





A Judges Scientific company

OxCryo is proud to be part of the Judges Scientific Group, a collection of world-leading companies dedicated to precision, performance, and scientific progress.

Established in 2004, Judges Scientific plc has built a portfolio of more than 20 businesses, each specialising in high-value, niche technologies that serve the global research and industrial markets. From materials science and microscopy to thermal analysis and spectroscopy, the group's companies share a single focus: delivering reliable, technically advanced tools that enable scientific excellence.



DEBEN:



Quorum



MOORFIELD
NANOTECHNOLOGY

Scientifica



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THE CRYOSTREAM

A cornerstone of diffraction analysis and the default choice in most XRD cabinets.

For more than 40 years, the Cryostream has set the standard for open-flow sample cooling, delivering a precisely controlled stream of nitrogen gas at any temperature between 80 and 500 K.



CONTROLS SAMPLE ENVIRONMENTS

PRESERVES CRYSTAL INTEGRITY

ENABLES CLEANER DIFFRACTION DATA

COOL & HEAT SAMPLES

The Cryostream supports experiments across a wide thermal range. Cooling slows radiation-induced sample damage, while heating reveals dynamic behaviours that would otherwise remain hidden.

PREVENT ICE FORMATION

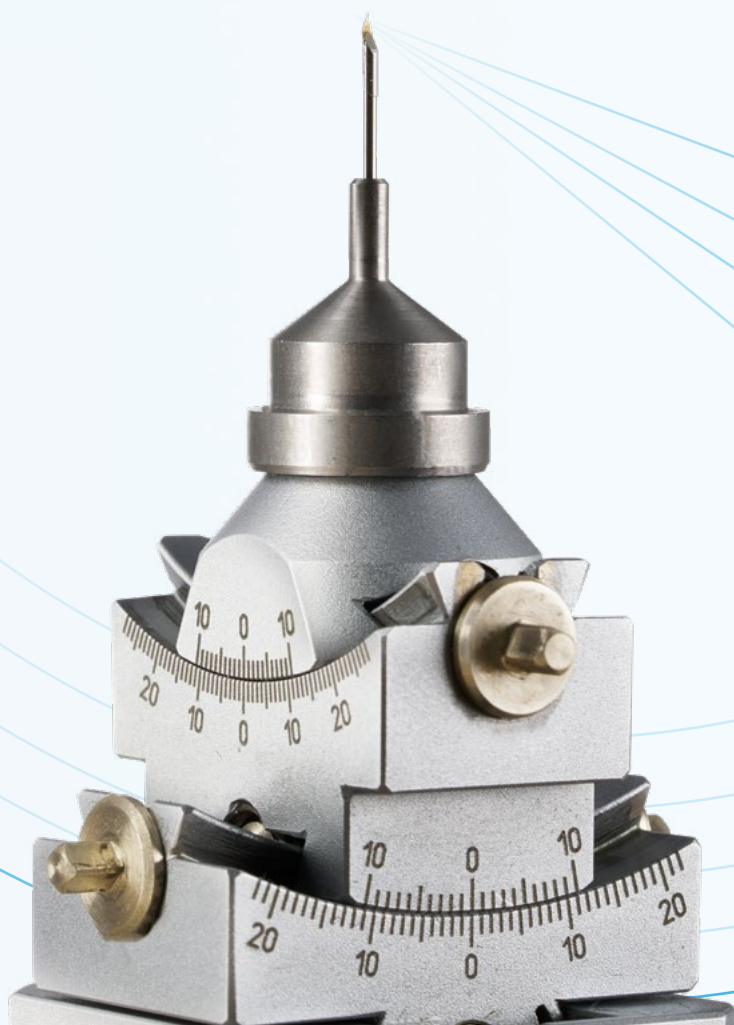
A laminar flow of dry air shields the sample stage from ambient moisture and protects the sample from ice formation during low-temperature experiments.

OPEN-FLOW COOLING

Open-flow cooling delivers a precisely controlled stream of cold nitrogen directly onto the sample, eliminating beamline windows and physical barriers that can interfere with the experiment.

0.1 K TEMPERATURE STABILITY

Exceptional thermal stability keeps temperature drift to an absolute minimum throughout data collection, ensuring precise, reproducible experimental conditions.



HOW IT WORKS

Every component within the Cryostream has a clearly defined role, working together to generate, regulate, and maintain a precisely controlled sample environment with exceptional thermal stability.

Together, they form a temperature control system that combines exceptional stability, efficient liquid nitrogen consumption (as low as 0.6 L/h) and flexible software integration to support everything from routine laboratory measurements to demanding beamline experiments.

