KMC CONTROLS

BAC-7000 Series
Variable Air Volume Controllers

The BAC-7000 series VAV controllers are BACnet Advanced Application Controllers designed for VAV terminal units. An integrated actuator and the supplied programs make these ideal controllers for single duct pressure independent or pressure dependent VAV terminal units. The BAC-7000 VAV controllers include the following features.

◆ BACnet MS/TP compliant
◆ Automatically assigns the MAC address and the device instance
◆ On-board airflow sensor for use with a single or multi-point differential pressure measuring station or pitot tube
◆ Use to control single duct VAV, parallel fan, and reheat
◆ An internal, easy-to-use air balancing program for air balancing technicians
◆ No programming required
◆ Standard applications configurable with any BACnet operator workstation

Application programs

The embedded standard programs provide single duct VAV terminal applications for both pressure independent and pressure dependent (bypass) terminal unit applications.

Pressure independent—KMC Controls supplies the BAC-7000 series VAV controllers with the following pressure independent configurations.

◆ Single duct cooling
◆ Single duct cooling with parallel fan and On/Off or modulating reheat
◆ Airflow balancing

Pressure dependent—The BAC-7000 series VAV controllers can be set up for the following pressure dependent (bypass VAV) configurations.

◆ Single duct cooling
◆ Single cooling duct with modulating or On/Off reheat

Still … Made in the U.S.A.

Specifications

Inputs

◆ 3 universal inputs each of which is programmable as an analog, binary, or accumulator object
◆ Standard units of measure
◆ Pull-up resistors for switch contacts, thermistor sensors, and other passive devices. Switch selectable for none or 10 kΩ
◆ Removable screw terminal block, wire size 14-22 AWG
◆ 10-bit analog-to-digital conversion
◆ 0-5 volts DC analog input range
◆ Overvoltage input protection
◆ Compatible with KMD-1161 NetSensor

Outputs, Universal

◆ Programmable as analog or binary object
◆ Standard and custom units of measure
◆ Removable screw terminal block, wire size 14-22 AWG
◆ 0-10 volts DC for analog objects
◆ 0-12 volts DC for binary objects
◆ Output current limited to 100 mA per output, 300 mA total for all outputs

Specifications based on firmware 2.0. Specifications and design subject to change without notice.

Specifications (continued)

Outputs, Triac
- Optically isolated triac output configured as a binary object
- Maximum switching 30 volts AC at 1 ampere maximum
- Removable screw terminal block, wire size 14-22 AWG

Outputs, Relay
- Normally open relay contact configured as a binary object
- Maximum switching 30 volts AC at 2 ampere maximum
- Removable screw terminal block, wire size 14-22 AWG

Programmable features
- 10 program objects—4 for standard Control Basic programs and 6 for custom Control Basic programs
- 4 PID loop objects
- 40 analog and 40 binary value objects
- See PIC statement for supported BACnet objects

Schedules
- 8 Schedule objects
- 3 Calendar objects

Alarms and events
- Supports intrinsic reporting
- 8 Notification class objects

Trends
  8 Trend objects

Memory
- Programs and program parameters are stored in nonvolatile memory
- Automatically restarts after power failure

Communications
- MS/TP operating up to 76.8 kilobaud with automatic baud detection
- Automatically assigns MAC addresses and device instance numbers
- NetSensor compatible through modular jack

MS/TP automatic MAC addressing is protected under United States Patent Number 7,987,257.

Airflow sensor features
Platinum-ceramic flow-through, 0 to 3000 FPM (15.24 m/s) using 24 inch, 1/4 FR tubing and SSS-1000 series flow pickups. Range dependent upon DP pickup, tubing size/length and connections.

Actuator features
Actuator motor is programmed by output 4

Torque

Minimum	50 in-lb. (5.7 N•m)
Maximum	70 in-lb. (7.9 N•m)

Angular Rotation
  0 to 95° rotation
  Adjustable end stops at 45/60/90° rotation

Motor Timing
  BAC-7001 and BAC-7003:
    18°/minute at 60 Hz
    15°/minute at 50 Hz

  BAC-7051 and BAC-7053:
    60°/minute at 60 Hz
    50°/minute at 50 Hz

Software compatibility
Requires the current version of BACstage or TotalControl for full configuration and custom Control Basic programming. Standard applications can be configured with any BTL listed BACnet operator workstation.

