



New Brunswick Scientific
Where Quality and Innovation Have Become Tradition

NBS -86°C Freezers

Space Saving, Energy Efficient, Quiet Running and Dependable

PREMIUM RANGE FREEZERS

ADVANCED FEATURES AT A GREAT VALUE

Premium Freezers are the result of nearly two decades of design innovations, yielding an efficient refrigeration system proven to perform reliably year after year. Like Innova freezers, Premiums are high-quality, full-featured freezers, with the ability to safely preserve your samples over the long term. The distinction is that Premium Freezers use traditional urethane insulation to achieve and maintain ultra-low temperatures.



Premium freezers offer external dimensions nearly identical to the Innova models and are available in two upright and two chest style models. Shown clockwise starting from back left: U410, U570, C660, and C340.

CAPACITY & DIMENSIONS

Model No. Style	Catalog #	Electrical	Capacity		Max. Box Capacity			Dimensions (H x W x D)†		Shipping Wt.
			L	Cubic Ft.	2"	3"	4"	External	Internal	
U410 Upright	U9260-0000	120 V, 60 Hz	410	14.5	240	180	120	75.4" x 31.5" x 33.5"	49.8" x 21.7" x 22.6"	518 lbs 235 kg
	U9260-0002	208/220 V, 60 Hz						191.5 x 80 x 85.2 cm	126.5 x 55 x 57.5 cm	
	U9260-0001	230 V, 50 Hz*								
U570 Upright	U9270-0000	120 V, 60 Hz	570	20	400	300	200	75.8" x 40.4" x 33.5"	49.8" x 30.1" x 22.6"	584 lbs 265 kg
	U9270-0002	208/220 V, 60 Hz						192.5 x 102.5 x 85.2 cm	126.5 x 76.5 x 57.5 cm	
	U9270-0001	230 V, 50 Hz*								
C340 Chest	U9230-0000	120 V, 60 Hz	340	12	260	180	120	42.3" x 52.8" x 33.1"	30.0" x 30.0" x 23.2"	441 lbs 205 kg
	U9230-0001	230 V, 50 Hz*						107.5 x 134 x 84 cm	76 x 76 x 59 cm	
C660 Chest	U9250-0002	208/220 V, 60 Hz	660	23.3	520	360	240	42.3" x 80.7" x 33.1"	30.0" x 57.9" x 23.2"	617 lbs 280 kg
	U9250-0001	230 V, 50 Hz*						107.5 x 205 x 84 cm	76 x 147 x 59 cm	

(†) 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 cord sets.



Upright: Model U410



Upright: Model U570



Upright: Model U570

(As shown here, not to scale)

PREMIUM FREEZER SPECIFICATIONS*

CONSTRUCTION

Insulation: Polyurethane foam, 5.1", 130 mm thick
Exterior: 18 gauge steel, 1.2 mm thick. Powder coated, scratch and rust resistant
Interior: Top-quality, polished 304L stainless steel
Heated Air Vent with Spring-Assisted Plunger: clears ice build-up and prevents vacuum formation
Air Filter: Front-mounted; easy access by 1/4 turn screws
Access Ports: Two pass-through ports, 3/4", 20 mm dia.
Casters & Feet: Heavy-duty lockable casters

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 at eye level on uprights
Optional Remote Control: Factory-installed RS-485 port with optional CryoCommand™ software monitors/controllers 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 adequate capacity to cope in high-ambient conditions
Compressors: Low-noise, heavy-duty & commercially-available
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 polyolester 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: Molded 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: Five compartments with four adjustable-height, stainless-steel shelves. Additional shelving available
Inner Doors: Five insulated doors on U410 & U570. Stainless-steel hinges unscrew for defrosting/cleaning
Cabinet & Outer Door: Insulated and fitted with low-temperature seals on outer door

CHEST MODELS FEATURES

Door Latch: Positive, single-handed cam action latch with lock
Sub-Lids: Two insulated Fomex panels with stainless steel edging on C340; three on C660

CERTIFICATIONS

CE Certified and UL Certified

(*) Specifications subject to change without notice



Chest: Model C340



Chest: Model C660

ENERGY EFFICIENT

NBS Freezers Consume Less Power per Kilowatt-Hour than ultra-low temperature freezers of similar size, resulting in lower energy bills. How much can you save over the lifetime of your freezer? See page 9

