Ultra-Low Temperature Freezers

Space Saving, Energy Efficient, Quiet Running and Dependable

New Brunswick
an eppendorf company

NBS -86°C Freezers

Space Saving, Energy Efficient, Quiet Running and Dependable

New Brunswick Scientific's lab equipment is legendary for design innovation, quality construction and long-term durability. Our -86°C freezers are no exception. Energy efficient, quiet running and dependable, they're offered in over ten models and three product ranges to accommodate a variety of needs; and are stocked for ready delivery:

Innova® Freezers — use Vacuum Insulation Panel technology to provide up to 30% more storage capacity than traditionally-insulated freezers — without increasing external dimensions.

Premium Freezers — are high quality and full-featured, using conventional polyurethane insulation to provide a cost-saving alternative.

For labs short on space, we offer an ultra-slender model, Innova U360. Use of ultra-efficient vacuum insulation panel technology enables the U360 to hold 25,200 samples, yet measure under 27" (67 cm) wide, including the handle. It features our advanced new controller with extra-large display and built-in data logging and graphing capability.

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.

Energy Efficient

NBS Freezers Consume Less Power per Kilowatt-Hour
than ultra-low temperature freezers of similar size, resulting in lower energy bills.

Rapid Temperature Recovery After Door Opening

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 Back-Up
maintains temperature settings and activates alarms during power outage

Optional CO_2 & LN_2 Back-Up 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 CO_2/LN_2 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
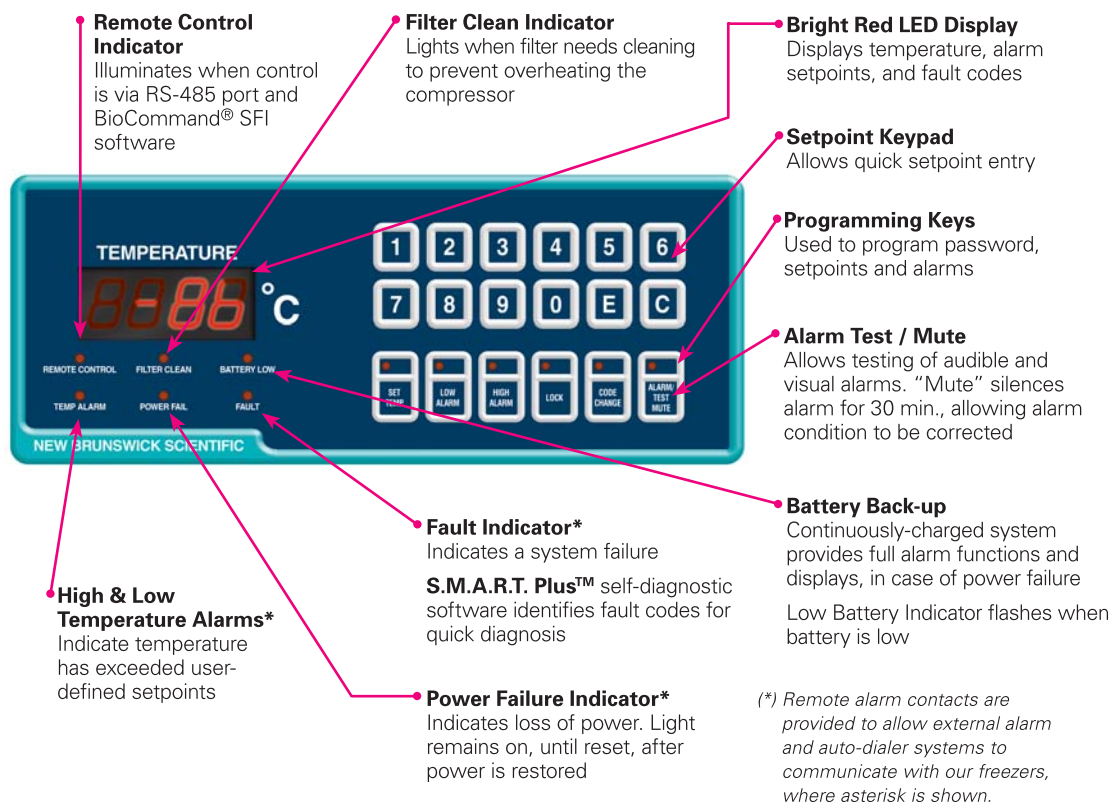
Internal Voltage Stabilizer
evens out voltage fluctuations to protect your freezer and maintain stable power. (Innova 60 Hz models only, excluding U101 & U360. Slide-in stabilizer optional on U360. External option on U101 and Premium models)

