A5xx Series Wall Mount Refrigeration and Defrost Controllers Product Bulletin

LIT-12012987

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Description

The A5xx Series Wall Mount Refrigeration and Defrost Controllers provide refrigerated space and defrost control for low and medium temperature refrigeration applications.

The A5xx Controller includes five line-voltage, dry-contact relays to control the compressor, defrost heater or solenoid, evaporator fans, and user-provided alarm devices. The A5xx Controller can control two-speed evaporator fans and resistive heat, hot-gas bypass, or passive defrost.

The A5xx Controller's adaptive defrost adjusts the defrost schedule to the minimum number of defrost intervals that you require to achieve peak efficiency, save energy, and maintain consistent space temperature.

The A525 includes an optional BACNet MSTP communication port to communicate with a BAS system.

The A5xx Controller includes an IP65 enclosure with holes in the enclosure base for wall and surface mounting. You can order an optional DIN rail mounting kit (part no. BKT524-1K).

Figure 1: A5xx Series Wall Mount Refrigeration and Defrost Controllers

Features and benefits

Plain language programming

Displays a scrolling alphanumeric message system that shows you what to program.

Time-based or adaptive defrost

Provides a choice between a conventional time-based defrost or the more advanced adaptive defrost. Adaptive defrost improves efficiency by learning and automatically adjusting the defrost schedule of your system.

Meets Title 24 standards

You can program the controller to determine when to operate the fan at high-speed, low-speed, or set the fan to off. This feature provides better air circulation in the conditioned space and meets energy efficiency standards.

Alarming

Facilitates the programming of high-temperature, low-temperature, door open, man-in-room, refrigeration leak, high-pressure, low-pressure, and sensor failure conditions. Failure messages display in plain language to reduce confusion about the source of an alarm.

Reporting and recording

Automatically records temperatures at preferred intervals to improve food safety. You can also create reports to show that food storage occurs at the required temperatures.

Program copy and firmware updates

Features a USB port that you can use to upload your preferred settings or to update the controller's operating firmware.

BACNet MSTP communication option

Allow for connection to BAS systems such as Metasys or Verasys.

Applications

You can use the A5xx Controller with single condenser evaporator refrigeration systems such as walk-in coolers and freezers.

Important: Use the A5xx Controller only as an operating control. Where failure or malfunction of the A5xx Controller could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the A5xx Controller.

Important: Utiliser ce A5xx Controller uniquement en tant que dispositif de contrôle de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du A5xx Régulateur risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du A5xx Régulateur.

User interface

The controller's system status and setup information displays on an LCD user interface with adjustable brightness. The status indicator icons show the defrost, cooling, evaporator fan, and alarm features and provide a visual indication of the system status and alarms.

The **Defrost** and **Alarm** icons also function as keys. You can use these keys to initiate unscheduled defrost cycles and clear system alarms. You can use the other four touchpad keys to navigate the system, see detailed system information, and change parameter settings. You can also use these touchpad keys to respond to system alarms.

Refrigeration mode

Refrigeration mode is the normal operating mode of the A5xx Controller. The system cycles the compressor on and off, and operates the evaporator fans according to the setup selections to maintain the setpoint temperature in the refrigerated space.

While in refrigeration mode, the **Fan** icon indicates the evaporator fan relay status and the defrost relay and **Defrost** icon remain off. The LCD user interface displays the **HOME** screen, which shows the system name, date, time, space temperature, and setpoint.

Defrost mode

The selections you make for defrost type, defrost termination type, and evaporator fan behavior determine how the refrigeration system operates during defrost mode. To manually start or stop a defrost cycle, press the **Defrost** icon for several seconds.

The A5xx Controller includes the following defrost modes:

- Off-cycle defrost is the defrost type commonly used on medium temperature refrigeration applications. During off-cycle defrost, refrigerant flow to the evaporator is interrupted. The evaporator fans remain on to move air over the evaporator coil and melt any accumulated frost or ice.
- Electric defrost uses electric resistive heating elements controlled by the defrost relay to melt the ice that accumulates on the evaporator coil during normal cooling operation. Low-temperature refrigeration applications often use electric defrost.
- Hot gas defrost systems use a bypass valve controlled by the defrost relay and extra refrigerant piping to temporarily reroute the hot gas discharge from the compressor through the evaporator coil. Low and very low temperature refrigeration applications use hot gas defrost.

