

**Thermo Scientific
Forma 900 -80C Series Upright ULT Freezers**

PART 1 – GENERAL

1.1 DESIGN AND PERFORMANCE CRITERIA

- A. Ultra Low Temperature Freezer manufactured to operate in a temperature range of -50C to -86C. Must be available in 115V/60 Hz or 208-230V/60 Hz.
- B. The freezer must be constructed of 5” non-CFC foamed-in-place polyurethane insulation; 4.5” in the door
- C. Door Gasket – triple-sealing silicone gasket provides thermal barrier to keep warm air out and cold air in and minimizes frost build-up on the inner doors.
- D. Freezer shall be painted with high-impact, scratch resistant powder coat finished interior and exterior to ensure long term viability and maximum interior temperature uniformity.
- E. Door latch allows one-handed opening and closing. Handle must include door key lock as well as padlock provision for added security.
- F. Freezer shall have four internal storage compartments with inner doors to ensure sample security.
- G. Freezer shall have a heated pressure equalization port allows rapid re-entry to cabinet.
- H. Freezer shall have a 1 inch access ports as standard
- I. Freezer shall have a RS485 output, Dry Contacts and 4-20mA output for remote monitoring Purposes.
- J. Freezer door must open at least 180 degrees for easy sample access.

1.2 SUBMITTALS

- A. Submit complete submittal package of product literature, manual, and drawings. Incomplete submittals are not acceptable, will be considered non-responsive, and will be returned without review.

1.3 QUALITY ASSURANCE

- A. ULT freezer must be built to, and contain the registration mark for, UL, cUL, (60 Hz models) and CE (50 Hz models) standards for safety and performance.

1.4 QUALIFICATION

- A. Manufacturer – Company must have 10 years documented experience in the construction of ULT freezers.
- B. ULT Freezer – Shall be registered for UL, cUL, (60 Hz models) and CE (50 Hz models) standards.

1.5 WARRANTY

- A. Manufacturer's warranty against defects in material and workmanship covering parts must be available for a period of 2 years covering parts and labor, with an additional 2 year warranty on the compressor (parts only).
- B. Standard exceptions for air filters, batteries, and gaskets shall apply.
- C. Extended manufacturer's warranty options should be available at additional charge if required

PART 2 – PRODUCT

2.1 MANUFACTURERS

- A. Thermo Scientific

2.2 Forma 900 Series ULT Freezer Capacity

- A. Model 903/909 – 13 cu ft capacity: 240 – 2" boxes
- B. Model 904/910 – 17.3 cu ft capacity: 320 – 2" boxes
- C. Model 956/957 – 23 cu ft capacity: 400 – 2" boxes
- D. Model 908 – 28 cu ft capacity: 600 – 2" boxes

2.3 Forma 900 Series ULT Freezers Dimensions

- 1. Exterior Dimensions (H x W x D)
 - A. Model 903/909 – 77.9" x 33.3" x 32.9" (197.9 x 84.6 x 83.6 cm)
 - B. Model 904/910 - 77.9" x 33.3" x 38.9" (197.9 x 84.6 x 98.8 cm)
 - C. Model 956/957 - 77.9" x 40.8" x 38.9" (197.9 x 103.6 x 98.8 cm)
 - D. Model 908 - 77.9" x 46.8" x 38.9" (197.9 x 118.9 x 98.8 cm)
- 2. Interior Dimensions (H x W x D)
 - A. Model 903/909 – 51.5" x 23.0" x 19.3" (130.8 x 58.4 x 49.0 cm)
 - B. Model 904/910 - 51.5" x 23.0" x 25.3" (130.8 x 58.4 x 64.3 cm)
 - C. Model 956/957 - 51.5" x 30.6" x 25.3" (130.8 x 77.7 x 64.3 cm)
 - D. Model 908 - 51.5" x 36.6" x 27.0" (130.8 x 93.0 x 68.6 cm)

2.3 Forma 900 Series Control Requirements

- A. Microprocessor controller must monitor in one degree C increments, with the digital display

- B. Eye level information center for “At-a-glance” monitoring and ease of setting controls.
- C. Must have high and low temperature alarms, door ajar alarm, power fail alarm, low battery alarm, and hot condenser alarm
- D. Battery back-up for temperature alarm monitoring system

2.4 – OPTIONS AND ACCESSORIES

A. Options

- a. CO2 or LN2 back-up system
- b. Inkless or ink chart recorder
- c. Stainless steel interior
- d. Water-cooled condenser

B. Accessories

- a. Racks
- b. Shelf kit
- c. Chart paper
- d. Replacement air filters
- e. Replacement battery
- f. Cryo Gloves
- g. Alarm delay module
- h. Remote alarms
- i. Seismic restraint kit

PART 3 – EXECUTION

1.01 INSTALLATION

- A. Install equipment level and plumb, according to manufacturer's written instructions.
 - 1. Verify utility services are in required locations and are ready for use before installation of equipment.
 - 2. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and requirements of authorities having jurisdiction.
 - 3. Complete equipment assembly where field assembly is required.
 - 4. Connect equipment to utilities.
 - 5. Remove all packing materials from the site.