



## Thermo Scientific Forma FDE Series Ultra-Low Temperature Freezers

# Thermo Scientific™ Forma™ FDE Series Ultra-Low Temperature Freezers

- **H-drive hydrocarbon refrigeration system** provides sustainable performance with reliability you can count on
- **Low peak variation** helps ensure sample temperature protection throughout entire cabinet
- **Fast door opening recovery** in as little as 14 minutes
- **Long warm-up time** from -80°C to -50°C in up to 5 hours
- **Four capacities:** 300, 400, 500 and 600 2-inch boxes
- **Decrease storage footprint** up to 25%
- **5-year** standard warranty



## Designed to keep your samples safe

- Worry-free storage; with low peak variation, samples are protected throughout the entire cabinet.<sup>1</sup>
- Secure freezer settings with sample security
- Backed by our Global Service and Support Team

## Limit environmental impact and lower HVAC costs

- Uses as low as 11.2 kWh/day, depending on size
- Less heat emission lowers HVAC costs
- Natural refrigerants compliant with EU F-Gas regulation: R170 and R290
- Environmentally-friendly, water-blown foam insulation
- Manufactured in an award-winning, zero-waste-to-landfill facility

## User-friendly and quiet

- New HIC touch screen user interface
- Quiet enough to reside directly in the laboratory; at just 50 dBA, the sound is comparable to a home refrigerator.<sup>2</sup>

1. Typical freezer data based on internal testing with freezer setpoint at -80°C and ambient temperature at 20°C. Performance data varies across freezer size and electrical specifications.

2. All data based on internal data unless otherwise noted. Data on file.

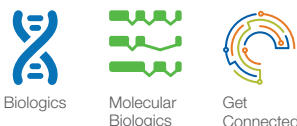
# Dependable storage with operational savings and sustainability

## User-friendly HIC interface and cabinet

- Easy to use: plug in and go; no setup required
- H-drive Information Center (HIC) combines easy-to-read temperature with simple capacitive touch buttons
- Advanced security features: alarm settings, setpoint security passcode, and padlock-compatible doors
- Ergonomic design: single-hand door operation, eye-level display, and shelf-level placement that do not require floor-level loading of racks
- Four inner doors minimize ambient temperature during sample retrieval



## Specifications & Ordering Information



### Upright Freezers (-50°C to -86°C)

General Purpose Model	Capacity		Electrical	Amps / Breaker (Plug type)	Max Shelf Weight kg	Interior Dimensions H x W x D cm	Exterior Dimensions H x W* x D cm	Shipping Weight kg
	Liters	Cryoboxes 5 cm						
FDE30086FD	422	300	208-230V/60Hz	5.6/15 (NEMA 6-15)	57	130.1 x 45.2 x 71.9	198.1 x 58.4 x 97.7	323
FDE30086FV			230V/50Hz	5.9/10 (European)				
FDE40086FD	549	400	208-230V/60Hz	5.9/15 (NEMA 6-15)	75	130.1 x 58.8 x 71.9	198.1 x 71.9 x 97.7	312
FDE40086FV			230V/50Hz	5.3/10 (European)				
FDE50086FD	682	500	208-230V/60Hz	5.0/15 (NEMA 6-15)	93	130.1 x 73.0 x 71.9	198.1 x 86.4 x 97.7**	333
FDE50086FV			230V/50Hz	5.9/10 (European)				
FDE60086FD	816	600	208-230V/60Hz	6.2/15 (NEMA 6-15)	111	130.1 x 87.3 x 71.9	198.1 x 100.6 x 97.7**	372
FDE60086FV			230V/50Hz	6.1/10 (European)				

