DIRECT-FIRED GAS AIR MAKE-UP UNITS

Model FCBT / BIBT

Built to ANSI Z83.4 & Z83.18 Standards

ETL Approved

CATALOG 872
March 2011
Introduction

What is make-up air?
Make-up air is outside air tempered and introduced into a building to eliminate negative pressure and provide a positive operating pressure within a facility.

Why do you need make-up air?
Fans and blowers used in spray booths, hoods, ovens, dust collectors, ventilators, and other plant equipment exhaust air to the outside. Without a controlled introduction of “make-up” air an air-starved environment will result.

When do you know you need make-up air?
Make-up air is required when:
- Gravity stacks from unit heaters and processes backvent.
- Exhaust systems do not perform at rated volume leading to poor control of contaminants.
- The perimeter of the building is cold due to a high infiltration rate.
- There are several indrafts at exterior doors, windows, and building openings.
- Exterior doors are hard to open.
- Heating systems are not able to maintain uniform comfort conditions throughout the building. The outer core area is cold due to infiltration while the center core is overheated.

How much does make-up air cost?
Make-up air doesn’t cost money. It actually saves money by:
- Extending the life of heat exchangers on combustion equipment.
- Providing more uniform temperatures throughout the building, reducing overheated areas and cold drafty areas.
- Allowing exhaust systems to operate at designed capacity, reducing the need for additional equipment.
- Minimizing the damage to materials from contaminants which may exist in the the local atmosphere.
- Reducing employee turnover and absenteeism because of better health conditions and plant cleanliness.
- Improving products with fewer rejects because furnaces operate at designed conditions.

How much make-up air do you need?
The recommended procedure to determine the amount of make-up air needed is to total the CFM capacity of all the exhaust fans and blowers in the plant and add 10% to create a positive pressure situation.

Paint Spray Booth: 125 to 175 CFM per square foot of face opening.
Oven Exhaust: One air change per minute of oven volume in cubic feet.
Fume Exhaust: CFM = area of discharge pipe in square feet x velocity (3,000 fpm average).
Roof Ventilator: CFM = area of discharge pipe in square feet x velocity (3,000 fpm average).
Dust Collector: Area of discharge pipe in square feet x velocity (4,000 fpm average).
Canopy Hoods: 100 to 300 CFM per square foot of hood open area.
Combustion Air For Furnaces: CFM = fuel consumed in Btu per hour divided by 6,000.
Drying, Baking, or Curing Ovens: 100 CFM per square foot of both cross sections.
Pickling or Cleaning Tanks: 150 CFM per square foot of door opening or 200 CFM per square foot of hood face opening.

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Application Considerations

Air Balance

Exhaust fans cannot work properly without an adequate supply of air. If provision for air supply is not made, the vacuum created reduces the effectiveness of mechanical ventilation. Negative pressure also causes excessive infiltration, making it difficult to heat properly. These conditions can be corrected by replacing the exhausted air with clean, fresh, pretreated air. The primary purpose of make-up air is to temper outside air and supply it in sufficient quantities to bring about the condition of balanced ventilation.

Depending upon the quantity of make-up air in relation to the exhaust, the heating system will shut down during the working day allowing the make-up air system to handle the entire load. The heating system then functions only to maintain satisfactory temperatures at nighttime and other plant shutdown periods.

When you add an air make-up system to an existing plant it is necessary to make a detailed analysis of the overall situation in order to determine what the relationship might be between the heat added by make-up air and that supplied from the plant heating system. Where exhaust systems already exist, the installation of make-up air usually will not increase the heating load and can bring about a reduction of overall heating costs. This may be understood by considering that infiltrated air, warmed at least partially by the plant heating system, is ultimately mixed with room air and exhausted through the ventilating fans. Infiltration of unheated air results in a decline of heating efficiency. Most heating systems are not adequately rated to cope with infiltration when appreciable negative pressures exist. Air make-up units provide a systematic method of heating entering air and supplying it in controlled quantity. With the proper balance of supply and exhaust, infiltration is eliminated and negative pressures are equalized. By properly tempering supply air, the heating system is relieved of this abnormal load. The results are uniform space heating, effective ventilation, and improved comfort.

