

ORTEC[®]

HTDS
Hi-Tech Detection Systems

X-COOLER™ III



3rd Generation Liquid-Nitrogen-Free Cooling
for Counting Laboratory Germanium Detectors

AMETEK[®]
ADVANCED MEASUREMENT TECHNOLOGY

X-COOLER™ III

- **Saves labor and expense in comparison to traditional LN₂ cooling: eliminates safety risk in handling of liquid cryogen.**
- **Separate cooler and compressor with flexible umbilical makes for easy installation in most existing shields .**
- **New design, maintenance-free, all-attitude cold head.**
- **“No-quibble” 2-year warranty (optional longer coverage available).**
- **Pop-Top™ flexibility: compatible with all ORTEC HPGe detector types.**
- **100% compatible replacement for all previous X-COOLER models.**
- **Flexible replacement options for earlier models.**
- **Easy in-field upgrade installation on any ORTEC PopTop detector.**
- **Near silent operation (<60 dB audible noise at 1 meter).**
- **Low power consumption (< 400 Watt in operation).**

X-COOLER III from ORTEC represents the third generation of X-COOLER products; solutions which eliminate the need for liquid nitrogen for the cooling of HPGe detectors installed in counting laboratories and similar environments.

The X-COOLER was first introduced as a counting laboratory convenience solution for spectroscopy applications, to save the cost and labor implicit in LN₂-cooled systems.

Transformational Technology

At introduction, the X-COOLER represented a transformational technology development: for the first time users could make a choice between LN₂ detector cooling and mechanical cooling for the counting laboratory, based on value and convenience, rather than being driven to a costly LN₂-free solution by radiation hazard issues or remote location restrictions.

The X-COOLER design, based on the ORTEC PopTop demountable detector capsule concept and featuring a flexible umbilical connection between the compact compressor and the cold head meant that many users rapidly converted from LN₂ to the X-COOLER.

The figure to the left shows a PopTop detector capsule being attached to an X-COOLER cold head; a simple process achieved in seconds.

Since introduction, several thousand X-COOLER systems have been deployed world-wide, along with several thousand more mechanically cooled ORTEC “Detective” instruments. Currently approximately three-quarters of all users of ORTEC HPGe detectors in counting laboratory applications choose to specify X-COOLER over traditional LN₂ cooling. There are more ORTEC HPGe detectors in operation today cooled by mechanical coolers than are cooled by all other mechanical coolers in total. ORTEC has by far the most experience as a supplier in this field.



The 3rd Generation X-COOLER Arrives

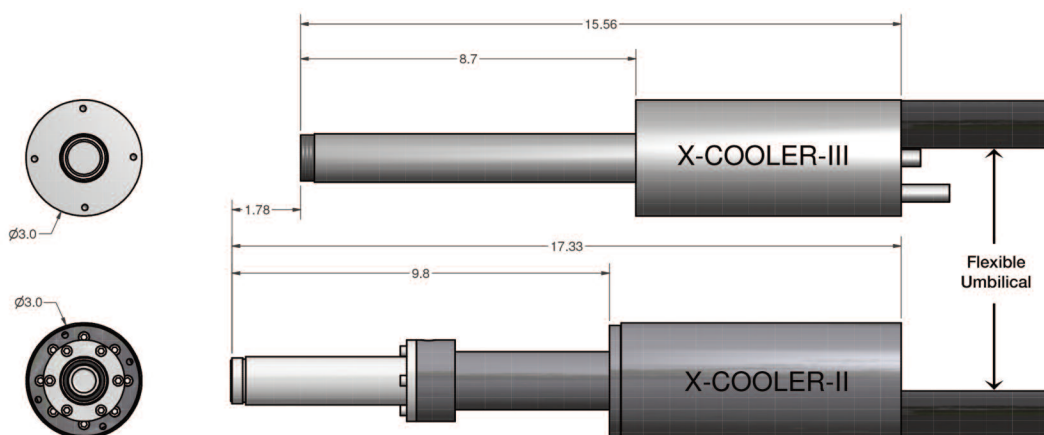
Zero Maintenance

The arrival of the X-COOLER III heralds further technological development. The new model has improved ambient temperature performance and has a 100% maintenance-free cold head. The periodic changing of the foam dust filter on the compressor cooling fan is all that is needed, and this can be carried out in seconds.

Backward Compatible

The new cold head design is entirely compatible with previous models meaning that the X-COOLER III can be considered a “drop in replacement” for all applications.

The figure below compares the cold heads of the X-COOLER II and the X-COOLER III. The new model is very slightly shorter in length but lacks the restrictive flange assembly on the narrow section of the previous version. This means that in the vast majority of cases, X-COOLER III is a “drop-in replacement”.



“Refresher” Option for Existing Installation Upgrades

In order to ensure longest trouble-free operational life, it is recommended that when fitting an X-COOLER III to an existing PopTop detector, that the detector be subjected to a vacuum “refresh” which is a simple pump and bake operation and can be carried out speedily at the local ORTEC Service Center or in some cases at a customer facility. This can be pre-arranged to minimize any down time, and will be carried out at a reduced charge for X-COOLER III purchasers.