Defrost termination types

The A5xx Controller can terminate defrost durations based on time or temperature. Temperature termination applications use a temperature sensor (Sn2) or a high-voltage termination temperature switch (HVBIN) installed on the evaporator.

- Time-based defrost terminates the defrost cycle when the user-defined maximum defrost duration elapses.
- Temperature-sensor defrost terminates the defrost cycle when the temperature sensed at the evaporator sensor (Sn2) reaches the user-defined defrost termination temperature.
- Temperature-switch based defrost terminates the defrost cycle when the temperature at the defrost termination switch on the evaporator reaches the switch's cutout temperature.

Note: The maximum defrost duration overrides both temperature-sensor and temperature-switch defrost termination and terminates the defrost cycle, even if the evaporator does not reach the termination temperature.

Defrost schedule types

You can set up the following defrost schedule types on the A5xx Controller:

- Scheduled defrost facilitates the set up of one to eight defrost cycles per day on a fixed schedule. Automatic scheduled defrost sets up the defrost intervals at equal time frequencies based on the selected number of defrost cycles per day. Manual scheduled defrost facilitates the selection of specific times at which each defrost cycle starts during the day.

- Adaptive defrost does not follow a user-defined time schedule, but instead continuously adapts to the refrigeration system conditions and schedules defrost cycles as needed. Adaptive defrost adjusts the defrost schedule to achieve a user-defined defrost duration. You set up the expected defrost duration, the first defrost interval, and a defrost termination temperature. The adaptive defrost system adjusts the length of the defrost interval so that the expected defrost duration coincides with the time that the evaporator reaches the termination temperature.

Adaptive defrost setup parameters

The A5xx Controller includes the following adaptive defrost setup parameters:

- The expected defrost duration is the estimated duration for a complete defrost of the evaporator coil and how long it takes for the evaporator to reach the defrost termination temperature after a typical defrost interval. During the set up of the adaptive defrost, select from 0 minutes to 99 minutes for the expected defrost duration.
- The defrost interval is the interval in hours between the start of consecutive defrost cycles. You can define the initial defrost interval when you set up the adaptive defrost feature, and the adaptive defrost feature shortens or lengthens the defrost interval to adapt to the required interval. Select from 1 hour to 48 hours for the initial defrost interval.
- Maximum time between defrosts defines the maximum hours for any adaptive defrost interval. If the system calculates a defrost interval greater than the maximum time set by you, the A5xx Controller ignores the calculation and starts the next defrost duration based on the maximum time. Select from 3 hours to 48 hours for the maximum time between defrosts.
- Minimum time between defrosts defines the minimum hours for any adaptive defrost interval. If the system calculates a defrost interval less than the minimum time set by you, the A5xx Controller ignores the calculation and starts the next defrost duration based on the minimum time. Select from 3 hours to 48 hours for the minimum time between defrosts.
- Blackout periods prevent the occurrence of defrost cycles during the defined blackout period. You can schedule daily blackout periods during regular, predictable periods of high cooling demand. Select from 0 minutes to 240 minutes for a blackout period.

Compressor and evaporator fan start delays

To control the compressor and evaporator fan operation, the A5xx Controller uses the following time delay features:

- The anti-short cycle delay (ASD) holds the compressor relay off (open) after the relay cycles off. The compressor relay cannot turn on (close) again until the ASD elapses, which protects the compressor from short cycling. Select from 0 minutes to 12 minutes for the ASD.
- The evaporator fan drip-time delay holds the compressor relay and evaporator fan relays off (open) after the defrost duration terminates. This feature ensures that any remaining moisture on the evaporator drips off. Select from 0 minutes to 10 minutes for the evaporator fan drip-time delay.
- The evaporator fan temperature delay holds the evaporator fan relays off (open) after the defrost termination, drip-time delay, and compressor start in cooling mode. The evaporator coil cools down and freezes any moisture before the evaporator fans start. This delay reduces the moisture and warm air that is blown into the refrigerated space. Select from -6°C to 1°C (20°F to 35°F) for the evaporator fan temperature delay.
- The evaporator fan time delay works with the evaporator fan temperature delay. The evaporator fan time delay holds the evaporator fan relays off (open) after the defrost termination, drip-time delay, and compressor start in cooling mode. The evaporator coil cools down and freezes any moisture before the evaporator fans start. This delay reduces the moisture and warm air that is blown into the refrigerated space. The evaporator fan delay is an adjustable time delay after a defrost cycle. Select from 0 minutes to 15 minutes for the evaporator fan time delay.

