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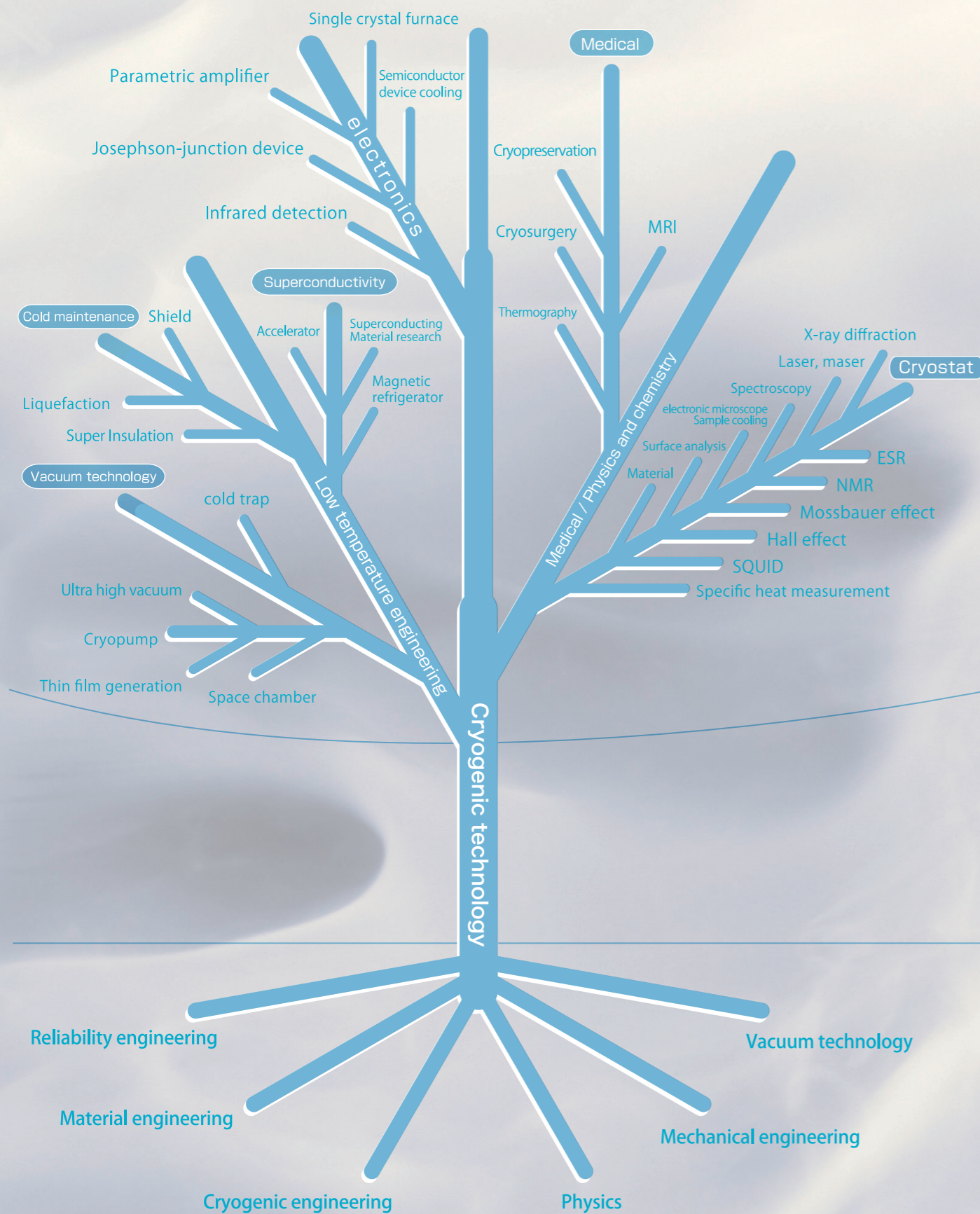
www.ulvac-cryo.com/english/



Contact Us



Cryogenic Technology in a Variety of Fields



Our Cryocoolers

ULVAC CRYOGENICS has provided a large number of cryopumps to be mounted on vacuum systems for semiconductor or LCD manufacturing equipments based on our rich experience and expertise in vacuum and cryogenic technology.

Recently, G-M refrigerators for cryopumps have been expanding the applications into new fields such as superconductivity.

As the demand for 4K or pulse-tube cryocoolers expands, we believe that our cryocoolers with proven technology will respond to the requirements for R&D or in advanced industries.

Application of cryogenic technology



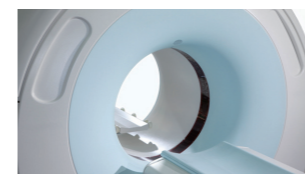
Vacuum technology

Cryopumps, Cryotraps



Environment

Remote sensing for environmental conservation (Ozone hole, global warming, air pollution, abnormal weather, acid rain, etc.)



