Technical Data Sheet

Thermo Scientific™ Ultra-Low Temperature Freezer

Upright Model Release - 84

Thermo Fisher Scientific, Asheville, North Carolina

ENERGY STAR® MDEC
(Maximum Daily Energy Consumption)

0.36 kW-hr/day/cuft

Model Number

TSX70086V

Application, Rating and Electrical Data

Application	Storage of General (non-flammable) Laboratory Materials
Storage Volume	33.5 cu. ft. (949 liters), 700 Standard 2" Boxes
Temperature Rating	-50°C to -86°C
Electrical Power	230V, 50 Hz, 1 Phase
Instrument Rated Current	6.1 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 - 32°C (59 - 90°F)

Interior Dimensions (H x D x W)	51.2 x 28.3 x 40.1 in. (1300 x 719 x 1019 mm)
Exterior Dimensions (H x D x W)	78 x 37.8 x 45.2 in. (1981 x 960 x 1148 mm)
Shipping Dimensions (H x D x W)	83.12 x 42.75 x 51.13 in. (2111 x 1086 x 1299 mm)
Shipping Weight / Net Weight	869 lbs. (304 kg) / 753 lbs. (341 kg)
Insulation	Vacuum Insulation Panels with High-Density Water-Blown Polyurethane Foam
Door Seal	Silicone-Based Gasket Seal with Electrical Cabinet Perimeter Heater
Shelves	3 Stainless Steel Adjustable Shelves in 1" (25mm) Increments
Shelf Capacity	Max. Capacity per Shelf: 285 lbs. (128 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 HID Controlled Access, Chart Recorder Exterior Illumination Kit

Electrical System Configuration

Controller Level	Top
Power Switch	(Front) Soft-touch / (Rear) Main Circuit Breaker
Controller Type	VIC Capacitive Touch Screen Input and Display with USB Data Retrieval
Setpoint Security	Yes
Compressor Safe Guard	High Temp Cutout Switch, Current, Logic protection
Control Sensor	Single RTD (1000 ohm Platinum RTD)
Connectivity / Remote Outputs	Wi-Fi Enabled, RS485/4-20mA output
Thermo Fisher Cloud	InstrumentConnect™ Remote Monitoring
Adjustable Warm/Cold Alarms	Fully Adjustable
Auto-Voltage Safeguard	Buck/Boost System

Refrigeration Configuration

Refrigeration System	Two Stage Cascade System
Compressor/Number	Industrial Rated, Hermetically Sealed / 2
Compressor Capacity*	525W (max). VCC
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

Typical Performance Characteristics in 20 °C Ambient

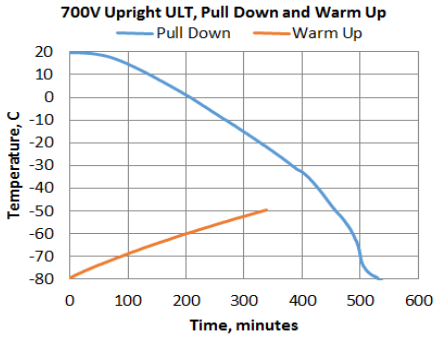
Standard Performance Mode

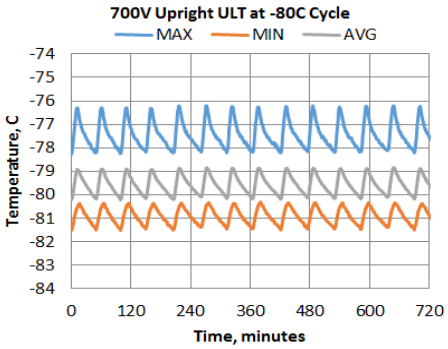
Energy Consumption (kW-hr/day)	9.4
Heat Rejection Rate (Btu/hr)	1336
Peak Variation from Setpoint (°C)	+7.4 / +2.0

High Performance Mode

Energy Consumption (kW-hr/day)	12.7
Heat Rejection Rate (Btu/hr)	1801
Peak Variation from Setpoint (°C)	+3.8 / -1.5

