

- Excellent energy resolution in the 3 to 300 keV range
- Active area from 30 to 1000 mm<sup>2</sup>
- PopTop flexibility
- Unequaled timing performance
- Detectors larger than 36-mm diameter available
- Available with special feedback resistor for high-rate applications
- POF preamplifier option for superior energy resolution and high count rate at low energies

The ORTEC GLP Series Planar Low-Energy Photon Spectrometer (LEPS) is a small-area, high-purity germanium photon spectrometer for use in applications over the energy range from 3 to ~300 keV.

Available in diameters from 6 to 36 mm, the LEPS offers exceptional energy resolution for low and intermediate energies. At low energies in nuclear structure physics GLP detectors are irreplaceable because of their excellent timing performance (see Table 1).

A cross sectional drawing of a 16-mm LEPS is shown in Figure 1.

### The Following Specifications are Provided for Each Model GLP Detector

- Active crystal diameter and depth.
- Energy resolution at 5.9 keV photons from <sup>55</sup>Fe at optimum shaping time unless the window material prohibits this energy.
- Energy resolution at 122 keV photons from <sup>57</sup>Co at optimum shaping time.

## Configuration Guidelines

### PopTop or Streamline (non-PopTop) Configuration

The essence of a PopTop detector system is that the HPGe detector element, preamplifier, and high voltage filter are housed in a detector “capsule” which is then attached to an appropriate cryostat (Figure 2.)

In so called Streamline systems, the detector capsule is NOT demountable. Detector capsule and cryostat share the same vacuum. In configuration terms, this requires a cryostat or cryostat/dewar selection with the cryostat having a matching diameter to the capsule endcap. A cryostat must always be ordered with a Streamline capsule, because they are integral.

The actual PopTop capsule has its own vacuum. It can be mounted on any of the available cryostats, cryostat/dewar combinations, or the X-COOLER III mechanical cooling system.

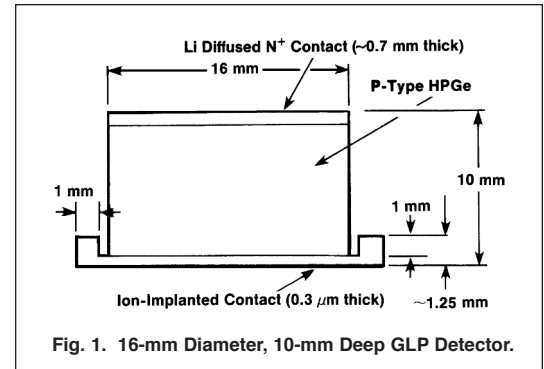


Fig. 1. 16-mm Diameter, 10-mm Deep GLP Detector.

Source	Energy (keV)	Time Resolution(ns)
<sup>22</sup> Na	20 ±10	20 ±2
	100 ±10	8.5 ±1
	511 ±5	4.5 ±0.2
<sup>133</sup> Ba	31 ±3	19 ±2
	81 ±3	Isomer
	85 ±5	11 ±1
	356 ±5	6.0 ±0.5
<sup>152</sup> Eu	41 ±3	15 ±1
	122 ±5	Isomer
	125 ±5	6.5 ±0.5
	344 ±5	5.0 ±0.2
	779 ±5	3.8 ±0.3

\*Data courtesy of Dr. Kim Lister, Argonne National Lab.

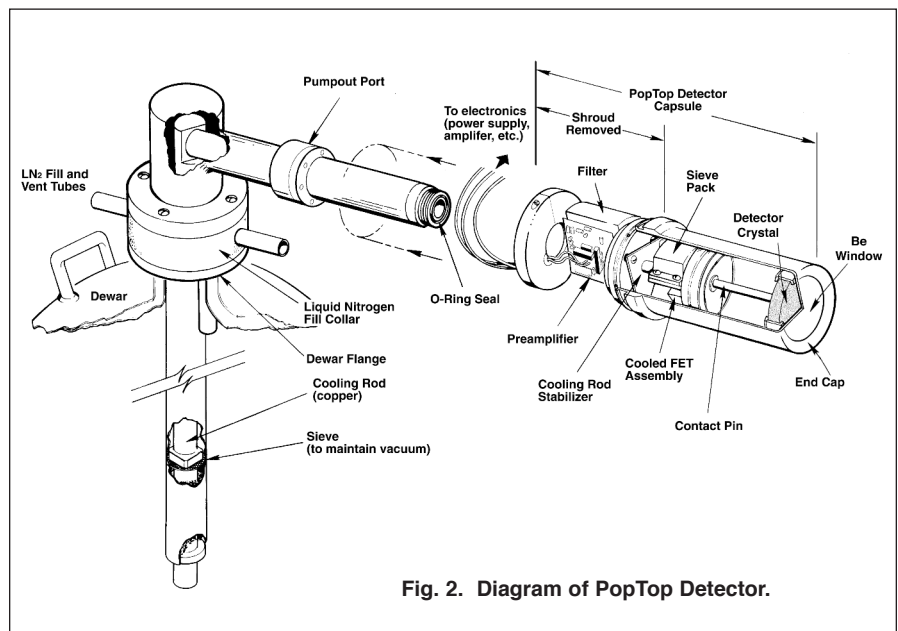


Fig. 2. Diagram of PopTop Detector.

# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

## Steps to Configure Your ORTEC HPGe Detector

### 1) Configure the Detector Model

- Capsule type (PopTop or Streamline)
- Crystal dimensions and specifications
- Endcap and window
- Mount
- Preamplifier
- High Voltage Filter
- Cable Package

Options are available for the detector model that can change specific materials used in the construction of the detector endcap, cup, and mount. Preamplifier options are also available.

