



**Technical Data Sheet**  
**Thermo Scientific™ Ultra-Low Temperature Freezer**  
 Upright Model Release - 83 5ID  
 Thermo Fisher Scientific, Asheville, North Carolina

**Model Number**

TDE50086FV  
 With optional 5 inner door configuration

**Application, Rating and Electrical Data**

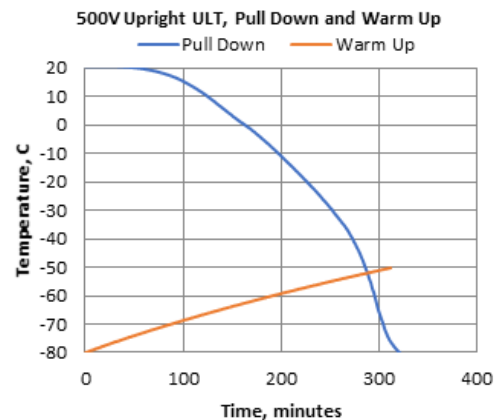
**Typical Performance Characteristics in 20 °C Ambient**

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	230V, 50 Hz, 1 Phase
Instrument Rated Current	6.5 AMP
Building Supply Rating	16A dedicated grounded circuit, Type C circuit protection or similar required, Ensure compliance with local electric code
Power Plug / Power Cord	Country Dependant plug / IEC Cords, 10 ft (3.05 m)
Agency Listings	UL, cUL, CE
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)	10.3
Heat Rejection Rate (Btu/hr)	1469
Peak Variation from Setpoint (°C)	+4.2 / -3.8
Sound (dBa)	50.0
1-min Door Opening Recovery to -75°C (min)	16
Average Uniformity at -80°C (°C)	5.2
Average Stability at -80°C (°C)	2.9
Pull Down Time (to -80°C) (hrs)	5.4
Warm Up Time (-80°C to -50°C) (min)	312

**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 38.2 in. (1981 x 978 x 970 mm)
Shipping Dimensions (H x D x W)	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	4 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

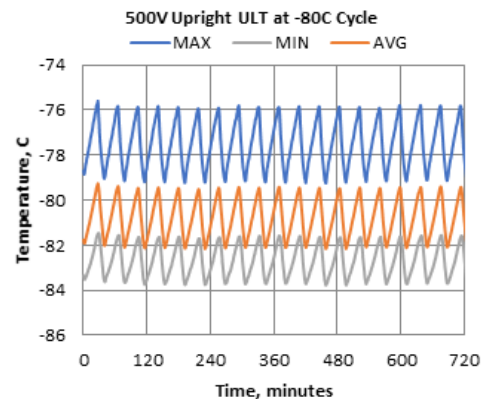


**Electrical System Configuration**

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*	797 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



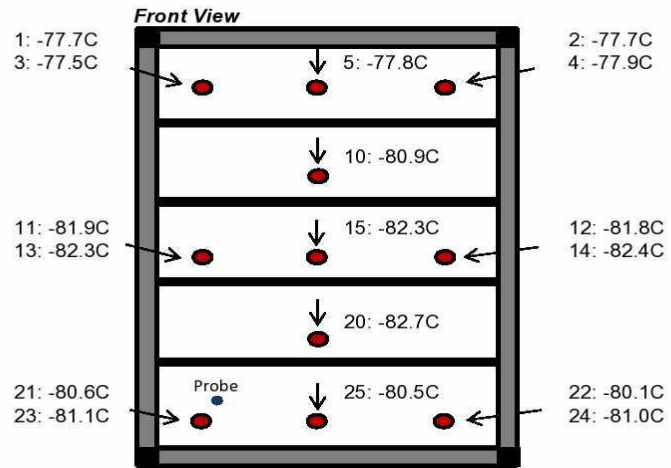
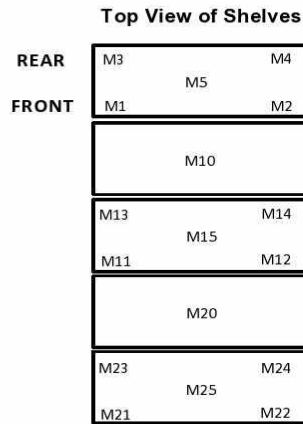
- Performance is nominal and individual units may vary.
- Freezer performance will differ due to product amount, product size and operating conditions.
- Continuous product enhancements may, without notice, result in amendments or omissions to this specification. Thermo Scientific cannot accept responsibility 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.



