

Smart Equipment Controls (SEC)

Product Bulletin

SE-SPU1001-1, SE-SPU1002-1, SE-SPU1011-1,
SE-SPU1012-1, SE-SPU1004-1, SE-FDD1001-1,
SE-ECO1001-1, SE-COM1001-0

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The Smart Equipment Controls improve occupant comfort by providing reliable control of standard Johnson Controls® Rooftop Units (RTU), including both split system and heat pump equipment types. The innovative control algorithms provide superior temperature control of HVAC equipment.

The Smart Equipment Controls advanced Direct Digital Control (DDC) controllers are bundled with Johnson Controls Single Packaged Units (SPUs), actuators, sensors, and damper assemblies.

Advanced operating modes, such as Fault Detection Diagnostics, load shed, power exhaust, demand-controlled ventilation (DCV), and occupancy sensing, ensure that SMART Equipment Controls are the most advanced equipment offering within the light commercial market.

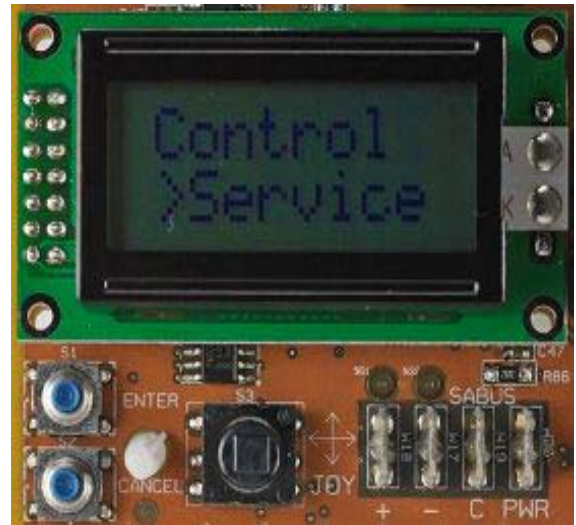


Figure 1: Smart Equipment Controls

Table 1: Features and Benefits (Part 1 of 2)

| Features | Benefits |
|---|--|
| Innovative Local User Interface | Provides a simple local UI for commissioning and startup that requires no additional hardware. |
| Factory-Mounted and Wired Equipment Assemblies | Save installation time and cost with pre-assembled and pre-configured controller and actuator systems. |
| Adjustable Logic Parameters | Optimize HVAC zone control of a system. |
| Factory-Loaded and Self-Configuring Components | Reduce installation time and cost by eliminating software commissioning tools. |
| Fault Detection Diagnostics (FDD) | Provides a game-changing feature with predictive failures that can assist on life cycle of the equipment, service awareness, and lower energy costs. |
| Performance Indexing | Provides efficiency and capacity real-time information that continues to calculate throughout the life cycle of the equipment. |
| Fully Integrated Economizer Control | Provides greater visibility of free cooling and energy savings. |
| Self Test Mode | Provides ease of startup and validation in the field by initiating an automatic self test through the local display. |
| Advanced Operating Mode | Provides greater capabilities, such as load shed for energy savings, Demand Controlled Ventilation (DCV) for CO ₂ level monitoring, and standby mode for occupancy sensing. |

Table 1: Features and Benefits (Part 2 of 2)

| Features | Benefits |
|---|---|
| Support for Standard Communication Protocols | Provides standard communication for integration of Building Management Systems (BMS). Protocols supported include: BACnet® MS/TP, Modbus®, and N2 communication. LONWORKS® networks are supported with an external gateway. |
| USB Support | Provides ease-of-service with the ability to view reports from a USB memory device and software upgrades. |
| Equipment Model Support | Provides future readiness of plug-and-play equipment to all parts of the Metasys® system architecture. |
| California Energy Code Compliance | Provides full compliance with Title 24 regulations to display faults on Economizer applications. |
| Mobile Access Portal Gateway | Provides a new tool for ease-of-service to commission, startup, configure, monitor, and control equipment through mobile devices. |

Operation Overview

The Smart Equipment Controls (SEC) offer a new control architecture designed to provide basic equipment protection, and simple thermostat control options, as well as advanced DDC control and diagnostic algorithms. This modular architecture offering helps control the costs that are associated with field installations. Programmed, factory-mounted controls eliminate the need for field wiring.

