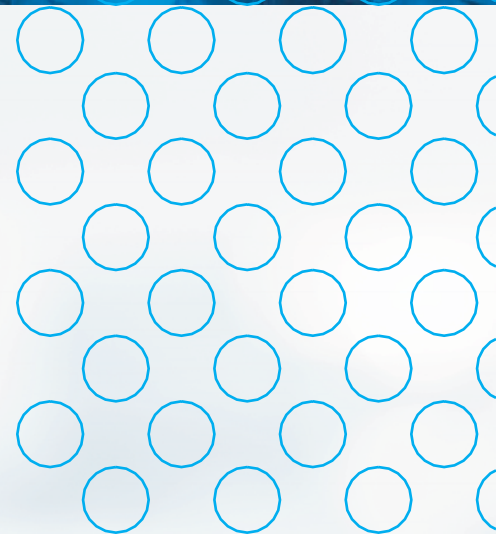



Bahnson Environmental Specialties

**Infinitely
Precise.
Ultimately
Reliable.**





Our chambers are finely crafted to satisfy some of the most stringent, precise conditions necessary to support a wide array of research, development, and manufacturing applications. **We are committed to providing our customers with the performance and reliability they need to recognize an ongoing return on their investment.**

VOLUMETRIC UNIFORMITY FOR PERFORMANCE THAT GOES BEYOND CONTROL

When assessing the performance of an environmental chamber, it is crucial to consider factors beyond temperature control and to take into account uniformity and repeatability.

All chambers are designed to reach certain temperatures or relative humidity (RH) set points, and most chambers specify control accuracy. However, few chambers are designed to achieve volumetric uniformity, a measure that indicates identical conditions across every inch of storage space.

The Bahnson reach-in chambers deliver precise volumetric uniformity, with measurable temperature and RH uniformities down to $\pm 0.3^{\circ}\text{C}$ and ± 3 percent.

SIMPLIFY MAINTENANCE BY ELIMINATING DEFROST

At BES, we designed the reach-in line to eliminate frost. Our chambers are capable of removing moisture from air circulation—without sacrificing temperature uniformity.

For additional protection, we never place sensors in glycol, which can mask temperature spikes.

PEACE-OF-MIND WITH FAIL-SAFE SYSTEM REDUNDANCY

Environmental chambers deal with highly sensitive products, which is why 100-percent mechanical redundancy of systems is essential.

Unlike many reach-in chambers, the double- and triple-wide models of the series can be equipped with system redundancy to keep contents safe in the event of a mechanical failure.

CONFIGURABLE CHAMBERS TO MEET SPECIALIZED APPLICATIONS

Environmental chambers are used for a wide variety of applications, some of which require creative solutions.

We have decades of experience designing and building custom walk-in chambers for a range of unique clients. Our team of professional engineers thrive on projects that require a special touch.

That same spirit extends to the design of our reach-in chambers, which have an array of customizable features that can be configured to some of the most challenging, specialized specifications.

SAFER AND GREENER

With control system wiring designed to meet NFPA 70E regulations for arc flash avoidance and R448A low-GWP refrigerant, Bahnson chambers help to protect the environment and the technicians that service them.

Our chambers come in a **range of sizes and design specifications** that allow them to meet some of the most demanding applications, specialized storage requirements, and unique conditions.

A COMPREHENSIVE SELECTION OF CONFIGURATION OPTIONS

Access Ports: Available in 1-inch, 2-inch, and 3-inch sizes. 1-inch port comes standard.

Chart Recorders: Factory installed into control panels for a permanent record of chamber conditions.

Classified/Hazardous Interiors: Constructed to National Electric Code (NEC) Class I Division II requirements.

CO2 Controls: The system allows for CO2 control from low parts per million to high percentage levels. A high quality, infrared technology gas sensor allows for excellent repeatability, linearity, and control.

Condensate Pump: Provided to move condensate/drain water to remote locations.

Data Communication: The RS-485 option enables both remote monitoring and control of parameters. The 4-20 mA option provides only remote monitoring.

