TSX Series High-Performance Refrigerators and Freezers

A better environment inside and out

NEW Models and Features for 2018

SUPPLYLΛB
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Thermo Fisher
S C I E N T I F I C

Lab and clinical-grade storage that adapts to you and your environment

Temperature variation can have an impact on the viability and efficacy of vaccines, medication, reagents and other temperature-sensitive materials. These variations can shorten product shelf life, degrade enzymes and reduce vaccine effectiveness. Therefore, it is important to choose a high-performance refrigerator or freezer that has been designed for the demanding standards of the laboratory and clinical environment.

The sustainable compliant choice

Thermo Scientific™ TSX Series high-performance refrigerators and freezers are designed with features that support sample protection, sustainability objectives and the EU F-gas regulations. Our V-drive technology is designed to provide temperature uniformity that continually adapts to the lab or clinical environment, offering significant energy savings without compromising protection.
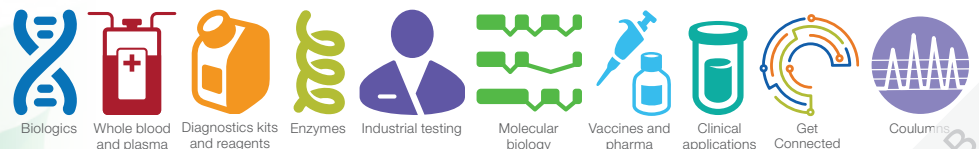
Whisper quiet operation

Compared to conventional refrigerant, high-performance models[†], the TSX Series offers a whisper quiet operation, so you can bring the refrigerator or freezer out of the hallway and back into your lab without disrupting your audio environment.

Significant energy savings

While conventional refrigerant, high-performance refrigerators and freezers can run at very high kWh/day in energy usage, the TSX Series by comparison has been designed to reduce energy usage without compromising performance.

Application-specific models

Our laboratory refrigerators feature your choice of glass or solid door with adjustable shelves. Freezers come in a choice of auto defrost –30°C or manual defrost –20°C setpoint. For blood banking applications, our plasma freezers are FDA Class I certified blood bank refrigerators are FDA Class II. Our pharmacy refrigerators feature convenient, adjustable basket drawers. And for enzyme storage, our –20°C freezers feature enzyme bins for convenient storage.

| Biologics | Whole blood and plasma | Diagnostics kits and reagents | Enzymes | Industrial testing | Molecular biology | Vaccines and pharma | Clinical applications | Get Connected | Coulumns |

The drive for sample integrity and energy savings

The performance and energy savings of the new TSX Series are driven by our unique **V-drive technology**.

- While conventional, high-performance refrigerators and freezers use single speed compressors that continually cycle on and off, the TSX Series V-drive runs at variable speeds to adjust cooling performance to the conditions inside and outside of the refrigerator or freezer.

- When combined with the automated tuning control, this variable speed drive optimizes the compressors running speed to the current conditions.

- When there are frequent door openings, or samples are added to the refrigerator or freezer, the control system detects the activity and increases the drive speed to bring temperatures back to the set point quickly. This innovative technology is one of the reasons the TSX Series delivers outstanding door opening recovery (DOR) speed, and more peace of mind for busy laboratories.

- When conditions are stable, such as when the unit is running overnight or on weekends, the drive runs at a low speed, reducing energy consumption while maintaining a stable temperature for your samples.
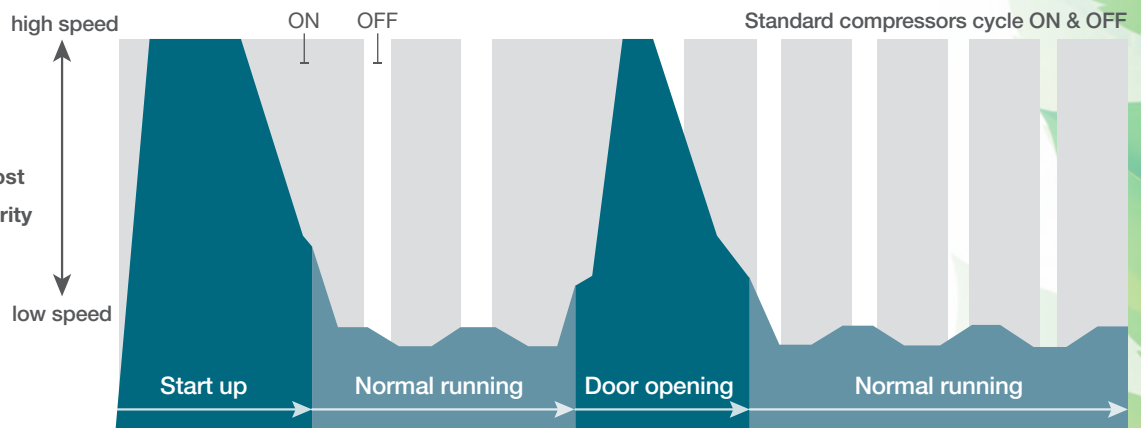
V-drive

Low energy → **Low operating cost**

Adaptive control → **Sample security**

Adaptive control

Adapting to your refrigerator or freezer usage patterns, the TSX V-drive increases compressor speed to quickly restore temperature after door openings.

high speed / low speed

ON   OFF   Standard compressors cycle ON & OFF

Start up | Normal running | Door opening | Normal running

Variable speed compressors (V-Drive) change speed. As shown in the above graphic, the TSX V-drive, unlike standard compressors that cycle on and off, adjusts to factors such as start-up and door openings, when a higher compressor speed is needed. During normal running time when the door is closed, the V-drive runs at a lower speed to maintain your setpoint.

