ORTEC

ICS Integrated Cryocooling System

Mechanical cooling for HPGe

Cool HPGe detectors without liquid nitrogen. ICS uses a Stirling cooler and is available in configurations for laboratory and field operation.



Weight

E/HJ: 14 kg excluding detector; P4: 12.7 kg excluding detector capsule [1]

Specifications

DETECTOR		
Detector compatibility	ORTEC GEM, GMX and PROFILE	[1]
PERFORMANCE		
Audible noise	<55 dBA at 1 m and ambient <30 °C	[1]
Effect on energy resolution	Above 100 keV: warranted FWHM unaffected; below 100 keV: FWHM limit +10% versus LN_2	[1]
COOLING		
Cooling technology	Sunpower Stirling cooler with active vibration cancellation (AVC)	[1]
POWER & BATTERY		
Power supply	100–240 V AC, 50/60 Hz	[1]
Power consumption	E/HJ: 70 W typical, 130 W max; P4: 80 W typical, 200 W max at room temperature	[1]
Backup battery	None built-in; external battery power or UPS may be used	[1]
MECHANICAL		
Weight	E/HJ: 14 kg excluding detector; P4: 12.7 kg excluding detector capsule	[1]
ENVIRONMENT & RATINGS		
perating temperature	–10 to +40 °C	[1]
ORDERING & ACCESSORIES		
Models	ICS-E, ICS-HJ and ICS-P4	[1]
GENERAL		
PopTop compatibility	ICS-P4: yes; ICS-E/HJ: no	[1]

Models

Model	Cooling technology	Detector compatibility	Power supply	Power consumption
CFG-ICS-P4	Sunpower Stirling cooler with active vibration cancellation (AVC) [2]	RTEC GEM, GMX and P OFILE; final combination se lected when ordering [2]	100–240 V AC, 50/60 Hz [2]	80 W typical; 200 W maximum at room temperature [2]
ICS STAND 2	–	–	–	–
ICS-E	Sunpower Stirling cooler with active vibration cancellation (AVC) [2]	RTEC GEM, GMX and P OFILE; final combination se lected when ordering [2]	100–240 V AC, 50/60 Hz [2]	70 W typical; 130 W maximum at room temperature [2]
ICS-HJ	Sunpower Stirling cooler with active vibration cancellation (AVC) [2]	RTEC GEM, GMX and P OFILE; final combination se lected when ordering [2]	100–240 V AC, 50/60 Hz [2]	70 W typical; 130 W maximum at room temperature [2]

Model	Operating temperature	Humidity	Audible noise	PopTop compatibility
CFG-ICS-P4	−10 to +40 °C [2]	Non-condensing [2]	<55 dBA at 1 m, fully operational and ambient <30 °C [2]	Yes [2]
ICS STAND 2	–	–	–	–
ICS-E	−10 to +40 °C [2]	Non-condensing [2]	<55 dBA at 1 m, fully operational and ambient <30 °C [2]	No [2]
ICS-HJ	−10 to +40 °C [2]	Non-condensing [2]	<55 dBA at 1 m, fully operational and ambient <30 °C [2]	No [2]

Model	Hardened cryostat	Compatible endcap windows	Molecular sieve	Operating orientation
CFG-ICS-P4	No; conventional cryostat [2]	Aluminium or carbon fibre [2]	Yes [2]	All attitudes [2]
ICS STAND 2	–	–	–	Vertical only [2]
ICS-E	Yes; can recool without full thermal cycling after partial warm-up [2]	Aluminium [2]	No [2]	All attitudes [2]
ICS-HJ	Yes; can recool without full thermal cycling after partial warm-up [2]	Aluminium [2]	No [2]	All attitudes [2]

Model	Effect on energy resolution	Status indication	Detector connectors	Stand
CFG-ICS-P4	Above 100 keV: warranted FWHM unaffected; below 100 keV: FWHM limit +10% versus LN_2 [2]	1 LED: power on [2]	None; detector cable set not included [2]	ICS STAND 2 is optional and not included [2]
ICS STAND 2	–	–	–	–
ICS-E	Above 100 keV: warranted FWHM unaffected; below 100 keV: FWHM limit +10% versus LN_2 [2]	2 LEDs: power on, cooler on [2]	0.3 m detector cable bundle from detector endcap; detector cable set included [2]	ICS STAND 2 is optional and not included [2]
ICS-HJ	Above 100 keV: warranted FWHM unaffected; below 100 keV: FWHM limit +10% versus LN_2 [2]	3 LEDs: power on, cooler on, status on preamp [2]	6 BNC, 1 SHV and 1 nine-pin connector on preamp; detector cable set included [2]	ICS STAND 2 is optional and not included [2]

