



## Technical Data Sheet

### Thermal Scientific Enzyme Freezer

Revision-0

Thermo Fisher Scientific, Asheville, North Carolina

Specifications	Model Number																								
	2320A Manual Defrost Enzyme Freezer																								
	Application, Rating and Electrical Data																								
Application	Storage of Enzyme Materials																								
Storage Volume	659 Liters / 23.3 Cubic Feet																								
Temperature Rating	-20°C @ 32°C (90°F) Ambient																								
Electrical Power	115 VAC, 60 hz, 1 Phase																								
Instrument Rated Current	13.5 FLA																								
Building Supply Rating	Breaker 20 Amps/115v±10 Volt while operating																								
Power Plug/Power Cord Length	5-20 P/ 10 feet																								
Agency Listings	UL, cUL																								
Indoor/Outdoor Usage	Indoor Use Only																								
Application Environment	Non-Corrosive, Non-Flammable, Non-Explosive, Good Air Ventilation, 15° C - 32° C (59° F - 90° F)																								
	Refrigeration Configuration																								
Refrigeration System	Vapor Compression System																								
Compressor / Number	1 hp Reciprocating Compressor / 1																								
Condenser Type/Number	Enhanced Finned-Tube and Forced-Air Cooled / 1																								
Expansion Device	Capillary Tube																								
Evaporator Type	Cold Wall With Enhanced Heat Transfer Treatment																								
Defrost Method	Manual Defrost																								
Refrigerant Charge/Flammability	Non-Flammable, CFC/HCFC-Free Environmentally Safe Refrigerant Mixtures																								
	Controller/Electrical System Configuration and Features																								
Controller Level	Eye Level																								
Power Switch	Keyed Off-On - Alarm																								
Controller Type	Microprocessor-Based IntrLogic™ Control																								
Setpoint Security / Programmable	Standard / Standard																								
Compressor Safe Guard	High Pressure Cutout Switch/High Temp Cutout Switch/Current protection																								
Control Sensor	Stainless Steel Shielded RTD in Air																								
Remote Alarm Terminals	Standard																								
Door Open, Probe Failure Alarms	Standard																								
Adjustable Warm/Cold Alarms	Standard																								
Power Failure Alarm	Standard																								
Standard Electronic chart Recorder	Optional																								
	Dimensions and Construction																								
Interior Dimensions (H x D x W)	147.3x 73.7 x 61.0 cm (58.0 x 29.0 x 24.0 in)																								
Exterior Dimensions (H x D x W)	201.2 x 94.5 x 71.1 cm (79.2 x 37.2 x 28.0 in)																								
Insulation	5.08 cm (2 in.) High Density HFC-blown Polyurethane Foam (R=42)																								
Door Perimeter heater	Electric																								
Shelves / Capacity	(9) Adjustable Wire Shelves. Max. Cap. per Shelf: 45 kg (100 lbs.)																								
All-Direction Casters	Standard with Two Locking and Two Regular																								
Ship Weight	Approximately 193 kg (425 lbs.)																								
1" Dia access port	Yes																								
	Typical Performance Characteristics																								
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>23 ft<sup>3</sup> -20 Freezer, Pull Down and Warm Up at 25 C</p> </div> <div style="width: 45%;"> <p>23 ft<sup>3</sup> -20 Freezer, -20C Cycle at 25 C Ambient</p> </div> </div> <table border="1" style="width: 100%; margin-top: 10px;"> <tr> <td>Test Unit Series or MSO Number:</td> <td style="text-align: right;">18829-B-D</td> </tr> <tr> <td>Avg Cabinet Temp at -20 C Cycle (C):</td> <td style="text-align: right;">-21.6</td> </tr> <tr> <td>PV from Setpoint (C)*:</td> <td style="text-align: right;">+ 0.8 / - 3.7</td> </tr> <tr> <td>Average Uniformity (C):</td> <td style="text-align: right;">2.1</td> </tr> <tr> <td>Average Stability (C):</td> <td style="text-align: right;">1.8</td> </tr> <tr> <td>1-min Door Open Recovery to-20C (min)</td> <td style="text-align: right;">16</td> </tr> <tr> <td>Duty Cycle at -20C Setpoint (%):</td> <td style="text-align: right;">64.5%</td> </tr> <tr> <td>Cycle (on/off) rate at -20C (min):</td> <td style="text-align: right;">11 / 6</td> </tr> <tr> <td>Avg. energy consumption (kW-hr/day):</td> <td style="text-align: right;">13.0</td> </tr> <tr> <td>Avg. heat rejection rate (Btu/hr):</td> <td style="text-align: right;">1855</td> </tr> <tr> <td>Overall Pulldown Time (to -20C) (min):</td> <td style="text-align: right;">76</td> </tr> <tr> <td>Warmup Time (-20 to 0 C) (min):</td> <td style="text-align: right;">156</td> </tr> </table> <p>* PV = Peak Variation</p>		Test Unit Series or MSO Number:	18829-B-D	Avg Cabinet Temp at -20 C Cycle (C):	-21.6	PV from Setpoint (C)*:	+ 0.8 / - 3.7	Average Uniformity (C):	2.1	Average Stability (C):	1.8	1-min Door Open Recovery to-20C (min)	16	Duty Cycle at -20C Setpoint (%):	64.5%	Cycle (on/off) rate at -20C (min):	11 / 6	Avg. energy consumption (kW-hr/day):	13.0	Avg. heat rejection rate (Btu/hr):	1855	Overall Pulldown Time (to -20C) (min):	76	Warmup Time (-20 to 0 C) (min):	156
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<p>1) Performance is nominal and individual units may vary.</p> <p>2) Freezer performance will differ due to product amount, product size and operating conditions.</p> <p>3) Continuous product enhancements may, without notice, result in amendments or omissions to this specification. Thermo Scientific cannot accept responsibility for damage, injury, loss or expenses resulting from misapplication of the information herein.</p>																									

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