

-70 C to +175 C -94 to +347 F

AF

Altitude, Temperature/Altitude
Temperature/Humidity/Altitude

Description:

Select altitude alone or combine this capability with precision temperature and humidity simulation in a state of the art Bemco A, AF, or AFW, Altitude, Temperature/Altitude, or Temperature/Humidity / Altitude Chamber.

Standard Bemco Temperature /Altitude and Temperature/Humidity/Altitude chambers have inner pressure liners to isolate the test environment while helping to prevent water migration into the insulation at low temperatures.

With over 50 years of experience in making environmental test equipment, vacuum vessels, and refrigeration systems, Bemco offers the chambers that others only copy.

We have twelve standard models ranging from 8 cubic feet to 80 cubic feet and custom units to fit almost any requirement.

Why settle for the appearance of testing when you can have a system that actually works?

Choose Bemco, the true experts in Altitude and combined environment simulation.

Environmental Test and Space Simulation Systems



Bemco AFW125, Temperature/Humidity/Altitude Chamber with a workspace of 5 feet by 5 feet by 5 feet.

Contact us for a free quotation or additional information.

Bemco Inc, since 1951



Bemco Inc.
Focused on Excellence

Altitude Chambers

Altitude or Vacuum



Standard Bemco Altitude and Vacuum Chambers									
Model Number	Interior			Exterior			Weight Pounds	Humidity Range	Temperature Range Standard
	Height	Width	Depth	Height	Width	Depth			
A8S	24"	24"	24"	68"	34"	42"	800	None	Ambient
A27S	36"	36"	36"	78"	48"	58"	1400	None	Ambient
A64S	48"	48"	48"	96"	64"	76"	2000	None	Ambient

A - Altitude and Vacuum Chambers

Today's modern A series of Altitude and Vacuum chambers feature another Bemco first, a standard Brooks Automation, Granville-Phillips Series 375 Convector Gauge Controller.

The Granville-Phillips 375 Controller provides accurate vacuum measurements from atmosphere to 1×10^{-4} Torr. This instrument features easy push button control and digital readout. With 1 Torr resolution at atmosphere (760 Torr) and 0.001 Torr resolution at low pressures, this instrument provides industry leading measurement accuracy.

Bemco's A series of Altitude and Vacuum Chambers are designed to meet the need for a rugged, high quality, vacuum system capable of performing reliable altitude testing and vacuum processing.

Standard chambers include:

- A rotary vane, two stage, oil sealed vacuum pump with an oil mist eliminator and an automatic, power off, suction line dive valve to prevent oil back streaming.
- Manual climb and dive valves.



- A 304 series stainless steel, 2B finish, continuously welded inner liner reinforced in accordance with Section VIII (Unfired Pressure Vessels) of the ASME Code.
- A hinged aluminum plate door with a replaceable "O" ring type gasket, with the door painted on the outside to match the chamber in Bemco Blue.

- A carbon steel angle reinforced base enclosure and chamber outer case painted with rust preventive primer and a Bemco Blue finish coat.
- Bemco's exclusive, easy to use, chrome plated, over center, cam type latches, two per door.
- A KF type, 50 mm access port with a clamp and a replaceable blank cover plate.
- Electrical switches for the vacuum pump and the controls.
- Four swivel type castors.



Bemco A Series Altitude enclosure with a "bullet proof" Lexan door for use with a separate vacuum pumping system.



Request a free quotation or analysis of your testing needs. Our experienced engineers are ready to help you.

We Deliver

Bemco chambers really simulate the environments expected. We take your specifications and requirements literally. Our equipment does what we promise and you specify. We are truly focused on Excellence.

Altitude Chambers

Altitude or Vacuum



Closeup of the standard Brooks Automation, Granville Phillips 375 Convectron Gauge Controller with its gauge tube. An industry standard that all similar gauges are compared to, this instrument includes individual gauge calibration by Granville Phillips, an easy to read 3 digit green LED display that automatically ranges, and optionally, an RS232 or RS485 interface.

