

TECHNICAL DATA SHEET

DS0120 rev 33

Cylon® CBV Series



DESCRIPTION

The **CBV Series** is a freely programmable range of BACnet® Unitary Controllers with native MS/TP communications support. The controllers are BTL listed as BACnet Advanced Application Controllers (B-AAC) and are ideally suited for the control of Variable Air Volume zoning applications.

Part of the ABB Cylon® **CB Line** of BACnet field controllers, the **CBV Series** features 2 UniPuts™, 4 Universal Inputs and 3 Digital (Triac) Outputs, along with an integrated airflow sensor and a dedicated input for ABB Cylon® room sensors. The **CBT-2U4-3T** model includes an integrated Belimo actuator. The **-N** variant has a facility for connection to an external actuator.

APPLICATION

The **CBV Series** is suitable for controlling single duct or fan assisted Variable Air Volume (VAV) applications. These controllers also support demand ventilation application, occupancy sensing or lighting control to further enhance energy savings.

Typical VAV zoning applications include;

- Cooling only
- Cooling with Reheat
- Cooling with Reheat and Perimeter Radiation
- Series fan VAV
- Parallel fan VAV
- Dump box
- Room pressurization

The controller accommodates available pre-engineered strategies or can be tailored to custom applications using CXpro^{HD} programming software.

2 UniPuts

Cylon's patented technology that can be configured as analog / digital outputs or voltage inputs

4 Universal Inputs

Can be configured as analog (voltage or current) or digital inputs

3 Digital (Triac) Outputs

Can switch 24 V AC @ 500 mA (live or neutral)

BACnet MS/TP Fieldbus

Supports the following configurable BACnet objects: AI / BI / AO / BO / AV / BV, Trend Logs, and Schedules

Integrated Pressure Sensor

0 ... 1.3 inches-water (0 ... 320 Pa)

Can measure differential pressure directly without need for a separate sensor

Integrated Actuator (CBV-2U4-3T)/External Actuator Port (CBV-2U4-3T-N)

Belimo actuator featuring a brushless DC motor with integrated position feedback and 45 inch-pounds (5 N-m) of torque

Cylon Intelligent Room Sensor support

Up to 750 Strategy Blocks

Up to 6 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

SPECIFICATIONS

MECHANICAL

Size (excluding terminal plugs)	CBV-2U4-3T 8.3 x 5.12 x 2.36" [210 x 130 x 60 mm] CBV-2U4-3T-N 7.1 x 5.12 x 2.36" [180 x 130 x 60 mm]
Enclosure	Injection molded ABS
Mounting	Direct Mount
Integrated Actuator (CBV-2U4-3T)	Belimo LMB24-MPL CYL with 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 Integrated position feedback

CONNECTION

Note: Use Copper or Copper Clad Aluminum 70 °C (158 °F) conductors only.

Terminals	PCB mounted plug terminal connections
Conductor Area	Max: AWG 12 (3.31 mm ²) Min: AWG 22 (0.355 mm ²)

ENVIRONMENT

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

Ambient Temperature	0 °C ... 50 °C [32 °F ... 122 °F] ambient.
Ambient Humidity	0% ... 90% RH non-condensing
EMC Immunity	EN61326-1:2013 Table 2
EMC Emission	EN61326-1:2013 Class B
Approvals	UL Listed (CDN & US) UL916 Energy Management Equipment - File No. E176435 BTL Listed – BACnet Advanced Application Controller (B-AAC)

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)
BACnet Loading	¼ unit load device
CBT-STAT Power Supply	12 V DC ... 13.5 V DC / 200 mA output

PROCESSOR

Type	STM32 F103ZET6 32bit processor
Clock Speed	8 MHz crystal, 72 MHz internal processor clock rate
System Memory (soldered to PCB not removable)	1M external flash, 64k SRAM internal to processor 1024k SRAM external

COMMUNICATIONS

Local serial port	RS232 TTL port @ 9600 Baud Max cable length 4 m
BACnet MS/TP port	RS485 @ 9K6,19K2, 38K4 or 76K8 Baud (defaults to 38K4) Max cable length 1.2 km
Local Sensor Port	RS485 with a maximum cable length 500 m Supports ABB Cylon® room sensors

INPUTS / OUTPUTS

Note: Shielded cable is recommended for all input connections.

