



COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

Engineered Solutions

INDEX - Directory of Custom Designed, Project Specific HVAC Equipment

The "clickable" images below will take you to a brief equipment synopsis featuring general operational overview, explanation of controls, and equipment size diagram.



Chilled Water - Coil Housing

- General Make-Up Air
- 40,000 Supply CFM
- 58.9 Tons of Cooling



Indirect Fired—AR Energy Recovery

- Wastewater Treatment Plant
- 8,735 Supply / 9,335 Exhaust
- Flat Plate Energy Cell, Heresite



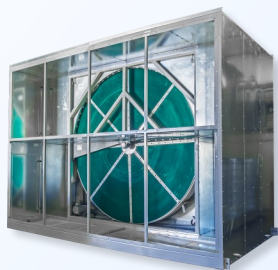
Chilled Water Cooling

- 100% Air Recirculation
- 8,130 CFM / 18 Tons
- Food Production App.



Air Turnover - Indirect

- 100% Air Recirculation
- 6,000 CFM / 48° F Rise
- Space Heating Application



Rotary Enthalpy Wheel

- Energy Recovery
- 24,000 CFM / 86° F Rise
- W/ Hot & Chilled Water



Direct Evaporative Cooling

- General Make-Up Air
- 40,000 Supply CFM
- Algae Resistant Media



Electric Coil Heating

- General Make-Up Air
- 3,400 CFM / 83° F Rise
- Open Coil Design



Electric Coil Heating

- General Make-Up Air
- 1,400 CFM / 92° F Rise
- Finned Tubular Coil



Indirect Fired – VRH

- Air Recirculation
- 20,000 CFM / 76° F Rise
- 10:1 Turndown Ratio



Packaged DX w/ Direct Fired

- Make-Up Air – Paintbooth
- 4,200 Supply CFM - 85° F Rise
- Piped, Wired, Charged by Titan



COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

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APPLICATION: *COIL HOUSING FOR 3RD PARTY UNIT*

EQUIPMENT: *CHILLED WATER COIL*

Unique Features & Benefits:

- Adding Cooling Capacity to Existing Systems
- Outdoor Insulated Construction
- Intermediate and Floor Condensate Drain Pans
- Low Pressure Drop to Allow Utilization by Existing Fans

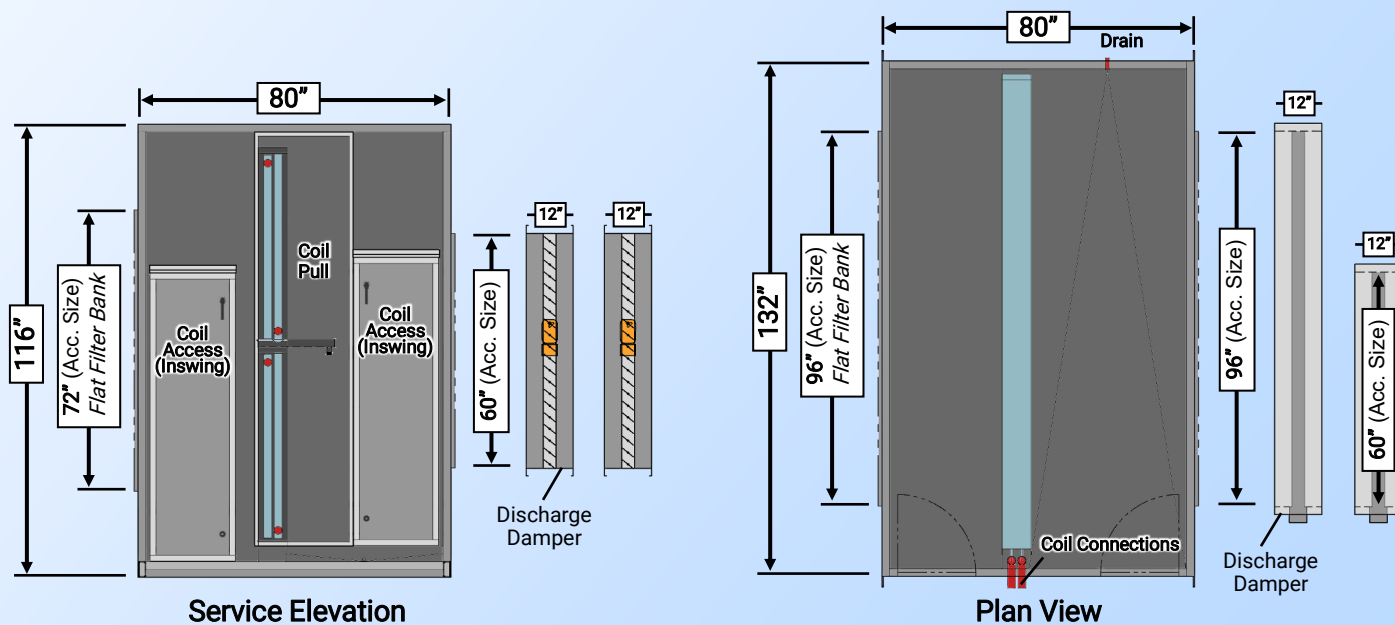
HOUSING MODEL - REF# CW1757



Technical Specifications:

Supply CFM: 40,000 CFM **Capacity:** 58.9 Tons

- Interior Lined Unit
- Fully Insulated Housing
- Coils Selected to Mitigate the Need for Additional Equipment
- Designed for 149 GPM of Chilled Water Flow





COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

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APPLICATION: *WASTEWATER TREATMENT PLANT*

EQUIPMENT: *INDIRECT FIRED AIR MAKE-UP UNIT
WITH EXHAUST AIR ENERGY RECOVERY*

Unique Features & Benefits:

- Flat Plate Energy Recovery Module
- TEFC Motors with VFDs
- Heresite Coated Accessories & Liner
- Blower/Motor Isolation
- DDC Discharge Controls w/ Frost Protection, Explosion Proof Sensors

Model: TAH - 122 PN ID0700 FP OA HRD



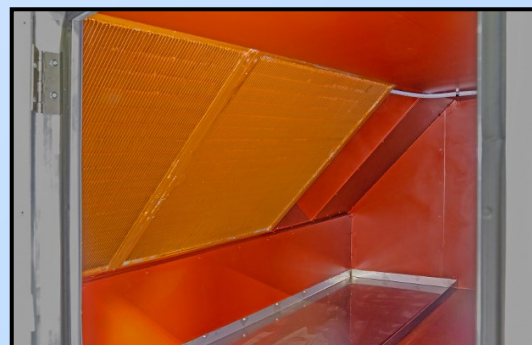
Equipment Specifications:

Supply CFM: 8,735 CFM Exhaust CFM: 9,335 CFM

Temp Rise: 58° F

Wastewater treatment facilities pose several unique challenges for HVAC equipment due to the possibilities for an explosion due to the gases that are present during the treatment process, as well as the damage that can be caused due to the corrosive environment.

Heresite coating is recommended as a heavy-duty, low maintenance coating for exposure to splash, spillage, and fumes. Heresite coatings form a hard corrosion-resistant film, making it an optimal choice for corrosive environments, and will result in years of reliable service for this equipment. Additional cost savings of the flat plate energy cell will save up to \$5,000/year, eventually recouping the investment for this custom-designed HVAC unit.

