Thermo Scientific Forma® Laboratory Refrigerators and Freezers

Unrivalled cold storage protection for valuable samples and materials

Chromatography
General Purpose
Blood Bank
Plasma
Pharmacy
Enzyme
Researchers worldwide protect more than two billion samples inside Thermo Scientific cold storage equipment. With proven solutions including +4°C refrigerators to -196°C cryogenic freezers and Nalgene® and Nunc™ consumables, you’re free to concentrate on your work without worrying about your valuable samples.
Reliable, dependable performance

- The Thermo Scientific IntrLogic™ microprocessor controller, available on all +4°C refrigerators and -20°C or -30°C lab freezers, controls, measures, compares, and reports cabinet operation with digital accuracy.
- All our refrigerator and freezer cabinets, including space-saving undercounter and upright models, share design and technology improvements developed through decades of experience.

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<tr>
<th>Operating Range</th>
<th>+1°C to +8°C</th>
<th>to -20°C</th>
<th>to -30°C</th>
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<td>Blood Bank Refrigerators</td>
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<td>Pharmacy Refrigerators</td>
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<td>General Purpose Freezers</td>
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<td>Plasma Freezers</td>
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<td>Enzyme Freezers</td>
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<td>Typical Use and Storage Applications</td>
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<td>Reagents and Kits</td>
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<td>Whole Blood</td>
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<td>Enzymes and Temperature Sensitive Materials</td>
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<td>Chromatography Apparatus and Instrumentation</td>
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<td>Test Samples</td>
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<td>Biologicals</td>
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<td>Culture Media</td>
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<tr>
<td></td>
<td>Shelf Life Testing</td>
<td>*</td>
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</table>
Thermo Scientific IntrLogic Controller Simplifies Operation, Improves Reliability

Intuitive Graphics and Microprocessor Technology

Thermo Scientific Forma lab refrigerators and freezers include enhanced digital electronic technology designed to simplify operation and deliver greater accuracy.

- Icon-based controls and displays include graphic references for universal operation
- Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
- A graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition, steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- Unique Service Required alarm alerts users when preventative maintenance is necessary to maintain optimum unit performance

IntrLogic Control Alarm Sequence

<table>
<thead>
<tr>
<th>Event</th>
<th>Audible Alarm</th>
<th>Visual Alarm</th>
<th>Self Corrected Event</th>
<th>Remote Alarm Controls Activated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overtemperature</td>
<td>continuous*</td>
<td>slow flash, scar only</td>
<td>yes</td>
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<tr>
<td>Undertemperature</td>
<td>continuous*</td>
<td>slow flash, scar only</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Power Loss</td>
<td>continuous*</td>
<td>slow flash, scar only</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Door Ajar</td>
<td>delay</td>
<td></td>
<td></td>
<td>no</td>
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<tr>
<td>Low Battery</td>
<td>no</td>
<td></td>
<td></td>
<td>no</td>
</tr>
<tr>
<td>Service Required</td>
<td>no</td>
<td></td>
<td></td>
<td>no</td>
</tr>
</tbody>
</table>

Audible and/or visual warnings for door ajar, low alarm battery, system maintenance and power failure provide immediate status of critical functions. A push-button audible alarm verifies sensor continuity, while the battery-backup assures system reliability. The enlarged digital display improves functionality, taking the guesswork out of setpoint and performance management.

*Voice alarm will silence audible alarm with 6-minute ring back interval; display remains flashing. Moving triple position key switch to enable position eliminates audible and audible-visual warnings.

Setpoint Security
- Key-operated triple position switch for main power and alarms. Locks in desired setpoint and alarm, prevents tampering.

Instrument Grade Components
- Electronic components and sub-systems are selected for performance and reliability under demanding laboratory conditions
- Service Procedures
- Troubleshooting sequence allows easy and quick access to control functions, defaults for troubleshooting

Modular Control Design
- Self-contained control housing integrated into main control panel for efficient maintenance, as required

IntrLogic Guide
- Offers information at-a-glance for all control and display functions

Microprocessor-Based Control
- IntrLogic microprocessor manages setpoint and actual conditions to provide the highest level of security for the stored product

Automatic Defrost System
- Defrost sensor manages automatic defrost cycle (manual defrost models excluded)

Instrument-Grade Components
- Electronic components and sub-systems are selected for performance and reliability under demanding laboratory conditions

Service Parameters
- Touchpad sequence allows override access to control function defaults for troubleshooting functions

Power Down Mode
- During power failure digital display dims to conserve backup battery
Laboratory Quality Cabinet Construction

Our refrigerators and freezers are available in seven sizes, from compact 4.9 cu.ft. (133 L) undercounter models to spacious, triple-door 78.8 cu.ft. (2231 L) cabinets. All models are built to meet UL, CUL, CE and TUV standards for safety.

- Hermetically sealed refrigeration compressor, air-cooled condenser and automatic condensate removal for auto defrost models
- An efficient, high-capacity air circulation system optimizes top-to-bottom temperature uniformity, accelerates temperature recovery following door openings, and accommodates insertion of warm product
- CFC-free refrigerants, insulation and product packaging
- Depending on model selection, standard or optional shelves, drawers, temperature recorders, cabinet casters and other accessories are available to meet most laboratory needs

Laboratory Refrigerator and Freezer Selection Guide

<table>
<thead>
<tr>
<th>Automatic Defrost Models</th>
<th>Cu.ft. (L)</th>
<th>4.9 (133)</th>
<th>11.5 (326)</th>
<th>23.3 (659)</th>
<th>29.2 (826)</th>
<th>45.8 (1297)</th>
<th>51.1 (1447)</th>
<th>78.8 (2231)</th>
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<tbody>
<tr>
<td>Chromatography Refrigerators</td>
<td>IntrLogic</td>
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<td>General Purpose Lab Refrigerators</td>
<td>IntrLogic</td>
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<tr>
<td>Blood Bank Refrigerators</td>
<td>IntrLogic</td>
<td>IntrLogic</td>
<td>IntrLogic</td>
<td>IntrLogic</td>
<td>IntrLogic</td>
<td>IntrLogic</td>
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<tr>
<td>Pharmacy Refrigerators</td>
<td>IntrLogic</td>
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<tr>
<td>General Purpose Lab Freezers, -30°C</td>
<td>IntrLogic</td>
<td>IntrLogic</td>
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<td>IntrLogic</td>
<td>IntrLogic</td>
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<tr>
<td>Plasma Freezers, -30°C</td>
<td>IntrLogic</td>
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<td>IntrLogic</td>
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<tr>
<td>Manual Defrost Models</td>
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<tr>
<td>Enzyme Freezer, -20°C</td>
<td>IntrLogic</td>
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</table>

Remote alarm contacts are included on all models.
Our chromatography refrigerators are designed for a variety of applications requiring close temperature control, full access to chromatography instrumentation and easy set-up of instrumentation and apparatus within the chamber.

**IntrLogic Microprocessor Control**

Our FRCR series refrigerators feature enhanced digital electronic technology designed to simplify operation and deliver greater accuracy (see pages 4 and 5).

- Adjustable temperature control, range +1°C to +8°C, factory pre-set to +4°C
- Icon-based controls and displays include graphic references for universal operation
- Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
- Audible/visual warnings for over-temperature, undertemperature and power failure, with visual status reports on critical functions
- Graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- Advanced defrost sensor manages the defrost cycle, minimizing trace amounts of frost build-up to maintain refrigeration coil efficiency
- Enlarged digital display, resolution to within 0.1°C, improves visibility
- Alarm silence, ringback and automatic reset functions
- Push-button alarm test verifies sensor continuity
- Battery backup assures control panel function during power failure
- Remote alarm contacts are included on all models
Cabinet Construction and Performance

- All refrigeration and control systems are top-mounted (except sliding glass door model FRCR4504, base mounted)
- Door lock provision on all models
- One duplex vapor-proof interior outlet, continuous on; separate power cord provided
- Door-activated light switch on all models except FRCR4504
- Model FRCR4504 has independent switch activated lights only
- Epoxy-coated, open wire shelves, adjustable in 1" (25 mm) increments; no tools required
- Multi-pane glass door(s) with spring loaded door closures and a 90° stay-open feature (except sliding door model FRCR4504)
- Positive, forced air circulation maintains temperature uniformity at all shelf levels
- Peripheral closed-cell door gaskets maintain temperature integrity

