MP-V

SmartX IP Controller

Introduction

SmartX IP Controller – MP-V is a multi-purpose, fully programmable, IP based field controller dedicated for VAV cooling and heating applications. MP-V integrates a controller, a damper actuator, and an air flow sensor in a single compact package for ease of installation. MP-V can either be used as a standalone BACnet/IP field controller or as part of an EcoStruxure BMS with a SmartX AS-P or AS-B server or an Enterprise Server as the parent server. MP-V comes in two models with different I/O count.

The MP-V has the following features:

- IP enabled with dual-port Ethernet switch
- Integrated damper actuator with feedback signal
- Factory-calibrated air flow sensor
- Highly available
- Sensor bus for living space sensors
- Mobile commissioning application
- Full EcoStruxure Building Operation software support, providing efficient engineering tools

IP connectivity and flexible network topologies

The SmartX IP controllers are based on open protocols that simplify interoperability, IP configuration, and device management:

- IP addressing
- BACnet/IP communications
- DHCP for easy network configuration

The SmartX IP controllers have a dual-port Ethernet switch, which enables flexible network topologies:

- Star
- Daisy chain
- Rapid Spanning Tree Protocol (RSTP) ring

In a star topology, the controller and the parent EcoStruxure BMS server are individually connected to an Ethernet switch. Daisy-chain multiple controllers together to reduce installation time and cost. Use an RSTP ring topology when you want a non-operational controller to be detected and recovered quickly and efficiently.

Models with a versatile mix of I/O points

MP-V comes in two models with different I/O point count and a versatile mix of I/O point types that match a wide variety of VAV applications.

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I/O Point Types by MP-V Models

I/O Point Types	MP-V-7A	MP-V-9A
Universal inputs	3	4
Triac outputs	3	3
Analog outputs	1	2

Configurations by I/O Point Types

Configurations	Universal Inputs	Triac Outputs	Analog Outputs
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	-	-
2-wire RTD temperature inputs	yes	-	-
Digital outputs	-	yes	-
Digital pulsed outputs	-	yes	-
PWM outputs	-	yes	-
Tristate outputs	-	yes	-
Tristate pulsed outputs	-	yes	-
Voltage outputs (0 to 10 VDC)	-	-	yes
Current outputs (0 to 20 mA)	-	-	yes

Universal inputs

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

As counter inputs, they are commonly used in energy metering applications. As RTD inputs, they are ideal for temperature points in a building control system. 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.

Triac outputs

The triac outputs can be used in many applications to switch 24 VAC on or off for external loads such as actuators, relays, or indicators. The triac outputs are isolated from the controller. Triacs are silent and are not adversely affected by relay contact wear.

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Analog outputs

The analog outputs are capable of supporting analog voltage or current point types, without the need for external bias resistors. Therefore, analog outputs support a wide range of devices, such as actuators.

I/O expansion

For applications that require more I/O resources, the SmartX IP Controller – IP-IO modules provide a versatile mix of I/O points for any application. For more information, see the SmartX IP Controller – IP-IO Specification Sheet.

Integrated damper actuator with feedback signal

The integrated damper actuator allows for simplified installation of MP-V directly over the damper shaft. This eliminates the need for separate installation, wiring, and positioning of the damper motor. MP-V uses the same actuator mechanics as many Schneider Electric VAV controller models from the Andover Continuum, TAC Vista, TAC I/A Series, and TAC 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 state-of-the-art technology that requires no air flow from the velocity probe. Unlike flow-through sensors, the sensor does not impose rigid requirements on tubing, dust, or filters, and the sensor is not affected by errors induced on the local probe pressure readings. The sensor requires no maintenance and a minimum of field adjustments.

Highly available

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

With user-defined fallback values, the IP-IO outputs will be in a predictable state in cases of network disruption.

