



# Optical Cryostat - Omniplex™

The **Omniplex™, DE210°F-GMX-19OP**, is a top loading optical cryostat with the ARS manufactured DE-210 cryocooler for high cooling power and fast cooldown. The helium vapor is particularly useful for cooling samples that do not conduct heat well.

The ARS Omniplex™ systems features large optical access and quick sample change. The Omniplex™ comes with 4 window ports and with warm and cold windows. The sample stick can use any of the standard ARS sample holders as well as receive a second set of temperature control instrumentation for fine tuning of the sample temperature. The system allows for a fast initial cooldown (~90 min to 20K and 2 1/2 hrs to base temperature).

The Omniplex allows for a variety of options so that it can be customized to fit the researchers needs, including custom tail pieces, load lock gate valves and low vibration interfaces.

## Applications

- Optical
- Raman
- UV, VIS, IR
- Electro & Magneto Optical
- Electro & Photoluminescence
- Resistivity/Hall Probe Experiments
- Diamond Anvil Cell
- PITS / DLTS
- Thermal, Electrical and Magnetic Susceptibility
- Low Vibration applications with bellows

## Features

- Cryogen Free, Low Power
- Top Loading Sample in Vapor, Fast Sample Change
- Welded Stainless Steel Vacuum Chamber
- Large clear view optical windows (1.5 in outer, 0.7 in cold windows)
- Large sample viewing angle for optical collection (F/1.9)
- Fully customizable

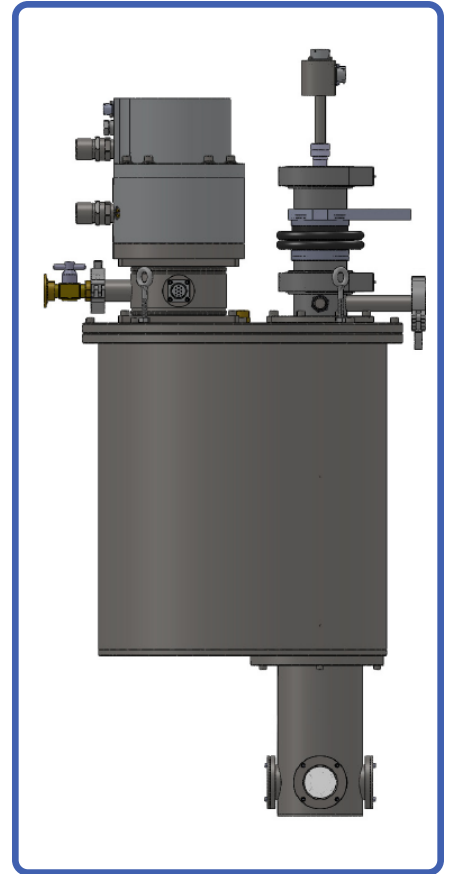
## Typical Configuration

- Cold head (DE-210AF)
- Compressor (ARS-10HW)
- 2 Helium Hoses
- Omniplex™, Sample in Vapor Vacuum Chamber with Optical Tailpiece and 4 window ports
- OFHC Copper Radiation Shield
- 2 High purity Sapphire Cold Windows and 2 High Purity Quartz Warm Windows
- Instrumentation for temperature measurement and control:
  - 10 pin hermetic feed through
  - 50 ohm thermfoil heater
  - Silicon diode sensor curve matched to ( $\pm 0.5K$ ) for control
- Wiring for electrical experiments:
  - 10 pin hermetic feed through
  - 4 copper wires
- Sample holder for optical and electrical experiments
- Temperature Controller

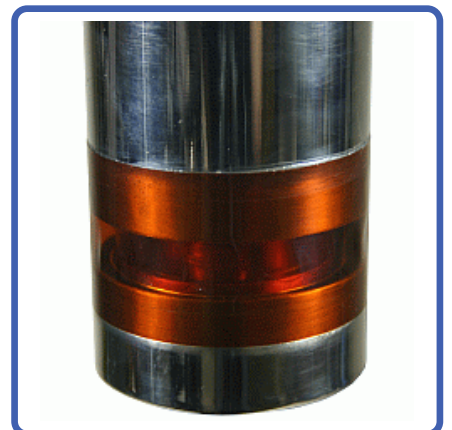
## Options and Upgrades

- 4K Coldhead (1W @ 4.2K)
- High Temperature Options (450K & 800K)
- Soft Rubber Bellows for low sample vibrations
- Load Lock Gate Valve
- Second set of temperature control instrumentation for fine sample temperature
- Custom wiring configurations (please contact our sales staff)

DS-CS210°F-GMX-19OP-R1



The above picture shows the Optical Omniplex™ with a DE210 Closed Cycle Cryocooler Installed.



