SMART EQUIPMENT
CONTROLLERS

VERASYS® APPLICATION CONTROLLERS

VAC

VERASYS APPLICATION CONTROLLERS

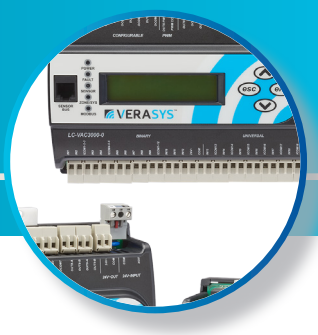
The *Verasys*® Application Controllers are part of the SMART Equipment Controller family. The *Verasys* Application Controllers run pre-engineered applications and provide the inputs and outputs required to monitor and control a wide variety of HVAC equipment.

Verasys Application Controllers operate on an RS-485 BACnet® MS/TP Bus as BACnet Advanced Application Controllers (B-AACs). The controllers integrate into Johnson Controls® and third-party BACnet systems.

Verasys Application Controllers include an integral real-time clock that enables the controllers to monitor and control schedules, calendars, and trends. The controllers can operate for extended periods of time as stand-alone controllers when they are disconnected from the system network.

FEATURES

- **Standard BACnet Protocol –** Provides interoperability with other Building Automation Systems (BAS) products that use the widely accepted BACnet standard.
- **Standard Software and Application Development –** 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.
- **Configurable Controller –** Eliminates the need for software or programming in the field. Factory commission and programmed. Only configuration of parameters in the field through local display or MAP.
- **Real-time Switchable communication protocols from BACnet MS/TP to Modbus® or N2 –** Is available through the onboard display or MAP Gateway one configuration parameter can be set to switch the protocol in real time.
- **Dedicated Modbus Integration bus –** Provides interoperability with other Modbus devices through the dedicated Modbus master port.
- **Predefined alarms and trends –** Based on HVAC/R application all alarms and trends will be predefined within the controller.
- **Auto-Tuned Control Loops –** Reduce commissioning time, eliminate change-of-season re-commissioning, and reduce wear and tear on mechanical devices.
- **Universal Inputs, Configurable Outputs, and Point Expansion Modules –** Allow multiple signal options to provide input/output flexibility.
- **USB Port –** Onboard USB port for firmware upgrades and backup/restore of configuration of the controller.
- **BACnet Testing Laboratories (BTL) Listing –** Ensures interoperability with other BTL rev 12- listed devices. BTL is a third-party agency, which validates that BAS vendor products meet the BACnet industry-standard protocol.



VAC - VERASYS® APPLICATION CONTROLLERS

ORDERING INFORMATION

CODES	DESCRIPTION
LC-VAC1000-0	*Verasys* Application Controller 18 Points 24 VAC – No Application
LC-VAC1100-0	*Verasys* Application Controller 18 Points 240 VAC – No Application
LC-VAC3000-0	*Verasys* Application Controller 32 Points 24 VAC – No Application

TECHNICAL SPECIFICATIONS

LC-VAC1000-0; 18 POINT, 24 VAC, WITH DISPLAY (PART 1/2)