- | | | |
|----------------------------|---------------------|--------------------|
| 1 GAS DELIVERY HEAD | 2 CONTROLLER | 3 GAS PUMP |
| 4 DRY AIR GENERATOR | 5 DEWAR | 6 AUTOFILL* |



* see accessories section for more information



1

GAS DELIVERY HEAD

The gas delivery head brings together two independently controlled gas flows to create a stable, temperature-controlled region around the sample.

COLD-STREAM

The cold-stream of gas delivers temperature-controlled nitrogen directly onto the sample.

GAS-SHIELD

A dry gas-shield isolates the cold-stream from the local atmosphere, creating a stable and controlled environment around the sample.



Sample pin courtesy of MiTeGen

TEMPERATURE REGULATION

The controller continuously adjusts multiple system parameters to maintain stable gas flow and precise temperature control throughout the experiment.

**SOFTWARE INTEGRATION**

Serial, USB and auxiliary interfaces support diffractometer platforms, beamline control systems, and custom experimental environments.

VISUAL INDICATORS

Front-panel status indicators provide immediate feedback on system condition.

PRECISE GAS FLOW

The gas pump works with the controller to maintain precise temperature regulation and reliable long-term performance during extended experiments.



4

DRY AIR GENERATOR

MOISTURE EXCLUSION

The dry air generator provides the dry, room temperature air necessary for the gas-shield, preventing ice formation during low-temperature operation.



5

DEWAR



LEVEL SENSOR

The liquid nitrogen dewar comes with a level sensor that continuously monitors the liquid nitrogen level.

AUTOFILL COMPATIBLE

An optional Autofill accessory is available, which enables automatic replenishment from a larger supply dewar.

60 LITRES

The dewar provides sufficient liquid nitrogen capacity for extended experimental runs.



SPECIFICATIONS

GAS DELIVERY HEAD	
Temperature Range	80 - 400 K (Standard) 80 - 500 K (Plus)
Nitrogen Gas Flow Rate	5 or 10 L/min
Stability	< 0.1 K
Cooldown Time (Room Temp. to 100 K)	~ 60 min
Transfer Line	1.5 m (Standard) 3 m (Long)
Weight & Dimensions	1.1 kg Ø82 x H: 442 x D: 98 (mm)
CONTROLLER	
Weight & Dimensions	5 kg W: 445 x H: 52 x D: 322 (mm)
Mains Power Supply	100 - 240 V 50/60 Hz
Power Consumption	200 VA
GAS PUMP	
Weight & Dimensions	10 kg W: 300 x H: 188 x D: 326 (mm)
Mains Power Supply	100 - 240 V 50/60 Hz
Power Consumption	150 VA
DRY AIR GENERATOR (OPTIONAL)	
Weight & Dimensions	25.5 kg W: 445 x H: 340 x D: 440 (mm)
Mains Power Supply	100 - 240 V 50/60 Hz
Power Consumption	500 VA
AUTOFILL (OPTIONAL)	
Weight & Dimensions	2.4 kg W: 120 x H: 180 x D: 245 (mm)
Mains Power Supply	100 - 240 V 50/60 Hz
Power Consumption	75 VA

CRYOCONNECTOR



Designed specifically for temperature controlled experiments, CryoConnector provides access to the full capabilities of the Cryostream through a modern and intuitive interface, from straightforward day-to-day operation to advanced control for specialist research.

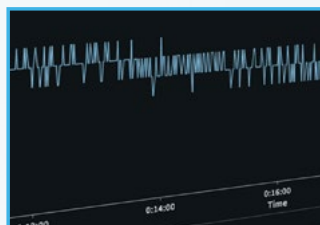
ADVANCED CONTROL

Fine control over temperature profiles, gas flow, and annealing techniques enable experiments beyond the capabilities of many standard instrument control systems.



REAL-TIME MONITORING

Real-time visualisation provides immediate insight into Cryostream performance throughout an experiment. Interactive time-series plots, diagnostics, and historical logging make it easy to analyse extended runs.



INTEGRATION READY

Python libraries are available for users to integrate control and diagnostics into their bespoke software, allowing the Cryostream to fit into existing workflows.



APPLICATIONS

PROTEIN CRYSTALLOGRAPHY

The Cryostream is the **industry standard for cooling single crystals on home sources and beamlines** during crystallographic experiments for precise temperature control, helping researchers identify the 3D structure of macromolecules and understand their function.



