PRODUCT CATALOGUE
Air Handling Units

Low weight
Innovative FRAMELESS casing
Maintenance-free PLENUM fan

VTS ensures TOP Quality

Conforms to UL Std 1995
Certified to CSA Std C22.2 No. 236
EN 1886
EN 13053
ISO 9001
ISO 14001
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VTS

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VTS Group is a global corporation, a trusted brand and a leading supplier of air conditioning units and heating appliances, focused on offering innovative products at competitive prices with a quick turn-around. The company is the No. 1 provider of Air Handling Units in Europe and leading provider in the world with established platforms across quickly developing markets of the Emirates, China and India, and network of sales representatives in USA.

VTS offers streamlined, flexible and innovative AHU with a wide range of applications and heating appliances covering market needs delivered in superb short lead time.

VTS Group
– a leader in HVAC sector

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ClimaCAD On-line.
User friendly on-line AHU selection tool, certified by EUROVENT

The Group’s sales and distribution network is based on experienced technical sales consultants who interact directly with clients regarding all enquiries through ClimaCAD On-line.

Proprietary software enables an easy-to-use client interface, quick online product set up, offers preparation in multiple languages and easy modification within minutes.

ClimaCAD is fully integrated with in-house IT systems and enables real time collaboration among multiple users all over the world.

- Easy to use AHU selection application (ClimaCAD On-line).
- Enter the selection application at www.vts-group.com
- Select the AHU you need in 60 seconds.
- Selection parameters are certified by EUROVENT.
Quality First

The highest quality of VTS devices is appreciated by the leading World experts - including EUROVENT, TÜV, BVQI, Rostest, MBF-TMB.

UL 1995
UL 1995 - VENTUS Born in the USA AHUs meet a number of strict security requirements imposed on equipment in the US and Canadian market. The units were tested by independent ETL laboratory in terms of durability of the structure and safe use of equipment.

TÜV
EN 1886 and EN 13053 are two European standards concerning Mechanical and Performance aspects of Air Handling Units. They are the only basis to apply for the membership in the EUROVENT Certification Company organization and obtain a EUROVENT certificate.
The research process is carried out by independent research institutions with CEN – European Committee for Standardization notification including TÜV among others.

EUROVENT
EUROVENT – the Eurovent certificate confirms the accordance of parameters of VENTUS VS 10-650 range calculated with the use of ClimaCAD On-line – the Group’s product configuration application with real operating parameters. EUROVENT certification is considered the top performance rating in Europe with a nearly 50-year history. EUROVENT is well known for its strict test means and high test standards. VTS integrated energy recovery AHU has been awarded the EUROVENT certificate with excellent performance.

CE
CE - VTS devices comply with safety standards in accordance with EU guidelines. VTS units have been tested in accordance with Low Voltage Directive, Electromagnetic Compatibility and Machinery Directive.

ISO
ISO 9001 / ISO 14001 – a system of quality management implemented in VTS in 1996 in the field of design guarantees full repeatability of all VTS devices. ISO 14001 certificate confirms the efficiency of the environment management system aimed at protection of health and the environment against the harmful influence of production activity, products and services.

Reliable Business Partner.
Thousands of satisfied customers around the world are the best recommendation of VTS.
The products worth investing in

Get more for less – maximum features in standard unit without added costs.

VTS Air Handing Unit – VENTUS Born in the USA combines European technology and American sustainability - it is tailored to the needs of the American market.

The compact air handlers are available in either horizontal (model VTS-h) or vertical (model VTS-v) configurations. Horizontal units are typically floor mounted, however they can be installed as a ceiling suspended unit.

Vertical units are typically floor mounted. The units can be configured for different inlet and outlet locations for easy duct connection and right or left hand configuration.

VTS compact air handlers offer a wide range of application and flexibility between the blower coil unit and the packaged units. Our VENTUS born in the USA line is available in nine nominal airflow sizes from 800 CFM up to 8,500 CFM, while the cooling capacities are available from 0.5 to 30 tons.