Additionally, the DDC controls and diagnostics offer the necessary startup and commissioning automation to further decrease installation costs while improving energy efficiency over the life of the installation. This fully implemented solution aligns with the product road maps for Building Automation Systems (BAS), HVAC, and refrigeration to not only deliver a *buy blue* product, but also to ensure we deliver a fully optimized solution to the market.

SEC is fully compatible with Metasys® software Release 6.5 or higher and its associated components. The equipment behaves similar to other Metasys network controllers, such as the Field Equipment Controller (FEC), so it is easily integrated into your network. The factory-programmed SEC is designed for all applications of equipment ranging from Series 5 to Series 40 ton RTUs. To ensure controller support for the wide range of RTUs, we developed a super application that consists of all available parameters within one controller. From an installation perspective, no programming is required. The unit is configured at the factory based on the order. You can modify the unit in the field with either the controller’s local display or Mobile Access Portal (MAP) Gateway.

SEC Local Display

The SEC local display provides a simple and local interface that lets mechanical contractors operate the equipment without additional tools, software, or computers. All configuration settings are accessible through the local LCD, and you can modify them for the specific application requirements (Figure 2).

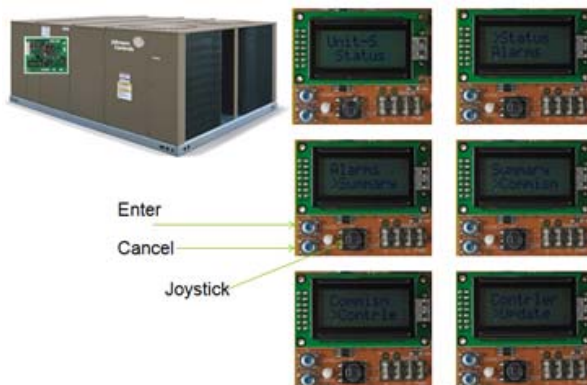


Figure 2: SEC Local Display

SEC Network Architecture

The following figures highlight the typical equipment setup for different application requirements.

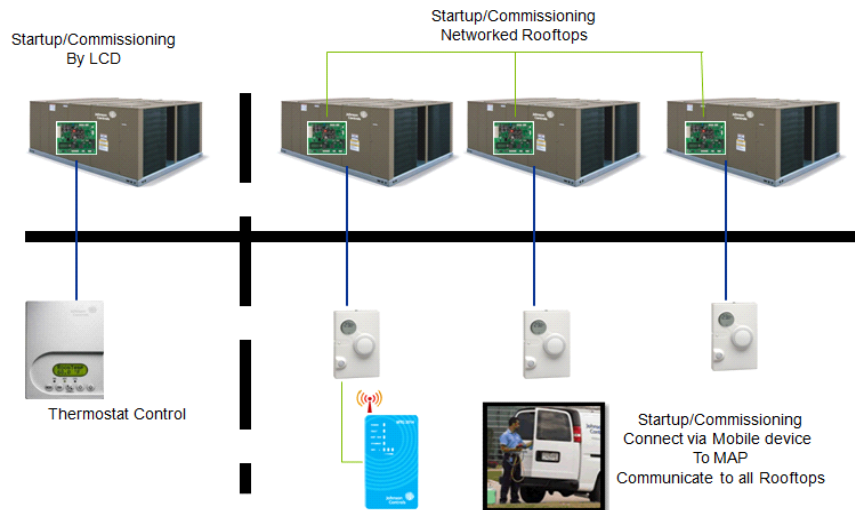


Figure 3: Typical Setup for Stand-alone Thermostat or Networked Equipment with Network Sensors

