Optical Cryostat - Very High Power

The **CS210*E-GMX-1SS** offers very high cooling power for fast cool downs and low base temperatures. This system is ideal when characterizing large materials with high heat loads or when the lowest possible temperature wants to be achieved. The system is capable of vacuum levels of 10^{-7} Torr with an appropriate vacuum pump. The lower vacuum reduces the sample surface contamination such as water molecules, which can be particularly detrimental to IR Spectroscopy.

Applications

- Optical
- Raman
- UV, VIS, IR
- FTIR
- Electro & Photoluminescence
- Resistivity/Hall Probe Experiments
- Diamond Anvil Cell
- Magneto-Optical
- PITS / DLTS
- Thermal, Electrical and Magnetic Susceptibility
- Magneto Optical Kerr Effect (MOKE)

Features

- Cryogen Free, High Power
- High Performance Stainless Steel Construction
- Large clear view optical windows (1.25 in)
- Large sample viewing angle for optical collection (F/1.6)
- Can operate in any orientation
- Fully customizable

Typical Configuration

- Cold head (DE-210SE)
- Compressor (ARS-10HW)
- 2 Helium Hoses
- Stainless Steel vacuum shroud with 4 window ports for optical and electrical measures (GMX-1SS)
- Nickel Plated OFHC radiation shield
- 2 High purity quartz windows
- Instrumentation for temperature measurement and control:
  - 10 pin hermetic feed through
  - 50 ohm thermofoil heater
  - Silicon diode sensor curve matched to (±0.5K) for control
  - Calibrated silicon diode sensor (±12 mk) with 4 in. free length for accurate sample measurement.
- Wiring for electrical experiments:
  - 10 pin hermetic feed through
  - 4 copper wires
- Sample holder for optical and electrical experiments
- Temperature Controller

Options and Upgrades

- 4K Coldhead (0.8W @ 4.2K)
- 450K High Temperature Interface
- 800K High Temperature Interface
- Custom temperature sensor configuration (please contact our sales staff
- Custom wiring configurations (please contact our sales staff)
- Window material upgrades (custom materials available)
- Sample holder upgrades (custom sample holders available)

The above picture shows a cryocooler with a vacuum shroud, radiation shield, and sample holder installed.

The above picture shows a complete system (minus the vacuum pump and temperature controller)

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Cooling Technology

DE-210	Closed Cycle Cryocooler
Refrigeration Type	Pneumatically Driven GM Cycle
Liquid Cryogen Usage	None, Cryogen Free

Temperature*

DE-210AE	< 9K - 350K
DE-210SE	< 3K - 350K
With 800K Interface	(Base Temp + 2K) - 700K
With 450K Interface	(Base Temp + 2K) - 450K
Stability	0.1K

*Based on bare cold head with a closed radiation shield, and no additional sources of experimental or parasitic heat load

Sample Space

Diameter	79 mm (3.1 in.)
Height	49 mm (1.9 in.)
Sample Holder Attachment	1/4 - 28 screw
Sample Holder	www.arscryo.com/Products/SampleHolders.html

Optical Access

Window Ports	4 - 90° Apart
Diameter	41 mm (1.63 in)
Clear View	32 mm (1.25 in)
#/F	1.6
Window Material	www.arscryo.com/Products/WindowMaterials.html

Temperature Instrumentation and Control (Standard)

Heater	50 ohm Thermofoil Heater anchored to the coldtip
Control Sensor	Curve Matched Silicon Diode installed on the coldtip
Sample Sensor	Calibrated Silicon Diode with free length wires

Contact ARS for other options

Instrumentation Access

Instrumentation Skirt	Bolt On Stainless Steel
Pump out Port	1 - NW 25
Instrumentation Ports	3
Instrumentation Wiring	Contact sales staff for options

Vacuum Shroud

Material	Stainless Steel
Length	508 mm (20 in)
Diameter	144 mm (5.66 in) at sample space
Width	102 mm (4.0 in) at sample space