### 2) Configure the Cryostat/Dewar Model

- Vertical Dipstick style (separate Dewar)
- Horizontal Dipstick style (separate Dewar)
- Portable with all-position or multi-position cryostat/dewar models
- Downlooking designed to be oriented with the detector pointing down
- Sidelooking designed to be oriented with the detector horizontal at the bottom of the dewar
- “SJ” configuration designed with the detector attached near the bottom of the dewar and a right angle bend in the cryostat orienting the detector to look up.

A cryostat and dewar or other cooling device are required for operation.

If a PopTop detector has been selected, you can choose a PopTop style cryostat, cryostat/dewar combination or the X-COOLER III mechanical cooler.

If a Streamline detector has been selected, you must choose a cryostat or cryostat/dewar model for the detector to be mounted on and vacuum sealed. The cryostat or cryostat/dewar combination diameter must match the endcap diameter of the selected detector.

## Detector Options

### SMART-1 Option (-SMN)

The SMART-1 option monitors and reports on vital system functions, and can save authentication codes and report the code at a later time. It has the high voltage included, so none of the instruments require an external high-voltage power supply.

The SMART-1 is housed in a rugged ABS molded plastic enclosure and is permanently attached to the detector endcap via a molded-strain-relieved sealed cable. This eliminates the possibility that the detector will suffer severe damage from moisture leaking into high-voltage connectors. The SMART-1 can be positioned in any convenient place and does not interfere with shielding or other mounting hardware.