Heating

Experience with fresh air heating systems has shown that it is practical and economically sound to heat industrial plants and even warehouses with fresh air. The question of whether to use 100% fresh air or recirculate some portion is debatable, and engineers are using both methods in their applications.

When direct-fired systems were first used some authorities felt that positive exhaust was necessary to assure a balance and prevent the possibility of products of combustion buildup. It is now generally recognized that air can be supplied into most buildings having no mechanical exhaust and in quantities sufficient to heat them without building up a positive pressure of more than a few hundredths of an inch water gauge. It is the reverse of infiltration and this principle can be used to design fresh air plant heating.

The standard air make-up unit is used for industrial space heating with 100% outside air or with a fixed percentage of recirculation, and in some designs with a combination of these. Your Aerovent representative can assist you in determining application requirements for general air make-up and for fresh air heating. They can supply detailed information as it may apply to specific conditions.
Construction Features

The BT series direct-fired gas air make-up unit is a complete air supply system in a self-contained package with fan, burner, and controls. The unit is ready for connection to the gas line and power source. These systems are for use in industrial or commercial applications where supplying tempered outside air is required.

Standard Features

- Heavy duty forward curved or backward inclined DWDDI centrifugal blower with pillow block bearings
- ANSI and FM approved gas manifold design
- Heavy duty 14 gauge steel housing
- Enamel paint
- Large access door for internal accessibility
- Lifting eyes for ease of unit installation
- Venturi monitored airflow supervision
- 0 to 92 degree temperature rise
- 120 volt fused control circuit with 230/460 to 120 volt control transformer
- Number-coded wires and terminal strips
- Dual fuel burner (Maxon)
- Factory assembled and tested
- Weatherproof control enclosure
- Remote operating station
- Unit support/mounting channels
- Maxitrol Series 14 temperature control
- Honeywell series 7800 flame safeguard protection
- Flame rod
- Safety shutoff valves
- Discharge temperature sensor
- Drives rated for 150% of motor nameplate rating
- High temperature limit
- Single point gas and electrical connections
- Non-recycle system with low fire start protection with main flame supervision
- 25:1 temperature control modulation
- Pilot gas pressure regulator
- High and low gas pressure switch
Accessories

80/20 Recirculating
The 80/20 recirculating system allows 80% recirculation and is designed to insure that a minimum of 20% of the designed performance is outside air. Recirculated air is not allowed to flow across the burner. Manual setpoint is standard. Room pressure control available as an option.

V-Bank Filter Section
The standard filter is a 2" Farr 30/30 disposable type with washable as an option.

Additional Options
- V-bank filter section
- Intake hood with bird screen
- 90 degree discharge elbow
- Roof curb
- Curb mount construction
- Inlet bird screen
- Modulating room temperature control (Maxitrol Series 44)
- IRI pipe train manifolds
- Directional discharge grille, single and double deflection
- Circuit analyzer
- Insulated construction
- Vertical support stand
- Two speed operation
- UV flame scanner
- Mild weather thermostat
- Service platform
- Main gas regulator
- Vibration isolators (unit mount)
- Tamper proof remote station
- Reset module
- Disconnect switch
- OSHA Belt guard
- Motor operated damper (inlet or discharge)
- Freeze protection thermostat
- Door switch interlock
- Painted unit and accessories
- Extended grease lines
Standard Temperature Controls

Two standard systems for temperature control are available offering a choice of functions for the regulation of air temperature. The outlet temperature control (OTC) system senses only the discharge air temperature at the unit. The sensing device is located in the airstream. It averages the temperature and sends a signal to the servomechanism in the modulating regulator. The regulator in turn modulates the gas pressure in the burner manifold, and the gas flow is varied to maintain the air temperature constant at the sensor. The OTC system is used where the volume of air supplied is relatively small compared to the volume of the building, which usually means that it is not intended for the air make-up unit to pick up an appreciable part of the building heating.

In most installations, room temperature control is desirable. Two controllers are available for this operation. The simplest and least expensive control is a thermostat added to the OTC system (OTC-RO) and located to sense the room temperature. The contacts close on a call for heat and cause an increase in the discharge air temperature. The air make-up unit delivers air at the higher temperature until the room thermostat is satisfied; full control is then returned to the discharge sensor. The limited amount of temperature increase eliminates excessive discharge air temperature. The temperature setting is usually 5° below the outlet temperature set point.

