# VMA Programmable VAV Box Controllers Catalog Page

Johnson Controls
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# VMA16 (32-bit), VMA18, and VMA1930 VAV Modular Assembly Controller Series

VMA16s (32-bit) and VMA18s are programmable digital controllers tailored for VAV applications that can be switched between MS/TP and N2 communications protocols. When they are used as MS/TP devices, they communicate through the BACnet® MS/TP protocol. In N2 mode, they can be used as replacements for legacy Johnson Controls® controllers. The VMA1615-xU and VMA1630-xU models are listed for UL 864 10th Edition UUKL/ORD-C100-13 UUKLC Smoke Control System applications.

ⓘ **Note:** When a VMA1400 Series controller is replaced on an existing N2 network, the VMA18 Series controller is the preferred device because certain existing sensor models can be reused. VMA18 controllers are intended for use as functional replacements for the VMA1410, VMA1415, VMA1420, and VMA1440 controllers only. VMA18 controllers support field-selectable BACnet MS/TP or N2 protocols. VMA18 controllers support the N2 Open Communications protocol at a maximum rate of 9600 baud.

The VMA1930 programmable controller uses BACnet/IP networking for higher speed communication with the Controller Configuration Tool (CCT) and improved bandwidth. This gives you more flexibility in choosing controllers for your site's specific needs.

The VMA1615, VMA1630, VMA1832, and VMA1930 (32-bit) controllers feature an integral digital differential pressure transducer (DPT), an integral damper actuator, and a 32-bit microprocessor. The controllers' small package size facilitates quick field installation and efficient use of space, while not compromising high-tech control performance. These controllers easily adapt NS Series Network Sensors for zone and discharge air temperature sensing.

The VMA1626 controller is shipped with an actuator but without a differential pressure transducer (DPT), making it well suited for commercial zoning applications or for pressure-dependent VAV box applications where no DPT is required.

The VMA1656 controller is shipped without a differential pressure transducer but with an integrated actuator and ball valve linkage. These controllers are for use on the Johnson Controls VG-1000 1/2 - 1 inch valves and needs to be used primarily as a replacement for the VMA assembly of the VG-1000 Series Smart Valve product. The smart valve product line is ideal for chilled beam applications.

The VMA1628 includes a DPT but does not have an actuator. Without an actuator, this controller is well suited for controlling large VAV boxes that require more than 4 N•m of torque.

These features make the VMA16 (32-bit) controllers the product of choice for VAV systems. The wide variety of network sensor models provides options for measuring and displaying zone temperature, occupancy detection, duct temperature, zone humidity and dewpoint determination, carbon dioxide ($CO_2$) level, setpoint adjustments, VAV box fan speed control, and discharge air temperatures.

The VMA18 models are designed to be functional replacements for the VMA14xx Series Variable Air Volume Modular Assembly controllers. They contain a sensor actuator bus port and accessories well suited for replacing VMA14xx controllers.

➤ **Important:** You cannot purchase a similar third-party device and install it in a UL/cUL Listed smoke control system. Doing so voids the UL/cUL Smoke Control Listing. Third-party devices must be provided and labeled by the factory as described in the UL/cUL Smoke Control Listing.

➤ **Important:** Only those Johnson Controls products identified for use in smoke control applications have been tested and listed by UL for use in a *Metasys* system UL 864 10th Edition UUKL/ORD-C100-13 UUKLC Smoke Control System. Installation of a product that is not UL/cUL Listed and labeled for this application prevents the entire system from being UL/cUL Listed for smoke control.