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

In WorkStation, you update the firmware of multiple SmartX IP controllers at the same time and with minimum down time. The EcoStruxure BMS server keeps track of the installed firmware to support backup, restore, and replacement of the controllers and sensors. The server can host controllers of different firmware versions.

Sensor bus for living space sensors

The SmartX IP controllers provide an interface designed for the SmartX Sensor family of living space sensors. The SmartX Sensors offer an efficient way to sense the temperature, humidity, CO_2, and occupancy in a room. The SmartX Sensors 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.

SmartX Sensors

The sensor bus provides both power and communications for up to four sensors that are daisy-chained using standard Cat 5 (or higher) cables. The maximum number of sensors that can be connected to a controller varies depending on 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 two sensor bases with CO_2 option
  - Up to four sensor bases without CO_2 option

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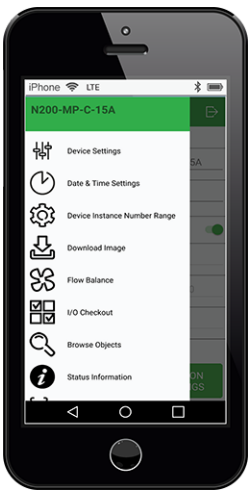
- SmartX LCD temperature sensors: Up to four sensors are supported

The maximum total length of the sensor bus is 61 m (200 ft). For more information, see the SmartX Living Space Sensors Specification Sheet.

Mobile commissioning application

The eCommission SmartX Controllers mobile application is designed for local configuration, field deployment, and commissioning of SmartX IP 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 10 devices. For more information, see the eCommission SmartX Controllers Specification Sheet.



eCommission SmartX Controllers mobile app

Using the eCommission SmartX Controllers mobile application, you can connect to one or many SmartX IP controllers. You can connect to a single SmartX IP controller using the eCommission Bluetooth Adapter connected to a SmartX Sensor. Using a wireless access point or a network switch, you can connect to a network of SmartX IP controllers on the local IP network.

Device configuration

With the eCommission SmartX Controllers mobile application, you can easily discover SmartX IP controllers on the IP network. You can change the configuration of each controller, including the BACnet and IP 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 deployment and I/O checkout

The eCommission SmartX Controllers mobile application does not require an EcoStruxure BMS server or a network infrastructure to be in place. You can use the mobile application to load the controller application directly into the local SmartX IP controller and deploy the controller. The controller application can be created offline using Project Configuration Tool or WorkStation. 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 eCommission SmartX Controllers mobile application, you can perform air flow balancing of VAV units controlled by MP-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 MP-V are stored in the parent server, which makes it easier to replace the controller if necessary.

Full EcoStruxure Building Operation software support

The power of the SmartX IP controller is fully realized when it is part of an EcoStruxure BMS, which provides the following benefits:

- WorkStation/WebStation interface
- Script and Function Block programming options
- Device discovery
- Engineering efficiency

WorkStation/WebStation interface

WorkStation and WebStation provide a consistent user experience regardless of which EcoStruxure BMS server the user is logged on to. The user can log on to the parent EcoStruxure BMS server to engineer, commission, supervise, and monitor the SmartX IP controller and its I/O as well as its attached SmartX Sensors. For more information, see the WorkStation and WebStation specification sheets.

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Script and Function Block programming options

Unique to the industry, the SmartX IP controllers have both Script and Function Block programming options. This flexibility assures that the best programming method can be selected for the application. Existing programs can easily be reused between the EcoStruxure BMS server and the controller.

Device discovery

The enhanced Device Discovery in WorkStation enables you to easily identify SmartX IP controllers on a BACnet network and to associate the controllers with their parent server.