80 – 100 K

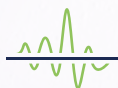
CRYOGENIC PRESERVATION



- Stabilise fragile crystals
- Minimise radiation damage
- Improve diffraction quality

180 – 293 K

EXPLORE DYNAMICS



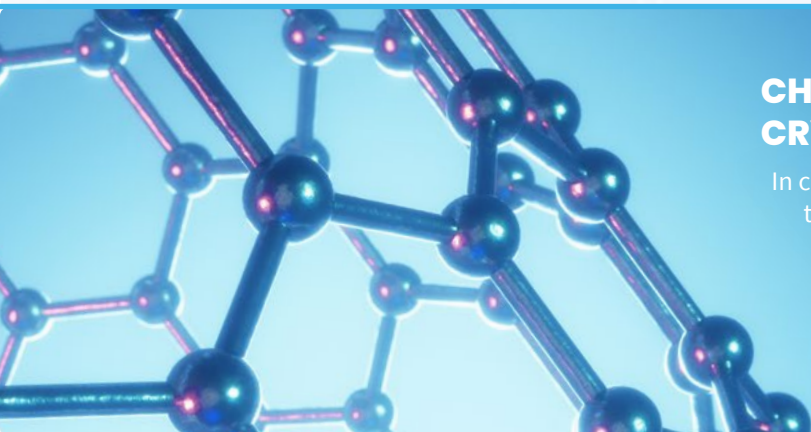
- Capture reaction intermediates
- Provides bio-relative structural information
- Reveals previously hidden conformations

294 – 320 K

BODY TEMPERATURE



- Mimics physiological conditions
- Structural info of biological processes



CHEMICAL CRYSTALLOGRAPHY

In chemical crystallography and materials science, temperature is one of the most important experimental variables. Using the **Cryostream Plus** to control the sample temperature from **80 - 500 K**, allows observation of structural changes, phase transitions and functional properties.



80 - 100 K

HIGH PRECISION



- Reduce thermal motion
- Sharper diffraction
- Essential for accurate structural models

150 - 300 K

VARIABLE TEMPERATURE STUDIES



- Thermal expansion
- Disorder & polymorphism
- Spin crossover

300 - 500 K

PHASE TRANSITIONS



- MOF breathing
- Ionic conductivity
- Storage materials

For more than 40 years, the Cryostream has enabled low-temperature diffraction experiments across structural biology, chemical crystallography, pharmaceutical research, and materials science.

SINGLE CRYSTAL DIFFRACTION

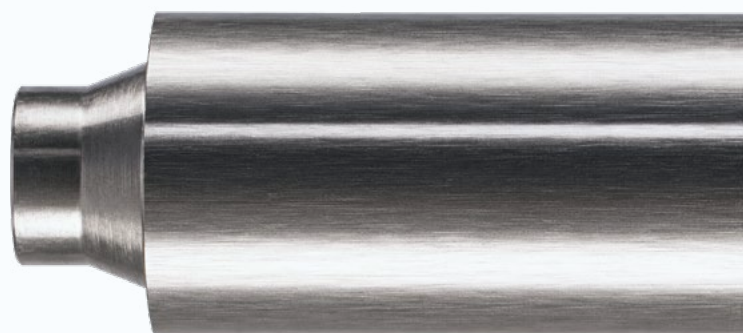
Single crystal X-ray diffraction provides detailed insight into molecular structure, revealing atomic positions, bond lengths, intermolecular interactions, and crystallographic disorder. By reducing thermal motion within the crystal lattice, low-temperature data collection improves structural resolution, reduces radiation damage, and enables more accurate refinement of crystallographic models.

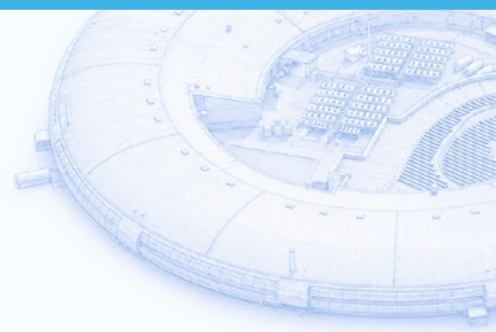


POWDER DIFFRACTION

Powder X-ray diffraction is widely used to identify crystalline phases, investigate structural transformations, and characterise materials across a broad range of scientific disciplines. Temperature-dependent studies provide valuable insight into phase transitions, thermal expansion, polymorphism, and material stability.

