TECHNICAL MANUAL

MBVC Blowers

- Refer to Service Manual RS6200006 for installation, operation, and troubleshooting information.
- All safety information must be followed as provided in the Service Manual.
- Refer to the appropriate Parts Catalog for part number information.
- Models listed on page 2.

This manual is to be used by qualified, professionally trained HVAC technicians only. Goodman does not assume any responsibility for property damage or personal injury due to improper service procedures or services performed by an unqualified person.

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PRODUCT IDENTIFICATION
The model number is used for positive identification of component parts used in manufacturing. Please use this number when requesting service or parts information.

MBVC1200AA-1**
MBVC1600AA-1**
MBVC2000AA-1**

MB  V  C  12  00  A  A  1

DESIGN SERIES:
MB: Modular Blower

COMMUNICATION FEATURE:
C: 4-wire Communication Ready

FACTORY HEAT:
00: No Heat

DESIGN SERIES:
A: First Series

CIRCUIT BREAKER:
A: No Circuit Breaker
B: Circuit Breaker

ELECTRICAL SUPPLY:
1: 208-230V/60HZ/1 phase

AIRLOW DELIVERED:
12: 1200 CFM
16: 1600 CFM
20: 2000 CFM

MOTOR TYPE:
V: Variable Speed

WARNING
HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

WARNING
Goodman will not be responsible for any injury or property damage arising from improper service or service procedures. If you install or perform service on this unit, you assume responsibility for any personal injury or property damage which may result. Many jurisdictions require a license to install or service heating and air conditioning equipment.

WARNING
Installation and repair of this unit should be performed ONLY by individuals meeting (at a minimum) the requirements of an "entry level technician" as specified by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI). Attempting to install or repair this unit without such background may result in product damage, personal injury or death.

WARNING
The United States Environmental Protection Agency ("EPA") has issued various regulations regarding the introduction and disposal of refrigerants introduced into this unit. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. These regulations may vary by jurisdiction. Should questions arise, contact your local EPA office.

WARNING
Do not connect or use any device that is not design certified by Goodman for use with this unit. Serious property damage, personal injury, reduced unit performance and/or hazardous conditions may result from the use of such non-approved devices.

WARNING
To prevent the risk of property damage, personal injury, or death, do not store combustible materials or use gasoline or other flammable liquids or vapors in the vicinity of this appliance.
PRODUCT DESIGN

**General Information**

The MBVC Blower Cabinets are used in combination with a cased evaporator coil for a two-piece blower and coil combination. This combination of blower and coil functions as the indoor part of a split air-conditioning system, and may be matched with a remote condensing or heat pump unit and allows for a variety of mix-matching possibilities.

The blower cabinet can also function as an electric furnace when used with an electric heater.

**NOTE:** The electric heating elements for electric furnace installation are not shipped with the cabinet and are field-installed. Electric heater kits (HKR) are available as sales accessories for supplemental electric heat.

Systems should be properly sized by heat gain and loss calculations made according to methods of the Air Conditioning Contractors Association (ACCA) or equivalent. It is the contractor’s responsibility to ensure the system has adequate capacity to heat or cool the conditioned space.

The MBVC blower cabinet uses a variable speed motor that maintains a constant airflow with a higher duct static. It is approved for applications with cooling coils of up to 0.8 inches W.C. external static pressure and includes a feature that allows airflow to be changed to ±10%.

The MBVC blower cabinets, with proper coil matches, can be positioned for upflow, counterflow, horizontal right or horizontal left operation. All units are constructed with R-4.2 insulation. In areas of extreme humidity (greater than 80% consistently), insulate the exterior of the blower with insulation having a vapor barrier equivalent to ductwork insulation, providing local codes permit.

The CAPX/CHPX coils are equipped with a thermostatic expansion valve that has a built-in check valve for refrigerant metering. The CACF/CAPF/CHPF coils are equipped with a fixed restrictor orifice.

The coils are designed for upflow, counterflow, or horizontal application, using ECM motors on the MBVC models.

