



# True UHV - High Power

The ARS manufactured **CS210\*B** is our most powerful True UHV cold head ( $10^{-11}$  Torr). As with our other True UHV cryocoolers 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 **CS210AB** 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.

## 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-210AB)
- Compressor (ARS-10HW)
- 2 Helium Hoses
- True 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 thermfoil heater
  - Silicon diode sensor curve matched to ( $\pm 0.5K$ ) for control
  - Calibrated silicon diode sensor ( $\pm 12$  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

- 4.5 and 8 inch rotatable CF flanges available
- 4K Coldhead (0.8W @ 4.2K)
- 450K High Temperature Interface (contains high temperature stycast)
- 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 True UHV Closed Cycle Cryocooler



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



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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-210AB	< 10K - 350K
DE-210SB	< 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	Large Open Radiation Shield
Height	Large Open Radiation Shield
Sample Holder Attachment	1/4 - 28 screw
Sample Holder	<a href="http://www.arscryo.com/Products/SampleHolders.html">www.arscryo.com/Products/SampleHolders.html</a>

## Chamber Interface

Flanges	CF, ISO
Size	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)

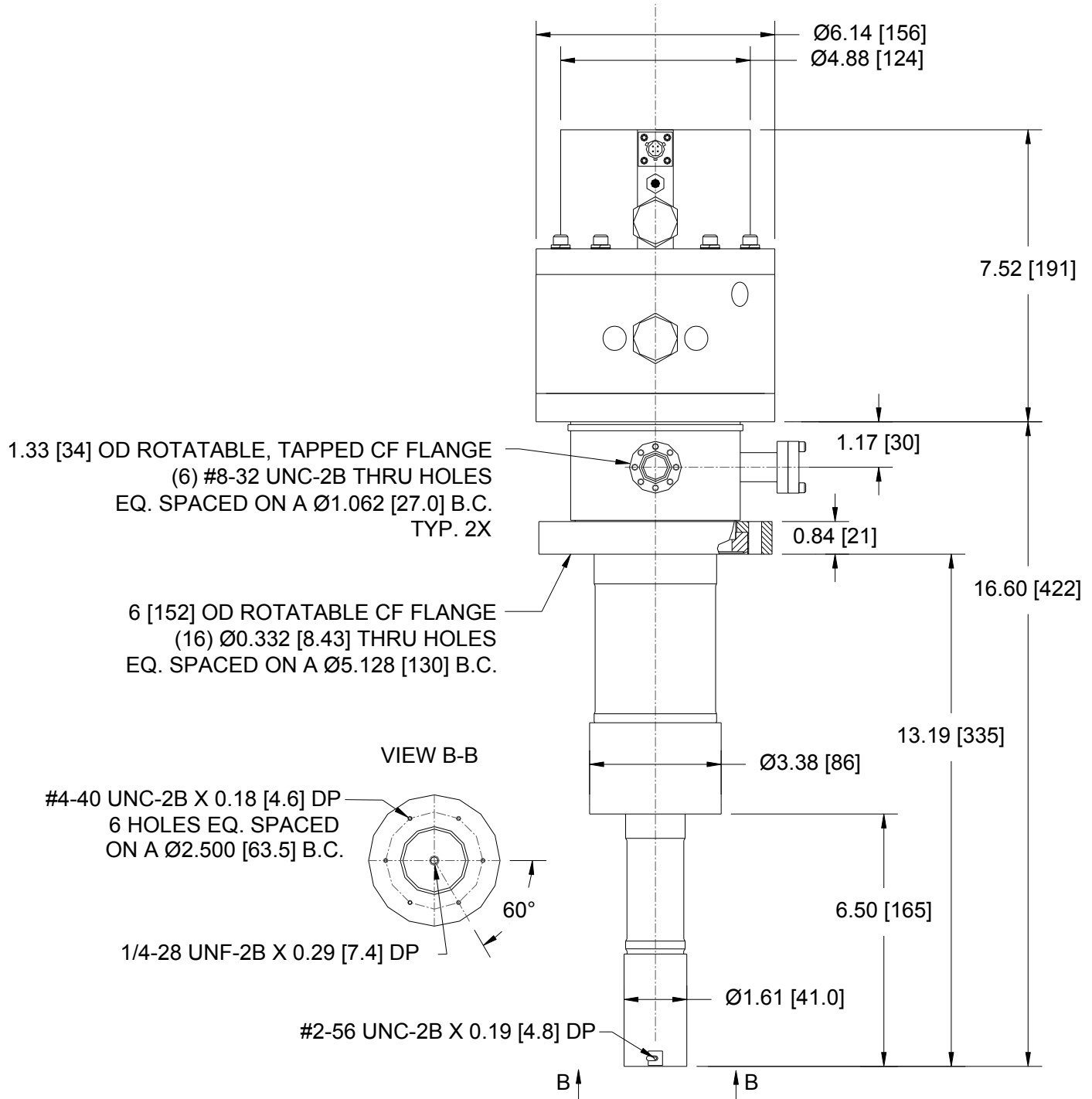
## Cryostat Footprint

Overall Length	613 mm (24.12 in) 335 mm (13.19 in) standard flange to tip dimension
Motor Housing Diameter	156 mm (6.14 in)
Rotational Clearance	200 mm (8 in) with "G" Configuration

## Cryocooler Model

		DE-210AB		DE-210SB	
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	

## CS210\*B Outline Drawing



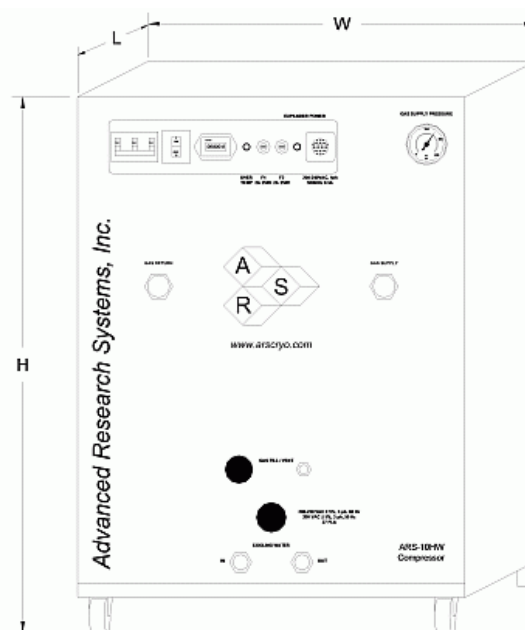


# True UHV - High Power

DE204SB with 16" Extension



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	