

Cylon BACnet VAV Controller (CBTVAV)

CBT13VAV

CBT12iVAV

The **Cylon BACnet VAV Controller** is a native BACnet Advanced Application Controller with integrated airflow sensor, 4 inputs and up to 8 outputs, ideally suited to controlling single items of equipment.

The **CBT12iVAV** has an integrated airflow sensor and actuator, and point support for single duct and fan assisted VAV applications.

- BACnet MS/TP Fieldbus
- Supports the following configurable BACnet objects: AI/BI/AO/BO/AV/BV, Alarms, Trend Logs, and Schedules
- Integrated Pressure Sensor
can measure differential pressure directly without need for a separate sensor. The measured value is converted to airflow rate by the controller's strategy.
- 4 Universal Inputs
can be configured as analog or digital inputs
- 4 Uniput with Triac Outputs (CBT13VAV only)
can be configured as analog / digital outputs or voltage inputs
- Up to 5 Triac Outputs
can switch up to 24VAC
- Integrated Actuator (CBT12iVAV only)
Points 9 and 10 are dedicated to controlling the integrated actuator.
- 2 Analog 0 to 10VDC Outputs (CBT12iVAV only)
- 500 Strategy Blocks
- Up to 4 Trendlogs
- 1024 entries per Trendlog
- Data Security
Strategy and setpoints backed up in Flash
- No Hardware I/O Jumpers
Hardware points are automatically configured by the downloaded strategy



The BACnet Controller of Choice

This native BACnet controller is a truly open solution for the most demanding of applications. Cylon BACnet controllers offer unparalleled flexibility and performance on an open platform. The system can easily be extended by adding best of breed 3rd party devices on the same MS/TP network.

Highly Flexible

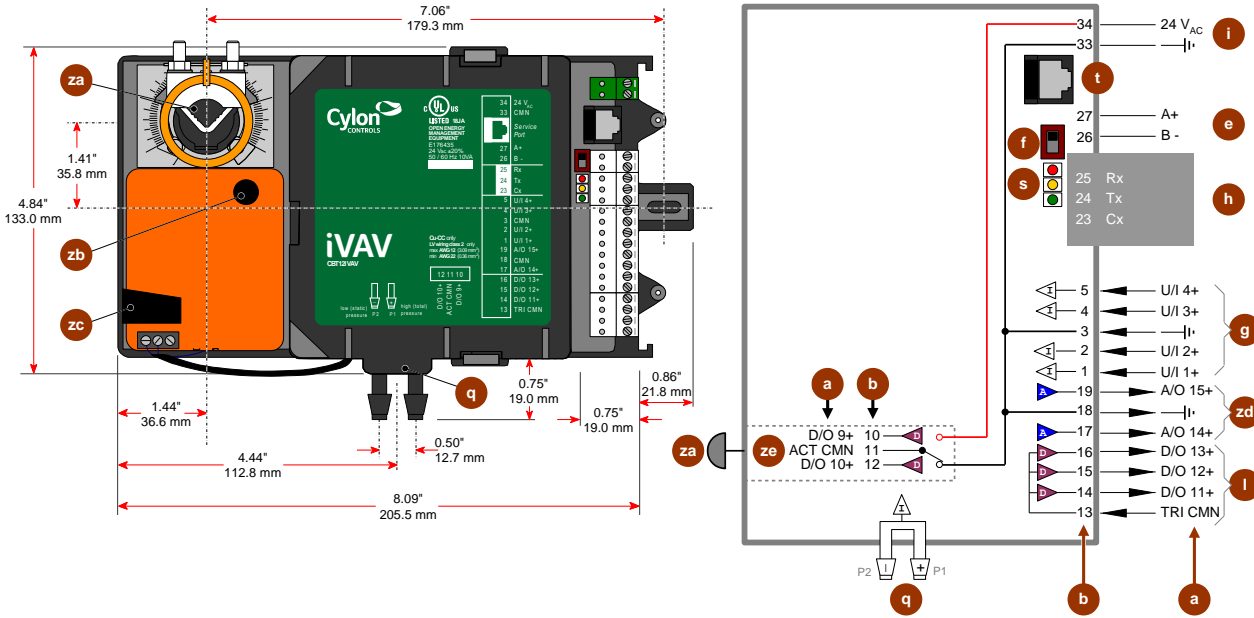
The **CBT12iVAV** is fully programmable to meet the most demanding control applications. Unlike others, the controller can be re-engineered for specific applications over BACnet.

