Thermo Scientific™
TSX 1,447 litre
refrigerator

Thermo Scientific™
TSX 650 litre
freezer

Thermo Scientific™
TSX 650 litre
pharmacy
refrigerator

Thermo Scientific™
TSX 650 litre
manual defrost
freezer

TSX Series high-performance refrigerators and freezers

A better environment inside and out

Thermo Fisher
SCIENTIFIC

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, F-Gas choice

Thermo Scientific™ TSX Series high-performance refrigerators and freezers are designed with features that support sample protection, sustainability objectives, European Union F-Gas regulations, and the Significant New Alternatives Policy (SNAP) from the US Environmental Protection Agency (EPA). Our variable-speed compressor technology (V-drive) is designed to provide temperature uniformity that continually adapts to the lab or clinical environment, offering significant energy savings without compromising protection. Each product has an ACT Environmental Impact Factor Label that provides clear, third party-verified information about the environmental impact of laboratory products. 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.

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.

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 with a –30°C setpoint or manual defrost and a –20°C setpoint. For blood banking applications, our plasma freezers and blood bank refrigerators are FDA Class II and have achieved recognition by the Association for the Advancement of Blood and Biotherapies' (AABB) Standards-Compliant Product Evaluation (SCoPE) program. Our pharmacy refrigerators feature convenient, adjustable basket drawers. And for enzyme storage, our –20°C freezers feature enzyme bins for convenient storage.

Biologics	Clinical applications	Columns	Connectivity	Diagnostics kits and reagents
Enzymes	Flammable material storage	Industrial testing	Molecular biology	Vaccines and pharma	Whole blood and plasma

* Based on published sound specifications, data on file. October, 2016.

The drive for sample integrity and energy savings

The performance and energy savings of the 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 compressor's 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 setpoint 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.
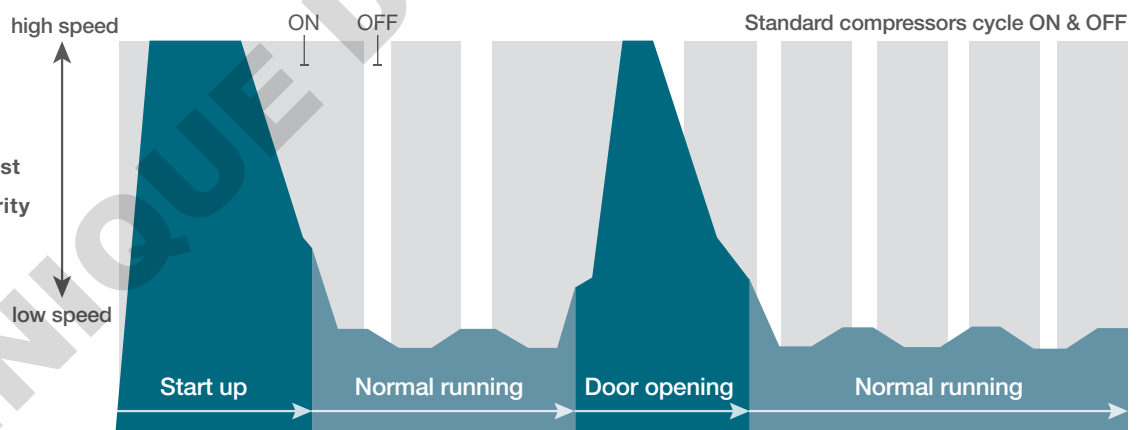
V-drive

