ECL-VAV Series

LonMark® Certified Single Duct VAV / VVT Controllers

Overview

The ECL-VAV Series controllers are microprocessor-based programmable variable air volume (VAV) controllers designed to control any variable air volume box. Each controller uses the LonTalk® communication protocol and is LonMark certified as an SCC VAV.

Applications

These controllers meet the requirements of the following applications:

- ☐ Cooling Only VAV Boxes
- ☐ Cooling with Reheat VAV Boxes
- ☐ Parallel Fan VAV Boxes
- ☐ Series Fan VAV Boxes
- ☐ Dual-Duct VAV Systems

Features & Benefits

Flexible Inputs and Outputs

This controller has various input types including resistance, voltage, and digital-based ones. Moreover, it provides digital, floating, pulse width modulation, and proportional control outputs for valves, heating elements, fans, and lighting applications. This controller covers all industry-standard HVAC unitary applications.

Highly Accurate Universal Inputs

Highly accurate universal inputs support thermistors and resistance temperature detectors (RTDs) that range from 0 Ohms to 350,000 Ohms, as well as support for inputs requiring 0 to 10VDC or 0 to 20mA with an external resistor. This provides the freedom of using your preferred or engineer-specified sensors, in addition to any existing ones.

Rugged Inputs/Outputs

Rugged hardware inputs and outputs eliminate need for external protection components, such as diodes for 12V DC relays.

Preloaded Applications

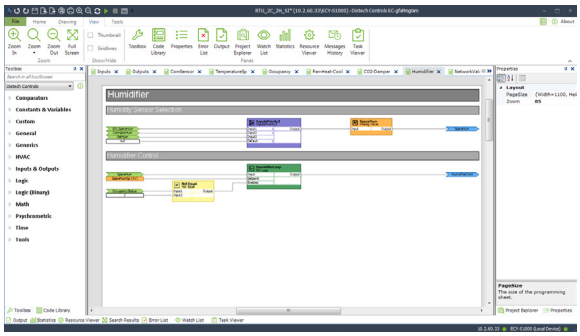
Factory preloaded applications allow these controllers, straight out of the box, to operate standard VAV equipment with a proven energy-efficient sequence of operation thereby eliminating the need for programming. The preloaded application can be selected using an Allure EC-Smart-Vue sensor even before the network has been installed for rapid deployment or through the EC-Net^{AX}™ solution using Distech Controls' *dcgfx*Applications.

Integrated VPACC

Integrated VAV Performance Assessment Control Charts (VPACC) control sequences, provides a means of automatically detecting when the VAV is operating outside of its design parameters including: Persistent High/Low Space Temperature, Persistent High/Low Discharge Temperature, Persistent High/Low Air Flow, and Unstable Air Flow.

Programmability

Supports Distech Controls' EC-*gfx*Program, which makes Building Automation System (BAS) programming effortless by allowing you to visually assemble building blocks together to create a custom control sequence for any HVAC / building automation application.



Increased Energy Efficiency

Improves energy efficiency when combined with:

- Motion detectors to automatically adjust a zone's occupancy mode from standby to occupied when presence is detected
- CO_2 sensors as part of a demand-controlled ventilation strategy that adjusts the amount of fresh air intake according to the number of building occupants
- Light switches to control both lighting and a room's HVAC occupancy / standby mode setting

On-Board Air Flow Sensor

The controllers (except for the VVTS model) are equipped with an accurate on-board air flow sensor for precise air flow monitoring and control at low and high air flow rates, allowing the design for maximum energy efficiency while maintaining an optimal comfort level

The on-board air flow sensor has a range of 0 to 2 inches of water column (500 Pascal).

Built-in Actuator

A built-in actuator with a brushless motor and integrated position feedback system eliminates periodic damper re-initialization and ensures worry-free operation, providing increased occupant comfort and extended service life (except VAV-N models).

The built-in actuator for precise damper positioning used for loads requiring up to 35 inch-pounds (4 Newton-meters) of torque.

Optimized Air Balancing

Optimized air balancing process saves time during commissioning: the flow sensor requires no zero flow calibration, and its variable-speed motor goes to minimum and maximum flow position in half the time of typical VAV actuators.

Smart Room Control Support

The Smart Room Control solution is an end-to-end system for the control of HVAC equipment, lighting, and shades/sunblinds, achieving the highest levels of comfort for occupants while cutting costs from installation time and wiring/material requirements to energy consumption. This solution combines:

- Lighting and shade/sunblind expansion modules to control lights (DALI, on/off or dimming) and shades/sunblinds (up/down and angle rotation).
- Multi-sensor combining motion and luminosity (Lux) sensors and equipped with an Infrared receiver that works with a convenient remote control.
- Wireless (infrared) personal remote control for increased occupant comfort.
- Allure™ Series Communicating Sensors for increased occupant comfort settings.

Open-to-Wireless™ Solution

Open-to-Wireless™

The controllers are Open-to-Wireless™ ready, and when paired with the Wireless Receiver, work with a variety of wireless battery-less sensors and switches, to reduce the cost of installation and minimize the impact on existing partition walls. For supported frequencies in your area, refer to the Open-to-Wireless Solution Guide.

Available with an optional Wireless Receiver that supports up to 18 wireless inputs to create wire-free installations.

Allure™ Series Communicating Sensor Support

These controllers work with a wide range of sensors, such as the Allure Series Communicating Sensors that are designed to provide intelligent sensing and control devices for increased user experience and energy efficiency.