Medical Treatment

Magnetic Resonance Imaging (MRI) Thermography Mass Spectrometer



Industry

MCZ (magnetic field applied silicon single crystal furnace device)
Magnetically levitated magnet for maglev LHC (superconducting accelerator)
Cooling electron microscope of semiconductor device Cooling infrared detection system of sample
Transmission electricity distributor · generator SMES (energy storage device)



The study

Millimeter wave measurement optical measurement NMR (nuclear magnetic resonance)
ESR / ERP (electron paramagnetic resonance) X ray diffraction Hall effect
SQUID (superconducting quantum interference device) Mössbauer superconducting material
J - J device magnetic cooling surface analysis radio telescope materials research
Compact refrigerator for satellites

4K GM cryocooler HE05

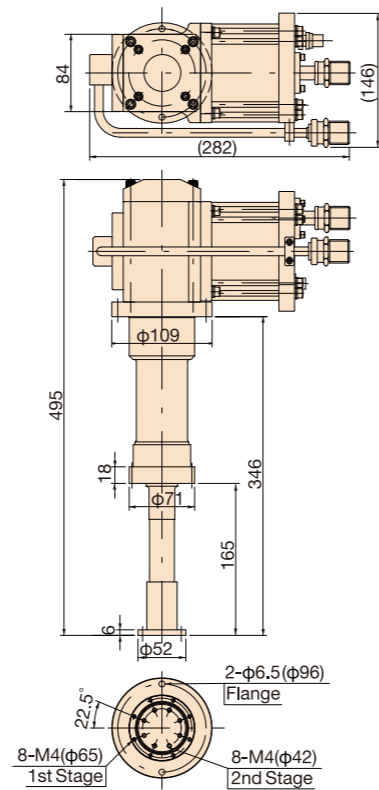
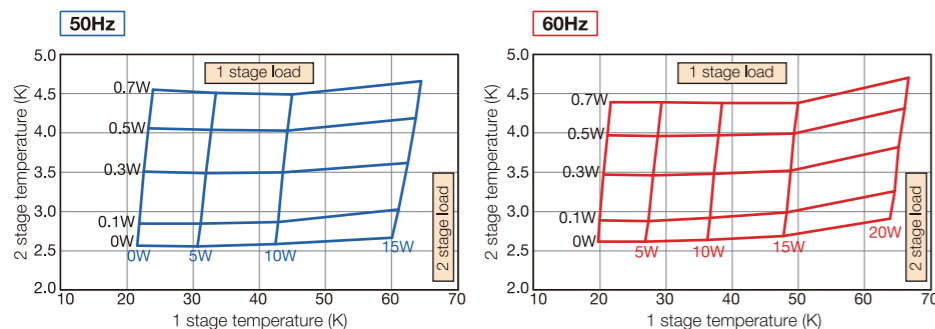


Specification

Power frequency	50Hz	60Hz
Cooling capacity *1	first stage	10W@45K
	second stage	0.5W@4.2K
Ultimate temperature *1	second stage	2.7K
Cooldown time(4.2K) *1	75min	60min
Weight	11kg	
Dimensions	282(D)×146(W)×495(H)mm	
Maintenance interval *2	10,000 hours	
Compressor unit	UW404	

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.
 * 2 Maintenance interval is recommended, not guaranteed time.

Examples of Performance curve (coldhead pointing-down)



4K GM cryocooler UHE12

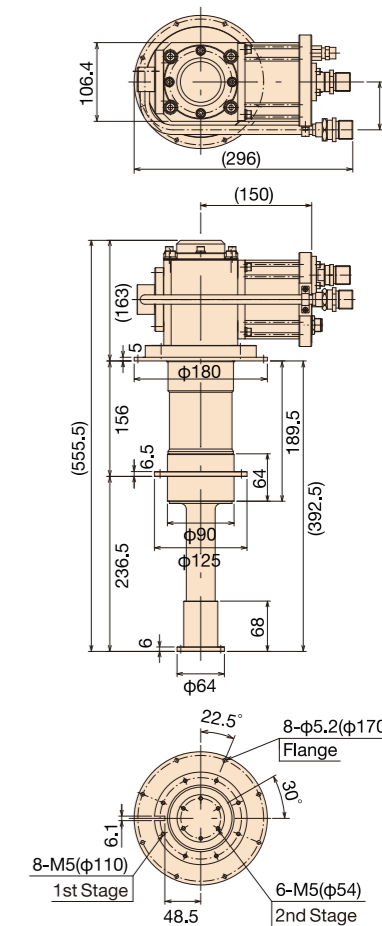
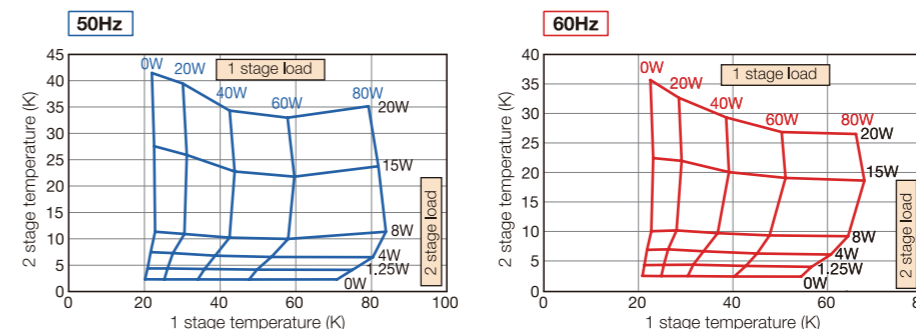


Specification

Power frequency	50Hz	60Hz
Cooling capacity *1	first stage	53W@43K
	second stage	1.25W@4.2K
Ultimate temperature *1	second stage	2.7K
Cooldown time(4.2K) *1	60min	
Weight	17kg	
Dimensions	296(D)×180(W)×556(H)mm	
Maintenance interval *2	10,000 hours	
Compressor unit	C30HVRT	

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.
 * 2 Maintenance interval is recommended, not guaranteed time.
 * Flexible hose standard length 20A×20m
 * UHE12F is UL/CE Compliant product.

