JOHNSON CONTROLS

Code No. LIT-1900459
Issued May 2, 2007

LN-VAVLF-1, LN-VAVLN-1, and LN-VVTLF-1

LN Series LN-VAVLF-1, LN-VAVLN-1, and LN-VVTLF-1 Controllers

Description

The LN Series LN-VAVLF-1, LN-VAVLN-1, and LN-VVTLF-1 Controllers use the latest technology to provide you more flexibility and reliability of control. The LN-VAVLF-1, LN-VAVLN-1, and LN-VVTLF-1 controllers are designed to meet the requirements of single duct Variable Air Volume (VAV) or Variable Air Volume and Temperature (VVT) applications.

The LN-VAVLF-1, LN-VAVLN-1, and LN-VVTLF-1 controllers are based on LONWORKS® technology for interoperability and peer-to-peer communication between controllers without any intermediary, but also integrate seamlessly into the Metasys® system.

For additional information, see the *LN Series LN-VAVLF-1, LN-VAVLN-1, and LN-VVTLF-1 Product Bulletin (LIT-12011298)*.

Features

- configurable software - features an LNS plug-in which provides the ability to easily configure inputs, outputs, and sequence options. Configured device complies with LONMARK Space Comfort Control (SCC) profile for interoperability with other LONMARK devices.
- robust hardware - allows you to use any commerically available thermistor type (100 ohms to 100k ohms) and setpoint potentiometer type and features an extremely accurate onboard air flow sensor for pressure independent single duct VAV applications. The controller can read differential pressure as small as 0.04 milli-inches.
- powerful control options - performs Demand Control Ventilation based on CO_2 sensor readings to ensure high indoor air quality in an efficient manner. Provides you with the ability to link VAV occupancy status with local lighting control.

Repair Information

If the LN-VAVLF-1, LN-VAVLN-1 or LN-VVTLF-1 controller fails to operate within its specifications, replace the unit. For a replacement, contact the nearest Johnson Controls® representative.

LN-VAVLF-1 Controller

Selection Chart

Code Number	Description
LN-VAVLF-1	Configurable VAV controller, acutator w/feedback, flow sensor, 10 I/O (4 UIs4 triac DOs, 2 UO) and LNS® plug-in.
LN-VAVLN-1	Configurable VAV controller, flow sensor, 10 I/O (4 UIs, 4 triac DOs, 2 UO) and LNS Plug-in. No actuator.
LN-VVTLF-1	Configurable VAV controller, actuator w/feedback, 10 I/O (4 UIs, 4 triac DOs, 2 UO) and LNS Plug-in. No flow sensor.

Technical Specifications

LN-VAVLF-1. LN-VAVLN-1, LN-VVTLF-1 Controllers		
Product Codes		LN-VAVLF-1, LN-VAVLN-1, LN-VVTLF-1
Power Requirements	**Voltage**	24VAC/DC; 15%, 50/60 Hz, Class 2
	Protection	3A removable fuse for triac when using the internal power supply
	Consumption	5 VA
	Maximum Consumption	10 VA (normal), or 85 VA if internal power supply is used for triac (special application)
Ambient Storage Conditions	**Ambient Operating Temperature**	0 - 70°C (3 to 158°F)
	Ambient Storage Temperature	-20 to 70°C (-4 to 158°F)
	Ambient Relative Humidity	0 to 90%
General	**Processor**	Neuron® 3150®, 8 bits. 10 MHz
	Memory	Non-volatile Flash 128k (storage) (APB application, Non-volatile Flash 64k (APB application)
	Media Channel	TP/FT-10, 78 Kbps
	Communication	LonTalk® protocol
	Transceiver	Echelon ® FTT-10
Enclosure (housing)	**Material**	FR/ABS Resin
	Dimensions (with screws)	4.88 x 8.9 x 2.48 in. (124 x 226 x 63 mm)
	Shipping Weight	2.30 lbs (1.05 kg)

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products. © 2007 Johnson Controls, Inc.