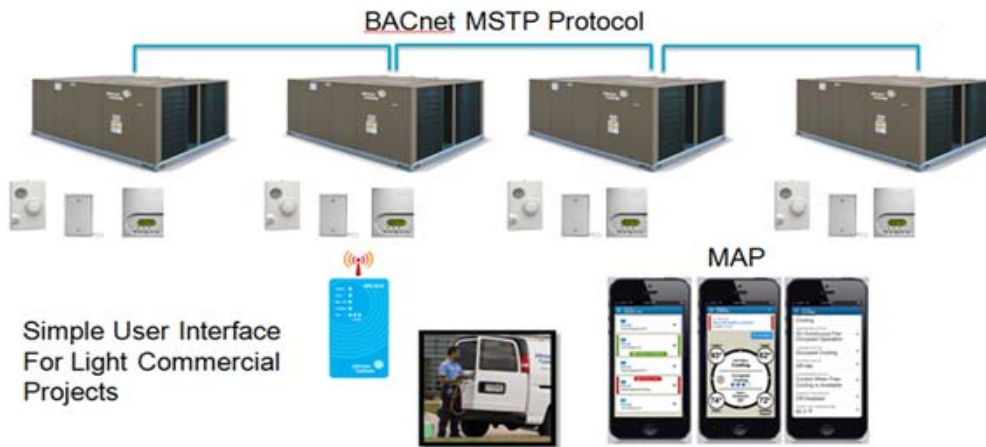


Figure 4: Communicating Equipment with Zone Sensors, Network Sensors, or Thermostat Control

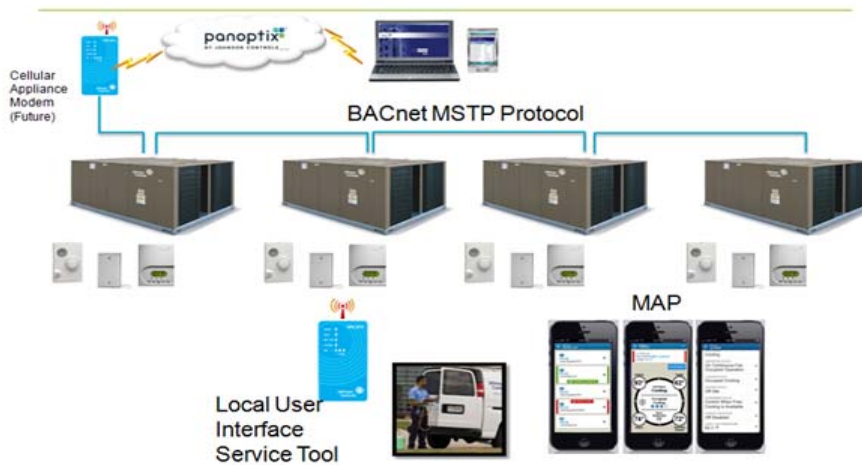


Figure 5: Connect Equipment with Zone Sensors, Network Sensors, or Thermostat Control

Smart Equipment Controllers

The SEC control platform consists of multiple modular design controllers. The controllers provide equipment protection, advanced DDC, or simple thermostat controls.

Unit Control Board (UCB)



Figure 6: Unit Control Boards SE-SPU1001 and SE-SPU1002, SE-SPU1011 and SE-SPU1012

The UCB provides multiple options for equipment, such as several inputs and outputs that provide thermostat interface and control of heating and cooling stages. All safety circuits are wired to the UCB for equipment protection. The UCB design and core asset foundation are based on the Metasys system FEC controller platform. The local display on the UCB is the main UI that lets you configure, self test, view local information, and control the equipment.

The UCB offers a new USB drive feature that provides valuable access to history and trends that you can later view on any computer.

