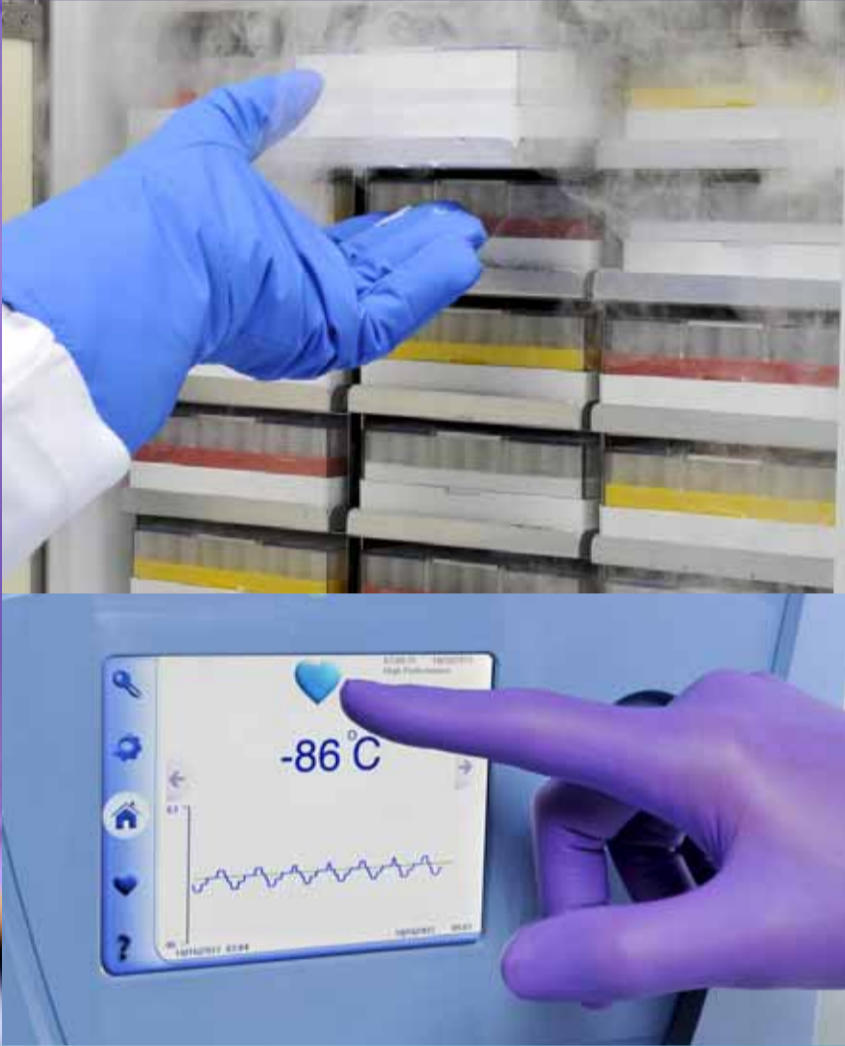


NEW! Thermo Scientific
TS Series Ultra-Low
Temperature Freezers



your samples

our obsession

Thermo
SCIENTIFIC

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your samples

To the rest of the world these are samples. To us they are a scientist's life's work. A lab's mission. A company's breakthrough. We are obsessed with sample integrity. Every one of our cold storage solutions is optimized for the best protection of critical samples. Our TS Series ultra-low temperature freezers offer a complete range of upright and chest configurations designed for maximum sample protection.

our obsession





Introducing the new Thermo Scientific™ TSU Series

Your samples need to stay cold. Period.

That's why our TSU Series freezers offer outstanding door opening recovery rates and consistent temperature uniformity. To ensure the safety of your samples, our new freezers endured rigorous testing – the equivalent of more than 26 years of run time before making their way to the market.

Your samples are precious and so is your lab space.

With our TSU Series freezers, it really is possible to fit more samples into less physical space. With five convenient sizes to choose from, we've got a freezer that will fit just right.

Sample protection should be easy.

Our TSU Series freezers feature an easy-to-use, touch screen panel with an innovative health monitor that lets you see what's going on inside without opening the door. On-board data logging provides you with a downloadable record.

Protect your samples and the environment too. From water-blown foam insulation and an environmentally-friendly mix of refrigerants, to an energy-saving mode option, our TSU Series freezers protect more than just your samples.

-86°C and -40°C upright and chest freezers

Our **TSE Series -86°C** and **TSD Series -40°C** upright freezers feature an intuitive microprocessor control for uncompromised sample protection.

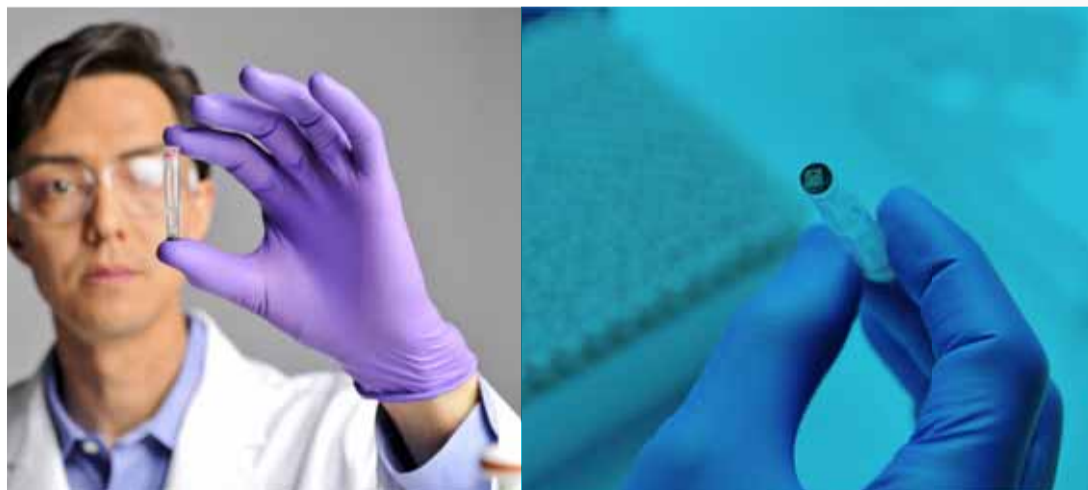
Our **TSC Series -86°C** and **-40°C chest freezers** offer all the features and benefits of our TSE and TSD uprights.

what to look for in an ultra-low temperature freezer

Select the optimal capacity and design

		Thermo Scientific TSU Series -86°C Freezers					Thermo Scientific TSE Series -86°C Freezers			
		TSU300	TSU400	TSU500	TSU600	TSU700	TSE240	TSE320	TSE400	TSE600
Capacity	cu. ft. (liters)	14.9	19.4	24.1	28.8	33.5	13	17.3	23	28
		(421)	(548)	(682)	(815)	(949)	(368)	(490)	(651)	(793)
2" Box Capacity	boxes	300	400	500	600	700	240	320	400	600
Vial Capacity	2mL vials	30,000	40,000	50,000	60,000	70,000	24,000	32,000	40,000	60,000
Footprint	sq. ft. (sq. meters)	7.05	8.46	9.92	11.38	12.85	7.61	9.00	11.02	12.64
		(0.65)	(0.79)	(0.92)	(1.06)	(1.19)	(0.71)	(0.84)	(1.02)	(1.17)
Energy*	KW/day	17	19	19	20	22	17	18	19.3	21
Vial to Footprint	vials/ft ² (vials/m ²)	4,255	4,728	5,040	5,272	5,447	3,154	3,600	3,360	4,747
		(46,154)	(50,633)	(54,348)	(56,604)	(58,824)	(33,803)	(38,095)	(39,216)	(51,282)
Vials to Energy	watts/100 2mL vials (box)	2.36	1.93	1.54	1.39	1.31	2.95	2.47	1.98	1.46

* Based on internal performance data. Data on file. May, 2011.



what to look for in an ultra-low temperature freezer

Choose advanced technologies

	Thermo Scientific TSU Series -86°C Freezers					Thermo Scientific TSE Series -86°C Freezers			
	TSU300	TSU400	TSU500	TSU600	TSU700	TSE240	TSE320	TSE400	TSE600
Performance									
Display	LCD Touch-Screen					LED Push Button			
On-Board Datalogging	Standard					Not Available			
Setpoint Security	Standard					Not Available			
Operating Modes	Two Modes – High-Performance or Energy-Savings					One Mode – Standard Operation			
Security									
Key Lock Padlock	Standard					Standard With Unique Key Option			
Compatible Key	Standard					Not Available			
Card Access	Optional					Not Available			
Setpoint Security	Standard					Not Available			
Data Management									
Monitoring Outputs	Standard: RS-485, 4-20mA, Dry Contacts					RS-485, 4-20mA, Dry Contacts - Standard PT100 Probe Optional			
Data Outputs	Log File Through USB					Not Available			

Other ultra-low temperature freezers

-40°C Upright and Chest Freezers

Choose our TSD Series -40°C upright freezers or TSC Series -40°C chest freezers for applications requiring storage between -10°C and -40°C. Select from 13, 17 or 23 cu. ft. (368, 490, 651L) uprights or 3, 12, 17 or 20 cu. ft. (85, 360, 481, 566L) chests. Models are available with optional chart recorders and backup systems.