Evaporator fan on/off and speed control

The evaporator fan control behavior depends on the evaporator fan speed type, the operation of cooling or defrost mode, and your selected setup values. On the A5xx Controller, you can set the evaporator fan as a single speed fan to run continuously or to cycle on and off with the compressor. You can also set the evaporator fan as a two-speed fan to run continuously at high-speed or to cycle between low-speed and high-speed.

System setup parameters

The system setup parameters define the system attributes, hardware features, and hard-wired components of the refrigeration system. The A5xx Controller includes the following system setup parameters:

- Time and date
- Defrost type
- Defrost termination type
- Evaporator fan type
- Sensor type
- Units of temperature in Celsius or Fahrenheit
- LCD brightness
- Touchpad sound
- System name

Universal inputs and alarms

The A5xx Controller includes the following universal inputs and alarms:

- The UI 4 and UI 5 universal inputs interface monitors external binary and analog signals, and defines conditions and actions based on those signals. The universal inputs receive signals from a door switch, refrigerant leak detector, man-in-room, or an emergency switch signal. When the A5xx Controller receives a signal, the system performs a specific action, such as energizing an alarm.
- Cooling shutdown occurs when one of the two universal input modes receives an external signal. When the system receives an external signal, the A5xx Controller turns the compressor and fan off.
- System shutdown takes priority over the normal control of the compressor, defrost, and fan relays. System shutdowns occur during an alarm condition such as man-in-room, refrigerant leak, or the activation of the emergency switch.

Dimensions

The following figures show the dimensions of the A5xx Controller.

Figure 2: A5xx Controller front panel with dimensions in millimeters (inches)

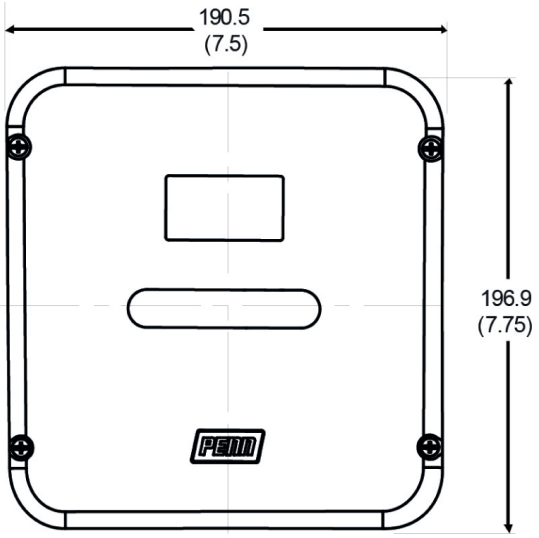


Figure 3: A5xx Controller rear panel with mounting hole dimensions in millimeters (inches)

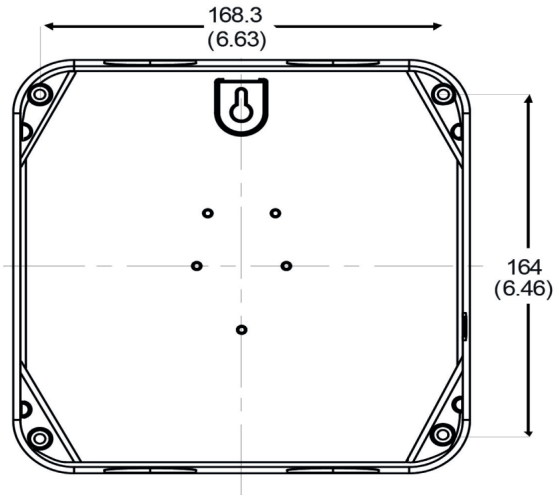


Figure 4: A5xx Controller side view with dimensions in millimeters (inches)

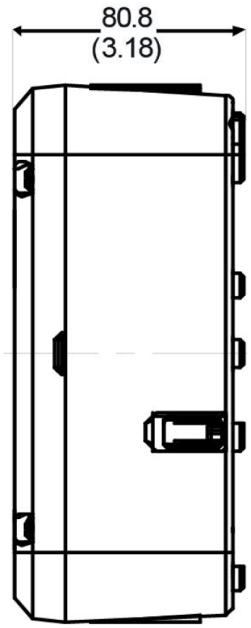
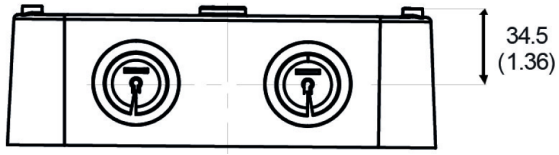


