

AR ARCHIVAL STORAGE CHAMBER

AR Series Overview

The AR series chambers are a top selling archival storage chamber. It is quiet, easy to clean, highly reliable and ideal for an archivist's use. It offers hot gas bypass control of refrigeration and resistive heat to facilitate reliable, critical temperature and humidity control.

AR030

The AR030 is a single-door archival storage chamber.

AR055

The AR055 is a 2-door archival storage chamber.



specified here.

AR SERIES: ENVIRONMENTAL CHAMBERS

The AR series chambers feature hot gas by-pass technology which controls the temperature of the epoxy coated evaporator for greater uniformity. All these models run with 0.25 - 0.67hp compressors making them efficient enough to run on 15-amp, 115-volt circuits. A separate 15-amp 115-volt circuit is needed for the desiccant wheel dryer

Why Choose the AR Series

The Darwin Chambers AR series is designed specifically for the needs of archival preservation. This series can provide long-term controlled storage of photographs, film, rare books, papers, and paintings. Utilizing a simple, precisely controlled refrigeration system and advanced desiccant-based dehumidification, temperatures are maintained to within $\pm 0.2^{\circ}\text{C}$ (at the sensor) and relative humidity to within $\pm 1\%$ (at the sensor).

Not only is this series of chambers perhaps the most precise, but they are also exceptionally energy efficient for the high performance they offer. Typical uses and temperature ranges the AR series is capable of providing a solution for are as follows:

- Books, papers, and paintings: 10°C (50°F), 30% RH
- Film, photographs, microfilm: 1.7°C (35°F), 35% RH

(The above settings are somewhat typical, but there are many different desired set-points, depending upon the nature of the preserved media.)

Options Available

- Extended Temperature Range**
- Chart Recorders
- Data Loggers
- Window or Glass door. **
- Full swinging interior glass door
- Magnetic latch door handle with lock and two keys
- Touch Screen interface
- Headless interface (Virtual Touch Screen VTS)
- Other control Options or monitoring i.e., CO_2
- Adjustable Fan Speeds. **
- Air exchanges filtered or non-filtered with ambient space. **
- Condensate drain pumps.
- Interior or exterior electrical outlets. (Limited power) **
- Door ajar alarm

***Some Options may limit chamber performance less or greater than*

The AR series chambers allow exceptional temperature control anywhere within the range of 0°C to 25°C (32°F-77°F). Temperatures below 4°C will require defrost. Relative humidity can be controlled at any percentage from 10% to 60%, within an allowed dew-point range of -12°C to ambient.

The standard chambers do not include humidification (they can be added as an option for unusual applications), as they are normally not needed to maintain lowered dewpoints.

The Darwin Solution

These chambers incorporate an innovative dryer control system that maximizes performance while lowering energy requirements and increasing reliability. In contrast to existing control systems that cycle dehumidification systems on and off, decreasing life span and causing erratic control, the Darwin solution accurately modulates the dryer output, maximizing reliability and producing tight control.

Widely Proven, Non-Proprietary Controllers

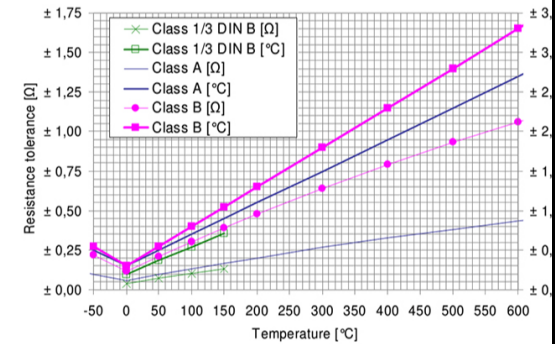
Standard controllers for the AR Series are manufactured by Fuji Electric and are ideal for stability testing chambers. Unlike many proprietary controllers, this controller is commercially available and proven in tens of thousands of installations. Standard functions include: autotuning, fuzzy logic, PID control, programmable alarms, calibration correction capability, ramp/soak, uniformity offset capability, etc. A touchscreen control interface is optional. Other controller manufacturers are also supported (Watlow, Allen Bradley etc.)