Supply Voltage	24 VAC, 20 VAC minimum and 30 VAC maximum, 50/60 Hz, Safety Extra-Low Voltage (SELV)
Power Consumption	20 VA maximum for LC-VAC1000-0 **Note:** VA rating does not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs). This 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	-20 to 70°C; 10 to 95% RH noncondensing; Pollution Degree 2
Storage	-40 to 85°C; 5 to 95% RH noncondensing.
Addressing	
BACnet® MS/TP	Valid field controller device addresses 4–127 Device addresses 0–3 and 128–255 are reserved and not valid field controller addresses.
N2	Valid field controller device addresses 1 to 255
Communications Bus	**BACnet® MS/TP, Modbus® and N2 through RS-485:** · Three-wire System Bus between the supervisory controller and field controller · Three-wire Sensor Bus between controller, network sensors and other sensor/actuator devices, includes a lead to source 15 VDC supply power from controller to bus devices · Three-wire one Modbus communication half-duplex (Master RTU port)
Processor	RX631 Renesas® 32-bit microcontroller
Memory	16 MB flash memory and 8 MB RAM
Input and Output Capabilities	**Five universal inputs:** User-configurable, 3 available modes: · Voltage input: 0 to 10 VDC · Current sense input: 4 to 20 mA · Resistive inputs/dry contact inputs **Four binary inputs:** Defined as Dry Contact maintained or Pulse Counter/Accumulator Mode **Three configurable outputs:** User-configurable, 2 available modes: · Analog output: 0 to 10 VDC, 10 mA · Triac output: 24 VAC, 0.5 A (externally sourced powered) **One utility output power port (24~ OUT):** Ability to deliver 24 VAC **Four binary outputs (relays):** Single-Pole, Single-Throw. Dry contacts rated 240 VAC. · UL: 240 VAC 5 A Resistive, 1.9 LA/11.1LRA, D300 Pilot Duty, 70°C (30,000 cycles) · IEC: 240 VAC 3 A Resistive, 3A Inductive, Cos=0.6, -20 to 70°C (100,000 cycles) **Note:** Reference all relay commons to the same pole of the supply circuit. **Two Binary Outputs (Triacs):** Output: 24 VAC or 240 VAC, 0.5 A (externally powered) **Note:** Reference all triac commons to the same pole of the supply circuit.

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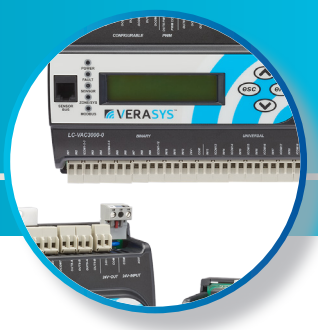

VAC - VERASYS® APPLICATION CONTROLLERS

TECHNICAL SPECIFICATIONS

LC-VAC1000-0; 18 POINT, 24 VAC, WITH DISPLAY (PART 2/2)

Analog Input/Analog Output Resolution and Accuracy	
Analog Input	12-bit resolution
Analog Output	15-bit resolution; +/- 200 mV accuracy in 0 to 10 VDC applications
Terminations	Input/output: Fixed spade terminals Sensor/System/Modbus: 4-wire and 3-wire pluggable screw terminal blocks Sensor bus tool port: RJ-12 6-pin modular jack **Field install option:** Input/output: Fixed solder terminals Sensor/System/Modbus: 4-wire and 3-wire pluggable screw terminal blocks Sensor Bus tool port: RJ-12 6-pin modular jack
Mounting	Horizontal on single 35 mm DIN rail mount is preferred, or screw mount on flat surface with three integral mounting clips on controller Mount the controller on a wall or DIN rail inside an enclosure rated at least IP20.
Housing	Enclosure material: Polycarbonate Lexan SABIC EXL9330
Dimensions (Height x Width x Depth)	164 mm x 125 mm x 53 mm excluding terminals and mounting clips
Weight	0.5 kg
CE Compliance	Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.

LC-VAC1100-0; 18 POINT, 240 VAC, WITH DISPLAY (PART 1/2)

Supply Voltage	240 VAC, 50/60 Hz, Safety Extra-Low Voltage (SELV)
Power Consumption	**20 VA maximum for LC-VAC110x-0** **Note:** VA rating does not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs). This 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	-20 to 70°C; 10 to 95% RH noncondensing; Pollution Degree 2
Storage	-40 to 85°C; 5 to 95% RH noncondensing.
Addressing	
BACnet® MS/TP	Valid field controller device addresses 4–127 Device addresses 0–3 and 128–255 are reserved and not valid field controller addresses.
N2	Valid field controller device addresses 1 to 255
Communications Bus	**BACnet® MS/TP, Modbus® and N2 through RS-485:** • Three-wire System Bus between the supervisory controller and field controller • Three-wire Sensor Bus between controller, network sensors, and other sensor and actuator devices, includes a lead to source 15 VDC supply power (from controller) to bus devices • Three-wire one Modbus communication half-duplex (Master RTU port)
Processor	RX631 Renesas® 32-bit microcontroller
Memory	16 MB flash memory and 8 MB RAM

