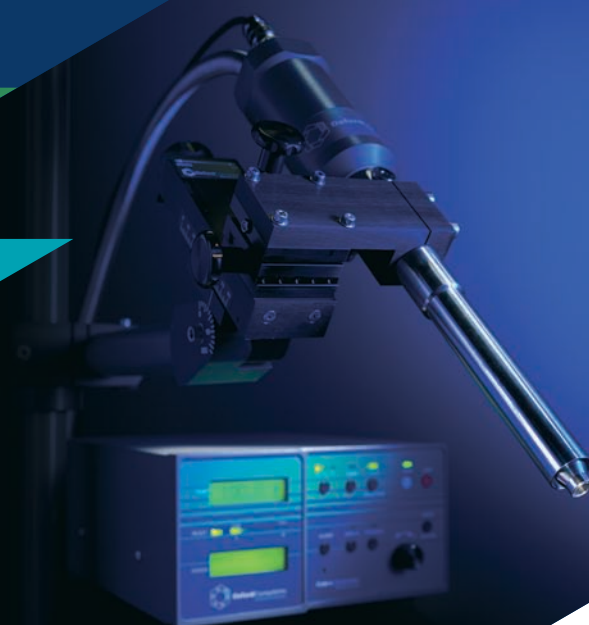
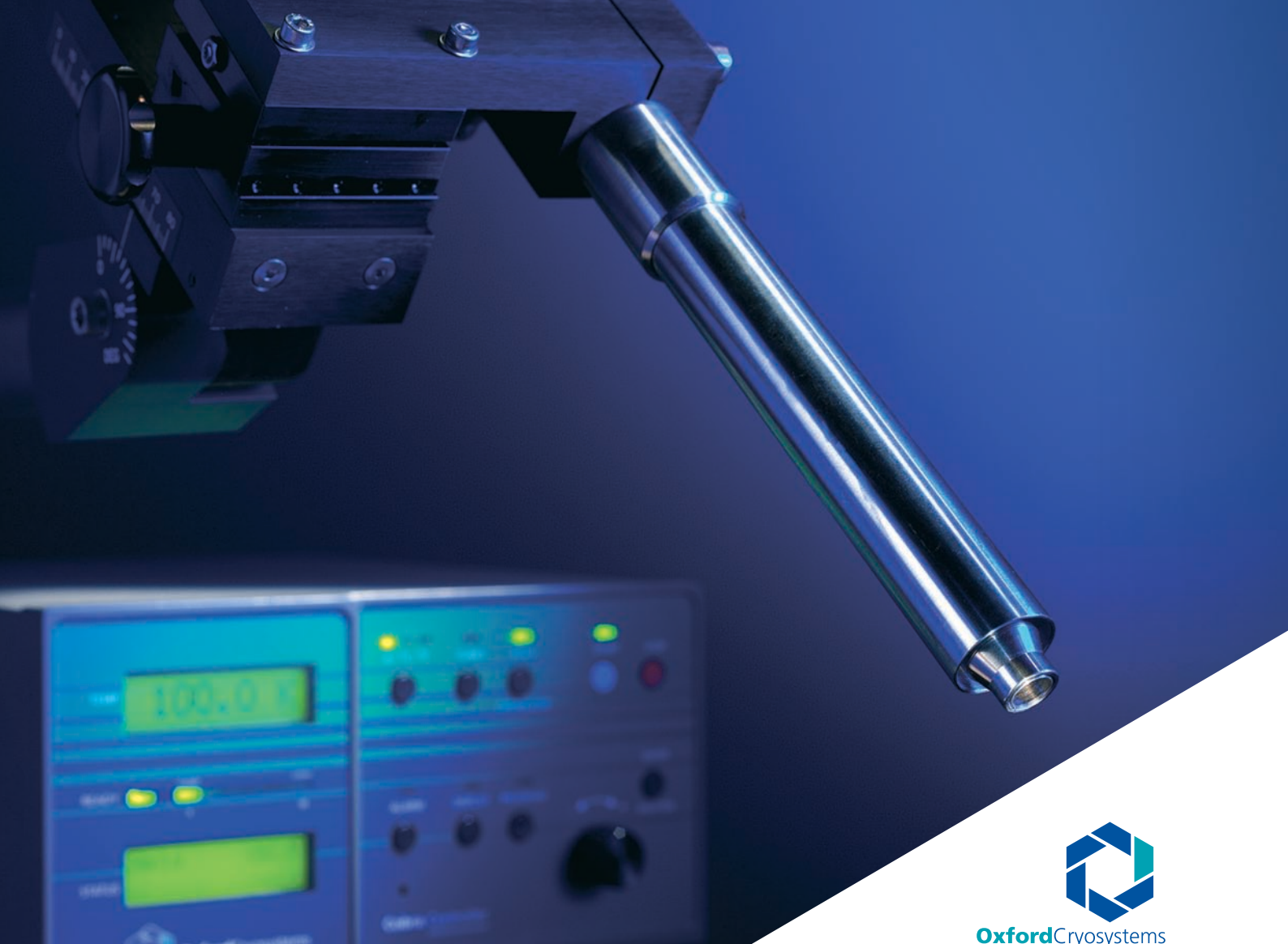


# Cobra

Non-liquid Nitrogen Cryostream



**Oxford**Cryosystems



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Non-liquid Nitrogen Cryostream

**Cobra is the new open flow Cooler from Oxford Cryosystems.**

**Simple Cryostream-like efficiency and reliability without the liquid...**

**Cobra truly offers the best of both worlds!**

Cobra has been designed for labs looking for Cryostream-like efficiency and functionality, without the need for liquid nitrogen.

