



A421 Series Electronic Temperature Controls

Description

The A421 Series Electronic Temperature Controls are single-stage controls with a single-pole, double-throw (SPDT) output relay.

A421 Controls feature a bright backlit LCD with adjustable brightness and a three-button touchpad interface that can be set up to restrict user adjustments. An LED indicates the output relay's On/Off status. Standard A421 Series control modules have simple On and Off temperature settings for heating or cooling, an adjustable anti-short cycle delay, temperature setback, and sensor offset capability. The temperature control range is -40 to 212°F or -40 to 100°C.

The A421 controls are available either in Type 1 (NEMA), IP20 (CE), high-impact plastic enclosures suitable for surface or DIN rail mounting or in Type 4X (NEMA), IP67 (CE) watertight, corrosion resistant surface mount enclosures.

Refer to the *A421 Series Electronic Temperature Controls Product Bulletin (LIT-12011972)* for important product application information.

Applications

The A421 Electronic Temperature Control can be used to control a wide variety of single-stage refrigeration or HVAC equipment.

Sample temperature control applications include:

- temperature monitoring and alarming
- on/off control of boilers and chillers
- boiler and chiller pump control
- heating and cooling control
- floating temperature control of damper and valve actuators
- cooling tower fan control based on water temperature
- supply, makeup, and mixed air temperature control
- temperature actuated valve control
- supply and makeup air damper and fan control
- condenser fan control based on condenser temperature

Features

- easy-to-read, bright, adjustable backlit LCD screen displays the temperature, parameters, and status clearly and allows you to adjust LCD brightness for the ambient light conditions. Custom icons on the display provide visual cues on system and control status.
- basic and advanced programming menus allow you to easily set up your control application on the LCD using a simple three-button touchpad interface.
- adjustable On and Off temperature setpoints enable easy to set up cooling or heating control applications on the three-button touchpad, eliminating the need to remove the cover and reposition jumpers for reverse or direct control actions.
- high and low temperature setpoint adjustment stops allow you to set up your application for your desired range of adjustment and restrict user adjustment to just the desired temperature adjustment range.
- displayed temperature offset allows you to adjust the displayed temperature to the actual sensed temperature in applications where the resistance error in long sensor cable leads cause a deviation in the displayed temperature from the actual sensed temperature.
- adjustable anti-short cycle delay keeps the output relay Off after the Off setpoint is reached for a user-defined time delay, which helps avoid short cycling, hard starts, and nuisance overload outages on compressors and other inductive applications.
- temperature setback/offset control enables the control to shift the On and Off setpoint values by a user-defined offset when an external switch closes the binary input control circuit. Using a switching timer enables you to set up occupied/unoccupied temperature setback schedules for your applications.
- high-impact, thermoplastic Type 1/IP20 or Type 4X (NEMA)/IP66 watertight, corrosion-resistant enclosures increase application options, allowing surface and snap-fit DIN rail mount, or watertight surface mount.



A421 Series Electronic Temperature Control

- parameter adjustment restriction allows you to lock the control's setup parameters and restrict user adjustments to just the On and Off temperature setpoint values within your defined setpoint adjustment range.
- low- and line-voltage control models provide industry standard control voltage options for most refrigeration and HVAC control applications.

Repair Information

If the A421 Series Electronic Temperature Control fails to operate within its specifications, replace the unit. For a replacement A421 Control, contact the nearest Authorized Johnson Controls/PENN® Distributor or Sales Representative.



