Clean air – within seconds...

Adaptive control system for sensitive operating ranges.

The digital VRP-M controller forms the core of the ready-to-plug-in Universal Control System for VAV units and for duct pressure control. Depending on the application, a variety of pressure sensors and actuators are available.

The precise pressure sensors and the reliable fast runner actuators enable the extraction of contaminated air and the supplying of fresh air within a few seconds when contaminated exhaust air is involved in the laboratory and production sector.

VAV applications with either standard or spring-return actuators can be integrated in an Optimiser System. This kind of demand-controlled (DCV) ventilation system combines energy efficiency and comfort. Also in combination with the proven VAV-Compact as needed.

Various actuator variants are available for controlling a pressure balance, e.g. duct pressure, including the proven fast runner or with a spring-return with defined emergency position.

The manufacturer of the VAV unit adjusts the VRP-M system individually for the respective application using the Belimo PC-Tool. Commissioning on the system is considerably simplified, thanks to the adaptive control characteristics.

Up to eight MP slaves – VRP-M including actuator and sensor – can be integrated in bundles into higher-level bus systems via the Belimo MP-Bus®. This lowers planning and cabling outlays, increases functionality and reduces costs – exactly the way you are used to with the solutions from Belimo!

MP BUS® TECHNOLOGY BY BELIMO

Perfect solutions for volumetric flow and pressure applications.

Belimo Europe

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Brunnenbachstrasse 1
CH-8340 Hinwil

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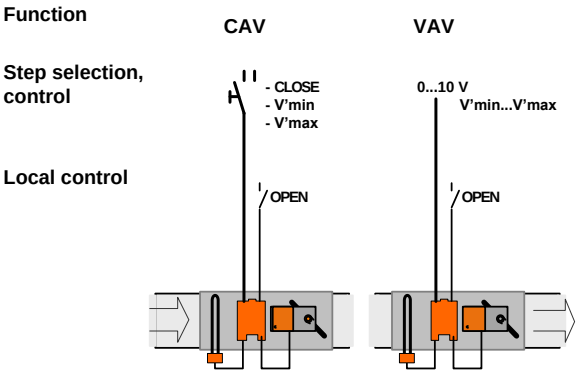
BELIMO®

VRP-M applications

CAV / VAV system, conventional

Constant and variable volumetric flow applications with standard or fast-running actuator.



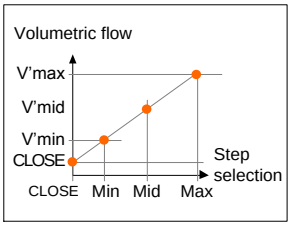
Application
- Standard actuator
  Extraction of contaminated air
- Fast-runner actuator
  Laboratory solutions, production exhaust air

Control
- CAV: step-control via switch, contacts
- VAV: control signal 0…10 / 2…10 V
  e.g. room temperature control CR24

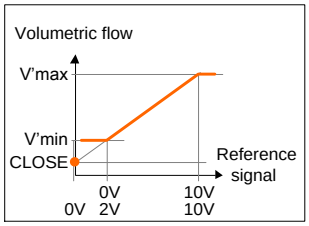
Local control
via switch, contacts
Available steps: CLOSE / OPEN / V'mid / V'max

Control diagram

- CAV

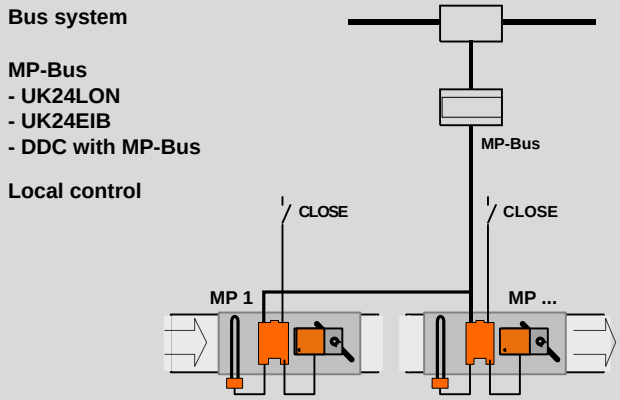


- VAV



VAV system, bus operation

VAV system solution for bus integration with standard or fast-running actuator.