In addition, VTS units are made with a high durability polyurethane sandwich panels which minimize vibration, noise and eliminate thermal bridges compared with typical blower coils and air handling units. This significantly reduces the emission of acoustic power level through the casing, enabling to keep quiet operation of our AHUs. The innovative casing design also enables operation of our units in very different climate conditions, including cold Siberia or hot and humid Middle East, without risk of any internal or external condensation.

Units performance calculations has been tested and approved by Eurovent.

1 WEEK lead time as a STANDARD

Available in 9 nominal capacities from 800 to 8500 CFM

Wide range of applications

• Operation in different climate conditions (-40°F to 150°F)
• Compact size – possibility of mounting in small spaces and easy relocation if needed

Filters
All units have internal or external flat filter frame for two or four-inch filters:
- Two-inch MERV8 filter
- Four-inch MERV13 filter

Coils
- Main coil with copper tubes and aluminum fins in 1, 2, 3, 4, 6 and 8 rows hydronic and 2, 3, 4 and 6 row for DX.

Innovative Frameless casing
Low vibration, noise and elimination of thermal bridges - high durability polyurethane sandwich panels.

PLENUM Fan
Composite backward-curved air foil fan impeller, directly driven by highly efficient electric motor.

Control options

Typical applications:

- Schools
- Offices
- Stores
- Hospitals
- Industries
VTS Air Handlers Family

Capacity: 800 – 8,500 CFM

Horizontal Air Handlers range
VTS 8 – VTS 85 Sizes:

Horizontal Air Handlers range with energy recovery
VTS 8 – VTS 85 Sizes:
VTS 8 - VTS 85 Units with Cross Flow Plate
VTS 12 - VTS 65 Units with Energy Recovery Wheel

Vertical Air Handlers range
VTS 8 – VTS 40 Sizes:

Symbols and labels

Basic functions of a base AHU

Energy recovery functions

V - Fan
P - Cross-Flow Plate
F - pre-Filter
H - Heater: water, electric, steam
R - Energy Wheel
C - Cooler: water, with direct expansion
M - Mixing box

Main unit configuration

Vertical unit
Horizontal unit

PLENUM fan section
Mixing box
Filter box
Cooling Coils
Heating Coils
External electric heater

VTS 8 – VTS 85 Sizes:
8 12 16 20 30 40 55 65 85

VTS 12 - VTS 65 Sizes:
8 12 16 20 30 40 55 65 85

VTS 8 - VTS 85 Units with Cross Flow Plate
VTS 12 - VTS 65 Units with Energy Recovery Wheel

Capacity: 800 – 8,500 CFM
## Configurations

### VTS Horizontal Air Handlers

<table>
<thead>
<tr>
<th>Supply</th>
<th>Heating</th>
<th>Cooling</th>
<th>Heating &amp; Cooling</th>
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<tr>
<th>Exhaust</th>
<th>Ventilation</th>
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<table>
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<tr>
<th>Cross-flow plate</th>
<th>Heating</th>
<th>Cooling</th>
<th>Heating &amp; Cooling</th>
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### VTS Vertical Air Handlers

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<thead>
<tr>
<th>Ventilation</th>
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<th>Supply</th>
<th>Cooling</th>
<th>Heating &amp; Cooling</th>
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### Air intake, Air discharge configurations

**Horizontal Air Handlers**

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<tr>
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### Vertical Air Handlers

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<td>31.5 x 11.3</td>
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</tbody>
</table>

**Legend:**
- W = unit width
- H = unit height
- W int = unit internal cross-section width
- H int = unit internal cross-section height
- h x w (in) = inlet height x width
- h x w (out) = outlet height x width

**Notes:**
- Minimum unit length (L min) and maximum unit length (L max) are provided for comparison.
- Units: [in] for dimension measurements, [CFM] for airflow capacity.
### Air intake, Air discharge configurations

#### Energy Wheel Air Handlers

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>W</th>
<th>H2</th>
<th>W int</th>
<th>H int</th>
<th>Base Unit L</th>
<th>h x w</th>
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<td>16.5</td>
<td>65</td>
<td>73.1</td>
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<td>19.7</td>
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<td>93.6</td>
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</table>