\*Allowance for handle and hinge, add 10.7 cm to cabinet width

\*\*Doorway width clearance is 87.6 cm for FDE50086 and FDE60086



### Performance Data

Model Series	Energy Consumption* (kW-hr/day)	Peak Variation from -80°C Setpoint (°C)**	60 Second Door Opening Recovery Time (minutes)	Warm-Up Time (-80°C to -50°C) (minutes)***	Noise Level (dBA)
FDE30086	11.2	+5.9/-3.7	14	248	52
FDE40086	12.3	+5.7/-2.9	17	257	51
FDE50086	12.7	+4.2/-2.9	21	260	50
FDE60086	14.2	+3.4/-2.9	24	297	50

\*Energy Consumption: Typical data - internal testing with freezer setpoint at -80°C and 20°C ambient temperature

\*\*Peak Variation from Setpoint: Typical data - internal testing with freezer setpoint at -80°C and 20°C ambient temperature

\*\*\*Warm Up Time: Typical data - internal testing with empty freezer setpoint at -80°C and ambient temperature at 20°C

## Options (Field installations must be performed by a qualified professional)

Description	Installation	For Model Series			
		FDE30086	FDE40086	FDE50086	FDE60086
<b>LN<sub>2</sub> Backup System</b> Maintains temperature down to -80°C with liquid nitrogen. Models for FDE30086 are stand alone.	Factory	N/A	LN4567	LN4567	LN4567
	Field	FLN300D* FLN300V** FLN300W***	FLN456LED* FLN456LEV**	FLN456LED* FLN456LEV**	FLN456LED* FLN456LEV**
<b>CO<sub>2</sub> Backup System</b> Maintains temperature down to -67°C with CO <sub>2</sub> . Models for FDE30086 are stand alone.	Factory	N/A	CO4567	CO4567	CO4567
	Field	FCO300D* FCO300V** FCO300W***	FCO456LED* FCO456LEV**	FCO456LED* FCO456LEV**	FCO456LED* FCO456LEV**
<b>Chart Recorder (Inkless)</b> Seven-day inkless recorder Range: -115° to +50°C (+5°C resolution) Dia.: 6" (15.2cm)	Factory	N/A	N/A	CR4567	CR4567
	Field	N/A	N/A	FCR500LE	FCR600LE
<b>Chart Recorder (Ink)</b> Seven day ink recorder Range: -100° to +38°C (+2°C resolution) Dia.: 6" (15.2 cm) Models for FDE30086 and FDE40086 are stand alone.	Factory	N/A	N/A	CRP4567	CRP4567
	Field	6383-6D* 6383-6V** 6383-6W***	6383-6D* 6383-6V** 6383-6W***	FGRP500LE	FGRP600LE
<b>Stainless Steel Freezer Interior</b>	Factory	SS34567	SS34567	SS34567	SS34567
<b>Water-Cooled Condenser Option</b>	Factory	N/A	WC34567****	WC34567****	WC34567
<b>Twist Lock Plug NEMA L6-15P for 208-230V/60Hz</b>	Factory	US230V15ATL	US230V15ATL	US230V15ATL	US230V15ATL
	Field	TL230V15A	TL230V15A	TL230V15A	TL230V15A
<b>Twist Lock Plug NEMA L6-20P for 208-230V/60Hz</b>	Factory	US230V20ATL	US230V20ATL	US230V20ATL	US230V20ATL
	Field	TL230V20A	TL230V20A	TL230V20A	TL230V20A

\* D = 208-230V/60Hz (NEMA 6-15 plug)

\*\*V = 230V/50Hz (European plug)

\*\*\*W = 230V/50Hz (UK plug)



