

Climate Chambers for ICH Stability, Shelf Life & Materials Testing

Patented Forced Air Convection with Cooling



Temperature:

0°C up to 100°C

- ECO: -10°C min. temp. option available.
- EVO: -20° min. temp. option available.

Refrigerant:

R 134a (R 449a for devices with -20°C min. temp. option)

Chamber:

AISI 304 stainless steel (AISI 316 option available).
Double wall, seamless main chamber with removable inner chamber.

Optional Lighting (EVO):

- Programmable UV & VIS ICH Q1B lighting for photostability studies.
- VIS LED shelf and door lighting.
- Light intensity controlled in 1% increments.

Electrical:

115V 50/60Hz: 55, 111, 222, 404, 707.

230V 50/60Hz: 1212 and lighted devices.

Optional Equipment:

- Stainless steel exterior: AISI 304 or 316.
- AISI 316 stainless steel chamber.
- Stacking frame for 111 devices.
- 160°C sterilization cycle on EVO models.
- 1" (25mm) / 2" (50mm) / 4" (100mm) access port.
- Flexible PT 100 temperature sensor.
- Ethernet communication port
- Automatic key and door lock.
- Door sensor and alarm.
- Waterproof interior electrical socket: 230V.
- Rolling cart for 111 and 222 models.
- 4-20mA and BMS contacts (24V, 1A).
- IQ/OQ protocols with 9pt. or 27pt. temperature mapping.
- Warmcomm software:
 - 4.0B - data monitoring.
 - 4.0P - data monitoring and control.
 - 4.0F - FDA 21 CFR part 11 compliance.

Friocell climate chambers simulate specific environmental conditions through precise control of temperature and optional lighting.

Applications for the Friocell include ICH Q1A stability testing of drug products and substances, shelf-life studies of food and beverage products, and materials testing. Friocell devices also meet the requirements for ICH Q1B photostability studies when equipped with the EVO advanced controller and fully programmable fluorescent shelf lighting.

Key Benefits:

- Pharmaceutical-grade stainless steel chamber for easier cleaning and sterilization.
- Patented forced air convection system with simultaneous vertical and horizontal airflow for precise temperature uniformity and rapid heating and cooling times.
- Patented refrigeration system offer accurate and fast simulation of natural processes and reduces the risk of sample drying.
- Temperature ramping and cycling.



ECO Controller:

- 3" LCD display.
- Fuzzy Logic algorithm constantly monitors chamber conditions and continuously optimizes parameters.
- (9) programs with (2) segments each for varying loads and parameters.
- Real-time programming and cycling.
- Programmable audible & visual alarms – temperature, time & humidity.
- USB flash & device, RS232 & optional Ethernet port.
- Integrated USB 30-day data logger for temperature measurement & recording.
- Keypad lock against unauthorized access.
- Optional FDA CFR 21 part 11 compliance.



EVO Controller:

- 5.7" LCD touch display.
- Fuzzy Logic algorithm constantly monitors chamber conditions and continuously optimizes parameters.
- (100) programs with (100) segments each for varying loads and parameters.
- Real-time programming and cycling with settings for temperature ramping.
- Fan adjustments in 1% increments.
- Programmable audible & visual alarms – temperature, time & humidity.
- Service programs for quick error diagnostics.
- USB device, RS232 & optional Ethernet port.
- Integrated SD card 30-day data logger & multi-level secure user authentication.
- Optional FDA CFR 21 part 11 compliance.