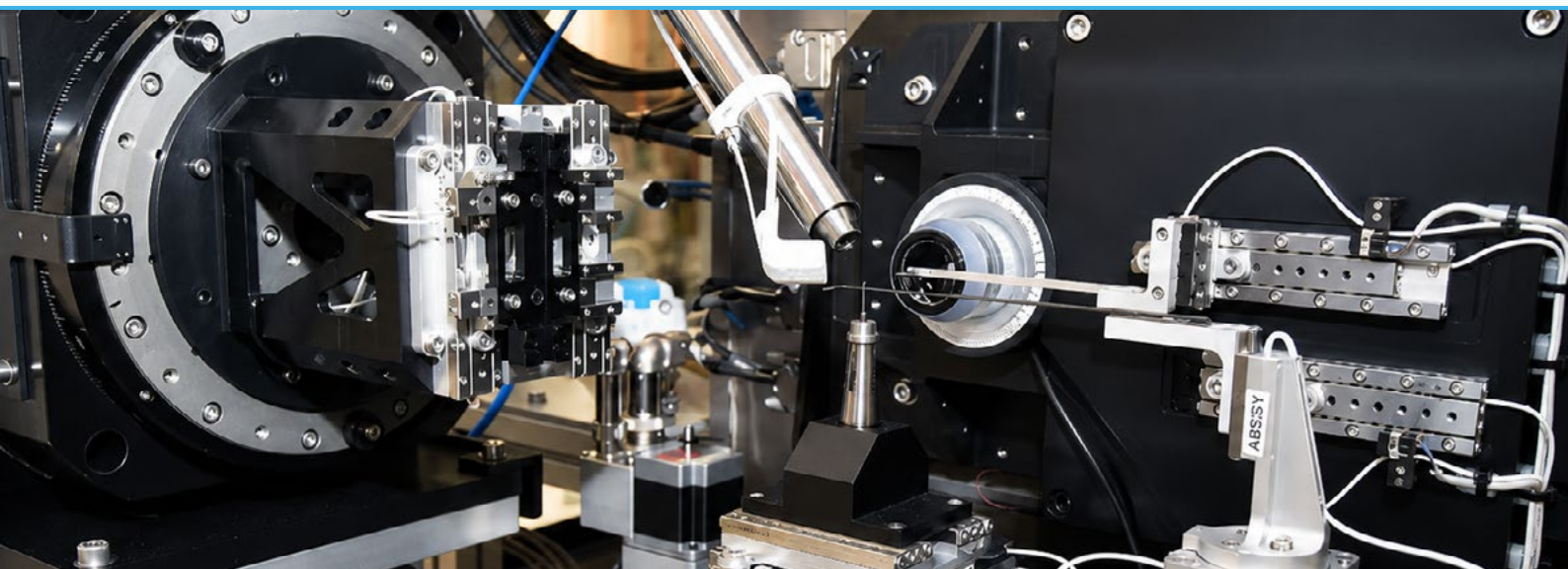
Operating from 80 K to 500 K, the Cryostream enables researchers to investigate structural behaviour across a wide temperature range, supporting applications in pharmaceuticals, energy storage, advanced materials, and *in situ* diffraction studies.





SUPPORTS OVER 20 SYNCHROTRONS WORLDWIDE

From dedicated macromolecular crystallography beamlines to advanced materials characterisation facilities, the Cryostream supports a diverse range of synchrotron experiments. Our engineering team works closely with facilities to accommodate specialised requirements, ensuring seamless integration into both established and next-generation beamline environments.



TRUSTED ACROSS 40 YEARS OF RESEARCH

“WE HAVE TO HAVE ONE OF THESE”



Elspeth Garman was the first to utilise the Cryostream for studies in structural biology. She recounts her introduction to the Cryostream and why it has remained the industry standard sample cooling device in single-crystal diffraction for over 40 years.

Watch our extended interview with Elspeth Garman

OVER 5,400 SCIENTIFIC CITATIONS



Trusted by researchers for over 40 years, Cryostream technology continues to support world-leading crystallography research across structural biology, chemistry and materials science.

Browse more than 5,400 publications by scanning the QR code.

OPTIONS

The following options support a broad range of applications.

Many of these began as bespoke solutions for specific customers, and we remain committed to ensuring that nothing stands in the way of our customers advancing their science, so if there's an option you'd like which isn't listed here, we want to hear from you!

LONGER TRANSFER LINE

LARGE CABINET INTEGRATION

The longer transfer line **extends the distance between the Cryostream and the dewar**, providing greater flexibility when integrating the system into large X-ray diffraction cabinets or laboratory environments.

