



Optical Cryostat: Omniplex™

The Omniplex™, DE204*F-FMX-190P, is a top loading optical cryostat with the ARS manufactured DE-204 cryocooler. 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).

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-204AF)
- Compressor (ARS-4HW)
- 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 (0.1W @ 4.2K)
- 5.5K Coldhead (1W @ 10K)
- 450K High Temperature Interface
- 800K High Temperature Interface
- Turbo upgrade for faster cooldown times
- 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)
- Window material upgrades (custom materials available)
- Sample holder upgrades (custom sample holders available)



The above picture shows the Optical Omniplex™ with a DE204 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 ~1-2K higher

DE-204AF	< 10K - 350K
DE-204PF	< 5.5K - 350K
DE-204S	< 4.2K - 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	www.arscryo.com/Products/SampleHolders.html

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	www.arscryo.com/Products/WindowMaterials.html

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	725 mm (28.5 in)
Motor Housing Diameter	114 mm (4.5 in)
Rotational Clearance	Contact our Sales Staff

Cryocooler Model

DE-204AF

DE-204A(T)F

DE-204PF

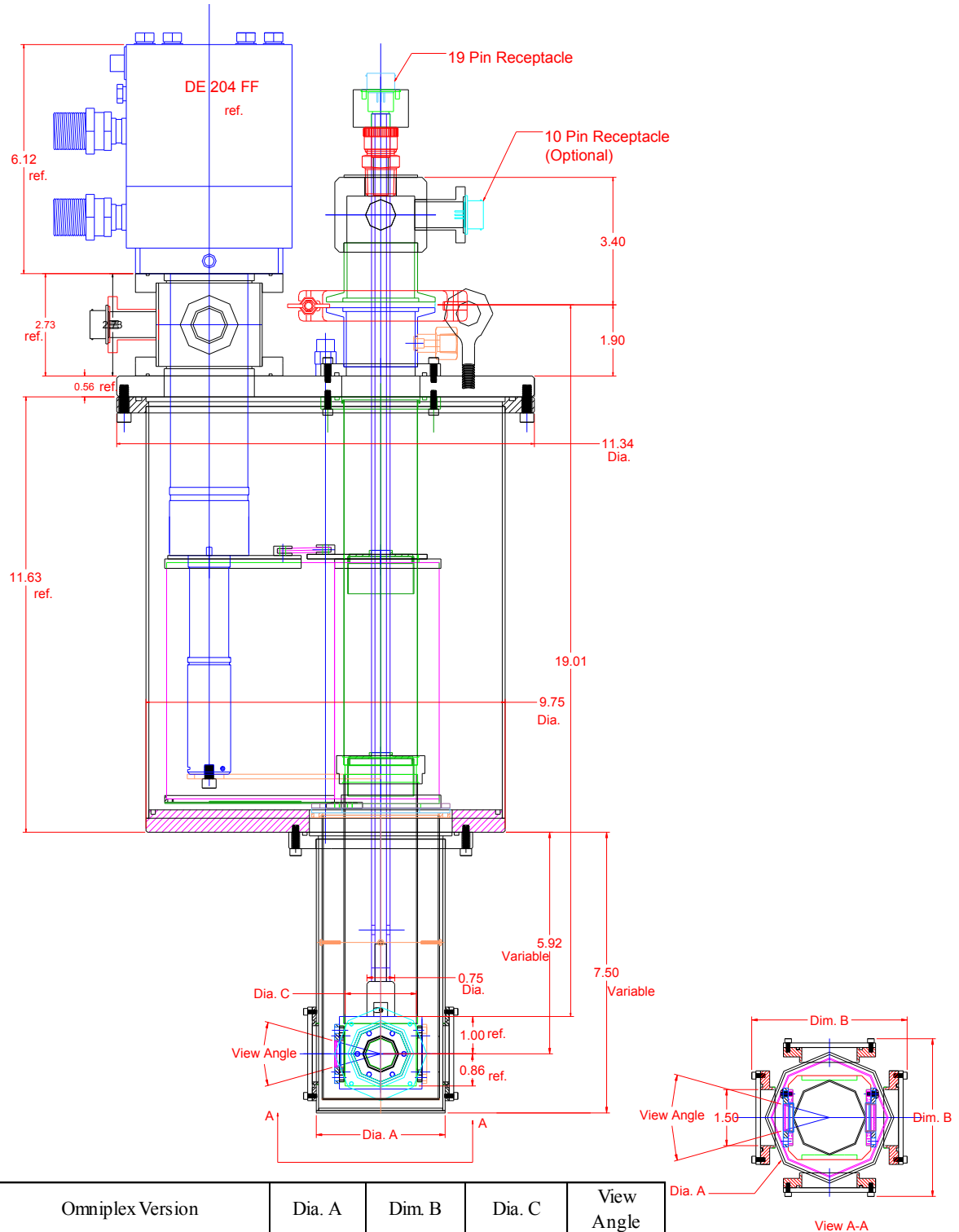
DE-204SF

	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	3W	2.4W	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	72 min
	Base Temperature	60 min	72 min	50 min	60 min	90 min	96 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	



