

**OPERATING INSTRUCTIONS  
FOR THE  
JANIS RESEARCH  
DUAL RESERVOIR NITROGEN  
CRYOSTAT**

**Janis Research Company, Inc.  
2 Jewel Drive  
P. O. Box 696  
Wilmington, MA 01887-0696  
(978) 657-8750**

# OPERATING INSTRUCTIONS FOR DUAL RESERVOIR NITROGEN CRYOSTAT

## SERIAL NUMBER 8795

### General

The cryostat is designed to allow sample changes without invading the insulating vacuum space. The uppermost clamp is removed to allow the sample positioning assembly to be taken out from the top. Sample plates can be installed on the work bench and secured to the sample carrier with the latch pin clips (provided).

Electrical attachment to the sample plates is accomplished by the modified alligator clips, supplied with the cryostat. A slot is provided in the upper portion of the sample mount to allow the routing of wires upward through the inner Nitrogen bath. Access to the atmosphere side of the reservoir would be through one of the two fill ports, located on the top flange, at the experimentalist's discretion. Any wiring should be dressed with enough slack to allow limited rotation within the +/- 30 degree marking range of the sample holder.

The cryostat should be evacuated to a pressure level of  $10^{-4}$  Torr, or lower, before introducing liquid Nitrogen into either reservoir.

The cryostat should be warmed to room temperature before exposing the interior to atmosphere.

### Filling

Select a source of liquid Nitrogen that is free of contaminants (water, Oxygen, dust, debris). This is most important for the inner reservoir, as the presence of such material defeats the nature of the cryostat design.

Fill the inner reservoir with dry Nitrogen or Helium gas to prevent cryopumping atmosphere while cooling down.

Introduce liquid Nitrogen to the outer reservoir first. This is desirable to minimize the thermal shock on the optical windows. Add slowly, about two cc at a time, through the funnel provided. The funnel is inserted through the 1/4 " hole in the intermediate flange. Venting for the outer reservoir is through the 90 degree exhaust port (opposite the fill port). When the rapid exhaust of vapour subsides, more liquid can be added until the reservoir is filled. The fill level can be monitored by removing the funnel assembly and inserting a 1/8" plastic rod,

running it to the bottom, and removing it after about 5 seconds. The length of the frost on the rod indicates the height of the liquid Nitrogen. Alternately, the reservoir can be filled until overflowing and then removing the funnel.

Following the cooling of the outer reservoir, the inner reservoir can be filled through the ports on the top flange of the dewar. Please note the caution to use contaminant-free cryogen. The funnel can be re-used to minimize the cryogen free-fall, but is not essential. The fill can proceed and be monitored through the windows; the height above the window is at the option of the experimentalist according to the estimated time to accomplish the research.

### **Operation**

The outer reservoir can be evacuated through the 90-degree port used for exhausting boiloff Nitrogen gas. The fill port is sealed using the rubber stopper provided with the cryostat. Factory testing is accomplished at approximately 20" of Mercury; at this level the bubbling of the inner reservoir ceases in about 15-20 seconds. The pump is valved off upon acquiring the pressure and only slowly gains about 10% over 15 minutes. During this time, typically, no visible bubbles form.

