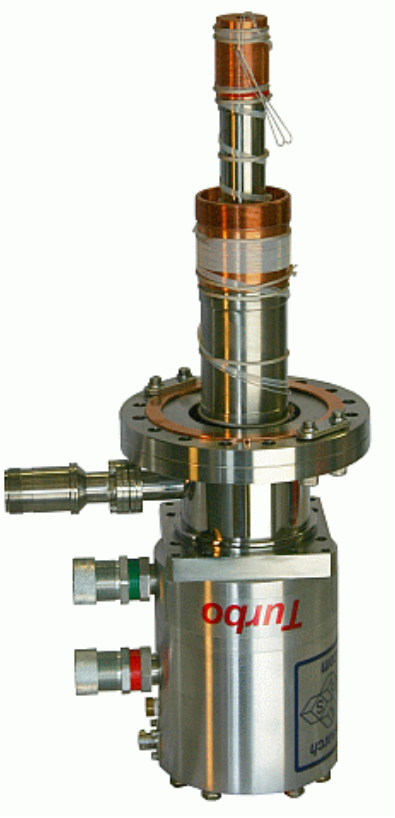
True UHV — Moderate Power

The **CS204*B** is a True UHV cold head (10^{-11} Torr) where all of the rubber o-ring seals have been replaced with welded joints and metal seals. A CF flange is directly welded to the cryocooler.

These True UHV systems are bakeable to 80C, and the 10K **CS204AB** is bakeable to 200C if the displacer is removed. (Special Training Required).

Cold tip extensions are available to put the sample right where it is needed in the chamber.



The above picture shows a True UHV Closed Cycle Cryocooler

Applications

- UHV
- Surface Science
- UHV Manipulator for XYZ motion
- Photoemission Spectroscopy

Features

- True UHV (10-11 Torr)
- Bakeable to **80C** (10K version can remove displacer and bake to 200C)
- Open Sample Space
- Optional Cold Tip Extensions
- Cryogen Free
- Operation in Any Orientation
- Fully Customizable

Typical Configuration

- Cold head (DE-204AB)
- Compressor (ARS-4HW)
- 2 Helium Hoses
- Tue UHV welded stainless steel instrumentation skirt with 6" rotatable CF flange
- Nickel Plated OFHC radiation shield terminating 0.125" short of the cold tip
- Instrumentation for temperature measurement and control:
  - 10 pin UHV feed through
  - 36 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

The above picture shows an instrumentation skirt with the electrical feedthroughs rotated 90 degrees upwards to allow for tight rotational clearances.

Options and Upgrades

- 4.5 and 8 inch rotatable CF flanges available
- 4K Coldhead (0.2W @ 4.2K)
- 5.5K Coldhead (3W @ 10K)
- 450K High Temperature Interface
- 800K High Temperature Interface
- 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)

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Cooling Technology

DE-204	Closed Cycle Cryocooler
Refrigeration Type	Pneumatically Driven GM Cycle
Liquid Cryogen Usage	None, Cryogen Free

Temperature*

DE-202AI	< 10K - 350K
DE-202PI	< 5.5K - 350K
DE-202SI	< 4K - 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	Large Open Radiation Shield
Height	Large Open Radiation Shield
Sample Holder Attachment	1/4 - 28 screw
Sample Holder	www.arscryo.com/Products/SampleHolders.html

Chamber Interface

Flanges	CF, ISO
Size	4.5”, 6”, 8”, 10”

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	True UHV Welded Stainless Steel
Instrumentation Ports	2
Instrumentation Wiring	Contact sales staff for options

