

Controlled Environment
Equipment Solutions
for the Lab



Forma[®] -86C ULT Chest and Upright Freezers

Reliable Chests & Uprights

Tested Ultra-Low Temperature Freezers You Can Trust

Researchers worldwide depend on Forma -86C ULT Freezers everyday for drug preservation; vaccine, critical enzyme, hormone, and tissue preservation; antibiotics manufacturing; pre-lyophilization; thermal shock testing; and dimensional conditioning of parts. Thermo Electron Corporation's broad -86C ULT freezer line includes the premium 8600 Series, deluxe 900 Series, and basic 700 Series so you can choose the freezer features, style, and capacity that meet your specific requirements.

Everyday reliability for peace of mind.

Our -86C ULT freezers are designed for everyday reliability and minimal maintenance so you can focus on your work, not on the freezer's functioning.

Proven performance for worry-free workdays.

Rugged cabinet construction and quieter operation, a carefully designed refrigeration system and controlled airflow, and a voltage compensator and back-up system result in freezers that provide peak performance day-after-day.

Easy to use...by design!

Our chest and upright freezer design enhances usability. The centralized information center on 8600 and 900 Series uprights is eye-level for at-a-glance monitoring. Powerful, intuitive Enviro-Scan® controls (8600 Series) are common to other Forma named products. Interior is easy to clean and air filter is easy to access and change. Ergonomically-designed handles ease door openings. An array of accessories (e.g., digital dataloggers, chart recorders, sample probes, inventory management systems, CO₂ and LN₂ back-ups) allow you to take full advantage of each freezer's maximum capacity and tailor the unit to your needs.



Range of capacities, including a 28.0 cu. ft. upright that holds 60,000* 2.0ml vials!



THREE SERIES

Premium 8600 Series 6
Deluxe 900 Series 8
Basic 700 Series 10

MULTIPLE STYLES & SIZES

- Single & double door uprights, & chests
- Uprights: 13.0, 17.3, 23.0, & 28.0 cu. ft.
Chests: 3.0, 6.7, 12.7, 17.0, & 20.0 cu. ft.

*Based on a 28.0 cu. ft. -86C ULT freezer, 2.0ml vial size, No. 820010 polycarbonate boxes, and No. 920090 sliding drawer racks. Refer to our *Forma -40C and -86C Freezer Accessories* brochure for details about boxes, racks, and other accessories.

Everyday Reliability for Peace of Mind

Experience the peace of mind of safe sample storage, an improved refrigeration system and temperature control, and the ultimate convenience of a ULT freezer designed with your work habits in mind.

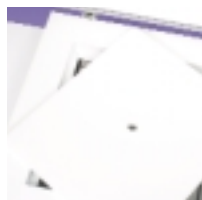
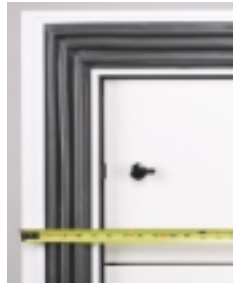
Our Forma -86C ULT Freezers are designed to perform reliably day after day, letting you focus on your work, not on freezer operation or maintenance.

Proven Performance for Worry-Free Workdays

Our chests and uprights are constructed and stress tested to operate efficiently at a temperature range of -50C to -86C (-58F to -123F).

Rugged Cabinet Construction for Everyday Use

- Heavy gauge, cold-rolled steel cabinets have a powder coat paint finish for a uniform exterior surface that **resists chipping and rust**.
- Maximum product protection is provided by approximately 5.0" (12.7cm) of foamed-in-place polyurethane insulation in the cabinet that
 - **reduces the amount of power consumed**
 - allows the cabinet to reach and **maintain the temperature setpoint**
 - **prevents condensation** from forming on the cabinet exterior
- Four interior compartment doors in uprights and polystyrene sub-lid(s) in chests reduce cold air loss, **improving temperature recovery** after door closings. Five door option is available for uprights.