- Allure EC-Smart-Vue sensors feature a backlit-display and graphical menus that provide precise environmental zone control, with any combination of the following: temperature, humidity, CO_2, and motion sensor.
- Allure EC-Smart-Comfort sensors feature colored LED indicators to provide user feedback, rotary knobs to adjust the setpoint offset and fan speed, and an occupancy override push button. This sensor can also be expanded with a combination of up to 4 add-on push button modules for lighting and shade/ sunblind control.
- Allure EC-Smart-Air sensors combine precise environmental sensing in a discreet and alluring enclosure for temperature, humidity, and CO_2.

Supported Platforms

EC-Net^{AX} Solution

The EC-Net^{AX} multi-protocol integration solution is web-enabled and powered by the Niagara^{AX} Framework, establishing a fully Internet-enabled, distributed architecture for real -time access, automation and control of devices. The EC- Net^{AX} open framework solution creates a common development and management environment for integration of LonWorks®, BACnet ® and other protocols. Regardless of manufacturer and protocol, the EC-Net^{AX} system provides a unified modeling of diverse systems and data, providing one common platform for development, management and enterprise applications.

VAV Terminal Block Cover

A cover designed to conceal the wire terminals. Required to meet local safety regulations in certain jurisdictions.

Model Selection

Model	ECL-VAVS-O	ECL-VAVS	ECL-VAV	ECL-VVTS	ECL-VAV-N
Points	5-Point VAV	7-Point VAV	12-Point VAV	6-Point VAV	11-Point VAV
Universal hardware inputs	0	2	4	2	4
Built-in flow sensor	■	■	■		■
Wireless inputs[1]	18	18	18	18	18
15 Vdc Power Supply			■		■
Digital (Triac) outputs	2	2	4	2	4
Universal outputs	1	1	2	1	2
Built-in actuator	■	■	■	■	

1. All controllers are Open-to-Wireless ready. Available when an optional Wireless Receiver is connected to the controller. Some wireless sensors may use more than one wireless input from the controller.

Recommended Applications

Model	ECL-VAVS-O	ECL-VAVS	ECL-VAV	ECL-VVTS	ECL-VAV-N
Cooling Only VAV Box	■	■		■	
Cooling w/ Reheat VAV Box	■	■		■	
Cooling w/ Reheat VAV Box & Perimeter Heating			■		
Parallel Fan VAV Box			■		
Series Fan VAV Box			■		
Dual Duct VAV Box[1,3]	■	■			
Large Damper VAV Box[2]					■
Existing Damper Actuator					■
Room Pressurization			■		
Smart Room Control support for HVAC, light, and shades/ sunblinds			■		

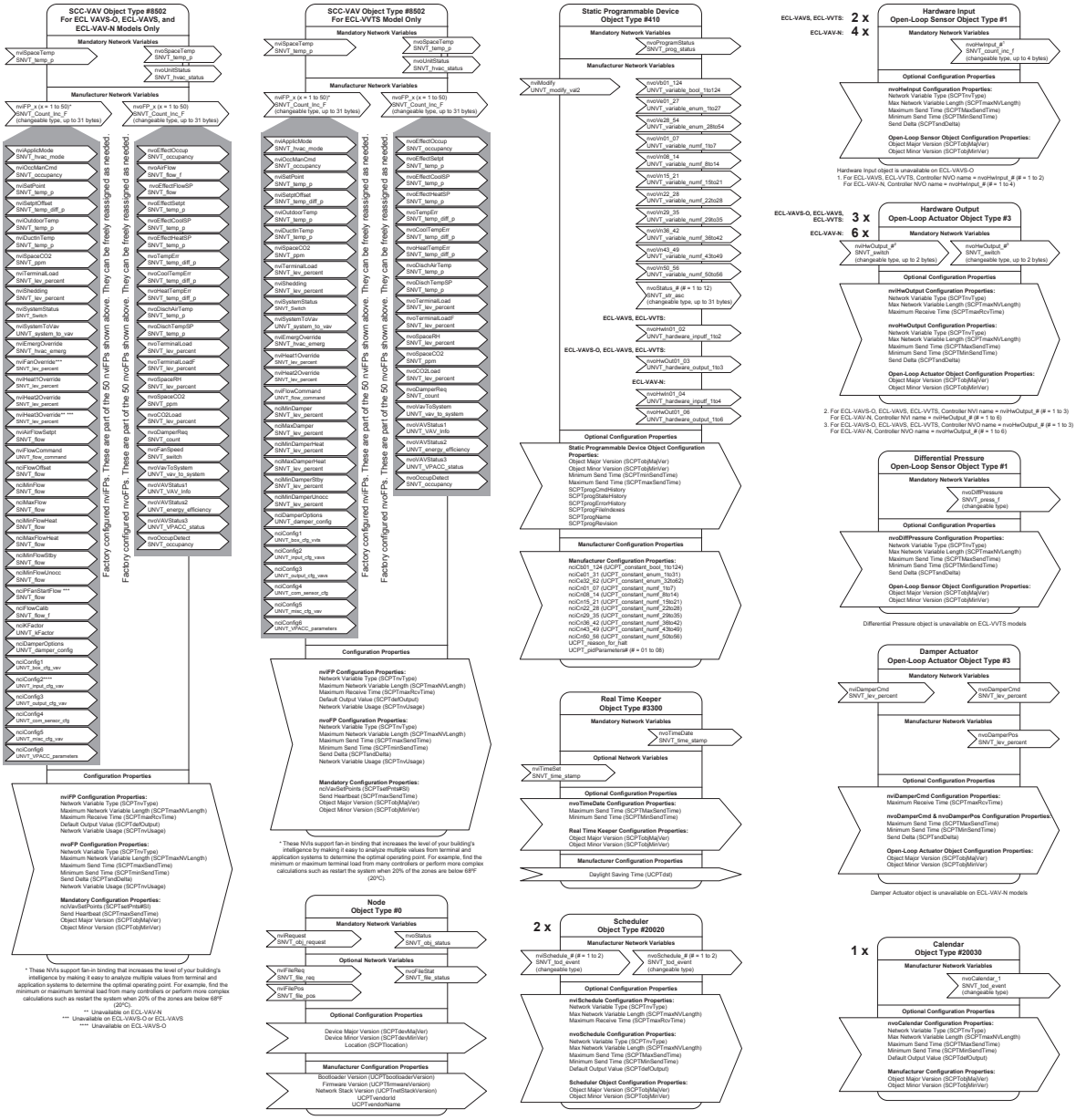
1. Two controllers are required or one controller with an external flow sensor and actuator.
2. Requiring more than 35 in-lb (4 Nm) actuator torque.
3. This configuration is not supported by factory preloaded allpications. Programming is required.