The modulating room temperature control (MRTC) is slightly more sophisticated. Instead of a thermostat, a thermistor is used to sense the room temperature. The signal actuates the modulating regulator to provide an incremental increase or decrease of the discharge temperature, providing closer control and preventing an abrupt change in the temperature of the air at the outlet of the unit or outlets of a distribution system. In the room temperature control system the discharge air temperature sensor performs a limiting function so that the discharge air cannot exceed a reasonable temperature. The discharge air temperature can be set to suit the individual requirements at the time of installation.

The air temperature controllers are combined with the operation selector switch and indicator lights—all mounted in a remote operating station. The OTC unit can be mounted in any convenient location and contains a summer-off-winter selector switch and indicator lamps showing that power is on, the fan is running, and there is a flame on the burner. There is also a knob for setting the discharge temperature of the air make-up unit.

The OTC-RO control station contains all of these controls and indicators in addition to a room temperature thermostat. The MRTC remote operating station has a thermistor on top instead of the on-off thermostat. The OTC-RO or MRTC remote operating stations should be mounted in a location where the desired room temperature is best sensed. This will be a matter of judgment, made at the time of installation. The circuit design can include an optional mild weather thermostat. This thermostat senses the outside temperature and, at a predetermined setting, will cause the burner to be shut off completely while allowing the fan to run. This makes it possible to have year-round operation with the selector switch set to the winter position and the mild weather thermostat set to a desirable “heat off” temperature (65°F). When the outside temperature is above 65° the heat will be off. When it is below 65° the burner will be in operation and the temperature regulated according to the modulating control.
Control Panel

The main control panel is designed with the service technician in mind. The panel is licensed to carry the UL label under the 508 listing. The panel meets all standards of the National Electric Code and includes as standard:

- Step-down control transformer
- Motor starter with overloads
- Ignition transformer
- Honeywell 7800 series primary flame safeguard system
- Maxitrol temperature controller
- Purge and reset timers

The incorporation of the Honeywell series 7800 flame relay offers the customer the following options:

- Remote relay reset (reset lockout from remote panel)
- Fault history (readout of six most recent faults from LED readout for troubleshooting flame failures)

Pipetrain

Liquid-tight conduit is used for all interconnecting wiring. Piping is in accordance with ANSI standard along with IRI and FM.

- Motorized safety shutoff valve
- Blocking valve
- Pilot solenoid
- High/Low gas pressure switch
- Pilot regulator
- Manual pilot shutoff valve
- Maxitrol MR 212 modulating valve
- Vent valve as required by IRI
- Adjustable pilot orifice
Sequence of Operation – Gas Burner

Remote Station Selector Switch starts and stops all unit functions. In “winter” position, operates fan and burner control system in proper sequence. In “summer” position, operates fan only. Serves also as manual reset.

Remote Station Indicator Lamp shows when selector is in either operating position.

Mild Weather Thermostat causes unit to automatically shift from winter to summer, whichever is required, according to outside temperature (adjustable) (optional).

Reset Timer allows timed bypass of the freeze protection thermostat, permitting unit to start when the temperature is below the set point of the freeze protection thermostat (optional with low limit).

Freeze Protection Thermostat causes complete unit shutdown if discharge air temperature falls dangerously low (optional).

Stop Relay causes complete unit shutdown in the event of any malfunction in the flame safety or fan starter circuit (optional with low limit).

Damper Motor opens damper when selector switch is turned on (optional).

Damper End Switch starts the fan when damper reaches open position (optional).

Fan Starter provides fan motor protection station, shows damper open and fan on.

Fan On Indicator at remote operating station, shows damper open and fan on.

Purge Timer provides 7-second prepurge time.

Low Gas Pressure Switch causes shutdown in event of insufficient gas pressure. (Manual reset on the switch.)

High Gas Pressure Switch causes shutdown in event of excessive gas pressure. (Manual reset on the switch.)

Airflow Switch senses air velocity pressure and will cause complete unit shutdown if airflow drops below requirement for satisfactory combustion.

