Ultra-low Temperature Freezer
ULT Vault for Your Samples

Lexicon®

Lexicon® Ultra-low Temperature Freezer
Model UUS-668A-1
Ultra-low temperature (ULT) freezers are widely used in scientific research for long-term storage of samples. As ULT freezers are often operated at -80°C continuously for years, reliability is of paramount importance to researchers.

constructed from high quality proven components with energy efficient refrigeration design, Esco Lexicon® ULT freezers provide top notch protection that can withstand the test of time to guarantee the integrity of your samples.
Esco Lexicon® Ultralow Temperature Freezer, Model UUS-668A-1

**Insulated Main Door**
- Minimum 4.5” (114 mm) CFC-free, foamed-in-place polyurethane insulation for thermal containment and structural support
- 3 durable main door hinges are used.

**Heated Pressure Equalization Port (PEP)**
- Heated port with spring-assisted mechanism to prevent icing on the vent
- Prevents vacuum formation, allowing door to be re-opened quickly
- Located on the main door for easy cleaning

**5 Individual Inner Doors**
- 5 individual inner doors can be opened independently to minimize sample exposure
- 1 continuous stainless steel hinge is used for excellent alignment of the inner doors to ensure a good seal
- Magnetic door contact for rapid closure

**Sample Port**
- 1” (25mm) diameter for easy access through wall

**Ergonomic Door Handle**
- Ergonomic door handle allows one handed door opening
- Key lock provided with every unit to prevent unauthorized access

**Optional Chart Recorder**
- Front-mounted
- For independent temperature monitoring

**Caster Wheel**
- Robust, adjustable, lockable
**Superior Performance**

**Fast Pull Down**

- Pull down time is the time required to bring down the temperature of the ULT freezer from ambient to the set temperature.
- Esco Lexicon® has a short pull down time which signifies an efficient refrigeration system*.

**Fast Temperature Recovery After Door Opening**

- Recovery time after door opening is the time required for the temperature to recover after the user places samples into the freezer.
- Esco Lexicon® recovers temperature in minutes following a 1 min. door opening*. Fast recovery in temperature ensures integrity of stored samples.

**Excellent Uniformity**

- Uniformity test measures the difference between the coldest spot and warmest spot in the freezer chamber when the freezer is operating at set temperature.
- Esco Lexicon® has excellent uniformity under normal operating conditions*. This guarantees that all samples are stored at or close to desired set temperature.

**Extended Warm-up Time During a Power Failure**

- Warm-up time measures the time taken for temperature to rise up (from -80°C to -50°C) when the power is interrupted.
- With a robust insulation system in place, Esco Lexicon® has probably the longest warm-up time among the freezers compared on the left*. Slower warm-up during an extended power failure buys the user time for carrying out a back-up plan.

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* Units were factory tested under controlled environmental conditions per Esco method. Esco does not guarantee identical results in the field under differing conditions. Original report available upon request. UUS-668A-1 units were used for all the tests above.
Quiet - Low Noise Operation

- According to OSHA 1910.95 Occupational Noise Exposure Regulation, the sound level of the workplace has to fall below 90 dBA for an employee who works 8 hours/day.
- Total noise in a lab is highly dependent upon the equipment that emits the greatest amount of noise.
- Esco Lexicon® ultra-low freezer has a noise level of approximately 56 dBA*. This ensures a quiet and pleasant working environment for lab users.

Large Reserve Capacity

- Reserve capacity test records the lowest temperature the freezer is able to sustain when a heat source is placed in the freezer. This resembles real life situations when hot samples are placed in the freezer. The lower the temperature the freezer can sustain, the higher chance the freezer can maintain the set temperature when warm samples are placed in the freezer.
- Esco reserve capacity surpasses that of all major brands tested above.

Energy Consumption

- Esco energy consumption is the lowest of all manufacturer’s conventional ULT freezers of similar size compared above*.