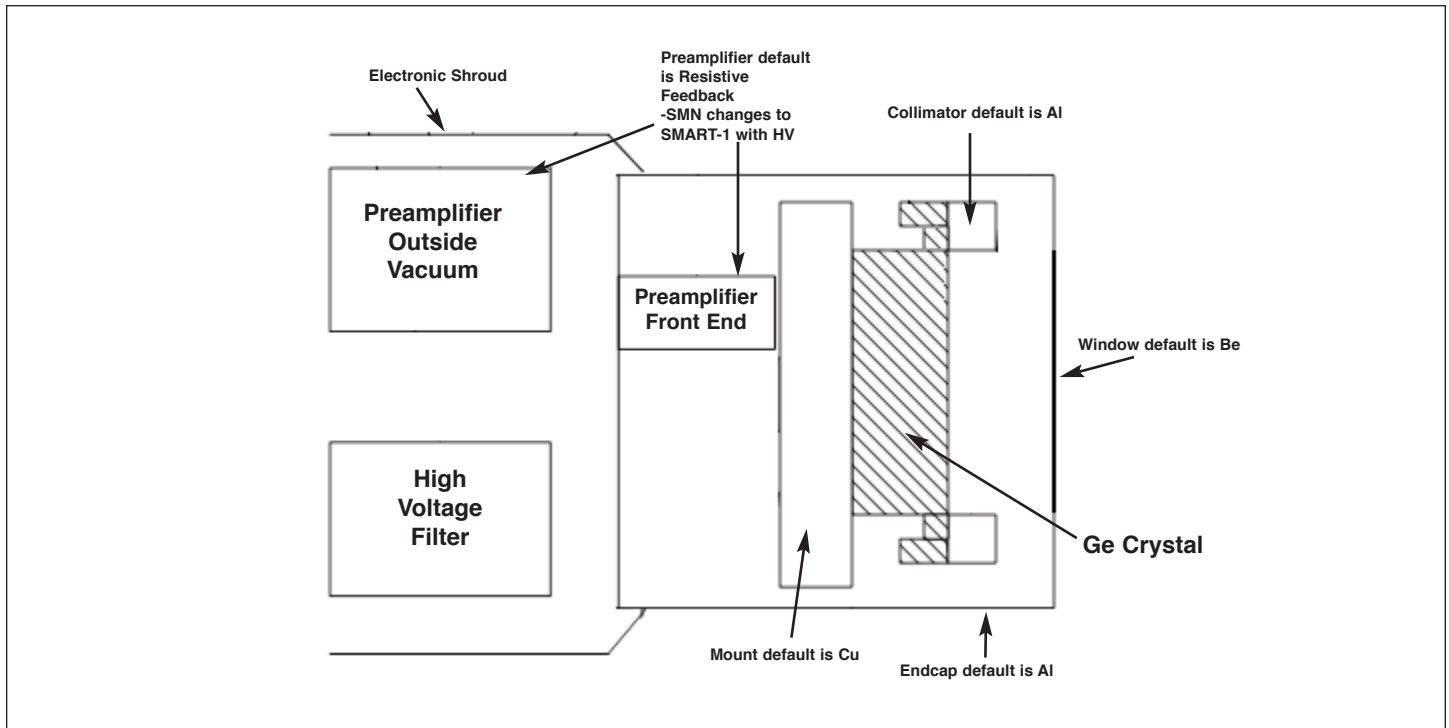


## Defining the Detector Model

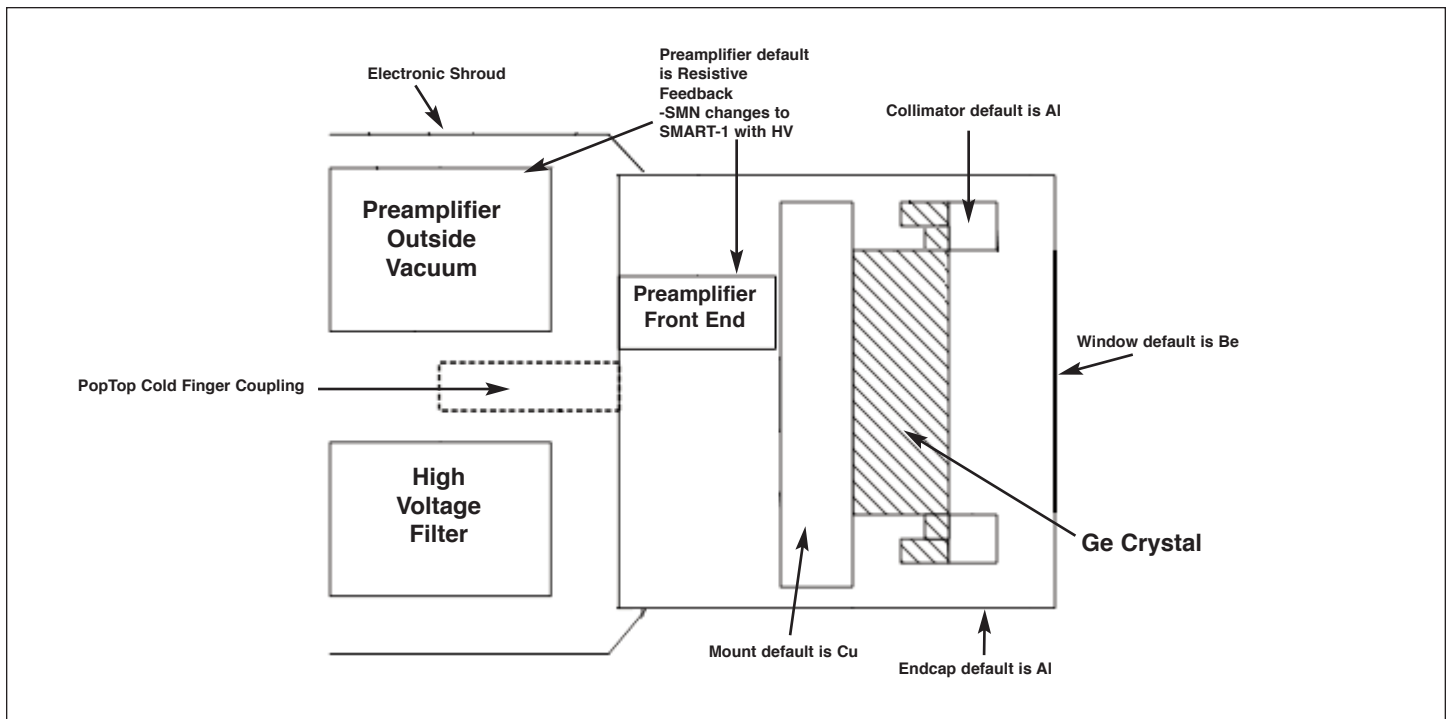
Base Model (example)	PopTop or Streamline	High Voltage Option (if required)
GLP-061695/05	P4 (PopTop) (Streamline)	-SMN

# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

## Streamline Detector Capsule



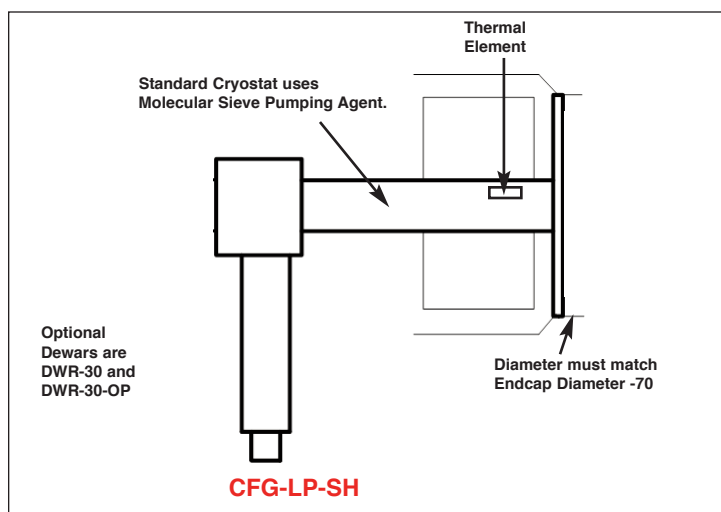
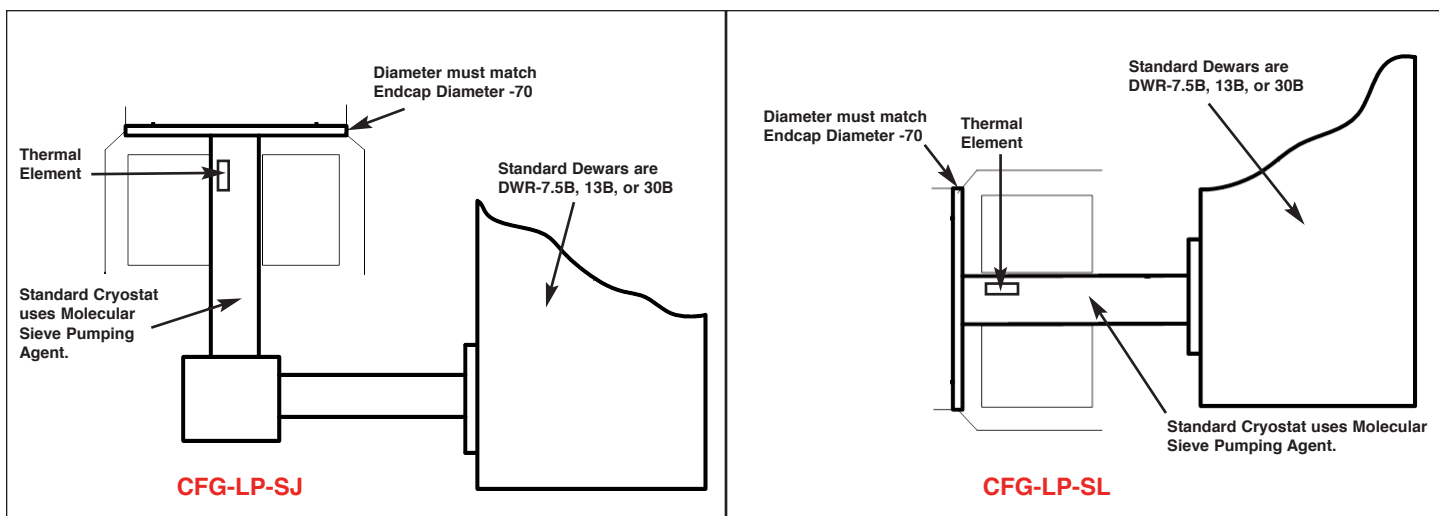
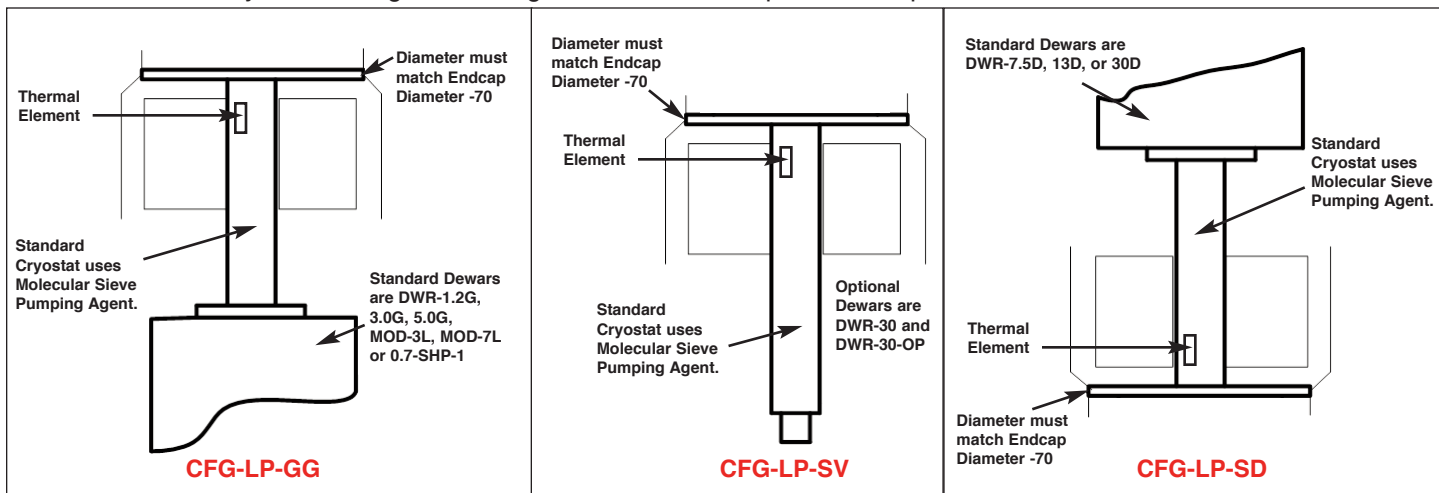
## PopTop Detector Capsule



# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

## Streamline Cryostat and Cryostat/Dewar Assemblies

Streamline systems (detector capsule and cryostat) share the same vacuum, requiring a cryostat or cryostat/dewar selection with the cryostat having a matching diameter to the capsule endcap.



# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

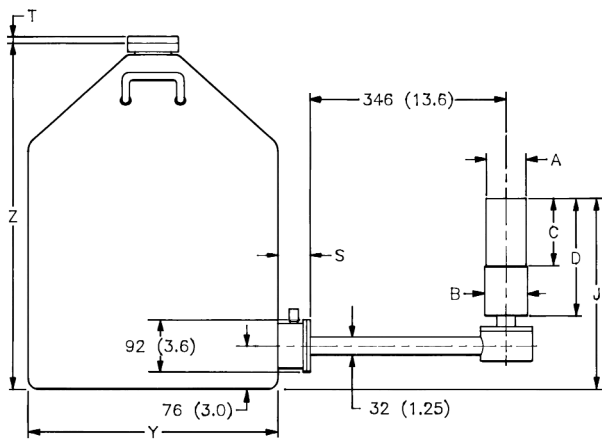
## PopTop and Streamline Dimensional Data

Streamline systems (detector capsule and cryostat) share the same vacuum, requiring a cryostat or cryostat/dewar selection with the cryostat having a matching diameter to the capsule endcap. A cryostat must be ordered with a Streamline capsule.

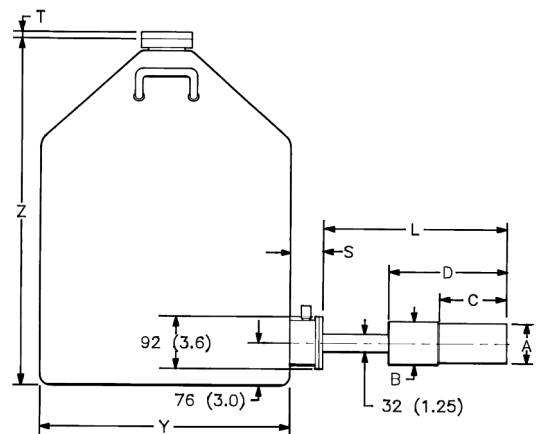
The PopTop capsule contains a vacuum unto itself. It can be mounted on any of the available cryostats, cryostat/dewar combinations, or the X-COOLER III mechanical cooling system.