High Limit Thermostat causes complete shutdown if discharge air temperature exceeds set point. (Manual reset on the switch.)

Combustion Safeguard Relay controls ignition, pilot and safety shut-off valve. Supervises main flame, closes SSOV instantly upon power or flame failure, causes complete shutdown in case of unproven pilot or flame failure after ignition of the main flame. (Optional remote manual reset from operating station.)

Indicator Lamp at remote station, shows burner on.

Low Fire Start integral with modulating valve.

Modulator/Regulator Valve

FULLY MODULATING TEMPERATURE CONTROL SYSTEMS

Outlet Temperature Control System (OTC) holds constant outlet temperature adjustable at the remote operating station and has outdoor temperature compensation. Discharge Air Temperature Thermostat actuates the modulating regulator to hold average outlet temperature to control point. Remotely adjustable.

Outlet Control System with room override (OTC-RO) (optional) maintains room temperature to remote thermostat setting and is discharge temperature compensated. Primarily used for morning warmup or when overhead doors open.

Room Thermostat resets the discharge air thermostat according to room requirements holding the room temperature to the control point. (Adjustable)

Discharge Air Temperature Thermostat automatically limits extreme changes in discharge temperature. (Adjustable)

Modulated Room Temperature Control (MRTC) (optional) maintains room temperature within very narrow limits, provides extreme accuracy and rapid response to small temperature changes.
Typical Specifications

Models FCBT forward curved and Models BIBT backward inclined direct-fired gas centrifugal DW air make-up units shall be manufactured by Aerovent, Minneapolis, Minnesota and shall be of the size and capacity as indicated on drawings and schedules.

WHEEL — Wheels shall be double width with forward curved blades or backward inclined blades. The forward curved wheels feature die-formed blades assembled in heavy end rings and center plate. Wheels shall be statically and dynamically balanced and furnished with straight bore hubs.

HOUSING — Housings shall be of 14 gauge steel, of modular construction where sections are mechanically fastened. Housings shall be equipped with a visual burner inspection port, access door, lifting eyes, and unit support frame for mounting.

GAS PIPETRAIN — Pipetrain shall consist of SSOV valve, pilot valve, vent valve (IRI only), blocking valve, high-low gas pressure switches with manual resets, heavy duty plug cocks, pressure gauge and modulating regulator out of the airstream. Piping shall conform to FM or IRI standards. Please specify when ordering.

CONTROL CABINET — A control cabinet shall house the fan motor magnetic starter with manual reset overload relays, control transformer, Honeywell solid-state flame sensing relay, non-recycle timer, fuse and terminal strips. Unit shall include a remote control station with summer-winter-off selection switch, power on, fan on, burner on lights, and discharge temperature selector. The temperature control system shall be of solid-state design manufactured by the Maxitrol Company to modulate the burner in accordance with the remote control station setting. All controls on the unit are to be wired to the respective points in the cabinet with liquid-tight conduit and in accordance with the National Electric Code. The unit shall also include high temperature limit, airflow switch, and positive low fire start.

FLAME DETECTOR — A flam rod flame detector shall be incorporated into the unit to supervise both the pilot and main burner flame.

BURNER — The burner is a Maxon with 25:1 turndown ratio. The manifold body is heavy duty cast iron, fully treated for rust resistance. The mixing plates are type 430 stainless steel.

UNITS SHALL COME COMPLETE WITH:
- V-Bank Filter Cabinet
- Inlet Hood with Vanes
- Inlet Hood less Vanes
- 90 Degree Discharge Elbow
- Filtered Inlet Hood
- Directional Discharge Grille
- Vibration Isolators
- Tamperproof Control Station
- Push-to-Test Lights
- Curb Mounting
- Roof Curb
- Mild Weather Control
- Freeze Protection Thermostat
- Inlet Bird Screen
- Circuit Analyzer
- OSHA Belt Guard
- Reset Module
- Service Platform
- Insulated Construction
- UV Flame Detection
- Digital Temperature Controls
- Door Switch Interlock
- Vertical Support Stand
- Two Speed Operation
- Main Gas Regulator
- Disconnect Switch
- Extended Grease Lines
- Modulating Room Temperature Controls

TESTING — Unit(s) shall be guaranteed by the manufacturer to deliver at the rated performance levels. Unit(s) shall be completely packaged and test fired at the factory before shipment.
Model FCBT Forward Curved Centrifugal DW Direct-Fired Gas Air Make-Up Units

Catalog Numbering System
Assign catalog number by using the numbering system outlined in the example at right. Fan type, fan size, RPM, and HP are found in the rating tables.

