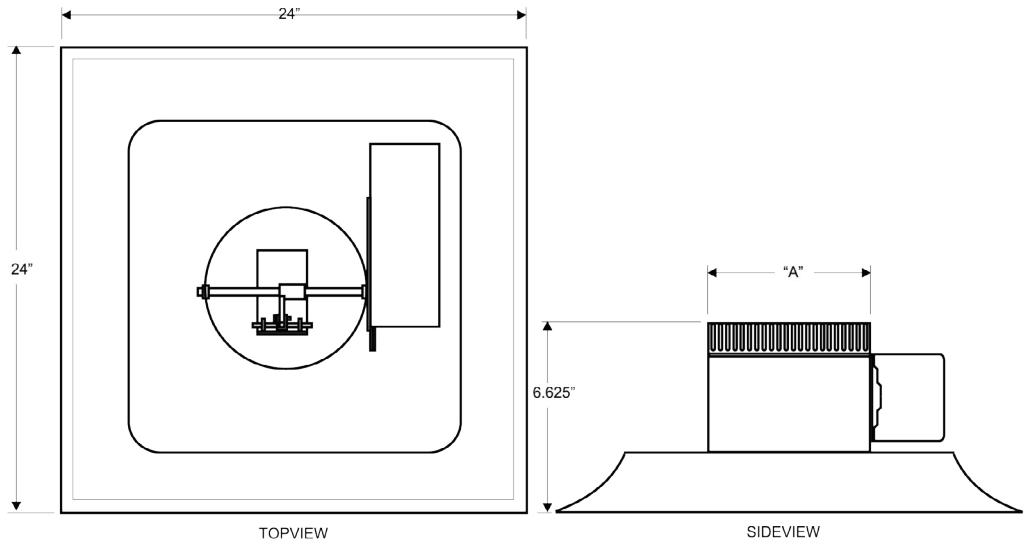
# XG-MSE-BN

## BACnet Electronic Diffuser for Variable Air Volume Applications




**Suggested Specifications:**
The electronically controlled variable air volume diffuser shall be the BACnet Electronic Diffuser. The removable face plate (minimum of 18 gauge steel) shall be attached to a unitary stamped backbone. The diffuser shall include an integral modulating disk that continually regulates the volume of supply air in response to the wall-mounted adjustable, communicating thermostat. Diffusers dependent on integral air induction ceiling-located sensors or wall-mounted setpoint adjustor methods other than from wall-mounted adjustable, communicating room sensors shall not be acceptable.

To ensure good temperature control, a modulated 24 VAC factory supplied native BACnet diffuser controller with integral actuator shall be used. Actuators that incorporate an expanding material shall not be acceptable. Electronic diffusers which incorporate an additional component for each or a group of electronic diffusers to allow proper communication via BACnet shall not be acceptable.

**Dimensions:**
XG-MSE-BN diffusers are available in a 24” x 24” face size with ‘A’ neck sizes of 6”, 8”, 10”, 12” and 14” diameters.

**Application:**
The electronic BACnet diffuser is used to vary the supply air volume via a factory supplied and mounted BACnet control module in combination with a factory supplied, wall mounted, adjustable and communicating room sensor. The diffuser is designed to maintain coanda effect (draft free) of discharge air along the ceiling, providing a sustained discharge velocity throughout the volume range of 118 to 710 cfm. The BACnet interface is designed to allow integration into the BAS, providing information, scheduling and adjustment via the factory supplied room sensor or via a BACnet Building Automation System by others.

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**Operation:**
The electronic BACnet diffuser incorporates an integral modulating disk that continually regulates the volume of supply air in response to the factory supplied, wall-mounted, adjustable, communicating thermostat and the factory installed duct temperature sensor.

**Construction:**
Unitary stamped seamless backbone with removable face plate

Steel construction with baked enamel finish

Four-way discharge pattern

Factory mounted native BACnet electronic diffuser controller with integral actuator

Auto-changeover duct temperature sensor (stainless steel)

**Accessories:**

**Diffuser Specific**
Static pressure relief rings available for 8-14” neck sizes

Aluminum diffuser option

Baffles to change diffuser from four-way pattern to three, two or one-way

Hard ceiling mounting frames

**Room Sensor Specific**
Motion sensing option

Co2 detection option

Humidity monitoring option

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### Controller Specifications

| | |
|---|---|
| **Power** | |
| Voltage | 24VAC; r 15%; 50/60Hz; Class 2 |
| Protection | 2.0A user-replaceable fuse<br>3.0A user-replaceable fuse for triacs when using the internal power supply |
| Power Consumption | 10 VA typical plus all external loads [1]<br>85 VA maximum |
| **Interoperability** | |
| Communication Bus | BACnet MS/TP |
| BACnet Profile | B-ASC[2] |
| EOL Resistor | Built-in, jumper selectable |
| Baud Rates | 9600, 19 200, 38 400, or 76 800 bps |
| Addressing | Dip Switch or Configurable with sensor |
| **Hardware** | |
| Processor | STM32 (ARM Cortex M3) MCU, 32 bit |
| Memory | 384 kB Non-volatile Flash (applications)<br>1 MB Non-volatile Flash (storage)<br>64 kB RAM |
| Real Time Clock (RTC) | Built-in Real Time Clock without battery: Network time synchronization is required at each power-up cycle before the RTC becomes available |
| Status Indicator | Green LEDs: Power Status & LAN Tx<br>Orange LEDs: Controller Status & LAN Rx |
| **Environmental** | |
| Operating Temperature | 0 °C to 50°C; 32°F to 122°F |
| Storage Temperature | -20 °C to 50°C; -4°F to 122°F |
| Relative Humidity | 0 to 90% Non-condensing |
| **Enclosure** | |
| Material | FR/ABS |
| Color | Black & blue casing & grey connectors |
| Dimensions (with Screws) | |
| - ECB-VVTS | 4.8 L u 5.9 W u 2.5 H<br>(122.7 mm u 149.1 mm u 63.0 mm) |
| - Other models | 4.8 L u 8.4 W u 2.5 H<br>(122.7 mm u 214.3 mm u 63.0 mm) |
| Shipping Weight | |
| - ECB-VVTS | 2.30lbs (1.05kg) |