COMPACT NOZZLE

SMALL CABINET INTEGRATION

The compact nozzle **reduces the overall length of the gas delivery head by 134 mm**, making it ideal for installations where space is limited. Its shortened design also supports applications requiring horizontal sample access or constrained experimental geometries.



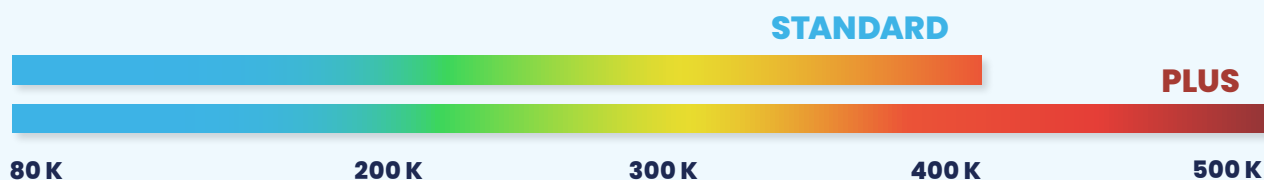
OPTIONS	SCD	PXRD
LONGER TRANSFER LINE	✓	
COMPACT NOZZLE		✓
CRYOSTREAM PLUS		✓
WIDE NOZZLE	✓	✓

These configurations are just examples of how you can configure the Cryostream to fit your needs. If you're unsure which would best suit your application, our experts will be happy to provide advice.

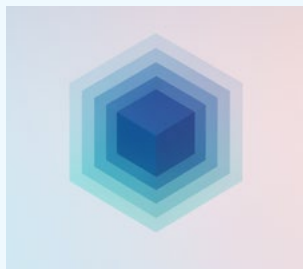
CRYOSTREAM PLUS

HEAT SAMPLES TO 500 K

Cryostream Plus extends the operating temperature range up to 500 K, enabling precise and reproducible heating of samples above ambient temperature. This expanded range **supports a wider variety of experiments, from catalyst and semiconductor studies to advanced materials research.**



WIDE NOZZLE



STUDY LARGE SAMPLES

The Wide Nozzle **allows large samples (3 mm wide) to be cooled efficiently at the standard 7 mm distance**. In neutron crystallography, these crystals often have huge unit cells and require cold neutron beams, so the wider stream ensures stable cooling and reliable diffraction data.

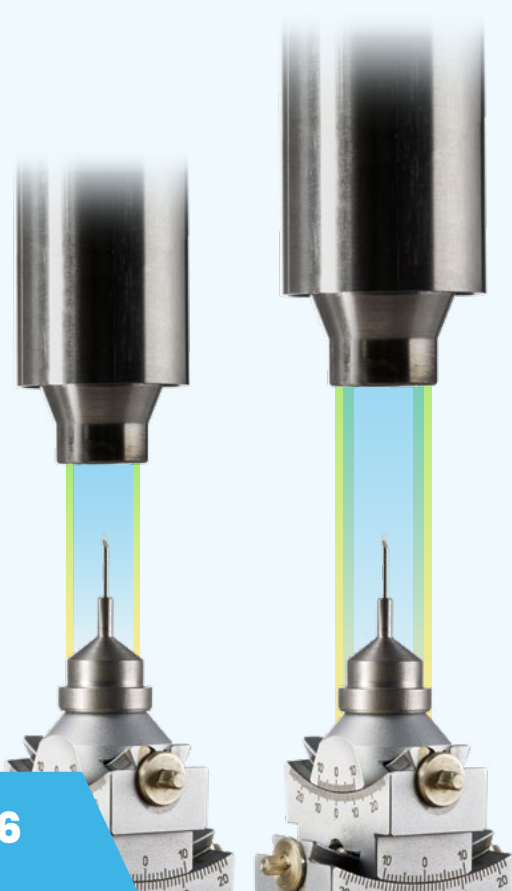
STUDY EMBEDDED MATERIALS

Many challenging samples must be embedded in resins, oils, or adhesives to stabilise or transport them. The Wide Nozzle accommodates these mounted or embedded specimens better than the standard width nozzle, ensuring cooling efficiency without compromising diffraction quality.



REDUCE SHADOWING

The larger sample area of the Wide Nozzle means standard-sized **samples can be positioned up to 16 mm from the nozzle** without compromising temperature stability. This reduces X-ray beam shadowing and improves data quality.