Figure 5: A5xx Controller top view with dimensions in millimeters (inches)



Parts included

Some A5xx Controllers include two Johnson Controls® and PENN® A99B temperature sensors; other A5xx Controller models do not include any temperature sensors and you must purchase the specified A99B sensors separately. For

more information about the A99B temperature sensors, refer to the *A99B Temperature Sensors Product Technical Bulletin (LIT-125186)* or contact the nearest Johnson Controls or PENN distributor or sales representative.

Ordering information

The following table contains product codes and descriptions for the A5xx Controller models.

Table 1: A5xx Series Wall Mount Refrigeration and Defrost Controllers

Product code	Description
A525AEDN-0000C	Electronic wall mount refrigeration and defrost controller with two sensor inputs and five output relays. Does not include sensors
A525AEDN-0203C	Electronic wall mount refrigeration and defrost controller with two sensor inputs and five output relays. Includes two A99B type sensors
A525AEDV-0203C	Electronic wall mount refrigeration and defrost controller with two sensor inputs and five output relays. Includes two A99B type sensors, and BACNet MSTP communcation option

The following table contains product codes and descriptions for the A5xx Controller accessories.

Table 2: Accessories for the A5xx Controller

Product code	Description
A99BB-200C	Positive temperature coefficient (PTC) silicon sensor with PVC cable; cable length: 2 m (6.5 ft); Range: -40°C to 100°C (-40°F to 212°F)
A99BB-300C	PTC silicon sensor with PVC cable; cable length: 3 m (9.8 ft); Range: -40°C to 100°C (-40°F to 212°F)
A99BB-400C	PTC silicon sensor with PVC cable; cable length: 4 m (13.1 ft); Range: -40°C to 100°C (-40°F to 212°F)
A99BB-500C	PTC silicon sensor with PVC cable; cable length: 5 m (16.4 ft) Range: -40°C to 100°C (-40°F to 212°F)
A99BB-600C	PTC silicon sensor with PVC cable; cable length: 6 m (19.7 ft) Range: -40°C to 100°C (-40°F to 212°F)
BKT287-1R	305 mm (12 in.) section of 35 mm DIN rail

Table 2: Accessories for the A5xx Controller

Product code	Description
BKT524-1K	Bracket kit for mounting A5xx Controller to 35 mm DIN rail. Includes five mounting screws
TS-6340K-F00	10K ohms NTC sensor with 1.5 m (4.9 ft) cable; available in Europe only

Repair information

If the A5xx Series Wall Mount Refrigeration and Defrost Controller fails to operate within its specifications, replace the unit. For a replacement A5xx Controller, contact the nearest Johnson Controls representative.

Electrical ratings

Table 3 to Table 7 provide the electrical ratings for the control relays in the A5xx Controller.

Table 3: Single-pole single-throw (SPST) compressor relay electrical ratings (100,000 cycles)

	UL 60730			EN 60730
Applied AC voltage at 50/60 Hz	24 VAC	120 VAC	240 VAC	240 VAC
Horsepower	n/a	1 hp	1 hp	1hp
Full load amperes	n/a	16 A	8 A	8 A
Locked rotor amperes	n/a	96 A	48 A	48 A
Resistive amperes	10 A	n/a	n/a	n/a
Pilot duty VA	125 VA at 24 VAC to 240 VAC			

Table 4: Single-pole double-throw (SPDT) alarm relay electrical ratings

	UL 60730			EN 60730
Applied AC voltage at 50/60 Hz	24 VAC	120 VAC	240 VAC	240 VAC
Horsepower (LC/LNO and LC/LNC)	n/a	1/2 hp	1/2 hp	1/2 hp
Full load amperes (LC/LNO and LC/LNC)	n/a	9.8 A	4.9 A	4.9 A
Locked rotor amperes (LC/LNO and LC/LNC)	n/a	58.8 A	29.4 A	29.4 A

