# Conquest™ Selection Guide
## Controllers, Sensors, and Accessories

## APPLICATIONS AND MODELS

| APPLICATIONS | MODELS* | APPLICATIONS | MODELS* |
|---|---|---|---|
| AHU (Air Handler Unit) | **BAC-5901** and **BAC-93x1** | Lighting | **STE-92x1/95x1** and **BAC-5901** |
| Boiler | **BAC-5901** | Occupancy control | **STE-92x1/95x1** and any controller |
| CAV (Constant Air Volume) | **BAC-90x1**, **BAC-9311**, and **STE-9xx1** | Other HVAC | **BAC-5901** |
| Chiller | **BAC-5901** | Pump | |
| Chilled beam | **BAC-5901**, **BAC-9301**, and **STE-9x21** | RTU (Roof Top Unit) | **BAC-5901**, **BAC-9301**, and **STE-9xx1** |
| Cooling tower | **BAC-5901** | Static pressure monitoring/control (RTU/HPU) | **BAC-9311** |
| DCV (Demand-Control Ventilation) | **STE-93x1/95x1** and any controller | Supply/exhaust tracking | **BAC-9001**, **TSP-8003**, and **STE-9xx1** |
| FCU (Fan Coil Unit) | **BAC-9301** and **STE-9xx1** | Unit ventilator | **BAC-5901**, **BAC-9301**, and **STE-9xx1** |
| HPU (Heat Pump Unit) | **BAC-9301**, **BAC-5901**, and **STE-9xx1** | VAV (Variable Air Volume) | **BAC-90x1**, **BAC-9311**, **TSP-8003**, and **STE-9xx1** |
| Humidity control | **STE-9x21**, **BAC-5901**, and **BAC-9301** | Ventilation control | **STE-93x1/95x1** and any controller |

*The most typical models are shown for an application. The controllers are fully programmable, and any controller with sufficient I/O can be adapted to the application. Programming and custom graphics requires KMC Connect™, TotalControl, and/or the KMC Converge™ app for Niagara^AX Workbench, but basic configuration for standard applications can be done using just an STE-9000 series NetSensor® or the KMC Connect Lite™ app or software. See **Setup Tools (Configuring, Programming, and Designing) on page 7**. See also **Accessories on page 6**.

## BAC-5900 SERIES GENERAL PURPOSE CONTROLLERS (B-AAC)

| APPLICATIONS | INPUTS* | OUTPUTS* | FEATURES | | | MODEL |
|---|---|---|---|---|---|---|
| | | | **Real Time Clock (RTC)** | **Ethernet Port** | **MS/TP Port** | |
| AHU, chillers, boilers, cooling towers, pumps, lighting, FCU, HPU, RTU, unit ventilators, other HVAC | 10 total:<br>• 2 analog (temperature sensor port)<br>• 8 universal inputs (software configurable as analog, binary, or accumulator on terminals) | 8 universal:<br>• Software configurable as analog or binary<br>• Override boards give additional options** | ✔ | | ✔ | BAC-5901C |
| | | | | ✔ | | BAC-5901CE |
| *Up to four (8 x 8) CAN-5901 I/O expansion modules can be used with BAC-5900 series controllers to provide up to (internal and external) 42 inputs and 40 outputs. | | | | | | |
| **HPO-6700 series output override board series provide (triac, NC/NO relays, 4−20 mA, adjustable 0−10 VDC) options for devices that cannot be powered from a standard universal output. The boards can also be used with the CAN-5901. | | | | | | |

These controllers can be used with the following types of equipment:

- Air handling units
- Boilers
- Chilled beams
- Chillers
- Cooling towers
- Fan coil units
- Heat pump units
- Pumps
- Roof top units
- Unit ventilators
- Other HVAC and building automation system equipment

Requires custom programming in the controller. For more information, see the **BAC-5900 Series** product page.

See also **Accessories on page 6**.

## CAN-5900 SERIES I/O EXPANSION MODULES

| APPLICATIONS | INPUTS | OUTPUTS* | MODEL |
|---|---|---|---|
| I/O Expansion | 8 universal (software configurable as analog, binary, or accumulator) | 8 universal<br>• Software configurable as analog or binary<br>• Override boards give additional options** | CAN-5901 |
| *Up to four (8 x 8) CAN-5901 I/O expansion modules can be used with BAC-5900 series controllers to provide up to (internal and external) 42 inputs and 40 outputs. | | | |
| **HPO-6700 series output override board series provide (triac, NC/NO relays, 4−20 mA, adjustable 0−10 VDC) options for devices that cannot be powered from a standard universal output. The boards can also be used with the CAN-5901. | | | |

These input/output expansion modules are designed for use with BAC-5900 series controllers. Multiple CAN-5901s can be connected to a controller via a CAN bus. For applications, see the BAC-5900 series section above. See also the **CAN-5900 Series I/O Expansion Modules** product page.