Smart Energy Control

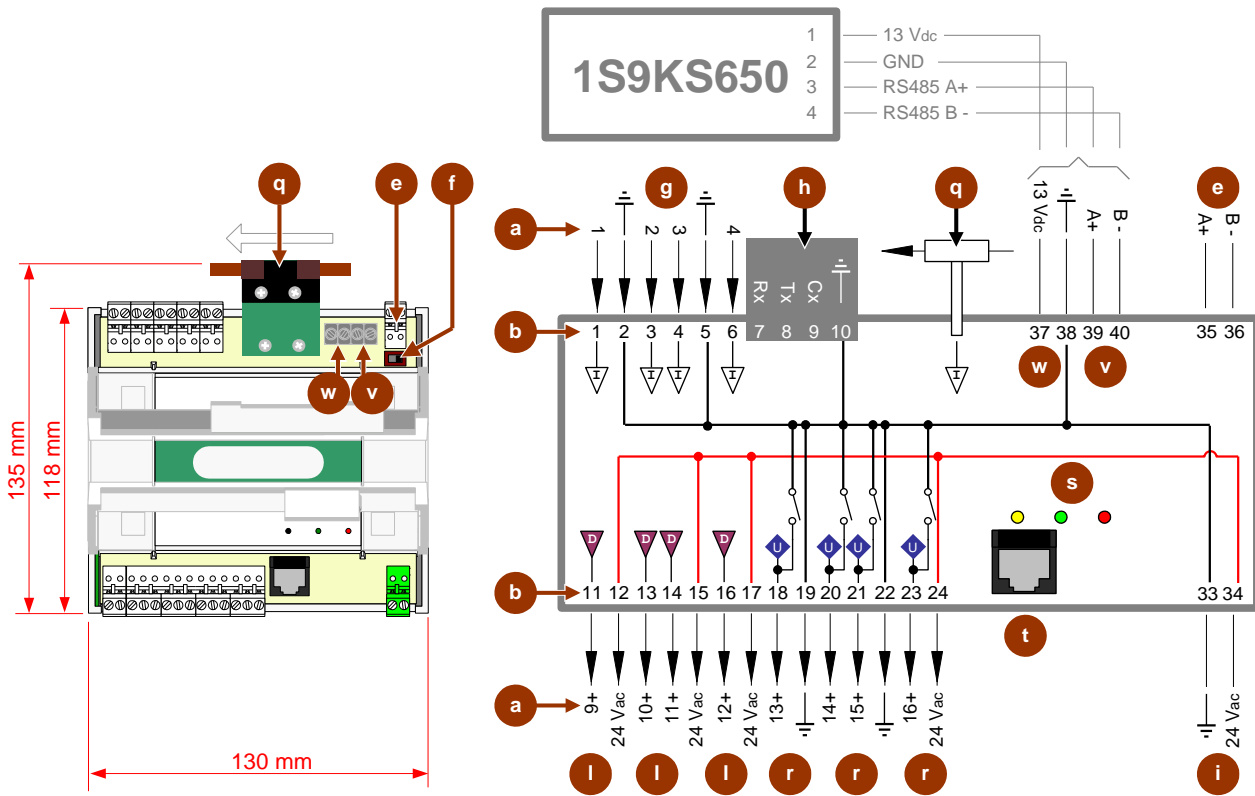
The enhanced flexibility of Cylon controllers delivers more energy efficient solutions for buildings. With smart energy optimization built-in your building manager can successfully drive down energy costs. With the **CBT12iVAV** you can add a demand ventilation application, occupancy sensors or lighting control to further enhance energy savings.

Cylon BACnet BEMS



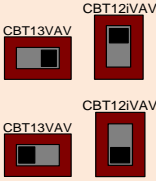





The **Cylon BACnet** range offers reduced costs in terms of training, implementation, rollout and maintenance. Modular, extendible packages along with low installation costs mean a low entry point for building control.



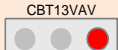
Note: In CBT 12iVAV Terminals 3, 18 and 33 are connected internally.



Note: In CBT13VAV Terminals 12, 15, 17, 24, and 34 are connected internally. When a controller is powered, 24 Vac is available for low current devices at terminals 12, 15, 17, and 24. The total combined current must be less than 0.9 A.

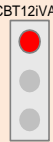
1S9KS650	UCU Room Keypad
	Common
a	Point Numbers
b	Terminal Numbers
e	BACnet MS/TP Port
	Important: In order for the BACnet MS/TP bus to operate reliably, the common power connection (terminal 33 ) must be connected to Earth. Cylon recommend that this is done at the 24 V _{ac} transformer.
f	BACnet MS/TP Terminator
	<ul style="list-style-type: none"> OFF (BACnet MS/TP bus not terminated at this controller) ON (BACnet MS/TP bus terminated at this controller)
	Universal Input
h	Service Port (screw terminal)
i	Power 24 Vac
	Important: The common power connection (terminal 33 ) must be connected to Earth. Cylon recommend that this is done at the 24 Vac transformer.
	Digital Outputs
q	Airflow Sensor
	UniPuts™ + Triac
t	Service Port (RJ-45)
v	Room Display RS485 (K versions only)
w	Room Display Power supply (K version only)
za	Rotary Actuator
zb	Actuator direction selector
zc	Damper Manual Override
	Analog Output
ze	Internal Actuator Outputs

S Indicator LEDs



Red LED

Continuous: Optional battery is healthy.
Flash once a second: Indicates no battery/battery is low.
Note: battery is present only on custom versions.



Green LED

Continuous: Strategy servicing and no comms.
Flash rapidly (every 100 ms): Strategy not servicing.
Flash once a second: MSTP comms, and Strategy servicing.
Note: when Service Port is in use, the Green LED blinks off as Service Port comms are received.