Easy-to-access controls with setpoint security

Setpoint security
Key-operated triple position switch for main power and alarm; locks in temperature and alarm setpoints to minimize setpoint error and prevent tampering

Graphic thermometer
Easy to view, shows normal, high or low temperature condition; steady green for normal, flashing top bar for overtemperature, flashing bulb for undertemperature

Power failure
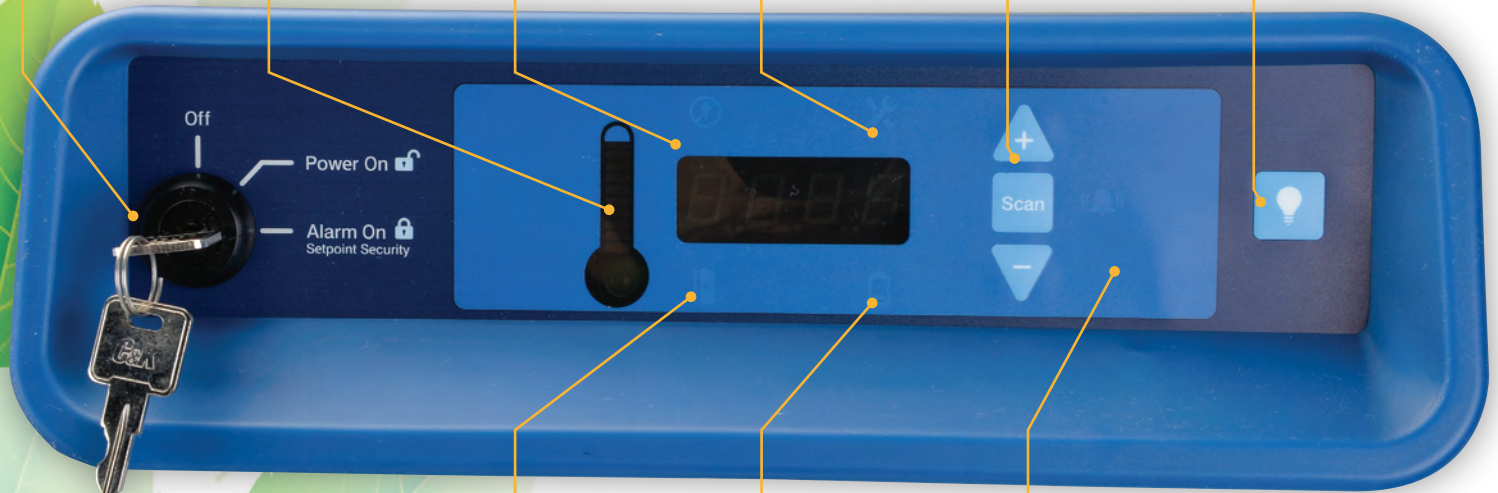Illuminated when main power is interrupted

Service mode
Illuminated when controller is in service programming mode

Touchpad data entry
Increases or decreases setpoint values in programming modes

Interior light switch
Enables interior lighting system (on glass door cabinets)

Automatic defrost system
Defrost sensor manages automatic defrost cycle (except manual defrost models)

Door ajar
Illuminated when door is left open

Battery backup
Continuous charge provide full alarm function in case of power failure

Low battery alarm
Illuminated when the alarm system battery backup charge is low

Audible alarm
Simulates in the event of warm, cold or power loss conditions. Mute will silence audible alarm with 6 minute ring back interval; display remains flashing

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DLH ready
for connectivity

TSX models are all compatible with DeviceLink Hub enabling you to have a connected experience with your unit so you know always—and anywhere—the safety of your samples and the performance of your refrigerator or freezer.

A sound environment for critical samples

up to 10X quieter

You know that the constant noise created by compressors can compromise communications and create a less than ideal working environment. The new TSX Series is **up to 10X quieter than our previous generation of refrigerators and freezers.*** Our new V-drive technology, combined with superior insulation, limits the sound output of the TSX Series to just **52 dB**, approximately the sound generated by a conventional refrigerator.**

Decibel scale of common sounds. Examples of noise levels in decibels

Noise source	Decibel level
Freeway traffic 15M, vacuum cleaner	70
Conversation in restaurant, office, background music	60
TSX Series (auto-defrost models)	**52**
TSX Series (manual defrost models)	**50**
Library	40
Quiet rural area	30
Rustling leaves	20
Breathing	10

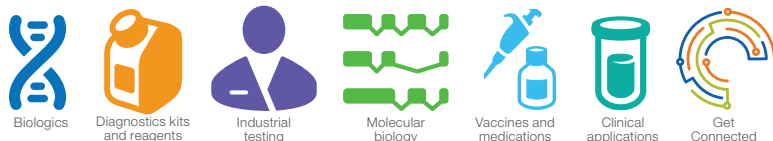* Thermo Scientific TSX2304GA compared to Thermo Scientific high-performance 2304A model (non TSX).