Refrigeration System

- Two access ports, 2" (50 mm) diameter, with hinged covers
- Keyed door locks for security (except model FRCR4504)
- 2" (50 mm) casters, 2 locking, 2 non-locking, factory installed
- Separate power cord for interior outlets on models FRCR4504 and FRCR4504
- High-density, CFC-free urethane foam insulation protects cabinet from ambient temperature fluctuations and minimizes operating costs
- Interior and exterior surfaces are finished with a high-impact powder paint coating

Optional Accessories

- Voltage safeguard, free standing
- Temperature recorder, 6" (152 mm) circular chart, 7-day drive
- Additional access port, 2" (50 mm) diameter, with cover
- Stainless steel interior and exterior surfaces
- Additional shelves, full or half size
- Heated glass doors and door swing variations available on most models

## Ordering Information

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<tbody>
<tr>
<td>FRC2304A</td>
<td>23.3</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>single, glass</td>
<td>0</td>
<td>2</td>
<td>58.0 x 29.0 x 24.0 (1470 x 730 x 610)</td>
<td>79.1 x 36.2 x 28.0 (2010 x 920 x 720)</td>
<td>425 (193)</td>
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<td>FRC2304B</td>
<td>29.2</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>single, glass</td>
<td>0</td>
<td>2</td>
<td>58.0 x 29.0 x 30.0 (1470 x 730 x 760)</td>
<td>79.1 x 36.2 x 34.0 (2010 x 920 x 870)</td>
<td>430 (197)</td>
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<td>FRC2304C</td>
<td>45.8</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>double, sliding, glass</td>
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<td>2</td>
<td>58.0 x 29.0 x 52.5 (1470 x 730 x 1333)</td>
<td>79.1 x 36.2 x 56.5 (2010 x 920 x 1440)</td>
<td>670 (304)</td>
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<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>double, sliding, glass</td>
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<td>2</td>
<td>58.0 x 29.0 x 52.5 (1470 x 730 x 1333)</td>
<td>79.1 x 36.2 x 56.5 (2010 x 920 x 1440)</td>
<td>580 (263)</td>
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<tr>
<td>FRC3004B</td>
<td>78.8</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>triple, glass</td>
<td>8</td>
<td>2</td>
<td>58.0 x 29.0 x 81.0 (1470 x 730 x 2050)</td>
<td>79.1 x 36.2 x 85.0 (2010 x 920 x 2160)</td>
<td>965 (438)</td>
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</table>

*Published interior volumes are nominal; useable cu.ft. (L) capacities may be offset by shelves, drawers, blower coils, or cabinet protrusions. For specific cabinet dimensions and allowances, or for verification of clearance tolerances, contact your sales representative. Product performance may be affected by ambient temperature conditions, humidity conditions, sample loading preferences, and frequency of door openings. Contact your sales representative for specific inquiries regarding your application. ** Not available in North America

Chromatography Refrigerators

Temperature Range: +1°C to +8°C, factory preset to +4°C (auto defrost)

### FRCR2304A**
- Heavy duty, industrial-grade, hermetically sealed compressors
- Automatic defrost for optimum cooling capacity
- Automatic condensate removal; no drain lines required

### FRCR4504 chromatography refrigerator with sliding glass doors as standard.

*Shown with optional temperature recorder.
Our selection of general purpose laboratory refrigerators offers cabinet sizes to fit a variety of space needs and storage volume requirements.

**Feature: IntrLogic Microprocessor Control**

Our FRGL series refrigerators feature enhanced digital electronic technology designed to simplify operation and deliver greater accuracy (see pages 4 and 5).

- **Adjustable temperature control**: range +1°C to +8°C, factory pre-set to +4°C
- **Icon-based controls and displays**: include graphic references for universal operation
- **Setpoint security with key-operated triple-position master switch controls power to all systems for added safety**
- **Audible/visual warnings for over-temperature, undertemperature and power failure**, with visual status reports on critical functions
- **Graphic thermometer** confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- **Advanced defrost sensor**: manages the defrost cycle, minimizing trace amounts of frost buildup to maintain refrigeration coil efficiency
- **Enlarged digital display**, resolution to within 0.1°C, improves visibility
- **Alarm silence, ringback and automatic reset functions**
- **Push-button alarm test verifies sensor continuity**
- **Battery backup** assures control panel function during power failure
- **Remote alarm contacts** are included on all models
**General Purpose Laboratory Refrigerators**

**Temperature Range:** +1°C to +8°C, factory preset to +4°C (auto defrost)

### Cabinet Construction and Inventory System
- **High-density, CFC-free urethane foam insulation** protects cabinet from ambient temperature fluctuations and minimizes operating costs
- **Positive, forced-air circulation** maintains temperature uniformity at all shelf levels
- **Directional airflow** assures quick recovery after door openings
- **Interior cabinet lights** with door-activated on/off switch, plus independent switch on control panel for 11.5 cu.ft. (326 L) and larger models
- **Full-length door handle(s)** on all models except FRGL4504
- **Self-closing doors close against closed-cell peripheral gasket**
- **Door locking provision** on all models except FRGL4504
- **Directional airflow** assures quick recovery after door openings
- **Interior and exterior surfaces** are finished with a high-impact powder paint coating
- **Epoxy-coated, open wire shelves, adjustable in 1” (25 mm) increments; no tools required**
- **2” (50 mm) casters standard on model FRGL4504**
- **Adjustable leveling feet standard**
- **1” (25 mm) access port standard on model FRGL4504**
- **Access port, 2” (50 mm) diameter, with cover**
- **Stainless steel interior and exterior surfaces**
- **2” (50 mm) casters**
- **Additional shelves**
- **Full-view glass doors, double pane construction (standard on FRGL4504)**
- **Heated glass doors and door swing variations are available on most models**
- **Finished countertop for FRGL404**

### Refrigeration System
- **Heavy duty, industrial-grade, hermetically sealed compressors**
- **Automatic defrost maintains optimum cooling capacity**
- **Automatic condensate removal; no drain lines required**

### Optional Accessories
- **Voltage safeguard, free standing**
- **Built-in 6” (152 mm) day/night circular chart recorder (free-standing on FRGL404)**
- **Voltage safeguard, free standing**
- **Built-in 6” (152 mm) day/night circular chart recorder (free-standing on FRGL404)**

### Ordering Information

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<tbody>
<tr>
<td>FRGL404A</td>
<td>4.9 (133)</td>
<td>115 (60)</td>
<td>6/0 (T1)</td>
<td>undercounter</td>
<td>single</td>
<td>solid</td>
<td>3.20 x 20.0 x 21.0 (500 x 500)</td>
<td>33.4 x 26.0 x 24.0 (850 x 660 x 610)</td>
<td>212 (96)</td>
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<td>FRGL404D</td>
<td>11.5 (328)</td>
<td>208/230 (60)</td>
<td>6/0 (T1)</td>
<td>undercounter</td>
<td>single</td>
<td>solid</td>
<td>5.20 x 21.0 x 30.0 (1320 x 530 x 500)</td>
<td>71.9 x 28.8 x 34.0 (1830 x 720 x 860)</td>
<td>285 (127)</td>
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<tr>
<td>FRGL404W</td>
<td>23.3 (655)</td>
<td>208/230 (60)</td>
<td>6/0 (T1)</td>
<td>undercounter</td>
<td>single</td>
<td>solid</td>
<td>8.50 x 20.0 x 30.0 (2100 x 510 x 720)</td>
<td>117.0 x 31.0 x 34.0 (2970 x 780 x 860)</td>
<td>345 (155)</td>
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<td>FRGL5004A</td>
<td>51.1 (1447)</td>
<td>115 (60)</td>
<td>8.5/15 (P1)</td>
<td>upright</td>
<td>single</td>
<td>solid</td>
<td>10.50 x 29.0 x 52.0 (2700 x 730 x 1320)</td>
<td>137.5 x 35.5 x 56.5 (3470 x 900 x 1440)</td>
<td>585 (265)</td>
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<tr>
<td>FRGL5004D</td>
<td>208/230 (60)</td>
<td>8.5/15 (P1)</td>
<td>upright</td>
<td>double</td>
<td>glass</td>
<td>11.50 x 30.0 x 52.0 (2900 x 760 x 1320)</td>
<td>147.0 x 39.5 x 56.5 (3750 x 990 x 1440)</td>
<td>605 (270)</td>
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<td>FRGL7504A</td>
<td>78.8 (2231)</td>
<td>115 (60)</td>
<td>10.5/15 (P1)</td>
<td>upright</td>
<td>triple</td>
<td>solid</td>
<td>15.50 x 29.0 x 81.0 (3900 x 730 x 2050)</td>
<td>195.0 x 35.5 x 85.0 (5030 x 990 x 2160)</td>
<td>805 (360)</td>
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</tbody>
</table>

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*Published interior volumes are nominal; useable cu.ft. (L) capacities may be offset by shelves, drawers, blower coils, or cabinet protrusions. For specific cabinet dimensions and allowances, or for verification of clearance tolerances, contact our sales representatives. Product performance may be affected by ambient temperature conditions, humidity conditions, sample loading preferences, and frequency of door openings. Contact our sales representatives for specific inquiries regarding your application.

