

- Standard holding times in the range of 1–5 days¹
- Available in all-attitude and compact multi-orientation dewar types
- Lightweight: <11 lbs for 24-hour holding time version
- Available for all GEM, GMX or GLP detectors
- Automatic high-voltage shutdown and high count-rate indicator
- PopTop or Streamline versions



Gamma Gage II is intended for most any situation in which it is necessary to "take the instrument to the sample." Examples of such measurements are found in many waste assay and site characterization measurements, as well as nuclear materials holdup, and portable safeguards isotopic ratio measurements. In some cases, a Gamma Gage dewar is an excellent solution when space/weight is at a premium, for example, in Whole Body Counting applications or in some multi-detector research applications, although increasingly, electrical cooling is a viable alternative in these.

The integral LN₂ dewar is available in a variety of hold times to suit the measurement constraints on size/weight and holding time.

A Tale of Two Dewars

Two dewar type options on Gamma Gage II allow a choice between complete all-attitude no-spill operation and no-spill operation in a slightly restricted range of attitudes from a more compact dewar, the MOD dewar.

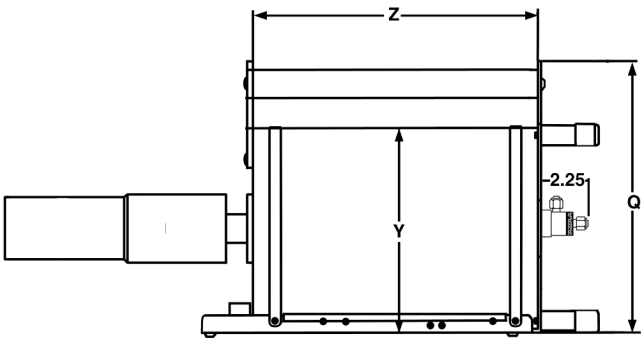
The definition of an all-attitude dewar is, apart from the inevitable venting of boil-off liquid nitrogen during use, the liquid refrigerant cannot escape from the dewar while the detector is in use, regardless of the orientation ("attitude") of the dewar. This is achieved by the relatively simple expedient of making the single fill-vent tube extend to the geometrical center of the LN₂ reservoir. Thus whatever the orientation of the dewar, the fill/vent tubes are above the level of the liquid. The dewar is never more than 50% full.

In some situations, the constraint on size is more important, and a dewar which may be filled completely is required, even at the expense of having to restrict the range of movement allowed without some venting of refrigerant. The MOD (multi-orientation dewar) option allows this. It may be operated pointing vertically upward, downward or horizontally. Table 1 gives the choice criteria between all-attitude and MOD dewar types; the basic tradeoff is between minimum size/weight for a given holding time and avoidance of loss of liquid refrigerant.

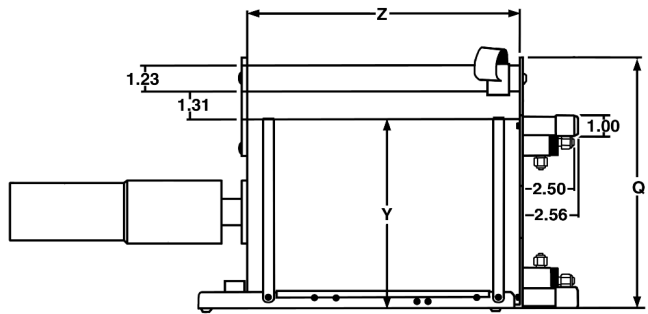
Table 1. Multi-Orientation Dewar vs. All-Attitude Dewar

	MOD	All-Attitude
Ease of filling with a funnel	More difficult and slower than all-attitude	Fills Easily
Ease of filling with a pressurized source	Equal	
Storage/Fill Dewar	Not compatible	Easily used with S/F dewar
Size	Smaller (all of the volume is utilized for LN)	Larger (only half the dewar volume is utilized for LN)
Dry Weight (Same LN ₂ Capacity)	Smaller dewar equals lighter weight	Larger dewar equals heavier weight (~4 lbs.)
Spill Possibilities	LN is Easily Spilled by moving dewar	Very Difficult to make LN spill out of ports
Rotation About Center Axis	Causes pressurization of dewar and consequent leakage of refrigerant	No LN is spilled
Rotation on Longitudinal Axis (Tilting Up or Down)	Position Fill port above Vent port to minimize LN spilling	No LN is spilled

Gamma Gage II Portable Cryostat/Dewar



All-Attitude Dewar



Multi-Orientation (MOD) Dewar

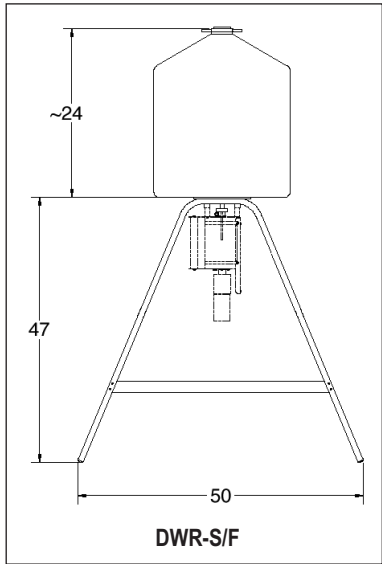
Dewar Type							
	Designation		All-Attitude			Multi-Orientation (MOD)	
	LN2 Volume> Hold Time¹		1.2L 1 Day¹	3L 2 Days¹	5L 4 Days¹	3L 2 Days¹	7L 5 Days¹
	Unit	Tolerance					
Q	mm (in.)	±13 ±0.5	229 (9.0)	302 (11.9)	302 (11.9)	229 (9.0)	302 (11.9)
Y	mm (in.)	±5 ±0.2	157 (6.2)	229 (9.0)	229 (9.0)	157 (6.2)	229 (9.0)
Z	mm (in.)	±5 ±0.2	229 (9.0)	267 (10.5)	419 (16.5)	292 (11.5)	320 (12.6)

¹Hold times are approximate for standard non-PopTop cryostats in 2.75" diameter size endcap only. Hold time for PopTop cryostats and special cryostats may vary. Actual hold times may vary depending on specific dewar, cryostat, and detector.

Gamma Gage II Fill Options

Both the all-attitude and MOD versions of the Gamma Gage II are supplied with fill funnels to allow manual filling in a HORIZONTAL orientation. (The MOD dewar cannot be filled in vertical orientation.) Both dewar types are compatible with the ORTEC manual and automatic LN₂ fill systems.

The all-attitude version may be filled in a vertical orientation or kept "at the ready" by attachment to the DWR-S/F "mother cow" long term storage dewar.



Specifications subject to change
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