Flush, Front-Mounted Microprocessor Control Panel
• Ergonomically located   • Easy to read and operate   • Membrane keypad is easily cleaned

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 Data Logging using optional software with RS-485 interface allows data capture from multiple freezers using a single PC

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)

Remote Control Indicator Illuminates when control is via RS-485 port and BioCommand® SFI 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

High & Low Temperature Alarms* Indicate temperature has exceeded user-defined setpoints

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

Battery Back-up Continuously-charged system provides full alarm functions and displays, in case of power failure

Low Battery Indicator flashes when battery is low

(*) Remote alarm contacts are provided to allow external alarm and auto-dialer systems to communicate with our freezers, where asterisk is shown.
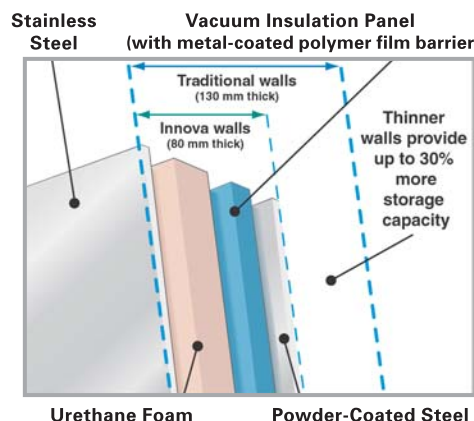
Vacuum insulation is an advanced thermal insulation technology that significantly outperforms insulating materials such as closed-cell foams (urethane), foam beads or fiber blankets. These conventional technologies attempt to trap gasses to reduce heat transfer. Vacuum insulation removes the gasses within 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.)

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.

Innova Freezer Advantages

• **Greater Internal Storage Capacity** in the same footprint through use of Vacuum Insulation Panel technology

• **Inner Door Seals Prevent Cold Air Loss** and eliminate need for a door heater, resulting in lower energy bills and less maintenance

• **Higher-Grade Seals** for outer door and cabinet; and better-quality internal lids on chest models

• **Heated Air Vent with Plunger** quickly clears any ice build-up and prevents vacuum formation for easy opening throughout the day

• **Inner Doors Lift Off Hinges Without Tools** to simplify removal for cleaning

• **Leveling Feet** provide stability on uneven floors

• **Two Unique Upright Models for Cramped Labs.** Space-saving Innova U101 fits on or under the bench (as shown at right), or can be stacked two high. Innova U360 is an ultra-slender model with advanced new controller and sophisticated display (shown under the flap at right)

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, or can be stacked two high.

Capacity & Dimensions

Model No. Style	VWR Catalog No.	Electrical	Capacity		Max. Box Capacity			Dimensions (H x W x D)†		Shipping Weight
			L	Cu. Ft.	2"	3"	4"	External	Internal	
U101 Upright	97048-896	120 V, 60 Hz	101	3.6	60	36	24	32.7" x 35.4" x 22.3" 83 x 90 x 56.6 cm	25.2" x 18.9" x 13" 64 x 48 x 33 cm	256 lbs 116 kg
U360 Upright	97048-898	120 V, 60 Hz	360	12.7	252	180	108	76.8" x 26.4" x 34.1" 195 x 60 x 86.7 cm	53.7" x 17.3" x 24.2" 136.5 x 44.0 x 61.5 cm	595 lbs 270 kg
U535 Upright	97048-900 97048-902	120 V, 60 Hz 208/240 V, 60 Hz	535	18.9	336	240	144	76.8" x 31.5" x 34.1" 195 x 80 x 86.7 cm	53.7" x 25.2" x 24.2" 136.5 x 64 x 61.5 cm	551 lbs 250 kg
U725 Upright	97048-904	208/230 V, 60 Hz	725	25.6	504	360	216	76.8" x 40.4" x 34.1" 195 x 102.5 x 86.7 cm	53.7" x 34.1" x 24.2" 136.5 x 86.5 x 61.5 cm	694 lbs 315 kg
C585 Chest	97048-906 97048-908	120 V, 60 Hz 208/230 V, 60 Hz	585	20.7	416	288	192	43" x 66.5" x 30.9" 109.2 x 169 x 78.5 cm	30.7" x 47.2" x 24.6" 78 x 120 x 62.5 cm	529 lbs 240 kg
C760 Chest	97048-910	208/230 V, 60 Hz	760	26.9	572	396	264	43" x 80.7" x 30.9" 109.2 x 205 x 78.5 cm	30.7" x 61.4" x 24.6" 78 x 156 x 62.5 cm	628 lbs 285 kg