Typical Cabinet Temperature Map  
ULT 500, 4 Inner-Shelves + Base, Single Outer Door

Temperatures are averages during > 12 cycles after reaching a setpoint of -80C



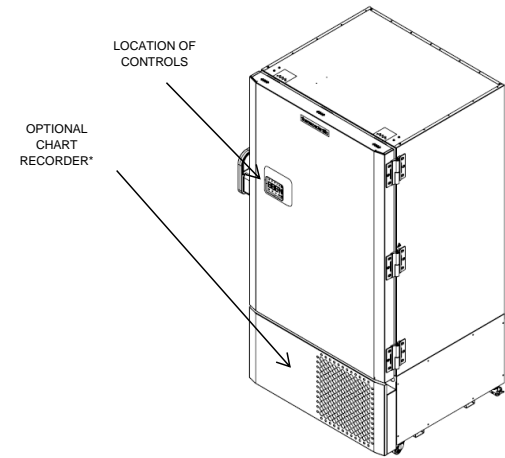
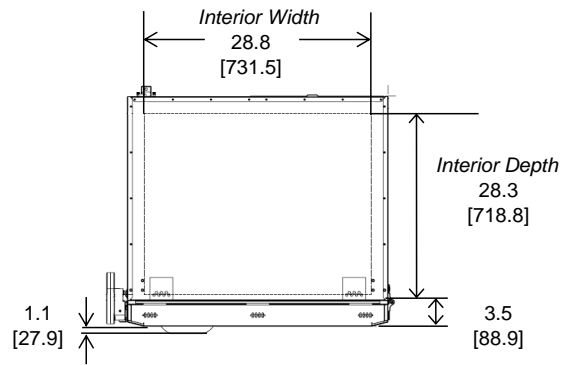
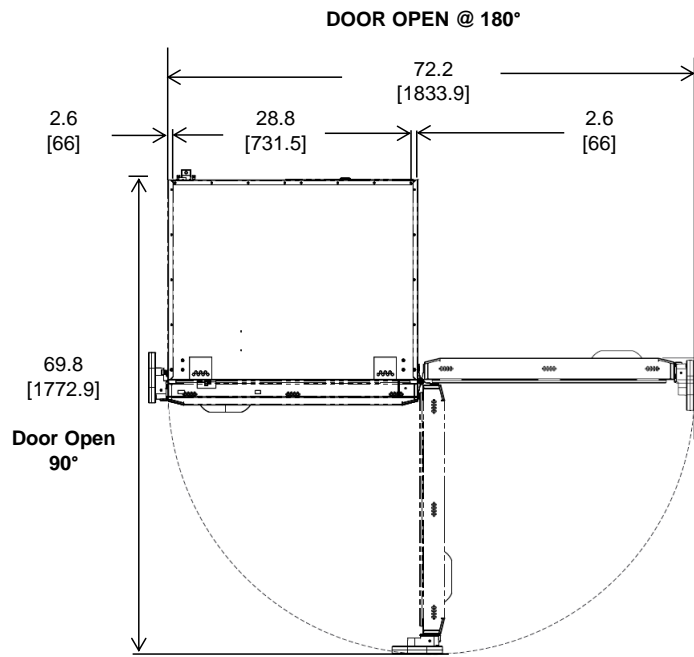
**Cabinet Average:** -80.8 C  
**Probe Average:** -80.8 C  
**Peak Variation:** +4.2 C / -3.8 C

