

AcuAir[®] Hygienic Air Units

Precision Engineered for Sanitary Food Processing

SINGLE SOURCE INDUSTRIAL REFRIGERATION SOLUTIONS

Frick[®]
INDUSTRIAL REFRIGERATION



When It's AcuAir® Clean, It's Process Room Clean

Cleanliness in food process rooms is paramount

FRICK® AcuAir systems are precision engineered and painstakingly built to help you meet the food processing requirements of the United States Department of Agriculture.

Food safety regulations seek to promote food safety through controlling:

- Process room temperatures
- Sanitary wash-down intervals
- Condensation on room surfaces
- Cleanability of equipment design
- Room clean-up procedures

AcuAir units provide temperature, pressure and humidity control to make sure you meet those requirements. By managing condensation, removing contaminants and limiting air migration, AcuAir units deliver clean, sanitary air to the environment. An array of options allows you to customize the unit to meet your every need.



Hazard Analysis and Critical Control Point (HACCP) assessment is required of all food processing facilities to protect both consumers and processors.

Proper and uniform room temperatures are critical for:

- Beef
- Chicken
- Pork
- Duck
- Turkey

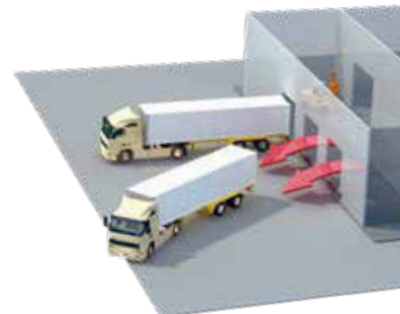


Proper humidity levels are critical for:

- Dairy
- Cheese
- Yogurt
- Ice cream
- Bread
- Dough



The presence of contaminants in the finished product can negatively affect the health of the consumer, the reputation of the processor and product shelf life, while increasing the processor's economic liability.



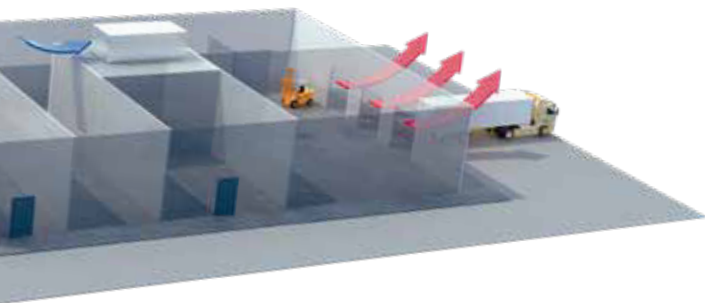
Solving the Room Environment

AcuAir provides temperature, pressure and humidity control for the processing environment.

FRICK has been in the refrigeration industry for nearly 150 years and has engineered and built environmental control technology for the food and beverage industry for decades. We are experts in applying the solutions that ensure your process room is ready for production when you are.

We have the experience and expertise to:

- Select the proper AcuAir hygienic unit to match your moisture and heat loads
- Understand and address your psychrometric requirements
- Integrate state-of-the-art controls to comply with increasingly stringent regulatory safeguards
- Link the control of your AcuAir hygienic units to your plantwide control system



Managing Condensation

Food contaminants generally migrate by direct contact or when attached to dirt or water particles. Airborne moisture in contact with cold surfaces increases the likelihood of condensation formation. Water droplets are highly visible and can carry thousands of microbial pathogens. Controlling the dew point of the air reduces the potential for the formation of condensation.



Managing Temperature

Maintaining proper and uniform temperatures in the food processing space limits the ability of contaminants to activate or propagate, increasing the safe production time between necessary sanitary wash-down periods.



Managing Sanitation Air

Food process rooms and equipment must be washed down regularly. This disturbs microbial contaminants, causing some to become airborne. The wash-down process also wets surfaces that then must be dried. Through effective management of room air during wash-down, airborne pathogens are expelled, the room is dried, and production can quickly resume.



Managing Airborne Contaminants

Processing activities tend to introduce and stir up dirt particles and pathogens that may become airborne. Uncontrolled, transient microbial pairs can contaminate open products and colonize in catch points. Constant air filtration captures free-floating microbes and minimizes the potential for cross-contamination of products.



Managing Air Migration

Not all spaces within a food processing facility have the same hygienic requirements. Air movement between processing spaces has the potential to carry airborne contaminants. Through management of the air pressure of adjacent spaces, air movement can be controlled, effectively mitigating the possibility of airborne cross-contamination.



