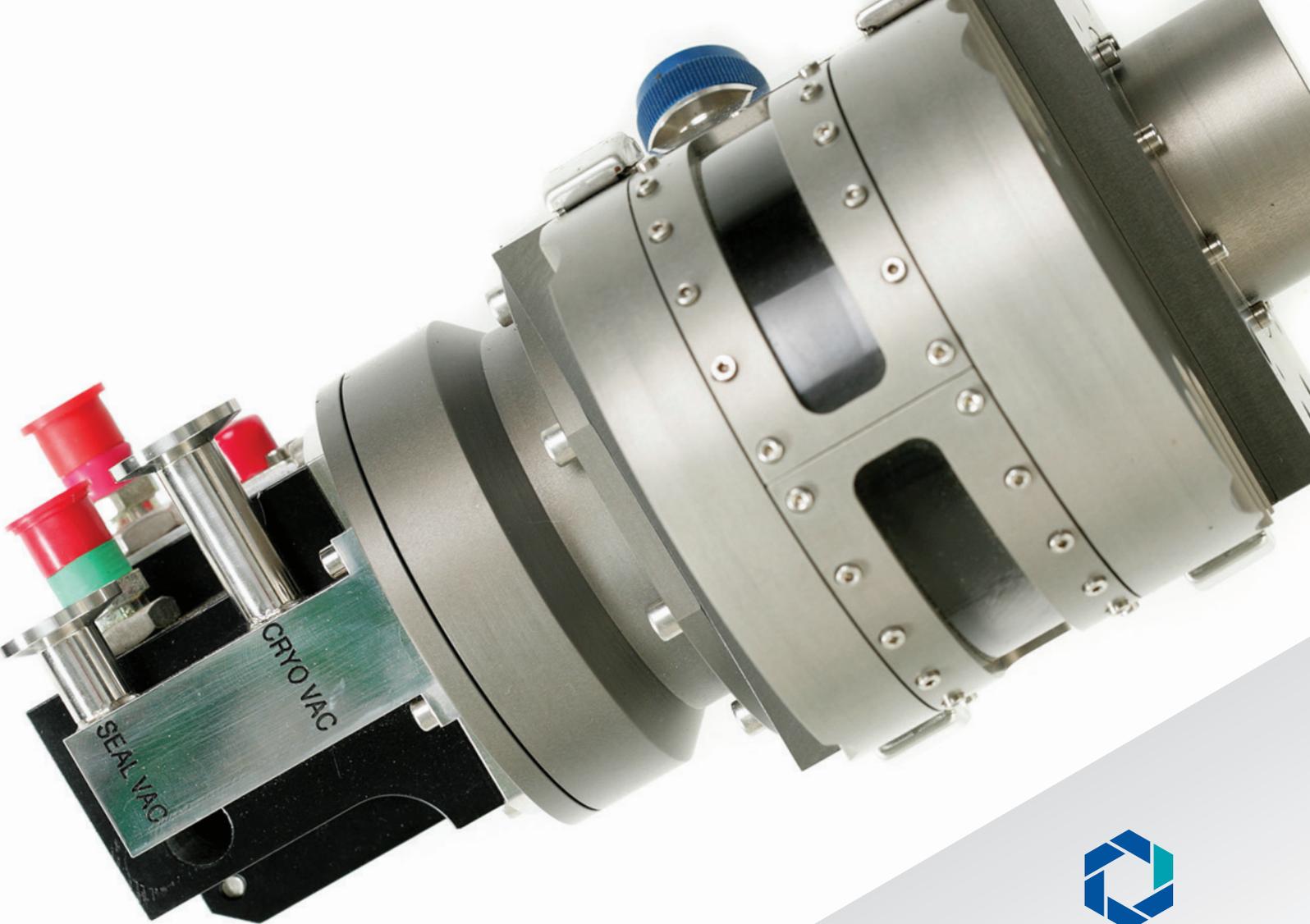


# PheniX

Low temperature cryostat for powder diffraction



OxfordCryosystems



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**The PheniX is a unique closed cycle cryostat especially designed for cooling flat plate powder samples to temperatures as low as 12K.**

The system incorporates a small and efficient Oxford Cryosystems 2-stage Gifford McMahon (GM) cooler, which allows fast and controllable cooling with no consumption of cryogens such as helium or nitrogen.