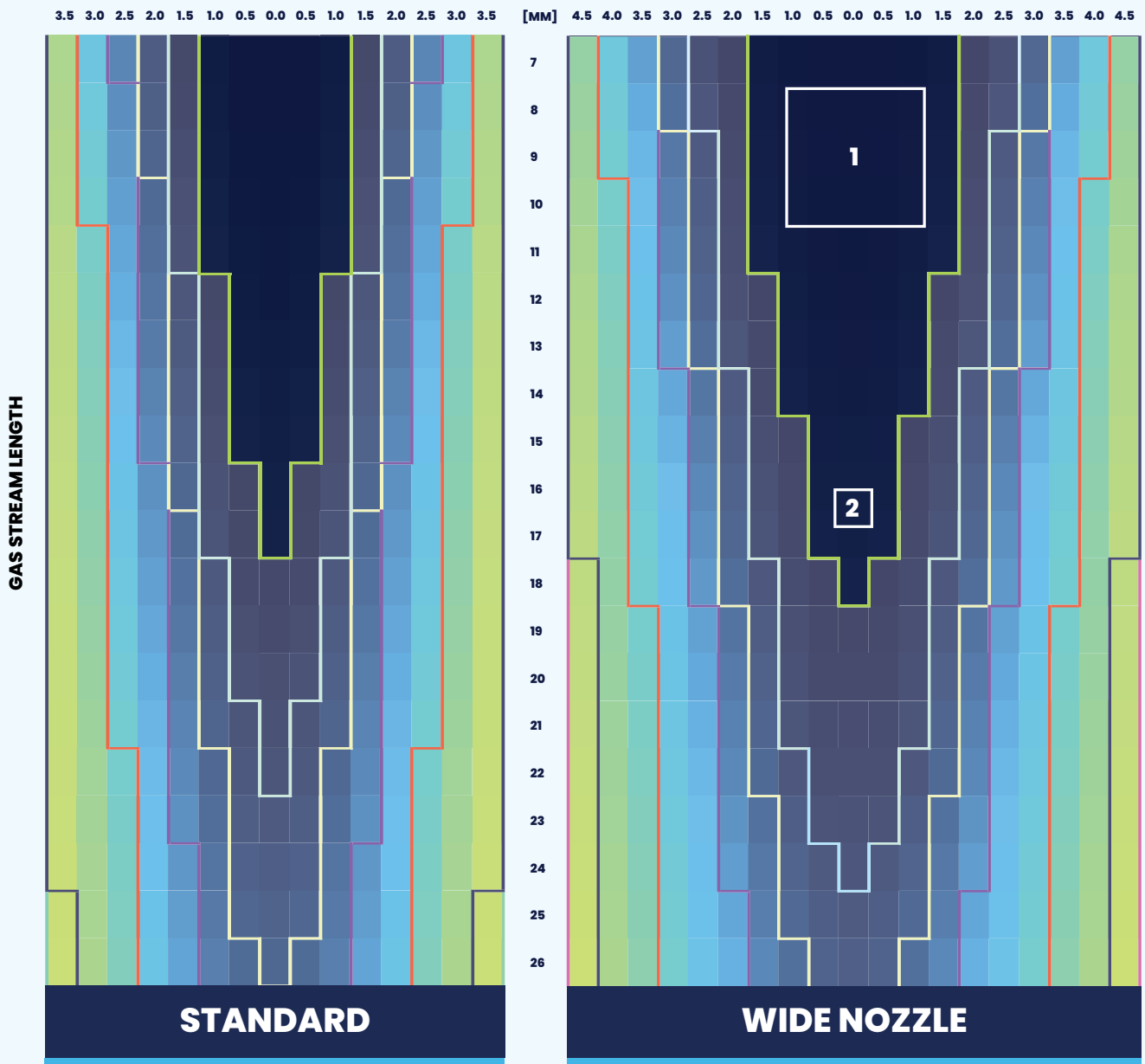


THERMAL MAP COMPARISON

The Wide Nozzle maintains a precise, temperature controlled sample zone (± 1 K of the setpoint) across a much broader central zone.

The thermal maps below illustrate how this enlarged area extends the usable sample region in both width and depth, giving researchers greater flexibility to use large samples [1] or reduce X-ray shadowing [2].

GAS STREAM WIDTH



ACCESSORIES

AUTOFILL

The Autofill continuously monitors the dewar level and performs automatic refill cycles. The result is **a safer, more convenient cryogenic workflow** with reduced maintenance requirements and extended operation.



1 VISUAL STATUS INDICATION

Integrated LED indicators provide clear feedback on liquid nitrogen level, refill activity, and system status for quick at-a-glance monitoring.