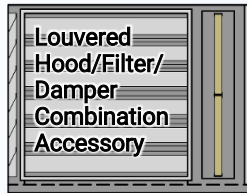


Detail of heresite coated interior and flat plate energy recovery cell

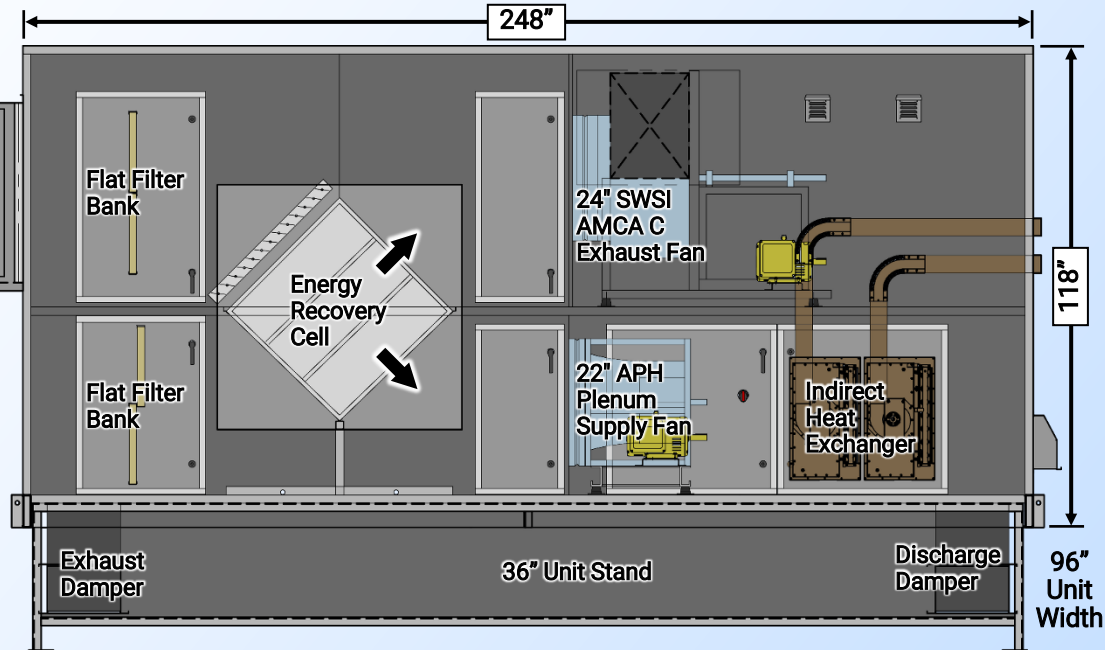


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Equipment Diagram



Service Elevation

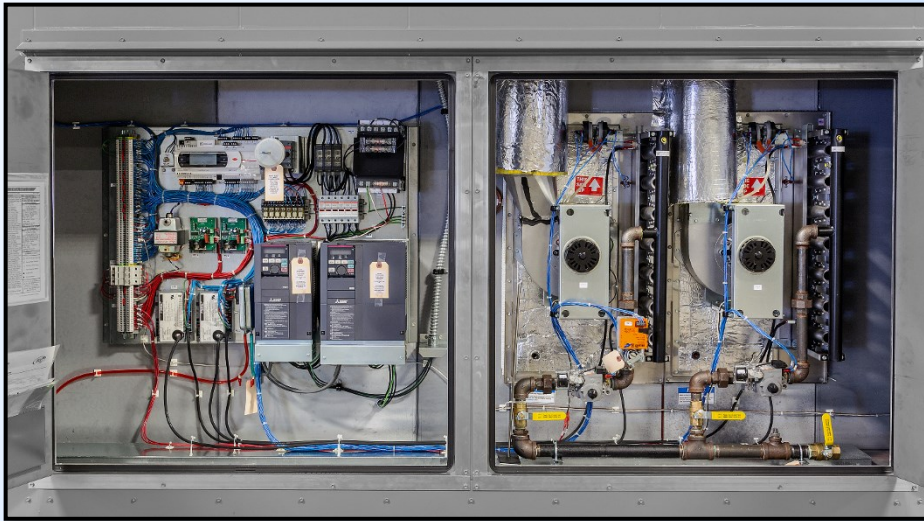


Technical Specifications:

- TEFC Motors with VFDs
- Face & Bypass Dampers for Energy Recovery Module
- Carel DDC Controls (see below)
- Cleanable Flat Plate Energy Recovery Module
- 2 Stage Indirect Heat Exchanger
- Fully Insulated Housing & Lined Unit Interior
- Explosion Proof Sensors
- Recovery Module with 70% Temperature Efficiency
- Mod. Indirect Heat Exchanger
- Neoprene Blower/Motor Isolation
- **Potential savings of \$5,000/Winter** *From Recovery Module*

* Estherville, IA Location - 24 HR/Day Runtime

Equipment Controls:



- Discharge Control with Room Override
- Audible Alarm Activated by DDC Fault
- Manual Speed Control for Supply VFD via Keypad
- Manual Speed Control for Exhaust VFD via Keypad
- 7-Day Occupancy Schedule
- Low Temp Safety Function via Program Control
- Controller Displays & Logs Faults for Easier Troubleshooting

Titan Air LLLP
Product Lines:

Direct-Fired
Indirect-Fired
Electric Coil

Air Turnover
Energy Recovery
Steam / Hot Water Coil

Chilled Water Coil
Custom Controls
Unit Accessories

Split & Packaged DX Cooling
Direct Evaporative Cooling
Dehumidification/Reheat Units



COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

Engineered Solutions

APPLICATION: *INDUSTRIAL COOLING*

EQUIPMENT: *DIRECT EVAPORATIVE COOLING*

Unique Features & Benefits:

- Extended Grease Lines
- Room Stat to Enable Cooling
- Auto Fill / Auto Drain Valves
- Algae Resistant Media
- Custom Color Epoxy Paint Exterior
- Unit "Split" to Ease Transportation

Model: TAH-227 FC EV OA HRD



Equipment Specifications:

Supply CFM: 40,000 CFM

Evaporative cooling is the most economical and simple way of adding cooling and humidity to an environment. This makes it especially more valuable in drier, arid environments that may not have easy access to chilled water, as well as in a variety of specialized industrial applications.

Titan's evaporative coolers feature algae resistant cooler media, making them an ideal choice. Also, upon power loss the fill drain closes and the sump pump is drained, reducing the chance of water damage occurring.

Technical Specifications:

- Forward Curve Fans
- Casing & Accessories Painted White
- Fill and Drain Kit for Evaporative Cooler
- ODP Premium Efficiency Supply Fan Motor
- Extended Grease Lines for Simple Blower Bearing Maintenance

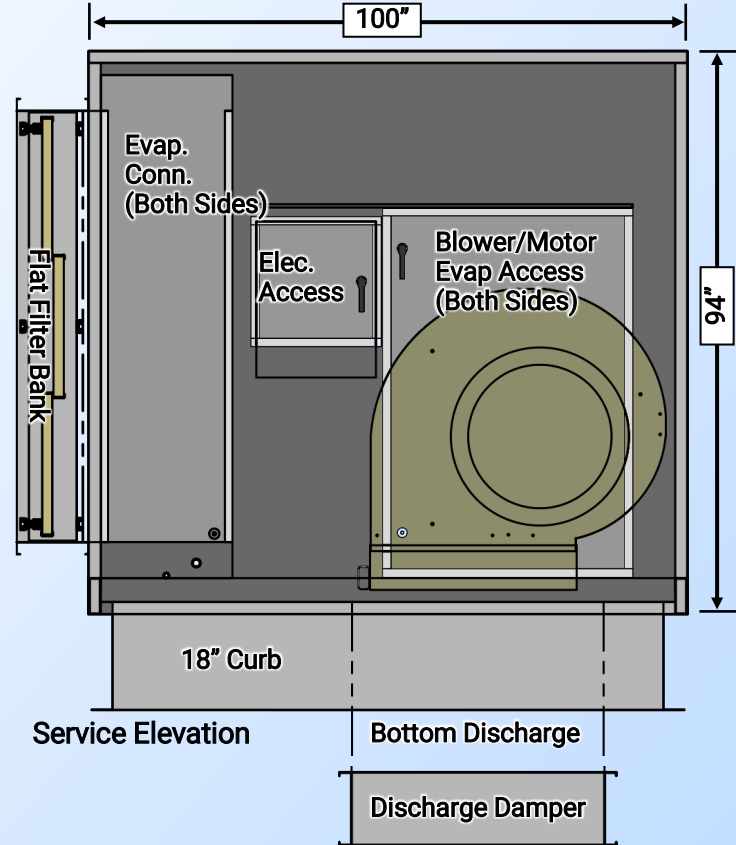
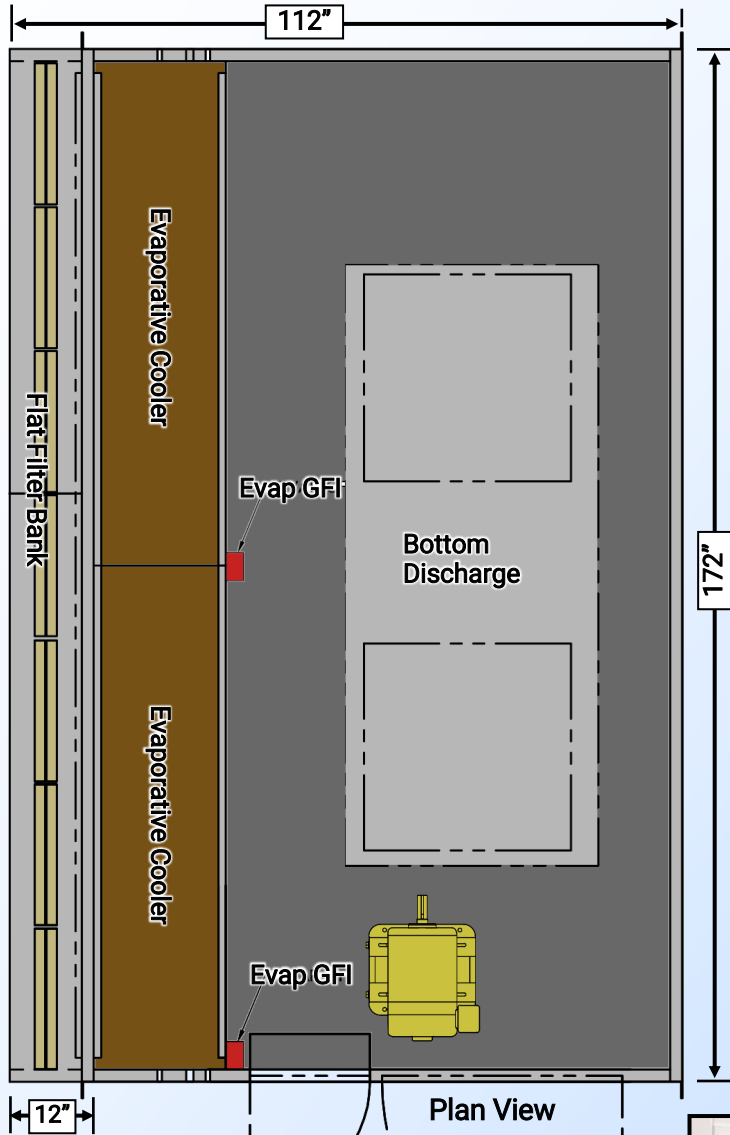