Low energy: **Low operating cost**

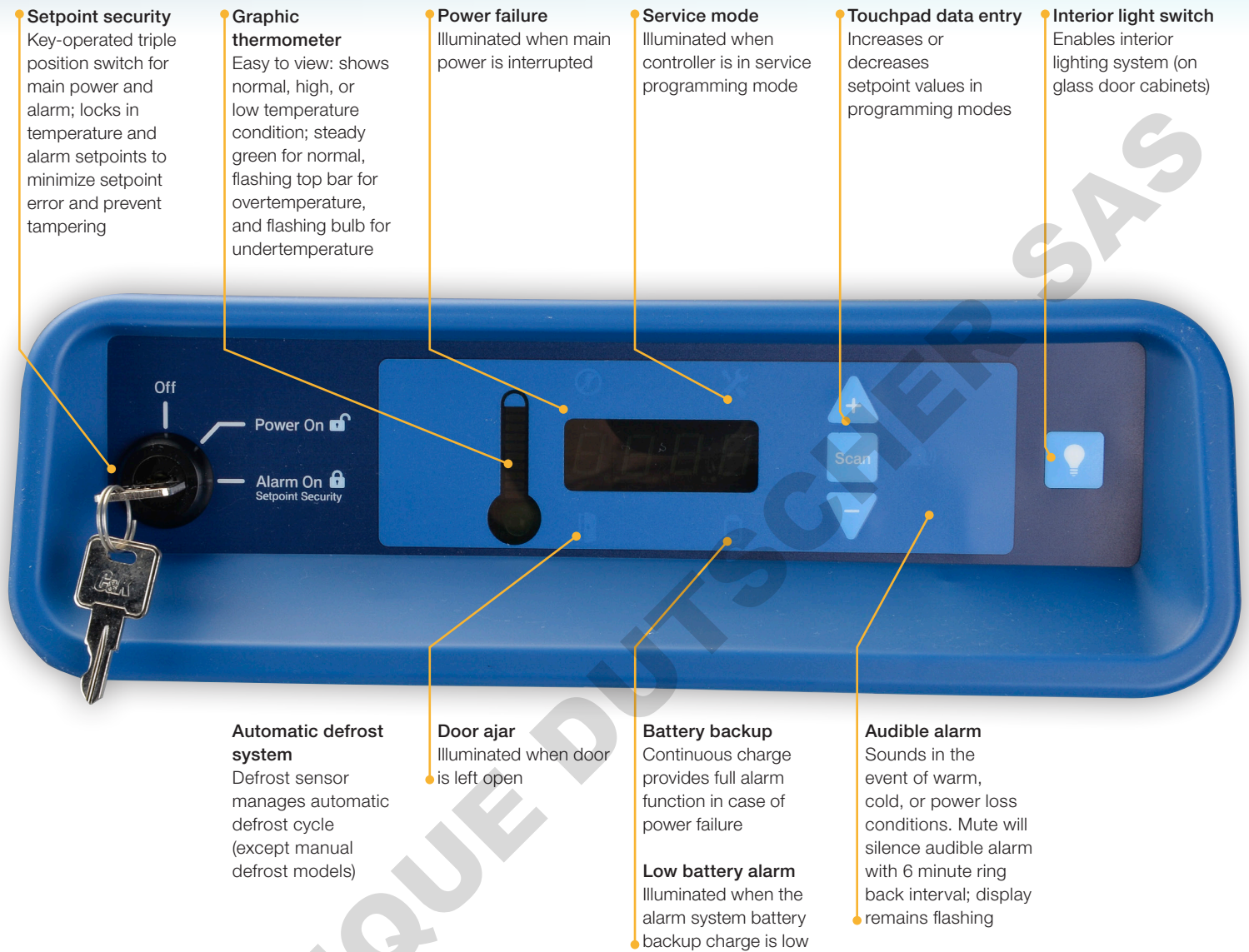Adaptive control: **Sample security**

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 · ON · OFF · Standard compressors cycle ON & OFF

low speed

| 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, and 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)

Off
Power On
Alarm On
Setpoint Security
Scan

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 provides full alarm function in case of power failure

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

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

Ready for connectivity

TSX models, except blood bank refrigerators and plasma freezers, are compatible with Thermo Scientific™ DeviceLink™ Connect, enabling you to have a connected experience with your units wherever Internet connection is available. The units are also compatible with Thermo Scientific™ Smart-Vue™ Pro wireless monitoring systems.

A sound environment for critical samples

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 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.

Noise source	Decibel level
Freeway traffic, vacuum cleaner	70
Conversation in restaurant, office, background music	60
TSX Series	**52**
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 with a soft-touch grip, and the microprocessor controller is angled to help prevent neck strain.

Verified sustainability

TSX Series freezers have completed the ACT Environmental Impact Factor Label labeling processes, which is designed to address the need of both scientists and procurement specialists for clear, third party-verified information about the environmental impact of laboratory products. The criteria for the ACT label were developed with input from industry experts and external stakeholders. The ACT label process entails third-party verification of the sustainable impacts of a product, its operations, and its end of life.

up to **10x** quieter

ACT.
The Environmental
Impact Factor Label

TSX Series high-performance biomedical glass door refrigerators

Biologics | **Diagnostics kits and reagents** | **Industrial testing** | **Molecular biology** | **Vaccines and pharma** | **Clinical applications** | **Connectivity**

Our high-performance glass door 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.