-86°C Chest Freezers

Do you require a -86°C chest freezer configuration? Select from our TSC Series' 3, 12, 17 or 20 cu. ft. (85, 360, 481, 566L) cabinets to meet a wide variety of storage needs. Models are available with optional chart recorders and backup systems.

ultimate protection

optimum capacity

Introducing the new Thermo Scientific TSU Series

Built specifically to protect the most critical of samples, our new TSU Series freezers achieve outstanding thermal performance, safety and security through state-of-the-art engineering.

Outstanding Performance

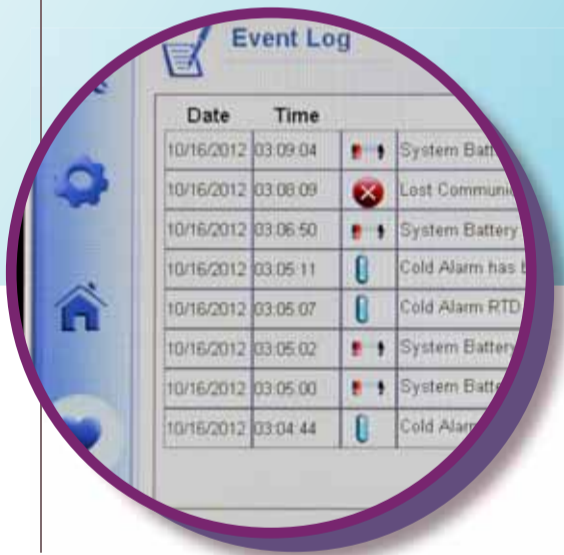
Our new TSU Series freezers feature an outstanding BTU (British Thermal Unit) reserve. This leads to fast door opening recovery times so that sample integrity isn't compromised.¹

Safety and Security

The highlight of our TSU Series freezers is an innovative, touch-screen user interface. Here you can control all freezer settings and user authority levels as well as monitor the freezer's health 24/7 and access a detailed event log. Need a record? Simply download a report of the current event log to a portable drive via a built-in USB port.

Energy-Savings

Save up to 15% in energy usage with our energy-savings mode* or choose our high-performance mode for applications requiring ultra-tight temperature uniformity.*



* Comparison between high-performance and energy-savings mode.
1. Based on internal performance data. Data on file. May, 2011.

ultimate protection

optimum capacity



Sample Storage Capacity

Laboratories come in all shapes and sizes, often creating a dilemma for the quantity of samples requiring protection. Our TSU Series freezers meet that challenge with five sizes, featuring outstanding capacity per footprint specifications.¹



designed for ultimate sample protection

Maximize temperature uniformity, space and minimize energy use

- High-tech construction combines vacuum panel insulation with environmentally-friendly, water-blown foam insulation for maximum sample-to-vial footprint storage.
- Environmentally-friendly, CFC/HCFC free refrigerants.
- Remote alarm contacts and 4-20 milliamp output compatible with external alarm and monitoring systems.
- Two rear access, 1-inch (25mm) ports allow for the use of external probes or instrumentation.
- Pressure Equalization Port (PEP) allows for quick re-entry after door openings.
- Power management system protects against a wide range of voltage variation and is easily accessible through the touch-screen display.
- NEW refrigeration system with high-efficiency compressors for outstanding performance and reliability. Brazed plate heat exchanger for more efficient heat transfer. Induction brazed joints to reduce leak potential and improve reliability.



NEW reinforced shelves

Store up to 278 lbs. of samples (depending on freezer model) on our reinforced, stainless steel shelving.

NEW inner doors

Four polystyrene insulated inner doors help maintain cabinet temperature during openings and feature embedded rare earth magnets, eliminating exposed latches or magnets.

NEW outer door gaskets

4x7 heated gasket provides four touchpoints of security and seven zones of protection, maximizing cabinet temperature and eliminating frost build-up.



Optional stainless steel inventory racking solutions

NEW optional hands-free locking option

Proximity card access control for enhanced security. On-board computer records who opened the door, when it occurred and for how long.



designed for ultimate sample protection

Long-life durability

Rugged steel construction with a corrosion-resistant coating.

Information at your fingertips

New touch-screen user interface provides access to vital freezer information including event log, settings and user profiles.

On-board data storage

Store up to 15 years worth of temperature and event data on our on-board computer.

Optional LN₂ and CO₂ back-up systems

Provides three control points of additional protection to ensure maximum sample protection

Single-hand operation

Easy-to-use, padlock-compatible, ergonomic door handle with integrated key lock.

Easy-to-remove, washable filter

Rugged steel construction with a corrosion-resistant coating.

Long-life durability

Provides protection against dust on the condenser, which can cause reduced refrigeration performance and increased risk to samples.

Simplified installation

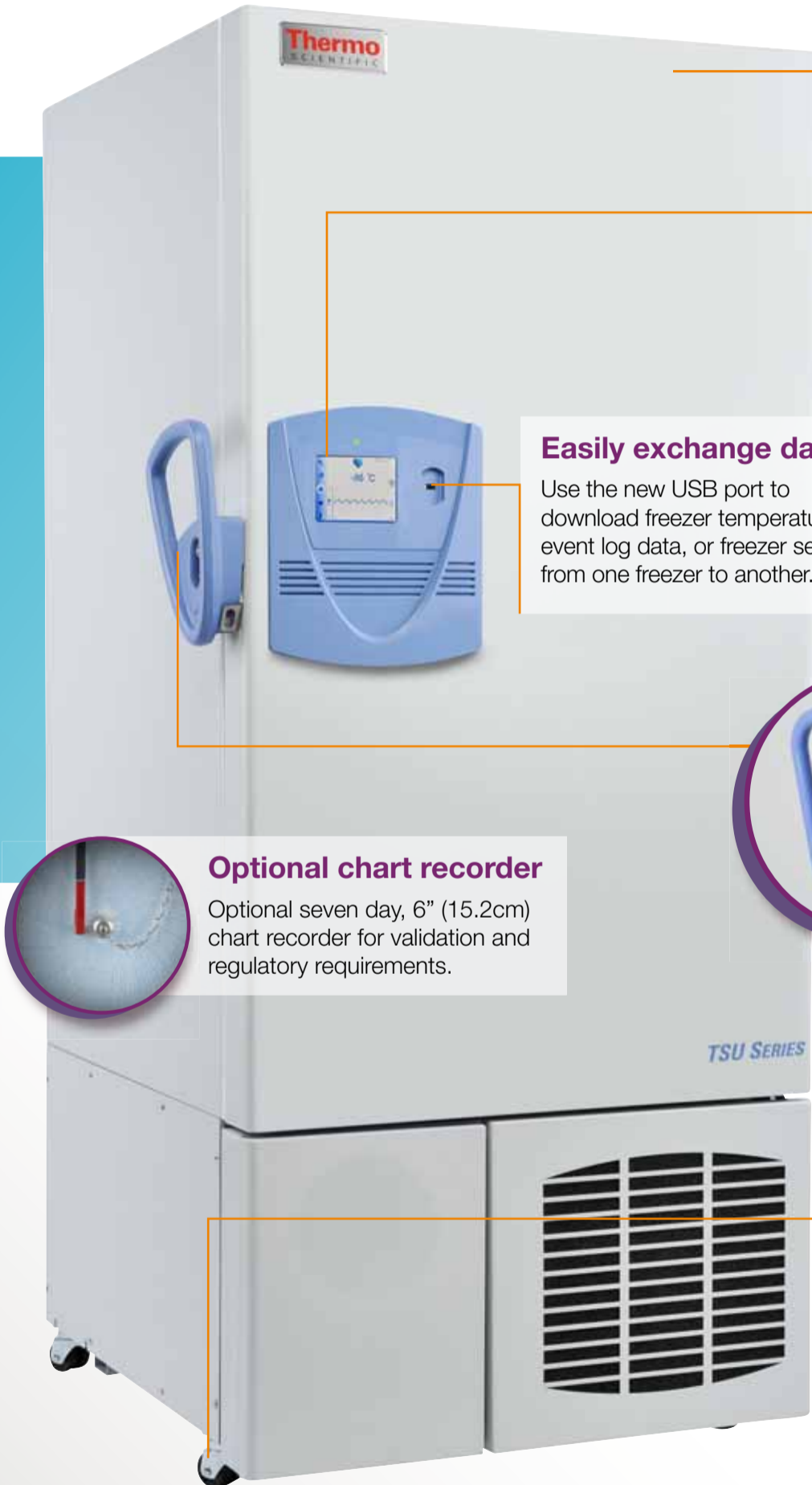
with our new easy-roll 2" (5cm) locking casters.

Easily exchange data

Use the new USB port to download freezer temperature and event log data, or freezer settings from one freezer to another.

Optional chart recorder

Optional seven day, 6" (15.2cm) chart recorder for validation and regulatory requirements.



more samples

less freezer footprint

Our TSU Series freezers maximize sample storage capacity while minimizing the freezer's physical space inside your laboratory. Space concerns are common in labs throughout the world and that's why we offer five models to accommodate your storage as well as your footprint requirements.

Store 20% more in 19% less space with our new TSU300*

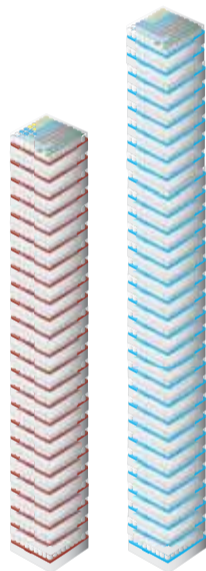
Store 30,000 2mL vials in our new TSU300 freezers compared with 24,000 in the previous generation Thermo Scientific freezer.