Dry Air Tower: Extends low humidity performance without drier reject heat or for frost-free operation below 0°C.

Duplex Receptacle: A single 3A receptacle may be provided on the interior back wall for small electric/electronic equipment.

Electrofin Coil Coating: Provides for ultra-high corrosion resistance to strongly acidic atmospheres.

Glass Door/View Window: A factory-installed, triple-pane window to view products in test. Note that this option limits the low-end range to 0°C.

Heated Condensate Pan: An alternative to the condensate pump to evaporate condensate/drain water.

International/Special Voltages: Available in 50 hertz and 220-240 volts with CE mark or 120 volts upon request.

Lighting: Various general internal lighting.

Low Temperature (LT): Capable of achieving -30°C.

Mechanical Redundancy: Both the double- and triple-wide units can be equipped with duplicate refrigeration and airflow systems.

Programmable/Ramping Control: Ramp/soak profile capability is available through drop down menus. Offerings extend up to 99 steps with cycle repeats to provide virtually unlimited numbers of profiles and steps.

Pass-Thru Chambers: To store or transfer material into or between cleanroom environments.

Benchtop Stand: 33-inch-high, stainless-steel single-unit stand with casters for -BT chambers.

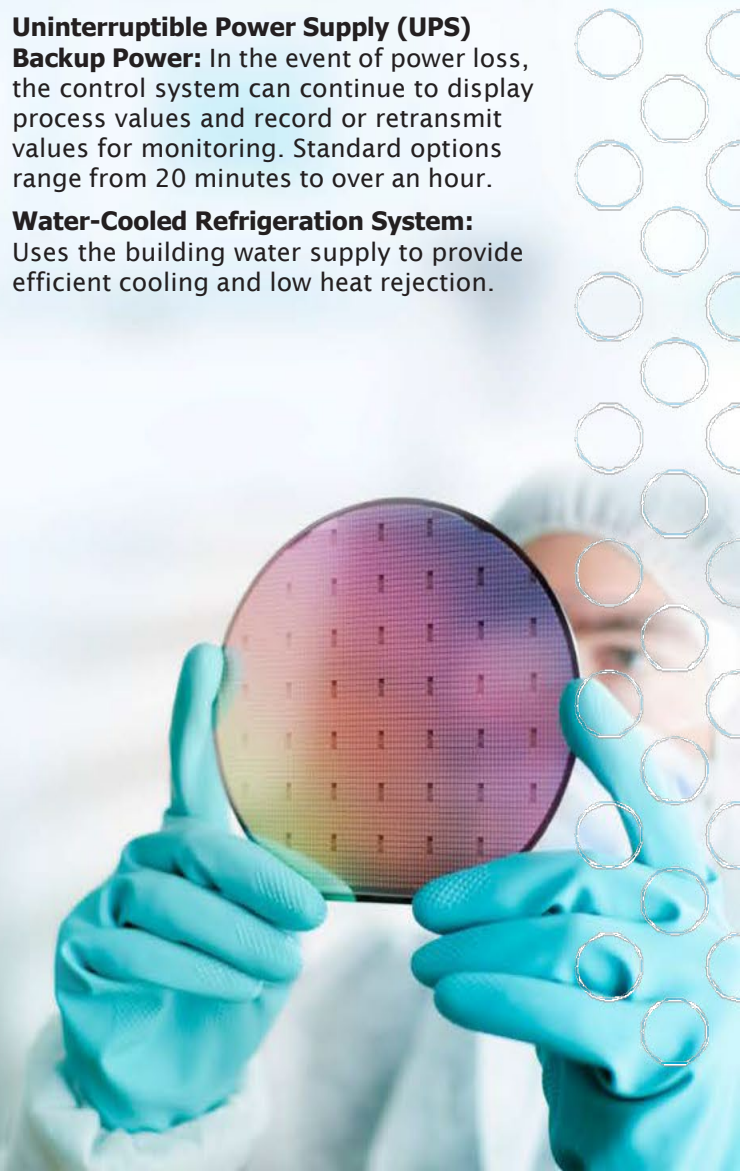
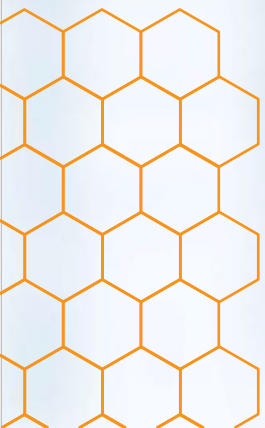
Cabinet and Shelves: Chamber interior, exterior, and shelves are available in 316 stainless steel.

