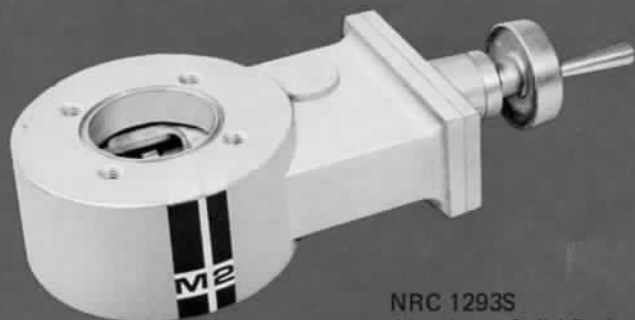




M-2 Diffusion Pump
(Water-cooled)



NRC 325 Cryotrap



NRC 1293S
Aluminum Solid-Body
Slide Valve



M-2A Diffusion Pump
(Air-cooled)



NRC 332 Low-Profile
Water-Cooled Baffle



M-2 Diffusion Pump



The M-2 Diffusion Pump belongs to a family of pumps designed to combine high performance and unusually low cost when used alone or with matching components.

Since the standard patented cold cap* intercepts over 98% of the backstreaming vapor, the backstreaming rate of the M-2 pump is less than $0.001 \text{ Mg/cm}^2/\text{min}$. — five times better than other diffusion pumps. As a result of this superior performance, it is often possible to use the M-2 without traps or baffles. However, when these components are added, the degree of cleanliness at inlet of the topmost component is greater than that possible with other pumping systems.

The ejector stage is a critical area for performance. The large condensing surface makes the M-2 virtually insensitive to variations in voltage and type of pump fluid. Because vapor is more thoroughly condensed, the loss that sometimes occurs under high-throughput conditions is minimized. The condenser's horizontal orientation and added length provide the most efficient degassing of the condensed fluid before it returns to the boiler.

The high powered boiler achieves high throughput and forepressure tolerance. By using innovative design, the boiler

temperature is still lower than in most diffusion pumps, thus minimizing pumping fluid breakdown. The fully compartmented jet separates and ejects whatever light fractions are produced from the vapor.

This pump is also available in an air-cooled model, the M-2A.

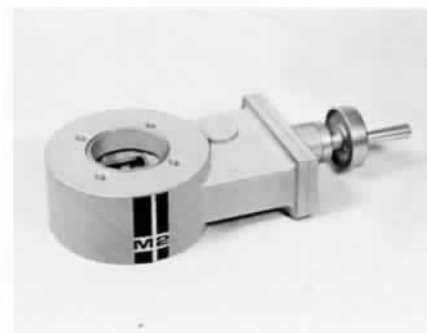


NRC 325 Cryotrap



This trap is ideal for applications requiring critical cleanliness, pressures below 10^{-4} Torr, or high pumping speed for condensables. While retaining almost 60% of the M-2 pump speed, its compact, optically-dense circular-chevron geometry assures the interception of molecules by cryogenic surfaces regardless of the direction from which they come. Filling is easy with the concentric fill/vent tube which also accepts standard liquid level control probes. Duration of a charge is typically 7.5 hours.

NRC 1293S Aluminum Solid-Body Slide Valve



Because of its low profile and full-diameter opening, the NRC 1293S slide valve provides the highest possible conductance. The self-adjusting disc with 90° motion at point of contact gives a no-scuff O-ring seal against the seat and provides long trouble-free service.

NRC 332 Low-Profile Water-Cooled Baffle

This compact, optically dense baffle provides complete interception of primary backstreaming while retaining 60% of pumping speed. This is useful in applications which don't require cryogenic traps, but where clean operation at 10^{-7} Torr or above is desired. The low profile adds only two inches of height to the pump stack.



MATCHED FOR TOP PERFORMANCE

M-2 Diffusion Pump and Matching Components

Combinations

Typical Applications

M-2 PUMP ONLY

- HIGHEST SPEED
- LOWEST COST

PUMP AND LOW-PROFILE BAFFLE

- HIGH SPEED
- CLEAN
- FAST CYCLES (Valved)

PUMP AND CRYOTRAP

- HIGH SPEED
- VERY CLEAN
- FAST CYCLES (Valved)

PUMP, LOW-PROFILE BAFFLE, CRYOTRAP, AND SLIDE VALVE

- EXTREMELY CLEAN
- EXTRA PROTECTION

GENERAL PURPOSE
VACUUM TUBE EVACUATION
METALLIZING
PROTECTIVE COATINGS

10^{-4} TO 10^{-7} TORR RANGE

THIN FILM DEPOSITION
OPTICAL COATINGS
ELECTRONIC COATINGS
SOLID-STATE RESEARCH
MOLECULAR BEAMS

10^{-6} TO 10^{-8} TORR RANGE

The combination given below is included for given above. Also it reduces pumping speed pressures exceeding normal operating range.