**Not available in North America**

FRGL404 refrigerator shown with optional casters and temperature recorder.

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**Temperature Range:** +1°C to +8°C, factory preset to +4°C (auto defrost)

**Int. Dimensions**
- H x D x W: inches (mm)

**Ext. Dimensions**
- H x D x W: inches (mm)

**Ship Weight**
- lb (kg)

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**ORDERING INFORMATION**

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**Cabinet Construction and Inventory System**
- **High-density, CFC-free urethane foam insulation** protects cabinet from ambient temperature fluctuations and minimizes operating costs
- **Positive, forced-air circulation** maintains temperature uniformity at all shelf levels
- **Directional airflow** assures quick recovery after door openings
- **Interior cabinet lights** with door-activated on/off switch, plus independent switch on control panel for 11.5 cu.ft. (326 L) and larger models
- **Model FRGL4504 features independent switch activated lights only; under-counter model FRGL404 does not have lights**
- **Self-closing doors close against closed-cell peripheral gasket**
- **Door locking provision on all models except FRGL4504**
- **Full-length door handle(s) on all models except sliding door model FRGL4504**
- **Interior and exterior surfaces are finished with a high-impact powder paint coating**
- **Epoxy-coated, open wire shelves, adjustable in 1” (25 mm) increments; no tools required**
- **2” (50 mm) casters standard on model FRGL4504**
- **Adjustable leveling feet standard**
- **1” (25 mm) access port standard on model FRGL4504**
- **Access port, 2” (50 mm) diameter, with cover**
- **Stainless steel interior and exterior surfaces**
- **2” (50 mm) casters**
- **Additional shelves**
- **Full-view glass doors, double pane construction (standard on FRGL4504)**
- **Heated glass doors and door swing variations are available on most models**
- **Finished countertop for FRGL404**

**Refrigeration System**
- **Heavy duty, industrial-grade, hermetically sealed compressors**
- **Automatic defrost maintains optimum cooling capacity**
- **Automatic condensate removal; no drain lines required**

**Optional Accessories**
- **Voltage safeguard, free standing**
- **Built-in 6” (152 mm) day/night circular chart recorder (free-standing on FRGL404)**
Our blood bank refrigerators are designed to meet strict requirements established by the AABB, ANRC and FDA for storage of whole blood and blood components. The complete selection of +4°C refrigerators feature simplified push-button alarm test functions and reliable, field-proven refrigeration systems.

IntrLogic Microprocessor Control

Our FRBB series refrigerators feature the IntrLogic microprocessor control system, positive airflow systems, industrial quality cabinet construction and extra-strength refrigeration compressors selected for industrial, clinical and scientific use.

- Adjustable temperature control, range +1°C to +8°C, factory pre-set to +4°C
- Icon-based controls and displays include graphic references for universal operation
- Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
- Audible/visual warnings for over-temperature, undertemperature and power failure, with visual status reports on critical functions
- Alarm setpoints pre-set to warn of temperature deviation at +5.5°C overtemperature and +1.5°C undertemperature
- Graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- Advanced defrost sensor manages the defrost cycle, minimizing trace amounts of frost build-up to maintain refrigeration coil efficiency
- Enlarged digital display, resolution to within 0.1°C, improves visibility
- Alarm silence, ringback and automatic reset functions
- Push button alarm test verifies sensor continuity
- Battery backup assures control panel function during power failure
- Extra-long alarm probe lead allows manual testing and verification
- Remote alarm contacts are included on all models
Blood Bank Refrigerators (Not Available in North America)

Temperature Range: +1°C to +8°C, factory preset to +4°C (also definable)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FRBB404A</td>
<td>4.0/133 115 (50)</td>
<td>6.0/15 (P1)</td>
<td>undercounter</td>
<td>single, solid</td>
<td>2</td>
<td>20.0 x 20.0 x 20.0</td>
<td>33.4 x 28.0 x 28.0</td>
<td>212 (96)</td>
<td></td>
</tr>
<tr>
<td>FRBB404D</td>
<td>11.5/320 208/230 (60)</td>
<td>6.0/15 (P4)</td>
<td>space</td>
<td>single, glass</td>
<td>5</td>
<td>52.0 x 21.0 x 30.0</td>
<td>71.9 x 28.0 x 30.0</td>
<td>320 (146)</td>
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</tr>
<tr>
<td>FRBB404V</td>
<td>23.9/659 208/230 (60)</td>
<td>6.0/15 (P4)</td>
<td>upright</td>
<td>single, glass</td>
<td>6</td>
<td>58.0 x 29.0 x 24.0</td>
<td>77.5 x 35.5 x 28.0</td>
<td>470 (213)</td>
<td></td>
</tr>
<tr>
<td>FRBB404W</td>
<td>29.2/626 208/230 (60)</td>
<td>8.5/15 (P3)</td>
<td>upright</td>
<td>single, glass</td>
<td>6</td>
<td>58.0 x 29.0 x 30.0</td>
<td>77.5 x 35.5 x 34.0</td>
<td>526 (237)</td>
<td></td>
</tr>
<tr>
<td>FRBB504A</td>
<td>51.1/1447 208/230 (60)</td>
<td>8.5/15 (P3)</td>
<td>upright</td>
<td>double, glass</td>
<td>12</td>
<td>58.0 x 29.0 x 52.0</td>
<td>77.5 x 35.5 x 58.5</td>
<td>790 (359)</td>
<td></td>
</tr>
<tr>
<td>FRBB504D</td>
<td>78.3/1980 208/230 (60)</td>
<td>8.5/15 (P3)</td>
<td>upright</td>
<td>double, glass</td>
<td>12</td>
<td>58.0 x 29.0 x 52.0</td>
<td>77.5 x 35.5 x 58.5</td>
<td>790 (359)</td>
<td></td>
</tr>
</tbody>
</table>

** Nominal capacity based on 450 mL whole blood bags.

---

Cabinet Construction and Inventory System
- Full-extension adjustable stainless steel drawers
- Dual-pane glass viewing door(s), insulated to prevent condensation (optional on FRBB404)
- High-density CFC-free urethane foam insulation protects cabinet from ambient temperature fluctuations and minimizes operating costs
- Positive, forced-air circulation to maintain temperature uniformity at all drawer levels
- Directional air flow assures quick recovery after door openings
- Interior cabinet lights with door activated on/off switch, plus independent switch on control panel (except on 4.9 cu.ft. (133 L) models)
- Self-closing doors close against closed-cell peripheral gasket
- Door locking provision on all models
- 1” (25 mm) access port standard on FRBB404

- Access port, 2” (50 mm) diameter, with cover (standard 1” (25 mm) port for FRBB504)
- Stainless steel interior and exterior surfaces
- 2” (50 mm) casters
- Additional drawers, stainless steel drawer dividers
- Heated glass doors and door swing variations available on most models
- Finished countertop for FRBB404

---

Refrigeration System
- Heavy duty, industrial-grade, hermetically sealed compressors
- Automatic defrost for optimum cooling capacity
- Automatic condensate removal; no drain lines required

---

Optional Accessories
- Voltage safeguard, free-standing
- Free-standing temperature recorder for FRBB404

---

* Published interior volumes are nominal; useable cu.ft. (L) capacities may be offset by shelves, drawers, blower coils, or cabinet protrusions. For specific cabinet dimensions and allowances, or for verification of clearance tolerances, contact our sales representative. Product performance may be affected by ambient temperature conditions, humidity conditions, sample loading preferences, and frequency of door openings. Contact our sales representative for specific inquiries regarding your application.
Thermo Scientific
Forma Pharmacy Refrigerators

Featuring IntrLogic
Microprocessor Control

Configured for accurate storage and easy retrieval of pharmacy products, our FRPH pharmacy refrigerators feature full extension stainless steel roll-out drawers. Developed for stable temperature control over a range of +1°C to +8°C, these refrigerators are available in four sizes.

