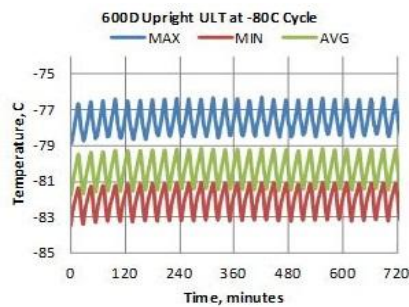
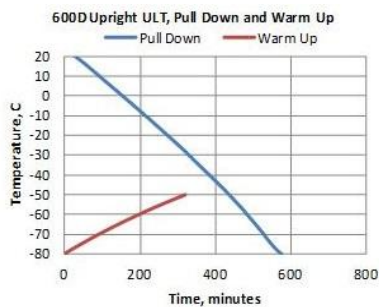




Technical Data Sheet
Forma Ultra-Low Temperature Upright Freezer
 MODEL RELEASE - 65
 Thermo Fisher Scientific, Asheville, North Carolina

Specifications	Model Number
Application, Rating and Electrical Data	
Application	Storage of General (non-flammable) Laboratory Materials
Storage Volume	815 liters / 28.8 cu. ft., 600 Standard 2" Boxes
Temperature Rating	-50°C to -86°C
Electrical Power	208-230V, 60 Hz, 1 Phase
Instrument Rated Current	9.5 AMP
Building Supply Rating	15.0A dedicated grounded circuit. Protected by circuit breaker rated for inductive loads
Power Plug/Power Cord Length	NEMA 6-15P for D / IEC Cords, 3.048 Meters (10 Feet)
Agency Listings	CE
Indoor/Outdoor Usage	Indoor Use Only
Application Environment	Non-Corrosive, Non-Flammable, Non-Explosive, Good Air Ventilation, 15° C - 32° C (59° F - 90° F)
Refrigeration Configuration	
Refrigeration System	Industrial-Rated Two Stage Cascade System
Compressor / Number	Hermetic Compressor for Low Temperature Application / 2
Compressor Capacity*	980 W
Condenser Type/Number	Enhanced Finned-Tube and Forced-Air Cooled / 1
Expansion Device	Capillary Tube
Evaporator Type	Cold Wall With Enhanced Heat Transfer Treatment
Defrost Method	Manual Defrost
Refrigerant Charge/Flammability	R404A in 1st Stage / R508B+R290 Mix in 2nd Stage / Non-Flammable
Controller/Electrical System Configuration and Features	
Controller Level	Top
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 Pressure Cutout Switch/High Temp Cutout Switch/Current protection/Logic protection
Control Sensor	Single RTD (1000 ohm Platinum RTD)
Remote Alarm Terminals	RS485/4-20mA output
Adjustable Warm/Cold Alarms	Fully Adjustable
Auto-Voltage Safeguard	Buck/Boost System
Dimensions and Construction	
Interior Dimensions (H x D x W)	1300 H x 686 D x 874 W mm (51.2 H x 27 D x 34.4 W in.)
Exterior Dimensions (H x D x W)	1981 H x 960 D x 1102 W mm (78 H x 37.8 D x 43.4 W in.)
Shipping Dimensions	2111 H x 1086 D x 1206 W mm (83.12 H x 42.75 D x 47.48 W in)
Insulation	High R-value Vacuum Insulation Panels and High Density Water-Blown Polyurethane Foam
Door Seal	Silicone-Based High Performance Seal Gasket with Electrical Door Perimeter Heater
Shelves / Capacity	3 Stainless Steel Shelves Adjustable In 25mm (1in) Increments. Max. Cap. per Shelf: 110 kg (245 lbs.)
All-Direction Casters	Standard with Locks
Shipping Weight	Approximately 388 kg / 854 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 20 ° C Ambient



Test Unit Series Number or MSO Number: 19029-TS-T17

Average Cabinet Temp at -80C Cycle (C):	-80.3
Peak Variation from Setpoint, High Performance (C):	+3.7 / -3.5
Peak Variation from Setpoint, Energy Savings (C):	+7.1 / -1.5
Avg Uniformity at -80C, High Performance:	4.5
Avg Stability at -80C, High Performance:	2.6
1-min Door Opening Recovery to -75C (min):	28
Duty Cycle at -80C, High Performance (%):	50
Cycle (on/off) rate at -80C, High Performance (min):	14 / 13
Energy Consumption, High Performance (kw-hr/day):	17.6
Heat Rejection Rate, High Performance (btu/hr):	2500
Energy Consumption, Energy Savings (kw-hr/day):	15.2
Heat Rejection Rate, Energy Savings (btu/hr):	2165
Pull Down Time (to -80C) (hrs):	9.6
Warm Up Time (-80C to -50C) (min):	319