**Figure 1: VAV Modular Assembly Controllers (VMAs) Family**

## Features

- **Standard BACnet Protocol**—Provides interoperability with other Building Automatcion System (BAS) products that use the widely accepted BACnet standard.
- **Standard Hardware and Software Platform**—Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows; also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- **Switchable communications protocols from BACnet MS/TP to N2 protocols or N2 to BACnet MS/TP protocols**
- **ZFR Wireless FC or SA Bus Interface**—Both the ZFR1800 Series Wireless and WNC1800/ZFR182x Pro Series Wireless Field Bus (ZFR Pro) provide a wireless alternative to hard-wired *Metasys* system counterparts, offering application flexibility and mobility with minimal disruption to building occupants.
- **Bluetooth® Wireless Commissioning**—Provides an easy-to-use connection to the configuration and commissioning tool.
- **Auto-Tuned Control Loops**—Reduce commissioning time, eliminate change-of-season re-commissioning, and reduce wear and tear on mechanical devices.
- **Universal Inputs and Configurable Outputs**—Allows multiple signal options to provide input/output flexibility.
- **Optional Local User Interface Display**—Allows convenient monitoring and adjusting capabilities at the local device.
- **BACnet Testing Laboratories (BTL) Listed and Certified**—Ensures interoperability with other BTL-listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.
- **32-bit Microprocessor**—Ensures optimum performance and meets industry specifications.
- **BACnet Automatic Discovery**—Supports easy controller integration into a *Metasys* BAS.
- **End-of-Line (EOL) Switch in MS/TP Field Controllers** —Enables field controllers to be terminating devices on the communications bus.
- **Pluggable Communications Bus and Supply Power Terminal Blocks**—Expedites installation

and troubleshooting.

- **Writable Flash Memory**—Allows standard or customized applications to be downloaded from the CCT and enables persistent application data.

The following features are specific to particular models:

- Models that include a DPT feature a state-of-the-art digital non-flow DPT to provide 14-bit resolution with bidirectional flow operation that supports automatic correction for polarity on high- and low-pressure DP tube connections; this pressure sensor eliminates high- and low-pressure connection mistakes.
- A phone jack-style connector on the FC Bus and SA Bus of the VMA16 supports quick connection to the Mobile Access Portal (MAP) Gateway, Wireless Commissioning Converter (BTCVT), ZFR or ZFR Pro Series Wireless Field Bus System wireless routers, and network sensors.
- Models that include an actuator feature a fast response actuator that drives the damper from full open to full closed (90°) in 60 seconds to reduce commissioning time.

# Application Documentation

Refer to the *Metasys System Field Equipment Controllers and Related Products Product Bulletin (LIT-12011042)* for product application details.

If the product fails to operate within its specifications, replace the product. For a replacement product, contact the nearest Johnson Controls® representative.

# VMA16 (32-bit) Series, VMA18 Series, and VMA1930 Model Information (Including Point Type Counts)

**Note:** The VMA1617 and VMA1632 models are currently only available in Asia. Contact your local Johnson Controls representative for more information.

**Table 1: VMA16 (32-bit) Series and VMA1930 Information (Including Point Type Counts per Model)**

<table>
<tr><th colspan="2"></th><th>VMA 1615</th><th>VMA 1626</th><th>VMA 1628</th><th>VMA 1630</th><th>VMA 1656</th><th>VMA 1930</th><th>VMA 1617</th><th>VMA 1632</th></tr>
<tr><td colspan="2">Communication Protocol</td><td colspan="5">BACnet MS/TP, N2</td><td>BACnet/IP</td><td colspan="2">BACnet MS/TP, N2</td></tr>
<tr><td colspan="2" rowspan="2">Engines</td><td colspan="5">All Model types*</td><td>NAE55, NAE85, ODS at R9.0 or later</td><td colspan="2">All Model types*</td></tr>
<tr><td colspan="8">*Some NIE models support MS/TP and N2 devices. Refer to the Network Engines Product Bulletin (LIT-12012138) for details.</td></tr>
<tr><td colspan="2" rowspan="2">Modular Jacks</td><td colspan="7">6-pin SA Bus Modular Port supports one communicating sensor. Or you can wire up to four communicating sensors to the SA Bus Terminal Block. They cannot be used at the same time.</td><td rowspan="2">8-pin SA Bus supports analog non-communicating sensor (port labeled TSTAT)</td></tr>
<tr><td colspan="7">6-pin FC Bus for tool support</td></tr>
<tr><td>Point Types</td><td>Signals Accepted</td><td colspan="8"></td></tr>
</table>