Objects List

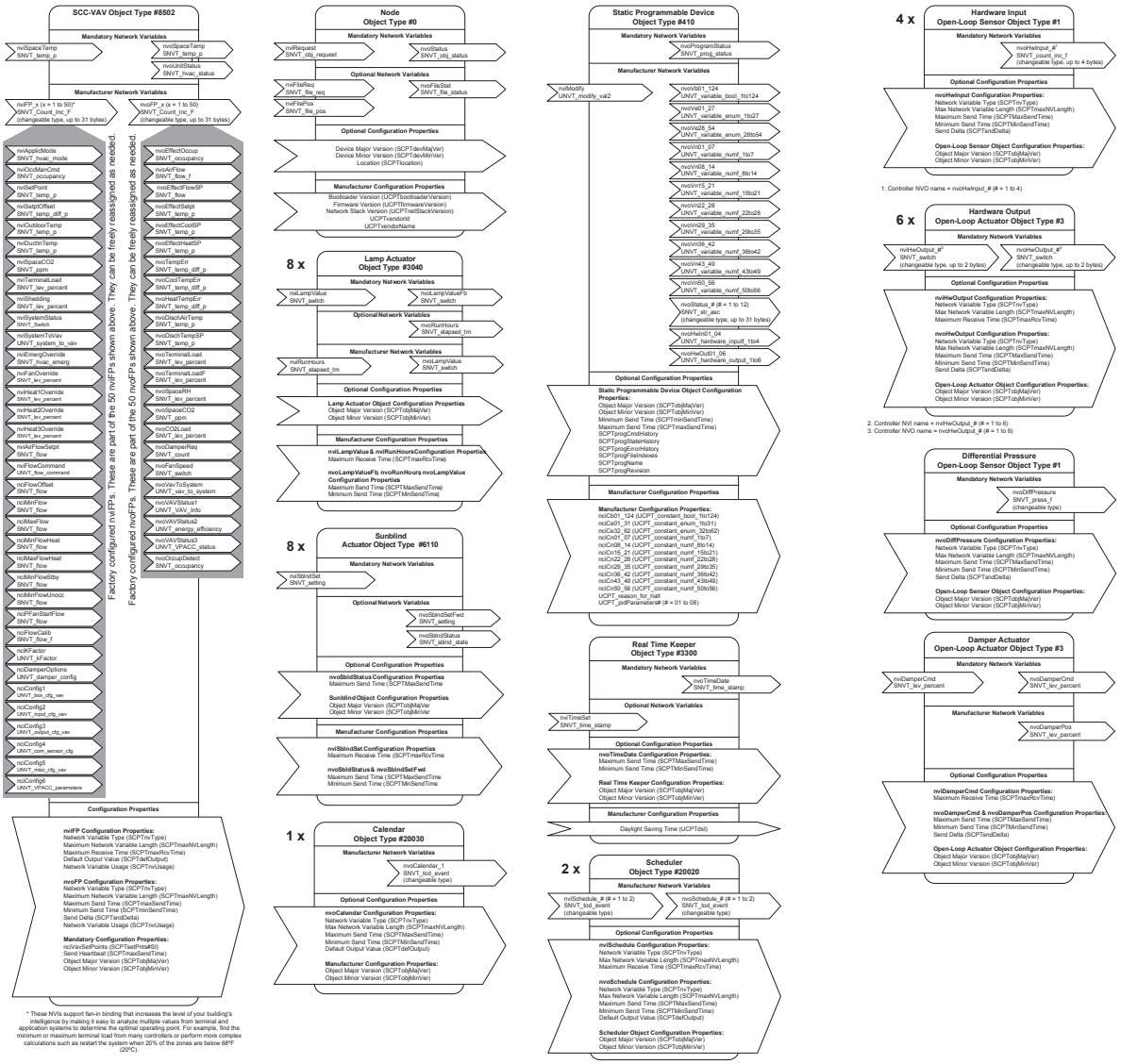
Model	ECL-VAVS-O	ECL-VAVS	ECL-VAV	ECL-VVTS	ECL-VAV-N
Calendar Objects	1	1	1	1	1
□ Events per calendar	50	50	50	50	50
Schedule Objects	2	2	2	2	2
□ Special events per schedule	5	5	5	5	5
PID Loop Objects	8	8	8	8	8
Constants:					
□ Boolean	124	124	124	124	124
□ Enumeration	62	62	62	62	62
□ Numeric	56	56	56	56	56
Variables:					
□ Boolean	124	124	124	124	124
□ Enumeration	54	54	54	54	54
□ Numeric	56	56	56	56	56
nciSetpoint	■	■	■	■	■
Total Network Variables	163	166	174	165	171
Network Variable Input (General Usage):					
□ NVI Changeable Type, Up to 31 Bytes	50	50	50	50	50
Network Variable Output (General Usage):					
□ NVO Changeable Type, Up to 31 Bytes	50	50	50	50	50
Hardware Input Network Variable:					
□ nvoHwInput per Hardware Input		■	■	■	■
Hardware Output Network Variable:					
□ nviHwInput per Hardware Output	■	■	■	■	■
□ nvoHwInput per Hardware Output	■	■	■	■	■
Lamp Object			8		
Sunblind Object			8		

