

Spyder Model 5

COMPACT VAV CONTROLLER

WEB-VA423B24N

Honeywell

PRODUCT DATA



Figure 1 :WEB- VA423B24N

GENERAL

The WEB-VA423B24N controller is part of the Honeywell WEBs Spyder Model 5 family. The Honeywell Spyder Model 5 (WEB- VA423B24N) family of unitary controllers provide flexible, freely programmable, demand-led control that delivers tangible benefits to reduce energy spends while driving new levels of functionality and efficiency in today's buildings. These scalable and freely programmable BACnet MS/TP-based unitary controllers utilize smart engineering & commissioning tools, and Sylk™ bus technology. Multiple flexible configurations can be achieved to address specific applications.

FEATURES

- Compact design for small enclosures.
- Easy to install on round ducts.

- Three 24 VAC solid state relay outputs with 1.5 A continuous and 3.5 A in-rush for 100 milliseconds per DO channel.
- Integrated DP sensor and field replaceable 44 in-lbs (5 Nm) actuator with 90 sec runtime at 60 Hz (108 sec at 50 Hz).
- High-precision bi-directional DP sensor to achieve precise measurement even at low air flow.
- Supports Auto-baud rate adaption for BACnet MS/TP communication.
- Auto MAC-addressing.
- Color-coded removable terminal blocks to simplify wiring and replacement.
- Supports offline and online programming. Online programming enables quick application optimization using single tool.
- Supports concept of flexible applications.
- Bulk commissioning of similar controller applications (Master-Follower concept).
- BACnet compliant time program.
- 24 VAC power supply.
- 20 VDC at 75mA auxiliary supply for field devices.
- Sylk™ bus two-wire polarity insensitive interface connects to Honeywell Sylk™ wall modules without using I/O points.
- Real-time clock, a supercapacitor for 72 Hours data retention.
- Qualified CE, UL916, UL2043
- BACnet BTL®- Listed as BACnet Advanced Application Controller (B-AAC) (In Progress).

SYSTEM OVERVIEW

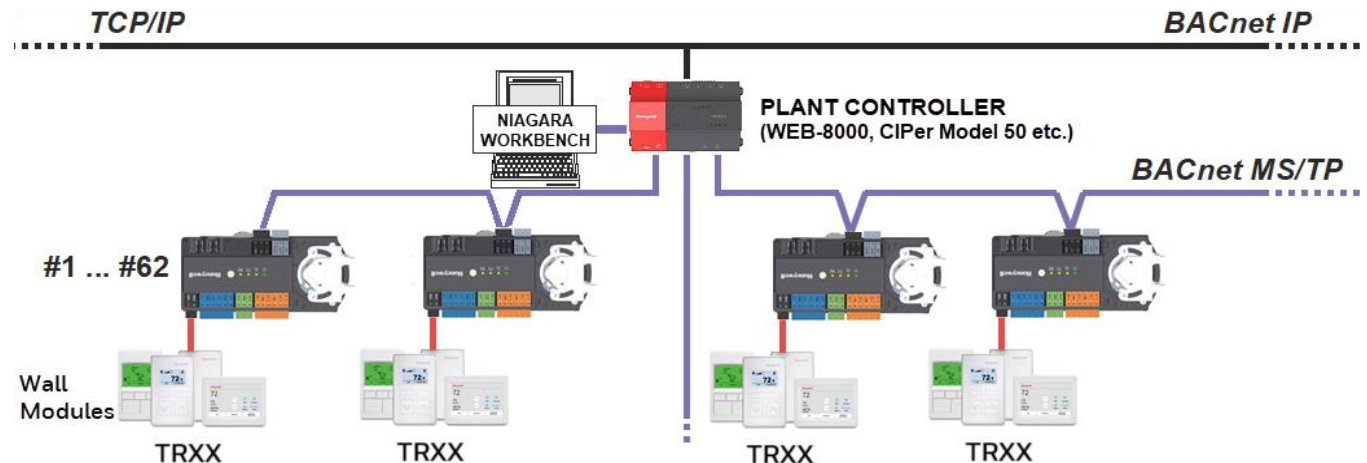


Figure 2: System Overview

Table 1. Ordering Information

Controller Model	Description	Power supply	UIs	AOs	Total no. of I/Os	Digital Outputs	Air flow sensor	Integrated Actuator / Declutch	Remarks
WEB-VA423B24N	Spyder Model 5 Compact VAV with integrated actuator	24 VAC	4	2	9	3	1	Yes	72 hours data retention