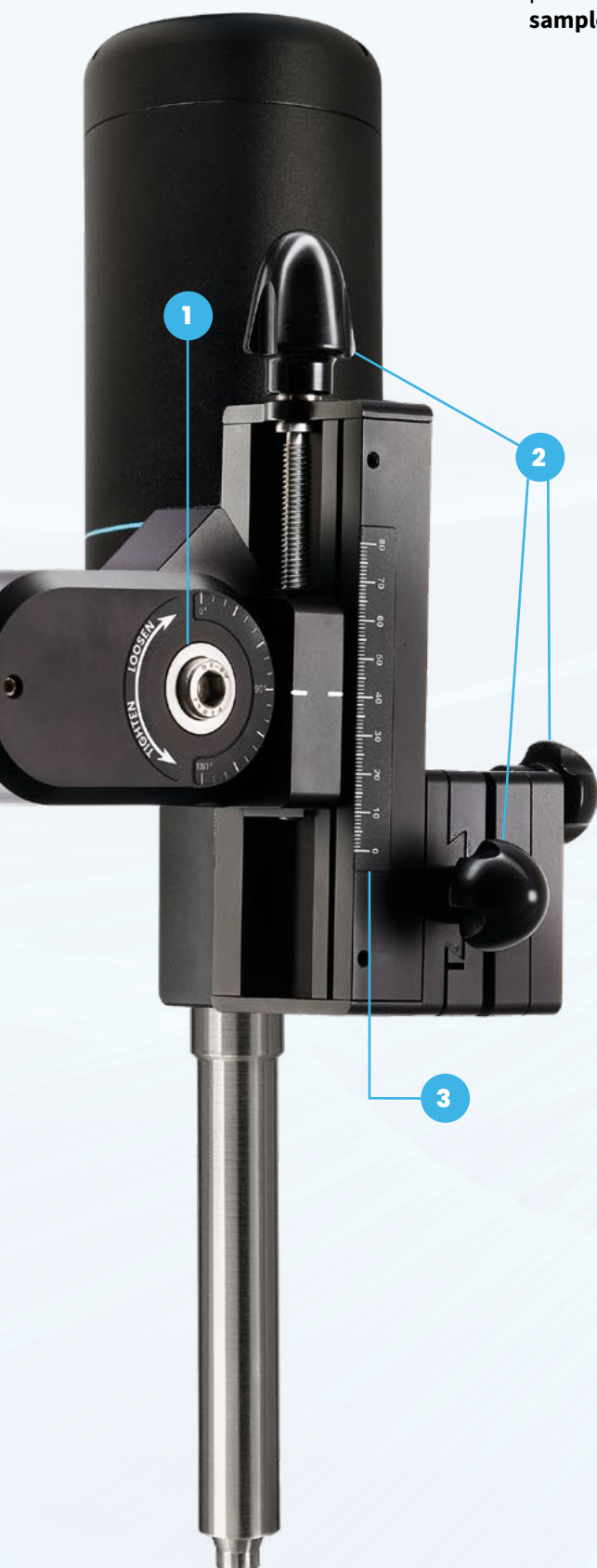
2 PROGRAMMABLE FILL LEVELS

User-defined start and stop thresholds allow refill cycles to be tailored to laboratory requirements, optimising liquid nitrogen consumption and system uptime.

VARIBEAM MOUNT

The Varibeam stand provides a sturdy support for the gas delivery head, facilitating easy and precise adjustment of gas delivery head orientation and positioning of the nozzle for **accurate alignment of the cold-stream onto the sample.**

Scan to watch our
nozzle alignment
tutorial



1 TILT CONTROL

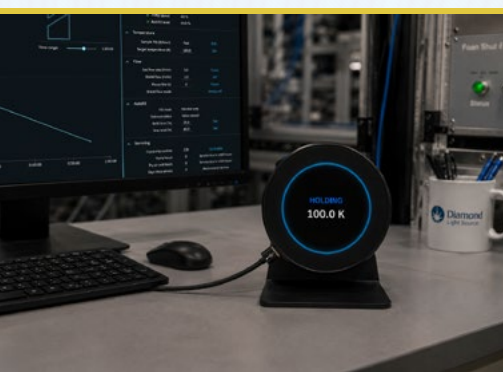
Secure and simple Allen key locks let you make quick, macro-level tilt adjustments to the gas delivery head, so you can dial in the orientation.

2 PRECISION XYZ

Smooth-action knobs provide precise control over the XYZ translation, with just the right amount of resistance to make adjustments easy to perform but keep positioning reliably locked in.

