

Description and Application

These native BACnet, fully programmable, direct digital controllers are factory **pre-programmed and pre-configured for use in Under Floor Air Distribution (UFAD)** applications. They have **modular input and output jacks** to simplify field wiring, using standard Ethernet cables (with modular RJ-45 plugs) for input sensors and KMC HSO-2200 series cables with RJ-12 modular plugs on the outputs. Outputs are typically connected to KMC MEP-4042/4842 proportional actuators with integral RJ-12 modular jacks.

They can provide up to five individual zones of control using a KMD-1x6x/1x8x/12x1 NetSensor and up to four STE-6014 or STE-6016 wall sensors. They are pre-configured to provide 5 cooling zones. Two outputs may also be changed from cooling to heating. (See the sample application drawings starting on page 3.) Depending on cable lengths and power wiring used, up to 8 MEP-4042/4842 actuators may be driven in each chain, and each chain can be individually tied to any of five zone sensors. These models can also be used with UFAD diffuser actuators manufactured by KMC Controls for specific OEMs.

These controllers provide precise monitoring and control of connected points. Remote building automation systems may further command occupancy modes and control setpoints of the networked devices, process alarm conditions, and use information generated by the controllers to optimize the performance of "upstream" air handlers, fans, and other building automation functions.

Models

BAC-5841	UFAD controller with Real Time Clock (RTC)
BAC-5842	UFAD controller without RTC

NOTE: For **VAV** zoning applications, see the BAC-5841-16 and BAC-5842-16 data sheet.



Specifications (All Models)

Pre-Programmed Features

- ◆ Default programmed to provide (up to) 5 independent cooling zones with cooling setpoint and control of connected proportional MEP-4x42 series actuators (see page 3)
- ◆ Independent heating outputs to provide 2 Heat/Cool zones (underfloor cooling with hot water reheat) can also be controlled from one common STE-6014 or STE-6016 space sensor for each zone (see page 4)

Programmable features

- ◆ See BAC-5801/5802 PIC statement for supported BACnet objects

Outputs (model dependent)

- ◆ 8 pre-configured outputs for control of proportional actuators or staged equipment
- ◆ 5 modular 6-pin RJ-12 female jacks for use with HSO-2200 series cables (or local equivalent)
- ◆ Removable screw terminal block, wire size 14-22 AWG for unitary equipment control
- ◆ Standard and custom units of measure
- ◆ 0-10 volts DC for analog objects
- ◆ 0 or 12 volts DC for binary objects
- ◆ Outputs protected against intermittent shorts
- ◆ Maximum output current 100 mA per output or 350 mA total

Inputs

- ◆ Four modular inputs pre-configured as zone temperature sensing inputs or setpoint inputs
- ◆ Four modular 8-pin RJ-45 female jacks for use with standard Ethernet cables to connect to STE-6014 or STE-6016 sensors
- ◆ Built-in sensor selection switch for STE-6014 or STE-6016 room sensors—when set to the “STE-6016” position, the controller sources necessary power for the LCD digital display on the STE-6016 sensors (internally using Output 8)
- ◆ Integral switchable network End of Line (EOL) resistors, indicating fuses, and network isolation switch with LED indication of operation for BACnet MS/TP communications
- ◆ Standard units of measure
- ◆ 10-bit analog-to-digital conversion
- ◆ Overvoltage input protection
- ◆ Compatible with KMD-1x6x/1x8x NetSensors

Schedules

- ◆ 8 Schedule objects
- ◆ 3 Calendar objects

Alarms and events

- ◆ Supports intrinsic reporting
- ◆ 8 Notification class objects

Trends

- ◆ 8 Trend objects

Memory and clock

- ◆ Real time clock with power backup for 72 hours (BAC-5841 only)
- ◆ Programs and program parameters are stored in nonvolatile memory
- ◆ Auto restart on power failure

Communications

- ◆ BACnet MS/TP compliant
- ◆ MS/TP operating at up to 76.8 kilobaud
- ◆ Automatically assigns MAC addresses and device instance numbers
- ◆ Modular jack for NetSensor connection (5 VDC at 25 mA typical)

Regulatory

- ◆ FCC Class A, Part 15, Subpart B

Installation

Supply Voltage

24 VAC (–15%, +20%), 60 Hz,
3.6 VA (not including connected actuators), Class 2 only

Fuse

4 A, fast acting

Weight

14 ounces (395 g)

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)

