



# Optical Cryostat - Economy

The **CS202\*E-DMX-1AL** offers a wide range of flexibility at a low cost, making it an excellent choice for most sample and device testing. This system is well suited for optical, electrical, and magnetic sample testing.

## Applications

- Optical
- Raman
- UV, VIS, IR
- FTIR
- Electro & Photoluminescence
- Resistivity/Hall Probe Experiments
- Diamond Anvil Cell
- Magneto-Optical
- PITS / DLTS
- Thermal, Electrical and Magnetic Susceptibility
- Magneto Optical Kerr Effect (MOKE)

## Features

- Cryogen Free, Low Power
- Low cost aluminum construction
- Large clear view optical windows (1.25 in)
- Large sample viewing angle for optical collection (F/1)
- Can operate in any orientation
- Fully customizable

## Typical Configuration

- Cold head (DE-202AE)
- Compressor (ARS-2HW)
- 2 Helium Hoses
- Aluminum vacuum shroud with 4 window ports for optical and electrical measures (DMX-1AL)
- Aluminum radiation shield
- 2 High purity quartz windows
- Instrumentation for temperature measurement and control:
  - 10 pin hermetic feed through
  - 36 ohm thermofoil 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

- 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
- 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 cryocooler with a vacuum shroud, radiation shield, and sample holder installed.



The above picture shows a complete system (minus the vacuum pump and temperature controller)



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## Cooling Technology-

DE-202	Closed Cycle Cryocooler
Refrigeration Type	Pneumatically Driven GM Cycle
Liquid Cryogen Usage	None, Cryogen Free

## Temperature\*-

DE-202AE	< 10K - 350K
DE-202SE	< 4.2K - 350K
DE-202PE	< 5.5K - 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	36 mm (1.43 in.)
Height	39 mm (1.53 in.)
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	41 mm (1.63 in)
Clear View	32 mm (1.25 in)
#/F	1
Window Material	<a href="http://www.arscryo.com/Products/WindowMaterials.html">www.arscryo.com/Products/WindowMaterials.html</a>

## Temperature Instrumentation and Control - (Standard) -

Heater	36 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	Bolt-On, Aluminum
Pump out Port	1 - NW 25
Instrumentation Ports	2
Instrumentation Wiring	Contact sales staff for options

## Vacuum Shroud -

Material	Aluminum
Length	338 mm (13.3 in)
Diameter	76 mm (3 in) at the sample space
Width	76 mm (3 in) at the sample space

## Radiation Shield -

Material	Aluminum
Attachment	Threaded
Optical Access	0, 2, or 4 (customer specified)