Save 20% in space with our new TSU400*

Store 40,000 2mL vials in a smaller footprint compared to the previous generation Thermo Scientific freezer



Each box represents 10 2" cryoboxes



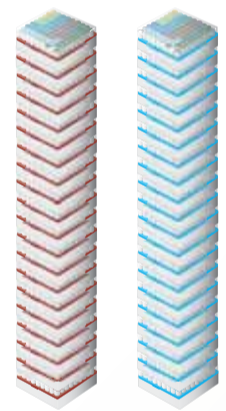
Previous Generation Freezer
13 cu. ft. (368L)
Held 24,000 vials

New TSU300
14.9 cu. ft. (421L)
Holds 30,000 vials

27" (68.6cm)
33.3" (84.6cm)



Each box represents 20 2" cryoboxes



Previous Generation Freezer
23 cu. ft. (651L)
Held 40,000 vials

New TSU400
19.4 cu. ft. (548L)
Holds 40,000 vials

32.4" (82.3cm)
40.8" (103.6cm)

Store up to 118,300 vials in a single freezer

Working with our new cabinet design, vacuum insulation panel technology increases the internal capacity of 2 inch vials over previous generation freezers. And, by using our 1mL CryoBank™ tubes, you gain up to 76% more capacity for high-density storage in the same footprint!*

Freezer Model	Footprint (Nominal)	2 inch Boxes	3 inch Boxes	2mL Tubes	1mL Tubes
TSU300	7.05 sq. ft. (0.65 m ²)	300	225	30,000	50,700
TSU400	8.46 sq. ft. (0.79 m ²)	400	300	40,000	67,600
TSU500	9.92 sq. ft. (0.92 m ²)	500	375	50,000	84,500
TSU600	11.38 sq. ft. (1.06 m ²)	600	450	60,000	101,400
TSU700	12.85 sq. ft. (1.19 m ²)	700	525	70,000	118,300

your choice of refrigeration

For the strictest tolerances, our high-performance mode provides the tightest temperature uniformity.**
For most applications, energy-savings mode offers excellent temperature control, plus up to 15% savings on energy usage.**

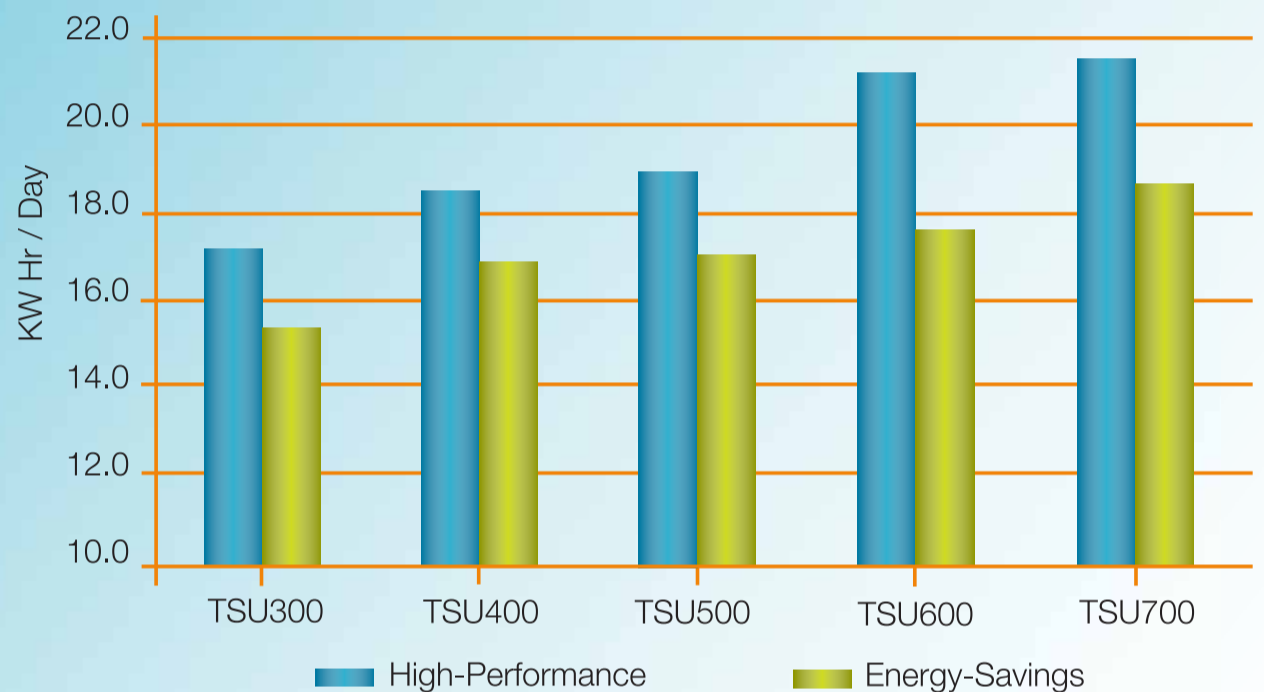
High-Performance¹

- Outstanding temperature uniformity and peak variation from setpoint
- Designed with GMP applications in mind

Energy-Savings¹

- Excellent temperature uniformity
- Up to 15% energy savings over high-performance mode

Energy Usage per Day



By controlling the temperature and time of the cycles, the energy-savings mode can save up to 15% while still offering tightly-controlled cabinet temperature and excellent door-opening recovery. The high-performance mode maintains the strictest cabinet temperature control.**

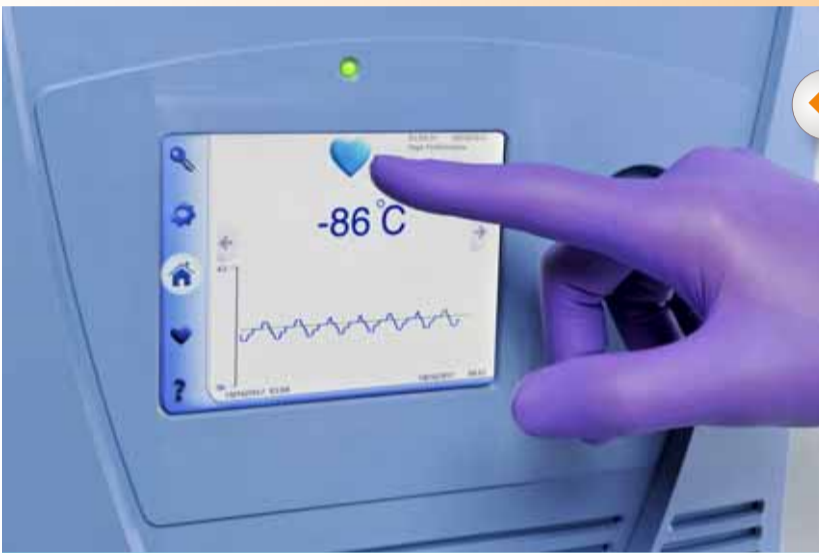
1. Based on internal performance data. Data on file. May, 2011.

* Compared to previous generation HERAFreeze.

** Comparison between high-performance and energy savings modes.

sample protection at your fingertips

You can check your freezer's "health" at any time by simply touching the heart icon on the main screen. Here, you will see the freezer's temperature and can access the settings.



Health monitoring system

- **If the heart is blue**, your freezer is in good health, protecting your samples.
- **In the event the heart changes to yellow**, something needs to be addressed. The yellow heart provides indications of system status, battery alerts, preventative maintenance reminders, ambient alerts and unacknowledged alarms.
- **A red heart indicates there is a problem.** Should this occur, you will be notified with visual and audible alarms. Conditions causing a red heart include warm and cold alarms, door open alarms and power failure.



Who is using this freezer?

Our freezers have multiple security levels to fit your lab requirements:

- **No access control required?** Use our full-access mode and the freezer operates like any other.
- **Need to restrict who can change setpoints?** Use our secure mode where you can designate different types of users.

sample protection at your fingertips

Don't open the door: here's what's going on inside...

If at any time you want to know what's going on inside the freezer, you don't need to open the door (despite our excellent recovery times). The following are just a finger stroke away:

- **Alarm status:** including active alarms and past events.
- **Door opening status:** How many door openings and length of time the door was open.
- **Temperature status:** What is the actual temperature? When was the freezer at its warmest and coldest? Need more detail? Simply press the thermometer icon to get the temperature status at 8 points in the freezer or refrigeration system.
- **Environmental conditions:** See a summary of the ambient temperature and the incoming electrical voltage.
- **Back-up system status:** CO₂ or LN₂ is actively injecting into the freezer. "Green" means good; "Red" signifies to re-fill the CO₂ or LN₂ supply tank.



What happened, when, where?

Because each of your samples is precious, we've developed an intuitive event log as part of the TSU Series freezer's touch-screen interface. And, you can easily export your event log data via the built-in USB port to Microsoft™ Excel™. Simply insert your USB drive and touch the download icon.



Do you have multiple freezers on-site?

No problem. Simply load the data from one freezer to the next, via the built-in USB port. This simple action takes the freezer setpoint and user database from one freezer to another.