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CS204*F-FMX-190P Outline Drawing

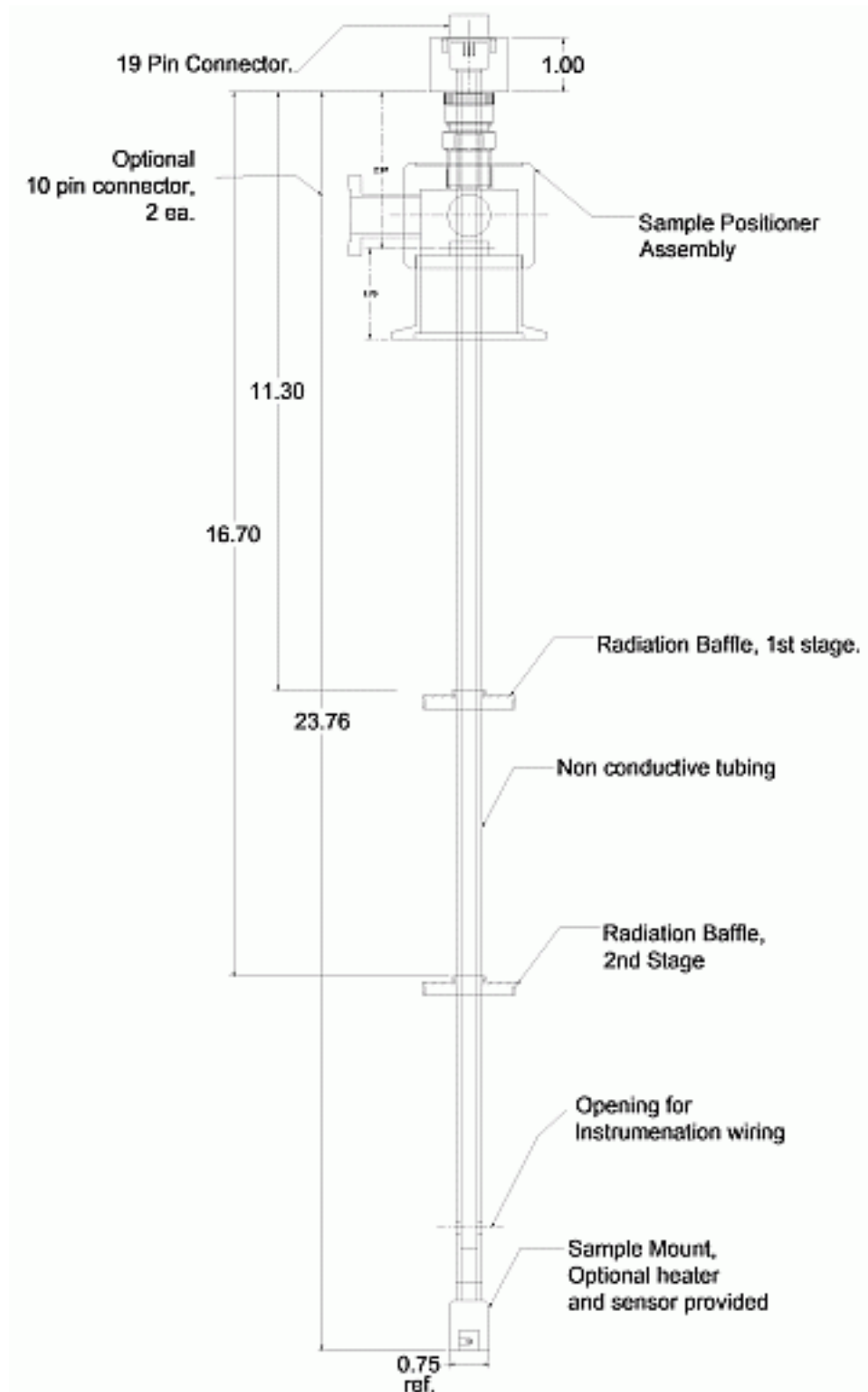


Omniplex Version	Dia. A	Dim. B	Dia. C	View Angle
Optical - 2" dia. Sample Well	3.5	4.2	1.94	30
Optical - 1.5" dia. Sample Well	3.25	3.8	1.44	36



