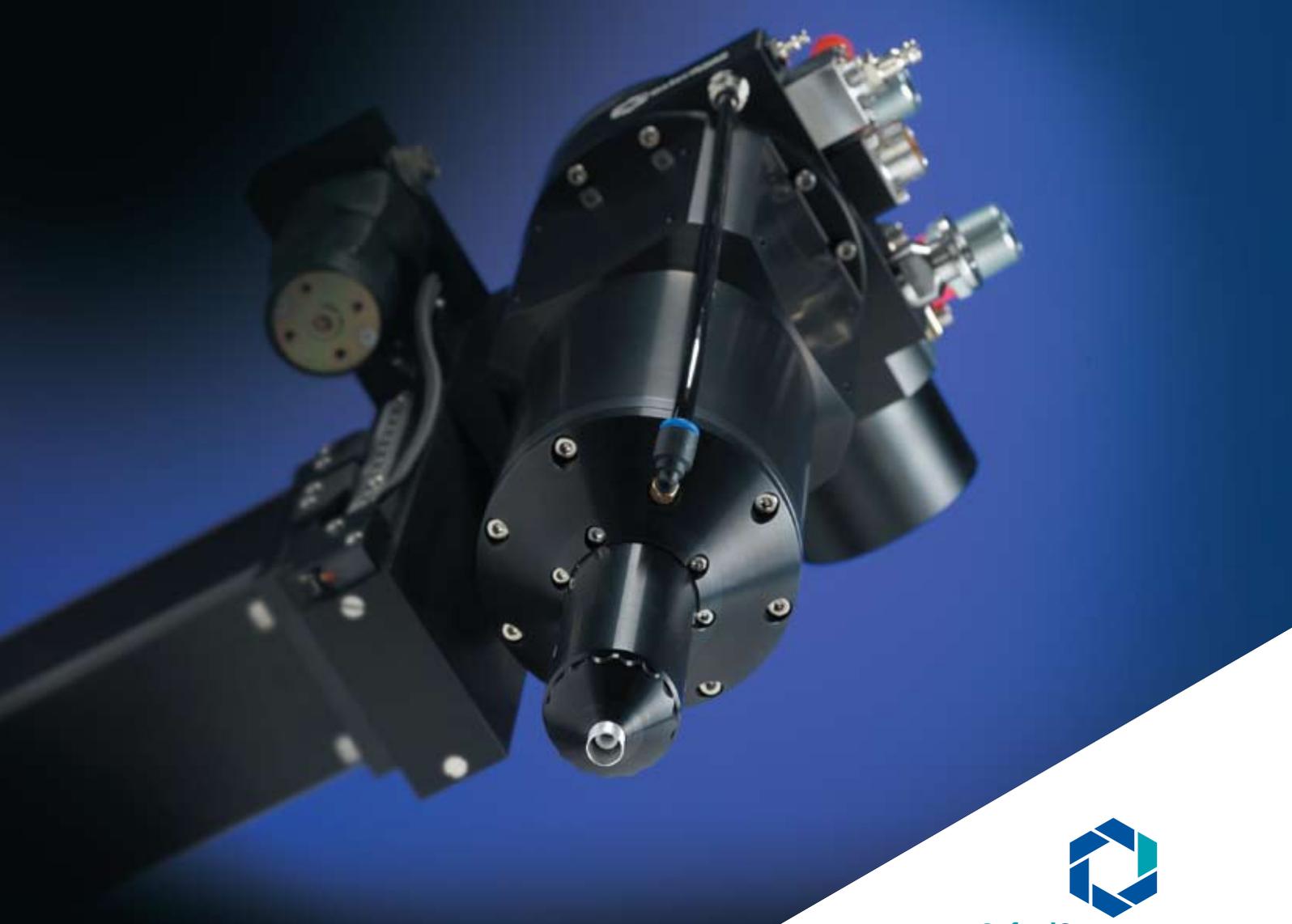


# N-HeliX

Helium gas open flow cryostat



**Oxford**Cryosystems



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**Oxford Cryosystems' N-HeliX is the latest version of the popular HeliX - the world's first helium gas open flow cryostat for X-ray crystallography.**

The HeliX was designed to cool crystals to temperatures as low as 28 Kelvin during the collection of X-ray data.

The major advantage of the HeliX over other commercially available open flow helium systems is that the HeliX does not use expensive and dangerous liquid helium – instead it uses gaseous helium from cylinders which is cooled mechanically to cryogenic temperatures.

The N-HeliX differs in that it can now be used with both helium and nitrogen gas, making it a more flexible and economical choice for those requiring a broad temperature range. The system uses helium and nitrogen gas, either from cylinders or (in the case of nitrogen) from a gas generator, such as that used with the Oxford Cryosystems' Cobra system.

The N-HeliX is capable of cooling samples to 28 K in an open stream of dry helium gas or to 100 K with nitrogen gas and can be used for long-term helium experiments by simply linking cylinders in a manifold.

### Features of the N-HeliX

- Uses helium gas from cylinders, not expensive liquid helium
- Can be used with nitrogen gas in addition to helium gas for greater flexibility and lower running costs
- Intelligent controller allows automatic mid-flow switching between nitrogen and helium
- Sample temperature is not affected by changing of gas cylinders, allowing long-term experiments to be performed with ease
- Fast cool-down to 100 Kelvin in just 45 minutes and 30 Kelvin in 75 minutes
- Excellent stability of 0.3 K at any temperature between 28 and 300 Kelvin
- Complete programmability and ability to monitor and control remotely via Cryopad software
- Can be used with nitrogen gas generator, which extracts gas from air

### Mode of Operation

Helium or nitrogen gas is cooled by passing it through heat exchangers mounted on a two stage, closed cycle cooler. The cold gas then passes out of the nozzle and over the sample.