- Heat-free defrost for maximum temperature uniformity

- 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

- Self-closing door with 90° stop to assist with inventory loads

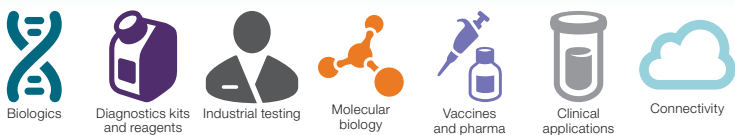- See pages 15–21 for options and accessories

**Thermo Scientific™
TSX 650 litre refrigerator**

TSX Series high-performance glass door lab refrigerators

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. (litre)	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)
TSX1205GY			115 V, 60 Hz (NEMA 5-15)							339 (154)
TSX1205GZ		11.5 (326)	208–230V, 60Hz (NEMA 6-15)	1 glass	4			21.8 x 20.0 x 52.4 (55.4 x 50.8 x 133.1)	30.5 x 24.0 x 73.0 (77.5 x 61.9 x 185.4)	339 (154)
TSX1205GV			208–230 V, 50 Hz (CEE 7/7)							339 (154)
TSX2305GY			115 V, 60 Hz (NEMA 5-15)							450 (204)
TSX2305GZ		23 (650)	208–230 V, 60 Hz (NEMA 6-15)	1 glass	4			28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	37.8 x 28.0 x 78.5 (96.0 x 71.1 x 199.4)	429 (195)
TSX2305GV			208–230 V, 50 Hz (CEE 7/7)							429 (195)
TSX3005GY			115 V, 60 Hz (NEMA 5-15)							458 (208)
TSX3005GZ	3–7°C (5°C)	29.2 (827)	208–230 V, 60 Hz (NEMA 6-15)	1 glass	4	auto	CE, cULus	28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	37.3 x 34.0 x 78.5 (94.7 x 86.4 x 199.4)	458 (208)
TSX3005GV			208–230 V, 50 Hz (CEE 7/7)							458 (208)
TSX4505GY			115 V, 60 Hz (NEMA 5-15)							611 (277)
TSX4505GZ		45.8 (1,297)	208–230 V, 60 Hz (NEMA 6-15)	Double sliding glass	8			26.0 x 52.5 x 58.0 (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			208–230 V, 50 Hz (CEE 7/7)							611 (277)
TSX5005GY			115 V, 60 Hz (NEMA 5-15)							669 (303)
TSX5005GZ		51.1 (1,447)	208–230 V, 60 Hz (NEMA 6-15)	2 glass	8			28.5 x 52.5 x 58.0 (72.4 x 133.4 x 147.3)	37.8 x 56.5 x 78.5 (96.0 x 143.5 x 199.4)	669 (303)
TSX5005GV			208–230 V, 50 Hz (CEE 7/7)							669 (303)

TSX Series high-performance biomedical solid door lab refrigerators

Biologics Diagnostics kits and reagents Industrial testing Molecular biology Vaccines and pharma Clinical applications Connectivity

Our high-performance solid door 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.

- Heat-free defrost for maximum temperature uniformity

- 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

- Self-closing door with 90° stop to assist with inventory loads

**Thermo Scientific™
TSX 1,447 litre
refrigerator**

TSX Series high-performance solid door lab refrigerators

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. (litre)	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)
TSX1205SY			115 V, 60 Hz (NEMA 5-15)							340 (154)
TSX1205SZ		11.5 (326)	208–230 V, 60 Hz (NEMA 6-15)	1 solid	4			21.8 x 20.0 x 52.4 (55.4 x 50.8 x 133.1)	31.1 x 24.0 x 73.0 (71.1 x 61.9 x 185.4)	340 (154)
TSX1205SV			208–230 V, 50 Hz (CEE 7/7)							340 (154)
TSX2305SY			115 V, 60 Hz (NEMA 5-15)							426 (193)
TSX2305SZ		23.0 (650)	208–230 V, 50/60 Hz (NEMA 6-15)	1 solid	4			28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	37.9 x 28.0 x 78.5 (96.2 x 71.1 x 199.4)	426 (193)
TSX2305SV	3–7°C (5°C)		208–230 V, 50 Hz (CEE 7/7)			auto	CE, cULus			405 (184)
TSX3005SY			115 V, 60 Hz (NEMA 5-15)							459 (208)
TSX3005SZ		29.2 (827)	208–230 V, 60 Hz (NEMA 6-15)	1 solid	4			28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	37.9 x 34.0 x 78.5 (96.2 x 86.4 x 199.4)	459 (208)
TSX3005SV			208–230 V, 50 Hz (CEE 7/7)							459 (208)
TSX5005SY			115 V, 60 Hz (NEMA 5-15)							621 (282)
TSX5005SZ		51.1 (1,447)	208–230 V, 60 Hz (NEMA 6-15)	2 solid	8			28.5 x 52.5 x 58.0 (72.4 x 133.4 x 147.3)	37.9 x 56.5 x 78.5 (96.2 x 143.5 x 199.4)	621 (282)
TSX5005SV			208–230 V, 50 Hz (CEE 7/7)							621 (282)

TSX Series high-performance chromatography refrigerators

Vaccines and pharma

Clinical applications

Diagnostics kits and reagents

Connectivity

Columns

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.