- Manipulators, drives, transfer systems, and mechanisms.
- Molecular sieve trap with heat regeneration on the roughing pump line.
- Automatic control of vacuum or altitude level.
- 12 inch, chart printing, circular recorder.
- Single pen or multi-pen strip chart recorders.
- RS-232 and RS-485 interfaces on the vacuum gauge control.
- Elapsed time meter.
- Programmable logic control sequencing of test processes. Bemco recommends Allen Bradley (ABB) PLC's and software.
- Touchscreen HMI's (human machine interfaces).
- Clean pumping systems. Scroll pumps are the most common selection. They are completely oil-free. They require no filters, no foreline trap, little routine maintenance, no oil changes, and are easy to disassemble.

A - Altitude and Vacuum Chambers

The standard A series chamber has the ability to reduce pressure from local atmospheric pressure to 8.2 Torr (equivalent to 100,000 feet altitude) in 10 minutes. Ultimate pressure is in excess of 0.13 Torr (equivalent to 200,000 feet altitude).

Standard system power is 115 VAC - 1 Phase - 60 Hertz on the A8 and 230 VAC - 1 Phase - 60 Hertz on the A27 and A64.

All electrical wiring meets the United States National Electric Code.

A Series Vacuum Ovens

A series chambers are available modified as vacuum ovens. These systems include heaters on all five walls, and in some cases, on the door as well. Vacuum oven chamber walls are insulated with high temperature

fiberglass insulation. No asbestos is used in chamber construction.

Standard high temperature on a vacuum oven system is 150 C (302 F).

A Series Options

- Access ports with ASA pattern flanges in 1, 1.5, 2, 3, 4, 6, 10, 12, and 24 inch sizes (24 inch is not available of the A8 due to its size).
- Wire type shelves and shelf pilasters.
- Access ports with Conflat or KF flanges in any commercially standard size with matching cover plates.
- A window with an interior light. Standard sizes are 12" x 12" and 18" x 18" clear viewing area.
- Electrical, thermocouple, and mechanical feed throughs.



We Deliver

Altitude Chambers

Altitude or Vacuum and Temperature



Standard Bemco Temperature/Altitude Chambers

Model Number	Interior			Exterior			Weight Pounds	Humidity Range	Temperature Range Standard
	Height	Width	Depth	Height	Width	Depth			
AF10	24"	24"	30"	76"	62"	60"	2900	None	-70 C to +170 C
AF25	33"	33"	40"	80"	73"	74"	4200	None	-70 C to +170 C
AF50	42"	42"	50"	92"	84"	90"	6600	None	-70 C to +170 C
AF80	48"	48"	60"	100"	92"	102"	9400	None	-70 C to +170 C

AF - Temperature Altitude Chambers



Built to last, many Bemco AF series Temperature/Altitude Chambers constructed in the 1950's, 1960's, and 1970's are still operating today.

These chambers are designed to precisely control temperature and vacuum (altitude) for environmental testing in accordance with MIL Standards (Military) and most commercial testing specifications.

Although already the industry standard, the AF series is now better than ever, with the latest in micro-processor based controls, high reliability vacuum pumps, and modern,

environmentally friendly refrigeration systems.

It's no wonder that we are the number one supplier of Altitude, Temperature/Altitude and Temperature/Humidity/Altitude chambers in America. What is our formula for success? The key word is quality.

Construction

AF Series chambers include a 304 Series stainless steel welded inner pressure liner with high temperature fiberglass insulation. No asbestos is used in chamber construction. The chamber liner is reinforced in accordance with Section VIII (Unfired Pressure Vessels) of the ASME Code.

The outer case is fabricated from cold rolled steel finished in Bemco Blue. Chamber doors feature Bemco's dual gasket construction with the inner gasket, a replaceable "O" ring. One or more, over-center Bemco cam-type latches, seal the door.

A 3 inch, ASA type access port, centered in the left hand wall is standard.

Vacuum System

Chamber pressure is reduced by a two stage, oil sealed vacuum pump with a power off automatic suction line dive valve to prevent oil back streaming. Standard pressure control inside the workspace is manual using a climb and dive valve.