The closed cycle cooler is mounted within the body of the N-HeliX and is driven by a helium compressor. The helium in this circuit is unrelated to the cold flow and is recycled by the compressor.

A second gas stream at room temperature provides extra shielding for the cold stream in order to improve the resistance to icing. For helium usage, a 10mm diameter X-ray transparent beryllium shield tube extends around and beyond the crystal to protect the cold stream from atmospheric contamination. Notches within the tube walls prevent primary X-ray beam diffraction and also allow accurate crystal positioning. This can be changed to a standard aluminium nozzle for data collection at nitrogen temperatures.

### Gas Sources

The N-HeliX can be used with nitrogen gas in addition to helium. The system requires a nitrogen gas flow regulated to 1 bar (14psi) with a flow of 10L-15L/minute and an atmospheric dewpoint of better than -70°C.

The options for nitrogen gas supply include:

1. In-house nitrogen gas supply if available
2. Oxford Cryosystems can supply a nitrogen gas generator, as used with our Cobra non-liquid Cryostream system, which produces pure dry nitrogen gas from the air. The generator has 2 outlet ports both providing gas at 1.2 bar for the inner and outer streams
3. Nitrogen gas cylinders

### N-HeliX Stand

Each N-HeliX is supplied with a motorised support stand. Oxford Cryosystems has a number of different stand designs, optimised for use with various X-ray systems. Please discuss the best option with your local office or agent before ordering the system.

### The Oxford Cryosystems Philosophy

When you buy a product from Oxford Cryosystems, you are investing in over twenty years of research and development in low temperature devices for X-ray crystallography. We see your low temperature device as more than just an accessory; to us, it is central to your research. We know that if your low temperature system were to let you down, then we would have let you down.

Because of our focus on low temperature systems, you will find that every one of our products has superior functionality, reliability and control. For example, the N-HeliX is built on a unique software platform which allows the constant monitoring of up to 14 different inputs and outputs within the system. The controller then manages a number of unique relationships such as refrigerator speed and cooling power as a function of vacuum.

An example of our attention to detail is the dual flow controller used in the N-HeliX. Not only does the controller detect which gases are fed in, it also enables the HeliX to switch between helium and nitrogen gas during a ramp. This means that helium gas is not wasted at temperatures above 100 Kelvin, where nitrogen would do just as well. Of course, this automatic gas selection can be easily overridden by the user if required.

These are just a few of the many unique design features engineered into all Oxford Cryosystems' low temperature devices. We take great pride in taking our product development that bit further, so that our customers benefit from the most stable, reliable and efficient devices available.

## Technical Specifications

N-HeliX	
Temperature range	28-300 Kelvin (100 -300 Kelvin with nitrogen)
Nitrogen gas flow rate	8 litres per minute (total of inner and outer streams)
Helium gas flow rate	7.5 litres per minute (total of inner and outer streams)
Temperature stability	0.3 Kelvin
Cool down time to 100 Kelvin	45 minutes
Cool down time to 30 Kelvin	75 minutes
N-HeliX coldhead weight	10.8 kg
N-HeliX coldhead clearance required	700mm vertically above the X-ray beam: diameter of 450mm
N-HeliX Controller	
Dimensions & weight	135 mm x 244 mm x 287 mm, 7.1 kg
Mains Power supply	230V 50Hz or 100/115V 50/60Hz
Power Consumption	500VA
Helium compressor (Cryodrive)	
Cryodrive weight	77 kg
Cryodrive dimensions	500 mm W x 500 mm H x 800 mm D
Mains power supply	200, 220 or 240 V at 50 Hz or 200, 208 or 220 V at 60 Hz
Cooling water supply	See pre-installation document, but typically 5 litres/minute at 12-20°C
Turbomolecular Vacuum Outfit	
Dimensions & weight	300mm W x 600mm H x 300mm D, 23kg
Mains Power supply	230V 50/60 Hz or 115V 50/60Hz
Lab nitrogen supply (if available)	
Gas purity	>97.5% purity
Gas pressure	Can be regulated to 1 bar (Max pressure 10 bar)
Gas flow	10-15 litres per minute
Atmospheric dewpoint of gas	-70°C or better
Gas outlet fitting	Outlet fitting size of ¼" BSPP female (or male with a 120 mm radial clearance for a regulator)
Nitrogen gas generator (optional)	
Generator weight	95 kg
Generator dimensions	900 mm W x 700 mm H x 310 mm D
Mains power supply	230V 50Hz, 100V 50Hz, 120V 60Hz, 100V 60Hz

### Support for all our customers...

Aside from our development expertise, Oxford Cryosystems have also gained an excellent reputation over the past twenty years for customer service and support.

Whilst Oxford Cryosystems' products are known for their reliability and ease of use, users may occasionally require advice on technical aspects of their system. Technical support is offered to all Oxford Cryosystems customers on all products. There are no time limits, no expensive telephone numbers and no small print. If you need support, you'll get it - it's that simple!

### Service when you need it...

Although Oxford Cryosystems design their devices to be as efficient and economical to maintain as possible, products such as the N-HeliX, due to its mechanical components, will need reasonably regular maintenance.

Therefore, Oxford Cryosystems offers a choice of pre-paid scheduled maintenance packages for complete peace of mind, or the more traditional reactive servicing approach. Whatever route you choose, you can be assured that we will advise you of the optimal service intervals. We simply don't believe in annual servicing for the sake of it - if your product needs servicing only every 3 years, or even every 5 we will tell you! For further details on the service packages we offer, simply contact your local Oxford Cryosystems office or agent.



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