Legend:
- W - unit width
- H2 - unit height
- W int - unit internal cross-section width
- H int - unit internal cross-section height
- L min: minimum unit length
- L max: maximum unit length
- h x w - inlet height x width
- h x w (out) - outlet height x width

### Air intake, Air discharge configurations

#### Cross Plate Air Handlers

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<thead>
<tr>
<th>Unit Size</th>
<th>W</th>
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<th>W int</th>
<th>H int</th>
<th>Base Unit L</th>
<th>h x w</th>
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<tr>
<td>VTS - 12</td>
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- L min: minimum unit length
- L max: maximum unit length
- h x w - inlet height x width
- h x w (out) - outlet height x width
**Variable Frequency Drives**

- Fan set based on single inlet, air foil backward curved radial impellers with 7 blades made of a polymer composite material to minimize the impeller weight and provide the best operating performance.
- Dynamically balanced.

**Impeller sizes**

<table>
<thead>
<tr>
<th>VTS Unit Size</th>
<th>Impeller nominal size (in)</th>
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<tbody>
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<tr>
<td>VTS - 85</td>
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</table>

**Function and application**

VENTUS Born in the USA units have a Variable Frequency Drive (VFD) as a standard.
- Accurate selection of air flow design and external static pressure with a smooth regulation by proportional change of the motor-fan unit rotational speed.
- Protection of the maximal value of the motor current, the capability to be integrated with external analogue and binary signals and the integration to the BMS system.

**Wiring Diagrams**

Connection the mains supply with frequency converters.

**Connection of 1ph frequency converters**
Functions

Connection of 3ph frequency converters

Filters

Function and Application
All units have a two or four inches flat pre-filter.

Cooling Coils

Horizontal units
- Optional internal or external filter for the units without mixing box.
- Internal filter for the units with mixing box.

Direct Expansion (DX) Coils

Parameters
- Type: Cu-Al: Copper pipes, Aluminium fins.
- Fin spacing: 10 fins per inch
- Tube spacing: 1 ½ in
- Tube diameter: ½ in
- Max operating pressure: 246 PSI
- Max glycol content: 50%

Chemical Water Coils

Available in 3, 4, 6 and 8 rows with the following features:
- Type: Cu-Al: Copper pipes, Aluminium fins.
- Fin spacing: 10 fins per inch
- Tube spacing: 1 ¼ in
- Tube diameter: ½ in
- Max operating pressure: 246 PSI
- Max glycol content: 50%

Hot Water Heating Coil

Vertical units
- External filter for the units without mixing box.
- Internal filter for the units with mixing box.

Direct Expansion (DX) Coils

Parameters
- Type: Cu-Al: Copper pipes, Aluminium fins.
- Fin spacing: 10 fins per inch
- Tube spacing: 1 ½ in
- Tube diameter: ½ in
- Max operating pressure: 246 PSI
- Max glycol content: 50%

Steam Coil

The steam coils are available in 1 row with the following features:
- Type: Cu-Al: Copper pipes, Aluminium fins.
- Fin spacing: 10 fins per inch
- Tube wall thickness: 0.015 in
- Tube diameter: 1/8 in
- Max operating pressure: 246 PSI
- Max refrigerant temp: 82° F
- Max operating temperature: 400° F

Energy recovery systems

Cross-Flow Plate

Function and Application
- Cross-Flow plates are an indirect energy recovery (sensible heat) accumulated in the stream of exhaust air and its transfer to the ventilation air supplied to the rooms.
- Heat recovery at very high separation of the stream of supply and exhaust air (99.9%).
- Application in block supply-exhaust AHUs.

Design
- Disabling energy recovery function.
- Function of the exchanger’s anti-freeze protection.
- Drop eliminator with a drain pan.

Operational Parameters
- Efficiency up to 75% (depends on the temperature difference between the air streams, moisture and ration of air streams) – Exchanger class B acc. EN 13053
- Exchanger tightness for nominal operation parameters: 99.9%
- Max. permissible air flow speed: 748 FPM
- Recommended max. pressure drop: 1.8 in WC
- Max. difference between air flow pressures of supply and exhaust air: 6 in WC
- Ambient temperature: -40° F to 176° F

Compliance with standards: EN 308, EN 13053.
Function and application:
- Indirect energy recovery (sensible heat) accumulated in the exhaust air flow and its transfer to the counter current supply air flow.
- Indirect recovery of latent heat (moisture) when the rotor surface temperature on the side of the exhaust air is lower than the supply air dew point temperature.
- Energy recovery without total separation of the supply and exhaust air flows (air leakages of 2 to 5%).
- Application in block supply-exhaust AHUs.