Rapid Temperature Recovery After Door Opening offers enhanced sample stability

- 1 Outer Door Seals**
flexible, low-temperature seals prevent cold air loss for lower energy bills and less maintenance
- Inner Door Seals**
reduce cabinet temp. fluctuations and limit cold air loss, reducing recovery time and energy consumption. (Innova models)
- 2 Quiet Powerful Fan**
reduces noise and maintenance
- 3 Multiple Compartments**
with insulated inner doors & sub-lids protect samples and improve energy efficiency

SAMPLE SECURITY

- 4 Keyed Locks on Outer Doors & Lids**
prevent unauthorized access. Optional padlock adapter kit available for added security
- 5 User-Defined Password**
prevents unauthorized changes to alarm and temperature setpoints
- 5 Audible and Visual Alarms**
indicate high & low temperature conditions, power failure, low battery, blocked filter & fault condition
- 6 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

7 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

Two Pass-Through Ports
allow CO₂/LN₂ injection or addition of probes

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

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

Internal Voltage Stabilizer
evens out voltage fluctuations to protect your freezer and maintain stable power. (Innova 60 Hz models only, excluding U101 & U360. Slide-in stabilizer optional on U360. External option on U101 and Premium models)

CONVENIENCE

- 9 **Flush, Front-Mounted Control Panel** is easy to read and reach
- 10 **Easy-to-Open Door** provides one-handed operation; cam latch ensures secure door closure
- 11 **Heated Vent with Spring-Assisted Plunger to Break Icing** prevents vacuum formation, allowing door to be re-opened quickly. (On Premium models, located at top of unit)
- Low Noise & Low Heat Output** allow freezer to be placed directly in the lab
- New Innova Inner Door System with Molded Grip and Ice-Proof Latch** provides improved accessibility
- 12 **Easy Mobility** all models fit through standard doors and elevators and include heavy-duty casters. (Compact U101 provided with rear rollers)
- Remote Control & Data Logging** using optional CryoCommand™ software with RS-485 interface controls up to 30 freezers. (Not available for Innova U360)
- 13 **Optional Data Loggers**, from chart recorders to independent temp. monitoring systems, simplify validation. (Innova U360 includes built-in, automated data logging & storage capability for up to 30 days of data)
- 14 **Optional Inventory Racking** is available to optimize your storage space
- 15 **Front-Mounted, Washable Filter** easily accessed without tools
- 16 **Stainless-Steel Shelves** provided in all uprights. Adjustable height, high quality
- 17 **Inner Doors Easily Lift Off Without Tools** for defrosting & cleaning. (Door hinges in Premium models unscrew)

FLUSH, FRONT-MOUNTED MICROPROCESSOR CONTROL PANEL

- Ergonomically located
- Easy to read and operate
- Membrane keypad is easily cleaned

The diagram shows a rectangular control panel with a red LED display showing '88.88 °C'. Below the display are three indicator lights labeled 'REMOTE CONTROL', 'FILTER CLEAN', and 'BATTERY LOW'. To the right is a numeric keypad (0-9) and function keys (E, C, SET TEMP, LOW ALARM, HIGH ALARM, LOCK, CODE CHANGE, ALARM TEST/MUTE). Below the keypad are three more indicator lights labeled 'TEMP ALARM', 'POWER FAIL', and 'FAULT'. The panel is labeled 'NEW BRUNSWICK SCIENTIFIC' at the bottom left.

- Remote Control Indicator**
Illuminates when control is via RS-485 port and CryoCommand software
- Filter Clean Indicator**
Lights when filter needs cleaning to prevent overheating the compressor
- Bright Red LED Display**
Displays temperature, alarm setpoints, and fault codes
- Setpoint Keypad**
Allows quick setpoint entry
- Programming Keys**
Used to program password, setpoints and alarms
- Alarm Test / Mute**
Allows testing of audible and visual alarms. "Mute" silences alarm for 30 min., allowing alarm condition to be corrected
- Battery Backup**
Continuously-charged system provides full alarm functions and displays, in case of power failure
Low Battery Indicator flashes when battery is low
- Fault Indicator***
Indicates a system failure
S.M.A.R.T. Plus™ self-diagnostic software identifies fault codes for quick diagnosis
- Power Failure Indicator***
Indicates loss of power. Light remains on, until reset, after power is restored
- High & Low Temperature Alarms***
Indicate temperature has exceeded user-defined setpoints

(*) Remote alarm contacts are provided to allow external alarm and auto-dialer systems to communicate with our freezers, where asterisk is shown.

