



DCV-AV AirVantage

ITEM NO. _____

MODEL AirVantage (DCV-AV) DEMAND CONTROL VENTILATION WITH SMART READ AND REACT TECHNOLOGY FOR MULTIPLE HOOD SINGLE FAN EXHAUST SYSTEMS

GENERAL SPECIFICATIONS AND DESCRIPTION

Furnish Gaylord Demand Control Ventilation (DCV) with smart read and react technology Model "DCV-AV" (AirVantage) as shown on plans and in accordance with the following specifications:

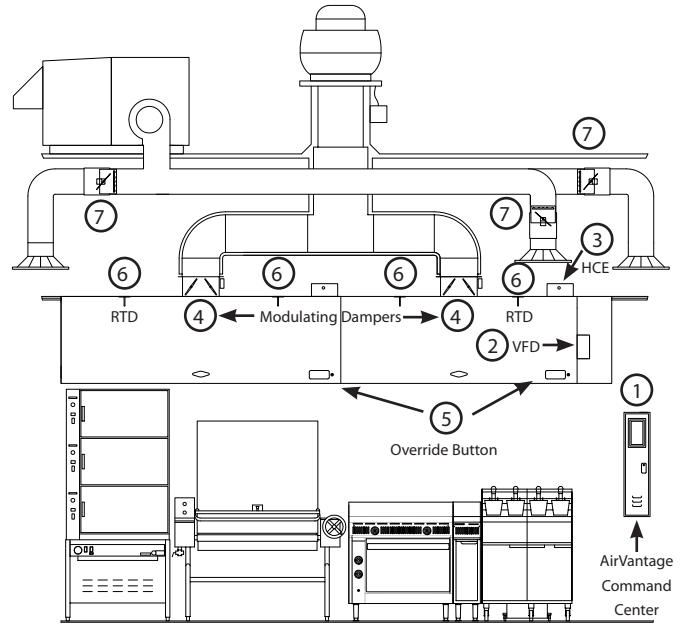
DCV-AV AIRVANTAGE SYSTEM DESCRIPTION: The purpose of the DCV-AV (AirVantage) system is to reduce kitchen operational and utility costs by conserving energy through the reduction of exhaust and makeup air for the commercial kitchen ventilation (CKV) system while effectively communicating with the Building Management System (BMS).

DEMAND CONTROL VENTILATION (DCV-AV) SYSTEM:

- Shall have an AirVantage Command Center enclosure including: 7 inch x 4.3 inch color touchscreen HMI digital control, room ambient temperature sensor, fire suppression integration controls, and VFD interface terminals.
- The AirVantage Command Center housing shall be constructed of 300 series stainless steel with a #4 finish complying with NSF/ANSI 2-2010.
- Shall utilize listed, programmable stainless steel resistance temperature detectors (RTDs) mounted inside the hood canopy to accurately read sensible heat from the cooking equipment and vary the speed of the exhaust and makeup air fans accordingly.
- Shall be able to control multiple hood sections, exhaust fan, and makeup air fan on one system. Additional systems may be required based on specific kitchen configurations.
- Upon hood activation, the controller(s) will turn on the DCV system to its minimum exhaust rate; a 4-20 mA signal will modulate the exhaust rate between the minimum and maximum set points.
- Shall have multiple programmable algorithms that can be selected per hood.
- Shall have an Override Button on each kitchen exhaust hood that ramps the exhaust to 100%.
- Variable frequency drive (VFD) options:
 - VFD(s) supplied by DCV manufacturer:
 - VFD shall be a NEMA 1 rated enclosure design allowing the VFD to be mounted as a stand-alone unit up to 75 HP.
 - Shall allow full system modulation with a maximum allowable 70% reduction in airflow.
 - Type NEMA 1 or NEMA 3R rated forced air or vented enclosures available upon request.
 - VFD provided by others:
 - DCV Manufacturer will provide the recommended programming specification with the DCV output information to the VFD.
- Complies with IMC 507.2.1.1
- Shall be UL 508A, UL 710, UL 873 listed. Only Listed demand control ventilation systems shall be accepted.

DCV-AV COMPONENTS:

- Individual Hood Section Components:
 - Hood process controller (accessed from inside the canopy)
 - Shall utilize strategically placed canopy mounted RTD(s) inside the hood canopy to determine equipment activity levels and calculate the required airflow and damper position. Optics or Infrared sensors shall not be allowed.
 - Shall have individual hood-mounted pressure transducer sized to the hood it monitors. The requirement for airflow is processed and assessed for risk resulting in a flow reference for the damper and a call for fan to be sent out to the fan controller.



1. AirVantage Command Center
2. Variable Frequency Drives shown mounted in an optional Hood End Cabinet
3. Hood Control Enclosure (HCE)
4. Modulating Dampers
5. Override Button
6. Resistance Temperature Detector (RTD)
7. SmartAir Variable Air Volume Terminal Unit (optional)

- Shall have time-programmable individual Override button on the front of each hood section that will override that section's exhaust rate to 100% when required.
- Lighting on each hood section is automatically controlled by the hood controller.

- Shall have Listed hood exhaust collar-installed dual blade modulating damper powered by an analog controlled 24 VAC actuator.

AIRVANTAGE COMMAND CENTER:

- Shall have wall or hood-mounted control enclosure housing a 7 inch tall by 4.3 inch wide color touch screen displaying equipment status, energy savings values, troubleshooting, and communications options.
- Control enclosure shall incorporate: room ambient temperature sensor, fire suppression integration controls, VFD connection terminals, and Wi-Fi and USB download data connections.

DCV-AV COMMUNICATIONS:

- The AirVantage Command Center shall be equipped with:
 - BACnet over IP communication.
 - USB port will provide quick downloading of runtime data and system configuration backup or upload.

