

Quality is more than a word

ESPEC

Temperature Cycling Chambers

Global-N Series



ESPEC NORTH AMERICA, INC

Faster test chambers ...

The Global-N series chambers from ESPEC provide the temperature cycling and humidity performance you need to validate quality and reliability for increasingly sophisticated electronics and other products.



28 cu. ft.



12 cu. ft.



4 cu. ft.

Global Features

World-standard performance and features on a minimal footprint

The Global-N chambers have temperature change rates from 5 to 30°C per minute. In addition, controlled humidity from 10 to 95% is an available feature. There are five sizes, including our newest and smallest size 4 cu.ft. (114L) They are compact, requiring the least amount of floor space for this level of performance.

These chambers feature the classic ESPEC look of stainless steel with a modern style. The control console is on the door, making the footprint of the unit even more compact. A simple, but secure, door latch is easier than ever to use.

International applications

Global-N chambers meet Mil-Std, JEDEC, IEC, and other international test performance standards. The units can be installed around the world for consistent testing at different facilities, supported by your local ESPEC service group.

Designed for serviceability and safety

For safety and worldwide compliance, Global-N series are UL 508A certified or CE-marked.

The refrigeration service panels are hinged for fast access. Analog refrigeration gauges help you monitor system performance and pinpoint service needs.

Standard features:

- Stainless steel exterior and interior
- High performance refrigeration utilizing reliable Scroll compressors (except -15WW models)
- Hinged service panels for easy access
- Unique non-metallic thermal breaks around the door-frame and cable ports
- Specimen power relay for interlocking test samples or external devices to chamber power for safety
- One 4" (100mm) cable port, one shelf & casters included



Innovative high-speed airflow suited for fast temperature cycling applications.



Advanced refrigeration design is especially compact for high performance test chambers.

Performance

Temperature cycling up to 30 degrees per minute

Global-N series has more than twenty different models to allow you to choose the size and performance best suited for your test applications. Temperature cycling rates from 5 to 30°C/min. are possible. Two different ultimate low temperatures are available: -35°C or -70°C.

Models EGNL & EGNX also control humidity, for expanded testing options beyond temperature cycling.

Global-N chambers are capable of meeting the performance requirements of JEDEC, IEC, Mil-Std, and other international environmental test performance standards.

Get a performance evaluation to help select your model

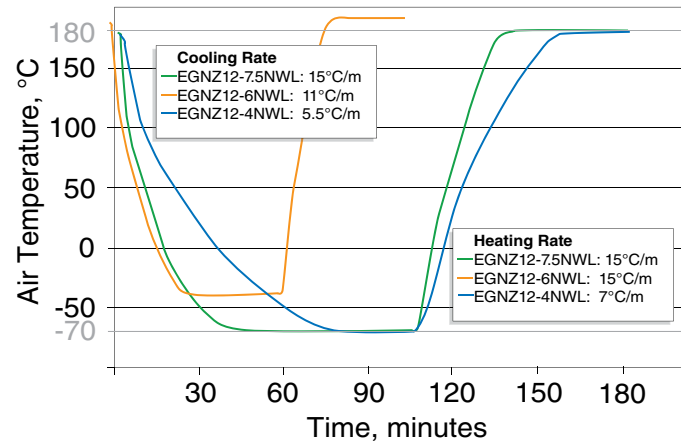
For better assurance of performance for your temperature cycling application, ESPEC can provide a guaranteed performance calculation based on your submitted requirements.

Please use these questions (at right) as a guide to define your test plan. You can then give this information to your local sales representative, or submit at www.espec.com, for review by an ESPEC engineer. A recommended model with appropriate refrigeration size will be returned.

Air-cooled models available

High performance test chambers usually mean water cooling utilities are required. Global-N models with 4 or 6-hp refrigeration are available with integrated air-cooling. The condenser is mounted on top with low-speed fans for minimal noise impact.

Larger systems can have remote/outdoor air-cooled condensers in place of water cooling.



Different Global-N models can heat and cool at different rates. Shown above are change rates for EGNZ12 models, following IEC 60068 3-5 standard, with the sensor in the supply air.

Questions for performance evaluation request:

1. Chamber type

Desired size: 4, 12, 16, 28, or 35 cu. ft.? (114, 380, 470, 800, or 1000 L?)

Local power: 60Hz or 50Hz?

Humidity control: Yes or no?

2. Your Sample

Sample description and type of material(s)

Total mass per test, including any racks or cabling

Heat output of samples, in watts, if powered during test

3. Your Test Plan

Test method, if a published standard (e.g. JEDEC JESD22-A104C)

Start temperature for cycling

End temperature for cycling

Ramp rate or time allowed between start and end temperatures

Ramp rate measured in the air or on the product



Air-cooled condenser on top of the chamber saves utility and installation cost. Adds 14" (350mm) to the exterior height.

Advanced Control



The door-mounted console includes the P-300 programmer, USB port, product temperature protector, and chamber light (option).