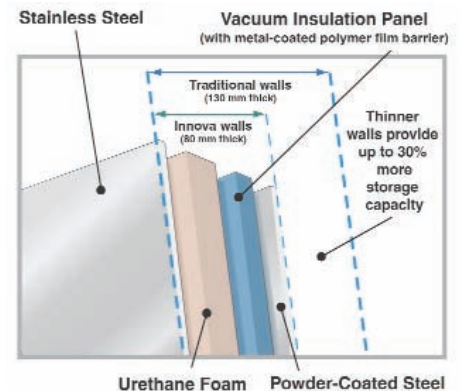
WHAT IS VACUUM INSULATION AND WHY IS IT ADVANTAGEOUS?

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 gasses to reduce heat transfer. Vacuum insulation removes the gasses 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 vacuum insulation panel technology, but none use Vacupor™ NT. Vacupor panels provide:

- The best thermal insulation of any traditional or vacuum insulation 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 gasses over time, resulting in a loss of vacuum level and therefore reduced thermal performance. Even under complete vacuum barrier failure, Vacupor outperforms foams. (Vacupor is a registered trademark of Porextherm GmbH.)



POWER CONSUMPTION - HOW MUCH CAN YOU SAVE?

POWER CONSUMPTION*

Brand	Model	Voltage	Amps	Plug Provided	Power Consump.		Pull-Down Time /Hrs.
					Watts	kWh/Day	
Innova	U101	120 V, 60 Hz 220/240 V, 50 Hz	13 5	A D/E	530	12.72	4.5
	U360	120 V, 60 Hz ◊ 230 V, 50 Hz	16.5 6.5	B D/E	487 491	11.7 11.8	5.6
	U535	120 V, 60 Hz ◊ 208/240 V, 60 Hz 220/240 V, 50 Hz	16.5 9 5	B C D/E	550 550 509	13.20 13.20 12.22	5.3
	U725	208/230 V, 60 Hz 220/240 V, 50 Hz	10 6.5	C D/E	685 660	16.44 15.84	5.2
	C585	120 V, 60 Hz ◊ 208/230 V, 60 Hz 220/240 V, 50 Hz	16.5 9 5.5	B C D/E	580 580 565	13.92 13.92 13.56	4.5
	C760	208/230 V, 60 Hz 220/240 V, 50 Hz	10 6	C D/E	698 665	16.75 15.96	5.8
Premium	U410	120 V, 60 Hz ◊ 208/230 V, 60 Hz 220/240 V, 50 Hz	16.5 8 5	B C D/E	540 540 525	12.96 12.96 12.60	4.1
	U570	120 V, 60 Hz ◊ 208/220 V, 60 Hz 230 V, 50 Hz	16.5 9 6	B C D/E	590 590 565	14.16 14.16 13.56	5.2
	C340	120 V, 60 Hz ◊ 220/240 V, 50 Hz	16.5 4.5	B D/E	430 420	10.32 10.08	3.4
	C660	208/230 V, 60 Hz 220/240 V, 50 Hz	8 6	C D/E	595	14.28	6.0

(*) 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 is based on an empty freezer set to -80°C, ambient temperature 20°C - 25°C. Test run over a 24 hr period at rated electrical supply.

Pull Down is based on an empty freezer at ambient temperature of 20 - 25°C.

POWER SAVINGS CALCULATOR (Over 10 Year Average Life span of Your Freezer)

Equation: kWh/Day x Local Cost kWh x 365 days x 10 years
Example: 20 cu. ft. Freezer, NBS vs. Competitor, in New York
NBS: 13.6 kWh/Day x 14.3¢/kWh x 365 x 10 = \$7,100
Competitor: 20.3 kWh/Day x 14.3¢/kWh x 365 x 10 = \$10,600
Savings: \$3,500 over 10 years. How much can you save?