THIN FILM DEPOSITION
OPTICAL COATINGS
ELECTRONIC COATINGS
SOLID-STATE RESEARCH
MOLECULAR BEAMS

10^{-6} TO 10^{-8} TORR RANGE

With internal geometry and transition between adjacent components as primary design considerations, the M-Series components were built to completely match and complement the M-2 Diffusion Pump. This matching design enables the M-2 Pump/Baffle combination to re-

tain almost 60% of the basic pump speed—a much greater percentage than previously possible. Backstreaming is virtually eliminated—less than 0.001 Mg/cm²/min. for the M-2 pump and almost zero* when used with the matching baffles. Now, you can order a matched vacuum pumping array

to suit your particular needs—with a minimum of speed/cleanliness compromise. The comprehensive table below will help you to make the ideal match.

*Too small to be measured using the standard collection method of the American Vacuum Society.

Pumping Speed l/s (air)	Ultimate Pressure*		Backstreaming Rate** at Inlet Mg/cm ² /min. (DC-704)	Total Height Inches	LN ₂ Duration Hours	Model Number
	DC-704	DC-705, S-5				
175	5 x 10 ⁻⁸	1 x 10 ⁻⁸	0.001	10.25	—	M-2
110	5 x 10 ⁻⁸	1 x 10 ⁻⁸	< 5 x 10 ⁻⁵ ***	12.25	—	M-2 332
90	1 x 10 ⁻⁷	< 1 x 10 ⁻⁷	< 5 x 10 ⁻⁵ ***	15.75	—	M-2 332 1293S (Custom 3")
125	1 x 10 ⁻⁸	5 x 10 ⁻⁹	~ 1 x 10 ⁻⁷	17.125	7.5	M-2 325
100	5 x 10 ⁻⁸	1 x 10 ⁻⁸	~ 1 x 10 ⁻⁷	20.625	7.5	M-2 325 1293S (Custom 3")

information purposes, but is not usually recommended because it offers no significant advantages over the combination approximately 45%. This system may provide added protection against accidental exposure of the diffusion pump to

80	5 x 10 ⁻⁸	1 x 10 ⁻⁸	1 x 10 ⁻⁷	22.625	7.5	M-2 332 325 1293S-2 (Custom 3")
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Specifications

M-2 AND M-2A DIFFUSION PUMPS

Speed (maximum) Air _____	175 ℓ/s
Forepressure (maximum) _____	.55 Torr (no load)
	.40 Torr (full load)
Maximum Throughput at 1×10^{-2} Torr _____	0.8 Torr-liters/second
Fluid Charge _____	100 cc
Heat-up _____	10 minutes
Cooldown _____	30 minutes
Water (M-2) _____	0.1 gpm at 60° C to 80° C
Heater Rating _____	450 W (120/240/1/60) \pm 5%
Jet Assembly _____	Three-stage self-aligning aluminum with cold cap
Foreline Baffle _____	Stainless steel, half-moon
Water Connections _____	1/8" FPT
Body _____	Stainless steel
Flanges _____	Stainless steel
Net Weight _____	6 pounds
Shipping Weight _____	10 pounds

NRC 332 LOW-PROFILE WATER-COOLED BAFFLE

Conductance _____	675 ℓ/s
Recommended Flow _____	0.1 to 0.2 gpm

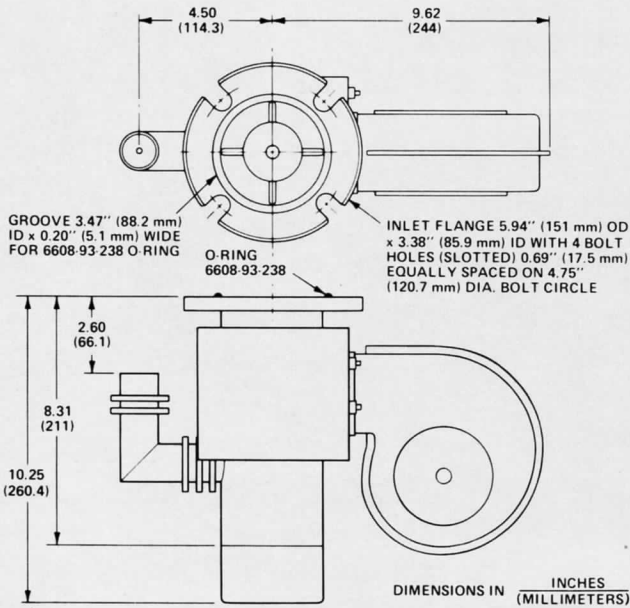
Conductance (below 10^{-4} Torr) _____	460 ℓ/s
Reservoir Volume _____	1500 cc
Liquid nitrogen required to fill and cool initially (approx.) _____	3500 cc
Holding time for single liquid nitrogen charge using auxiliary water baffle below NRC 325 Cryotrap (approx.) _____	7.5 hours

