

EasyLogic RP-V for Niagara Framework® Room Controllers

I/A Series



Introduction

EasyLogic™ RP-V-5C-M for Niagara Framework® is a room-purpose, fully programmable, BACnet MS/TP based field controller dedicated for VAV cooling and Heating applications. The RP-V integrates a controller, a damper actuator, and an air flow sensor in a single compact package for ease of installation. The RP-V can either be used as a standalone field controller or as part of an I/A Series Niagara BMS with a JACE or Niagara Supervisor as the parent server.

The RP-V has the following features:

- Native BACnet MS/TP support
- Integrated damper actuator with feedback signal

- Factory-calibrated air flow sensor
- Versatile onboard I/O point mix
- Built-in isolated power supply
- Advanced monitoring
- RS-485 port to support Sensor Bus
- Sensor bus for SpaceLogic living space sensors
- EasyLogic living space sensors
- Commission mobile application for commissioning of the controller before the BMS is in place
- Seamless integration with I/A Series Niagara software
- Upgrade with signed firmware

EasyLogic RP-V for Niagara Framework®

Native BACnet MS/TP support

The EasyLogic range of RP and MP controllers and RP-IO I/O modules natively communicate with JACE controllers/servers and field devices using the BACnet MS/TP protocol.

The RS-485 port with 3-pole screw terminal block is used for connection to the BACnet MS/TP network.

The other RS-485 port (Com A), with RJ45 interface, can be configured to support the sensor bus. For more information, see section “RS-485 port to support Sensor Bus”.

Versatile mix of I/O points

The RP-V-5C-M controller has an I/O point count and a versatile mix of I/O point types that match a wide variety of VAV applications. The universal inputs/outputs are highly flexible and can be configured as either inputs or outputs.

I/O Point Types

I/O Point Types	RP-V-5C-M
Universal I/O Type Ub	2
Solid-state relay outputs (MOSFET)	3

Configurations by I/O Point Types

Configurations	Universal I/O Type Ub	Solid-state Relay Outputs (MOSFET)
Digital inputs	yes	-
Counter inputs	yes	-
Supervised inputs	yes	-
Voltage inputs (0 to 10 VDC)	yes	-
Current inputs (0 to 20 mA)	yes	-
Temperature inputs	yes	-
Resistive inputs	yes	-
Voltage outputs (0 to 10 VDC)	yes	-
Digital outputs	-	yes
Digital pulsed outputs	-	yes
PWM outputs	-	yes
Tristate outputs	-	yes
Tristate pulsed outputs	-	yes

Universal inputs/outputs

The universal inputs/outputs are ideal for any mix of temperature, pressure, flow, status points, and similar point types in a building control system.

As counter inputs, the universal inputs/outputs are commonly used in energy metering applications. As supervised inputs, they are used for security applications where it is critical to know

whether or not a wire has been cut or shorted. These events provide a separate indication of alarms and events in the system.

For all analog inputs, maximum and minimum levels can be defined to automatically detect over-range and under-range values.

EasyLogic RP-V for Niagara Framework®

The universal inputs/outputs are capable of supporting analog outputs of type voltage outputs. Therefore, the universal inputs/outputs support a wide range of devices, such as actuators.

Only devices with safe extra low voltage equipment (SELV/PELV) inputs/outputs should be connected to the universal inputs/outputs.

Solid-state relay outputs

The solid-state relay (SSR) outputs can be used in many applications to switch 24 VAC or 24 VDC on or off for external loads such as actuators, relays, or indicators. SSRs are silent and are not adversely affected by relay contact wear.

For UL-compliant applications, the SSR outputs are rated for 24 VAC, Class 2 circuits.

I/O expansion

For applications that require more I/O resources, the EasyLogic RP-IO modules provide a versatile mix of I/O points for any application. For more information, see the EasyLogic RP-IO for Niagara Framework Specification Sheet.

Integrated damper actuator with feedback signal

The integrated damper actuator allows for simplified installation of RP-V directly over the damper shaft. This means that separate installation, wiring, and positioning of the damper motor is not needed. RP-V uses the same actuator mechanics as MP-V and many Schneider Electric VAV controller models from the Andover Continuum, Vista, I/A Series, and I/NET product lines. The feedback signal from the actuator makes it possible to determine the exact position of the damper. The actuator also features a push button for manual positioning of the damper during commissioning.

