Technical Data Sheet

Thermo Scientific Ultra-Low Temperature Freezer

Upright Model Release - 90

Thermo Fisher Scientific, Asheville, North Carolina

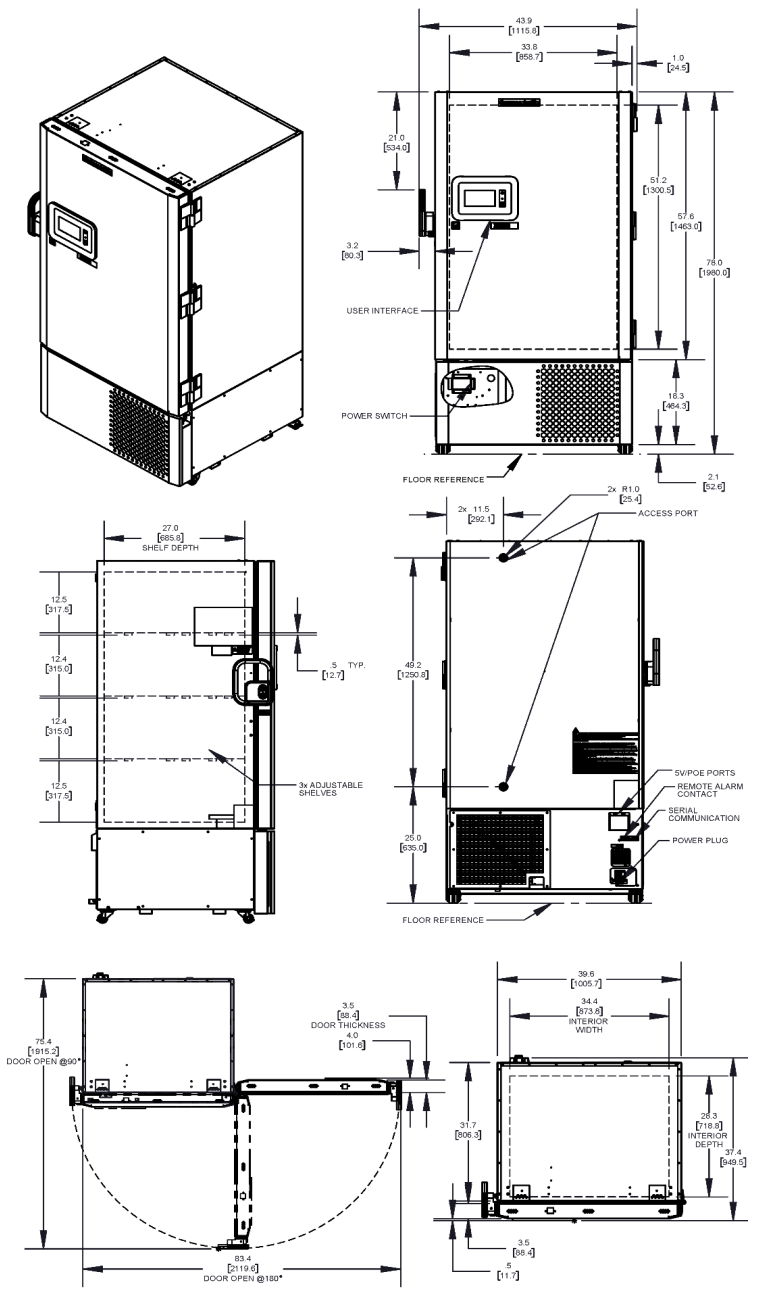
ENERGY STAR®
(Daily Energy Consumption)
0.27 kW-hr/day/cuft