## Cryostat Footprint -

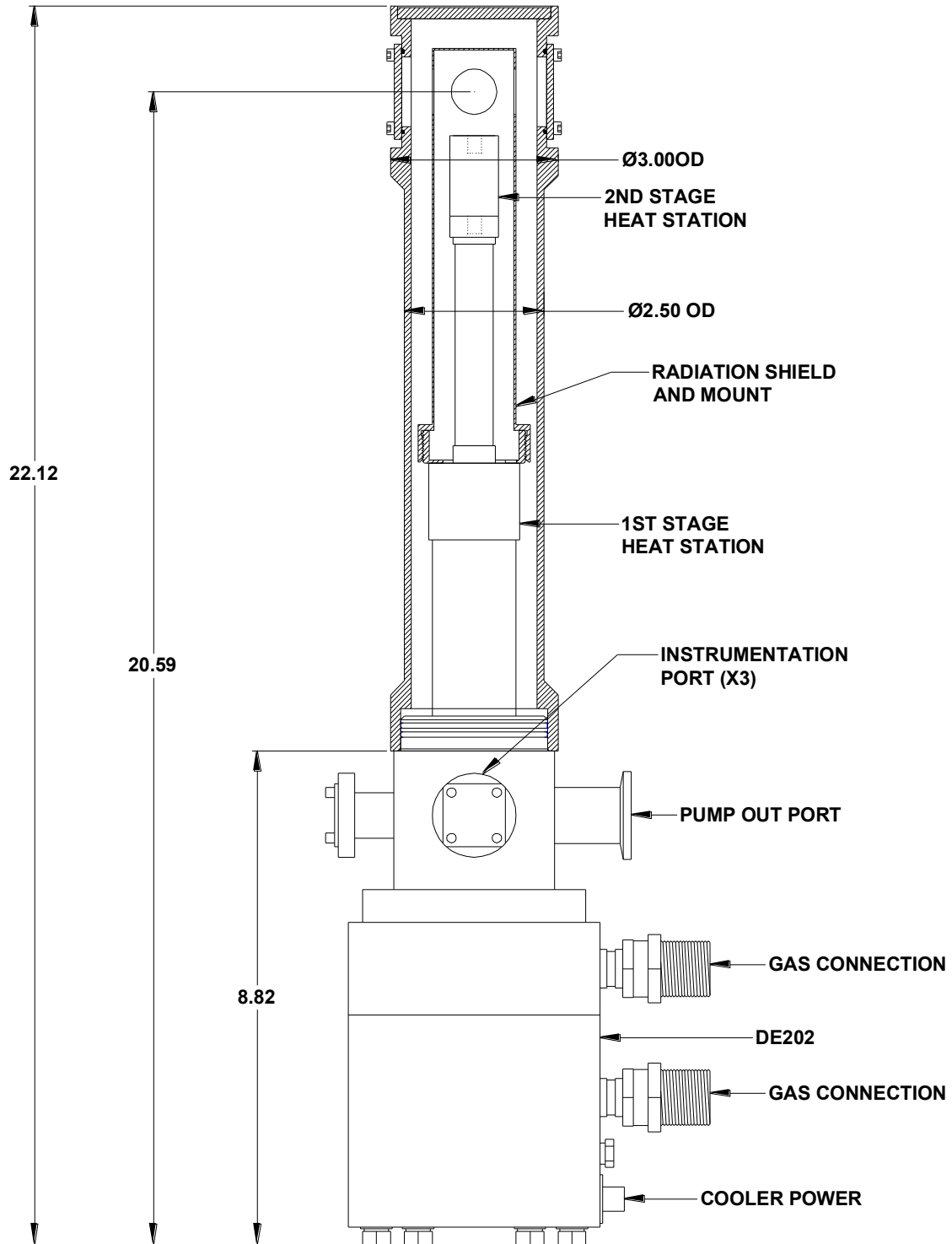
Overall Length	562 mm (22.12 in)
Motor Housing Diameter	114 mm (4.5 in)
Rotational Clearance	200 mm (8 in) with "G" Configuration

Cryocooler Model		DE-202AE		DE-202A(T)E		DE-202PE		DE-202SE	
		60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz
	Frequency	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz
<b>Base Temperature</b>		<9K	<9K	<9K	<9K	<5.5K	<5.5K	<4.2K	<4.2K
<b>Cooling Capacity</b>	4.2K	-	-	-	-	-	-	0.1W	0.08W
	10K	0.5W	0.4W	0.7W	0.56W	1W	0.8W	1.2W	1W
	20K	2.5W	2W	3.7W	3W	3.5W	2.8W	4W	3.2W
	77K	4W	3.2W	6W	4.8W	3.5W	2.8W	4W	3.2W
<b>Radiation Shield Cooling Capacity</b>		10W	8W	15W	12W	10W	8W	10W	8W
<b>Cooldown Time</b>	20K	50 min	60 min	35 min	42 min	60 min	72 min	60 min	72 min
	Base Temperature	70 min	84 min	50 min	60 min	90 min	108 min	90 min	108 min
<b>Compressor Model</b>		ARS-2HW		ARS-2HW		ARS-2HW		ARS-4HW	
<b>Typical Maintenance Cycle</b>		12,000 hours		8,000 hours		12,000 hours		12,000 hours	