** Data on file. October, 2016.

Designed for ergonomic usage

In addition to the significant reduction in sound, the TSX Series features an ergonomically designed door handle featuring soft touch grip and the microprocessor controller is angled to help prevent neck strain.

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TSX Series High-Performance BioMedical Lab Refrigerators

Biologics | Diagnostics kits and reagents | Industrial testing | Molecular biology | Vaccines and medications | Clinical applications | Get Connected

Available in glass or solid door, our high-performance refrigerators combine advanced temperature control with high-quality cabinet construction and alarm systems. Positive, forced-air circulation is designed to maintain temperature uniformity to protect important medical and pharmaceutical-products as well as laboratory media, reagents and more.

- Forced-air circulation for temperature uniformity at all shelf levels
- Heat-free defrost for maximum temperature uniformity
- Quiet operation at just 52 dBA
- GMP Clean Room Class A / ISO 6 (ISO EN 14644-1) compatible with appropriate pre-install preparation
- Four 2" casters for easy mobility; the front two are lockable
- Bright, LED interior lighting
- Keyed on/off switch with easy to use, setpoint security
- Self-closing door with 90° stop to assist with inventory loads
- Glass door versions are standard with triple pane glass door
- See pages 14–19 for options and accessories

TSX Series high-performance lab refrigerators

Model no.	Temp. range (setpoint)	Capacity cu. ft. (liters)	Electrical (plug)	Doors	Shelves	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2305GA			115V, 60Hz (NEMA 5-15)				UL, cUL			450 (204)
TSX2305GD	3–7°C (5°C)	23 (650)	208-230V, 60Hz (NEMA 6-15)	1 glass	4	auto	UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37.8 x 28 x 78.5 (96 x 71.1 x 199.4)	429 (195)
TSX2305GV			230V, 50Hz (European)				UL, cUL, CE			429 (195)
TSX2305SA			115V, 60Hz (NEMA 5-15)				UL, cUL			426 (193)
TSX2305SD	3–7°C (5°C)	23 (650)	208-230V, 60Hz (NEMA 6-15)	1 solid	4	auto	UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37.8 x 28 x 78.5 (96 x 71.1 x 199.4)	405 (186)
TSX2305SV			230V, 50Hz (European)				UL, cUL, CE			405 (186)
TSX4505GA			115V, 60Hz (NEMA 5-15)				UL, cUL			611 (277)
TSX4505GD	3–7°C (5°C)	45.8 (1297)	208-230V, 60Hz (NEMA 6-15)	Double Sliding Glass	8	auto	UL, cUL	26 x 52.5 x 58 (66 x 133.4 x 147.3)	36.6 x 56.5 x 78.5 (93.1 x 143.5 x 199.4)	611 (277)
TSX4505GV			230V, 50Hz (European)				UL, cUL, CE			611 (277)
TSX5005SA			115V, 60Hz (NEMA 5-15)				UL, cUL			621 (282)
TSX5005SD	3–7°C (5°C)	51 (1447)	208-230V, 60Hz (NEMA 6-15)	2 solid	8	auto	UL, cUL	28.5 x 52.5 x 58 (72.4 x 133.4 x 147.3)	37.8 x 56.5 x 78.5 (96 x 143.5 x 199.4)	621 (282)
TSX5005SV			230V, 50Hz (European)				UL, cUL, CE			621 (282)
TSX5005GA			115V, 60Hz (NEMA 5-15)				UL, cUL			669 (303)
TSX5005GD	3–7°C (5°C)	51 (1447)	208-230V, 60Hz (NEMA 6-15)	2 Glass	8	auto	UL, cUL	28.5 x 52.5 x 58 (72.4 x 133.4 x 147.3)	37.8 x 56.5 x 78.5 (96 x 143.5 x 199.4)	669 (303)
TSX5005GV			230V, 50Hz (European)				UL, cUL, CE			

TSX Series High Performance Chromatography Refrigerators

Vaccines and medications | Clinical applications | Diagnostics kits and reagents | Get Connected | Coulumns

Our TSX high-performance 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. The TSX Chromatography series features industry-leading safety features to ensure maximum protection.