The cryostat and dewar drawings that follow are to be used in conjunction with the accompanying tables of dimensions.

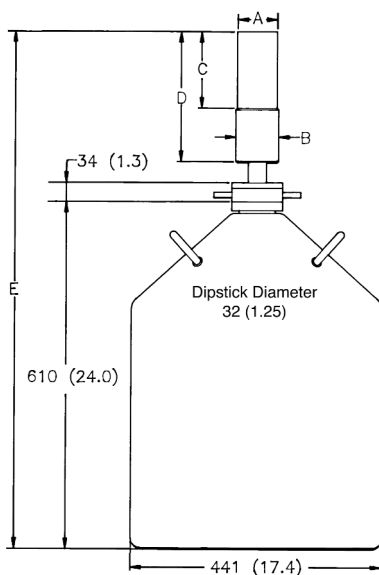
**Note: Cryostat/Dewar drawings are NOT to scale, see tables that follow for complete dimensions.**



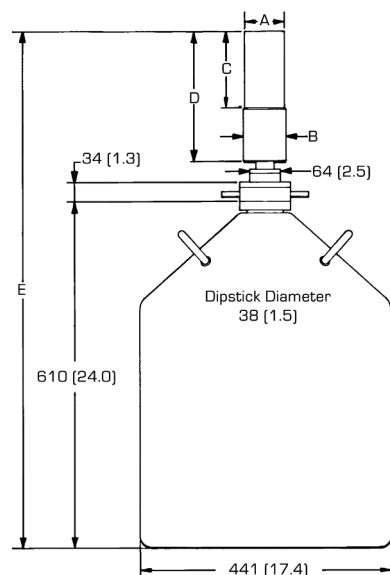
**CFG-LP-SJ, DWR-30B (or -13B or -7.5B)**



**CFG-PS4-30 (or -13 or -7.5)  
or  
CFG-LP-SL, DWR-30B (or -13B or -7.5B)**



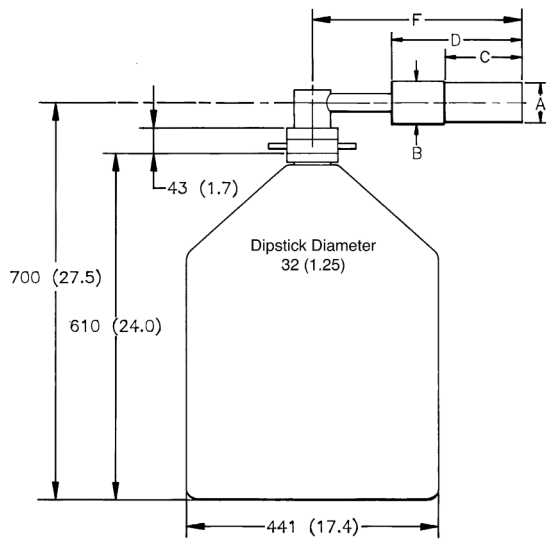
**CFG-LP-SV, DWR-30**



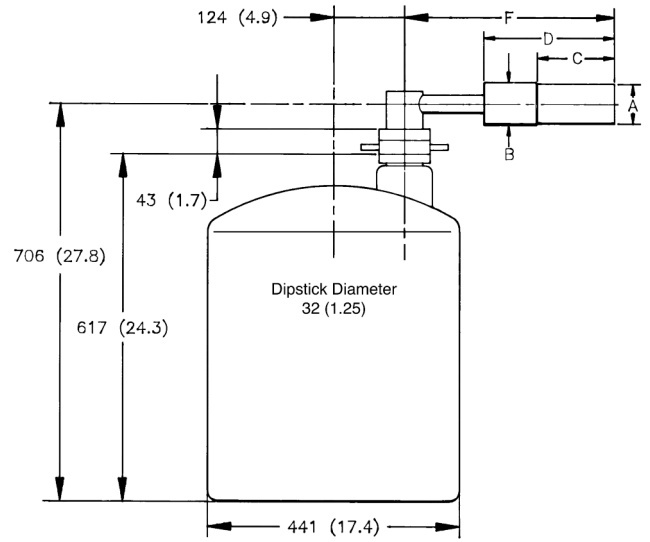
**CFG-PV4, DWR-30**

# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

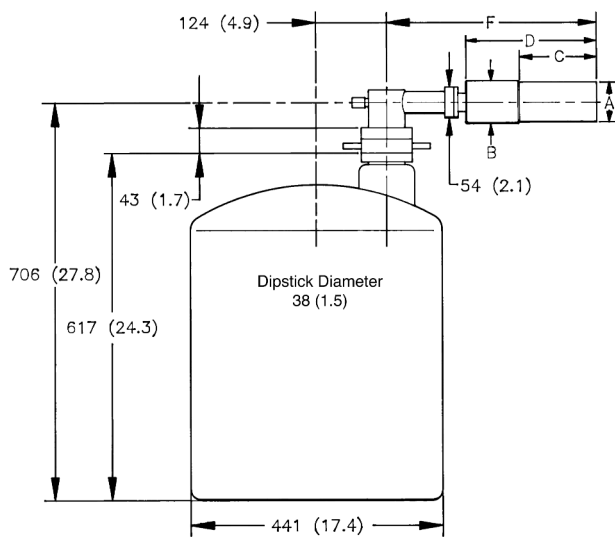
Note: Cryostat/Dewar drawings are NOT to scale, see tables that follow for complete dimensions.