Factory-calibrated air flow sensor

The factory-calibrated air flow sensor uses a micro-flow channel integrated with the sensor chip that requires only a small air flow from the velocity probe. The sensor requires no maintenance and a minimum of field adjustments.

Built-in isolated power supply

The RP-V controller has a built-in power supply designed to accommodate 24 VAC input power. The AC power input (L and N) is galvanically isolated from the electronics. This minimizes the risk of damage due to earth currents and permits the input power to be wired without concern for AC polarity matching. With the isolated AC power input, you can use a central transformer for many RP-Vs, instead of one transformer for each RP-V, to reduce installation costs.

Advanced monitoring

The RP and MP controllers support local trends, schedules, and alarms, enabling local operation when the controller is offline or used in standalone applications.

The battery-free power backup of the memory helps prevent data loss and allows seamless and quick recovery after a power disruption.

RS-485 port to support Sensor Bus

The RP-V-5C-M controller has one RS-485 port (Com A), which can be configured to support the Sensor Bus.

Sensor bus for SpaceLogic living space sensors

The RP and MP controllers provide an interface designed for the SpaceLogic Sensor family of living space sensors. The SpaceLogic Sensor devices offer an efficient way to sense the temperature, humidity, CO₂, and occupancy in a room. The SpaceLogic Sensor devices are available with different combinations of sensor types and various covers and user interface options, such as touchscreen, setpoint and override buttons, and blank covers. For more information, see the SpaceLogic Sensors - SXWS Sensors for MP and RP IP Controllers - Specification Sheet.



SpaceLogic Sensor devices

The RP controller sensor bus provides both power and communications for up to four sensors that are daisy-chained using standard Cat 5 (or higher) cables. This maximum number of sensors that can be connected to a controller is regardless of

EasyLogic RP-V for Niagara Framework®

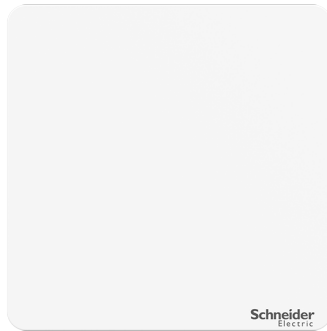
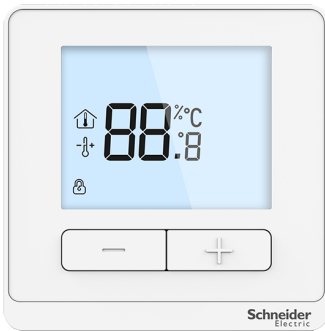
the sensor model and the combination of cover and sensor base type:

- Blank covers: Up to four sensors of any combination of sensor base types
- 3-button and touchscreen covers: Up to four sensors of any combination of sensor base types
- SpaceLogic LCD temperature sensors: Up to four sensors are supported

The maximum total length of the sensor bus is 61 m (200 ft). For more information, see the SpaceLogic Sensors - SXWS Sensors for MP and RP IP Controllers - Specification Sheet.

EasyLogic living space sensors

The EasyLogic Sensor devices provide a cost-effective solution to measure, control, and communicate the temperature. The sensors are connected to analog inputs of the RP or MP controller. The EasyLogic Sensor devices are available in two models with different user interfaces, a blank cover or an LCD display with buttons for setpoint control. For more information, see the EasyLogic Sensors - Temperature Sensors – Analog - Specification Sheet.

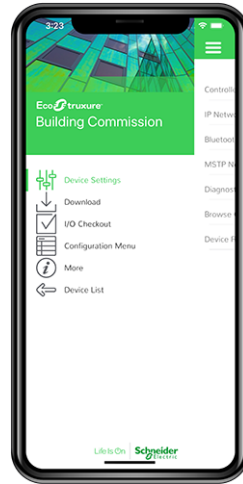


EasyLogic Sensor devices

Commission mobile application

The Commission mobile application is designed for local configuration, field deployment, commissioning of RP and MP controllers, and air flow balancing of VAV units. The mobile application reduces the commissioning time, allows flexibility in project execution, and minimizes dependencies on network infrastructure.

