

NOR-LAKE® SCIENTIFIC

HUMIDITY AND TEMPERATURE STABILITY TEST CHAMBERS

SOLID DOOR

Designed to meet the demanding requirements for scientific and laboratory research. Advanced engineered design incorporates the latest in cabinet, refrigeration, temperature control and monitoring features. Provides energy efficient, convenient, safe and reliable performance for optimal storage temperature environments necessary for a wide range of life science, pharmacy, biological, medical, clinical, and industrial applications.

Standard Features:

- Digital 132 x 64 LED display
- Programmable logic (PLC) microprocessor temperature controller
- Audible and visual Hi/Lo temperature alarm
- Adjustable temperature and humidity control range: +4°C to +70°C
- Humidity transmitter (0-10 VDC)
- Temperature transmitter (0-10 VDC) (selectable to air temperature)
- RS-485 digital communications port (MODBUS-RTU)
- Programmable ramp and soak
- Remote alarm contacts
- Continuous product temperature display
- 3 sensor system, 1 product, 1 air, 1 coil temperature
- Sensor access port 1" diameter
- Power supply breaker and convenience power switch located on facade
- Door ajar alarm, audible and visual
- Password protection – set-points and factory settings
- 100 event alarm logging date/time stamp
- Integrated Hi/Lo product temperature alarm test
- Digital calibration air and product
- Real time clock with date and time display
- Adjustable alarm beep or constant on (key pad selectable)
- Alarm volume adjustable manually
- Low battery test switch with buzzer
- Perimeter anti-condensate door frame (temperature selectable heater wire)
- Sensor failure alarm
- Power failure alarm
- Exterior cabinet front, sides and back are powder coated
- Exterior cabinet top and bottom are galvanized steel
- Interior cabinet liner is stainless steel
- Cabinet is foamed-in-place with CFC free high density polyurethane foam insulation
- Solid doors(s), full size
- Heavy duty door pivot hinges
- Pull door handles, full length
- Magnetic door gaskets
- Centered key door lock(s) (2 keys)
- Four casters on one and two door models (2 locking), Six casters (3 locking) on three door models
- 3 coated wire shelves per door section
- Interior drain with plug
- Top mounted forced air refrigeration system
- Condensate evaporation
- LED lighting
- Warranties: 18 month parts and labor, 5 year compressor (US and Canada), 18 months parts (International)
- UL, C-UL listed (60Hz models only)

Optional Features:

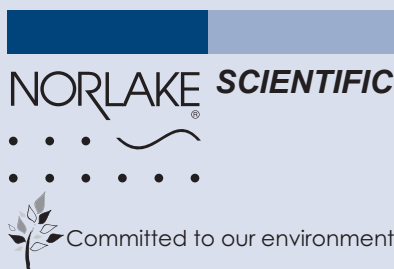
- Recirculating water system
- Extra shelf
- Legs 6" in lieu of casters
- Reverse hinge door(s)
- Stainless steel exterior
- Stainless steel drawer (max 8 per door)
- Wire basket drawer (max 8 per door)
- Temperature chart recorder with chart paper (1 or 2 pen)
- 4-20ma output for product temperature (selectable to air temperature)
- Ethernet 10 baseT (HTTP control monitoring web card)
- Secure Guard II™ Lock ProxKey (Factory Installed)
- Secure Guard II™ MagKey (Factory Installed)
- Secure Guard II™ Lock Software
- Seismic mounting kit
- Electrical duplex outlet
- Access port 2" with sleeve and cover
- Export crating



NSRI241WSW/_H



NSRI241WSW/_H NSRI331WSW/_H NSRI522WSW/_H NSRI803WSW/_H



Nor-Lake, Inc.
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CONTROL SYSTEM: A fully programmable logic microprocessor with non-volatile memory provides a user interface through a liquid crystal alphanumeric display. All set points are adjustable by one multi-function interface key pad. The standard control includes: Fully programmable ramp soak functions, product and air temperature Centigrade scale, alarm / temperature logging, system mode indicator heating / cooling, high / low audible / visual alarms, real time clock, power failure alarm, sensor failure alarms, service prompts and user password entry system. The modular system includes expansion slots on the control board for the ability to add options at a later date.