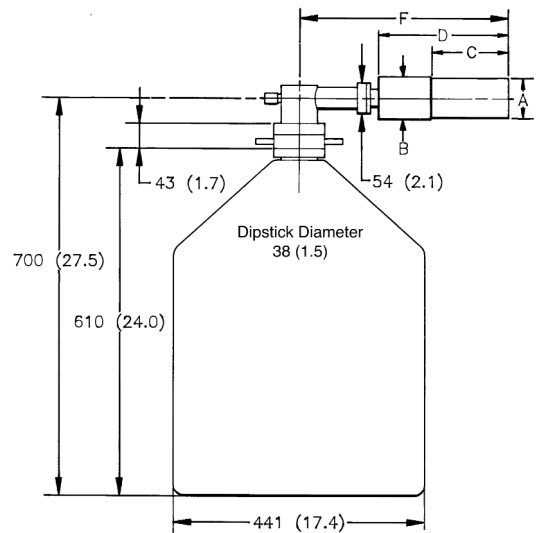
**CFG-LP-SH, DWR-30**



**CFG-LP-SH, DWR-30-OP**



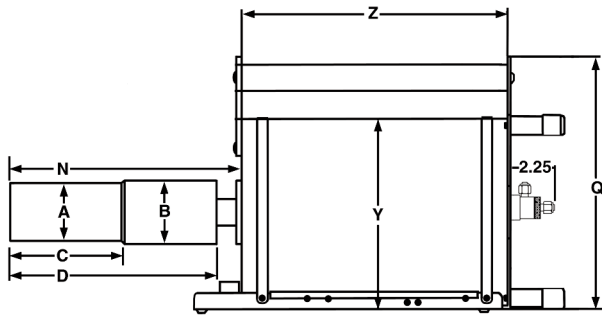
**CFG-PH4, DWR-30-OP**



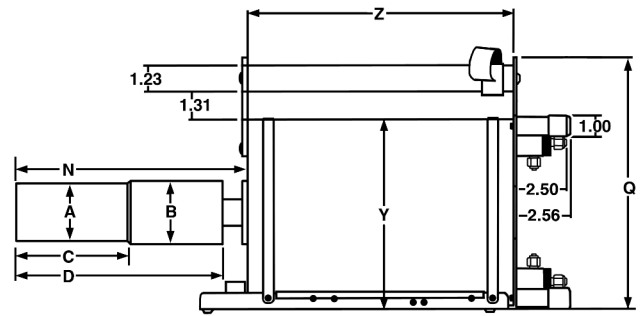
**CFG-PH4, DWR-30**

# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

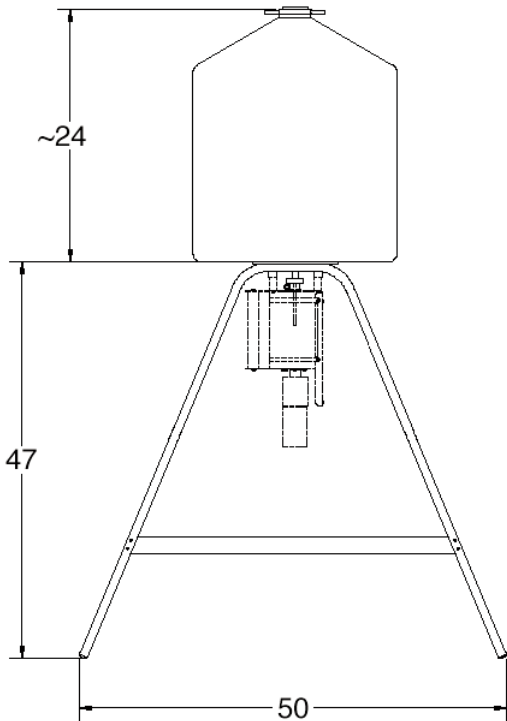
Note: Cryostat/Dewar drawings are NOT to scale, see tables that follow for complete dimensions.



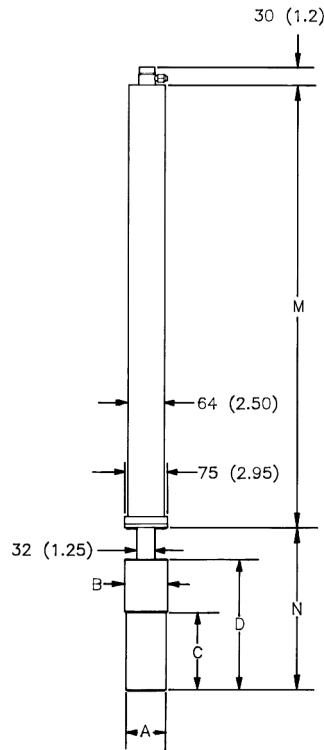
**CFG-PG4-1.2 (or -3 or -5)  
or  
CFG-LP-GG, DWR-1.2G (or -3.0G, -5.0G)**



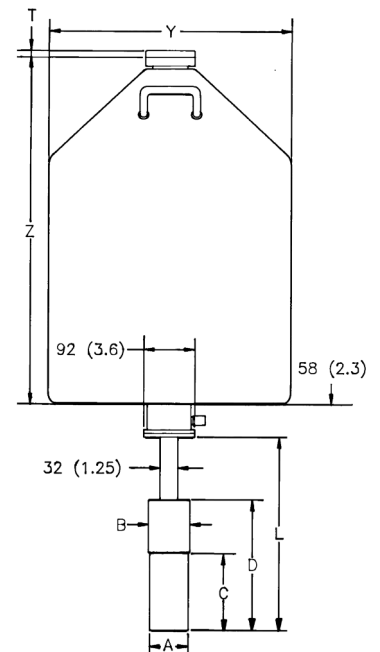
**CFG-PMOD4-3 (or -7)  
or  
CFG-LP-GG, DWR-MOD3L (or -MOD7L)**