- Triple-point silicone gasket and latch/handle on uprights and flexible gasket on chests ensure a snug seal that
 - helps **assure product protection**
 - minimizes ambient temperature and humidity migration to the interior, **reducing maintenance** because less frost builds up on the inner doors and chest sub-lid(s)
 - provides an energy efficient thermal barrier to keep cold air in and room temperature air out, **contributing to safe product storage** and **reducing wear and tear on the compressors** because they don't have to operate as often

Quieter Operation for a Comfortable Working Environment

You spend many hours surrounded by lab equipment. We want those hours to be as comfortable and productive as possible.

Uprights include acoustical mufflers designed into the base and sound absorbing foam that work together to reduce noise level, ensuring **quiet operation for more comfortable working conditions**. The mufflers are tuned specifically for the audible sound frequencies generated.

Automatic Voltage Compensator for Longer Compressor Life

Automatic voltage compensator detects the line frequency (50 or 60 Hz) and monitors the incoming voltage. Based on that data, the automatic voltage compensator dynamically adjusts compressor voltage.

- Monitoring/controlling the voltage
 - ensures that a more consistent electrical current flows to the freezer, **reducing wear and tear on the compressor(s)**
 - increases compressor life by **maintaining reliability over a wide voltage range**
 - prevents incorrect voltage from being applied to the freezer's fan(s) and compressors (e.g., **ensures use of the correct electrical outlet**)

DOUBLE DOOR DESIGN

It's a unique design! Store frequently used specimens and samples in the top chamber, while long-term storage items remain undisturbed in the bottom.

Because cold air "falls," this design (8600 and 900 Series) stabilizes the bottom chamber's temperature, providing product protection during repeated upper door openings and making freezer sharing more feasible.

U.S. Patents 5,600,966 and 5,737,939

Carefully Designed Refrigeration System for Peak Performance

Our combination of engineering expertise; the latest energy efficient, non-CFC refrigerants; and a leading worldwide manufacturer's compressors achieve peak freezer performance and maximum reliability over a wide ambient temperature range.

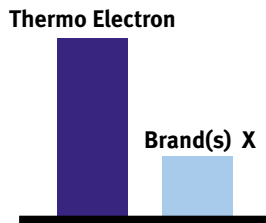
The fully tested refrigeration system improves temperature control for more consistent temperature cycling and increases reserve BTUH capacity, resulting in a **more stable temperature for safer product storage**.

- Refrigerant expansion tank (U.S. Patent 6,539,735) in the 17.3, 23.0, and 28.0 cu. ft. (489.9, 651.3, and 792.8 liters) uprights increases reserve BTU capacity, ensuring **faster temperature recovery** after door closings (see the charts below).
- Hermetic compressors designed to our quality requirements provide **improved product protection, better temperature recovery times, and increased heat removal per kilowatt of energy used**.

Controlled Airflow for Increased Cooling

Ambient air enters the front of the grille and passes through the filter, condenser, and compressor housing and then exits the rear of the unit. An air filter and condenser fans protect and enhance the longevity of the compressors, **saving downtime and minimizing maintenance costs**.

Overall, the front-to-back air circulation system results in **cooler compressor temperatures, increased performance and reliability, and longer compressor life**.



Our upright freezers have three times the reserve BTUH capacity of other brands.

RESERVE BTUH CAPACITY

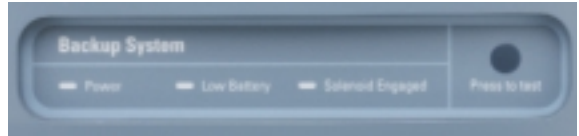
To illustrate the meaning of reserve BTUH capacity, the Reserve Capacity Comparison graph shows the temperature rise and recovery time when eight two-liter bottles of room temperature water were added to the freezer.

Our upright freezers recover temperature quicker and have three times the reserve BTUH capacity of other brands.

Back-Up Systems and Data Monitoring Devices for Added Peace of Mind

All freezers include a battery back-up system that **provides power to the monitoring/alarm system in the event of a power failure**. The system is designed to always have the battery back-up at a full charge without special programming.

While on back-up, freezer cabinet temperature and alarm conditions are monitored. The heavy-duty **battery requires no maintenance**.



