

Stryker™ Lon Configurable VAV/CVAHU Controllers

INSTALLATION INSTRUCTIONS

APPLICATION

The Stryker™ configurable, direct digital controllers are used for either pressure-independent or pressure single-duct VAV terminal units OR constant volume, air-handling unit control solutions. VAV controllers feature preprogrammed heat/cooling or reheat algorithms for VAV box control applications and can be configured to match a wide range of VAV applications. The CVAHU controller is designed to control a wide range of air-handling units including single-zone and heat pump air handlers. All Stryker™ controllers use Echelon LONWORKS communication technology and the Free Topology Transceiver (FTT) for great installation flexibility.

One model of the CUL controller (CUL6438SR-CV1) and two models of the CVL controller (CVL4022AS-VAV1 and CVL4024NS-VAV1) are available. The CVL4022AS-VAV1 model consists of a VAV controller and a floating actuator. The CVL4024NS-VAV1 VAV controller model does not include an actuator. Both models contain an integral microbridge air flow sensor that provides flow measurement for pressure independent applications.

The CUL controller controls space temperature in a given zone by regulating heating and cooling equipment in the air handler delivering air to that space.

The CVL controller controls the space temperature in a given zone by modulating a damper and/or regulating a reheat coil in a Variable Air Volume Box that delivers air to one space.

The controllers are capable of stand-alone operation; however, optimum functional benefits are achieved when the network communication capabilities are used.

The Zio (TR71/75) wall modules are used in conjunction with the CUL and CVL controllers. Zio is an LCD Wall Module to communicate via a two-wire, polarity insensitive bus with the Honeywell Spyder and Stryker™ controller families. The CUL and CVL controllers can be configured in Zio.



Table 1. Controller Configurations

Controller Model	Communication Protocol	Application	UI (Universal Input)	DI (Digital Input)	AO (Analog Output)	DO (Digital Output)	Velocity Pressure Sensor (Microbridge)	Series 60 Floating Actuator
CVL4022AS-VAV1	LonWorks	VAV	4	0	2	2	YES	YES
CVL4024NS-VAV1	LonWorks	VAV	4	0	2	4	YES	NO
CUL6438SR-CV1	LonWorks	CVAHU	6	4	3	8 Relays	NO	NO



Specifications

Electrical

Rated Voltage: 20-30 Vac; 50/60 Hz

Power Consumption:

100 VA for controller and all connected loads

Controller only Load: 5 VA maximum for models

CUL6438SR-CV1 and CVL4024NS-VAV1

Controller and Actuator Load: 9 VA maximum, model

CVL4022AS-VAV1

External Sensors Power Output: 20 Vdc $\pm 10\%$ @ 75 mA maximum

Environmental

VAV Operating & Storage Temperature Ambient Rating

(models CVL4022AS-VAV1 and CVL4024NS-VAV1):

Minimum 32° F (0° C); Maximum 122° F (50° C)

CVAHU Operating & Storage Temperature Ambient Rating

(model CUL6438SR-CV1)

Minimum -40° F (-40° C); Maximum 150° F (65.5° C)

Relative Humidity: 5% to 95% non-condensing

Approval Bodies

UL/cUL (E87741) listed under UL916 (Standard for Open Energy Management Equipment) with plenum rating.

CSA (LR95329-3) listed.

Meets FCC Part 15, Subpart B, Class B (radiated emissions) requirements.

Meets Canadian standard C108.8 (radiated emissions).

Conforms to the following requirements per European

Consortium standards:

- EN 61000-6-1; 2001 (EU Immunity).

- EN 61000-6-3; 2001 (EU Emissions)

Velocity Pressure Sensor (models CVL4022AS-VAV1 and CVL4024NS-VAV1)

Operating Range: 0 to 1.5 in. H₂O (0 to 374 Pa)

Series 60 Floating Actuator (model CVL4022AS-VAV1)

Rotation Stroke: 95° $\pm$ 3° for CW or CCW opening dampers

Torque Rating: 44 lb-in. (5 Nm)

Run Time for 90° rotation: 90 seconds at 60 Hz

Hardware

CPU: Each controller uses a Texas Instruments MSP430 family microprocessor. The processor contains on-chip FLASH program memory, FLASH information memory, and RAM.