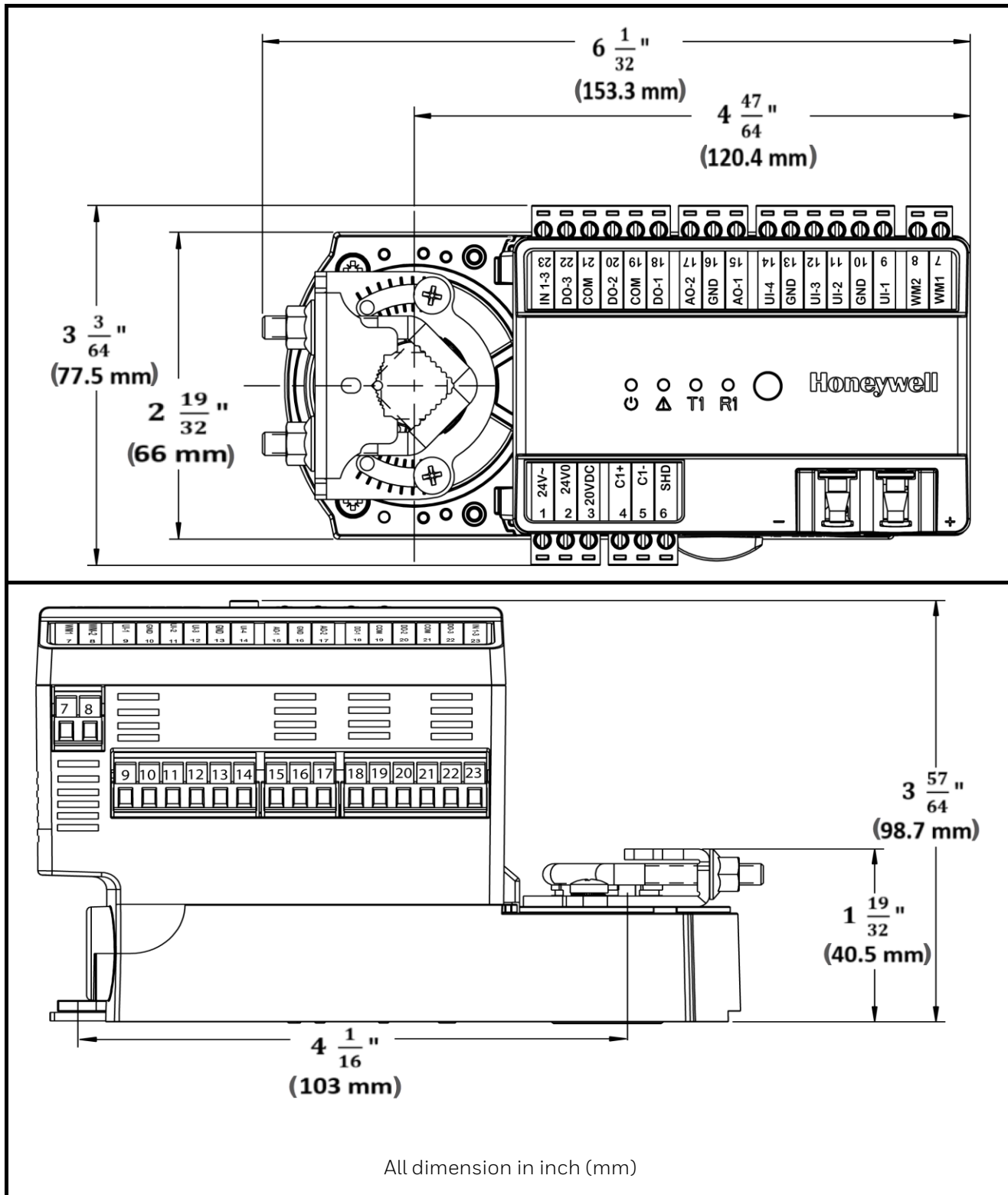
Table 2. Replacement Parts

Device Model	Description	Power supply	UIs	AOs	Total no. of I/Os	Digital Outputs	Air flow sensor	Integrated Actuator / Declutch	Remarks
WEB-V423B24N	Spyder Model 5 Compact VAV controller only	24 VAC	4	2	9	3	1	No	72 hours data retention
COVA	Spyder Model 5 Compact VAV actuator only	24 VAC	-	-	-	-	-	-	-

Table 3. Controller Part number Description

Legend	Description
WEB	Brand Identifier
V	VAV Application
A	Actuator
4	Universal Inputs
2	Analog Outputs
3	Digital Outputs
B	BACnet MS/TP
24	24VAC power supply
N	Firmware version - Niagara

DIMENSIONS



SPECIFICATIONS

Electrical		
Power Supply	20-30 VAC, 50/60 Hz, Class 2 transformer	
Power Consumption	<ul style="list-style-type: none"> • Controller with all connected loads: 100 VA maximum • Controller only: 20 VA maximum 	
Auxiliary Output	20 VDC ± 10% at 75 mA	
Real Time Clock	72-hr backup after power failure	
Indicator LEDs	Green – Power Yellow – Status, BACnet MS/TP transmit and receive	