The mobile application is designed for use with Android, Apple (iOS), and Microsoft Windows devices. For more information, see the EcoStruxure Building Commission Specification Sheet.



Commission mobile application

Using the Commission mobile application, you can connect to an RP controller. To connect to the RP controller, you use the SpaceLogic Bluetooth Adapter connected to a SpaceLogic Sensor.

Device configuration

With the Commission mobile application, you can easily discover RP controllers on the BACnet network. You can change the configuration of each controller, including the BACnet network settings, location, and parent server. To save engineering time, you can save common device settings and then reuse them for controllers of the same model.

Field I/O checkout

The Commission mobile application does not require an I/A Series Niagara server or a network infrastructure to be in place. You can use the mobile application to browse objects and view device status information. You can also perform an I/O checkout to verify that the controller's I/O points are configured, wired, and operating correctly.

Air flow balancing

Using the Commission mobile application, you can perform air flow balancing of VAV units controlled by RP-Vs. An intuitive workflow automatically guides you through the process. After the flow balancing, you can generate a report in HTML format for one or more VAV units. The balancing parameters associated with each RP-V are stored in the parent server, which makes it easier to replace the controller if necessary.

EasyLogic RP-V for Niagara Framework®

Seamless integration with I/A Series Niagara software

The power of the RP and MP controllers is fully realized when part of an I/A Series Niagara BMS, which provides the following benefits:

- Device discovery
- Full engineering capability from Workbench
- Graphical programming from a Wiresheet
- Support for custom Script programs
- Engineering efficiency

Device discovery

The enhanced Device Discovery in Workbench enables you to easily identify RP and MP controllers on a BACnet network and to associate the controllers with their parent server.

Full engineering capability from Workbench

Workbench provides a consistent user experience regardless of which I/A Series Niagara BMS server the user is logged on to. The user can log on to the parent Niagara BMS server to engineer, commission, supervise, and monitor the RP or MP controller and its I/O as well as its attached SpaceLogic or EasyLogic Sensor devices.

Graphical programming from a Wiresheet

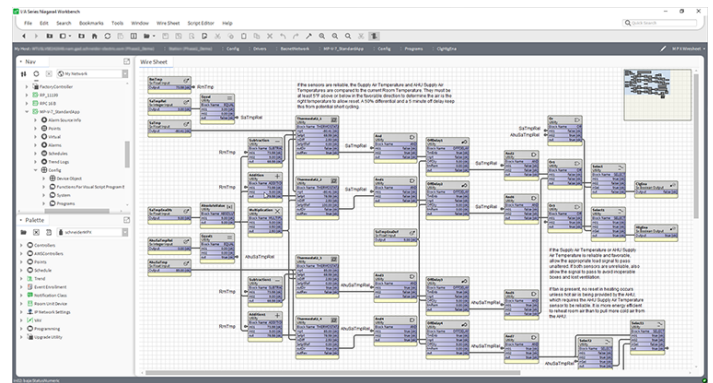
The RP and MP controllers can be programmed directly using the familiar Wiresheet interface and an extensive palette of graphical program objects. Users can quickly drag, drop, and configure program objects to create full applications and download to the controllers.

Support for custom Script programs

The RP and MP controllers also support custom Script programs. Users can write their own custom Script programs, compile, and download them to the controller. These custom Script programs will appear graphically on a Wiresheet where they can be bound with other objects.

Engineering efficiency

Workbench supports both online and offline engineering of RP and MP controllers. You can create and engineer controllers offline and then associate with an online controller when complete.



Workbench

Upgrade with signed firmware

Using digitally signed firmware provides more secure upgrading of the device. During an upgrade, the device verifies that the firmware is authentic and uncompromised. If the device detects discrepancies in the authenticity or integrity of the firmware, it will reject the upgrade. Once the device is upgraded with signed firmware, all upgrades thereafter must be with a signed firmware version.

Part Number for EasyLogic RP-V

Product	Part number
RP-V-5C-M	SXWRPV5CM1001

Part Numbers for RP-V Accessories

Product	Part number
Adapter for damper shaft diameter 9.5 mm (0.375 inch)	AM-135
SpaceLogic Bluetooth Adapter	SXWBTAECXX1001

For more information on part numbers for Network Connectivity Accessories, see the Product Selection Guide - EcoStruxure Building.

