

FS SERIES STABILITY FREEZER

FS Series Overview

The FS series stability freezer chambers are designed for performance specifications exceeding FDA and ICH requirements.

FS011

The FS011 is a bench top stability freezer chamber designed to fit on 24" benchtops or stacked with optional racking.

FS030

The FS030 is a single-door stability freezer chamber.

FS055

The FS055 is a 2-door stability freezer chamber.

FS084

The FS084 is a 3-door stability freezer chamber.



FS SERIES: STABILITY FREEZER

Temperature Range

The FS series offers a temperature range of -25°C to 15°C. Temperature during defrost typically does not exceed -15°C when setpoint is at -20°C.

Widely Proven, Non-Proprietary Controllers

Standard controllers for the FS Series are manufactured by Fuji Electric and are ideal for stability testing chambers. Unlike many proprietary controllers, this controller is commercially available and proven in tens of thousands of installations. Standard functions include: autotuning, fuzzy logic, PID control, programmable alarms, calibration correction capability, ramp/soak, uniformity offset capability, etc. A touchscreen control interface is optional. Other controller manufacturers are also supported (Watlow, Allen Bradley etc.)

Options Available

- Extended Temperature Range**
- Chart Recorders
- Data Loggers
- Window or Glass door. **
- Full swinging interior glass door
- Magnetic latch door handle with lock and two keys (011 and 034)
- Touch Screen interface
- Headless interface (Virtual Touch Screen VTS)
- Other control Options or monitoring i.e., CO₂
- Adjustable Fan Speeds. **
- Air exchanges filtered or non-filtered with ambient space. **
- Condensate drain pumps.
- Interior or exterior electrical outlets. (Limited power) **
- Stainless Steel Exterior (030, 055 and 084)
- Door ajar alarm

***Some Options may limit chamber performance less or greater than specified here.*

Services and Warranties

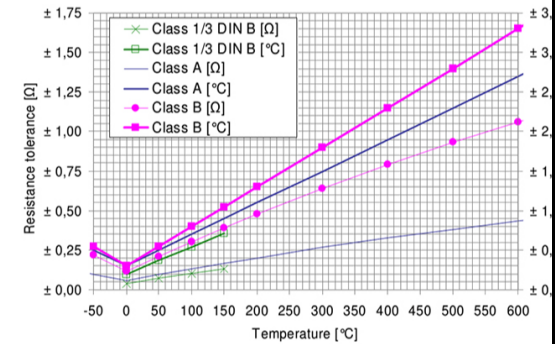
We offer technical support throughout the lifetime of your chamber. In addition to standard warranties, we also offer extended warranties for cooling components, parts, and labor. We also provide qualifications, validations, and preventive maintenance services at an additional cost.

Refrigeration System


The FS Series provides an oversized and balanced, environmentally friendly R404A refrigeration system, epoxy coated evaporator, large evaporator, and coil heater permit for a short defrost cycle.

FS Series Stability Freezer Chamber Specifications (ambient 23° C)

		Temperature	
Performance	Standard	Optional	
Temperature Range	-25° C to 15° C	Available	
Ambient Temperature	21° C ± 3° C		
Temperature Control	± 0.2° C		
*Temperature Uniformity	± 0.7° C		
Control Resolution	0.1° C		
Temperature Sensor Type	3 wire PT100 Class A RTD		




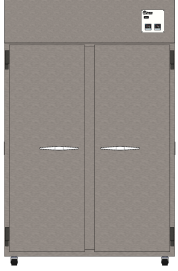

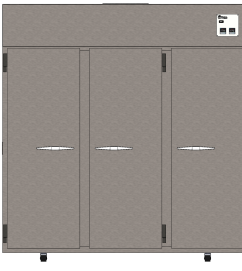


* We place 5 sensors in the chamber, one in each corner (vertically) and one in the center. We log it overnight and look at the min to max across all points.