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LN Series LN-VAVLF-1, LN-VAVLN-1, and LN-VVTLF-1 Controllers (Continued)

LN-VAVLF-1. LN-VAVLN-1, LN-VVTLF-1 Controllers		
Inputs	**Quantity**	4 universal software configurable
	Input Types	Digital: Dry Contact, Analog Voltage: 0 -10 VDC, Accuracy: ±0.5%, Analog current: 4-20 mA with 249Ω external resistor
	Resistor Support	Thermistor: 100 ohms (PT100), 1 K (RTD I K Type 85), 10 K (Type, 2, 3), Range: -40 to 125º C, (-40 to 257º F) Accuracy: ±0.5º C, ±0.9º F Resolution: 0.1 to 0.18º F (10K ohms to 100K ohms supported using translation table)
	Potentiometer	10k ohms or 100K ohms, translation table (21 points)
	Differential Range	0-250 Pa (0-1 in. H_20)
	Pressure Sensor	(VAV model only): Resolution 0.04 milli-inches H_20
	Accuracy	±0.3% full scale
	Input Resolution	16 bit analog/digital converter
Hardware Outputs	**Quantity**	6 Hardware 4 Digital: Triac 0.75 AMp @ 24 VAC, External or Internal power supply 2 Universal: 0-10 VDC linear, digital 0-10 VDC linear, digital 0-12 VDC (Analog or Digital) or PWM 20 mA max, Maximum load 600 ohms Output Resolution: 10 bits digital/analog converter
Damper Actuator	**Torque**	35 in·lb, 4 N·m Angle of Rotation: 95º adjustable Fits Shaft Diameter: 5/16 to 3/4 in. (8.5 mm to 18.2 mm) Power Supply: from controller

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LX Series Variable Air Volume (VAV)/Variable Air Volume and Temperature (VVT) Controllers

Product Bulletin

Code No. LIT-12011495
Issued June 22, 2009

The LX Series VAV/VVT controllers use the latest technology to provide you with more flexibility and reliability of control. The LX-VAVLF-1, LX-VAVLN-1, and LX-VVTLF-1 controllers are designed to meet the requirements of single duct VAV or VVT applications.

The LX VAV/VVT controllers are based on LONWORKS® technology for interoperability and peer-to-peer communication between controllers without any intermediary, but also integrate seamlessly into the Facility Explorer system.

Figure 1: LX VAV Controller

Table 1: Features and Benefits

Features	Benefits
Configurable Software	Features FX Workbench compatible wizards, which provide the ability to easily configure inputs, outputs, and sequence options. Configured device complies with LONMARK Space Comfort Control (SCC) profile for interoperability with other LONMARK devices.
Robust Hardware	Allows you to use any commercially available thermistor type (100 ohm to 10 k ohm) and setpoint potentiometer type. Features an extremely accurate onboard airflow sensor for pressure independent single duct VAV applications. The controller can read differential pressure as small as 0.04 milli-inches.
Powerful Control Options	Performs Demand Control Ventilation based on CO_2 sensor readings to ensure high indoor air quality in an efficient manner. Provides you with the ability to link VAV occupancy status with local lighting control.

LX VAV/VVT Controller Overview

The LX Controller line offers three VAV/VVT controllers: LX-VAVLF-1, LX-VAVLN-1, and LX-VVTLF-1. Each controller has an integrated brushless constant torque actuator, which has a longer life expectancy than standard brushed motors. The 16-bit analog-digital converter provides high accuracy input and flow pressure sensor readings and allows for precise VAV balancing.

The LX VAV/VVT controller line features expanded Input/Output (I/O) capability with four universal (analog-digital) inputs, four digital outputs, two universal control outputs, and six network outputs that allow you to simultaneously control eight instances of any type of Heating, Ventilating, and Air Conditioning (HVAC) equipment, including duct heaters, fans, multi-stage heaters, coolers, analog and floating valve actuators, and lights.

The network outputs are bound to the physical outputs of other controllers on the network. The universal inputs similarly allow for the connection of any HVAC equipment or peripheral. The controller dynamically adapts its sequence of operations based on the connected equipment without any need for user intervention. Link spare I/O points on the controller to other controllers on the network allowing for efficient control of devices that are close to the LX VAV/VVT controller.

Figure 2 shows the dimensions for the LX-VAVLF and LX-VVTLF controllers. Figure 3 shows the dimensions for the LX-VAVLN controller.