(†) 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.

Upright: Model U101 (Models not shown to scale)

Chest: Model C585

Chest: Model C760

Advanced Design, Sophisticated Control & Automated Data Logging

Designed for labs tight on space, the ultra-slender U360 is the first in the Innova line to feature our advanced new controller with extra-large display, data logging and graphing capability. The U360 offers all the quality construction and system advantages as our original Innova models, plus the following:

Large character display provides immediate review of important parameters "at a glance" from a distance. Intuitive menu system and directional arrows provide simple access and control of all parameters.

Multiple sensors and Up To 30 days of data storage provide a graphic record of all system temperatures and activity, including door openings

Innova U360 Advantages

Extra-Large Innova Display

On-Screen System Messaging: displays setpoints, and details of alarms, door openings and operating conditions with time-date stamp

Automated Data Logging: temperature, alarms and door opening data are stored for up to 30 days, for on-screen graphing. Downloadable to PC with optional communication ports, for your strictest validation requirements

Bright, Easily Read, Backlit LCD: is located at eye level. Display screen measures 4.75″ x 2.7″ (12 x 6.8 cm)

On-screen messaging with time-date stamp identifies and logs current and past system status and events

Superior User Controls

Total System Security & Control: are ensured through use of multiple sensors, and flexible programming of alarms, user ID & passwords

Alarm Log: identifies door open, power failure, electric fault, and sensor failures for cabinet and ambient temp. and air-cooled and cascade condensers

Flexible alarm programming helps avoid false temperature alarms and allows greater user flexibility in alarm control

Significantly Reduced Noise Levels

Quiet Operation: achieved through an advanced compressor housing with noise-reducing insulation, enabling placement of the freezer directly in your work area
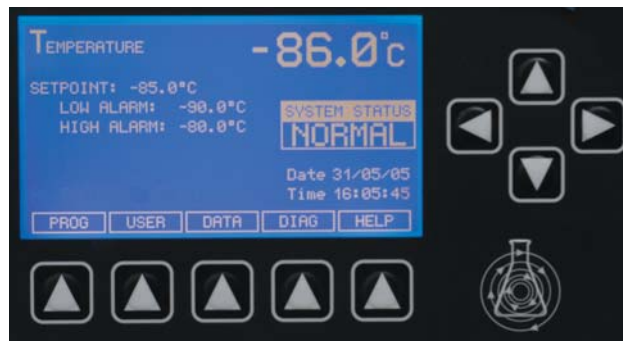
Large Capacity, Small Footprint
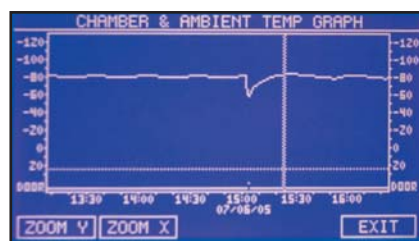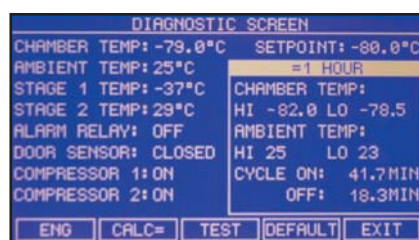
360 liters (12.7 cubic feet): Holds up to 252 2" boxes
Narrow Design: Only 26.4" (67 cm) wide, with the handle