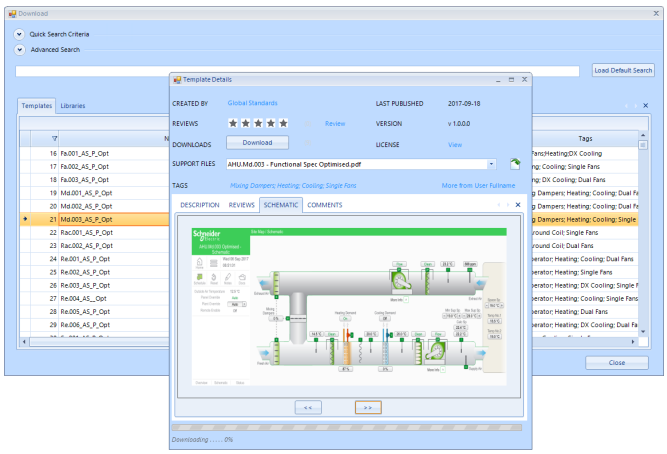
Engineering efficiency

The engineering and maintenance of SmartX IP controllers can be done very efficiently using the EcoStruxure Building Operation reusability features. With these features, you can create library items (Custom Types) for a complete controller application that contains programs and all necessary objects such as trends, alarms, and schedules. The controller application in the Custom Types library is reusable across all controllers of the same model. You can use the controller application as a base for creating new controllers intended for similar applications. You can then edit the controller application, and the changes are automatically replicated to all controllers, while each controller keeps its local values.

WorkStation supports both online and offline engineering of SmartX IP controllers. You can make the configuration changes online or use database mode to make the changes offline. In database mode, the changes are saved to the EcoStruxure Building Operation database so that you can apply the changes to the controllers later.

Project Configuration Tool enables you to perform all the engineering off site, without the need for physical hardware, which minimizes the time you need to spend on site. You can run the EcoStruxure BMS servers virtually and engineer the SmartX IP controllers before you deploy your server and controller applications to the servers and controllers on site. For more information, see the Project Configuration Tool specification sheet.

In addition, you can use Automated Engineering Tool to facilitate your engineering process when using SmartX IP controllers. This tool provides access to a library of standard controller applications that can be quickly configured and customized using the wizards and mass edit functions provided in the tool. You can then load these customized applications into your target server. The tool also enables the quick creation of your own templates based on SmartX IP controller applications that you have developed. These templates facilitate a standard approach and easy reuse and duplication of common controller applications. For more information, see the Automated Engineering Tool specification sheet.



Library of standard HVAC applications

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Part Numbers

Product	Part number
MP-V-7A	SXWMPV7AX10001
MP-V-9A	SXWMPV9AX10001
Spare terminal blocks for all MP-V models (1 x 2-pin, 2 x 3-pin, 2 x 4-pin, 1 x 5-pin, 1 x 6-pin terminal blocks)	SXWMPVCON10001
Adapter for damper shaft diameter 9.5 mm (0.375 inch)	AM-135
eCommission Bluetooth Adapter	SXWBTAECXX10001

For more information on part numbers for Network Connectivity Accessories, see section “SmartX IP Controllers – Accessories” in the Product Selection Guide - EcoStruxure Building.

Specifications

AC input

Nominal voltage .....24 VAC
Operating voltage range .....+/-20 %
Frequency .....50/60 Hz
Maximum power consumption (MP-V-7A) .....21 VA
Maximum power consumption (MP-V-9A) .....22 VA
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