| | |
|---|---|
| **Inputs** | |
| Input Types | Universal |
| -Voltage | - 0 to 10VDC (40k: input impedance)<br>- 0 to 5VDC (high input impedance) |
| -Current | 0 to 20mA with 249: external resistor (wired in parallel) |
| -Digital | Dry contact |
| -Pulse | Dry contact; 500ms minimum ON/OFF |
| -Resistor | 0 to 350 K: All thermistor types that operate in this range are supported. The following temperature sensors are pre-configured: |
| *Thermistor* | 10K: Type 2, 3 (10K: @ 25°C; 77°F) |
| Input Resolution | 16-bit analog / digital converter |
| Power Supply Output | 15VDC; maximum 80mA (4 inputs @ 20mA each) |
| **Outputs** | |
| Digital | 24 VAC Triac, digital (on/off), PWM, or floating; software configurable<br>- 0.5A continuous<br>- 1A @ 15% duty cycle for a 10-minute period<br>- PWM control: adjustable period from 2 to 65sec.<br>- Floating control:<br>- Min pulse on/off: 500msec.<br>- Adjustable drive time period |
| Universal | External or internal power supply (jumper selectable)<br>0 to 10VDC linear, digital 0 to 12VDC (on/off), floating or PWM. Built-in snubbing diode to protect against back EMF, for example when used with a 12VDC relay.<br>- PWM control: adjustable period from 2 to 65sec.<br>- Floating control:<br>- Min pulse on/off: 500msec.<br>- Adjustable drive time period<br>- 20mA max. @ 12VDC<br>- Minimum resistance 600: |
| Output Resolution | 10-bit digital / analog converter |

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## BACnet Electronic Diffuser for Variable Air Volume Applications

### Controller Specifications

**Integrated Damper Actuator**

| | |
|---|---|
| Motor | Belimo LMZS-H brushless DC motor |
| Torque | 35 in-lb, 4 Nm |
| Degrees of Rotation | 95º adjustable |
| Fits Shaft Diameter | 5/16 to 3/4; 8.5 to 18.2mm |
| Acoustic Noise Level | < 35 dB (A) @ 95º rotation in 95 seconds |

**Wireless Receiver**[3]

| | |
|---|---|
| Communication | EnOcean wireless standard |
| Number of wireless inputs[4] | 18 |
| Supported Wireless | Wireless Receiver (315) |
| Receivers | Wireless Receiver (868) |
| Cable | Telephone cord |
| - Connector | 4P4C modular jack |
| - Length (maximum) | 6.5ft; 2m |

**Standards and Regulation**

| | |
|---|---|
| CE -Emission | EN61000-6-3: 2007; Generic standards for residential, commercial and light-industrial environments |
| -Immunity | EN61000-6-1: 2007; Generic standards for residential, commercial and light-industrial environments |
| FCC | This device complies with FCC rules part 15, subpart B, class B |

| | |
|---|---|
| UL Listed (CDN & US) | UL916 Energy management equipment |
| Material[5] | Plastic housing, UL94-5VB flammability rating<br>Plenum rating per UL1995 |
| CEC Appliance Database | Appliance Efficiency Program[6] |

**Thermostat**

| | |
|---|---|
| Communication | RS-485 |
| Number of sensors per controller | Up to 4, in daisy-chain configuration |
| Cable | Cat 5e or Cat 6, 8 conductor twisted pair |
| Connector | RJ-45 |

**Agency Approvals**

| | |
|---|---|
| UL Listed (CDN & US) | UL916 Energy management equipment |
| Material[4] | UL94-5VA |

1. External loads must include the power consumption of any connected modules such as an Allure EC-Smart-Vue sensor. Refer to the respective modules datasheet for related power consumption information.
2. Refer to Controls Protocol Implementation Conformity Statement for BACnet.
3. Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Solution Guide for a list of supported EnOcean wireless modules.
4. Some wireless modules may use more than one wireless input from the controller.
5. All materials and manufacturing processes comply with the RoHS directive and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive.
6. California Energy Commission's Appliance Efficiency Program: The manufacturer has certified this product to the California Energy Commission in accordance with California law.

Notes: ☐ (check if provided)

| 1. Available Finishes | 2. Available Accessories | 3. Available Options | 4. Construction Details |
|---|---|---|---|
| **Standard Finish:**<br>☐ 01 White<br>**Optional Finishes (special order):**<br>☐ 24 Mill | | | • 18 gauge steel construction.<br>• Diffuser sizes 24" x 24".<br>• Neck Sizes: 6", 8", 10", 12" & 14"<br>• Damper Actuator Type: 24 VAC, 1.5 VA, 35 in-lb.<br>• Timing: approximately 95 seconds (variable per intelligent controller).<br>• Communication Bus: BACnet MS/TP |