



Technical Data Sheet
Thermo Scientific™ Ultra-Low Temperature Freezer
 Chest Model Release - 23
 Thermo Fisher Scientific, Marietta, Ohio

Model Number

TDEC39686FV

Application, Rating and Electrical Data

Typical Performance Characteristics in 20 °C Ambient

Application	Storage of General (non-flammable) Laboratory Materials
Storage Volume	20 cu. ft. (566.3 liters), 396 Standard 2" Boxes
Temperature Rating	-50°C to -86°C
Electrical Power	230V, 50 Hz, 1 Phase
Instrument Rated Current	5.5 AMP
Building Supply Rating	16.0A (min) dedicated grounded circuit, Type C circuit protector or similar required, Ensurance compliance with local electric code
Power Plug / Power Cord	Country Dependant plug / IEC Cords, 10 ft (3.05 m)
Agency Listings	CE, UKCA
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)	10.8
Heat Rejection Rate (Btu/hr)	1535
Peak Variation from Setpoint (°C)	5.9/-3.5
Sound (dBa)	53.7
1-min Door Opening Recovery to -75°C (min)	2
Average Uniformity at -80°C (°C)	5.4
Average Stability at -80°C (°C)	3.9
Pull Down Time (to -80°C) (hrs)	3.3
Warm Up Time (-80°C to -50°C) (min)	156

Dimensions and Construction

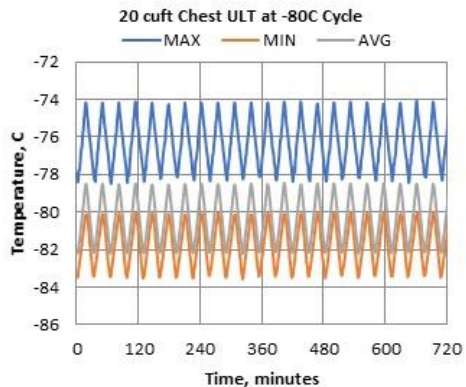
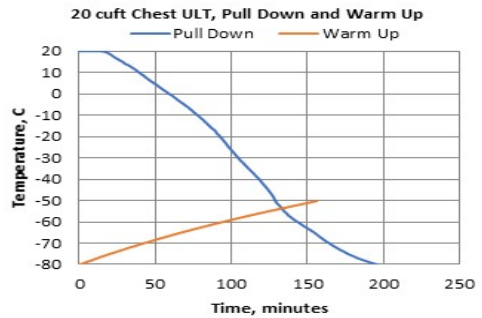
Interior Dimensions (H x D x W)	27.8 x 18.5 x 66.4 in. (706 x 470 x 1687 mm)
Exterior Dimensions (H x D x W)	40.5 x 33.1 x 96.3 in. (1029 x 841 x 2446 mm)
Shipping Dimensions (H x D x W)	47.5 x 37.5 x 106.0 in. (1207 x 953 x 2692 mm)
Shipping Weight / Net Weight	860 lbs. (390 kg) / 650 lbs. (295 kg)
Insulation	Polyurethane foam with non-HFC blowing agent having zero GWP
Door Seal	PVC-Based Gasket
Interior / Exterior Material	Stainless Steel / Painted Steel
All-Direction Casters	Standard with Locks
Other Options	LN2 or CO2 Backup System, Chart Recorder

Electrical System Configuration

Controller Level	Top
Power Switch	(Front) 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*	599 W
Condenser Type	Enhanced Micro-Channel and Forced-Air Cooled
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.

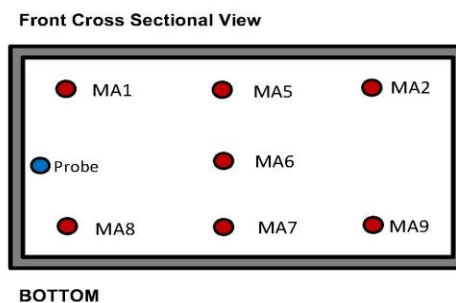
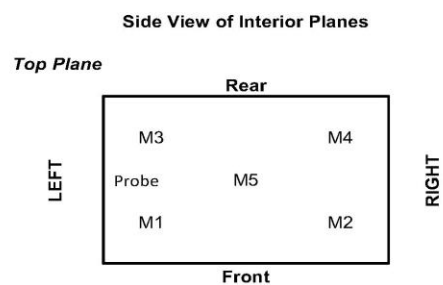
* Manufacturer measured compressor capacity taken at standard -35°C/45°C (Evap/Cond) condition.