The USB port allows provisioning of the main controller software and pushes updates to all networked controllers on the SA Bus network. One simple command through the UCB display invokes a software upgrade to all control boards.

UCB features include:

- thermostat input
- safety control
- DDC controller
- local LCD
- all control output for cooling and heating
- all input for sensors (space, return air, outside air, supply air, and smoke)
- Sensor Actuator (SA) bus to communicate with network sensors
- pluggable communication card for standard protocols, including BACnet, MS/TP, Modbus®, and N2
- super application to meet all application requirements
- sequence of operation for RTU that consists of multiple configurations
- factory installed for Johnson Controls Series 5, Series 10, Series 20, Series 40, and single packaged units
- BTL certified

Economizer Controller



Figure 7: Economizer Controller SE-ECO1001

The SEC Economizer controller is a newly designed controller that meets the requirements of the Series Package Equipment. The new economizer controller replaces the existing third-party economizer controller.

The economizer controller communicates via standard SA bus to the main controller of the RTU, the UCB. When the economizer is installed as a field option, the controller is factory mounted with a wiring harness that is necessary for connection. Once connected, the economizer controller receives power and communication from the UCB. No additional programming is required in the field.

The UCB self-discovers the Economizer controller. After self-discovery, the Economizer application executes based on the factory default settings. Use the local display to make any configuration changes. You can also accomplish this using the Mobile Access Portal (MAP) gateway.

The economizer control meets Title 24 Standards. The economizer has the ability to report up to five dedicated Fault Detection Diagnostics (FDD) through the local LCD, network sensor, thermostat with the X output for faults, or MAP Gateway. In cases of equipment integration into a BMS, the same faults are communicated via the standard communication protocols. Table 2 describes the Title 24 Fault Codes

Table 2: Network Sensors with Fault Code Capability Error Codes

| Display Text | California Title 24 Economizer Fault Condition | Possible Problem |
|--------------|--|--|
| EF1 | Air temperature sensor failure/fault | Problem with one of the air temperature sensors. Check Outdoor Air, Return Air, or Supply Air sensors. |
| EF5 | Not economizing when it should | The economizer is not using outdoor air when it should. |
| EF6 | Economizing when it should | The economizer is allowing outdoor air inside when the conditions are not suitable for economizer operation. |
| EF8 | Damper not modulating | The economizer damper is not able to modulate properly. Check damper, linkage to actuator, or the actuator. |
| EF9 | Excess outdoor air | The economizer is allowing excess outdoor air inside. |

Economizer features include:

- replaces existing Honeywell® Economizer
- plug-and-play via BACnet communication
- Factory- or field-mounted
- meets Title 24 requirements

Fault Detection Diagnostics Controller



**Figure 8: FDD Controller
SE-FDD1001-0**

The Fault Detection Diagnostics (FDD) board is new and unique for the light commercial product market. The FDD controller lets the package equipment predict faults before they become a major failure, cause comfort issues, or result in efficiency problems. The FDD controller is one of the key components of the SEC platform.

Embedded algorithms continuously run within the FDD controller. The algorithms monitor the types of inputs to precisely indicate the faults and recommend how to correct them. This new innovative feature comes optional with the SEC product line for Series 5 to 40, as well as the new Series 12R. The FDD controller meets all of the pending California Energy Code Regulations (Title 24).

During the startup process, the FDD controller calculates the efficiency and capacity of the equipment and generates a baseline for future measurements. The algorithms provide this type of information during the equipment life cycle. You can view this information from the UCB local display, MAP, or through a BMS connection. These two calculated values, efficiency and capacity, enable you to make smart decisions regarding your equipment. You can quickly and easily see when the equipment is not performing to the startup and commissioning efficiency calculation.

Table 3 shows all the refrigeration circuit FDDs.

