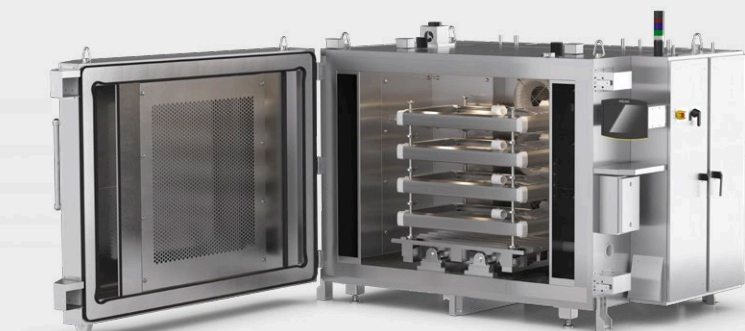


Celsius® FFT Freezer



Product Information

The Celsius® FFT Freezer is a blast freezer that supports consistent and programmable large-volume freezing and thawing of biopharmaceuticals. It is designed for palletized loads of Celsius® FFT single-use containers, allowing easy, flexible, and scalable freezing and thawing of up to 300 L of bulk drug substance. The system is available with standard or low global warming potential refrigerant.

Features and Benefits

- Consistent blast freezing and thawing for up to 300 L bulk drug substance
- For palletized Celsius® FFT 6, 12, or 75 L containers, enabling a scalable and flexible process
- Available with low global warming potential refrigerant
- Freezing down to -70 °C and thawing up to 35 °C with an integrated agitation system for optimal thawing time

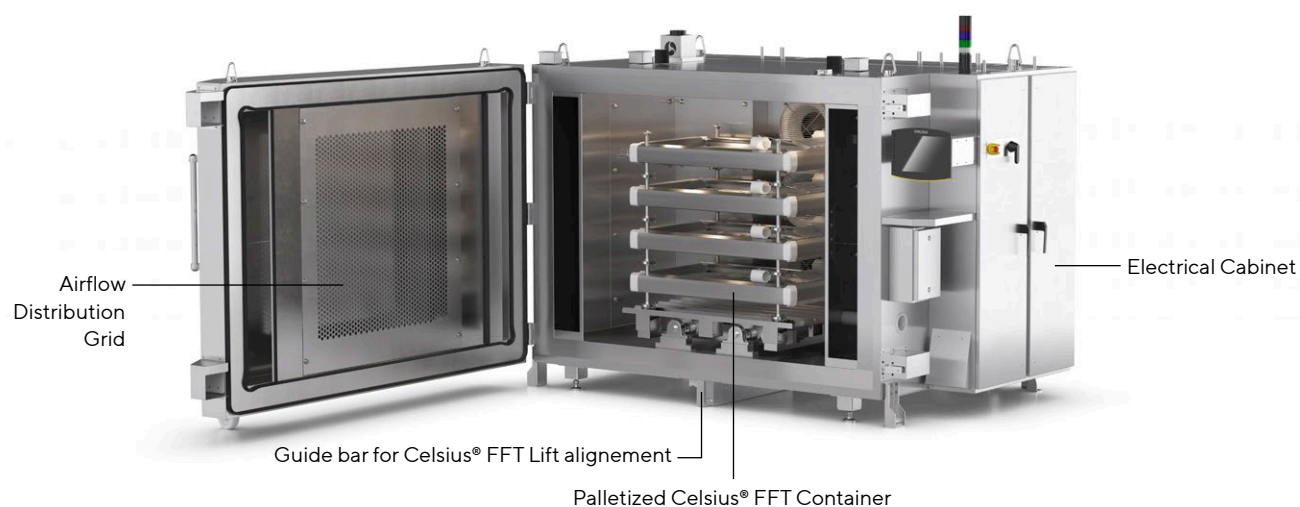
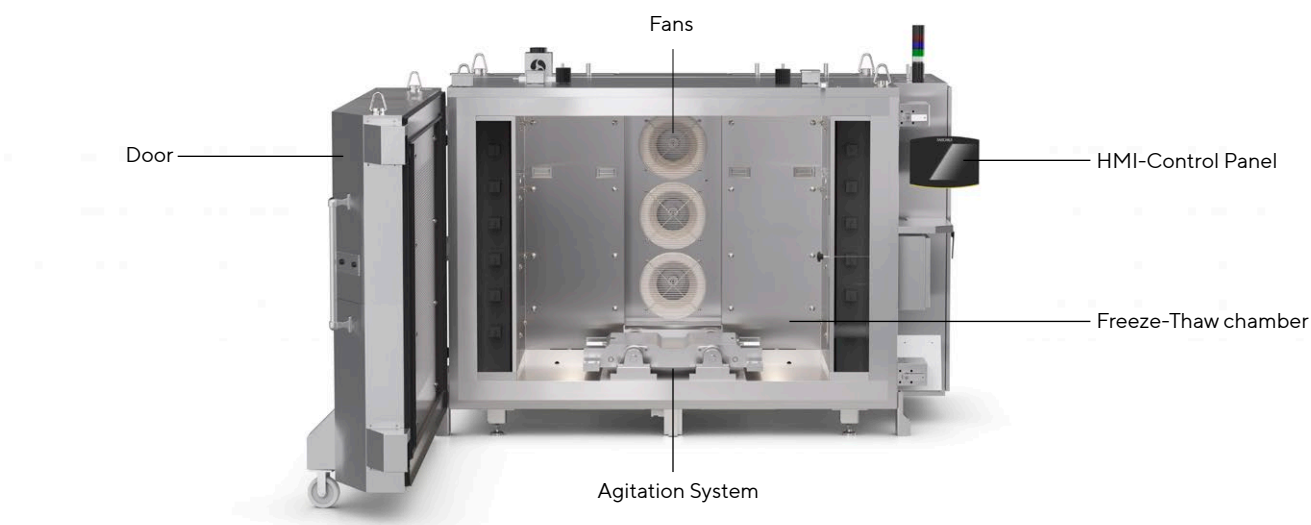
Introduction