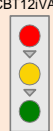
Yellow LED

Off: Normal operation.
On: Priority Array set above 16, for one or more Hardware Points, by external BACnet Client, or by the UEC.



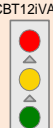
Cycle left-to-right (13VAV) or top to bottom (iVAV)

Controller is in terminal mode.



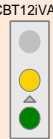
Cycle right-to-left (13VAV) or bottom to top (iVAV)

Upgrade in progress while Controller is in terminal mode.
Note: The strategy is not serviced while in upgrade mode.



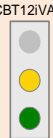
Cycle green to yellow

Globals communication/setup problem



Green and yellow flash simultaneously

Globals communication/setup problem **and** Hardware Point Priority Array is set above 16 by external BACnet Client, or by the UEC.



Specifications:

MECHANICAL

Size (excluding terminal plugs)	CBT12iVAV: 8.3 x 5.12 x 2.36" [210 x 130 x 60 mm] CBT13VAV: 5.7 x 5.12 x 1.78" [145 x 130 x 45 mm]
Enclosure	Injection moulded ABS
Mounting	Screw mounting
Airflow Sensor Connection	Use rubber hose suitable for a 0.2" [5.1 mm] O.D. nozzle.

ENVIRONMENT

Note: This equipment is intended for field installation within another enclosure.

Ambient Temperature	32°-122°F [0° - 50°C] ambient.
Ambient Humidity	0% - 90% RH non-condensing
EMC Immunity	EN 55024, 2010
EMC Emission	EN 55022, 2010 Class A
Approvals	UL Listed (CDN & US) UL916 Energy Management Equipment - File No. E176435

WIRING

Note: Use Copper or Copper Clad Aluminium conductors only.

Termination	PCB mounted screw terminal connections.
Conductor Area	Max: AWG 12 [3.09 mm ²] Min: AWG 22 [0.355 mm ²]

ELECTRICAL





Supply Requirements	24 V AC ±20% 50/60 Hz
Transformer Rating	up to 55 VA (up to 12 VA internal power plus up to 43 VA supplied to Triac loads)


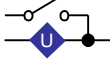
PROCESSOR

Type	STM32F103ZTE6 32bit processor
Clock Speed	8 MHz crystal, 72 MHz internal processor clock rate
System Memory (soldered to PCB not removable)	512k flash, 64k SRAM internal to processor 1024k SRAM external

INPUTS/OUTPUTS

Note: Screened cable is recommended for all input connections.

4 Universal Inputs (Points 1 to 4) 	Active voltage input 0-10 V @ 130 K. 12 bit resolution. Passive Input for a large range of temperature sensors, 10K3A1 sensors are recommended. Temperature input range: 32 °F to 122 °F [0 °C to 50 °C] Active current input 0-20 mA @ 390 Ω (screened cable). Digital Volt Free Contact (Dry Contact). Note: UCU Universal inputs do not support pulse counting.
1 Airflow Sensor (Point 5) 	0 - 320 Pa airflow measurement using internal microbridge type airflow sensor.
1 Actuator (CBT12iVAV only) (Points 9 and 10)	One integrated Actuator (Belimo LMB24-3-T) Points 9 and 10 are dedicated to operating the actuator and are not user accessible.
CBT12iVAV: 3 Digital Outputs (points 11 to 13) 	24 V AC Triac @ 500 mA maximum. Switch Live or Switch Neutral
CBT13VAV: 4 Digital Outputs (points 9 to 12) 	24 V AC Triac @ 500 mA maximum. Switch Neutral only

CBT12iVAV: 2 Analog Outputs (Points 14 and 15)	Analog 0-10 V 10ma Max current
	
CBT13VAV: 4 Uniputs with Triac	(Software selectable interfaces) Active Input 0 – 10 V @ 40 KΩ. 12 bit resolution. Digital Volt-Free contact @ 25 mA not continuous. Active Output 0 – 10 V @ 10 mA max load. 12 bit resolution. 24 V AC Triac @ 500 mA maximum. Switch neutral only.
	
24 V AC output terminals	Total current drawn from 24 V AC terminals is limited to 0.9 A.

COMMUNICATIONS

Local RS232 TTL port	@ 9600 Baud Max cable length 4m
BACnet MS/TP port	RS485 @ 9K6, 19K2, 38K4 (default) or 76K8 Baud Max cable length 1.2 km

INTERFACE

Engineering Software	Unitron Engineering Centre (BACnet edition) NetLink (portable operator interface tool)
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SOFTWARE FEATURES

Data Security	Strategy and Setpoints backed up in flash memory
Maximum number of Strategy Blocks	500
Maximum number of Trendlog Modules	4
Maximum internal Trendlog capacity (standard)	1024
Maximum Controllers per BACnet MS/TP bus	99*

**It is recommended for typical conditions that the number of controllers on a unitary BACnet MS/TP bus be limited to 32. MSTP devices with a fractional (1/4 or smaller) unit load will be required in order to extend a single BACnet MS/TP bus trunk beyond 32 devices. Both CBM and CBT controllers are 1/4 unit load devices. Please refer to MAN0106 for recommendations on configuring a specific network for optimal comms speed.*