**Table 1: VMA16 (32-bit) Series and VMA1930 Information (Including Point Type Counts per Model)**

| | | VMA 1615 | VMA 1626 | VMA 1628 | VMA 1630 | VMA 1656 | VMA 1930 | VMA 1617 | VMA 1632 |
|---|---|---|---|---|---|---|---|---|---|
| **Universal Input (UI)** | Analog Input, Voltage Mode, 0–10 VDC<br><br>Analog Input, Resistive Mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2)<br><br>Binary Input, Dry Contact Maintained Mode | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Binary Output (BO)** | 24 VAC Triac | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| **Configurable Output (CO)** | Analog Output, Voltage Mode, 0–10 VDC<br><br>Binary Output Mode, 24 VAC Triac | | 2 | 2 | 2 | 2 | 2 | | 2 |
| **Integrated Actuator** | Internal | 1 | 1 | | 1 | 1 with ball valve linkage | 1 | 1 | 1 |
| **Differential Pressure Transducer** | Internal | 1 | | 1 | 1 | | 1 | 1 | 1 |
| **Zone Sensor Input** | On SA Bus (A total of 10 MS/TP addresses (IOMs), not including sensor addresses, can be used in a single VMA controller.) | Up to 4 NS Series Network Zone Sensors | | | | | | | |
| | | Up to 9 WRZ sensors when using the ZFR or ZFR Pro Series wireless router configuration and up to 5 WRZ sensors when using the one-to-one WRZ-78xx wireless configuration | | | | | | | |

**Table 2: VMA18 Series Information (Including Point Type Counts per Model)**

| | | VMA1826 | VMA1832 |
|---|---|---|---|
| **Communication Protocol** | | BACnet MS/TP, N2 | |
| **Engines** | | NAEs, NCEs, ODS | |
| **Modular Jacks** | | 8-pin SA Bus supports analog non-communicating sensor | |
| **Point Types** | **Signals Accepted** | | |
| **Universal Input (UI)** | Analog Input, Voltage Mode, 0–10 VDC<br>Analog Input, Resistive Mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2)<br>Binary Input, Dry Contact Maintained Mode | 3 | 3 |
| **Binary Output (BO)** | 24 VAC Triac | 3 | 3 |
| **Configurable Output (CO)** | Analog Output, Voltage Mode, 0–10 VDC<br>Binary Output Mode, 24 VAC Triac | 2 | 2 |

**Table 2: VMA18 Series Information (Including Point Type Counts per Model)**

| | | VMA1826 | VMA1832 |
|---|---|---|---|
| **Integrated Actuator** | Internal | 1 | 1 |
| **Differential Pressure Transducer** | Internal | | 1 |
| **Zone Sensor Input** | On SA Bus (A total of 10 MS/TP addresses (IOMs), not including sensor addresses, can be used in a single VMA controller.) | Up to 4 NS Series Network Zone Sensors<br>Up to 9 WRZ sensors when using the ZFR or ZFR Pro Series wireless router configurations and up to 5 WRZ sensors when using the one-to-one WRZ-78xx wireless configuration | |

# VMA16 (32-bit), VMA18 Series, and VMA1930 Ordering Information

**Table 3: VMA16 (32-bit), VMA18 and VMA1930 Series Ordering Information**

| Product Code Number | Description |
|---|---|
| MS-VMA1615-1 | 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI and 2 BO; 24 VAC; FC Bus, and SA Bus |
| MS-VMA1617-1 | 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI and 2 BO; 24 VAC; FC Bus, and SA Bus, includes 8-pin TSTAT Port for use with TE-7xx Series Non-Communicating Sensors<br>ⓘ **Note:** This model is currently only available in Asia. Contact your local Johnson Controls representative for more information. |
| MS-VMA1626-1 | 32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus; (No DPT) |
| MS-VMA1628-1 | 32-bit, Integrated VAV Controller and DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus (No Actuator) |
| MS-VMA1630-1 | 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus |
| MS-VMA1632-1 | 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus, Includes 8-pin TSTAT Port for use with TE-7xx Series Non-Communicating Sensors<br>ⓘ **Note:** This model is currently only available in Asia. Contact your local Johnson Controls representative for more information. |
| MS-VMA1656-1 | 32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus, Integrated Ball Valve Linkage |

