

BACnet® CBT Controllers CBT12/CBT12iVAV

The CBT12iVAV is a BTL Listed BACnet Advanced Application Controller with an integrated airflow sensor and actuator, and point support for single duct and fan-assisted VAV applications.

The CBT12 is also a BTL Listed BACnet Advanced Application Controller, with 4 inputs and 8 outputs, and is ideally suited to control single items of equipment.

BENEFITS

The BACnet Controller of Choice

These BACnet controllers are a truly open solution for the most demanding of applications. American Auto-Matrix 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 BACnet MS/TP network.

Highly Flexible

The CBT12 and CBT12iVAV are fully programmable to meet the needs of the most demanding control applications. Unlike others, the controllers can be re-engineered for specific applications over BACnet.

Smart Energy Control

The enhanced flexibility of American Auto-Matrix 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 your energy savings. With the CBT12, you can add user setpoint adjustments, room occupancy sensors, or window contacts.

American Auto-Matrix BACnet BAS

The American Auto-Matrix 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.







BACnet is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of listed products to the requirements of ASHRAE Standard 135 is the responsibility of BACnet International (Bl). BTL is a registered trademark of BACnet

BACnet MS/TP Fieldbus

Supports the following Configurable BACnet Objects:

AI/BI/AO/BO/AV/BV, Alarms, Trend Logs and Schedules

Integrated Pressure Sensor (CBT12iVAV only)

Can measure differential pressure directly without need for 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

4 UniPuts™ with Triac Outputs (CBT12 only)

Can be configured as analog / digital outputs or voltage inputs

2 UniPuts™ (CBT12iVAV only)

Can be configured as analog / digital outputs or voltage inputs Configured as analog outputs in preloaded strategy

Triac Outputs

3 on the CBT12iVAV / Up to 8 on the CBT12

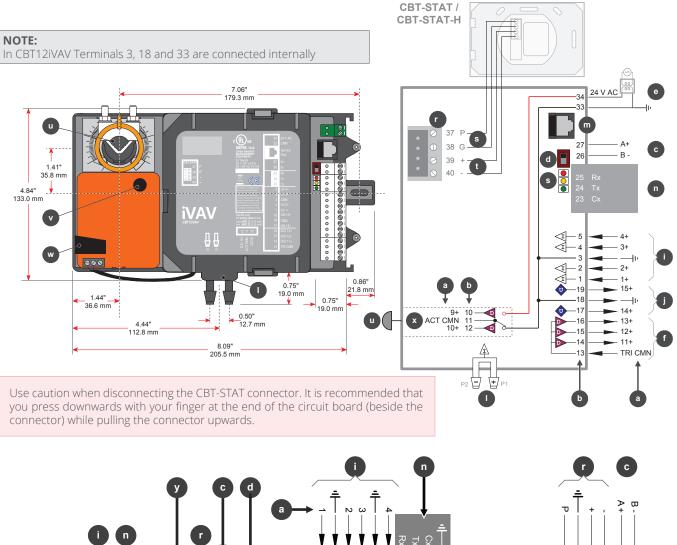
Integrated Actuator (CBT12iVAV only)

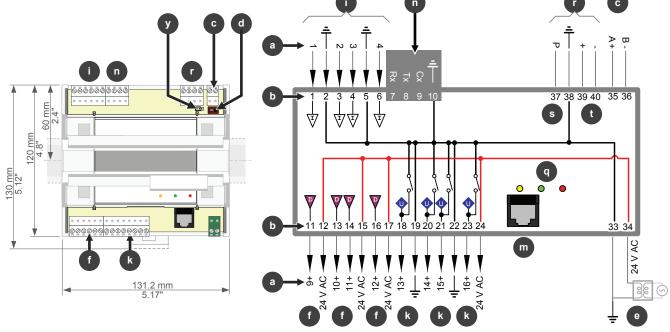
Points 9 and 10 are dedicated to controlling the integrated actuator

Up to 500 Strategy Blocks

Up to 6 Trendlogs

1024 entries per Trendlog





NOTE:

In CBT12 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.