The AcuAir Solution – Production Mode

AcuAir mixed-air units provide temperature, pressure, humidity and airborne contaminant control in the process room.

Fresh Air

Fresh air in small quantities is mixed with process room air to provide positive air pressure in the space. This supplemental air offsets the air removed by processing equipment or escaping the space through doors and openings. Providing makeup air effectively controls the infiltration of unconditioned air into the process room.

Pre-Filter

The mixed air is immediately filtered to capture airborne particles that could compromise the integrity of the hygienic process air unit. In addition to enhancing internal cleanliness, these filters economically extend the service life of the AcuAir unit's final filters.

Cooling Coils

Industrial-grade cooling coils remove heat and moisture from the airstream. Selected specifically for the application and manufactured for duty in food production settings, fin-coil bundles are the heart of managing temperature and humidity in the processing space.

Plenum Fans

Unhoused plenum fans are utilized to circulate the process room air. The inherent capability of the fans to handle static pressure, and the open nature of the design, make them particularly well-suited for use in hygienic applications.

Final Filters

Final filters capture particles as small as 0.30mm. The air delivered to the food process space is of the highest quality.

Hygienic Supply Air Distribution

AcuAir hygienic supply air distribution diffusers distribute conditioned air in the process space. Proper air velocity ensures that maximum coverage is obtained and condensation risk is minimized.

Exhaust Fans

Exhaust fans positioned in the return airstream provide control of the process room air pressure. As process equipment exhaust fluctuates and doors open and close, the fan speed is adjusted to control air pressure within the room and to manage air migration to adjacent spaces.

AcuAir Quantum HD Unity™ Controller

The AcuAir Quantum™ HD Unity controller provides the supervisory control to safely and effectively manage control of the process room environment. Developed and refined over years of hygienic air unit control, the system delivers proven and reliable control.

The AcuAir Solution – Clean-Up Mode

Wash-down of the food process room is about floor safety and room recovery.

The AcuAir solution is about continuously flushing the space with dry, clean air and exhausting saturated, dirty air.

100% fresh outside air is drawn into the AcuAir hygienic unit. The fresh air is conditioned for optimal moisture collection and filtered to hygienic quality. The dry, clean air sweeps across the ceilings and walls as it is delivered to the space undergoing cleanup.

This dynamic flow of air dries the surfaces it encounters, capturing suspended moisture and drawing it toward the return air opening. Once in the return duct, moisture-laden air is exhausted to the outdoors.

Depending on the temperature and humidity of the outside air being conditioned, different strategies are used.

In warmer, humid conditions, mechanical cooling may be used to remove moisture from the air stream, allowing drying capacity to be enhanced.

In colder, dryer conditions, heating may be used to increase the moisture capturing capacity of the air stream, allowing drying capacity to be enhanced.

In extreme cold and dry conditions, 100% fresh air may not be required. Reduced airflow and heating may be used to provide cost-savings while maintaining drying times.

These functions are precisely controlled with the AcuAir Quantum™ HD Unity controller.



Specialized Units



Carbon Dioxide (CO₂) Abatement Units

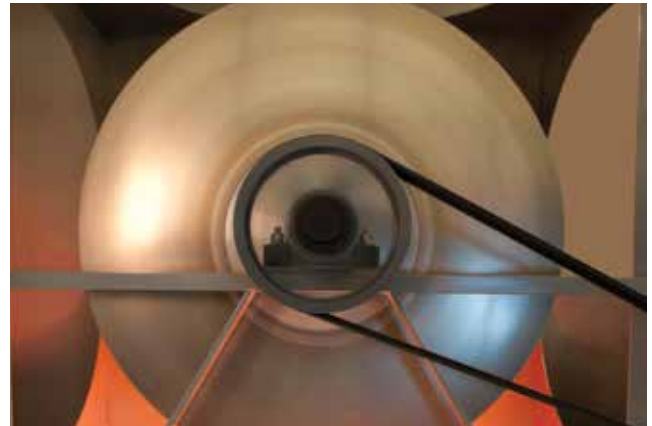
Carbon dioxide exposure is limited by federal regulation. CO₂ concentrations are not allowed to exceed 5,000 PPM for continuous occupancy. Receiving and storage areas containing product packed in CO₂ pellets will accumulate high levels of airborne CO₂ gas.