CONDITIONING SYSTEM: Precision control provided by the uniform distribution of air through a ceiling plenum. The plenum delivers conditioned air evenly through out the chamber providing maximum uniformity and efficiency. A heavy duty refrigeration system provides rapid removal of heat caused by door openings or product load. The system accurately delivers cooling based on demand and modulates the system to provide precision control. The system utilizes environmentally safe non-toxic CFC free refrigerant, with air-cooled, hermetically sealed compressor backed by a 5 year warranty. The system includes an expansion valve system to optimize capacity and efficiency. Heating is provided by a proportionally controlled fin strip heater. Complete cabinet is UL and C-UL listed (60Hz models only).

CONSTRUCTION: Heavy duty double wall construction. Exterior cabinet front, sides and back are coated with scratch resistant powder coating. Interior cabinet liner is stainless steel. Complete cabinet and door are insulated and sealed with 100% UL Class 1 rigid polyurethane foam insulation. The foamed-in-place insulation provides low heat transfer, improved cabinet performance and prohibits moisture from migrating into the cabinet walls. Hardware includes: Heavy duty self closing door hinges, full length powder coated pull handle, full peripheral high temperature door gasket providing a tight seal. Key lock door and 2" casters for ease of rolling. Complete perimeter anti-condensate door heater wire thermostatically controlled for energy savings.

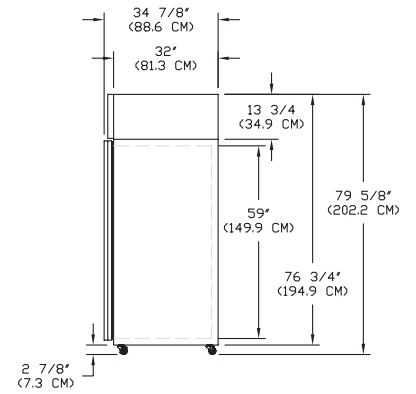
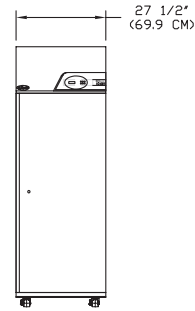
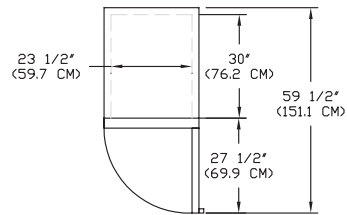
SPECIFICATIONS

Models	NSRI241WSW/0H	NSRI331WSW/0H	NSRI522WSW/0H	NSRI803WSW/0H
	NSRI241WSW/4H	NSRI331WSW/4H	NSRI522WSW/4H	NSRI803WSW/4H
	NSRI241WSW/5H	NSRI331WSW/5H	NSRI522WSW/5H	NSRI803WSW/5H
Crated Weight (lbs) (kg)	380 (172)	473 (199)	611 (275)	830 (377)
Crated Height (in) (cm)	83 (212)	91 (233)	83 (212)	83 (212)
Crated Width (in) (cm)	31 (79)	36-1/4 (89)	59 (149)	86-1/2 (218)
Crated Depth (in) (cm)	38-7/8 (96)	39-7/8 (99)	38-7/8 (96)	38-7/8 (96)
Interior Height (in) (cm)	59 (149)	67 (170)	59 (149)	59 (149)
Interior Width (in) (cm)	23-1/2 (59)	27-3/4 (70)	51 (129)	78-1/2 (199)
Interior Depth (in) (cm)	30 (76)	31 (78)	30 (76)	30 (76)
Overall Height (in) (cm)	79-5/8 (204)	87-5/8 (224)	79-5/8 (204)	79-5/8 (204)
Overall Width (in) (cm)	27-1/2 (69)	31-3/4 (80)	55 (139)	82-1/2 (209)
Overall Depth (in) (cm)	34-7/8 (88)	35-7/8 (91)	34-7/8 (88)	34-7/8 (88)
Gross Cubage (CuFt) (L)	24.1 (684)	33.1 (940)	51.9 (1473)	79.9 (2269)
Shelf Area (SqFt) (Sqm)	12.83 (0.36)	15.85 (0.4)	28.58 (0.8)	42.88 (1.2)
Number of Shelves	3	3	6	9
Number of Casters	4	4	4	6
Condensing Unit Size	1/3 HP	1/3 HP	1/3 HP	1/3 HP
Refrigerant	R-134a	R-134a	R-134a	R-134a
Total Amp Draw /0	14.7	14.7	14.7	14.7
Total Amp Draw /4	7.5	7.5	7.5	7.5
Total Amp Draw /5	7.5	7.5	7.5	7.5

