

SPECIFICATION

DUO-AIRE STANDARD PACKAGE KITCHEN VENTILATION SYSTEM

VERTICAL AIR CURTAIN (CW, CI SERIES)

Furnished and install a complete Duo-Aire packaged cooking ventilation system as per schedule and plans. The system(s) shall include all of the following components, as manufactured by Duo-Aire; kitchen ventilation hood, of size and style shown on schedule and plans; U.L. Listed concentric ductwork, combination low profile fan base; exhaust fan, and supply air unit designed and guaranteed to meet complete system performance requirements at design CFM and full system static pressure.

The complete system shall be manufactured by Duo-Aire, Inc. to insure the proper engineering, design and compatibility of all components integral to the kitchen ventilation system. Duo-Aire shall be responsible for the package system engineering and design and shall guarantee performance of the system.

The Duo-Aire ventilator shall be of the complete double shell type with integral supply air plenum along full front, top and back of the ventilator and shall be available in wall or island configuration. This supply air plenum shall be a minimum of 3" deep along top and back, and 6" along front. The exhaust plenum shall be fully and continuously welded to insure no crossover of grease laden air or flame from the exhaust plenum to the supply plenum. Silicone or other sealants in lieu of continuous welds will not be accepted as meeting the requirements or intent of this specification. The exterior supply air plenum shall also be fully and continuously welded, creating a second fire barrier. The ventilator shall be U.L. Listed as required by local codes, shall be NSF approved and built in compliance with current edition of NFPA 96.

Kitchen ventilation canopies that do not meet the construction requirements of a fully welded exhaust capture plenum, fully welded integral supply air plenum covering the entire exhaust plenum, and a full air space surrounding the top, back and front of the hood shall not be considered as meeting the requirements of this specification and will not be allowed.

The kitchen, ventilation canopy, built in strict compliance with the requirements of paragraph (3) above, shall be an integral component of a complete packaged system, which shall consist of all of the following components, as designed and furnished by a single manufacturer.

1. VERTICAL AIR CURTAIN CANOPY

The canopy shall be constructed of 18 gauge U.S. manufactured stainless steel, 300 series. The exhaust canopy, including the plenum area behind the exhaust filters, shall be stainless steel as specified above. As specified above, the outer shell shall be 18 gauge stainless steel on the front and ends. The outer shell back, when concealed, and the outside top, shall be 18 gauge MSG aluminized steel. Galvanized steel, black iron, plain or painted will not be accepted.

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The supply air shall be introduced into the supply air plenum through the outer top shell, pressurizing the total supply plenum and discharging vertically along the full length of the canopy. The plane of the vertical air discharge shall be the same as the lowest point of the exhaust plenum. The supply air shall be introduced under controlled balanced conditions and discharge velocity shall not exceed 300 to 425 feet per minute at point of discharge, dependent of exhaust/supply air ratio and type of cooking equipment to be ventilated. The supply air volume/velocity ratio, as well as the equal distribution of the supply air along the full length of the supply air slot shall be achieved by use of fixed internal baffles, pressurization of the supply air plenum and variations in the size of the supply air slot. Directional air foil louvers shall be installed in the supply air slot and shall be capable of being independently adjusted at time of system start-up and locked in place. The use of commercial registers or linear diffusers, with or without opposed blade or balancing dampers, will not be accepted.

The supply air quantity through the vertical air curtain shall be a minimum of 88% of the exhaust air required for the cooking equipment to be ventilated, as tested by U.L. Supply air shall not be introduced into the kitchen space from registers, grills, perforated panels or diffusers located on the face of the canopy unless the kitchen ventilation package make-up air unit is capable of heating and cooling the air from outside ambient conditions of the building HVAC systems.

2. **DUCTWORK**

The kitchen exhaust ductwork, both exhaust and supply, shall be U.L. Listed as “grease duct for restaurant cooking appliances” and listed for 1” clearance to combustibles. (See specification).