Single-Stage Electronic Temperature Controls

A421 Series Electronic Temperature Controls (Continued)

Selection Chart

A421 Electronic Temperature Control Selection Chart

Product Code Number	Description
A421ABC-02C	Line-Voltage Type 1 Electronic Temperature Control: Type 1 (NEMA), IP20 standard enclosure for DIN rail and surface-mount applications. Rated for 120/240 VAC. Includes an A99BB-200C temperature sensor with 6 ft 7-1/5 in. (2.0 m) cable.
A421ABC-03C	Line-Voltage Type 1 Electronic Temperature Control: Type 1 (NEMA), IP20 standard enclosure for DIN rail and surface-mount applications. Rated for 120/240 VAC. Includes an A99BB-300C temperature sensor with 9 ft 9 in. (3.0 m) cable.
A421ABC-04C	Line-Voltage Type 1 Electronic Temperature Control: Type 1 (NEMA), IP20 standard enclosure for DIN rail and surface-mount applications. Rated for 120/240 VAC. Includes an A99BB-400C temperature sensor with 13 ft 1-1/5 in. (4.0 m) cable.
A421ABC-06C	Line-Voltage Type 1 Electronic Temperature Control: Type 1 (NEMA), IP20 standard enclosure for DIN rail and surface-mount applications. Rated for 120/240 VAC. Includes an A99BB-400C temperature sensor with 19 ft 6 in. (6.0 m) cable.
A421AEC-01C	Line-Voltage Type 4X Electronic Temperature Control: Type 4X (NEMA), IP67 weathertight enclosure for surface-mount applications. Rated for 120/240 VAC. Includes an A99BB-25C temperature sensor with 9-7/8 in. (0.25 m) cable.
A421AEC-02C	Line-Voltage Type 4X Electronic Temperature Control: Type 4X (NEMA), IP67 weathertight enclosure for surface-mount applications. Rated for 120/240 VAC. Includes an A99BB-200C temperature sensor with 6 ft 7-1/5 in. (2.0 m) cable.
A421GBF-02C	Low-Voltage Type 1 Electronic Temperature Control: Type 1 (NEMA), IP20 standard enclosure for DIN rail and surface-mount applications. Rated for 24 VAC Class 2, Safety Extra Low Voltage. Includes an A99BB-200C temperature sensor with 6 ft 7-1/5 in. (2.0 m) cable.
A421GEF-01C	Low-Voltage Type 4X Electronic Temperature Control: Type 4X (NEMA), IP67 weathertight enclosure for surface-mount applications. Rated for 24 VAC Class 2, Safety Extra Low Voltage (SELV). Includes an A99BB-25C temperature sensor with 9-7/8 in. (0.25 m) cable.
A421GEF-02C	Low-Voltage Type 4X Electronic Temperature Control: Type 4X (NEMA), IP67 weathertight enclosure for surface-mount applications. Rated for 24 VAC Class 2 (SELV). Includes an A99BB-200C temperature sensor with 6 ft 7-1/5 in. (2.0 m) cable.

A99 Temperature Sensors Compatible with the A421 Control¹

Product Code Number	Description
A99BA-200C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 6 ft 7-1/5 in. (2.0 m) shielded PVC cable; Ambient operating temperature range: -40 to 212°F (-40 to 100°C)
A99BB-25C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 9-7/8 in. (0.25 m) PVC cable; Ambient operating temperature range: -40 to 212°F (-40 to 100°C)
A99BB-200C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 6 ft 7-1/5 in. (2.0 m) PVC cable; Ambient operating temperature range: -40 to 212°F (-40 to 100°C)
A99BB-300C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 9 ft 9-3/5 in. (3.0 m) PVC cable; Ambient operating temperature range: -40 to 212°F (-40 to 100°C)
A99BB-400C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 13 ft 1-1/5 in. (4.0 m) PVC cable; Ambient operating temperature range: -40 to 212°F (-40 to 100°C)
A99BB-600C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 19 ft 8-2/5 in. (6.0 m) PVC cable; Ambient operating temperature range: -40 to 212°F (-40 to 100°C)
A99BC-25C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 9-7/8 in. (0.25 m) high-temperature silicon cable; Ambient operating temperature range: -40 to 248°F (-40 to 100°C)
A99BC-100C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 3 ft 3-3/5 in. (1.0 m) high-temperature silicon cable; Ambient operating temperature range: -40 to 248°F (-40 to 120°C)
A99BC-300C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 9 ft 9-3/5 in. (3.0 m) high-temperature silicon cable; Ambient operating temperature range: -40 to 248°F (-40 to 120°C)
A99BC-500C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 16 ft 4-4/5 in. (5.0 m) high-temperature silicon cable; Ambient operating temperature range: -40 to 248°F (-40 to 120°C)
A99BC-1500C	PTC Temperature Sensor: Standard probe 2 in. (5.1 cm) with 49 ft 2-2/5 in. (15.0 m) high-temperature silicon cable; Ambient operating temperature range: -40 to 248°F (-40 to 120°C)
A99CB-200C	PTC Temperature Sensor: Extended probe 6 in. (15.2 cm) with 6 ft 7-1/5 in. (2.0 m) PVC cable; Ambient operating temperature range: -40 to 212°F (-40 to 100°C)
A99CB-600C	PTC Temperature Sensor: Extended probe 6 in. (15.2 cm) with 19 ft 8-2/5 in. (6.0 m) PVC cable; Ambient operating temperature range: -40 to 212°F (-40 to 100°C)

