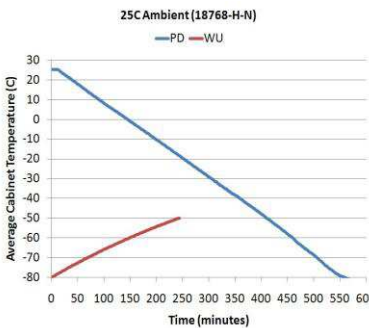
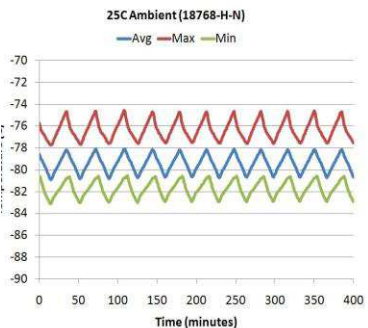


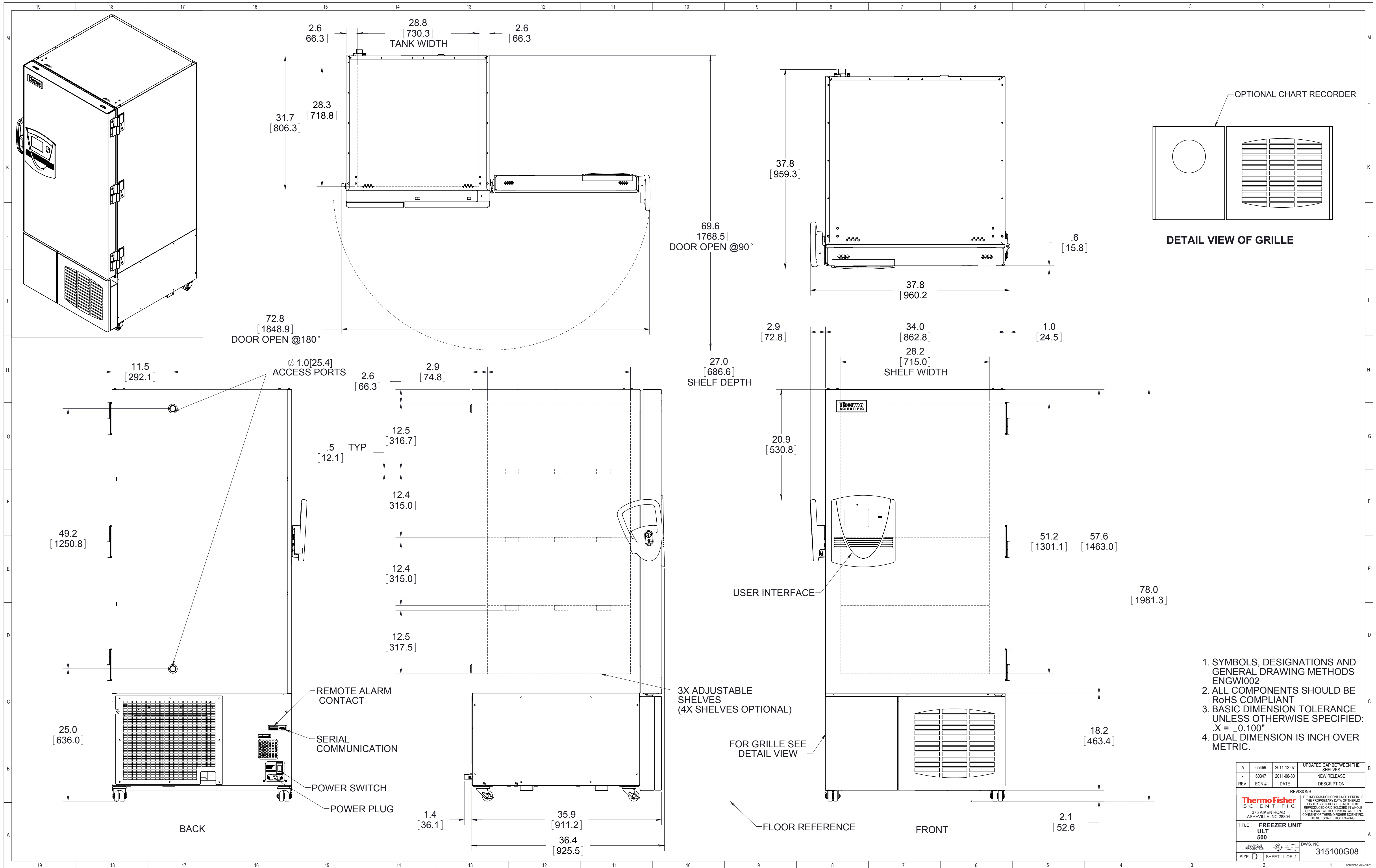
Technical Data Sheet

Thermo Scientific Ultra-Low Temperature Upright Freezer

Revision-3

Thermo Fisher Scientific, Asheville, North Carolina

Specifications	Model Number																														
	Thermo Scientific TSU500D																														
Application, Rating and Electrical Data	Application, Rating and Electrical Data																														
Application	Storage of General (non-flammable) Laboratory Materials																														
Storage Volume	682 liters / 24.1 cu. ft., 500 Standard 2" Boxes																														
Temperature Rating	-50°C to -85°C @ 32 °C(90°F) Ambient																														
Electrical Power	208V/230V, 60 Hz, 1 Phase																														
Instrument Rated Current	9.0 FLA																														
Building Supply Rating	20.0A dedicated grounded circuit. Protected by circuit breaker rated for inductive loads																														
Power Plug/Power Cord Length	NEMA 6-15P, 10 Feet or 3.0 Meters																														
Agency Listings	UL, cUL																														
Application Environment	Indoor Use Only; Non-Corrosive, Non-Flammable, Non-Explosive, Good Air Ventilation, 15C - 32C (59F - 90F)																														
Cooling Water Condition	N/A																														
Lifetime of Product	10 years																														
Refrigeration Configuration	Refrigeration Configuration																														
Refrigeration System	Industrial-Rated Two Stage Cascade System																														
Compressor / Number	1 HP Hermetic Compressor for Low Temperature Application / 2																														
Condenser Type/Number	Enhanced Finned-Tube and Forced-Air Cooled / 1																														
Expansion Device	Capillary Tube On Both Cascade Stages																														
Evaporator Type	Cold Wall With Enhanced Heat Transfer Treatment																														
Defrost Method	Manual Defrost																														