Detail of service side of evaporative cooler, showing blower/motor and control door access of unit.



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Equipment Diagram



Equipment Controls:

- Remote Panel Controls: ON/OFF Switch to Enable Fan
- Cooling Enable Stat Enables Evap. Pumps
- Fill and Drain Switch to Either Keep the Sump Full When Fan is Running or to Keep it Empty.



Titan Air LLLP
Product Lines:

Direct-Fired
Indirect-Fired
Electric Coil

Air Turnover
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COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

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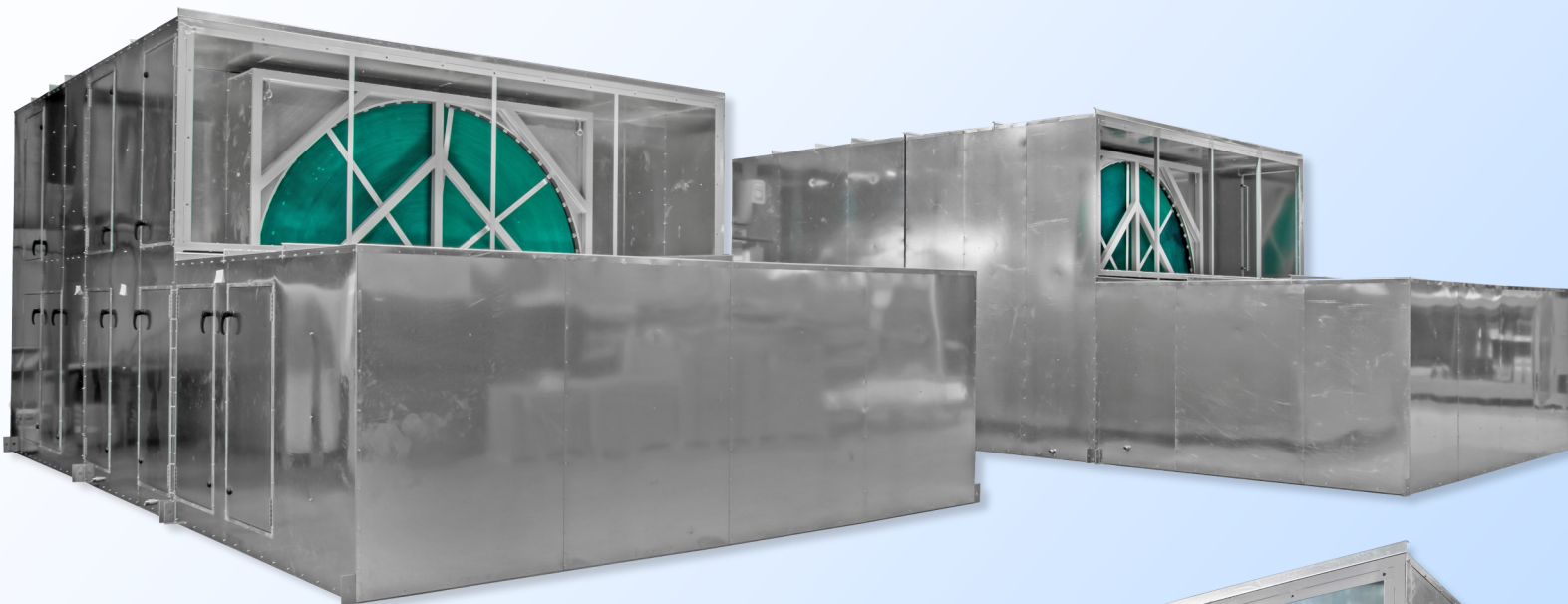
APPLICATION: *ENERGY RECOVERY*

EQUIPMENT: *ROTARY ENTHALPY WHEEL*

Unique Features & Benefits:

- Energy Recovery - Up to 70% Efficiency
- Sensible and Latent Recovery
- Hot Water & Chilled Water Coils in System
- Provision for Future Coils is Provided in Equipment Design

Model: TAH-54.0-227 BA CW HW RR OA HRD



Equipment Specifications:

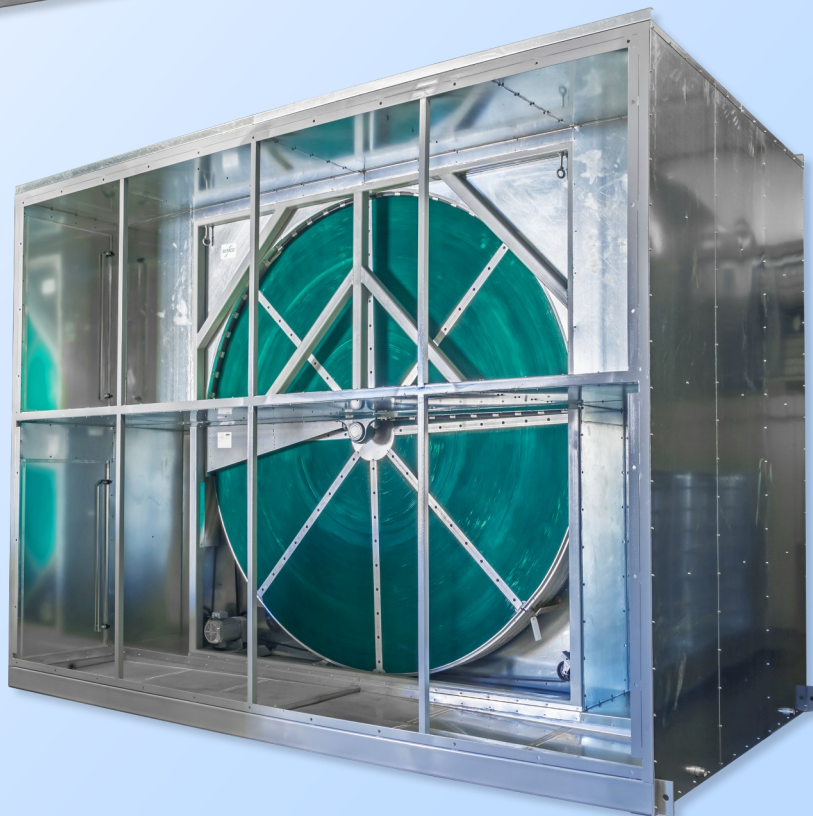
Supply CFM: 24,000 CFM

Temp Rise: 86° F

This large, custom HVAC system features energy recovery through a rotary enthalpy wheel, in combination with hot and chilled water for precise and efficient climate control.