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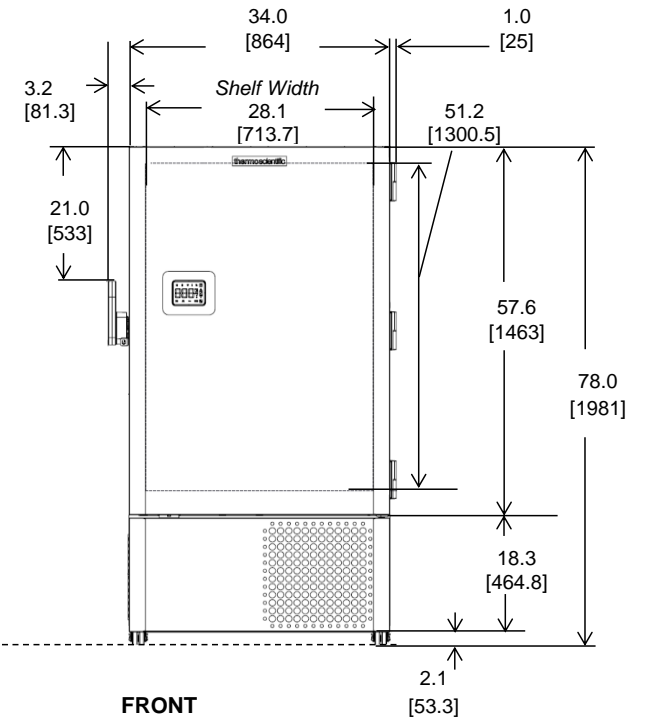
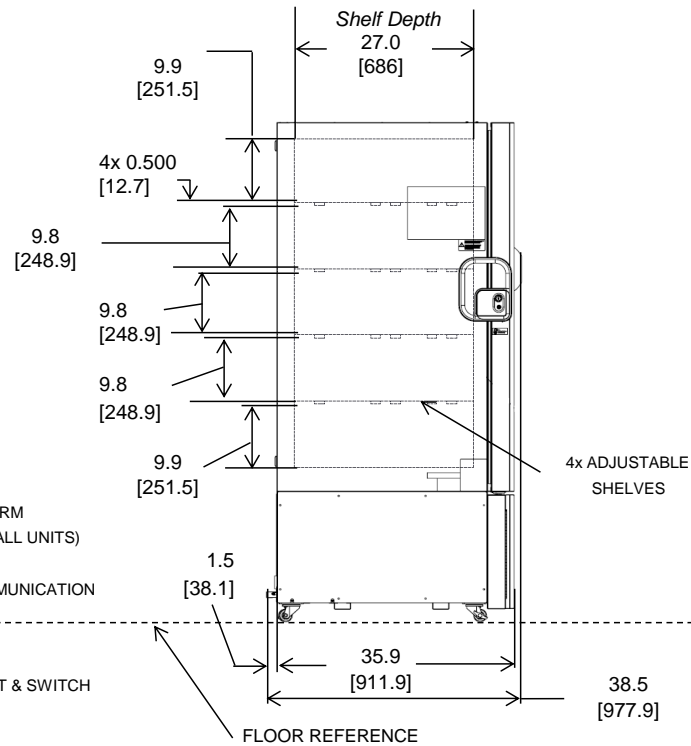
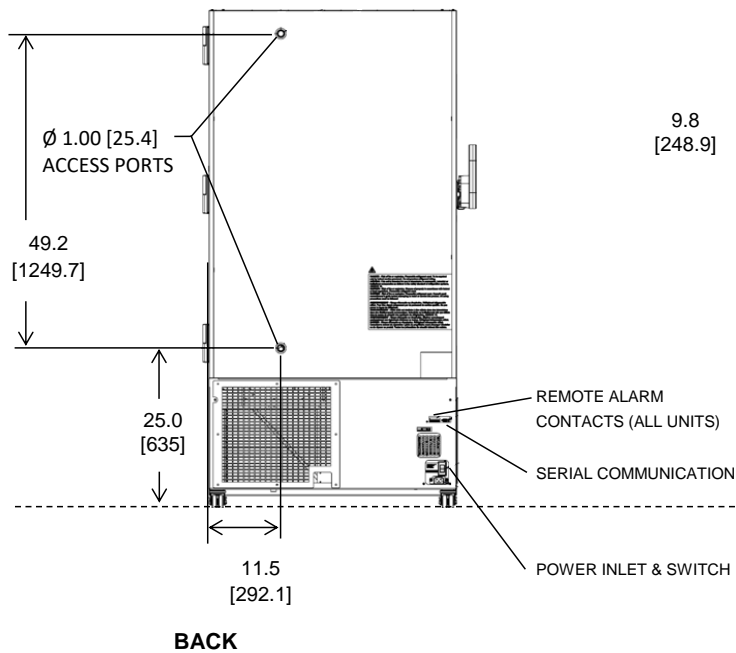
	M1	M2	M3	M4	M5	M10	M11	M12	M13
Avg	-77.7	-77.7	-77.5	-77.9	-77.8	-80.9	-81.9	-81.8	-82.3
Max	-76	-76.1	-75.8	-76.3	-76.2	-79.2	-80.6	-80.5	-80.9
Min	-79.3	-79.2	-79.3	-79.5	-79.3	-82.5	-83	-82.9	-83.6

	M14	M15	M20	M21	M22	M23	M24	M25
Avg	-82.4	-82.3	-82.7	-80.6	-80.1	-81.1	-81	-80.5
Max	-81	-80.9	-81.6	-79.4	-78.8	-79.6	-79.4	-79.2
Min	-83.8	-83.5	-83.7	-81.8	-81.5	-82.8	-82.7	-81.8

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\*Chart recorders are stand alone on 300/400 models  
 \*Backup systems are stand alone on 300 models.



**NOTE: DUAL DIMENSION IS INCH OVER METRIC**

DO NOT USE FOR ENGINEERING PURPOSES. SUBJECT TO CHANGE WITHOUT NOTICE.



**24.1 cuft Upright Freezer**  
 5 Inner Doors  
 Single Outer Door  
 Top Mount Controls