The above picture shows a 180 degree wrapped Kapton Window



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## Cooling Technology-

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

## Temperature\*- Interface Temperature may be ~1K higher

DE-210AF	< 10K - 350K
DE-210S	< 3K - 350K
With 800K Interface	Base Temp +2K - 700K
With 450K Interface	Base Temp - 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	49, 36 mm (1.94, 1.44 in.)
Height	47-190mm (1.86-7.5in.) Variable
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>

## Optical Access-

Window Ports	4- 90° Apart
Diameter	50.8 mm (2 in) Outer Window
Clear View	38 mm (1.5 in) Outer Window 17 mm (0.7 in) Inner Cold Window
#/F	1.9
Window Material	<a href="http://www.arscryo.com/Products/WindowMaterials.html">www.arscryo.com/Products/WindowMaterials.html</a>

## Temperature Instrumentation and Control - (Standard) -

Heater	50ohm 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	2
Instrumentation Wiring	Contact sales staff for options

## Vacuum Shroud -

Material	Stainless Steel
Length	190 mm (7.5 in) At the tail piece
Diameter	89,83 mm (3.5, 3.25 in) At Sample Space
Width	107, 97 mm (4.2, 3.8 in) At Sample Space

## Radiation Shield -

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

## Cryostat Footprint -

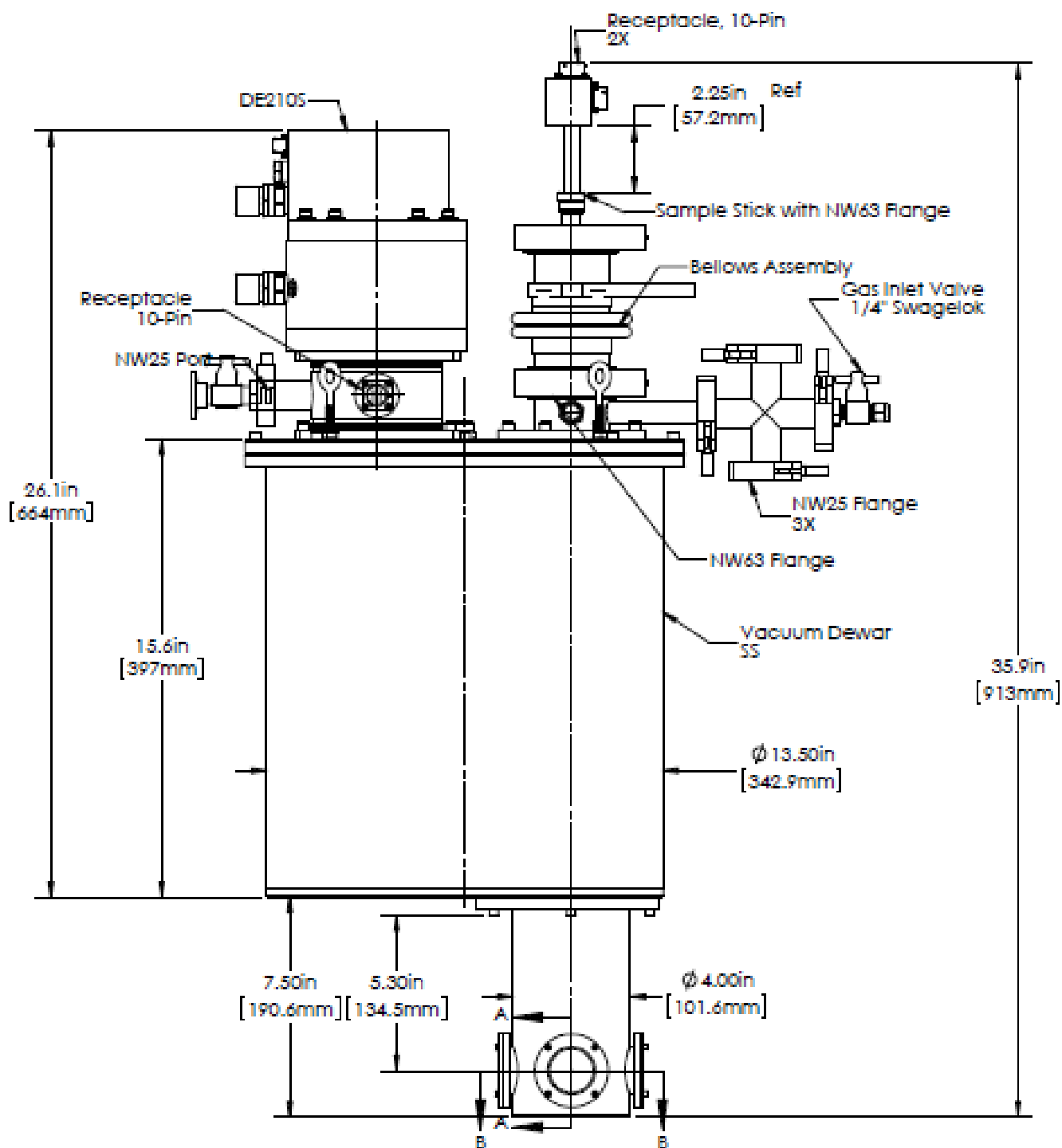
Overall Length	913 mm (35.9 in)
Motor Housing Diameter	114 mm (4.5 in)