**DWR-S/F**



**CFG-PSHP4  
or  
CFG-LP-GG, DWR-0.7-SHP-1**



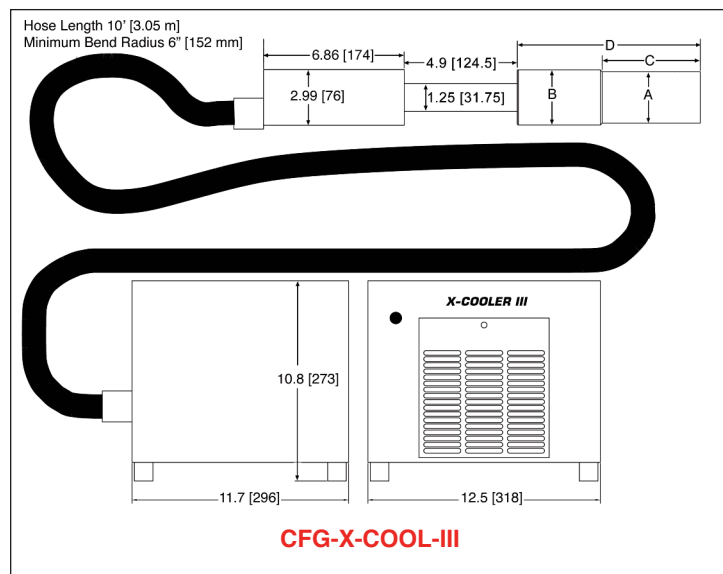
**CFG-PD4-30 (or -13 or -7.5)  
or  
CFG-LP-SD, DWR-30D (or -13D or -7.5D)**

# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

## GLP Detector Dimensions

- Dimensions are for reference only and subject to change.
- If dimensional constraints are critical, contact the factory.

Dim.	Unit	Tol.	PopTop	Streamline
A	mm (in)	0.3 (0.01)	70 (2.75)	70 (2.75)
B	mm (in)	0.3 (0.01)	75 (2.95)	75 (2.95)
C	mm (in)	5 (0.2)	135 (5.3)	71 (2.8)
D	mm (in)	8 (0.3)	250 (9.8)	182 (7.2)
E	mm (in)	8 (0.3)	947 (37.3)	854 (33.6)
F	mm (in)	18 (0.7)	396 (15.6)	305 (12.0)
J	mm (in)	10 (0.4)	X X	318 (12.5)
L	mm (in)	18 (0.7)	338 (13.3)	274 (10.8)
M	mm (in)	10 (0.4)	790 (31.1)	X X
N	mm (in)	8 (0.3)	278 (10.9)	215 (8.5)



## Gamma Gage and Side-Looking Dewar Dimensions

- Dimensions are for reference only and subject to change.
- If dimensional constraints are critical, contact the factory.

			Cryostat/Dewar or Dewar Type							
			CFG-PG4 and DWR-x.xG			CFG-PMOD4 and DWR-MOD-xL		CFG-PS4, CFG-PD4, DWR-xxB and DWR-xxD		
			VOLUME			VOLUME		VOLUME		
Dim.	UNIT	TOL. ±	1.2L	3L	5L	3L	7L	7.5L	13L	30L
Q	mm (in)	13 (0.5)	229 (9.0)	302 (11.9)	302 (11.9)	229 (9.0)	302 (11.9)	X X	X X	X X
S	mm (in)	7.6 (0.3)	X X	X X	X X	X X	X X	77 (3.0)	77 (3.0)	60 (2.3)
T	mm (in)	5 (0.2)	X X	X X	X X	X X	X X	10 (0.4)	10 (0.4)	13 (0.5)
Y	mm (in)	5 (0.2)	157 (6.2)	229 (9.0)	229 (9.0)	157 (6.2)	229 (9.0)	224 (8.8)	307 (12.1)	442 (17.4)
Z	mm (in)	5 (0.2)	229 (9.0)	267 (10.5)	419 (16.5)	292 (11.5)	320 (12.6)	452 (17.8)	429 (16.9)	610 (24.0)



# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

## Example Model Numbers

### Streamline Configuration

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GLP-06165/05	6-mm diameter, 5-mm deep GLP planar detector with 70-mm diameter endcap.
CFG-LP-GG-70	Portable Gamma Gage cryostat with matching 70-mm diameter flange.
DWR-1.2G	1.2 liter all-position dewar for Gamma Gage cryostat.

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GLP-36385/10	36-mm diameter, 10-mm deep GLP detector with 70-mm diameter endcap.
CFG-LP-SD-70	Downlooking cryostat with matching 70-mm diameter flange.
DWR-7.5D	7.5 Liter downlooking dewar for downlooking cryostat.

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GLP-16195/10-SMN	16-mm diameter, 10-mm deep GLP detector with 70-mm diameter endcap and SMART-1 preamplifier and high voltage supply.
CFG-LP-SV-70	Vertical “dipstick” style cryostat with matching 70-mm diameter flange.
DWR-30	30 liter top port dewar that accepts “dipstick” style cryostats.

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### PopTop Configuration

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GLP-36360/13P4-SMN	36-mm diameter, 13-mm deep GLP detector with 70-mm diameter endcap and SMART-1 preamplifier and high voltage supply.
CFG-PG-3	Portable Gamma Gage cryostat with 3 liter all-position dewar.