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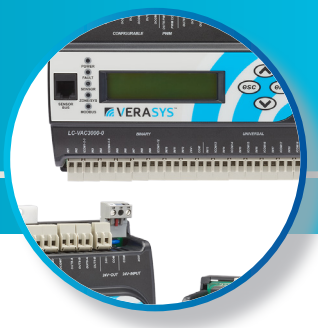
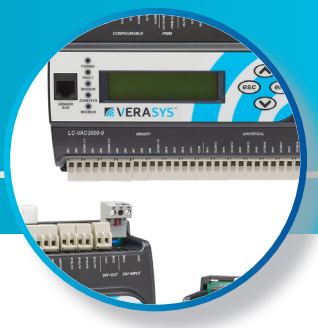


VAC - VERASYS® APPLICATION CONTROLLERS

TECHNICAL SPECIFICATIONS

LC-VAC1100-0; 18 POINT, 240 VAC, WITH DISPLAY (PART 2/2)

Input and Output Capabilities	**Five universal inputs:** User-configurable, 3 available modes: · Voltage input: 0 to 10 VDC · Current sense input: 4 to 20 mA · Resistive inputs/dry contact inputs **Four binary inputs:** Defined as Dry Contact maintained or Pulse Counter/Accumulator Mode **Three configurable outputs:** User-configurable, 2 available modes: · Analog Output: 0 to 10 VDC, 10 mA · Triac Output: 24 VAC, 0.5 A (externally sourced powered) **One utility output power port:** Ability to deliver 24 VAC **Four binary outputs (relays):** Single-Pole, Single-Throw. Dry contacts rated 240 VAC. · UL: 240 VAC, 5 A Resistive, 1.9 LA/11.1LRA, D300 Pilot Duty, (30,000 cycles) · IEC: 240 VAC, 3 A Resistive, 3 A Inductive, Cos=0.6, -20 to 70°C (100,000 cycles) **Note:** Reference all relay commons to the same pole of the supply circuit. **Two Binary Outputs (Triacs):** Output: 24 VAC or 240 VAC, 0.5 A (externally powered) **Note:** Reference all triac commons to the same pole of the supply circuit.
Analog Input/Analog Output Resolution and Accuracy	
Analog Input	12-bit resolution
Analog Output	15-bit resolution, +/- 200 mV accuracy in 0 to 10 VDC applications
Terminations	Input/output: Fixed spade terminals Sensor/System/Modbus: 4-wire and 3-wire pluggable screw terminal blocks Sensor bus tool port: RJ-12 6-pin modular jack **Field install option:** Input/output: Fixed solder terminals Sensor/System/Modbus: 4-wire and 3-wire pluggable screw terminal blocks Sensor Bus Tool Port: RJ-12 6-pin modular jack
Mounting	Horizontal on single 35 mm DIN rail mount is preferred, or screw mount on flat surface with three integral mounting clips on controller. Mount the controller on a wall or DIN rail inside an enclosure (rated at least IP20).
Method to Provide Earthing (Grounding)	Functional earthing: Terminal W44
Housing	Enclosure material: Polycarbonate Lexan SABIC EXL9330
Dimensions (Height x Width x Depth)	190 mm x 125 mm x 58 mm excluding terminals and mounting clips
Weight	0.5 kg
CE Compliance	Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.