Cryocooler Model		DE-210AF		DE-210SF	
	Frequency	60 Hz	50 Hz	60 Hz	50 Hz
Base Temperature		<9K	<9K	<3K	<3K
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	



# Optical Cryostat - Omniplex™

CS210\*F-GMX-19OP Outline Drawing

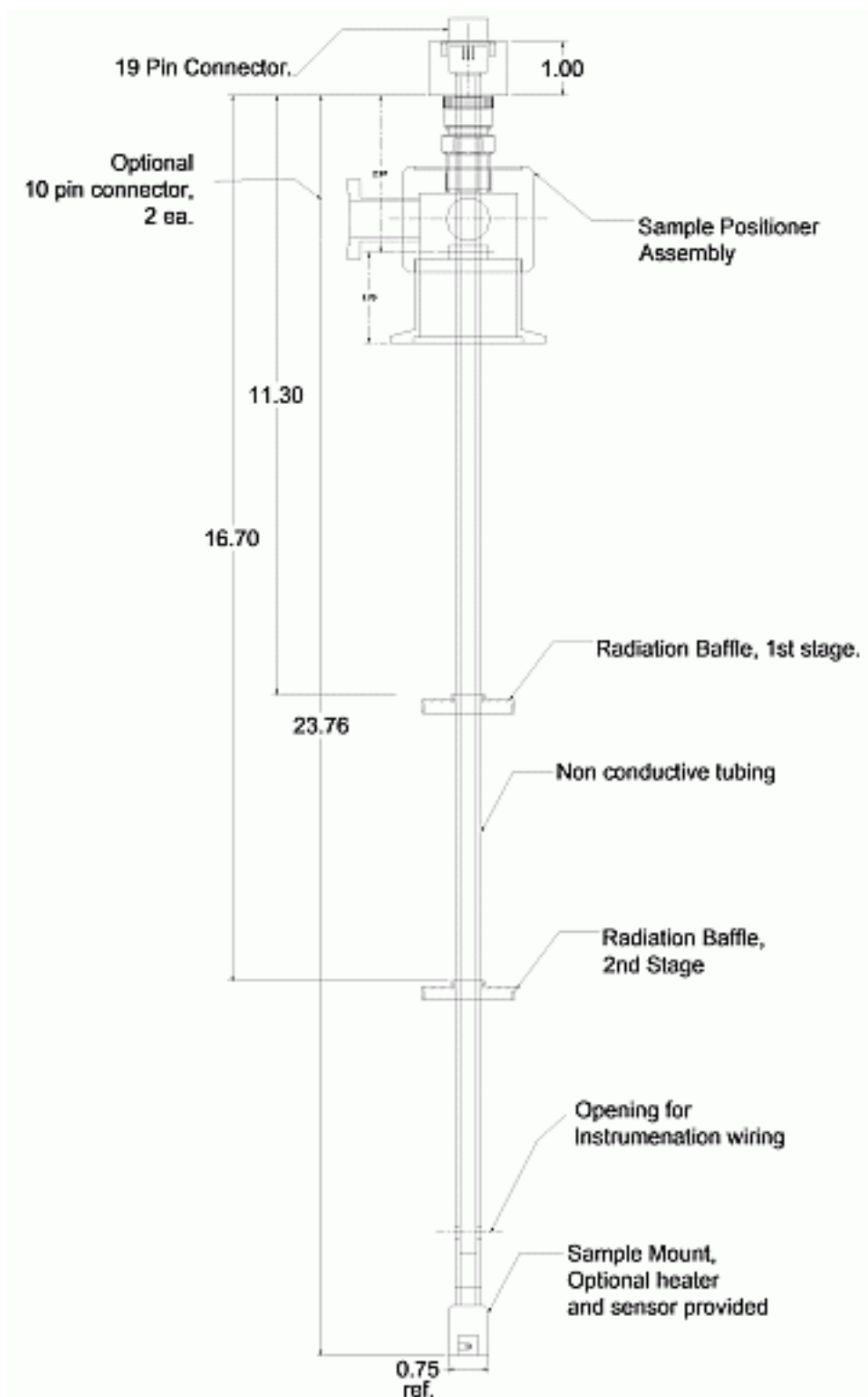


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# Optical Cryostat - Omniplex™