VARIABLE FREQUENCY DRIVE(S):

- NEMA 1 enclosed VFD(s) up to 75 HP, shall be installed to allow full system modulation up to a 70% reduction in airflow from design.
 - Optional: Engineered enclosures available for outdoor use.*
- All related low voltage communication cabling shall be provided by the electrical contractor.

SCOPE OF WORK / AREAS OF RESPONSIBILITIES:

- Responsibility of Mechanical Engineer of record and/or the Mechanical contractor:
 - Shall provide DCV Manufacturer with the following information, prior to the start of the project submittal drafting process to support a successful installation of the DCV System.
 - Kitchen exhaust fan details including exhaust and makeup air fan schedules that list fan motor voltage and horsepower and identify which exhaust hoods are associated with each fan.
 - Details of the Makeup Air Unit type and operational airflow range.
 - Mechanical ductwork details of kitchen exhaust and MUA system
 - Confirm that the kitchen exhaust hood makeup air unit can modulate to as low as 30% of design air flow.
 - Location of the VFDs for the makeup air and exhaust fan associated with the kitchen exhaust hoods.
 - Shall for systems specified with SmartAir VAV determine VAV unit sizing, VAV placement, and installation.

SCOPE OF WORK PERFORMED BY DCV MANUFACTURER:

- Supply the DCV System in accordance with approved drawings.
- Provide all individual hood section dampers and controller(s) as part of the hood assembly.
- Provide all appropriate sensors in the hood canopy as part of the hood assembly.
 - Optional*
 - Provide AirVantage Command Center mounted onto a hood section.

SCOPE OF WORK PERFORMED BY KITCHEN EQUIPMENT CONTRACTOR (KEC):

- Install AirVantage Command Center per specified drawing location(s) and DCV installation manual guidelines.
- Coordination of the high and low voltage wiring connections, VFD cabling, any conduit, and ceiling or wall penetrations.

SCOPE OF WORK PERFORMED BY ELECTRICAL CONTRACTOR, COORDINATED BY KEC:

- The wall mounted AirVantage Command Center will require:
 - 120V, single-phase dedicated circuit to AirVantage Command Center.
 - (1) RJ45 cable interfacing the controller with the individual hood sections
 - Provide (1) or more 3-phase service(s) for supply and exhaust motors as dictated by the system design.
- Each Gaylord hood provided with the AirVantage Command Center will require:
 - (1) 120/240 VAC single-phase input to be shared with the hood canopy lighting.
 - (1) RJ45 cable to transmit runtime data and the hood's requirement for air to the AirVantage Command Center.
- Connect low voltage wire between hood sections per wiring schematics.
- Connect 120VAC single-phase wiring between hood sections per wiring schematics.
- Provide all wiring needed to connect hood fire protection system to AirVantage Command Center per wiring schematics.

- Provide all low voltage cabling from AirVantage Command Center to the associated VFD(s) per wiring schematics.
- Provide all 3-phase wiring to VFD per local AHJ and code requirements.
- Upon completion of wiring the DCV-AV system, the electrician must verify proper fan rotation of each fan motor with the VFD drive ON and operating to ensure proper fan rotation.

SCOPE OF WORK PERFORMED BY BUILDING CONTROLS CONTRACTOR, COORDINATED BY KEC:

- (If project requires DCV system to connect to a Building Management System)*
- Install low voltage wiring from BACnet connections on the AirVantage Command Center to the BMS panel for system operations, motor speed data, and additional information.

SCOPE OF WORK PERFORMED BY DCV CERTIFIED TECHNICIAN:

- Shall verify that all final cable connections to the AirVantage Command Center are properly installed prior to the DCV startup process.
- Shall verify any control wiring to BMS, if required, is properly installed prior to the DCV startup process.
- Shall perform the complete startup and commissioning process of the DCV system per the Technical Manual once all installation of the equipment and wiring is confirmed complete by KEC.
 - Set all hood sections to design air flow
 - Adjust the VFD set points if the VFD(s) were provided by DCV System manufacturer; or coordinate the adjustments with the contractor providing the VFD(s).
 - Verify complete DCV system functionality per Sequence of Operations and maximize system optimization and provide a written report of the functionality of the system.
 - Optional*
 - DCV Certified Technician to oversee the installation of the system through up to 3 site visits, in addition to the commissioning visits, to explain the system, answer questions for all trades involved with the install of the DCV system, and assure proper installation and coordination.

SCOPE OF WORK PERFORMED BY PROJECT SUPERINTENDENT/MANAGER:

- Coordinate system balancing with qualified TAB contractor once DCV Certified Technician sets hood or hood and SmartAir VAV design airflow rates when equipped.
- Coordinate any required fan and/or SmartAir VAV adjustments.

GENERAL NOTES:

1. No substitution of Gaylord components allowed except cables.
2. All motors must be 3-phase inverter duty rated as specified in NEMA Std. 1, part 31.
3. Minimum airflows are to be set for a maximum turndown with the Test Balance Technician responsible for any necessary field adjustments to fan sheaves.
4. Gaylord Operations and Maintenance Manuals (O&Ms) are available online at www.gaylordventilation.com.

CAPTURE AND CONTAINMENT: Shall be per ASHRAE STD 154.

ACCEPTANCE & APPROVALS: DCV System will comply with current IMC 507.2.1.1. The AirVantage Command Center shall be listed to UL 508A, UL 710 and UL 873. The AirVantage Command Center enclosure shall be compliant with NSF Standard No. 2.



The manufacturer reserves the right to modify the materials and specifications resulting from a continuing program of product improvement or the availability of new materials.

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