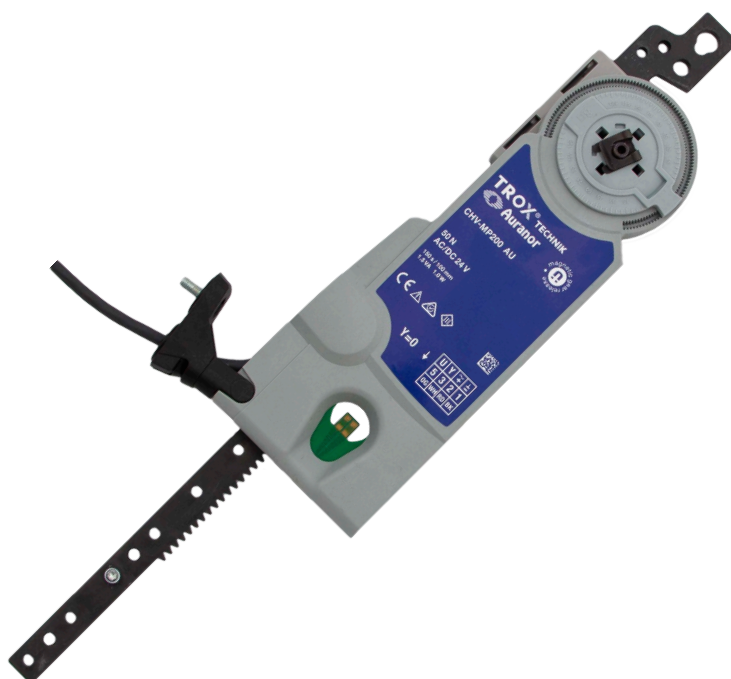


CHV-MP200-AU

VAV- actuator for Tellus-VAV



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VAV- control unit complete with air velocity sensor for pressure-independent VAV- applications.

- Air velocities: 0.5... 6m/s
- Control: DC0/2 ... 10 V / MP-Bus
- Feedback: Volume / Position DC0/2 ... 10 V
- Integration in bus systems
 - DDC controller with MP interface
 - Fan Optimiser systems
 - Gateway for LON / Modbus / KNX / ...– with integrated temperature sensor
- With additional connection option for active sensors and switches

- Connection of the Service and PC-Tool



Brief description

Application	The CHV-MP200-AU is used for the pressure-independent control of air volume flows for supply air.
Air volume measurement	The integrated thermoanemometric measurement system is for the recording of minimal air velocities. This enables the energy-optimised operation of the individual systems without any sacrifice of comfort.
Actuator	All installation sizes have the same actuator.
Control function	VAV or CAV mode in accordance with external setpoint specification.
Feedback	Current volumetric flow or damper position for Fan Optimiser systems.
VAV – variable volumetric flow	Variable volumetric flow with a modulating reference variable, e.g. room temperature controller, direct digital control or bus system, enables demand-related, energy-saving ventilation of individual rooms or zones. The input for the operating range \dot{V}_{\min} ... \dot{V}_{\max} can be adapted at the reference controller (mode switching).
CAV – constant volumetric flow	For constant volumetric flow applications, e.g. in step mode, controlled by means of a switch. The following operating modes can be selected from: CLOSED / \dot{V}_{\min} / \dot{V}_{mid} / \dot{V}_{\max} / OPEN
Bus function	Up to eight Belimo MP devices (VAV / damper actuator / valve actuator) can be connected together over the MP-Bus and integrated into the following systems: <ul style="list-style-type: none"> – LONWORKS® applications with Belimo UK24LON interface – KNX applications with Belimo UK24EIB interface – Modbus RTU applications with Belimo UK24MOD interface – BACnet applications with Belimo UK24BAC interface – DDC controller with integrated MP bus protocol – Fan Optimiser applications with optimiser COU24-A-MP An active sensor (0...10V, e.g. temperature), or a switch can optionally be integrated into the higher-level DDC or bus system via the MP-Bus.
Operating and service devices	BELIMO PC-Tool (PP or MP-Bus) or service tool ZTH (PP only) can be connected to the CHV-VAV

