The **EPIC** offers up to 30 sq ft of shelf area with a **condensing rate of 40 Liters in 24 hours,** the perfect unit for small scale production. 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 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, Auto-Dry™ Protocol Optimization, AccuFlux™** and **CIP**. The combination provides the ideal platform for simplified and optimized protocol development.

THE EPIC has been developed from over 50 years of experience in the freeze drying world. The 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. In addition, the system is designed to be **more tolerant of fluctuations in room temperature and supply voltage**, which are common issues with lower end systems.

We have addressed common application issues in our design with features such as; 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 25 minutes
- Vacuum leak rate less than 30 mT per hour
- Vacuum level 10 mT in clean dry system (-85)

EPIC HIGHLIGHTS

CONTROL SYSTEM

- 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 and Controlled Nucleation

SHELF SYSTEM

- Up to 30 sq. ft. of shelf area
- Large shelves for more product capacity – 18" x 24"
- Increased stoppering pressure – for 2ml vials
- 316L on all wetted parts

CONDENSER

- 8" vapor port standard
- Exposed coil condenser for maximum efficiency
- Hot gas defrost

REFRIGERATION

- High reliability scroll compressors
- Water cooled
- Oversized refrigeration components for high reliability
- CFC-free, non-proprietary refrigerants

VACUUM

- Pirani vacuum sensor standard
- Vacuum control standard
- Gas backfill standard
- 525LPM corrosion resistant vacuum pump

PORTS

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

APPLICATIONS

- Tissue Bank
- R&D/Small Scale Production
- Diagnostics
- Well Plates
- Vials
- Bulk Applications / Trays

MILLROCK TECHNOLOGY®

FEATURES & SPECIFICATIONS

EPIC™ STANDARD FEATURES	
SHELF AREA	15 sq ft to 30 sq ft
SHELF ASSEMBLY	Bulk or Hydraulic Stoppering
SHELF TEMPERATURE RANGE	-70° to + 65°C
SHELF HEAT TRANSFER	Hollow Fluid Filled
SHELF SIZE/FINISH	18"x 24", 316L, 20 Ra or better
VAPOR PORT	8" Standard
CONDENSER TEMP	-85°C
CONDENSER CAPACITY	50L
CONDENSING RATE	40L in 24 hours
CONDENSER STYLE	Exposed Coil
DEFROST	Hot Gas
COMPRESSORS (SCROLL)	5hp and 3.5hp
PRODUCT SENSORS	4, Type T
VACUUM PUMP	525 LPM, Corrosion Resistant
VACUUM CONTROL	Pirani w/ Solenoid & Needle Valve
GAS BACKFILL	Included
CONTROL SYSTEM	PC/PLC with Opti-Dry Software
TRAYS	Two per shelf included
CABINET	62" w x 44"d x 87.5"h
ELECTRICAL	230V/3ph/60Hz/60A

SHELF CONFIGURATION

SHELVES	SPACING (in/mm)	AREA (sq ft/sq M)
5	5.5/139	15/1.39
6	4.5/114	18/1.67
7	3.75/95	21/1.95
8	3.25/82	24/2.23
9	2.8/71	27/2.51
10	2.5/63	30/2.79

VIAL CAPACITY

VIAL ml	DIA (mm)	HT (mm)	5	6	7	8	9	10
2	16	41	5760	6912	8064	9216	10368	11520
5	22	48	2990	3588	4186	4784	5382	
10	24	58	2410	2892	3374	3856	4338	
20	29	71	1610	1932	2254	2576		
50	43	81	660	792	924	1056		
100	52	92	450	540	630			

AVAILABLE OPTIONS

- **FreezeBooster®** Controlled Nucleation*
- **LyoPAT®** Determines vial heat transfer coefficient(Kv), defines process design space in a single run & develops transferrable protocols*
- **Auto-Dry™** Protocol Development Software*
- Water Defrost
- Up to 18 Product Probes
- Capacitance Manometer
- Proportional Vacuum Control
- Dry Vacuum Pump
- Isolation Valve
- Stainless Steel Doors
- Shelf Latching Kit
- LN2 Trap
- Resistivity Probe
- CIP
- Clean Room Configuration
- Isolator Interface
- H2O2 Integration Kit
- 21 CFR Part 11 Software
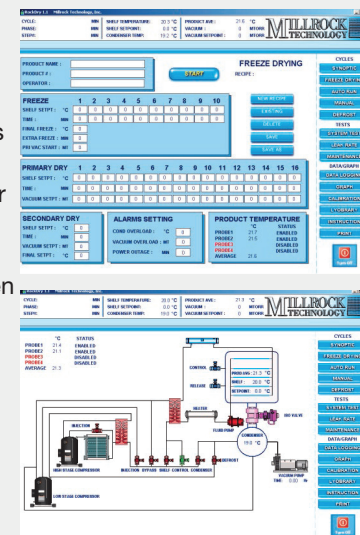- Validation Documentation
- IQ/OQ Workbook
- FAT/SAT

OPTI-DRY® PC/PLC CONTROL

THE EPIC Series comes complete with 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 dryers, allowing scaling to production. An interactive maintenance screen simplifies component servicing.

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.

For R&D, Protocol Development, Small Scale Production, Cycle Automation and Optimization, Opti-Dry offers all the tools you need.

BUILT-IN CONTROL FEATURES

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

BULK FILL (LITERS)

DEPTH	5	6	7	8	9	10
10mm	13.9	16.7	19.5	22.3	25.1	27.8
15mm	20.9	25	29.2	33.4	37.6	41.8
20mm	27.8	33.4	39	44.6	50.1	55.7

* Patented and Patent Pending technology.
Note: Specifications subject to change without notice. All specifications based on 20C ambient on 60Hz.