- Forced-air circulation for temperature uniformity at all shelf levels
- Heat-free defrost for maximum temperature uniformity
- Quiet operation at just 52 dBA
- Two 2" (5 cm) side wall access ports with insulated hinged covers
- GMP Clean Room Class A / ISO 6 (ISO EN 14644-1) compatible with appropriate pre-install preparation
- Four 2" casters for easy mobility; the front two are lockable
- Bright, LED interior lighting
- Keyed on/off switch with easy to use, set-point security
- Self-closing door with 90° stop to assist with inventory loads
- Triple pane glass doors standard on all models
- Safety switch protected internal electrical outlet on all models (Duplex outlet on A and D models, single outlet on V models)
- See pages 14–19 for options and accessories

TSX Series high-performance lab refrigerators

Model no.	Temp. range (setpoint)	Capacity cu. ft. (liters)	Electrical (plug)	Doors	Shelves	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2305CA			115V, 60Hz (NEMA 5-15)				UL, cUL			439 (199)
TSX2305CD	3-7°C (5°C)	23 (650)	208-230V, 60Hz (NEMA 6-15)	1 glass	0 Full 2 Half	auto	UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37.8 x 28 x 78.5 (96 x 71.1 x 199.4)	439 (199)
TSX2305CV			230V, 50Hz (European)				UL, cUL, CE			439 (199)
TSX5005CA			115V, 60Hz (NEMA 5-15)				UL, cUL			658 (298)
TSX5005CD	3–7°C (5°C)	51.1 (1447)	208-230V, 60Hz (NEMA 6-15)	2 glass	4 Full 2 Half	auto	UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37.8 x 56.5 x 78.5 (96 x 96 x 199.4)	658 (298)
TSX5005CV			230V, 50Hz (European)				UL, cUL, CE			658 (298)
TSX4505CA			115V, 60Hz (NEMA 5-15)				UL, cUL			600 (272)
TSX4505CD	3–7°C (5°C)	45.8 (1297)	208-230V, 60Hz (NEMA 6-15)	Double Sliding Glass	4 Full 2 Half	auto	UL, cUL	26 x 52.5 x 58 (66 x 133.4 x 147.3)	36.6 x 56.5 x 78.5 (93.1 x 143.5 x 199.4)	600 (272)
TSX4505CV			230V, 60Hz (European)				UL, cUL, CE			600 (272)

8

TSX Series High-Performance Blood Bank Refrigerators

Whole blood and plasma

Get Connected

Our high-performance blood bank refrigerators are designed to meet strict requirements established by the AABB for the storage of whole blood and blood components.

- Factory pre-set to 4°C to meet blood storage guidelines
- Triple pane glass door helps maintain optimal internal condition
- Forced-air circulation for temperature uniformity and fast temperature recovery
- Heat-free defrost for maximum temperature uniformity
- Convenient, stainless steel, fully extendable and adjustable drawers
- Standard, built-in chart recorder
- Quiet operation at just 52 dBA
- GMP Clean Room Class A / ISO 6 (ISO EN 14644-1) compatible with appropriate pre-install preparation
- Four 2" casters for easy mobility; the front two are lockable
- Bright, LED interior lighting
- Keyed on/off switch with easy to use, setpoint security
- Self-closing door with 90° stop to assist with inventory loads
- See pages 14–19 for options and accessories

TSX Series high-performance blood bank refrigerators

Model no.	Temp. range (setpoint)	Capacity cu. ft./liters (blood bags*)	Electrical (plug)	Doors	Drawers	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2304BA			115V, 60Hz (NEMA 5-15)				FDA, UL, cUL			575 (261)
TSX2304BD	3–7°C (4°C)	23/650 (385)	208-230V, 60Hz (NEMA 6-15)	1 glass	7	auto	FDA, UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37.8 x 28 x 78.5 (96 x 71.1 x 199.4)	554 (251)
TSX2304BV			230V, 50Hz (European)				FDA, UL, cUL, CE			554 (251)
TSX5004BA			115V, 60Hz (NEMA 5-15)				FDA, UL, cUL			865 (392)
TSX5004BD	3–7°C (4°C)	51/1447 (770)	208-230V, 60Hz (NEMA 6-15)	2 glass	14	auto	FDA, UL, cUL	28.5 x 52.5 x 58 (72.4 x 133.4 147.3)	37.8 x 56.5 x 78.5 (96 x 143.5 x 199.4)	865 (392)
TSX5004BV			230V, 50Hz (European)				FDA, UL, cUL, CE			

TSX Series High-Performance Pharmacy Refrigerators

Vaccines and medications

Clinical applications

Diagnostics kits and reagents

Get Connected

Our high-performance pharmacy refrigerators feature adjustable basket drawers and glass doors for the easy identification and access of vaccines, pharmaceuticals, chemotherapeutics and other material requiring 2 to 8°C storage.

- Triple panel glass door helps maintain optimal internal conditions
- Forced-air circulation for temperature uniformity and fast temperature recovery
- Heat-free defrost for maximum temperature uniformity
- Convenient, fully extendable and adjustable basket drawers
- Quiet operation at just 52 dBA
- GMP Clean Room Class A / ISO 6 (ISO EN 14644-1) compatible with appropriate pre-install preparation
- Four 2" casters for easy mobility; the front two are lockable
- Bright, LED interior lighting
- Keyed on/off switch with easy to use, setpoint security
- Self-closing door with 90° stop to assist with inventory loads
- NEW ergonomic handle with soft touch grip
- Built-in remote alarm contacts
- See pages 14–19 for options and accessories