1S9K660 **CBT-STAT** Common **Point Numbers Terminal Numbers BACnet MS/TP Port** Important: in order for the BACnet MS/TP bus to operate reliably, the common power connection (terminal 33 \(\ddot\)) must be connected to Earth. AAM recommends that this is done at the 24 V AC transformer **BACnet MS/TP Terminator** CBT12 CBT12iVAV OFF (BACnet MS/TP bus not terminated at this controller) CBT12 CBT12iVAV (BACnet MS/TP bus terminated at this controller) Power 24 V AC Important: The common power connection

(terminal 33 ±) must be connected to Earth. AAM

recommends that this is done at the 24 V AC

Note: Service Port must not be connected until

Note: Service Port must not be connected until after the device is powered on.

Room Display / CBT-STAT Power Supply

Room Display / CBT-STAT EIA-485

Actuator direction selector

Damper Manual Override

Internal Actuator Outputs

• • •

OFF (Not Terminated)

Room Display / CBT-STAT Terminator

ON (Terminated)

after the device is powered on.

Service Port (screw terminal)

transformer.

Digital Outputs

Universal Input

Airflow Sensor

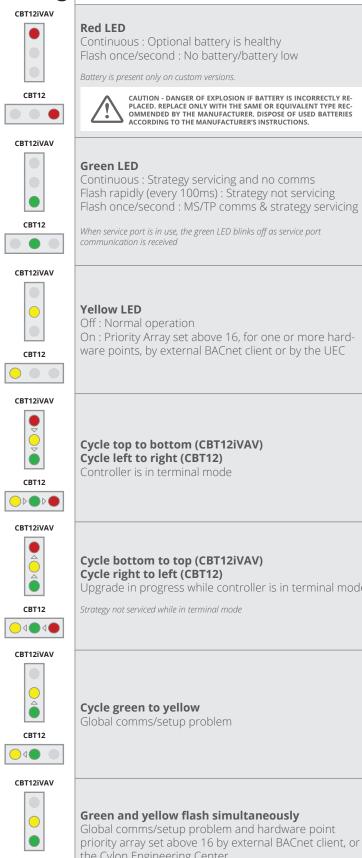
UniPuts® + Triac

Keypad Port

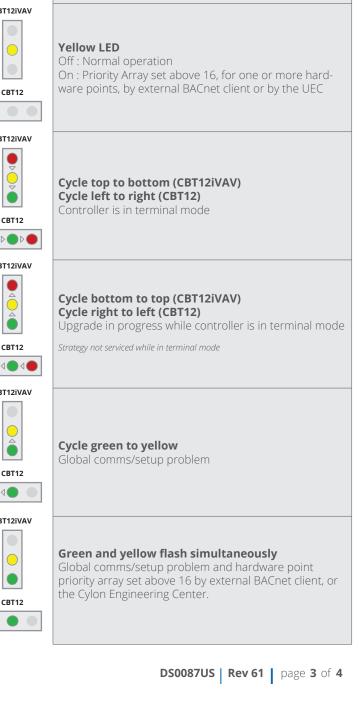
Rotary Actuator

Service Port (RJ-45)

UniPut[®]



Indicator LEDs



SPECIFICATIONS

MECHANICAL

Size (excluding terminal plugs)	CBT12iVAV : 8.3 x 5.1 x 2.3" (210 x 130 x 60 mm) CBT12 : 5.7 x 5.1 x 1.7" (145 x 130 x 45 mm)
Enclosure	Injection-molded ABS
Mounting	CBT12iVAV (direct) CBT12 (DIN rail)
Airflow Sensor (CBT12iVAV only)	Use rubber hose suitable for a 0.2" (5.1 mm) O.D. nozzle
Integrated Actuator (CBT12iVAV only)	Belimo® LMB24-3-T with Belimo® Brushless DC Motor Torque: 45 in-lb [5 Nm] Degrees of Rotation: 95° adjustable with mechanical stop Fits Shaft Diameter 1/4" to 5/8" [6mm to 16mm] Noise level < 35 dB (A) Running Time - 95 sec constant, independent of load

ENVIRONMENT Intended for field installation within another enclosure

Temperature & Humidity	32° - 122° F (0° - 50° C) ambient 0 - 90 % RH non-condensing
EMC Immunity / Emission	EN 55024, 2010 / EN 55002, 2010 Class A
Approvals	UL Listed (CDN & US) UL916 Energy Management Equipment File Number E176435 BTL Listed – BACnet Advanced Application Controller (B-AAC)

COMMUNICATIONS

Local RS-232 Port	@ 9600 baud : max cable length 13.12 ft (4 m)
BACnet MS/TP Port	EIA-485 @ 9600, 19k2, 38k4, or 76k8 baud (defaults to 38k4)

WIRING Use Copper or Copper clad Aluminum conductors only

Termination	PCB mounted plug terminal connections
Conductor Area	Max : AWG 12 (3.09 mm²) Min : AWG 22 (0.355 mm²)

ELECTRICAL

Supply Requirements	24 V AC +15%* / -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)

^{*} for CBT12 devices manufactured before August 2016 – i.e. with serial number starting with "CT12635----" or earlier, the supply requirements are 24 V AC +10 % / –20 % 50/60 Hz.