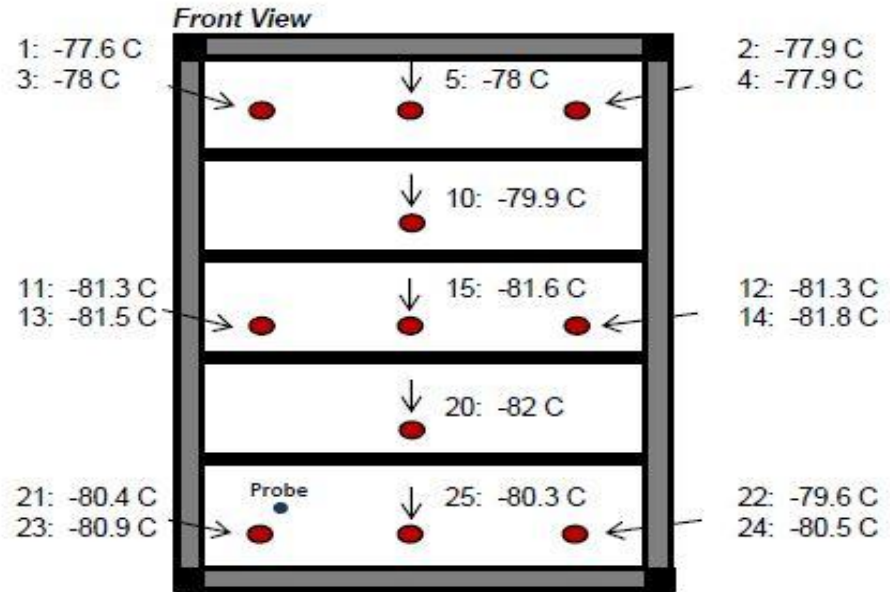
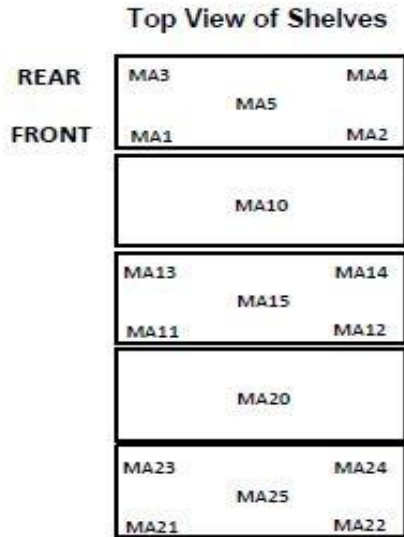
- Performance is nominal and individual units may vary.
- Freezer performance will differ due to product amount, product size and operating conditions.
- Continuous product enhancements may, without notice, result in amendments or omissions to this specification. Thermo Scientific cannot accept responsibility for damage, injury, loss or expenses resulting from misapplication of the information herein.

* Manufacturer measured compressor capacity taken at standard -23°C/49°C (Evap/Cond) condition.

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Typical Cabinet Temperature Map
600D ULT, 4 Inner-Shelves + Base, Single Outer Door

Temperatures are averages during > 12
hours of cycle after reaching setpoint of -80 C

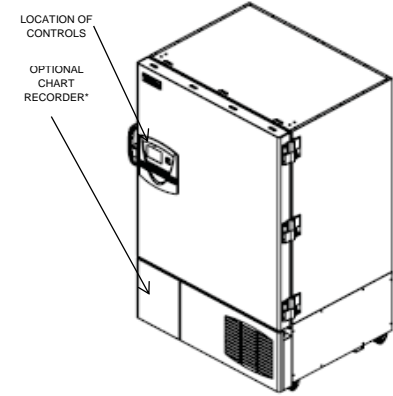
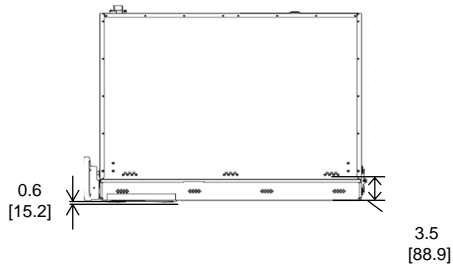
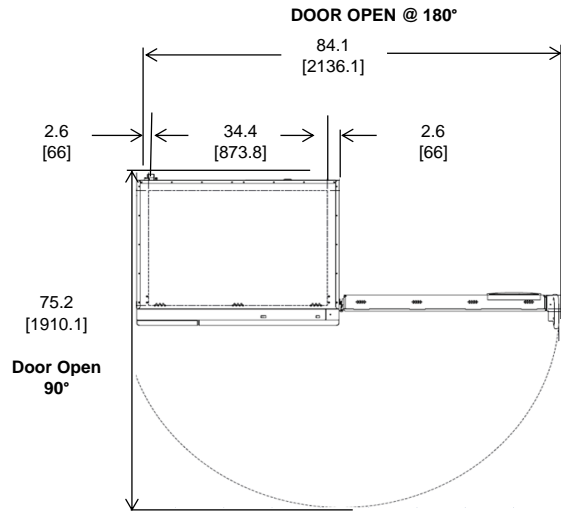