Refrigerant Charge/Flammability	CFC/HCFC-Free Environmentally Safe Refrigerant Mixtures / Non-Flammable in both stages																														
Controller/Electrical System Configuration and Features	Controller/Electrical System Configuration and Features																														
Controller Level	Eye Level																														
Power Switch	On-Off with Circuit Breaker																														
Controller Type	Microprocessor Control with Touch Screen Input and Display. Includes USB System Data Retrieval																														
Setpoint Security	Yes																														
Compressor Safe Guard	High Temperature Warning/Current and Temperature Protection/Logic Protection																														
Control Sensor	Single RTD (1000 ohm Platinum RTD)																														
RS232/Remote Alarm Terminals	RS485/4-20mA output																														
Adjustable Warm/Cold Alarms	Fully Adjustable																														
Auto-Voltage Safeguard	Buck/Boost System																														
Dimensions and Construction	Dimensions and Construction																														
Interior Dimensions (H x D x W)	1.30 x 0.72 x 0.73 m (51.2 x 28.3 x 28.8 in.)																														
Exterior Dimensions (H x D x W)	1.98 x 0.96 x 0.97 m (78.0 x 37.6 x 38.0 in.)																														
Insulation	High R-value Vacuum Insulation Panels and High Density Water-Blown Polyurethane Foam																														
Perimeter Heater	Silicone-Based High Performance Seal Gasket with Electrical Door Perimeter Heater																														
Shelves / Capacity	3 or 4 Stainless Steel Shelves Adjustable In 1" Increments. Max. Cap. per Shelf: 91.7 kg (205 lbs.)																														
All-Direction Casters	Standard with Locks																														
Ship Weight	Approximately 355 kg (782 lbs.)																														
Other Options	LN2 or CO2 Back Up System, HID Controlled Access, SMS Text, Chart Recorder, 4 or 5 Inner Doors																														
Typical Performance Characteristics in Normal Ambient Condition	Typical Performance Characteristics in Normal Ambient Condition																														
																															