AcuAir CO₂ abatement units use dual airstreams to efficiently remove the high concentration of CO₂ from the space and replace with conditioned fresh air. Utilizing energy recovery, the conditioned CO₂ airstream is used to temper the incoming fresh air, thus reducing the cooling load required to maintain the space temperature.

Makeup Air-Only Units

AcuAir makeup air-only units incorporate all of the air treatment technology required for the hygienic space without the recirculation and exhaust features. These units are dedicated to providing fresh, conditioned air for pressurization, comfort and air quality.

Makeup air-only units have the potential to improve productivity, employee retention and product quality when applied in key locations. AcuAir units are custom-designed to be as simple or complex as needed to meet the demands of your application.



We Make "Smart" Work for You With Quantum™ HD Unity Control

Powerful Control Logic

The AcuAir Quantum™ HD Unity controller employs the most powerful hygienic air processing control logic in the industry. The combination of innovative technology, powerful software and reliable performance maximizes the efficiency of your hygienic air unit, providing the greatest value available while meeting your air-handling control needs.

AcuAir Quantum™ HD-based controls are:

- Built to recognized standards that include cUL
- Factory-tested prior to shipment
- Proven control software
- Compatible with new installations or existing equipment
- Fully compatible with A/B control systems, appearing as a native device on the network
- Accessible anywhere there is internet access



System Interface Panel

The optional system interface panel provides both local and remote access to your AcuAir hygienic air units and any other Quantum™ HD panel on the network. It features an industrial touchscreen panel that puts control at your fingertips.

Get Connected

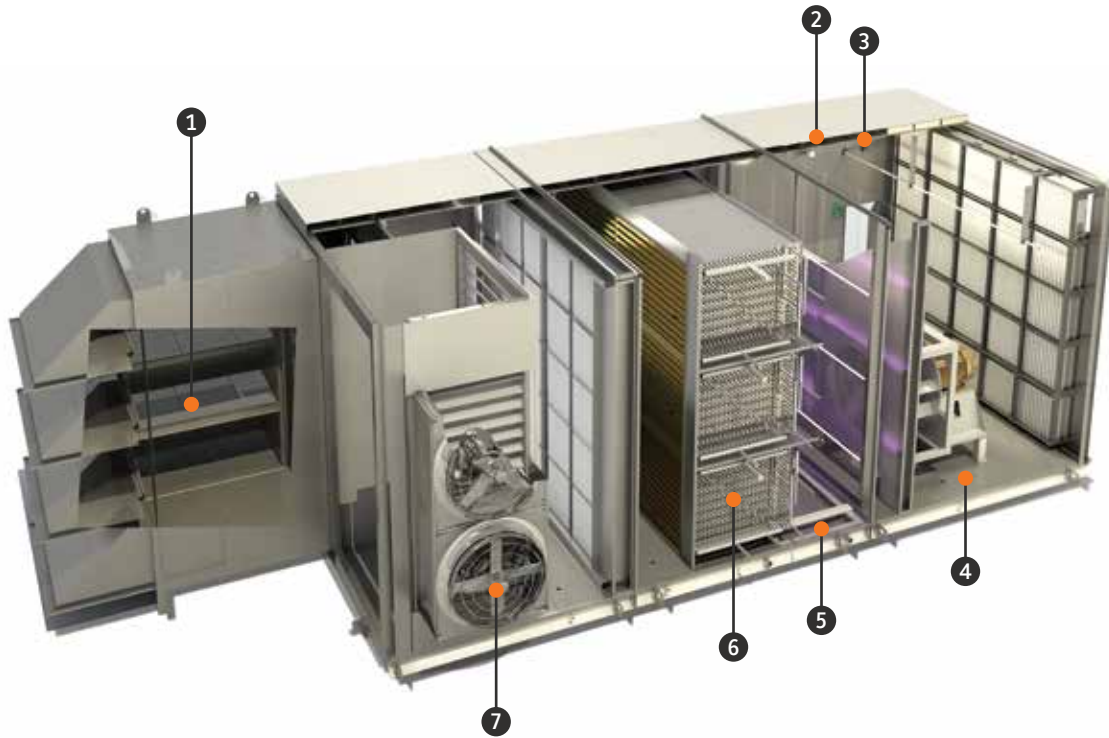
All Quantum™ HD-based controls offer the connectivity you have come to expect from FRICK products. Whether you are connected at the unit with your laptop, in your office with a network-connected computer or remotely via the internet, you are always in control of your processes.

