Non-Optical Cryostat - Omniplex™

The **Omniplex™**, **DE204*F-FMX-19N,** is a top loading non-optical cryostat with the ARS manufactured DE-204 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 feature quick sample change, fast initial cooldown (~90 min to 20K and ~ 2 1/2 hrs to base temperature) and adjustable radiation baffles to optimize sample temperatures. large sample access and quick sample change. The Omniplex™ allows for a variety of options so that it can be customized to fir the researchers needs, including custom tail pieces, load lock gate valves and low vibration interfaces.

The sample stick can use any of the starndard ARS sample holders as well as receive a second set of temperature control instrumentation for fine tuning of the sample temperature.

Applications

- Resistivity
- Vibrating Sample Magnetometer (VSM)
- AC Susceptibility Experiments
- Hall Probe Experiments
- Non-Optical

Features

- Cryogen Free, Low Power
- Top Loading Sample in Vapor, Fast Sample Change
- Welded Stainless Steel Vacuum Chamber
- Fully customizable

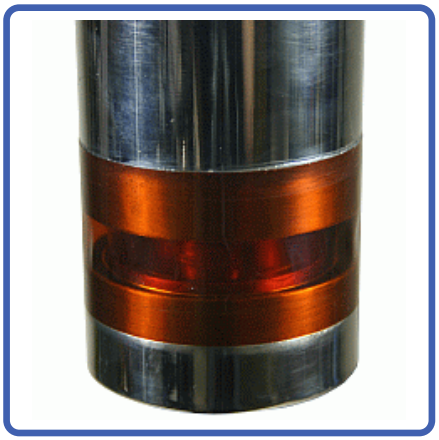
Typical Configuration

- Cold head (DE-204AF)
- Compressor (ARS-4HW)
- 2 Helium Hoses
- Omniplex™, Sample in Vapor Vacuum Chamber
- Tail Piece
- OFHC Copper Radiation Shield
- 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
- 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 a Non-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 ~.5 - 1K 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	23, 36, 49 mm (0.94, 1.44 , 1.94 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	N/A
Diameter	N/A
Clear View	N/A
#/F	N/A
Window Material	N/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	38, 51, 64 mm (1.5, 2, 2.5 in) At Sample Space
Width	38, 51, 64 mm (1.5, 2, 2.5 in) At Sample Space