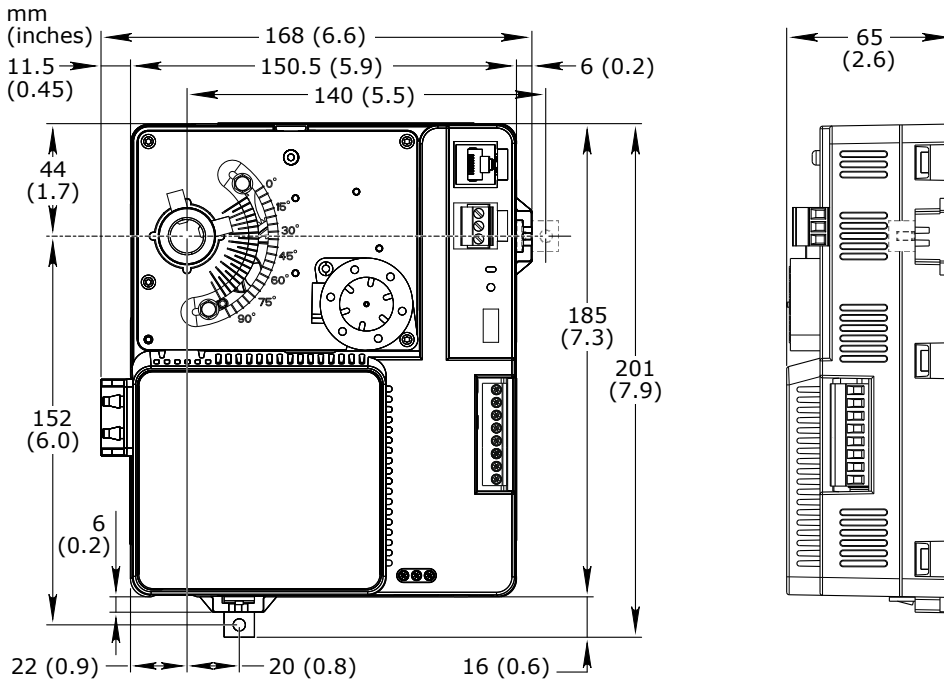
EasyLogic RP-V for Niagara Framework®

Specifications

EasyLogic RP-V for Niagara Framework®		
AC input		
Type		Isolated Class 2 input
Nominal voltage		24 VAC
Operating voltage range		+/-15 %
Frequency		50/60 Hz
Maximum power consumption		11 VA
Base Load Including All I/O	SpaceLogic Sensors on Sensor Bus	Total
6.4 VA	4.6 VA ^a	11 VA
<small>a) The example of 4.6 VA for the Sensor Bus (Com A) is based on a 2.8 W load on Com A. This gives an approximate conversion factor of 1.644 VA per Watt, which can be applied to the Com A load, which should not exceed 3 W.</small>		
Power input protection		MOV suppression and internal fuse
Environment		
Ambient temperature, operating		0 to 50 °C (32 to 122 °F)
Ambient temperature, storage		-40 to +70 °C (-40 to +158 °F)
Maximum humidity		95 % RH non-condensing
Material		
Plastic flame rating		UL94 V-0
Ingress protection rating		IP 20
Mechanical		
Dimensions		168 W x 201 H x 65 D mm (6.6 W x 7.9 H x 2.6 D in.)

EasyLogic RP-V for Niagara Framework®

Continued



Weight	0.972 kg (2.143 lb)
Installation	Over the damper shaft
Terminal blocks	Power and I/O: Fixed BACnet MS/TP communications: Removable
Compatibility	
I/A Series Niagara software	version 4.10 and later
Agency compliances	
Emission	RCM; BS/EN 61000-6-3; BS/EN IEC 63044-5-2; FCC Part 15, Sub-part B, Class B
Immunity	BS/EN 61000-6-2; BS/EN IEC 63044-5-3
Safety standards	BS/EN 60730-1; BS/EN 60730-2-11; BS/EN IEC 63044-3; UL 916 C-UL US Listed ^a
a) The RP-V-5C-M model is marked "Energy Management Equipment".	
Fire performance in air-handling spaces ^a	UL 2043
a) The RP-V-5C-M model is approved for plenum applications.	
Communication ports	
RS-485 port Com A	24 VDC, 3 W, RS-485 (RJ45) Transient voltage suppressors on communication and power signals
RS-485 port Com B	RS-485 (3-pole screw terminal block) Transient voltage suppressors on communication signals
RS-485 transceiver characteristics	
Transceiver type	Failsafe Non-isolated