User ID and password, programmable for up to eight users, provide multiple levels of security and control, including alarm acknowledgement log by user

Co$_2$ & LN$_2$ Controller Back-Up System

	Freezer model	Catalog No.
Innova	CO$_2$	97048-924
	LN$_2$	97048-928

Sophisticated diagnostics allow system engineers to diagnose most issues over the phone, saving you time and money

Innova Freezer Specifications*

Construction

Insulation: Ultra-thin Vacuum Insulation Panels with Vacupor NT™, 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 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; Easily accessed by quarter turn screws
Access Ports: Two pass-through ports, 3/4", 20 mm diameter
Casters & Feet: Heavy-duty, lockable casters with leveling feet. Model U101 provided with two rear wheels

Temperature Control System

Range: Programmable, to -86°C, in 1°C increments, even at ambient temperature up to 32°C
Control: Microprocessor-controlled temperature & alarms with non-volatile memory. Model U360: Advanced new user interface with extra large display, automated data logging, communications ports & more. Open flap at right for details
Display: Large, bright, digital LED characters, 1/2", 1.3 cm high. Mounted at eye level on uprights. Model U360: Extra-large, backlit LCD measuring 4.75" x 2.7" (12 x 6.8 cm), identifies alarms, door opening, temp., passwords and more. Open flap at right for details
Optional Remote Monitoring: Factory-installed RS-485 port with optional BioCommand® SFI software monitors multiple freezers simultaneously. (Not available on U360)
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
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"

 (*) Specifications subject to change without notice

Security Features

Unique 4-Digit Password: For temperature setpoint and alarms, prevents unauthorized changes. Model U360: Up to eight users can program alphanumeric names & passwords
Removable Keyed Lock: For outer door/lid. Padlock adapter kit optional
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 temp. condition, power out, system fail, battery low, filter clean and remote-controlled operation indicated via LED light; with fault codes displayed on screen. Model U360: Readout of alarm septoints and status, including door open alarms, are displayed on screen with time-date stamp. User-programmable, password protected, with alarm acknowledgements logged by user. Lift flap at right for details
Audible Alarms: High/low temperature, power out & system fail, with battery back-up. Model U360 adds a door-open alarm

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: Three compartments with two adjustable-height, stainless-steel shelves. Additional shelving available. Model U101: Two compartments, one fixed shelf
Inner Doors: Three insulated & gasketed with high-quality seals. New one-piece molded design with push-pull latch eliminates icing issues. Lightweight doors lift off stainless-steel hinges without tools. (Two inner doors on U101)
Cabinet & Outer Door: Insulated, and provided with high-efficiency silicone seals on outer door

Chest Models Features

Lid Latch: Positive, single-handed cam-action latch with lock
Sub-Lids: Two injection-molded, insulated lids on C585; three on C760

Certifications

CE and UL Certified

Upright: Model U360   *Upright: Model U535*   *Upright: Model U725*

Sliding Drawer Racks

Freezer model		Rack Catalog No. by Box Size			Total Racks per Freezer	Boxes Per Rack	Total # boxes per Freezer	Samples per Freezer
		2" (50 mm)	3" (75 mm)	4" (100 mm)				
Innova	U101	97049-502			6	10	60	6,000
			97049-504			6	36	3,600
				97049-506		4	24	2,400
	U360	97049-496			9	28	252	25,200
			97049-498			20	180	18,000
				97049-500		12	108	10,800
	U535	97049-496			12	28	336	33,600
			97049-498			20	240	24,000
				97049-500		12	144	14,400
	U725	97049-496			18	28	504	50,400
			97049-498			20	360	36,000
				97049-500		12	216	21,600
	C585	97048-948			32	13	416	41,600
			97048-950			9	288	28,800
				97048-952		6	192	19,200
	C760	97048-948			44	13	572	57,200
			97048-950			9	396	39,600
				97048-952		6	264	26,400