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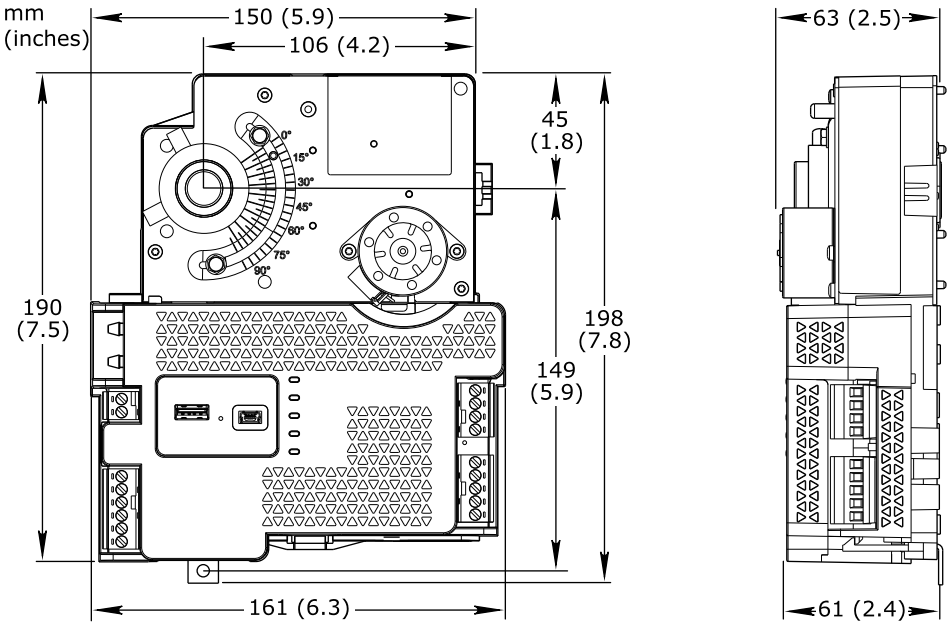
Mechanical

Dimensions .....161 W x 198 H x 63 D mm (6.3 W x 7.8 H x 2.5 D in.)



Weight .....1.13 kg (2.5 lb)

Installation .....Over the damper shaft

Terminal blocks .....Removable

Software compatibility

EcoStruxure Building Operation software .....version 2.0 or later

Agency compliances

Emission .....RCM; EN 61000-6-3; EN 50491-5-2; FCC Part 15, Sub-part B, Class B

Immunity .....EN 61000-6-2; EN 50491-5-3

Safety standards .....EN 60730-1; EN 60730-2-11; EN 50491-3; UL 916 C-UL US Listed

Fire performance in air-handling spaces[a] ..... UL 2043

a) MP-V-7A and MP-V-9A are approved for plenum applications.

Real-time clock

Accuracy, at 25 °C (77 °F) .....+/-1 minute per month

Backup time, at 25 °C (77 °F) .....7 days minimum

Communication ports

Ethernet ..... Dual 10/100BASE-TX (RJ45)

USB .....1 USB 2.0 device port (mini-B)
.....1 USB 2.0 host port (type-A), 5 VDC, 2.5 W

Sensor bus .....24 VDC, 2 W, RS-485 (RJ45)

Sensor bus protection .....Transient voltage suppressors on communication and power signals

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Communications

BACnet .....BACnet/IP, port configurable, default 47808
.....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 dual-core
DDR3 SDRAM .....128 MB
NOR flash memory .....32 MB
Memory backup .....128 kB, FRAM, non-volatile

Damper actuator

Torque rating .....6 Nm (53 lbf.in)
Stroke .....0° to 90°, fully adjustable
Timing .....Approximately 2 seconds/degree at 60 Hz and 2.4 seconds/degree at 50 Hz for 90° rotation at 24 VAC
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_2O)
Resolution .....0.33 Pa (0.001 inH_2O) at 25°C (77°F)
Accuracy .....±5% of 249 Pa (1.00 inH_2O) span at 25°C (77°F)

Universal inputs, UI

Channels, MP-V-7A ..... 3, UI1 to UI3
Channels, MP-V-9A ..... 4, UI1 to UI4
Absolute maximum ratings .....-0.5 to +24 VDC
A/D converter resolution .....16 bits
Universal input protection .....Transient voltage suppressor on each input

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

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Supervised inputs

5 V circuit, 1 or 2 resistors
Monitored switch combinations ..... Series only, parallel only, and series and parallel

Resistor range ..... 1 to 10 kohm
For a 2-resistor configuration, each resistor must have the same value +/- 5 %

Voltage inputs

Range ..... 0 to 10 VDC

Accuracy ..... +/-(7 mV + 0.2 % of reading)

