



**Technical Data Sheet**  
**Forma Ultra-Low Temperature Freezer**  
 Upright Model Release - 81  
 Thermo Fisher Scientific, Asheville, North Carolina

**Model Number**

Thermo Scientific Forma 8930086V

**Application, Rating and Electrical Data**

|                          |  |
|--------------------------|--|
| Application              | Storage of General (non-flammable) Laboratory Materials  |
| Storage Volume           | 14.9 cu. ft. (422 liters), 300 Standard 2" Boxes   |
| Temperature Rating       | -50°C to -86°C   |
| Electrical Power         | 230V, 50 Hz, 1 Phase   |
| Instrument Rated Current | 5.9 AMP  |
| Building Supply Rating   | 10.0A (min) dedicated grounded circuit   |
| 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<br>Indoor Use Only, Ventilated 15° C - 32° C (59° F - 90° F) |

**Dimensions and Construction**

|                                 |  |
|---------------------------------|--|
| Interior Dimensions (H x D x W) | 51.2 x 28.3 x 17.8 in. (1300 x 719 x 452 mm)                             |
| Exterior Dimensions (H x D x W) | 78 x 39.3 x 23 in. (1981 x 998 x 584 mm)                                 |
| Shipping Dimensions             | 83.12 x 42.75 x 34 in. (2111 x 1086 x 864 mm)                            |
| Shipping Weight / Net Weight    | 712 lbs. (323 kg) / 622 lbs. (282 kg)                                    |
| Insulation                      | Vacuum Insulation Panels with High-Density Water-Blown Polyurethane Foam |
| Door Seal                       | Silicone-Based Gasket Seal with Electrical Door Perimeter Heater         |
| Shelves                         | 3 Stainless Steel<br>Adjustable Shelves in 1" (25mm) Increments          |
| Shelf Capacity                  | Max. Capacity per Shelf: 125 lbs. (56.8 kg)                              |
| Interior / Exterior Material    | Painted Steel (Stainless Steel Option) / Painted Steel                   |
| All-Direction Casters           | Standard with Locks  |
| Other Options                   | LN2 or CO2 Back Up System<br>HID Controlled Access, Chart Recorder       |

**Electrical System Configuration**

|                               |   |
|-------------------------------|---|
| Controller Level              | Top   |
| Power Switch                  | (Front) Soft-touch / (Rear) Main Circuit Breaker                  |
| Controller Type               | 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*        | 559 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)<br>ODP: 0 (R290); 0 (R170) |
| Flammable                   | Yes   |

**Typical Performance Characteristics in 20 °C Ambient**

**Standard Performance Mode**

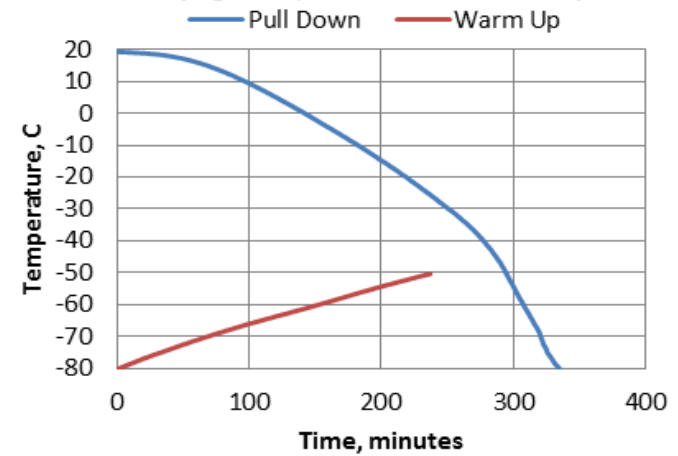
|                                   |             |
|-----------------------------------|-------------|
| Energy Consumption (kW-hr/day)    | 9.1         |
| Heat Rejection Rate (Btu/hr)      | 1297        |
| Peak Variation from Setpoint (°C) | +8.6 / -1.6 |

**High Performance Mode**

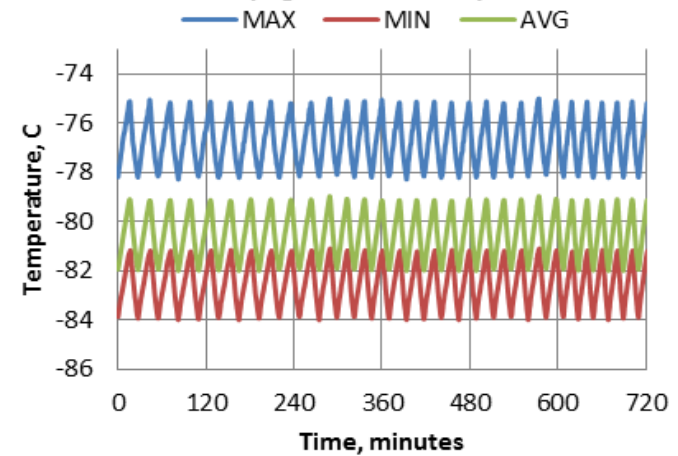
|                                   |             |
|-----------------------------------|-------------|
| Energy Consumption (kW-hr/day)    | 11.6        |
| Heat Rejection Rate (Btu/hr)      | 1647        |
| Peak Variation from Setpoint (°C) | +5.0 / -4.0 |

|  |      |
|--|------|
| Sound (dBa)                                | 52.3 |
| 1-min Door Opening Recovery to -75°C (min) | 16   |
| Average Uniformity at -80°C (°C)           | 5.8  |
| Average Stability at -80°C (°C)            | 3.1  |
| Pull Down Time (to -80°C) (hrs)            | 5.6  |
| Warm Up Time (-80°C to -50°C) (min)        | 237  |

**300V Upright ULT, Pull Down and Warm Up**



**300V Upright ULT at -80C Cycle**



- 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.

\*\* For Australian/New Zealand Units: Due to different wiring regulations in Australia and New Zealand, a 10A dedicated ground circuit, protected by a circuit breaker rated for inductive loads is required for this unit. The power cord is AS/NZS 3112: 10A (2.5m length). Contact your local sales representative for more information.

© 2019 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific Inc. and its subsidiaries. Specifications, terms and pricing are subject to change.

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