IntrLogic Microprocessor Control
Our FRPH pharmacy refrigerators feature enhanced digital electronic technology designed to simplify operation and deliver greater accuracy (see pages 4 and 5).

• Adjustable temperature control, range +1°C to +8°C, factory pre-set to +4°C
• Icon-based controls and displays include graphic references for universal operation
• Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
• Audible/visual warnings for over-temperature, undertemperature and power failure, with visual status reports on critical functions
• Graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
• Advanced defrost sensor manages the defrost cycle, minimizing trace amounts of frost build-up to maintain refrigeration coil efficiency
• Enlarged digital display, resolution to within 0.1°C, improves visibility
• Alarm silence, ringback and automatic reset functions
• Push button alarm test verifies sensor continuity
• Battery backup assures control panel function during power failure
• Remote alarm contacts are included on all models

Our FRPH series pharmacy refrigerators feature the IntrLogic microprocessor control system, positive airflow systems, industrial quality cabinet construction and extra-strength refrigeration compressors selected for industrial, clinical and scientific use.

Our pharmacy refrigerators are designed to provide stable temperature control and allow efficient inventory management. Model shown: FRPH3004 with full extension roll-out drawers and full view glass door.
ORDERING INFORMATION

Pharmacy Refrigerators

Temperature Range: +1°C to +8°C, factory preset to +4°C (auto defrost)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Cu.Ft. (L)</th>
<th>Voltage (Hz)</th>
<th>Amps/Breaker (Plug)</th>
<th>Cabinet</th>
<th>Door</th>
<th>Drawers</th>
<th>Int. Dimensions*</th>
<th>Ext. Dimensions*</th>
<th>Ship Weight &amp; (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRPH1204A</td>
<td>11.5 (326)</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>upright</td>
<td>single, glass</td>
<td>5</td>
<td>52.0 x 21.0 x 30.0 (1320 x 530 x 760)</td>
<td>71.9 x 38.8 x 24.0 (1830 x 740 x 610)</td>
<td>320 (145)</td>
</tr>
<tr>
<td>FRPH1204D</td>
<td>208/230 (60)</td>
<td>6.0/15 (P4)</td>
<td>glass (1470 x 730 x 610)</td>
<td>glass (1830 x 910 x 720)</td>
<td>470 (213)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRPH1204V</td>
<td>230 (50)</td>
<td>6.0/15 (P7)</td>
<td>glass (1470 x 730 x 610)</td>
<td>glass (1970 x 910 x 720)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRPH1204W</td>
<td>230 (50)</td>
<td>6.0/15 (P8)</td>
<td>glass (1470 x 730 x 610)</td>
<td>glass (1970 x 910 x 720)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>FRPH1204A**</td>
<td>115 (326)</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>upright</td>
<td>glass (1320 x 530 x 500)</td>
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<tr>
<td>FRPH1204V**</td>
<td>230 (50)</td>
<td>6.0/15 (P7)</td>
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<td></td>
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<tr>
<td>FRPH1204W**</td>
<td>230 (50)</td>
<td>6.0/15 (P8)</td>
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</tr>
<tr>
<td>FRPH1204A</td>
<td>23.3 (659)</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>upright</td>
<td>single, glass</td>
<td>5</td>
<td>58.0 x 29.0 x 30.0 (1470 x 730 x 760)</td>
<td>77.5 x 35.5 x 34.0 (1830 x 910 x 720)</td>
<td>526 (227)</td>
</tr>
<tr>
<td>FRPH1204D**</td>
<td>208/230 (60)</td>
<td>6.0/15 (P4)</td>
<td>glass (1470 x 730 x 760)</td>
<td>glass (1970 x 910 x 870)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRPH1204V**</td>
<td>230 (50)</td>
<td>6.0/15 (P7)</td>
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<td></td>
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</tr>
<tr>
<td>FRPH1204W**</td>
<td>230 (50)</td>
<td>6.0/15 (P8)</td>
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</tr>
<tr>
<td>FRPH2304A</td>
<td>29.2 (826)</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>upright</td>
<td>single, glass</td>
<td>6</td>
<td>58.0 x 29.0 x 30.0 (1470 x 730 x 760)</td>
<td>77.5 x 35.5 x 34.0 (1830 x 910 x 720)</td>
<td>505 (227)</td>
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<tr>
<td>FRPH2304D**</td>
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<td>6.0/15 (P4)</td>
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<td>glass (1970 x 910 x 1440)</td>
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<tr>
<td>FRPH2304V**</td>
<td>230 (50)</td>
<td>6.0/15 (P7)</td>
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</tr>
<tr>
<td>FRPH2304W**</td>
<td>230 (50)</td>
<td>6.0/15 (P8)</td>
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</tr>
<tr>
<td>FRPH5004A</td>
<td>51.1 (1447)</td>
<td>115 (60)</td>
<td>6.0/15 (P1)</td>
<td>upright</td>
<td>single, glass</td>
<td>12</td>
<td>58.0 x 29.0 x 30.0 (1470 x 730 x 1320)</td>
<td>77.5 x 35.5 x 96.5 (1970 x 910 x 1440)</td>
<td>790 (359)</td>
</tr>
<tr>
<td>FRPH5004D**</td>
<td>208/230 (60)</td>
<td>6.0/15 (P4)</td>
<td>glass (1470 x 730 x 1320)</td>
<td>glass (1970 x 910 x 1440)</td>
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<td></td>
</tr>
<tr>
<td>FRPH5004V**</td>
<td>230 (50)</td>
<td>6.0/15 (P7)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>FRPH5004W**</td>
<td>230 (50)</td>
<td>6.0/15 (P8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Published interior volumes are nominal; useable cu.ft. (L) capacities may be offset by shelves, drawers, blower coils, or cabinet protrusions. For specific cabinet dimensions and allowances, or for verification of clearance tolerances, contact our sales representative. Product performance may be affected by ambient temperature conditions, humidity conditions, sample loading preferences, and frequency of door openings. Contact our sales representative for specific inquiries regarding your application.

** Not available in North America

Cabinet Construction and Inventory System
- Full extension stainless steel drawers, fully adjustable
- Full view glass doors, double pane construction eliminates condensation; spring-loaded closures include 90° stay open feature
- High-density, CFC-free urethane foam insulation protects cabinet from ambient temperature fluctuations and minimizes operating costs
- Positive, forced-air circulation maintains temperature uniformity at all shelf levels
- Directional air flow assures quick recovery after door openings
- Interior cabinet lights with door activated on/off switch, plus independent switch on control panel
- Self-closing doors close against closed-cell peripheral gasket
- Door locking provision on all models
- Adjustable leveling feet standard; optional casters are available
- Smooth scratch resistant painted interior and exterior surfaces for easy cleaning

Refrigeration System
- Heavy duty, industrial-grade, hermetically sealed compressors
- Automatic defrost maintains optimum cooling capacity
- Automatic condensate removal; no drain lines required

Optional Accessories
- Voltage safeguard, free standing
- Built-in 6” (152 mm), 7-day circular chart recorder
- Access port, 2” (50 mm) diameter, with cover
- Stainless steel interior and exterior surfaces
- 2” (50 mm) casters
- Additional shelves
- Additional drawers
- Heated glass doors and door swing variations available on most models
Thermo Scientific
Forma High
Performance
Laboratory Freezers

Our general laboratory freezers are designed for medical and scientific applications such as storage of reagents, pharmaceuticals, biologicals, or other commonly used laboratory materials. Models offer cabinet sizes to fit a variety of space needs and storage volume requirements.

FFGL5030 (left) and FFGL2330 (right) -30°C freezers, shown with optional casters and temperature recorder.

Our freezers feature the IntrLogic microprocessor control system, positive airflow systems, industrial quality cabinet construction and extra-strength refrigeration compressors selected for industrial, clinical and scientific use.

IntrLogic Microprocessor Control
Our FFGL series lab freezers feature enhanced digital electronic technology designed to simplify operation and deliver greater accuracy (see pages 4 and 5).

