ningbo, 315040, China
TEL : +86-(0)574-8790-3322
FAX : +86-(0)574-8791-0707

www.ulvac-cryo.com/english/

For inquiries

●The content of this catalog is subject to change without notice for improvement of the products.

1410500PL

149E

ULVAC

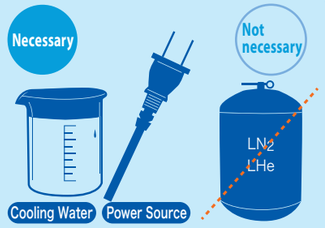
CRYOSTAT

ULVAC CRYOGENICS INC.

Mini Stat provides powerful support for the research and development in the cryogenic field.

For cryogenic research and development, cryostats or cryocoolers are needed to cool samples (specimen). ULVAC CRYOGENICS Mini Stat is our unique cryostat that employs a compact cryocooler (Cryo-Mini) instead of cryogens that need to be replenished such as liquid nitrogen or liquid helium.
With electricity and water, Mini Stat can cool samples to cryogenic temperature by simple operation. In addition, with temperature controllers, samples can be kept precisely at a desired temperature between cryogenic and room temperature, enabling the measurement in a wide temperature range.
We offer wide variety of cryocoolers to provide the best choice for your desired temperature as well as we design and manufacture cryostats that satisfy various kinds of requirements based on our rich experience and expertise.

ADVANTAGE 1



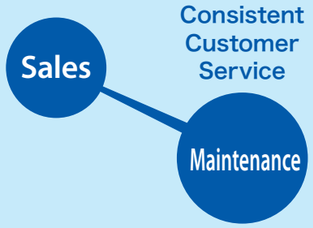
No need for liquid nitrogen or liquid helium. With electricity and water, Mini Stat can control temperature between cryogenic and ambient with simple operation.

ADVANTAGE 2

Unattended Operation

Unattended continuous operation is possible as cryogen is not used.

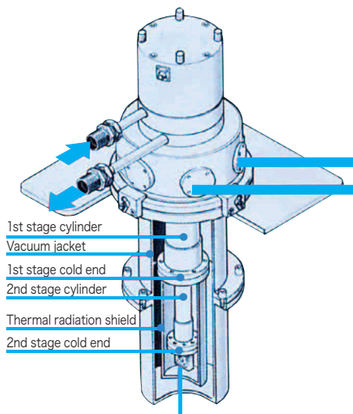
ADVANTAGE 3



CryoMini is our unique cryocooler and made in Japan.
We provide consistent service from sales to maintenance.

Helium Cycle Provides Ultra Low Temperature

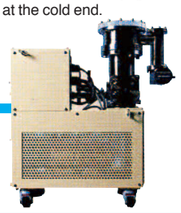
CryoMini is our unique closed-cycle cryocooler. CryoMini recirculates helium gas and there is no need to add gas. Helium gas is first compressed, supplied to the cylinder, and is adiabatically-expanded and then returns to the compressor. Ultra low temperature is gradually generated by repeating this cycle.



Temperature controller

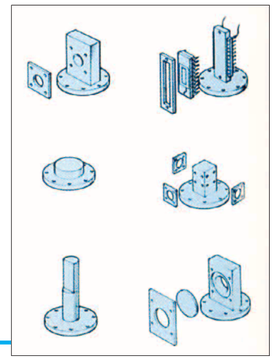
Vacuum evacuation device

This device provides vacuum layer inside Mini Stat to prevent heat transfer and keeps the cryogenic temperature at the cold end.



Sample holder

We design sample holders that fit the shape or numbers of samples.



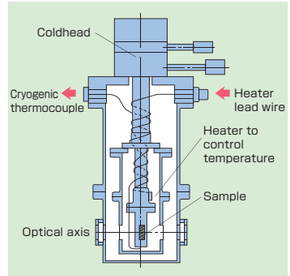
For Optical Transmission Measurement — CRT-006-1000

For measuring samples with a spectroscope

This model is used to measure samples in conjunction with a spectroscope, at temperatures from cryogenic to ambient.