Table 3: Refrigeration Circuit FDDs

| |
|--|
| FDD |
| Refrigerant Low |
| Excessive Refrigerant Flow |
| Inefficient Compressor |
| Refrigerant Flow Restriction |
| High Side Heat Transfer Problem |
| Low Side Heat Transfer Problem |
| Reduce Evaporator Airflow |
| Add Charge |
| Insufficient Refrigerant Flow |
| Recover Charge |
| Safe And Reasonable Performance |
| Non-Condensable Present |
| Efficiency Index |
| Capacity Index |

The Efficiency index and Capacity index are added features from the FDD controller. You can use the indexes for the entire suite of the Packaged Equipment.

Four-Stage Controller



**Figure 9: Four-Stage Controller
SE-SPU1004**

The four-stage controller of the SEC family enables the larger tonnage range (Series 25 to 40) of packaged equipment for two additional stages of cooling and one additional stage of heating. Similar to all components of SEC, the four-stage expansion controller communicates via BACnet MS/TP and is simply plug-and-play to the UCB. The four-stage expansion control board communicates via Modbus to the gas ignition controller. The gas ignition controller is a third-party supported product.

Four-stage features include:

- plug-and-play via BACnet communication bus
- two additional cooling stages
- one additional heating stage
- Modbus connection to gas ignition controller

Communication Card



**Figure 10: Communication Board
SE-SPU1001 and SE-SPU1002**

The SEC Communication card comes with a connector that enables communication to a BMS. This card supports BACnet MS/TP, Modbus, and N2 communication types. For LONWORKS networks, an external gateway is required from the BACnet device to the Modbus network.

Communication card features include:

- support for multiple communication types
- plug-in on the UCB
- real-time clock chip
- communication traffic LEDs and on-board end-of-line switch

NS Network Sensor with Fault Code Capability



Figure 11: NS Sensor with Fault Code Capability

The surface-mounted NS Series Network Sensor with Fault Code Capability is an electronic zone sensor designed to function directly with Johnson Controls BACnet MS/TP digital controllers in SEC controls. Models in this series monitor the temperature setpoint and zone temperature and transmit this data to a field controller on the Sensor Actuator (SA) Bus.

This sensor is designed to assist with the California Energy Code (Title 24) providing a visual indication of operational faults with rooftop equipment. The NS Series sensor displays codes that may indicate the system is operating inefficiently. Fault codes include: air temperature sensor failure or fault, not economizing properly, economizer return air, economizer not using outdoor air, outdoor air not suitable, and damper not modulating.

You may adjust the setpoint while the sensor displays the fault. You must reset the fault at the equipment controller. The sensor cannot reset the fault. All models feature a temperature setpoint dial and LCD designed to make adjusting the temperature setpoint and viewing the zone temperature easier.

Mobile Access Portal (MAP) Gateway



Figure 12: MAP Gateway

MAP Gateway is an intuitive controller commissioning tool that simplifies how users can access the Johnson Controls family of products. The MAP Gateway enables users to leverage the power of mobility using smart phones, tablets, and laptop PCs to interact with building automation equipment controls and HVAC equipment.

Offering many-to-one, multi-client connectivity, the MAP Gateway gives users access to any device with an equipment model number that is on a connected BACnet MS/TP field bus. The MAP Gateway solution is conveniently sized; has a built-in wireless access point; and lets personnel to use an intuitive, browser-based interface to access advanced features like alarms, schedules, and point configuration.

The wireless connection on the MAP Gateway lets users be up to 100 ft. (30.48 m line of sight) away indoors and up to 300 ft. (91.44 m line of sight) away outdoors while using a supported mobile device. Power may be supplied via the SA bus or Field Controller (FC) bus, an Ethernet connection, a supplied external power supply, or a micro USB port.

You can use the MAP gateway as a mobile commissioning tool for the package equipment Series 5 to 40. MAP is available as an accessory for the SEC platform and equipment.