AcuAir™ Air Handling Unit



Industrial Ethernet Hub by FRICK





Heating Options

Typical clean-up heat is direct fired gas heater with a high turndown ratio for accurate temperature control. Other options include: indirect gas heat, steam, etc.

1 Fresh-Air Plenum

Inlet plenum and hoods block out rain and snow, and are constructed of a single wall of sheet metal. Materials used in fabrication are selected to match the unit's exterior.

2 Refrigerant Detector

Refrigerant-cooled units are equipped with a chemical cell refrigerant gas detector that is connected with the AcuAir controller.

3 Smoke Detector

A smoke detector is provided as standard on every unit. The unit will shut down if a fire is detected.

4 Unit Floors

Each section of the AcuAir unit has a floor drain for wash-down purposes. Drains are factory-piped to the side of the unit base, and the underside is spray-coated with insulation to minimize condensation.

5 Drain Pans

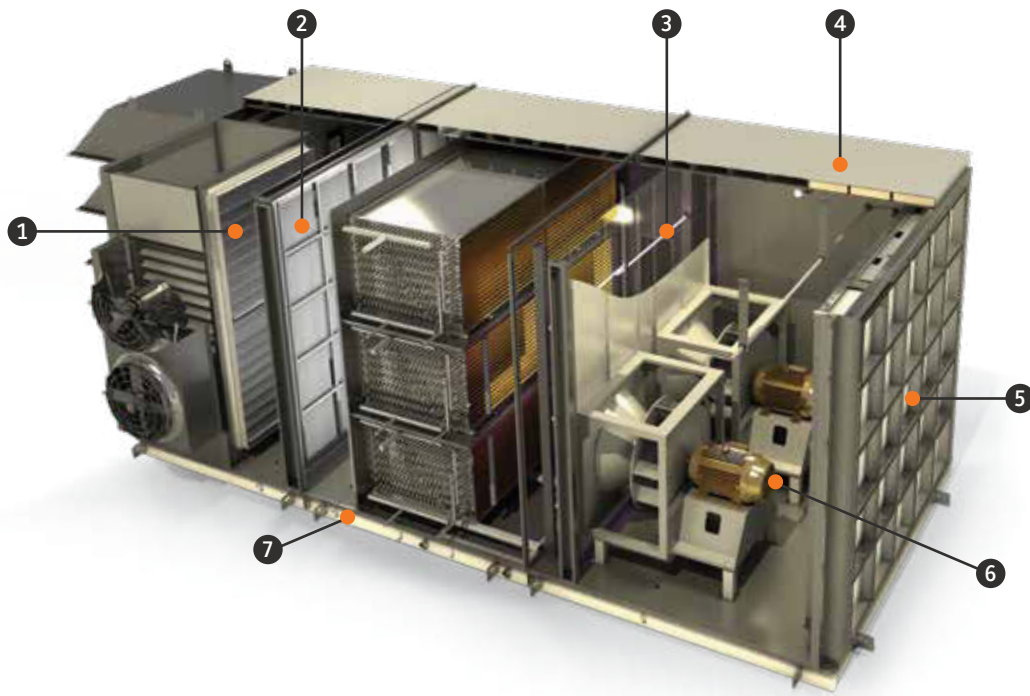
Recessed, triple-sloping stainless steel drain pans are located in the base under the cooling coil(s) and immediately downstream. They are designed to hygienically remove condensation and prevent standing water.

6 Cooling Coils

Cooling options include recirculated glycol, flooded refrigerant, recirculated refrigerant or direct-expansion (DX) refrigerant. Common materials are stainless steel tube and aluminum fin, or copper tube with aluminum fin. Coil materials, construction and circuit design are custom for each application. Intermediate drain pans are provided for stacked coils.

7 Exhaust Fans and Dampers

Direct-drive axial fans and backdraft dampers are mounted in the return air section for cleanup and economizer cycles. Fans can provide up to 100% exhaust of the system airflow. Fans are factory-mounted, wired and controlled.



Mixing Box

The mixing box is the merge point of the return and the fresh makeup airstreams. Low air velocity prevents water carryover and provides uniform flow into the pre-filters.

Controls

Standard AcuAir Quantum™ HD computer-based controls are factory-wired to the unit starter/disconnect and VFD panel. A NEMA 4X remote mode selection panel and optional operator interface touchscreen panel are shipped separately. The AcuAir Quantum™ HD controller comes standard with Ethernet communications capability. Optional AcuAir A-B controls are also available.