- Optional CO₂ and LN₂ safety back-up systems are available to provide **additional product protection** in the event of a power or mechanical failure.
- Optional built-in chart recorder or digital datalogger can be installed at eye level on 8600 and 900 Series Freezers and on the base of 700 Series Freezers for **continuous monitoring**.

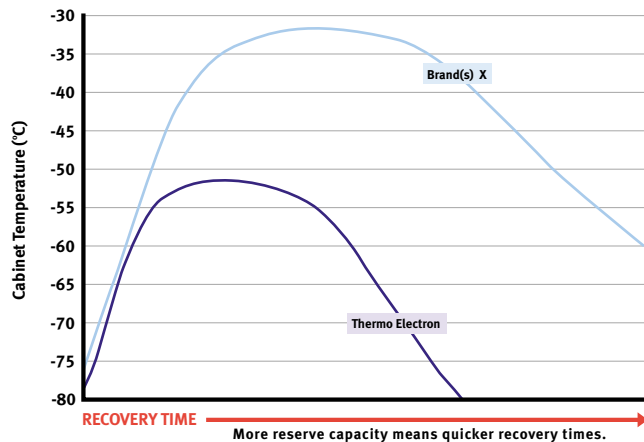


Dataloggers and optional evaluation software, which calculates Mean Kinetic Temperature (MKT), are designed to meet U.S. FDA guidelines cGLP 21 CFR Part 58, Software Validation 21 CFR Part 820, and Electronic Records 21 CFR Part 11. Full compliance requires user training. Contact our Services Department (888-213-1790) for an implementation quotation.



- Freezers include remote alarm contacts for **connection to an in-house security system, optional remote alarm system, or Sensaphone® Telephone Dialing System**.

RESERVE CAPACITY COMPARISON



Easy to Use...by Design!

Sleek design of the uprights and updated appearance of the chests focus on functionality and ease of use to ensure convenience and time savings.

Easy-to-Clean Interior Designed for a Full Product Load

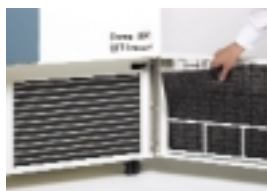
- **Easy to clean interior.** 8600 and 900 Series freezers feature a stainless steel interior. 700 Series freezers feature a powder coated galvanized interior.



- **Sturdy, solid stainless steel shelving to support a full product load.** 8600 and 900 Series uprights include three fully adjustable shelves. 700 Series uprights include three fixed position shelves.

We offer a wide range of inventory control systems so you can take full advantage of available freezer space. Ask for details, or visit our web site.

- Air filter's convenient location allows **quick visual inspection of the filter's condition.** Hinged grille swings out for convenient access to the filter, which can be **removed easily for cleaning or replacement.**



Easy-to-Grasp Handle for One-Handed Operation

Ergonomically-designed handle on chests and uprights ensures that **minimal effort is required during freezer openings and closings.**

- You can **hold samples in one hand while opening or closing the freezer** with the other.



- Cam-actuated latch/handle on uprights is mounted to the door rather than to the cabinet, serving as a **comfortable handle** when the door is open.



- Vacuum relief port on uprights equalizes the pressure quickly, allowing **easy re-entry after a door closing.**
- Key lock **prevents unwanted access to your valuable samples.**

- For **added security**, an audible/visual alarm occurs if the door or lid is not closed properly.

Easy-to-Reach Controls and Easy-to-Monitor Displays

All freezers feature a centralized information center. Eye level location on 8600 and 900 Series freezers makes it easy to view freezer parameters and conditions from across the lab. (700 Series controls are in the base.)



- Convenient position of an optional recorder or datalogger on 8600 and 900 Series freezers ensures **easy monitoring and paper changes.**
- Storage pocket on 8600 Series uprights tilts forward, serving as a **handy, centralized location for daily logs, IQ/OQ procedures, inventory control records, or the freezer's operating and maintenance manual.**



Premium 8600 Series Uprights and Chests for Ultimate Convenience and Performance

8600 Series upright and chest freezers are designed for pharmaceutical, biotech, and blood bank applications, and any other industry that requires validation.