**Features**

This modular blower is a part of the ComfortNet™ family of products. It may be installed as part of a “legacy” system using a standard 24 VAC thermostat. However, with the CTK0*AA ComfortNet thermostat kit, this modular blower may be installed as part of a digitally communicating system. The ComfortNet system provides automatic airflow configuration, enhanced setup features, and enhanced diagnostics. It also reduces the number of thermostat wires to a maximum of four.

**ComfortNet System**

**Overview**

The ComfortNet system (or CT system) is a system that includes a ComfortNet compatible modular blower and air conditioner or heat pump with a CTK0*AA thermostat. Any other system configurations are considered invalid ComfortNet systems and must be connected as a traditional (or legacy) system. The table below compares the valid CT systems.

<table>
<thead>
<tr>
<th>CT compatible Modular Blower</th>
<th>CT compatible Air Conditioner</th>
<th>Full CT system benefits &amp; features</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT compatible Modular Blower</td>
<td>CT compatible Heat Pump</td>
<td>Full CT system benefits &amp; features</td>
</tr>
</tbody>
</table>

A ComfortNet heating/air conditioning system differs from a legacy/traditional system in the manner in which the indoor unit, outdoor unit and thermostat interact with one another. In a traditional system, the thermostat sends commands to the indoor and outdoor units via analog 24 VAC signals. It is a one-way communication path in that the indoor and outdoor units typically do not return information to the thermostat.

On the other hand, the indoor unit, outdoor unit, and thermostat comprising a ComfortNet system “communicate” digitally with one another. It is now a two-way communications path. The thermostat still sends commands to the indoor and outdoor units. However, the thermostat may also request and receive information from both the indoor and outdoor units. This information may be displayed on the CT thermostat. The indoor and outdoor units also interact with one another. The outdoor unit may send commands to or request information from the indoor unit. This two-way digital communications between the thermostat and subsystems (indoor/outdoor unit) and between subsystems is the key to unlocking the benefits and features of the ComfortNet system.

Two-way digital communications is accomplished using only two wires. The thermostat and subsystem controls are powered with 24 VAC. Thus, a maximum of 4 wires between the equipment and thermostat is all that is required to operate the system.
MBVC BLOWER SPECIFICATIONS

MBVC1200/1600/2000

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Physical Information</th>
<th>Dimensions, inches (mm)</th>
<th>Shipping Weight lbs. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blower Wheel (D x W)</td>
<td>Blower Motor (HP)</td>
<td>W</td>
</tr>
<tr>
<td>MBVC1200</td>
<td>10X8</td>
<td>1/2</td>
<td>4.3</td>
</tr>
<tr>
<td>MBVC1600</td>
<td>10X8</td>
<td>3/4</td>
<td>6.3</td>
</tr>
<tr>
<td>MBVC2000</td>
<td>11X10</td>
<td>3/4</td>
<td>5.8</td>
</tr>
</tbody>
</table>

1 Minimum Circuit Ampacity (MCA) and Maximum Overcurrent Protection (MOP) for blower without supplemental heat installed. Refer to unit nameplate for MCA and MOP with approved accessory heaters installed.
MBVC BLOWER SPECIFICATIONS

BLOWER OPENING DIMENSIONS
(TOP VIEW)

MBVC1200/1600/2000

HKR HEATER DATA

<table>
<thead>
<tr>
<th>BLOWER</th>
<th>HEATER KIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO HEAT KIT</td>
</tr>
<tr>
<td>MBVC</td>
<td></td>
</tr>
<tr>
<td>1200AA-1**</td>
<td>X</td>
</tr>
<tr>
<td>1600AA-1**</td>
<td>X</td>
</tr>
<tr>
<td>2000AA-1**</td>
<td>X</td>
</tr>
</tbody>
</table>

^ = Circuit 1: Single Phase for Air Handler Motor
   Circuit 2: 3-Phase for HKR3 Heater Kits

X = Allowable combinations
~ = Restricted combinations

* = Revision level that my or may not be designated
C = Circuit Breaker option

HKR HEATER KIT

<table>
<thead>
<tr>
<th>BLOWER</th>
<th>HEATER KIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HKR-10(C)*</td>
</tr>
<tr>
<td>MBVC</td>
<td></td>
</tr>
<tr>
<td>1200AA-1**</td>
<td>X</td>
</tr>
<tr>
<td>1600AA-1**</td>
<td>X</td>
</tr>
<tr>
<td>2000AA-1**</td>
<td>X</td>
</tr>
</tbody>
</table>