Resolution ..... 1.0 mV

Impedance ..... 100 kohm

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 ..... $+/-(7 + 4 \times 10^{-3} \times R)$ ohm
R = Resistance in ohm

10 kohm to 60 kohm accuracy ..... $+/-(4 \times 10^{-3} \times R + 7 \times 10^{-8} \times R^2)$ ohm
R = Resistance in 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

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)

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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)

RTD temperature inputs

Supported RTDs .....Pt1000, Ni1000, and LG-Ni1000

Pt1000

Sensor range .....-50 to +150 °C (-58 to +302 °F)

SmartX IP Controller device environment	Sensor range	Measurement accuracy
0 to 50 °C (32 to 122 °F)	-50 to +70 °C (-58 to +158 °F)	+/-0.5 °C (+/-0.9 °F)
0 to 50 °C (32 to 122 °F)	70 to 150 °C (158 to 302 °F)	+/-0.7 °C (+/-1.3 °F)

Ni1000

Sensor range .....-50 to +150 °C (-58 to +302 °F)

SmartX IP Controller device environment	Sensor range	Measurement accuracy
0 to 50 °C (32 to 122 °F)	-50 to +150 °C (-58 to +302 °F)	+/-0.5 °C (+/-0.9 °F)

LG-Ni1000

Sensor range .....-50 to +150 °C (-58 to +302 °F)

SmartX IP Controller device environment	Sensor range	Measurement accuracy
0 to 50 °C (32 to 122 °F)	-50 to +150 °C (-58 to +302 °F)	+/-0.5 °C (+/-0.9 °F)

RTD temperature wiring

Maximum wire resistance .....20 ohm/wire (40 ohm total)

Maximum wire capacitance .....60 nF
The wire resistance and capacitance typically corresponds to a 200 m wire.

Triac outputs, DO

Channels, MP-V-7A ..... 3, DO1 to DO3

Channels, MP-V-9A ..... 3, DO1 to DO3

Output rating (for each triac output) .....Max. 0.5 A

Voltage .....24 VAC +/-20 %

Commons .....COM (terminal number 18)
The common terminal COM can be connected to 24 VAC or to ground.

Common voltage, high side output .....24 VAC

Common voltage, low side output .....0 VAC (ground)

Minimum pulse width .....100 ms

Triac output protection .....MOV and snubber across each triac output
.....MOV from triac COM to ground

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Analog outputs, AO

Channels, MP-V-7A 1, VO1/CO1
Channels, MP-V-9A .....2, VO1/CO1 and VO2/CO2
Analog output protection .....Transient voltage suppressor on each output

Voltage outputs

Range .....0 to 10 VDC
Accuracy.....+/-60 mV
Resolution.....10 mV
Minimum load resistance.....5 kohm to ground
Load range.....0 to +2 mA
Terminals .....Voltage Output (VO), Return (RET)

Current outputs

Range .....0 to 20 mA
Accuracy .....+/-0.2 mA
Resolution.....21 µA
Load range.....0 to 650 ohm
Terminals .....Current Output (CO), Return (RET)

Terminals

Follow proper installation wiring diagrams and instructions, including these instructions:

- MP-V-7A and MP-V-9A have several RET terminals for connection of I/O returns, so a common chassis/signal ground rail is optional and may not be needed.
- Individual 24 V power sources to the field must be current limited to maximum 4 A for UL compliant installations, and maximum 6 A in other areas.
- For more information on wiring, see Hardware Reference Guide.

