

The CS204\*I-FMX-4SS provides the same high performance as our CS204\*I-FMX-1SS with all stainless steel construction and welded stainless steel instrumentation skirt, but provides a larger than standard sample space. The vacuum shroud comes standard with four window ports, and a fifth port can be added at the top. The system is powered by our DE-204 series of closed cycle cryocoolers. These liquid helium free cryostats use a pneumatically drive Gifford-McMahon cycle to cool the sample.

#### **Applications**

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

#### **Features**

- Cryogen Free, Moderate Power
- Welded Stainless Steel Construction
- Large clear view optical windows (1.5 in)
- Large sample viewing angle for optical collection (F/1.25)
- Can operate in any orientation
- Fully customizable

#### **Typical Configuration**

- Cold head (DE-204AI)
- Compressor (ARS-4HW)
- 2 Helium Hoses
- Stainless Steel vacuum shroud with 4 window ports for optical and electrical measurements.
- Nickel Plated OFHC Copper 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 ( $\pm 12$  mk) with  $\stackrel{\checkmark}{4}$  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 (0.2W @ 4.2K)
- 5.5K Coldhead (3.5W @ 10K)
- High Temperature Interface (450K or 800K)
- Turbo upgrade for faster cooldown times
- 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 the FMX-4SS Vacuum Shroud.



The above picture shows a coldhead, vacuum shroud, and radiation shield.



## **Cooling Technology**

	DE-204	Closed Cycle Cryocooler				
	Refrigeration Type	Pneumatically Driven GM Cycle				
	Liquid Cryogen Usage	None, Cryogen Free				
Tem	perature*					
	DE-204AI	< 9K - 350K				
	DE-204SI	< 4K - 350K				
	DE-204PI	< 5.5K - 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	60 mm (2.38 in.)				
Height	90 mm (3.54 in.)				
Sample Holder Attachment	1/4 - 28 screw				
Sample Holder	www.arscryo.com/Products/ SampleHolders.html				

### **Optical Access**

Window Ports	4 - 90° Apart			
Diameter	50.8 mm (2 in)			
Clear View	38.1 mm (1.5 in)			
#/F	1.25			
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	Welded, Stainless Steel
Pump out Port	1 - NW 25
Instrumentation Ports	3
Instrumentation Wiring	Contact sales staff for options

#### Vacuum Shroud

Material	Welded, Stainless Steel
Length	378 mm (14.88 in)
Diameter	83 mm (3.25 in) at the sample space
Width	108 mm (4.25 in) at the sample space

#### **Radiation Shield**

Material	OFHC Copper, Nickel Plated				
Attachment	Bolt On				
Optical Access	0, 1, 2, 3, or 4 (customer specified)				