Definitions
Btu/Hr is sensible heat release. To determine cfh gas input, divide Btu by the net heat value of the fuel.

CFM is net volume at discharge at 70°F.

External Static Pressure is pressure available for addition of ducts.

Performance Data

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Performance ratings of the base units include the effects of appurtenances in the airstream (i.e. burner section).
Performance ratings do not include the effects of optional accessories in the airstream (i.e. filter cabinet). See pages 24-27 for pressure losses.
Power rating (bhp) does not include drive losses.
Performance ratings are based on units with ducted discharge.
### Performance Data

**Model BIBT Backward Inclined Centrifugal DW Direct-Fired Gas Air Make-Up Units**

**Catalog Numbering System**
Assign catalog number by using the numbering system outlined in the example at right. Fan type, fan size, RPM, and HP are found in the rating tables.

**Definitions**
- Btu/Hr is sensible heat release. To determine cfm gas input, divide Btu by the net heat value of the fuel.
- CFM is net volume at discharge at 70°F.
- External Static Pressure is pressure available for addition of ducts.

<table>
<thead>
<tr>
<th>AMU MODEL</th>
<th>FAN MODEL</th>
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<th>OUTLET VELOCITY</th>
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### Performance Data

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### Performance Data

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Performance ratings of the base units include the effects of appurtenances in the airstream (i.e., burner section). Performance ratings do not include the effects of optional accessories in the airstream (i.e., filter cabinet).

See pages 24-27 for pressure losses.

Power rating (bhp) does not include drive losses.
Performance ratings are based on units with ducted discharge.
## Single Fan Model FCBT – Size 110-122 Direct-Fired Gas Air Make-up Unit

### Horizontal Configuration - 100% Outside Air

**NOTES:**
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 FRONT 2 UP 3 DOWN
6. D = Damper dimension when ordered and flange on down discharge.
7. P and R = Discharge opening when damper is not ordered.
8. Damper is shipped loose on down discharge units.

### Vertical Configuration - 100% Outside Air

**NOTES:**
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 FRONT 2 UP 3 DOWN
6. D = Damper dimension when ordered.
7. P and R = Discharge opening when damper is not ordered.
8. Damper is shipped loose on down discharge units.

---

### Horizontal Configuration - 100% Outside Air Dimensions

<table>
<thead>
<tr>
<th>SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<th>K</th>
<th>L</th>
<th>P</th>
<th>R</th>
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### Vertical Configuration - 100% Outside Air Dimensions

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<td>27.25</td>
<td>27.25</td>
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Dimensions are not to be used for construction.
Single Fan Model FCBT – Size 110-122
Direct-Fired Gas Air Make-up Unit

Horizontal Configuration - 80/20 Recirculation

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 FRONT 2 UP 3 DOWN
6. D = Damper dim. when ordered and flange on down discharge.
7. P and R = Discharge opening when damper is not ordered.
8. Damper is shipped loose on down discharge units.

Vertical Configuration - 80/20 Recirculation

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 LHORZ 2 UP 3 RHORZ
6. D = Damper dimension when ordered.
7. P and R = Discharge opening when damper is not ordered.
8. Return air position: 4 LEFT 5 RIGHT

Aerovent Catalog 872

R27609
Single Fan Model FCBT – Size 127-136
Direct-Fired Gas Air Make-up Unit

Horizontal Configuration - 100% Outside Air

NOTES:
1. * Designates damper dimension when ordered.
2. Discharge position: 1 FRONT   2 UP   3 DOWN
3. Damper is shipped loose on down discharge units.

Vertical Configuration - 100% Outside Air

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 LHorz
   2 Up
   3 RHoriz
6. D = Damper dimension when ordered.
7. P and R = Discharge opening when damper is not ordered.