Radiation Shield

Material	Nickel Plated OFHC Copper
Attachment	Threaded
Optical Access	0, 2, or 4 (customer specified)

Cryostat Footprint

Overall Length	784 mm (30.84 in)
Motor Housing Diameter	156 mm (6.14 in)

Cryocooler Model		DE-210AE		DE-210SE	
	Frequency	60 Hz	50 Hz	60 Hz	50 Hz
Base Temperature		<9K	<9K	<9K	<9K
Cooling Capacity*	4.2K	-	-	0.8W	0.8W
	10K	4W	4W	9W	9W
	20K	17W	17W	16W	16W
	77K	25W	25W	25W	25W
Radiation Shield Cooling Capacity		60W	60W	60W	60W
Cooldown Time	20K	35 min	35 min	40 min	40 min
	Base Temperature	70 min	70 min	80 min	80 min
Compressor Model		ARS-10HW		ARS-10HW	
Typical Maintenance Cycle		12,000 hours		12,000 hours	

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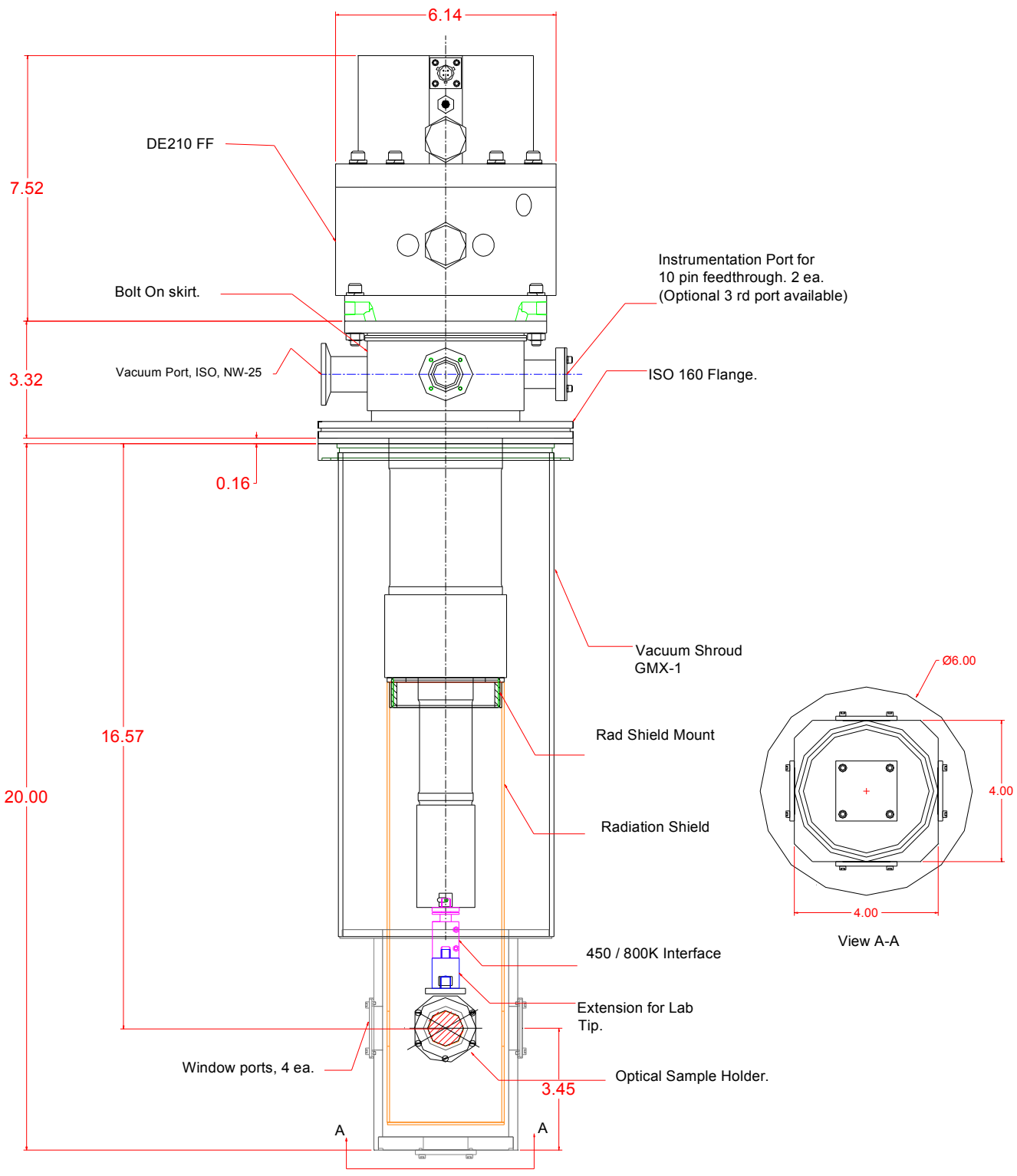
DE210*E-GMX-1SS Outline Drawing