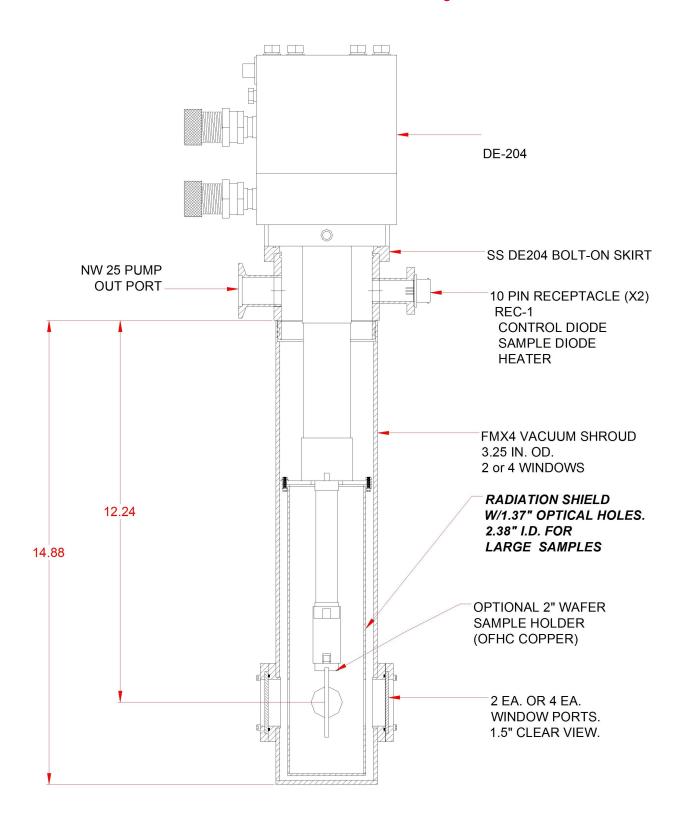
## **Cryostat Footprint**

Overall Length	600 mm (23.7 in)			
Motor Housing Diameter	114 mm (4.5 in)			
Rotational Clearance	200 mm (8 in) with "G" Configuration			

Cryocooler Model		DE-2	.04AI	DE-20	4A(T)I	DE-2	04PI	DE-2	204SI
	Frequency	60 Hz	50 Hz						
Base Temperature	•	<9K	<9K	<9K	<9K	<5.5K	<5.5K	<4.2K	<4.2K
Cooling Capacity	4.2K	-	-	-	-	-	-	0.2W	0.16W
	10K	2W	1.6W	2.7W	2.2W	3.5W	2.8W	4W	3.2W
	20K	9W	7.2W	12W	9.6W	8W	6.4W	8W	6.4W
	77K	17W	14W	23W	18.4W	14W	11W	14W	11W
Radiation Shield C	Cooling Capacity	18W	14W	24W	19W	18W	14W	18W	14W
Cooldown Time	20K	30 min	36 min	25 min	30 min	40 min	48 min	40 min	48 min
	Base Temperature	60 min	72 min	50 min	60 min	80 min	102 min	90 min	108 min
Compressor Model		ARS-	4HW	ARS-	4HW	ARS-	4HW	ARS-	4HW
Typical Maintenance Cycle		12,000	) hours	12,000	) hours	12,000	hours	12,000	) hours

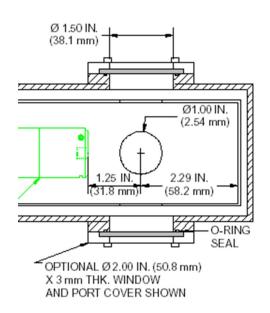


## DE204\*I-FMX-1SS Outline Drawing

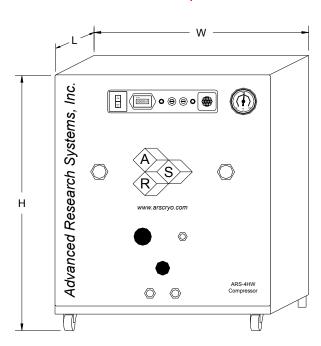




## Sample Space



## **ARS-4HW Compressor**



Compresso	r Model	ARS-4HW			
	Frequency	60 Hz	50 Hz		
Standard Voltage	Min	208 V	190 V		
	Max	230 V	210 V		
Transformer Options	10%		220 V, 230 V		
	15%		240 V		
Power Usage	Single Phase	3.6 kW	3.0 kW		
Refrigerant Gas		99.999% Helium Gas, Pre-Charged			
Noise Level		60 dBA			
Ambient Temperature					
Cooling Water	Consumption	2.3 L / min (0.6 Gal. / min)			
	Temperature	10 - 35 C (50–95 F)			
	Connection		3/8 in. Swagelok Fitting		
Dimensions:	L	483 mm (1	9 in)		
	W	434 mm (1	7.1 in)		
	Н	516 mm (2	516 mm (20.3 in)		
Weight		72 kg (160 lbs)			
Typical Maintenance Cy	cle	12,000 hours			
Water Recirculation Opt	ion	CoolPac Compatible			