### Single Fan Model FCBT – Size 127-136
Direct-Fired Gas Air Make-up Unit

Horizontal Configuration - 100% Outside Air

<table>
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<tr>
<th>SIZE</th>
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<th>D</th>
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<th>P</th>
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Dimensions are not to be used for construction.

### Single Fan Model FCBT – Size 127-136
Direct-Fired Gas Air Make-up Unit

Vertical Configuration - 100% Outside Air

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<tr>
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<th>C</th>
<th>D</th>
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<th>G</th>
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<th>V</th>
<th>W</th>
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<td>40.00</td>
<td>60.00</td>
<td>156.00</td>
<td>2,950</td>
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Dimensions are not to be used for construction.
Single Fan Model FCBT – Size 127-136
Direct-Fired Gas Air Make-up Unit

Horizontal Configuration - 80/20 Recirculation

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 FRONT  2 UP  3 DOWN
6. D = Damper dim. when ordered and flange on down discharge.
7. P and R = Discharge opening when damper is not ordered.
8. Damper is shipped loose on down discharge units.
9. Unit built as one piece.

<table>
<thead>
<tr>
<th>SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<th>W</th>
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Dimensions are not to be used for construction.

Vertical Configuration - 80/20 Recirculation

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 LHORZ  2 UP  3 RHORZ
6. D = Damper dimension when ordered.
7. P and R = Discharge opening when damper is not ordered.
8. Return air position: 4 LEFT  5 RIGHT

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<th>W</th>
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Dimensions are not to be used for construction.
Single Fan Model BIBT Direct-Fired Gas Air Make-up Unit

Horizontal Configuration - 100% Outside Air

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 FRONT 2 UP 3 DOWN
6. D = Damper dimension when ordered and flange on down discharge.
7. P and R = Discharge opening when damper is not ordered.
8. Damper is shipped loose on down discharge units.

Vertical Configuration - 100% Outside Air

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 LHORZ 2 UP 3 RHORZ
6. D = Damper dimension when ordered.
7. P and R = Discharge opening when damper is not ordered.

---

### Horizontal Configuration - 100% Outside Air

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<th>C</th>
<th>D</th>
<th>E</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>P</th>
<th>R</th>
<th>U</th>
<th>V</th>
<th>W</th>
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Dimensions are not to be used for construction.

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### Vertical Configuration - 100% Outside Air

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<th>C</th>
<th>D</th>
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<th>J</th>
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<th>P</th>
<th>R</th>
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<th>W</th>
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Dimensions are not to be used for construction.
**Single Fan Model BIBT**

**Direct-Fired Gas Air Make-up Unit**

### Horizontal Configuration - 80/20 Recirculation

![Diagram of Horizontal Configuration]

**NOTES:**
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 FRONT 2 UP 3 DOWN
6. D = Damper dimension when ordered and flange on down discharge.
7. P and R = Discharge opening when damper is not ordered.
8. Damper is shipped loose on down discharge units.
9. One piece construction.

**SIZE A B C D E H J K L M N P R U V W Y APPROX. WTS. (LB)**

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<td>40.00</td>
<td>40.00</td>
<td>60.00</td>
<td>156.00</td>
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</table>

**Vertical Configuration - 80/20 Recirculation**

![Diagram of Vertical Configuration]

**NOTES:**
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 LHORZ 2 UP 3 RHORZ
6. D = Damper dimension when ordered.
7. P and R = Discharge opening when damper is not ordered.
8. Return air position: 4 LEFT 5 RIGHT
9. Sizes 116 & 122 are built as one piece.