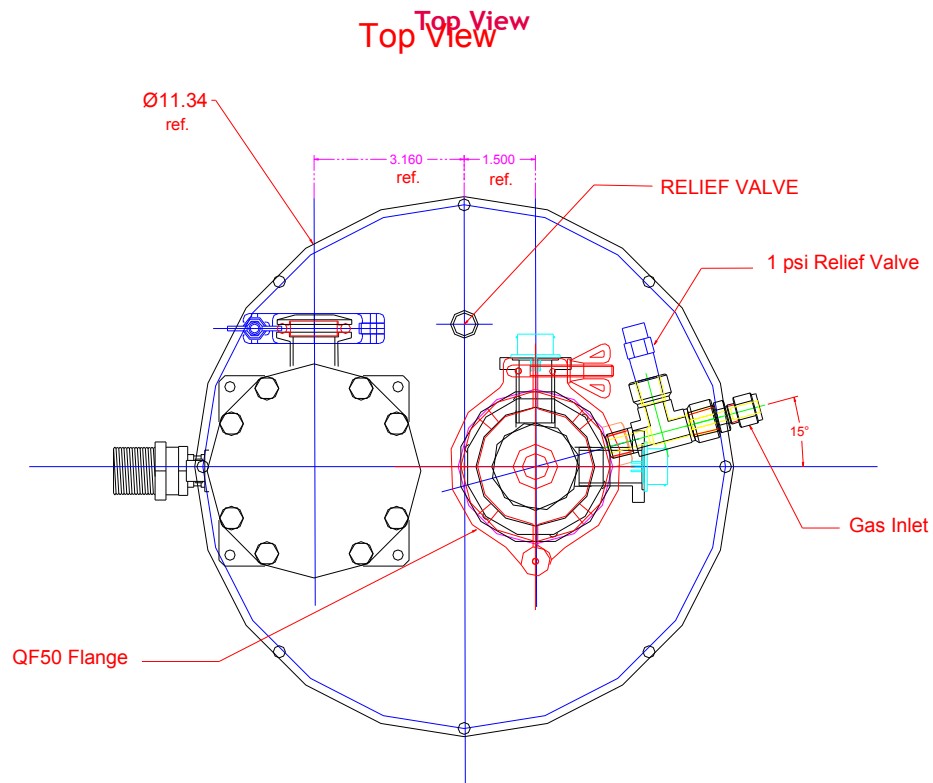
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Sample Stick



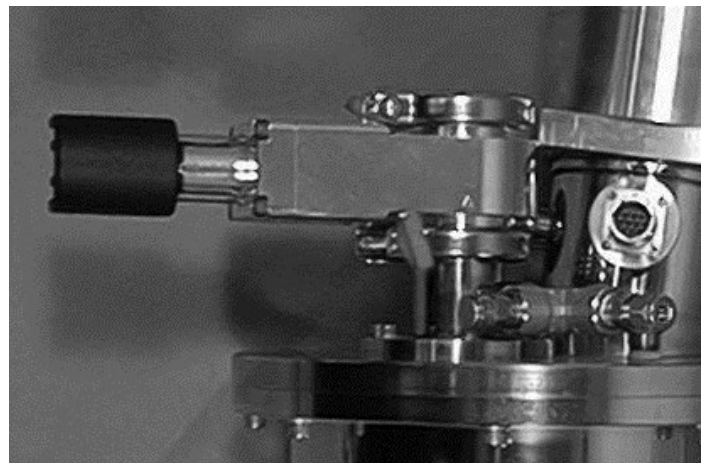


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Optional Rubber Bellows

Optional Gate Valve



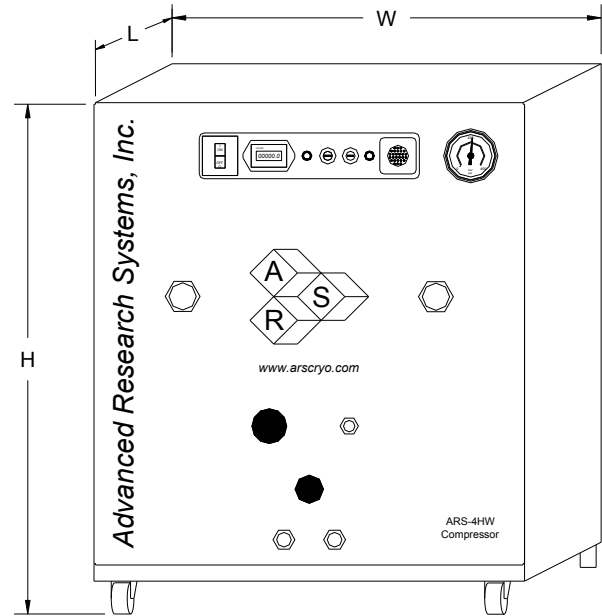


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Optional Rubber Bladder



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	