\*\*\*\* Water-cooled option only available on 230V/50Hz units

## Accessories



Description	For Model Series			
	FDE30086	FDE40086	FDE50086	FDE60086
<b>Air Filter (Replacement)</b>	AF34567LE	AF34567LE	AF34567LE	AF34567LE
<b>Alarm Delay Module</b> Eliminates nuisance alarms due to intermittent or transitory conditions. (The alarm conditions must exist for a user-defined period before the signal is broadcast.)	6903	6903	6903	6903
<b>Battery Backup (Replacement)</b>	400159	400159	400159	400159
<b>Chart Paper, for Inkless Recorder, 50/Pack</b>	N/A	N/A	6185	6185
<b>Chart Paper, for Ink Recorder, 50/Pack</b>	17020	17020	17020	17020
<b>Cryo Gloves, Medium</b>	4425	4425	4425	4425
<b>Cryo Gloves, Large</b>	4426	4426	4426	4426
<b>Seismic Restraint Kits</b>	TF-ULT300	TF-ULT400	TF-ULT500	TF-ULT600
<b>Shelf Kits: Include One Shelf and Clips</b>	SK300	SK400	SK500	SK600

# Racks for Boxes and Microplates

## Racks for 5 cm Boxes

Catalog No.	Description	Dimensions H x W x D cm	Storage Capacities	For Model Series			
				FDE30086	FDE40086	FDE50086	FDE60086
 920090	Sliding Drawer Rack	30.2 x 14 x 68.3	Boxes/Rack	25	25	25	25
			Racks/Shelf	3	4	5	6
			Racks/Freezer	12	16	20	24
			Boxes/Freezer	300	400	500	600
 1950520	Adjustable Side Access Rack	29.5 x 13.7 x 67.9	Boxes/Rack	25	25	25	25
			Racks/Shelf	3	4	5	6
			Racks/Freezer	12	16	20	24
			Boxes/Freezer	300	400	500	600




## Racks for 7.62 cm Boxes

Catalog No.	Description	Dimensions H x W x D cm	Storage Capacities	For Model Series			
				FDE30086	FDE40086	FDE50086	FDE60086
 920091	Sliding Drawer Rack	30.2 x 14 x 68.3	Boxes/Rack	15	15	15	15
			Racks/Shelf	3	4	5	6
			Racks/Freezer	12	16	20	24
			Boxes/Freezer	180	240	300	360
 1950521	Adjustable Side Access Rack for 3 in. boxes	29.5 x 13.7 x 67.9	Boxes/Rack	15	15	15	15
			Racks/Shelf	3	4	5	6
			Racks/Freezer	12	16	20	24
			Boxes/Freezer	180	240	300	360

## Racking Shelf Kits

Description	Storage Capacities	For Model Series			
		FDE30086	FDE40086	FDE50086	FDE60086
	Catalog No.	RSK300SD4	RSK400SD4	RSK500SD4	RSK600SD4
Sliding Drawer Racks with Boxes for One Shelf (12.7 x 12.7 x 5 cm Boxes with 100-Count Cell Dividers)	Racks Included	3	4	5	6
	Boxes Included	75	100	125	150

## Racks for Standard or Deepwell Microplates

Catalog No.	Description	Dimensions H x W x D cm	Storage Capacities	For Model Series			
				FDE30086	FDE40086	FDE50086	FDE60086
 1950592	Side Access Rack with Locking Rod	30.2 x 14 x 65.3	Plates/Rack	147	147	147	147
			Racks/Shelf	3	4	5	6
			Racks/Freezer	12	16	20	24
			Plates/Freezer	1,764	2,352	2,940	3,528
 1950523	Side Access Microplate Rack	30.2 x 14 x 65.3	Plates/Rack	105	105	105	105
			Racks/Shelf	3	4	5	6
			Racks/Freezer	12	16	20	24
			Plates/Freezer	1,260	1,680	2,100	2,520
 1950642	Sliding Drawer Microplate Rack	30.2 x 14 x 66.3	Plates/Rack	35	35	35	35
			Racks/Shelf	3	4	5	6
			Racks/Freezer	12	16	20	24
			Plates/Freezer	420	560	700	840