CPU	32-bit MK24FN NXP Kinetis Cortex M4	
Memory Capacity	K24 Flash	1MB
	K24 RAM	256KB
	SPI Flash	8MB
Communication		
BACnet MS/TP	Auto-baud rate adaption. Cable length 3600 ft (1200 m) for up to 76.8 kbps. Refer also to communication section.	
Sylk™ Bus	2-wire, polarity-insensitive	
Actuator		
Torque	44 in-lbs (5 Nm)	
Run Time	Floating 108 s at 50 Hz Floating 90 s at 60 Hz	
Mounting Shaft	Round	5/16 – 5/8 in. (8-16 mm)
	Square	15/64 – 33/64 in. (6-13 mm)
	Shaft length ≥ 44 mm (1 ⁴⁷ /64 in).	
Differential Pressure Sensor (Bi-Directional)		
Range	0 - 2.0 in. H ₂ O (500 Pa)	
Accuracy	±3% of measured value	
Inputs and Outputs		
I/O	4 UI, 2AO, 3 Digital Outputs	
Analog Output Resolution	16-bit digital to analog converter	
Analog Voltage Outputs	Voltage Output Range	0-10 VDC
	Output Current	10.0 mA DC
Analog Current Outputs	Current output range	4-20 mA DC
	Output Load Resistance	Maximum 550 Ω
Digital Outputs	Voltage Rating	24 VAC at 50/60 Hz
	Current Rating	1.5 A continuous and 3.5 A in-rush for 100 ms. Per DO channel.