Design
- The rotor which is 7.9 in thick, is installed on a shaft with bearing and built in a steel construction frame.
- Rotor filling: a spiral built on two alternating layers of flat and corrugated aluminum sheets of 13 gauge creating ducts of hydraulic diameter D = 0.86 in.
- Variable rotary speed drive system enabling max. exchanger efficiency and regulation of energy recovery level.
- Purge sector reducing the penetration of "dirty" exhaust air into the supply air to the minimum.
- Brush seals placed on the rotor’s perimeter and in the dividing line providing additional protection against air leakages.

Operational Parameters
- Efficiency up to 85% (depends on the temperature differences between the air streams, moisture contents of air flows) – exchanger class A acc. EN 13053
- Exchanger tightness for nominal operation parameters: 95%.
- Max. permissible airflow speed: 1,000 FPM
- Rotor rotational speed: 10 RPM
- Recommended max. pressure drop: 1.8 in WC.
- Ambient temperature: -30 °F to 158°F

Function and Application:
- Direct energy recovery (sensible and latent heat) as result of mixing two streams of air – the outside with the exhaust air.
- AHU operation in fast heating mode for AHUs.
- In case of high concentration of toxic substances in a room using recirculation is forbidden.
- The recirculation function constitutes an optional element of a unit’s equipment.

Horizontal units - lengths

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Base Unit L min</th>
<th>Base Unit L max</th>
<th>With Mixing Box L min</th>
<th>With Mixing Box L max</th>
</tr>
</thead>
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Vertical units - lengths

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VENTUS Born In The USA air handling units are not only devices, they also feature systems carefully selected and programmed control applications enabling professional management of air ventilation and conditioning systems.

VTS uses control algorithms that have been developed with energy savings philosophy, while at the same time maintaining the required parameters of the air supplied and ensuring reliability of our units.

For management of our VENTUS Born In The USA air handling units we recommend our control application based on CAREL UPC controller, supporting all advanced control functions, variable ways of external communication including integration with Building Management Systems.
Function and Application
- Power supply: directly from the controller (24 VAC (±15%, +10%) or 22...35 VDC)
- Frequency converters: remote programming
- Temperature range: -15°C to +40°C
- Communication: Modbus RTU protocol (TCP/IP)
- Communication cable length: max. 1,500 ft
- Modbus RTU protocol
- Total count of available parameters exceeds 200 datapoints

Design
- Electronic circuit installed inside a plastic housing
- LCD display, operating panel, switch, knob, buttons
- Communication port: serial port, RS485 (standard)

Operation parameters
- Power supply: directly from the UPC controller
- Communication port: serial port, RS485 standard
- Connection method: 11
- Protection class: NEMA 2
- Ambient temperature: -4 ÷ +140°F / -20 ÷ +60°C

HMI Service
- Setting and reading of advanced operating parameters of ventilation or air conditioning units.
- Frequency converters remote programming
- Management and cancellation of units operational errors is done by full text description.
- Management of the controller main Calendar.
- Configuration of the controller universal inputs and outputs.

Navigation:
1. In the main menu level use UP/DOWN arrows to find the desired sub-menu.
2. Press ENTER to go to the sub-menu level.
3. Use UP/DOWN arrows to move across the sub-menu screens.
4. In the desired screen, use the ENTER button to switch between the changeable parameters - the cursor starts from the upper left corner, then jumps on and on until going back to the upper left corner, then the type can be switched.
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Parameters available in the LCD window depends on the AHU type and the control application. Hence in AHUs not equipped with heater, options related to the heating module will not be visible. HMI Service UPC can’t serve as a room temperature sensor. HMI Service is an optional element.