1 Fresh- and Return-Air Dampers

AcuAir uses opposed-blade dampers in the fresh airstream and parallel blade dampers in the return airstream for optimal control of the mixture percentage. Blade and frame materials are constructed to match the interior walls.

2 Pre-Filters

Pre-filters have an outside access door to ease maintenance. Typically, 4" MERV 8 filters are used to protect the interior of the AcuAir unit and extend the life of the final filters.

3 Optional UV Lights

Optional UV lights control microbial growth on the cooling coil.

4 Unit Panels

Walls and roof are galvanized, interior and exterior sandwich-style panels. The 3" cabinet enclosure has foam-in-place insulation. Panel joints are sealed with food-grade caulking to ensure a watertight and airtight system suitable for wash-down. Optional stainless steel interior as well as 2" and 4" insulated panels are available.

5 Final Filters

Filter options include high-efficiency MERV 14 filters through a MERV 18 (HEPA) filtration system that can remove up to 99.99% of particles as small as 0.3 microns. A standard differential pressure gauge monitors filter life. An access door to the final section makes filter maintenance easier.

6 Fan Motor and Drives

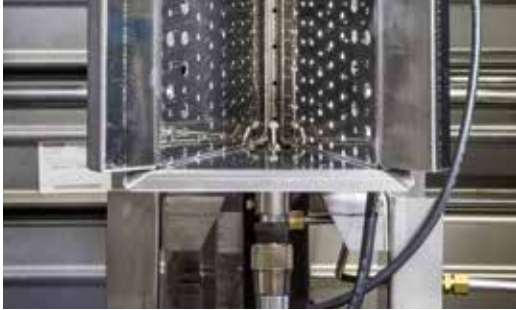
A direct driven centrifugal, backward-inclined plenum fan with a premium efficiency TEFC motor is standard for long life and ease of maintenance. As standard, a VFD is provided. Multiple parallel direct driven fans are available. Belt driven is available.

7 Unit Frame

Fully foamed-in-place drain pans and floors provide a vapor seal and thermal break. The rigid, fully welded and factory-painted steel frame has lifting lugs positioned for safely raising the unit. The underside of each section is protected with a galvanized sheet metal panel.



Optional Features



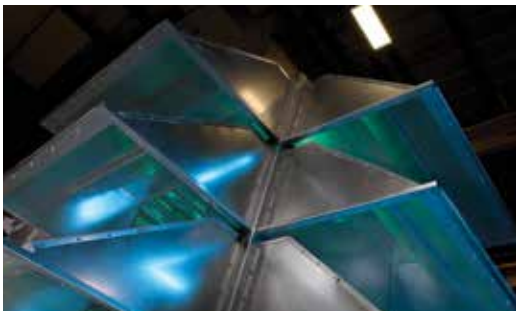
Gas Heat in Production

Some process rooms require additional heat during production mode operation. That happens when the cooling effect of the makeup pressurizing air is greater than the heat load being generated in the space. AcuAir has the ability to apply several technologies to provide and control heat in the process mode.



Sequential Defrost

Where process room operating temperatures must be low, the likelihood of frost building up on the cooling coil increases. AcuAir has technology that allows the hygienic unit to operate in that frosted cooling coil condition, and defrost the coils individually while maintaining operation. This technology reduces the size of the AcuAir units and eliminates the cost of stopping the unit's operation or providing hot gas for defrost of the evaporators.



Economizer

AcuAir economizing is the use of cool outside air to handle the heat load generated within the process space. When an AcuAir unit is equipped with the economizer option, AcuAir controls shut down mechanical cooling and transition to economizer cooling based on unique set points defined for that particular facility. Room pressure is maintained by controlling the amount of warm air that is exhausted to offset the incoming cool air. Economizer cooling has the potential to create substantial energy savings in many parts of North America.



Direct-Drive Blowers

Direct-drive supply fan configurations are simpler, more efficient and cleaner than belt-driven configurations. AcuAir supply fans are equipped with variable-speed drives that are fine-tuned to system operating conditions, minimizing energy usage while maintaining space conditions.



Parallel Fan Assemblies

Operation of the AcuAir hygienic unit is critical for keeping the process room in production. AcuAir offers the option of parallel plenum fans to provide a degree of redundancy in the event of mechanical failure and to reduce the size of individual fans and motors. Should a fan or motor fail, the remaining fans will continue to operate, providing sufficient air flow to the room and preventing a shutdown of your process space.