Specifications

Coldhead	HE05/UW404	D510/SW115	D105/SW112
Ultimate Temperature	4K	12K	12K
Temperature Controllable Range	4K-300K±0.2K	12K-300K±0.2K	12K-300K±0.2K
Optical Window Dimensions	ϕ20×4		
Sample Dimensions	10(W) ×10 (D) ×1t (H) (mm)		
Number of Samples	2		
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement) ●Coldhead rotation system		



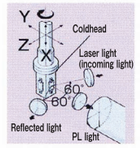
For Photoluminescence Measurement — CRT-006-2000

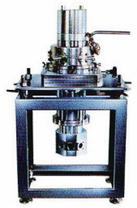
Controls samples and temperature freely.

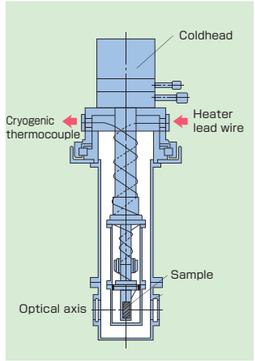
Conventional types of PL measuring instrument can measure the samples of Si, GaAs, etc. only at certain temperature. With this model of Mini Stat, you can measure samples at temperatures from ambient to cryogenic while moving samples in X, Y or Z directions.

Specifications

Coldhead	HE05/UW404	D510/SW115	D105/SW112
Ultimate Temperature	4K	12K	12K
Temperature Controllable Range	4K-300K±0.2K	12K-300K±0.2K	12K-300K±0.2K
Optical Window Dimensions	●Light Inlet : ϕ20(mm) ●Photoluminescence : ϕ30(mm) ●Reflected Light : ϕ20(mm)		
Sample Dimensions	10(W) ×10 (D) ×1t (H) (mm)		
Number of Samples	3		
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement) ●Coldhead rotation system ●XYZ Table		







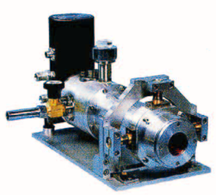
For Low-Vibration Measurement — CRT-006-3000

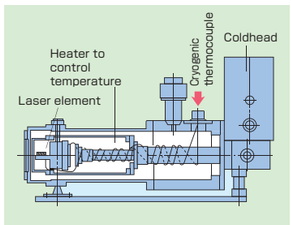
For using a cryocooler for the experiment with samples vulnerable to vibrations

With our unique vibration-proof system, it is now possible to use cryocoolers for the cryogenic experiment even when the samples are vulnerable to vibrations such as laser diodes.

Specifications

Coldhead	HE05/UW404	D510/SW115	D105/SW112
Ultimate Temperature	6K	25K	25K
Temperature Controllable Range	6K-300K±0.2K	25K-300K±0.2K	25K-300K±0.2K
Optical Window Dimensions	●Light Inlet : ϕ20(mm) ●Photoluminescence : ϕ30(mm) ●Reflected Light : ϕ20(mm)		
Sample Dimensions	10(W) ×10 (D) ×1t (H) (mm)		
Number of Samples	1		
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement)		

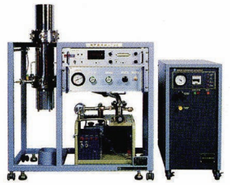


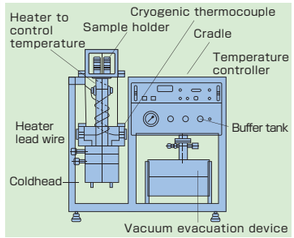


For Measuring Superconductive Material (Helium Encapsulation type) CRT-006-4000

Optimal for Measuring Superconductive Materials

With encapsulated helium, uniform cryogenic temperature can be obtained for each sample which is ideal for measuring superconductive materials. This model also cools voluminous samples or large sized samples evenly.