No Quibble Warranty

At ORTEC we understand the importance of continuous equipment operation in a busy counting laboratory.

The unique, demountable ORTEC PopTop detector capsule system permits a rather special “no-quibble” 2-year warranty.

In the unlikely event of an X-COOLER III failure while in warranty, a replacement loan X-COOLER will be dispatched immediately by ORTEC on receipt of the failed unit. On arrival at your location, your existing PopTop capsule may be installed in minutes and once cooled, the system returns immediately to 100% operational condition. The replacement loan cooler is retained until the repaired unit has been received.

The PopTop solution is superior to what can be achieved with systems which are not PopTop based. In the case of a non PopTop detector, any substituted detector must be recalibrated for all different counting geometries used in the laboratory, a process which could take literally weeks in a busy counting lab. To replace a cooler on these systems requires that the vacuum be breached extending further any down time.

No Quibble Warranty Extension

At time of purchase, you may choose to extend the warranty to 3 or 4 years with no change of coverage.

X-COOLER™ III

X-COOLER III Specifications

Mechanical

Dimensions

- Compressor: 31.8 cm W × 31.8 cm D × 28 cm H (12.5 in. × 12.5 in. × 11 in.).
- Cold Head Length with Detector Capsule (figure in "" is capsule end cap diameter mm):
 - "-70" detector capsules 55.1 cm (21.7 in.).
 - "-76" or "-83" detector capsules 58.4 cm (23 in.).
 - "-95" detector capsules 61 cm (24 in.).
 - "-108" detector capsules 62.5 cm (24.6 in.).

Weight

- Compressor: 16.4 kg (36 lbs).
- Cold Head: 5 kg (11 lbs) not including crystal.

Acoustic Noise Less than 60 dB at 1 m.

Input Power 110–120 V ac 57, 63 Hz; or 220–240 V ac 47–53 Hz. Input power must be selected by ordering the appropriate model number.

Power Consumption <500 W during initial cool down; <400 W during normal operation.

Operating Temperature 5°C to 25°C (40°F to 77°F).

Relative Humidity 5–95% non-condensing.

Umbilical Connector Hose 3 m (10 ft) gas hose connected between compressor box and cold head assembly is included. Longer lengths available on special request. Contact ORTEC for more information and pricing on other hoses.

Refrigerant Mixed-gas, CFC-free refrigerant; MSDS available on request.

CE Conforms to CE standards for radiated and conducted emissions, susceptibility, and low-vo CryoSecure option.

X-COOLER III HPGe Spectroscopic Performance:

The flexible umbilical between compressor and cold head and the no-moving-parts cold head design makes for excellent spectroscopic performance in terms of measured detector energy resolution at full width half maximum (FWHM). In many cases no degradation at all is detectable.

For detectors ordered with an X-COOLER, in comparison to warranted specifications cooled on liquid nitrogen the following resolution performance warranty applies:

No degradation discernable above 500 keV. Below 500 keV degradation less than 10% of warranted LN₂ specification. As in the case of LN₂-cooled ORTEC HPGe detectors, "super specifications" are available on special order if required. When an existing PopTop detector capsule is upgraded to an X-COOLER III, the resolution specifications above cannot be warranted, but may be regarded as typical.

Ordering information

Model

CFG-X-COOL-III-115

Description

X-COOLER III with PopTop connector using 110–120 V ac, 60 Hz Input Power with 2 year warranty

CFG-X-COOL-III-230

X-COOLER III with PopTop connector using 220–240 V ac, 50 Hz Input Power with 2 year warranty

CFG-X-COOL-III-115-3

X-COOLER III with PopTop connector using 110–120 V ac, 60 Hz Input Power with 3 year warranty

CFG-X-COOL-III-230-3

X-COOLER III with PopTop connector using 220–240 V ac, 50 Hz Input Power with 3 year warranty

CFG-X-COOL-III-115-4

X-COOLER III with PopTop connector using 110–120 V ac, 60 Hz Input Power with 4 year warranty

CFG-X-COOL-III-230-4

X-COOLER III with PopTop connector using 220–240 V ac, 50 Hz Input Power with 4 year warranty

X-COOL-STAND

Omnidirectional Cold Head Stand (ideal when replacing 30 L dewar dipstick type cryostats)

X-COOL-RACKMOUNT

Cold Head Rackmount Bracket

CRYOSECURE

Programmable Compressor Power Controller (ensures that detector is fully warmed before commencing cool down after power failure)

X-COOL-UPS-115

30 minute backup power system (1440 VA) for maintaining Mains power to the X-COOLER III during brief power outages. Input/Output power: 110–120 V ac, 60 Hz.

X-COOL-UPS-230

30 minute backup power system (1440 VA) for maintaining Mains power to the X-COOLER III during brief power outages. Input/Output power: 220–240 V ac, 50 Hz.

X-COOL-FILTER

Replacement fan filters (pkg. of 12).

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