Examples of Performance curve (coldhead pointing-down)



4K GM cryocooler UHE10

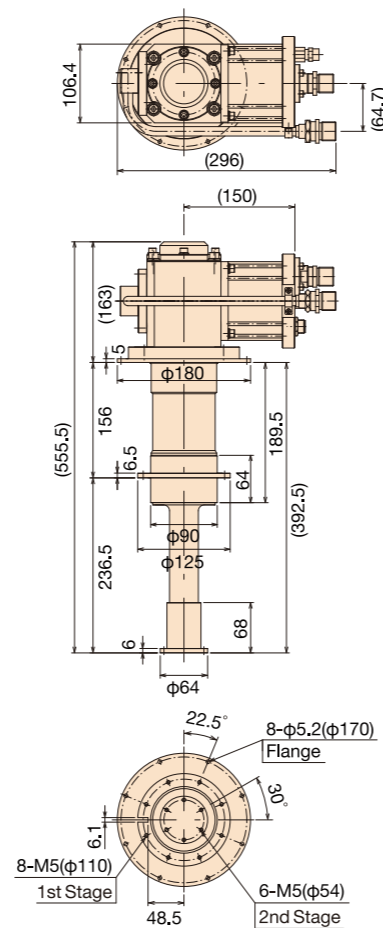
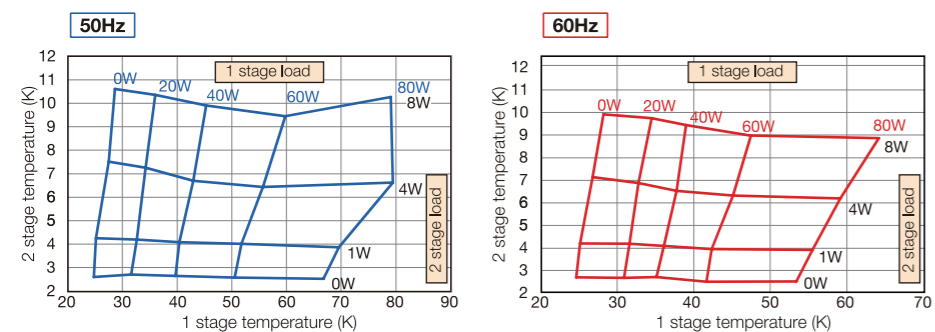


Specification

Power frequency	50Hz	60Hz
Cooling capacity *1	first stage	40W@43K
	second stage	1.0W@4.2K
Ultimate temperature *1	second stage	2.7K
Cooldown time(4.2K) *1	60min	
Weight	17kg	
Dimensions	296(D)×180(W)×556(H)mm	
Maintenance interval *2	10,000 hours	
Compressor unit	C30HVRT	

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.
 * 2 Maintenance interval is recommended, not guaranteed time.
 * Flexible hose standard length 20A×10m
 * UHE10F is UL/CE Compliant product.

Examples of Performance curve (coldhead pointing-down)



4K GM cryocooler UHE15

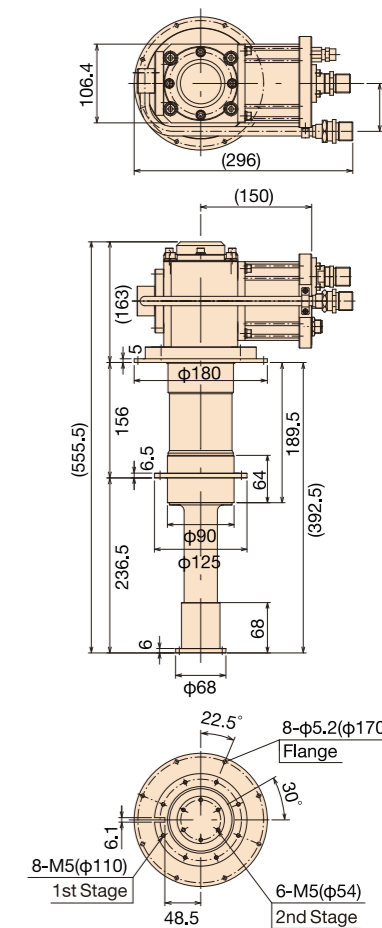
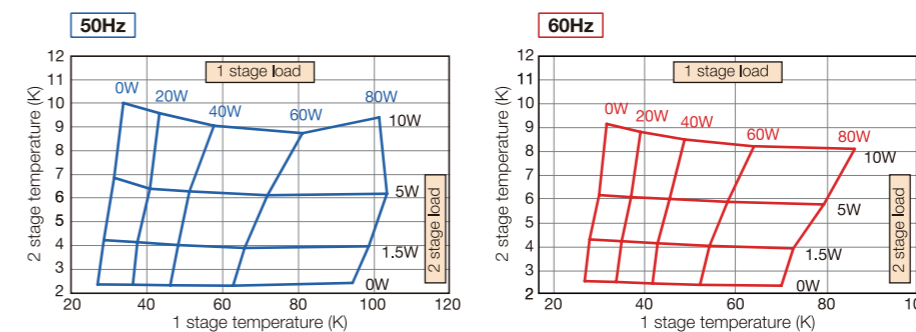


Specification

Power frequency	50Hz	60Hz
Cooling capacity *1	first stage	35W@50K
	second stage	1.5W@4.2K
Ultimate temperature *1	second stage	2.7K
Cooldown time(4.2K) *1	60min	
Weight	17kg	
Dimensions	296(D)×180(W)×556(H)mm	
Maintenance interval *2	10,000 hours	
Compressor unit	C30HVRT	

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.
 * 2 Maintenance interval is recommended, not guaranteed time.
 * Flexible hose standard length 20A×10m
 * UHE15F is UL/CE Compliant product.