Conditioning

Chamber air is recirculated by one or more high volume, stainless steel axial fan(s) discharging through a hinged rear mounted guard and diffuser baffle to create a uniform



Custom Bemco AF1.5H-20/350S, bench top Temperature Altitude Chamber with a workspace of 1.5 cubic feet.



Request a free quotation or analysis of your testing needs. Our experienced engineers are ready to help you.

We Deliver

Bemco chambers really simulate the environments expected. We take your specifications and requirements literally. Our equipment does what we promise and you specify. We are truly focused on Excellence.

Altitude Chambers

Altitude or Vacuum and Temperature

AF



AF - Temperature Altitude Chambers

environment around your test objects.

The fan is driven by a vertically mounted motor with dual ball bearing races driving a large diameter stainless steel shaft through a magnetically sealed shaft seal.

Fast-response sheath type heaters behind a radiation baffle raise chamber temperature as required.

Cooling

A proportionally controlled cascade, two compressor refrigeration system utilizing modern environmentally friendly refrigerants cools the workspace. The system includes automatic hot gas bypass and suc-

tion cooling unloading as well as Bemco's exclusive, high reliability coaxial cascade heat exchanger.

All systems are water cooled, have thermal and current sensors on each compressor, as well as numerous safety and reliability protection systems for dependable operation.

Controls

Each Bemco AF chamber is furnished with a microprocessor based programmable 1/4-DIN, solid state, 256-step ramping temperature controller which includes a 4-line LCD interface display and a large red LED display.

Temperature inside the AF chamber is sensed by a precision thermocouple. An RS232 and RS485 interface is standard.

Heaters are interlocked with a separate heavy duty power contactor and a factory preset high temperature safety control.

Vacuum is monitored by a Brooks Automation, Granville-Phillips Series 375 Convectron Gauge Controller. This instrument provides accurate vacuum measurements from atmosphere to 1×10^{-4} Torr. It features easy push button control and digital readout. For AF chambers, the RS-232 and RS-485 interfaces on the vacuum gauge control are standard.

Performance

Standard Bemco AF chambers cool from 23 C (+73 F) to -65 C (-85 F) in approximately 60 minutes and heat from 23 C (+73 F) to +150 C (302 F) in approximately 45 minutes, both with the chamber empty.



Bemco Inc.

Request a free quotation or analysis of your testing needs. Our experienced engineers are ready to help you.

We Deliver

Bemco chambers really simulate the environments expected. We take your specifications and requirements literally. Our equipment does what we promise and you specify. We are truly focused on Excellence.

Altitude Chambers

Altitude or Vacuum and Temperature

AF



Temperature control is + or - 1 C (+ or - 1.8 F) guaranteed, + or - 0.15 C (+ or - 0.25 F) typical.

The standard AF series chamber has the ability to reduce pressure from local atmospheric pressure to 8.2 Torr (equivalent to 100,000 feet altitude) in 20 minutes. Ultimate pressure is in excess of 0.13 Torr (equivalent to 200,000 feet altitude).

Standard system power is 230 VAC - 3 Phase - 60 Hertz on the AF10 and AF25 and 460 VAC - 3 Phase - 60 Hertz on the AF50 and AF80.

All electrical wiring meets the United States National Electric Code.

