BAC-9300A Series

BACnet Unitary Controllers (B-BC)

DESCRIPTION

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KMC Conquest™ BAC-9300A series controllers are designed to operate unitary and terminal equipment. The integrated alarming, scheduling, and trending enable these BACnet Building Controllers to be powerful edge devices for the modern smart building ecosystem.

The factory-supplied programming covers common unitary applications. The controllers feature simple, menu-driven setup choices using an STE-9000 series digital sensor, which can be installed permanently as the room sensor or used temporarily as a technician's service tool.

Alternately, quick configuration of controller properties can be done using NFC (Near Field Communication) from a smart phone, tablet, or computer (using the KMC Connect Lite™ app) while the controller is unpowered.

The Ethernet-enabled BAC-93x1AC***E*** models can also be configured by connecting an HTML5-compatible web browser to the built-in configuration web pages.

To meet the most demanding building automation custom requirements, these controllers are also fully programmable. Custom configuration and programming, with wizards for application programming selection/configuration, are enabled by KMC Connect™ software and the KMC Converge™ module for Niagara Workbench.

KMC Converge and TotalControl™ software additionally provide the capability of creating custom graphical web pages (hosted on a remote web server) to use as a custom user-interface for the controllers.

(BAC-9301ACE Shown)

KMC Conquest™ Automation Hardware

APPLICATIONS

Can be used with the following types of unitary equipment:

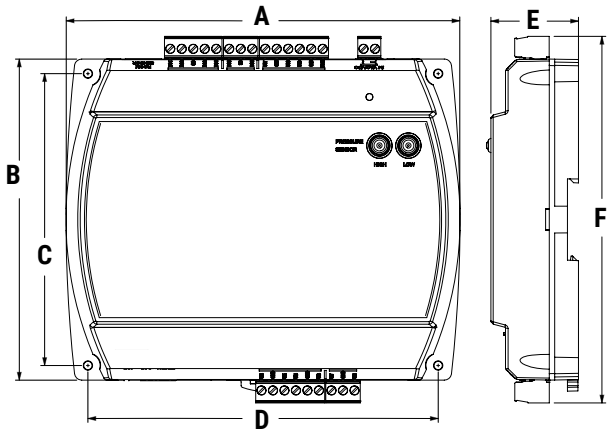
- Air handling units (AHU)
- Chilled beams
- Constant air volume (CAV) with external actuator
- Fan coil units (FCU)
- Heat pump units (HPU)
- Roof top units (RTU)
- Unit ventilators
- Variable air volume (VAV) with external actuator

(Some applications require custom programming. See also **Sample Installation on page 6**.)

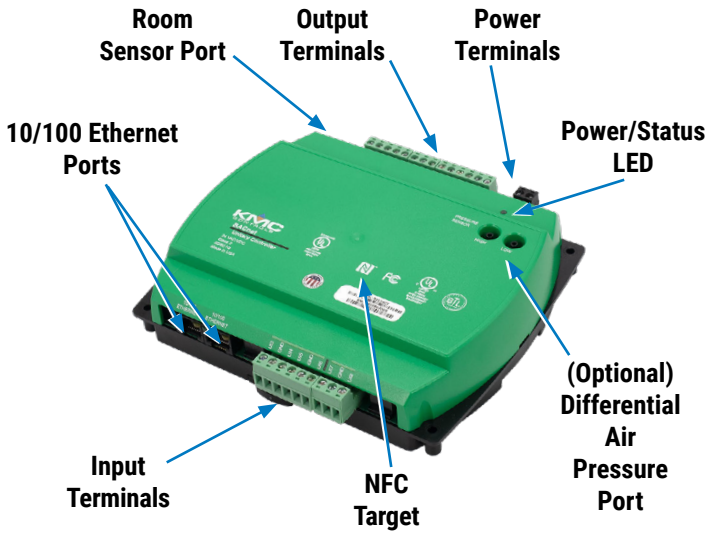
MODELS

APPLICATIONS	INPUTS	OUTPUTS	FEATURES				MODEL
			Air Pressure Sensor (Input)	Real Time Clock (RTC)	Ethernet Port	MS/TP Port	
RTU, HPU, FCU, AHU, and unit ventilator	1 opt. air pressure sensor and 8 (total) standard: • 2 analog (temp. sensor port) • 6 universal inputs (software configurable as analog, binary, or accumulator on terminals)	10 total: • 6 triacs (binary) • 4 universal (software configurable as analog or binary)				✓	**BAC-9301A**
VAV/CAV (with external tri-state actuator), RTU/ HPU static pressure monitoring/control				✓		✓	**BAC-9301AC**
				✓	✓		**BAC-9301ACE**
			✓			✓	**BAC-9311A**
			✓	✓		✓	**BAC-9311AC**
			✓	✓	✓		**BAC-9311ACE**