Uninterruptible Power Supply (UPS)

Backup Power: In the event of power loss, the control system can continue to display process values and record or retransmit values for monitoring. Standard options range from 20 minutes to over an hour.

Water-Cooled Refrigeration System:

Uses the building water supply to provide efficient cooling and low heat rejection.





Bahnson Environmental Specialties can manufacture chambers to meet special size, voltage, or range requirements not accommodated below. Please speak with a sales associate to discuss your needs.

Interior finish:
22 gauge stainless steel

Exterior finish:
Sprayed enamel over steel

BENCHTOP MODEL

Model	Interior volume	Temp range	Humidity range	Volumetric uniformity	4-wire electrical volts/Ø/ Amps	Int. dimensions WxDxH	Ext. dimensions WxDxH	Shelves Std/ max	Weight LBS/KG
A-BT	12.0 ft ³ (340 liters)	35-70 °C	N/A	±0.3 °C ±3.0% RH	208-230 / 1 / 30	34 x 28.5 x 21.5 in. (87 x 73 x 55 cm)	41 x 34.5 x 52.5 in. (104 x 88 x 133 cm)	2/7	350/159
AM-BT			10-96%						425/193
C-BT		2-70 °C	N/A						525/238
CDM-BT			10-96%						570/259
CDMD-BT			10-96%						600/272

COMPACT MODEL

Model	Interior volume	Temp range	Humidity range	Volumetric uniformity	4-wire electrical volts/Ø/ Amps	Int. dimensions WxDxH	Ext. dimensions WxDxH	Shelves Std/ max	Weight LBS/KG
A-C	25.2 ft ³ (714 liters)	35-70 °C	N/A	±0.3 °C ±3.0% RH	208-230 / 1 / 30	34 x 28.5 x 45 in. (87 x 73 x 114 cm)	41 x 34.5 x 76.5 in. (104 x 88 x 194 cm)	4/14	425/193
AM-C			10-96%						500/227
C-C		2-70 °C	N/A						675/306
CDM-C			10-96%						720/327
CDMD-C			10-96%						750/340

UPRIGHT MODEL

Model	Interior volume	Temp range	Humidity range	Volumetric uniformity	4-wire electrical volts/Ø/ Amps	Int. dimensions WxDxH	Ext. dimensions WxDxH	Shelves Std/ max	Weight LBS/KG
A	33.8 ft ³ (957 liters)	35-70 °C	N/A	±0.3 °C ±3.0% RH	208-230 / 1 / 30	34 x 28.5 x 60 in. (87 x 73 x 153 cm)	41 x 34.5 x 91.5 in. (104 x 88 x 233 cm)	4/19	450/204
AM			10-96%						525/238
C		2-70 °C	N/A						700/318
CDM			10-96%						745/338
CDMD			10-96%						775/352

DOUBLEWIDE MODEL

Model	Interior volume	Temp range	Humidity range	Volumetric uniformity	4-wire electrical volts/Ø/Amps	Int. dimensions WxDxH	Ext. dimensions WxDxH	Shelves Std/max	Weight LBS/KG
A-DW	74.2 ft ³ (2101 liters)	35-70 °C	N/A	±1.0 °C ±5.0% RH	208-230 / 1 / 30	75 x 28.5 x 60 in. (191 x 73 x 153 cm)	82 x 34.5 x 91.5 in. (208 x 88 x 233 cm)	8/38	1020/463
AM-DW			10-96%						1060/481
C-DW		2-70 °C	N/A						1120/508
CDM-DW			10-96%						1170/531
CDMD-DW									1200/544