Services and Warranties

We offer technical support throughout the lifetime of your chamber. In addition to standard warranties, we also offer extended warranties for cooling components, parts, and labor. We also provide qualifications, validations, and preventive maintenance services at an additional cost.

AR Series Environmental Chamber Specifications (ambient 23° C)

Temperature		
Performance	Standard	Optional
Temperature Range	0° C to 25° C (4C and below require defrost) *	-5° C to 70° C with Optional Defrost
Ambient Temperature	21° C ± 3° C	
Temperature Control	± 0.2° C	
*Temperature Uniformity	± 0.7° C	
Control Resolution	0.1° C	
Temperature Sensor Type	3 wire PT100 Class A RTD	




*Chambers that are required to run at temperatures at 4°C and lower for periods longer than one day will require a defrost. As the evaporator coil will be at freezing temperatures and may frost or ice up over extended periods

* We place 5 sensors in the chamber, one in each corner (vertically) and one in the center. We log it overnight and look at the min to max across all points.



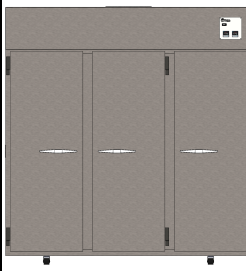
Humidity		
Performance	Standard	Optional
Humidity Range	Ambient Absolute Humidity* to 10% Relative Humidity @ 42°C Dewpoint	2 to 95% @ 22° C (or other ranges)
Humidity Control	± 1.0%	
Control Resolution	0.1%	
Humidity Sensor	<p>Rotronic HC2A-S Operating range -50...100 °C / 0...100 %RH Accuracy: ±0.8 %RH, ±0.1 K, at 23 °C ±5 K Digital interface (UART) and scalable analogue outputs, 0...1 V</p> <p>RH Sensor Accuracy Overview</p>	Vaisala or other

*Absolute Humidity is the amount of moisture in the air in a particular environment.




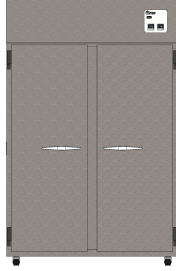

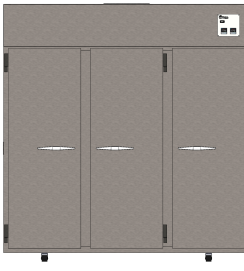
Control System	Standard	Optional
Controller	Fuji PXF4	VTS (Virtual Touchscreen), Gefran 650, Future Design Controls CM and MCT4 + More
Control Readout	Actual and Set-Point Values 	Trending, Duty Cycle
Indication Accuracy	RTD input: $\pm 0.2\%$ of indication value ± 1 digit or $\pm 0.5^\circ\text{C} \pm 1$ digit, whichever is larger	Dependent on optional Controller
Sample Rate	Fast as 50 ms	Dependent on optional Controller
Control Speed	Fast as 100 ms	Dependent on optional Controller
Control Type	PID - Fuzzy Logic (9 types available)	Dependent on optional Controller
Auto Tuning	YES	Dependent on optional Controller
Calibration Correction Capability	± 0.1 lower and upper scale	Dependent on optional Controller
Uniformity Off Set	± 0.1 Resolution Linear adjustment	± 0.1 Resolution
Alarm	High / Low Audible and Visual	Text, Email, Web Server, Remote Access
Alarm Type	High / Low Deviation in 0.1 resolution with adjustable Delay. Control audible alarm enable or disable components.	Absolute & Deviation 0.1 Resolution with Delay
Remote Monitoring / BMS connection	Double throw Dry Contact Alarm, RS 485 MODBUS RTU / ASCII**	Ethernet & Analog Output (Specify voltage or mA)
Password Protection	Hexadecimal	Numeric, Alpha Numeric
Audit Trail	Not Standard*	Dependent on optional Controller
Universal Power Supply for Monitoring	Not Standard	Available. <i>Controllers and sensors powered during outage for data logging. Chamber operation not supported.</i>
Ramp Soak Function	Up to 64 steps. A Step includes a ramp and soak. Up to 8 patterns / programs (recipes).	Dependent on optional Controller




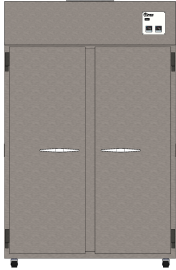

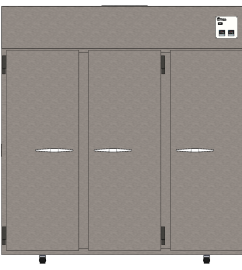
*Applies with touchscreen or VTS option.