Model Number

Thermo Scientific TSX60086FA

Application and Rating	
Application	Storage of General (non-flammable) Laboratory Materials
Storage Volume	28.79 cu. ft. (815 liters), 600 Standard 2" Boxes
Temperature Rating	-40°C to -86°C
Electrical Power	100V - 230V 50/60Hz
Instrument Rated Current	8.9A - 4.9A
Recommended Building Supply Rating	Type C circuit protection or similar required, Ensure compliance with local electric code
Power Plug / Power Cord	Country Dependent Plug / IEC Cords, 10 ft (3.05 m)
Agency Listings	UL, cUL, CE, ACT, Energy Star
Application Environment	Non-Corrosive, Non-Flammable, Non-Explosive
	Indoor Use Only, Ventilated 15 - 32°C (59 - 90°F)
Sound Pressure Level	43.6 dBA @ -80C Setpoint
Dimensions and Construction	
Interior Dimensions (H x D x W)	51.2 x 28.3 x 34.4 in. (1300 x 719 x 874 mm)
Exterior Dimensions (H x D x W)	78 x 37.4 x 39.6 in. (1981 x 950 x 1006 mm)
Shipping Dimensions	83 x 45 x 52.5 in. (2108 x 1143 x 1334 mm)
Shipping Weight / Net Weight	808 / 697 lbs (367 / 316 kg)
Insulation	Vacuum Insulation Panels with High-Density Water-Blown Polyurethane Foam, Electric Heater at Breaker Area
Door	Single Outer: Silicone-Based Gasket Seal
	Number of Inner: 2x Stainless Steel (5x Optional)
Shelves	3x Stainless Steel (4x Optional) Adjustable Shelves in 1" (25 mm) Increments
Shelf Capacity	Shelf: 150 / 245 lbs (68 / 111 kg) General / Rack Storage Cabinet Load not to Exceed: 1140 lbs (517 kg)
Interior / Exterior Wall Material	Painted Steel (Stainless Steel Optional) / Painted Steel
Casters	4x Standard All-Direction with Locks
Locking mechanism	Handle Key Lock and Pad Lock Loop Standard, HID Controlled Access Optional
Back Up Systems	LN2 or CO2 Optional
Electrical System Configuration	
Power Switch	Soft-touch UI / Main Circuit Breaker (Behind Grill Door)
Controller Type	Capacitive Touch Screen Input and Display with USB Data Retrieval at Eye Level
Control Security	Setpoint Setting, User Log In Access
Compressor Safe Guard	High Temp Cutout Switch, Current, Logic protection
Control Sensor	Single RTD (1000 ohm Platinum RTD, class B, -196°C)
Remote Outputs	RS485, 4-20 mA Output, Remote Alarm Dry Contacts
Thermo Fisher Cloud	InstrumentConnect™ Compatible with Accessory
Adjustable Warm/Cold Alarms	Adjustable in 1°C Increments
Acessory Power	5V, POE
Refrigeration Configuration	
Refrigeration System	Two Stage Cascade System
Compressor/Number	Variable Speed Industrial Rated, Hermetically Sealed / 2
Compressor Capacity*	938 W (max. speed)
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

Dimensions in inch [metric in: mm]



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, options selected, operating conditions, test methodology and performing recommended maintenance.
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* Manufacturer measured compressor capacity taken at LBP: ASHRAE condition.

Not all products are available in all countries. Please consult your local sales representative for details.

Performance Data Sheet -80C Setpoint

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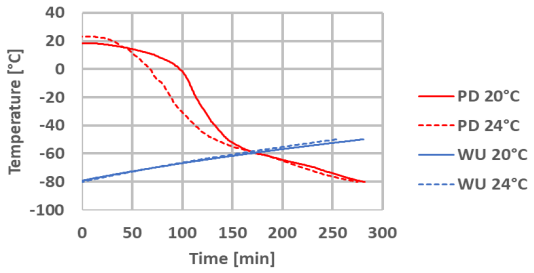
Performance