VAC - VERASYS® APPLICATION CONTROLLERS

TECHNICAL SPECIFICATIONS

LC-VAC3000-0; 32 POINT, 24 VAC WITH DISPLAY (PART 1/2)

Supply Voltage	24 VAC, 20 VAC minimum/30 VAC maximum, 50/60 Hz, Safety Extra-Low Voltage (SELV).
Power Consumption	**20 VA maximum** **Note:** VA rating does not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs). This 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	-20 to 70°C; 10 to 95% Relative Humidity (RH) noncondensing; Pollution Degree 2.
Storage	-40 to 85°C; 5 to 95% RH noncondensing
Addressing	
BACnet® MS/TP	Valid field controller device addresses 4–127 Device addresses 0–3 and 128–255 are reserved and not valid field controller addresses.
N2	Valid field controller device addresses 1 to 255
Communications Bus	**BACnet® MS/TP, Modbus® and N2 through RS-485:** Three-wire System Bus between the supervisory controller and field controller addresses Three-wire Sensor Bus between controller, network sensors and other sensor and actuator devices, includes a lead to source 15 VDC supply power (from controller) to bus devices Three-wire one Modbus communication half-duplex (master RTU port)
Processor	RX631 Renesas® 32-bit microcontroller
Memory	16 MB flash memory and 8 MB RAM
Input and Output Capabilities	**Six Universal Inputs:** User-configurable, 3 available modes: Voltage input: 0 to 10 VDC Current sense input: 4 to 20 mA Resistive inputs/dry contact inputs **12 Binary Inputs:** Defined as Dry Contact maintained or Pulse Counter/Accumulator Mode **Four Configurable Outputs:** User-configurable, 2 available modes: Analog Output: 0 to 10 VDC, 10 mA Triac Output: 24 VAC, 0.5 A (externally sourced powered) One Utility Output Power Port (24~ OUT): Ability to deliver 24 VAC **Four Binary Outputs (Relays):** Single-Pole, Single-Throw. Dry Contacts rated 240 VAC UL: 240 VAC 5A Resistive, 1.9 LA/11.1LRA, D300 Pilot Duty, (30,000 cycles) IEC: 240 VAC 3A Resistive, 3A Inductive, Cos=0.6, -20 to 70°C (100,000 cycles) **One Binary Outputs (Relays):** Single-Pole, Double-Throw, Dry Contacts rated 240 VAC UL: 240 VAC 5A Resistive, 1.9 LA/11.1LRA, D300 Pilot Duty, (30,000 cycles) IEC: 240 VAC 3A Resistive, 3A Inductive, Cos=0.6, -20 to 70°C (100,000 cycles) **One PWM Output Port:** 5 V, 12 V, 15 V selectable PWM output voltage, 10 mA (maximum) continuous current, 100 Hz **Note:** Reference all relay commons to the same pole of the supply circuit. **Four Binary Outputs (Triacs):** Output: 24 VAC or 240 VAC, 0.5 A (externally powered) **Note:** Reference all triac commons to the same pole of the supply circuit.

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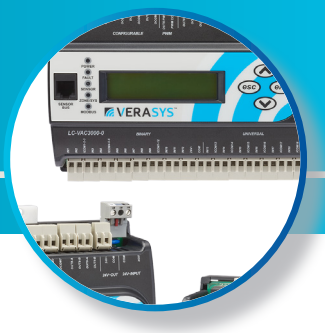

VAC - VERASYS® APPLICATION CONTROLLERS

TECHNICAL SPECIFICATIONS

LC-VAC3000-0; 32 POINT, 24 VAC WITH DISPLAY (PART 2/2)

Analog Input/Analog Output Resolution and Accuracy	
Analog Input	12-bit resolution
Analog Output	15-bit resolution, +/- 200 mV accuracy in 0 to 10 VDC applications
Terminations	Input/Output: Fixed spade terminals Sensor/System/Modbus: 4-wire and 3-wire pluggable screw terminal blocks Sensor Bus Tool Port: RJ-12 6-pin modular jack **Field install option:** Input/output: Fixed solder terminals Sensor/System/Modbus: 4-wire and 3-wire pluggable screw terminal blocks Sensor Bus Tool Port: RJ-12 6-pin modular jack
Mounting	Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller. Mount the *Verasys* Controllers on a wall or DIN rail inside an enclosure (rated at least IP20).
Housing	Enclosure material: Polycarbonate LEXAN® SABIC EXL9330
Dimensions (Height x Width x Depth)	220 mm x 125 mm x 58 mm
Weight	0.5 kg
CE Compliance	Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.