Application
- Standard actuator
  Extraction of contaminated air
  Combined systems with VAV-Compact
- Fast-runner actuator
  Laboratory solutions, production exhaust air

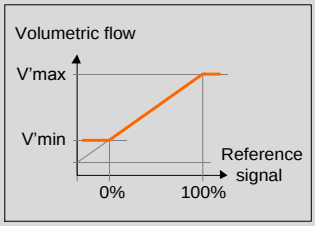
Control, sensor integration
- MP-Bus
- Additional 0…10 V sensor

Local control
via switch, contacts
available steps: CLOSE / OPEN / V'mid / V'max

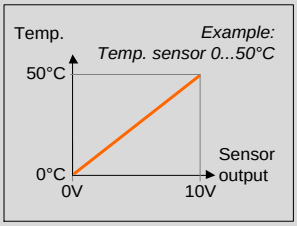
Integration in
- Modbus, BACnet, LONWORKS®, KNX
- DDC system with MP-Interface

Control diagram

- VAV controller



- Sensor object

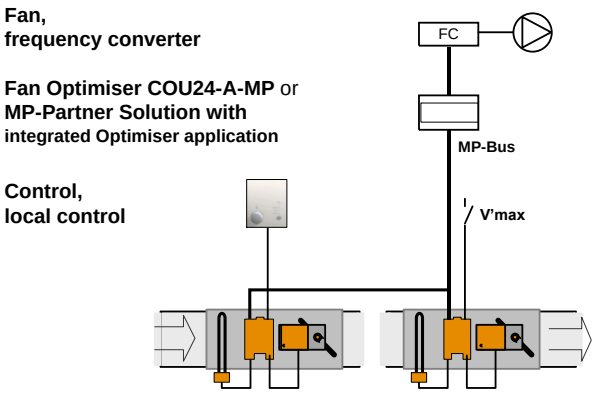


For detailed information for planning, application and operation, see www.belimo.eu.

VRP-M applications

DCV Demand Controlled Ventilation

DCV System solution –
Optimiser function for energy-efficient fan control via damper positions of the integrated VAV units.



Application
- Standard actuator
  Energy-efficient fan control
  Extraction of contaminated air
  Combined systems with VAV-Compact

Control
- CAV: step-control via switch, contacts
- VAV: reference signal 0…10 / 2…10 V,
  e.g. room temperature control CR24

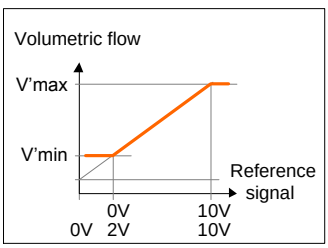
Local control
via switch, contact
Available steps: CLOSE / OPEN / V'mid / V'max

Fan optimiser
- Belimo Fan Optimiser COU24-A-MP
- DDC with integrated MP-Interface and
  Optimiser application

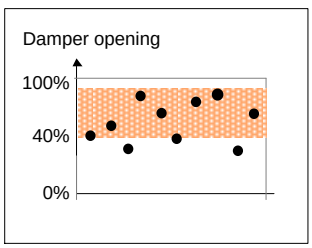
Frequency converter control
Analogue signal 0…10 V

Control diagram

- VAV controller

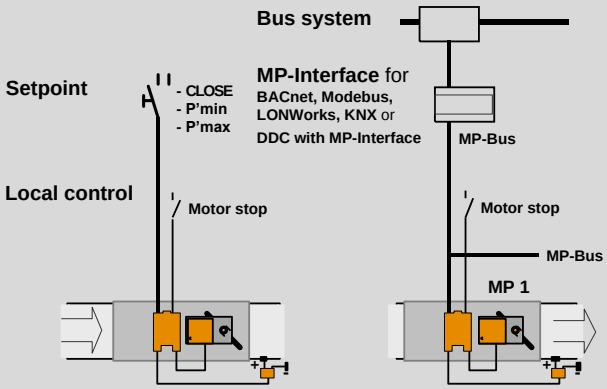


- Damper behaviour optimiser



STP – conventional & bus operation

System solution with standard or fast-running actuator for room and duct pressure control.