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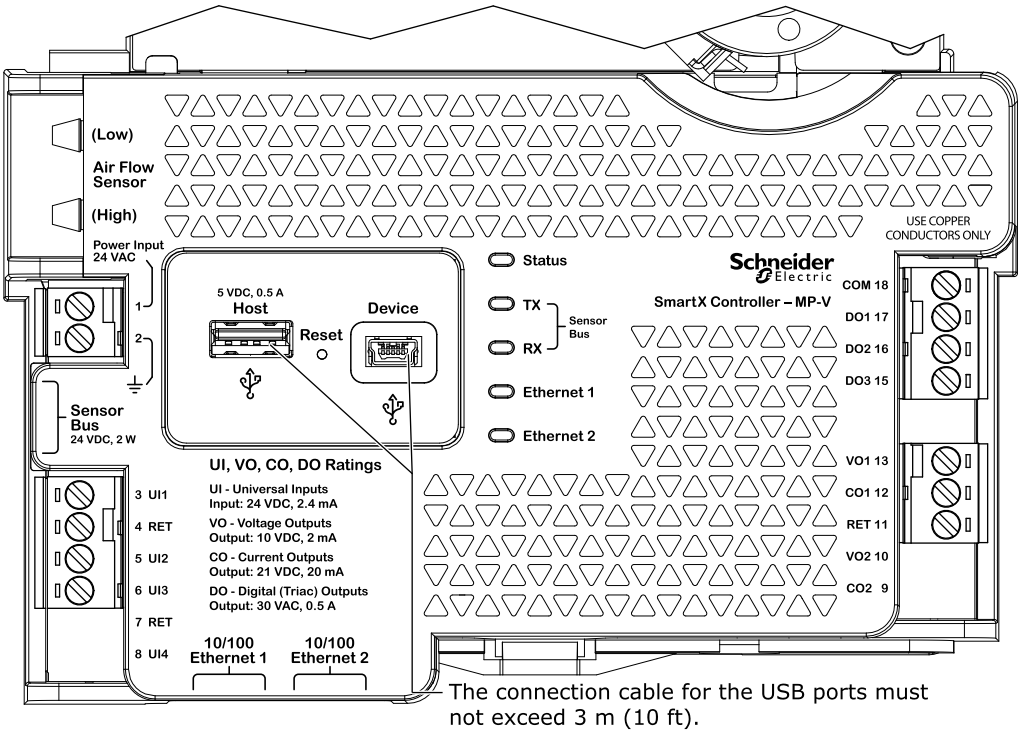
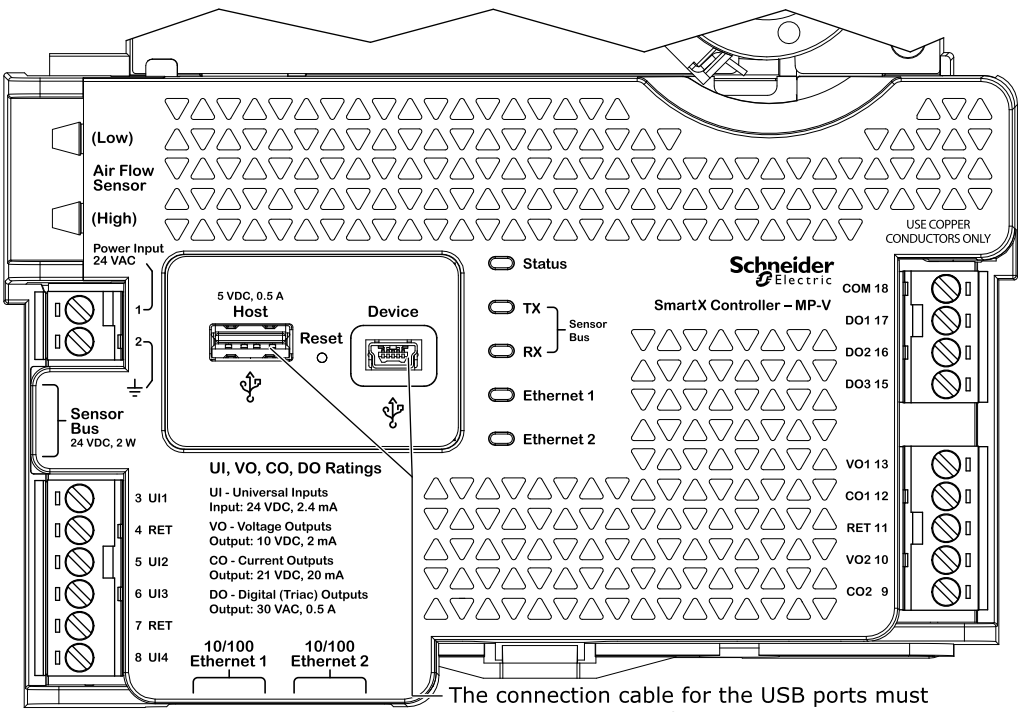