Motor Service Rails

Changing out heavy fan motors inside tight spaces can be both stressful and hazardous, especially under time constraints. AcuAir offers built-in motor service rails in certain sizes to facilitate safe, easy and rapid handling of the task.



Epoxy-Coated Cooling Coil Fins

As hygienic design becomes more extreme, the use of stainless steel coils or tubes in place of galvanized steel tubes increases. Applying aluminum fins on stainless steel refrigerant coils is great for heat transfer. AcuAir offers epoxy-coated fins for stainless steel tube aluminum fin hygienic cooling coils. The epoxy coating offers excellent protection to the aluminum against most cleaning solutions while retaining its outstanding heat transfer properties.



Flooded-Surge Vessels

Many AcuAir applications used cooling coils designed for a flooded refrigerant feed. The AcuAir series of flooded-surge vessels are sized to match your system requirements, built to current ASME standards and painted for longevity.



Optional Features (Cont.)



Indirect-Fired Heaters

AcuAir offers state-of-the-art, modular, indirect-fired gas heaters as a heat source for both sanitation and heat in process. The heaters offer high turndown while retaining maximum efficiency over the entire range. Indirect-fired gas heaters keep the combustion byproducts out of the process airstream, alleviating concerns related to incomplete combustion and contamination of the workplace air and product.



Supply-Air Diffusers

The AcuAir hygienic supply-air diffusers are constructed of 304 stainless steel to prevent corrosion and withstand the frequent wash-downs typical of food process spaces. The air discharge openings are sized to provide the required air velocity for proper throw and distribution.

Oversized drain pans catch any condensation droplets from the diffuser face or grills. Drain pans are insulated and have underside electric heat tracing to guard against condensation that may form under the pan and risk dripping onto products or surfaces below.



Return-Air Boxes and Return Drip Pans

AcuAir hygienic return-air boxes and return drip pans are constructed of 304 stainless steel to prevent corrosion and withstand the frequent wash-down chemicals typical of food process spaces. The oversized return box pan will catch any condensation droplets from the air box face or grills.

Both return box drip pans and return drip pans are insulated. Both have optional underside electric heat for added protection against condensation that may form under the pan and risk dripping onto products and surfaces below.



Reheat Coils

Relative humidity refers to how close air is to being saturated with moisture at a particular sensible temperature. Warming the air increases the air's ability to hold moisture, thereby reducing its relative humidity. Mechanical refrigeration removes moisture from the air, leaving it cool and nearly saturated.

Adding a few degrees of sensible heat into mechanically chilled air improves the moisture absorption capacity of the air and reduces the potential for condensation in the process room. Reheat coils are a means to add the heat necessary for humidity control. FRICK offers economical hot gas coils in addition to steam and brine coils.



Recessed Drain Pans and Hygienic Drain Outlets

Condensation on the refrigeration cooling coil occurs when cooling food processes room air. Preventing collection of stagnant water and buildup of biological material is critical in order to inhibit the colonization of pathogens. Triple-sloped recessed drain pans are provided in areas in which condensation is anticipated to be present, and are designed to freely drain all water without catch points.

