



OxfordCryosystems



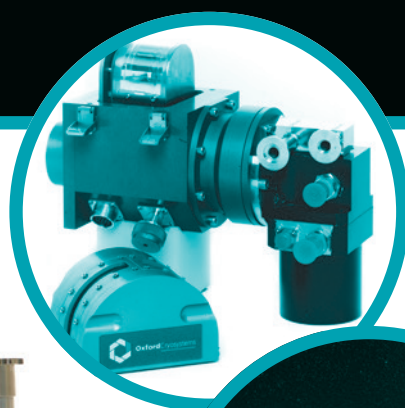
COMPACT, VARIABLE SPEED
GM CRYOCOOLERS

COOLSTAR

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The Coolstar range of Gifford McMahon Cryocoolers has long been regarded as one of the most versatile, compact and cost-effective solutions available.

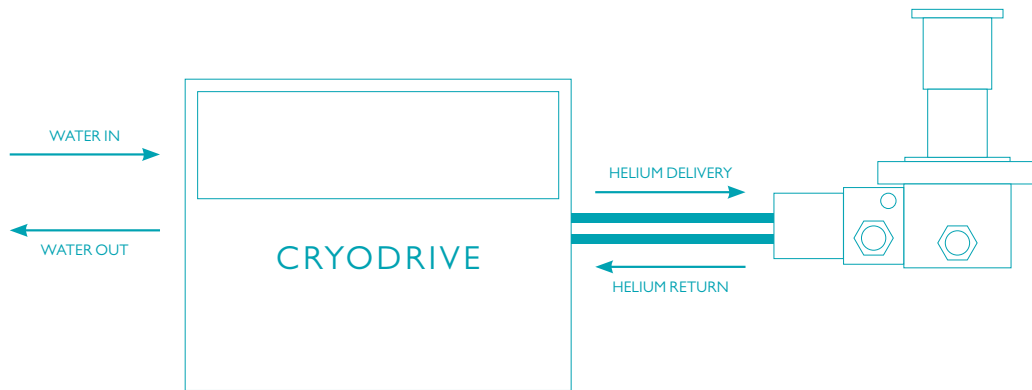
Comprising single stage coldheads and two stage 10 K coldheads coupled with the Cryodrive helium compressor, Coolstar Cryocoolers all offer fast cooldown times, variable coldhead speed and compact size, making them the perfect choice for integration into a wide range of applications.

Today, the Coolstar range is manufactured in the UK by Oxford Cryosystems – a leader in the design and manufacture of cutting-edge cryostats for scientific research and industrial applications. Building on over 25 years of experience in cryogenic engineering, Oxford Cryosystems has developed and refined the Coolstar product range, resulting in a range of Cryocoolers that offer reliability, efficiency, compact design, variable coldhead speed and long service intervals.



COOLSTAR CRYOCOOLER FEATURES:

- **Compact and powerful design:** Small coldhead allows easier installation in systems – particularly where space is at a premium
- **Efficient and Powerful System:** Capable of reaching 10 K with single-phase electrical power requirement.
- **Multi-drive capability:** Enables up to two coldheads to be driven from a single compressor.
- **Proprietary Software:** Free Cryoconnector programme is easily integrated and features local PC and online control.



MODE OF OPERATION

Oxford Cryosystems' Coolstar is the only commercially available range of GM cryocoolers offering complete control of the coldhead speed; by using a variable speed stepper motor, combined with proprietary control software, every Cryocooler in the range can be operated at speeds from 40- 90 rpm. This offers major advantages to the user including:

- **Prolonged service intervals:** Decreased coldhead speed during low demand periods reduces wear on coldhead seals.
- **Cooling power control:** Varying the cycle rate second-by-second offers increased control for integration into cryostats or custom designs.
- **Fast cooldown time:** Increased coldhead speed makes it possible to reach 20 K in as little as 16 minutes (depending on Coldhead).

POTENTIAL APPLICATIONS OF THE COOLSTAR RANGE

The compact size, range of cooling power and orientation independence of the Coolstar range lends itself to a wide range of applications including:

- shield coolers
- laboratory cryostats
- radio astronomy
- custom cryostat design

SINGLE STAGE COLDHEADS: 0/12 AND 0/40

The Coolstar single stage coldheads comprise the 0/12 and 0/40 models, respectively delivering cooling powers of 12 and 40 W at 77 Kelvin. These compact models have the major advantage of being some of the smallest and most cost-effective GM heads available, and can thus be installed in systems where space is at a premium. The coldheads function independently of orientation, and can be used with any Coolstar Cryodrive Compressor.

TWO STAGE COLDHEADS: 2/9 AND 6/30

The Coolstar two stage coldheads comprise the 2/9 model (delivering cooling power of 2 W at 20 K and 9 W at 77 K simultaneously) and 6/30 model (delivering cooling power of 6 W at 20 K and 30 W at 77 K simultaneously). Both of these coldheads can reach a base temperature of 10 K. These efficient coolers are still compact, lending themselves to a wide range of applications. The coldheads function independently of orientation, and should be used with the 2.0 kW or 3.0 kW Coolstar Cryodrive compressor, depending on application.