## Sample Stick

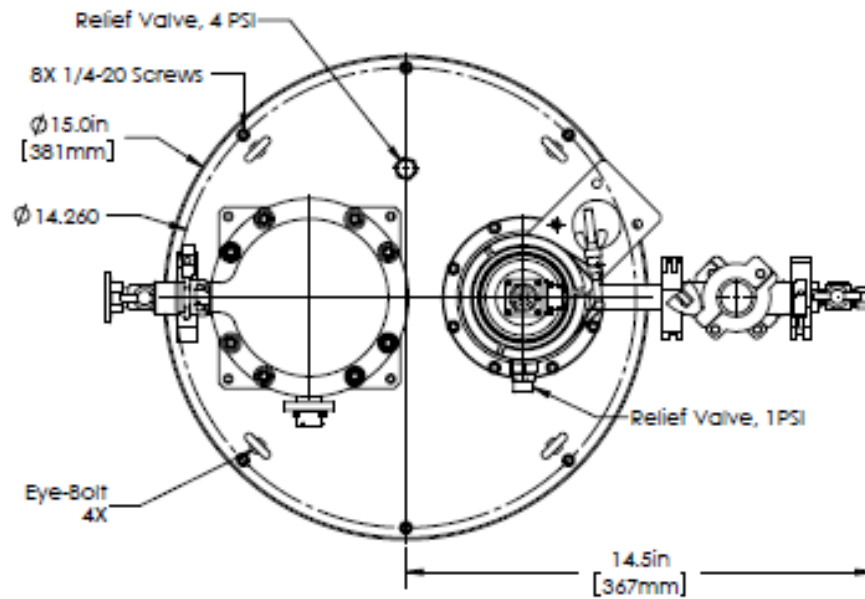


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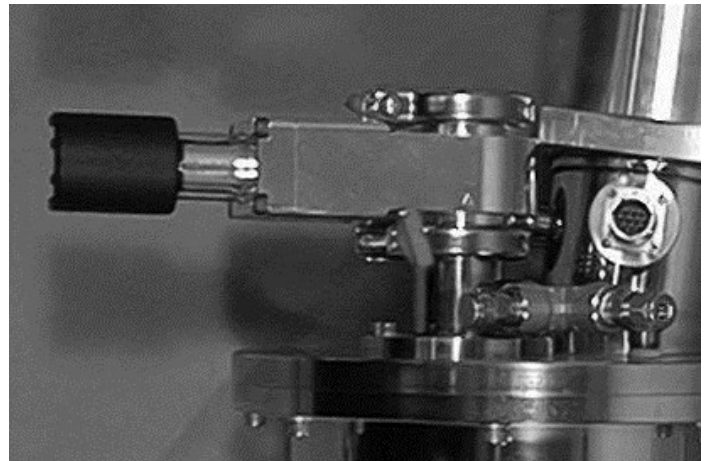
Top View



Optional Rubber Bellows



Optional Gate Valve



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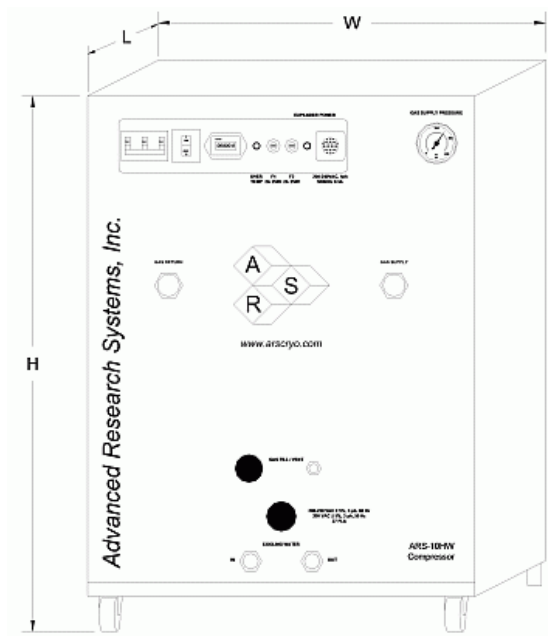


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**Optional Rubber Bladder**



**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	

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