As seen in the equipment diagram (*next page*), this unit also features multiple levels of filtration and is coupled with optimal fan/blower selections to ensure consistent performance regardless of static pressure changes due to filter loading.

With up to 70% efficiency, this unit provides the lowest operational cost compared to other typical HVAC equipment in this application with high system utilization and required precise temperature and humidity control.

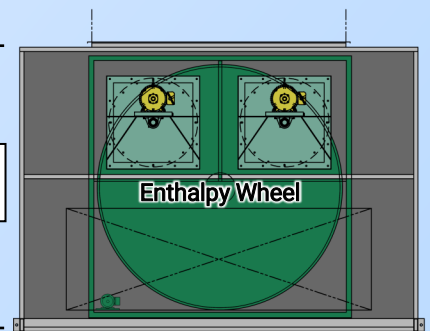
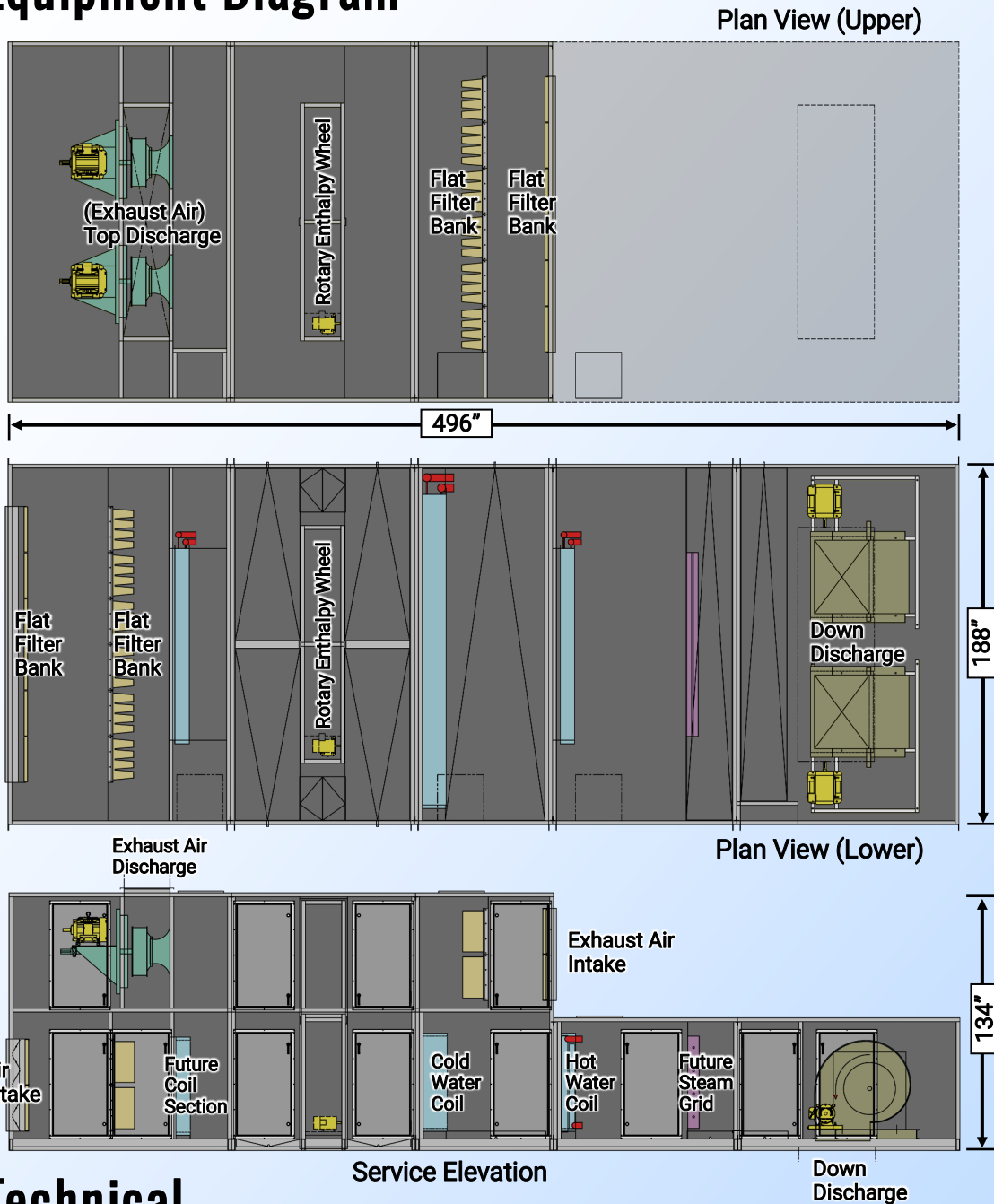


Detail of "split" equipment component of this HVAC unit featuring the rotary enthalpy wheel. This specific application required two identical HVAC units.



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Equipment Diagram



Technical Specifications:

- Chilled Water Capacity: 186 Tons
- Hot Water Capacity: 224,000 BTU/HR
- Fully Insulated, 2" Wall Construction
- Manifolds and Controls for HW & CW Coils
- Equipment Controls by Titan Air
- Twin 27" DWDI Class II BAF Supply Fans
- Twin 27" PLG Class II AMCA B Exhaust Fan
- Integrated Damper/Actuator
- Equipment Split into (5) Sections for Transporting

Titan Air LLLP
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Dehumidification/Reheat Units



COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

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APPLICATION: *INDUSTRIAL HEATING (Pump Station)*

EQUIPMENT: *ELECTRIC COIL (Open coil)*

Unique Features & Benefits:

- High and Low Speed Modes
- 2" Construction with Lined Interior
- Single Point Power Connection
- Supply Fan VFD
- Room Control
- Vibration Isolation

Model: TAH-112 FC EL OA HRH 2SPD



Equipment Specifications:

Supply CFM: 3,400 CFM

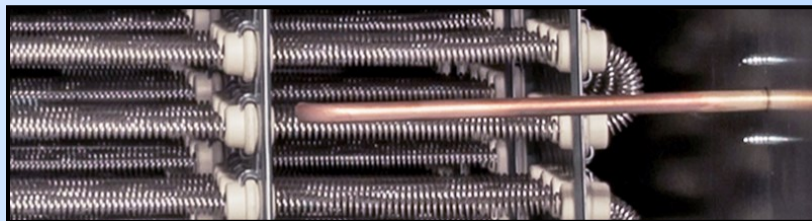
Temp Rise: 83° F (90 KW, 109 Amps)

Electric coil HVAC equipment is an optimal solution in locations where utilities such as natural gas are unavailable, and/or a "clean" heating source is required that would not result in "byproducts of combustion" entering the space being heated.

This air make-up unit features a supply VFD allowing for two speed operation. The low speed mode was set for 85% of maximum airflow. Neoprene blower/motor isolation was utilized to reduce noise while in operation. Extended grease lines aid in easy maintenance.

This unit was equipped with room control via the Carel DDC and Vernier SCR controls, with the high speed mode programmed to become active when the space reached 80°.

Other unique equipment features include an exhaust fan interlock contact and L50 200,000 hour pillow block bearings, and an inlet ductstat which turns off the heating if warm outside air is detected. A low temperature safety function will shut off the unit if the electric coil fails to operate and would result in cold air entering the space.



Detail of "open coil" electrical coils. Compared to "finned tubular" these coils feature a lower pressure drop, lighter weight, and a more rapid thermal response.