HMI User
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Design
- Electronic circuit with thermostat measuring element (NTC) installed in a plastic housing.
- LCD display, operating panel, switch, knob, buttons
- Communication port: serial port, RS485 (standard)

Operation parameters
- Power supply: directly from the controller (24 VAC (±15%, +10%) or 22...35 VDC)
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**Room temperature sensor**

**Function and Application**
- Measurement of the temperature of supply, exhaust and outside air.
- Securing max. and min. temperature of supply air.
- Protection against frost on the energy recovery unit via the temperature measurement of air exhausted upstream the energy recovery unit.

**Design**
- Resistance measuring element installed in an aluminum bayonet probe of 9.8 inches long.
- The connection between the sensor and control cabinet is made with a shielded cable.

**Operation parameters**
- Measurement range: -58 °F to +194 °F
- Air humidity: 5 % R.H.
- Measurement accuracy: ±0.5K
- Measuring element: NTC 10k
- Output signal: resistance
- Cables length: max. 300 ft
- Protection class: NEMA 6

**Duct temperature sensor**

**Function and Application**
- Room temperature measurement.

**Design**
- Resistance measuring element fitted on a PCB installed inside a plastic housing.
- The connection between the sensor and control cabinet is made with a shielded cable.

**Operation parameters**
- Measurement range: 4 °F to +158 °F
- Air humidity: 5 % R.H.
- Measurement accuracy: ±0.5K
- Measuring element: NTC 10k
- Output signal: resistance
- Cables length: max. 300 ft
- Protection class: NEMA 1

**Low limit Thermostat**

**Function and Application**
- When the air temperature drops below the minimum allowable temperature, signal from the thermostat stops AHU fans, closes external air dampers and adjusts control valve of the heater to the max. flow of heating medium.
- Switching into permanent alarm condition if the AHU protection is triggered three times within an hour.

**Design**
- Measuring element: Capillary pipe filled with refrigerant.
- The thermostat is equipped with adjusting screws which enable setting the minimum allowable operating temperature as well as the temperature of system reactivation (hysteresis).
- Housing: plastic.

**Operation parameters**
- Measurement range: -0.4 °F to +59 °F
- Default switching threshold setting: +1 °F
- Hysteresis: 1.7 to 12K
- Rated operating voltage: 30 V DC, 230 V AC
- Output signal: potential-free (switchover contact)
- Protection class: NEMA 3

- If the thermostat is used as anti-frost protection of the water heater, the capillary should be installed in the lowest temperature zone of the medium flowing into the heat.

**Variable Frequency Drives**

**Function and Application**
- Smooth regulation of the AHU airflow by proportional change of the motor-fan unit rotational speed.
- Maintaining fixed AHU operating parameters at varying air flow resistance of the ductworks.
- Protection of maximal value of motor current.
- Controlling of fan start-up with simultaneous protection of maximal value of start-up current.
- Integration with external analog and binary signals.
- Displaying and modification of fan-set working parameters.

**Design**
- The electronic circuit enabling motor voltage frequency adjustment and maintaining optimal U/f ratio.
- The circuit is installed inside a plastic housing.
- The fan ensuring cooling of the converter internal circuits.
- The operating panel allowing entering the frequency converter parameters.
- The parameters are specific for a frequency converter models that were selected as an examples.
- The frequency converter types and models to be used in AHUs, each time have to be confirmed with VTS Sales Representative.
- The frequency converters comply to EMC Directive 89/336/EEC (RFI Filters for the Second Environment are not required).

**Overheat protection thermostat**

**Function and Application**
- Over-heating protection for electric heater – switching off the heater and automatic reactivation once the temperature is lowered by the hysteresis value.