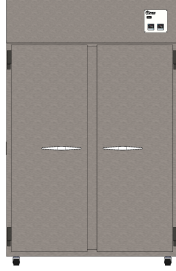

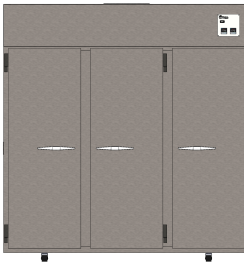
****For BACNET or MODBUS TCP (Ethernet) please contact your BMS vendor about using a gateway to interface with controllers via the RS485.**

	AR011	AR030	AR034	AR055	AR068	AR084
AR						
Construction						
Exterior	Powder Coated Finish	Stainless Steel Front continuous coil coated steel sides	Powder Coated Finish	Stainless Steel Front continuous coil coated steel sides	Powder Coated Finish	Stainless Steel Front continuous coil coated steel sides
Exterior Material Thickness	Heavy Gauge	Medium Gauge	Heavy Gauge	Medium Gauge	Heavy Gauge	Medium Gauge
Interior	Stainless Steel	Coated Aluminum	Stainless Steel	Coated Aluminum	Stainless Steel	Coated Aluminum
Interior Material Thickness	.036"	Medium Gauge	.036"	Medium Gauge	.036"	Medium Gauge
Door QTY	1	1	1	2	2	3
Door Lock	Optional	Tumbler Cam Key Lock	Optional	Tumbler Cam Key Lock	Optional	Tumbler Cam Key Lock
Door Swing	+180°	120° Stay Open Feature	+180°	120° Stay Open Feature	+180°	120° Stay Open Feature
Door Gasket	Magnetic Gasket	Snap in Magnetic Gasket	Magnetic Gasket	Snap in Magnetic Gasket	Magnetic Gasket	Snap in Magnetic Gasket
Shelving Material	304 Stainless Steel	Epoxy Coated	304 Stainless Steel	Epoxy Coated	304 Stainless Steel	Epoxy Coated
Shelf Quantity per Door	2	3	3	3	3	3
Casters Height	2.75"	3"	2.75"	3"	2.75"	3"
Caster QTY	4	4	4	4	5	4
Caster Locking Brakes	2	2	2	2	2	2
Access Port Qty	2	2	2	2	2	2
Multi-Purpose ports	YES	YES	YES	YES	YES	YES

Continuous coil coated is treated metal before it is cut and formed, the entire surface is cleaned and treated, providing tightly bonded finish. Formed sides have holes, valleys, recessed areas, and hidden areas that make it difficult to clean and uniformly coat. Coil coated metal is often considered more durable and corrosion resistant than most painted metal as it is treated before shaped.