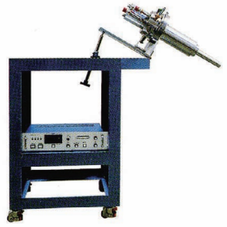
Specifications

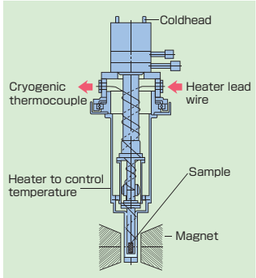
Coldhead	HE05/UW404	D510/SW115
Ultimate Temperature	10K	15K
Temperature Controllable Range	10K-300K±0.2K	15K-300K±0.2K
Sample Dimensions	10(W) ×10 (D) ×3t (H) (mm) *Bulk material or thin film	
Number of Samples	4 for electric resistance (4-terminal method) 4 for magnetic susceptibility *by mutual inducting measuring method	
Sample cooling method	Helium encapsulation	
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement)	

For Hall Effect Measurement CRT-006-5000

For precise measurement of hall effect

With this model, it is possible to change the temperature of samples freely from cryogenic to ambient. This model can be attached to electro-magnets.





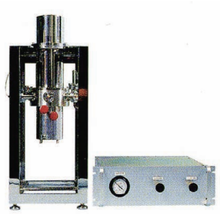
Specifications

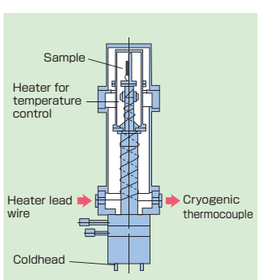
Coldhead	HE05/UW404	D510/SW115	D105/SW112
Ultimate Temperature	4K	12K	12K
Temperature Controllable Range	4K-300K±0.2K	12K-300K±0.2K	12K-300K±0.2K
Distance from magnet	Minimum 40 mm		
Sample Dimensions	10(W) ×10 (D) ×1t (H) (mm)		
Number of Samples	1		
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement) ●Lead wire (Coaxial cable) : 4 ●Coldhead rotation system		

For DLTS Measurement CRT-006-6000

For analyzing semiconductor materials

DLTS is one of the methods to analyze impurities contained in semiconductor materials. With this model, it is possible to measure samples while freely changing the temperature of samples from cryogenic to ambient. This model can also be used for other types of electrical measurements.





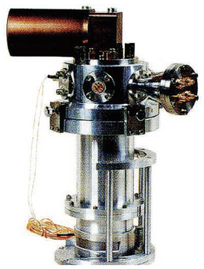
Specifications

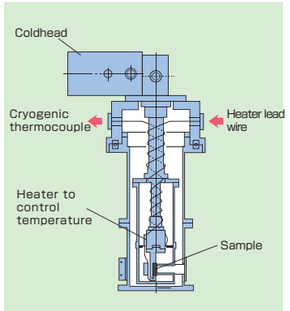
Coldhead	HE05/UW404	D510/SW115	D105/SW112
Ultimate Temperature	4K	12K	12K
Temperature Controllable Range	4K-300K±0.2K	12K-300K±0.2K	12K-300K±0.2K
Sample Dimensions	10(W) ×10 (D) ×1t (H) (mm)		
Number of Samples	1		
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement) ●Lead wire for measurement ●Coaxial cable		

For X-Ray Diffraction Measurement CRT-006-7000

For thoroughly analyzing the structure of samples with X-ray.

With a conventional X-ray measurement device, it is only possible to measure samples at a certain temperature. With this model, it is now possible to measure samples while changing temperatures from cryogenic to ambient.





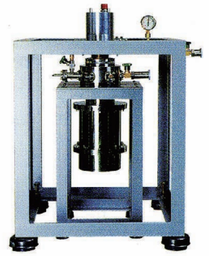
Specifications

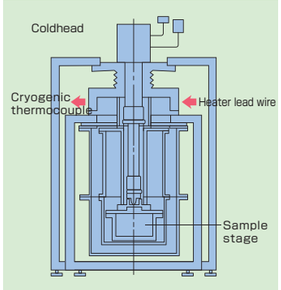
Coldhead	HE05/UW404	D510/SW115	D105/SW112
Ultimate Temperature	4K	12K	12K
Temperature Controllable Range	4K-300K±0.2K	12K-300K±0.2K	12K-300K±0.2K
Sample Dimensions	10(W) ×10 (D) ×1t (H) (mm)		
Number of Samples	1		
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement) ●Coldhead rotation system		

Mössbauer Spectroscopy Measurement (Ultra Low Vibration Type) CRT-006-8000

With our unique vibration isolation system for Mössbauer Spectroscopy

So far, Mössbauer measurement has been difficult due to vibration of cryocoolers. This model is equipped with our own vibration isolation system to enable the use of cryocoolers for Mössbauer measurement. The measurement can be done at any temperature from ambient to cryogenic.