- Pre-set -30°C operation
- Icon-based controls and displays include graphic references for universal operation
- Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
- Audible/visual warnings for over-temperature, undertemperature and power failure, with visual status reports on critical functions
- Graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- Advanced defrost sensor manages the defrost cycle, minimizing trace amounts of frost build-up to maintain refrigeration coil efficiency
- Enlarged digital display, resolution to within 0.1°C, improves visibility
- Alarm silence, ringback and automatic reset functions
- Push button alarm test verifies sensor continuity
- Battery backup assures control panel function during power failure
- Remote alarm contacts are included on all models

IntrLogic Microprocessor Control
- Pre-set -30°C operation
- Icon-based controls and displays include graphic references for universal operation
- Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
- Audible/visual warnings for over-temperature, undertemperature and power failure, with visual status reports on critical functions
- Graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- Advanced defrost sensor manages the defrost cycle, minimizing trace amounts of frost build-up to maintain refrigeration coil efficiency
- Enlarged digital display, resolution to within 0.1°C, improves visibility
- Alarm silence, ringback and automatic reset functions
- Push button alarm test verifies sensor continuity
- Battery backup assures control panel function during power failure
- Remote alarm contacts are included on all models
### Ordering Information

**General Purpose Laboratory Freezers**

**Temperature Range: -30°C (auto defrost)**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Cu. Ft. (L)</th>
<th>Voltage (Hz)</th>
<th>Amps/Breaker (Plug)</th>
<th>Cabinet</th>
<th>Door</th>
<th>Shelves</th>
<th>Int. Dimensions* H x D x W inches (mm)</th>
<th>Ext. Dimensions* H x D x W inches (mm)</th>
<th>Ship Weight B (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFGL430A*</td>
<td>4.9 (133)</td>
<td>115 (60)</td>
<td>6/0 (PT)</td>
<td>undercounter</td>
<td>single</td>
<td>solid</td>
<td>20.0 x 20.0 x 30.0 (50 x 50 x 760)</td>
<td>33.4 x 26.0 x 34.0 (850 x 660 x 864)</td>
<td>212 (96)</td>
</tr>
<tr>
<td>FFGL430D*</td>
<td>11.5 (326)</td>
<td>208/230 (60)</td>
<td>8/0 (PT)</td>
<td>space</td>
<td>single</td>
<td>solid</td>
<td>52.0 x 21.0 x 30.0 (1320 x 530 x 760)</td>
<td>71. x 28.8 x 34.0 (1830 x 740 x 864)</td>
<td>280 (127)</td>
</tr>
<tr>
<td>FFGL430V*</td>
<td>23.3 (659)</td>
<td>115 (60)</td>
<td>12/0 (PT)</td>
<td>upright</td>
<td>single</td>
<td>solid</td>
<td>58.0 x 20.0 x 34.0 (1470 x 730 x 864)</td>
<td>77.5 x 35.5 x 34.0 (1970 x 900 x 870)</td>
<td>370 (168)</td>
</tr>
<tr>
<td>FFGL430W*</td>
<td>23.3 (659)</td>
<td>208/230 (60)</td>
<td>12/0 (PT)</td>
<td>upright</td>
<td>single</td>
<td>solid</td>
<td>58.0 x 20.0 x 30.0 (1470 x 730 x 760)</td>
<td>77.5 x 35.5 x 30.0 (1970 x 900 x 760)</td>
<td>445 (200)</td>
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</tbody>
</table>

**Temperature Range: -20°C (manual defrost)**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Cu. Ft. (L)</th>
<th>Voltage (Hz)</th>
<th>Amps/Breaker (Plug)</th>
<th>Cabinet</th>
<th>Door</th>
<th>Shelves</th>
<th>Int. Dimensions* H x D x W inches (mm)</th>
<th>Ext. Dimensions* H x D x W inches (mm)</th>
<th>Ship Weight B (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFGL2320A*</td>
<td>23.3 (659)</td>
<td>115 (60)</td>
<td>12/0 (PT)</td>
<td>upright</td>
<td>single</td>
<td>solid</td>
<td>58.0 x 20.0 x 34.0 (1470 x 730 x 864)</td>
<td>77.5 x 35.5 x 34.0 (1970 x 900 x 870)</td>
<td>425 (193)</td>
</tr>
<tr>
<td>FFGL2320D*</td>
<td>208/230 (60)</td>
<td>12/0 (PT)</td>
<td>12/0 (PT)</td>
<td>upright</td>
<td>double</td>
<td>solid</td>
<td>89.0 x 20.0 x 52.0 (2250 x 1320)</td>
<td>115.0 x 35.5 x 52.0 (2920 x 1345)</td>
<td>600 (272)</td>
</tr>
</tbody>
</table>

* All interior volumes are nominal, usable cu.ft. Capacities may be offset by shelves, drawers, blower coils, or cabinet protrusions. For specific cabinet dimensions and allowances, or for verification of clearance tolerances, contact our sales representative. Product performance may be affected by ambient temperature conditions, humidity conditions, sample loading preferences, and frequency of door openings. Contact our sales representative for specific inquiries regarding your application.

** Not available in North America

---

**Cabinet Construction and Inventory System**

- Cabinet capacities from 4.9 to 51.1 cu. ft. (133 to 1447 L)
- High-density, CFC-free urethane foam insulation protects cabinet from ambient temperature fluctuations and minimizes operating costs
- Positive, forced-air circulation maintains temperature uniformity at all shelf levels
- Directional air flow assures quick recovery after door openings
- Solid door with keyed door lock for added security
- Self-closing doors close against closed-cell peripheral gasket
- Door locking provision on all models
- Full-length door handle(s) on all models
- Epoxy-coated, open wire shelves, adjustable in 1” (25 mm) increments; no tools required
- Adjustable leveling feet standard; optional casters are available
- Scratch resistant painted interior and exterior finish for easy cleaning
- 1” (25 mm) access port standard on FFGL430

**Refrigeration System**

- Heavy duty, industrial-grade, hermetically sealed compressors
- Automatic defrost maintains optimum cooling capacity (All models except FFGL2320)
- Manual defrost for maximum temperature uniformity performance (FFGL2320)

**Optional Accessories**

- Voltage safeguard, free standing
- Built-in 6” (152 mm), 7-day circular chart recorder (free-standing on FFGL430)
- Access port 1” (25 mm) diameter, (standard on FFGL430)
- Stainless steel interior and exterior surfaces
- 2’ (50 mm) casters
- Additional shelves
- Finished countertop for FFGL430
Our -30°C plasma freezers are designed to meet AABB, ANRC and FDA standards for safety and performance in plasma storage. Five models offer cabinet sizes to meet a variety of space needs and storage volume requirements.

**IntrLogic Microprocessor Control**

Our plasma freezers feature enhanced digital electronic technology designed to simplify operation and deliver greater accuracy (see pages 4 and 5).

- Pre-set -30°C operation
- Icon-based controls and displays include graphic references for universal operation
- Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
- Audible/visual warnings for over-temperature, undertemperature and power failure, with visual status reports on critical functions
- Graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- Advanced defrost sensor manages the defrost cycle, minimizing trace amounts of frost build-up to maintain refrigeration coil efficiency
- Enlarged digital display, resolution to within 0.1°C, improves visibility
- Alarm silence, ringback and automatic reset functions
- Push button alarm test verifies sensor continuity
- Battery backup assures control panel function during power failure
- Extra-long alarm probe lead allows manual testing and verification
- Remote alarm contacts are standard on all models

Our -30°C plasma freezers feature the IntrLogic microprocessor control system, positive airflow systems, industrial quality cabinet construction, and extra-strength refrigeration compressors selected for demanding blood bank applications.

**IntrLogic Microprocessor Control**

Our plasma freezers feature enhanced digital electronic technology designed to simplify operation and deliver greater accuracy (see pages 4 and 5).