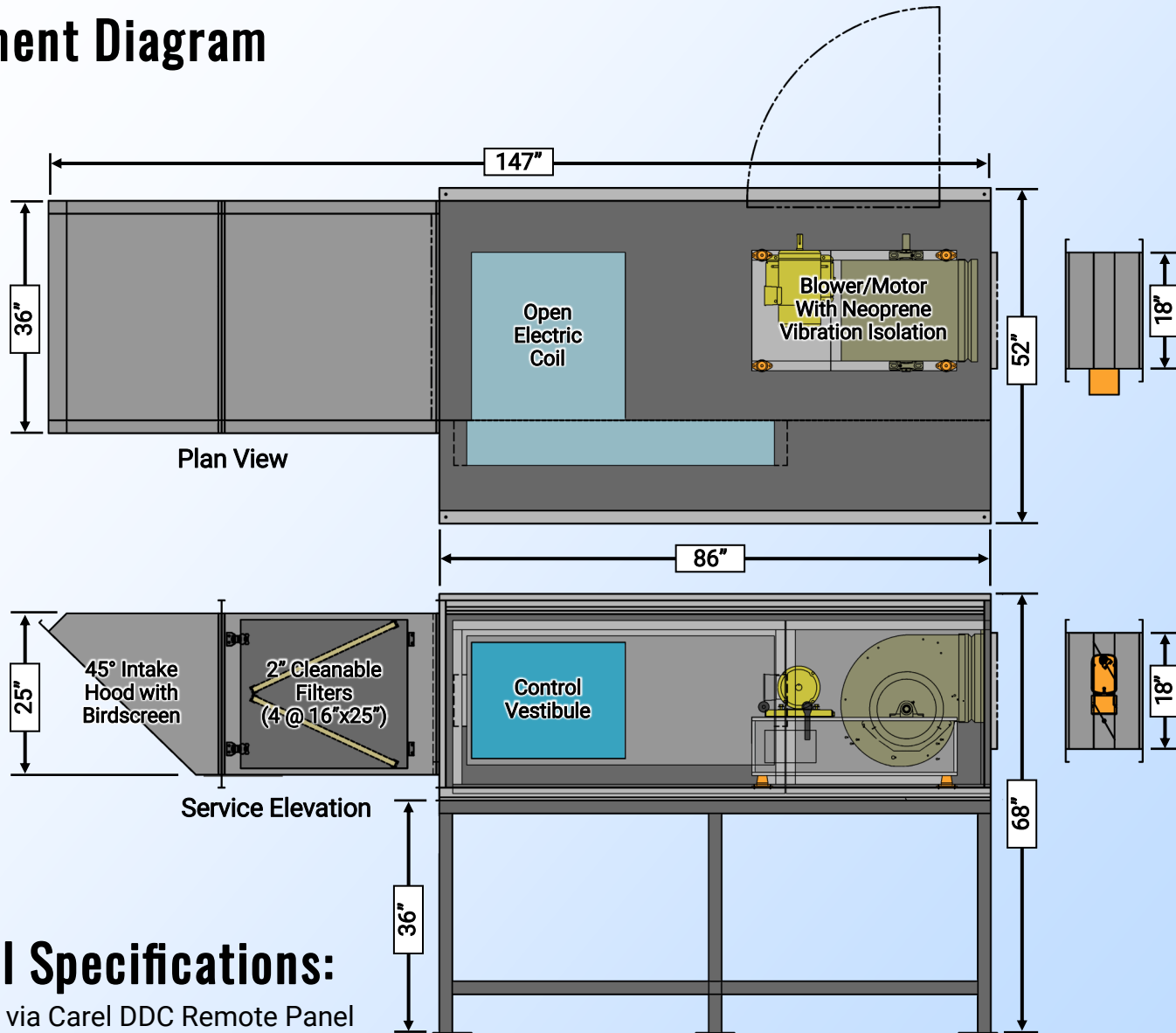
They are also more economical than finned tubular coils, making them an optimal solution in applications where water spray or conductive particle contamination are not an issue.



TITAN AIR LLLP

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Equipment Diagram



Control Specifications:

- Control via Carel DDC Remote Panel



Detail of unit Intake, with electric coil visible.

***Titan Air LLLP
Product Lines:***

Direct-Fired
Indirect-Fired
Electric Coil

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COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

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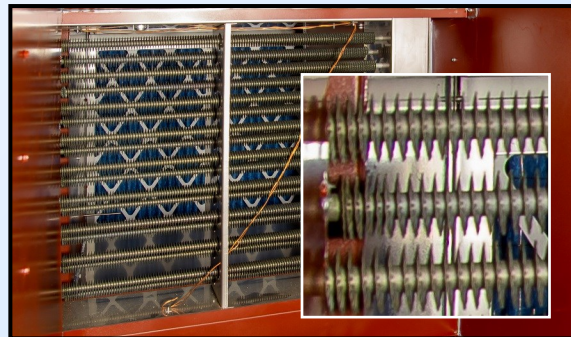
APPLICATION: *FOOD PRODUCTION / PROCESSING*

EQUIPMENT: *ELECTRIC COIL (Finned Tubular)*

Unique Features & Benefits:

- Two Position OA/RA Damper Control
- Heresite Coated Unit and Accessories
- Single Point Power Connection
- Supply Fan VFD
- Discharge Control With Room Override

MODEL: TAH - 109 FC EL AR HRH



Finned tubular electric heating coil.
Close-up of coil seen at inset.

Equipment Specifications:

Supply CFM: 1,400 CFM

Temp Rise: 92° F
(41KW, 50 Amps)

Applications with corrosive or conductive contaminants in the airstream are well-served by "finned tubular" electric coil heating.

Compared to open coils, these finned tubular coils have a metal sheath, making them safer in regards to accidental shock if conductive materials, or a human operator were to come into contact with them.

This unit allows for air recirculation via a two position control of OA/RA dampers and also incorporated an interlock with the space lighting system.

To ensure a long lifespan of the unit in this corrosive environment, several features were incorporated such as a heresite coating on the unit interior and accessories. The dampers were coated with epoxy paint, while all airstream sensors were stainless steel.

The unit was specified as single speed, with the supply fan VFD used for balancing, and soft motor start.



Heresite coated blower, also featuring neoprene isolation base.