The PheniX offers excellent stability of 0.1 K, and fast cool-down and warm-up times for easy access and sample change.

Typical applications include:

- Investigation of materials at low temperature including organics, inorganics, drugs, minerals, metals and ceramics.
- Phase identification, quantitative analysis and determination of structure imperfections
- Determination of crystal structures & extraction of 3-D microstructural properties

The PheniX is designed to fit to vertical powder diffractometers and be used in both the theta - theta and theta - 2 theta modes. This is made possible by a uniquely designed rotating seal between the integrated GM Cryocooler and the sample stage. This allows the sample stage to move in the theta - 2 theta range of the detector without the high pressure hoses and cables becoming tangled up or interfering with other services in the enclosure.

The compact design means the PheniX can be easily fitted to the goniometer from the front with a specific adapter plate available for most popular types of goniometer.

## Features of the PheniX

- Incorporates two stage Oxford Cryosystems GM Cryocooler, so no consumption of cryogens
- Base temperature of 12 K and excellent stability of 0.1 K
- Fast cool-down to 20 K in just 40 minutes and 12 K in 60 minutes
- Fast warm-up to room temperature from 12 K in just 45 minutes
- Compact chamber allows easy sample access and can be fitted to most popular vertical goniometers
- Complete programmability and ability to monitor and control remotely via Cryoconnector software and Oxford Connect website

## Mode of Operation

A two stage Gifford McMahon (GM) closed cycle cooler made by Oxford Cryosystems is mounted within the body of the PheniX and operates using compressed helium gas provided by the Cryodrive compressor. It is important to note that there is no helium gas consumption in this system and the helium gas circuit in the Cryodrive/Coldhead combination is sealed.

The sample is cooled by the conduction of heat between the sample stage and the cold stages of the Coldhead, and the PheniX sample temperature is measured at the sample stage.

Heat leaks within the PheniX are reduced by a radiation shield incorporating 0.005mm mylar windows, and the robust PheniX lid incorporates X-ray transparent windows of 0.25mm carbon fibre.

A number of 20mm diameter chromium plated copper sample stages are provided with the PheniX system, however different materials may be available at an additional charge.

A vacuum system (optionally supplied) is used to continuously pump the vacuum space around the PheniX internals and the rotating seal to minimise unwanted heat leaks into the system.

## Goniometer Mounting Plate

Oxford Cryosystems has worked with major X-ray companies to design a number of goniometer mounting plates, 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 five 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 PheniX is built on a unique software platform which allows the constant monitoring of a wide range of inputs and outputs within the system. The controller then manages a number of unique relationships such as sample temperature as a function of coldhead motor speed.

## Oxford Connect

The PheniX now incorporates our Oxford Connect feature. By using our Cryoconnector software and registering your system on Oxford Connect, you will be able to:

- Start, program and stop your Oxford Cryosystems device from your PC, tablet or smartphone
- Easily access historical performance data on the Oxford Connect website
- Enable remote technical assistance, allowing faster support of your device
- Receive email notifications when your device status changes

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

PheniX	
Temperature range	12- 290 Kelvin
Temperature stability	0.1 Kelvin
Cool down time to 20 Kelvin	40 minutes
Cool down time to 12 Kelvin	60 minutes
PheniX coldhead dimensions & weight	120 mm W x 302mm L x 259 mm H, 6 kg
PheniX window materials	PheniX lid incorporating carbon fibre windows, thickness: 0.25mm, Radiation shield, thickness of mylar: 0.005mm
PheniX sample mounts	2 x 20mm diameter Chromium-plated copper flat sample holder 2 x 20mm diameter Chromium-plated copper sample holder with 1mm recess
PheniX 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	80 kg
Cryodrive dimensions	447 mm W x 450 mm H x 560 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 (optionally supplied)	
Dimensions & weight	510 mm W x 740 mm H x 360 mm D
Mains Power supply	230V 50/60 Hz or 115V 50/60Hz

### 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 PheniX, due to its mechanical components, may 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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