Examples of Performance curve (coldhead pointing-down)

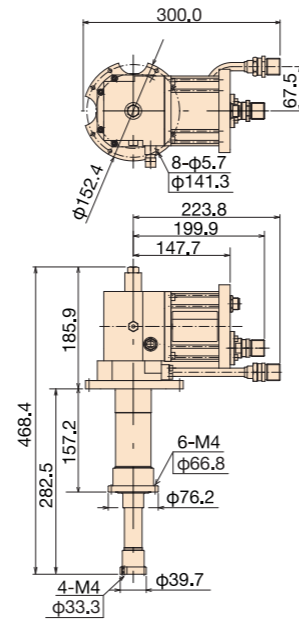


GM cryocooler RM10T

Specification

Power frequency	50Hz	60Hz
Refrigerator system	CRM10T	
Cooling capacity	first stage	10W@77K
	second stage	3W@20K
Ultimate temperature	12K	
Cooldown time(20K)	45min	40min
Weight	11kg	
Maintenance interval	16,000 hours	
Compressor unit	C10T , C10AT	

* Cooling capacity,Ultimate temperature, Cooldown time are the combination when the refrigerator and compressor are 1:1/ambient temperature:24°C/No-Load Value.

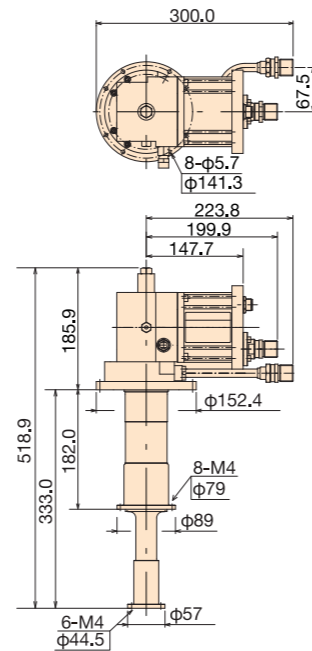


GM cryocooler RM20T

Specification

Power frequency	50Hz	60Hz
Refrigerator system	CRM20T	
Cooling capacity	first stage	30W@77K
	second stage	10W@20K
Ultimate temperature	12K	
Cooldown time(20K)	35min	30min
Weight	12kg	
Maintenance interval	16,000 hours	
Compressor unit	C30VRT	

* Cooling capacity,Ultimate temperature, Cooldown time are the combination when the refrigerator and compressor are 1:1/ambient temperature:24°C/No-Load Value.

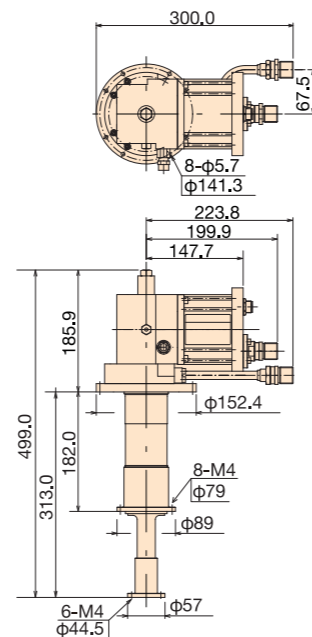


GM cryocooler RM50T

Specification

Power frequency	50Hz	60Hz
Refrigerator system	CRM50T	
Cooling capacity	first stage	55W@77K
	second stage	5W@20K
Ultimate temperature	12K	
Cooldown time(20K)	45min	40min
Weight	12kg	
Maintenance interval	16,000 hours	
Compressor unit	C30VRT	

* Cooling capacity,Ultimate temperature, Cooldown time are the combination when the refrigerator and compressor are 1:1/ambient temperature:24°C/No-Load Value.

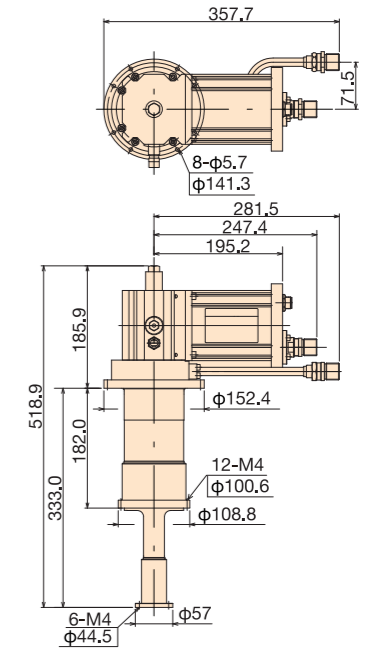


GM cryocooler RM80T

Specification

Power frequency	50Hz	60Hz
Refrigerator system	CRM80T	
Cooling capacity	first stage	80W@77K
	second stage	8W@20K
Ultimate temperature	12K	
Cooldown time(20K)	40min	35min
Weight	16kg	
Maintenance interval	16,000 hours	
Compressor unit	C30PVRT	

* Cooling capacity,Ultimate temperature, Cooldown time are the combination when the refrigerator and compressor are 1:1/ambient temperature:24°C/No-Load Value.