Relevant Applications

Freezing and thawing of bulk drug substance or process intermediates in large volumes for frozen storage or shipping.

Relevant Process Steps

- Process intermediates freezing and thawing
- Bulk drug substance freezing and thawing



Technical Specifications

Freeze and Thaw Chamber

Attribute	Standard Version	Low Global Warming Potential Version
Maximum Load Capacity	1 to 4 Celsius® FFT 75 L containers (300 L max) on Celsius® FFT 75 L Pallet 1 to 10 Celsius® FFT 12 L containers (120 L max) on Celsius® FFT 6 12 L Pallet 1 to 10 Celsius® FFT 6 L containers (60 L max) on Celsius® FFT 6 12 L Pallet	
Min max temperature [°C]	-70 +35	
Air Temperature monitoring	2 × PT100	
Dimensions – Door closed L × W × H [mm in]*	2,990 × 2,565 × 2,183 118 × 101 × 86	
Dimensions – Door open L × W × H [mm in]*	3,320 × 4,812 × 2,183 131 × 190 × 86	
Weight [kg lb]	2,132 4,700	
Material	Exterior: 304 SS Interior: 316 SS	
Clean room compatibility	ISO 7 Grade C	
Control system PLC type	Siemens WinCC OA	
Power supply (according to customer requirement location)	480 460 440 V – 3p – 60 Hz 415 400 380 V – 3p – 50 Hz 380 V – 3p – 60 Hz	
Noise level [dB(A) at 1 meter]	<80	
Compressed air supply	Type of connection ½" NPTF Min. Pressure [barg]: 6.2 Max. Pressure [barg]: 6.9 Max. required flow: 0,425 m³/min Dew point: -73 °C	
Drain	Type of connection ½" NPTF	

Refrigeration Units

Attribute	Standard Version	Low Global Warming Potential Version
Dimensions (L × W × H) [mm in]	1,143 × 1,981 × 2,273 45 × 78 × 90	950 × 1,547 × 1,705 38 × 61 × 67
Weight [kg lb]	1,727 3,807	1,106 2438
Refrigeration system	Direct expansion refrigeration scheme	Mechanical Cascade Refrigeration System
Refrigerant types and mass	Primary: R-449A – 6.6 kg Secondary: R-508B – 6.8 kg R-600A – 0.14 kg	Primary: R1270 – 2.25 kg Secondary: R170 – 1.25 kg
Coolant	Water 100%, or mixture of water and propylene glycol	
Housing material	304 SS	
Control system PLC type	Siemens	
Installation	Can be installed in a separate room (max. distance 22 m)	Can be installed in a separate room (max. distance 10 m)
Power supply	Powered by chamber	
Noise level [dB (A) at 1 meter]	Approx. 70	Approx. 70
Cooling water inlet	Type of connection 1.25 NPTF Min. Max Pressure [barg]: 2.1 – 6 Min. Differential Pressure [barg]: 2.1 Min. Max. Temp. [°C]: 2 30 Flowrate required @ 7.2 / 18.3 / 29.4 °C (100% water): 42.6 56.8 121.7 L/min	Type of connection G ¾" Male thread Min. Max Pressure [barg]: 1 – 6 Min Differential Pressure [barg]: >1 Min. Max. Temp. [°C]: 4 20 Flowrate [L/min]: 22
Cooling water return	Type of connection 1.25 NPTF Min. / Max Pressure [barg]: 0 – 5 Min. Differential Pressure [barg]: 2.1 Min. / Max Temp. [°C]: 37 55	Type of connection G ¾" Male thread Min. / Max Pressure [barg]: 0 – 5 Min Differential Pressure [barg]: >1 Min. / Max. Temp. [°C]: 33 50 Flowrate [L/min]: 22
Protection class	IP54	IP20
Min max ambient temperature [°C]	5 40	5 40

