

Magnum[®] Pilot Freeze Dryer

APPLICATIONS

Tissue Bank
Small Scale Production
Bulk Applications/Trays
Diagnostics
Well Plates
Vials

The **MAGNUM[®]** offers up to 20 sq ft (1.858 sq M) of lyophilization shelf area with a condensing capacity of 30 liters. Not only does the price/performance beat anything in its class, but Millrock also provides the most advanced controls/user interface, as a standard feature. The standard controls are PC/PLC based, offering data collection and self-testing features.

Our easy-to-use software provides automatic freeze drying, defrost, system and leak rate testing. Data can be printed either numerically or graphically. This same control system is used on industrial freeze dryers, allowing scaling to production. An interactive maintenance screen simplifies component servicing. All systems are remotely accessible, with customer approval, for troubleshooting process issues.

Advanced system options include FreezeBooster[®] Controlled Nucleation and Auto-Dry[™] Protocol Optimization. The combination provides the ideal platform for simplified and optimized protocol development.

The **MAGNUM[®] Pilot Freeze Dryer** standard system design provides a highly reliable platform for your freeze drying needs. Using more robust refrigeration components ensures the highest performance and reliability available. Unique design features include: more accurate vacuum sensors; no rubber hoses; no vapor flow choke points; superior shelf temperature uniformity; reduced shelf temperature transition times; increased stoppering pressure; and more, to ensure that the equipment is not a limit to your freeze drying needs.

SYSTEM PERFORMANCE

- 10 Shelf pull down from +20 to -40C in less than 40 minutes
- Vacuum pull down to 100 mT in less than 20 minutes
- Vacuum leak rate less than 30 mT per hour
- Vacuum level 10 mT in clean dry system (-85C)



MAGNUM Features

CONTROL SYSTEM

- MCS - PC/PLC with ethernet and remote internet connectivity
- Manual and automatic operating modes
- Graphic and numeric data collection
- Automatic system and leak rate testing
- Options for Protocol Optimization & Controlled Nucleation

SHELF SYSTEM

- Up to 20 sq ft (1.858) sq M) of shelf area
- Larger shelves - 12" x 24" *(304.8mm x 608mm)
- Increased stoppering pressure for hard to stopper systems
- 316L stainless steel on all wetted parts

CONDENSER

- 6" vapor port

REFRIGERATION

- Highly reliable scroll compressors
- Oversized compressors for high performance
- CFC Free non-proprietary refrigerants
- Hot gas defrost

VACUUM

- Pirani vacuum sensor
- Vacuum control
- Gas backfill
- 375 lpm corrosion resistant vacuum pump

ADDITIONAL

- Sanitary style fittings on all sensor and vacuum ports
- Built in validation port

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Magnum[®] Pilot Freeze Dryer

SPECIFICATIONS

MAGNUM[®] STANDARD SPECIFICATIONS

SHELF AREA	10 to 20 sq ft (0.929 to 1.858 sqM)
SHELF ASSEMBLY	Bulk or Hydraulic Stoppering
SHELF TEMPERATURE RANGE	-45C or -70C to +65C
SHELF HEAT TRANSFER	Hollow Fluid Filled
SHELF SIZE/FINISH	12"x 24", 316LSS, 20 Ra or better (304 x 304 mm)
CONDENSER TEMPERATURE	-53C or -85C
CONDENSER CAPACITY	30 L
CONDENSING RATE	20 L in 24 hours
CONDENSER STYLE	Exposed Coil, 6" port
DEFROST	Hot Gas
COMPRESSORS (SCROLL)	5 HP (-53C), 3.5 HP & 2 HP(-85C)
PRODUCT SENSORS	4, Type T Thermocouples
VACUUM PUMP	375 LPM,
VACUUM CONTROL	Pirani w/ Solenoid & Needle Valve
GAS BACKFILL	Included
CONTROL SYSTEM	PC/PLC with Opti-Dry [®] Software
TRAYS	One per shelf included
CABINET	35" w x 46"d x 75"h
ELECTRICAL FOR -53C UNITS	230V/60Hz, 3 ph, 30 A 460V/60Hz, 3ph, 25 A 380V/50Hz, 3 ph, 30A 220V/50Hz, 3 ph, 30 A
ELECTRICAL FOR -85C UNITS	230V/60Hz, 1 ph, 40 A 220V/50Hz, 1 ph, 40 A 380V/50Hz, 3 ph, 30A
PLEASE NOTE THAT 50HZ UNITS HAVE HEAT REMOVAL RERATED BY 17%	

AVAILABLE OPTIONS

- Up to 18 Product Probes
- Capacitance Manometer
- Proportional Vacuum Control
- Dry Vacuum Pump
- Stainless Steel Door
- Shelf Latching Kit
- Isolation valve
- Water Cooled Condenser
- Hydraulic Stoppering
- Resistivity Probe
- Clean Room Configuration
- Isolator Interface
- H2O2 Integration Kit
- 21 CFR Part 11 Software
- Validation Documentation
- IQ/OQ Workbook
- FAT/SAT
- LN2 Trap
- 8" vapor port

OPTI DRY- PC/PLC CONTROL

THE **MAGNUM[®]** Pilot Freeze Dryer comes complete with Opti Dry PLC controls and a PC for programming and data collection. Our easy-to-use software provides automatic freeze-drying, defrost, and system test. Data can be printed either numerically or graphically. This same control system can be used on industrial lyophilizers, allowing scaling to production. An interactive maintenance screen simplifies component servicing.



SHELF CONFIGURATION

SHELVES	SPACING (in/mm)	AREA (sq ft/sq M)
5	5.5/139	10/0.93
6	4.5/114	12/1.1
7	3.75/95	14/1.3
8	3.25/82	16/1.48
9	2.8/71	18/1.67
10	2.5/63.5	20/1.858

OPTI DRY uses an ethernet platform for hardware connectivity making data transmission extremely fast. It also provides web connectivity for those who want remote access to their systems.

VIAL CAPACITY

VIAL ml	DIA (mm)	HEIGHT (mm)	NUMBER OF SHELVES					
			5	6	7	8	9	10
2	16	41	3870	4644	5418	6192	6966	7740
5	22	48	2015	2418	2821	3224	3627	
10	24	58	1610	1932	2254	1744	2898	
20	29	71	1090	1308	1526	768		
50	43	81	480	576	672			
100	52	92	325	390	455			

BULK FILL (LITERS)

#trays	5	6	7	8	9	10
Depth						
10mm	9.3	11.1	13	14.8	16.7	18.8
15mm	13.9	16.7	19.5	22.3	25	27.8

Product temperature feedback optimizes the recipe, both freezing and primary drying, based on the product temperature average. Multiple methods for Primary Drying end-point determination (requires a capacitance manometer) Pressure Rise Testing (requires an isolation valve).

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Specifications subject to change without notification. All specifications based on 20C ambient and 60 Hz
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