Low Heat Emission To Ambient

- Less heat emission than conventional ULT freezers of similar size*.
- Substantial savings on air-conditioning costs.

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** Average value of the Brand S to Brand F.
Intelligent Design with Quality Components

Effective Cooling Technology

- 2-Stage cascade refrigeration system.
- Two fans are employed to draw consistent air flow from the front to the back of the freezer to cool the condenser.
- Two 1-Hp hermetic compressors operated at a low speed for longer life.
- The compressors sit directly behind the fans and are air-cooled for better operating conditions.

HeatRecycler™ Technology allows efficient recycling of the heat generated by the system. This reduces power consumption and prolongs the life of the freezer.
- Two additional “heat exchangers” to channel heat energy.
- “Mullion heater” recycles excess heat from 1st stage compressor to heat up main door gasket. This prevents ice from forming on the gasket and provides for easy door closing.

Superior Insulation System

- Maximum product protection is provided by Lexicon’s superior insulation system.
- 5” thick polyurethane foamed in place in the main cabinet, 4.5” in the door.
- Triple gasket seal protects against thermal leaks and prevents frost built-up.

Quality Components

All freezer components were selected from many tear-down and comparison tests. Only the most reliable components were selected.
- Danfoss® compressors are reliable and have high performance.
- Danfoss® filter drier is optimized for HFC refrigerants and uses 100% 3Å molecular sieve core for high moisture drying capacity. (Moisture equates to clogs in the system!).
- Condenser is oversized by design to provide a greater capacity for cooling.
- Condenser fans generate high air flow and have quiet operation.
- Energy efficient high performance oil separator eliminates solid contaminants along with excess oil from the system and enhances the entire system’s performance.
- One seamless full wrap copper evaporator tube with no joints reduces any possibility of leak in the field.
- Highly efficient corrosion resistant and pressure resistant heat exchanger used for maximum heat transfer.
Strict Process Control

- First in the industry to use thermal imager to ensure cabinet integrity.
- Strict evacuation protocols and process controls to ensure a clean, dry, leak free system.
- Climate controlled assembly area to eliminate particulates and maintain a constant ambient temperature.
- Pre-flush all critical components to ensure all parts are clean prior to assembly.
- Computer controlled foaming machine to eliminate foaming variables.
- Advanced data logging system to ensure all units are tested and analyzed properly and documented.
- In-house designed and developed oil drying, evacuation and charging process equipment specifically designed for the manufacture of ultra-low cascade refrigeration systems.

QuickOpen™ Fast Door Re-Open System

- Esco designed Pressure Equalization Port (PEP) relieves the vacuum that is formed inside the chamber after door opening. PEP is heated to prevent ice formation on the port.
- Ergonomically designed door handle allows one-handed door opening.

Environmentally Friendly

- Only CFC-free and HCFC-free HFC blowing agent is used.
- Only environmentally friendly CFC-free and HCFC-free HFC refrigerants are used.
- CFC and HCFC compounds have high impact on the ozone in the Earth’s atmosphere, where HFC does not contain chlorine and is not harmful to earth’s atmosphere.
- Biodegradable, high-performance synthetic polyolester oil is used.

Easy to Service

- Embedded thermocouples in the foam for easy field troubleshooting.
- Filter driers are located at the deck for easy replacement.
- Field reversible door.
- Adjustable main door hinge and latch.
- Condenser filter is conveniently located at the front of the freezer. This allows easy access for inspection, cleaning and/or changing.
- 5 years warranty on compressors, 3 years on complete system.
Ultra-low Temperature Upright Freezers

- Commercially available and easy to adjust.
- Power failure alarm and high temperature alarm are available for S-Series ULT freezers.
Options and Accessories

6" Chart Recorder, Temp, 115/230VAC 50/60HZ
The chart recorder provides an easy-to-read graph of data vs time. It is a reliable, accurate, and stable instrument, for on-the-spot written documentation of freezer chamber temperature. This model offers 6" chart of temperature data.