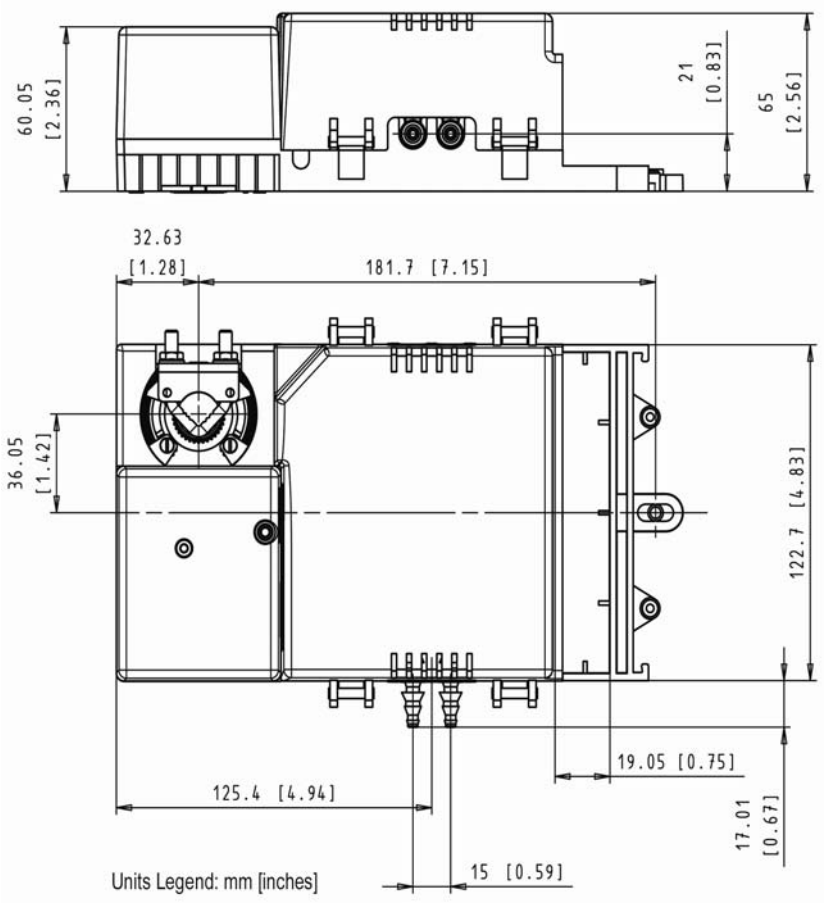
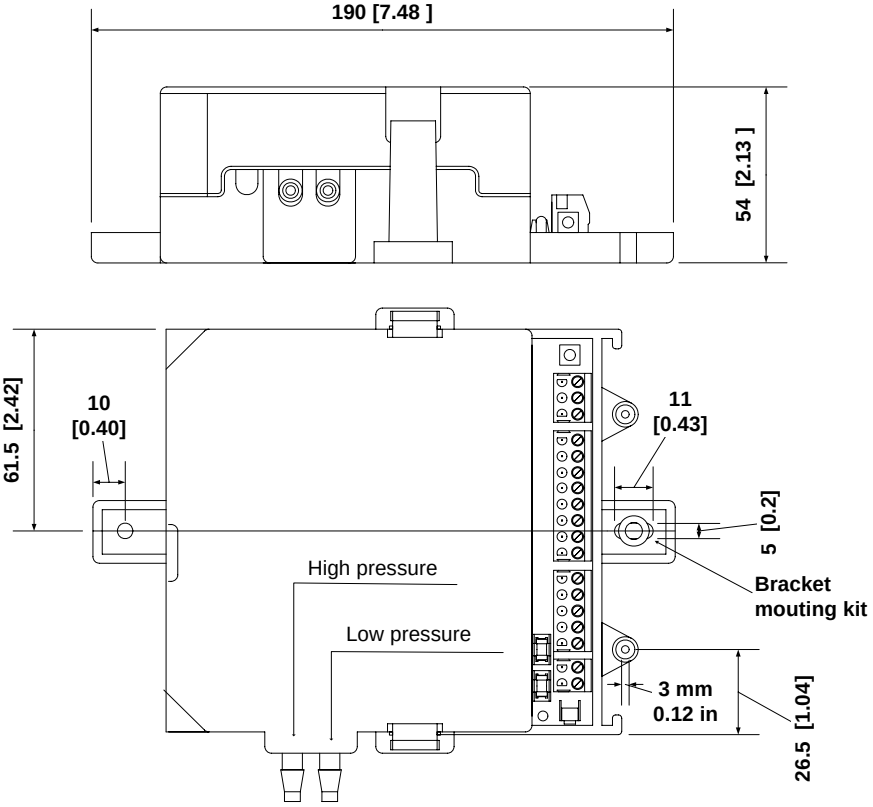


Figure 2: LX-VAVLF and LX-VVTLF Dimensions (mm, in.)