## BAC-9000 SERIES VAV CONTROLLER-ACTUATORS (B-AAC)

| APPLICATIONS | INPUTS | OUTPUTS | FEATURES | | | | MODEL |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Air Pressure Sensor | Real Time Clock | MS/TP | Ethernet | |
| Pressure-**independent** VAV, cooling/heating with fan and reheat; CAV | 8 total:<br>• 1 internal actuator position feedback<br>• 1 integrated air pressure sensor (except BAC-9021)<br>• 2 analog (temperature sensor port)<br>• 4 software-configurable universal inputs (terminals) | 9 total:<br>• 2 internal triacs (actuator motor control)<br>• 4 external triacs (terminals)<br>• 3 universal outputs (0–12 VDC on terminals) | ✔ | | ✔ | | BAC-9001 |
| | | | | | ✔ | ✔ | BAC-9001CE |
| Pressure-**dependent** VAV | | | | | ✔ | | BAC-9021 |

VAV application options for these controllers include:

- Pressure independent or dependent VAV
- Cooling only and with changeover
- Staged, modulated, floating, or time-proportional reheat
- Series or parallel fan control
- Dual duct (with TSP-8003 actuators, see below)
- Supply/exhaust tracking (with TSP-8003 actuators)
- CAV (Constant Air Volume)

For installations with a BACnet building automation system, these easily integrated controllers signal demands for higher static duct pressure, cooler or warmer supply air, and other diagnostics for AHU optimization. For more information, see the **BAC-9000 Series** product page. See also **Accessories on page 6**.

## TSP-8003 (DUAL DUCT) TRI-STATE ACTUATOR WITH PRESSURE SENSOR

The TSP-8003 is a 40 in-lb. tri-state actuator with a differential air pressure sensor, typically used in Conquest VAV dual-duct applications as a secondary actuator. The TSP-8003 connects directly to a BAC-9001 VAV controller-actuator for easy installation. Application options include:

- Dual duct VAV or CAV
- Bypass damper*
- Economizer damper*
- Building pressure control damper*
- Supply/exhaust tracking*

**\*NOTE:** Requires custom programming in the controller.

For more information, see the **TSP-8003** product page.

# BAC-9300 SERIES UNITARY CONTROLLERS (B-AAC)

| 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 | 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) | | | | ✔ | BAC-9301 |
| | | | | ✔ | | ✔ | BAC-9301C |
| | | | | ✔ | ✔ | | BAC-9301CE |
| VAV/CAV (with external tri-state actuator), RTU/ HPU static pressure monitoring/control | | | ✔ | | | ✔ | BAC-9311 |
| | | | ✔ | ✔ | | ✔ | BAC-9311C |
| | | | ✔ | ✔ | ✔ | | BAC-9311CE |

These controllers can be used with the following equipment:

• Air handling units
• CAV or VAV with external actuator
• Chilled beams*
• Fan coil units
• Heat pump units
• Roof top units
• Unit ventilators

For more information, see the **BAC-9300 Series** product page.
See also **Accessories on page 6**.

**\*NOTE:** Requires custom programming in the controller.

# STE-9000 SERIES NETSENSORS (DIGITAL ROOM SENSORS)

| APPLICATIONS: TEMPERATURE CONTROL PLUS... | INTEGRATED SENSORS* | | | | MODEL** |
|---|---|---|---|---|---|
| | Temp. | Humidity | Motion | CO$_2$ | |
| (Temperature control only) | ✔ | | | | STE-9001W |
| Humidity control for dehumidification/humidification | | ✔ | | | STE-9021W |
| Enhanced occupancy-based control (lighting/setback/self-learning) | | | ✔ | | STE-9201W |
| Humidity and occupancy control | | ✔ | ✔ | | STE-9221W |
| DCV (Demand-Control Ventilation) | | | | ✔ | STE-9301W |
| Humidity and ventilation control | | ✔ | | ✔ | STE-9321W |
| Occupancy and ventilation control | | | ✔ | ✔ | STE-9501W |
| Humidity, occupancy, and ventilation control | | ✔ | ✔ | ✔ | STE-9521W |

*All units have a temperature sensor (standard). See above for additional sensor options.

**A **W** at the end of the model number indicates a **white** case. To order the sensor with **light almond** color instead of white, drop the W on the end of the model number (e.g., STE-9001W is white and STE-9001 is light almond).

Conquest STE-9000 series NetSensors are wall-mounted digital space temperature sensors designed for use with KMC BAC-5900/9000/9300 series controllers. Key features include the following:

- Up to four sensors in a single package minimizes labor, wiring, and wall space, while optional humidity, motion, and CO$_2$ sensors allow expanded energy-efficient control of humidity, temperature setback, lighting, and ventilation
- A user-friendly three-button integrated operator interface provides occupant viewing and adjusting of setpoints
- It installs permanently as a room sensor or temporarily as a service tool; as a service tool, it commissions controllers without software, configures communication and application settings, and balances VAV air flow
- An HPO-9001 NetSensor distribution module allows up to eight STE-9000 series NetSensors to be linked to one controller or allows one **STE-6010/6014/6017** analog temperature sensor to be connected with up to seven NetSensors

For more information, see the **STE-9000 Series** product page.