Functional Profile

ECL VAVS-O, ECL-VAVS, ECL-VAV-N, and ECL-VVTS



ECL-VAV


SCC-VAV Object Type #8502
Mandatory Network Variables
nviSpaceTemp
SNVT_temp_p
nvoSpaceTemp
SNVT_temp_p
nvoUnitStatus
SNVT_hvac_status
Manufacturer Network Variables
nviFP_x (x = 1 to 50)
SNVT_Count_Inc_f
(changeable type, up to 31 bytes)
nvoFP_x (x = 1 to 50)
SNVT_Count_Inc_f
(changeable type, up to 31 bytes)
nviApplicMode
SNVT_hvac_mode
nviOccManCmd
SNVT_occupancy
nviSetPoint
SNVT_temp_p
nviSetptOffset
SNVT_temp_diff_p
nviOutdoorTemp
SNVT_temp_p
nviDuctInTemp
SNVT_temp_p
nviSpaceCO2
SNVT_ppm
nviTerminalLoad
SNVT_lev_percent
nviShedding
SNVT_lev_percent
nviSystemStatus
SNVT_switch
nviSystemToVav
UNVT_system_to_vav
nviEmergOverride
SNVT_hvac_emerg
nviFanOverride
SNVT_lev_percent
nviHeat1Override
SNVT_lev_percent
nviHeat2Override
SNVT_lev_percent
nviHeat3Override
SNVT_lev_percent
nviAirFlowSetpt
SNVT_flow
nviFlowCommand
UNVT_flow_command
nciFlowOffset
SNVT_flow
nciMinFlow
SNVT_flow
nciMaxFlow
SNVT_flow
nciMinFlowHeat
SNVT_flow
nciMaxFlowHeat
SNVT_flow
nciMinFlowStby
SNVT_flow
nciMinFlowUnocc
SNVT_flow
nciPFanStartFlow
SNVT_flow
nciFlowCalib
SNVT_flow_f
nciKFactor
UNVT_kFactor
nciDamperOptions
UNVT_damper_config
nciConfig1
UNVT_box_cfg_vav
nciConfig2
UNVT_input_cfg_vav
nciConfig3
UNVT_output_cfg_vav
nciConfig4
UNVT_com_sensor_cfg
nciConfig5
UNVT_misc_cfg_vav
nciConfig6
UNVT_VPACC_parameters
Factory configured nviFPs. These are part of the 50 nviFPs shown above. They can be freely reassigned as needed.
Factory configured nvoFPs. These are part of the 50 nvoFPs shown above. They can be freely reassigned as needed.
nvoEffectOccup
SNVT_occupancy
nvoAirFlow
SNVT_flow_f
nvoEffectFlowSP
SNVT_flow
nvoEffectSetpt
SNVT_temp_p
nvoEffectCoolSP
SNVT_temp_p
nvoEffectHeatSP
SNVT_temp_p
nvoTempErr
SNVT_temp_diff_p
nvoCoolTempErr
SNVT_temp_diff_p
nvoHeatTempErr
SNVT_temp_diff_p
nvoDischAirTemp
SNVT_temp_p
nvoDischTempSP
SNVT_temp_p
nvoTerminalLoad
SNVT_lev_percent
nvoTerminalLoadF
SNVT_lev_percent
nvoSpaceRH
SNVT_lev_percent
nvoSpaceCO2
SNVT_ppm
nvoCO2Load
SNVT_lev_percent
nvoDamperReq
SNVT_count
nvoFanSpeed
SNVT_switch
nvoVavToSystem
UNVT_vav_to_system
nvoVAVStatus1
UNVT_VAV_Info
nvoVAVStatus2
UNVT_energy_efficiency
nvoVAVStatus3
UNVT_VPACC_status
nvoOccupDetect
SNVT_occupancy
Configuration Properties
nviFP Configuration Properties:
Network Variable Type (SCPTnvType)
Maximum Network Variable Length (SCPTmaxNVLength)
Maximum Receive Time (SCPTmaxRcvTime)
Default Output Value (SCPTdefOutput)
Network Variable Usage (SCPTnvUsage)
nvoFP Configuration Properties:
Network Variable Type (SCPTnvType)
Maximum Network Variable Length (SCPTmaxNVLength)
Maximum Send Time (SCPTmaxSendTime)
Minimum Send Time (SCPTminSendTime)
Send Delta (SCPTsndDelta)
Network Variable Usage (SCPTnvUsage)
Mandatory Configuration Properties:
nciVavSetPoints (SCPTsetPntMSI)
Send Heartbeat (SCPTmaxSendTime)
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
* These NVIs support fan-in binding that increases the level of your building's intelligence by making it easy to analyze multiple values from terminal and application systems to determine the optimal operating point. For example, first the minimum or maximum terminal load from many controllers or peform more complex calculations such as restart the system when 20% of the zones are below 68°F (20°C).
Node
Object Type #0
Mandatory Network Variables
nviRequest
SNVT_obj_request
nvoStatus
SNVT_obj_status
Optional Network Variables
nviFileReq
SNVT_file_req
nviFilePos
SNVT_file_pos
nvoFileStat
SNVT_file_status
Optional Configuration Properties
Device Major Version (SCPTdevMajVer)