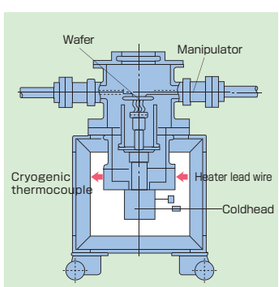
Specifications

Coldhead	HE05/UW404	D510/SW115
Ultimate Temperature	6K	15K
Temperature Controllable Range	6K-300K±0.2K	15K-300K±0.2K
Sample Dimensions	10(W) ×10 (D) ×1t (H) (mm)	
Number of Samples	1	
Sample Holder Vibration	Less than 1 μm (Floor vibration ≦ 2 μm)	
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement)	

For Wafer Cooling CRT-006-WEF

For inspecting semiconductors in the form of wafer

With conventional cryostats, inspection of semiconductors is only possible in the form of a chip. With this model, inspection is possible in wafer state while controlling the temperature from ambient to cryogenic. This model is equipped with manipulators with which probing can be done during cooling down wafers.



Specifications

Coldhead	D510/UW404	S030/SW115
Ultimate Temperature	25K	40K
Temperature Controllable Range	25K-300K±0.2K	40K-300K±0.2K
Maximum wafer size	2 inches	
Sample Holder Vibration	Less than 1 μm (Floor vibration ≦ 2 μm)	
Accessories	●Evacuation valve ●Heater for temperature control ●Cryogenic thermometer (for temperature control / measurement)	

Examples of Special Models

Specialty Cryostat

Ulvac Cryogenics has been developing many different types of cryostats ever since it succeeded to develop its own compact cryocooler (Cryo Mini). We are ready to design and manufacture cryostats that satisfy your specific requirements based on our rich expertise and experience. Please contact our sales representatives.

For Low Vibration Optical Measurement

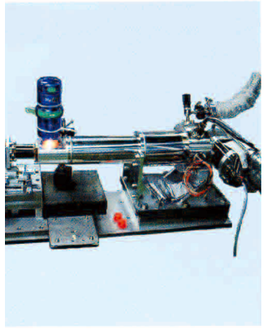
Specifications

Coldhead / HE05
Ultimate Temperature / Lower than 6K
Cooldown time / Less than 240 minutes (To 10K)
Vibration / Less than 5μm
Lead wires for measurement / 10
Optical window / Effective diameter : φ17mm

For Microscope Raman Scattering Measurement

Specifications

Coldhead / HE05
Ultimate Temperature / Lower than 11K
Cooldown time / Less than 150 minutes (To 10K)
Vibration / Less than 3μm
Temperature stability / Within 0.2 K
Optical window / Effective diameter : φ20mm



Cryogenic Micro Prober

Specifications

Coldhead / P301
Temperature range / −173 - 180℃
Cooldown time / Within 60 minutes (0 - 173℃)
Temperature stability / ±0.2K
Number of probes / 6
Moving range / Up and Down ±5mm Side to Side ±5mm Front to Back ±10mm
Stereoscopic Microscopes can be mounted

For Anvil Cell Cooling

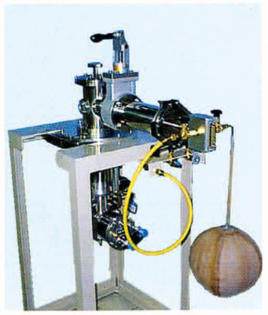
Specifications

Coldhead / D510
Ultimate Temperature / Lower than 20K
Cooldown time / Within 90 minutes (To 20K)
Temperature stability / Within ±0.2K
Lead wires for measurement / 4
X-Ray Diffraction Measurement Window / Material Mylar Entrance Window Diameter φ20mm Scatter Window Diameter φ48mm