Model	Ordering code	Height adjustment	Compatibility	Installation into shielding
CFG-ICS-P4	CFG-ICS-P4; cooler version ICS-P4 [2]	–	–	–
ICS STAND 2	–	Multiple height positions with pneumatic arm for raising/lowering [2]	ICS-E and ICS-P4 explicitly listed in ordering table; brochure narrative states any ICS model [2]	Installed from below; opening must exceed ICS-E detector seal-clamp diameter [2]
ICS-E	–	–	–	–
ICS-HJ	–	–	–	–

Model	Stand weight	Maximum combined load	Periodic stand maintenance	Weight
CFG-ICS-P4	–	–	–	–
ICS STAND 2	26 lb (approx. 11.8 kg) [3]	100 lb including ICS, detector and any lead plugs [3]	Not required; detector and cooler have their own maintenance requirements [3]	–
ICS-E	–	–	–	14 kg excluding detector [2]
ICS-HJ	–	–	–	14 kg excluding detector [2]

Model	Cooling rod length (selected when ordering)	Ordering	Preamplifier option
CFG-ICS-P4	–	–	–
ICS STAND 2	–	–	–
ICS-E	25, 114, 139 or 190 mm (tolerance ±3 mm); other lengths by special order [2]	Streamline only: suffix -ICS-E on the detector model, plus CFG-ICS-E and a cooling-rod line item ICS-LLExxx-[endcap]; sold only with a detector [4]	PLUS ultra-high-count-rate preamplifier available as CFG-ICS-E-PL (ICS with external PLUS preamp); cooling rod length must be specified [4]
ICS-HJ	–	Integrated with selected detector using suffix -ICS-HJ; not a standalone PopTop cooler [4]	–

Sources

[1] ICS Integrated Cryocooling System
ORTEC (AMETEK) · product-page · Specifications – Common; More Information; Specifications – Unique · checked 2026-10-16
https://web.archive.org/web/20261016000000/https://www.ortec-online.com/products/radiation-detectors/high-pu...

[2] ICS Integrated Cryocooling Systems
RTEC (AMETEK) · brochure · p. 5 'Specifications – Common for ICS-E, ICS-HJ, and ICS-P4' (Cooler); p. 2 Introduction; p. 5 'Specifications – Common...' (HPGe Compatibility); p. 7 'ICS-P4 GEM, GMX, and PROFILE PopTop Detector Dimensions'; p. 5 'Specifications – Common...' (E lectrical Supply) · checked 2026-10-16
https://edge.sitecorecloud.io/ametekinc1236b-ametekb19a-productiondcfa-1d17/media/Project/Ametek/ortec-onlin...

[3] ICS Stand II User Manual (ORTEC Part No. 1108265, Rev. B)
RTEC (AMETEK) · manual · PDF p. 6 (manual p. 4), §1.1.2 Mechanical; PDF p. 6 (manual p. 4), §1.1.1 Performance · checked 2026-10-16
https://web.archive.org/web/20230405074033/https://www.ortec-online.com/-/media/ametekortec/manuals/i/ics-st...

[4] ORTEC Product Guide
RTEC (AMETEK) · catalog · PDF p. 13 'GEM Detector Options' (-ICS-E) and PDF p. 15 'GEM Streamline ICS Cryostat'; PDF p. 15 'GEM Streamline IC S Cryostat' (also PDF p. 18 for PROFILE); PDF p. 13 'GEM Detector Options' (-ICS-HJ); PDF p. 17 for PROFILE · checked 2026-10-16
https://web.archive.org/web/20230405035438/https://www.ortec-online.com/-/media/ametekortec/product-guide/pr...

Every value is taken from the manufacturer’s own document; the number after the value refers to the source list. Always check against the latest datasheet before ordering.

The data comes from the manufacturer’s published documents. Manufacturers may change specifications; the current configuration and performance are confirmed in the quotation.