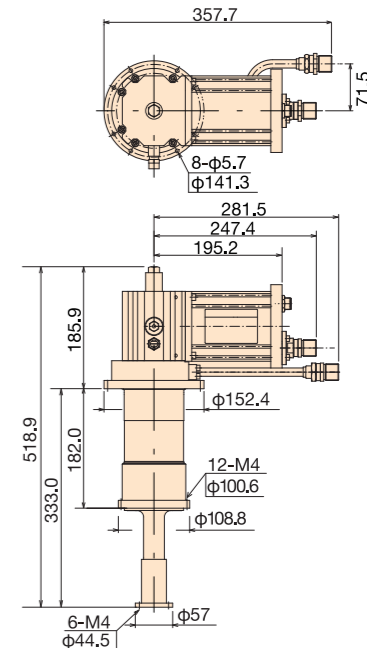


GM cryocooler RM120ET

Specification

Power frequency	50Hz	60Hz
Refrigerator system	CRM120ET	
Cooling capacity	first stage	110W@77K
	second stage	12W@20K
Ultimate temperature	10K	
Cooldown time(20K)	35min	30min
Weight	16kg	
Maintenance interval	16,000 hours	
Compressor unit	C30PVRT	

* Cooling capacity,Ultimate temperature, Cooldown time are the combination when the refrigerator and compressor are 1:1/ambient temperature:24°C/No-Load Value.

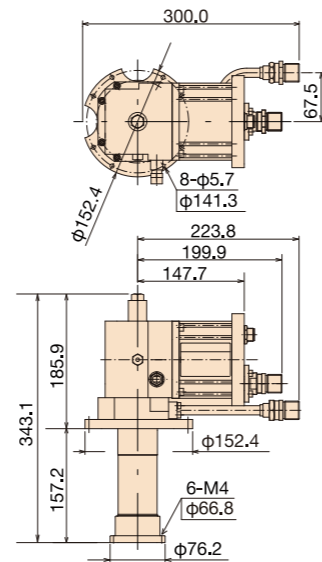


GM cryocooler RMS10T

Specification

Power frequency	50Hz	60Hz	
Refrigerator system	CRMS10T		
Cooling capacity	first stage	29W@77K	35W@77K
Ultimate temperature	30K		
Cooldown time(77K)	35min	30min	
Weight	10Kg		
Maintenance interval	16,000 hours		
Compressor unit	C10T , C10AT		

* Cooling capacity,Ultimate temperature, Cooldown time are the combination when the refrigerator and compressor are 1:1/ambient temperature:24°C/No-Load Value.

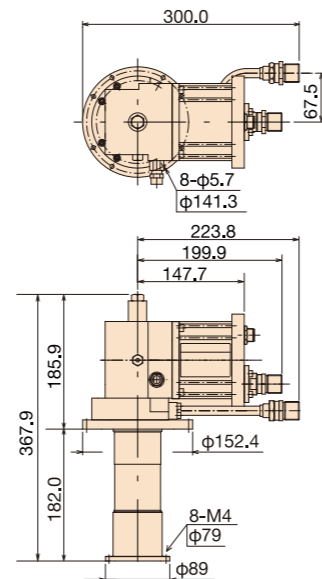


GM cryocooler RMS50T

Specification

Power frequency	50Hz	60Hz	
Refrigerator system	CRMS50T		
Cooling capacity	first stage	67W@77K	85W@77K
Ultimate temperature	30K		
Cooldown time(77K)	25min	20min	
Weight	11Kg		
Maintenance interval	16,000 hours		
Compressor unit	C30VRT		

* Cooling capacity,Ultimate temperature, Cooldown time are the combination when the refrigerator and compressor are 1:1/ambient temperature:24°C/No-Load Value.

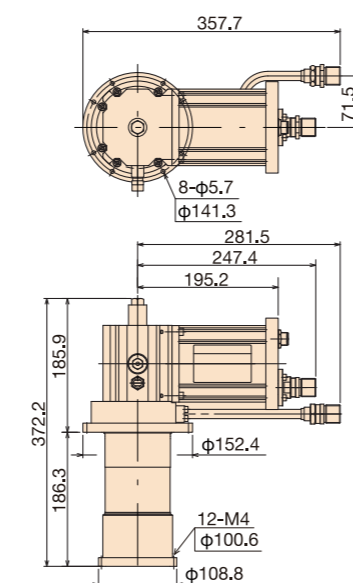


GM cryocooler RMS80T

Specification

Power frequency	50Hz	60Hz	
Refrigerator system	CRMS80T		
Cooling capacity	first stage	120W@77K	130W@77K
Ultimate temperature	35K		
Cooldown time(77K)	20min	18min	
Weight	15Kg		
Maintenance interval	20,000 hours		
Compressor unit	C30PVRT		

* Cooling capacity,Ultimate temperature, Cooldown time are the combination when the refrigerator and compressor are 1:1/ambient temperature:24°C/No-Load Value.



GM cryocooler RMS150T



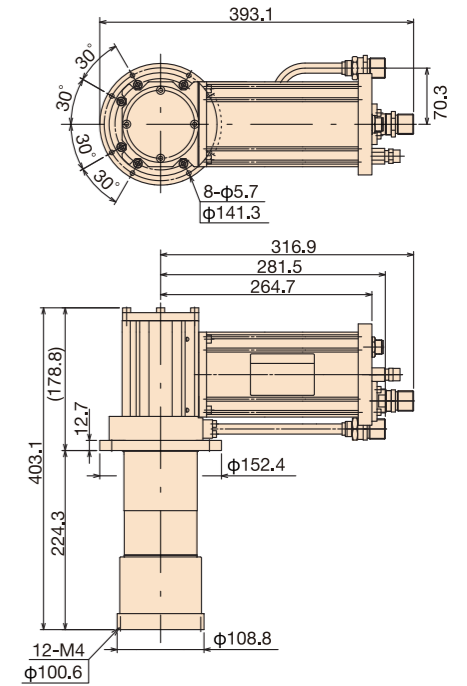
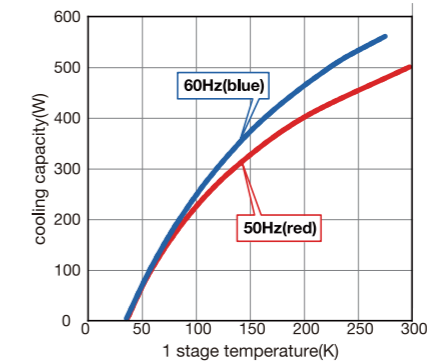
Specification

Power frequency	50Hz	60Hz	
Refrigerator system	CRMS150T		
Cooling capacity *1	first stage	150W@77K	165W@77K
Ultimate temperature *1	40K		
Cooldown time(77K) *1	15min	13min	
Weight	20Kg		
Dimensions	394(D)×163(W)×404(H)mm		
Maintenance interval *2	10,000 hours		
Compressor unit	C30PVRT		

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.