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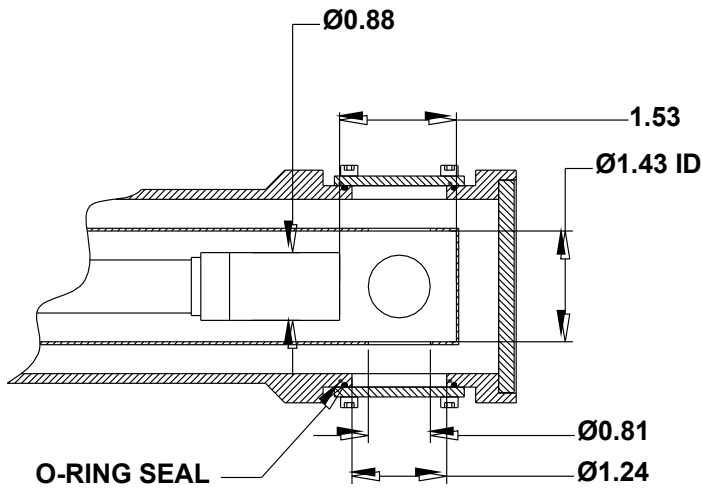
## DE202\*E-DMX-1AL Outline Drawing



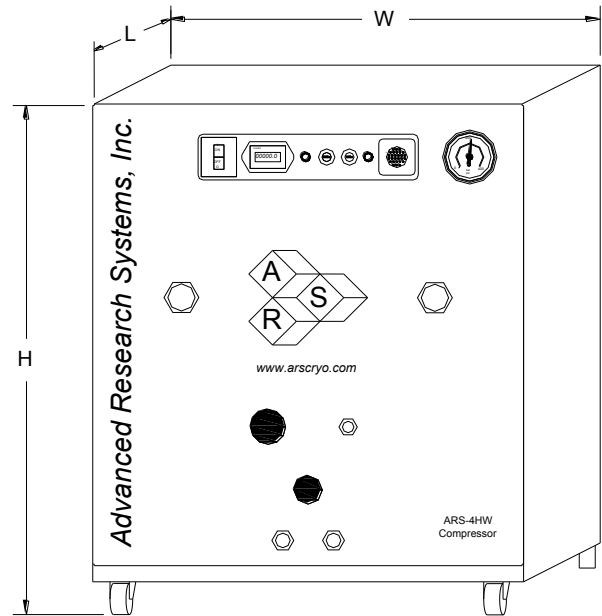


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**Sample Space**



**ARS-2HW/ARS-4HW Compressor**



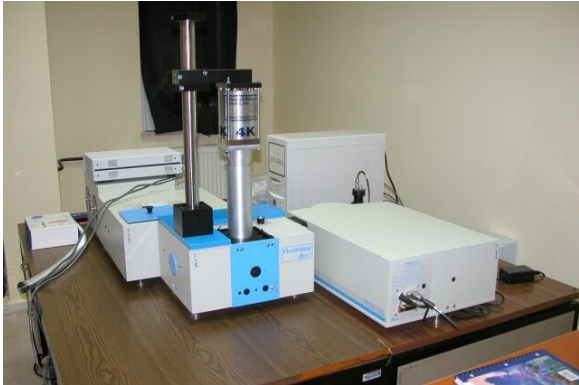
Compressor Model		ARS-2HW		ARS-4HW	
	Frequency	60 Hz	50 Hz	60 Hz	50 Hz
<b>Standard Voltage</b>	Min	208 V	190 V	208 V	190 V
	Max	230 V	210 V	230 V	210 V
<b>Transformer Options</b>	10%		220 V, 230V		220 V, 230 V
	15%		240 V		240 V
<b>Power Usage</b>	Single Phase	1.3 kW	1.2 kW	3.6 kW	3.0 kW
<b>Refrigerant Gas</b>		99.999% Helium Gas, Pre-Charged		99.999% Helium Gas, Pre-Charged	
<b>Noise Level</b>		60 dBA		60 dBA	
<b>Ambient Temperature</b>		12 - 40 C (54—104 F)			
<b>Cooling Water</b>	Consumption	1.5 L / min (0.4 Gal. / min)		2.3 L / min (0.6 Gal. / min)	
	Temperature	10 - 35 C (50—95 F)		10 - 35 C (50—95 F)	
	Connection	3/8 in. Swagelok Fitting		3/8 in. Swagelok Fitting	
<b>Dimensions:</b>	L	483 mm (19 in)		483 mm (19 in)	
	W	434 mm (17.1 in)		434 mm (17.1 in)	
	H	516 mm (20.3 in)		516 mm (20.3 in)	
<b>Weight</b>		62 kg (137 lbs)		72 kg (160 lbs)	
<b>Typical Maintenance Cycle</b>		12,000 hours		12,000 hours	
<b>Water Recirculation Option</b>		CoolPac Compatible		CoolPac Compatible	



