

State of the  
Performance

**Thermo**  
S C I E N T I F I C

**supplyLAB**

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## Quality and efficiency

The cooling of the LyoPro 6000 condenser is carried out by Heto-Holten's own unique twin-capillary tube system - the PowerDry® system. This new development features auto-regulation for maximum cooling performance, thus providing the fastest possible drying time as well as evenly and fully distributed ice condensation. The full condenser surface is optimally used, ensuring extraordinarily high throughput.

You choose the model that's right for the job, based on your specific needs. Regardless of choice you get a freeze dryer with high quality in materials and design and access to a wide range of accessories covering all requirements e.g.:

- bulk drying in flasks or trays
- ampoule drying on manifold
- vial drying in chambers with stoppering arrangement

A unique feature is that all Heto accessories can be freely interchanged between any of our models.

Heto-Holten has been developing and manufacturing freeze dryers for over 30 years, equipping research and general laboratories around the world with reliable products of unsurpassed quality. LyoPro 6000 is part of an extensive family of freeze dryers.

Choosing a freeze dryer from Heto-Holten means you get access to a full line of freeze dryers covering capacities from 1 to 8 kg as well as industrial scale freeze dryers manufactured to individual needs.

## LyoPro 6000 Freeze Dryers

### Strong tools for small scale freeze drying tasks

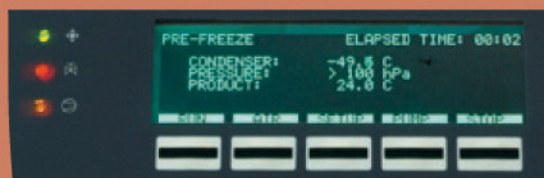
6000 stands for 6 kilograms per 24 hours of ice trapping capacity and both LyoPro 6000 freeze dryer models are compatible with our extensive range of accessories, which are interchangeable between any of our freeze dryers. Both models employ Heto-Holten PowerDry® technology for fast reliable and efficient drying. Your choice will be to decide what is needed to make your application optimal.

### LyoPro 6000 -55 for general laboratory applications

The LyoPro 6000 -55 has a standard condenser temperature of -55°C, which is well suited for straightforward freeze drying applications.

### LyoPro 6000 -90 for applications using solvents other than water

The LyoPro 6000 -90 has an advanced refrigeration system designed for more complicated and demanding applications; it uses a cascade refrigeration system providing a temperature down to -90°C.



### Versatility in use

Both units are state-of-the-art freeze dryers designed to handle any kind of applications including:

Pharmaceutical preparations, food and beverages, museum objects, micro-organisms such as bacteria and yeast, viruses, vaccines and antitoxins, blood fractions, enzymes, vitamins, biological reagents and standards.

### We make freeze drying easy

Success in freeze drying lies to a great extent in the simplicity of the unit and in the operator's comfort. A freeze dryer should perform the application in a safe, fast and reliable way. Some applications only need standard condenser temperatures whereas others require very low temperatures to freeze the solvents involved. The idea behind the LyoPro 6000 -55 and the LyoPro 6000 -90 is to be able to select a unit for both requirements, without compromising quality and reliability.

# Reliability and flexibility

The LyoPro 6000 is built around the same fundamental structure as our other freeze dryer units: a fully welded, one-piece, vertically constructed condenser with surrounding cooling coils and an integrated drainage system. Both LyoPro 6000 units have an ice-trapping capacity of 6kg/ 24 hours, an outer cabinet of powder-painted steel and an acid-proof stainless steel top. A lid

of transparent acrylic offers an NW 40-mm standard flange for the connection of manifolds, and additional chambers, which can therefore be placed directly on the condenser. All auxiliary connections are conveniently grouped at the rear of the machine. The unit is extremely compact and can - if required - be placed out of the way on a specially designed mobile trolley.

## LYO PRO 6000 Manifold Configurations

The use of manifolds is particularly well suited for bulk drying where a standard -55°C condenser temperature is often adequate due to the high content of water in the solvent.



### Flask drying using a 4-port flask manifold

This configuration is ideal for bulk drying in a few flasks. The manifold will accommodate the flasks mounted with cones on individual rubber valves. This manifold can be extended with a 4 port manifold thereby offering additional valves for connection.