- RS-232 and 4-20 milliamp analog outputs are standard. RS-232 allows **connection to a computer, recorder, or independent monitoring device**. Output configurations other than the RS-232, 4-20 milliamp default are available (i.e., RS-485 or RS-232, and 0-1V, 4-20 milliamp, or 0-5V).
- Optional sample probe in the top chamber of 8600 Series uprights measures sample temperature or top chamber temperature, **assuring you of the sample temperature or uniformity** between the top and bottom of the freezer.

Enviro-Scan for Easy Setup, Programming, and Monitoring

The centralized information center, which includes the Enviro-Scan Microprocessor Control/Monitoring System (shown below) and an optional chart recorder or datalogger, ensures that all **controls and displays are easy to reach and read**.

- Highly visible display, intuitive controls, and simplified programming make it **easy to set up, program, check, and monitor parameters and conditions**.
- Personal access code ensures **setpoint security**.
- Numerous audible/visual alarms (e.g., power failure, high/low temp, door ajar, condenser hot, probe failure, etc.) offer **peace-of mind monitoring**.

Temperature – Displays actual and sample probe (optional) temperatures

Mode – Select Run, Settings, Calibrate, or Configuration mode

Message Center – 12-character alpha-numeric LED displays setpoints, "SYSTEM OK" during normal operation, and other messages

Run – "SYSTEM OK" appears in the message center during normal operation; message changes to describe alarm conditions

Scroll for Program Parameters

Settings – Set Cabinet Temp Setpoint, Overtemp Alarm, Undertemp Alarm, and Back-Up System Temp Setpoint (optional)

Calibrate – Calibrate Control Probe Temp and Sample Probe Temp (optional)

Audible/Visual Alarm

Alarm Silence

Low Battery and Hot Condenser Indicators

Configuration – Configure Access Code, Serial Output, Temperature Alarm Test, and System Battery Test

Programming Buttons



8600 Series

- **Single door uprights:** 13.0, 17.3, 23.0, & 28.0 cu. ft.
- **Double door uprights:** 13.0, 17.3, & 23.0 cu. ft.
- **Chests:** 12.7, 17.0, & 20.0 cu. ft. (refer to the 700 Series section for 3.0 & 6.7 cu. ft. chests)



8600 Series Specifications

Temperature

Range	-50C to -86C (-58F to -123F) in an 18C to 32C* (64.4F to 89.6F) ambient
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Capacities & Models

Uprights	
13.0 Cu. Ft. (368.1 liters)	8603 (8602) Single Door 8692 (8691) Double Door
17.3 Cu. Ft. (489.9 liters)	8604 (8605) Single Door 8693 (8694) Double Door
23.0 Cu. Ft. (651.3 liters)	8606 Single Door 8695 Double Door
28.0 Cu. Ft. (792.8 liters)	8607 Single Door
Chests	
12.7 Cu. Ft. (359.6 liters)	8615 (8612)
17.0 Cu. Ft. (481.4 liters)	8618 (8619)
20.0 Cu. Ft. (566.3 liters)	8621 (8620)

Exterior Dimensions

Uprights	
Width (13.0, 17.3)	33.3" (84.6cm)
Width (23.0)	40.8" (103.6cm)
Width (28.0)	46.8" (118.9cm)
Height	77.8" (197.6cm)
F-B (13.0)	31.0" (78.7cm)
F-B (17.3, 23.0, 28.0)	37.0" (94.0cm)
Chests	
Width (12.7)	72.0" (182.9cm)
Width (17.0)	87.6" (222.5cm)
Width (20.0)	96.0" (243.8cm)
Height	40.5" (102.9cm)
F-B	28.8" (73.2cm)

Interior Dimensions

Uprights	
Width (13.0, 17.3)	23.0" (58.4cm)
Width (23.0)	30.6" (77.7cm)
Width (28.0)	36.6" (93.0cm)
Height	51.5" (130.8cm)
F-B (13.0)	19.3" (49.0cm)
F-B (17.3, 23.0)	25.3" (64.3cm)
F-B (28.0)	27.0" (68.6cm)
Chests	
Width (12.7)	42.5" (108.0cm)
Width (17.0)	58.8" (149.4cm)
Width (20.0)	66.5" (168.9cm)
Height	28.0" (71.1cm)
F-B	18.5" (47.0cm)