Units Legend: mm [inches]

Figure 3: LX-VAVLN Dimensions (mm, in.)

LONMARK® Objects and Network Variables

Figure 4 shows the LONMARK Objects and Network Variables.

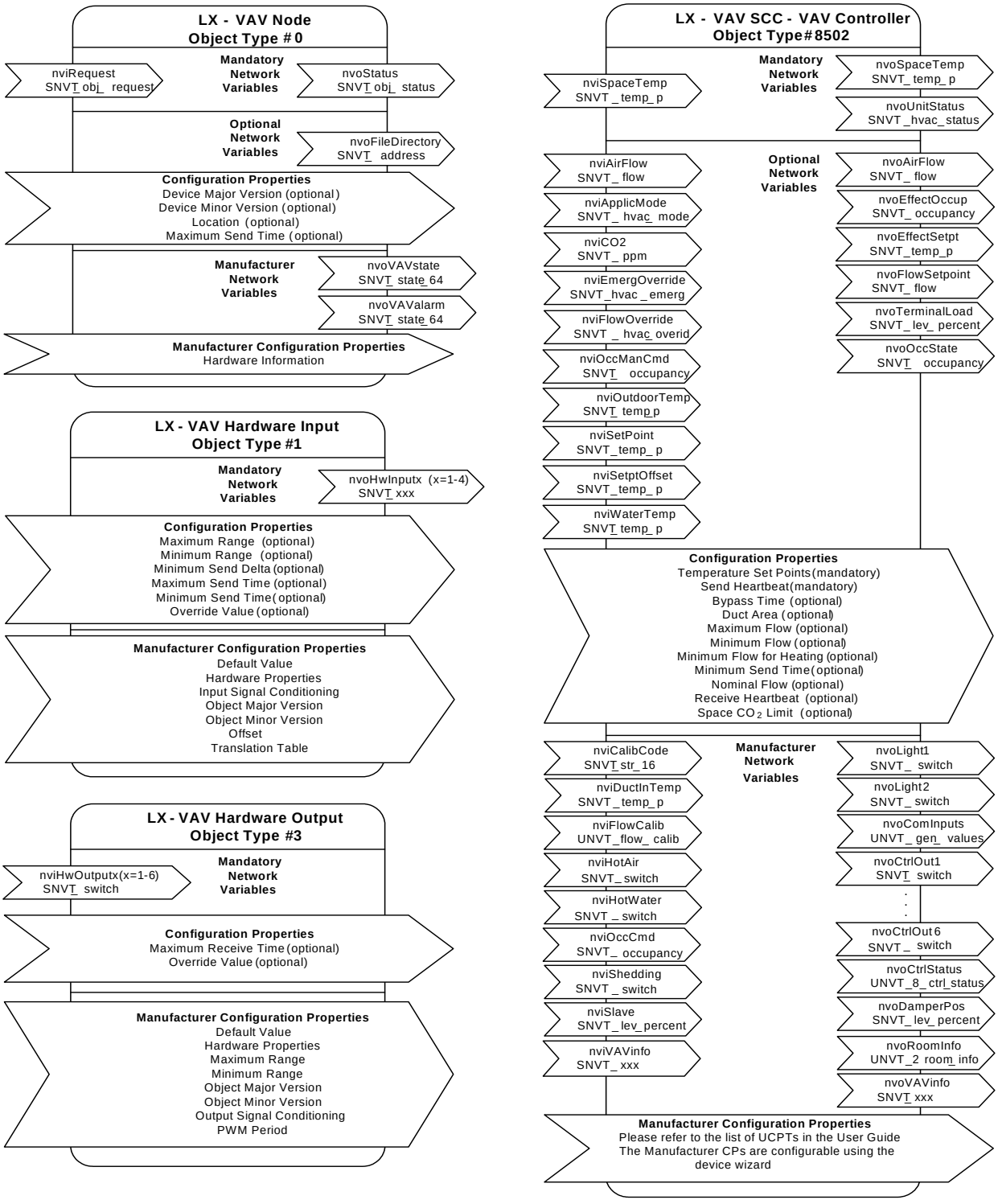


Figure 4: LONMARK Objects and Network Variables-LX-VAVLF-1, LX-VAVLN-1, and LX-VVTLF-1