TSU300



TSU400



TSU500



TSU600



TSU700



Thermo Scientific TSU Series Upright Freezers (-50°C to -86°C)

Model No.	Capacity cu. ft. (liters)	2 inch Box Qty.	Electrical	Amps/Breaker (Plug)	Shelf Weight lbs. (kg)	Interior Dimensions H x W x D in. (cm)	Exterior Dimensions H x W x D in. (cm)	Shipping Weight lbs. (kg)
TSU300A TSU300D TSU300V	14.9 (421)	300	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	125 (56.8)	51.23 x 17.78 x 28.29 (130.11 x 45.16 x 71.86)	78.0 x 27.0 x 37.6 (198.1 x 68.6 x 95.5)	697 (303)
TSU400A TSU400D TSU400V	19.4 (548)	400	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	165 (73.4)	51.23 x 23.13 x 28.29 (130.11 x 58.74 x 71.86)	78.0 x 32.4 x 37.6 (198.1 x 82.2 x 95.5)	730 (332)
TSU500A TSU500D TSU500V	24.1 (682)	500	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	205 (91.7)	51.23 x 28.75 x 28.29 (130.11 x 73.03 x 71.86)	78.0 x 38.0 x 37.6* (198.1 x 96.5 x 95.5)	782 (355)
TSU600A TSU600D TSU600V	28.8 (815)	600	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	245 (110.1)	51.23 x 34.38 x 28.29 (130.11 x 87.31 x 71.86)	78.0 x 43.6 x 37.6* (198.1 x 110.8 x 95.5)	854 (388)
TSU700D TSU700V	33.5 (949)	700	208-230V / 60Hz 230V / 50Hz	12/15 (NEMA 6-15) 12/15 (European)	285 (128.4)	51.23 x 40.0 x 28.29 (130.11 x 101.60 x 71.86)	78.0 x 49.2 x 37.6* (198.1 x 125.1 x 95.5)	951 (432)

* Door opening clearance for TSU500, TSU600 and TSU700 is 34.5" (86cm).

TSU300



TSU400



TSU500



TSU600



TSU700



Freezer Performance Data

Model No.	Energy Consumption (kW-hour/day)*		Peak Variation From -80°C Setpoint (°C)**	Door Opening Recovery (Minutes)	Warm-Up Time (-80°C to -50°C) (Minutes)***
	Energy-Savings Mode	High-Performance Mode			
TSU300	15.3	17	+5.5 / -6.4	13	213
TSU400	16.9	18.5	+5.6 / -5.3	20	225
TSU500	17	19	+3.8 / -5.6	28	237
TSU600	17	21.3	+2.9 / -4.9	33	240
TSU700	18.5	21.8	+2.2 / -5.5	39	241

* Energy Calculation: Average data based on internal testing with freezer setpoint at -80°C and ambient temperature at 25°C
 ** Peak Variation from Setpoint: Average data based on internal testing with freezer setpoint at -80°C and ambient temperature at 25°C
 *** Warm-Up Time: Average: Average data based on internal testing with freezer setpoint at -80°C and ambient temperature at 25°C

Standard Plug Options

Model No.	Plug Description	Plug Type
US125V20A	NEMA 5-20	
US230V15A	NEMA 6-15	
EU230V16A	Continental EU	

Specialty Plug Options

Choose one of our specialty plugs to configure your freezer to meet local requirements

Model No.	Plug Description	Plug Type
IT230V16A	Italy	
UK230V13A	Great Britain	
IN230V16A	India	
IS230V16A	Israel	
AU230V16A	Australia	
CH230V16A	China	
DK230V16A	Denmark	
AR230V16A	Argentina	
SW230V16A	Switzerland	
BR230V16A	Brazil	

Additional Cords and Plugs

Model No.	Plug Description
430266	115V/20A Twist Lock Plug (NEMA L5-20P)
430267	230V/15A Twist Lock Plug (NEMA L6-15P)

Options (Field-installed must be installed by qualified professional)

Description	For Use With ▶	TSU300	TSU400	TSU500	TSU600	TSU700
LN2 Back-Up System Maintains temperature down to -80°C with liquid nitrogen. Models for TSE300 are stand alone.	Factory Installed	N/A	LN4567	LN4567	LN4567	LN4567
	Field Installed	FLN300A* FLN300D* FLN300V* FLN300W*	FLN4567	FLN4567	FLN4567	FLN4567
CO2 Back-Up System Maintains temperature down to -67°C with CO2. Models for TSE300 are stand alone.	Factory Installed	N/A	C04567	C04567	C04567	C04567
	Field Installed	FC0300A* FC0300D* FC0300V* FC0300W*	FC04567	FC04567	FC04567	FC04567
Chart Recorder (Inkless) 6" (150mm), seven day, inkless recorder, to -115 to +50°C, +5°C resolution	Factory Installed	N/A	CR4567	CR4567	CR4567	CR4567
	Field Installed	N/A	FCR400FT	FCR567FTH	FCR567FTH	FCR567FTH
Chart Recorder (Ink) 6" (150mm), seven day, recorder, -100 to +38°C, +2°C resolution	Factory Installed	N/A	CRP4567	CRP4567	CRP4567	CRP4567
	Field Installed	6383-6A* 6383-6D* 6383-6V* 6383-6W*	FGRP400FT	FGRP567FTH	FGRP567FTH	FGRP567FTH
Access Key Option Card access control, includes five key cards	Factory Installed	RAC34567	RAC34567	RAC34567	RAC34567	RAC34567
	Field Installed	FRAC34567	FRAC34567	FRAC34567	FRAC34567	FRAC34567
Stainless Steel Freezer Interior	Factory Installed	SS34567	SS34567	SS34567	SS34567	SS34567

* A = 115V/60 Hz (NEMA 5-20 plug); D = 208-230V/60 Hz (NEMA 6-15 plug); V = 230V/50 Hz (EU plug); W = 230V/50 Hz (UK plug).

Accessories

Description	For Use With ▶	TSU300	TSU400	TSU500	TSU600	TSU700
Access Key Pack (US) Includes five cards; supports ISO15693 Protocol		ACU34567	ACU34567	ACU34567	ACU34567	ACU34567
Access Key Pack (EU) Includes five cards; supports ISO14443 Protocol		ACE34567	ACE34567	ACE34567	ACE34567	ACE34567
Replacement Air Filter		AF34567	AF34567	AF34567	AF34567	AF34567
Replacement Back-Up Battery		400159	400159	400159	400159	400159
Shelf Kit Includes one shelf and clips		SK300	SK400	SK500	SK600	SK700
Chart Recorder Paper (Inkless) Quantity: 50		N/A	6185	6185	6185	6185
Chart Recorder Paper (Ink) Quantity: 50		17020	17020	17020	17020	17020
Cryo Gloves™ Medium		4425	4425	4425	4425	4425
Cryo Gloves™ Large		4426	4426	4426	4426	4426
Alarm Delay Module Eliminates nuisance alarms due to intermittent or transitory conditions. Adjustable delay requires alarm condition to exist for user defined period before signal is released to monitoring system		6903	6903	6903	6903	6903
Seismic Restraint Kit		TF-ULT300	TF-ULT400	TF-ULT500	TF-ULT600	TF-ULT700

Water-Cooled Condenser Option

Model No.	For Use With
WC34567	All TSU Series freezers

The water-cooled condenser option is available on our TSU Series as a factory-installed option. Improve your energy utilization by decreasing energy consumption by up to 5% and decreasing heat emitted into your surroundings by up to 80%. This option utilizes our cascade refrigeration design to absorb heat into the water, re-using the energy while maximizing sample protection. Like our standard freezers, those with the water-cooled condenser options are UL or CE marked, depending on the voltage.

Water Requirement

Pressure Range less than 90 PSI
206.8–620.5 kpa

Temperature Range 12.0°C (53.6°F)
to 25.0°C (77.0°F)



Water Flow Rate Required (per minute)



1.0 gal. (3.8L) per min.




Connections

1/2" NPT or 1/2" BSPT on inlet and outlet.
Installation requires a qualified technician.

Thermo Scientific TSU Series Upright Freezer Racks



2" Box Racks	Model No. (Description)	Dimensions H x W x D in. (cm)	Storage	TSU300	TSU400	TSU500	TSU600	TSU700
	920090 (Sliding Drawer Rack for 2" Boxes)	11.9 x 5.5 x 26.9 (30.2 x 14 x 66.3)	Boxes Per Rack	25	25	25	25	25
			Racks Per Shelf	3	4	5	6	7
			Racks Per Freezer	12	16	20	24	28
			Boxes Per Freezer	300	400	500	600	700
	1950520 (Adjustable Side Access Rack for 2" Boxes)	11.6 x 5.4 x 26.75 (29.5 x 13.7 x 67.9)	Boxes Per Rack	25	25	25	25	25
			Racks Per Shelf	3	4	5	6	7
			Racks Per Freezer	12	16	20	24	28
			Boxes Per Freezer	300	400	500	600	700

3" Box Racks	Model No. (Description)	Dimensions H x W x D in. (cm)	Storage	TSU300	TSU400	TSU500	TSU600	TSU700
	920091 (Sliding Drawer Rack for 3" Boxes)	11.9 x 5.5 x 26.9 (30.2 x 14 x 66.3)	Boxes Per Rack	15	15	15	15	15
			Racks Per Shelf	3	4	5	6	7
			Racks Per Freezer	12	16	20	24	28
			Boxes Per Freezer	180	240	300	360	420
	1950521 (Adjustable Side Access Rack for 3" Boxes)	11.6 x 5.4 x 26.75 (29.5 x 13.7 x 67.9)	Boxes Per Rack	15	15	15	15	15
			Racks Per Shelf	3	4	5	6	7
			Racks Per Freezer	12	16	20	24	28
			Boxes Per Freezer	180	240	300	360	420