Friocell ECO/EVO Technical Data		Model	55	111	222	404	707	1212
Interior Dimensions Chamber: AISI 304 stainless steel (AISI 316 stainless steel option available)	Volume	ft ³	2	4	8	14.3	25	43
		liters	55	111	222	404	707	1212
	Width	inches	15.7	21.3	21.3	21.3	37	3 x 21.25
		mm	400	540	540	540	940	3 x 540
	Depth	inches	14.6/15	14.6/15	20.5/20.9	20.5/20.9	20.5/20.9	20.5/20.9
		mm	370/380	370/380	520/530	520/530	520/530	520/530
	Height	inches	13.8/14	20.9/21	29.9/30.1	55.7	55.7	55.7
		mm	350/355	530/535	760/765	1415	1415	1415
Exterior Dimensions (ECO/EVO)	Width	inches	24.4/25.2	29.9/30.7	29.9/30.7	41.7/43.3	57.5/59	95.9/99.6
		mm	620/640	760/780	760/780	1060/1100	1460/1500	2435/2530
	Depth	inches	25.2/29.7	29.2/29.7	35.2/34.8	31.1/34.8	31.1/34.8	34.2/35.4
		mm	640/755	640/755	895/885	790/885	790/885	870/898
	Height	inches	34.4/37	41.1/46.7	50.2/57.1	75/74.4	75/74.4	75/75.6
		mm	875/940	1045/1187	1275/1450	1905/1890	1905/1890	1905/1921
Shelves: Stainless Steel	Capacity: # of shelf guides in chamber side walls	maximum #	4	7	10	19	19	3 x 19
		standard #	2	2	2	2	2	6
Shelf Distance	Min. distance between trays	inches	2.8	2.8	2.8	2.8	2.8	2.8
		mm	70	70	70	70	70	70
Useable Shelf Area	Width x Depth	inches	15x13.2	20.5x13.2	20.5x19.1	20.5x19.1	36.3x19.1	20.5x19.1x3
		mm	380x335	520x335	520x485	520x485	920x485	520x485x3
Maximum Shelf Load	One Shelf	lbs	44.1	44.1	66.1	66.1	110.2	66.1
		kg	20	20	30	30	50	30
	Total Per Unit	lbs	110.2	110.2	154.3	220.5	286.6	661
		kg	50	50	70	100	130	300
# Outer Metal Doors			1	1	1	1	2	3
# Inner Glass Doors			1	1	1	1	2	3
Volume of Steam Space		ft ³	3.1/3.2	5.8/5.9	10.6/10.8	18.5/18.7	30.9/31	61.9
		liters	89/91	163/167	299/305	524/530	876/878	1753
Operation Temperature	From 0°C (-10°C / -20°C)	up to °C	100	100	100	100	100	100/70
Temperature Accuracy	Distribution @ 10°C	± °C	<0.5	<0.5	<0.5	<1	<1	<0.6
	Distribution @ 37°C	± °C	<0.5	<0.5	<0.5	<1	<1	<0.5
	Uniformity	± °C	<0.2	<0.2	<0.2	<0.3	<0.4	<0.2
Heating Time to 37°C From the Ambient Temperature		minutes	<11	<11	<11	<13	<13	<30
Cooling Down Time From 22°C to 10°C		minutes	<21	<21	<17	<19	<21	<21
Recovery time after door opened for 30 s according to DIN 12880	@ 37°C	minutes	<5	<5	<2	<2	<6	<10
	@ 50°C	minutes	<6	<6	<3	<4	<6	<10
Heat Emission	@ 37°C	W	55	70	63	123	148	200
CO2 Concentration (EVO Only)		%	0.1 - 20		-		0.1 - 20	
CO2 Required Pressure (EVO Only)		Bar/PSI	0.3-0.7/5--10		-		0.3-0.7/5--10	
Noise Level of Complete Device		dB	45	46	50	56	58	60
Electrical Data	Max Consumption 50/60Hz	W	700/850**	1000/1150**	1150/1300**	1700	2000/2050**	2500/3300**
		A	7.6	7.7/10	9.2/11.2	16	17.9	11.6
		V	115	115	115	115	115	230
IP Code			IP20	IP20	IP20	IP20	IP20	IP20
ECO/EVO Weight	Net	lbs	183/209.4	233.7/242.5	302/315.3	493.8/507.1	562.2/565.2	1144.2/1201.5
		kg	83/95	106/110	137/143	224/230	255/270	519/545
	Gross	lbs	224.9/396.8	299.8/485	383.6/579.8	606.3/859.8	707.7/1102.3	1849.7/1907
		kg	102/180	136/220	174/263	275/390	321/500	839/865
EVO Weight -20°C	Net	lbs	231.5	264.6	337.3	551.2	639.3	1201.5
		kg	105	120	153	250	290	545
	Gross	lbs	419	507.1	601.9	881.8	1124.4	1907
		kg	190	230	273	400	510	865

ECO Value/EVO Value

**Value at cooling down to -20°C