TSX Series high-performance pharmacy refrigerators

Model no.	Temp. range (setpoint)	Capacity cu. ft. (liters)	Electrical (plug)	Doors	Basket drawers	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2305PA			115V, 60Hz (NEMA 5-15)				UL, cUL			531 (241)
TSX2305PD	3–7°C (5°C)	23 (650)	208-230V, 60Hz (NEMA 6-15)	1 glass	6	auto	UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37.8 x 28 x 78.5 (96.2 x 71.1 x 199.4)	510 (231)
TSX2305PV			230V, 50Hz (European)				UL, cUL, CE			510 (231)
TSX5005PA			115V, 60Hz (NEMA 5-15)				UL, cUL			830 (376)
TSX5005PD	3–7°C (5°C)	51 (1447)	208-230V, 60Hz (NEMA 6-15)	2 glass	12	auto	UL, cUL	28.5 x 52.5 x58 (72.4 x 133.4 x 147.3)	37.8 x 56.5 x 78.5 (96 x 143.5 x 199.4)	830 (376)
TSX5005PV			230V, 50Hz (European)				UL, cUL, CE			

*450 mL whole blood bags

10

TSX Series High-Performance Auto Defrost –30°C Freezers

Biologics Diagnostics kits and reagents Industrial testing Molecular biology Get Connected

Our high-performance laboratory freezers are designed for applications requiring storage of reagents, pharmaceuticals, biological and other commonly used laboratory materials such as primers, siRNA molecules and fetal bovine serum (FBS).

- Forced-air circulation for temperature uniformity and fast temperature recovery
- Non-invasive defrost with time and temperature guided cycle
- GMP Clean Room Class A / ISO 6 (ISO EN 14644-1) compatible with appropriate pre-install preparation
- Quiet operation at just 52 dBA
- Available in single and double door models
- Four 2" casters for easy mobility; the front two are lockable
- Keyed on/off switch with easy to use, setpoint security
- Self-closing door with 90° stop to assist with inventory loads
- NEW ergonomic handle with soft touch grip
- Built-in remote alarm contacts
- See pages 14–19 for options and accessories

TSX Series high-performance auto defrost –30°C freezers

Model no.	Temp. range (setpoint)	Capacity cu. ft. (liters)	Electrical (plug)	Doors	Shelves	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2330FA			115V, 60Hz (NEMA 5-15)				FDA, UL, cUL			437 (198)
TSX2330FD	–35°C to –15°C (–30°C)	23 (650)	208-230V, 60Hz (NEMA 6-15)	1 solid	4	auto	FDA, UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37.8 x 28 x 78.5 (71.1 x 96.2 x 199.4)	416 (189)
TSX2330FV			230V, 50Hz (European)				FDA, UL, cUL, CE			416 (189)
TSX5030FA			115V, 60Hz (NEMA 5-20)				FDA, UL, cUL			621 (282)
TSX5030FD	–35°C to –15°C (–30°C)	51 (1447)	208-230V, 60Hz (NEMA 6-15)	2 solid	8	auto	FDA, UL, cUL	28.5 x 52.5 x 58 (72.4 x 133.4 x 147.3)	37.8 x56.5 x 78.5 (96 x 143.5 x 199.4)	621 (282)
TSX5030FV			230V, 50Hz (European)				FDA, UL, cUL, CE			

TSX Series High-Performance Manual Defrost –20°C Freezers

Biologics | Diagnostics kits and reagents | Enzymes | Industrial testing | Molecular biology | Get Connected

Our manual defrost, high-performance freezers are designed for applications in which even slight intermittent coil warming during auto defrost cannot be tolerated.

- Cold wall convection cooling with temperature uniformity
- Enzyme freezers feature enzyme bins
- GMP Clean Room Class A / ISO 6 (ISO EN 14644-1) compatible with appropriate pre-install preparation
- Quiet operation at just 50 dBA
- Four 2" casters for easy mobility; the front two are lockable
- Keyed on/off switch with easy to use, setpoint security
- NEW ergonomic handle with soft touch grip
- Self-closing door with 90° stop to assist with inventory loads
- Built-in remote alarm contacts
- See pages 14–19 for options and accessories

TSX Series high-performance manual defrost –20°C freezers

Model no.	Temp. range (setpoint)	Capacity cu. ft. (liters)	Electrical (plug)	Doors	Shelves	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2320FA	–25°C to –15°C (–20°C)	23 (650)	115V, 60Hz (NEMA 5-15)	1 solid	4	manual	UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37 x 28 x 78.6 (94 x 71.1 x 199.6)	442 (200)
TSX2320FD			208-230V, 60Hz (NEMA 6-15)				UL, cUL			421 (191)
TSX2320FV			230V, 50Hz (European)				UL, cUL, CE			421 (191)

TSX Series high-performance manual defrost –20°C enzyme freezers

Model no.	Temp. range (setpoint)	Capacity cu. ft. (liters)	Electrical (plug)	Doors	Shelves (bins)	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2320EA	–25°C to –15°C (–20°C)	23 (650)	115V, 60Hz (NEMA 5-15)	1 solid	9 (45)	manual	UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37 x 28 x 78.6 (94 x 71.1 x 199.6)	497 (225)
TSX2320ED			208-230V, 60Hz (NEMA 6-15)				UL, cUL			476 (216)
TSX2320EV			230V, 50Hz (European)				UL, cUL, CE			

TSX Series High-Performance –30°C Plasma Freezers

Whole blood and plasma

Get Connected

Our pre-set, high-performance –30°C plasma freezers with automatic defrost are designed to meet strict requirements established by the AABB for the storage of plasma.