Microplate Racks	Model No. (Description)	Dimensions H x W x D in. (cm)	Storage	TSU300	TSU400	TSU500	TSU600	TSU700
	1950642 (Sliding Drawer Microplate Racks for Standard or Deepwell Plates)	11.9 x 5.5 x 26.9 (30.2 x 14 x 66.3)	Plates Per Rack	25	25	25	25	25
			Racks Per Shelf	3	4	5	6	7
			Racks Per Freezer	12	16	20	24	28
			Plates Per Freezer	420	560	700	840	980
	1950523 (Side Access Rack for Standard or Deepwell)	11.9 x 5.5 x 25.5 (30.2 x 14 x 64.8)	Plates Per Rack	105	105	105	105	105
			Racks Per Shelf	3	4	5	6	7
			Racks Per Freezer	12	16	20	24	28
			Plates Per Freezer	1,260	1,680	2,100	2,520	2,940
	1950592 (Side Access Rack with Locking Rod for Standard or Deepwell)	11.9 x 5.5 x 25.7 (30.2 x 14 x 65.3)	Plates Per Rack	147	147	147	147	147
			Racks Per Shelf	3	4	5	6	7
			Racks Per Freezer	12	16	20	24	28
			Plates Per Freezer	1,764	2,352	2,940	3,528	4,116

Racking Shelf Kits Includes Sliding Drawer Racks and 2" Boxes With 100 Count Cell Dividers	For Use With ▶	TSU300	TSU400	TSU500	TSU600	TSU700
	Model No.	RSK300SD4	RSK400SD4	RSK500SD4	RSK600SD4	RSK700SD4
	Number of Racks Included	3	4	5	6	7
	Number of 2" Boxes Included	75	100	125	150	175

Fiberboard Cryo Boxes

	Description	Model No.	Quantity	Dividers
	2" (50mm) Fiberboard Boxes 5" x 5" (12.7 x 12.7cm) water-repellant cardboard	5954	12	none
		820002	1	81
		820109	1	100
	3" (80mm) Fiberboard Boxes 5" x 5" (12.7 x 12.7cm) water-repellant cardboard	5956	12	none
		820003	1	81

Fiberboard Grid Dividers

Model No.	Dimensions	Quantity	Holds
5958	10 x 10, 0.49" cell	12	12mm vials (100)
820100	10 x 10, 0.49" cell	1	12mm vials (100)
6212	9 x 9, 0.54" cell	12	13mm vials (81)
820081	9 x 9, 0.54" cell	1	13mm vials (81)
5960	8 x 8, 0.61" cell	12	14mm vials (64)
820064	8 x 8, 0.61" cell	1	14mm vials (64)
5959	7 x 7, 0.7" cell	12	16mm vials (49)
820049	7 x 7, 0.7" cell	1	16mm vials (49)
820025	5 x 5, 0.98" cell	1	25 vials
820016	4 x 4, 1.22" cell	1	16 vials

Sliding Drawer Inserts (Pack of 5)

Description	Model No.	Slots
microplate insert	1950671P5	7
box insert	1950672P5	5



Thermo Scientific™ Nunc™ Cryobank™ systems

are a natural companion for our ultra-low temperature freezers. Both products have been designed to maximize sample protection as well as sample space. The vials' 2D barcode is easily read by instruments, offering safe sample identification and reading of entire racks in one process. In addition, our Cryobank™ systems provide the highest density cryo vial available: you can actually store up to 118,300 vials inside our 33.5 cu. ft. (948.7L) freezer.

Plus Thermo Scientific Nunc tubes conveniently click into their storage compartments with ease and can be handled without the risk of an accidental drop – yet one more reason why your samples deserve the outstanding quality and protection of Nunc storage products.

For more information, visit www.thermoscientific.com/densestorage.

daily dependability

Thermo Scientific TSE and TSD Series upright freezers are designed for daily sample protection and dependability. Choose our TSE Series freezers for applications requiring -50°C to -86°C or our TSD Series freezers when your storage requirements call for -10°C to -40°C . All models feature state-of-the-art refrigeration, rugged construction and easy-to-use microprocessor control.



TSD Series -40°C Freezer

Rugged construction for everyday use

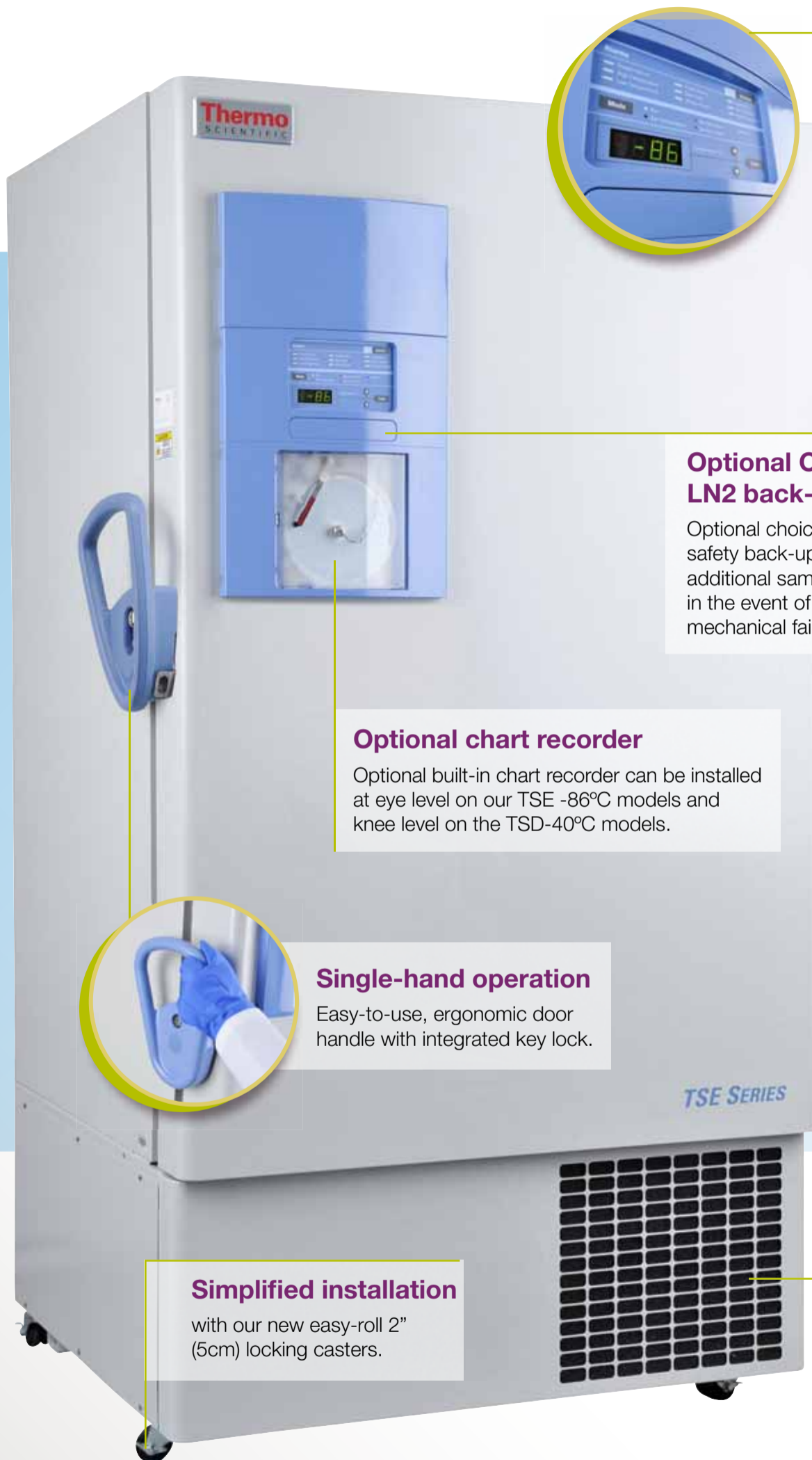
- Heavy gauge, cold-rolled steel cabinets with a powder coat paint finish for a uniform exterior that resists chipping and rust.
- 5" (127mm) foamed-in-place, polyurethane insulation reduces power consumption, maintains temperature setpoint and combined with triple-point door gasket, provides longer holding time in the event of a power loss.
- State-of-the-art, refrigeration system improves temperature control and increases reserve capacity, resulting in a more stable temperature sample.
- Two 1" (25mm) access ports allow for the use of inexpedient probes or instrumentation.
- Select from painted glaveneel or stainless steel interiors on the TSE Series or glaveneel interior on the TSD Series.
- Vacuum relief port permits easy access after door openings



Secure inner doors

Four inner doors reduce cold air loss and improve temperature recovery after door openings.

daily dependability



Microprocessor control

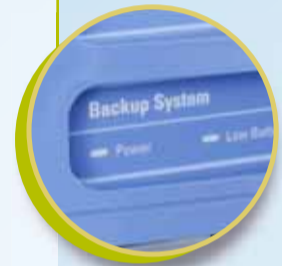
Centralized information center, including microprocessor control and monitoring system, ensures that all controls and displays are easy to reach and read. Eye level on our TSE -86°C models and knee level on the TSD-40°C models.

Power Management System

With low voltage surge protection and buck/boost.

