ULTRA-LOW TEMPERATURE FREEZERS

Now The Legendary Durability Of The New Brunswick Shaker Is Available For Your Storage Needs Too!
NBS -86°C Freezers

Entrust the Storage of Your Cultures to the Company You Trust Most for Their Growth
New Brunswick Scientific’s lab equipment is legendary for design innovation, quality construction and long-term durability. Our -86°C freezers are no exception. Already a leading freezer supplier in Europe, our ultra-low temperature freezers have a 20-year track record of proven performance and are now available worldwide.

Nine models in two ranges accommodate a variety of needs:

**Innova models** — utilize Vacuum Insulation Panel (VIP) technology to provide up to 30% more storage capacity, without increasing external dimensions.

**Premium models** — are high-quality, full-featured, yet provide a cost saving alternative by utilizing conventional polyurethane insulation.

More storage — same space. That’s the advantage of our Innova freezers, available in chest or upright styles. It’s room you won’t have to make room for.

We fit 10,400 more samples in this freezer without increasing its size. Magic? No...VIP technology. Details, pages 4 and 5.
ENERGY EFFICIENT

Tollesbury Technology reduces time compressor remains on by 40-50%. Provides quick temperature recovery after door opening, optimizes heat removal, lowers energy bills & extends compressor life. (Innova Models only)

Outer Door Seals flexible, low-temperature seals prevent cold air loss for lower energy bills and less maintenance

Quiet Powerful Fan reduces noise and maintenance

Multiple Compartments with insulated inner doors & lids protect samples and improve energy efficiency

SAMPLE SECURITY

Keyed Locks on Outer Doors & Lids prevent unauthorized access

User-Defined 4-Digit Password prevents unauthorized changes to alarm and temperature setpoints

Audible and Visual Alarms indicate high & low temperature conditions, power failure, low battery, blocked filter & fault condition

Lockable Plate over power & alarm switches prevent accidental shutdown

Automatic Restart with Non-Volatile Memory returns setpoints to user-programmed levels after power interrupt

Battery Backup maintains temperature settings and activates alarms during power outage

Optional CO₂ & LN₂ Backup Systems protect freezer contents

Remote Contacts provide connection to an external, user-supplied, security system

OTHER DESIGN ADVANTAGES

Innova Models increase storage by up to 30% over freezers of equal size

Top-Quality Stainless-Steel Interior prevents oxidation, scratches or rust; easily cleaned

Unique Automatic Reset protects the microprocessor controller from damage by electrical spikes

Two-Stage Cascade Refrigeration system uses industrial-grade, commercially-available, hermetically-sealed compressors

Internal Voltage Stabilizer evens out voltage fluctuations, maintaining stable power (60 Hz Innova models only excluding U101). External option on Premium and U101 models

Two Pass-Through Ports allow CO₂/LN₂ injection or addition of probes
Vacuum insulation is an advanced thermal insulation technology that significantly outperforms insulating materials such as closed-cell foams (urethane), foam beads or fiber blankets. These conventional technologies attempt to trap gases to reduce heat transfer. Vacuum insulation removes the gases within the insulating space, so the material is placed under a “vacuum.” With air molecules removed, heat transfer is greatly reduced. The result is:

- Thermal insulation performance that far exceeds traditional insulating materials
- Ultra-thin walls for up to 30% more room to store samples

There are other freezers that use Innova Vacuum Insulation Panel technology, but none use NANOGEL™. NANOGEL panels provide:

- The best thermal insulation of any traditional or VIP material on the market
- An environmentally friendly design, using biodegradable, CFC-free and HCFC-free materials
- A metal-coated polymer film barrier seal to maintain its vacuum. Competitive models are subject to accumulation of gases over time, resulting in a loss of vacuum level and therefore reduced thermal performance. Even under complete vacuum barrier failure, NANOGEL’s performance is two times better than foams.
INNOVA FREEZERS WITH VACUUM

UP TO 30% MORE STORAGE CAPACITY — SAME FOOTPRINT

NBS’ Innova freezers combine Vacuum Insulation Panel technology with our efficient cooling technology to provide the ultimate in space and power efficiency. These models offer up to 30% more storage capacity than traditionally insulated freezers, without increasing external dimensions. Plus, they come standard with NBS’ unique Tollesbury Technology to provide more rapid temperature recovery after door opening for better preserved samples and reduced power consumption.