**Table 3: VMA16 (32-bit), VMA18 and VMA1930 Series Ordering Information**

| Product Code Number | Description |
|---|---|
| MS-VMA1826-1 | 32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus; Includes cable adapters for use when replacing VMA14xx Series controllers. Recommended replacement for VMA1440 controller (No DPT) |
| MS-VMA1832-1 | 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI and 2 BO; 24 VAC; FC Bus, and SA Bus, includes cable adapters for use when replacing VMA14xx Series controllers. Recommended replacement for VMA1410, VMA1415, or VMA1420 controller. |
| MS-VMA1930-0 | 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; and SA Sensor Port; Integral Real-time Clock; 2 Ethernet Ports for BACnet/IP Communications |

# Accessories

ⓘ **Note:** The accessories marked with an asterisk (*) in the table are not qualified for use with a UL 864 UUKL/UUKLC 10th Edition Listed Smoke Control system.

**Table 4: VMA16 (32-bit) Accessories**

| Product Code Number | Description |
|---|---|
| IOM Series | Refer to the *Metasys® System Field Equipment Controllers and Related Products Product Bulletin (LIT-12011042)* for a complete list of available IOM Series Modules. |
| TL-CCT-0 | *Metasys* Controller Configuration Tool (CCT) software |
| MS-FCP-0 | *Metasys* Field Controller Firmware Package Files for CCT |
| Mobile Access Portal (MAP) Gateway | Refer to the *Mobile Access Portal Gateway Catalog Page (LIT-1900869)* to identify the appropriate product for your region.<br>ⓘ **Note:** The MAP Gateway serves as a replacement for the the BTCVT, which is no longer available for purchase, but continues to be supported. |
| NS Series Network Sensors | Refer to the *NS Series Network Sensors Product Bulletin (LIT-12011574)* for specific sensor model descriptions. |
| MS-DIS1710-0* | Local Controller Display: Refer to *Local Controller Display Product Bulletin (LIT-12011273)* for more information. |
| NS-ATV7003-0 | Handheld VAV Balancing Tool |
| WRZ Series Wireless Room Sensors* | Refer to the *WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011653)* for specific sensor model descriptions. |
| Y64T15-0* | Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 30 in. Primary Leads and 30 in. Secondary Leads, Class 2 |
| Y65A13-0* | Transformer, 120 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount (Y65AS), 8 in. Primary Leads and 30 in. Secondary Leads, Class 2 |

**Table 4: VMA16 (32-bit) Accessories**

| Product Code Number | Description |
|---|---|
| Y65T42-0* | Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Hub Mount (Y65SP+), 8 in. Primary Leads and Secondary Screw Terminals, Class 2 |
| Y65T31-0 * | Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount (Y65AR+), 8 in. Primary Leads and Secondary Screw Terminals, Class 2 |
| AP-TBK1002-0 | 2-Position Screw Terminal that Plugs onto VMA Output Point Spade Lug |
| AP-TBK1003-0 | 3-Position Screw Terminal that Plugs onto VMA Output Point Spade Lugs |
| AP-TBK4SA-0 | Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown (Bulk Pack of 10) |
| AP-TBK4FC-0 | Replacement MS/TP FC Bus Terminal, 4-Position Connector (Bulk Pack of 10) |
| AP-TBK3PW-0 | Replacement Power Terminal, 3-Position Connector, Gray (Bulk Pack of 10) |
| AP-TBK2PW-0 | Replacement Power Terminal, 2-Position Connector, Gray (Bulk Pack of 10) |
| AS-CBLTSTAT-0 | Cable adapter for connection to 8-pin TE-6700 Series sensors |
| AS-CBLVMA-1 | Cable Adapter, 8-Pin Female Socket to 6-Pin Male Jack (Bulk Pack of 10) |
| AS-CBLVMA-2 | Cable Adapter, 8-Pin Female Socket to 8-Pin Male Jack with 6-Pin Female Socket for Wireless Commissioning Converter (Bulk Pack of 10) |
| MS-TBKLV03-0 | Terminal Block Kit - FAC Line Voltage AC Power - 3 Pieces |
| MS-TBKRO02-0 | Terminal Block Kit - FAC 2-Position Relay Output - 9 Pieces |
| MS-TBKRO03-0 | Terminal Block Kit - FAC 3-Position Relay Output - 6 Pieces |
| MS-TBKCO04-0 | Terminal Block Kit - FAC 4-Position Configurable Output - 6 Pieces |
| MS-TBKUI04-0 | Terminal Block Kit - FAC 4-Position Universal Input - 3 Pieces |
| MS-TBKUI05-0 | Terminal Block Kit - FAC 4-Position Universal Input - 3 Pieces |
| MS-VMAACT-701 | VMA Actuator Assembly Gearbox Replacement Kit |
| NS-WALLPLATE-0 | Network Sensor Wall Plate |
| F-1000-325 | Replacement Barbed Fitting for use on VMA1615, VMA1630, and VMA1832 for Connecting Tubing (Bulk Pack of 10) |
| F-1000-326 | Flexible Tubing Extension with Barbed Fitting for VMA1615, VMA1630, and VMA1832, 14 in. Length (Bulk Pack of 20). Use to extend tubing that connects between the DPT connectors and the DPT sensors, including when replacing a VMA1400 series controller with a VMA16xx or VMA18xx controller. |
| TL-BRTRP-0* | Portable BACnet/IP to MS/TP Router |
| WRZ-7860-0* | Receiver for One-to-One Wireless Room Sensing Systems - functions with WRZ Series Sensors room sensors |
| ZFR-USBHA-0* | ZFR USB Dongle provides a wireless connection through CCT to allow wireless commissioning of the wirelessly enabled FEC, FAC, IOM, and VMA16 controllers. Also allows use of the ZFR Checkout Tool (ZCT) in CCT.<br>ⓘ **Note:** The ZFR-USBHA-0 replaces the IA OEM DAUBI_2400 ZFR USB dongle.Foradditional information about the ZFR-USBHA-0 ZFR dongle, refer tothe *ZFR1800Series Wireless Field Bus System Technical Bulletin (LIT-12011295)*or *ZFR1800Series Wireless Field Bus System Quick Reference Guide(LIT-12011630)*. |