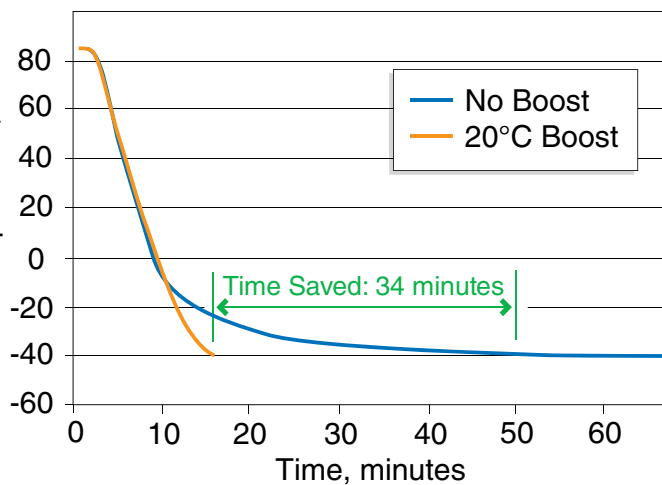
Enhanced performance and USB access with P-300 touch-screen controller

The exclusive ESPEC P-300 programmer/controller brings energy savings, user-friendly operation, and expanded data access to the Global-N chambers. Tabs on the updated user interface allow faster access to any screen. Standard USB and optional Ethernet interfaces make programming and data acquisition much simpler. In addition, improved algorithms make operation more energy efficient, as well as faster and smoother.

- Store up to forty programs, as well as three constant-mode configurations.
- Multilingual display in English, Japanese, Chinese, or Korean.
- Alarm history and diagnostics, plus a "back trace" feature for troubleshooting.

Sophisticated future-looking algorithms make temperature ramping faster and smoother. They also improve energy efficiency and make tests more repeatable.

Standard USB port for upload/download of programs and test data. Test programs can be edited and stored on a PC using included software, then uploaded via USB. Operation data can be downloaded for review, graphing, or exporting to Excel.



Product temperature control generates faster ramp-rates for test samples, as well as significant time savings for soak periods.

Optional product temperature control

- Monitors product temperature
- Enables faster product change rates
- Shortens testing time

During normal cycling tests, product temperature can lag behind air temperatures by up to 20 degrees. The optional product temperature control is a valuable feature for high performance testing in Global-N chambers. This feature drives faster change rates by directly monitoring product temperature and automatically boosting air-temperature setpoints until the sample approaches the desired temperature.

As shown in the example at left, achieving -40°C product temperature with a 20°C boost (air overshooting temporarily to -60°C) took just 16 minutes, compared for nearly 50 minutes with the chamber air set at -40°C.

GLOBAL-N MODEL SELECTION

120 possible chamber models

Select from two temperature ranges, humidity and five different sizes. You can then select by your desired change rate. Then use our selector tool on our website. The tool allows you to drill down to the right chamber based on your testing requirements.

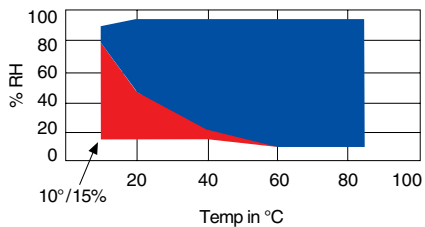
Temp/Humidity and Change Rates

| Model Prefix | Temperature Range | Humidity Control (see chart below) | Air-Cooled Change Rate | Water-Cooled Change Rate |
|--------------|-------------------|------------------------------------|------------------------|--------------------------|
| EGNZ4 | -65 to 180°C | — | — | 25-30°C/min |
| EGNU | -35 to 180°C | — | 5-13°C/min | 5-16°C/min |
| EGNL | -35 to 180°C | 10 to 95% RH | 9-13°C/min | 5-16°C/min |
| EGNZ | -70 to 180°C | — | 3-13°C/min | 3-20°C/min |
| EGNX | -70 to 180°C | 10 to 95% RH | 3-13°C/min | 3-20°C/min |

Chamber Sizes

| Volume | Workspace (WxDxH) | Refrigeration Sizes | Exterior (WxDxH) |
|----------------------|---|------------------------------|--|
| 4 cu. ft. (114 L) | 19.6" x 15" x 23.6" (498 x 381 x 600 mm) | 5-hp water-cooled | 30" x 55.5" x 75" (770 x 1409 x 1905 mm) |
| 12 cu. ft. (380 L) | 23.6" x 29.3" x 33.5" (600 x 743 x 850 mm) | 4 or 6-hp air-cooled | 35" x 83" x 84" (889 x 2103 x 2129 mm) |
| | | 4, 6, or 7.5-hp water-cooled | 35" x 83" x 70" (889 x 2098 x 1768 mm) |
| 16 cu. ft. (473 L) | 29.5" x 29.3" x 33.5" (749 x 743 x 850 mm) | 4 or 6-hp air-cooled | 41" x 83" x 84" (1038 x 2098 x 2129 mm) |
| | | 4, 6, or 7.5-hp water-cooled | 41" x 83" x 70" (1038 x 2098 x 1768 mm) |
| 28 cu. ft. (800 L) | 39.4" x 31.5" x 39.4" (1000 x 800 x 1000 mm) | 4 or 6-hp air-cooled | 51" x 85" x 90" (1290 x 2159 x 2280 mm) |
| | | 4, 6, or 12-hp water-cooled | 51" x 85" x 76" (1290 x 2159 x 1920 mm) |
| | | 15-hp water-cooled | 51" x 121" x 80" (1290 x 3074 x 2014 mm) |
| 35 cu. ft. (1,000 L) | 39.4" x 39.4" x 39.4" (1000 x 1000 x 1000 mm) | 4 or 6-hp air-cooled | 51" x 93" x 90" (1290 x 2359 x 2280 mm) |
| | | 4, 6, or 12-hp water-cooled | 51" x 93" x 76" (1290 x 2359 x 1920 mm) |
| | | 15-hp water-cooled | 51" x 129" x 80" (1290 x 3274 x 2014 mm) |