As Cobra uses nitrogen gas it offers complete freedom from liquid nitrogen, and the challenges it presents such as storage, logistical and safety issues or simply the worry and responsibility of remembering to refill the Dewar! In fact, the Cobra can be left to run for weeks or even months without any user intervention, offering complete peace of mind and a stress-free laboratory environment.

Like the Cryostream, the Cobra is fully programmable, and can produce a cold stream at any temperature between 80 and 400 Kelvin, with a stability of 0.1 Kelvin. If a laboratory nitrogen gas supply is available, this can be used for the Cobra. Otherwise, an optional extra is the nitrogen gas generator which produces pure dry nitrogen gas from the air.

### Features of the Cobra

- No liquid nitrogen required
- Stable system can be run for weeks without user attention
- Superior nozzle design for better laminar flow and less risk of icing than competitive systems
- Temperature range of 80-400 K or 80-500 K for the Plus
- Very fast cooldown time (40 mins to 100 K)
- Excellent stability of 0.1 K with ability to log and record temperatures
- Complete programmability and ability to monitor and control remotely via Cryopad software

### Mode of Operation

Room temperature compressed nitrogen gas is cooled by the Cobra refrigerator (which incorporates a GM closed cycle cooler) and delivered to the Cobra head via a vacuum insulated transfer line. Whilst the Cobra head is smaller than the Cryostream coldhead, the dimensions of the nozzle have been retained, meaning the Varibeam support stand can still be used to support and position the gas delivery head. An external stream of nitrogen gas (or dry air) at room temperature provides the shield gas, which prevents icing of the sample.

### Cobra consists of

- Cobra gas delivery head, designed in the style of the Cryostream head \*
- 1.5 metre flexible insulated vacuum hose connecting Cobra head to Cobra refrigerator \*
- Cobra refrigerator incorporating a single stage GM coldhead \*
- Water-cooled helium compressor
- Optional nitrogen gas generator

\* The first 3 items are permanently joined to form an integrated assembly

### Optional Nitrogen Generator

The Cobra utilises dry compressed nitrogen gas which is cooled to <80 Kelvin by the Cobra's integrated Gifford McMahon refrigerator. Many labs have access to a piped-in dry nitrogen supply which can be used directly by the Cobra. If dry nitrogen gas is not available however, Oxford Cryosystems can supply a nitrogen gas generator, 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, thus avoiding the need for a dry air unit.

### Cobra Plus

Due to the high demand for our Cryostream Plus system, we have also introduced the Cobra Plus - a version of Cobra with an expanded temperature range of 80- 500K. Please contact Oxford Cryosystems or your local agent for details.

### 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 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 Cobra 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 gas temperature as a function of flow or cooling power as a function of vacuum quality.

A perfect example of our superior engineering is the unique gas delivery nozzle design which is used by both the 700 Series Cryostream and Cobra. Experience and development have led us to create the ideal laminar flow system ensuring that the likelihood of ice forming anywhere near the sample is virtually zero, and that the temperature at the crystal is accurately mapped and very stable.

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

<b>Cobra Gas Delivery Head *</b>	
Temperature range	80-400 Kelvin (or 80-500 Kelvin for Plus)
Nitrogen gas flow rate	5 or 10 litres/minute
Temperature stability	0.1 Kelvin
Cool down time to 100 Kelvin	40 minutes
Length of transfer line (to end of nozzle)	2000 mm
<b>Cobra Controller</b>	
Controller weight	7.1 kg
Controller size	135 mm x 244 mm x 287 mm
Mains Power supply	230V 50Hz or 100/115V 50/60Hz
Controller Power Consumption	500VA
<b>Cobra Refrigerator *</b>	
Refrigerator weight	15 kg
Refrigerator dimensions	278 mm x 200 mm x 277 mm
<b>Helium compressor (Cryodrive)</b>	
Cryodrive weight	77 kg
Cryodrive dimensions	500 mm W x 500 mm H x 800 mm L
Mains power supply	200, 220 or 240 V at 50 Hz or 200, 208 or 220 V at 60 Hz
Cooling water supply	See full technical specifications, but typically 5 litres/minute at 12-20°C
<b>Lab nitrogen supply (if available)</b>	
Gas purity	>97.5% purity
Gas pressure	Can be regulated to 1 bar (Max pressure 10 bar)
Gas flow	Approx 30 litres/minute per Cobra
Atmospheric dewpoint of gas	-75°C or better (-70°C acceptable)
Gas outlet fitting	Outlet fitting size of 1/4" BSPF female (or male with a 120 mm radial clearance for a regulator)
<b>Nitrogen gas generator (optional)</b>	
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

\* These items permanently joined to form an integrated assembly

### 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 Cobra, 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 2 years, or even every 3, 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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