* 2 Maintenance interval is recommended,not guaranteed time.

Measurement example of refrigeration capacity



20K GM cryocooler RSC50T



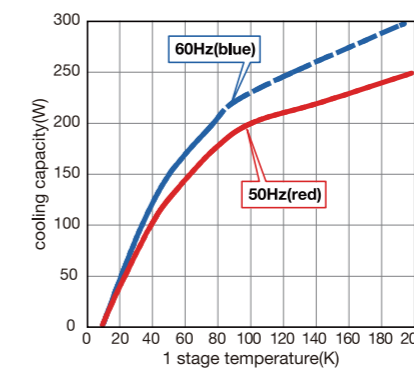
Specification

Power frequency	50Hz	60Hz	
Cooling capacity *1	first stage	40W@20K	45W@20K
Ultimate temperature *1	13K		
Cooldown time(20K) *1	50min	40min	
Weight	23kg		
Dimensions	394(D)×176(W)×476(H)mm		
Maintenance interval *2	12,000 hours		
Compressor unit	C30HVRT		

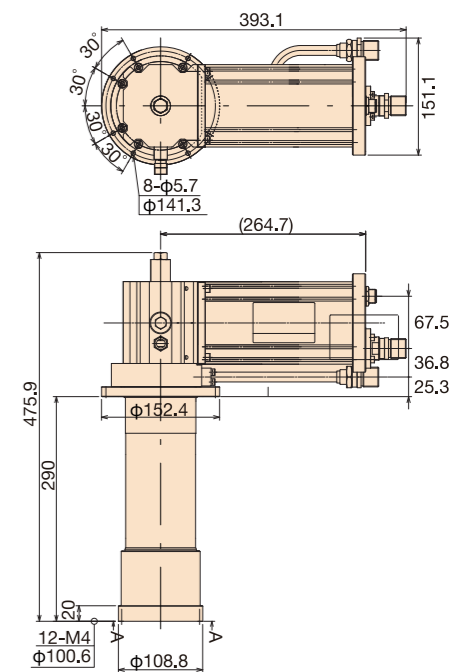
* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.

* 2 Maintenance interval is recommended,not guaranteed time.

Measurement example of refrigeration capacity



Please contact us if you are considering use in temperature range with power frequency 60Hz 77K or higher.



Pulse tube cryocooler PDC08

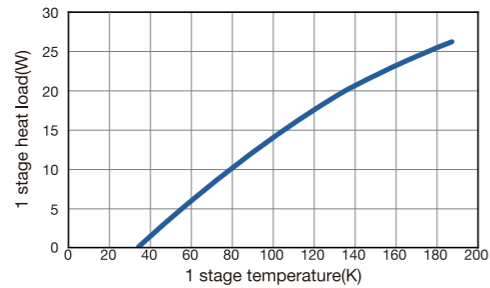


Specification

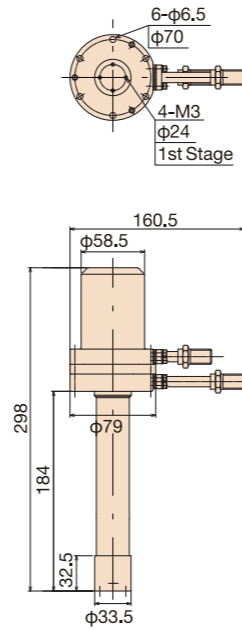
Power frequency	50Hz	60Hz
Cooling capacity (first stage) *1	Connection Pipe (without Buffer Tank) $\phi 6.35 \times 2m \times 1$	8W@77K
	Connection Pipe (with Buffer Tank) $\phi 6.35 \times 2m \times 2$	11W@77K
Ultimate temperature *1	40K	
Cooldown time(77K) *1	20min	
Weight	1.5kg	
Motor unit	M601(100V)	
Motor unit weight	4kg	
Dimensions	161(D) \times 179(W) \times 298(H)mm	
Maintenance interval *2	10,000 hours	
Compressor unit	SA112-C , SW112-C	

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.
* 2 Maintenance interval is recommended,not guaranteed time.

Measurement example of refrigeration capacity



* This refrigeration capacity curve is a typical example and is not guaranteed.



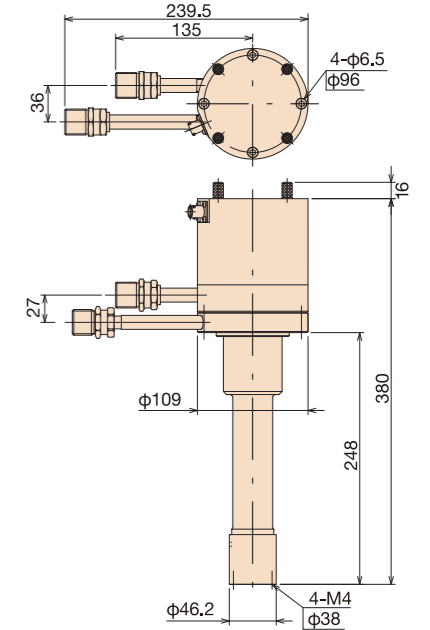
Solvay cryocooler S030Z



Specification

Power frequency	50Hz	60Hz
Cooling capacity *1	first stage	25W@77K
		30W@77K
Ultimate temperature *1	30K	
Cooldown time(77K) *1	25min	
Weight	5.9kg	
Dimensions	240(D) \times 109(W) \times 396(H)mm	
Maintenance interval *2	10,000 hours	
Compressor unit	SA112-C , SW112-C	

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.
* 2 Maintenance interval is recommended,not guaranteed time.