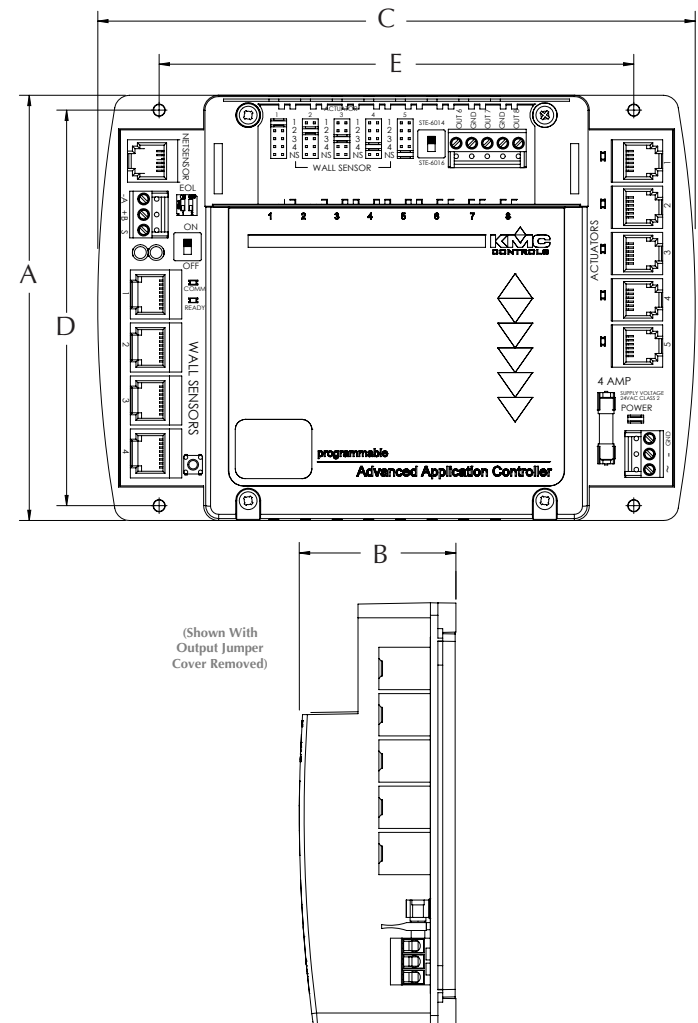
Humidity

0 to 95% RH (non-condensing)

Software Compatibility

Requires the current version of BACstage or TotalControl for field customization or modification of default configuration and programming features

