



System 450™ Control Modules with Analog Output

Description

System 450™ is a family of modular, digital electronic controls that is easily assembled and set up to provide reliable temperature, pressure, and humidity control for a wide variety of HVACR applications, commercial process applications, and industrial process applications.

The System 450 control system is designed to replace System 350™ and System 27 control systems, and to provide many additional features and benefits with fewer than twenty model variations.

System 450 control modules provide a field-configurable out-of-the-box solution. Most System 450 control modules can control temperature, pressure, and humidity systems simultaneously.

A single C450 control module can be set up as a stand-alone control or connected to expansion modules to control up to ten On/Off relay and proportional analog outputs, based on any of the three available inputs.

Refer to the following documents for important product application information:

- *System 450™ Series Modular Controls Product Bulletin (LIT-12011458)*
- *System 450™ Series Modular Control Systems with Standard Control Modules Technical Bulletin (LIT-12011459)*
- *System 450™ Series Control Modules with Analog Outputs Installation Instructions (Part No. 24-7664-2853)*

Features

- Durable, compact, interchangeable modular components with plug-together connectors and DIN rail or direct wall mount capability eliminate field wiring between modules and allow you to quickly and easily design, assemble, install, and upgrade your control systems.
- Versatile, multipurpose, field-configurable control modules and expansion modules designed for global use allow you to create a wide variety of application-specific control systems capable of controlling temperature, pressure, or humidity, or all three conditions simultaneously, with only a small suite of module models.
- Up to three hard-wired input sensors and up to ten relay or analog outputs (in any combination) per control system allow you to build complex custom control systems while reducing your control system cost to only the cost of the required components.
- Control Modules with bright backlit LCDs and four-button touch pad user interfaces provide quick, clear, visual status of your System 450 control system inputs and outputs with the touch of a button and enable you to quickly and easily set up and adjust your control system.



C450CPN-3C Control Module with Analog Output

- Multipurpose, all-in-one control modules enable simple stand-alone, single-module control systems that are temperature, pressure, and humidity capable out of the box and easy to set up in the field to replace a wide variety of OEM HVACR and process controls.
- An extensive suite of compatible temperature and humidity sensors, and pressure transducers allows you to monitor and control a wide range of HVACR and process conditions in a variety of standard and global units of measurement.
- High input signal selection enables your control system to monitor a temperature, pressure, or humidity condition with two or three sensors (of the same type) and control your system outputs based on the highest condition value sensed by the referenced sensors.
- Differential control enables your control system to monitor and maintain a temperature, pressure, or humidity differential between two sensor points within a system, process, or space.

Repair Information

If the System 450™ Control Module with Analog Outputs fails to operate within its specifications, replace the unit. For a replacement System 450™ Control Module with Analog Outputs, contact your Johnson Controls® representative.

Selection Charts

Refer to the *System 450 Compatible Sensors, Transducers, and Accessories Catalog Page (LIT-1900662)* for temperature sensors, humidity sensors, and pressure transducers compatible with the System 450 Control Modules with Analog Outputs.

Standard System 450 Modules and Accessories Ordering Information

Product Code Number	Product Description
C450CPN-3C	Standard Control Module with LCD, Four-Button Touchpad UI, and Analog Output; provides one analog output (0–10 VDC or 4–20 mA self-selecting signal) for proportional control.
C450CQN-3C	Standard Control Module with LCD and Four-Button Touchpad UI, and Analog Output; provides two analog outputs (0–10 VDC or 4–20 mA self-selecting signals) for proportional control.
BKT287-1R	DIN Rail; 0.30 m (12 in.) long
BKT287-2R	DIN Rail; 1 m (39-1/3 in.) long
BKT287-3R	DIN Rail; 0.61 m (24 in.) long
BKT287-4R	DIN Rail; 0.36 m (14 in.) long
PLT344-1R	DIN Rail End Clamps (2 clamps)



System 450™ Control Modules with Analog Output (Continued)

Technical Specifications

C450CPN-3C and C450CQN-3C Control Modules with Analog Output

Product	C450CPN-3C and C450CQN-3C: System 450 Control Module models are sensing controls and operating controls with LCD, four-button touchpad, and SPDT analog output C450CPN-3C: Control Module with one analog output C450CQN-3C: Control Module with two analog outputs
Power Consumption	C450CPN-3C: 1.3 VA maximum using 0–10 V out; 1.5 VA maximum using 4–20 mA out C450CQN-3C: 2.0 VA maximum using 0–10 V out; 2.4 VA maximum using 4–20 mA out
Supply Power	Internal Supply Power: C450YNN-1C Power Supply Module External Supply Power: 24 VAC (20–30 VAC) Safety Extra-Low Voltage (SELV) (Europe), Class 2 (North America), 50/60 Hz, 10 VA minimum; or 22 to 30 VDC Note: A System 450 control module or module assembly can use an internal or an external supply power source, but must not be connected to both simultaneously.
Ambient Operating Conditions	Temperature: -40 to 66°C (-40 to 150°F) when using 0–10 VDC outputs; -40 to 40°C (-40 to 104°F) when using 4–20 mA outputs Humidity: Up to 95% RH noncondensing; maximum dew point 29°C (85°F)
Ambient Shipping and Storage Conditions	Temperature: -40 to 80°C (-40 to 176°F) Humidity: Up to 95% RH noncondensing; maximum dew point 29°C (85°F)
Input Signal	0–5 VDC for humidity sensors and static pressure transducers 0.5–4.5 VDC for ratiometric pressure transducers 1,035 ohms at 25°C (77°F) for A99 PTC temperature sensors 1,000 ohms at 21.1°C (70°F) for TE-6xxx Nickel temperature sensors
Analog Output	Voltage Mode (0–10 VDC): 10 VDC maximum output voltage 10 mA maximum output current Requires an external load of 1,000 ohms or more The AO operates in Voltage Mode when connected to devices with impedance greater than 1,000 ohms. Devices that fall below 1,000 ohms may not operate as intended with Voltage Mode applications. Current Mode (4–20 mA): Requires an external load between 0–300 ohms The AO operates in Current Mode when connected to devices with impedance less than 300 ohms. Devices that rise above 300 ohms may not operate as intended with Current Mode applications.
Analog Input Accuracy	Resolution: 14 bits
Control Construction	Independently mounted control, surface mounted with Lexan® 950 enclosure suitable for DIN rail mounting or direct mounting to a hard, even surface.
Dimensions (H x W x D)	127 x 61 x 61 mm (5 x 2-3/8 x 2-3/8 in.)
Weight	C450CPN-3C: 195 g (0.43 lb) C450CQN-3C: 195 g (0.43 lb)
Compliance	North America: cULus Listed; UL 60730, File E27734; FCC Compliant to CFR47, Part 15, Subpart B, Class B Industry Canada (IC) Compliant to Canadian ICES-003, Class B limits Europe: CE Mark – Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive. Australia: Mark: C-Tick Compliant (N1813)