Racking Capacity Chart for Upright & Chest Freezers

Style	Model	Max. Racks Per Shelf	Max No. of Shelves	Max. Racks Per Freezer
Upright	U101 Innova	3	2	6
	U360 Innova	3	3	9
	U535 Innova	4	3	12
	U725 Innova	6	3	18
Chest	C585 Innova	N/A	N/A	32
	C760 Innova	N/A	N/A	44

External Rack Dimensions (H x W x D)

Style	Model	Inches	mm
Upright	U101 Innova	11.52 x 12.13 X 5.55	308 x 141 x 292.5
	U360, U535 & U725	16.16 x 22.24 x 5.55	565 x 141 x 410.5
Chest	All Models	29.61 x 5.47 x 5.47	136 x 139 x 752

Boxes and Dividers

Description	VWR Catalog No.
Freezer Box 2"	97048-954
Freezer Box 3"	97048-956
Freezer Box 4"	97048-958
Freezer Divider, 10 x 10	97048-960
Freezer Divider, 9 x 9	97048-966
Freezer Divider, 8x 8	97048-964
Freezer Divider, 7 x 7	97048-962

PREMIUM RANGE FREEZERS

Advanced Features at a Great Value

Premium Freezers are the result of over 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 No.	Electrical	Capacity		Max. Box Capacity			Dimensions (H x W x D)†		Shipping Weight
			L	Cu. Ft.	2"	3"	4"	External	Internal	
U410 Upright	97048-912 97048-914	120 V, 60 Hz 208/230 V, 60 Hz	410	14.5	240	180	120	75.4" x 31.5" x 33.5" 191.5 x 80 x 85.2 cm	49.8" x 21.7" x 22.6" 126.5 x 55 x 57.5 cm	518 lbs 235 kg
U570 Upright	97048-916 97048-918	120 V, 60 Hz 208/220 V, 60 Hz	570	20	400	300	200	75.8" x 40.4" x 33.5" 192.5 x 102.5 x 85.2 cm	49.8" x 30.1" x 22.6" 126.5 x 76.5 x 57.5 cm	584 lbs 265 kg
C340 Chest	97048-920	120 V, 60 Hz	340	12	260	180	120	42.3" x 52.8" x 33.1" 107.5 x 134 x 84 cm	30.0" x 30.0" x 23.2" 76 x 76 x 59 cm	441 lbs 205 kg
C660 Chest	97048-922	208/230 V, 60 Hz	660	23.3	520	360	240	42.3" x 80.7" x 33.1" 107.5 x 205 x 84 cm	30.0"x 57.9"x 23.2" 76 x 147 x 59 cm	617 lbs 280 kg

(†) 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.
(*) Specifications subject to change without notice

Premium Freezer Advantages

Low Temperature Silicone Door Seals: Silicone door seals remain flexible at -86°C eliminating need for door seal heaters

Heated Air Vent with Plunger: Quickly clears any ice build-up and prevents vacuum formation for easy opening throughout the day

Stainless Steel Interior: Like the Innova, Premium models are also constructed from 304L stainless steel which are corrosion proof and simple to clean

Leveling Feet: Provide stability on uneven floors

Cam-latch Door Handle: Specially designed, locking door handle provides easy one-handed access and security through a key lock

Single Cooling Fan: Efficient cascade cooling system requires only one cooling fan reducing noise and energy consumption

Locking Power Switch Plate: Lockable power switch plate prevents unwanted users from accidentally disabling the freezer

Environmentally Friendly Refrigerants: Only CFC free and HCFC free refrigerants are used

Upright: Model U410 (Models not shown to scale) *Upright: Model U570* *Upright: Model U570*
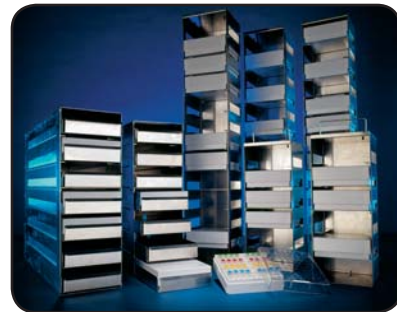
Sliding Drawer Racks