Device Minor Version (SCPTdevMinVer)
Location (SCPTlocation)
Manufacturer Configuration Properties
Bootloader Version (UCPTbootloaderVersion)
Firmware Version (UCPTfirmwareVersion)
Network Stack Version (UCPTnetStackVersion)
UCPTvendorId
UCPTvendorName
8 x
Lamp Actuator
Object Type #3040
Mandatory Network Variables
nviLampValue
SNVT_switch
nvoLampValueFb
SNVT_switch
Optional Network Variables
nviRunHours
SNVT_elapsed_tm
Manufacturer Network Variables
nvoRunHours
SNVT_elapsed_tm
nviLampValue
SNVT_switch
Optional Configuration Properties
Lamp Actuator Object Configuration Properties
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
Manufacturer Configuration Properties
nviLampValue & nviRunHoursConfiguration Properties
Maximum Receive Time (SCPTmaxRcvTime)
nvoLampValueFb nvoRunHours nvoLampValue Configuration Properties
Maximum Send Time (SCPTMaxSendTime)
Minimum Send Time (SCPTMinSendTime)
8 x
Sunblind
Actuator Object Type #6110
Mandatory Network Variables
nviSblndSet
SNVT_setting
Optional Network Variables
nvoSblndSetFwd
SNVT_setting
nvoSblndStatus
SNVT_sblnd_state
Optional Configuration Properties
nvoSblndStatus Configuration Properties
Maximum Send Time (SCPTMaxSendTime
Sunblind Object Configuration Properties
Object Major Version (SCPTobjMajVer
Object Minor Version (SCPTobjMinVer
Manufacturer Configuration Properties
nviSblndSet Configuration Properties
Maximum Receive Time (SCPTmaxRcvTime
nvoSblndStatus & nvoSblndSetFwd
Maximum Send Time (SCPTMaxSendTime
Minimum Send Time (SCPTMinSendTime
1 x
Calendar
Object Type #20030
Manufacturer Network Variables
nvoCalendar_1
SNVT_tod_event
(changeable type)
Optional Configuration Properties
nvoCalendar Configuration Properties:
Network Variable Type (SCPTnvType)
Max Network Variable Length (SCPTmaxNVLength)
Maximum Send Time (SCPTMaxSendTime)
Minimum Send Time (SCPTMinSendTime)
Default Output Value (SCPTdefOutput)
Manufacturer Configuration Properties:
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
Static Programmable Device
Object Type #410
Mandatory Network Variables
nvoProgramStatus
SNVT_prog_status
Manufacturer Network Variables
nviModify
UNVT_modify_val2
nvoVib01_124
UNVT_variable_bool_1to124
nvoVia01_27
UNVT_variable_enum_1to27
nvoVia28_54
UNVT_variable_enum_28to54
nvoVin01_07
UNVT_variable_numf_1to7
nvoVin08_14
UNVT_variable_numf_8to14
nvoVin15_21
UNVT_variable_numf_15to21
nvoVin22_28
UNVT_variable_numf_22to28
nvoVin29_35
UNVT_variable_numf_29to35
nvoVin36_42
UNVT_variable_numf_36to42
nvoVin43_49
UNVT_variable_numf_43to49
nvoVin50_56
UNVT_variable_numf_50to56
nvoStatus_# (# = 1 to 12)
SNVT_str_asc
(changeable type, up to 31 bytes)
nvoHwIn01_04
UNVT_hardware_inputf_1to4
nvoHwOut01_06
UNVT_hardware_output_1to6
Optional Configuration Properties
Static Programmable Device Object Configuration Properties:
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
Minimum Send Time (SCPTminSendTime)
Maximum Send Time (SCPTmaxSendTime)
SCPTprogCmdHistory
SCPTprogStateHistory
SCPTprogErrorHistory
SCPTprogFileIndexes
SCPTprogName
SCPTprogRevision
Manufacturer Configuration Properties
Manufacturer Configuration Properties:
nciCb01_124 (UCPT_constant_bool_1to124)
nciCa01_31 (UCPT_constant_enum_1to31)
nciCe32_62 (UCPT_constant_enum_32to62)
nciCn01_07 (UCPT_constant_numf_1to7)
nciCn08_14 (UCPT_constant_numf_8to14)
nciCn15_21 (UCPT_constant_numf_15to21)
nciCn22_28 (UCPT_constant_numf_22to28)
nciCn29_35 (UCPT_constant_numf_29to35)
nciCn36_42 (UCPT_constant_numf_36to42)
nciCn43_49 (UCPT_constant_numf_43to49)
nciCn50_56 (UCPT_constant_numf_50to56)
UCPT_reason_for_halt
UCPT_pidParameter# (# = 01 to 08)
