Thermo Scientific
Forma 900 Double Door -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. Handles 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 two exterior doors

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 Double Door ULT Freezer Capacity

A. Model 992/986 – 13 cu ft capacity: 216 – 2" boxes
B. Model 993/988 – 17.3 cu ft capacity: 288 – 2" boxes
C. Model 990/989 – 23 cu ft capacity: 360 – 2" boxes

2.3 Forma 900 Series Double Door ULT Freezers Dimensions

1. Exterior Dimensions (H x W x D)

A. Model 992/986 – 77.9" x 33.3" x 32.9" (197.9 x 84.6 x 83.6 cm)
B. Model 993/988 - 77.9" x 33.3" x 38.9" (197.9 x 84.6 x 98.8 cm)
C. Model 990/989 - 77.9" x 40.8" x 38.9" (197.9 x 103.6 x 98.8 cm)

2. Interior Dimensions (H x W x D)

A. Model 992/986 – 51.5" x 23.0" x 19.3" (130.8 x 58.4 x 49.0 cm)
B. Model 993/988 - 51.5" x 23.0" x 25.3" (130.8 x 58.4 x 64.3 cm)
C. Model 990/989 - 51.5" x 30.6" x 25.3" (130.8 x 77.7 x 64.3 cm)

2.3 Forma 900 Series Double Door 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.