• Heat-free defrost for maximum temperature uniformity

• 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

• Self-closing door with 90° stop to assist with inventory loads

• Safety switch protected internal electrical outlet on all models (Duplex outlet on A and D models, single outlet on V models)

• See pages 15–21 for options and accessories

Thermo Scientific™ TSX 827 litre chromatography refrigerator

TSX Series high-performance chromatography refrigerators

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. (litre)	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)
TSX2305CY			115 V, 60 Hz (NEMA 5-15)							439 (199)
TSX2305CZ		23 (650)	208–230 V, 50/60 Hz (NEMA 6-15)	1 glass	0 Full 2 Half			28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	37.8 x 28.0 x 78.5 (96.0 x 71.1 x 199.4)	418 (190)
TSX2305CV			208–230 V, 50/60 Hz (CEE 7/7)							418 (190)
TSX3005CY			115 V, 60 Hz (NEMA 5-15)							442 (201)
TSX3005CZ		29.2 (827)	208–230 V, 50/60 Hz (NEMA 6-15)	1 glass	0 Full 2 Half			28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	37.3 x 34.0 x 78.5 (94.7 x 86.4 x 199.4)	442 (201)
TSX3005CV	3–7°C (5°C)		208–230 V, 50/60 Hz (CEE 7/7)			auto	CE, cULus			442 (201)
TSX4505CY			115 V, 60 Hz (NEMA 5-15)							600 (272)
TSX4505CZ		45.8 (1,297)	208–230 V, 50/60 Hz (NEMA 6-15)	Double sliding glass	4 Full 2 Half			26.0 x 52.5 x 58.0 (66.0 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			208–230 V, 50/60 Hz (CEE 7/7)							600 (272)
TSX5005CY			115 V, 60 Hz (NEMA 5-15)							658 (298)
TSX5005CZ		51.1 (1,447)	208–230 V, 50/60 Hz (NEMA 6-15)	2 glass	4 Full 2 Half			28.5 x 52.5 x 58.0 (72.4 x 133.4 x 147.3)	37.8 x 56.5 x 78.5 (96.0 x 143.5 x 199.4)	658 (298)
TSX5005CV			208–230 V, 50/60 Hz (CEE 7/7)							658 (298)

TSX Series high-performance blood bank refrigerators

Whole blood and plasma

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. They are approved products under the AABB Standards-Compliant Product Evaluation (SCoPE) program.

- Factory pre-set to 4°C to meet blood storage guidelines

- Heat-free defrost for maximum temperature uniformity

- Convenient, stainless steel, fully extendable and adjustable drawers

- Standard, built-in chart recorder

- 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

- Self-closing door with 90° stop to assist with inventory loads

- See pages 15–21 for options and accessories

- FDA listed Class II Medical Device, 510K-exempt, and comply with the requirements of the European Medical Device Directive, 93/42/EEC (Class IIa)*

Thermo Scientific™
TSX 650 litre
blood bank refrigerator

* Only V voltage models are listed under European Medical Device Directive, 93/42/EEC (Class IIa).

TSX Series high-performance blood bank refrigerators

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. / litre (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)
TSX1204BY			115 V, 60 Hz (NEMA 5-15)							404 (183)
TSX1204BZ		11.5 / 326 (192)	208–230 V, 60 Hz (NEMA 6-15)	1 glass	6			21.8 x 20.0 x 52.4 (55.4 x 50.8 x 133.1)	30.5 x 24.0 x 73.0 (77.5 x 61.9 x 185.4)	404 (183)
TSX1204BV			208–230 V, 50 Hz (CEE 7/7)							404 (183)
TSX2304BY			115 V, 60 Hz (NEMA 5-15)							550 (249)
TSX2304BZ		23 / 650 (385)	208–230 V, 60 Hz (NEMA 6-15)	1 glass	7			28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	37.8 x 28.0 x 78.5 (96.0 x 71.1 x 199.4)	529 (240)
TSX2304BV	3–7°C (4°C)		208–230 V, 50 Hz (CEE 7/7)			auto	CE, cULus			529 (240)
TSX3004BY			115 V, 60 Hz (NEMA 5-15)							554 (251)
TSX3004BZ		29.2 / 827 (426)	208–230 V, 60 Hz (NEMA 6-15)	1 glass	6			28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	37.3 x 34.0 x 78.5 (94.7 x 86.4 x 199.4)	554 (251)
TSX3004BV			208–230 V, 50 Hz (CEE 7/7)							554 (251)
TSX5004BY			115 V, 60 Hz (NEMA 5-15)							865 (392)
TSX5004BZ		51.1 / 1447 (770)	208–230 V, 60 Hz (NEMA 6-15)	2 glass	14			28.5 x 52.5 x 58.0 (72.4 x 133.4 x 147.3)	37.8 x 56.5 x 78.5 (96.0 x 143.5 x 199.4)	865 (392)
TSX5004BV			208–230 V, 50 Hz (CEE 7/7)							865 (392)

** 450 mL whole blood bags.

TSX Series high-performance pharmacy refrigerators

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 2–8°C storage. NSF/ANSI 456 Vaccine Storage Standard–certified*, the TSX series delivers the performance, quality, and compliance needed for vaccine storage.