Application
- Standard actuator
  Duct pressure control circuit
- Fast-running actuator
  Duct pressure control circuit

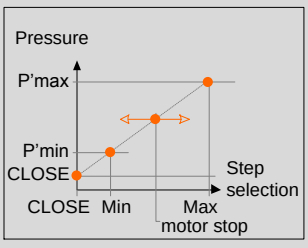
Control, sensor integration
- MP-Bus
- integration of additional 0…10 V sensor

Local control
via switch, contact
Available steps: CLOSE / OPEN / Motor stop /
P'mid / P'max

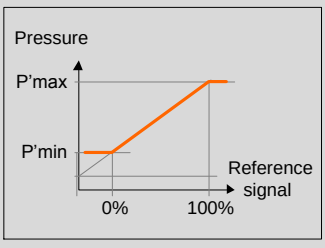
Integration in
- Modbus, BACnet, LONWORKS®, KNX
- DDC system with MP-Interface

Control diagram

- STP step mode



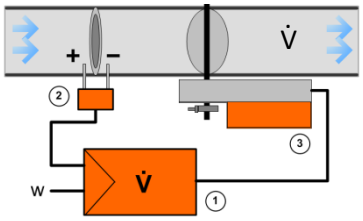
- STP modulating – Bus mode



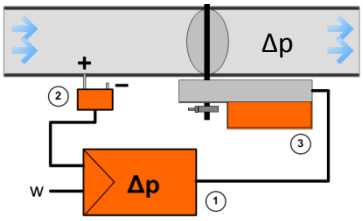
VRP-M System Overview

Application

VAV-CAV



STP (Pressure)



Control mode	Flow	Δp
Supply / exhaust air systems	■	
Extraction system	■	
Duct pressure system		■
Actuator variants	According to application: standard or fast runner, see ❸ section Actuator	
	Spring-return actuator with emergency position open or close	
Sensor variants	According to application: static / dynamic, see ❷ section Δp-Sensor	
Optimiser function for energy efficient fan control	■ a)	-
Step control	■	■
Modulating control	■	■
Local override steps	Close, V'mid, V'max, Open	Close, V'max, Motor stopp, Open
Bus integration	MP-Bus (MP-Partner systems), LonWorks, KNX, Modbus, BACnet, COU24-A-MP	

❶ Controller plattform

VRP-M

Application	**VAV / CAV**	**STP**
Power supply	AC / DC 24 V	
Control signal	0/2...10 V, 0/4...20 mA	
Feedback, actual value	Flow 0/2...10 V	Δp 0/2...10 V
Tools	PC-Tool VRP-M Modul, Service-Tool ZTH-GEN	
Optimiser compatible	■	-
Gateways	UK24LON, UK24EIB, UK24MOD, UK24BAC	
MP-Master	DDC systems from Belimo MP-Partner, COU24-A-MP	

❷ Δp-Sensor




	VFP-100	VFP-300	VFP-600	VFD3
Type				
Measuring principle	static	Static	Static	Dynamic
Pressure range	0...100 Pa	0...300 Pa	0...600 Pa	selectable: 0...100/300/600 Pa
Comfort zone	■	■	■	■
Dust-laden air	Dusty to heavily dust-laden air b)			Dusty air b)
Corrosive media	Corrosive air c)			d)
Connection	integrated cable-/plug-in unit corresponding to VRP-M			

❸ Actuator




	LM24A-V-ST	LMQ24A-SRV-ST	NMQ24A-SRV-ST	SF24A-V-ST
Type				
Function	Standard	Fast runner	Fast runner	Spring-return
Emergency function	-	-	-	open or close
Running time	110...150 s	2,5 s	4 s	110...150 s
Connection	integrated cable-/plug-in unit corresponding to VRP-M			

a) Restriction: Optimiser requires actuators with standard running time (fast runners are not allowed).
b) Independent from the sensor type, the pick-up device (part of VAV-unit) must be checked periodically and cleaned if necessary.
c) The VAV unit (pick-up, etc.) must be selected according to the media. The compatibility of the sensor materials must be examined, see VFP-xxx Technical Data
d) Air-duct cleaning agent and disinfectant compatible

PM EU, DEU –27.2.2012 – Subject to technical changes

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