Selection Chart

Table 2: Selection Chart

Code Number	Description
LX-VAVLF-1	Configurable VAV controller, actuator with feedback, flow sensor, 10 I/O (4 Universal Inputs [UIs], 4 triac Digital Outputs [DOs], 2 Universal Ouputs [UOs]) and wizard.
LX-VAVLN-1	Configurable VAV controller, flow sensor, 10 I/O (4 UIs, 4 triac DOs, 2 UOs) and wizard. No actuator.
LX-VVTLF-1	Configurable VAV controller, actuator with feedback, 10 I/O (4 UIs, 4 triac DOs, 2 UOs) and wizard. No flow sensor.

Technical Specifications

Table 3: LX-VAVLF, LX-VAVLN, and LX-VVTLF (Part 1 of 2)

Product Codes	LX-VAVLF-1, LX-VAVLN-1, and LX-VVTLF-1
Power Requirement	Voltage: 24 VAC/DC; ±15%, 50/60 Hz, Class 2 Protection: 3 A removable fuse for triac when using the internal power supply Consumption: 5 VA Maximum Consumption: 10 VA (normal), or 85 VA if internal power supply is used for triac (special application)
Ambient Storage Conditions	Ambient Operating Temperature: 0 to 70°C, (32 to 158°F) Ambient Storage Temperature: -20 to 70°C, (-4 to 158°F) Ambient Relative Humidity: 0 to 90% noncondensing
General	Standard: LONMARK Functional Profile: SCC-VAV Controller #8502 Processor: Neuron® 3150®, 8 bits, 10 MHz Memory: Nonvolatile Flash 64k (APB application), Nonvolatile Flash 64k (storage) Media Channel: TP/FT-10; 78 Kbps Communication: LonTalk® protocol Transceiver: Echleon® FTT-10
Enclosure	Material: FR/ABS Resin Dimensions (with screws): 4.88 x 8.9 x 2.48 in. (124 x 226 x 63 mm) Shipping Weight: 2.30 lb (1.05 kg)
Inputs	Quantity: 4 universal software configurable Input Types: Digital: Dry Contact, Analog Voltage: 0 to 10 VDC, Accuracy: ±0.5%, Analog current: 4 to 20 mA with 249 ohm external resistor Resistor Support: Thermistor: 100 ohm (PT100), 1 K (RTD I K Type 85), 10 K (Type 2, Type 3) Range: -40 to 125°C, (-40 to 257°F) Accuracy: ±0.5°C, ±0.9°F Resolution: 0.1°C to 0.18°F (10k ohm to 100k ohm supported using translation table) Potentiometer: Linear 2-point setpoint adjustment Min/Max linear configuration Differential: Range 0 to 250 Pa (0-1 in. H_20) Pressure Sensor (VAV model only): Resolution 0.04 milli-inches H_20, Accuracy ±0.3% full scale Input Resolution: 16-bit analog/digital converter
Hardware Outputs	Quantity: 6 Hardware 4 Digital: Triac 0.75 A at 24 VAC, External or Internal power supply 2 Universal: 0-10 VDC linear, digital 0-10 VDC linear, digital 0-12 VDC (Analog or Digital) or PWM 20 mA max, Maximum load 600 ohm Output Resolution: 10-bit digital/analog converter

Table 3: LX-VAVLF, LX-VAVLN, and LX-VVTLF (Part 2 of 2)

Network Outputs	Quantity: 6 (Software Configurable) The network outputs are used by binding them to the free physical outputs of controllers on the network.
Damper Actuator	Torque: 35 in·lb, 4 N·m Angle of Rotation: 95° adjustable Fits Shaft Diameter: 5/16 to 3/4 in. (8.5 to 18.2 mm) Power Supply: from controller

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United States Emissions Compliance

Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian Emissions Compliance

Industry Canada Statement

The term **IC** *before the certification/registration number only signifies that the Industry Canada technical specifications were met.*

Le terme « IC » précédant le numéro d'accréditation/inscription signifie simplement que le produit est conforme aux spécifications techniques d'Industry Canada.

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