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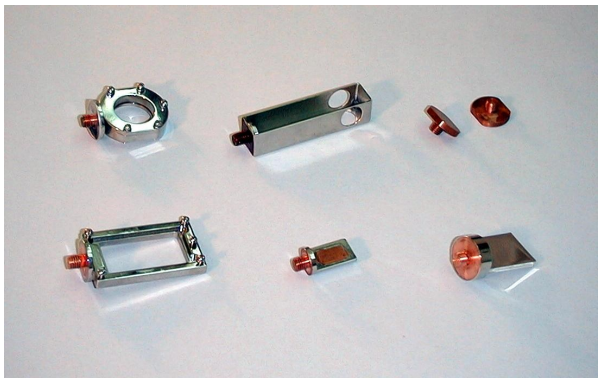
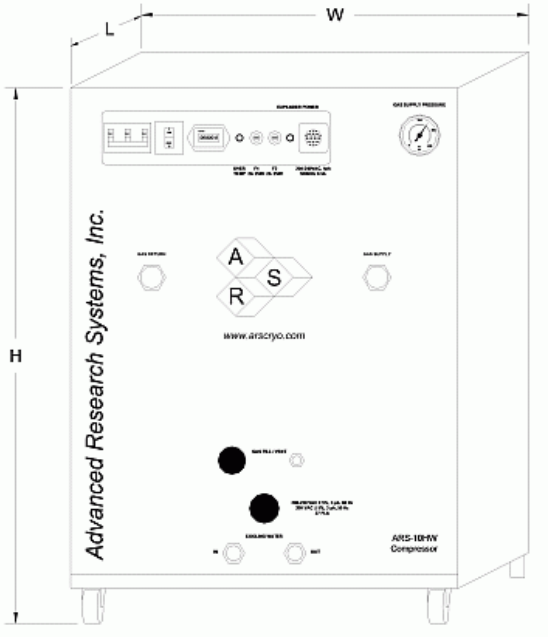
Optional Sample Holders



A wide range of sample holders are available for large bulk, thin film or liquid samples. Backscattering, reflection and transmission experiments.

See selection guide for more details.

ARS-10HW Compressor



Compressor Model		ARS-10HW	
	Frequency	60 Hz, 3 Phase	50 Hz, 3 Phase
Standard Voltage	Min	208 V	190 V
	Max	230 V	210 V
High Voltage	Min	380 V	440 V
	Max	415 V	480 V
Power Usage	Three Phase	7.7 kW	7.7 kW
Refrigerant Gas		99.999% Helium Gas, Pre-Charged	
Ambient Temperature		5 - 40 C (40—104 F)	
Cooling Water	Consumption	5.7 L / min (1.5 Gal. / min)	
	Temperature	< 20 C (68 F)	
	Connection	1/2 in. Swagelok Fitting	
Dimensions:	L	483 mm (19 in)	
	W	533 mm (21 in)	
	H	617 mm (24.3 in)	
Weight		105 kg (230 lbs)	
Typical Maintenance Cycle		12,000 hours	