SPECIFICATIONS



DIMENSIONS					
A	6.744 inches	171 mm	**D**	6.000 inches	152 mm
B	5.500 inches	140 mm	**E**	1.500 inches	38 mm
C	5.000 inches	127 mm	**F**	6.279 inches	159 mm



TERMINAL COLOR CODE	
Black	24 VAC/VDC Power
Green	Inputs and Outputs

Inputs and Outputs

Inputs, Universal (6 on Terminal Blocks)

Universal inputs	Configurable as analog, binary, or accumulator objects
Termination	1K and 10K ohm sensors, 0–12 VDC, or 0–20 mA (without need for an external resistor)
Resolution	16-bit analog-to-digital conversion
Protection	Overvoltage protection (24 VAC, continuous)
Wire size	12–24 AWG, copper, in removable screw terminal blocks

Input, Dedicated Room Sensor Port

Connector	Modular connector for STE-9xx1 series digital wall sensors or STE-6010/6014/6017 analog temperature sensors
Cable	Uses standard Ethernet patch cable up to 150 feet (45 meters)

Input, Integrated Air Pressure Sensor (BAC-9311ACE)

D pressure range	0 to 2" wc (0 to 500 Pa)
Sensor accuracy	±4.5% of the reading or (when near zero) 0.0008" wc (0.2 Pa), whichever is greater (@ 25° C); internally linearized and temperature compensated
Connections	Barbed for 1/4 inch FR (Flame Retardant) tubing

Outputs, Universal (4 on Terminal Blocks)

Universal outputs	Configurable as an analog (0 to 12 VDC) or binary object (0 or 12 VDC, on/off)
Power/protection	Each short-circuit protected universal output capable of driving up to 100 mA (at 0–12 VDC) or 100 mA total for all outputs
Resolution	12-bit digital-to-analog conversion
Wire size	12–24 AWG, copper, in removable screw terminal blocks

Outputs, Triac (6 Binary)

Triac outputs	Optically isolated zero-crossing triac output configured as a binary object
Power	Maximum switching 24 VAC at 1.0 A for each output; maximum total for controller is 3.0 A
Wire size	12–24 AWG, copper, in removable screw terminal blocks

Communication Ports

MS/TP (optional)	One EIA-485 port (removable terminal block) for BACnet MS/TP, operating at 9.6, 19.2, 38.4, 57.6, 76.8, or 115.2 kilobaud; max. length of up to 4,000 feet (1,200 meters) of 18 AWG shielded, twisted-pair, no more than 51 pf/ft (167 pf/m); use repeaters for longer distances
Ethernet (optional)	Two 10/100BaseT Ethernet connectors for BACnet IP, Foreign Device, and Ethernet 802.3 (ISO 8802-3); segmentation supported; up to 328 ft (100 m) between controllers (using T568B Category 5 or better cable)
NFC	NFC (Near Field Communication) up to 1 inch (2.54 cm) from the top of the enclosure
Room sensor	Modular STE connection jack for STE-9000 series digital sensors and STE-6010/6014/6017 analog sensors

Configurability

OBJECTS*	MAXIMUM #	
Inputs and Outputs		
Analog, binary, or accumulator input	8 for BAC-9301	9 for BAC-9311
Analog or binary output	10	
Values		
Analog value	120	
Binary value	80	
Multi-state value	40	
Program and Control		
Program (Control Basic)	10	
PID loop	10	
Schedules		
Schedule	2	
Calendar	1	
Logs		
Trend log	20	
Trend log multiple (must be created)	4 (default 0)	
Alarms and Events		
Notification class	5	
Event enrollment	40	
Tables		
Input tables	20	
Control Basic tables	20	

*Configuration allows creation and deletion of objects (maximum number of objects shown). The number and configuration of default objects depends on the selected application. For lists of default objects, see the **KMC Conquest Controller Application Guide**. See also the PIC statement for all supported BACnet objects.