NRC 1293S (Custom 3") SLIDE VALVE

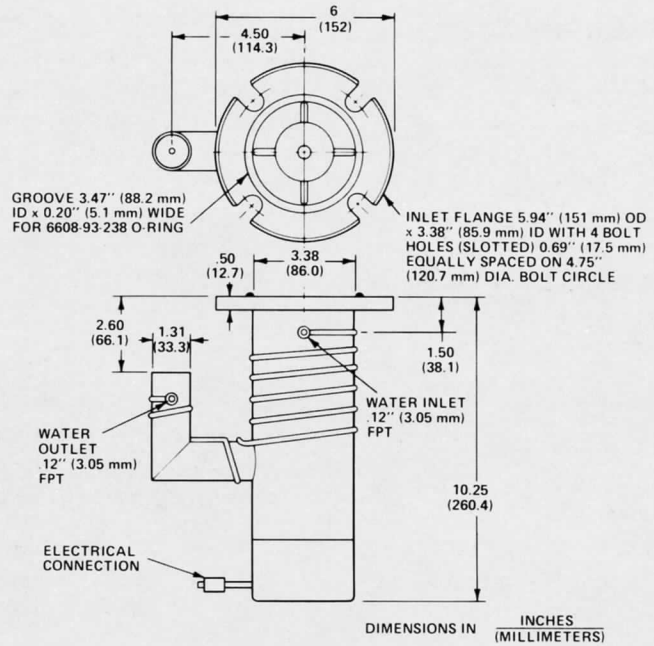
Conductance _____	500 ℓ/s
Seal (non-scuff) _____	O-ring

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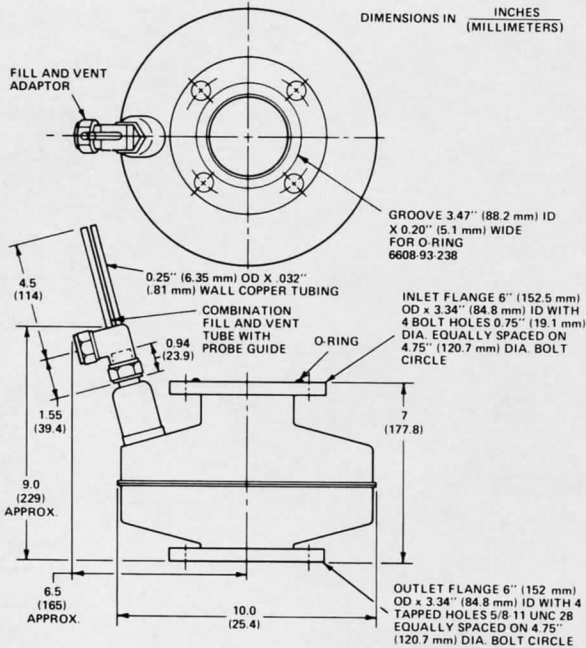
Dimension Drawings



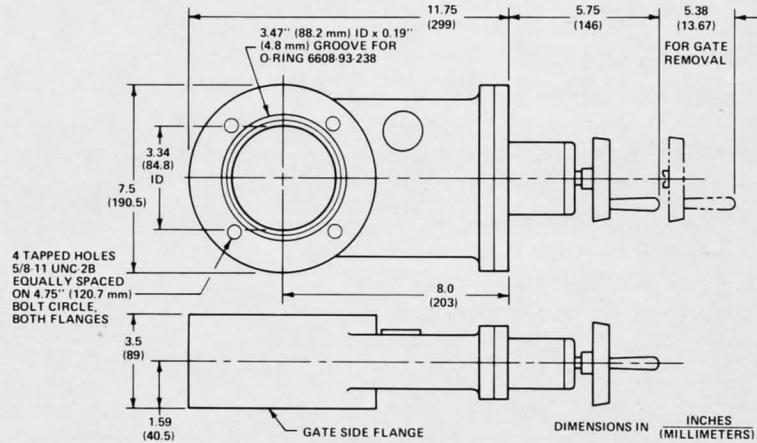
M-2A DIFFUSION PUMP (AIR-COOLED)



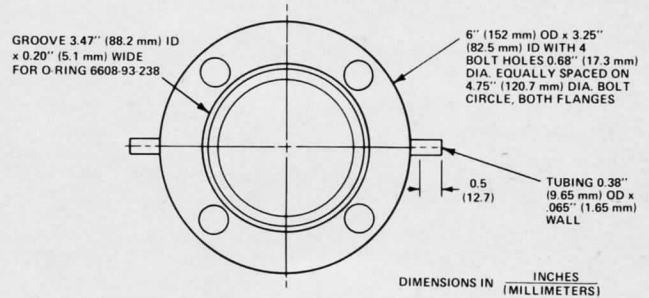
M-2 DIFFUSION PUMP (WATER-COOLED)



NRC 325 CRYOTRAP



NRC 1293S SLIDE VALVE (CUSTOM 3')



NRC 332 LOW-PROFILE WATER-COOLED BAFFLE