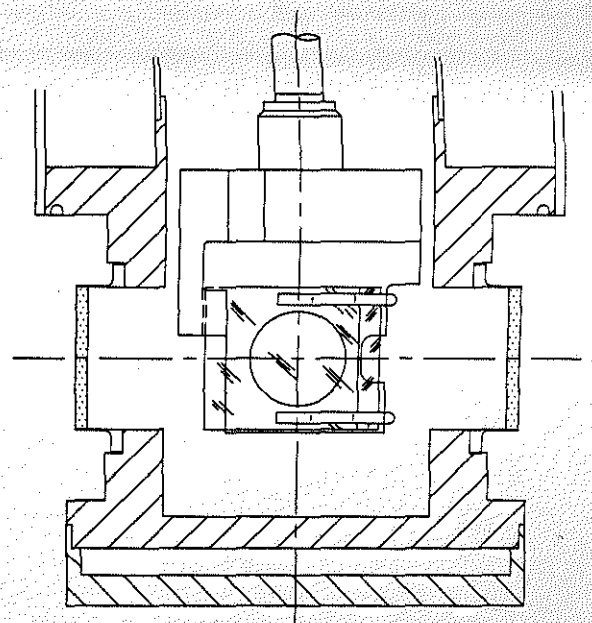
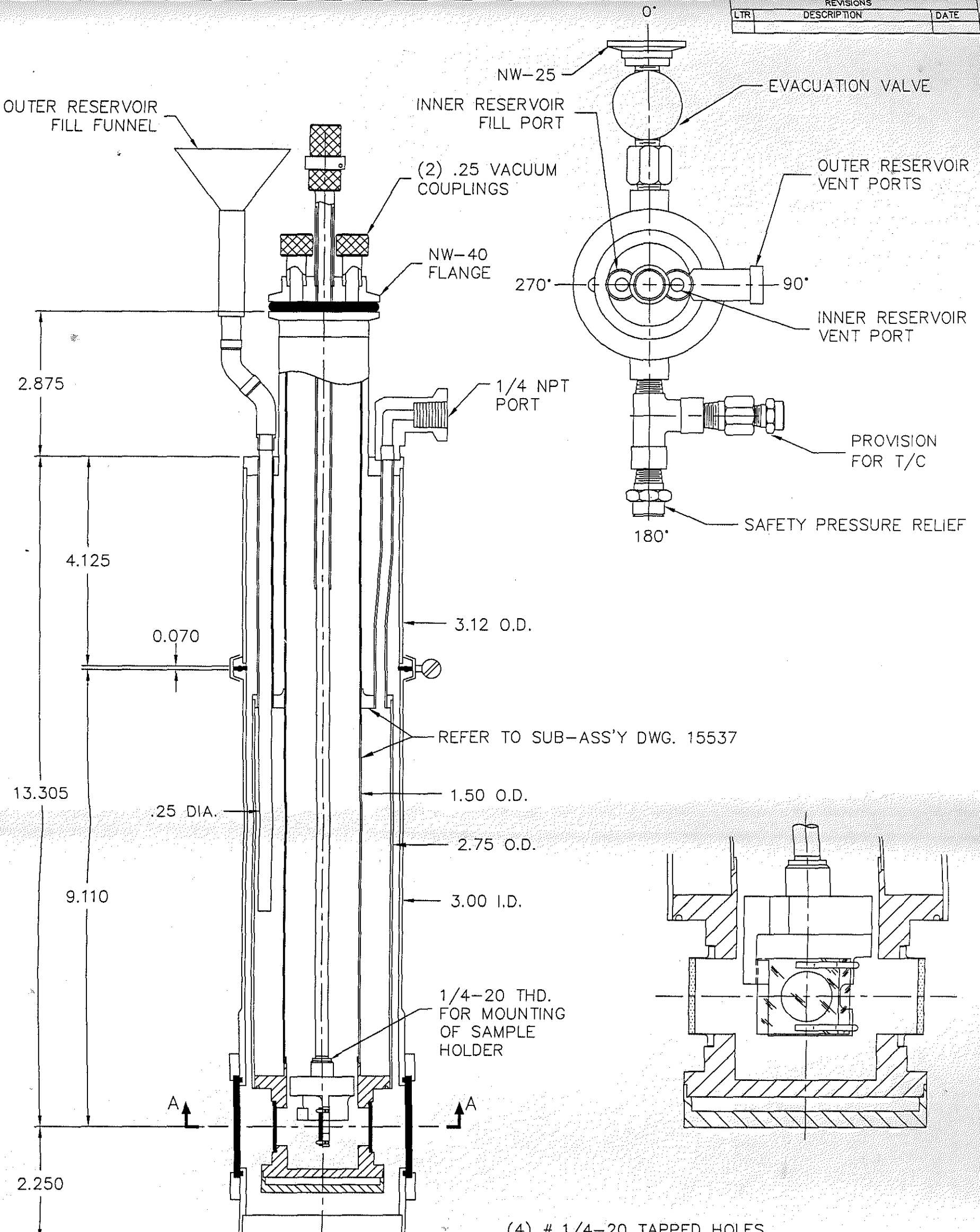
Sample rotation is by means of the knurled knob at the top of the sample rod. The amount of rotation can be monitored through one of the cold windows by observation of the scale scribed on the sample holder.