## Boxes and Dividers

Catalog No.	Description	# of Dividers	Quantity	Color
5026-0909	Thermo Scientific™ Nalgene™ polycarbonate 5.08 cm box for 1.2 to 2 mL vials	81	24/Case	White
5954	5.08 cm Fiberboard Box	0	12/Pack	White
820002	5.08 cm Fiberboard Box	81	1	White
820109	5.08 cm Fiberboard Box	100	1	White
5956	7.62 cm Fiberboard Box	0	12/Pack	White
820003	7.62 cm Fiberboard Box	81	1	White
1950878	5.08 cm Fiberboard Box	0	12/Pack	Multiple
1950879	5.08 cm Fiberboard Box	0	12/Pack	Pink
1950880	5.08 cm Fiberboard Box	0	12/Pack	Red
1950881	5.08 cm Fiberboard Box	0	12/Pack	Yellow
1950882	5.08 cm Fiberboard Box	0	12/Pack	Green
1950883	5.08 cm Fiberboard Box	0	12/Pack	Blue
1950884	5.08 cm Fiberboard Box	0	12/Pack	Black

## Fiberboard Dividers

Catalog No.	Description	Quantity/Pack
5958	Grid Dividers, Hold 100 x 12 mm Tubes/Vials	12
6212	Grid Dividers, Hold 81 x 13 mm Tubes/Vials	12
5960	Grid Dividers, Hold 64 x 14 mm Tubes/Vials	12
5959	Grid Dividers, Hold 49 x 16 mm Tubes/Vials	12

## Vials and Tubes

Catalog No.	Description	Quantity
377267	Thermo Scientific™ Nunc™ 1.8 mL Screw-Top Round-Bottom Vials with Internal Threading	1,800/Case

## Sliding Drawer Racks for Matrix and Cryobank Tubes

Racks work with all Thermo Scientific™ Matrix™ and Nunc™ Cryobank Tubes

		For Model Series	FDE30086	FDE40086	FDE50086	FDE60086
<b>200 µL Capacity Tubes</b>						
3747, 3748, 4988	Matrix 200 µL 2D Internally Threaded Universal Tubes Box Dimensions: 8.5 x 12.8 x 2.75 cm	<b>Rack Model No.</b>	<b>1950787</b>	<b>1950787</b>	<b>1950787</b>	<b>1950787</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
		Tubes/Box	96	96	96	96
		Boxes/Rack	56	56	56	56
		Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
		Tubes/Freezer	64,512	86,016	107,520	129,024
<b>500 µL Capacity Tubes</b>						
3734, 3735, 4898	Matrix 500 µL 2D Open Top Tubes Box Dimensions: 8.5 x 12.8 x 2.6 cm	<b>Rack Model No.</b>	<b>1950787</b>	<b>1950787</b>	<b>1950787</b>	<b>1950787</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
3736, 3737, 4899	Matrix 200 µL 2D Internally Threaded Universal Tubes with Installed DuraSeal™ Seal Box Dimensions: 8.5 x 12.8 x 2.75 cm	Tubes/Box	96	96	96	96
		Boxes/Rack	56	56	56	56
		Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
		Tubes/Freezer	64,512	86,016	107,520	129,024
374086, 374087 (including color options)	Nunc Cryobank 500 µL Internally Threaded Tubes Box Dimensions: 8.5 x 12.8 x 3.5 cm	<b>Rack Model No.</b>	<b>1950791</b>	<b>1950791</b>	<b>1950791</b>	<b>1950791</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
3743, 3744, 3745 (including color options)	Matrix 500 µL 2D Internally Threaded ScrewTop Tubes Box Dimensions: 8.5 x 12.8 x 4.4 cm	Tubes/Box	96	96	96	96
		Boxes/Rack	42	42	42	42
		Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
		Tubes/Freezer	48,384	64,512	80,640	96,768