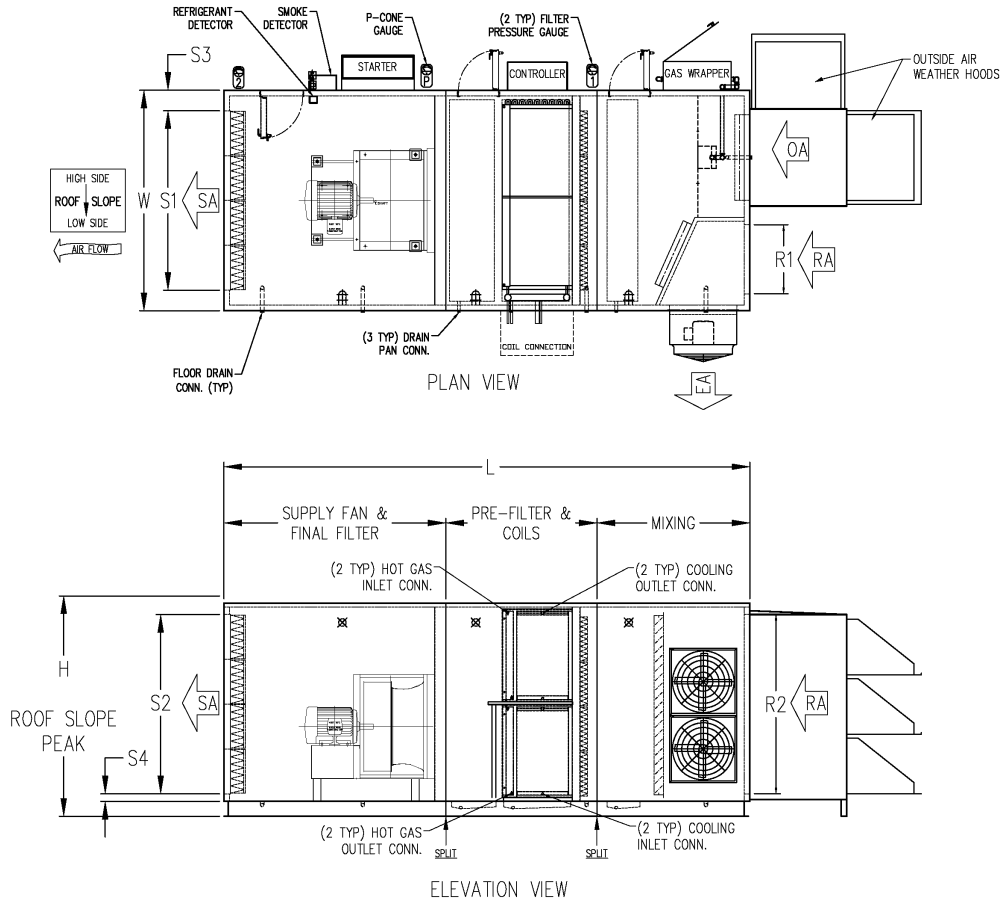


HEPA Filters

Filtration is a key function of treating hygienic room air. Most biological contaminants of concern are not free-floating, but rather hitchhike on airborne particles. HEPA filters placed in the discharge end of the AcuAir hygienic unit are an excellent way to ensure that only the highest quality of clean, cool and dry air is delivered to your process room.



AcuAir Standard Unit Dimensions



MODEL ^{1,2,3}	(L)	(W)	(H)	Discharge Air				Return Air	
	Length Std. ⁴	Width Std.	Height Std.	Opening Width (S1)	Opening Height (S2)	Flat Surface Side (S3)	Flat Surface Bottom (S4)	Opening Width (R1)	Opening Height (R2)
YC-AA-F-07	252	86	57.5	72	36	7	4	32	34
YC-AA-F-10	268	86	69.5	72	48	7	4	32	48
YC-AA-F-15	270	86	93.5	72	72	7	4	32	72
YC-AA-F-20	270	118	88	96	60	11	7	48	66
YC-AA-F-30	296	118	118	96	96	11	4	45	96
YC-AA-F-40	294	144	118.5	120	96	12	4	60	96
YC-AA-F-50	300	144	142.5	120	120	12	4	61	120
YC-AA-F-60	311	182	130.5	166	108	8	4	79	109
YC-AA-F-70	336	182	141.5	166	120	8	4	79	119
YC-AA-F-80	342	218	142	202	120	8	4	97	119

1. Measurements in inches based on assembly shown above. Section splits not shown. Consult factory for additional information. For reference only, use certified drawings for design purposes.
2. The above tabulated dimensions are standard. Alternate unit dimensions are available. Please consult factory with application specific requirements and constraints.
3. Additional CFM capacity units available. Please consult factory for selections and applications.
4. Unit length will vary based on unit configuration and options selected.

FRICK – Committed to Cold for Over 135 Years

We deliver innovative products that help the world run smoothly, smartly, simply and safely.

FRICK is the leader in industrial refrigeration.

Through our unrivaled expertise, developed and honed over nearly a century and a half, we provide world-class refrigeration technology that is reliably cold.

We relentlessly pursue and achieve superior-quality products so you can confidently focus on your core businesses.

We offer a full line of equipment for food and beverage applications including low charge systems, rotary screw compressor packages, condensers, evaporators, heat exchangers, hygienic air handlers, controls, vessels and replacement parts for these products.

And we work with an elite set of sales and installation partners – our FRICK Factors – whose dedication to your absolute satisfaction contributes to our successful products, processes and services.

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