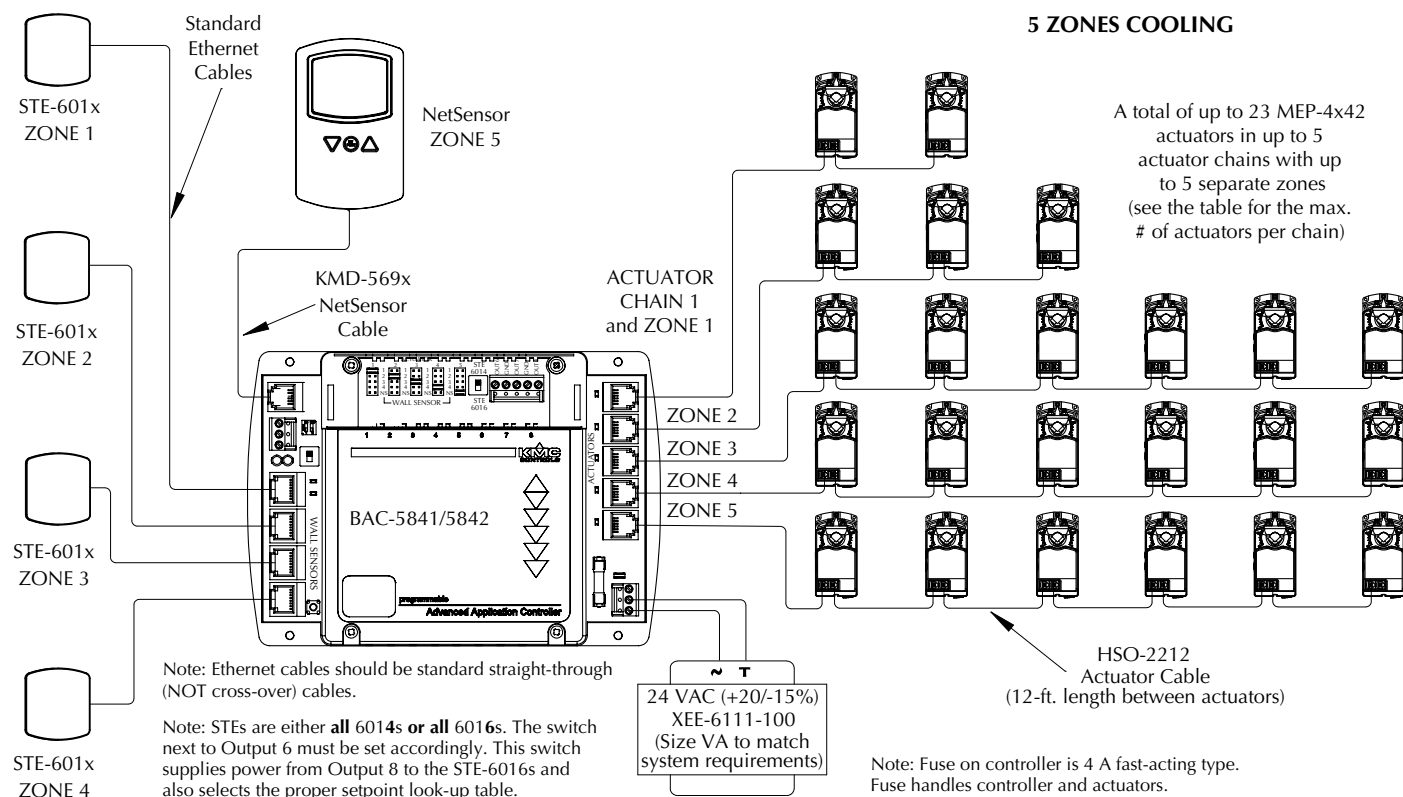
Dimensions



A	B	C	D	E
5.38 in.	1.98 in.	7.55 in.	5.0 in.	6.0 in.
137 mm	50 mm	192 mm	127 mm	152 mm

Sample Under Floor Air Distribution Applications

Five Zones Cooling

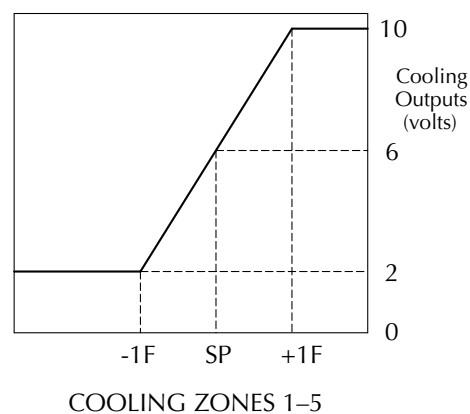


Cable P/N	Cable Length	Max. # of Daisy-Chained MEP-4x42s	
		WithOUT HSO-5010	WITH HSO-5010*
HSO-2203	3 feet	8	8
HSO-2206	6 feet	8	8
HSO-2212	12 feet	6	8
HSO-2220	20 feet	4	8
HSO-2250	50 feet	2	4

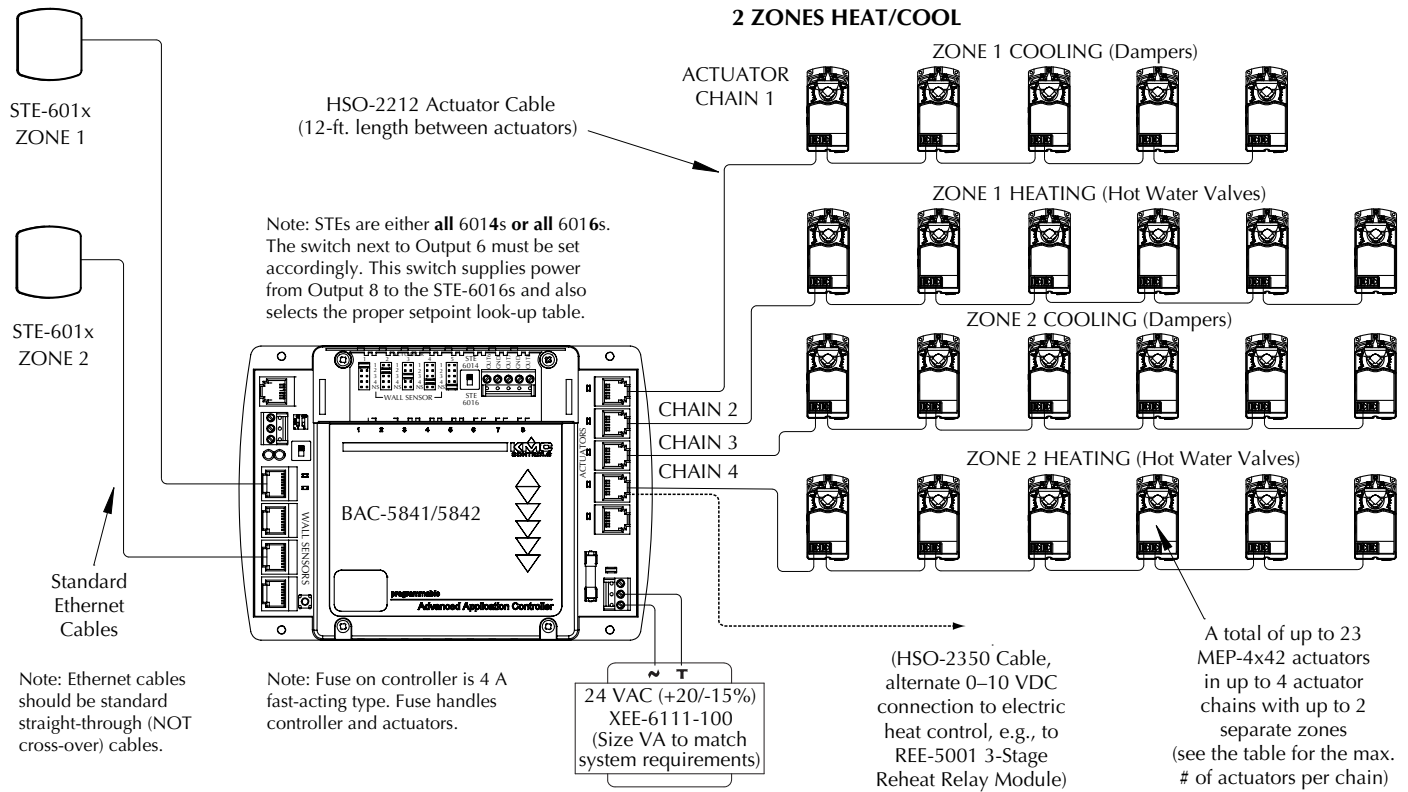
*For examples of the HSO-5010 3-way "Y" modular connector in use with the actuators, see the MEP-4042/4842 data sheet.