UniPuts™



When configured as Input:

Analog Input
Range: 0 ... 10 V @ 40 kΩ
Resolution: 12 bit
Digital Volt-Free contact, @ 25 mA not continuous

When configured as Output:

Analog Output 0 ... 10 V (@20 mA), 12-bit resolution
Digital Output 0 ... 10 V (@20 mA)

Universal Inputs



Analog Input
Range: 0 ... 10 V @ 130 kΩ
Resolution: 12 bit
Temperature measurement
Range: 0 °C ... +50 °C (32 °F ... 122 °F)
Resolution: 12 bit
Passive Input for a large range of temperature sensors.
10K3A1 sensors are recommended.

Note: It is not recommended using Sensors with a heating dissipation constant (K factor) < 2 as this will lead to an offset error.

Current input

Range: 0 ... 20 mA @ 390 Ω
Accuracy: ±0.5% full scale [100µA]
Digital Volt-Free contact, Dry Contact

Digital (Triac) Outputs



(DO11, DO12 & DO13)
24 V AC Triac @ 500 mA maximum. Switch live or switch neutral.

Triac Common



13

Connected to 24 V AC: Digital Outputs will switch live.
Connected to 0 V: Digital Outputs will switch neutral.

Airflow Sensor



0 ... 1.3 inches of water (0 ... 320 Pa) airflow measurement using internal microbridge type airflow sensor.

Integrated Actuator



CBV-2U4-3T only: Belimo LMB24-MPL CYL

External Actuator Port



CBV-2U4-3T-N only: points 9 and 10 are dedicated to operating the actuator.
24 V AC Triac @ 200 mA maximum
Switching only internal 24 V AC

SOFTWARE FEATURES

Maximum number of Strategy Blocks	750
Maximum number of Trend log Modules	6
Maximum internal Trend log capacity (standard)	1024
Data Security	Strategy and Set points backed up in Flash

