SARTORIUS

Celsius® FFTp Freezer

Executive Summary

Celsius® FFTp freezer is a horizontal plate freezer allowing controlled and adjustable freezing and thawing of products filled into Celsius® FFTp with Safecore™ Technology containers. In collaboration with HOF Sonderanlagenbau GmbH, two freeze-thaw units have been custom designed to provide a tailored solution together with Celsius® FFTp containers. The system allows for a reliable process control during freezing and thawing but also adapt to production volumes and foot-print restrictions.

Key Benefits

- Compact and small footprint design
- Online monitoring of critical process parameters
- Optimized contact between moveable shelves and bag providing uniform heat transfer
- Vertical integration: hardware, software and refrigeration system from a single expert

HOF

Relevant Applications

Controlled freezing and thawing of process intermediates or bulk drug substances for frozen storage or shipping.

Relevant Process Steps

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

Electro-pneumatic door

Control panel

Product moveable shelves (×5)

Freeze-Thaw chamber

Housing with refrigeration and heat transfer systems

Celsius® FFTp freezer overview

Technical Specifications

Attribute	4.38 m² Shelf Surface Version	5.6 m² Shelf Surface Version
Maximum load capacity	10 × Celsius® FFTp 6 L containers* or 10 × Celsius® FFTp 12 L containers	15 × Celsius® FFTp 6 L containers* or 10 × Celsius® FFTp 12 L containers
Weight of the equipment	2,500 kg	2,700 kg
Shelf System		
Adjusting shelf outside dimensions (L × P)	Approx. 1,250 × 700 mm	Approx. 1,400 × 800 mm
Total shelf surface area	Approx 4.38 m²	Approx 5.6 m²
Number of adjusting shelves	5	
Distance between shelves	Approx. 90 mm	
Shelf material	316 L Stainless steel, grinded with Ra ≤ 0.8 µm	
Compression force on shelves	0.0 to 2.0 bar	
Shelf temperature control range	-73 °C | +40 °C	
Temperature monitoring within product chamber	2X PT100	
Minimum shelf temperature	≤ -70 °C	
Shelf cooling speed	+20 °C to -60 °C: ≤ 45 min (without load)	
Shelf heating speed	1.0 K/min (without load)	
Spacer material	PET	
Spacer height	Approx. 69 mm	

* available in Q2 2022

Cooling | Heating System

Attribute	4.38 m² and 5.6 m² Shelf Surface Version
Heat transfer fluid	Silicone oil
Refrigerant	R452A (partly halogenated fluoric-hydrocarbon)
Cooling Water	
Flow rate (inlet | outlet)	Max. 6 m³/h
Pressure (inlet)	Min. 2 bars | Max. 6 bars
Pressure difference (inlet | outlet)	Approx. 1.5 bars
Inlet temperature	Max. 16 °C
Connection (inlet | outlet)	G 1¼
Compressed Air	
Flow rate	Approx. 100 L i.N./h
Pressure	Min. 5 bars | Max. 6 bars
Connection	G ½

Housing

Attribute	4.38 m² and 5.6 m² Shelf Surface Version
Housing material	321 Stainless steel, grinded with Ra ≤ 1.2 µm
Housing ingress protection	IP 40
Electrical switch cabinet ingress protection	IP 54
Dimensions (width × height × depth)	2,350 × 2,500 × 1,400 mm
Clean room compatibility	ISO8

Control System	
PLC type	Siemens

Media Supply

Attribute	4.38 m² and 5.6 m² Shelf Surface Version	
Main power supply	Dependent on country 400 | 415 | 440 | 480 V	
Total power	Dependent on country 34 – 38 kW	
Nominal current	Dependent on country 50 – 60 A	
Supply fuse	Dependent on country 63 – 80 A	Dependent on country 63 – 80 A

Main Compliances and Additional Features

Attribute	4.38 m² and 5.6 m² Shelf Surface Version
Noise level	Approx. 75 dB (A)
Machinery Directive 2006/42/EG	Compliant
Low Voltage Directive 2014/35/EU	Compliant
Electro Magnetic Compatibility Directive 2014/30/EU	Compliant
Pressure Equipment Directive 2014/68/EU (if applicable)	Compliant
Electrical design and construction according to EN 60204	Compliant

Celsius® FFTp freezer control panel

Celsius® FFTp containers between plates
in the freezer

Celsius® FFTp container

🚚 Ordering Information

Celsius® FFTp Freezer 4.38 m²

5-shelves Horizontal Plate Freezer With 4.38 m² Shelf Area

Country	Region	Electrical Requirement	Order Number
USA	480 Volts, 60 Hz, 3-phases/N/PE	FTH-PF00438-0051
EU	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0052
China	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0053
India	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0054
Japan	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0055
Japan	440 Volts, 60 Hz, 3-phases/N/PE	FTH-PF00438-0056
Russia	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0057
Israel	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0058
Singapore	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0059
South Korea	400 Volts, 60 Hz, 3-phases/PE	FTH-PF00438-0060
Australia	415 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0061
Canada	460 Volts, 60 Hz, 3-phases/N/PE	FTH-PF00438-0062
Taiwan	440 Volts, 60 Hz, 3-phases/N/PE	FTH-PF00438-0063
Turkey	380 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0064
Europe outside EU	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00438-0065

Celsius® FFTp Freezer 5.6 m²

5-shelves Horizontal Plate Freezer With 5.6 m² Shelf Area

Country	Region	Electrical Requirement	Order Number
USA	480 Volts, 60 Hz, 3-phases/N/PE	FTH-PF00560-0051
EU	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0052
China	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0053
India	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0054
Japan	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0055
Japan	440 Volts, 60 Hz, 3-phases/N/PE	FTH-PF00560-0056
Russia	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0057
Israel	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0058
Singapore	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0059
South Korea	400 Volts, 60 Hz, 3-phases/PE	FTH-PF00560-0060
Australia	415 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0061
Canada	460 Volts, 60 Hz, 3-phases/N/PE	FTH-PF00560-0062
Taiwan	440 Volts, 60 Hz, 3-phases/N/PE	FTH-PF00560-0063
Turkey	380 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0064
Europe outside EU	400 Volts, 50 Hz, 3-phases/N/PE	FTH-PF00560-0065

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