Sound (dBa)	48.6
1-min Door Opening Recovery to -75°C (min)	34
Average Uniformity at -80°C (°C)	3.5
Average Stability at -80°C (°C)	1.5
Pull Down Time (to -80°C) (hrs)	8.9
Warm Up Time (-80°C to -50°C) (min)	339





1) Data is representative of performance and not published product specifications. Technical data sheet test results should not be referenced in developing any regulatory parameters for specific customer usage.
2) Freezer performance will vary based on customer product volume, storage format, operating conditions, test methodology and performing recommended maintenance
3) Continuous product enhancements may, without notice, result in amendments or omissions to this technical data sheet. 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/40°C (Evap/Cond) condition.

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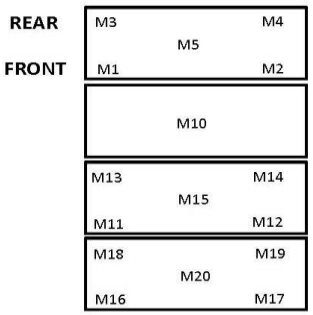
Typical Cabinet Temperature Map
ULT 700, 3 Inner-Shelves + Base, Single Outer Door

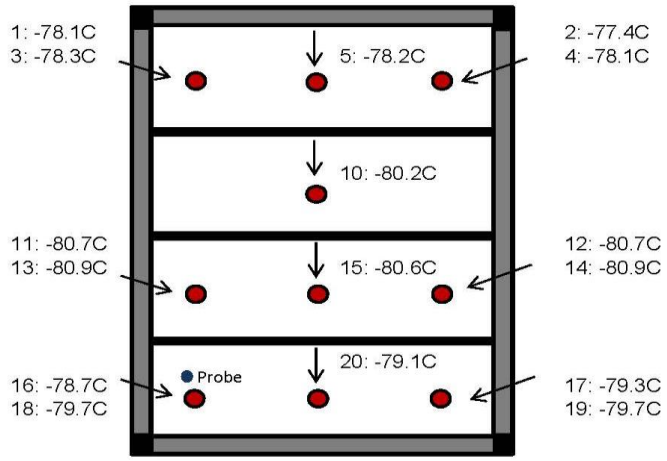
Temperatures are averages during > 12 cycles after reaching a setpoint of -80C

Top View of Shelves



Cabinet Average: -79.6 C
Probe Average: -80.1 C
Peak Variation: +3.8 C / -1.5 C

Front View



20065-B-5-4

	M1	M2	M3	M4	M5	M10	M11	M12	M13
Avg	-78.1	-77.4	-78.3	-78.1	-78.2	-80.2	-80.7	-80.7	-80.9
Max	-77	-76.2	-77.1	-76.8	-77.1	-79.4	-80.1	-80.2	-80.2
Min	-78.9	-78.3	-79.2	-78.9	-79	-80.8	-81.3	-81.2	-81.5

	M14	M15	M16	M17	M18	M19	M20
Avg	-80.9	-80.6	-78.7	-79.3	-79.7	-79.7	-79.1
Max	-80.3	-80.1	-77.9	-78.7	-78.9	-79	-78.5
Min	-81.5	-81.1	-79.4	-79.9	-80.4	-80.3	-79.7