Radiation Shield -

Material	Nickel Plated OFHC Copper
Attachment	Bolt On
Optical Access	N/A

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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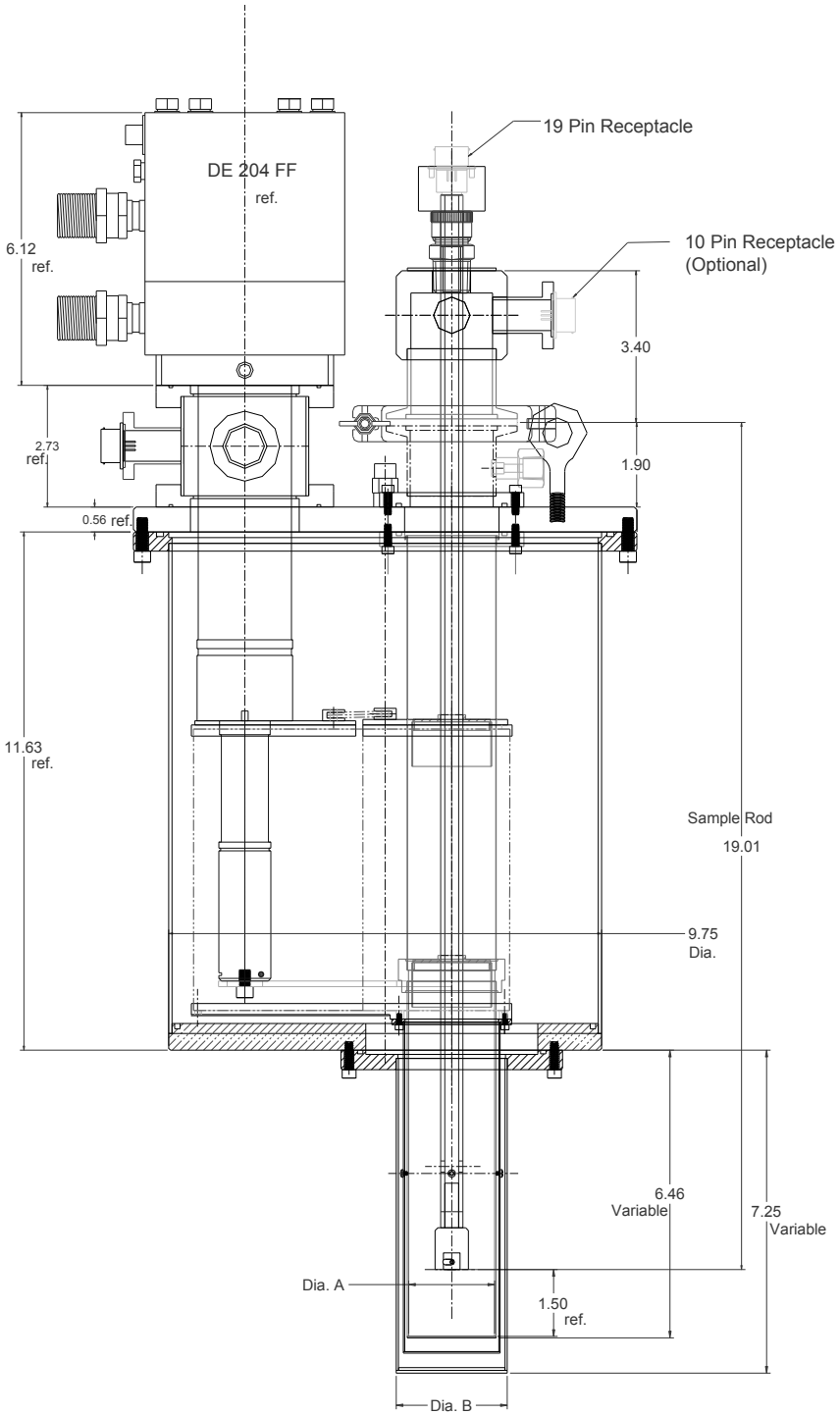
CS204*F-FMX-19N Outline Drawing



	Omniplex Version	Dia. A	Dia. B
052164-A1	Non-Optical - 2" dia. Sample Well	1.94	2.50
052164-A2	Non-Optical - 1.5" dia. Sample Well	1.44	2.00
052164-A3	Non-Optical - 1" dia. Sample Well	0.94	1.50