Clearance Requirements

Width (Uprights)**	Add 3.4" (8.6cm) for latch/hinge
F-B (Uprights)	Add 7.0" (17.8cm) for control panel bezel/wall spacer
F-B (Chests)	Add 7.9" (20.1cm) for wall spacer/handle

Refrigeration

HP	Two 1 HP (2545 BTUH each)
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Insulation

Type	Non-CFC, foamed-in-place polyurethane
Quantity	Approx. 5.0" (12.7cm) cabinet, 4.5" (11.4cm) door/2.0" (5.1cm) lid
Chest Sub-Lids	1.0" (2.5cm) polystyrene

Estimated Kilowatts per 24 Hours***

8612	12
8619	14
8615/8620	15
8602/8691	16
8605/8694	17
8606/8695/8607@208V/ 8618	18
8602/8692/8607@230V/ 8621	19
8604/8693	21

Electrical, Breaker Requirements, & Plug

8603/8604/8692/8693/ 8615/8618/8621	120V, 60 Hz, 16.0 FLA (Operating range 108-130V); 20 Amp, Dedicated Circuit, Time Delay Breaker
All Other Models	230V, 50/60 Hz, 12.0 FLA, (Operating range 208- 240V); 15 Amp, Dedicated Circuit, Time Delay Breaker
Plug	120V: NEMA 5-20P Plug 230V: NEMA 6-15P Plug

Weight

Net	
13.0 Cu. Ft. Uprights	605 lbs. (274.4 kg)
17.3 Cu. Ft. Uprights	690 lbs. (313.0 kg)
23.0 Cu. Ft. Uprights	755 lbs. (342.5 kg)
28.0 Cu. Ft. Upright	821 lbs. (372.4 kg)
12.7 Cu. Ft. Chests	545 lbs. (247.2 kg)
17.0 Cu. Ft. Chests	613 lbs. (278.1 kg)
20.0 Cu. Ft. Chests	650 lbs. (294.8 kg)
Shipping (Motor)	
13.0 Cu. Ft. Uprights	712 lbs. (323.0 kg)
17.3 Cu. Ft. Uprights	795 lbs. (360.6 kg)
23.0 Cu. Ft. Uprights	900 lbs. (408.2 kg)
28.0 Cu. Ft. Upright	980 lbs. (444.5 kg)
12.7 Cu. Ft. Chests	716 lbs. (324.8 kg)
17.0 Cu. Ft. Chests	821 lbs. (372.4 kg)
20.0 Cu. Ft. Chests	833 lbs. (377.8 kg)

All units, including those with the water-cooled condenser option, are UL Listed to United States and Canadian requirements and bear the CE Mark.

*Compressors may not cycle off with the cabinet running at -86C in a 32C ambient.

**Upright freezers pass through a 34.0" (86.4cm) wide doorway with door open, front panel past 180 degrees, and rolling the freezer from side-to-side.

***At -80C (-112F), 23C (73.4F) ambient, 50 percent product load



Deluxe 900 Series Uprights for Daily Dependability

900 Series upright freezers are designed for universities, research facilities, and industrial institutions where **easily adjusted shelves, easy-to-access controls, and convenient at-a-glance monitoring** are preferred.



Eye Level Information Center for At-a-Glance Monitoring

The centralized information center, which includes a microprocessor control/monitoring system and an optional chart recorder or datalogger, ensures that **all controls and displays are easy to reach and read.**

Alarms (alarm/maintenance indicators) – Monitor freezer conditions (i.e., power failure, high or low temperature, probe failure, door open, clean gasket, low battery, hot condenser, and clean filter)

Audible/Visual Alarm

Alarm Silence

Mode – Select Run, Set Temp, Set High Alarm, Set Low Alarm, Calibrate, or optional Back-Up mode

Calibrate – Set control probe parameters

Run – Used during typical freezer operation

Set Temperature – Used to assign the setpoint



Temperature Display

Set High Alarm and Set Low Alarm – Used to define overtemp and undertemp setpoints

Programming Buttons

900 SERIES

- Single door uprights: 13.0, 17.3, 23.0, and 28.0 cu. ft.
- Double door uprights: 13.0, 17.3, and 23.0 cu. ft.