0/12 Coldhead

0/40 Coldhead

2/9 Coldhead

6/30 Coldhead

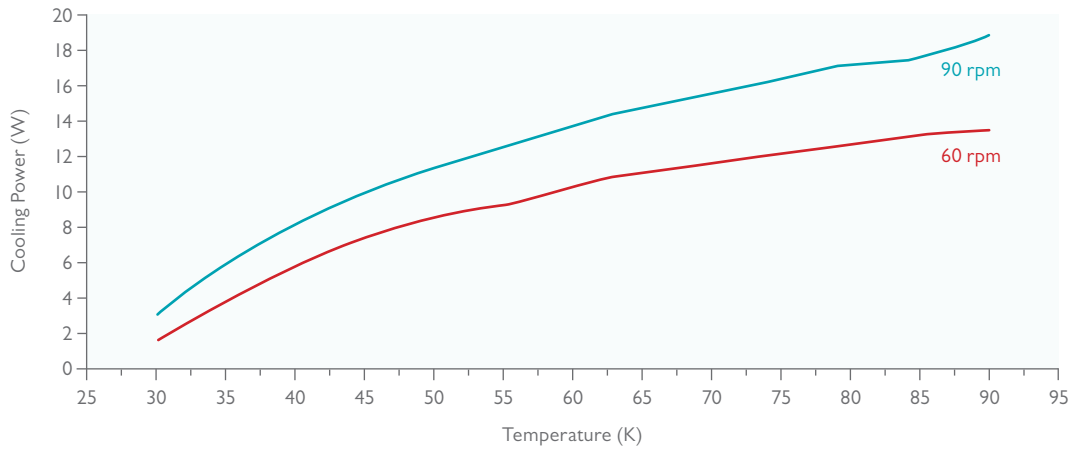
COOLSTAR CRYODRIVE

The Coolstar coldheads run in conjunction with the Oxford Cryosystems Cryodrive, which delivers compressed helium for the operation of Coolstar coldheads. The multi-drive capability of the Cryodrive enables up to 2 coldheads to be driven from a single compressor, depending on coldhead and compressor sizes. The capacity for closed loop control of cooling power allows full integration into complex custom cryostats via the proprietary Oxford Cryosystems Cryoconnector software.

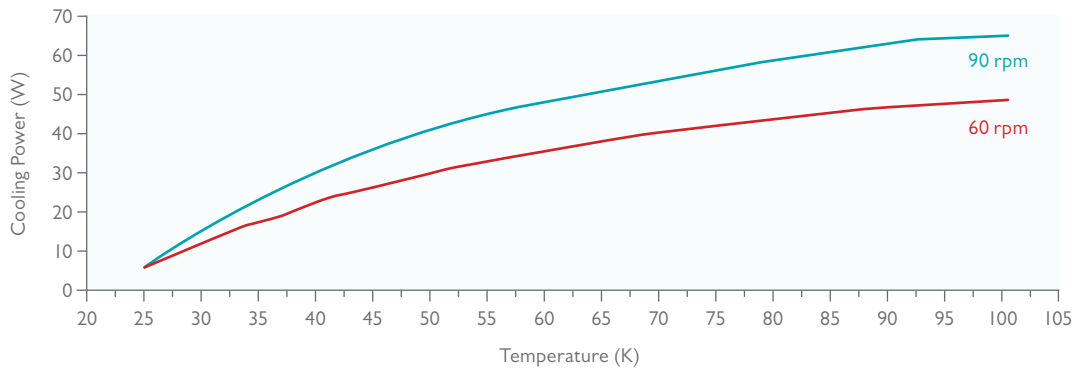
Coolstar Cryodrive Compressors are available in 3 sizes, 1.5 kW, 2.0 kW and 3.0 kW. Smaller capacity compressors (Cryodrive 1.5 and 2.0) offer reduced power and cooling water requirements whilst the larger capacity compressor (Cryodrive 3.0) produces increased power for systems requiring increased cooling capacity.