Optional CO₂ or LN₂ back-up

Optional choice of CO₂ or LN₂ safety back-up systems for additional sample protection in the event of a power or mechanical failure.



Optional chart recorder

Optional built-in chart recorder can be installed at eye level on our TSE -86°C models and knee level on the TSD-40°C models.



Single-hand operation

Easy-to-use, ergonomic door handle with integrated key lock.



Easy-to-remove, washable filter

Provides protection from dust on the condenser, causing reduced refrigeration performance and increased risk to samples.

Simplified installation

with our new easy-roll 2" (5cm) locking casters.

TSE Series -86°C Freezer

Thermo Scientific TSE Series -86°C Upright Freezers (-50°C to -86°C)

Model No. (Painted Interior)	Model No. (Stainless Steel Interior)	Capacity cu. ft. (liters)	2 in. Box Qty.	Electrical	Amps / Breaker (Plug)	Maximum Shelf Weight lbs. (kg)	Interior Dimensions H x W x D in. (cm)	Exterior Dimensions H x W x D in. (cm)	Shipping Weight lbs. (kg)
TSE240A TSE240D TSE240V	TSE240SSA TSE240SSD TSE240SSV	13.0 (368)	240	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	125 (57)	51.5 x 23.0 x 19.3 (130.8 x 58.4 x 49.0)	77.9 x 33.3 x 32.9 (197.9 x 84.6 x 83.6)	711 (323)
TSE320A TSE320D TSE320V	TSE320SSA TSE320SSD TSE320SSV	17.3 (490)	320	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	125 (57)	51.5 x 23.0 x 25.3 (130.8 x 58.4 x 64.3)	77.9 x 33.3 x 38.9 (197.9 x 84.6 x 98.8)	830 (376)
TSE400A TSE400D TSE400V	TSE400SSA TSE400SSD TSE400SSV	23.0 (651)	400	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	125 (57)	51.5 x 30.6 x 25.3 (130.8 x 77.7 x 64.3)	77.9 x 40.8 x 38.9 (197.9 x 103.6 x 98.8)	879 (399)
TSE600D TSE600V	TSE600SSD TSE600SSV	28.0 (793)	600	208-230V / 60Hz 230V / 50Hz	12/15 (NEMA 5-20) 12/15 (European)	125 (57)	51.5 x 36.6 x 27.0 (130.8 x 93.0 x 68.6)	77.9 x 46.8 x 38.9 (197.9 x 118.9 x 98.8)	1090 (494)

Thermo Scientific TSD Series -40°C Upright Freezers (-10°C to -40°C)

Model No.	Capacity cu. ft. (liters)	2 in. Box Qty.	Electrical	Amps / Breaker (Plug)	Maximum Shelf Weight lbs. (kg)	Interior Dimensions H x W x D in. (cm)	Exterior Dimensions H x W x D in. (cm)	Shipping Weight lbs. (kg)
TSD40240A TSD40240D TSD40240V	13.0 (368)	240	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 5-15) 12/16 (European)	125 (57)	51.5 x 23.0 x 19.3 (130.8 x 58.4 x 49.0)	77.9 x 33.3 x 32.9 (197.9 x 84.6 x 83.6)	711 (323)
TSD40320A TSD40320D TSD40320V	17.3 (490)	320	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 5-15) 12/16 (European)	125 (57)	51.5 x 23.0 x 25.3 (130.8 x 58.4 x 64.3)	77.9 x 33.3 x 38.9 (197.9 x 84.6 x 94.0)	830 (376)
TSD40400D TSD40400V	23.0 (651)	400	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 5-15) 12/16 (European)	125 (57)	51.5 x 30.6 x 25.3 (130.8 x 77.7 x 64.3)	77.9 x 40.8 x 38.9 (197.9 x 103.6 x 94.0)	879 (399)

Monitoring and Remote Options

Model No.	Electrical	Description
5612-1A 5612-3V	120V / 60Hz 230V / 50Hz	Remote Alarm with Audible Signal Extend the freezer's on-board alarm systems to remote locations in the facility.
400047 400182	120V / 60Hz 220V / 50Hz	Sensaphone™ Telephone Dialing System Monitors up to four channels and dials up to four telephone numbers. A dedicated telephone line is required. Not approved for sales requiring CE.
400134 400183	120V / 60Hz 220V / 50Hz	Sensaphone Telephone Dialing System Monitors up to eight channels and dials up to eight telephone numbers. A dedicated telephone line is required. Not approved for sales requiring CE.
400048 400049	120V / 60Hz 220V / 50Hz	Temperature / Power Monitor External digital and audible/visual alarm monitors temperature and power supply of the freezer. Includes temperature probes.



Sensaphone
Telephone
Dialing System

Options (Field-installed must be installed by qualified professional)

Model No.	Installation	Description
1950447	Factory	LN2 Back-Up System
1950448	Field	Maintains temperature down to -80°C with liquid nitrogen
1950445	Factory	CO2 Back-Up System
1950446	Field	Maintains temperature down to -70°C with CO2
201241	Factory	Ink Chart Recorder
201240	Field	6" (15.2cm), seven day recorder to -150°C. Includes one red felt tip pen and box of chart paper (quantity: 50)
201249	Factory	Inkless Chart Recorder
201248	Field	6" (15.2cm), seven day inkless recorder to -150°C. Includes box of chart paper (quantity: 50)
195915	Factory	Unique Key Lock
290199	Factory	PT100 Sensor
290211	Field	Optional sensor for connection to building automation systems



Back-Up Systems



Chart Recorder

Accessories

Model No.	Description
195890	Replacement Air Filter (quantity: 5)
400159	Replacement Back-Up Battery
991505	High-Pressure Liquid CO2 Hose 6' long, kink-resistant, stainless steel lined, double-braided sheath. 316 stainless steel NPT F fitting. Maximum working pressure 25,000 psig
950316	Wall Clamp – CO2 cylinder holder for securing tank to the wall for OSHA guidelines
4000401	LN2 Transfer Hose – flexible 6' metal hose: 0.5" diameter, 45° flare with swivel end
17020	Ink Chart Paper (quantity: 50)
180000	Inkless Chart Paper (quantity: 50)
224134	Shelf Kit for 240 box capacity freezers (includes one shelf and clips)
224135	Shelf Kit for 320 box capacity freezers (includes one shelf and clips)
224158	Shelf Kit for 400 box capacity freezers (includes one shelf and clips)
224180	Shelf Kit for 600 box capacity freezers (includes one shelf and clips)
245231	Red Felt Tip Pen
245232	Blue Felt Tip Pen
4425	Cryo Gloves (medium)
4426	Cryo Gloves (large)
TF-ULT13	Seismic restraint kit for 13 cu. ft. (368L)
TF-ULT17	Seismic restraint kit for 17.3 cu. ft. (490L)
TF-ULT23	Seismic restraint kit for 23 cu. ft. (651L)
TF-ULT28	Seismic restraint kit for 28 cu. ft. (600L)

Water-Cooled Condenser Option

Model No.	For Use With
195964	TSE240
195965	TSE320, TSE400, TSE600

The water-cooled condenser option is available on our -86°C upright and chest freezers. Your work environment stays cooler because 50% less heat is emitted to your surroundings (i.e. less BTU rejection) A water regulating valve automatically controls the water flow needed to maintain the compressor discharge pressure. Cooler compressor temperatures enhance compressor stability and reliability.

Like our standard freezers, those with the watercooled condenser options are also UL listed to Canadian and United States requirements and bear the CE mark.

The following specifications apply to tower and city water sources:*

Water Pressure and Temperature

Maximum Pressure 150 psig

Maximum Temperature 29.4°C

Connections

Inlet 0.5" compression

Outlet 0.5" compression

Water Flow Rate Required (per minute)

Tower Water 3.0 gal. (11.4L)

City Water..... 1.0 gal. (3.8L)

Drain Required?

Tower Water No (return line)

City Water..... Yes

Installation requires a qualified technician and should include proper adjustment of the regulating valve which controls the discharge pressure.






*Actual requirements may vary due to specific water pressure conditions.