Memory Capacity

Flash Memory: 116 kilobytes with 8 kilobytes available for user program. The controller is able to retain FLASH memory settings for up to ten (10) years.

RAM: 8 kilobytes

Dimensions

CUL6438SR-CV1: H/W/D: 5.45 x 6.85 x 2.26 in.

(13.84 x 17.40 x 5.74 cm)

CVL4022AS-VAV1: H/W/D: 6.60 x 8.28 x 2.26 in.

(16.7 x 21.1 x 5.7 cm)

CVL4024NS-VAV1: H/W/D: 6.60 x 4.75 x 2.26 in.

(15.9 x 12.1 x 5.7 cm)

Real Time Clock

Operating Range: 24 hour, 365 day, multi-year calendar including day of week and configuration for automatic day-light savings time adjustment to occur at 2:00 a.m. local time on configured start and stop dates.

Power Failure Backup: 24 hours at 32 to 100° F (0 to 38° C), 22 hours at 100 to 122° F (38 to 50° C)

Accuracy: ± 1 minute per month at 77° F (25° C)

Inputs and Outputs

CVL4022AS-VAV1 has four universal input (UI) circuits, two analog outputs (AO), and two digital Triac outputs (DO).

Two Digital Outputs are reserved for the actuator.

CVL4024NS-VAV1 has four universal input (UI) circuits, two analog outputs (AO), and four digital Triac outputs (DO).

CUL6438SR-CV1 has six universal inputs (UI), four digital inputs (DI), three analog outputs (AO), and eight digital relay outputs (DO).

Universal Input (UI) Circuits

See Table 2 for the UI specifications.

Table 2. Universal Input Circuit Specifications

Input Type	Sensor Type	Operating Range
Room/Zone Discharge Air Outdoor Air Temperature	20K Ohm NTC	-40° F to 199° F (-40° C to 93° C)
Outdoor Air Temperature	C7031G ^a	-40° to 120°F (-40° to 49°C)
	C7041F ^a	-40° to 250°F (-40° to 121°C)
	PT1000 (IEC751 3850)	-40° F to 199° F (-40° C to 93° C)
TR23 Setpoint Potentiometer	500 Ohm to 10,500 Ohm	-4° DDC to 4° DDC (-8° DDF to 7° DDF) or 50° F to 90° F (10° C to 32° C)
Resistive Input	Generic	100 Ohms to 100K Ohms
Voltage Input	Transducer, Controller	0–10 Vdc
Discrete Input	Dry Contact closure	OpenCircuit $\geq$ 3000Ohms ClosedCircuit $<$ 3000Ohms

^a C7031G and C7041F are recommended for use with these controllers, due to improved resolution and accuracy when compared to the PT1000.

Analog Output (AO) Circuits

ANALOG CURRENT OUTPUTS:

Current Output Range: 4.0 to 20.0 mA

Output Load Resistance: 550 Ohms maximum

ANALOG VOLTAGE OUTPUTS:

Current Output Range: 4.0 to 20.0 mA

Output Load Resistance: 550 Ohms maximum

Digital Triac Output (DO) Circuits (CVL4022AS-VAV1 and CVL4024NS-VAV1 only)

Voltage Rating: 20 to 30 Vac @ 50-60Hz

Current Rating: 25 mA to 500 mA continuous, 800 mA (AC rms) for 60 milliseconds

Digital Relay Output (DO) Circuits (CUL6438SR-CV1 only)

Voltage Rating: 20 to 30 Vac @ 50-60Hz

Current Rating: 0 mA to 1 A continuous, 3.5 A inrush (AC rms) for 100 milliseconds