Ordering Information

Table 4: Ordering Information

| Product Code Number | Description |
|---------------------|--|
| SE-SPU1001-1 | Single-stage UCB, 9 analog inputs (AIs), 13 Binary inputs (BIs), 5 binary outputs (BOs) |
| SE-SPU1002-1 | Dual-stage Unit Control Board (UCB), 12 AIs, 16 BIs, 8 BOs, 1 AO |
| SE-SPU1011-1 | Single-stage Unit Control Board with Field Bus Expansion Module, 9 AIs, 13 BIs, 5 BOs |
| SE-SPU1012-1 | Dual-stage Unit Control Board with Field Bus Expansion Module, 12 AIs, 16 BIs, 8 BOs, 1 AO |
| SE-SPU1004-1 | Four-stage Expansion Control Board, 7 AIs, 12 BIs, 6 BOs, 5 AOs |
| SE-FDD1001-1 | Fault Detection Diagnostics Board, 8 AIs, 2 BIs, 2 AOs |
| SE-ECO1001-1 | Economizer, 8 AIs, 2 BIs, 2 AOs, 3 BOs |
| SE-COM1001-1 | Isolated Field Bus Expansion daughter card |

Accessories

Table 5: Accessories

| Product Code Number | Description |
|---------------------|--|
| NS-xTx7F03-x | NS Series Sensor with Fault Code Capability. See Table 6. |
| TL-MAP1810-0Px | Metasys®/FX Portable MAP Gateway (Includes MAP Gateway, RJ-12 cable, bumper guard, and lanyard.) US-compatible countries. Last digit (x) represents non-US country requirements. |

Table 6: Network Sensors with Fault Code Capability Ordering Information (Title 24 Models for Economizer Fault Detection Diagnostics [FDD])

| Product Code Number | Size (mm), Height x Width | Vertical Wallbox-Mounted (WB) | LCD Display, F/C Scale Toggle | Screw Terminals | Address Switches | Temperature Adjustment: Setpoint (Set) or Warmer/Cooler Dial (W/C) | Johnson Controls Logo | VAV Balancing Feature |
|---------------------|---------------------------|-------------------------------|-------------------------------|-----------------|------------------|--|-----------------------|-----------------------|
| NS-ATB7F03-0 | 80 x 80 | Yes | Yes, Yes | Yes | Yes | Set | Yes | No |
| NS-ATB7F03-1 | 80 x 80 | Yes | Yes, Yes | Yes | Yes | Set | No | No |
| NS-BTB7F03-0 | 80 x 120 | Yes | Yes, Yes | Yes | Yes | Set | Yes | No |
| NS-BTB7F03-1 | 80 x 120 | Yes | Yes, Yes | Yes | Yes | Set | No | No |

Technical Specifications

Unit Control Board

| | |
|--|--|
| Product Code Number | SE-SPU1001-1 – Single-stage Unit Control Board SE-SPU1002-1 – Dual-stage Unit Control Board |
| Power Supply Requirement | 24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety |
| Power Consumption | 15 VA maximum Note: VA ratings do not include any power supplied to the peripheral devices connected to binary outputs (BOs). |
| Ambient Conditions | Operating: -40 to 158°F (-40 to 70°C); 10 to 90% RH noncondensing UI Operating: -4 to 158°F (-20 to 70°C); 10 to 90% RH noncondensing Storage: -40 to 194°F (-40 to 85°C); 5 to 95% RH noncondensing |
| Processor | RX631 Renesas® microcontroller |
| Memory | 2 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory |
| Input and Output Capabilities | SE-SPU1001-1: 9 AIs: 7: 10k RTD, 1: 0 to 10 VDC, 1: 24 VAC voltage monitor 13 BIs: 24 VAC input with contact cleaning circuits 5 BOs: 4: relay outputs, 1: Transistor output SE-SPU1002-1: 12 AIs: 9: 10k RTD, 2: 0 to 10 VDC, 1: 24 VAC Voltage Monitor 1 AOs: 2 to 10 VDC, 10 mA maximum 16 BIs: 24 VAC input with contact cleaning circuits 8 BOs: 7: relay outputs, 1: transistor output |
| Housing | Unpackaged printed circuit board (PCB) with silkscreen labels |
| Mounting | Mounted with Nylon Standoffs |
| Dimensions (Height x Width x Depth) | 1.44 x 6.5 x 5.27 in. (36 x 165 x 133 mm) |
| Shipping Weight | SE-SPU1001-1 – 3.3 lb (1.50 kg) SE-SPU1002-1 – 3.4 lb (1.54 kg) |
| Compliance | United States: UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized |

Unit Control Board with BACnet Communication (Part 1 of 2)

| | |
|---------------------------------|---|
| Product Code Number | SE-SPU1011-1 – Single-stage Unit Control Board with Field Bus Expansion Module SE-SPU1012-1 – Dual-stage Unit Control Board with Field Bus Expansion Module |
| Power Supply Requirement | 24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety |
| Power Consumption | 15 VA maximum Note: VA ratings do not include any power supplied to the peripheral devices connected to binary outputs (BOs) |
| Ambient Conditions | Operating: -40 to 158°F (-40 to 70°C); 10 to 90% RH noncondensing UI Operating: -4 to 158°F (-20 to 70°C); 10 to 90% RH noncondensing Storage: -40 to 194°F (-40 to 85°C); 5 to 95% RH noncondensing |
| Processor | RX631 Renesas® microcontroller |

Unit Control Board with BACnet Communication (Part 2 of 2)

| | |
|--|---|
| Memory | 2 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory |
| Input and Output Capabilities | <p>SE-SPU1011-1: 9 AIs: 7: 10k RTD, 1: 0 to 10 VDC, 1: 24 VAC Voltage Monitor 13 BIs: 24 VAC input with contact cleaning circuits 5 BOs: 4: relay outputs, 1: Transistor output</p> <p>SE-SPU1012-1: 12 AIs: 9: 10k RTD, 2: 0 to 10 VDC, 1: 24 VAC Voltage Monitor 1 AOs: 2 to 10 VDC, 10 mA maximum 16 BIs: 24 VAC input with contact cleaning circuits 8 BOs: 7: relay outputs, 1: transistor output</p> |
| Housing | Unpackaged printed circuit board (PCB) with silkscreen labels |
| Mounting | Mounted with Nylon Standoffs |
| Dimensions (Height x Width x Depth) | 1.44 x 6.5 x 5.27 in. (36 x 165 x 133 mm) |
| Shipping Weight | SE-SPU1011-1 – 3.6 lb (1.63 kg) SE-SPU1012-1 – 3.7 lb (1.68 kg) |
| Compliance | <p>United States: UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B</p> <p>Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized</p> |

Four-Stage Expansion Controller (Part 1 of 2)

| | |
|--------------------------------------|--|
| Product Code Number | SE-SPU1004-1 – Four-stage Expansion Control Board |
| Power Supply Requirement | 24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety |
| Power Consumption | 15 VA maximum Note: VA ratings do not include any power supplied to the peripheral devices connected to binary outputs (BOs) |
| Ambient Conditions | Operating: -40 to 158°F (-40 to 70°C); 10 to 90% RH noncondensing Storage: -40 to 194°F (-40 to 85°C); 5 to 95% RH noncondensing |
| Processor | RX630 Renesas® microcontroller |
| Memory | 2 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory |
| Input and Output Capabilities | 7 AIs: 6: 10k RTD, 1: 24 VAC Voltage Monitor 12 BIs: 24 VAC input with contact cleaning circuits 6 BIs: 6: relay outputs 5 AOs: 2 to 10 VDC Analog Output 10 mA maximum |
| Housing | Unpackaged printed circuit board (PCB) with silkscreen labels |