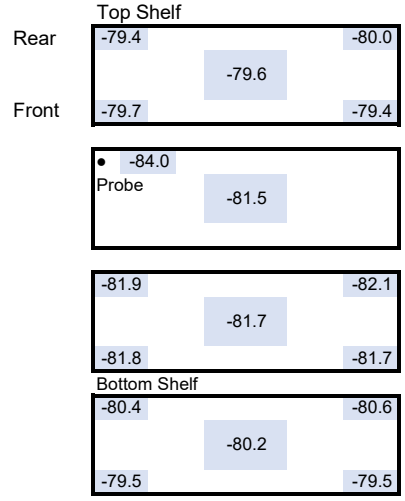
Ambient	°C	20	24
Energy Consumption	kWh/day	7.9	9.0
Heat Rejection Rate	Btu/h	1127	1276
Peak Variation from Setpoint	°C	-2.4/1	-2.9/1.2
Cabinet Temperature Uniformity	°C	3.2	3.6
Cabinet Temperature Stability	°C	0.2	0.2
Average Cabinet Temperature	°C	-80.8	-81.0
1-min Door Opening Recovery to -75°C	min	14.8	20.0
Pull Down Time to -80°C	min	287	282
Warm Up Time -80°C to -50°C	min	288	267

Pull Down and Warm Up at 20°C and 24°C Ambient



Cabinet Temperature Distribution [°C]

20°C Ambient



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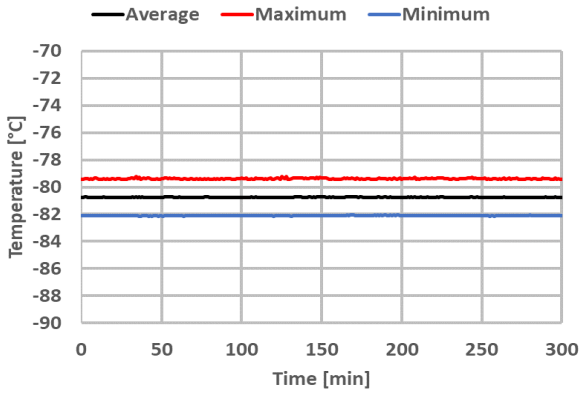
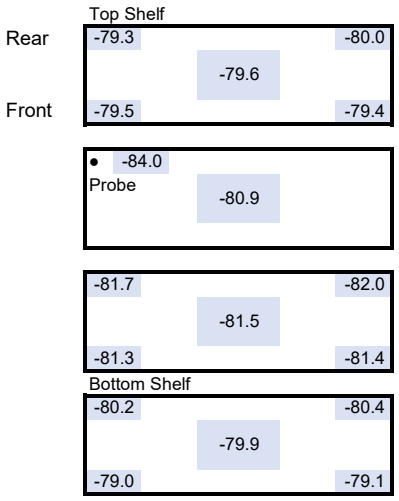


24°C Ambient



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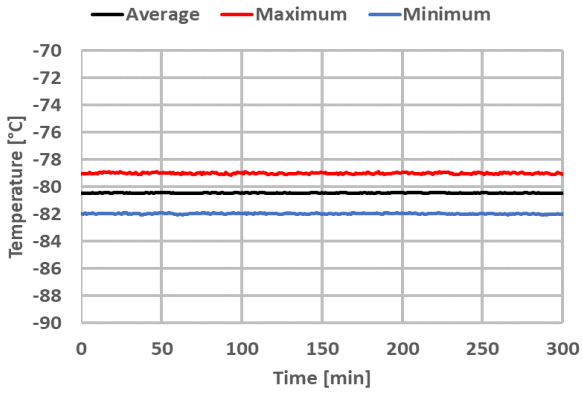

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Performance Data Sheet Warm Setpoints