Technical data

Electrical data	Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V
	Operating range	AC/DC 19.2 ... 28.8 V
	Power consumption	Operation 1.5 W Rest position 1 W Dimensioning 1.5 VA
	Connection	Cable 1 m, 4 x 0.34 mm ²
Integrated sensors	Type	Thermo-anemometer
	Air velocity	0.3 ... 7 m/s
	Accuracy	± (0.1 m/s + 10% of the required air volume)
	Temperature sensor	for the measurement of the air temperature in the duct (read out via MP-Bus)
Accuracy	± 0.3 K (at 25°C and sufficient inflow)	
Actuator	Torque	Min. 50N @ nominal voltage
	Synchronisation	After every electricity interruption
	Manual adjustment	Gear disengagement with magnet
	Sound power level, actuator	max. 35 dB(A)
	Angle of rotation	200mm stroke length
	Running time	150s/100mm
Adjustment values	\dot{V}_{nom}	OEM-specific setting (3 / 5 / 7 m/s)
	\dot{V}_{max}	20 ... 100% of \dot{V}_{nom}
	\dot{V}_{min}	0 ... 100% of \dot{V}_{nom}
	\dot{V}_{mid}	between \dot{V}_{min} ... \dot{V}_{max}
	Site Adjustment factor	Setting range: 0.7 ... 1,3
	Altitude compensation	Range: 0 ... 3000 m above sea level
Analogue control	VAV mode for reference value input Y	– DC 2 ... 10 V / (4 ... 20 mA with 500 Ω) – DC 0 ... 10 V / (0 ... 20 mA with 500 Ω) Input impedance min. 100 kOhm
	Actual value signal U5	– DC 0/2 ... 10 V (max. 1 mA) Depending on the mode Adjustable: Volumetric flow / damper position
	CAV operating modes: (constant volumetric flow)	CLOSED / \dot{V}_{min} / \dot{V}_{mid} * / \dot{V}_{max} / OPEN* (*only with AC 24 V supply)
MP-Bus functions	Addressing in bus mode	MP1 ... 8 (16) (analogue operation: PP)
	DDC controller	DDC controllers / programmable controller with an integrated MP-Bus interface For manufacturers, see www.belimo.eu
	Fan Optimiser (fan control)	with BELIMO Fan Optimiser COU24-A-MP or DDC controller
	Sensor integration	– active sensors (0 ... 10 V) – 2-point signal (switching capacity 0.5 mA @ 24V)
Safety	Protection class	III Safety extra-low voltage
	Degree of protection	IP00
	EMC	CE according to 2004/108/EU
	Certification	– Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 – UL approval applied for

Technical data

(continued)

Safety	Flame class	Actuator	UL 94 V-0
	Fire behavior group	Actuator	RF2 (CH)
	Mode of operation		Type 1
	Rated impulse voltage		0.8 kV
	Environmental contamination		2
	Ambient temperature		0 ... 50 °C
	Non-operating temperature		-40 ... 80 °C
	Ambient humidity		max. 95 % r.h., non-condensing
	Maintenance		Maintenance-free

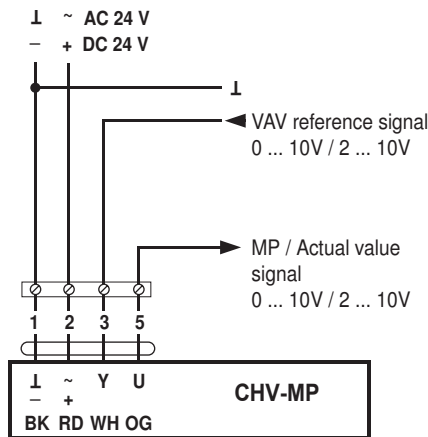
Connection

Cable connection

The connection is made using the connecting cable mounted to the CHV-MP200-AU.

Notes

- Supply via safety isolating transformer!
- Connections 1 and 2 (AC/DC 24V) and 5 (MP signal) must be routed to accessible terminals (room temperature controller, floor distributor, control cabinet, etc.) in order to enable access with the tools for diagnostic and service work.



Wire colours:

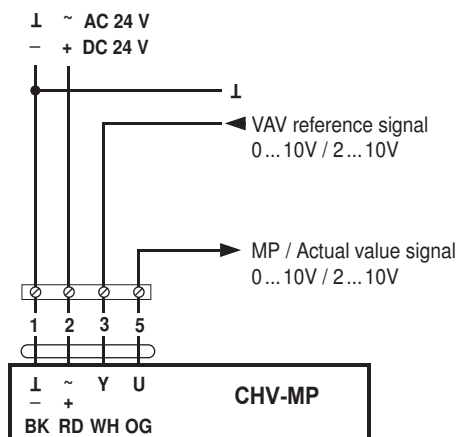
- 1 = black (BK)
- 2 = red (RD)
- 3 = white (WH)
- 5 = orange (OG)

