



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

Model Number

FDE30086FA

Application, Rating and Electrical Data

Application	Storage of General (non-flammable) Laboratory Materials
Storage Volume	14.9 cu. ft. (422 liters), 300 Standard 2" Boxes
Temperature Rating	-50°C to -86°C
Electrical Power	115V, 60 Hz, 1 Phase
Instrument Rated Current	15.3 AMP
Building Supply Rating	20A dedicated grounded circuit, Type C circuit protection or similar required, Ensure compliance with local electric code
Power Plug / Power Cord	NEMA 5-20 / 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)

Dimensions and Construction

Interior Dimensions (H x D x W)	51.2 x 28.3 x 17.8 in. (1300 x 719 x 452 mm)
Exterior Dimensions (H x D x W)	78 x 38.5 x 23 in. (1981 x 978 x 584 mm)
Shipping Dimensions	83.12 x 42.75 x 34 in. (2111 x 1086 x 864 mm)
Shipping Weight / Net Weight	712 lbs. (323 kg) / 622 lbs. (282 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: 125 lbs. (56.8 kg) Cabinet Load not to Exceed 1140 lbs (517.1 kg)
Interior / Exterior Material	Painted Steel (Stainless Steel Option) / Painted Steel
All-Direction Casters	Standard with Locks
Other Options	Chart Recorder, VIC Capacitive Touch Screen Input and Display with USB Data Retrieval

Electrical System Configuration

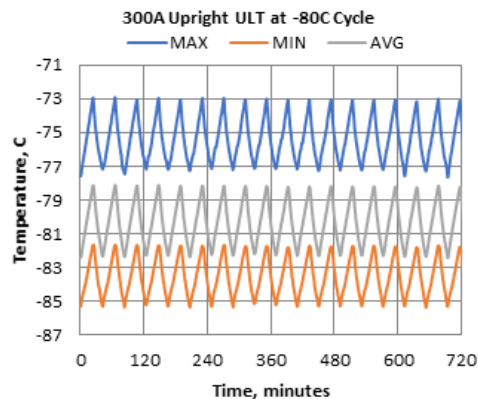
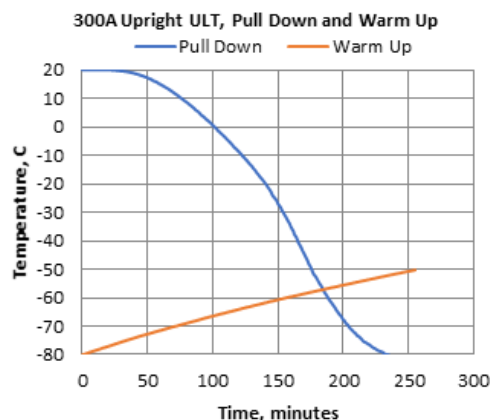
Controller Level	Top
Power Switch	(Rear) Main Circuit Breaker
Controller Type	HIC Interface: 7-segment Display with Capacitive Touch Screen Buttons
Setpoint Security	Yes
Compressor Safe Guard	High Temp Cutout Switch, Current, Logic protection
Control Sensor	Single RTD (1000 ohm Platinum RTD)
Connectivity / 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*	509 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 GWP: 3 (R290) ; 6 (R170) ODP: 0 (R290); 0 (R170)
Environmental Effects	
Flammable	Yes

Typical Performance Characteristics in 20 °C Ambient

Energy Consumption (kW-hr/day)	11.2
Heat Rejection Rate (Btu/hr)	1590
Peak Variation from Setpoint (°C)	+7.1 / -6.1
Sound (dBA)	51.5
1-min Door Opening Recovery to -75°C (min)	13
Average Uniformity at -80°C (°C)	8.2
Average Stability at -80°C (°C)	4.6
Pull Down Time (to -80°C) (hrs)	4.0
Warm Up Time (-80°C to -50°C) (min)	255



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

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

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