Pulse tube cryocooler PD016

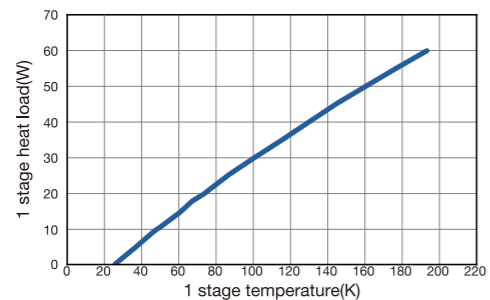


Specification

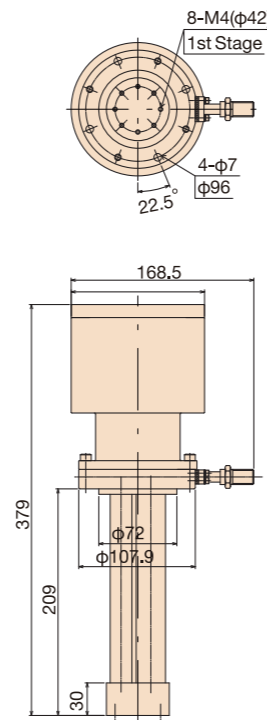
Power frequency	50Hz	60Hz
Cooling capacity (first stage) *1	Connection Pipe (100V) $\phi 6.35 \times 0.5m \times 1$	12W@77K
	Connection Pipe (200V) $\phi 6.35 \times 0.5m \times 1$	18W@77K
Ultimate temperature *1	40K	
Cooldown time(77K) *1	30min	
Weight	4.5kg	
Motor unit	M501(100V)/M502(200V)	
Motor unit weight	4kg	
Dimensions	169(D) \times 123(W) \times 379(H)mm	
Maintenance interval *2	10,000 hours	
Compressor unit	SA112-C , SW112-C SA115-C , SW115-C	

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.
* 2 Maintenance interval is recommended,not guaranteed time.

Measurement example of refrigeration capacity



* This refrigeration capacity curve is a typical example and is not guaranteed.



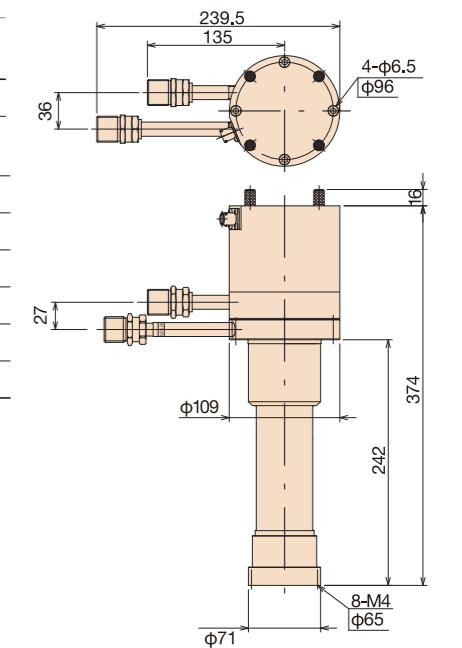
Solvay cryocooler S050



Specification

Power frequency	50Hz	60Hz
Cooling capacity *1	first stage	60W@77K
		62W@77K
Ultimate temperature *1	30K	
Cooldown time(77K) *1	20min	
Weight	6.5kg	
Dimensions	240(D) \times 109(W) \times 390(H)mm	
Maintenance interval *2	10,000 hours	
Compressor unit	UW404	

* 1 No-Load Value. The performance depends on the installation environment of the refrigerator and the cooling object.
* 2 Maintenance interval is recommended,not guaranteed time.



Compressor unit

Specification

	Model	Power supply (ACV×φ×Hz)	Power consumption (KW)(50/60Hz)	Breaker capacity (Recommendation)	Dimensions (mm)	Weight(Kg)	Cooling method water quantity (L/min)(20°C)	Adsorber exchange time(H)
	SA112-C	100×1×50 100×1×60	1.1/1.3	15A	449(D) 373(W) 396(H)	44	air -	30,000
	SW112-C		1.0/1.2			53	water 2.0	
	SA115-C	200×3×50 200×3×60	1.6/1.9	15A	494(D) 494(W) 484(H)	59	air -	30,000
	SW115-C		1.5/1.8			54	water 2.0	
	UW404	200×3×50 220×3×60	3.5/4.5	20A	580(D) 339(W) 601(H)	100	water 3.4	30,000
	C10T	200×3×50 220×3×60	1.5/1.7	15A	543(D) 332(W) 573(H)	75	water 2.0	24,000
	C10AT	200×3×50 220×3×60	1.5/1.7	15A	554(D) 489(W) 486(H)	77	air -	24,000
	C30VRT	200×3×50 220×3×60	5.0/6.0	30A	510(D) 453(W) 680(H)	127	water 5.5	24,000
	C30PVRT	200×3×50 220×3×60	5.7/7.5	40A	510(D) 453(W) 680(H)	121	water 5.5	24,000
	C30HVRT	200×3×50 220×3×60	5.8/7.2	40A	510(D) 453(W) 680(H)	121	water 5.5	24,000
	C30F2	200×3×50 200×3×60 208×3×60 220×3×60	6.6/8.3	32-50A	510(D) 453(W) 740(H)	124	water 5.5	24,000
	C30F4	308×3×50 400×3×50 415×3×50 480×3×60	6.4/7.7	19-30A		136		