POWER FEATURES, ADVANTAGES & PLUGS

Internal Voltage Stabilizer (60 Hz Innova Models excluding U101 & U360): Evens out high and low voltage fluctuations and optimizes energy usage. Optional external unit available for Premiums and Innova U101; slide-in stabilizer optional for Innova U360

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

Freezers with this Code	Have this Plug	Require this Receptacle	NEMA	Reference
			Plug	Receptacle
A			5-15P	5-15
B			5-20P	5-20
C			6-15P	6-15
I N T E R N A T I O N A L				
D			European (Schuko)	
E			UK Model	

RACKING CAPACITIES & CATALOG NUMBERS

Freezer Brand	Freezer Model	Cu. Ft.	Compartments Per Freezer	Racks Per Shelf	Racks Per Freezer	Box Size *	Boxes Per Rack	Boxes Per Freezer	Vials Per Freezer	Rack Catalog No.
Innova	U101	3.6	2	3	6	2" 3"	10 6	60 36	6,000 3,600	K0641-3003 K0641-3004
	U360	12.7	3	3	9	2" 3"	28 20	252 180	25,200 18,000	K0641-3000 K0641-3001
	U535	18.9	3	4	12	2" 3"	28 20	336 240	33,600 24,000	K0641-3000 K0641-3001
	U725	25.6	3	6	18	2" 3"	28 20	504 360	50,400 36,000	K0641-3000 K0641-3001
	C585	20.7	NA	NA	32 †	2" 3"	13 9	416 288	41,600 28,800	K0641-1690 K0641-1700
	C760	26.9	NA	NA	44 †	2" 3"	13 9	572 396	57,200 39,600	K0641-1690 K0641-1700
Premium	U410	14.5	5	3	15	2" 3"	16 12	240 180	24,000 18,000	K0641-1900 K0641-1890
	U570	20.0	5	5	25	2" 3"	28 20	400 300	40,000 30,000	K0641-1900 K0641-1890
	C340	12.0	NA	NA	20 †	2" 3"	16 12	260 180	26,000 18,000	K0641-1690 K0641-1700
	C660	23.3	NA	NA	40 †	2" 3"	13 9	520 360	52,000 36,000	K0641-1690 K0641-1700

(*) 4" Boxes also available. Ask your rep for details

(**) Based on a box capacity of 100 vials

(†) Half-height racking available

FREEZER ACCESSORIES

Everything you need to preserve the integrity of your samples.

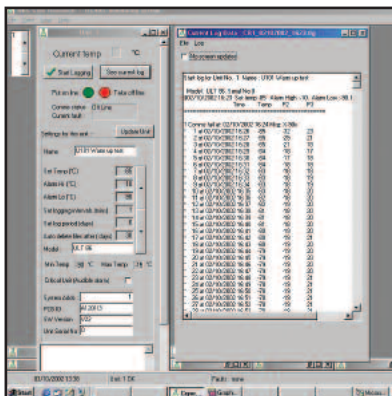


CO₂/LN₂ controller features selectable setpoint dial. LED lights to indicate when system is activated or valve open

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



NBS' CryoCommand software

CRYOCOMMAND™ SOFTWARE

Remotely log and control temperature and alarms in up to 30 NBS freezers from a single PC. (Not available on Innova U360)

- 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



7-day chart recorder

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



NBS manufactures a variety of racking systems, boxes and dividers to maximize storage space

VOLTAGE STABILIZER

Modulates incoming line voltage.

- Internal slide-in stabilizer available for U360 120 V units
- External stabilizer available for Premium and U101 models

PADLOCK ADAPTER KIT

Allows up to two user-supplied padlocks to be secured to outer door handle for extra security

WARRANTY & AFTER SALES SUPPORT

All NBS freezers are covered by a FIVE-YEAR Limited Warranty:

Two years covering parts and labor — with THREE ADDITIONAL years covering parts. Additionally, Innova vacuum insulation panels are warranted for TWELVE YEARS. **Freezer accessories**, such as chart recorders or back up systems, carry a one-year warranty on parts and labor. **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 also conform to European WEEE Directives affecting disposal.

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.



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