*Without piping

Layout and Operational Dimensions

Chamber

Figure 1: Door Closed – Top View With Main Dimensions

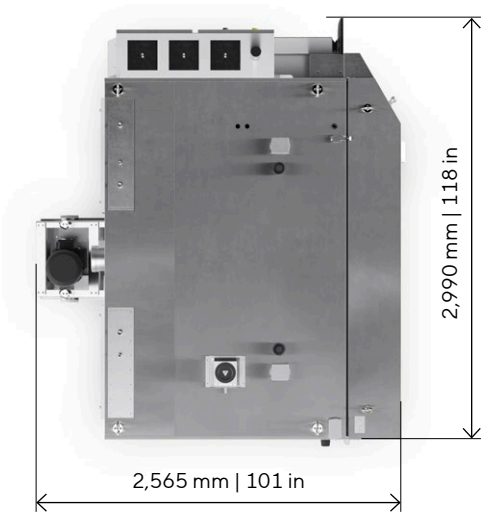
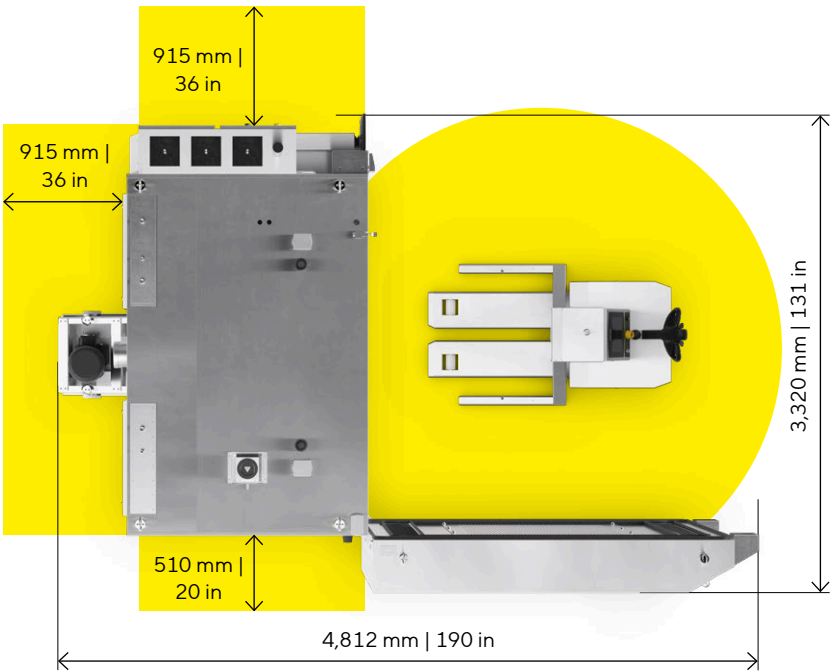


Figure 2: Door Open (Left Opening Version) – Top View With Clearance Area for Minimum Service Access and Loading | Unloading With Celsius® FFT Lift