INNOVA FREEZER ADVANTAGES

- **Greater Internal Storage Capacity** in the same footprint through use of Vacuum Insulation Panel technology
- **Faster Temperature Recovery** after door opening through patented Tollesbury Technology. Improves sample preservation, lowers energy consumption and lengthens compressor life
- **Inner Door Seals That Prevent Cold Air Loss** and eliminate need for a door heater, for lower energy bills and less maintenance
- **And Higher-Grade Seals** for outer door and cabinet; better-quality internal lids on chest models; and inner doors on uprights that lift off hinges without tools

KEEP YOUR SAMPLES SAFE, SECURE AND ACCESSIBLE ONLY BY YOU WITH MODEL U101 — A UNIQUE, PERSONAL-SIZED UPRIGHT FREEZER THAT FITS ON OR UNDER YOUR LAB BENCH.

CAPACITY & DIMENSIONS

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Catalog #</th>
<th>Electrical</th>
<th>Capacity</th>
<th>Max. Box Capacity</th>
<th>Dimensions (H x W x D)†</th>
<th>Shipping Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L Cubic Ft. 2” 3” 4”</td>
<td>External Internal</td>
<td></td>
</tr>
<tr>
<td>U101 Upright</td>
<td>U9420-0000</td>
<td>120 V, 60 Hz</td>
<td>101</td>
<td>3.6</td>
<td>60 36 24</td>
<td>32.7” x 35.4” x 22.3”</td>
</tr>
<tr>
<td></td>
<td>U9420-0001</td>
<td>230 V, 50 Hz</td>
<td></td>
<td></td>
<td>64 x 48 x 33 cm</td>
<td></td>
</tr>
<tr>
<td>U535 Upright</td>
<td>U9430-0000</td>
<td>120 V, 60 Hz</td>
<td>535</td>
<td>18.9</td>
<td>336 240 144</td>
<td>76.8” x 31.5” x 34.1”</td>
</tr>
<tr>
<td></td>
<td>U9430-0002</td>
<td>208/220 V, 60 Hz</td>
<td></td>
<td></td>
<td>195 x 80 x 86.7 cm</td>
<td>136.5 x 64 x 61.5 cm</td>
</tr>
<tr>
<td></td>
<td>U9430-0001</td>
<td>230 V, 50 Hz</td>
<td></td>
<td></td>
<td>136.5 x 64 x 61.5 cm</td>
<td></td>
</tr>
<tr>
<td>U725 Upright</td>
<td>U9440-0002</td>
<td>208/220 V, 60 Hz</td>
<td>725</td>
<td>25.6</td>
<td>504 360 216</td>
<td>76.8” x 40.4” x 34.1”</td>
</tr>
<tr>
<td></td>
<td>U9440-0001</td>
<td>230 V, 50 Hz</td>
<td></td>
<td></td>
<td>136.5 x 86.5 x 61.5 cm</td>
<td></td>
</tr>
<tr>
<td>C585 Chest</td>
<td>U9400-0000</td>
<td>120 V, 60 Hz</td>
<td>585</td>
<td>20.7</td>
<td>416 288 192</td>
<td>43” x 66.5” x 30.9”</td>
</tr>
<tr>
<td></td>
<td>U9400-0002</td>
<td>208/220 V, 60 Hz</td>
<td></td>
<td></td>
<td>109.2 x 169 x 78.5 cm</td>
<td>78 x 120 x 62.5 cm</td>
</tr>
<tr>
<td></td>
<td>U9400-0001</td>
<td>230 V, 50 Hz</td>
<td></td>
<td></td>
<td>78 x 156 x 62.5 cm</td>
<td></td>
</tr>
<tr>
<td>C760 Chest</td>
<td>U9410-0002</td>
<td>208/220 V, 60 Hz</td>
<td>760</td>
<td>26.9</td>
<td>572 396 264</td>
<td>43” x 80.7” x 30.9”</td>
</tr>
<tr>
<td></td>
<td>U9410-0001</td>
<td>230 V, 50 Hz</td>
<td></td>
<td></td>
<td>109.2 x 205 x 78.5 cm</td>
<td>78 x 156 x 62.5 cm</td>
</tr>
</tbody>
</table>