For Side-Loading Type Optical Measurement

Specifications

Coldhead / HE05
Ultimate Temperature / Lower than 6K
Cooldown time / Less than 240 minutes (To 10K)
Window for Optical Measurement / Effective diameter : φ12mm Number : 3
Lead-Wires for Measurement / 24



For Top-Loading Type Optical Measurement

Specifications

Coldhead / HE05
Ultimate Temperature / Lower than 6K
Cooldown time / Less than 240 minutes (To 10K)
Vibration / Less than 3μm
Window for Optical Measurement / Effective diameter : φ15mm Number : 3

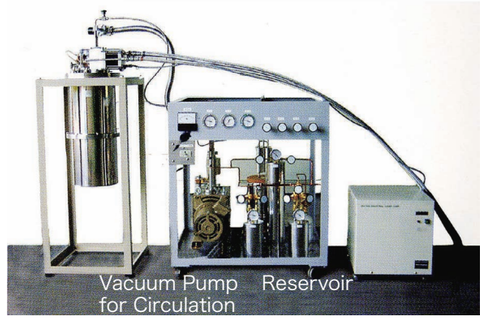
Applied Equipments

1K Cryocooler System

So far, the typical method to obtain cryogenic temperature of below 1K has been to decompress liquid He-3. However, it has been quite inconvenient as liquid He-4 is needed to liquefy He-3.
Our 1K Cryocooler System, developed with the best of our cryogenic technology, is equipped with CryoMini 4K cryocooler instead of liquid He-4. As cryogenic temperature of below 1K can be obtained by circulating He-3 in a closed cycle, there is no need to add liquid He-4 or expensive He-3. He-4 can also be circulated instead of He-3, though the ultimate temperature is 1.6K with He-4.

Specifications

Ultimate Temperature	1K (With ^{3}He) 1.6K (With ^{4}He)
Cooling Capacity	60mW/1.5K (With ^{3}He) 200mW/2.0K (With ^{4}He)
Cooldown time	Approx. 24 hours



1K Cryostat ^{3}He Circulation Unit Compressor

EMP Series (Liquid Nitrogen Generator)

With EMP Series, you can easily produce liquid nitrogen as long as water and electricity are supplied. You will be free from the inconvenience of administering the supply of small amount of LN_2. EMP offers the best solution for electron microscope EDS, cold traps, high temperature superconductivity, LN_2 cryostats, freezing biological samples, or other cryogenic cooling purposes.

EMP-07

EMP-14

EMP-20W

Specifications

	EMP-07A	EMP-07W	EMP-14A	EMP-14W	EMP-20W
LN_2 Generation Capacity	8ℓ/day (60Hz)、6ℓ/day (50Hz)		14ℓ/day (60Hz)、14ℓ/day (50Hz)		20ℓ/day (60Hz)、19ℓ/day (50Hz)
LN_2 Reserve Capacity	40ℓ		40ℓ		80ℓ
Dimensions	600(W)×750(D)×1628(H)mm		600(W)×750(D)×1688(H)mm		930(W)×740(D)×1661(H)mm
Weight	Approx. 220kg	Approx. 230kg	Approx. 235kg	Approx. 230kg	Approx. 340kg
Power Supply	100VAC Single Phase Approx. 1.2/1.4kW (50/60Hz) Breaking capacity 20A		200VAC 3 Phase Approx. 1.7/2.0kW (50/60Hz) Breaking capacity 20A	200VAC 3 Phase Approx. 1.6/1.9kW (50/60Hz) Breaking capacity 20A	200VAC 3 Phase Approx. 3.3/4.1kW (50/60Hz) Breaking capacity 30A
Cooling Water	Not needed (Air cooled)	Entrance Temperature : 5-35℃ Flow Rate : 2-5ℓ/min Pressure : < 0.8 MPa Water quality : Tap water equivalent	Not needed (Air cooled)	Entrance Temperature : 5-35℃ Flow Rate : 2-6ℓ/min Pressure : < 0.8 MPa Water quality : Tap water equivalent	Entrance Temperature : 10-30℃ Flow Rate : 3-6ℓ/min Pressure : < 0.8 MPa Water quality : Tap water equivalent
	Nitrogen gas generator: GN-10T		Nitrogen gas generator: GN-10T		Nitrogen gas generator: GN-10T