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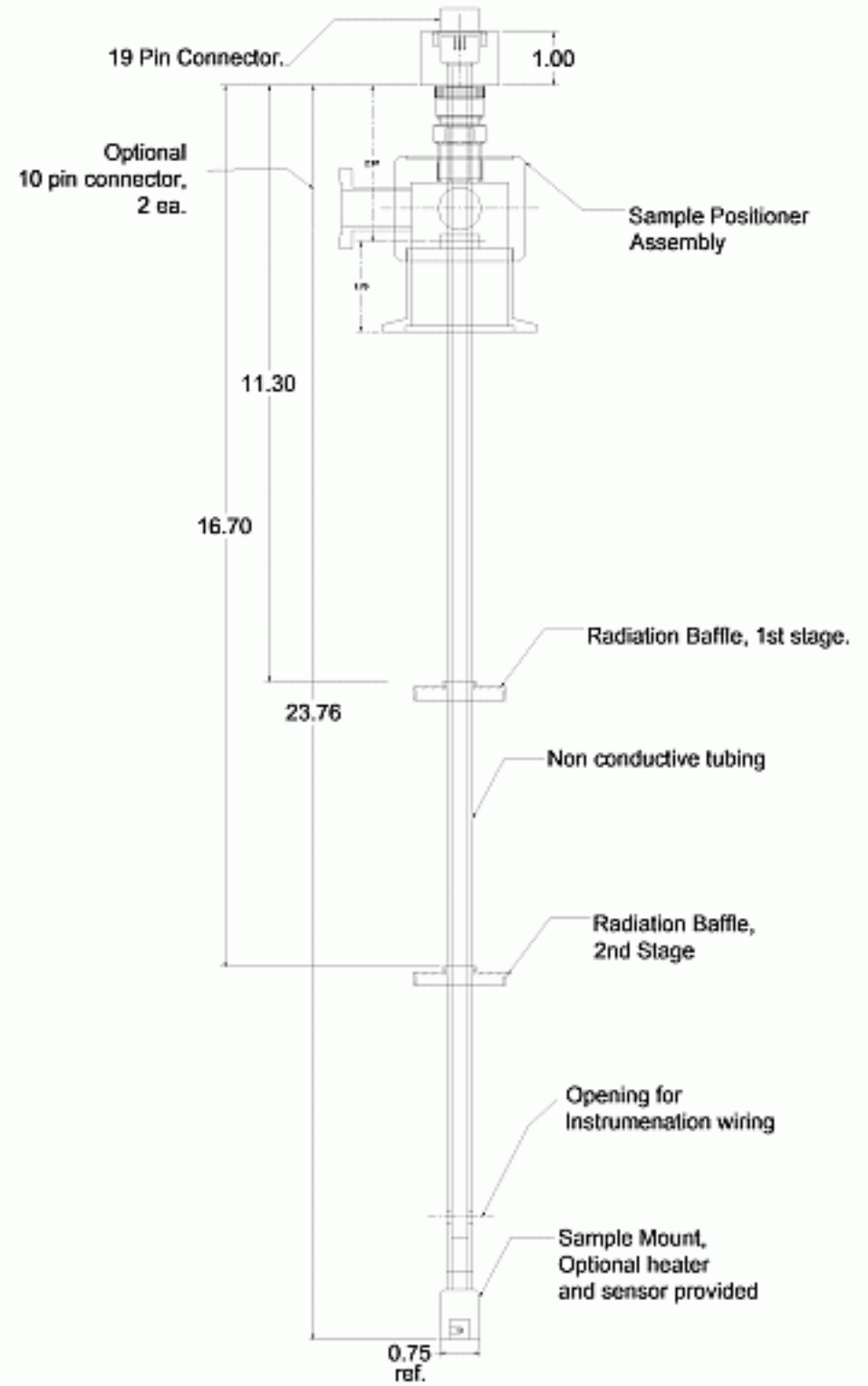
Sample Stick



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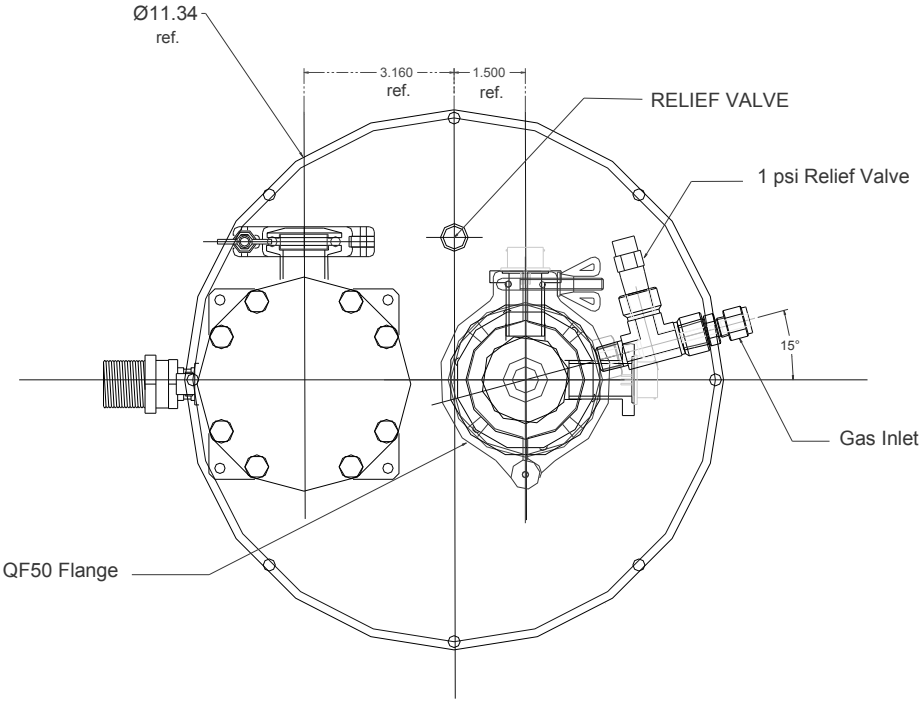
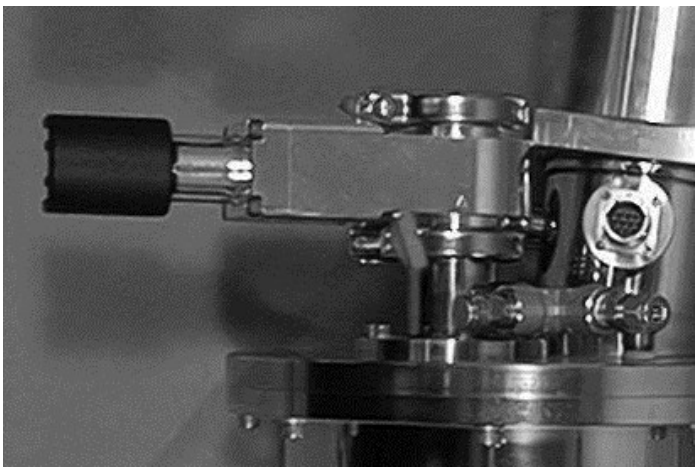
Top View