AF & AFW Series Options

- Access ports with ASA pattern flanges in 1, 1.5, 2, 3, 4, 6, 10, 12, and 24 inch sizes (24 inch is not available on the A8 due to its size).
- Wire type shelves and shelf pilasters.
- Access ports with Conflat or KF flanges in any commercially standard size with matching cover plates.
- A multi-pane, insulated, nitrogen filled vacuum window with an interior light. Standard sizes are 12" x 12" and 18" x 18" clear viewing area.
- Electrical, thermocouple, and mechanical feed throughs.
- Manipulators, drives, transfer systems, and mechanisms.
- An oil mist eliminator on the vacuum line.
- A molecular sieve trap with heat regeneration on the roughing pump line.
- Four swivel casters with locks.
- A heat exchanger type LN2 boost cooling system with automatic level control and vent for extra or back-up cooling.
- GN2 gas purge with pressure regulator, gauge, flow measuring and regulating valved rotameter, and vent. Note that this system can only be operated at site pressure.
- Desiccant Drier purge with dual tower 10 cfm desiccant drier, pressure regulator, gauge, flow measuring and regulating valved rotameter, and vent. Note that this system can only be operated at site pressure.
- Four refrigeration gauges (two per compressor) mounted in the refrigeration package available with or without isolation valves.
- An outer pressure liner system with a continuously welded inner liner. Outer pressure liners are recommended on rapid tempera-

ture cycling chambers. A Bemco equalizer system is furnished to limit potential condensation.

Optional Instruments

- Automatic control of vacuum or altitude level.
- Set of two, one high and one low, microprocessor-based FM Approved temperature safety controls.
- A two pen, 12 inch, chart printing, circular recorder to record temperature and absolute pressure.
- A two pen or multi-pen strip chart recorder to record temperature and absolute pressure.
- An elapsed time meter.
- Programmable logic control sequencing of test processes. Bemco recommends Allen Bradley (ABB) PLC's and software.
- Touchscreen HMI's (human machine interfaces).



Walk-in sized altitude, temperature, and humidity chambers are also available. Please request a Bemco FL Series Bulletin.



Bemco Inc.

Request a free quotation or analysis of your testing needs. Our experienced engineers are ready to help you.

We Deliver

Bemco chambers really simulate the environments expected. We take your specifications and requirements literally. Our equipment does what we promise and you specify. We are truly focused on Excellence.

Altitude Chambers

Altitude, Temperature, and Humidity



Standard Bemco Temperature/Humidity/Altitude Chambers									
Model Number	Interior			Exterior			Weight Pounds	Humidity Range (1)	Temperature Range Standard
	Height	Width	Depth	Height	Width	Depth			
AFW10	24"	24"	30"	78"	62"	60"	3200	5 to 95% RH	-70 C to +170 C
AFW25	33"	33"	40"	83"	73"	74"	4600	5 to 95% RH	-70 C to +170 C
AFW50	42"	42"	50"	95"	84"	90"	7100	5 to 95% RH	-70 C to +170 C
AFW80	48"	48"	60"	104"	92"	102"	10000	5 to 95% RH	-70 C to +170 C

(1) See Humidity Chart for humidity operating range information. Humidity chambers include direct dry air injection.

AFW - Temperature/Humidity/Altitude Chambers

Bemco AFW Temperature, Humidity, and Altitude chambers add humidity capability to the already outstanding features of the Bemco AF series of Temperature/Altitude chambers.

With a standard desiccant drier and a direct humidity sensor you can reliably test your product in both high and low humidity without having to move to another chamber. Humidity operation is always at ambient pressure.

Conditioning

Chamber air is recirculated by the same high volume, stainless steel axial fan system located behind a hinged rear mounted diffuser baffle included on the Bemco AF Chambers.

The cooling system performance and features match the Bemco AF series chamber systems.