Weight and Dimensions		
Dimension (L X W X H)	6 ¹ / ₃₂ X 3 ³ / ₆₄ X 3 ⁵⁷ / ₆₄ in. (153.3 X 77.5 X 98.7 mm.)	
Weight	1.3 lbs (0.6 kg)	
Mounting	Fixation with bracket and shaft	
Operating Environmental (Position Insensitive)		
Storage	-40 °F to 150 °F (-40 °C to 66 °C)	
Operation	32 °F to 122 °F (0 °C to 50 °C)	
Humidity	5% to 95% RH., non-condensing	
Protection	IP20, NEMA-1	
Pollution Level	2	
Certification		
<ul style="list-style-type: none"> • UL916, UL2043 certified • BTL-listed, BACnet B-AAC profile (In progress) • CB Certificate • CE approved • FCC part 15B-compliant. • RoHS conformity • IC (Industrial Canada) 		
Sylk™ Devices Supported		
Wall Modules Sensors	TR40, TR40-H, TR40-CO2, TR40-H-CO2, TR42, TR42-H, TR42-CO2, TR42-H-CO2, TR71, TR71-H, TR75, TR75-H, TR120, TR120-H	
C7400S Sylk™ Sensor		
Universal Input (UI) Circuits		
Input Type	Sensor type	Operating Range
Universal Input Resolution	16-bit analog to digital converter	
Room/Zone Discharge Air Outdoor Air Temperature	20 KΩ NTC	-40 °F to 199 °F (-40 °C to 93 °C)
Outdoor Air Temperature	PT1000 (IEC751 3850)	-40 °F to 199° F (-40 °C to 93 °C)
Resistive Input	Custom	100 Ω to 100 KΩ
Voltage Input	Transducer, Controller	0-10 VDC
Discrete Input	Dry Contact closure	0-10 VDC without pull-up resistor, External 499 Ω resistor required to measure 0-20 mA
Slow Binary Input specifications	Closed Contact	≤10 KΩ
	Open Contact	≥20 KΩ
Pulse Input ^a	Counter/Meter	<ul style="list-style-type: none"> • Maximum frequency: 15 Hz • Minimum pulse width: 33 ms.
^a One Universal Input (UI-1) on the WEB-VA423B24N is user selectable as a fast digital pulse meter.		

INTERFACES AND TERMINALS

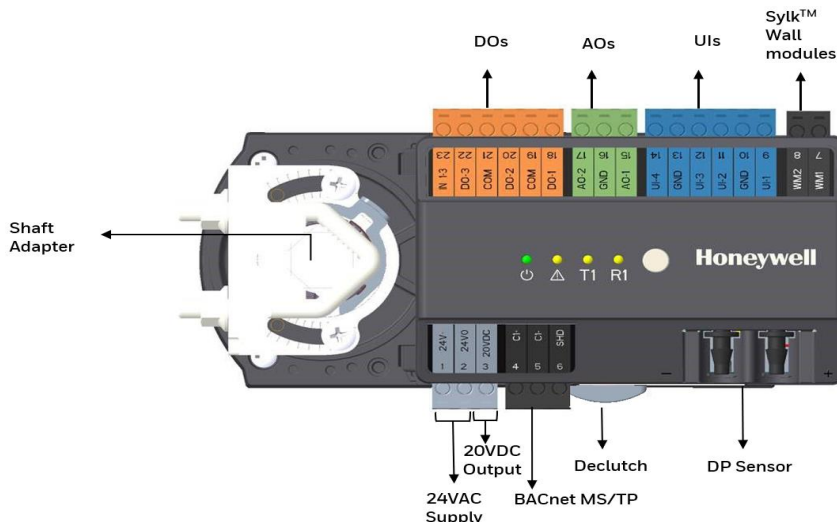


Table 4. Assigned Terminals

Terminal	Printing	Function
1	24 V~	Supply Voltage (24 V)
2	24 V0	Supply Voltage (GND), internally connected with terminal 10, 13 & 16
3	20 VDC	20 VDC power out
4,5	C1+, C1-	Removable BACnet MS/TP interface
6	SHD	Shield for external wiring support. It is not connected internally.
7,8	WM1, WM2	Removable interface for Sylk™ bus
9	UI-1	Universal Input 1
10	GND	Ground
11	UI-2	Universal Input 2
12	UI-3	Universal Input 3
13	GND	Ground
14	UI-4	Universal Input 4
15	AO-1	Analog Output 1
16	GND	Ground
17	AO-2	Analog Output 2
18	DO-1	Digital Output 1
19	COM	Supply voltage common terminal for DO. It is internally connected to terminal 21 but not to the controller's GND terminal.
20	DO-2	Digital Output 2

Terminal	Printing	Function
21	COM	Supply voltage common terminal for DO. It is internally connected to terminal 19 but not to the controller's GND terminal.
22	DO-3	Digital Output 3
23	IN 1-3	24V AC/DC input for DOs 1-3

STATUS INFORMATION

The LED's on the top of the controller provides a visual indication of the status of the device. When the controller receives power, the LED appears in one of the following allowable states, as described below.