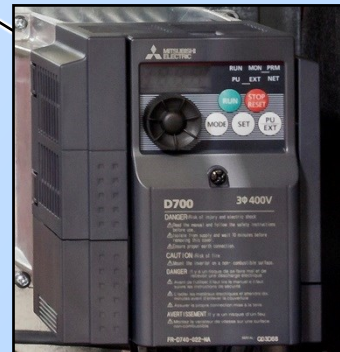
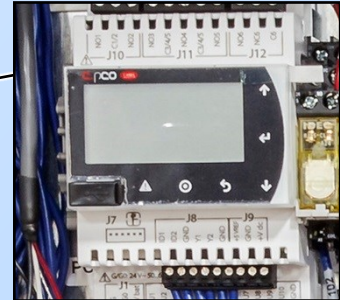
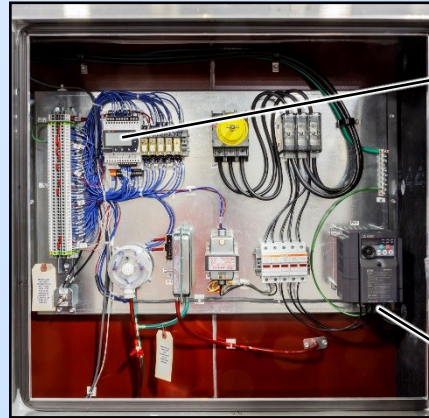
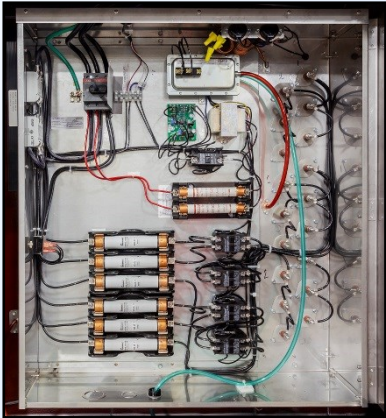
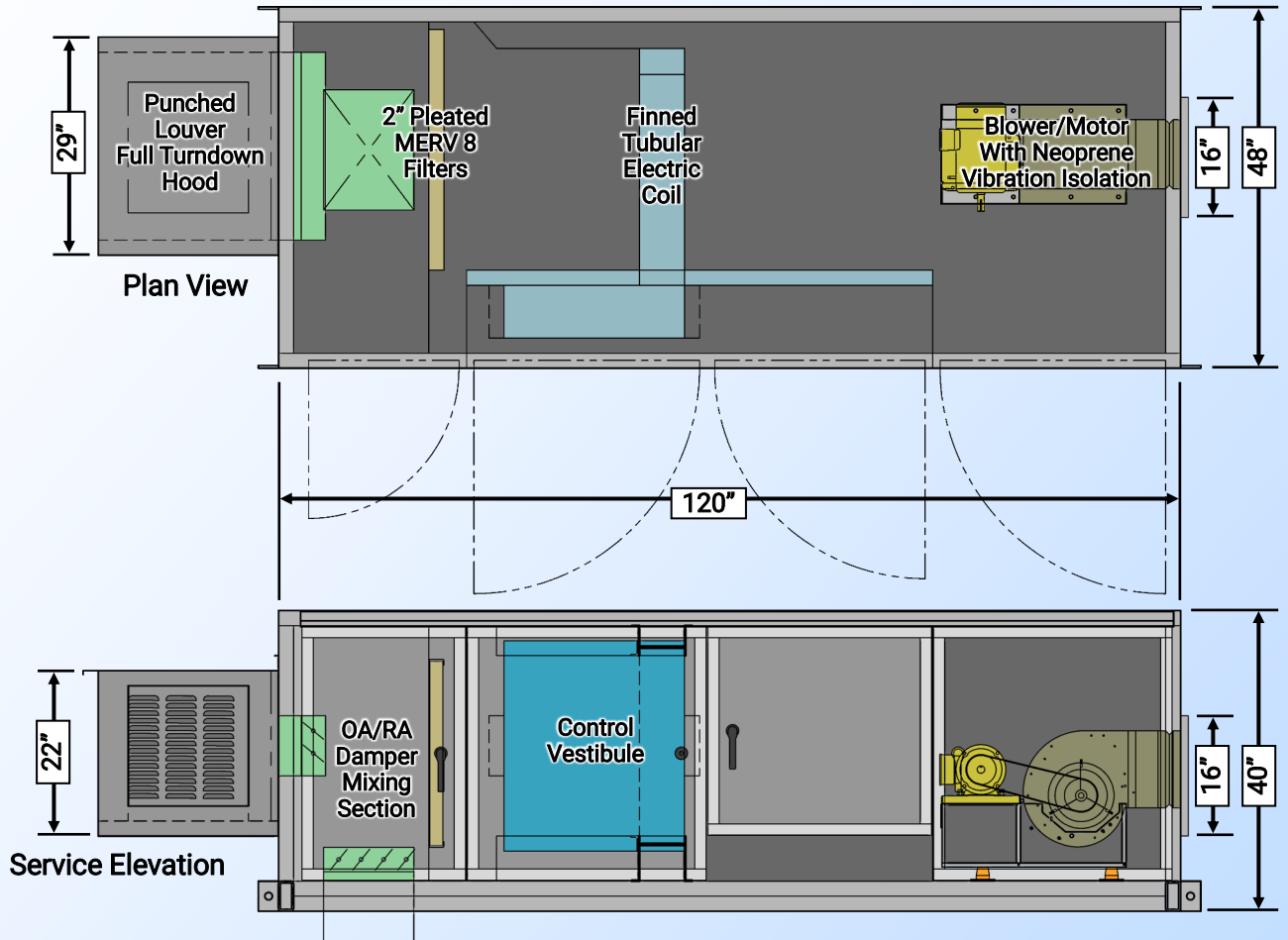


Detail of *outside air* and *return air* dampers and flat filter bank featuring 2" MERV 8 filters.



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Equipment Diagram



Technical Specifications:

- VFD Controlled Fan: 1,400 CFM
- Integrated Electric Heat (40kW)
- Vibration Isolation
- 2" Insulated and Lined Walls and Doors
- Carel DDC Control

Titan Air LLLP
Product Lines:

Direct-Fired
Indirect-Fired
Electric Coil

Air Turnover
Energy Recovery
Steam / Hot Water Coil

Chilled Water Coil
Custom Controls
Unit Accessories

Split & Packaged DX Cooling
Direct Evaporative Cooling
Dehumidification/Reheat Units



COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

Engineered Solutions

APPLICATION: *MAKEUP AIR - (Paintbooth)*

EQUIPMENT: *Direct Fired w/Packaged DX Cooling*

Unique Features & Benefits:

- Piped & Wired by Titan Factory
- Initial Charging of System by Titan
- Lined and Insulated Unit
- Custom-Selected Cooling Coil Size and Optimized Equipment Footprint

MODEL: TA-112 NG HRV w/DX



Equipment Specifications:

Supply CFM: 4,200 CFM

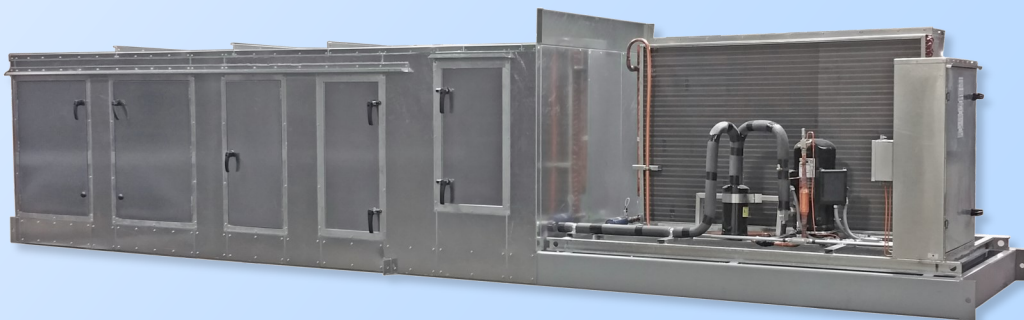
Temp Rise: 85° F

Cooling: 16 Tons (45° F Suction Temp)

A packaged system of direct fired heat with DX cooling system from Titan can be an optimal "turnkey" solution for a variety of applications. Available with heating/cooling controls by Titan, or for control "by others," all packaged equipment is specifically engineered for your individual application and heating/cooling demands.

Compared to standard, mass-assembled packaged systems available in the market, Titan Air packaged system have **many advantages as seen below:**

- Heating & cooling components are selected for your specific application. Don't pay for oversized equipment that will cycle on/off repeatedly, or smaller equipment that may not adequately meet peak demands.
- Equipment can be sized to a required footprint size, and virtually any intake/discharge equipment configuration can be accommodated, along with any required built-in accessories.
- A quicker jobsite installation and setup is possible with initial charging and testing of the system by the Titan factory, as well as equipment piping/wiring.



Equipment seen above during final construction, prior to addition of galvanized (G-90) unit casing to cover the DX compressor.



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Equipment Diagram



Technical Specifications:

- Compressor R410A Charge: 25.7 Lbs (included for 10 ft of piping)
- Pleated MERV 8 Filtration
- Lined and Insulated Construction - Outdoor Mounted Unit
- Supply Fan VFD, 460 V 5 HP Motor - 6.7 Unit FLA
- Carel DDC Cooling Controls



***Titan Air LLLP
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COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

Engineered Solutions

APPLICATION: *FOOD PROCESSING*

EQUIPMENT: *CHILLED WATER COOLING*

Unique Features & Benefits:

- 100% Air Recirculation (No Outside Air)
- Discharge Outlets Field Cut by Others
- Clogged Filter Switch for "Controls By Others"
- Double Wall Insulated Skirted Stand, Insulated and Lined Unit Interior

MODEL: TAH-120 FC CW RA VLH

Equipment Specifications:

Supply CFM: 8,130 CFM

Cooling: 18 Tons

Entering Dry Bulb: 81° F

Leaving Dry Bulb: 59° F

Entering Wet Bulb: 66° F

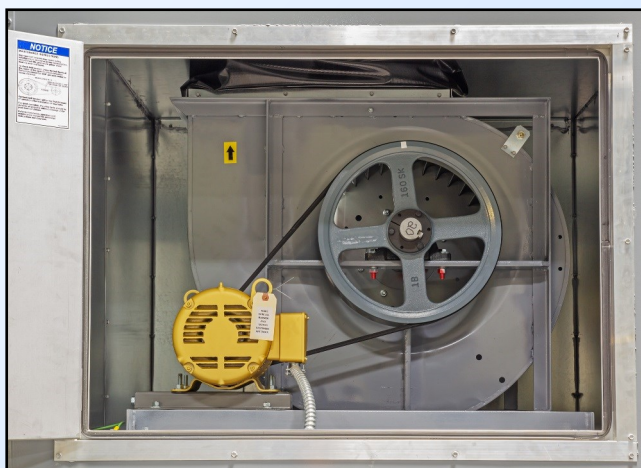
Leaving Wet Bulb: 57° F

Titan's design flexibility allows for this vertically oriented equipment with a height of almost 20 feet once assembled.