(†) To allow for handles and hinges, add 3.1” (8 cm) to width of upright freezers and 4.3” (11 cm) to the depth of chest freezers.

(*) All 50 Hz freezers are supplied with both U.K. and Schuko cordsets.
INNOVA FREEZER SPECIFICATIONS*

CONSTRUCTION
Insulation: VIP: Ultra-thin Vacuum Insulation Panels with NANOGEL™, encapsulated between a metallic polymer film barrier, bonded to foamed-in-place polyurethane foam; 3.15”, 80 mm thick
Exterior: 18 gauge steel, 1.2 mm thick. Powder coated, scratch and frez resistant
Interior: Top-quality, polished 304L stainless steel
Heated Air Vent: with plunger prevents vacuum formation
Air Filter: Front-mounted; Easily accessed by 1/4 turn screws
Access Ports: Two pass-through ports, 3/4”, 20 mm dia.
Casters & Feet: Heavy-duty lockable casters with adjustable leveling feet. Two rear rollers provided on Model U101

TEMPERATURE CONTROL SYSTEM
Range: Programmable, to -86°C, in 1°C increments, even at ambient temperature up to 32°C
Control: Microprocessor-controlled temperature and alarms with non-volatile memory
Display: Large, bright, digital LED characters, 1/2”, 1.3 cm high. Mounted for ergonomic viewing
Optional Remote Control: Factory-installed RS-485 port with optional CryoCommand™ software monitors/controls up to 30 freezers simultaneously
Battery Back-up: Activates alarms and displays temperature during power outages. Separate on-off switch provided for cleaning/servicing/thawing

REFRIGERATION
Cascade Refrigeration: Hermetically-sealed two-stage cascade system with capacity to cope in high-ambient conditions
Compressors: Low-noise, heavy-duty & commercially-available
Tollesbury Technology: Patented system reduces temperature recovery time after door opening, minimizing power consumption and optimizing compressor efficiency
Circulation: Requires just one fan for reduced power consumption and noise
Refrigerants: CFC-free and HCFC-free
Compressor Lubricants: Biodegradable and commercially-available, high-performance, synthetic polylester oil. Prevents “oil-logging”

SECURITY FEATURES
Unique 4-Digit Password: For temperature setpoint and alarms, prevents unauthorized changes
Lock and Key: for outer doors/lids. Barrel lock is removable
Lockable Security Plate: protects on-off switch and alarm on/off

MONITORING & ALARMS
S.M.A.R.T. Plus™ Diagnostic Software: Built into the control panel, provides fault codes to trace and solve system errors
Remote Alarm Contacts: Provide connection to external user-supplied alarm/monitoring system
Visual Alarms: High/low temperature, power out, system fail, battery low, filter clean and fault analysis. LED lamp for remote control operation
Audible Alarms: High/low temperature, power out and system fail

UPRIGHT MODEL FEATURES
Door Latch: Injection-molded fiber-reinforced handle with built-in removable lock. Powerful cam-action/reverse cam-action latch provides one-handed operation; pulls door firmly closed and pushes door open. Clicks to indicate proper closure
Compartments and Shelving: Three compartments with two adjustable-height, stainless-steel shelves. (Model U101: Two compartments, one fixed shelf.) Additional shelving available
Insulated Inner Doors: Latchable doors lift off stainless-steel hinges, without tools. Two on U101; three on U535 & U725
Cabinet & Door Seals: Cabinet and outer doors fitted with high-efficiency silicone seals. High-quality seals for inner doors also provided