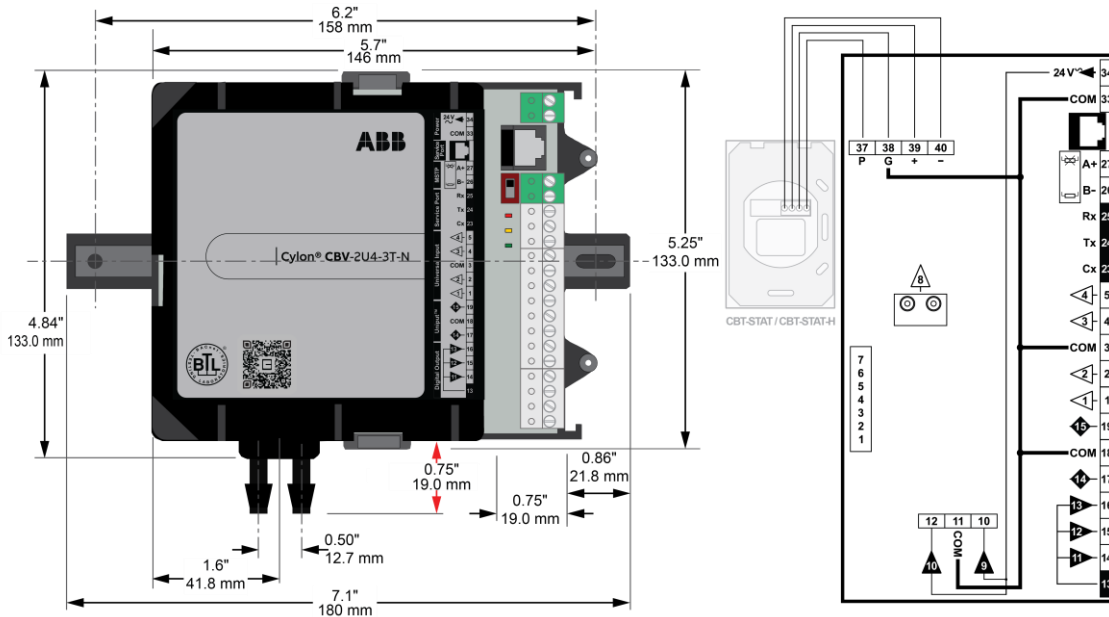
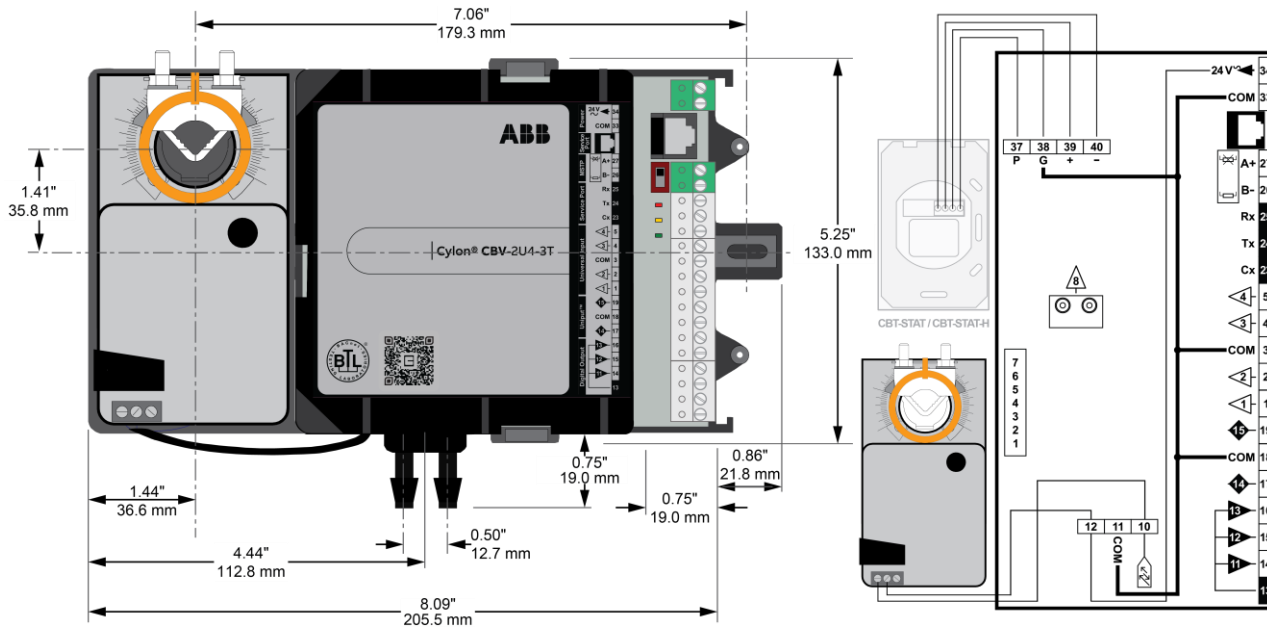
INTERFACE