TRIPLEWIDE MODEL

Model	Interior volume	Temp range	Humidity range	Volumetric uniformity	4-wire electrical volts/Ø/Amps	Int. dimensions WxDxH	Ext. dimensions WxDxH	Shelves Std/max	Weight LBS/KG
A-TW	114.8 ft ³ (3251 liters)	35-70 °C	N/A	±1.0 °C ±5.0% RH	208-230 / 1 / 30	116 x 28.5 x 60 in. (295 x 73 x 153 cm)	123 x 34.5 x 91.5 in. (312 x 88 x 233 cm)	12/57	1420/644
AM-TW			10-96%						1460/662
C-TW		2-70 °C	N/A						1520/689
CDM-TW			10-96%						1570/712
CDMD-TW									1600/726

Notes:

- Temperature and humidity ranges are based on 25 °C /50% RH ambient.
- Refer to separate Humidity Performance Curves for specific range limitations of humidity controls models.
- “CDMD” models – a desiccant wheel drier is field mounted on the unit behind this model chamber. This requires an additional depth allowance of 12”.
- “CDM-AT” models – an air tower drier is field mounted on the unit behind this special model chamber. This requires an additional depth allowance of 5” for the compressed air fed system.
- “-LT” & “-SS” models – the suffixes are added to denote Low Temperature capability option (-25 °C) and Stainless Steel exterior option.
- Exterior height shown with casters (upright floor model) and with leveling bolts (benchtop model). Door may be removed to decrease depth to 33”.
- Shelf quantities are: “standard” number supplied with unit, “maximum” number based on minimum 3” spacings as recommended by BES
- 50Hz/220V, 120V, and other special voltages are available upon special request. Consult factory for more information.

“When I buy a Bahnson chamber, I know two things for certain; the chamber will pass validation and it will work for 20 years.”

-Pharmaceutical Lab Manager



Our **photostability chambers** utilize custom-designed lighting systems to provide up to three simultaneous light studies with adjustable, uniformly-controlled light levels across product shelves. Intensity within units is easily and individually controlled at each light bank with a microprocessor-based controller and a photo diode sensor to provide a fully automated, closed-loop control system.

A COMPREHENSIVE SELECTION OF CONFIGURATION OPTIONS

Additional Light Bank: The 33 cu ft chamber can accommodate an additional light bank for a total of (4) banks.

Dual Source Light Bank: The 12 cu ft chamber features a unique Dual Source (DS) light bank. The system combines both cool white and ultraviolet-A lamps integrated into a single bank and independently controlled by corresponding light sensors. This system is an option for the 33 cu ft chamber providing the possibility of one, two or all three banks being converted to dual source.

Full Spectrum Light Source: Full Spectrum (FS) lights are available for ICH Q1B Option 1 compliance providing a similar output to the D65/ID65 emission standard.

Low-Level Light Filters: Support lower intensity light studies.

Chart Recorders: Factory installed into control panels for a permanent record of chamber conditions.

Condensate Pump: Can be provided to move condensate/drain water to remote locations.

Data Communication: The RS-485 option enables both remote monitoring and control of parameters. The 4-20 mA option provides only remote monitoring.

Heated Condensate Pan: An alternative to the condensate pump to evaporate condensate/drain water.

Low Temperature (LT): An extended temperature range down to 4°C is available for low temperature studies. The chamber is provided with a temperature stabilizing heat system to give accurate light intensities at low temperature conditions.

Benchtop Stand: 33-inch-high, stainless steel single-unit stand with casters for -BT chambers.

Uninterruptible Power Supply (UPS)

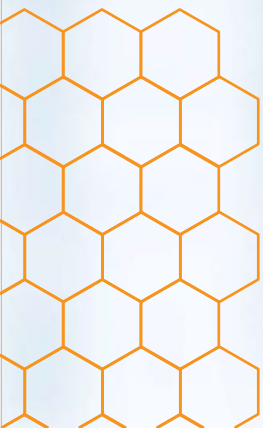
Backup Power: In the event of power loss, the control system can continue to display process values and record or retransmit values for monitoring. Standard options range from 20 minutes to over an hour.