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**Typical Cabinet Temperature Map
ULT 20 CFT Chest, Single Outer Lid**

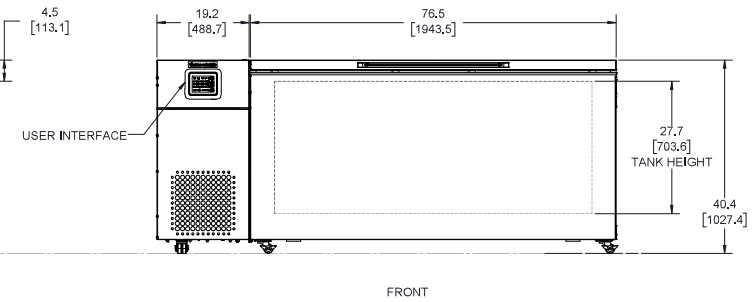
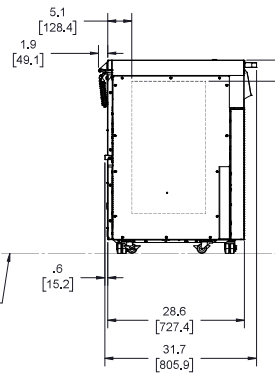
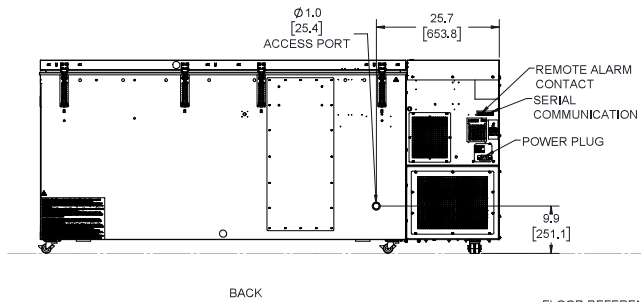
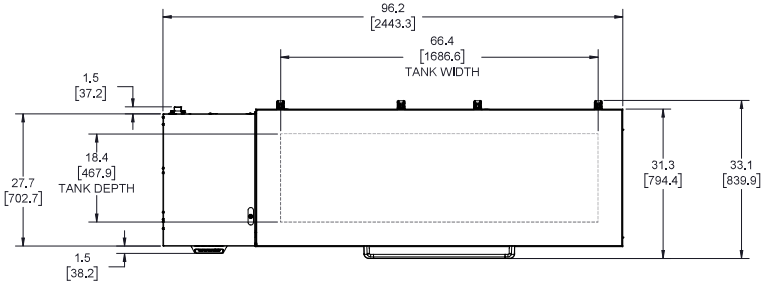
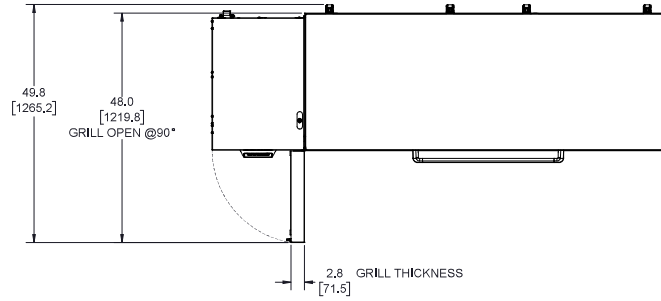
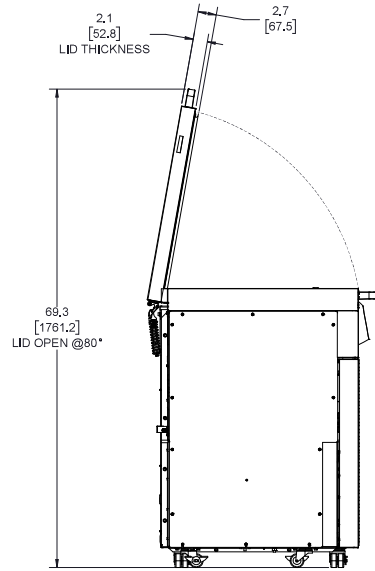
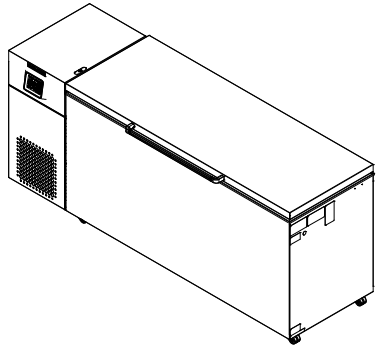
Temperatures are averages during > 20 cycles after reaching a setpoint of -80C



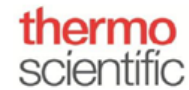
Cabinet Average: -80.4 C
Probe Average: -82.4 C
Peak Variation: +5.9 C / -3.5 C

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	<i>Top Plane</i>					<i>Mid Plane</i>	<i>Bottom Plane</i>				
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11
Avg	-80.2	-79.5	-80.4	-79.9	-76.3	-81.1	-81.1	-81.7	-81.6	-81	-81.5
Max	-77.9	-77	-78.1	-77.5	-74.1	-79.4	-79.4	-80	-79.9	-79.3	-79.9
Min	-82.2	-81.6	-82.3	-82	-78.5	-82.7	-82.9	-83.5	-83.3	-82.7	-83.3



NOTE: DUAL DIMENSIONS IS INCH OVER METRIC.
DO NOT USE FOR ENGINEERING PURPOSES SUBJECT TO CHANGE WITHOUT NOTICE



UNIT DIMENSIONAL DRAWING
20 cu.ft.