Humidity Control Range



For EGNL & EGNX models:

Blue = Standard humidity range
Red = Optional low-humidity range

Guaranteed humidity control range without live load.
Fluctuation is within $\pm 3\%$, per IEC 60068 3-6.

ESPEC Product Selector Tool

View and compare our Global-N chambers with our "Selector Tool" on our website. It allows you to drill down to the right chamber based on your testing requirements with all of our chambers.

espec.com/na/products/selector

OPTIONS

Cabinet Options

- Additional adjustable shelves, capacity 45 kg. (100 lbs.)
- Additional cable ports with cover and flexible port plug



50, 100, or 150mm (2", 4", or 6") diameters available

- Viewing window with LED lighting
 - 114 L : 152 x 305 mm (6" x 12")
 - 380 L : 175 x 260mm (7" x 10.5")
 - 470 L : 175 x 260mm (7" x 10.5")
 - 800 L : 290 x 380mm (11.5" x 15")
 - 1000 L : 290 x 380mm (11.5" x 15")

Operational Options

- Attached air-cooled condenser for applications where water-cooling isn't practical. (see p. 5)
- Liquid nitrogen (LN₂) cooling boost for faster ramping.
- Dry air purge - Keeps moisture in the chamber extremely low by purging with -40°C dewpoint air. Compressed air supply required.
- Spare parts kit

- Remote environmentally conditioned air (ECA)



Allows conditioning of remotely-located equipment that cannot be placed inside the chamber.

- Low humidity control systems (see chart on previous pages for range)
- Humidity water filter
- Humidity water tank supply

Instrumentation Options

- RS-232 or RS-485 serial interface
- Product temperature control
- Solid state humidity sensor
- Chino paperless recorders with Ethernet
- Solid state humidity sensor in lieu of wet/dry bulb (humidity models)
- Additional time signals for controlling external devices
- Emergency-stop button
- Web Controller for remote Ethernet/web access
- Analog data outputs for data acquisition and recording

- NEW: Chamber Camera

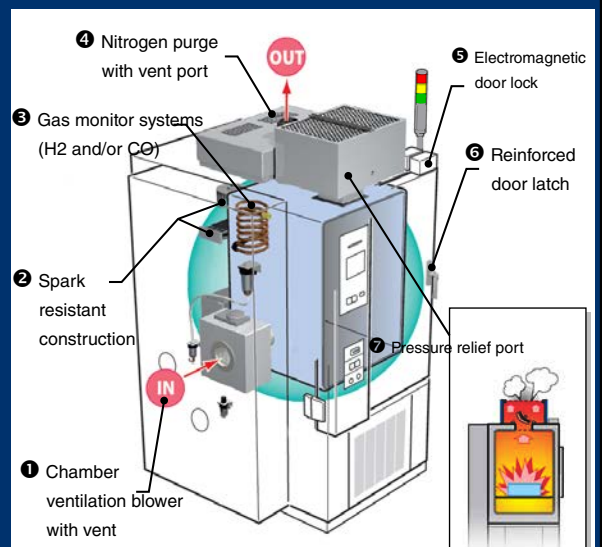


USB Camera inserts in cable port. Allowable range of -40 to 150°C

Battery Safety Options

Because battery failure is a real risk (and sometimes a desired outcome), environmental chambers need safety systems to protect from harmful explosions and ensure operator safety.

- Spark resistant interior w/ sheathed heaters
- Fenwall Detect-a-fire system, alarms and shuts-down chamber
- Fire suppression system using FM200, CO₂, or Argon
- Product overheat protector
- Gas monitor and alarm (single or two gas, H₂ or CO)
- Chamber ventilation blower and exhaust port
- Pressure-relief blow-out port
- Cable port plug restraint
- Door switch to stop operation if door is opened
- Solenoid-activated pin door lock to prevent opening during operation
- Reinforced door latch, to withstand 1.4 psi pressure
- Product drip tray, in case of battery leak



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DANGER

Not for use with specimens which are explosive or flammable, or which contain such substances. To do so could be hazardous, as this may lead to fire or an explosion.