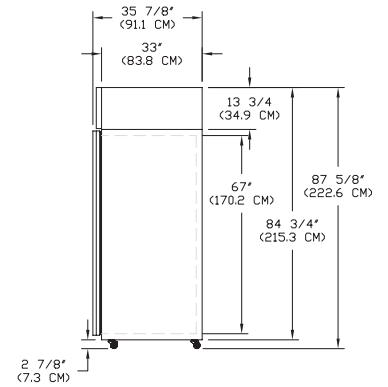
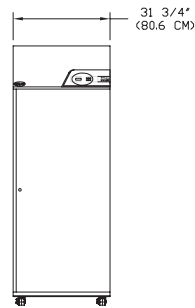
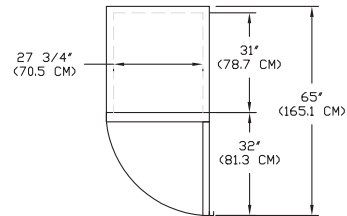
Voltage Model Suffix Code	Voltage Description	NEMA Plug	NEMA Receptacle
/0	115V, 1PH, 60HZ	5-20P	5-20R
/4	208-230V, 1PH, 60HZ	6-15P	6-15R
/5	230V, 1PH, 50HZ	Power Inlet (IEC 60320) Module	Cord Supplied Locally



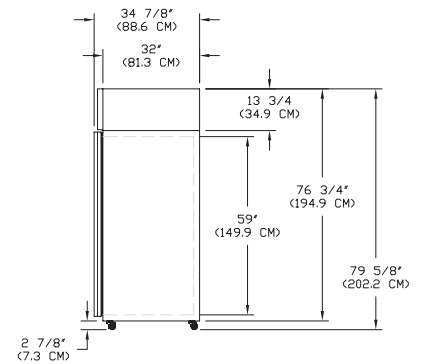
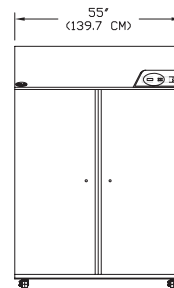
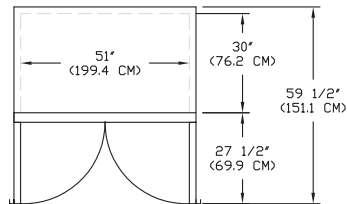
NSRI241WSW/_H



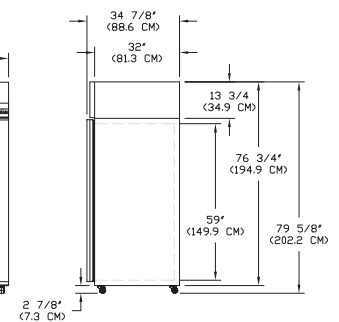
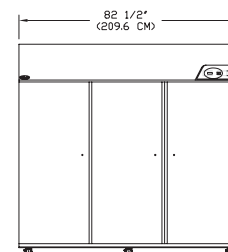
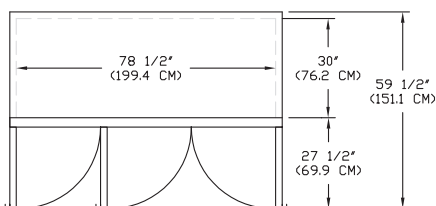
NSRI331WSW/_H



NSRI522WSW/_H



NSRI803WSW/_H



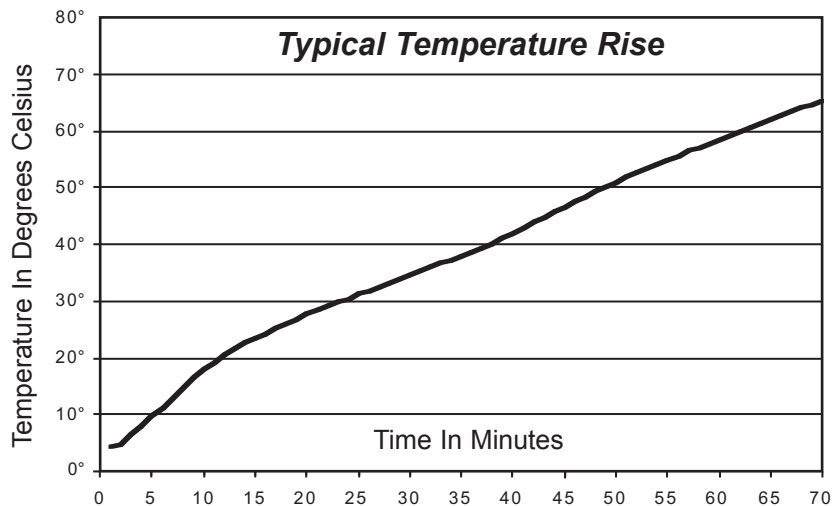
Performance:

