

# BAC-9300A Series

## BACnet Unitary Controllers (B-BC)

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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-93x1ACE(F) 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)



## APPLICATIONS

Can be used with the following types of unitary equipment:

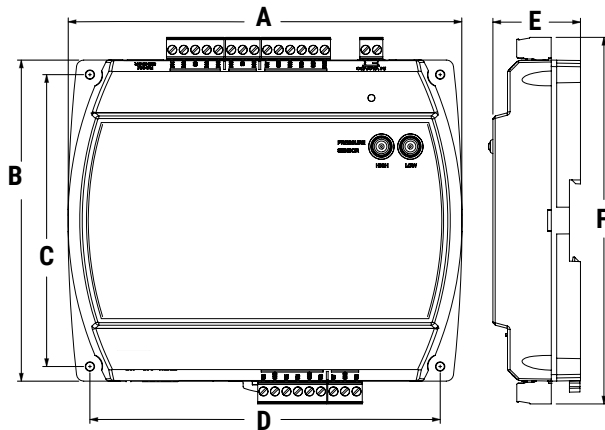
- Air handling units (AHU)
- Chilled beams
- Constant air volume (CAV) with external actuator
- Fan coil units (FCU)
- Heat pump units (HPU)
- Roof top units (RTU)
- Unit ventilators
- Variable air volume (VAV) with external actuator

(Some applications require custom programming. See also [Sample Installation on page 6.](#))

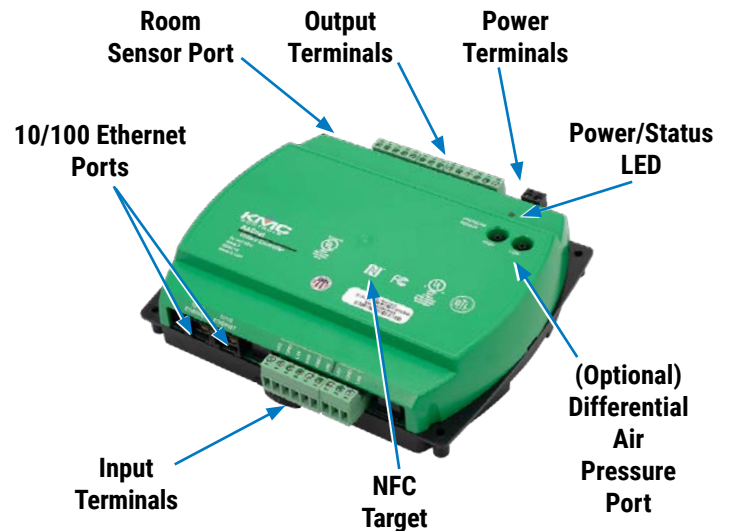
## MODELS

| APPLICATIONS                            | INPUTS                                                                                                                                                                              | OUTPUTS                                                                                       | FEATURES                    |                       |                   | MODEL                        |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------|-----------------------|-------------------|------------------------------|
|                                         |                                                                                                                                                                                     |                                                                                               | Air Pressure Sensor (Input) | Real Time Clock (RTC) | Network           |                              |
| RTU, HPU, FCU, AHU, and unit ventilator | 1 opt. air pressure sensor and 8 (total) standard:<br>• 2 analog (temp. sensor port)<br>• 6 universal inputs (software configurable as analog, binary, or accumulator on terminals) | 10 total:<br>• 6 triacs (binary)<br>• 4 universal (software configurable as analog or binary) |                             |                       | MS/TP             | <a href="#">BAC-9301A</a>    |
|                                         |                                                                                                                                                                                     |                                                                                               |                             | ✓                     | MS/TP             | <a href="#">BAC-9301AC</a>   |
|                                         |                                                                                                                                                                                     |                                                                                               |                             | ✓                     | Ethernet          | <a href="#">BAC-9301ACE</a>  |
|                                         |                                                                                                                                                                                     |                                                                                               |                             | ✓                     | Failover Ethernet | <a href="#">BAC-9301ACEF</a> |
|                                         |                                                                                                                                                                                     |                                                                                               | ✓                           |                       | MS/TP             | <a href="#">BAC-9311A</a>    |
|                                         |                                                                                                                                                                                     |                                                                                               | ✓                           | ✓                     | MS/TP             | <a href="#">BAC-9311AC</a>   |
|                                         |                                                                                                                                                                                     |                                                                                               | ✓                           | ✓                     | Ethernet          | <a href="#">BAC-9311ACE</a>  |
|                                         |                                                                                                                                                                                     |                                                                                               | ✓                           | ✓                     | Failover Ethernet | <a href="#">BAC-9311ACEF</a> |

# SPECIFICATIONS



| DIMENSIONS |              |        |          |              |        |
|------------|--------------|--------|----------|--------------|--------|
| <b>A</b>   | 6.744 inches | 171 mm | <b>D</b> | 6.000 inches | 152 mm |
| <b>B</b>   | 5.500 inches | 140 mm | <b>E</b> | 1.500 inches | 38 mm  |
| <b>C</b>   | 5.000 inches | 127 mm | <b>F</b> | 6.279 inches | 159 mm |



| TERMINAL COLOR CODE |                    |
|---------------------|--------------------|
| <b>Black</b>        | 24 VAC/VDC Power   |
| <b>Green</b>        | 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(F))

|                  |                                                                                                                                                 |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 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)                                                                    |
| Failover Ethernet | (optional) In the event of a power loss, signals are internally connected to support communication through the device.                                                                                                                                                                      |
| 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 <b>KMC Conquest Controller Application Guide</b> . See also the PIC statement for all supported BACnet objects. |                |                |