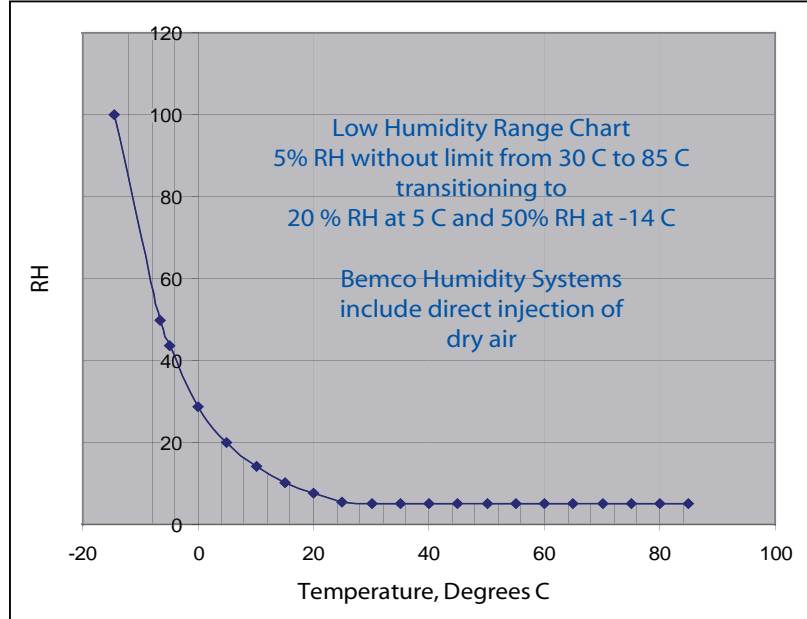
Humidity

Chamber humidity is increased by a Bemco valve isolated, and auto-

matically vented on altitude, mass transfer vapor generator with a sight glass, low water, and automatic drain freeze protection. It can be shut-off and drained when very low humidity control is desired.

Chamber humidity is decreased by

the direct injection of -73 C (-100 F) dew point dry air produced by a dual bed regenerative compressed air drier furnished with an isolation valve, a safety setup valve, an inlet particulate and coalescing filter, and an outlet filter regulator. Humidity operation is limited to site pressure.



Request a free quotation or analysis of your testing needs. Our experienced engineers are ready to help you.

We Deliver

Bemco chambers really simulate the environments expected. We take your specifications and requirements literally. Our equipment does what we promise and you specify. We are truly focused on Excellence.

Altitude Chambers

Altitude, Temperature, and Humidity

AFW



AFW Series Humidity Performance

+ or - 1 C (+ or - 1.8 F) guaranteed control, + or - 0.15 C (+ or - 0.25 F) typical. + or - 5% RH guaranteed, + or - 1% RH typical.

Humidity range is 5% RH to 95% RH, see chart. 95% RH at 85 C (185 F) maximum. Humidity systems operate without dewpoint limit from 5% RH to 95% RH over the range of 30 C to 85 C.

AFW Series Humidity Options

- A window wiper with an external operating handle.
- A 5 gallon water reservoir with an internal pump, low level sensor, low level alarm, and isolation valve to allow system operation without a source of pressurized water. This system requires occasional manual filling.
- Single and dual cartridge, point of use, demineralization systems.

AFW - Temperature/Humidity/Altitude Chambers

The humidification system requires a source of demineralized but not deionized water.

We recommend that you contact a local water conditioning company for a survey of your laboratory's available water supply.

Construction

AFW Series chambers include the same high quality features offered with the Bemco AF Chambers plus:

A sloped roof insert to minimize potential water dripping on test objects in accordance with MIL-STD-810 and MIL-STD-202. This feature reduces overall height in the workspace by 1-1/2 inches.

A trapped drain line to remove condensed water from the workspace.

A door drip through to catch condensed water.

Controls

Each Bemco AFW chamber is furnished with a two channel microprocessor based programmable 1/4-DIN solid state 256-step ramping controller for controlling temperature and humidity that includes a 4-line LCD interface display and a large red LED display.

Temperature inside the AFW chamber is sensed by a precision thermocouple.

Humidity is sensed by a direct reading, electronic humidity sensor accurate to + or - 2% RH over the dew point temperature range of -20 C to 85 C (-4 F to 185 F).



AFW series control panel with optional circular chart recorder, high-low temperature safety, and direct altitude indicator.



Bemco Inc.

2255 Union Place, Simi Valley
California 93065, USA
805-583-4970 telephone
805-583-5033 fax
<http://www.bemcoinc.com>

Combined Environments

Temperature, Humidity, Altitude, Vibration, Vacuum, Rain, Sunshine, Salt Spray, Sand and Dust, and Gasses. Space Simulation Systems, Walk-in Chambers, Drive-in Rooms, PAO Fluid Chillers, and Air Servos.