Thermo Scientific TSE and TSD Series Upright Freezer Racks for 2" Boxes

2" Box Racks	Model No. (Description)	Dimensions H x W x D in. (cm)	Freezer Vol. cu. ft. (liters)	Boxes/ Rack	Racks/ Shelf	Racks/ Freezer	Boxes/ Freezer
	920094 (Sliding Drawer Rack for 2" Boxes)	11.9 x 5.5 x 16.6 (30.2 x 14 x 42.2)	13 (368.1)	15	4	16	240
	920096 (Sliding Drawer Rack for 2" Boxes)	11.9 x 5.5 x 22 (30.2 x 14 x 55.9)	17.3 (490)	20	4	16	320
			23 (651.3)	20	5	20	400
	1950726 (Sliding Drawer Rack for 2" Boxes)	11.9 x 5.5 x 26.3 (30.2 x 14 x 66.5)	28.1 (793)	25	6	24	600
	920015 (Adjustable Side Access Rack)	11.6 x 5.4 x 16.5 (29.5 x 13.7 x 41.9)	13 (368.1)	15	4	16	240
	920022 (Side Access Rack for 2" Boxes)	11.6 x 5.4 x 24.6 (29.5 x 13.7 x 62.5)	17.3 (490)	22	4	16	352
			23 (651.3)	22	5	20	440
	920018 (Adjustable Side Access Rack)	11.6 x 5.4 x 22 (29.5 x 13.7 x 55.8)	17.3 (490)	20	4	16	320
			23 (651.3)	20	5	20	400

**Thermo Scientific TSE and TSD Series
Upright Freezer Racks for 3" Boxes**

3" Box Racks	Model No. (Description)	Dimensions H x W x D in. (cm)	Freezer Vol. cu. ft. (liters)	Boxes/ Rack	Racks/ Shelf	Racks/ Freezer	Boxes/ Freezer
	920095 (Sliding Drawer Rack for 3" Boxes)	11.9 x 5.5 x 16.6 (30.2 x 14 x 44.2)	13 (368.1)	9	4	16	144
	920097 (Sliding Drawer Rack for 3" Boxes)	11.9 x 5.5 x 22 (30.2 x 14 x 55.9)	17.3 (490)	12	4	16	192
			23 (651.3)	12	5	20	240
	1950727 (Sliding Drawer Rack for 3" Boxes)	11.9 x 5.5 x 26.3 (30.2 x 14 x 66.5)	28.1 (793)	15	6	24	360
	920009 (Side Access Rack for 3" Boxes)	11.6 x 5.4 x 16.5 (29.5 x 13.7 x 41.9)	13 (368.1)	9	4	16	144
	920017 (Side Access Rack for 3" Boxes)	11.6 x 5.4 x 22 (29.5 x 13.7 x 55.9)	17.3 (490)	12	4	16	192
			23 (651.3)	12	5	20	240

Thermo Scientific TSE and TSD Series Upright Freezer Specialty Racks

Specialty Racks	Model No. (Description)	Dimensions H x W x D in. (cm)	Freezer Vol. cu. ft. (liters)	Racks/ Shelf	Racks/ Freezer
	830012 (Multi-Drawer Rack)	11.5 x 11 x 11 (29.2 x 28 x 28)	13 (368.1)	1	4
			17.3 (490)	2	8
			23 (651.3)	4	16
	830030 (8 Compartment Container)	5.3 x 7 x 18 (13.5 x 18 x 45.7)	13 (368.1)	6	24
	830032 (10 Compartment Container)	5.3 x 7 x 22.6 (13.5 x 18 x 56)	17.3 (490)	6	24
			23 (651.3)	6	32

Sliding Drawer Inserts (Pack of 5)







Model No.	For	Freezer Volume	Slots
1950666P5	microplates	13 cu. ft. (368L)	4
1950669P5	microplates	17/23 cu. ft. (490/651L)	6
1950671P5	microplates	28 cu. ft. (793L)	7

Model No.	For	Freezer Volume	Slots
1950668P5	boxes	13 cu. ft. (368L)	3
1950670P5	boxes	17/23 cu. ft. (490/651L)	4
1950672P5	boxes	28 cu. ft. (793L)	5

Racking Shelf Kits (Includes Sliding Drawer Racks and 2" Boxes with 100-Count Cell Dividers)

Model No.	Freezer Vol. cu. ft. (liters)	Racks Included	Boxes Included
RSK13SD4	13.0 (368)	4	60
RSK17SD4	17.3 (490)	4	80
RSK23SD4	23.0 (651)	5	100
RSK28CFSD4	28.0 (793)	6	150

Thermo Scientific TSE and TSD Series Upright Freezer Racks for Microplates

Microplate Racks	Model No. (Description)	Dimensions H x W x D in. (cm)	Freezer Vol. cu. ft. (liters)	Plates/Rack	Racks/Shelf	Racks/Freezer	Plates/Freezer
	1950640 Sliding drawer rack	11.9 x 5.5 x 16.6 (30.2 x 14 x 44.2)	13 (368.1)	20	4	16	320
	1950641 Sliding drawer rack	11.9 x 5.5 x 22 (30.2 x 14 x 55.9)	17.3 (490)	30	4	16	480
23 (651.3)			30	5	20	600	
	1950731 Sliding drawer rack	11.9 x 5.5 x 26.3 (30.2 x 14 x 66.8)	28 (793)	35	6	24	840
	1950651 Side access rack	11.9 x 5.3 x 14.7 (30.2 x 13.5 x 37.3)	13 (368.1)	56	4	16	896
	1950652 Side access rack	11.9 x 5.3 x 22 (30.2 x 13.5 x 55.9)	17.3 (490)	84	4	16	1344
			23 (651.3)	84	5	20	1680
	820036 Side access rack	12 x 5.5 x 22 (30.5 x 14 x 55.9)	17.3 (490)	36	4	16	576
			23 (651.3)	36	5	20	720

See Page 19 for Boxes and Dividers

versatile and reliable

Thermo Scientific TSC Series chest freezers contain all the sample protection features of our TSE and TSD upright series. Choose a -86°C or -40°C cabinet in four convenient sizes as well as a full range of racking solutions.

Rugged construction for everyday use

- Heavy gauge, cold-rolled steel cabinets with a powder coat paint finish for a uniform exterior that resists chipping and rust.
- 5" (127mm) foamed-in-place, polyurethane insulation reduces power consumption, maintains temperature setpoint and combined with sub lids and door gasket, provides longer holding time in the event of a power failure.
- State-of-the-art, refrigeration system improves temperature control and increases reserve capacity, resulting in a more stable temperature sample.
- Stainless steel interior.
- 1" (2.5cm) access ports allow for the use of independent probes or instrumentation.



Optional CO₂ or LN₂ back-up

Optional choice of CO₂ or LN₂ safety back-up systems for additional sample protection in the event of a power or mechanical failure.



Microprocessor control

Centralized information center, including microprocessor control and monitoring system ensures that all controls and displays are easy to reach and read. Knee level on the 3 cu. ft. (85L) models.



Polystyrene interiorsub-lids

Reduce cold air loss and improve temperature recovery after door openings.



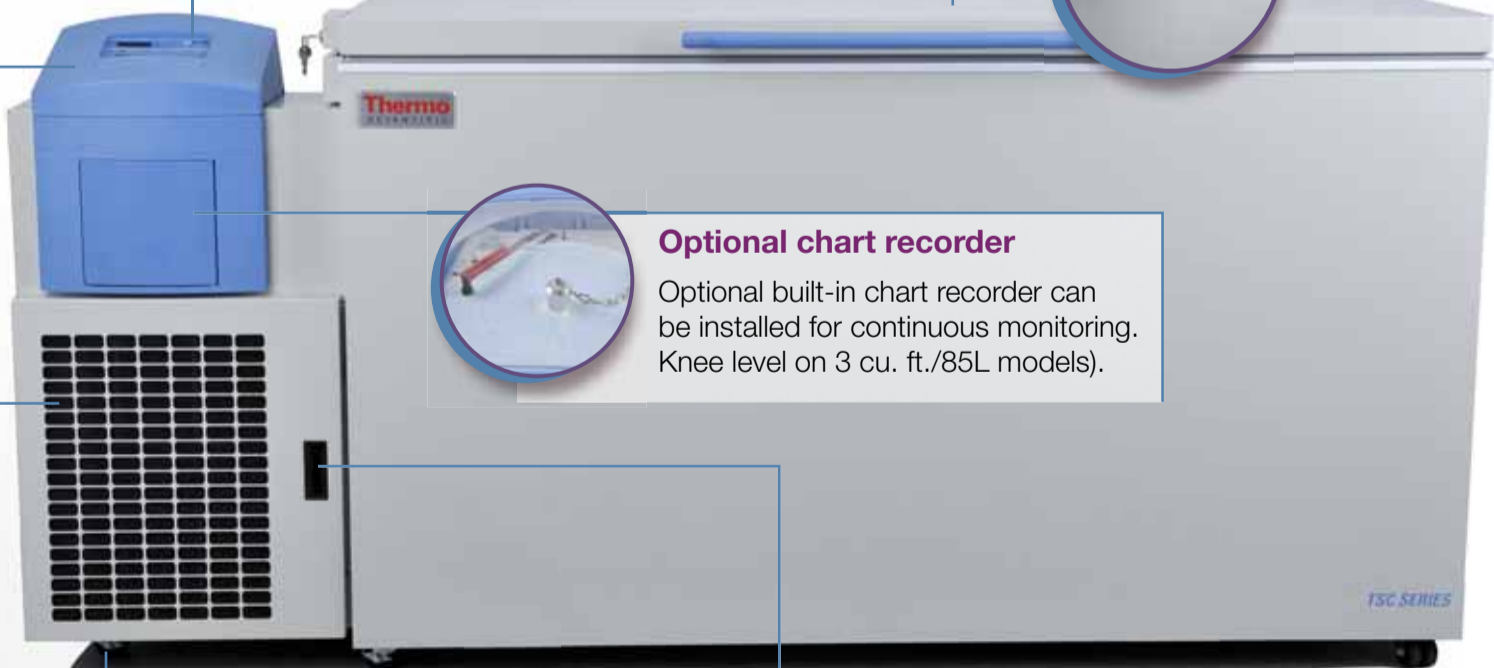
Single-hand operation

Easy-to-use, ergonomic, lockable door handle.



Optional chart recorder

Optional built-in chart recorder can be installed for continuous monitoring. Knee level on 3 cu. ft./85L models).



Simplified installation

With our new easy-roll 2" (5cm) locking casters.

RS-485 and 4-20 milliamp analog outputs

For independent monitoring devices and recorders.