900 Series Specifications

Temperature

Range	-50C to -86C (-58F to -123F) in an 18C to 32C* (64.4F to 89.6F) ambient
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Capacities & Models

13.0 Cu. Ft. (368.1 liters)	903 (902) Single Door 992 (991) Double Door
17.3 Cu. Ft. (489.9 liters)	904 (905) Single Door 993 (994) Double Door
23.0 Cu. Ft. (651.3 liters)	906 Single Door 995 Double Door
28.0 Cu. Ft. (792.8 liters)	907 Single Door

Exterior Dimensions

Width (13.0, 17.3)	33.3" (84.6cm)
Width (23.0)	40.8" (103.6cm)
Width (28.0)	46.8" (118.9cm)
Height	77.8" (197.6cm)
F-B (13.0)	31.0" (78.7cm)
F-B (17.3, 23.0, 28.0)	37.0" (94.0cm)

Interior Dimensions

Width (13.0, 17.3)	23.0" (58.4cm)
Width (23.0)	30.6" (77.7cm)
Width (28.0)	36.6" (93.0cm)
Height	51.5" (130.8cm)
F-B (13.0)	19.3" (49.0cm)
F-B (17.3, 23.0)	25.3" (64.3cm)
F-B (28.0)	27.0" (68.6cm)

Clearance Requirements

Width**	Add 3.4" (8.6cm) for latch/hinge
F-B	Add 7.0" (17.8cm) for control panel bezel/wall spacer

Refrigeration

HP	Two 1 HP (2545 BTUH each)
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Insulation

Type	Non-CFC, foamed-in-place polyurethane
Quantity	Approx. 5.0" (12.7cm) cabinet, 4.5" (11.4cm) door

Estimated Kilowatts per 24 Hours***

903/992 & 907@230V	19
902/991	16
904/993	21
905/994	17
906/995 & 907@208V	18

Electrical, Breaker Requirements, & Plug

903/904/992/993	120V, 60 Hz, 16.0 FLA (Operating range 108-130V); 20 Amp, Dedicated Circuit, Time Delay Breaker
All Other Models	230V, 50/60 Hz, 12.0 FLA (Operating range 208-240V); 15 Amp, Dedicated Circuit, Time Delay Breaker
Plug	120V: NEMA 5-20P Plug 230V: NEMA 6-15P Plug

Weight

Net	
13.0 Cu. Ft. Uprights	605 lbs. (274.4 kg)
17.3 Cu. Ft. Uprights	690 lbs. (313.0 kg)
23.0 Cu. Ft. Uprights	755 lbs. (342.5 kg)
28.0 Cu. Ft. Upright	821 lbs. (372.4 kg)
Shipping (Motor)	
13.0 Cu. Ft. Uprights	712 lbs. (323.0 kg)
17.3 Cu. Ft. Uprights	795 lbs. (360.6 kg)
23.0 Cu. Ft. Uprights	900 lbs. (408.2 kg)
28.0 Cu. Ft. Upright	980 lbs. (444.5 kg)

All units, including those with the water-cooled condenser option, are UL Listed to United States and Canadian requirements and bear the CE Mark.

*Compressors may not cycle off with the cabinet running at -86C in a 32C ambient.

**Upright freezers pass through a 34.0" (86.4cm) wide doorway with door open, front panel past 180 degrees, and rolling the freezer from side-to-side.

***At -80C (-112F), 23C (73.4F) ambient, 50 percent product load



Basic 700 Series Uprights and Chests for Fundamental Function

The 700 Series upright and chest freezers are designed for clinical and academic institutions that require no-frills functionality.

Temperature Controller and Monitor/Alarm System for Continuous Monitoring

The information center mounted in the freezer base features simplified programmable controls, a temperature display, and an optional chart recorder or datalogger for continuous monitoring.