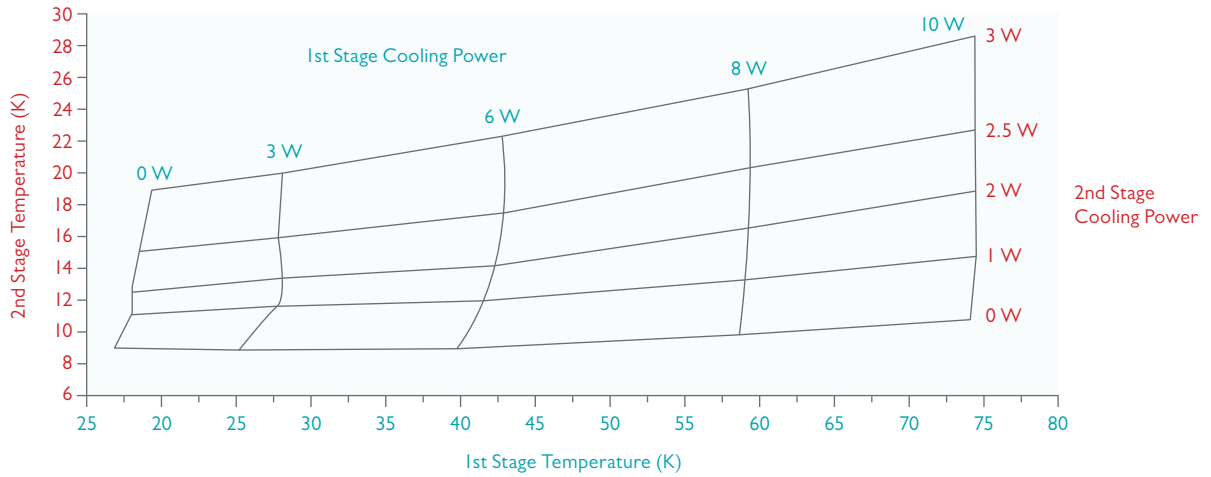
0/12 COLDHEAD



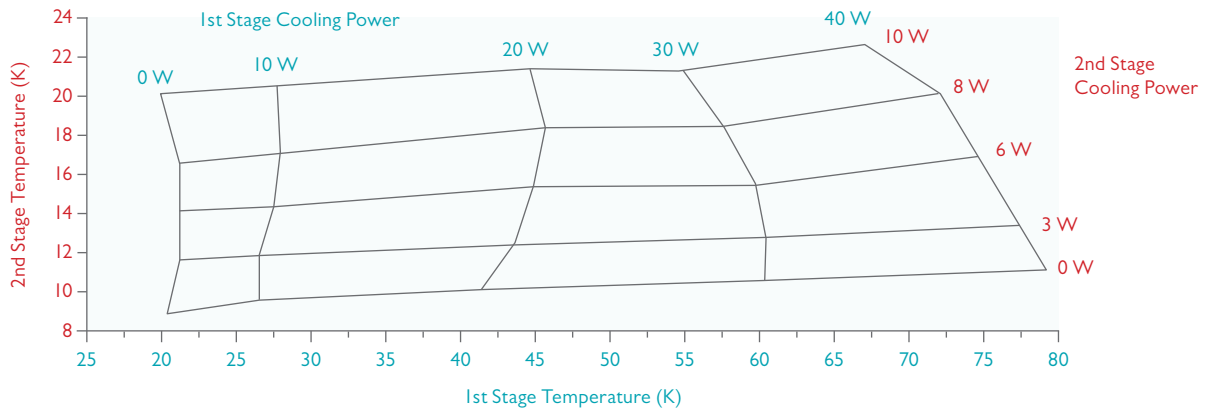
0/40 COLDHEAD



2/9 COLDHEAD



6/30 COLDHEAD



COLDHEAD SPECIFICATIONS

	Coolstar 2/9	Coolstar 6/30	Coolstar 0/12	Coolstar 0/40
Base Temperature (Unloaded)	10 K	10 K	30 K	30 K
Nominal Cooling Power at 20 K			-	-
Normal Speed (72 rpm)	2 W	6 W	-	-
High Speed (90 rpm)	2.4 W	7 W	-	-
Nominal Cooling Power at 77 K				
Normal Speed (72 rpm)	9 W	28 W	12 W	42 W
High Speed (90 rpm)	11 W	30 W	17 W	57 W
Time to cooldown bare coldhead				
to 20 K	<16 min	<18 min		
to 77 K			<11 min	<11 min
Increase in cooldown time for each 100 g Copper added	14 min	5.2 min	6 min	2 min
Weight	2.5 kg	6.1 kg	2.4 kg	5.6 kg
Dimensions	278 x 129 x 150mm	344 x 155 x 207mm	185 x 123 x 150mm	219 x 155 x 207mm

SPECIFICATIONS

Electrical Power ($\pm 6\%$)	Only single-phase power required 200 V, 220 V, 240 V 50 Hz or 200 V, 208 V, 220 V, 60 Hz
Typical Running current:	
Cryodrive 2.0	11 A
Cryodrive 3.0	13 A
Typical Helium Pressure	
Running	22.5 Bar
Static	16.5 Bar
Operating Temperature	4-38°C
Typical Cooling Water Flow	5 l/min at 18°C
Weight + Dimensions	80 kg, 451 x 556 x 448mm
Standard Helium Hose and Coldhead Cable Length	3 m
Cooling Water Connection	½" ID nozzle

SUPPORT AND SERVICE

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

The Coolstar range of coldheads and compressors was designed to be as efficient and economical to maintain as possible. Oxford Cryosystems can provide a range of service kits and accessories with full user instructions so that customers can easily service systems in-house.

For those who prefer to have Oxford Cryosystems service their equipment, we maintain dedicated production and service facilities in the UK, where we take pride in the fast and efficient diagnosis, service and return of the Coolstar systems.

We can also offer a coldhead swap-out service on request.



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