FEATURES UNIQUE TO CHEST MODELS
Door Latch: Positive, single-handed cam action latch with lock
Insulated Sub-Lids: Two injection-molded lids on C585; three on C760

CERTIFICATIONS
CE Certified and UL Certified

(*) Specifications subject to change without notice
(◊) U.S. patent No. 6,449,980. U.K patent No. GB2370874.
### POWER FEATURES & ADVANTAGES

**Internal Voltage Stabilizer (60 Hz Innova Models excluding U101):** Evens out high and low voltage fluctuations and optimizes energy usage. Optional external unit available for Premiums and U101.

**Automatic Reset:** Protects the microprocessor controller from failure caused by power spikes.

**Automatic Restart with Non-Volatile Memory:** Returns alarms and setpoints to user-programmed levels after power interrupt.

**Programmed Restart:** Random startup, 1 - 1.5 minutes apart. Prevents power overload.

### PLUG CONFIGURATIONS

<table>
<thead>
<tr>
<th>Freezers with this Code</th>
<th>Have this Plug</th>
<th>Require this Receptacle</th>
<th>NEMA Plug</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td>5-15P</td>
<td>5-15</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td>5-20P</td>
<td>5-20</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>6-15P</td>
<td>6-15</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td>European (Schuko)</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td>UK Model</td>
<td></td>
</tr>
</tbody>
</table>

### INVENTORY RACKING CAPACITIES

<table>
<thead>
<tr>
<th>Model</th>
<th>Style</th>
<th>Brand</th>
<th>Cu. Ft.</th>
<th>Compartments per Freezer</th>
<th>Racks per Shelf</th>
<th>Racks per Freezer</th>
<th>Box Size*</th>
<th>Boxes per Rack</th>
<th>Boxes per Freezer</th>
<th>Boxes per Freezer**</th>
<th>Vials per Freezer*</th>
</tr>
</thead>
<tbody>
<tr>
<td>U101</td>
<td>Upright</td>
<td>Innova</td>
<td>3.6</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>2&quot; x 3&quot;</td>
<td>10</td>
<td>60</td>
<td>6,000</td>
<td>3,600</td>
</tr>
<tr>
<td>U535</td>
<td>Upright</td>
<td>Innova</td>
<td>18.9</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>2&quot; x 3&quot;</td>
<td>28</td>
<td>336</td>
<td>33,600</td>
<td>24,000</td>
</tr>
<tr>
<td>U725</td>
<td>Upright</td>
<td>Innova</td>
<td>25.6</td>
<td>3</td>
<td>6</td>
<td>18</td>
<td>2&quot; x 3&quot;</td>
<td>28</td>
<td>504</td>
<td>50,400</td>
<td>36,000</td>
</tr>
<tr>
<td>C585</td>
<td>Chest</td>
<td>Innova</td>
<td>20.7</td>
<td>NA</td>
<td>NA</td>
<td>32†</td>
<td>2&quot; x 3&quot;</td>
<td>13</td>
<td>416</td>
<td>41,600</td>
<td>28,800</td>
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<tr>
<td>C760</td>
<td>Chest</td>
<td>Innova</td>
<td>26.9</td>
<td>NA</td>
<td>NA</td>
<td>44†</td>
<td>2&quot; x 3&quot;</td>
<td>13</td>
<td>572</td>
<td>57,200</td>
<td>39,600</td>
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<td>U410</td>
<td>Upright</td>
<td>Premium</td>
<td>14.5</td>
<td>5</td>
<td>3</td>
<td>15</td>
<td>2&quot; x 3&quot;</td>
<td>16</td>
<td>240</td>
<td>24,000</td>
<td>18,000</td>
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<tr>
<td>U570</td>
<td>Upright</td>
<td>Premium</td>
<td>20.0</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>2&quot; x 3&quot;</td>
<td>16</td>
<td>400</td>
<td>40,000</td>
<td>30,000</td>
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<tr>
<td>C340</td>
<td>Chest</td>
<td>Premium</td>
<td>12.0</td>
<td>NA</td>
<td>NA</td>
<td>20†</td>
<td>2&quot; x 3&quot;</td>
<td>13</td>
<td>260</td>
<td>26,000</td>
<td>18,000</td>
</tr>
<tr>
<td>C660</td>
<td>Chest</td>
<td>Premium</td>
<td>23.3</td>
<td>NA</td>
<td>NA</td>
<td>40†</td>
<td>2&quot; x 3&quot;</td>
<td>13</td>
<td>520</td>
<td>52,000</td>
<td>36,000</td>
</tr>
</tbody>
</table>