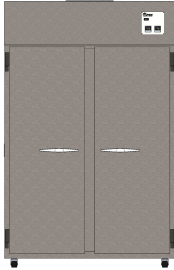

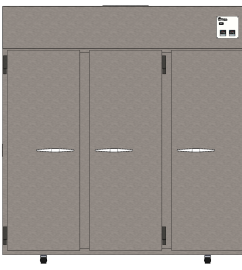
Control System	Standard	Optional
Controller	Fuji PXF4	VTS (Virtual Touchscreen), Gefran 650, Future Design Controls CM and MCT4 + More
Control Readout	Actual and Set-Point Values 	Trending, Duty Cycle
Indication Accuracy	RTD input: $\pm 0.2\%$ of indication value ± 1 digit or $\pm 0.5^\circ\text{C} \pm 1$ digit, whichever is larger	Dependent on optional Controller
Sample Rate	Fast as 50 ms	Dependent on optional Controller
Control Speed	Fast as 100 ms	Dependent on optional Controller
Control Type	PID - Fuzzy Logic (9 types available)	Dependent on optional Controller
Auto Tuning	YES	Dependent on optional Controller
Calibration Correction Capability	± 0.1 lower and upper scale	Dependent on optional Controller
Uniformity Off Set	± 0.1 Resolution Linear adjustment	± 0.1 Resolution
Alarm	High / Low Audible and Visual	Text, Email, Web Server, Remote Access
Alarm Type	High / Low Deviation in 0.1 resolution with adjustable Delay. Control audible alarm enable or disable components.	Absolute & Deviation 0.1 Resolution with Delay
Remote Monitoring / BMS connection	Double throw Dry Contact Alarm, RS 485 MODBUS RTU / ASCII**	Ethernet & Analog Output (Specify voltage or mA)
Password Protection	Hexadecimal	Numeric, Alpha Numeric
Audit Trail	Not Standard*	Dependent on optional Controller
Universal Power Supply for Monitoring	Not Standard	Available. <i>Controllers and sensors powered during outage for data logging. Chamber operation not supported.</i>
Ramp Soak Function	Up to 64 steps. A Step includes a ramp and soak. Up to 8 patterns / programs (recipes).	Dependent on optional Controller




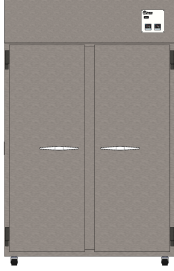

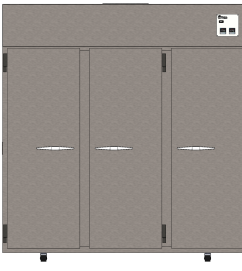
*Applies with touchscreen or VTS option.

**For BACNET or MODBUS TCP (Ethernet) please contact your BMS vendor about using a gateway to interface with controllers via the RS485.

	FS011	FS030	FS034	FS055	FS068	FS084
FS						
Construction						
Exterior	Powder Coated Finish	Stainless Steel Front continuous coil coated steel sides	Powder Coated Finish	Stainless Steel Front continuous coil coated steel sides	Powder Coated Finish	Stainless Steel Front continuous coil coated steel sides
Exterior Material Thickness	Heavy Gauge	Medium Gauge	Heavy Gauge	Medium Gauge	Heavy Gauge	Medium Gauge
Interior	304 Stainless Steel	Coated Aluminum	304 Stainless Steel	Coated Aluminum	304 Stainless Steel	Coated Aluminum
Interior Material Thickness	.036"	Medium Gauge	.036"	Medium Gauge	.036"	Medium Gauge
Door QTY	1	1	1	2	2	3
Door Lock	Optional	Tumbler Cam Key Lock	Optional	Tumbler Cam Key Lock	Optional	Tumbler Cam Key Lock
Door Swing	+180°	120° Stay Open Feature	+180°	120° Stay Open Feature	+180°	120° Stay Open Feature
Door Gasket	Magnetic Gasket	Snap in Magnetic Gasket	Magnetic Gasket	Snap in Magnetic Gasket	Magnetic Gasket	Snap in Magnetic Gasket
Shelving Material	304 Stainless Steel	Epoxy Coated	304 Stainless Steel	Epoxy Coated	304 Stainless Steel	Epoxy Coated
Shelf Quantity per Door	2	3	3	3	3	3
Casters Height	2.75"	3"	2.75"	3"	2.75"	3"
Caster QTY	4	4	4	4	5	4
Caster Locking Brakes	2	2	2	2	2	2
Access Port Qty	2	2	2	2	2	2
Multi-Purpose ports	YES	YES	YES	YES	YES	YES

Continuous coil coated is treated metal before it is cut and formed, the entire surface is cleaned and treated, providing tightly bonded finish. Formed sides have holes, valleys, recessed areas, and hidden areas that make it difficult to clean and uniformly coat. Coil coated metal is often considered more durable and corrosion resistant than most painted metal as it is treated before shaped.