This food production facility is able to utilize process chilled water to provide cooling to the areas served by this unit, which operates solely with return air, not bringing any outside air into the building.

The building management system provides the operational control of this unit, which features a clogged filter switch that also integrates with that control system.

The neoprene blower/motor isolation reduces operational noise which is desirable in this occupied space. Extended grease lines help facilitate quicker preventative motor maintenance.



Seen above is the blower/motor assembly featuring neoprene isolation. The blower has been mounted for vertical discharge.

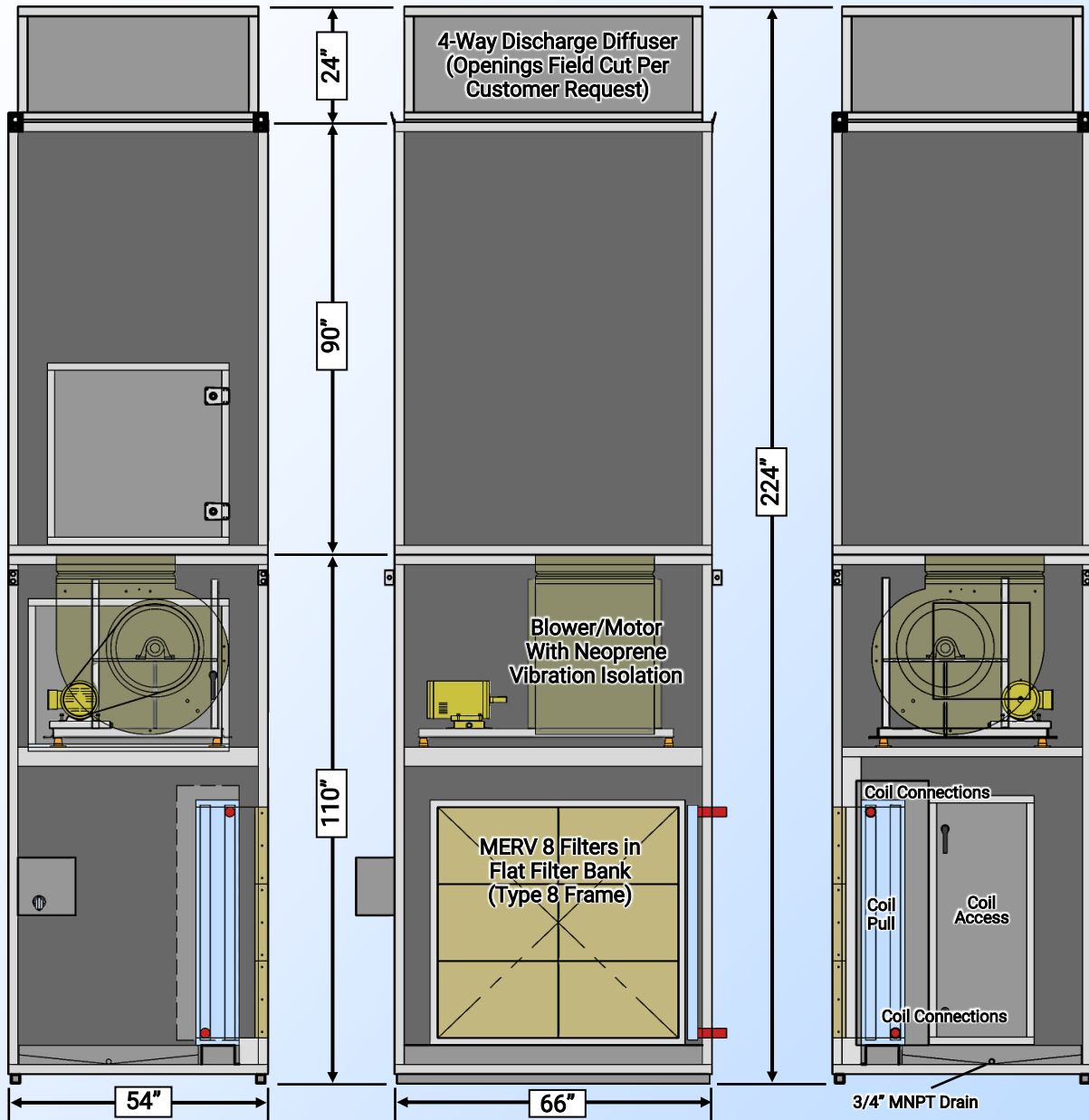


Seen above is the lower "split" section of this unit, without the upper portion or discharge diffuser. The overall equipment height once installed is 224". The chilled water coil can be seen as the MERV 8 filters have not been placed in the flat filter bank here.



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Equipment Diagram



Technical Specifications:

- Blower Type: FC DWDI 20"
- Motor Horsepower: 3 HP (2.6 BHP) - ODP Premium E
- Total Static Pressure of Airhandler: 0.73"
- Painted Gray Exterior / G-90 Interior Liner
- Insulation (Entire Airstream): 1" 1.5#
- Pleated MERV 8 Filters / 4-Way Discharge Diffuser
- Airhandler Location: Mounted Indoors



Detail of Motor disconnect and Clogged Filter Switch

Titan Air LLLP
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Direct-Fired
Indirect-Fired
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Dehumidification/Reheat Units



COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

Engineered Solutions

APPLICATION: *SPACE HEATING (INDUSTRIAL)*

EQUIPMENT: *AIR TURNOVER - INDIRECT FIRED*

Unique Features & Benefits:

- 100% Air Recirculation (No Outside Air)
- 409 Stainless Steel Heat Exchanger
- 30" SBE-3H30 Prop Fan
- Operating Lights
- 2 Stage Room Control
- 4-Way Discharge Diffuser

MODEL: TAH-130 PR AT0400 VRV



Equipment Specifications:

Supply CFM: 6,000 CFM

Temp Rise: 48° F

Titan's indirect fired air turnover systems have been designed to heat large open areas for both commercial and industrial applications.

These units do not require outside air, so no intake duct work is required, allowing for location flexibility and ease of installation.

Titan's line of air turnover equipment is designed with custom designs, options, and controls available to meet your requirements.

Titan air turnover units feature either an in-shot or drum and tube type heat exchanger. The in-shot heat exchanger has formed dimples that control expansion and reduce noise.

Standard heat exchangers are available in either 304 or 409 stainless steel. Special belt driven propeller fans are designed to handle high volumes of air at low static pressures.

Blade design makes for a quieter and more efficient fan operation. Centrifugal fans are used in higher static pressure applications. Lastly, Titan's air turnover units feature a discharge plenum extension, allowing for an easy accommodation to virtually any building height.