3 METERED NOZZLE POSITION

Meters offer clear references for both angle and depth, making it easy to record and return to a precise nozzle position.



DISPLAY PUCK

The Puck provides a convenient visual display for users who want to see key Cryostream information at a glance. Connected directly to the controller, it cycles through operating parameters, temperature information, and system status.



1 LIVE SYSTEM STATUS

Displays key operating information including temperature, operating mode, and system status, providing instant feedback without opening the control software.

2 MAGNETIC BACK

The integrated magnetic rear allows the display puck to attach securely to the mobile storage rack, instrument cabinets, or any suitable steel surface for convenient positioning.

3 METALLIC STAND

Transforms the display puck into a freestanding display, making key system information easy to view from any workstation.

MOBILE STORAGE RACK

This mobile storage rack is a **dedicated workstation for the Cryostream**, bringing the **core components together into a single organised footprint**. Purpose-designed for Cryostream it improves cable management and makes the system easier to operate, maintain, and relocate within the laboratory.

1 DEDICATED HOUSING

Shelving is spaced so that the Cryostream components sit in a tidy and organised fashion, with easy access for operation and maintenance.

3 CABLE MANAGEMENT

Integrated cable routing helps organise power, communication, and gas line connections, reducing clutter and maintaining a professional laboratory installation.

2 HOLDER

A dedicated holder houses the gas delivery head when not installed in the diffractometer, useful during maintenance.



4 LOCKABLE CASTORS

Lockable castors allow the Cryostream to be moved as a single unit during maintenance, and safely locked in place when in use.

CRYOSTREAM 1000

Existing alongside the modular Cryostream platform, the Cryostream 1000 is a fully integrated solution for conventional X-ray diffraction laboratories.

By combining the controller, gas handling, and cooling hardware into a single enclosure, it offers straightforward installation and access to the proven reliability that has made the Cryostream the industry standard for more than 40 years.

1 GAS DELIVERY HEAD

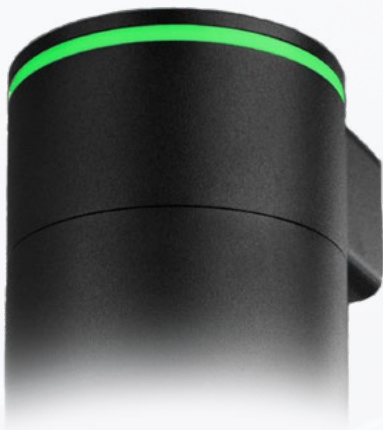
2 GAS SUPPLY MODULE (GSM)

3 DEWAR



LED RING STATUS INDICATOR

The illuminated LED ring provides immediate visual feedback from inside the diffractometer enclosure, allowing users to quickly confirm system status from a distance.



INTEGRATED CONTROLS

A built-in touchscreen provides direct access to temperature control, system monitoring and diagnostics.

STREAMLINED CABLING

By housing multiple Cryostream subsystems within a single enclosure, the Cryostream 1000 reduces external cabling and simplifies installation.



GAS SUPPLY MODULE

Weight & Dimensions	75 kg W: 430 x H: 870 x D: 570 (mm)
GAS DELIVERY HEAD 1000	
Weight & Dimensions	3.4 kg Ø85 x H: 450 x D: 108 (mm)

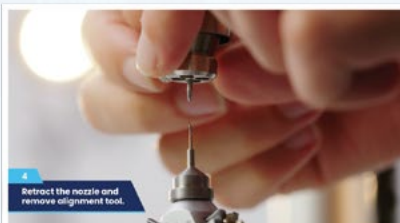
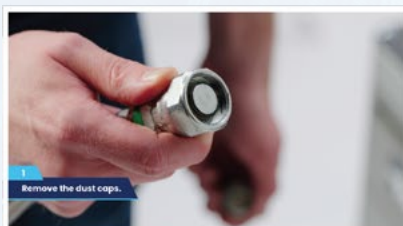
PARTS & SUPPORT

Our dedicated Support team is here to help you ensure your OxCryo equipment performs at its best. From our free expert advice and tailored service contracts, to the maintenance kits available on our e-store and a growing library of resources in our online Support Hub; we're here to keep your system running smoothly.



SUPPORT HUB

Explore our library of quick, easy-to-follow video guides and tech-notes, covering setup, installation, and routine maintenance. Learn from our experts and keep your system performing flawlessly.



SERVICE CONTRACTS

Keep your system in peak condition with our flexible service plans, from parts-only options to full on-site support. Choose the level of cover that fits your lab, and leave the rest to us.





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