- Forced-air circulation for temperature uniformity and fast temperature recovery
- Heat-free defrost for maximum temperature uniformity
- Convenient, stainless steel, fully extendable and adjustable drawers
- GMP Clean Room Class A / ISO 6 (ISO EN 14644-1) compatible with appropriate pre-install preparation
- Standard, built-in chart recorder
- Quiet operation at just 52 dBA
- Available in single and double door models
- Four 2" casters for easy mobility; the front two are lockable
- Bright, LED interior lighting
- Keyed on/off switch with easy to use, setpoint security
- Self-closing door with 90° stop to assist with inventory loads
- NEW ergonomic handle with soft touch grip
- Built-in remote alarm contacts
- See pages 14–19 for options and accessories

TSX Series high-performance -30°C plasma freezer

Model no.	Temp. range (setpoint)	Capacity cu. ft./liters (plasma boxes*)	Electrical (plug)	Doors	Drawers	Defrost	Certification	Interior dimensions D x W x H in. (cm)	Exterior dimensions D x W x H in. (cm)	Shipping weight lbs. (kg)
TSX2330LA	–35°C to –15°C (–30°C)	23/65 (532)	115V, 60Hz (NEMA 5-15)	1 solid	7	auto	FDA, UL, cUL	28.5 x 24 x 58 (72.3 x 61 x 147.3)	37.8 x 28 x 78.5 (96 x 71.1 x 199.4)	549 (249)
TSX2330LD			208-230V, 60Hz (NEMA 6-15)				FDA, UL, cUL			528 (239)
TSX2330LV			230V, 50Hz (European)				FDA, UL, cUL, CE			528 (239)
TSX5030LA	–35°C to –15°C (–30°C)	51 (1447)	115V, 60Hz (NEMA 5-20)	2 solid	14	auto	FDA, UL, cUL	28.5 x 52.5 x 58 (72.4 x 133.4 x 147.3)	37.8 x56.5 x78.5 (96 x 143.5 x 199.4)	817 (371)
TSX5030LD			208-230V, 60Hz (NEMA 6-15)				FDA, UL, cUL			817
TSX5030LV			230V, 50Hz (European)				FDA, UL, cUL, CE			

*250 mL plasma boxes

Options and Accessories

Productive use of our TSX Series refrigerators and freezers can be enhanced with options and accessories specifically designed to improve utility and convenience. Many options are factory-installed and must be specified with your refrigerator and freezer order. Customer-installed options may require the services of a factory authorized technician. The ordering chart on pages 15-16 will inform you which options are factory- or customer-installed.

Before ordering…

Serial number tags on all of our TSX Series refrigerators and freezers provide model numbers and voltage information needed for accurate selection of options ordered for field installation. You can also refer to the refrigerator and freezer ordering charts in this brochure for model numbers and voltage information. It is recommended that options be ordered when your refrigerator or freezer is ordered. Factory-installed options eliminate down-time during product installation.

Adjustable alarm delay modules

The adjustable alarm delay is designed to eliminate 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 that 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, 18 or 32 minutes

- Operates independent of the line power; built-in battery uses customer supplied 9V battery

Remote alarm modules

Free-standing remote alarm modules tie-in to the standard remote alarm terminals on the refrigerators and freezers.

4–20 milliamp (MA) transmitters

4–20 milliamp transmitters offer a point-to-point circuit to transmit signals from refrigerator and freezer sensors to a controller, sending an analog signal from 4 to 20 milliamps.

Temperature chart recorders

Standard on blood bank refrigerators and plasma freezers but optional on other models. Chart recorders are 6" (15.2 cm), seven-day and use pressure-sensitive chart paper. One box of 50 charts is included with order.

Door swing options

All TSX Series refrigerators and freezers are right-hand swing but factory-installed, left hand swings are available.

Surge suppressors

Designed to prevent issues related to voltage surges.

Seismic restraint kits

Provides additional stability for regions prone to earthquakes.

e-lock adapter kits

E-locks provide access control with audit-trail capabilities, as well as temperature monitoring. These kits require no electricity and are available in both factory- and customer-installed options for CompX™, Pyxis®, Omnicell® and McKesson™ locks.

Specialty electrical plugs

For countries where NEMA 5-15, 6-15 and Continental EU plugs are not standard, specialty plug options are available.