VAV – Variable operation $\dot{V}_{min} \dots \dot{V}_{max}$

Wiring diagram

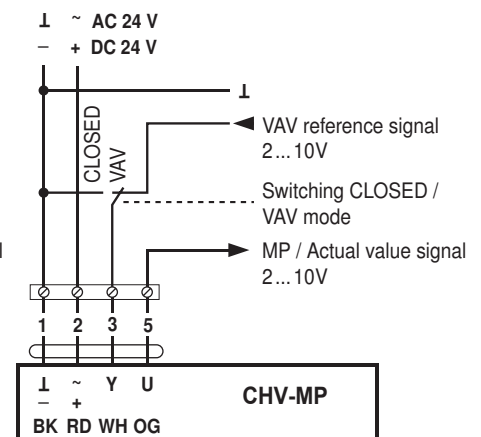
Example 1:

VAV with analogue reference signal



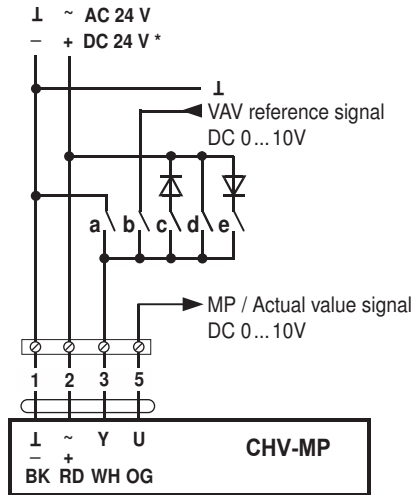
Example 2:

VAV with shut-off (CLOSED), 2 ... 10V mode



CAV – Step mode CLOSED / \dot{V}_{min} / \dot{V}_{mid} / \dot{V}_{max} / OPEN

Wiring diagram



Wire colours:

- 1 = black (BK)
- 2 = red (RD)
- 3 = white (WH)
- 5 = orange (OG)

Note

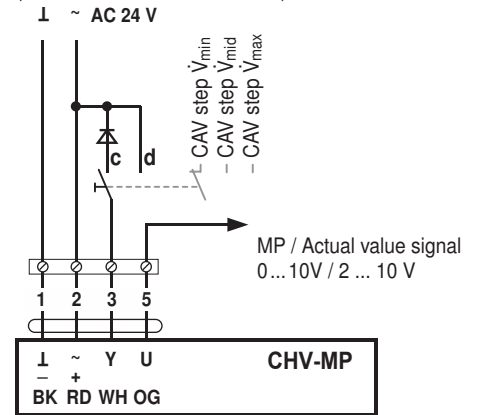
- Restrictions with DC 24 V power supply
- Note that the contacts are mutually interlocking!

CAV function

Mode setting	-	0 ... 10 V	0 ... 10 V	0 ... 10 V	0 ... 10 V
Signal	$\frac{I}{-}$ 2 ... 10 V	$\frac{I}{-}$ 0 ... 10 V 2 ... 10 V	\sim	\sim	\sim
Function	3	3	3	3	3
Damper CLOSED	a) CLOSED				
$\dot{V}_{min} \dots \dot{V}_{max}$		b) VAV			
CAV – \dot{V}_{min}	All open – \dot{V}_{min} active				
Damper OPEN				e) OPEN *	
CAV – \dot{V}_{max}			d) \dot{V}_{max}		
CAV – \dot{V}_{mid}		c) \dot{V}_{mid}			

Example 2:

CAV application \dot{V}_{min} - \dot{V}_{mid} - \dot{V}_{max}
(Mode 0 ... 10 V / 2 ... 10 V)



Note

- Supply through safety transformer
- Connections 1 and 2 (AC/DC 24V) and 5 (MP signal) must be routed to accessible terminals (room temperature controller, floor distributor, control cabinet, etc.) in order to enable access with the tools for diagnostic and service work.

Legend

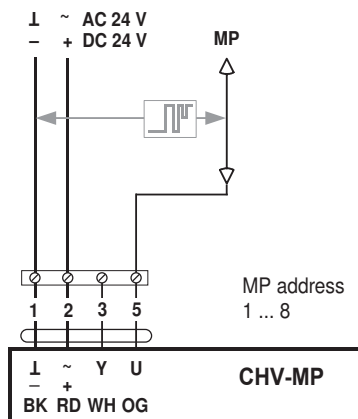
- Contact closed, function active
- Contact closed, function active, only in 2 ... 10 V mode
- Contact open

* \dot{V}_{mid} and OPEN not available with DC 24 V supply

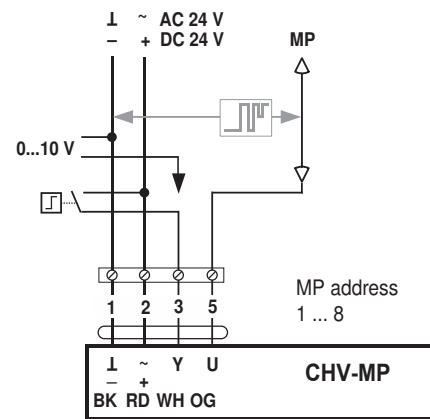
MP-Bus operation – VAV / CAV function

Wiring diagram

Control via MP-Bus



MP-Bus connection with integrated sensor



Note

- This is a connection description. Depending on the application, the terminal assignments may vary. The connection and the commissioning must be carried out by trained personnel.