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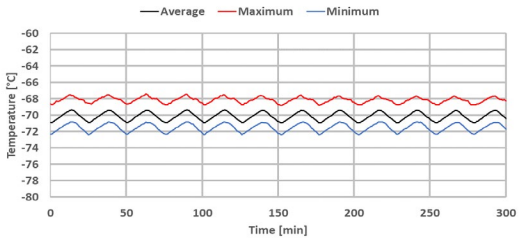
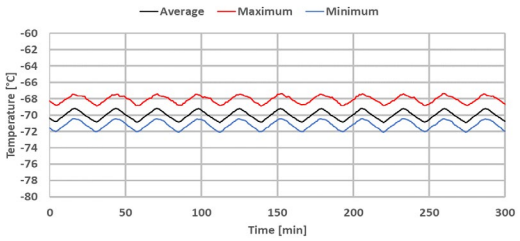
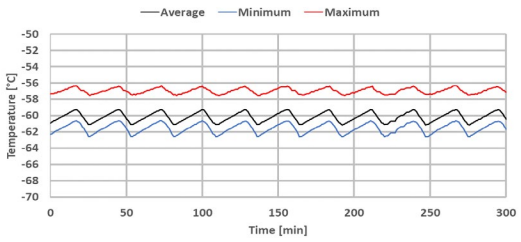
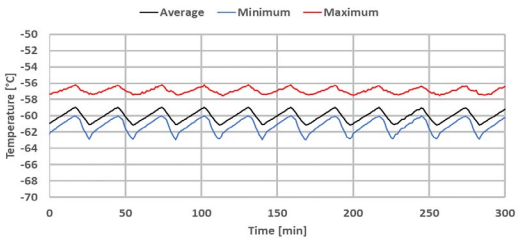
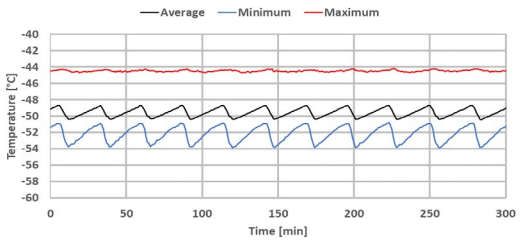
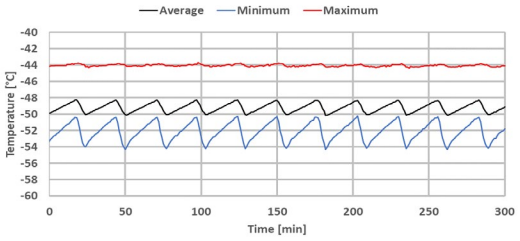
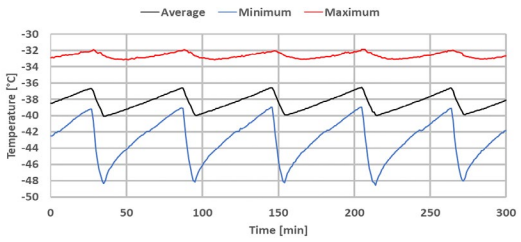
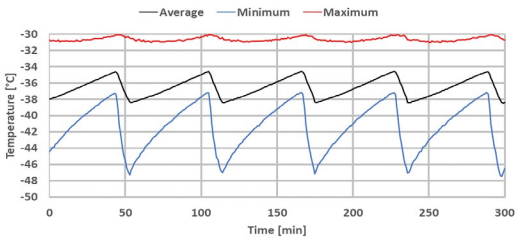
Performance

Ambient	°C	20				24			
Setpoint	°C	**-70**	**-60**	**-50**	**-40**	**-70**	**-60**	**-50**	**-40**
Energy Consumption	kWh/day	5.1	4.2	3.6	3.1	5.9	4.7	4.1	3.5
Heat Rejection Rate	Btu/h	724	596	518	447	836	661	584	495
Peak Variation from Setpoint	°C	-3/2.2	-3.4/2.7	-4.4/4.9	-8.4/8	-2.6/2.7	-3.3/2.8	-4.1/5.4	-7.5/8.9
Cabinet Temperature Uniformity	°C	3.3	4.3	7.1	10.0	3.4	4.1	7.0	10.3
Cabinet Temperature Stability	°C	1.5	1.8	1.6	3.1	1.3	1.6	1.3	2.8
Average Cabinet Temperature	°C	-70.6	-60.7	-50.1	-38.0	-70.4	-60.6	-49.8	-37.3

Setpoint	20°C ambient	24°C ambient
-70°C		
-60°C		
-50°C		
-40°C		

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