Radiation Shield

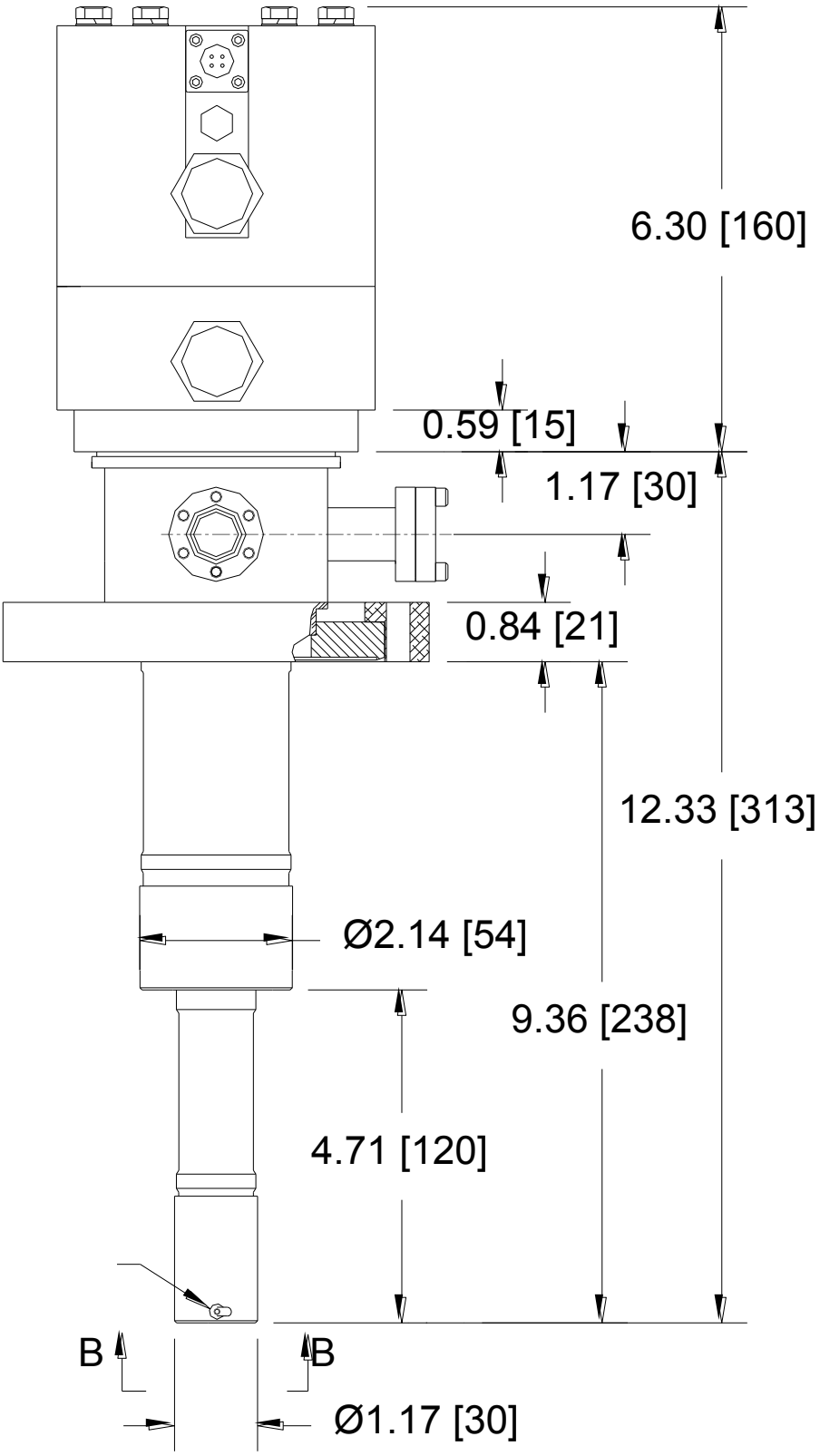
Material	Nickel Plated OFHC Copper
Attachment	Threaded
Optical Access	Open End Radiation shield terminates 0.125” short of cold tip (customer specified)

Cryostat Footprint

Overall Length	313 mm (12.33 in)
Motor Housing Diameter	114 mm (4.5 in)
Rotational Clearance	200 mm (8 in) with “G” Configuration

Cryocooler Model		DE-204AB		DE-204A(T)B		DE-204PB		DE-204SB	
	Frequency	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	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 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		8,000 hours		12,000 hours		12,000 hours	

CS204*B Outline Drawing



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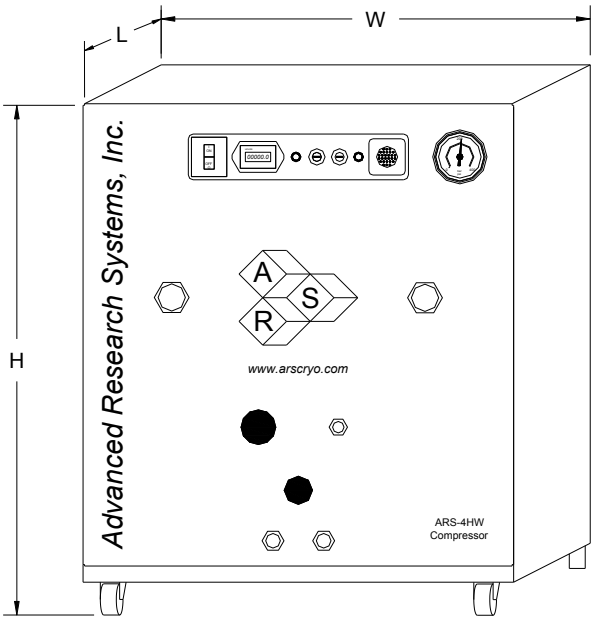
DE204SB with 16” Extension

ARS-4HW Compressor



Compressor 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		12 - 40 C (54 - 104 F)	
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 (19 in)	
	W	434 mm (17.1 in)	
	H	516 mm (20.3 in)	
Weight		72 kg (160 lbs)	
Typical Maintenance Cycle		12,000 hours	
Water Recirculation Option		CoolPac Compatible	