Easy-to-remove, washable filter

Provides protection from dust on condenser, reducing the risk of refrigeration malfunction or risk to samples

Thermo Scientific TSC Series -86°C Chest Freezers

Model No.	Capacity cu. ft. (liters)	2 in. Box Qty.	Electrical	Amps / Breaker (Plug)	Interior Dimensions H x W x D in. (cm)	Exterior Dimensions H x W x D in. (cm)	Shipping Weight lbs. (kg)
TSC390A TSC390V	3.0 (85)	63	115V / 60Hz 230V / 50Hz	10.5/20 (NEMA 5-20) 5.4/15 (European)	16.5 x 18.5 x 18.5 (41.69 x 47.0 x 47.0)	43.8 x 28.5 x 29.9 (113.3 x 72.4 x 75.9)	432 (196)
TSC1390A TSC1390D TSC1390V	12.7 (360)	252	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	28.0 x 42.5 x 18.5 (71.1 x 108.0 x 47.0)	40.5 x 72.0 x 33.4 (102.9 x 182.9 x 84.8)	716 (325)
TSC1790A TSC1790D TSC1790V	17.0 (481)	348	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	28.0 x 58.8 x 18.5 (71.1 x 149.4 x 47.0)	40.5 x 87.6 x 33.8 (102.9 x 222.5 x 85.9)	821 (372)
TSC2090A TSC2090D TSC2090V	20.0 (566)	396	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	16/20 (NEMA 5-20) 12/15 (NEMA 6-15) 12/15 (European)	28.0 x 66.5 x 18.5 (71.1 x 168.9 x 47.0)	40.5 x 96.0 x 33.4 (102.9 x 243.8 x 84.8)	833 (378)

Thermo Scientific TSC Series -40°C Chest Freezers (-10°C to -40°C)

Model No.	Capacity cu. ft. (liters)	2 in. Box Qty.	Electrical	Amps / Breaker (Plug)	Interior Dimensions H x W x D in. (cm)	Exterior Dimensions H x W x D in. (cm)	Shipping Weight lbs. (kg)
TSC350A TSC350V	3.0 (85)	63	115V / 60Hz 230V / 50Hz	5/15 (NEMA 5-20) 3/15 (European)	16.5 x 18.5 x 18.5 (41.69 x 47.0 x 47.0)	43.8 x 28.5 x 29.9 (113.3 x 72.4 x 75.9)	395 (179)
TSC1350A TSC1350D TSC1350V	12.7 (360)	252	115V / 60Hz 208-230V / 60Hz 230V / 50H	6.5/15 (NEMA 5-20) 6.5/15 (NEMA 6-15) 6.5/15 (European)	28.0 x 42.5 x 18.5 (71.1 x 108.0 x 47.0)	40.5 x 72.0 x 33.4 (102.9 x 182.9 x 84.8)	659 (299)
TSC1750A TSC1750D TSC1750V	17.0 (481)	348	115V / 60Hz 208-230V / 60Hz 230V / 50Hz	6.5/15 (NEMA 5-20) 6.5/15 (NEMA 6-15) 6.5/15 (European)	28.0 x 58.8 x 18.5 (71.1 x 149.4 x 47.0)	40.5 x 87.6 x 33.8 (102.9 x 222.5 x 85.9)	764 (34)
TSC2050A TSC2050D TSC2050V	20.0 (566)	396	115V / 60Hz 208-230V / 60Hz 230V / 50H	6.5/15 (NEMA 5-20) 6.5/15 (NEMA 6-15) 6.5/15 (European)	28.0 x 66.5 x 18.5 (71.1 x 168.9 x 47.0)	40.5 x 96.0 x 33.4 (102.9 x 243.8 x 84.8)	776 (352)

Monitoring and Remote Options

Model No.	Electrical	Description
5612-1A 5612-3V	120V / 60Hz 230V / 50Hz	Remote Alarm with Audible Signal Extend the freezer's on-board alarm systems to remote locations in the facility
400047 400182	120V / 60Hz 220V / 50Hz	Sensaphone Telephone Dialing System Monitors up to four channels and dials up to four telephone numbers. A dedicated telephone line is required. Not approved for sales requiring CE.
400134 400183	120V / 60Hz 220V / 50Hz	Sensaphone Telephone Dialing System Monitors up to eight channels and dials up to eight telephone numbers. A dedicated telephone line is required. Not approved for sales requiring CE.
400048 400049	120V / 60Hz 220V / 50Hz	Temperature / Power Monitor External digital and audible/visual alarm monitors temperature and power supply of the freezer. Includes temperature probes.

Options

Model No.	Installation	Description
1950447	Factory	LN2 Back-Up System Maintains temperature down to -80°C with liquid nitrogen
1950448	Field	
1950445	Factory	CO2 Back-Up System Maintains temperature down to -70°C with CO2
1950446	Field	
201241	Factory	Chart Recorder 6" (150mm), seven day recorder to -150°C. Includes box of chart paper (quantity: 50)
201240	Field	
398213	RS-232 (0-1)	Data Outputs (Factory-Installed Only)
398214	RS-485 (0-1V)	
398215	RS-485 (0-5V)	
195967	Factory	Water-Cooled Condenser Option for -86°C Chest Freezers See page 24 for details.

Accessories

Model No.	Description
195947	Replacement Air Filter for 3 cu. ft. (84.9L) Chest Freezers (quantity: 5)
195948	Replacement Air Filter for Other Chest Freezers (quantity: 5)
17020	Ink Chart Paper (quantity: 50)
400159	Replacement Back-Up Battery
245231	Red Felt Tip Pen
245232	Blue Felt Tip Pen
4425	Cryo Gloves (medium)
4426	Cryo Gloves (large)
4000401	LN2 Transfer Hose – flexible 6' metal hose: 0.5" diameter, 45° flare with swivel end
950316	Wall Clamp – CO2 cylinder holder for securing tank to the wall for OSHA guidelines
991505	High-Pressure Liquid CO2 Hose – 6' long, kink-resistant, stainless steel lined, double-braided sheath. 316 stainless steel NPT F fitting. Maximum working pressure 2,500 psig.

Chest Freezer Racks

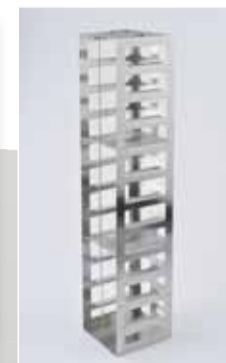
Model No. (Description)	Dimensions W x D x H in. (cm)	Freezer Vol. cu. ft. (liters)	Boxes/ Rack (Plates)	Racks/ Freezer (Plates)	Boxes/ Freezer (Plates)
398184 (2" Box Rack with locking rod)	5.5 x 5.5 x 15.2 (14 x 14 x 38.6)	3.0 (85)	7	9	63
398186 (2" Box Rack with locking rod)	5.5 x 5.6 x 26.5 (14 x 14.2 x 67.3)	12.7 (360) 17.0 (481) 20.0 (566)	12 12 12	21 29 33	252 348 396
398185 (3" Box Rack)	5.5 x 5.5 x 16 (14 x 14 x 40.6)	3.0 (85)	5	9	45
398187 (3" Box Rack)	9.4 x 5.5 x 26.5 (14 x 14 x 67.3)	12.7 (360) 17.0 (481) 20.0 (566)	8 8 8	21 29 33	168 232 264
398188 (27 Position Microplate Rack)	5.3 x 3.5 x 25.8 (13.5 x 8.9 x 65.5)	12.7 (360) 17.0 (481) 20.0 (566)	(27) (27) (27)	(33) (48) (51)	(891) (1,296) (1,377)
114048 (Wire Basket with Rollers)*	11.8 x 16.5 x 12.3 (29.9 x 41.9 x 31.2)	12.7 (360) 20.0 (566)	N/A	5 9	N/A
189001 189000 (Basket Rail Set)	11.8 x 16.5 x 12.3 (29.9 x 41.9 x 31.2)	12.7 (360) 20.0 (566)	N/A	N/A	N/A



**2" Box Rack
Model No.
398184**



**3" Box Rack
Model No.
398185**



**2" Box Rack
Model No.
398186**



**Wire Basket
Model No.
114048**



**3" Box
Rack
Model No.
398187**



**Microplate
Rack
Model No.
398188**

See Page 19 for Boxes and Dividers

Wireless remote monitoring for your ultra-low temperature freezer

Trust Thermo Scientific™ Smart-Vue™, a complete and simplified wireless monitoring solution to monitor critical samples stored inside your ultra-low temperature freezer. Smart-Vue monitor features audit trail traceability to assist with conformance to 21 CFR part 11 and other regulatory requirements while safeguarding critical samples.

- Intelligent plug and play simplicity
- Intuitive dashboard
- Flexible operation
- Precise monitoring
- Data traceability and security
- Numerous configuration capabilities
- Central monitoring system

For more information contact your sales representative. Smart-Vue Wireless Monitoring Solution for Ultra-Low Temperature Freezers* is not available in all Radio Frequency (RF) regions.

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* Smart-Vue wireless monitoring kits are designed for first time users monitoring critical temperature parameters in ultra-low temperature freezers. Smart-Vue modules and sensors are available for temperature, RH, CO2 concentration, differential pressure, 4-20mA output, ambient conditions and alarm/relay dry contacts. Solutions vary by RF regions worldwide and are compatible with multiple types of laboratory equipment. Please ask your sales representative to evaluate a Smart-Vue wireless monitoring solution that best meets your specific needs.



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