# Optical Cryostat - Economy

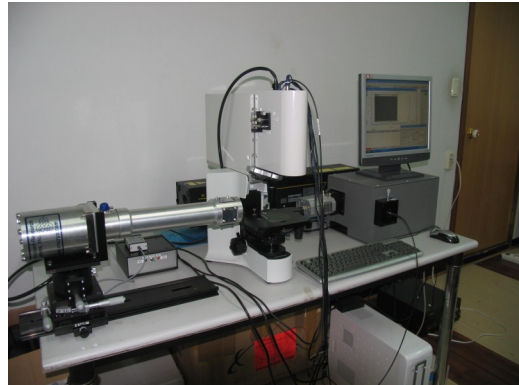
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## Optical Spectroscopy



CS202SE-DMX1-AL Installed on Jobyn Yvon Spectrometer.

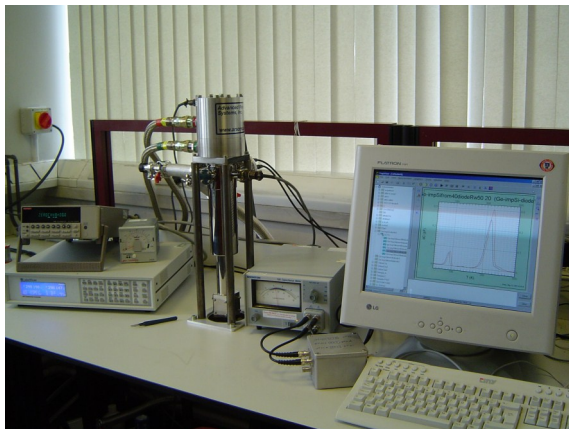
Courtesy: Prof. Dr. Suleyman, Gazi University



Micro PL. Adjustable sample to window distance for short focal length experiments.

Courtesy: Mr. DongHyun Kim

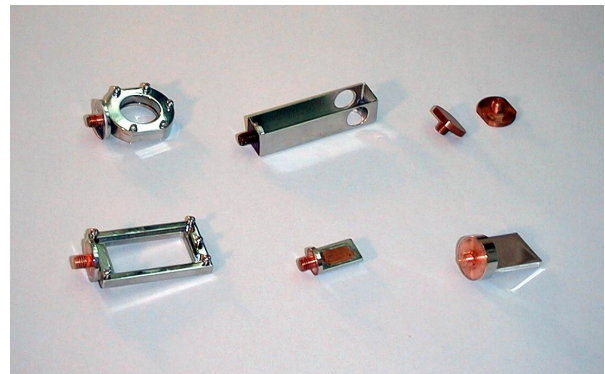
## High Performance Stainless Steel Upgrade



Displex installed for spectroscopy.

Courtesy: Dr. M. Gad , Sheffield Hallam University

## Optional Sample Holders



A wide range of sample holders are available for large bulk, thin film or liquid samples. Backscattering, reflection and transmission experiments.

See selection guide for more details.