EasyLogic RP-V for Niagara Framework®

Continued

External biasing	None required
Total Unit Load (UL) per device	Maximum 0.5 UL

Communications

BACnet	BACnet MS/TP, maximum bus length: 1200 m (4000 ft), maximum baud rate: 76800 BTL B-AAC (BACnet Advanced Application Controller) ^a
a) See the BTL Product Catalog for up-to-date details on BTL listed firmware revisions on BACnet International's home page.	

CPU

Frequency	500 MHz
Type	ARM Cortex-A7 single-core
Internal SRAM	6 MB
NOR flash memory	32 MB
Memory backup	128 kB ^a , FRAM, non-volatile
a) RP-V-5C-M with hardware version earlier than 05 has a FRAM memory with a size of 8 kB. For these hardware versions, the use of Script programs is recommended to save FRAM memory space.	

Damper actuator

Torque rating	10 Nm (88.5 lbf.in)
Stroke	0° to 90°, fully adjustable
Timing	Approximately 2 seconds/degree at 60 Hz and 2.4 seconds/degree at 50 Hz
Position indication	Visual indication
Damper position feedback	Yes
Manual override	Push-button clutch release
Damper shaft diameter	12.7 mm (0.5 inch) or 9.5 mm (0.375 inch) Adapter kit AM-135 is required for 9.5 mm (0.375 inch) diameter shafts.
Damper shaft minimum length (from VAV box)	22.2 mm (0.875 inch)

Air flow sensor

Range	0 to 249 Pa (0 to 1 inH ₂ O)
Resolution	0.0167 Pa (0.000067 inH ₂ O)
Accuracy	±5% of reading (typical) at 25°C (77°F)

Universal inputs/outputs

Channels	2 Ub, Ub1 to Ub2
Absolute maximum ratings	-0.5 to +24 VDC
A/D converter resolution	16 bits
Universal input/output protection	Transient voltage suppressor on each universal input/output

EasyLogic RP-V for Niagara Framework®

Continued

Digital inputs	
Range	Dry contact switch closure or open collector/open drain, 24 VDC, typical wetting current 2.4 mA
Minimum pulse width	150 ms
Counter inputs	
Range	Dry contact switch closure or open collector/open drain, 24 VDC, typical wetting current 2.4 mA
Minimum pulse width	20 ms
Maximum frequency	25 Hz
Supervised inputs	
5 V circuit, 1 or 2 resistors Monitored switch combinations	Series only, parallel only, and series and parallel
Resistor range For a 2-resistor configuration, each resistor must have the same value +/- 5 %	1 to 10 kohm
Voltage inputs	
Range	0 to 10 VDC
Accuracy	+/- (7 mV + 0.2 % of reading)
Resolution	1.0 mV
Impedance	1 Mohm
Current inputs	
Range	0 to 20 mA
Accuracy	+/- (0.01 mA + 0.4 % of reading)
Resolution	1 µA
Impedance	47 ohm
Resistive inputs	
10 ohm to 10 kohm accuracy R = Resistance in ohm	+/- (7 + 4 x 10 ⁻³ x R) ohm
10 kohm to 60 kohm accuracy R = Resistance in ohm	+/- (4 x 10 ⁻³ x R + 7 x 10 ⁻⁸ x R ²) ohm
Temperature inputs (thermistors)	
Range	-50 to +150 °C (-58 to +302 °F)
Supported thermistors	
Honeywell	20 kohm
Type I (Continuum)	10 kohm
Type II (I/NET)	10 kohm