Installation

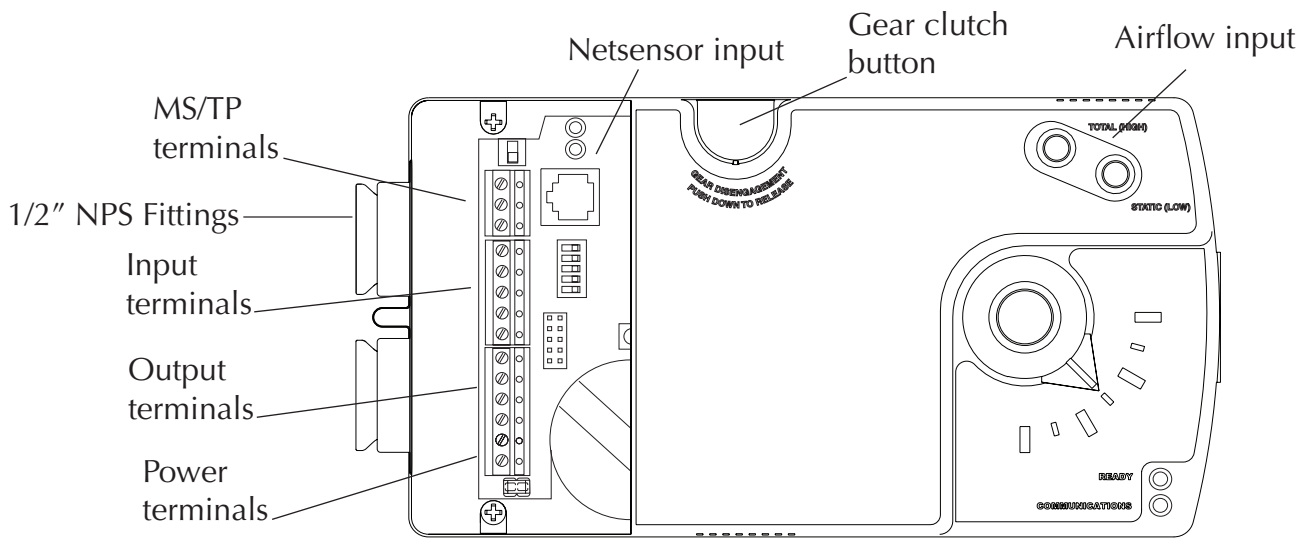|	
Supply voltage	24 volts AC (–15%, +20%), 50-60 Hz, 8 VA minimum, 15 VA maximum load, Class 2 only, non-supervised (all circuits, including supply voltage, are power limited circuits)
Weight	2.4 lbs (1.1 kg)
Case material	Green and black flame retardant plastic

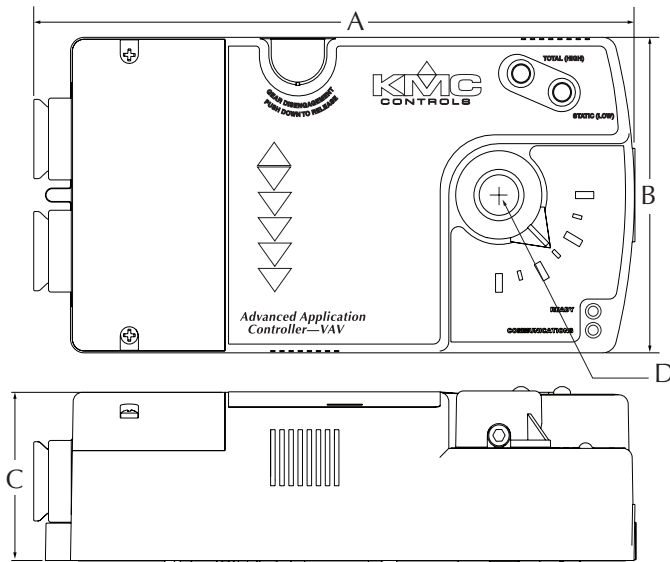**Environmental limits**

Operating	32 to 120° F (0 to 49° C)
Shipping	–40 to 140° F (–40 to 60° C)
Humidity	0-95% relative humidity (non-condensing)

Regulatory
- UL 916 Energy Management Equipment
- FCC Class B, Part 15, Subpart B
- BACnet Testing Laboratory listed
- CE compliant
- SASO PCP Registration KSA R-103263

MS/TP terminals

1/2″ NPS Fittings

Input terminals

Output terminals

Power terminals

Netsensor input

Gear clutch button

Airflow input

Dimensions

A

B

C

D

Advanced Application Controller—VAV

	A	B	C	D
	8.23 in.	4.22 in.	2.25 in.	0.51 in.
	209 mm	107 mm	57 mm	13 mm

Accessories

Shaft adaptor
HFO-0011   3/8 inch (9.5 mm) shaft adaptor
Airflow sensors
Order one of the following for installation on VAV units without airflow sensors.

SSS-1012   3-5/32 in. length (80 mm)
SSS-1013   5-13/32 in. length (137 mm)
SSS-1014   7-21-32 in. length (195 mm)
SSS-1015   9-29/32 in. length (252 mm)
Power transformer
XEE-6111-40   Single-hub 120 volt transformer
XEE-6112-40   Dual-hub 120 volt transformer

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Controller selection guide

Model	Universal inputs	Universal outputs	Relay Outputs	Triac outputs	Rotation 18°/minute at 60 Hz	60°/minute at 60 Hz
BAC-7001	3	3			◆	
BAC-7051	3	3				◆
BAC-7003	3	1	1	1	◆	
BAC-7053	3	1	1	1		◆

Ordering information

Model description	Model number
BACnet AAC for VAV, 18°/minute at 60 Hz, 15°/minute at 50 Hz	BAC-7001
BACnet AAC for VAV, 60°/minute at 60 Hz, 50°/minute at 50 Hz	BAC-7051
BACnet AAC for VAV FIU, 18°/minute at 60 Hz, 15°/minute at 50 Hz	BAC-7003
BACnet AAC for VAV FIU, 60°/minute at 60Hz, 50°/minute at 50 Hz	BAC-7053

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