- Pre-set -30°C operation
- Icon-based controls and displays include graphic references for universal operation
- Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
- Audible/visual warnings for over-temperature, undertemperature and power failure, with visual status reports on critical functions
- Graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- Advanced defrost sensor manages the defrost cycle, minimizing trace amounts of frost build-up to maintain refrigeration coil efficiency
- Enlarged digital display, resolution to within 0.1°C, improves visibility
- Alarm silence, ringback and automatic reset functions
- Push button alarm test verifies sensor continuity
- Battery backup assures control panel function during power failure
- Extra-long alarm probe lead allows manual testing and verification
- Remote alarm contacts are standard on all models
**Plasma Freezers** *(Not Available in North America)*

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Capacity** (Plasma Box Voltage Amps/Hz)</th>
<th>Breaker (Plug)</th>
<th>Cabinet</th>
<th>Door</th>
<th>Drawers</th>
<th>Int. Dimensions*</th>
<th>Ext. Dimensions*</th>
<th>Ship Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFPF430A</td>
<td>4.9/133 115 (60)</td>
<td>6/0(15) (P1)</td>
<td>undercounter</td>
<td>single, solid</td>
<td>2</td>
<td>20.0 x 20.0 x 20.0 (600 x 500 x 500)</td>
<td>35.4 x 26.0 x 24.0 (900 x 660 x 610)</td>
<td>212 (96)</td>
</tr>
<tr>
<td>FFPF430D</td>
<td>11.5/269 120 (60)</td>
<td>6/0(15) (P1)</td>
<td>space saver</td>
<td>single, solid</td>
<td>7</td>
<td>52.0 x 21.0 x 20.0 (1320 x 530 x 500)</td>
<td>71.0 x 28.8 x 24.0 (1830 x 740 x 610)</td>
<td>65 (166)</td>
</tr>
<tr>
<td>FFPF430V</td>
<td>23.3/699 208/230 (60)</td>
<td>6/0(15) (P1)</td>
<td>upright</td>
<td>single, solid</td>
<td>7</td>
<td>58.0 x 28.0 x 24.0 (1470 x 730 x 610)</td>
<td>77.5 x 35.5 x 28.0 (1970 x 910 x 720)</td>
<td>425 (193)</td>
</tr>
<tr>
<td>FFPF430W</td>
<td>23.3/699 208/230 (60)</td>
<td>6/0(15) (P1)</td>
<td>upright</td>
<td>single, solid</td>
<td>7</td>
<td>58.0 x 28.0 x 30.0 (1470 x 730 x 760)</td>
<td>77.5 x 35.5 x 38.0 (1970 x 910 x 870)</td>
<td>580 (263)</td>
</tr>
<tr>
<td>FFPF5030A</td>
<td>51.1/1447 208/230 (60)</td>
<td>6/0(15) (P1)</td>
<td>upright</td>
<td>double, solid</td>
<td>14</td>
<td>58.0 x 28.0 x 52.0 (1470 x 730 x 1320)</td>
<td>77.5 x 35.5 x 58.5 (1970 x 910 x 1440)</td>
<td>650 (296)</td>
</tr>
</tbody>
</table>

* *Published interior volumes are nominal; useable cu.ft. (L) capacities may be offset by shelves, drawers, blower coils, or cabinet protrusions. For specific cabinet dimensions and allowances, or for verification of clearance tolerances, contact our sales representative. Product performance may be affected by ambient temperature conditions, humidity conditions, sample loading preferences, and frequency of door openings. Contact our sales representative for specific inquiries regarding your application.

** Nominal capacity based on 250 mL plasma boxes.

---

*Plasma Freezers* *(Not Available in North America)*

**Temperature Range**: -30°C (auto defrost)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Voltage Amps/Hz</th>
<th>Breaker (Plug)</th>
<th>Cabinet</th>
<th>Door</th>
<th>Drawers</th>
<th>Int. Dimensions*</th>
<th>Ext. Dimensions*</th>
<th>Ship Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFPF430A</td>
<td>4.9/133 115 (60)</td>
<td>6/0(15) (P1)</td>
<td>undercounter</td>
<td>single, solid</td>
<td>2</td>
<td>20.0 x 20.0 x 20.0 (600 x 500 x 500)</td>
<td>35.4 x 26.0 x 24.0 (900 x 660 x 610)</td>
<td>212 (96)</td>
</tr>
<tr>
<td>FFPF430D</td>
<td>11.5/269 120 (60)</td>
<td>6/0(15) (P1)</td>
<td>space saver</td>
<td>single, solid</td>
<td>7</td>
<td>52.0 x 21.0 x 20.0 (1320 x 530 x 500)</td>
<td>71.0 x 28.8 x 24.0 (1830 x 740 x 610)</td>
<td>65 (166)</td>
</tr>
<tr>
<td>FFPF430V</td>
<td>23.3/699 208/230 (60)</td>
<td>6/0(15) (P1)</td>
<td>upright</td>
<td>single, solid</td>
<td>7</td>
<td>58.0 x 28.0 x 24.0 (1470 x 730 x 610)</td>
<td>77.5 x 35.5 x 28.0 (1970 x 910 x 720)</td>
<td>425 (193)</td>
</tr>
<tr>
<td>FFPF430W</td>
<td>23.3/699 208/230 (60)</td>
<td>6/0(15) (P1)</td>
<td>upright</td>
<td>single, solid</td>
<td>7</td>
<td>58.0 x 28.0 x 30.0 (1470 x 730 x 760)</td>
<td>77.5 x 35.5 x 38.0 (1970 x 910 x 870)</td>
<td>580 (263)</td>
</tr>
<tr>
<td>FFPF5030A</td>
<td>51.1/1447 208/230 (60)</td>
<td>6/0(15) (P1)</td>
<td>upright</td>
<td>double, solid</td>
<td>14</td>
<td>58.0 x 28.0 x 52.0 (1470 x 730 x 1320)</td>
<td>77.5 x 35.5 x 58.5 (1970 x 910 x 1440)</td>
<td>650 (296)</td>
</tr>
</tbody>
</table>

---

*Material capacity based on 250 mL plasma boxes.

---

Cabinet Construction and Inventory System
- High-density, CFC-free urethane foam insulation protects cabinet from ambient temperature fluctuations and minimizes operating costs
- Positive, forced-air circulation maintains uniformity at all shelf levels
- Directional airflow assures quick recovery after door openings
- Solid door with keyed door lock for added security
- Doors are self-closing against a closed-cell peripheral gasket; doors are spring loaded on all but undercounter models
- Door locking provision on all models
- Full-length door handle on all models
- Full extension stainless steel drawers

- Adjustable leveling feet standard; optional casters are available
- Interior and exterior surfaces are finished with a high-impact powder paint coating
- Built-in 6" (152 mm), 7-day chart recorder, standard (optional free-standing on FFPF430)
- Provides permanent record of storage conditions

Temperature Recorders
- Heavy duty, industrial-grade, hermetically sealed compressors
- Automatic defrost maintains optimum cooling capacity
- Automatic condensate removal; no drain lines required

Optional Accessories
- Voltage safeguard, free-standing
- Access port, 1" (25 mm) diameter
- Stainless steel interior and exterior surfaces
- 2" (50 mm) casters
- Stainless steel drawer dividers
- Finished countertop for FFPF430
- Free-standing temperature recorder for FFPF430
Our manual defrost -20°C upright freezers are designed for storage applications where slight intermittent coil warming during an auto defrost cycle is not desired. Our models feature gravity convection air systems for maximum stability without blowers or fans.

Our -20°C freezers feature the IntrLogic microprocessor control system, gravity air circulation, industrial quality cabinet construction, and extra-strength refrigeration compressors selected for industrial, clinical and scientific use. The FFEN2320 enzyme freezer features an easily accessible inventory system.

**IntrLogic Microprocessor Control**

Our -20°C enzyme and laboratory freezers feature enhanced digital electronic technology designed to simplify operation and deliver greater accuracy (see pages 4 and 5).