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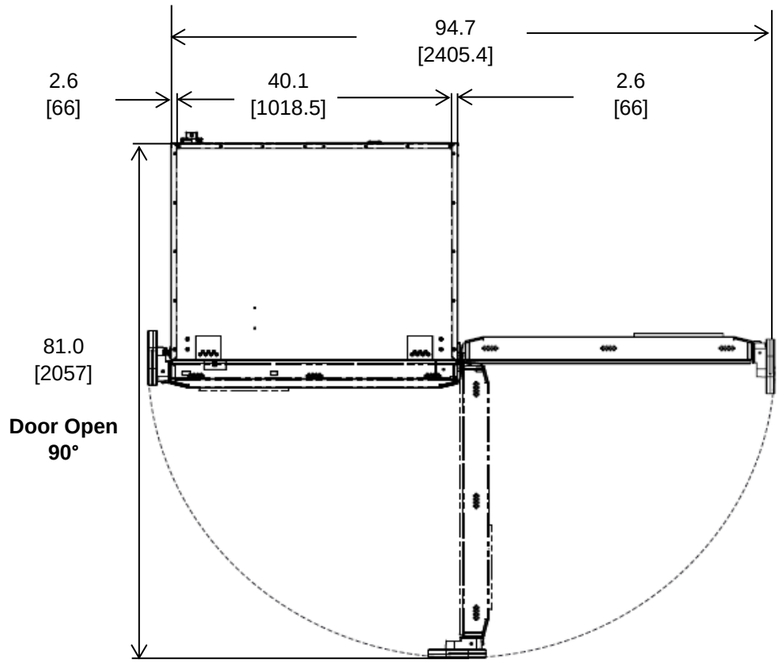
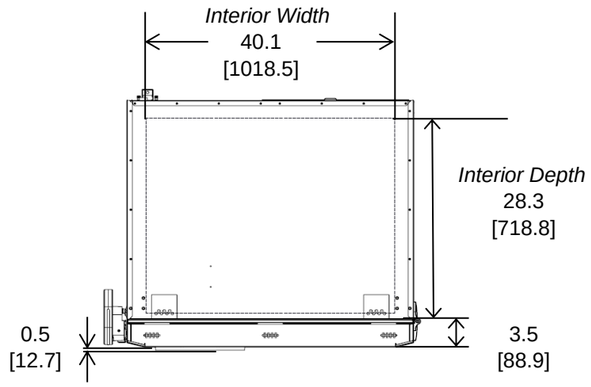
DOOR OPEN @ 180°