## Sliding Drawer Racks for Matrix and Cryobank Tubes

Racks work with all Thermo Scientific™ Matrix™ and Nunc™ Cryobank Tubes

		For Model Series	FDE30086	FDE40086	FDE50086	FDE60086
<b>750 µL Capacity Tubes</b>						
3731, 3732, 4896	Matrix 750 µL 2D Open Top Tubes Box Dimensions: 8.5 x 12.8 x 3.9 cm	<b>Rack Model No.</b>	<b>1950791</b>	<b>1950791</b>	<b>1950791</b>	<b>1950791</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
3729, 4896	Matrix 750 µL 2D Tubes with Installed DuraSeal Seal Box Dimensions: 8.5 x 12.8 x 3.9 cm	Tubes/Box	96	96	96	96
		Boxes/Rack	42	42	42	42
		Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
		Tubes/Freezer	48,384	64,512	80,640	96,768
<b>1 mL Capacity Tubes</b>						
374088, 374089 (including color options)	Nunc Cryobank 1 mL Internally Threaded Tubes Box Dimensions: 8.5 x 12.8 x 4.9 cm	<b>Rack Model No.</b>	<b>1950642</b>	<b>1950642</b>	<b>1950642</b>	<b>1950642</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
		Tubes/Box	96	96	96	96
		Boxes/Rack	35	35	35	35
		Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
		Tubes/Freezer	40,320	53,760	67,200	80,640
3740, 3741, 3742 (including color options)	Matrix 1 mL 2D Internally Threaded Screw Top Tubes Box Dimensions: 8.5 x 12.8 x 5.8 cm	<b>Rack Model No.</b>	<b>1950799</b>	<b>1950799</b>	<b>1950799</b>	<b>1950799</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
		Tubes/Box	96	96	96	96
		Boxes/Rack	28	28	28	28
		Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
		Tubes/Freezer	32,256	43,008	53,760	64,512



## Sliding Drawer Racks for Matrix and Cryobank Tubes

Racks work with all Thermo Scientific™ Matrix™ and Nunc™ Cryobank Tubes

		For Model Series	FDE30086	FDE40086	FDE50086	FDE60086
<b>1.4 mL Capacity Tubes</b>						
3791, 3792, 4890	Matrix 1.4 mL 2D Open Top Tubes Box Dimensions: 8.5 x 12.8 x 4.9 cm	<b>Rack Model No.</b>	<b>1950642</b>	<b>1950642</b>	<b>1950642</b>	<b>1950642</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
3801, 4890	1.4 mL 2D Tubes with Installed DuraSeal Seal Box Dimensions: 8.5 x 12.8 x 4.9 cm	Tubes/Box	96	96	96	96
		Boxes/Rack	35	35	35	35
3711, 3112, 4890	Matrix 1.4 mL Human Readable Open Top Tubes Box Dimensions: 8.5 x 12.8 x 4.9 cm	Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
		Tubes/Freezer	40,320	53,760	67,200	80,640
<b>1.8 to 2 mL Capacity Tubes</b>						
374500, 374501	Nunc 1.8 mL Externally Threaded Universal Tubes Box Dimensions: 8.5 x 12.8 x 5.5 cm	<b>Rack Model No.</b>	<b>1950642</b>	<b>1950642</b>	<b>1950642</b>	<b>1950642</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
374221, 374223	Nunc Cryobank 2 mL Internally Threaded Tubes Box Dimension: 8.5 x 12.8 x 5.5 cm	Tubes/Box	48	48	48	48
		Boxes/Rack	35	35	35	35
		Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
		Tubes/Freezer	20,160	26,880	33,600	40,320
<b>5 mL Capacity Tubes</b>						
374220, 374222	Nunc Cryobank 5 mL Internally Threaded Tubes Box Dimensions: 8.5 x 12.8 x 9.6 cm	<b>Rack Model No.</b>	<b>1950819</b>	<b>1950819</b>	<b>1950819</b>	<b>1950819</b>
		Freezer Rack Dimensions W x H x D	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm	14 x 30.3 x 68.5 cm
		Tubes/Box	48	48	48	48
		Boxes/Rack	21	21	21	21
		Racks/Shelf	3	4	5	6
		Racks/Freezer	12	16	20	24
Tubes/Freezer	12,096	16,128	20,160	24,192		