Connection of active sensors (0...10 V e.g. humidity) or switch (e.g. window contact)

Dimensioning of supply and connecting cable

General In addition to the actual wire sizing, attention must also be paid to the surrounding area and the cable routing. If at all possible, signal cables must not be laid in the vicinity of load cables, objects liable to cause EMC interference, etc. Paired or layer stranded cables enhance interference resistance.

24 V supply, dimensioning and cabling The wire sizing and installation of the AC 24V supply, the fuse protection, and the cables are dependent on the total operated load and local regulations. Account must be taken of the following performance data, including the starting currents of the actuators:

- Dimensioning values of the CHV-MP, see Technical data
- Dimensioning values of further controlling elements, etc. can be found in the current data sheets and product information.
- Additional intended devices which are connected to the same 24V supply
- Reserve capacity for subsequent expansion (if planned).

MP-Bus integration – supply, dimensioning and cabling Detailed information on bus integration under www.belimo.eu

Commissioning

Ideally, the service tool ZTH is used for the commissioning and the functional check. This means that all relevant parameters can be set and the units are tested for correct functioning. The use of the PC-Tool is recommended for further settings.

Function	Setting value / range	Operating device		Remarks, notes
		PC-Tool from V3.9	ZTH	
System-specific settings				
V max	20...100% of V nom	r / w	r / w	
V mid	V min ... V max	r / w	r / w	
V min	0...100% of V nom	r / w	r / w	
Mode	0...10 V / 2...10 V	r / w	r / w	
Address	MP1...MP8 (16)	r / w	r / w	MP-Bus address
Position	16 characters	r / w	r	Display in operating and bus devices
Designation	16 characters	r / w	r	Display in operating and bus devices
Feedback U5 - function	Volumetric flow / damper position	r / w	---	
Installation height	0...3000 m above sea level	r / w	r / w	
Unit-specific settings				
Nominal air velocity	3 / 5 / 7 m/s	r / w	---	Value is permanently set by the OEM
V nom	Unit-specific value	r	r	Related to nominal air velocity
Specific settings				
Override control	AUTO / OPEN / CLOSE / V min / V mid / V max / STOP	r / w	r / w	
Site adjustment factor	0,7...1,3	r / w	r / w	
Bus fail position	Last value/ OPEN / CLOSE / V min / V max	r / w	---	MP-Bus function: Behaviour with bus master failure
Display				
Duct temperature	Actual in the duct	r	r	
Air velocity	Actual in the duct	r	r	
Control loop display	Volume / setpoint / damper position	r	r	
Type	Type designation	r	r	
Version overview	Firmware	r	r	
Serial number	nnnnn-nnnnn-nnn-nnn	r	r	
Operating data	Operating time / running time / ratio	r	---	

Additional information is contained in the instructions for the respective tools

Installation height entry The air density has an influence on the measurement system of the CHV-MP. This is strongly affected by the elevation above sea level of the current mounting position.

An additional parameter is available for increasing the measuring accuracy of the CHV-VAV with which the elevation of the system can be entered.

Range: 0 ... 3000 m above sea level

Upkeep and maintenance

The CHV-MP is in principle maintenance-free. A periodic visual check of the device and the checking of its perfect functioning is recommended.

Functional check

When dismantled:

1. Place the enclosed magnet on the marked point of the actuator housing.
2. Check the damper blade for free movement.
3. Do not fail to pull the magnet off again after testing.

In installed condition:

1. Connect ZTH to the RJ12 connection.
2. Use the override control to move the damper CLOSED and OPEN and observe the respective changes of the volumetric flow air and the damper position.
3. After completed inspection switch back the override controls, into AUTO mode and disconnect the ZTH.

Cleaning instruction

The housing of the CHV-VAV has been specially developed for low susceptibility to dirt. Nevertheless, periodic monitoring is recommended.

Cleaning:

Should dirt deposits nevertheless be found on the sensor, these can be carefully wiped away with a fine brush.

Do not use any hard objects or cleaning sprays for cleaning.