

Standard specification	HelioxVL	HelioxVT	HelioxTL	HelioxAC-V
Sample environment	Vacuum	Vacuum	Liquid	Vacuum
Sample space	40 mm sample space to suit 52 mm cold bore magnet	25 mm sample space for VT30, 43 mm sample space for VT50	38 mm	130 mm diameter x 100 mm height
Base temperature (no applied heat load, with standard radiation shields)	≤ 245 mK for ≥ 90 hours	≤ 300 mK for ≥ 40 hours	≤ 260 mK for ≥ 50 hours	≤ 300 mK for ≥ 50 hours
Maximum temperature	1.2 K as standard. Higher temperature option available: up to 300 K in zero field, up to 100 K in magnetic field	1.2 K as standard. Higher temperature option available: up to 300 K	1.2 K as standard. Higher temperature option available: up to 80 K	300 K as standard
Cooling power (with standard radiation shields)	40 μW at ≤ 290 mK for ≥ 10 hrs	50 μW at ≤ 350 mK for 6 hrs	400 μW at ≤ 300 mK for 6 hrs	100 μW at 350 mK for > 6 hrs
Temperature stability	±3 mK at T ≤ 1.2 K	±3 mK at T ≤ 1.2 K	±3 mK at T ≤ 1.2 K (on the probe)	±3 mK at T ≤ 2 K; ±0.1 K at T > 2 K (measured over a 10 minute period; see note 1)
Thermometers	Uncalibrated RuO ₂ sensors on the ³ He pot and the 1 K plate Uncalibrated carbon sensor on the ³ He sorb	Uncalibrated RuO ₂ sensors on the ³ He pot and the 1 K plate, Resistance sensor on sorption pump	Uncalibrated RuO ₂ sensors on the ³ He pot and the 1 K plate, Resistance sensor on sorption pump, uncalibrated RuO ₂ on top loading probe	Uncalibrated RuO ₂ sensors and calibrated Cernox sensors on ³ He pot, uncalibrated carbon sensors on sorb and other critical control elements
³ He regeneration time	30 min	40 min	50 min	Typically 3 hours (note 2)
Liquid helium consumption (typical)	3 litres to cool the insert from room temperature to 4.2 K. 0.04 l/hr running at base temperature	Consumption of the VTI 100-150 cc/hr	2 litres to cool probe to 4 K. 0.05 l/hr additional consumption to run	NA
Sample access	Sliding seal with clamp, via removal of IVC at greased cone seal. Two line-of-sight ports to the sample space, 6.0 mm clear internal diameter. NW16 flanges at room temperature	Brass IVC with greased cone seal	Via top-loading probe	Via removal of IVC
Cryogenic service interval	NA	NA	NA	15,000 hours

Note 1: using an ITC503 to stabilise **Note 2:** For low heat capacity sample and standard radiation shields. 3 hours is the time to recondense ³He charge and cool the ³He pot to ≤ 320 mK (if ³He initially at < 4 K)

Experimental access

HelioxVL	24-way Fischer connector and mating plug at room temperature. Nomex woven ribbon cable of 12 twisted pairs (24 wires). 0.1 mm diameter constantan wires with polyester insulation. 25-way miniature D-type connector and plug on top of ³ He pot .
HelioxVT	10-way loom of constantan wires (twisted pairs) to connector on the ³ He pot.
HelioxTL	Via top loading probe. 24-way loom of twisted pair constantan to tag strip in the 1 K region. Blank top fitting for customer use. 2 off 6 mm diameter ports to allow fitting of extra wiring, fibre optics, etc.
HelioxAC-V	24-way constantan loom (12 twisted pairs). 0.1 mm diameter wire with polyester insulation. 24-way Fischer connector at room temperature. 25-way micro D connector mounted on the ³ He pot. Spare 22 mm internal diameter access port to the cryostat vacuum chamber. The port is fitted to the cryostat top plate and has an NW25 flange termination.

Options

HelioxVL for INTEGRA™ environment system	HelioxVLMD
BT100/150/200	100/150/200 mm clear sample space to field centre line
BTLEC	Low eddy current sample holder with BT200 sample option
HELVLSWR	Swedish rotator (Manual/Automatic)
HelioxVL for transport dewar	HelioxVLTD
HELVLHT	High temperature upgrade
HD120H	120 litre helium dewar
HELIOXMAG	Integral magnet 2 T, 4 T, 6 T
HELIOXCL	Magnet current leads
HelioxVLMD & HelioxVLTD - Common options	
UNIVSTD+4S1	Additional 4 x stainless steel co-axial cables wired to the ³ He pot
24C	24-way constantan loom
4S1	4 x flexible co-axial cables wired to the ³ He pot
24C+4S1	Combination of 4S1 and 24-way loom
UT85VL	1 x semi-rigid stainless steel co-axial cable wired to 1 K plate
HELVL1KPUMP	1 K stage pumping system (Heliox 1 K pump)
HELVL1KMAN	1 K pump manifold only option
HelioxVT	
HELVTHT	High temperature upgrade
HelioxVT30SYS	HelioxVT to fit standard 30 mm sample space VTI
HelioxVT50SYS	HelioxVT to fit 50 mm sample space VTI
VTI50	50 mm sample space VTI to suit HelioxVT50SYS
HelioxTL	
HELHT	High temperature upgrade
HEL3TLP38	Spare top loading probe for wide bore insert
HE3TLPUMP	Pumping manifold for 1 K pot (Rotary pump, pumping lines, vacuum valves and gauge)
HelioxAC-V	
24C-HAC	24-way constantan loom
4S1-HAC	4 x flexible stainless steel co-axial cables wired to the ³ He pot
24C+4S1-HAC	24-way wired connector + 4 x flexible stainless steel co-axial cables wired to ³ He pot
Generic parts:	
H4-600	Turbo pumping kit excluding vacuum gauge
H4-601	Turbo pumping kit including vacuum gauge
ISOM	Isobus master cable
CONCAB	1 x ISOM and 2 x ISOS cables
ROTH1VL	RuO ₂ thermometer, type 1, 30 point calibrated
ROTH2VL	RuO ₂ thermometer, type 2, generically calibrated

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