NOTE: STE-6010/6014/6017 analog temperature sensors can be connected to a controller in the place of an STE-9001W after the connected controller is configured. See **Accessories on page 6**.



**STE-9221W**
**Temperature/Humidity/Motion Sensing**
**with Full Control/Configuration**



**STE-6017W10**
**Temperature Sensing (Only)**
**with Setpoint Dial and Override Button**

# 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-9311 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 |
| **TSP-8003** | Dual duct actuator (for BAC-9001)— see **TSP-8003 (Dual Duct) Tri-State Actuator with Pressure Sensor on page 3** |

## Expansion Module

| | |
|---|---|
| **CAN-5901** | I/O expansion module (for BAC-5900 series)—see **CAN-5900 Series I/O Expansion Modules on page 2** |

## Misc. Hardware

| | |
|---|---|
| **HCO-1102** | Steel control enclosure, 10.1 x 2.4 x 7.1 inches (257 x 62 x 181 mm) |
| **HPO-0055** | Replacement network bulb assembly (pack of 5) |
| **HPO-0063** | Replacement output jumper, 2-pin (pack of 5) |
| **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) |

## Network Communications

| | |
|---|---|
| **BAC-5051E** | BACnet IP, Ethernet, and (single port) MS/TP router |
| **HPO-5551** | Router technician cable kit |
| **HPO-9003** | NFC Bluetooth/USB module (fob) |
| **HSO-9001** | Ethernet cable, 50 feet |
| **HSO-9011** | Ethernet cable, 50 feet, plenum rated |
| **KMD-5567** | Network surge suppressor |

## Output Override Boards (for BAC/CAN-5901)

| | |
|---|---|
| **HPO-6701** | Triac output w/ zero-cross switching (AC only) |
| **HPO-6702** | 0−10 VDC analog with adjustable override potentiometer |
| **HPO-6703** | Relay, NO contacts (AC/DC) |
| **HPO-6704** | 4−20 mA DC current loop with adjustable override potentiometer |
| **HPO-6705** | Relay, NC contacts (AC/DC) |

## Sensors, Analog Room

| | |
|---|---|
| **STE-6010W10** | Temperature sensor, white |
| **STE-6014W10** | Sensor with rotary setpoint dial, white |
| **STE-6017W10** | Sensor with rotary setpoint dial and override button, white |

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

**NOTE:** To order the STE-601x sensor with **light almond color** instead of white, **replace the W on the end of the model number with a hyphen** (e.g., STE-6010W10 is white and STE-6010-10 is light almond).

**NOTE:** See also **STE-9000 Series NetSensors (Digital Room Sensors) on page 5**.

## Sensors, Differential Air Pressure

| | |
|---|---|
| **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 |

## Sensors, Digital (LCD Display) Room

| | |
|---|---|
| **HMO-10000W** | White (or order HMO-10000 for light almond) mounting plate, allows mounting to horizontal 2 x 4 or 4 x 4 inch electrical boxes |
| **HPO-0044** | Replacement cover hex screw |
| **HPO-9002** | Foam insulating gasket (mounts between the black backplate and the electrical box) |
| **HPO-9001** | NetSensor distribution module |
| **SP-001** | Screwdriver (KMC branded) with hex end (for cover screws) and flat blade (for controller terminals) |
| **STE-9000 Series** | NetSensor digital room temperature sensors for viewing and configuration and optional humidity, occupancy, and $CO_2$ sensing—see **STE-9000 Series NetSensors (Digital Room Sensors) on page 5** |

## Sensors, Miscellaneous Temperature

| | |
|---|---|
| **STE-1405** | DAT sensor with plenum cable |
| **STE-1451** | OAT sensor |

## Transformers, 120 to 24 VAC

| | |
|---|---|
| **XEE-6111-050** | 50 VA, single-hub |
| **XEE-6112-050** | 50 VA, dual-hub |

## SUPPORT

For more information, see the data sheets and other support documents on the respective product series pages on the KMC Controls web site (**www.kmccontrols.com**).

# SETUP TOOLS (CONFIGURING, PROGRAMMING, AND DESIGNING)

| SETUP PROCESS | | | KMC TOOL** |
|---|---|---|---|
| **Configuration** | **Programming (Control Basic)** | **Web Page Graphics*** | |
| ✔ | | | Conquest NetSensor™ |
| ✔ | | | KMC Connect Lite™ (NFC) app or software*** |
| ✔ | ✔ | | KMC Connect™ software |
| | | ✔ | TotalControl™ software |
| | | ✔ | KMC Converge™ module for Niagara^AX WorkBench |

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

**For configuration and programming information, see the documents and Help systems for the respective tool.

***Near Field Communication via enabled smart phone or tablet running the KMC Connect Lite app or a PC (with an HPO-9003 NFC-Bluetooth/USB module/fob) running the KMC Connect Lite Desktop software.