- Pre-set -20°C operation
- Icon-based controls and displays include graphic references for universal operation
- Setpoint security with key-operated triple-position master switch controls power to all systems for added safety
- Audible/visual warnings for over-temperature, undertemperature and power failure, with visual status reports on critical functions
- Graphic thermometer confirms proper operation at-a-glance, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature
- Enlarged digital display, resolution to within 0.1°C, improves visibility
- Alarm silence, ringback and automatic reset functions
- Push button alarm test verifies sensor continuity
- Battery backup assures control panel function during power failure
- Remote alarm contacts are standard on all models

The -20°C FFEN2320 enzyme freezer stores 45 enzyme bins on 9 shelves. Shown with optional casters and temperature recorder.
Enzyme Freezers

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Cu.Ft. (L)</th>
<th>Voltage (Hz)</th>
<th>Breaker (Plug)</th>
<th>Cabinet</th>
<th>Door</th>
<th>Shelves</th>
<th>Int. Dimensions*</th>
<th>Ext. Dimensions*</th>
<th>Ship Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFENZ2020A</td>
<td>23.3 (659)</td>
<td>115 (60)</td>
<td>5.6/15 (P1)</td>
<td>upright</td>
<td>single</td>
<td>9</td>
<td>58.0 x 29.0 x 24.0</td>
<td>77.5 x 35.5 x 28.0</td>
<td>425 (193)</td>
</tr>
<tr>
<td>FFENZ2020D</td>
<td>208/230 (60)</td>
<td>5.6/15 (P4)</td>
<td>solid</td>
<td>(1470 x 730 x 610)</td>
<td>(1970 x 910 x 720)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FFENZ2020V</td>
<td>230 (50)</td>
<td>5.6/15 (P7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FFENZ2020W</td>
<td>230 (50)</td>
<td>5.6/15 (P8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Published interior volumes are nominal; usable cu.ft. (L) capacities may be offset by shelves, drawers, blower coils, or cabinet protrusions. For specific cabinet dimensions and allowances, or for verification of clearance tolerances, contact our sales representative. Product performance may be affected by ambient temperature conditions, humidity conditions, sample loading preferences, and frequency of door openings. Contact our sales representative for specific inquiries regarding your application.

Cabinet Construction
- Upright 23.3 cu.ft. (659 L) cabinet
- High-density, CFC-free urethane foam insulation protects cabinet from ambient temperature fluctuations and minimizes operating costs
- Solid door with keyed door lock for added security
- Self-closing door closes against closed-cell peripheral gasket
- Door locking provision on all models
- Full-length door handle
- Adjustable leveling feet standard; optional casters are available
- Scratch resistant painted interior and exterior finish for easy cleaning

Inventory System
- Epoxy-coated, open wire shelves, adjustable in 1" (25 mm) increments; no tools required
- Includes nine shelves with enzyme storage system of five bins per shelf, maximum 45 bins; labels not provided

Refrigeration System
- Heavy duty, industrial-grade, hermetically sealed compressors
- Manual defrost for maximum temperature uniformity performance

Optional Accessories
- Voltage safeguard, free-standing
- Built-in 6" (152 mm), 7-day circular chart recorder
- Access port, 1" (25 mm) diameter
- Stainless steel exterior
- 2" (50 mm) casters
- Additional shelves
- Additional bins

| FFENZ2020 -20°C freezer shown with optional casters and temperature recorder. |
Accessories

Productive use of your refrigerator or freezer can be enhanced with accessories specially designed to improve utility and convenience. Many accessories are factory installed and must be specified with your original order.

Field installed accessories may require the services of a factory authorized technician.

Some accessories or options may affect refrigerator or freezer performance; for more information contact your Sales Representative.

Volatile and Serial Numbers

Serial number tags on all our Forma products contain model numbers and voltage information needed for accurate selection of accessories ordered for field installation.

- It is recommended that accessories be ordered when your refrigerator or freezer is ordered
- Factory-installed accessories allow proper setup without powering down or emptying the cabinet

Validation Testing Program

Validation testing services in advance of shipment can accelerate in-house FDA Installation Qualification (IQ) and Operation Qualification (OQ) programs. Validation services include documentation and performance reports, compressor and sub-system component specifications, microprocessor flow diagrams, software specifications and more. For more details, contact your sales representative.

Certification of Calibration

Control, alarm and temperature recording systems are systematically calibrated at the factory for accurate performance. An optional Certificate of Calibration to an NIST (National Institute of Standards and Technology, formerly National Bureau of Standards) traceable instrument includes a model number and serial number certificate and single point calibration. Multiple point calibration is also available. Calibration certificates must be requested when ordering.

Catalog No. 6916-2

Shelves

Additional epoxy-coated, open-wire shelves are designed to fit individual cabinets; shelves are available in full- and half-sizes. Undercounter models use full-size only.

<table>
<thead>
<tr>
<th>Shelves</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Sized</td>
<td>6695-1</td>
</tr>
<tr>
<td>Half-Sized</td>
<td>6695-1</td>
</tr>
</tbody>
</table>

Glass Doors

Solid doors are offered standard on most refrigerators unless otherwise specified. Optional dual-pane glass doors must be specified when ordering. Contact your Sales Representative for information on heated glass doors.

Swing Type

<table>
<thead>
<tr>
<th>Serial</th>
<th>Type</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid</td>
<td>LH</td>
<td>7119</td>
</tr>
<tr>
<td>Glass</td>
<td>LH/LH</td>
<td>7067</td>
</tr>
<tr>
<td>Glass</td>
<td>RH/RH</td>
<td>7008</td>
</tr>
<tr>
<td>Glass</td>
<td>LH/RH</td>
<td>7015</td>
</tr>
<tr>
<td>Glass</td>
<td>LH/LH/LH</td>
<td>7071</td>
</tr>
<tr>
<td>Glass</td>
<td>RH/RH/RH</td>
<td>7009</td>
</tr>
<tr>
<td>Glass</td>
<td>LH/LH/RH</td>
<td>7010</td>
</tr>
<tr>
<td>Glass</td>
<td>RH/RH/LH</td>
<td>7001</td>
</tr>
<tr>
<td>Glass</td>
<td>LH/RH/LH</td>
<td>7014</td>
</tr>
</tbody>
</table>

* Left Open, LH = Left Hand, RH = Right Hand

Note: Glass doors are standard on selected blood bank, chromatography and pharmacy refrigerators; consult specification chart for details.

Sliding glass doors are standard on all 45.8 cu.ft. (1297 L) models. Heated glass doors will increase amperage and may require next size breaker.

Voltage safeguard
Roll-Out Drawers
Optional stainless steel drawers, offered as an alternative to standard open wire shelving, are adjustable with full extension. Drawers are factory installed and must be specified when ordering cabinet.

Interior, Exterior and Countertop Finishes
• Optional stainless steel interior and/or exterior surfaces are available and must be specified when ordering.
• Optional stainless steel or white finished countertops on undercounter models

Casters
Casters are optional on most models. Casters are factory installed when ordered at time of cabinet order; customer installed if ordered separately. Choose from 2" (50 mm) or 3" (76 mm) casters.

Temperature Recorders
Optional 6" (152 mm) chart, 7-day temperature recorders use pressure-sensitive chart paper; one box of 50 charts included. Built-in recorders must be specified when ordering. Recorders are standard on 11.5 cu.ft. (326 L) and larger blood bank refrigerators and plasma freezers.

Alarm Delay Module
The alarm delay eliminates nuisance alarms due to intermittent or transitory conditions such as lightning or brief power outages. The adjustable delay requires an alarm condition to exist continuously for a pre-determined time (adjustable) before a signal is released to a central alarm/monitoring system or telephone dialer.
• Adjustable delay from 0.5 to 32 minutes
• Red alarm indicator light remains flashing after transient condition is corrected; requires manual reset
• Signals chronic alarm conditions which may indicate impending component failure; allows time for inspection or corrective maintenance
• Inserts variable time interval between detection of alarm condition and transmission of signal
• Includes accurate digital timing circuit adjustable from 0.5, 1, 2, 4, 8, 10, or 32 minutes
• Operates independent of line power; built-in battery and alarm test function uses customer supplied 9V battery

Thermo Scientific LabCooler Modules
Our LabCooler™ Benchtop cooler helps maintain enzymes and other frozen material at stable temperatures when used at the lab bench. When stored in a freezer, coolers insulate enzymes and other biologicals from periodic temperature fluctuations due to door openings, defrost cycles or temporary power outages of short duration. Choose from two models.

Auto-Defrost Cooling
• The LabCooler II Benchtop Cooler maintains enzymes at stable -20°C for up to two hours. Holds (24) 1.5 ml tubes and (96) 0.5 ml tubes.
• The LabCooler Lite Benchtop Cooler is smaller and more compact, maintains enzyme temperatures at -10°C or below for up to one hour outside the freezer. Holds up to (7) 1.5 ml tubes. Includes a clear interlocking top.