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GLP-10180/07P4	10-mm diameter, 7-mm deep GLP detector with 70-mm diameter endcap.
CFG-PD4-7.5	Downlooking cryostat with 7.5 liter dewar.

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# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

## Ordering Information

- For Streamline, remove the “P4” from the model number.
- If dimensional considerations are critical, contact factory.
- Cryostat and dewar or other cooling device are not included with detector.
- Cryostat and dewar or other cooling device are required for operation.
- A cryostat must be ordered with a Streamline detector.

Model No.	Active Diameter (mm)	Dimensions		Energy Resolution FWHM		Endcap Diameter (mm)	Be Window Thickness (mm)
		Area (mm <sup>2</sup> )	Depth (mm)	@5.9 keV (eV)	@122 keV (eV)		
GLP-06165/05P4	≥6	≥28	≥5	≤165	≤480	70	0.13
GLP-10180/07P4	10	80	7	180	485	70	0.13
GLP-16195/10P4	16	200	10	205	525	70	0.13
GLP-25325/10P4	25	500	10	325	550	70	0.25
GLP-25300/13P4	25	500	13	300	545	70	0.25
GLP-32355/10P4	32	800	10	355	580	70	0.25
GLP-32340/13P4	32	800	13	340	570	70	0.25
GLP-36385/10P4	36	1000	10	385	595	70	0.25
GLP-36360/13P4	36	1000	13	360	585	70	0.25

## GLP Detector Options

-SMN SMART-1 detector option for negative bias detector, add “-SMN” to the model number.

## GLP PopTop Cryostats and Dewars

- Dewar included except where marked \*.

Model No.	Description
CFG-PD4-7.5	Down-looking Cryostat with 7.5-liter Dewar
CFG-PD4-13	Down-looking Cryostat with 13-liter Dewar
CFG-PD4-30	Down-looking Cryostat with 30-liter Dewar
CFG-PG4-1.2	Gamma Gage Cryostat with 1.2-liter Dewar
CFG-PG4-3	Gamma Gage Cryostat with 3-liter Dewar
CFG-PG4-5	Gamma Gage Cryostat with 5-liter Dewar
CFG-PH4	Horizontal Cryostat (Dipstick type). Includes LNTC1.5WH. Dewar not included.* Choose DWR-30 or DWR-30-OP.
CFG-PMOD4-3	Gamma Gage Cryostat with 3-liter Multi-Orientation Dewar
CFG-PMOD4-7	Gamma Gage Cryostat with 7-liter Multi-Orientation Dewar
CFG-PS4-7.5	Side-Looking Cryostat with 7.5-liter Dewar
CFG-PS4-13	Side-Looking Cryostat with 13-liter Dewar
CFG-PS4-30	Side-Looking Cryostat with 30-liter Dewar
CFG-PSHP4	Down-Looking Shallow-Hole Probe with 0.7-liter Dewar
CFG-PV4	Vertical Cryostat (Dipstick type). Includes LNTC1.5WH. Dewar not included.* Choose DWR-30 or DWR-30-OP.
DWR-30	30-liter Dewar
DWR-30-OP	30-liter Offset-Port Dewar
DWR-S/F	Storage Fill Dewar for CFG-PG4-X
CFG-X-COOL-III-115	X-COOLER III with PopTop connector using 110-120 V ac, 60 Hz Input Power
CFG-X-COOL-III-230	X-COOLER III with PopTop connector using 220-240 V ac, 50 Hz Input Power

# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

## GLP Streamline Cryostats

• Select dewar from GLP Streamline Dewars. Dewar included except where marked\*.

Model No.	Description
CFG-LP-GG-70	Gamma Gage Cryostat Dewar
CFG-LP-SD-70	Down-Looking Cryostat with Dewar
CFG-LP-SH-70	Horizontal Cryostat (Dipstick type). Includes LNTC1.25WH. Dewar not included.*
CFG-LP-SJ-70	J-type Cryostat with Dewar
CFG-LP-SL-70	Side-Looking Cryostat with Dewar
CFG-LP-SV-70	Vertical Cryostat with (Dipstick type). Includes LNTC1.25WH. Dewar not included.*

## GLP Streamline Dewars

For Cryostat	Choose	Description	
CFG-LP-GG	DWR-1.2G	1.2-liter All-Orientation Dewar	Included with Cryostat
	DWR-3.0G	3.0-liter All-Orientation Dewar	Included with Cryostat
	DWR-5.0G	5.0-liter All-Orientation Dewar	Included with Cryostat
	DWR-MOD-3L	3-liter Multi-Orientation Dewar	Included with Cryostat
	DWR-MOD-7L	7-liter Multi-Orientation Dewar	Included with Cryostat
	DWR-0.7-SHP-1	0.7-liter Shallow-Hole Probe Dewar	Included with Cryostat
CFG-LP-SJ, SL	DWR-S/F	Storage/Fill Dewar for DWR-XG	
	DWR-7.5B	7.5-liter Side-Looking Dewar	Included with Cryostat
	DWR-13B	13-liter Side-Looking Dewar	Included with Cryostat
CFG-LP-SD	DWR-30B	30-liter Side-Looking Dewar	Included with Cryostat
	DWR-7.5D	7.5-liter Down-Looking Dewar	Included with Cryostat
	DWR-13D	13-liter Down-Looking Dewar	Included with Cryostat
CFG-LP-SV, SH	DWR-30D	30-liter Down-Looking Dewar	Included with Cryostat
	DWR-30-OP	30-liter Offset-Port Dewar	
	DWR-30	30-liter Dewar	

# GLP Series Planar HPGe Low-Energy Detector Product Configuration Guide

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