Real Time Keeper
Object Type #3300
Mandatory Network Variables
nvoTimeDate
SNVT_time_stamp
Optional Network Variables
nviTimeSet
SNVT_time_stamp
Optional Configuration Properties
nvoTimeDate Configuration Properties:
Maximum Send Time (SCPTMaxSendTime)
Minimum Send Time (SCPTMinSendTime)
Real Time Keeper Configuration Properties:
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
Manufacturer Configuration Properties
Daylight Saving Time (UCPTdst)
2 x
Scheduler
Object Type #20020
Manufacturer Network Variables
nviSchedule_# (# = 1 to 2)
SNVT_tod_event
(changeable type)
nvoSchedule_# (# = 1 to 2)
SNVT_tod_event
(changeable type)
Optional Configuration Properties
nviSchedule Configuration Properties:
Network Variable Type (SCPTnvType)
Max Network Variable Length (SCPTmaxNVLength)
Maximum Receive Time (SCPTmaxRcvTime)
nvoSchedule Configuration Properties:
Network Variable Type (SCPTnvType)
Max Network Variable Length (SCPTmaxNVLength)
Maximum Send Time (SCPTMaxSendTime)
Minimum Send Time (SCPTMinSendTime)
Default Output Value (SCPTdefOutput)
Scheduler Object Configuration Properties:
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
4 x
Hardware Input
Open-Loop Sensor Object Type #1
Mandatory Network Variables
nvoHwInput_#*
SNVT_count_inc_f
(changeable type, up to 4 bytes)
Optional Configuration Properties
nvoHwInput Configuration Properties:
Network Variable Type (SCPTnvType)
Max Network Variable Length (SCPTmaxNVLength)
Maximum Send Time (SCPTMaxSendTime)
Minimum Send Time (SCPTMinSendTime)
Send Delta (SCPTsndDelta)
Open-Loop Sensor Object Configuration Properties:
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
1. Controller NVO name = nvoHwInput_# (# = 1 to 4)
6 x
Hardware Output
Open-Loop Actuator Object Type #3
Mandatory Network Variables
nviHwOutput_#*
SNVT_switch
(changeable type, up to 2 bytes)
nvoHwOutput_#*
SNVT_switch
(changeable type, up to 2 bytes)
Optional Configuration Properties
nviHwOutput Configuration Properties:
Network Variable Type (SCPTnvType)
Max Network Variable Length (SCPTmaxNVLength)
Maximum Receive Time (SCPTmaxRcvTime)
nvoHwOutput Configuration Properties:
Network Variable Type (SCPTnvType)
Max Network Variable Length (SCPTmaxNVLength)
Maximum Send Time (SCPTMaxSendTime)
Minimum Send Time (SCPTMinSendTime)
Send Delta (SCPTsndDelta)
Open-Loop Actuator Object Configuration Properties:
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
2. Controller NVI name = nviHwOutput_# (# = 1 to 6)
3. Controller NVO name = nvoHwOutput_# (# = 1 to 6)
Differential Pressure
Open-Loop Sensor Object Type #1
Mandatory Network Variables
nvoDiffPressure
SNVT_press_f
(changeable type)
Optional Configuration Properties
nvoDiffPressure Configuration Properties:
Network Variable Type (SCPTnvType)
Max Network Variable Length (SCPTmaxNVLength)
Maximum Send Time (SCPTMaxSendTime)
Minimum Send Time (SCPTMinSendTime)
Send Delta (SCPTsndDelta)
Open-Loop Sensor Object Configuration Properties:
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)
Damper Actuator
Open-Loop Actuator Object Type #3
Mandatory Network Variables
nviDamperCmd
SNVT_lev_percent
nvoDamperCmd
SNVT_lev_percent
Manufacturer Network Variables
nvoDamperPos
SNVT_lev_percent
Optional Configuration Properties
nviDamperCmd Configuration Properties:
Maximum Receive Time (SCPTmaxRcvTime)
nvoDamperCmd & nvoDamperPos Configuration Properties:
Maximum Send Time (SCPTMaxSendTime)
Minimum Send Time (SCPTMinSendTime)
Send Delta (SCPTsndDelta)
Open-Loop Actuator Object Configuration Properties:
Object Major Version (SCPTobjMajVer)
Object Minor Version (SCPTobjMinVer)