Modifiable Clip Rack for Standard 2-inch and/or 3-inch Boxes
The modifiable clip rack is able to fit standard 5.25" x 5.25" x 2" (130 X 130 X 50 mm) boxes and/or standard 5.25" x 5.25" x 3" (130 X 130 X 80 mm) boxes by changing the position of the clips. It is made of stainless steel and has handles. Each Rack includes 6 L-Clips and 9 T-Clips.

Additional shelving kit
Each Lexicon® ULT freezer comes standard with 4 shelves and 16 clips. Extra shelves are available and each shelf comes with 4 clips.

Standard Cardboard 2-inch Box
Fiberboard boxes have the dimension of 5.25"X5.25"X2" (or 130X130X50 mm). All boxes do not come with dividers. Dividers have to be ordered separately.

Standard Cardboard 3-inch Box
Fiberboard boxes have the dimension of 5.25"X5.25"X3" (or 130X130X80 mm). All boxes do not come with dividers. Dividers have to be ordered separately.

Standard Cardboard 100-cell Divider
100-cell Dividers are made of 10X10, 7/16" cells and each divider holds 100 12 mm vials.

Standard Cardboard 81-cell Divider
81-cell Dividers are made of 9X9, 1/4" cells and each divider holds 81 13 mm vials.

Standard Cardboard 64-cell Divider
64-cell Dividers are made of 8X8, 9/16" cells and each divider holds 64 14 mm vials.
IQ/OQ Protocol document is available for verifying that the equipment has been installed in accordance with installation specifications and is functioning and operating at the intended operational parameters.
Lexicon® Ultralow Temperature Freezer Technical Specifications

Front View

1. Access port
2. Main door
3. PEP cover
4. S-series standard controller
5. Main door handle
6. Front bottom door
7. Chart recorder box (optional)
8. Inner doors
9. Embedded pulls
10. Omega bracket
11. Shelves
12. Pilaster
13. PU foam insulation
14. Shelf clip
15. Caster wheel

Side View

Ordering Information

<table>
<thead>
<tr>
<th>Models</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UUS-668A-1</td>
<td>Ultra low temp. freezer; Upright; 24 cu. ft (668L); S-series controller; 230V, 50/60 Hz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1080585-U</td>
<td>Accessory, Chart Recorder, 115/230VAC 50/60Hz</td>
</tr>
<tr>
<td>1180060-U</td>
<td>Accessory, Modifiable Clip Rack for Standard 2-inch High Boxes and/or 3-inch High Boxes</td>
</tr>
<tr>
<td>5170356-U</td>
<td>Accessory, Additional shelving kit</td>
</tr>
<tr>
<td>1180061-U</td>
<td>Accessory, Standard Cardboard 2-inch Box</td>
</tr>
<tr>
<td>1180062-U</td>
<td>Accessory, Standard Cardboard 3-inch Box</td>
</tr>
<tr>
<td>1180063-U</td>
<td>Accessory, Standard Cardboard 100-Cell Divider</td>
</tr>
<tr>
<td>1180064-U</td>
<td>Accessory, Standard Cardboard 81-Cell Divider</td>
</tr>
<tr>
<td>1180065-U</td>
<td>Accessory, Standard Cardboard 64-Cell Divider</td>
</tr>
<tr>
<td>1180066-U</td>
<td>Accessory, Standard Cardboard 49-Cell Divider</td>
</tr>
<tr>
<td>5170358-U</td>
<td>Accessory, CO2 back-up system</td>
</tr>
<tr>
<td>5170357-U</td>
<td>Accessory, LN, back-up system</td>
</tr>
<tr>
<td>9010103-U</td>
<td>Accessory, Ice Scraper</td>
</tr>
<tr>
<td>9010102-U</td>
<td>Accessory, Cryo Safety Gloves</td>
</tr>
<tr>
<td>9010101-U</td>
<td>Accessory, IQ/OQ Documentation</td>
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</tbody>
</table>