- Heat-free defrost for maximum temperature uniformity

- Convenient, fully extendable and adjustable basket drawers

- 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

- Self-closing door with 90° stop to assist with inventory loads
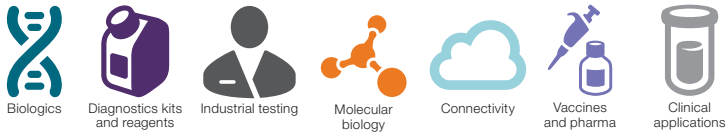
- See pages 15–21 for options and accessories

Vaccines and pharma

Clinical applications

Diagnostics kits and reagents

Connectivity

Thermo Scientific™ TSX 650 litre pharmacy refrigerator

* Only Y and Z voltages available with NSF/ANSI 456 labeling.

TSX Series high-performance pharmacy refrigerators

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. (litre)	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)
TSX1205PY			115 V, 60 Hz (NEMA 5-15)							388 (176)
TSX1205PZ		11.5 (326)	208–230 V, 60 Hz (NEMA 6-15)	1 glass	5			21.8 x 20.0 x 52.4 (55.4 x 50.8 x 133.1)	30.5 x 24.0 x 73.0 (77.5 x 61.9 x 185.4)	388 (176)
TSX1205PV			208–230 V, 50 Hz (CEE 7/7)							388 (176)
TSX2305PY			115 V, 60 Hz (NEMA 5-15)							531 (241)
TSX2305PZ		23 (650)	208–230 V, 60 Hz (NEMA 6-15)	1 glass	6			28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	37.8 x 28.0 x 78.5 (96.0 x 71.1 x 199.4)	510 (231)
TSX2305PV	3–7°C (5°C)		208–230 V, 50 Hz (CEE 7/7)			auto	CE, cULus			510 (231)
TSX3005PY			115 V, 60 Hz (NEMA 5-15)							541 (245)
TSX3005PZ		29.2 (827)	208–230 V, 60 Hz (NEMA 6-15)	1 glass	6			28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	37.3 x 34.0 x 78.5 (94.7 x 86.4 x 199.4)	541 (245)
TSX3005PV			208–230 V, 50 Hz (CEE 7/7)							541 (245)
TSX5005PY			115 V, 60 Hz (NEMA 5-15)							830 (376)
TSX5005PZ		51.1 (1,447)	208–230 V, 60 Hz (NEMA 6-15)	2 glass	12			28.5 x 52.5 x 58.0 (72.4 x 133.4 x 147.3)	37.8 x 56.5 x 78.5 (96.0 x 143.5 x 199.4)	830 (376)
TSX5005PV			208–230 V, 50 Hz (CEE 7/7)							830 (376)

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

Our high-performance laboratory freezers are designed for applications requiring storage of vaccines, pharmaceuticals, chemotherapeutics, reagents, and other commonly used biological or laboratory materials such as primers, siRNA molecules, and fetal bovine serum (FBS). With NSF/ANSI 456 Vaccine Storage Standard certification*, the TSX series delivers the performance, quality, and compliance needed for vaccine storage.

- 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

- NSF/ANSI 456–certified when ordered with Certificate of Calibration*

- Four 2" casters for easy mobility; the front two are lockable

- Self-closing door with 90° stop to assist with inventory loads

- See pages 15–21 for options and accessories

Biologics | Diagnostics kits and reagents | Industrial testing | Molecular biology | Connectivity | Vaccines and pharma | Clinical applications

Thermo Scientific™ TSX 1,447 litre freezer

Thermo Scientific™ TSX 326 litre freezer

* 6916-2 Certificate of Calibration must be ordered with freezers to have label indicating NSF/ANSI 456 compliance. Only Y and Z voltages available with NSF/ANSI 456 labeling.