Chiller – Standard Version

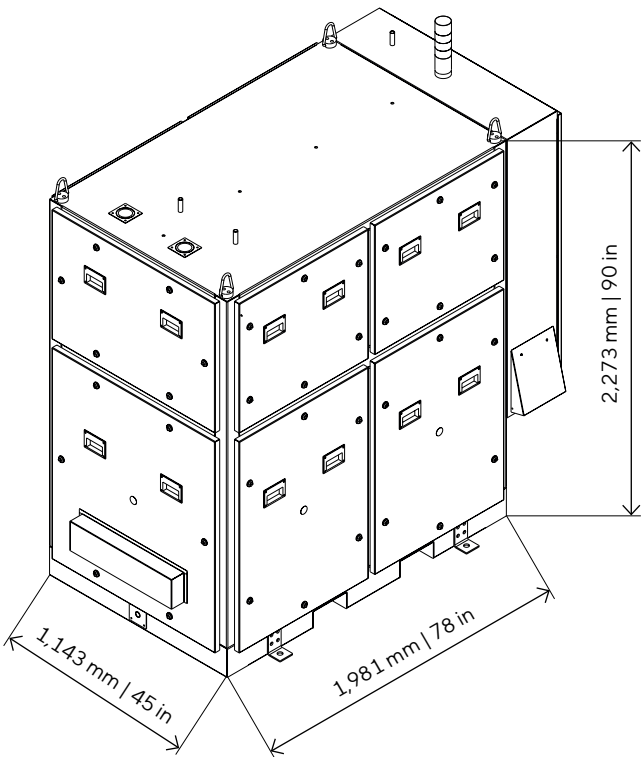
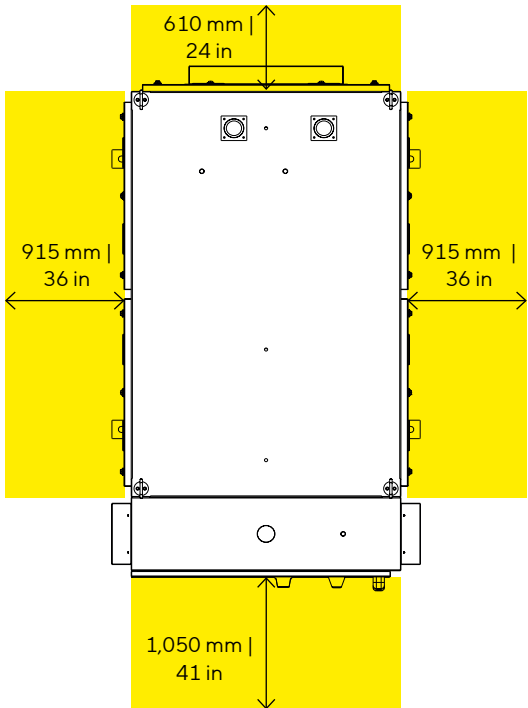


Figure 3: Top View With Clearance Area for Minimum Service Access



Chiller – Low Global Warming Potential Version

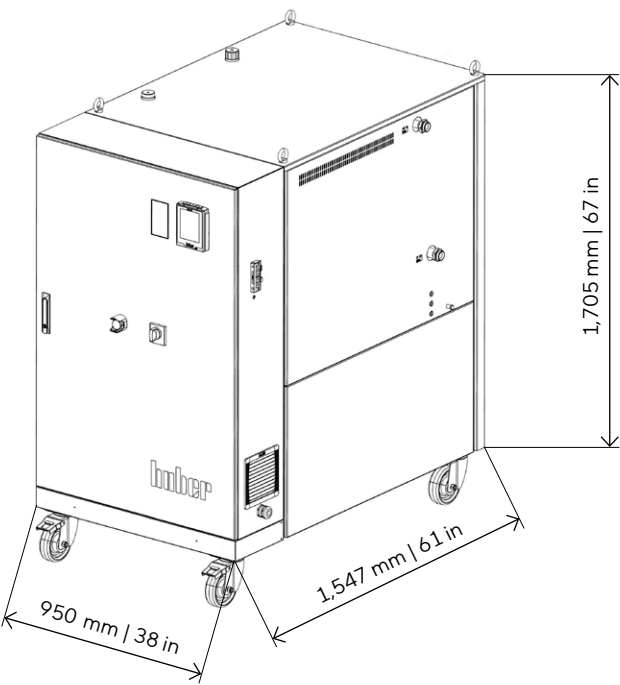
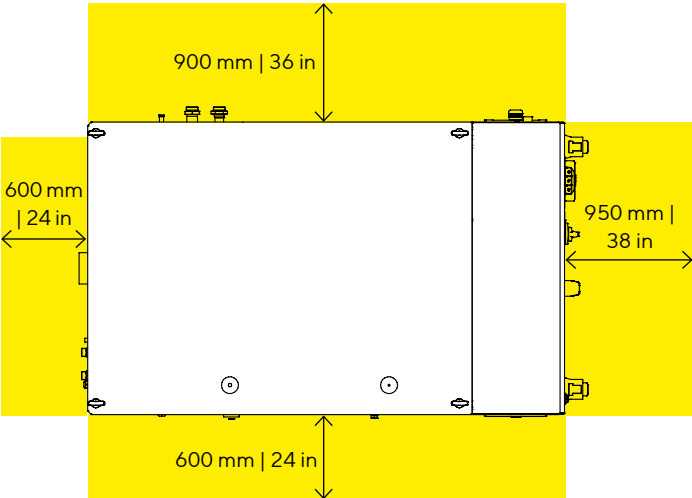