	AR011	AR030	AR034	AR055	AR068	AR084
<h1>AR</h1>						
Capacity & Dimensions						
NET Capacity*	9.2 ft ³	22.1 ft ³	29.0 ft ³	48.2 ft ³	62.6 ft ³	74.3 ft ³
Conditioned Space	11.6 ft ³	23.9 ft ³	32.1 ft ³	50.0 ft ³	69.3 ft ³	76.2 ft ³
External Dimensions	36.2W x 27.4D x 47.1H	26W x 32D x 78.75H	35.7W x 33.8D x 80.8H	52W x 32D x 78.75H	68.4W x 34.2D x 81.8H	78W x 32D x 78.75H
Internal Dimensions	29.7W x 23.6H x 22.6D	22W x 28D x 62H	29.4W x 29.0D x 57.3H	48W x 28D x 62H	64.2W x 29.4D x 57.3H	74W x 28D x 62H
Access Port Dimensions	2" ID with Foam Insert	2" ID with Foam Insert	2" ID with Foam Insert	2" ID with Foam Insert	2" ID with Foam Insert	2" ID with Foam Insert
Recommended Clearance	Top 12"	Top 12"	Top 12"	Top 12"	Top 12"	Top 12"
	Rear 6"	Rear 6"	Rear 6"	Rear 6"	Rear 6"	Rear 6"
	Sides 6"	Sides 6"	Sides 6"	Sides 6"	Sides 6"	Sides 6"
Shelf Dimensions	28.9W x 20.4D	21.25W x 24.6D	28.75W x 26D	22.75W x 22.75D	31.4W x 24.25D	24W x 22.75D
Shelf Weight Capacity	150 lbs.	90 lbs.	150 lbs.	90 lbs.	150 lbs.	90 lbs.
Approx. Max Storage weight	600	600	700	750	1000	750
Approx. Crated Weight	470 lbs.	526 lbs.	765 lbs.	740 lbs.	1100lbs	1100 lbs.

	AR011	AR030	AR034	AR055	AR068	AR084
AR						
Components						
Compressor Size	1/3 hp	1/3 hp	1/3 hp	½ hp	½ hp	2*1/3 hp
Refrigerant	134a	134a	134a	134a	134a	134a
Charge (oz)	13.5 oz	13.5 oz	13.5 oz	18.5 oz	18.5 oz	13.5 oz
Defrost	Optional	Optional	Optional	Optional	Optional	Optional
Perimeter Heater	Optional	Optional	Optional	Optional	Optional	Optional
Air flow direction	Front to Back	Front to Back	Front to Back	Front to Back	Front to Back	Front to Back
Fan Count	3	1	3	1	6	1
Fan CFM per fan	125	Up to 600	125	Up to 600	125	Up to 600
Variable Speed	Manual Adjust	Manual Adjust	Manual Adjust	Manual Adjust	Manual Adjust	Manual Adjust

	AR011	AR030	AR034	AR055	AR068	AR084
AR						
Electrical North America						
Voltage	115 VAC/ 60 Hz Chamber & 115VAC /60Hz Dryer					
RLA	6.0 & 9.0	6.0 & 9.0	8.0 & 9.0	9.0 & 9.0	9.0 & 9.0	9.0 & 9.0
Heat Rejection	4307 + 3400 Btu/h	4307 + 3400 Btu/h	4307 + 3400 Btu/h	6037 + 3400 Btu/h	6037 + 3400 Btu/h	8614 + 3400 Btu/h
Cord Length	9 ft	9 ft	9 ft	9 ft	9 ft	9 ft
Dedicated Circuit	15 / 15 A	15 / 15 A	15 / 15 A	15 / 15 A	15 / 15 A	15 / 15 A
Electrical International via Buck Boost Transformer						
Voltage	230 VAC/ 50 Hz Chamber Transformer & 230 VAC /50Hz Dryer					
RLA	4.0 / 4.5	3.3 / 4.5	4.0 / 4.5	6.0 / 4.5	6.0 / 4.5	6.0 / 4.5
Heat Rejection	4307 + 3400 Btu/h	4307 + 3400 Btu/h	4307 + 3400 Btu/h	6037 + 3400 Btu/h	6037 + 3400 Btu/h	8614 + 3400 Btu/h
Cord Length	2.74 m	2.74 m	2.74 m	2.74 m	2.74 m	2.74 m
Accessory connections						
BMS Dry Contact	Screw terminal 3 position Common / Normally Closed / Normally Open					
RS485 MODBUS	1/8" or 2.5mm stereo input jack					
Optional Re transmission	Screw terminal					
Desiccant Wheel Dryer	Twist lock 4 pin din connector					
Aux 24VDC output (500 mA limit)	5.2 mm Barrel Connector					

*Interior Capacity includes the 2" spacing from interior walls to allow for best air flow performance.

**Include width with handle and height with castors installed.

RLA and heat rejection is based on a controlled operation temperature of 30C and 65% RH. Value may change on operating set points.