Options for High-Performance Refrigerators Ordering Guide

For use with refrigerator size	23.3 cu. ft. (659 L)	45.8 cu. ft. (1297 L)	51.1 cu. ft. (1447 L)
Door options (factory-installed)	Model No.	Model No.	Model No.
Left hand swing, solid door	6997		
Left hand swing, glass door	6998		
Left hand swing, heated glass door	7075		
Right hand swing, glass door	7012		
Right hand swing, heated glass door	7086		
Double left hand swinging doors, solid			7001
Double left hand swinging doors, glass			7067
Double left hand swinging doors, heated glass			7089
Double right hand swinging doors, solid			7068
Double right hand swinging doors, glass			7069
Double right hand swinging doors, heated glass			7090
Double left and right hand swinging doors, solid			7019
Double left and right hand swinging doors, glass			7014
Double left and right hand swinging doors, heated glass			7091
6" 7-day inkless chart recorders, -40°C to +25°C			
Free-standing, customer-installed, 115V, 60Hz models		6383-7A	
Free-standing, customer-installed, 208-230V, 60Hz models		6383-7D	
Free-standing, customer-installed, 230V, 50Hz models (EU)		6383-7V	
Free-standing, customer-installed, 230V, 50Hz models (UK)		6383-7W	
Factory-installed (all voltages)		6183-7	
Replacement chart paper, box of 50		6184	
Surge suppressor (factory-installed)			
115V, 60Hz models		6402-1	
208-230V, 60Hz models		6402-2	
230V, 50Hz models		6402-3	
Remote alarm modules (factory-installed)			
115V, 60Hz models		5612-1A	
208-230V, 60Hz models		5612-2D	
230V, 50Hz models		5612-3V	

	For use with refrigerator size	23.3 cu. ft. (659 L)	45.8 cu. ft. (1297 L)	51.1 cu. ft. (1447 L)
Alarm delay modules				
Battery operated			6903	
Digital temperature monitors				
Single input channel, temperature range -100° to +25°C, set point resolution of 1°C, high temperature alarm only, numeric LCD display, red visual alarm, 8 ft. Teflon® lead wire, Velcro® mounting strap, 5"L x 2"D x 4.5"W (mm,130 x 50 x 110), 120v, 60hz, with a 15amp dual prong plug (fits NEMA 5-15R)			6898	
Deluxe electronic remote alarm				
Requires a dedicated, analog phone line			6224TA	
4-20 milliamp transmitters				
Self-powered, factory-installed			7204	
Non-powered, factory-installed			6907-1	
Non-powered, customer-installed			6907-2	
e-Lock adapter kits (does not include locks; single door models only)				
CompX adapter, factory-installed		CXELAF		
CompX adapter, customer-installed		CXELAC		
Pyxis glass door adapter, factory-installed		PXELAGF		
Pyxis glass door adapter, customer-installed		PXELAGC		
Pyxis solid door adapter, factory-installed		PXELASF		
Pyxis solid door adapter, customer-installed		PXELASC		
Omnicell glass door adapter, factory-installed		OMELAGF		
Omnicell glass door adapter, customer-installed		OMELAGC		
Omnicell solid door adapter, factory-installed		OMELASF		
Omnicell solid door adapter, customer-installed		OMELASC		
McKesson glass door adapter, factory-installed		MKELAGF		
McKesson glass door adapter, customer-installed		MKELAGC		
McKesson solid door adapter, factory-installed		MKELASF		
McKesson solid door adapter, customer-installed		MKELASC		
Stainless steel interior (factory-installed)				
Stainless steel interior finish		6115	6711	6116

Options (Freezers)

Options for High-Performance Freezers Ordering Guide

	For use with refrigerator size	23.3 cu. ft. (659 L)	51.1 cu. ft. (1447 L)
Door options (factory-installed)		Model No.	Model No.
Left hand swing, solid door		6997	
Double left hand swinging doors, solid			7001
Double right hand swinging doors, solid			7068
Double left and right hand swinging doors, solid			7019
6" 7-day inkless chart recorders, -40°C to +25°C			
Factory-installed (all voltages)		6183-7	
Free-standing, customer-installed, 115V, 60Hz models		6383-7A	
Free-standing, customer-installed, 208-230V, 60Hz models		6383-7D	
Free-standing, customer-installed, 230V, 50Hz models (EU)		6383-7V	
Free-standing, customer-installed, 230V, 50Hz models (UK)		6383-7W	
Replacement chart paper, box of 50		6184	
Surge suppressor (factory-installed)			
115V, 60Hz models		6402-1	
208-230V, 60Hz models		6402-2	
230V, 50Hz models		6402-3	
Remote alarm modules (factory-installed)			
115V, 60Hz models		5612-1A	
208-230V, 60Hz models		5612-2D	
230V, 50Hz models		5612-3V	
Alarm delay modules			
Battery operated		6903	
Digital temperature monitors			
Single input channel, temperature range -100° to +25°C, set point resolution of 1°C, high temperature alarm only, numeric LCD display, red visual alarm, 8 ft. Teflon® lead wire, Velcro® mounting strap, 5"L x 2"D x 4.5"W (mm,130 x 50 x 110), 120v, 60hz, with a 15amp dual prong plug (fits NEMA 5-15R)		6898	
Deluxe electronic remote alarm			
Requires a dedicated, analog phone line		6224TA	
4-20 milliamp transmitters			
Self-powered, factory-installed		7205TA	
Non-powered, factory-installed		4706	
e-Lock adapter kits (does not include locks; single door models only)			
CompX adapter, factory-installed		CXELAF	
CompX adapter, customer-installed		CXELAC	
Pyxis glass door adapter, factory-installed		PXELAGF	
Pyxis glass door adapter, customer-installed		PXELAGC	
Omnicell solid door adapter, factory-installed		OMELASF	
Omnicell solid door adapter, customer-installed		OMELASC	
McKesson solid door adapter, factory-installed		MKELASF	
McKesson solid door adapter, customer-installed		MKELASC	
Stainless steel interior (factory-installed)			
Stainless steel interior finish		6115	

