



**Technical Data Sheet**  
**Forma™ Ultra-Low Temperature Freezer**  
 Upright Model Release - 83  
 Thermo Fisher Scientific, Asheville, North Carolina

**Model Number**

FDE50086FD

**Application, Rating and Electrical Data**

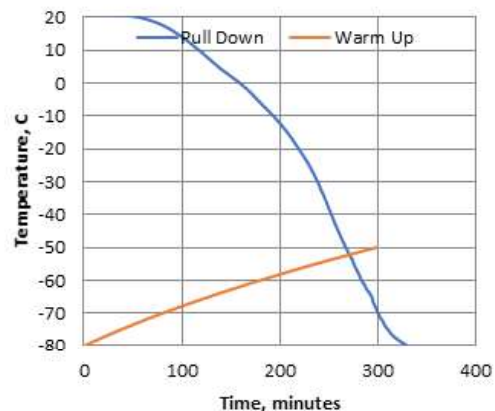
**Typical Performance Characteristics in 20 °C Ambient**

Application	Storage of General (non-flammable) Laboratory Materials
Storage Volume	24.1 cu. ft. (682 liters), 500 Standard 2" Boxes
Temperature Rating	-50°C to -86°C
Electrical Power	208-230V, 60 Hz, 1 Phase
Instrument Rated Current	7.6 AMP
Building Supply Rating	15A dedicated grounded circuit, Type C circuit protection or similar required, Ensure compliance with local electric code
Power Plug / Power Cord	NEMA 6-15P / IEC Cords, 10 ft (3.05 m)
Agency Listings	UL, cUL
Application Environment	Non-Corrosive, Non-Flammable, Non-Explosive Indoor Use Only, Ventilated 15° C - 32° C (59° F - 90° F)

Energy Consumption (kW-hr/day)	11.9
Heat Rejection Rate (Btu/hr)	1693
Peak Variation from Setpoint (°C)	+5.7 / -3.2
Sound (dBa)	51.0
1-min Door Opening Recovery to -75°C (min)	23
Average Uniformity at -80°C (°C)	5.6
Average Stability at -80°C (°C)	3.3
Pull Down Time (to -80°C) (hrs)	5.5
Warm Up Time (-80°C to -50°C) (min)	304

**Dimensions and Construction**

Interior Dimensions (H x D x W)	51.2 x 28.3 x 28.8 in. (1300 x 719 x 732 mm)
Exterior Dimensions (H x D x W)	78 x 38.5 x 34 in. (1981 x 978 x 864 mm)
Shipping Dimensions	83.12 x 42.75 x 41.88 in. (2111 x 1086 x 1064 mm)
Shipping Weight / Net Weight	734 lbs. (333 kg) / 640 lbs. (290 kg)
Insulation	Vacuum Insulation Panels with High-Density Water-Blown Polyurethane Foam
Door Seal	Silicone-Based High Performance Seal Gasket with Electrical Cabinet Perimeter Heater
Shelves	3 Stainless Steel Adjustable Shelves in 1" (25mm) Increments
Shelf Capacity	Maximum Capacity per Shelf: 205 lbs. (91.7 kg) Cabinet Load not to Exceed 1140lb (517.1 kg)
Interior / Exterior Material	Painted Steel (Stainless Steel Option) / Painted Steel
All-Direction Casters	Standard with Locks
Other Options	LN2 or CO2 Backup System, Chart Recorder, VIC Capacitive Touch Screen Input and Display with USB Data Retrieval

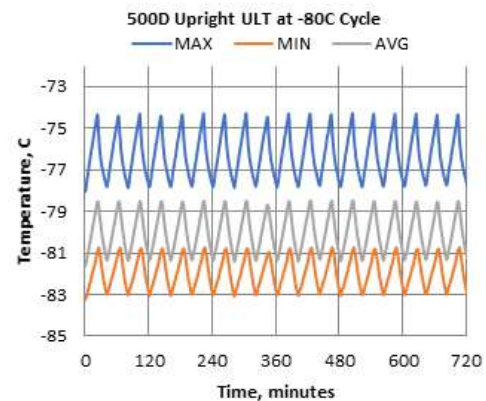


**Electrical System Configuration**

Controller Level	Top
Power Switch	(Rear) Main Circuit Breaker
Controller Type	HIC Interface: 7-segment Display with Capacitive Touch Screen Buttons
Setpoint Security	Yes
Compressor Safe Guard	High Temp Cutout Switch, Current, Logic protection
Control Sensor	Single RTD (1000 ohm Platinum RTD)
Connectivity / Remote Outputs	RS485/4-20mA output/Dry Contacts
Thermo Fisher Cloud	InstrumentConnect™ Remote Monitoring (compatible)
Adjustable Warm/Cold Alarms	Fully Adjustable

**Refrigeration Configuration**

Refrigeration System	Two Stage Cascade System
Compressor/Number	Industrial Rated, Hermetically Sealed / 2
Compressor Capacity*	506 W
Condenser Type	Enhanced Tube and Fin with Forced-Air Cooling
Expansion Device	Capillary Tube
Evaporator Type	Enhanced Cold Wall Design
Defrost Method	Manual Defrost
Refrigerant (1st/2nd Stage)	R290 / R170+R290 Mix
Environmental Effects	GWP: 3 (R290) , 6 (R170) ODP: 0 (R290); 0 (R170)
Flammable	Yes



- Performance is nominal and individual units may vary.
- Freezer performance will differ due to product amount, product size and operating conditions.
- 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.

\* Manufacturer measured compressor capacity taken at standard -35°C/45°C (Evap/Cond) condition.