### High volume flask drying using a horizontal 14-port manifold

The horizontal manifold made of stainless steel will accommodate the flasks mounted with cones on individual rubber valves. On the top the manifold has a flange for connection of additional manifolds if required.



### Multiple flask drying using a 12-port drum manifold

The drum manifold made of stainless steel will accommodate the flasks mounted with cones on individual rubber valves. The acrylic lid on top has a flange connection for additional manifolds if required. Can accommodate Ø 200 chambers as well.

## Mobile trolley

The mobile trolley, which can easily accommodate a freeze dryer with all its accessories, was conceived with a dual purpose: not only does it free up valuable space on a crowded laboratory tabletop, it also simplifies sharing equipment between labs. The LyoPro 6000 models have been designed integrating all connections at the back, allowing easy set-up in any location.



## Optimisation

The need for applying heat is essential to any freeze drying process. This is normally done by using radiation from the surroundings or by applying electrically controlled heat to the shelves. The Heto shelf controller HSC 500 will work on any Heto freeze dryer and will interface with the LyoPro 6000 controller providing the ultimate temperature regulation and ensuring safest freeze drying cycle.



## Documentation

To keep track of various applications, the LyoPro 6000 is equipped with both a product sensor connection and an RS 232 C interface connection for a computer or a serial printer link. This allows for the data-logging of condenser and product temperatures, as well as vacuum parameters.



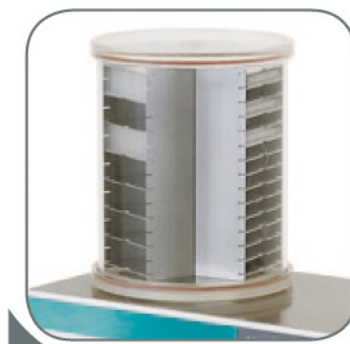
## LYO PRO 6000 Chamber Configurations

The use of chambers is particularly well suited where vacuum regulation is required and we recommend LyoPro 6000 either in standard version with  $-55^{\circ}\text{C}$  condenser temperature for mainly water based solvents or  $-90^{\circ}\text{C}$  as optional when low freezing point solvents are involved. The controller can be set to a specific vacuum level and time, allowing for semi-automatic functioning.



### Bulk drying

Each shelf is rack-mounted and removable, and can be used with various other Heto trays etc. The chamber design allows heat radiation through the acrylic cylinder wall. As option a shelf controller HSC 500 can be connected for additional heat appliance and control.



### Microtitre plate drying

The chamber can be easily filled, emptied and cleaned. The rack will accommodate 3 x 14 standard microtitre plates or 3 x 7 deep well plates. The chamber design allows heat radiation through the acrylic cylinder wall.



### Vial drying

This configuration is ideal where vacuum regulation and heating are required. The manual stoppering system will close the vials after the run is finished. The number of vials that can be processed depends on their diameter. (Please ask for details).