# Repair Information

If the product fails to operate within its specifications, replace the product. For a replacement product, contact the nearest Johnson Controls® representative.

# VMA16 (32-bit), VMA18 Series, and VMA1930 Technical Specifications

ⓘ **Note:** The MS-VMA1617-x and MS-VMA1632-x models are currently only available in Asia. Contact your local Johnson Controls representative for more information.

**Table 5: VMA16 (32-bit), VMA18 Series, and VMA1930**

| | |
|---|---|
| **Product Code Numbers** | **MS-VMA1615-1:** 32-bit, Integrated VAV Controller/Actuator/Pressure Sensor, 3 UI and 2 BO; 24 VAC; FC and SA Bus<br>**MS-VMA1617-1:** Same description as VMA1615 but includes 8-pin TSTAT Port for use with TE-7xx Series Non-Communicating Sensors<br>**MS-VMA1626-1:** 32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus (No DPT)<br>**MS-VMA1628-1:** 32-bit, Integrated VAV Controller and DPT, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus (No Actuator)<br>**MS-VMA1630-1:** 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, 2 CO; 24 VAC; FC and SA Bus<br>**MS-VMA1632-1:** Same description as VMA1630 but includes 8-pin TSTAT Port for use with TE-7xx Series Non-Communicating Sensors<br>**MS-VMA1656-1:** 32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus, Integrated Ball Valve Linkage (No DPT)<br>**MS-VMA1826-1:** 32-bit, Integrated VAV Controller and Actuator, 3 UI, 3 BO, and 2 CO; 24 VAC; FC Bus, and SA Bus, with 8-9in TSTAT Port, Recommended for use as a replacement for VMA1440 (No DPT)<br>**MS-VMA1832-1:** 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, 2 CO; 24 VAC; FC and SA Bus, with 8-pin TSTAT Port. Recommended for use as a replacement for VMA1410, VMA1415, or VMA1420<br>**MS-VMA1930-0:** 32-bit, Integrated VAV Controller/Actuator/Pressure Sensor - DPT, 3 UI and 3 BO, 2 CO, 24 VAC, and SA Bus, Includes 6-pin Sensor Port for use with TE-7xx Series Non-Communicating Sensors and two Ethernet Ports for BACnet/IP Communications<br><br>**Smoke Control Models:**<br>**MS-VMA1615-0U:** 32-bit, Integrated VAV Controller/Actuator/Pressure Sensor, 3 UI and 2 BO; 24 VAC; FC and SA Bus<br>**MS-VMA1630-0U:** 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, 2 CO; 24 VAC; FC and SA Bus<br>**MS-VMA1615-1U:** 32-bit, Integrated VAV Controller/Actuator/Pressure Sensor, 3 UI and 2 BO; 24 VAC; FC and SA Bus, Isolation Optimized<br>**MS-VMA1630-1U:** 32-bit, Integrated VAV Controller/Actuator/DPT, 3 UI, 3 BO, 2 CO; 24 VAC; FC and SA Bus, Isolation Optimized |

