



# Ultra Low-Background Cryostats (ULB)

## Features

- Low background materials
- No-stream-path design
- Offset preamplifier and adsorber
- Standardized hardware
- Uncompromised reliability

## Description

CANBERRA has years of experience in building custom low-background detectors for low level gamma spectroscopy. The most important features of these custom detectors have been incorporated into standardized cryostat designs which can be produced quickly and economically and which produce predictable results. There are two basic Ultra Low-Background cryostat designs available, a vertical dipstick and a U-style integral. Both have the following design and construction features in common:



1. Low background materials are used for detector chamber, holder, and internal hardware.
2. Design offsets are used to allow the use of shielding materials between the detector element and hotter materials such as the preamplifier and adsorber (molecular sieves).
3. Direct streaming paths for external (to shield) sources of radiation are eliminated.
4. Materials having high cross-section for cosmic neutrons are avoided in construction.
5. Designs do not compromise ease of use or long-term reliability.

Among the select materials used in CANBERRA ULB cryostats are the following:

- Aluminum – 99.999% pure with guaranteed thorium and uranium less than 1 ppb.
- Copper – 99.99% pure (better than standard OFHC grade).
- Stainless Steel – selected low <sup>60</sup>Co content.
- Composite Carbon – Virtually zero background substitute for Be in low energy and wide range detectors.

A thorough discussion of low background detectors and systems can be found in CANBERRA's "Ultra Low-Background Detector Systems" Application Note. Ordering information is given below:

### Model List for Ultra Low-Background Cryostat Option:

Cryostat Type	Dipstick	U-Style Integral
Cryostat Model	7500SL	7915-30
Remote Detector Chamber	RDC-X*	N.A.

\*X = 2, 4, or 6 for 2 inch, 4 inch or 6 inch neck.

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Material (Choose one of the following):	
Detector Type	Hardware Option
Standard Electrode Coax	ULB-GC
Reverse Electrode Coax	ULB-GR
Extended Range Coax	ULB-GX
Low Energy	ULB-GL
Well Detector	ULB-GW
Broad Energy	ULB-GB

End cap dimensions depend on detector size. The chart below shows the typical efficiency range vs. end-cap diameter. End cap lengths are also greater for larger detectors. Consult the factory if end-cap size is critical in your application.

Rel. Efficiency (%)	Diameter in. (mm)
≤40	3.0 (76)
40-50	3.25 (83)
50-70	3.50 (89)
70-100	3.75 (95)
≥100	4.0 (102)