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

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. (litre)	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)
TSX1230FY			115 V, 60 Hz (NEMA 5-15)							335 (152)
TSX1230FZ		11.5 (326)	208–230 V, 60 Hz (NEMA 6-15)	1 solid	4			21.8 x 20.0 x 52.4 (55.4 x 50.8 x 133.1)	31.1 x 24.0 x 73.0 (79.0 x 61.9 x 185.4)	335 (152)
TSX1230FV			208–230 V, 50 Hz (CEE 7/7)							335 (152)
TSX2330FY			115 V, 60 Hz (NEMA 5-15)							423 (192)
TSX2330FZ		23.3 (659)	208–230 V, 60 Hz (NEMA 6-15)	1 solid	4			28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	37.9 x 28.0 x 78.5 (96.2 x 71.1 x 199.4)	402 (182)
TSX2330FV	–35° to –15°C (–30°C)		208–230 V, 50 Hz (CEE 7/7)			auto	CE, cULus			402 (182)
TSX3030FY			115 V, 60 Hz (NEMA 5-15)							439 (199)
TSX3030FZ		29.2 (827)	208–230 V, 60 Hz (NEMA 6-15)	1 solid	4			28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	37.9 x 34.0 x 78.5 (96.2 x 86.4 x 199.4)	439 (199)
TSX3030FV			208–230 V, 50 Hz (CEE 7/7)							439 (199)
TSX5030FY			115 V, 60 Hz (NEMA 5-15)							621 (282)
TSX5030FZ		51.1 (1,447)	208–230 V, 60 Hz (NEMA 6-15)	2 solid	8			28.5 x 52.5 x 58.0 (72.3 x 133.4 x 147.3)	37.9 x 56.5 x 78.5 (96.2 x 143.5 x 199.4)	621 (282)
TSX5030FV			208–230 V, 50 Hz (CEE 7/7)							621 (282)

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

Biologics   Diagnostics kits   Enzymes   Industrial testing   Molecular   Connectivity
             and reagents   biology

Thermo Scientific™ high-performance manual defrost freezers are designed to prevent slight and intermittent temperature variations that occur due to coil warming during an automatic defrost cycle. The enzyme freezers also come with enzyme bins.

TSX Series high-performance manual defrost freezers feature:

• Cold-wall convection cooling and temperature uniformity

• Compatibility with GMP Clean Room Class A and ISO 6 (ISO EN 14644-1) standards with appropriate pre-installation

• Four 2" casters for easy movement and lockable front casters

• Self-closing doors with 90° stop to assist with inventory loads

• See pages 15–21 for options and accessories

**Thermo Scientific™
TSX 650 litre freezer**

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

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. (litre)	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)
TSX2320FY	–25° to –15°C (–20°C)	23.3 (659)	115 V, 60 Hz (NEMA 5-15)	1 solid	4 (0)	manual	CE, cULus	28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	38.9 x 28.0 x 78.5 (99.0 x 71.1 x 199.4)	459 (208)
TSX2320FZ			208–230 V, 60 Hz (NEMA 6-15)							438 (199)
TSX2320FV			208–230 V, 50/60 Hz (CEE 7/7)							438 (199)
TSX3020FY		29.2 (827)	115 V, 60 Hz (NEMA 5-15)	1 solid	4 (0)			28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	38.9 x 34.0 x 78.5 (99.0 x 86.4 x 199.4)	483 (219)
TSX3020FZ			208–230 V, 60 Hz (NEMA 6-15)							483 (219)
TSX3020FV			208–230 V, 50/60 Hz (CEE 7/7)							483 (219)

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

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. (litre)	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)
TSX2320EY	–25° to –15°C (–20°C)	23.3 (659)	115 V, 60 Hz (NEMA 5-15)	1 solid	9 (45)	manual	CE, cULus	28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	38.9 x 28.0 x 78.5 (99.0 x 71.1 x 199.4)	514 (233)
TSX2320EZ			208–230 V, 60 Hz (NEMA 6-15)							493 (224)
TSX2320EV			208–230 V, 50/60 Hz (CEE 7/7)							493 (224)
TSX3020EY		29.2 (827)	115 V, 60 Hz (NEMA 5-15)	1 solid	9 (45)			28.5 x 30.0 x 58 (72.3 x 76.2 x 147.3)	38.9 x 34.0 x 78.5 (99.0 x 86.4 x 199.4)	552 (251)
TSX3020EZ			208–230 V, 60 Hz (NEMA 6-15)							552 (251)
TSX3020EV			208–230 V, 50/60 Hz (CEE 7/7)							552 (251)

TSX Series high-performance –30°C plasma freezers

Our preset, high-performance –30°C plasma freezers with automatic defrost are designed to meet strict requirements established by the AABB and are approved products under their Standards-Compliant Product Evaluation (SCoPE) program for the storage of plasma.

- Forced-air circulation for temperature uniformity and fast temperature recovery

- 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

- Four 2" casters for easy mobility; the front two are lockable

- Self-closing door with 90° stop to assist with inventory loads

- See pages 15–21 for options and accessories

- FDA listed Class II Medical Device, 510K exempt, and comply with the requirements of the European Medical Device Directive, 93/42/EEC (Class IIa)*

Thermo Scientific™ TSX 650 litre plasma freezer

* Only V voltage models are listed under European Medical Device Directive, 93/42/EEC (Class IIa).