(*) All models use single phase power. Amperage shown designates “running” amps.

(◊) 120 V freezers with this designation require a dedicated 20 Amp line to cover the amps drawn at start-up.

Power Consumption Data & Pull-Down Times are based on an empty freezer set to -80°C, ambient temperature 23°C, using a 240 V, 50 Hz power supply.
CO₂ & LN₂ CONTROLLER BACK-UP SYSTEM
Safely protect your samples

- Maintain temperature between -55°C and -70°C with Liquid CO₂, or down to -85°C with LN₂, subject to environmental conditions
- Coolant addition is pulsed to avoid excessive consumption
- Built-in safety device prevents pulsing while the door is open

DATA LOGGING and CONTROL
CryoCommand™ Software
Remotely log and control temperature and alarms in up to 30 NBS freezers from a single PC

- Easy-to-use screens let you individually change high and low temperature alarms and setpoints
- Alarm conditions are recorded and signalled by a flashing screen
- Package includes software and factory-installed RS-485 interface

Chart Recorder/Data Loggers
Continuously monitor and record temperature for up to 7 days

- Temperature range of +20°C to -90°C, ± 2%
- Front-mounted for easy access. Factory installation recommended
- Contact your sales representative for other options

AUTO-DIALERS
Auto-dialers can call a set of preprogrammed telephone numbers in the event of an alarm condition and connect right into the freezer’s remote alarm port

TEMPERATURE PROBES
Additional temperature probe for an external alarm system or for validation can be installed upon request

VALIDATION PACKAGES
Installation and operational qualifications are available. Ask your NBS sales rep for details

INVENTORY RACKING & SHELVES
Exclusively designed and manufactured for NBS freezers to maximize storage space

- Anodized aluminum racking is lightweight and durable
- Standard racks hold 2”, 3” or 4” boxes
- Custom racking solutions also available
- Waterproof boxes and wax-coated cardboard dividers provide a low-cost alternative to injection-molded boxes
- Supplemental stainless-steel shelves also available
All NBS freezers are covered by a FIVE-YEAR Limited Warranty:
Two years covering parts and labor — with THREE ADDITIONAL years covering parts. Additionally, VIP insulation panels are warranted for TWELVE YEARS. Customizable extended warranties and preventive maintenance plans can also be tailored to best suit your individual requirements. Outside of the U.S. and Europe, contact your local NBS sales representative for warranty details.

Every NBS freezer is also equipped with unique S.M.A.R.T. Plus™ diagnostic software to help quickly identify the cause of a fault or setpoint variance. Easily accessed through the front control panel, S.M.A.R.T., Systems Monitoring and Reporting Technology, can be used to identify and correct problems, often over the phone at no charge, with the aid of our trained service technicians. S.M.A.R.T. Plus not only eliminates unnecessary service calls, but provides advance diagnosis, so should an on-site repair become necessary, the service engineer arrives at your facility with the components needed to complete the repair.

Compressor and biodegradable gasses are commercially available, for ready replacement, anywhere in the world.

NBS freezers are backed by one of the largest service organizations, comprised of in-house technicians, field engineers, and factory-authorized service centers in your local area.