**SIZE A B C D E H J K L M N P R U V W Y APPROX. WTS. (LB)**

| SIZE          | 29.25 | 58.50 | 55.00 | 24.00 | 30.63 | 2.00  | 36.00 | 32.50 | 54.00 | 24.00 | 12.00 | 20.00 | 30.00 | 30.00 | 30.00 | 60.00 | 114.00 | 1,375 |
|---------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| BIBT-116      |       |       |       |       |       |      |       |       |       |       |       |       |       |       |   |      |       |
| BIBT-122      | 36.75 | 73.50 | 70.00 | 30.00 | 42.19 | 2.00  | 48.00 | 44.50 | 86.00 | 36.00 | 18.00 | 28.19 | 28.19 | 40.00 | 40.00 | 60.00 | 126.00 | 1,950 |
| BIBT-125      | 36.75 | 73.50 | 70.00 | 36.00 | 46.94 | 2.00  | 60.13 | 56.63 | 84.00 | 36.00 | 24.00 | 31.56 | 31.56 | 40.00 | 40.00 | 60.00 | 144.00 | 2,600 |
| BIBT-128      | 48.75 | 97.50 | 94.00 | 42.00 | 52.94 | 2.00  | 60.13 | 56.63 | 84.00 | 60.00 | 24.00 | 35.38 | 35.38 | 40.00 | 40.00 | 60.00 | 144.00 | 2,650 |
| BIBT-132      | 48.75 | 97.50 | 94.00 | 42.00 | 38.13 | 2.00  | 60.13 | 56.63 | 96.00 | 60.00 | 24.00 | 40.00 | 39.69 | 40.00 | 40.00 | 60.00 | 156.00 | 2,775 |
| BIBT-135      | 48.75 | 97.50 | 94.00 | 48.00 | 64.88 | 2.00  | 68.00 | 66.50 | 96.00 | 60.00 | 24.00 | 44.81 | 44.50 | 40.00 | 40.00 | 60.00 | 156.00 | 3,200 |

**DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION.**

R2730BD

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Aerovent Catalog 872

17
## Accessories – Single Fan Assemblies

### V-Bank Filter Cabinet

Standard filter is a disposable type with washable as an option.

![Diagram of V-Bank Filter Cabinet]

**Based on:**
- "F" Filters, 20 x 25 x 2
- 1600 CFM per filter

**Dimensions are not to be used for construction.**

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<thead>
<tr>
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<th>A</th>
<th>B</th>
<th>D</th>
<th>F</th>
<th>G</th>
<th>J</th>
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### Inlet Hood with Removable Bird Screen

![Diagram of Inlet Hood with Removable Bird Screen]

**Dimensions are not to be used for construction.**

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Accessories – Single Fan Assemblies

Directional Discharge Grille

NOTES:
1. Grilles are single or double deflection per order.
2. Assembly requires support from the top or bottom.
3. Single deflection grilles are 80% open area.
4. Double deflection grilles are 65% open area.

```
SIZE A B C D E F H J APPROX.
WTS. (LB)
115, 116, 118 24.00 27.50 48.00 36.00 12.00 65.56 21.00 21.00 280
120, 122 FC, 122 BI 30.00 33.50 60.00 45.00 15.00 81.97 27.00 27.00 305
125, 127 36.00 39.50 64.00 48.00 16.00 87.44 33.00 29.00 280
128, 130A, 130B, 132 42.00 45.50 64.00 48.00 16.00 87.44 39.00 29.00 305
135, 136 48.00 51.50 96.00 72.00 24.00 131.13 45.00 45.00 459
```

DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION.

Air Distributor

NOTES:
1. Grilles are single or double deflection per order.
2. Single deflection grilles are 80% open area.
3. Double deflection grilles are 65% open area.

```
SIZE NOMINAL A B C D E F APPROX.
WTS. (LB)
115, 116, 118 21 x 21 27.50 24.00 20.50 20.50 36.00 26.00 88
120, 122 FC, 122 BI 27 x 27 33.50 30.00 26.50 26.50 36.00 32.00 114
125, 127 33 x 29 39.50 36.00 28.50 32.50 46.00 38.00 142
128, 130A, 130B, 132 39 x 29 45.50 42.00 28.50 38.50 46.00 44.00 197
135, 136 45 x 45 51.50 48.00 44.50 44.50 56.00 50.00 243
```

DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION.
**Twin Fan Model FCBT-DW**

**Direct-Fired Gas Air Make-up Unit**

**Horizontal Configuration - 100% Outside Air**

**NOTES:**
1. * Designates damper dimension when ordered.
2. Discharge position: 1 FRONT 2 UP 3 DOWN
3. Damper is shipped loose on down discharge units.