TSX Series high-performance –30°C plasma freezer

Cat. No.	Temp. range (setpoint)	Capacity cu. ft. / litre (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)
TSX1230LY			115 V, 60 Hz (NEMA 5-15)							412 (187)
TSX1230LZ		11.5 / 326 (273)	208–230 V, 60 Hz (NEMA 6-15)	1 solid	7			21.8 x 20.0 x 52.4 (55.4 x 50.8 x 133.1)	31.1 x 24.0 x 73.0 (79.0 x 61.9 x 185.4)	412 (187)
TSX1230LV			208–230 V, 50 Hz (CEE 7/7)							412 (187)
TSX2330LY			115 V, 60 Hz (NEMA 5-15)							526 (239)
TSX2330LZ		23.3 / 659 (532)	208–230 V, 60 Hz (NEMA 6-15)	1 solid	7			28.5 x 24.0 x 58.0 (72.3 x 61.0 x 147.3)	37.9 x 28.0 x 78.5 (96.2 x 71.1 x 199.4)	505 (229)
TSX2330LV	–35° to –15°C (–30°C)		208–230 V, 50 Hz (CEE 7/7)			auto	CE, cULus			505 (229)
TSX3030LY			115 V, 60 Hz (NEMA 5-15)							556 (252)
TSX3030LZ		29.2 / 827 (665)	208–230 V, 60 Hz (NEMA 6-15)	1 solid	7			28.5 x 30.0 x 58.0 (72.3 x 76.2 x 147.3)	37.9 x 34.0 x 78.5 (96.2 x 86.4 x 199.4)	556 (252)
TSX3030LV			208–230 V, 50 Hz (CEE 7/7)							556 (252)
TSX5030LY			115 V, 60 Hz (NEMA 5-15)							817 (371)
TSX5030LZ		51.1 / 1447 (1,064)	208–230 V, 60 Hz (NEMA 6-15)	2 solid	14			28.5 x 52.5 x 58.0 (72.4 x 133.4 x 147.3)	37.9 x 56.5 x 78.5 (96.2 x 143.5 x 199.4)	817 (371)
TSX5030LV			208–230 V, 50 Hz (CEE 7/7)							817 (371)

** 250 mL plasma boxes.

Options and accessories

Productive use of 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 16–19 will inform you which options are factory- or customer-installed.

Before ordering …

Serial number tags on all 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 downtime 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 and 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 independently 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 4–20 milliamps.

Temperature chart recorders

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

Door swing options

All single-door TSX refrigerators and freezers are right-hand swing but factory-installed, left-hand swing doors are available. Door swing direction cannot be changed on double door TSX refrigerators and freezers.

Surge suppressors

Surge suppressors are designed to prevent issues related to voltage surges.

Seismic restraint kits

Seismic restraint kits provide 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. See page 19 for these country-specific plugs.

Options

Refrigerators

Ordering guide: options for high-performance refrigerators

For use with refrigerator size:	11.5 cu. ft. (325 L)	23 cu. ft. (650 L)	29.2 cu. ft. (826 L)	45.8 cu. ft. (1,297 L)	51.1 cu. ft. (1,447 L)
	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Door options (factory-installed)					
Left-hand swing, solid door	6995	6997	6999		
Left-hand swing, glass door	6996	6998	7000		
Right-hand swing, glass door	7066	7012	7013		
Left- and right-hand swinging doors, solid					7019
Left- and right-hand swinging doors, glass					7014
6" 7-day inkless chart recorders, –40°C to +25°C					
Free-standing, customer-installed, 115 V, 60 Hz models			6383-7A		
Free-standing, customer-installed, 208-230 V, 60 Hz models			6383-7D		
Free-standing, customer-installed, 230 V, 50 Hz models (EU)			6383-7V		
Free-standing, customer-installed, 230 V, 50 Hz models (UK)			6383-7W		
Factory-installed (all voltages)			6183-7		
Replacement chart paper, box of 50			6184		
Remote alarm modules (customer-installed)					
115 V, 60 Hz models			5612-1A		
208-230 V, 60 Hz models			5612-2D		
230 V, 50 Hz models			5612-3V		
Alarm delay modules					
Battery operated			6903		
Digital temperature monitor					
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 (130 x 50 x 110 mm), 120 V, 60 Hz, with a 15 amp dual prong plug (fits NEMA 5-15R)			6898		

For use with refrigerator size:	11.5 cu. ft. (325 L)	23 cu. ft. (650 L)	29.2 cu. ft. (826 L)	45.8 cu. ft. (1,297 L)	51.1 cu. ft. (1,447 L)
	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
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	6199-3D	6115	6709	6711	6116