	FS011	FS030	FS034	FS055	FS068	FS084
FS						
Capacity & Dimensions						
NET Capacity*	9.2 ft ³	22.1 ft ³	29.0 ft ³	48.2 ft ³	62.6 ft ³	74.3 ft ³
Conditioned Space	11.6 ft ³	23.9 ft ³	32.1 ft ³	50.0 ft ³	69.3 ft ³	76.2 ft ³
External Dimensions	36.2W x 27.4D x 47.1H	26W x 32D x 78.75H	35.7W x 33.8D x 80.8H	52W x 32D x 78.75H	68.4W x 34.2D x 81.8H	78W x 32D x 78.75H
Internal Dimensions	29.7W x 23.6H x 22.6D	22W x 28D x 62H	29.4W x 29.0D x 57.3H	48W x 28D x 62H	64.2W x 29.4D x 57.3H	74W x 28D x 62H
Access Port Dimensions	2" ID with Foam Insert	2" ID with Foam Insert	2" ID with Foam Insert	2" ID with Foam Insert	2" ID with Foam Insert	2" ID with Foam Insert
Recommended Clearance	Top 12"	Top 12"	Top 12"	Top 12"	Top 12"	Top 12"
	Rear 6"	Rear 6"	Rear 6"	Rear 6"	Rear 6"	Rear 6"
	Sides 6"	Sides 6"	Sides 6"	Sides 6"	Sides 6"	Sides 6"
Shelf Dimensions	28.9W x 20.4D	21.25W x 24.6D	28.75W x 26D	22.75W x 22.75D	31.4W x 24.25D	24W x 22.75D
Shelf Weight Capacity	150 lbs.	90 lbs.	150 lbs.	90 lbs.	150 lbs.	90 lbs.
Approx. Max Storage weight	600	500	700	1000	1000	1500
Approx. Crated Weight	470 lbs.	526 lbs.	765 lbs.	740 lbs.	1100lbs	1100 lbs.

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FS						
Components						
Compressor Size	1/2 hp	1/2 hp	1/2 hp	1 hp	1 hp	2 * 1/2 hp
Refrigerant	404a	404a	404a	404a	404a	404a
Charge (oz)	13.5 oz	13.5 oz	13.5 oz	13.5 oz	13.5 oz	13.5 oz
Defrost	Standard- adjustable duration and frequency	Standard- adjustable duration and frequency	Standard- adjustable duration and frequency	Standard- adjustable duration and frequency	Standard- adjustable duration and frequency	Standard- adjustable duration and frequency
Defrost Heater Watt Size	350	290	350	290	600	290
Heater Qty	1	1	1	1	1	2
Perimeter Heater	YES	YES	YES	YES	YES	YES
Air flow direction	Front to Back	Front to Back	Front to Back	Front to Back	Front to Back	Front to Back
Fan Count	3	1	3	1	6	1
Fan CFM per fan	125	Up to 600	125	Up to 600	125	Up to 600
Variable Speed	Manual Adjust	Manual Adjust	Manual Adjust	Manual Adjust	Manual Adjust	Manual Adjust

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FS						
Electrical North America						
Voltage	115 VAC/ 60 Hz					115/208-230 VAC /60HZ Chamber & 115 VAC /60Hz Dryer NEMA L14-20P
RLA	8.0	7.0	8.0	8.5	12.0	9.0/9.0
Heat Rejection	3921Btu/h	3921 Btu/h	3921 Btu/h	5102 Btu/h	5102 Btu/h	8011 Btu/h
Cord Length	9 ft	9 ft	9 ft	9 ft	9 ft	9 ft
Dedicated Circuit	15 A	15 A	15 A	20 A	20 A	20 A
Electrical International via Buck Boost Transformer						
Voltage	230 VAC/ 50 Hz					
RLA	4.0	3.3	4.0	6.0	6.0	6.0
Heat Rejection	3921Btu/h	3921 Btu/h	3921 Btu/h	5102 Btu/h	5102 Btu/h	8011 Btu/h
Cord Length	2.74 m	2.74 m	2.74 m	2.74 m	2.74 m	2.74 m
Accessory connections						
BMS Dry Contact	Screw terminal 3 position Common / Normally Closed / Normally Open					
RS485 MODBUS	1/8" or 2.5mm stereo input jack					
Optional Re transmission	Screw terminal					
Aux 24VDC output (500 mA limit)	5.2 mm Barrel Connector					

*Interior Capacity includes the 2" spacing from interior walls to allow for best air flow performance.

**Include width with handle and height with castors installed.

RLA and heat rejection is based on a controlled operation temperature of 30C and 65% RH. Value may change on operating set points.