Table 5. Description of LED behaviors

Symbol	Color	Function
	Green	Power LED indicating firmware problems, hardware problems, etc.
	Yellow	Status LED indicating firmware problems, hardware problems, etc.
	Yellow*	LED indicating transmission of communication signals via the BACnet MS/TP interface.
	Yellow*	LED indicating reception of communication signals via the BACnet MS/TP interface.

*In case of no communication LED will not glow.

Table 6. Status LED and power LED behaviors

Mode	Power LED (green)	Status LEDs (yellow)
Power failure	OFF	OFF
Device error*	ON	ON
Firmware Download	ON/OFF (1 Hz)	ON/OFF (1 Hz)
No application	ON/OFF (0.5 Hz)	ON/OFF (0.25 Hz)
Broken sensor	ON/OFF (0.25 Hz)	Stays ON
Short-circuiting	ON/OFF (0.5 Hz)	Stays ON
Auto-MAC	ON/OFF (1 Hz)	ON/OFF (0.5 Hz)
Unacknowledged alarm	ON/OFF (2 Hz)	ON/OFF (2 Hz)
Normal operation	ON/OFF (0.5 Hz)	Stays OFF

*Please return the controller for repair. Contact Honeywell WEBs Customer Care for assistance. The ON/OFF frequencies listed in Table above can be converted from "Hz" (i.e., "ON/OFF per second") to "ON/OFF per minute" by multiplying them by 60.

COMMUNICATION

BACnet MS/TP

The controller features an RS485 interface (Terminal 4,5, and 6) suitable for BACnet MS/TP communication. The terminal block containing it is black.

Baud rate	Maximum cable length (L)
9.6, 19.2, 38.4 , 57.6, and 76.8 kbps	3600 ft (1200 m)

The controller supports auto-baud rate adaption for BACnet MS/TP communication at all of the aforementioned baud rates. For information on wire gauge, maximum permissible cable length, possible shielding and grounding requirements, and the maximum number of devices which can be connected to a bus, refer to standard EIA-485. Each controller uses a high-quality EIA-485 transceiver and exerts 1/8 unit load on the MS/TP network.

Automatic MAC Addressing

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In contrast to many other MS/TP controllers, the WEB-VA423B24N controller features automatic MAC addressing. There is no need to manually set the MAC address.

INSTALLATION

WEB-VA423B24N controllers include the direct-coupled actuator with declutch mechanism, which is shipped hard-wired to the controller. The actuator mounts directly onto the VAV box damper shaft and has up to 44 in-lbs (5 Nm) torque, 90-degree stroke, and 108 second timing at 50 Hz and 90 second timing at 60 Hz. The minimum VAV damper shaft length is 1 47/64 in. (44 mm). Please see installation manual for more information.

RELATED TECHNICAL LITERATURE

Title	Product Literature number
Spyder Model 5 Compact VAV controller WEB-VA423B24N - Installation Instructions	31-00362
Spyder Model 5 Compact VAV controller WEB-VA423B24N – Mounting Instructions	31-00347
Spyder Model 5 Compact VAV controller WEB-VA423B24N – Migration Guide	31-00363
Spyder Model 5 – Engineering Tool User Guide	31-00282
TR40x/TR42x – Specification Data	63-1389
TR40x/TR42x – Installation Instructions	62-0467
TR40x/TR42x – Operating Guide	63-2741
TR2x Series – Specification Data	63-1321
TR2x Series – Installation Instructions	62-0267
TR120 – Specification Data	31-00312
TR120 – Installation Instructions	31-00275
TR120 – Operating Guide	63-2719
TR75 – Specification Data	63-1322
TR75 – Installation Instructions	62-0271
TR75 – Operating Guide	63-2719
C7400S – Specification Data	63-1365
C7400S – Installation Instructions	62-0332

TRADEMARK INFORMATION

BACnet™ is a trademark of ASHRAE Inc.
 Sylk™ is a trademark of Honeywell International Inc.