



#### 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          |
|--|---|-----------------|---------------|-------------|-------------|-------------|---------------|---------------|
| <b>Interior Dimensions</b><br><br><b>Chamber:</b><br>AISI 304 stainless steel<br>(AISI 316 stainless steel option available) | Volume  | ft <sup>3</sup> | 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          |
| <b>Exterior Dimensions (ECO/EVO)</b>   | 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     |
| <b>Shelves: Stainless Steel</b>  | Capacity: # of shelf guides in chamber side walls | maximum #       | 4             | 7           | 10          | 19          | 19            | 3 x 19        |
|  |   | standard #      | 2             | 2           | 2           | 2           | 2             | 6             |
| <b>Shelf Distance</b>  | Min. distance between trays                       | inches          | 2.8           | 2.8         | 2.8         | 2.8         | 2.8           | 2.8           |
|  |   | mm              | 70            | 70          | 70          | 70          | 70            | 70            |
| <b>Useable Shelf Area</b>  | 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     |
| <b>Maximum Shelf Load</b>  | 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           |
| <b># Outer Metal Doors</b>   |   |                 | 1             | 1           | 1           | 1           | 2             | 3             |
| <b># Inner Glass Doors</b>   |   |                 | 1             | 1           | 1           | 1           | 2             | 3             |
| <b>Volume of Steam Space</b>   |   | ft <sup>3</sup> | 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          |
| <b>Operation Temperature</b>   | From 0°C (-10°C / -20°C)                          | up to °C        | 100           | 100         | 100         | 100         | 100           | 100/70        |
| <b>Temperature Accuracy</b>  | 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          |
| <b>Heating Time to 37°C From the Ambient Temperature</b>   |   | minutes         | <11           | <11         | <11         | <13         | <13           | <30           |
| <b>Cooling Down Time From 22°C to 10°C</b>   |   | minutes         | <21           | <21         | <17         | <19         | <21           | <21           |
| <b>Recovery time after door opened for 30 s according to DIN 12880</b>   | @ 37°C  | minutes         | <5            | <5          | <2          | <2          | <6            | <10           |
|  | @ 50°C  | minutes         | <6            | <6          | <3          | <4          | <6            | <10           |
| <b>Heat Emission</b>   | @ 37°C  | W               | 55            | 70          | 63          | 123         | 148           | 200           |
| <b>CO2 Concentration (EVO Only)</b>  |   | %               | 0.1 - 20      |             | -           |             | 0.1 - 20      |               |
| <b>CO2 Required Pressure (EVO Only)</b>  |   | Bar/PSI         | 0.3-0.7/5--10 |             | -           |             | 0.3-0.7/5--10 |               |
| <b>Noise Level of Complete Device</b>  |   | dB              | 45            | 46          | 50          | 56          | 58            | 60            |
| <b>Electrical Data</b>   | 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           |
| <b>IP Code</b>   |   |                 | IP20          | IP20        | IP20        | IP20        | IP20          | IP20          |
| <b>ECO/EVO Weight</b>  | 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       |
| <b>EVO Weight -20°C</b>  | 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