Options

Freezers

Ordering guide: options for high-performance freezers

For use with freezer size:	11.5 cu. ft. (326 L)	23.3 cu. ft. (659 L)	29.2 cu. ft. (826 L)	51.1 cu. ft. (1,447 L)
	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Door options (factory-installed)				
Left-hand swing, solid door	6995	6997	6999	
6" 7-day inkless chart recorders, –40°C to +25°C				
Factory-installed (all voltages)	6183-7			
Free-standing, customer-installed, 115 V, 60 Hz models	6383-7A			
Free-standing, customer-installed, 208-230 V, 60 Hz models	6383-7D			
Free-standing, customer-installed, 230 V, 50 Hz models (EU)	6383-7V			
Free-standing, customer-installed, 230 V, 50 Hz models (UK)	6383-7W			
Replacement chart paper, box of 50	6184			
Remote alarm modules (customer-installed)				
115 V, 60 Hz models	5612-1A			
208-230 V, 60 Hz models	5612-2D			
230 V, 50 Hz models	5612-3V			
Alarm delay modules				
Battery operated	6903			
Digital temperature monitor				
Single input channel, temperature range –100° to +25°C, setpoint 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), 120 V, 60 Hz, with a 15 amp 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 solid door adapter, factory-installed	PXELASF			
Pyxis solid door adapter, customer-installed	PXELASC			
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 (not available on –20°C models)	6199-3D	6115	6709	6116

Accessories

Ordering guide: accessories for high-performance refrigerators and freezers

For use with unit size:	11.5 cu. ft. (326 L)	23.3 cu. ft. (659 L)	29.2 cu. ft. (826 L)	45.8 cu. ft. (1,297 L)	51.1 cu. ft. (1,447 L)
	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Shelves					
Epoxy-coated, full size shelf	7125	6696	6695	6696	
Epoxy-coated, half size shelf		6698	6697	6698	
Stainless steel, full size shelf	6696-3	6696-1	6695-1	6696-1	6696-1
Roll-out drawers					
Complete set: Cat. No. (quantity)	7445 (5)	6699 (6)	6704 (6)		6700 (12)
Single drawers	7122	6702	6725		6702
Drawer dividers for roll-out , stainless steel drawers					
4-place divider, order one divider per drawer (quantity)	7027 (4)	6206 (4)	6963 (5)		6206 (4)
3" casters (note: all models ship standard with 2")					
Set of four, 3" (76 mm) casters		6041-1			
Additional wire basket drawers					
Single drawer, for pharmacy refrigerators	WB12	WB23/50	WB30		WB23/50
Chromatography refrigerator shelf supports					
Stainless steel full		CSSFULL			
Stainless steel half		CSSHALF			
Painted full		CSPFULL			
Painted half		CSPHALF			
Enzyme bins					
Sold as each, labels not included		6736			
Thermo Scientific Lab Cooler Module					
Holds twenty-four 1.5 mL tubes and eight 0.5 mL tubes		6744			
Seismic restraint kits					
Basic		TFR210			
For OSHPD	TF-LRF12	TF-LRF23	TF-LRF30	TF-LRF50	TF-LRF50

Specialty plugs for refrigerators and freezers

Specialty plugs (factory-installed) for all models		Cat. No.
Specialty Plug	Argentina	430381H01
Specialty Plug	Australia (10 Amp)	326741H01
Specialty Plug	Australia (15 Amp)	430268H01
Specialty Plug	Brazil	430383H01
Specialty Plug	China	316705H01
Specialty Plug	Denmark	430380H01
Specialty Plug	Great Britain	316704H01

Specialty plugs (factory-installed) for all models		Cat. No.
Specialty Plug	India	430271H01
Specialty Plug	Israel	430273H01
Specialty Plug	Italy	430272H01
Specialty Plug	Switzerland	430382H01
Specialty Plug	Twist lock plug NEMA L5-20P	327197H02
Specialty Plug	Twist lock plug NEMA L6-15P	327197H01

Services

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 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 factory for accurate performance. An optional Certificate of Calibration to an NIST 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 ordered 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.

Cat. No.	Service 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
6916-4	Factory quality control test log report
6916-5	Factory quality control test temperature graphs

Other accessories

Wireless monitoring

The Smart-Vue Pro system is a remote monitoring solution for sample processing and storage applications from research through to production and patient care. This advanced solution is connected by a secure, long-range, dedicated network that enables 21 CFR Part 11–compliant data logging and monitoring of critical parameters across your laboratory equipment.

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. 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.

See wireless monitoring solutions, consumables, media, reagents, and more at **thermofisher.com**

thermo scientific

Also available: Thermo Scientific™ TSX Series high-performance undercounter refrigerators

The only undercounter lab-grade refrigerator with redundant cooling

- Low energy usage

- Low noise

- High storage capacity

- Universal voltage

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