Configuring, Programming, and Designing

SETUP PROCESS			KMC CONTROLS TOOL
Configuration	Programming (Control Basic)	Web Page Graphics*	
✓			Conquest NetSensor
✓			Internal configuration web pages in Conquest Ethernet "E" models**
✓			KMC Connect Lite™ (NFC) app***
✓	✓		KMC Connect™ software
✓****	✓****		TotalControl™ software
✓	✓		KMC Converge™ module for Niagara WorkBench
		✓	KMC Converge **GFX** module for Niagara WorkBench

*Custom graphical user-interface web pages can be hosted on a remote web server, but not in the controller.

Conquest Ethernet-enabled "E" models with the latest firmware can be configured with an HTML5 compatible web browser from pages served from within the controller. For information, see the **Conquest Ethernet Controller Configuration Web Pages Application Guide.

***Near Field Communication via enabled smart phone or tablet running the KMC Connect Lite app.

****Full configuration and programming of KMC Conquest controllers is supported starting with TotalControl ver. 4.0.

Hardware Features

Processor, Memory, and Clock

Processor	32-bit ARM® Cortex-M4
Memory	Programs and configuration parameters are stored in nonvolatile memory; auto restart on power failure
RTC	Real time clock with (capacitor) power backup for 72 hours ("C" model only) for network time synchronization or full stand-alone operation

Indicators and Isolation

LED indicators	Power/status and Ethernet status

Installation

Power

Supply voltage	24 VAC (50/60 Hz) or 24 VDC; –15%, +20%; Class 2 only; non-supervised (all circuits, including supply voltage, are power limited circuits)
Required power	8 VA, plus external loads
Wire size	12–24 AWG, copper, in a removable screw terminal block

Enclosure and Mounting

Weight	14 ounces (0.4 kg)
Case material	Green and black flame retardant plastic
Mounting	Direct mounting to panels or on DIN rails

Environmental Limits

Operating	32 to 120° F (0 to 49° C)
Shipping	–40 to 160° F (–40 to 71° C)
Humidity	0 to 95% relative humidity (non-condensing)

Warranty, Protocol, and Approvals

Warranty

KMC Limited Warranty	5 years (from mfg. date code)

BACnet Protocol

Standard	Meets or exceeds the specifications in ANSI/ASHRAE BACnet Standard 135-2010 for Building Controllers
Type	BTL-certified as a B-BC controller type

Regulatory Approvals

UL	UL 916 Energy Management Equipment listed
BTL	BACnet Testing Laboratory listed as Building Controller (B-BC) (pending)
RoHS 2	RoHS 2 compliant
FCC	FCC Class A, Part 15, Subpart B and complies with Canadian ICES-003 Class A*

*This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept

any interference received, including interference that may cause undesired operation. (NFC operation meets FCC compliance while the controller is in an unpowered state.)

ACCESSORIES

NOTE: For accessory details, see the respective product data sheets and installation guides.

Actuators

NOTE: See also the selection chart in the Connecting a Remote Actuator to a BAC-9311A section of the **KMC Conquest Controller Application Guide**.

MEP-4xxx	Actuators, 25 to 90 in-lb., fail-safe and non-fail-safe
MEP-7xxx	Actuators, 180 and 320 in-lb., fail-safe and non-fail-safe

Differential Air Pressure Sensors

SSS-1012	Sensor, 3-5/32 inches (80 mm) length
SSS-1013	Sensor, 5-13/32 in. (137 mm) length
SSS-1014	Sensor, 7-21/32 in. (194 mm) length
SSS-1015	Sensor, 9-29/32 in. (252 mm) length

Miscellaneous Hardware

HCO-1103	Steel control enclosure with DIN rail mounting, 10 x 7.5 x 2.5 inches (257 x 67 x 193 mm)
HCO-1035	Steel control enclosure, 20 x 24 x 6 inches (508 x 610 x 152 mm)*
HCO-1036	Steel control enclosure, 24 x 36 x 6 inches (610 x 914 x 152 mm)*
SP-001	Screwdriver (KMC branded) with a hex end (for NetSensor cover screws) and a flat blade end (for controller terminals)
HPO-9901	Controller replacement parts kit with terminal blocks (1 gray, 1 black, 2 green 3-terminal, 4 green 4-terminal, 2 green 5-terminal, 2 green 6-terminal) and DIN clips (2 small for router and 1 large for controllers)

***NOTE:** For smoke control applications, the controller must be mounted in a UL Listed FSCS enclosure or listed enclosure with minimum dimensions. The HCO-1035 and HCO-1036 are approved for such applications.