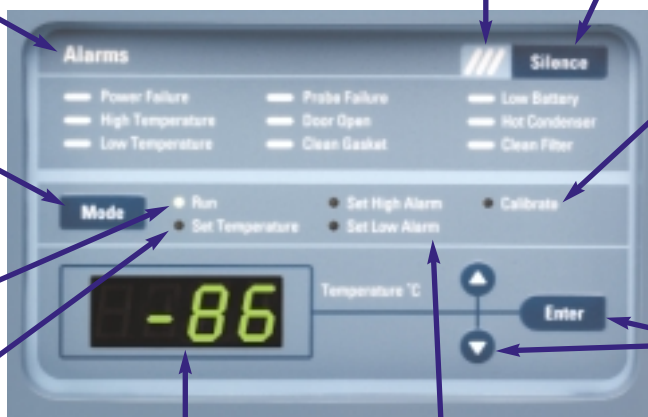


Alarms (alarm/maintenance indicators) – Monitor freezer conditions (i.e., power failure, high or low temperature, probe failure, door open, clean gasket, low battery, hot condenser, and clean filter)

Mode – Select Run, Set Temp, Set High Alarm, Set Low Alarm, Calibrate, or optional Back-Up mode

Run – Used during typical freezer operation

Set Temperature – Used to assign the setpoint



Temperature Display

Set High Alarm and Set Low Alarm – Used to define overtemp and undertemp setpoints

Calibrate – Set control probe parameters

Programming Buttons

700 SERIES

- Single door uprights: 13.0, 17.3, & 23.0 cu. ft.
- Chests: 3.0, 6.7, 12.7, 17.0, & 20.0 cu. ft.



700 Series Specifications

Temperature

Range	-50C to -86C (-58F to -123F) in an 18C to 32C* (64.4F to 89.6F) ambient
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Capacities & Models

Uprights (Single Door)	
13.0 Cu. Ft. (368.1 liters)	703 (702)
17.3 Cu. Ft. (489.9 liters)	704 (705)
23.0 Cu. Ft. (651.3 liters)	706
Chests	
3.0 Cu. Ft. (84.9 liters)	708 (709)
6.7 Cu. Ft. (189.7 liters)	710 (711)
12.7 Cu. Ft. (359.6 liters)	715 (712)
17.0 Cu. Ft. (481.4 liters)	718 (719)
20.0 Cu. Ft. (566.3 liters)	721 (720)

Exterior Dimensions

Uprights	
Width (13.0, 17.3)	33.3" (84.6cm)
Width (23.0)	40.8" (103.6cm)
Height	77.8" (197.6cm)
F-B (13.0)	31.0" (78.7cm)
F-B (17.3, 23.0)	37.0" (94.0cm)
Chests	
Width (3.0)	28.5" (72.4cm)
Width (6.7)	48.0" (121.9cm)
Width (12.7)	72.0" (182.9cm)
Width (17.0)	87.6" (222.5cm)
Width (20.0)	96.0" (243.8cm)
Height (3.0, 6.7)	43.8" (111.3cm)
Height (12.7, 17.0, 20.0)	40.5" (102.9cm)
F-B	28.8" (73.2cm)

Interior Dimensions

Uprights	
Width (13.0, 17.3)	23.0" (58.4cm)
Width (23.0)	30.6" (77.7cm)
Height	51.5" (130.8cm)
F-B (13.0)	19.3" (49.0cm)
F-B (17.3, 23.0)	25.3" (64.3cm)
Chests	
Width (3.0)	18.5" (47.0cm)
Width (6.7)	38.0" (96.5cm)
Width (12.7)	42.5" (108.0cm)
Width (17.0)	58.8" (149.4cm)
Width (20.0)	66.5" (168.9cm)
Height (3.0, 6.7)	16.5" (41.9cm)
Height (12.7, 17.0, 20.0)	28.0" (71.1cm)
F-B	18.5" (47.0cm)

Clearance Requirements

Width (Uprights)**	Add 3.4" (8.6cm) for latch/hinge
F-B (Uprights)	Add 5.5" (14.0cm) for control panel bezel/wall spacer
F-B (Chests)	Add 7.9" (20.1cm) for wall spacer/handle

Refrigeration

HP	3.0 and 6.7 Cu. Ft. Two 1/3 HP (848 BTUH each)
All Other Capacities	Two 1 HP (2545 BTUH each)