Accessories

Accessories for High-Performance Refrigerators and Freezers Ordering Guide

For use with refrigerator size →	23.3 cu. ft. (659 L)	45.8 cu. ft. (1297 L)	51.1 cu. ft. (1447 L)
Shelves	Model No.	Model No.	Model No.
Epoxy-coated, full size shelf		6696	
Epoxy-coated, half size shelf		6698	
Stainless steel, full size shelf		6696-1	
Drawer dividers for roll-out , stainless steel drawers			
4-place divider, order one divider per drawer	6206 (4)		6206 (4)
3" casters (note: all models ship standard with 2")			
Set of four, 3" (76mm) casters		6041-1	
Additional wire basket drawers			
For pharmacy refrigerators	WB23/50		WB23/50
Enzyme bins			
Labels not included	6736		6736
Thermo Scientific Lab Cooler Module			
Holds twenty-four 1.5mL tubes and eight 0.5mL tubes		6744	
Seismic restraint kits			
Basic		TFR210	
For OSHPD	TF-LRF23	TF-LRF45	TF-LRF50

Specialty Plugs for Refrigerators and Freezers

Specialty plugs (factory-installed) for all Models		Model No.
Specialty Plug	Argentina	AR230V16A
Specialty Plug	Australia	AU230V16A
Specialty Plug	Brazil	BR230V16A
Specialty Plug	China	CH230V16A
Specialty Plug	Denmark	DK230V16A
Specialty Plug	Great Britain	UK230V13A
Specialty Plug	India	IN230V16A
Specialty Plug	Israel	IS230V16A
Specialty Plug	Italy	IT230V16A
Specialty Plug	Switzerland	SW230V16
Specialty Plug	Twist lock plug NEMA L6-15P	TL230V15A

Services

Our TSX Series high-performance refrigerators and freezers are designed to meet UL and CE 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, which require corresponding receptacles

- Site preparation requires availability of the proper receptacle; a dedicated circuit is required

- 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 your sales representative

Certificate of Calibration

Control, alarm and temperature recording systems are systematically calibrated at the factor 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 your sales representative.

Validation Testing Program

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

Model no.	Services description
7455TA	Temperature mapping of 24 hours at setpoint to include: • Mapping data graphed at each location • Thermocouple placement diagram • Test equipment list • Average uniformity and stability at specified cycle • Minimum, average and maximum temperatures at each thermocouple location • Uniformity and stability at each location
7456TA	Temperature mapping of 24 hours (traceable instruments and raw data) at setpoint to include: • Mapping data graphed at each location • Thermocouple placement diagram • Test equipment list- utilizing Kaye Validator® thermal validation equipment • Calibration certificates of test equipment • Thermocouple calibration reports • Average uniformity and stability at specified cycle • Minimum, average and maximum temperatures at each thermocouple location • Uniformity and stability at each location
6916-2	Certificate of calibration

Other Accessories

Wireless Monitoring
Thermo Scientific Smart-Vue™ wireless monitoring solution offers 24/7 continuous, real-time wireless monitoring of critical parameters, early warning alerts, and remote data logging. Likewise, Thermo Scientific Smart-Tracker™ requires only a smart phone to access stored temperature readings. No other equipment or installation is necessary.

Clinical Containers
Made with the highest quality resins, Thermo Scientific Nalgene™ bottles are engineered to work together with a proprietary valve seal and a strong, semi-buttress thread design. Our Nalgene bottles offer a leakproof* guarantee because we manufacture and test both components together as part of our routine quality program.

Gibco Media
Gibco™ media, sera, supplements, cells and cell culture reagents are designed to deliver reproducibility and performance for results you can count on. Regardless of whether you are performing cell culture in a research lab or production facility, need a special or defined formulation, or are growing cell lines, primary cells, or stem cells, Gibco products offer a reliable solution.

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Also available, TSX Series ultra-low freezers

Our TSX Series also includes ultra-low freezers for storage applications requiring a –70°C or –80°C setpoint:

• Two capacities: 400 or 600 2-inch box

• Up to 50% energy savings over conventional-refrigerant ultra-low freezers

• Quiet operation enabling you to move the freezer out of the hall and into the lab

• SNAP compliant

All of our TSX Series refrigerators, –30°C and –20°C freezers and ultra-low freezers are manufactured in an award-winning, zero waste to landfill facility.

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