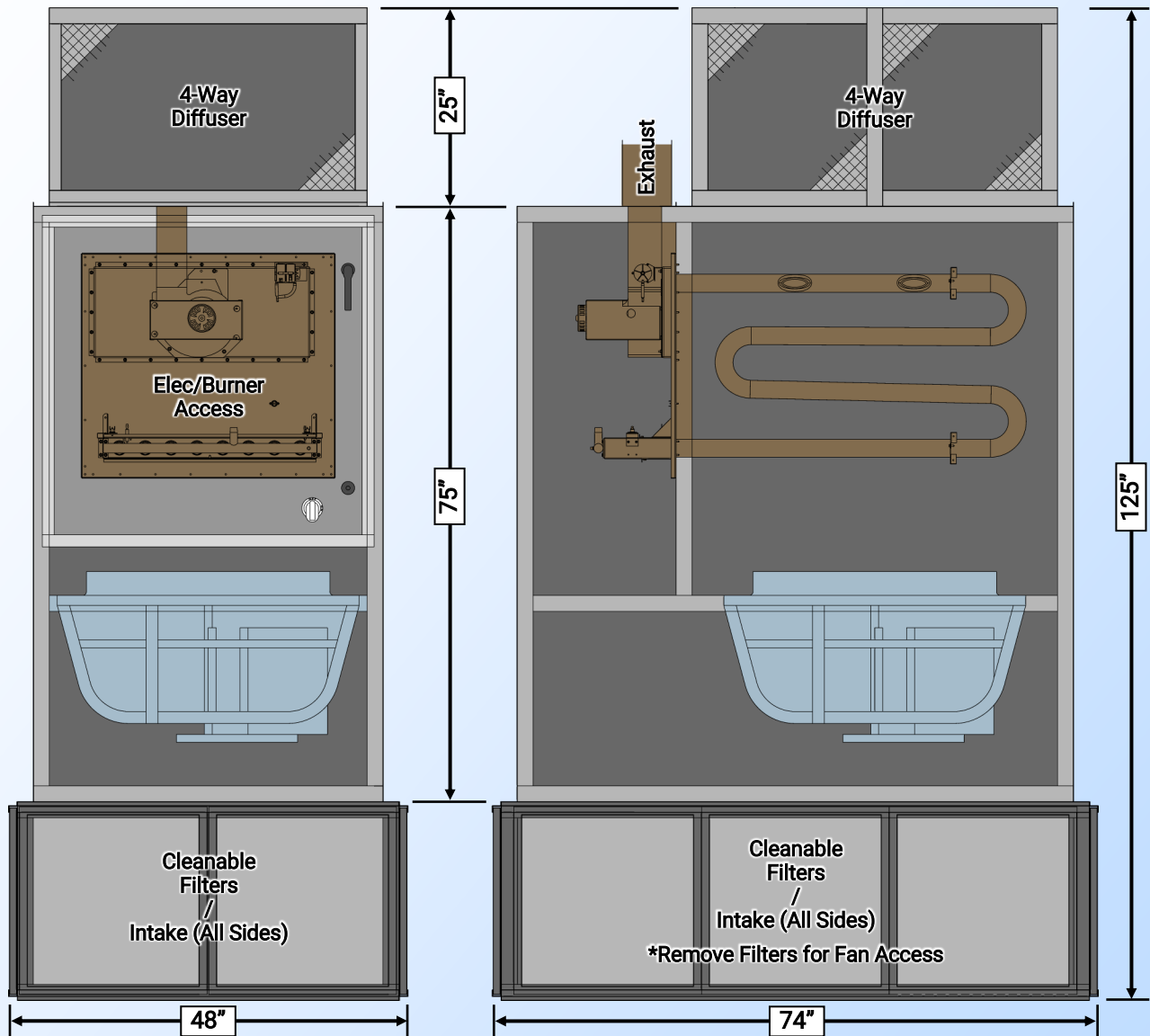
Air Turnover units also have the following advantages:

- *No additional rooftop support required*
- *Rooftop penetrations can be avoided, lowering the chance of leaks*
- *Ductwork is not required, lowering overall costs and installation time*
- *Indoor or outdoor installation is available*
- *Cooling options are available*



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Equipment Diagram



Detail of unit prior to filter installation



Detail of equipment controls with operating lights

***Titan Air LLLP
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COMMERCIAL & INDUSTRIAL HVAC EQUIPMENT

Engineered Solutions

APPLICATION: *Air Recirculation (INDUSTRIAL)*

EQUIPMENT: *INDIRECT FIRED*

Unique Features & Benefits:

- Carel DDC Building Pressure Control - Outside/Inside Air Mixing
- 409 Stainless Steel Heat Exchanger with 10:1 Turndown Ratio
- Low Temperature Safety Function via Programmable Controls

MODEL: TAH-220 FC ID01750 AR VRH



Equipment Specifications:

Supply CFM: 20,000 CFM **Temp Rise:** 76° F

Indirect fired equipment is an ideal solution for applications where air recirculation is desired. As no byproducts of combustion enter the space being heated, air can be recirculated through the unit without requiring any fresh outside air. For this specific application the outside/return air proportion is controlled based on building pressure, modulating to achieve a slightly positive building pressure overall.

Titan indirect fired heating equipment can be designed with multiple heat exchangers, offering enhanced turndown potential. This unit featured 10:1 turndown ratio.



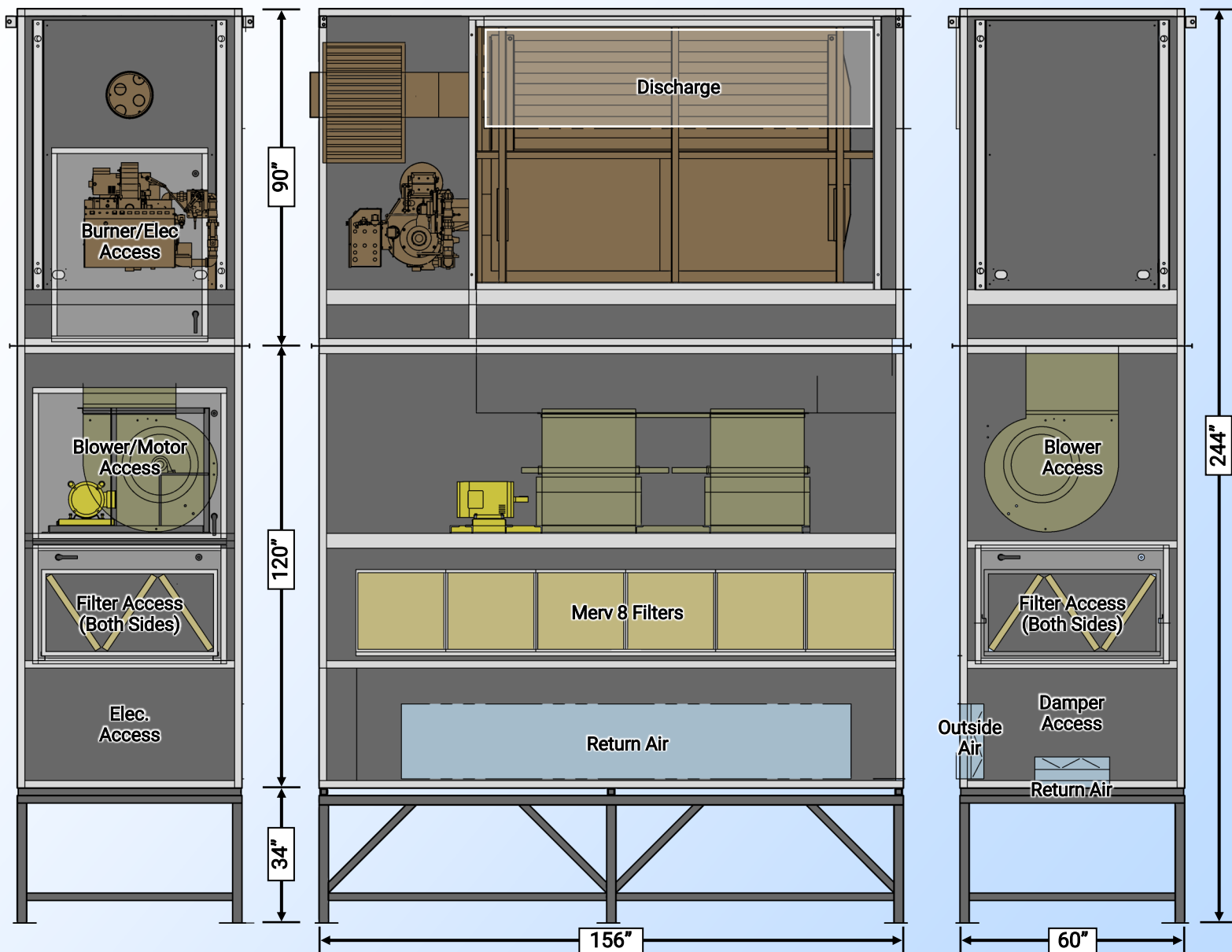
Detail of Drum & Tube Heat Exchanger



TITAN AIR LLLP

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Equipment Diagram



Technical Specifications:

- Blower Type: Twin FC DWDI 20"
- Motor Horsepower: 10 HP (8.54 BHP) - ODP Premium E
- Total Static Pressure of Airhandler: 0.83"
- Painted Gray Exterior / G-90 Interior Liner
- Insulation (Entire Airstream): 1" 1.5#
- Pleated MERV 8 Filters for Mixed Air Section
- Airhandler Location: Mounted Outdoors
- Room (Building Pres. Control - *W/Inlet Ductstat, Low Temp. Safety*)



Detail of Carel DDC Control Interface

Titan Air LLLP
Product Lines:

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