Temperature Variation: $\pm 0.5^{\circ}\text{C}$ @ $+4^{\circ}\text{C}$ to $+70^{\circ}\text{C}$. The published temperature variation is derived from the maximum deviation of the thermocouple located nearest the chamber geometric center during the entire test period. (i.e. $+25.0^{\circ}\text{C}$ min and $+26.0^{\circ}\text{C}$ max divided by two would be a variation of $\pm 0.5^{\circ}\text{C}$).

Temperature Uniformity:

$\pm 1^{\circ}\text{C}$ @ $+4^{\circ}\text{C}$ to $+70^{\circ}\text{C}$. The published temperature uniformity is derived from the maximum deviation of 9 thermocouples are placed on 3 horizontal planes, each plane having the thermocouples evenly spaced diagonally across the shelf from the left and right inner wall, and the middle sensor placed in the approximate geometric center of the shelf.

Humidity Variation: $\pm 3\%$ @ $+10^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ (humidity controlled range) and RH within performance graph. Humidity variation is derived from the maximum deviation of the humidity sensor during the test period.

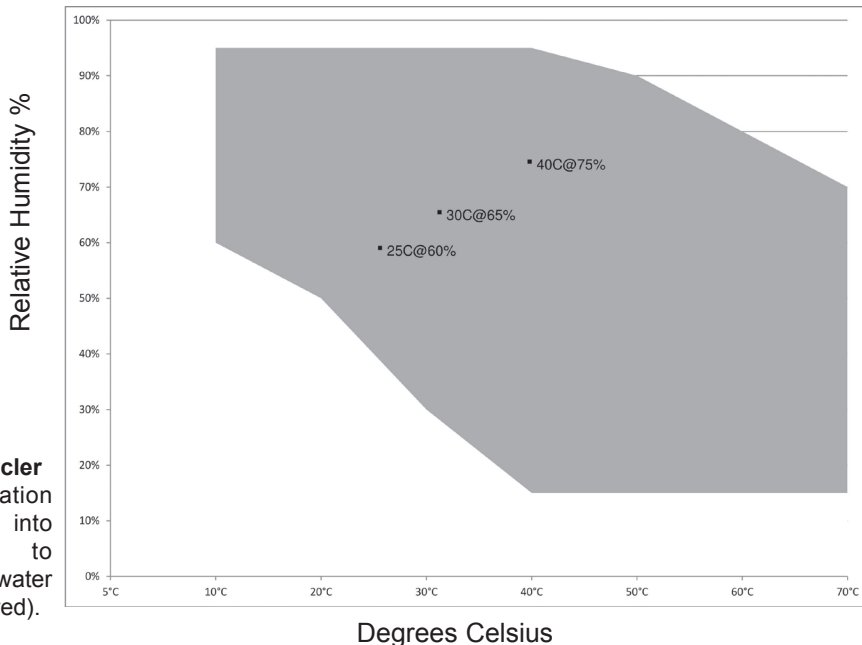


Performance data is based on solid door cabinet at $+23^{\circ}\text{C}$, 50% RH ambient conditions, type T-24 Ga. thermocouples with 1.0 oz. brass slugs attached and no product in the chamber. Data may vary if; ambient conditions change, product load is added, or other changes cause interference to chamber airflow.

Humidification / Dehumidification:

Relative humidity is induced by a highly efficient ultrasonic and low maintenance reservoir. Dehumidification is achieved by the use of a separate dehumidification latent coil. Both systems are precisely controlled by the programmable logic microprocessor controller. The humidity controller utilizes a dry capacitance type sensor for rapid response to humidity changes with exceptional accuracy. The humidifier requires a water source with low mineral content; i.e., resistance of 0.05 - 1.0 megohm and a pressure of 10 - 60 psi. Reverse osmosis treated water is recommended. The water supply connection requires 1/4" plastic or copper tubing.

Typical Temperature / Humidity Operation



Specifications subject to change without notice.



Optional Feature: Water Recycler
Water recirculation purification system converts tap water into purified water. Connects to chamber and recycles used water continuously. (Installation required).



NSRI522WSW/_H



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