## Configuring, Programming, and Designing

| SETUP PROCESS  |                             |                    | KMC CONTROLS TOOL                                                           |
|----------------|-----------------------------|--------------------|-----------------------------------------------------------------------------|
| Config-uration | Programming (Control Basic) | Web Page Graphics* |                                                                             |
| ✓              |                             |                    | Conquest NetSensor                                                          |
| ✓              |                             |                    | Internal configuration web pages in Conquest Ethernet "E" and "EF" 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" and "EF" 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)               |
| 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**.

|                 |                                                            |
|-----------------|------------------------------------------------------------|
| <b>MEP-4xxx</b> | Actuators, 25 to 90 in-lb., fail-safe and non-fail-safe    |
| <b>MEP-7xxx</b> | Actuators, 180 and 320 in-lb., fail-safe and non-fail-safe |

### Differential Air Pressure Sensors

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

### Miscellaneous Hardware

|                 |                                                                                                                                                                                                                        |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>HCO-1103</b> | Steel control enclosure with DIN rail mounting, 10 x 7.5 x 2.5 inches (257 x 67 x 193 mm)                                                                                                                              |
| <b>HCO-1035</b> | Steel control enclosure, 20 x 24 x 6 inches (508 x 610 x 152 mm)*                                                                                                                                                      |
| <b>HCO-1036</b> | Steel control enclosure, 24 x 36 x 6 inches (610 x 914 x 152 mm)*                                                                                                                                                      |
| <b>SP-001</b>   | Screwdriver (KMC branded) with a hex end (for NetSensor cover screws) and a flat blade end (for controller terminals)                                                                                                  |
| <b>HPO-9901</b> | 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

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

### Room Sensors, Analog

|                    |                                                                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STE-6010W10</b> | Temperature sensor, white                                                                                                                                                                     |
| <b>STE-6014W10</b> | Sensor with rotary setpoint dial, white                                                                                                                                                       |
| <b>STE-6017W10</b> | Sensor with rotary setpoint dial and override button, white                                                                                                                                   |
| <b>HPO-9005</b>    | 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)

|                        |                                                                                                                                                 |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STE-9000 Series</b> | KMC Conquest NetSensor digital room temperature sensors for viewing, configuring, and optional humidity, occupancy, and CO <sub>2</sub> sensing |
| <b>HPO-9001</b>        | NetSensor distribution module                                                                                                                   |

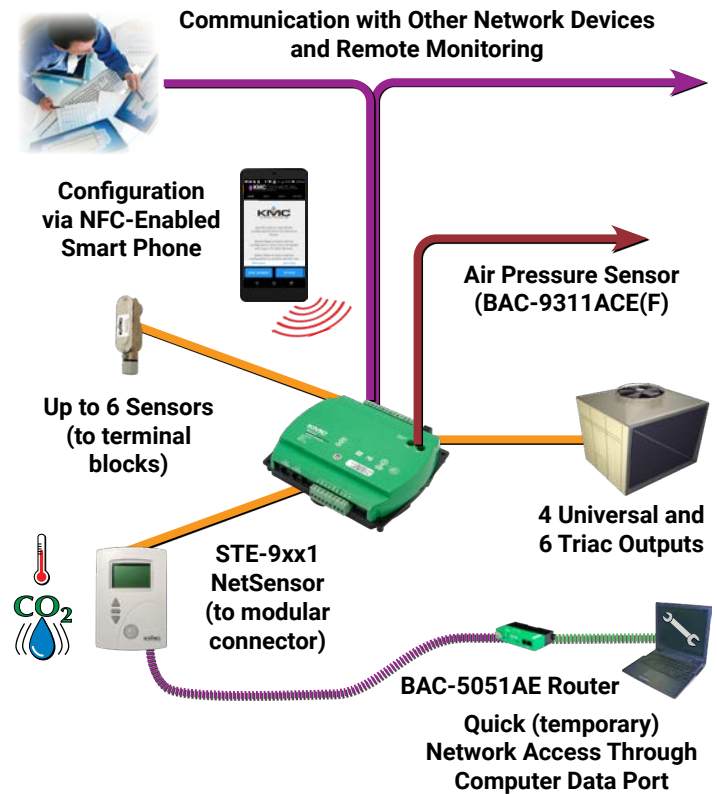
### Sensors, Miscellaneous

|                 |                                    |
|-----------------|------------------------------------|
| <b>STE-1405</b> | DAT sensor with plenum-rated cable |
| <b>STE-1451</b> | OAT sensor                         |

## Transformers, 120 to 24 VAC

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| <b>XEE-6111-050</b> | 50 VA, single-hub                                         |
| <b>XEE-6112-050</b> | 50 VA, dual-hub                                           |
| <b>XEE-6112-100</b> | 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](http://www.kmccontrols.com). Log-in to see all available files.