Four-Stage Expansion Controller (Part 2 of 2)

| | |
|--|---|
| Mounting | Mounted with Nylon Standoffs |
| Dimensions (Height x Width x Depth) | 1.44 x 6.5 x 5.27 in. (36 x 165 x 133 mm) |
| Shipping Weight | 2.2 lb (1.0 kg) |
| Compliance | United States: UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized |

Fault Detection Diagnostics (FDD) Controller

| | |
|--|---|
| Product Code Number | SE-FDD1001-1 – Fault Detection Diagnostics Board |
| Power Supply Requirement | 24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety |
| Power Consumption | 10 VA maximum Note: VA ratings do not include any power supplied to the peripheral devices connected to binary outputs (BOs) |
| Ambient Conditions | Operating: -40 to 194°F (-40 to 85°C); 10 to 90% RH noncondensing Storage: -40 to 194°F (-40 to 85°C); 5 to 95% RH noncondensing |
| Processor | RX630 Renesas® microcontroller |
| Memory | 1.5 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory |
| Input and Output Capabilities | 8 AIs: 4: 10k RTD, 4: 0 to 10 VDC 2 BIs: 24 VAC input 2 AOs: 15 V +/- 10% sensor supply outputs |
| Housing | Unpackaged printed circuit board (PCB) with silkscreen labels |
| Mounting | Mounted with Nylon Standoffs |
| Dimensions (Height x Width x Depth) | 1.44 x 6.5 x 5.27 in. (36 x 165 x 133 mm) |
| Shipping Weight | 1.9 lb (0.9 kg) |
| Compliance | United States: UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized |

Economizer Controller (Part 1 of 2)

| | |
|---------------------------------|---|
| Product Code Number | SE-ECO1001-1 – Economizer |
| Power Supply Requirement | 24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety |
| Power Consumption | 10 VA maximum |
| Ambient Conditions | Operating: -40 to 194°F (-40 to 85°C); 10 to 90% RH noncondensing Storage: -40 to 194°F (-40 to 85°C); 5 to 95% RH noncondensing |
| Processor | RX630 Renesas® microcontroller |

Economizer Controller (Part 2 of 2)

| | |
|--|--|
| Memory | 1.5 MB Internal Program Flash, 32 KB Internal E2Data Flash, 4 MB External Serial Flash Memory |
| Input and Output Capabilities | 8 AIs: 1: 10k RTD, 7: 0 to 10 VDC 2 AOs: 15 V +/- 10% sensor supply outputs 2 BIs: 24 VAC input with contact cleaning circuits 3 BOs: 3 Triac outputs |
| Housing (Enclosure) | Noryl® UL94-V0 self-extinguishing, UL2043 Plenum Rated, Protection Class: IP20 (IEC529) |
| Mounting | DIN Rail mounting, or with screws utilizing the DIN rail clips in the extended position |
| Dimensions (Height x Width x Depth) | 5.8 x 6.5 x 1.73 in. (147 x 165 x 44 mm) |
| Shipping Weight | 4.1 lb (65 oz; 1.9 kg) |
| Compliance | <p>United States: UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B</p> <p>Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized</p> |

Communication Card (for BACnet MS/TP)

| | |
|--|--|
| Product Code Number | SE-COM1001-0 – Isolated field bus expansion daughter card |
| Power Supply Requirement | Power drawn from host controller internal power supply |
| Power Consumption | 4 VA maximum |
| Ambient Conditions | <p>Operating: -40 to 194°F (-40 to 85°C); 10 to 90% RH noncondensing</p> <p>Storage: -40 to 194°F (-40 to 85°C); 5 to 95% RH noncondensing</p> |
| Housing | Unpackaged printed circuit board (PCB) |
| Mounting | Mounts to host controller with two plastic standoffs and dual row connector |
| Dimensions (Height x Width x Depth) | 2.35 x 6.5 x 1.25 in. (59 x 165 x 31 mm) |
| Shipping Weight | 0.3 lb (0.13 kg) |
| Compliance | <p>United States: UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B</p> <p>Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized</p> |



Building Efficiency

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