MP-V-7A



MP-V-9A

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Part Numbers for SmartX Sensors, Sensor Bases

Product	Part number
Sensor base with temperature sensor	SXWSBTXXXSXX
Sensor base with temperature and humidity sensors	SXWSBTHXXSXX
Sensor base with temperature and CO_2 sensors	SXWSBTXCXSXX
Sensor base with temperature, humidity, and CO_2 sensors	SXWSBTHCXSXX

Part Numbers for SmartX Sensors, Covers

Product	Housing	Part number
Blank cover	Medium matte white	SXWSCBXSELXX
Blank cover	Optimum glass white	SXWSCBXSELXW
Blank cover	Optimum glass black	SXWSCBXSELXB
Blank cover with occupancy sensor	Medium matte white	SXWSCBPSELXX
Blank cover with occupancy sensor	Optimum glass white	SXWSCBPSELXW
Blank cover with occupancy sensor	Optimum glass black	SXWSCBPSELXB
3-button cover	Medium matte white	SXWSC3XSELXX
3-button cover	Optimum glass white	SXWSC3XSELXW
3-button cover	Optimum glass black	SXWSC3XSELXB
3-button cover with occupancy sensor	Medium matte white	SXWSC3PSELXX
3-button cover with occupancy sensor	Optimum glass white	SXWSC3PSELXW
3-button cover with occupancy sensor	Optimum glass black	SXWSC3PSELXB
Touchscreen display cover	Medium matte white	SXWSCDXSELXX
Touchscreen display cover	Optimum glass white	SXWSCDXSELXW
Touchscreen display cover	Optimum glass black	SXWSCDXSELXB
Touchscreen display cover with occupancy sensor	Medium matte white	SXWSCDPSELXX
Touchscreen display cover with occupancy sensor	Optimum glass white	SXWSCDPSELXW
Touchscreen display cover with occupancy sensor	Optimum glass black	SXWSCDPSELXB

Part Numbers for SmartX Sensors, Combination Models

Product	Housing	Part number
Complete SmartX Sensor model with temperature sensor, buttons for override and setpoint control, and LCD display cover	Medium matte white	SXWSATXXXSLX
Complete SmartX Sensor model with temperature sensor, buttons for override and setpoint control, and LCD display cover	Optimum glass white	SXWSATXXXSLW

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Product	Housing	Part number
Complete SmartX Sensor model with temperature sensor, buttons for override and setpoint control, and LCD display cover	Optimum glass black	SXWSATXXXSLB
Complete non-communicating[a] SmartX Sensor model with resistive temperature sensor (10 kohm type 3 thermistor) and blank cover	Medium matte white	SLASXXX
Complete non-communicating[a] SmartX Sensor model with resistive temperature sensor (10 kohm type 3 thermistor) and blank cover	Optimum glass white	SLAWXXX
Complete non-communicating[a] SmartX Sensor model with resistive temperature sensor (10 kohm type 3 thermistor) and blank cover	Optimum glass black	SLABXXX

a) The SmartX resistive temperature sensor (SLA...) is not designed to be connected to the sensor bus. This sensor is connected to I/O points/terminals on the SmartX IP controller using a two-wire connection.

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
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) per the provisions of the following standards: EN 60730-1, EN 60730-2-11, and EN 50491-3 Safety Standards.

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.

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

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