Optional Rubber Bellows

Optional Gate Valve



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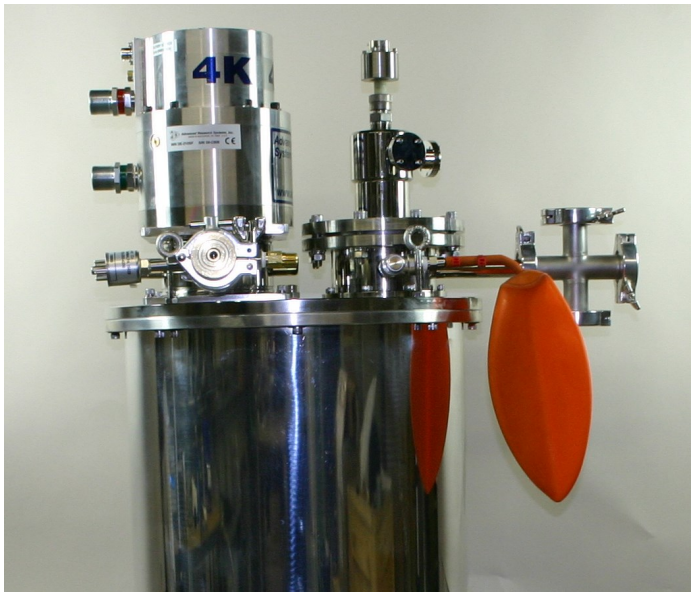
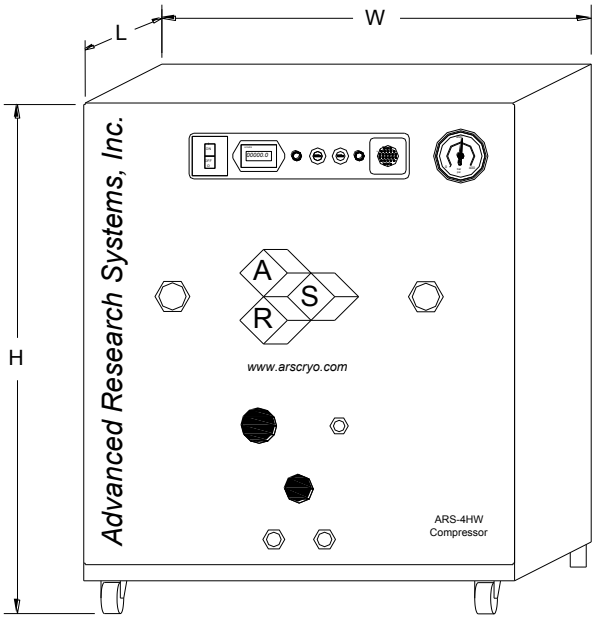
Optional Rubber Bladder



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	