Network Communications

BAC-5051AE	BACnet router with single MS/TP and IP/Ethernet ports
HPO-0055	Replacement network bulb assembly (pack of 5)
HPO-5551	Router technician cable kit
HPO-9003	NFC Bluetooth/USB module (fob)
HSO-9001	Ethernet patch cable, 50 feet
HSO-9011	Ethernet patch cable, 50 feet, plenum rated
HSO-9012	Ethernet patch cable, 75 feet, plenum rated

Room Sensors, Analog

STE-6010W10	Temperature sensor, white
STE-6014W10	Sensor with rotary setpoint dial, white
STE-6017W10	Sensor with rotary setpoint dial and override button, white
HPO-9005	Room sensor adapter allows the use of other sensors and optional setpoint potentiometers (with wire leads or terminal blocks) to be used instead of STE-601x sensor models with modular jacks

NOTE: Other STE-6000 series sensors are not fully compatible with the dedicated sensor port. However, various other models can be used with an HPO-9005 adapter or with the controller screw terminals. See the STE-6000 series data sheet for more information. For digital sensor information, see the STE-9000 series.

NOTE: To order the STE-601x sensor with light almond color instead of white, drop the W on the end of the model number (e.g., STE-6010W is white and STE-6010 is light almond).

Room Sensors, Digital (LCD Display)

STE-9000 Series	KMC Conquest NetSensor digital room temperature sensors for viewing, configuring, and optional humidity, occupancy, and CO_2 sensing
HPO-9001	NetSensor distribution module

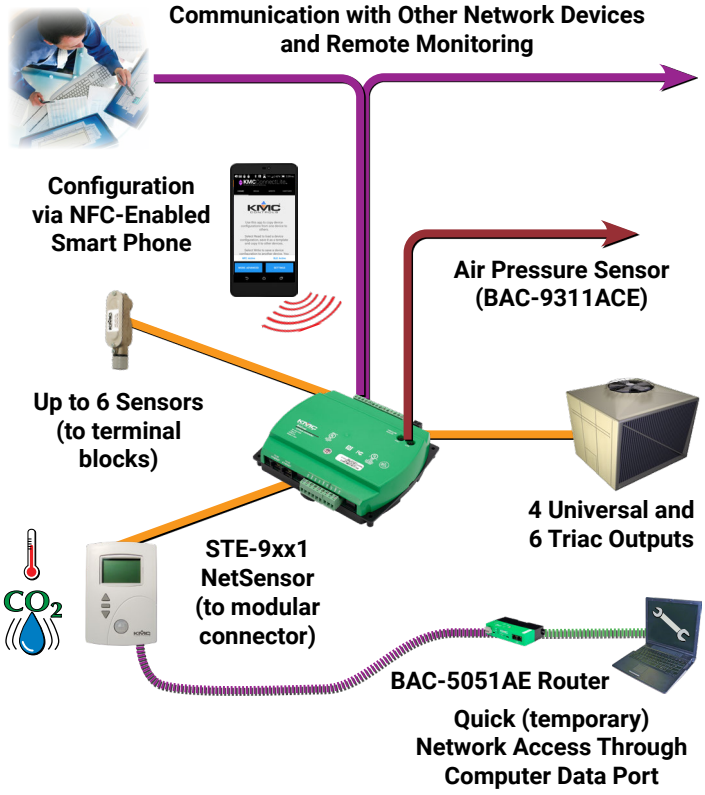
Sensors, Miscellaneous

STE-1405	DAT sensor with plenum-rated cable
STE-1451	OAT sensor

Transformers, 120 to 24 VAC

XEE-6111-050	50 VA, single-hub
XEE-6112-050	50 VA, dual-hub
XEE-6112-100	96 VA, dual-hub (approved for smoke control applications)

SAMPLE INSTALLATION



For more information about installation and operation, see:

- BAC-9300 Series Controller Installation Guide
- KMC Conquest Controller Application Guide
- KMC Conquest Wiring: BAC-9300 Series Controllers (Video)
- Smoke Control Manual for KMC Conquest Systems

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SUPPORT

Additional resources for installation, configuration, application, operation, programming, upgrading, and much more are available on the web at **www.kmccontrols.com**. Log-in to see all available files.