19029-TS-T17

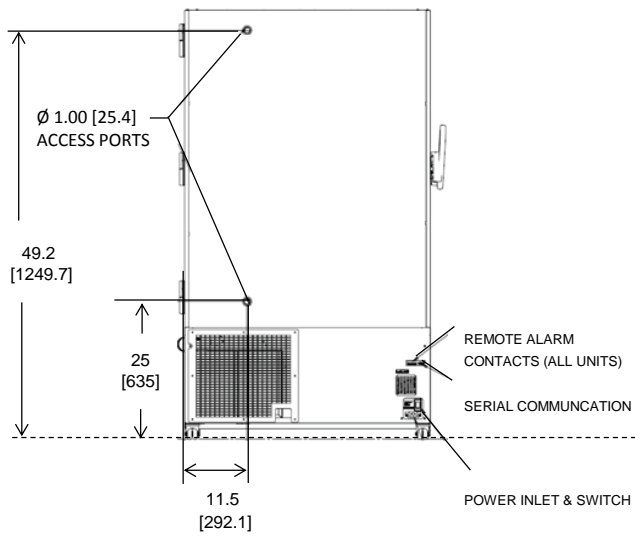
Cabinet Average: -80.3 C
Probe Average: -81.3 C
Peak Variation: +3.7 C / -3.5 C

	MA1	MA2	MA3	MA4	MA5	MA10	MA11	MA12	MA13
Avg	-77.6	-77.9	-78.0	-77.9	-78.0	-79.9	-81.3	-81.3	-81.5
Max	-76.3	-76.6	-76.7	-76.3	-76.7	-78.5	-80.1	-80.0	-80.2
Min	-78.9	-79.2	-79.2	-79.4	-79.2	-81.5	-82.7	-82.7	-83.0

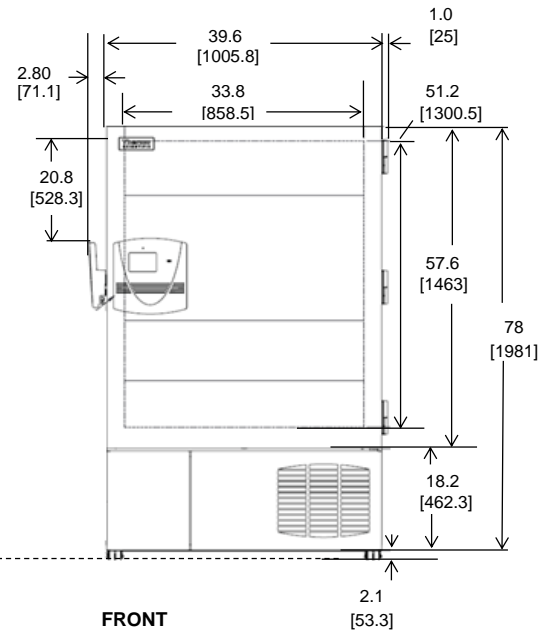
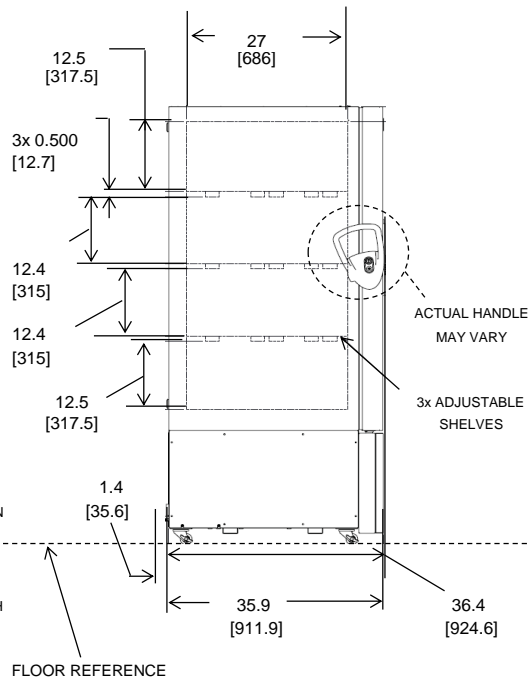
	MA14	MA15	MA20	MA21	MA22	MA23	MA24	MA25
Avg	-81.8	-81.6	-82.0	-80.4	-79.6	-80.9	-80.5	-80.3
Max	-80.4	-80.4	-81.0	-79.7	-78.9	-79.9	-79.1	-79.4
Min	-83.3	-83.1	-83.5	-81.6	-80.8	-82.6	-82.5	-81.7



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



BACK



NOTE: DUAL DIMENSION IS INCH OVER METRIC

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

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29 cuft Upright Freezer

4 Inner Doors
Single Outer Door
Top Mount Controls