^ = Circuit 1: Single Phase for Air Handler Motor
   Circuit 2: 3-Phase for HKR3 Heater Kits

X = Allowable combinations
~ = Restricted combinations
BLOWER PERFORMANCE DATA

<table>
<thead>
<tr>
<th>HTR kW</th>
<th>MBVC1200*</th>
<th>MBVC1600*</th>
<th>MBVC2000*</th>
<th>SWITCH 9</th>
<th>SWITCH 10</th>
<th>SWITCH 11</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>600</td>
<td>800</td>
<td>800</td>
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<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>5</td>
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<td>800</td>
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<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
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<td>ON</td>
</tr>
<tr>
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<td>OFF</td>
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<td>NR</td>
<td>NR</td>
<td>ON^</td>
<td>ON^</td>
<td>ON^</td>
</tr>
</tbody>
</table>

^ Factory setting

Locate the blower speed selection DIP switches on the integrated control module. Select the desired “cooling” speed tap by positioning switches 1 and 2 appropriately. Select the desired “adjust” tap by positioning switches 3 and 4 appropriately. Refer to the following figure for switch positions and their corresponding taps. Verify CFM by counting the number of times the green CFM LED blinks.

Thermostat "Fan Only" Mode
During "Fan Only" operations, the CFM output is 30% of the maximum CFM capability.

CFM Trim Adjust
Minor adjustments can be made through the dipswitch combination of 3-4.
**WARNING**

DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

Typical Two-Stage Cool, Two-Stage Heat
Thermostat

*Thermostat “R” required if outdoor unit is equipped with a ComfortAlert™ module or if the outdoor unit is a part of the ComfortNet™ family of equipment AND is wired as a legacy system.

Remote Condensing Unit
(Two-Stage AC)

Typical Two-Stage Cooling with Two-Stage Heating

Typical Two-Stage Cool, Two-Stage Heat
Heat Pump Thermostat

*Thermostat “R” required if outdoor unit is equipped with a ComfortAlert™ module or if the outdoor unit is a part of the ComfortNet™ family of equipment AND is wired as a legacy system.

Remote Condensing Unit
(Two-Stage HP)

Typical Two Stage Heat Pump heating and Auxiliary/Emergency Heating

Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.
WIRING DIAGRAMS

WARNING
HIGH VOLTAGE!
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THISUNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO
DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

1. PLACE RED WIRE ON TRANSFORMER TERMINAL 2 FOR 208 VAC
OPERATION.
2. MANUFACTURER'S SPECIFIED REPLACEMENT PARTS MUST BE USED
WHEN SERVICING.
3. IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE BLOWER MUST
BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A
TEMPERATURE RATING OF AT LEAST 105°C. USE COPPER CONDUCTORS
ONLY.
4. UNIT MUST BE PERMANENTLY GROUNDED AND CONFORM TO N.E.C. AND
LOCAL CODES.
5. TO RECALL THE LAST 6 FAULTS, MOST RECENT TO LEAST RECENT,
DEPRESS SWITCH FOR MORE THAN 2 SECONDS WHILE IN STANDBY (IN
TERMESTAT INPUTS).
6. BIAS AND TERM DIP SWITCHES MUST BE IN "ON" POSITION. RED
STATUS LED PROVIDES NETWORK STATUS. GREEN RX LED INDICATES
NETWORK TRAFFIC. USE LEARN BUTTON TO RESET NETWORK.
7. DISCARD CONNECTOR PL1 WHEN INSTALLING OPTIONAL HEAT KIT.

0140A00039 REV.A

NOTE: LOW VOLTAGE (24V)

LOW VOLTAGE (24V)

LOW VOLTAGE FIELD

HI VOLTAGE (230V)

HI VOLTAGE FIELD

JUNCTION

TERMINAL

INTERNAL TO

INTEGRATED CONTROL

EQUIPMENT GND

FIELD GND

FIELD SPICE

RESISTER

OVERCURRENT

PROT. DEVICE

PLUG CONNECTION

Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.