3. **FAN BASE**

The fan base shall be a single integrated base for both exhaust fan and supply air unit. It shall be constructed with a solid fan base for single penetration of supply and exhaust duct and shall be of sufficient height to insure compliance with code requirements for duct discharge, exhaust fan discharge and supply air intake.

4. **EXHAUST FAN**

The exhaust fan shall be up blast type U.L. 762 listed as power ventilator for restaurant exhaust appliances. The exhaust fan shall be sized to allow for design CFM at total static pressure. Total static pressure calculation to include: hood, filter and duct entry loss, and fan system loss shall be scheduled on submittal drawings, along with exhaust fan curve.

5. **MAKE-UP AIR UNIT**

The Duo-Aire roof mounted make-up air unit (see drawing) including all components, shall be fully factory built and assembled by Duo-Aire and wired in accordance with NEC #70. The system shall include:

A. Complete housing constructed of 18 gauge aluminized steel painted with a weatherproof production enamel over a primed surface.

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- B. Centrifugal supply fan with forward curved blades and adjustable belt drive.
- C. Motor, pulleys and belts.

D. Master Control Panel

A factory wired control panel to the voltage specified, mounted in weatherproof box, shall contain in addition to terminals and wiring for the above, magnetic starters with three leg overload and disconnect switches for supply and exhaust fans and control transformer. All electrical work shall be by Duo-Aire in accordance with system design and in strict adherence to NEC #70 and other applicable codes. Master disconnect switch and wiring to the master electrical panel is a standard part of the Duo-Aire built system.

- E. Filter section for supply air with bird screen. Cleanable, 20" x 25" x 1" aluminum mesh filters shall be provided in an easy access housing and slip frame.
- F. When specified, motorized inlet air dampers shall be provided with all operating controls installed.
- G. When specified, preheat section with all operating controls shall be:

1. Direct Fired Gas Preheat

A direct fired gas heating unit as built by Duo-Aire and furnished as an integral part of the make-up air unit is provided. The heating unit will be factory fired, pre-tested and adjusted. A pre-wired heater control panel with all necessary control elements shall be an integral part of the make-up air unit. Heating unit will conform to Duo-Aire specifications and shall be ETL certified. Burner controls will include stainless steel burner with capability of 30:1 turndown ratio, gas modulating valve, flame safeguards and proper safety valves, or

2. Indirect Fired Gas Preheat

Each unit shall have a stainless steel heat exchanger with aluminized steel burners. The unit will be equipped with stainless steel port protectors and approved weather caps. Control valves shall be inside the casing with access through the side panel.

Heaters shall be approved for use on natural or LP gases. When arranged for natural gas, each furnace shall be equipped with a non-100% shut-off automatic electric pilot gas ignition system. For LP gas use, each unit shall have a 100% shut-off automatic electric pilot system and shall be equipped with an induced power operated draft fan. Unit shall be approved for outdoor use, AGA certified heat exchanger.

Gas and electric components include: Main gas valve, main gas pressure regulator, pilot gas valve, main solenoid gas valve, pilot relighter spark ignition system, thermocouple actuated intermittent safety pilot, high limit control and 115/24 volt control transformer.

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All connecting ductwork and transitions are furnished as integrated system components,
or

3. Electric Preheat

Electric heating unit shall be an open coil duct heater, U.L. Listed for zero clearance and meet all the applicable requirements of the National Electrical Code. All heater frames and control boxes shall be constructed of a minimum 18 to 24 gauge, hot dipped galvanized steel. The open coils shall be formed of high grade nickel chromium alloy wire and insulated by ceramic insulators. A disc type automatic reset thermal cut out shall be furnished for primary heater protection. For secondary protection, fusible links shall be furnished of sufficient quantity, as required, to de-energize the circuits.

6. **FIRE PROTECTION**

Fire protection shall be a wet chemical system, U.L. 300 listed and FM approved. The fire suppression system shall be designed, installed and certified to meet all applicable federal, state and local codes. Fire protection systems shall be pre-piped and installed complete in the factory or completely field installed, as required.

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