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**Vertical Configuration - 100% Outside Air**

**NOTES:**
1. * Designates damper dimension when ordered.
2. Discharge position: 1 LHORZ 2 UP 3 RHORZ

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<tr>
<th>SIZE</th>
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<th>C</th>
<th>D</th>
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**Dimensions are not to be used for construction.**

**R27000G**
Twin Fan Model FCBT-DW
Direct-Fired Gas Air Make-up Unit

Horizontal Configuration - 80/20 Recirculation

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 FRONT 2 UP 3 DOWN
6. Discharge flange is standard on down discharge only.

Vertical Configuration - 80/20 Recirculation

NOTES:
1. * Designates damper dimension when ordered.
2. Pipe train size varies with unit.
3. Birdscreen is optional.
4. 16 gauge housing.
5. Discharge position: 1 LHORZ 2 UP 3 RHORZ
6. Return air position: 4 LEFT 5 RIGHT

SIZE | A | B | C | D | E | F | G | H | J | K | L | M | P | R | U | V | Y | APPROX. WTS. (LB)
FCBT-222 | 136.50 | 30.00 | 78.00 | 30.00 | 33.88 | 40.88 | 29.25 | 51.00 | 2.12 | 48.00 | 22.00 | 84.00 | 78.00 | 27.25 | 27.25 | 40.00 | 40.00 | 144.00 | 2,639
FCBT-225 | 136.50 | 24.50 | 96.00 | 36.00 | 46.13 | 20.25 | 51.00 | 2.12 | 48.00 | 25.00 | 84.00 | 78.00 | 31.25 | 31.25 | 40.00 | 40.00 | 144.00 | 3,059
FCBT-227 | 156.00 | 30.25 | 108.00 | 36.00 | 63.13 | 24.00 | 63.13 | 2.12 | 60.13 | 27.00 | 84.00 | 108.00 | 34.25 | 34.25 | 40.00 | 40.00 | 144.00 | 3,694
FCBT-230 | 156.00 | 26.25 | 108.00 | 42.00 | 63.13 | 24.00 | 63.13 | 2.19 | 60.13 | 30.00 | 84.00 | 108.00 | 36.75 | 36.75 | 40.00 | 40.00 | 144.00 | 4,169
FCBT-233 | 171.50 | 29.50 | 120.00 | 48.00 | 59.19 | 25.75 | 63.13 | 2.19 | 60.13 | 33.00 | 96.00 | 132.00 | 39.75 | 42.94 | 40.00 | 40.00 | 156.00 | 4,668
FCBT-236 | 171.50 | 25.00 | 132.00 | 48.00 | 59.19 | 19.75 | 63.13 | 2.19 | 60.13 | 36.00 | 96.00 | 132.00 | 42.75 | 42.94 | 40.00 | 40.00 | 156.00 | 5,249

Dimensions are not to be used for construction.

R27314F
Accessories – Twin Fan Assemblies

V-Bank Filter Cabinet
Standard filter is a disposable type with washable as an option.

![Diagram of V-Bank Filter Cabinet]

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DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION.

Inlet Hood with Removable Bird Screen

![Diagram of Inlet Hood with Removable Bird Screen]

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DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION.
Accessories – Twin Fan Assemblies

Air Distributor

NOTES:
1. Grilles are available as single or double deflection.
2. Single deflection grilles are 80% open area.
3. Double deflection grilles are 65% open area.

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<th>NOMINAL SIZE</th>
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DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION.

R27313B

Directional Discharge Grille

NOTES:
1. Grilles are single or double deflection per order.
2. Assembly requires support from the top or bottom.
3. Single deflection grilles are 80% open area.
4. Double deflection grilles are 65% open area.

<table>
<thead>
<tr>
<th>SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION.

R27311B
Pressure Drop Curves for Accessories

V-Bank Filter Cabinet

Single Fan

Twin Fan
Pressure Drop Curves for Accessories

Parallel Blade Discharge Damper

Single Fan

Twin Fan
Pressure Drop Curves for Accessories

Directional Discharge Grille

**Single Fan**

**Twin Fan**
Pressure Drop Curves for Accessories

Air Distributor

**Single Fan**

![Graph showing pressure drop curves for single fan accessories.](image)

**Twin Fan**

![Graph showing pressure drop curves for twin fan accessories.](image)