Freezer model	Rack Catalog No. by Box Size			Total Racks per Freezer	Boxes Per Rack	Total # boxes per Freezer	Samples per Freezer
	2" (50 mm)	3" (75 mm)	4" (100 mm)				
Premium U410	97049-490			15	16	240	24,000
		97049-492			12	180	18,000
			97049-494		8	120	12,000
U570	97049-490			25	16	400	40,000
		97049-492			12	300	30,000
			97049-494		8	200	20,000
C340	97048-948			20	13	260	26,000
		97048-950			9	180	18,000
			97048-952		6	120	12,000
C660	97048-948			40	13	520	52,000
		97048-950			9	360	36,000
			97048-952		6	240	24,000

Racking Capacity Chart for Upright & Chest Freezers

Style	Model	Max. Racks Per Shelf	Max No. of Shelves	Max. Racks Per Freezer
Upright	**U410 Premium**	3	5	15
	U570 Premium	5	5	25
Chest	**C340 Premium**	N/A	N/A	20
	C660 Premium	N/A	N/A	40

External Rack Dimensions (H x W x D)

Style	Model	Inches
Upright	**U410 & U570 Premium**	9.25" x 22.24" x 5.55" 565 x 141 x 235 mm
Chest	**All Models**	29.61" x 5.47" x 5.47" 136 x 139 x 752

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

Co$_2$ & LN$_2$ Controller Back-Up System

	Model	Catalog No.
Premium	CO$_2$	97048-926
	LN$_2$	97048-930

CO$_2$/LN$_2$ controller features selectable setpoint dial. LED lights to indicate when system is activated or valve open

Chest: Model C340

Chest: Model C660

9

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 quarter 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 Monitoring: Factory-installed RS-485 port with optional BioCommand® SFI software monitors multiple 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 and UL Certified

(*) Specifications subject to change without notice

Energy Savings!

NBS offers the most energy-efficient freezers in the industry, reducing power consumption by thousands of kilowatt hours over our competition. Net effect:

- An average savings of 45% in yearly operating costs
- Approximately $4,000 savings over the life of the freezer
- 28-ton reduction of CO_2 emissions on average, over the life of the freezer.

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

Power Consumption*

Brand	Model	Voltage	Amps	Plug Provided	Power Consumption		Pull-Down Time / Hrs.
					Watts	kWh/Day	
Innova	U101	120 V, 60 Hz	13	A	265	6.3	3.5
	U360	120 V, 60 Hz ◊	16.5	B	487	11.6	5
	U535	120 V, 60 Hz / 208/240 V, 60 Hz	16.5 / 9	B / C	550	13.2	5.3
	U725	208/230 V, 60 Hz	10	C	685	16.4	5.2
	C585	120 V, 60 Hz / 208/230 V, 60 Hz	16.5 / 9	B / C	580 / 580	13.9 / 13.9	4.3 / 4.3
	C760	208/230 V, 60 Hz	10	C	698	16.7	5.8
Premium	U410	120 V, 60 Hz ◊ / 208/230 V, 60 Hz	16.5 / 8	B / C	540 / 540	12.9 / 12.9	4.1 / 4.1
	U570	120 V, 60 Hz ◊ / 208/220 V, 60 Hz	16.5 / 9	B / C	590 / 590	14.1 / 14.1	5.3 / 5.3
	C340	120 V, 60 Hz ◊	16.5	B	430	10.3	3.4
	C660	208/230 V, 60 Hz	8	C	625	15	6

(*) 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.

Less Power Consumption, Smaller Carbon Footprint and Thousands of Dollars in Savings

Freezer Brand	Freezer Model	Cu. Ft.	kWh/Day NBS	kWh/Day Competitor	kWh/Day Savings with NBS Freezer	Average US kWh Cost	NBS Energy Savings Over 10 Years	NBS Reduction in CO_2 Emissions over 10 Years*
Innova	U101	3.6	6.3	19.8	13.5		$4,928	38.2 tons
	U360	12.7	11.6	23.9	12.3		4,490	34.8 tons
	U535	18.9	13.2	26.3	13.1		4,782	37.1 tons
	U725	25.6	16.4	25.0	8.6		3,139	24.3 tons
	C585	20.7	13.9	27.5	13.6	$0.10	4,964	38.5 tons
	C760	26.9	16.7	30.0	13.3		4,855	37.6 tons
Premium	U410	14.5	12.9	23.8	10.9		3,979	30.8 tons
	U570	20.0	14.1	24.0	9.9		3,614	28.0 tons
	C340	12.0	10.3	24.0	13.7		5,001	38.8 tons
	C660	23.3	15.0	24.0	9.0		3,285	25.5 tons
	Average		13.0	24.8	11.8		4,303	33.4 tons**