**Table 5: VMA16 (32-bit), VMA18 Series, and VMA1930**

| | |
|---|---|
| **Communications Protocol** | **MS-VMA16xx-x and MS-VMA18xx-x:**<br>BACnet MS/TP, N2<br>**MS-VMA1930-0:**<br>BACnet/IP |
| **Engines Supported** | **MS-VMA16xx-x and MS-VMA18xx-x:**<br>All Models<br>**MS-VMA1930-0:**<br>NAE55, NAE85, ODS (MS-VMA1930-0 supports R9.0 or later versions of these engines.) |
| **Power Requirement** | 24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety Extra-Low Voltage (SELV) (Europe) |
| **Power Consumption** | 10 VA typical, 14 VA maximum<br>ⓘ **Note:** VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 60 VA (maximum). |
| **Ambient Conditions** | **Operating:** 0 to 50°C (32 to 122°F)<br>**Storage:** -40 to 70°C (-40 to 158°F) |
| **Terminations** | **MS-VMA1615-x, MS-VMA1626-x, MS-VMA1628-x, MS-VMA1630-x, and MS-VMA1656-x:**<br>Inputs/Outputs: 6.3 mm (1/4 in.) Spade Lugs<br>FC Bus, SA Bus, and Supply Power: 4-Wire and 2-Wire Pluggable Screw Terminal Blocks<br>FC Bus and SA Bus Port: RJ-12 6-Pin Modular Jacks<br>**MS-VMA1617-x and MS-VMA1632-x:**<br>Inputs/Outputs, SA Bus, and Supply Power: 6.3 mm (1/4 in.) Spade Lugs<br>FC Bus: Pluggable Screw Terminal Block<br>TSTAT Modular Port: RJ-45 8-Pin Modular Jack<br>**MS-VMA1826-x and MS-VMA1832-x:**<br>Inputs/Outputs, SA Bus, and Supply Power: 6.3 mm (1/4 in.) Spade Lugs<br>N2/FC Bus: Pluggable Screw Terminal Block<br>TSTAT Modular Port: RJ-45 8-Pin Modular Jack<br>**MS-VMA1930-0:**<br>Inputs/Outputs: 6.3 mm (1/4 in.) Spade Lugs<br>SA Bus and Supply Power: 4-Wire and 2-Wire Pluggable Screw Terminal Blocks<br>SA Bus Modular Ports: RJ-12 6-Pin Modular Jacks |