PROCESSOR

Туре	STM32F103ZET6 32-bit Processor
Clock Speed	8 Mhz Crystal, 72 MHz internal processor clock rate
System Memory (soldered to PCB)	512k flash, 64k SRAM internal to processor 1024k SRAM external

SOFTWARE FEATURES

Max strategy blocks	CBT12iVAV: 500 CBT12: 255
Max trendlogs / capacity	CBT12iVAV : 4 / 1024 CBT12 : 6 / 1024
Max controllers per BACnet MS/TP	99*

^{*}It is recommended for typical conditions that the number of main plant controllers on a main plant fieldbus be limited to 16. MS/TP devices with a fractional (1/4 or smaller) unit load will be required in order to extend a single fieldbus trunk beyond 32 devices. Both CBM and CBT controllers are 1/4 load devices. Please refer to MAN0106 for recommendation on configuring a specific network for optimal communication speeds.

INPUTS/OUTPUTS Screened cable is recommended for all input connections

	CBT12	CBT12iVAV	
Universal Inputs	4	4 (points 1-4)	Software Selectable Interfaces Active Input 0 to 10 V @ 130K. 12-bit resolution Passive Input for a large range of temp sensors, 10K3A1 sensors recommended NOTE: its not recommended using sensors with heating dissipation constant (K factor) < 2 as this will lead to an offset error Active Current Input 0 to 20 mA @ 390 Ohms (screened cable) Digital Volt-Free contact @ 1 mA continuous NOTE: CBT universal inputs do not support pulse counting
UniPuts + Triac	4		Software Selectable Interfaces Active Input 0 to 10 V @ 40 KΩ. 12-bit resolution Active Output 0 to 10 V @ 10 mA max load: 12-bit resolution Digital Volt-Free contact @ 25 mA not continuous 24 V AC triac @ 500 mA maximum: switch neutral only
Digital Outputs	4	3 (points 11-13)	• 24 V AC triac @ 500 mA maximum. CBT12 : switch neutral only. CBT12iVAV : switch live or switch neutral.
Triac CMN		1	Connected to 24 V AC : Digital Outputs will switch live. Connected to 0 V : Digital Outputs will switch neutral.
UniPuts		2 (points 14 & 15)	Software Selectable Interfaces Active Input 0 to 10 V @ 40 KΩ. 12 bit resolution. Active Output 0 to 10 V @ 10 mA max load. Digital Volt-Free contact @ 25 mA not continuous.
Actuator		1 (points 9 and 10)	Integrated Actuator. Points are dedicated to actuator and are not user accessible
Airflow Sensor		1	0-1.3 inches of water (0-320 Pa) Pa airflow measurement using internal microbridge type airflow sensor



American Auto-Matrix One Technology Lane Export, PA 15632 (724) 733-2000

aam@aamatrix.com www.aamatrix.com Appropriate safety precautions must always be taken when operating or maintaining equipment connected to any American Auto-Matrix product or other Licensed Materials or Hardware. AAM assumes no responsibility or liability for any injuries or damage to any persons or property resulting from the use of these products. As always, these products should be used in the manner they are intended.

All trademarks, trade names, service marks, or logos contained herein are the property of their respective owners and are only used to describe the product(s) being listed in this document. Every effort has been made to properly capitalize, punctuate, and identify and attribute all required trademarks with the use of the appropriate ® or ™ wherever practical and possible. American Auto-Matrix is not affiliated or a licensee holder of any of the trademarks other than those detailed below.

American Auto-Matrix, Smart Building Solutions, Solution Integrator, the Rocket-A, AspectFT, Auto-Flow, AspectFT-Facility, AspectFT-Enterprise, AspectFT-Studio, AspectFT-Nexus, AspectFT-Matrix MAX, and vSTAT are either registered trademarks or trademarks of American Auto-Matrix.