Engineering Software

CXpro^{HD}



DIMENSIONS AND WIRING



ORDERING INFORMATION

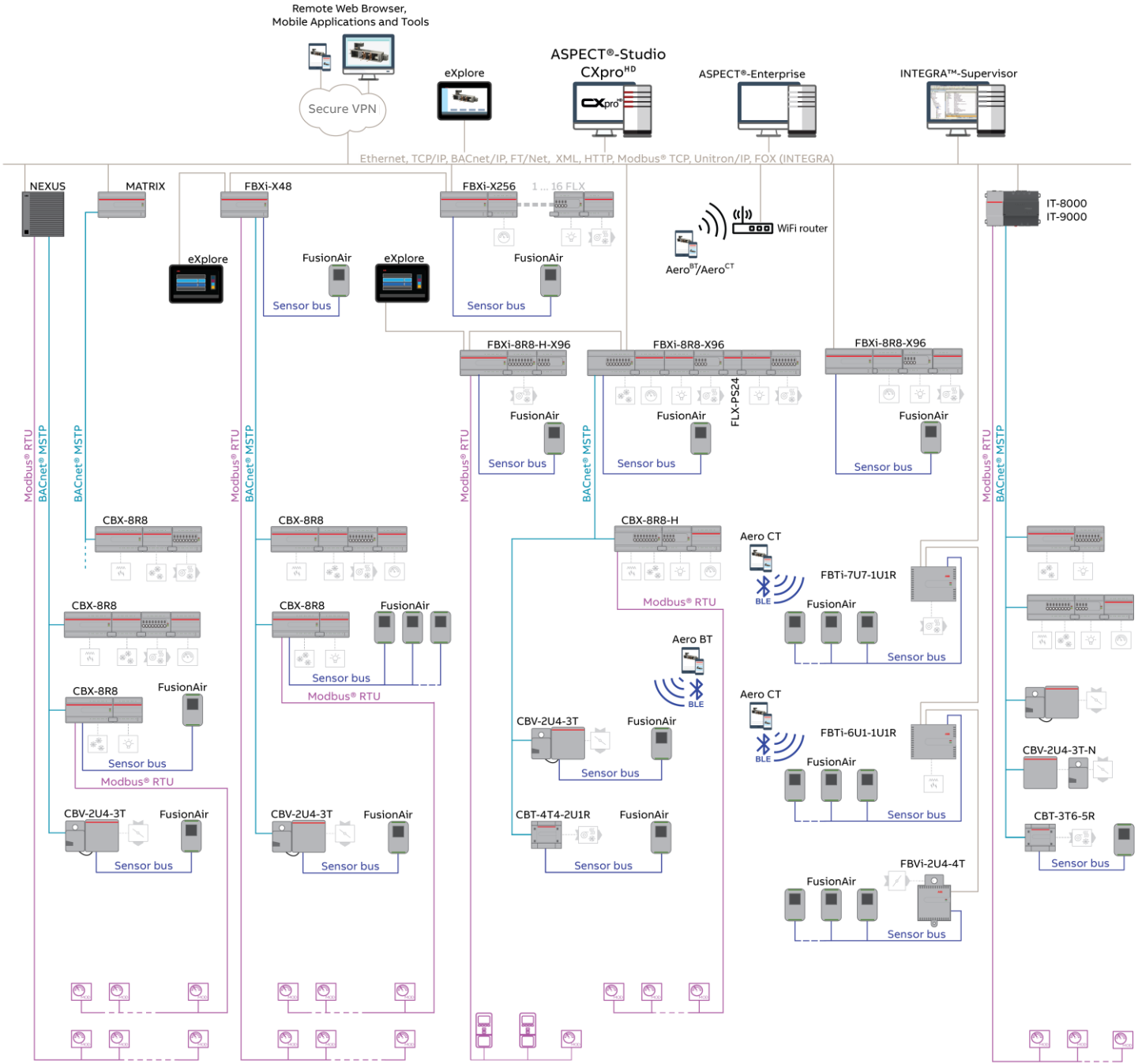
Order Code	Product Name	Description
ABB2CQG201512R0021	CBV-2U4-3T-N-SI	B-AAC VAV no act (SI)
ABB2CQG201513R0021	CBV-2U4-3T-SI	B-AAC VAV incl act (SI)
ABB2CQG201510R0021	CBV-2U4-3T-IMP	B-AAC VAV Ctr w/act (US)
ABB2CQG201511R0021	CBV-2U4-3T-N-IMP	B-AAC VAV no act (US)
ABB2CQG201518R1011	CBV-2U4-3T-FA-SI	B-AAC VAV+act SI FsnAr
ABB2CQG201515R1011	CBV-2U4-3T-FA-IMP	B-AAC VAV+act US FsnAr
ABB2CQG201516R1011	CBV-2U4-3T-N-FA-IMP	B-AAC VAV US FsnAir
ABB2CQG201517R1011	CBV-2U4-3T-N-FA-SI	B-AAC VAV SI FsnAir
ABB2CQG201520R1011	CBV-2U4-3T-S	B-AAC VAV incl act (UUKL)

Note: This variant complies with UL 864 UUKL and must be installed in accordance with Design Guide MAN0156

ABB2CQG201521R1011	CBV-2U4-3T-N-S	B-AAC VAV (UUKL)
--------------------	----------------	------------------

Note: This variant complies with UL 864 UUKL and must be installed in accordance with Design Guide MAN0156

SYSTEM ARCHITECTURE



FBXi / CBXi-8R8 / CBX-8R8	FLX-8R8 -H	FBVi-2U4-4T	INTEGRA Series	FusionAir Smart Sensor
CBXi-8R8-H / CBX-8R8-H	FLX-4R4-H	NEXUS Series	eXplore	CBT-STAT
CBV-2U4-3T	FLX-PS24	MATRIX-2 Series		UCU Room Display
FLX-8R8 / FLX-4R4 / FLX-16DI	CBT-4T4-2U1R			