Table 4: Single-pole double-throw (SPDT) alarm relay electrical ratings

	UL 60730	EN 60730
Resistive amperes (LC/LNO and LC/LNC)	10 A	
Pilot duty VA (LC/LNO and LC/LNC)	125 VA at 24 VAC to 240 VAC	

Table 5: SPST low-speed fan or auxiliary (lo-spd aux) relay electrical ratings

	UL 60730			EN 60730
Applied AC voltage at 50/60 Hz	24 VAC	120 VAC	240 VAC	240 VAC
Horsepower	n/a	1/2 hp	1/2 hp	1/2 hp
Full load amperes	n/a	9.8 A	4.9 A	4.9 A
Locked rotor amperes	n/a	58.8 A	29.4 A	29.4 A
Resistive amperes	10 A			
Pilot duty VA	125 VA at 24 VAC to 240 VAC			

Table 6: SPST high-speed (hi-spd) relay electrical ratings (30,000 cycles)

	UL 60730			EN 60730
Applied AC voltage at 50/60 Hz	24 VAC	120 VAC	240 VAC	240 VAC

Table 6: SPST high-speed (hi-spd) relay electrical ratings (30,000 cycles)

	UL 60730			EN 60730
Horsepower	n/a	1/2 hp	1/2 hp	1/2 hp
Full load amperes	n/a	9.8 A	4.9 A	4.9 A
Locked rotor amperes	n/a	58.8 A	29.4 A	29.4 A
Resistive amperes	10 A			
Pilot duty VA	125 VA at 24 VAC to 240 VAC			

Table 7: SPST defrost relay electrical ratings (30,000 cycles)

	UL 60730			EN 60730
Applied AC Voltage at 50/60 Hz	24 VAC	120 VAC	240 VAC	240 VAC
Resistive amperes	10 A	24 A [1]	24 A[1]	24 A[1]
Pilot duty VA	125 VA at 24 VAC to 240 VAC			

1 The A5xx Controller is rated for 24 A at temperatures up to 45°C (113°F). When the controller operates from 45°C to 60°C (113°F to 140°F), the ampere rating decreases from 24 A to 15 A at a rate of 0.6 A per 1°C. The A5xx Controller is not rated for use in ambient conditions above 60°C (140°F).

A5xx Series Wall Mount Refrigeration and Defrost Controllers technical specifications

Table 8: A5xx Series Wall Mount Refrigeration and Defrost Controllers technical specifications

Product	A525
Power consumption	1.8 VA maximum
Supply power	84 VAC–260 VAC, 50/60 Hz, 10 VA maximum
Ambient conditions	Operating: -30°C to 60°C (-22°F to 140°F), 0% to 95% RH noncondensing Shipping and storage: -40°C to 85°C (-40°F to 185°F), 0% to 95% RH noncondensing
Temperature sensing	-40°C to 50°C (-40°F to 122°F)
Input signal (Sn1 and Sn2)	A99B PTC temperature sensor: 1,035 ohms at 25°C (77°F) TS-6340K-F00 NTC temperature sensor: 10K ohms at 25°C (77°F); available in Europe only
Input signal (UI 4 and UI 5)	0 VDC–10 VDC input for leak detector status or dry contact binary input with a switch wired between terminals UI 4 or UI 5 and a common (C) terminal
HVBIN signal	120 VAC or 240 VAC

Table 8: A5xx Series Wall Mount Refrigeration and Defrost Controllers technical specifications

Sensor offset range	3ºC or 5ºF
RS485 BACnet interface (included with some models)	Maximum distance: 5,000 ft (1,524 m) Baud rate: 38.4K with AWG 20 wiring Address range: 1-127
Enclosure	IP65 watertight, corrosion-resistant, high-impact thermoplastic
Dimensions (H x W x D)	196.8 mm (7.75 in.) x 190.5 mm (7.5 in.) x 82.6 cm (3.25 in.)
Weight	1.1 kg (2.4 lb)
Compliance	North America: • United States: cULus Listed; UL60730-1, UL60730-2-9, File SA516; FCC Compliant to CFR47, Part 15, Subpart B, Class B limits • Canada: cULus Listed; CAN/CSA-E60730-1:15, CAN/CSA-E60730-2-9:15, File SA516; Industry Canada (IC) compliant to Canadian ICES-003, Class B limits
CE	Europe: CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive; RoHS Directive
	Australia and New Zealand: RCM Mark, Australia/NZ emissions compliant

These performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

Table 9: A99B type PTC temperature sensors

Ambient sensing and operating conditions [1]	Type A99BA [2]: -40°C to 100°C (-40°F to 212°F); 0% to 100% RH, condensing Type A99BB: -40°C to 100°C (-40°F to 212°F); 0% to 100% RH, condensing Type A99BC: -40°C to 120°C (-40°F to 248°F); 0% to 100% RH,condensing
Reference resistance	1,035 ohms at 25°C(77°F) and 855 ohms at 0°C (32°F)
Accuracy	5°C (0.9°F) between -15°C and 57°C (5°F and 135°F). Refer to the *A99B Temperature Sensors Product/Technical Bulletin (LIT-125186)* for accuracy ratings outside of this temperature range
Sensor construction	Probe: stainless steel; 50 mm x 6.0 mm (2 in. x 0.2 in.)
Sensor cable sheath	Type A99BA: Shielded PVC cable Type A99BB: PVC cable Type A99BC: High-temperature silicon cable
Wire gauge	22 AWG (0.33 mm [2])
Ambient storage conditions	Type A99BA: -40°C to 105°C (-40°F to 221°F); 0% to 100% RH, condensing Type A99BB:-40°C to 105°C (-40°F to 221°F); 0% to 100% RH, condensing Type A99BC: -40°C to 130°C (-40°F to 266°F); 0% to 100% RH,condensing
Shipping weight	41 g (1.4 oz) for 2 m (6.5 ft) sensor

1 When you connect any A99B temperature sensor to an A5xx Controller, the range of the displayed temperature values is restricted from -40°C to 50°C (-40°F to 122°F).

2 Refer to the *A99B Series Temperature Sensor Product/Technical Bulletin (LIT-125186)* for detailed information about the A99B sensors.

Table 10: TS6340K-F00 NTC temperature sensor

Ambient sensing and operating conditions	-40°C to 100°C (-40°F to 212°F); 0% to 100% RH, condensing
Reference resistance	10K ohms at 25°C (77°F)
Sensor construction	Probe: stainless steel; 50 mm x 6.0 mm (2 in. x 0.2 in.) Cable length: 1.5 m (4.9 ft)
Sensor cable sheath	PVC cable

North American emissions compliance

United States

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canada

This Class (B) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (B) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Software terms

Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

Patents

Patents: http://jcipat.com

Single point of contact

APAC	Europe	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIJANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS WESTENDHOF 3 45143 ESSEN GERMANY	JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA

For more contact information, refer to www.johnsoncontrols.com/locations.

Contact information

Table 11: Contact information

Region	Group	Contact information
Global	Johnson Controls	www.johnsoncontrols.com/contact-us www.johnsoncontrols.com/locations
North America	PENN Controls	www.penncontrols.com/contact 1-888-220-6668
	Verasys Controls	www.verasyscontrols.com/contact 1-844-820-4830
	Triatek	www.triatek.com/contact 1-888-424-1922 | 1-770-242-1922

Table 12: Sales support

Region	Group	Contact information
North America	Product Sales Support	jciorder@jci.com 1-800-275-5676; Option 1: Order Support
	Applied DX Sales Support	applieddxsalessupport@jci.com
	Triatek Sales Support	sales@triatek.com 1-888-424-1922 | 1-770-242-1922

Table 13: Technical support

Region	Group	Contact information
North America	Product Technical Support	1-800-275-5676 Option 2: Product Technical Support, then: - Option 1: HVAC (psotechsupport@jci.com) - Option 2: FX and Metasys - Option 3: PENN Controls/Refrigeration (refrig.techsupport@jci.com)
	Field Support Center	CGFieldSupportCenter@jci.com 1-800-524-1330
	Applied DX Technical Support	applieddxtechsupport@jci.com
	Triatek Technical Support	triatekservice@triatek.com 1-888-424-1922 | 1-770-242-1922
Latin America	Technical Support	BE-LA-Support@jci.com
Europe	Technical Support	Refer to your respective country for support: www.johnsoncontrols.com/locations
Asia (except Japan)	Technical Support	Asia.TechnicalSupport@jci.com
Japan	Technical Support	Yoshiyuki.Maeda@jci.com
Middle-East, Turkey, and Africa	Technical Support	BE-MEA-Systems-Tech-Support@jci.com