EasyLogic RP-V for Niagara Framework®

Continued

Type III (Satchwell)	10 kohm
Type IV (FD)	10 kohm
Type V (FD w/ 11k shunt)	Linearized 10 kohm
Satchwell D?T	Linearized 10 kohm
Johnson Controls	2.2 kohm
Xenta	1.8 kohm
Balco	1 kohm
Measurement accuracy	
20 kohm	-50 to -30 °C: +/-1.5 °C (-58 to -22 °F: +/-2.7 °F) -30 to 0 °C: +/-0.5 °C (-22 to +32 °F: +/-0.9 °F) 0 to 100 °C: +/-0.2 °C (32 to 212 °F: +/-0.4 °F) 100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)
10 kohm, 2.2 kohm, and 1.8 kohm	-50 to -30 °C: +/-0.75 °C (-58 to -22 °F: +/-1.35 °F) -30 to +100 °C: +/-0.2 °C (-22 to +212 °F: +/-0.4 °F) 100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)
Linearized 10 kohm	-50 to -30 °C: +/-2.0 °C (-58 to -22 °F: +/-3.6 °F) -30 to 0 °C: +/-0.75 °C (-22 to +32 °F: +/-1.35 °F) 0 to 100 °C: +/-0.2 °C (32 to 212 °F: +/-0.4 °F) 100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)
1 kohm	-50 to +150 °C: +/-1.0 °C (-58 to +302° F: +/-1.8 °F)
Voltage outputs	
Range	0 to 10 VDC
Accuracy	+/-60 mV
Resolution	10 mV
Minimum load resistance	2.4 kohm
Source current	+4.2 mA
Sink current	-1 mA (0 to 0.4 VDC) -4.2 mA (0.4 to 10 VDC)
Solid-state relay outputs, DO	
Channels	3, DO1 to DO3
Output ratings for Non-UL applications	
Current range	Maximum 1.5 A load per output Maximum 3 A total load for the 3 outputs
AC voltage range	Maximum 30 VAC
DC voltage range	Maximum 30 VDC
Commons	COM for DO1, DO2, and DO3
When the SSR outputs are used to switch AC, the common terminals can be connected to 0 to 30 VAC. When the SSR outputs are used to switch DC, the common terminals can be connected to -30 VDC to +30 VDC.	
Common voltage range (AC)	0 to 30 VAC