<table border="0" style="width: 100%;"> <thead> <tr> <th colspan="2" style="text-align: left;">Performance Data Summary (Typical Average Values)</th> </tr> </thead> <tbody> <tr> <td>Avg. Cabinet Temp. at -80C Setpoint, High Performance (C):</td> <td style="text-align: right;">-79.6</td> </tr> <tr> <td>Peak Variation From -80C Setpoint, High Performance (C):</td> <td style="text-align: right;">+5.6 / -3.8</td> </tr> <tr> <td>Peak Variation From -80C Setpoint, Energy Saving (C):</td> <td style="text-align: right;">+8.8 / -5.6</td> </tr> <tr> <td>Stability, -80C Setpoint, High Performance (C):</td> <td style="text-align: right;">3.8</td> </tr> <tr> <td>Uniformity, -80C Setpoint, High Performance (C):</td> <td style="text-align: right;">5.2</td> </tr> <tr> <td>1 Min. Door Open Recovery to -75C Avg. Cabinet Temp. (min):</td> <td style="text-align: right;">28</td> </tr> <tr> <td>Cycle Rate, -80C Setpoint, High Performance (on/off, min/min):</td> <td style="text-align: right;">26/20</td> </tr> <tr> <td>Duty Cycle, -80C Setpoint, High Performance (%):</td> <td style="text-align: right;">57</td> </tr> <tr> <td>Energy Consumption, -80C Setpoint, High Performance (kWh/day):</td> <td style="text-align: right;">19.0</td> </tr> <tr> <td>Heat Rejection, -80C Setpoint, High Performance (BTU/hr):</td> <td style="text-align: right;">2701</td> </tr> <tr> <td>Energy Consumption, -80C Setpoint, Energy Saving (kWh/day):</td> <td style="text-align: right;">17.6</td> </tr> <tr> <td>Heat Rejection, -80C Setpoint, Energy Saving (BTU/hr):</td> <td style="text-align: right;">2502</td> </tr> <tr> <td>Pulldown Time to -80C Average Cabinet Temp. (hours)</td> <td style="text-align: right;">9.0</td> </tr> <tr> <td>Warmup Time, From Average Cabinet Temp. of -80C to -50C (min):</td> <td style="text-align: right;">237</td> </tr> </tbody> </table>		Performance Data Summary (Typical Average Values)		Avg. Cabinet Temp. at -80C Setpoint, High Performance (C):	-79.6	Peak Variation From -80C Setpoint, High Performance (C):	+5.6 / -3.8	Peak Variation From -80C Setpoint, Energy Saving (C):	+8.8 / -5.6	Stability, -80C Setpoint, High Performance (C):	3.8	Uniformity, -80C Setpoint, High Performance (C):	5.2	1 Min. Door Open Recovery to -75C Avg. Cabinet Temp. (min):	28	Cycle Rate, -80C Setpoint, High Performance (on/off, min/min):	26/20	Duty Cycle, -80C Setpoint, High Performance (%):	57	Energy Consumption, -80C Setpoint, High Performance (kWh/day):	19.0	Heat Rejection, -80C Setpoint, High Performance (BTU/hr):	2701	Energy Consumption, -80C Setpoint, Energy Saving (kWh/day):	17.6	Heat Rejection, -80C Setpoint, Energy Saving (BTU/hr):	2502	Pulldown Time to -80C Average Cabinet Temp. (hours)	9.0	Warmup Time, From Average Cabinet Temp. of -80C to -50C (min):	237
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<p>1) Performance is nominal and individual units may vary.</p> <p>2) Freezer performance will differ due to product amount, product size and operating conditions.</p> <p>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.</p>																															



1. SYMBOLS, DESIGNATIONS AND GENERAL DRAWING METHODS ENGWI002
2. ALL COMPONENTS SHOULD BE RoHS COMPLIANT
3. BASIC DIMENSION TOLERANCE UNLESS OTHERWISE SPECIFIED: X = ±0.100"
4. DUAL DIMENSION IS INCH OVER METRIC.

REV.	ECN #	DATE	DESCRIPTION
A	65469	2011-12-07	UPDATED GAP BETWEEN THE SHELVES
-	60347	2011-06-30	NEW RELEASE

REVISIONS

ThermoFisher SCIENTIFIC

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TITLE: **FREEZER UNIT ULT 500**

SIZE: **D** SHEET 1 OF 1

DWG. NO.: **315100G08**