**Table 5: VMA16 (32-bit), VMA18 Series, and VMA1930**

| | |
|---|---|
| **Controller Addressing** | **For BACnet-configured controllers:** DIP switch set: valid field controller device addresses 4–127 (device addresses 0–3 and 128–255 are reserved)<br>**For BACnet/IP controllers:** 3 rotary switches to assign a unique number for each controller on the subnet to identify it in the Controller Tool for uploading, downloading, and commissioning<br>**For N2-configured controllers:** DIP switch set; valid control device addresses 1–254 |
| **Communications Bus** | **MS-VMA16xx and MS-VMA18xx models:**<br>RS-485, field selectable between BACnet MS/TP and N2 communications:<br>**N2/FC Bus:** 1.5 mm (18 AWG) standard 3-wire, twisted, shielded cable recommended between the supervisory controller and field controllers<br>**BACnet MS/TP:** 0.6 mm (22 AWG) stranded, 4-wire (2-twisted pairs) shielded cable recommended from the VMA controller for network sensors and other sensor/actuator devices; includes a terminal to source 15 VDC supply power from VMA to SA Bus devices<br>ⓘ **Note:** For more information, refer to the *MS/TP Communications Bus Technical Bulletin (LIT-12011034)*.<br>**MS-VMA1930-0:**<br>BACnet/IP: Two Ethernet ports; 10/100 Mbps; 8-pin RJ-45 connector |
| **Processor** | **MS-VMA16 (32-bit) and MS-VMA18 models:** RX630 32-bit Renesas® microcontroller<br>**MS-VMA1930-0:** RX63N 32-bit Renesas microcontroller |
| **Memory** | **MS-VMA16 (32-bit) and MS-VMA18 models:** 1 MB Flash Memory and 512 KB RAM<br>**MS-VMA1930-0:** 16 MB serial flash memory and 8 MB of SDRAM |
| **Input and Output Capabilities** | **MS-VMA1615-x and MS-VMA1617-x:**<br>3 - Universal Input: Defined as 0–10 VDC, 0–600k ohm, or Binary Dry Contact<br>2 - Binary Outputs: Defined as 24 VAC Triac (internal power source)<br>**MS-VMA1626-x, MS-VMA1628-x, MS-VMA1630-x, MS-VMA1632-x, MS-VMA1656-x, MS-VMA1826-x, MS-VMA1832-x and MS-VMA1930-0:**<br>3 - Universal Input: Defined as 0–10 VDC, 0–600k ohm, or Binary Dry Contact<br>3 - Binary Outputs: Defined as 24 VAC Triac (internal power source)<br>2 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO |
| **Analog Input/ Analog Output Accuracy** | **Analog Input:** 15-bit resolution on UIs<br>**Analog Output:** 0–10 VDC ± 200 mV |

**Table 5: VMA16 (32-bit), VMA18 Series, and VMA1930**

| | |
|---|---|
| **Differential Pressure Transducer** | Range: -1.5 in. to 1.5 in. W.C.<br>**Performance Characteristics:**<br>Accuracy +/-1.3% Full Span Maximum (+/- .039 in. w.c.)<br>ⓘ **Note:** Combined error due to offset, non-linearity, and temperature variation.<br>Typical accuracy at zero (null) pressure is +/-0.2% fullscale<br>ⓘ **Note:** Includes error due to non-linearity. |
| **Mounting** | Mounts to damper shaft using single set screw and to duct with single mounting screw. |
| **Actuator Rating** | 4 N•m (35 lb•in.) minimum shaft length = 44 mm (1-3/4 in.) |
| **Dimensions** | **Height x Width x Depth:** 165 x 125 x 73 mm (6.5 x 4.92 x 2.9 in.)<br>**Center of Output Hub to Center of Captive Spacer:** 135 mm (5-5/16 in.) |
| **Weight** | 0.65 kg (1.45 lb) |
| **Compliance** | **United States:** UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment.<br>Suitable for use in other environmental air space (plenums) in accordance with Section 300.22(C) of the National Electric Code (1615, 1630, 1617, 1626, 1628, 1632, 1656, 1832, 1826 and 1930). UL1995 Plenum Rated (Models other than 1615, 1630,1617,1626, 1628, 1632, 1656, 1832, 1826 and 1930).<br>UL Listed, File S4977, UL 864 UUKL/UUKLC 10th Edition Listed, Smoke Control Units and Accessories for Fire Alarm Systems Equipment (models with **U** product code suffix only)<br>FCC Compliant to CFR47, Part 15, Subpart B, Class A. |
| | **Canada:** UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003<br>UL Listed, File S4977, UL 864 UUKL/ORD-C100-13 10th Edition Listed, Smoke Control Units and Accessories for Fire Alarm Systems (models with U product code suffix only) |
| CE | **Europe:** CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and RoHS Directive. |
| | **Australia and New Zealand:** RCM Mark, Australia/NZ Emissions Compliant. |
| | **BACnet International:**<br>**MS-VMA16xx and MS-VMA18xx models:** BACnet Testing Laboratories (BTL) Protocol Revision 7 Listed BACnet Application Specific Controller (B-ASC)<br>**MS-VMA1930-0:** BACnet Testing Laboratories (BTL) Protocol Revision 15 Listed and Certified BACnet Advanced Application Controller (B-AAC) |

*The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.*