Insulation

Type	Non-CFC, foamed-in-place polyurethane
Quantity	5.0" (12.7cm) cabinet, 4.5" (11.4cm) door/ 2.0" (5.1cm) lid
Chest Sub-Lids	1.0" (2.5cm) polystyrene

Estimated Kilowatts per 24 Hours***

709	5
708/711	6/6.5
710	8
712	12
719	14
715/720	15
702	16
705	17
706/718	18
703/721	19
704	21

Electrical, Breaker Requirements, & Plug

708/710	115V, 60 Hz, 10.5 FLA (Operating range 103-127V); 15 Amp, Dedicated Circuit, Time Delay Breaker
703/704/715/718/721	120V, 60 Hz, 16.0 FLA (Operating range 108-130V); 20 Amp, Dedicated Circuit, Time Delay Breaker
709/711	230V, 50 Hz, 5.4 FLA, (Operating range 208-240V); 15 Amp, Dedicated Circuit, Time Delay Breaker
702/705/706/712/719/720	230V, 50/60 Hz, 12.0 FLA, (Operating range 208-240V); 15 Amp, Dedicated Circuit, Time Delay Breaker

(continued)

All units, including those with the water-cooled condenser option, are UL Listed to United States and Canadian requirements and bear the CE Mark.

*Compressors may not cycle off with the cabinet running at -86C in a 32C ambient.

**Upright freezers pass through a 34.0" (86.4cm) wide doorway with door open, front panel past 180 degrees, and rolling the freezer from side-to-side.

***At -80C (-112F), 23C (73.4F) ambient, 50 percent product load



700 Series Specifications (continued)

Electrical, Breaker Requirements, & Plug (continued)

Plug for Uprights

120V	NEMA 5-20P Plug
230V	NEMA 6-15P Plug

Plug for Chests

120V 708/710.	NEMA 5-15P Plug
120V 715/718/721	NEMA 5-20P Plug
230V 709/711.	CEE 7/7 Plug
230V 712/719/720	NEMA 6-15P Plug

Weight

Net

13.0 Cu. Ft. Uprights	605 lbs. (274.4 kg)
17.3 Cu. Ft. Uprights	690 lbs. (313.0 kg)
23.0 Cu. Ft. Upright	755 lbs. (342.5 kg)
3.0 Cu. Ft. Chests	330 lbs. (149.7 kg)
6.7 Cu. Ft. Chests	430 lbs. (195.0 kg)
12.7 Cu. Ft. Chests	545 lbs. (247.2 kg)
17.0 Cu. Ft. Chests	613 lbs. (278.1 kg)
20.0 Cu. Ft. Chests	650 lbs. (294.8 kg)

Shipping (Motor)

13.0 Cu. Ft. Uprights	712 lbs. (323.0 kg)
17.3 Cu. Ft. Uprights	795 lbs. (360.6 kg)
23.0 Cu. Ft. Upright	900 lbs. (408.2 kg)
3.0 Cu. Ft. Chests	432 lbs. (196.0 kg)
6.7 Cu. Ft. Chests	566 lbs. (256.7 kg)
12.7 Cu. Ft. Chests	716 lbs. (324.8 kg)
17.0 Cu. Ft. Chests	821 lbs. (372.4 kg)
20.0 Cu. Ft. Chests	833 lbs. (377.8 kg)

Warranty for Each Series

8600 and 900 Series -86C ULT Freezers feature a Lifetime Cabinet Warranty, which includes the cabinet, evaporator, and door(s)/lid.

The 8600 Series includes a two year parts and labor warranty, with three additional years on the compressors, parts only. The 900 Series includes a two year parts and labor warranty, with two additional years on the compressors, parts only. The 700 Series includes a one year parts and labor warranty, with two additional years on the compressors, parts only. Extended warranties and preventive maintenance agreements are available.

Customers within the United States can call 888-213-1790 for details about warranties. Those outside the United States should contact their local distributor.

**Want to take full advantage
of your -86C ULT freezer?**

Before ordering, request the *Forma -40C and -86C Freezer Accessories* brochure to learn about our factory and customer installed options and inventory management systems.

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