EasyLogic RP-V for Niagara Framework®

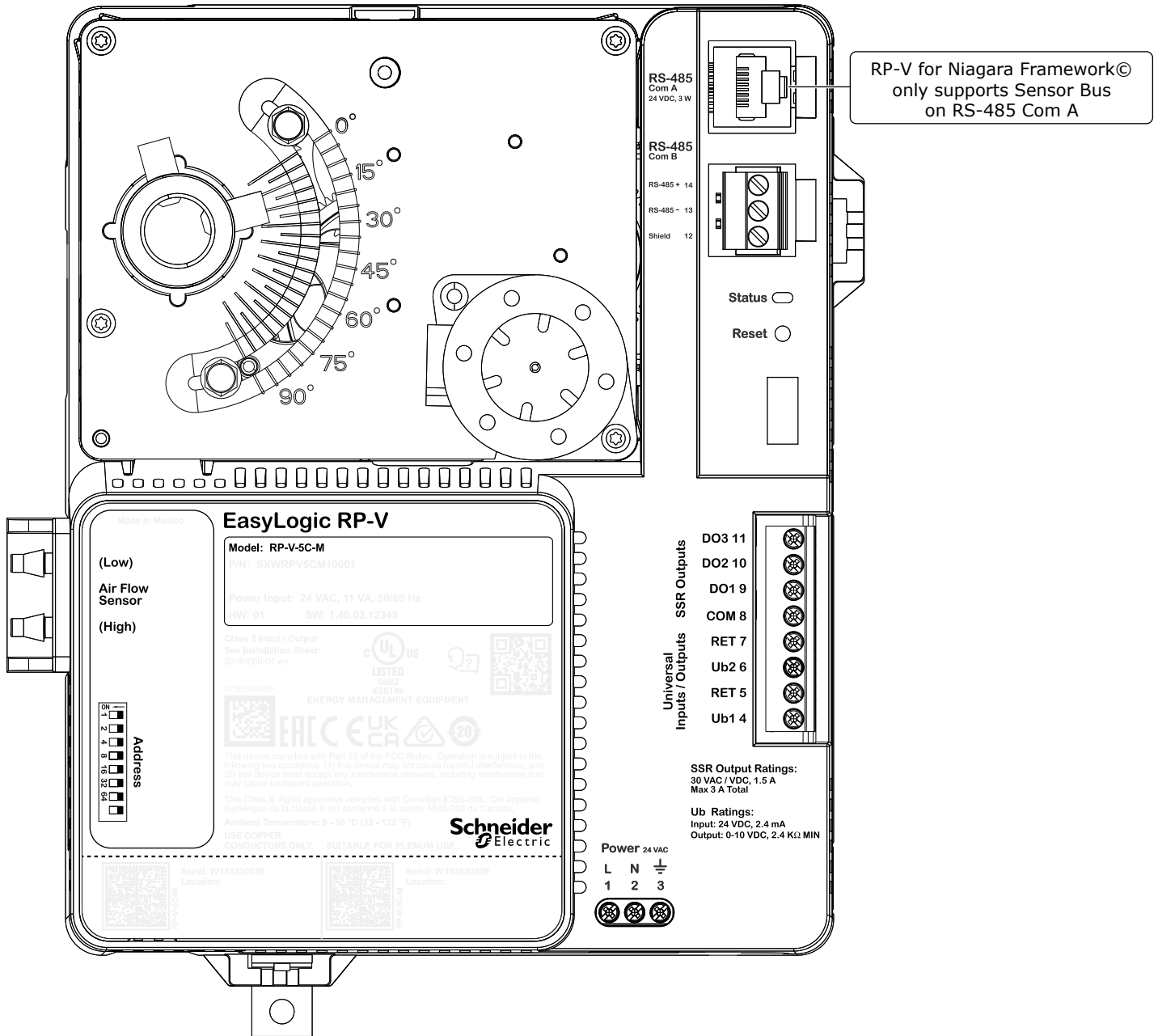
Continued

Common voltage range (DC)	-30 to +30 VDC
Minimum pulse width	100 ms
Solid-state relay output protection	Transient voltage suppressor across each solid-state relay (SSR) output
Output ratings for UL applications	
Classification	Class 2
Current range	Maximum 1.5 A load per output Maximum 3 A total load for the 3 outputs
AC voltage range	Maximum 24 VAC
Commons	COM for DO1, DO2, and DO3
When the SSR outputs are used to switch AC, the common terminals can be connected to 0 to 24 VAC.	
Common voltage range (AC)	0 to 24 VAC
Minimum pulse width	100 ms
Solid-state relay output protection	Transient voltage suppressor across each solid-state relay (SSR) output

Terminals

For more information on wiring, see the SpaceLogic and EasyLogic - Hardware Installation System Guide.

EasyLogic RP-V for Niagara Framework®



RP-V-5C-M

EasyLogic RP-V for Niagara Framework®

Regulatory Notices



Federal Communications Commission

FCC Rules and Regulations CFR 47, Part 15, Class B

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation.

Industry Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.



Regulatory Compliance Mark (RCM) - Australian Communications and Media Authority (ACMA)

This equipment complies with the requirements of the relevant ACMA standards made under the Radiocommunications Act 1992 and the Telecommunications Act 1997. These standards are referenced in notices made under section 182 of the Radiocommunications Act and 407 of the Telecommunications Act.



CE - Compliance to European Union (EU)

2014/30/EU Electromagnetic Compatibility Directive

2014/35/EU Low Voltage Directive

2011/65/EU Restriction of Hazardous Substances (RoHS) Directive

2015/863/EU amending Annex II to Directive 2011/65/EU

This equipment complies with the rules, of the Official Journal of the European Union, for governing the Self Declaration of the CE Marking for the European Union as specified in the above directive(s).



WEEE - Directive of the European Union (EU)

This equipment and its packaging carry the waste of electrical and electronic equipment (WEEE) label, in compliance with European Union (EU) Directive 2012/19/EU, governing the disposal and recycling of electrical and electronic equipment in the European community.



UK Conformity Assessed

S.I. 2016/1091 - Electromagnetic Compatibility Regulations 2016

S.I. 2016/1101 - Electrical Equipment (Safety) Regulations 2016

S.I. 2012/3032 - Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

S.I. 2013/3113 - Waste Electrical and Electronic Equipment Regulations 2013

This equipment complies with the rules, of the UK regulations, for governing the UKCA Marking for the United Kingdom specified in the above directive(s).



UL 916 Listed products for the United States and Canada, Open Class Energy Management Equipment. UL file E80146.

www.se.com/buildings

Life Is On

Schneider
Electric