**Design**
- Bimetallic element installed inside a metal housing.

**Operation parameters**
- Supply Frequency: 50/60 Hz (48 Hz to 62 Hz)
- Control: - Method: Type of control: V/F (Scalar);
- VVM: Voltage vector control; PWM SVM
- Output Frequency: 0 to 500 Hz, resolution of 0,015 Hz
- Analog Inputs: -1 insulated input. Levels: (0 to 10) V or (0 a 20) mA or (4 to 20) mA
- Programmable functions.
- Digital Inputs: -4 insulated inputs.
- Programmable functions:
  - Active high (PNP)
  - Active low (NPN)
- Analog Output: -1 insulated output. Level (0 to 10) V or (0 to 20) mA or (4 to 20) mA
- Programmable functions.
- Relay Output: -1 relay with NC/NO contact.
- Maximum voltage: 240 Vac
- Maximum current 0.5 A.
- Programmable functions.
- Communication Interface: RS 485
- Insulated RS485
- Modbus-RTU protocol with maximum communication of 38.4kbaud.
- Enclosure:
  - NEMA1/IP20

**Operation parameters**
- Overheating setpoint temperature: 65 °F
- Re-switch On setpoint temperature: 113 °F
- Output signal: potential free (switchover contact)
- Rated operating voltage: 20 V DC, 230 V AC
Differential pressure switch

Function and Application
- Monitoring the filter contamination in the Air Handling Unit by measuring the difference of static pressure before and after the filter.
- Control of the operation of a direct driven fan unit in case of cooperation with electric heater.

Design
- Membrane coupled with the mechanical system deforms when a set acceptable pressure difference is exceeded, and, as a result, switches electrical contacts (filter contamination signal or fan unit operation).
- Housing material: ABS.

Operation parameters
- Measurement: 0,12÷1,20 in WG – filters of class MERV 6÷15
- Rated operating voltage: 250V AC (Imax=3A)
- Output signal: potential-free contact, NO or NC according to the application
- Switching capacity: 1mln of cycles (at temp. of 140 °F)
- Power consumption: 1W
- Protection class: NEMA 3
- Ambient temperature: -4 °F ÷ +140 °F

VS UPC controller for air supply, exhaust and supply-exhaust units

Function and Application
- Ventilation or air condition unit operating parameters adjustment, control and protection - operation, temperature, air flow and fault conditions.
- The AHU operation according to the Calendar with a possibility of a division into a time “zones”.
- Remote management of the unit operation by means of external communication modules - HMI Basic or HMI Advanced user interfaces.

Design
- Set of fuse-switches on the power supply circuit of the frequency converters
- Controller
- Mains switch
- PC (polycarbonate) housing with dimensions: 17.7 x 25.2 x 6.7 in

Operation parameters
- - start signal;
- - fire protection signal;
- - START/STOP circuit
- - Protection class: NEMA 3
- - Ambient temperature: -4 °F ÷ +140 °F

Three-way valve with electric actuator

Function and Application
- Mixing ratio control for outdoor and room-exhausted air (economizer): 0-10 V actuator.
- Control of bypass air damper opening level for the Plate Cross Flow – anti-frost protection of the energy recovery system.
- 0-10 V actuator.
- Actuator with spring return: economizer fresh air side
- Actuator with no spring return: economizer return air side
- by-pass damper for cross-plate based energy recovery system

Design
- Mechanical system with an electric motor installed inside housing.
- Actuator fitted for installation with a square-section stem 0.39÷0.62 in or a round-section stem Ø 0.39÷0.78 in.
- For air handling units equipped with water heater, the air damper actuator is additionally equipped with a return spring - air damper is closed when no supply voltage is present.

Operation parameters
- Regulation method: smooth 0-100%.
- Supply voltage: 24 V AC.
- Input signal: 0 - 10 V DC.
- Rated torque: 88 in-lbs.
- Rotation angle: 90°.
- Full opening time: 0.10 V: 80÷100s; spring-forced return: 10s.
- Number of cycles: 60 000.
- Max. air damper area: 43 ft².
- Protection class: NEMA 3.
- Ambient temperature: -4 +122 °F.