Water-Cooled Refrigeration System:

Uses the building water supply to provide efficient cooling and low heat rejection.

“Improper testing in my lab can endanger lives. I refuse to use anything other than a Bahnson chamber. The risk is too high to use anything else.”

-Consumer Goods Stability Manager



PHOTOSTABILITY CHAMBER MODELS

Model	Interior volume	Temp range	Humidity range	Volumetric uniformity	4-wire electrical volts/Ø/Amps	Int. dimensions WxDxH	Ext. dimensions WxDxH	Weight LBS/KG
CL-BT	12.0 ft ³ (340 liters)	20-40 °C	N/A	±2.0 °C (±3.6 °F) ±.5.0% RH	208-230 /1/30	34 x 28.5 x 21.5 in. (87 x 73 x 55 cm)	41 x 34.5 x 52.5 in. (104 x 88 x 133 cm)	555/252
CDML-BT			30-75%					600/272
CL	33.8 ft ³ (957 liters)		N/A			34 x 28.5 x 60 in. (87 x 73 x 153 cm)	41 x 34.5 x 91.5 in. (104 x 88 x 233 cm)	800/363
CDML			30-75%					845/383

STANDARD SINGLE SOURCE LIGHT BANK MODELS

Light Bank Model	Typical Intensity Range	Factory Default Level	Fluorescent Lamp Source
CW: Cool White 400-750 nm. wavelengths	3.20 – 19.90 kilolux	16.00 kilolux	(7) T-5 Biax Cool White lamps 40 W/22"
UV: Ultraviolet-A 315-400 nm. wavelengths	8.00 – 37.30 W/m ²	22.00 W/m ²	(7) T-5 Biax Ultraviolet-A lamps 40 W/22"
FS: Full Spectrum 315-750 nm. wavelengths	3.10 – 12.00 kilolux	10.00 kilolux	(7) T-5 Biax Full Spectrum lamps 40 W/22"

OPTIONAL DUAL SOURCE LIGHT BANK MODELS

Light Bank Model	Typical Intensity Range	Factory Default Level	Fluorescent Lamp Source
DS: Dual Source 315-750 nm. wavelengths	3.4 – 9.90 kilolux 4.30 – 17.80 W/m ²	8.00 kilolux 10.00 W/m ²	(4) T-5 Biax Cool White lamps (3) T-5 Biax Ultraviolet-A lamps

Specified Light Uniformity	Standard +10.0% from setpoint over 70% of usable shelf area. Optional 4 bank +15.0% from setpoint over 70% of usable shelf space (at lower sensor height).
Specified Light Control & Sensor Accuracy	±1.0% from setpoint (referenced to NIST traceable meter; meter error not included in accuracy).
Usable Shelf Area	70% region = 23" W x 23" D x 12" H per shelf (x3 max).
Light Bank Dimensions	9.1 cm. H x 82.9 cm. W x 71.7 cm. D (3.6" H x 32.7" W x 27.8" D).
Pre-shipment Testing	At factory default light levels (or customer-specified light levels)

Notes:

- Dual source light bank not available in 4 bank configurations.
- Alternate light measurement units are available on request.
- All low-level readings are based on 4-lamp operational mode.
- Ranges are subject to change with special filtration requests.
- Dual source ranges are based on single light source operation.
- Factory default level is based on approximately 60% (UV) and 80% (CW, FS) of maximum light intensity.
- Usable chamber dimensions are restricted by light bank dimensions. See "Light Bank Dimensions" above.
- Low temp (4 °C) option is available upon special request. Consult factory for more information.
- Light Banks: 20 gauge stainless steel with acrylic barrier and specular aluminum reflector. Standard 12" clearance to shelf (9" clearance for 4 bank)



Bahnsen

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Ultimately
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