Figure 4: Top View With Clearance Area for Minimum Service Access



Standard and Guidelines

The Celsius® FFT Freezer is designed and manufactured according to the following standards, guidelines, and legal requirements:

Quality Management System

- ISO 9001-2015

Directives

- Machinery Directive 2006/42/EC
- Low Voltage Directive
- Electro Magnetic Compatibility Directive 2014/30/EC
- Pressure Equipment Directive 2014/68/EC

Standards

- UL508A Standard for Industrial Control Panels
- NEC
- UL61010-1
- UL61010-2-012

Figure 5: Celsius® FFT Freezer Loading Operation With Celsius® FFT 75 L Palletized Container (300 L)



Figure 6: Palletized Celsius® FFT 75 L



Ordering Information








With Standard Chiller Version

Countries	Electrical Requirement	Door Opening		Order Number
		Left	Right	
USA Canada Mexico	3p - 480 V - 60 Hz	■		FTH-BF01111-0001
			■	FTH-BF01112-0002
Russia China Hong Kong Argentina	3p - 380 V - 50 Hz	■		FTH-BF01121-0003
			■	FTH-BF01122-0004
EU Europe India Israel Turkey UK Singapore Thailand Australia Malaysia	3p - 400 V - 50 Hz	■		FTH-BF01131-0005
			■	FTH-BF01132-0006
Malaysia	3p - 415 V - 50 Hz	■		FTH-BF01141-0007
			■	FTH-BF01142-0008
South Korea Brazil	3p - 380 V - 60 Hz	■		FTH-BF01151-0009
			■	FTH-BF01151-0010

With Low Global Warming Potential Version

Countries	Electrical Requirement	Door Opening		Order Number
		Left	Right	
USA Canada Mexico	3p - 480 V - 60 Hz	■		FTH-BF02111-0021
			■	FTH-BF02112-0022
Russia China Hong Kong Argentina	3p - 380 V - 50 Hz	■		FTH-BF02121-0023
			■	FTH-BF02122-0024
EU Europe India Israel Turkey UK Singapore Thailand Australia Malaysia	3p - 400 V - 50 Hz	■		FTH-BF02131-0025
			■	FTH-BF02132-0026
Malaysia	3p - 415 V - 50 Hz	■		FTH-BF02141-0027
			■	FTH-BF02142-0028
South Korea Brazil	3p - 380 V - 60 Hz	■		FTH-BF02151-0029
			■	FTH-BF02152-0030

Peripherals and Accessories

Product	Description	Order Number
<p>Celsius® FFT 75 L Containers</p> 	<p>Celsius® FFT 75 L single-use container with a min max filling volume of 18.75 75 L. Ready to use sterile container to be stacked (4 max) on Celsius® FFT 75 L Pallet</p>	<p>Configuration dependent</p>
<p>Celsius® FFT 75 L Pallet</p>  	<p>The Celsius® FFT 75 L Pallet Base allows stacking of up to 4 Celsius® FFT 75 L to enable the freezing or thawing of up to 300 L</p> <p>It can be covered for container protection during storage and shipping with the Celsius® FFT 75 L Pallet Cover</p>	<p>Celsius® FFT 75 L Pallet Base: FTH-SM00101-0087</p> <p>Celsius® FFT 75 L Pallet Cover: FTH-SM00101-0088</p>
<p>Celsius® FFT 6/12 L Pallet</p> 	<p>Celsius® FFT 6/12 L Pallet Base allows stacking of up to 10 Celsius® FFT 12 or 6 L and to freeze or thaw up to 120 L. It can be covered for container protection during storage and shipping with Celsius® FFT 6/12 L Pallet Cover.</p>	<p>Celsius® FFT 6/12 L Pallet Base: FTH-SM00101-0091 Celsius®</p> <p>Celsius® FFT 6/12 L Pallet Cover: FTH-SM00101-0092</p>
<p>Celsius® FFT Lift</p> 	<p>Electrically-powered forklift with automated functionalities for safe and ergonomic handling of palletized Celsius® FFT containers and secured loading and unloading of Celsius® FFT equipment.</p>	<p>FTH-FL00001-0001</p>
<p>Aliquot® Pallet</p> 	<p>Automatic filling and draining system for Celsius® FFT palletized on Celsius® FFT 75 L Pallet or Celsius® FFT 6/12 L Pallet</p>	<p>Configuration dependent</p>
<p>Celsius® FFT Mixer</p> 	<p>Allows for swift homogenization of Celsius® FFT palletized containers content before freezing or after thawing</p>	<p>Configuration dependent</p>

Germany

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www.sartorius.com/large-scale-freezing