0-10 V air damper actuator

Function and Application
- Mixing ratio control for outdoor and room-exhausted air (economizer): 0-10 V actuator.
- Control of bypass air damper opening level for the Plate Cross Flow – anti-frost protection of the energy recovery system.
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## Control Applications

### Control Applications List

#### AP - control system application for air supply-exhaust units with cross-flow heat exchanger

<table>
<thead>
<tr>
<th>Application code</th>
<th>Functions available in particular applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP 32</td>
<td>HW</td>
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<td>AP 33</td>
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<td>AP 169</td>
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</table>

#### AR - control system application for air supply-exhaust units with thermal wheel

<table>
<thead>
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<th>Application code</th>
<th>Functions available in particular applications</th>
</tr>
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<td>AE 154</td>
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<td>AE 157</td>
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</tbody>
</table>

#### AS - control system application for air supply units

<table>
<thead>
<tr>
<th>Application code</th>
<th>Functions available in particular applications</th>
</tr>
</thead>
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<td>AS 1</td>
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<td>AS 201</td>
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</tbody>
</table>

### Symbols:

- HW - Hydronic Water Coil
- CW - Hydronic Cooling Coil
- DX - Direct Expansion Cooling Coil
- PRC. BPS - Cross-plate by-pass function
- MIX. BOX - Cross Air Mixing Box, economizer
- SUM. ER - Energy recovery for summer operations

## Control applications

### Supply AHUs

**Control**
- Control of room temperature, optionally supply or exhaust air temperature.
- Control of the energy recovery level – first stage of heating/cooling.
- Air flow control.
- Operation according to calendar – temperature, efficiency, operation mode (OPERATION, STAND-BY, STOP).
- STAND-BY – maintaining the minimum, set indoor temperature.
- Initial heating of external air.
- Information on outdoor, supply, exhaust and indoor air temperatures.
- Filter contamination info.
- Alarm status info.
- Analog and digital input and output status info.

**Protection**
- Limiting the allowed supply air temperature.
- Fan unit protection – the function is active:
  - if an electric heater is applied.
  - Anti-frost protection of a water heater.
- Overload protection of a drive unit.
- Optional protection against minimal and maximal temperature of medium returning from the water heater with use of Strap-on temperature sensor, standard NTC 10K.
- The control application layouts have been prepared on the basis of water exchangers.
- The quantity of applied pressure switches for filters depends on the filters' configuration.
Control applications
Supply AHUs

Control
Control of room temperature, optionally supply or exhaust air temperature.
Control of the energy recovery level – first stage of heating/cooling.
Air flow control.
Operation according to calendar – temperature, efficiency, operation mode (OPERATION, STAND-BY, STOP).
STAND-BY – maintaining the minimum, set indoor temperature.
* Initial heating of external air.

Information
Information on outdoor, supply, exhaust and indoor air temperatures.
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Control applications
Supply-exhaust AHUs: cross-flow exchanger

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The quantity of applied pressure switches for filters depends on the filters' configuration.
Optional Strap-on temperature sensor is not a part of VTS offer.

Control
Control of room temperature, optionally supply or exhaust air temperature
Control of the energy recovery level – first stage of heating/cooling.
Air flow control.
Operation according to calendar – temperature, efficiency, operation mode (OPERATION, STAND-BY, STOP). STAND-BY – maintaining the minimum, set indoor temperature. Initial heating of external air.
Information
Information on outdoor, supply, exhaust and indoor air temperatures.
Filter contamination info.
Alarm status info.
Analog and digital input and output status info.
Protection
Limiting the allowed supply air temperature.
Fan unit protection – the function is active:
- If an electric heater is applied.
Overload protection of drive unit.
Anti-frost protection of a water heater.
Protection against overheating of an electric heater.
Anti-frost protection of an energy recovery exchanger.
Optional protection against minimal and maximal temperature of medium returning from the water heater with use of Strap-on temperature sensor, standard NTC 10K.
The control application layouts have been prepared on the basis of water exchangers.
The quantity of applied pressure switches for filters depends on the filters' configuration.
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Control applications
Supply-exhaust AHUs: rotary exchanger

Control
Control of room temperature, optionally supply or exhaust air temperature.
Control of the energy recovery level – first stage of heating/cooling.
Air flow control.
Operation according to calendar – temperature, efficiency, operation mode (OPERATION, STAND-BY, STOP).
STAND-BY – maintaining the minimum, set indoor temperature.
* Initial heating of external air.

Information
Information on outdoor, supply, exhaust and indoor air temperatures.
Filter contamination info.
Alarm status info.
Analog and digital input and output status info.

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