NOTE: If desired, the jumpers can tie multiple actuator chains to a single sensor, forming a single zone of those multiple actuator chains.

Sequence Diagram



Two Zones Heating and Cooling



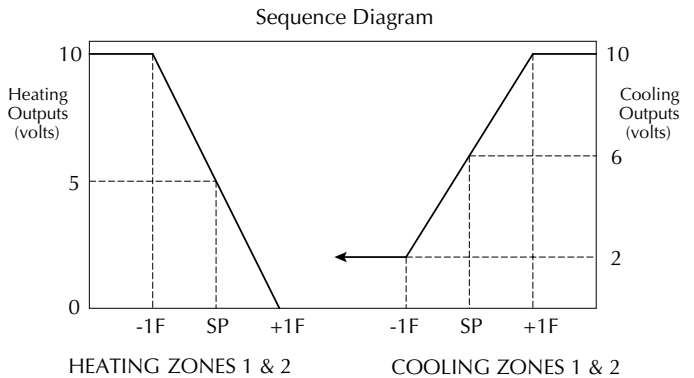
NOTE: Room temperature sensors must **all** be STE-6014s (with rotary setpoint dial) **or all** be STE-6016s (with LCD display and up/down setpoint buttons) and the switch by Output 6 must be set accordingly.



STE-6014



STE-6016



NOTE: See the cable chart on the previous page.

Accessories

Connectors and Fuses

902-602-04	Replacement three-pin removable terminal block
902-602-06	Replacement five-pin removable terminal block
HPO-0054	Replacement fuse bulb
HPO-0063	Replacement two-pin jumper

Enclosure

HCO-1102	Steel control enclosure, 10.1 W x 2.4 H x 7.1" D (257 x 62 x 181 mm)
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Power Transformers

XEE-6112-100	Transformer, 120-to-24 VAC, 96 VA, dual-hub
XEE-6311-100	Transformer, 120/240/277/480-to-24 VAC, 96 VA, dual-hub

Sensors

KMD-116x	NetSensor
KMD-118x	NetSensor with humidity sensor
KMD-12x1	NetSensor with motion sensor
STE-6014	Room temp. sensor w/ rotary setpoint dial
STE-6016	Room temp. sensor w/ LCD display and up/down setpoint buttons

Actuators

MEP-4042	40 inch-lbs. min. torque, with modular jacks
MEP-4842	80 inch-lbs. min. torque, with modular jacks

Cables and Miscellaneous

HSO-2350	DDC controller analog output cable, 50 ft., with RJ-12 plug on one end (provides 2–10 VDC control signal to actuator from remote controller)
HSO-22xx	Modular cables, RJ-12 plug on both ends (see the table and sample application on the page 3 for the appropriate part number)
HSO-2121	Transformer cable, 12 inches, with RJ-12 plug on one end (provides local power to actuator from transformer mounted at actuator location)
HSO-5010	“Y” connector with 3 RJ-12 jacks (allows powering of two strings of actuators when power is applied through an HSO-2121 and the HSO-5010 “splitter” is mounted in the center of each string)
KMD-5690	25-foot NetSensor cable
KMD-5691	50-foot NetSensor cable
KMD-5692	75-foot NetSensor cable



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