Product Specifications

Power Supply Input

Voltage Range	24VAC/DC; ±15%; Class 2
Frequency Range	50/60Hz
Overcurrent Protection	Field replaceable fuse
Fuse Type	2.0A
	3.0A (for triacs when using the internal power supply)
Power Consumption	10 VA typical plus all external loads[1], 85 VA max. (including powered triac outputs)

1. External loads must include the power consumption of any connected modules such as an Allure Series Communicating Sensor. Refer to the respective module's datasheet for related power consumption information.

Communications

Communication	LonTalk Protocol
Transceiver	FT 5000 Free Topology Smart Transceiver
Channel	TP/FT-10; 78Kbps
LonMark Interoperability Guidelines	Version 3.4
Device Class	SCC VAV

LonMark Functional Profile :

☐ Input Objects	Open-Loop Sensor #1
☐ Output Objects	Open-Loop Actuator #3
☐ Node Object	Node Object #0
☐ Real Time Clock	Real Time Keeper #3300
☐ Scheduler	Scheduler #20020
☐ Calendar	Calendar #20030
☐ Programmable Device	Static Programmable Device #410
☐ SCC Object	SCC VAV #8502

Hardware

Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	68 MHz
Memory	384 kB Non-volatile Flash (applications)
	1 MB Non-volatile Flash (storage)
	64 kB RAM
Real Time Clock (RTC)	Built-in Real Time Clock without battery
	Network time synchronization is required at each power-up cycle before the RTC become available
Status Indicator	Green LEDs: power status & LAN Tx
	Orange LEDs: controller status & LAN Rx

Subnetwork

Communication	RS-485
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain Configuration

Maximum number of supported devices per controller combined — 4[1]

- ☐ Allure EC-Smart-Vue Series — Up to 4
- ☐ Allure EC-Smart-Comfort Series — Up to 4
- ☐ Allure EC-Smart-Air Series — Up to 4
- ☐ For the ECL-VAV Model Only[2]:
  - – EC-Multi Sensor — Up to 4
  - – ECx-Light-4 / ECx-Light-4D — Up to 2
  - – ECx-Blind-4 / ECx-Blind-4LV — Up to 2

1. A controller can support a maximum of two Allure Series Communicating Sensor models equipped with a CO_2 sensor. The remaining connected Allure Series Communicating Sensor models must be without a CO_2 sensor.
2. For supported quantities, see the **VAV-Smart Room Control Device Calculator.xlsm** spreadsheet file available for download from SmartSource.

Wireless Receiver[1]

Communication Protocol — EnOcean wireless standard

Number of Wireless Inputs[2] — 18

Supported Wireless Receivers — Refer to the Open-to-Wireless Solution Guide

Cable — Telephone cord

- ☐ Connector — 4P4C modular jack
- ☐ Length (maximum) — 6.5ft; 2m

enocean®

1. Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Solution Guide for a list of supported EnOcean wireless modules.
2. Some wireless modules may use more than one wireless input from the controller.

Integrated Damper Actuator

Motor — Belimo LMZS-H brushless DC motor

Torque — 35 in-lb, 4 Nm

Degrees of Rotation — 95º adjustable

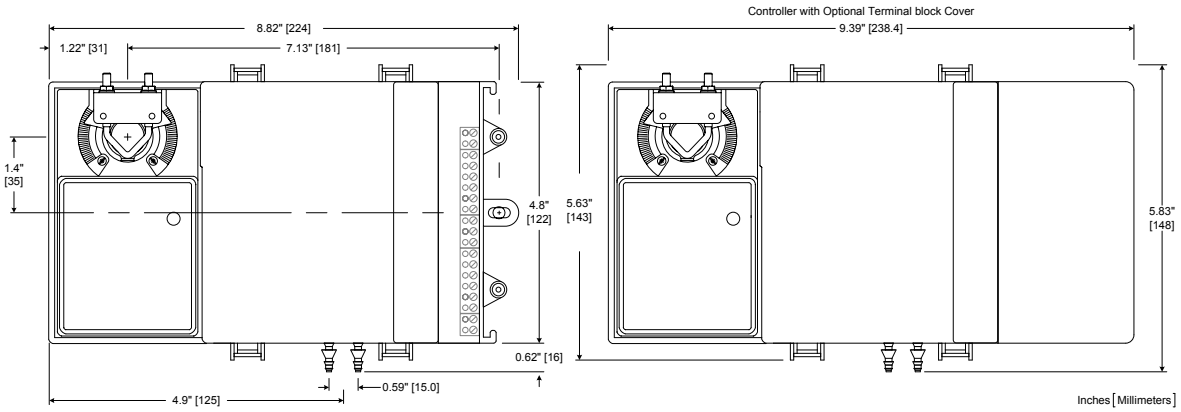
Fits Shaft Diameter — 5/16 to 3/4”; 8.5 to 18.2mm

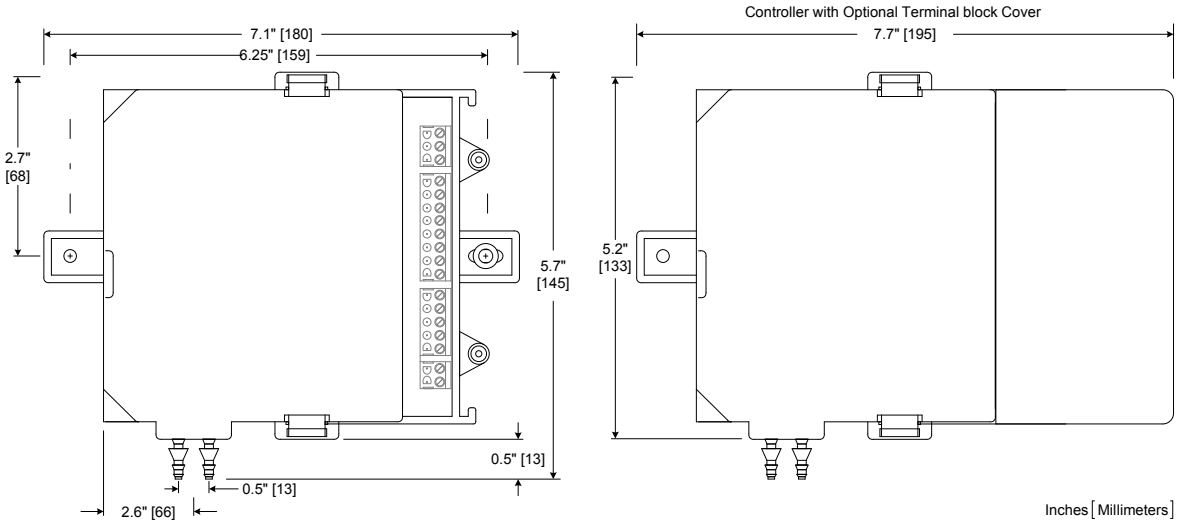
Acoustic Noise Level — < 35 dB (A) @ 95º rotation in 95 seconds