* U-field installed by user; T-field installed by technician; F-factory installed
## Lexicon, General Specification for Model UUS-668A-1*

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. Range</td>
<td>-50 to -86°C</td>
</tr>
<tr>
<td>Ambient Temp. Range</td>
<td>15 to 32°C (59 to 89°F)</td>
</tr>
<tr>
<td>External Dimension (W x D x H)</td>
<td>1010 x 945 x 1980 mm (40.0&quot; x 37.2&quot; x 78.0&quot;)</td>
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<tr>
<td>Internal Dimension (W x D x H)</td>
<td>750 x 685 x 1304 mm (30.0&quot; x 27.0&quot; x 51.0&quot;)</td>
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<tr>
<td>Capacity</td>
<td>668.8 L (23.6 cu.ft)</td>
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<tr>
<td>Compressor</td>
<td>2 hermetic 1.0 hp compressors</td>
</tr>
<tr>
<td>Condenser</td>
<td>Enhanced finned-tube, forced-air cooled condenser</td>
</tr>
<tr>
<td>Insulation Type</td>
<td>Polyurethane foam</td>
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<tr>
<td>Refrigerant Type</td>
<td>Environmentally friendly HFC refrigerants</td>
</tr>
<tr>
<td>Temperature Controller</td>
<td>Digital controller</td>
</tr>
<tr>
<td>Number of Outer / Inner Doors</td>
<td>1 / 5</td>
</tr>
<tr>
<td>Shelves</td>
<td>Material 55304, adjustable, 4 shelves</td>
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<tr>
<td></td>
<td>Shelf Area (W x D) 738 x 611 mm (28.9&quot; x 25.1&quot;)</td>
</tr>
<tr>
<td></td>
<td>Max Load 50 kg (110 lbs)</td>
</tr>
<tr>
<td>Storage Box Capacity (With Inventory Rack)</td>
<td>2 * Box 400</td>
</tr>
<tr>
<td></td>
<td>3 * Box 300</td>
</tr>
<tr>
<td>Access Port</td>
<td>Ø 25 mm (1&quot;) - 1 port</td>
</tr>
<tr>
<td>Electrical Rating / Full Load Amps</td>
<td>230V, 50Hz, 1Φ / 12A</td>
</tr>
<tr>
<td>Power Consumption at -80°C</td>
<td>Approximately 14.2 KWht/day</td>
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<tr>
<td>Net Weight</td>
<td>326.5 kg (720 lbs)</td>
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<tr>
<td>Shipping Weight</td>
<td>378 kg (833 lbs)</td>
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<tr>
<td>Shipping Dimensions (W x D x H)</td>
<td>1152 x 1092 x 2160 mm (45.3&quot; x 43.0&quot; x 85.0&quot;)</td>
</tr>
</tbody>
</table>

* Model UUS-668A-1: 23.6 cu. ft; 230V, 50Hz, 1Φ; S-series digital controller

Since 1978, Esco has emerged as a leader in the development of controlled environment, laboratory and cleanroom equipment solutions. Products sold in more than 100 countries include biological safety cabinets, cleanroom products, compounding pharmacy equipment, CO2 incubators, containment / pharma products, ductless fume hoods, in vitro fertilization workstations, lab animal research products, laboratory fume hoods, laboratory ovens and incubators, laminar flow clean benches and PCR products and instrumentation. With the most extensive product line in the industry, Esco has passed more tests, in more languages, for more certifications, throughout more countries than any biosafety cabinet manufacturer in the world. Esco remains dedicated to delivering innovative solutions for the clinical, life science, research and industrial laboratory community. www.escoglobal.com.

**Biological Safety Cabinets and Laminar Flow • Laboratory Fume Hoods • Laboratory Ovens Laboratory Incubators • PCR Thermal Cyclers • Microplate Shaker/Incubators • Ultralow Freezers**

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