Roll-Out Drawers

<table>
<thead>
<tr>
<th>Roll-Out Drawers</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional Stainless Steel</td>
<td>6041</td>
</tr>
<tr>
<td>Factory Installed</td>
<td>6041-1</td>
</tr>
</tbody>
</table>

Costers

<table>
<thead>
<tr>
<th>Casters</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; Casters</td>
<td>6041</td>
</tr>
<tr>
<td>3&quot; Casters</td>
<td>6041-1</td>
</tr>
</tbody>
</table>

Drawer Dividers (Blood Bank Refrigerators and Plasma Freezers)
Stainless steel drawer dividers help manage inventory of bags and boxes.

<table>
<thead>
<tr>
<th>Drawer Dividers</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>6094</td>
</tr>
<tr>
<td>Customer Installed</td>
<td>6094-1</td>
</tr>
</tbody>
</table>

Temperature Recorders

<table>
<thead>
<tr>
<th>Temperature Recorders</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>31°C - 38°C</td>
<td>6100-7</td>
</tr>
<tr>
<td>-40°C to +4°C</td>
<td>6100-4</td>
</tr>
</tbody>
</table>

Thermo Scientific LabCooler Modules

<table>
<thead>
<tr>
<th>LabCooler Modules</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>LabCooler II</td>
<td>6744</td>
</tr>
<tr>
<td>LabCooler Lite</td>
<td>6745</td>
</tr>
</tbody>
</table>
NALGENE® and NUNC™ cryogenic storage
give you everything you need to safely storeprecious
specimens, organize freezer space and simplify sample
retrieval. NALGENE and NUNC combine to provide one-stop
shopping for the widest variety and highest quality of
externally and internally
threaded cryovials, storage
boxes, lab top coolers and controlled-rate freezing
containers. New NUNC Cryobank and Bank-IT™
cryovials are designed automated cryogenic storage.
For further information regarding these products
– visit www.nalgene.com

Accessories

Enzyme Storage Bin
Bins are supplied standard on Model FFEN-2320 Enzyme Freezer.
Additional bins are useful for storage and inventory management. Formed of high impact ABS plastic, off-white.
Labels not included.
Catalog No. 6736

Access Port
Additional port for probes, cables, leads or measuring instruments may be added to any cabinet. Port is 1” (25 mm) diameter for freezers and 2” (50 mm) for refrigerators. Location must be specified when ordering. Z” for refrigerators and freezers.

Catalog No. 6328

Digital Temperature Monitor
Simple, accurate and cost-effective, the digital temperature and power monitor provides both alarm/monitoring and digital temperature display in a single, self-contained unit. Standard features include high alarm, alarm mute and chirp, audio delay timer, remote alarm contacts (SPDT), NiCad battery backup, and low voltage AC power supply, 120V, AC.

- The monitor can be installed on or adjacent to any refrigerator or freezer
- Activates an audible and visual warning in case of power failure or overtemperature condition
- Choose from single probe digital models or multiple probe, microprocessor-based models
- Temperature range is -100°C to +25°C
- Probe size 1.25”L x 0.25” diameter (32 mm x 6 mm)

Digital Temperature Monitor Specifications

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Characteristics</th>
<th>-100°C</th>
<th>-50°C</th>
<th>0°C</th>
<th>5°C</th>
<th>10°C</th>
<th>15°C</th>
<th>20°C</th>
<th>25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Input channels</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temperature range</td>
<td>-100°C</td>
<td>4°C</td>
<td>0°C</td>
<td>5°C</td>
<td>10°C</td>
<td>15°C</td>
<td>20°C</td>
<td>25°C</td>
</tr>
<tr>
<td></td>
<td>Temperature alarm</td>
<td>high only</td>
<td>high and low</td>
<td>high and low</td>
<td>high and low</td>
<td>high and low</td>
<td>high and low</td>
<td>high and low</td>
<td>high and low</td>
</tr>
<tr>
<td></td>
<td>Visual alarm</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
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<tr>
<td></td>
<td>Output delay</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
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<tr>
<td></td>
<td>Power supply</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
</tr>
</tbody>
</table>

Enzyme Storage Bin
Bins are supplied standard on Model FFEN-2320 Enzyme Freezer.
Additional bins are useful for storage and inventory management. Formed of high impact ABS plastic, off-white.
Labels not included.
Catalog No. 6736

Interior Dimensions (nominal)
3.5”W (90 mm) x 3”H (76 mm) x 24”L (610 mm)

Exterior Dimensions (nominal)
4.4”W (112 mm) x 3.04”H (77 mm) x 25.25”L (641 mm)

Solid wood Catalog No. 6099

Wood frame Catalog No. 6924

Digital Temperature Monitor Specifications

<table>
<thead>
<tr>
<th>Catalog No.</th>
<th>Characteristics</th>
<th>-100°C</th>
<th>-50°C</th>
<th>0°C</th>
<th>5°C</th>
<th>10°C</th>
<th>15°C</th>
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<th>25°C</th>
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<tbody>
<tr>
<td></td>
<td>Input channels</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temperature range</td>
<td>-100°C</td>
<td>4°C</td>
<td>0°C</td>
<td>5°C</td>
<td>10°C</td>
<td>15°C</td>
<td>20°C</td>
<td>25°C</td>
</tr>
<tr>
<td></td>
<td>Temperature alarm</td>
<td>high only</td>
<td>high and low</td>
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<td>high and low</td>
<td>high and low</td>
<td>high and low</td>
<td>high and low</td>
<td>high and low</td>
</tr>
<tr>
<td></td>
<td>Visual alarm</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
<td>green = normal, red = deviation</td>
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<td>green = normal, red = deviation</td>
</tr>
<tr>
<td></td>
<td>Output delay</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
<td>n/a programmable, 0 – 30 minutes</td>
</tr>
<tr>
<td></td>
<td>Power supply</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
<td>120V, AC</td>
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</tr>
</tbody>
</table>
CFC-Free Refrigerants, Insulation and Packaging
All our refrigerators and freezers use CFC-free refrigerants, cabinet insulation and packaging.

Product Selection
This catalog is divided into sections according to general product application. Because most controllers allow adjustable setpoints, all temperatures are listed as design operating temperatures and typically represent the lowest or coldest temperature of a temperature range.

Electrical Information
Thermo Scientific Forma refrigerators and freezers are designed to meet UL, CUL, CE and TUV criteria for safety and performance. All connections must comply with local electrical codes.
- Selection charts for each standard model list voltage, rated amperage, recommended circuit breaker size, and NEMA (National Electrical Manufacturers’ Association, USA) electrical plug information
- Most refrigerators and freezers are supplied with line cord plugs (P) which require corresponding receptacles illustrated in the Line Cord Plug Reference chart to the right
- Site preparation requires availability of the proper receptacle; a dedicated circuit is recommended
- Special voltage selections may be available at extra cost and must be specified when ordering
- For questions regarding site preparation, installation and electrical connection, contact our sales representative

Certification of Calibration
Control, alarm and temperature recording systems are systematically calibrated at the factory for accurate performance. An optional Certificate of Calibration to an NIST (National Institute of Standards and Technology, formerly National Bureau of Standards) traceable instrument includes a Model Number and Serial Number Certificate (single point calibration). Multiple point calibration is also available. Calibration certificates must be requested when ordering; for details contact our sales representatives.

Validation Testing Program
Validation testing services in advance of shipment can accelerate in-house FDA Installation Qualification (IQ) and Operation Qualification (OQ) programs. Validation services include documentation and performance reports, compressor and sub-system component specifications, microprocessor flow diagrams, software specifications and more. For more details, contact our sales representatives.

Performance Data
For detailed performance information such as temperature recovery, power consumption and other model-specific operational characteristics, contact our sales representatives.

Ordering Information
Our sales representatives will assist in choosing the proper refrigerator or freezer for your application.
- Each model number is voltage specific. For clarity, please include the voltage of your selected refrigerator or freezer when ordering
- When ordering your refrigerator or freezer, please consider current or future accessory requirements such as temperature recorders, extra shelves and alarm/monitoring systems
- Many accessories are factory installed and must be specified when ordering

Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Models with this code P1 P2 P3 P4 P5 P6 P7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>110V, 220V, 230V, 230V, 440V, 480V, 500V</td>
</tr>
<tr>
<td>NEMA Plug</td>
<td>5-15P, 5-20P, 5-20P, 6-15P, 6-20P, 6-30P, European</td>
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</table>

Refrigerators and freezers supplied with line cord plugs (P) require corresponding receptacles illustrated in the Line Cord Plug Reference. Catalog selection charts list each standard model with voltage, rated amperage, recommended circuit breaker size and NEMA electrical plug information.