(*) Based on 1.55lbs CO_2/kWh   (**) CO_2 reduction of 33.4 tons is equivalent to planting 143 trees!

CO_2/LN_2 controller features selectable setpoint dial. LED lights to indicate when system is activated or valve open

7-day chart recorder

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

NBS Accsense Monitoring System

CO_2 & LN_2 Controller Back-Up System

Safely protects your samples
- Maintain temperature between -55°C and -70°C with Liquid CO_2, or down to -85°C with LN_2, subject to environmental conditions
- Coolant addition is pulsed to avoid excessive consumption
- Built-in safety device prevents pulsing while the door is open

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

Validation Packages

Installation and operational qualifications are available. Contact your VWR Catalyst at 888-793-2300 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

Voltage Stabilizer

Modulates incoming line voltage
- Internal slide-in stabilizer available for U360 120 V units (VWR Catalog No. 97054-152)
- External stabilizer available for Premium and U101 models
  – 120 V (VWR Catalog No. 97054-154)
  – 220 V (VWR Catalog No. 97054-156)

Padlock Adapter Kit

Allows up to two user-supplied padlocks to be secured to outer door handle for extra security (VWR Catalog No. 97054-158)

Accsense Monitoring System

Real time independent monitoring system with web access for your -86°C ULT freezer (VWR Catalog No. 97054-150)
- Receive email and voicemail alarms if the temperature exceeds desired levels
- View temperature data readings, graphs and statistics from any web browser
- Installation in 5 minutes on any freezer regardless of manufacturer

Boxes and Dividers

Description	VWR Catalog No.
Freezer Box 2"	97048-954
Freezer Box 3"	97048-956
Freezer Box 4"	97048-958
Freezer Divider, 10 x 10	97048-960
Freezer Divider, 9 x 9	97048-966
Freezer Divider, 8x 8	97048-964
Freezer Divider, 7 x 7	97048-962

Chart Recorder

Description	VWR Catalog No.
Chart recorder with Reverse Scale Charts, Temperature Sensor	97048-932
Chart recorder paper, pack of 100 charts, for 97048-932	97048-934
Chart recorder pens, 3, for 97048-932	97048-936

Freezer Extra Shelves

Description	VWR Catalog No.
Extra Shelf for Model U570	97048-938
Extra Shelf for Model U410	97048-940
Extra Shelf for Model U535	97048-942
Extra Shelf for Model U725	97048-944
Extra Shelf for Model U360	97048-946

Spare Part Air Filters

Description	VWR Catalog No.
Air Filter, Model U101, replacement	97048-968
Air Filter, Models U535, U725, U410 & U570, replacement	97048-970
Air Filter, Models C585, C760, C340 & C660, replacement	97048-972
Air Filter, Model C360, replacement	97048-974

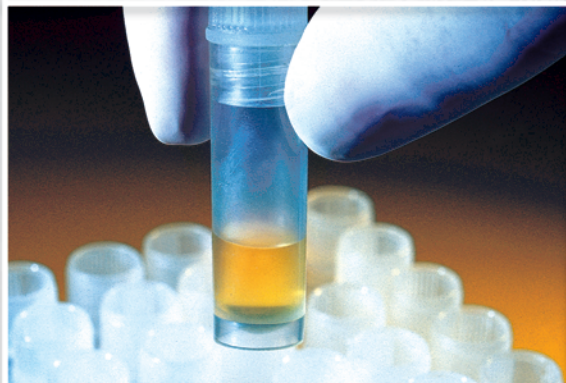## Warranty & After Sales Support

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 warranteed 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.

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.

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