Refrigerator/compressor combination table 1/3

		4K GM						
Model		HE05	UHE10	UHE12	UHE15	UHE10F	UHE12F	UHE15F
Cooling capacity (first stage)	50Hz	10W@45K	40W@43K	53W@43K	35W@50K	40W@43K	53W@43K	35W@50K
	60Hz	10W@40K	50W@43K	60W@43K	45W@50K	50W@43K	60W@43K	45W@50K
Cooling capacity (second stage)	50Hz	0.5W@4.2K	1.0W@4.2K	1.25W@4.2K	1.5W@4.2K	1.0W@4.2K	1.25W@4.2K	1.5W@4.2K
	60Hz	0.5W@4.2K	1.0W@4.2K	1.25W@4.2K	1.5W@4.2K	1.0W@4.2K	1.25W@4.2K	1.5W@4.2K
Ultimate temperature	50Hz	2.7K	2.7K	2.7K	2.7K	2.7K	2.7K	2.7K
	60Hz	2.7K	2.7K	2.7K	2.7K	2.7K	2.7K	2.7K
Cooldown time	50Hz	75min (4.2K)	60min (4.2K)	60min (4.2K)	60min (4.2K)	60min (4.2K)	60min (4.2K)	60min (4.2K)
	60Hz	60min (4.2K)	60min (4.2K)	60min (4.2K)	60min (4.2K)	60min (4.2K)	60min (4.2K)	60min (4.2K)
Weight		11kg	17kg	17kg	17kg	17kg	17kg	17kg
SA112-C								
SW112-C								
SA115-C								
SW115-C								
UW404		○						
C10T								
C10AT								
C30VRT								
C30PVRT								
C30HVRT			○	○	○			
C30F2						○	○	○
C30F4						○	○	○

Refrigerator/compressor combination table 2/3

		GM						
Model		RM10T	RM20T	RM50T	RM80T	RM120ET	RMS10T	RMS50T
Cooling capacity (first stage)	50Hz	10W@77K	30W@77K	55W@77K	80W@77K	110W@77K	29W@77K	67W@77K
	60Hz	13W@77K	35W@77K	65W@77K	100W@77K	125W@77K	35W@77K	85W@77K
Cooling capacity (second stage)	50Hz	3W@20K	10W@20K	5W@20K	8W@20K	12W@20K	-	-
	60Hz	3.5W@20K	12W@20K	7W@20K	8W@20K	14W@20K	-	-
Ultimate temperature	50Hz	12K	12K	12K	12K	10K	30K	30K
	60Hz	12K	12K	12K	12K	10K	30K	30K
Cooldown time	50Hz	45min (20K)	35min (20K)	45min (20K)	40min (20K)	35min (20K)	35min (77K)	25min (77K)
	60Hz	40min (20K)	30min (20K)	40min (20K)	35min (20K)	30min (20K)	30min (77K)	20min (77K)
Weight		11kg	12kg	12kg	16kg	16kg	10kg	11kg
SA112-C								
SW112-C								
SA115-C								
SW115-C								
UW404								
C10T		○					○	
C10AT		○					○	
C30VRT			○	○				○
C30PVRT					○	○		
C30HVRT								
C30F2								
C30F4								

Refrigerator/compressor combination table 3/3

Model		GM		20K GM	Pulse-Tube		Solvay	
		RMS80T	RMS150T	RSC50T	PDC08	PD016	S030Z	S050
Cooling capacity (first stage)	50Hz	120W@77K	150W@77K	40W@20K	8W@77K	12W@77K *1 18W@77K *2	25W@77K	60W@77K
	60Hz	130W@77K	165W@77K	45W@20K	8W@77K	12W@77K *1 18W@77K *2	30W@77K	62W@77K
Cooling capacity (second stage)	50Hz	—	—	—	—	—	—	—
	60Hz	—	—	—	—	—	—	—
Ultimate temperature	50Hz	35K	40K	13K	40K	40K	30K	30K
	60Hz	35K	40K	13K	40K	40K	30K	30K
Cooldown time	50Hz	20min (77K)	15min (77K)	50min (20K)	20min (77K)	30min (77K)	25min (77K)	20min (77K)
	60Hz	18min (77K)	13min (77K)	40min (20K)	20min (77K)	30min (77K)	25min (77K)	20min (77K)
Weight		15kg	20kg	23kg	1.5kg	4.5kg	5.9kg	6.5kg
SA112-C					○	○ *1	○	
SW112-C					○	○ *1	○	
SA115-C						○ *2		
SW115-C						○ *2		
UW404								○
C10T								
C10AT								
C30VRT								
C30PVRT		○	○					
C30HVRT				○				
C30F2								
C30F4								

■ When applying our refrigerator to a cryocooler for optical sensors, the cryocooler falls under row 6.A.2.d.2 of the control list established by The Wassenaar Arrangement, which is equal to row 10(2) of appended table 1 of Japan Export Trade Control Order.
Customers must follow all related rules and regulations such as Foreign Exchange and Foreign Trade Act and take appropriate procedures when exporting or re-exporting our refrigerators.

*1 Using M501 motor unit *2 Using M502 motor unit