1. When any A99 Series Temperature Sensor is connected to a standard temperature A421 Control model, the range of usable values is -40 to 212°F (-40 to 100°C).



Single-Stage Electronic Temperature Controls

A421 Series Electronic Temperature Controls (Continued)

Accessories for the A421 Controls

Product Code Number	Description
BKT287-1R	12 in. (305 mm) long DIN rail section
BKT287-2R	36 in. (914 mm) long DIN rail section
PLT344-1R	Two End Clamps for DIN rail sections
A99-CLP-1	Surface Mounting Clip for A99B and A99C Series Temperature Sensors
SHL10-603R	Sun Shield for A99B and A99C Series Temperature Sensors
BOX10A-603R	PVC Enclosure for A99B and A99C Series Temperature Sensors
WEL11A-601R	Immersion well for applying sensor in fluid applications

Technical Specifications

A421 Series Electronic Temperature Controls	
Power Consumption	1.8 VA maximum
Supply Power	Low Voltage Models: 24 VAC (20 to 30 VAC), 50/60 Hz, Class 2 or Safety Extra-Low Voltage Line Voltage Models: 110/120 or 208/230/240 VAC, 50/60 Hz
Ambient Conditions	Operating: Type 1 Models: -40 to 150°F (-40 to 66°C), 0 to 95% RH Noncondensing Type 4X Models: -40 to 140°F (-40 to 60°C), 0 to 95% RH Noncondensing Shipping and Storage: -40 to 185°F (-40 to 85°C), 0 to 95% RH Noncondensing
Temperature Control Range	-40 to 212°F (-40 to 100°C)
Input Signal	1,035 ohm at 77°F (25°C) for A99 PTC temperature sensors
Sensor Offset Range	±5°F or ±3°C
Output Relay Contacts Electrical Ratings	24 VAC models: 100 VA, 30 VAC maximum, Class 2 120/240 VAC models: Applied Voltage: 24 VAC 120 VAC 208 VAC 240 VAC Horsepower N.O. (N.C.): -- 1 (0.25) hp 1 (0.33) hp 1 (0.5) hp Full Load Amperes N.O. (N.C.): -- 16 (5.8) A 9.2 (4.0) A 8.0 (4.9) A Locked Rotor Amperes N.O. (N.C.): -- 96 (34.8) A 55.2 (24) A 48 (29.4) A Resistive Amperes N.O. (N.C.): 15 (10) A 15 (10) A 10 (10) A 10 (10) A Pilot Duty N.O. (N.C.): 125 (50) VA 125 (125) VA 125 (125) VA 125 (125) VA
Enclosure Material	Type 1/IP20 high-impact thermoplastic or Type 4X/IP66 watertight, corrosion-resistant, high-impact thermoplastic
Compliance	North America: cULus Listed; UL 60730, File E27734, Vol. 1; 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 2004/108/EC and the Low Voltage Directive 2006/95/EC. Australia: Regulatory Compliance Mark (RCM)



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