### **Warm up**

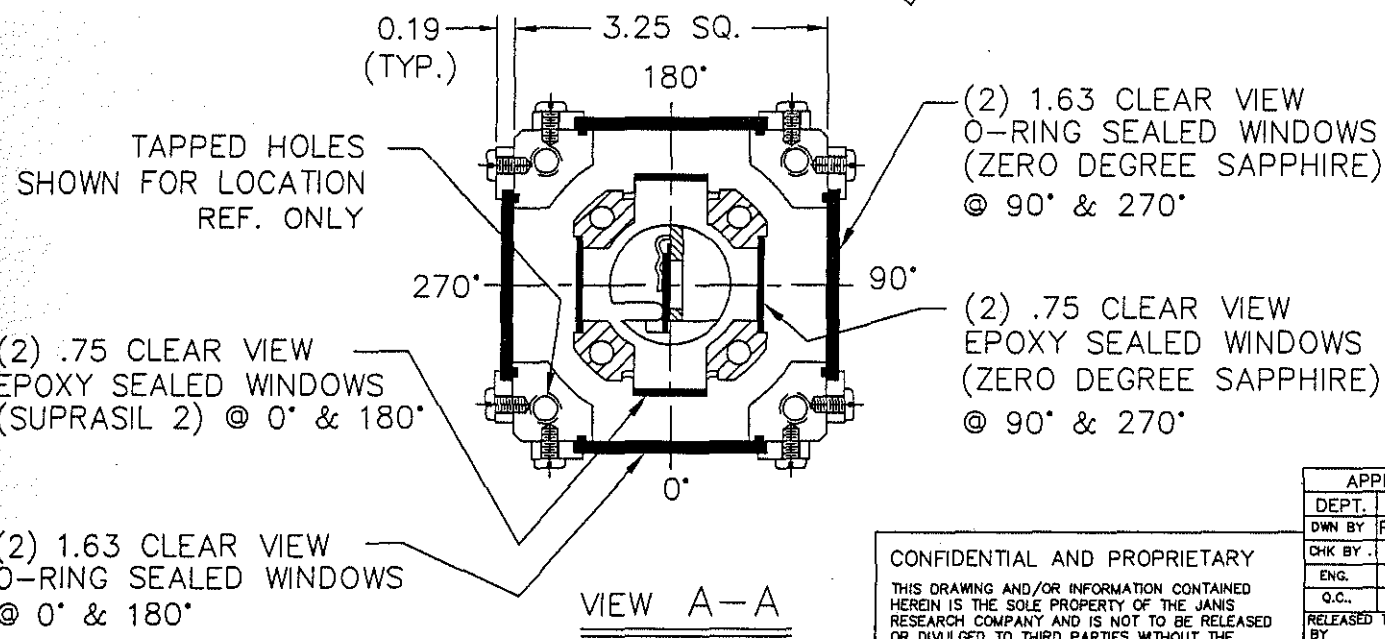
The system can be warmed up with the sample in place or removed. If the sample is removed, the cryostat can be inverted and the cryogen dumped. If this method is selected, it is best to leave it in this position until warm in order to avoid moisture collecting in the sample (inner) reservoir.

The cryostat can be left with cryogen in place if pressure relief is provided for each reservoir. The inner reservoir can be left with the upper sealing clamp removed, the sample carrier assembly and top flange can act as a gravity-activated pop off valve. The outer reservoir can remain with the rubber stopper in place if pressure relief is provided for the 90 degree exhaust port. A Bunsen valve with the tubing end clamped closed is recommended; such a valve is inexpensive, very convenient, and effective.

REVISIONS		
LTR	DESCRIPTION	DATE



(4) # 1/4-20 TAPPED HOLES  
EQ. SP. ON A 3.75 DIA. B. C.  
FOR MOUNTING PURPOSES



NOTE: ALL DIMENSIONS ARE IN INCHES

APPROVALS			JANIS RESEARCH CO. WILMINGTON, MA.		
DEPT.	SIG.	DATE	TITLE	REV.	
DWN BY	REB	6/01/04	DUAL LN2 RESERVOIR CRYOSTAT	D	
CHK BY					DRAWING NO. D06-01-04B
ENG.					
Q.C.					
RELEASED TO MFG. BY			SIZE		
CUST. APPROVAL BY			D		
			P. N.		
			SCALE: FULL	SHT 1 OF 1	

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