Mechanical

Dimensions (H × W × D):

- ☐ ECL-VAV-N — 145 × 180 × 54.0mm (5.7 × 7.1 × 2.13")
- ☐ Other Models — 5.83 × 8.82 × 2.56" (148 × 224 × 65.0mm)





Shipping Weight:

- ECL-VAV-N — 0.92lbs (0.42kg)
- Other Models — 2.03lbs (1.05kg)

Enclosure Material[1] — FR/ABS

Enclosure Rating — Plastic housing, UL94-5VB flammability rating
Plenum rating per UL1995

Color — Black & blue casing & grey connectors

1. All materials and manufacturing processes comply with the RoHS directive and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive

Environmental

Operating Temperature — 32°F to 122°F; 0°C to 50°C

Storage Temperature — -4°F to 122°F; -20°C to 50°C

Relative Humidity — 0 to 90% Non-condensing

Standards and Regulations

CE:

- Emission — EN61000-6-3: 2007; A1:2011; Generic standards for residential, commercial and light-industrial environments
- Immunity — EN61000-6-1: 2007; Generic standards for residential, commercial and light-industrial environments

FCC — This device complies with FCC rules part 15, subpart B, class B

UL Listed (CDN & US) — UL916 Energy management equipment

CEC Appliance Database — Appliance Efficiency Program[1]

1. California Energy Commission's Appliance Efficiency Program: The manufacturer has certified this product to the California Energy Commission in accordance with California law.

Specifications - On-Board Air Flow Sensor

Range	0-2.0 in. W.C. (0-500 Pa)
Input Resolution	0.00007 in. W.C. (0.0167 Pa)
Air Flow Accuracy	±4.0% @ > 0.05 in. W.C. (12.5 Pa)
	±1.5% once calibrated through air flow balancing @ > 0.05 in. W.C. (12.5 Pa)

Specifications - Universal Inputs (UI)

General

Input Type	Universal; software configurable
Input Resolution	16-bit analog / digital converter
Power Supply Output	15VDC; maximum 80mA

Contact

Type	Dry contact

Counter

Type	Dry contact
Maximum Frequency	1Hz maximum,
Minimum Duty Cycle	500milliseconds On / 500milliseconds Off

0 to 10VDC

Range	0 to 10VDC (40kΩ input impedance)

0 to 5VDC

Range	0 to 5VDC (high input impedance)

0 to 20mA

Range	0 to 20mA
	249Ω external resistor wired in parallel

Resistance/Thermistor

Range	0 to 350 KΩ
Supported Thermistor Types	Any that operate in this range

Pre-configured Temperature Sensor Types:

□ Thermistor	10KΩ Type 2, 3 (10KΩ @ 77ºF; 25ºC)
□ Platinum	Pt1000 (1KΩ @ 32ºF; 0ºC)
□ Nickel	RTD Ni1000 (1KΩ @ 32ºF; 0ºC)
	RTD Ni1000 (1KΩ @ 69.8ºF; 21ºC)

Specifications - Universal Outputs (UO)

General

Output Type	Universal; software configurable
Output Resolution	10-bit digital to analog Converter
Output Protection	Built-in snubbing diode to protect against back-EMF, for example when used with a 12VDC relay Output is internally protected against short circuits
Load Resistance	Minimum 600 Ω for 0-10VDC and 0-12VDC outputs Maximum 500 Ω for 0-20mA output
Auto-reset fuse	Provides 24VAC over voltage protection

0 or 12VDC (On/Off)

Range	0 or 12VDC
Source Current	Maximum 20 mA at 12VDC (minimum load resistance 600Ω)[1]

1. Relays equipped with coil that consume between 20 and 35mA can be used with up to 2 Universal Outputs when the 15V Power Supply Output is de-rated to supply 50mA maximum current.

PWM

Range	Adjustable period from 2 to 65seconds
Thermal Actuator Management	Adjustable warm up and cool down time

Floating

Minimum Pulse On/Off Time	500milliseconds
Drive Time Period	Adjustable

0 to 10VDC

Voltage Range	0 to 10VDC linear
Source Current	Maximum 20 mA at 10VDC (minimum load resistance 600 Ω)

Specifications - Digital Output (DO)

General

Output Type	24VAC Triac; software configurable
Maximum Current per Output	0.5A continuous
	1A @ 15% duty cycle for a 10-minute period
Power Source	External or internal power supply (jumper selectable)

0 or 24VAC (On/Off)

Range	0 or 24VAC

PWM

Range	Adjustable period from 2 to 65seconds

Floating

Minimum Pulse On/Off Time	500milliseconds
Drive Time Period	Adjustable
Power Source	External or internal power supply (jumper selectable)

Specifications subject to change without notice.
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