## Vacuum Pump

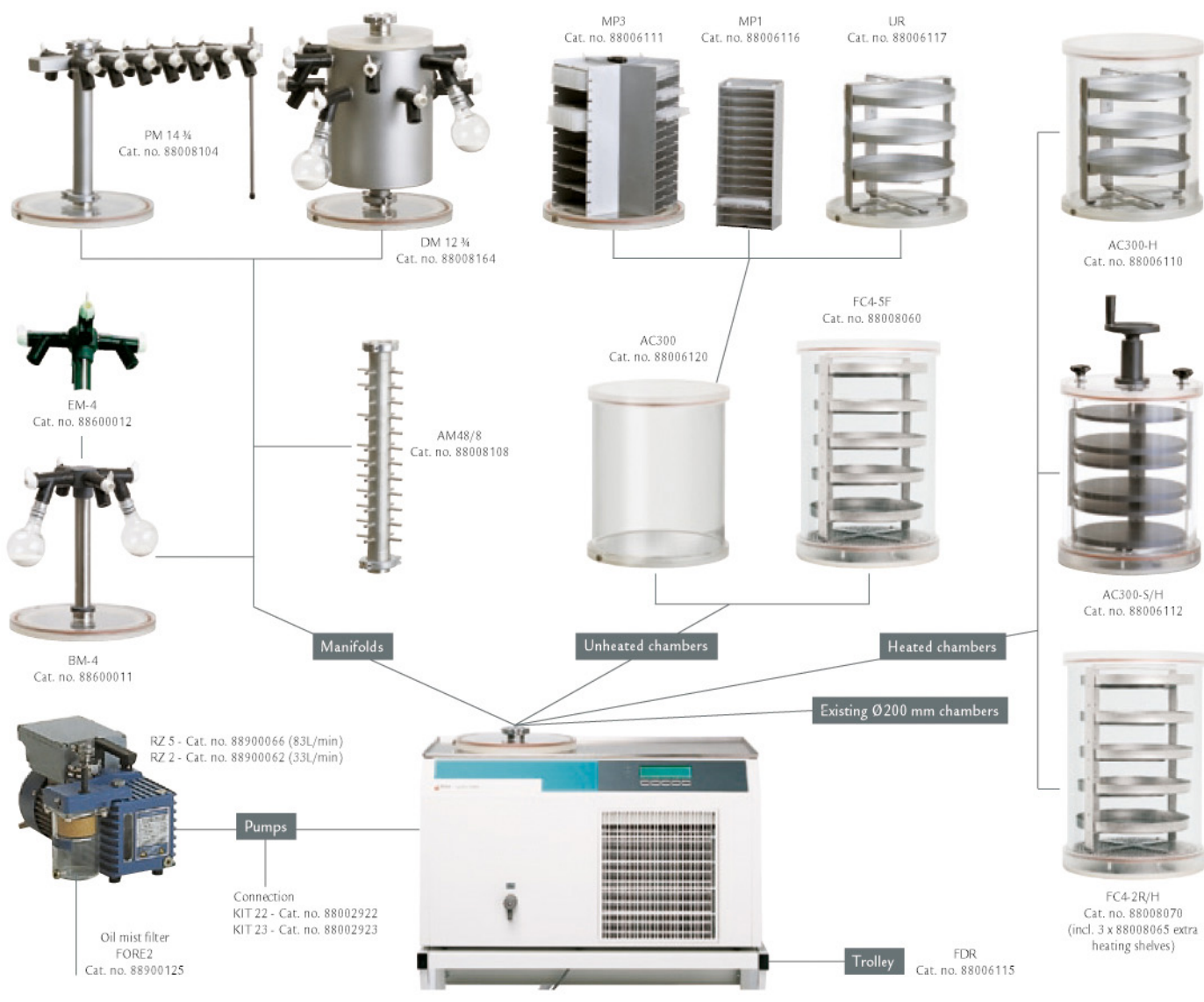
LyoPro 6000 is designed for use with a high-quality rotary vane pump with a capacity of  $5 \text{ m}^3$  per hour.

The chambers and shelf arrangements are mounted directly on top of the condenser or on the acrylic lid. A shelf heat regulator is available if additional heat is required to ensure optimal drying on the shelves. When operating vials a manual stoppering arrangement makes sure all samples are tightly closed. Most chambers are made of versatile  $\varnothing 300 \text{ mm}$  or  $\varnothing 200 \text{ mm}$  acrylic cylinders for maximum safety and performance.

Technical Specifications		LyoLab 6000 -55	LyoPro 6000 -90
Cat. No.	230V/115V	88008820/88008870	88008821/88008871
Required power supply	V/Hz	230/50 or 115/60	
Condenser temperature	°C	-55	-90
Condenser capacity/24 hours	kg	6	
Total ice capacity	kg	10	
Condenser volume	L	12.5	
Condenser diameter x height	mm	Ø 230 x 300	
Cooling capacity* at +20/+0/-30°C or +20/+0/-60°C	W	670/435/320	255/245/125
Microprocessor		Yes	Yes
RS232-C interface		Yes	Yes
Pressure readout & regulation		Yes	Yes
Digital temperature display		Ambient to < -99°C	
Ambient temperature	°C	+5 to +32	
Noise level	dBA	<51	
Ice condenser material		AISI 316	
External dimensions	D x W x H mm	526 x 842 x 455	
Weight	kg	78	87

\* measured at ambient temperature +20°C +/-2°C

## Accessories



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