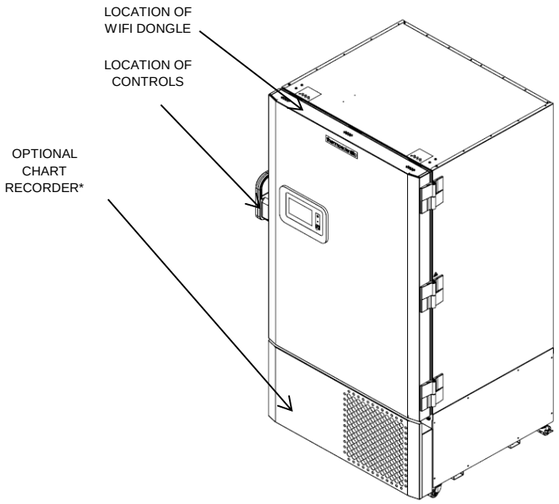
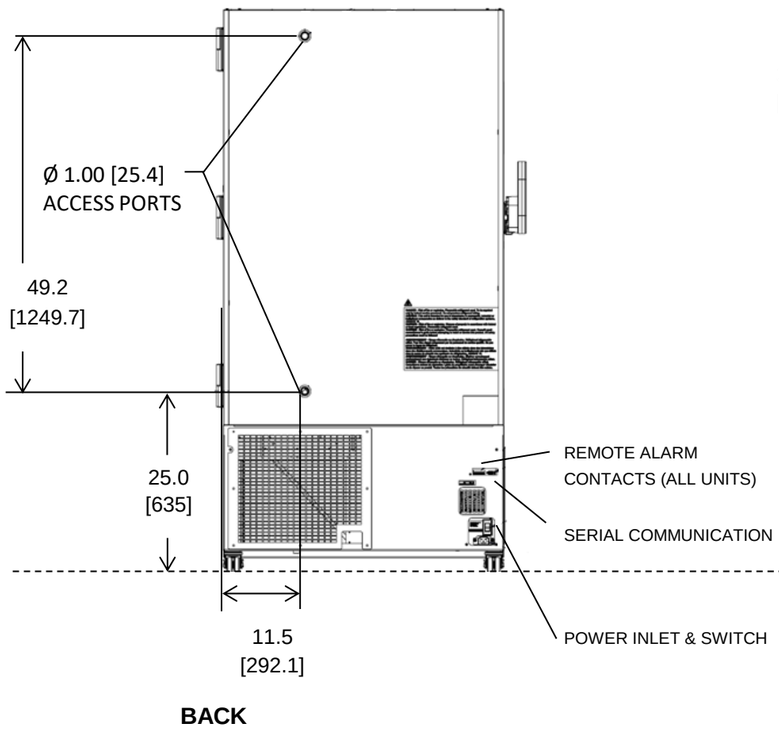
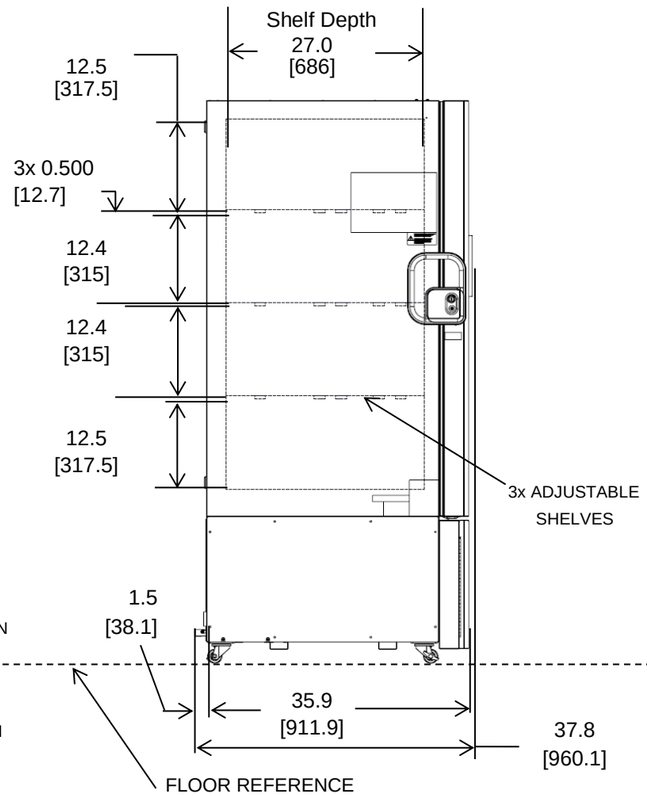
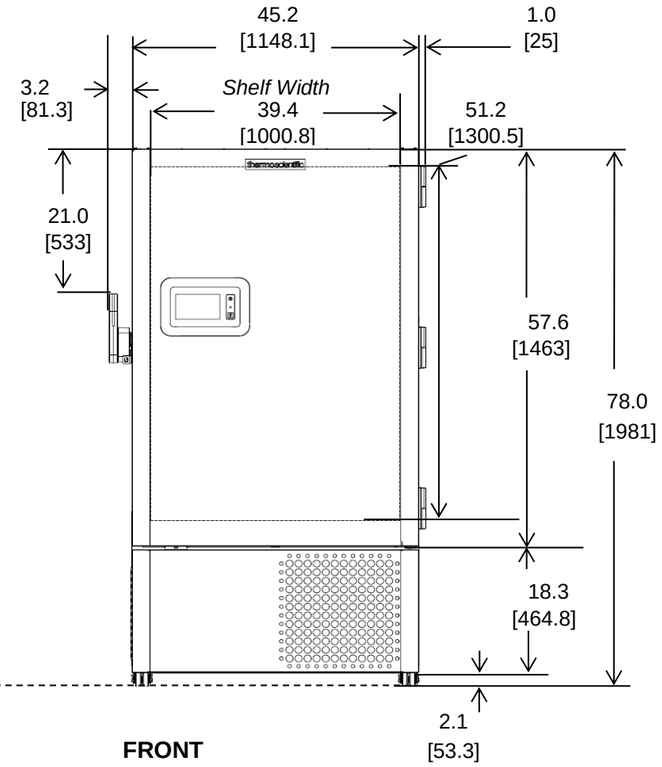


*Chart recorder/Back up systems
are stand alone on 300 models.



BACK





FRONT

NOTE: DUAL DIMENSION IS INCH OVER METRIC

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

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33.5 cuft Upright Freezer
2 Inner Doors
Single Outer Door
Top Mount Controls