

RVP-P

VAV RECTANGULAR VARIABLE FLOW REGULATOR



Specification:

VAV variable flow regulator with a rectangular section, operating from the flow rate of 2 m/s. Equipped with an actuator and a measuring orifice.

Table 1. Key parameters.

Key parameters	
VAV Function	VAV
Operating range	2-10 m/s
Material	Zinc-galvanized steel or stainless steel 1.4301, aluminium
Operating pressure range	50-1000Pa
Air leakage class	B2 /A2
Control accuracy	10%
Operating temperature range	0-50°C

Intended use

Flow regulators are used for the automatic control of a stream flowing through the ventilation air ducts in the air supply and in the exhaust part of the installation. RVP-P regulators may be manufactured in two versions in terms of the speed of operation. In the standard version (the time of clipping the regulator damper shutter is 150 seconds) or in the fast version, it is 3 seconds.

Performance

The housing and the shutter of the regulation damper is made of the zinc-plated steel sheet or on special request it is made of stainless steel 1.4301. The slats of the multi-blade damper made of aluminium or stainless steel are equipped with igelit sealing, thus obtaining tightness at the complete partition closure. This regulator, according to PN-EN1751, has air leakage class B2 (for $A \leq 250$ mm and $B \leq 205$ mm) or A2 (for $A > 250$ mm or $B > 205$ mm).

Dimensions

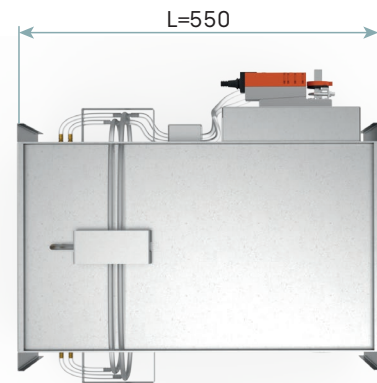
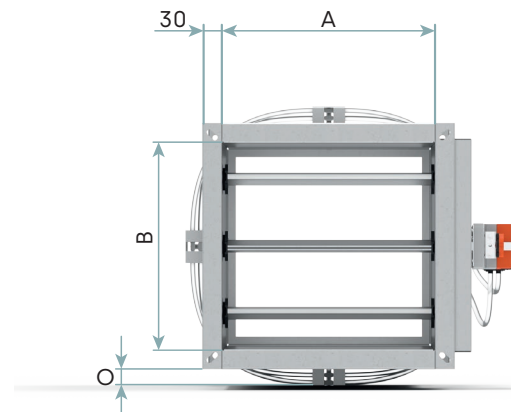


Figure 2. Dimensions of RVP-P regulator.

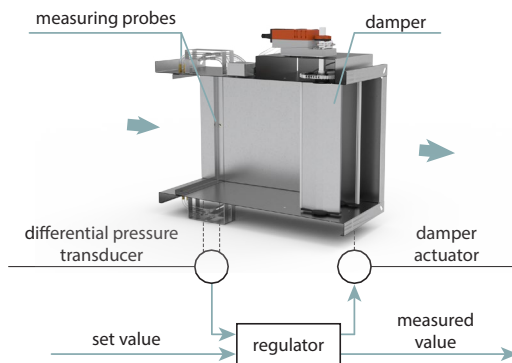
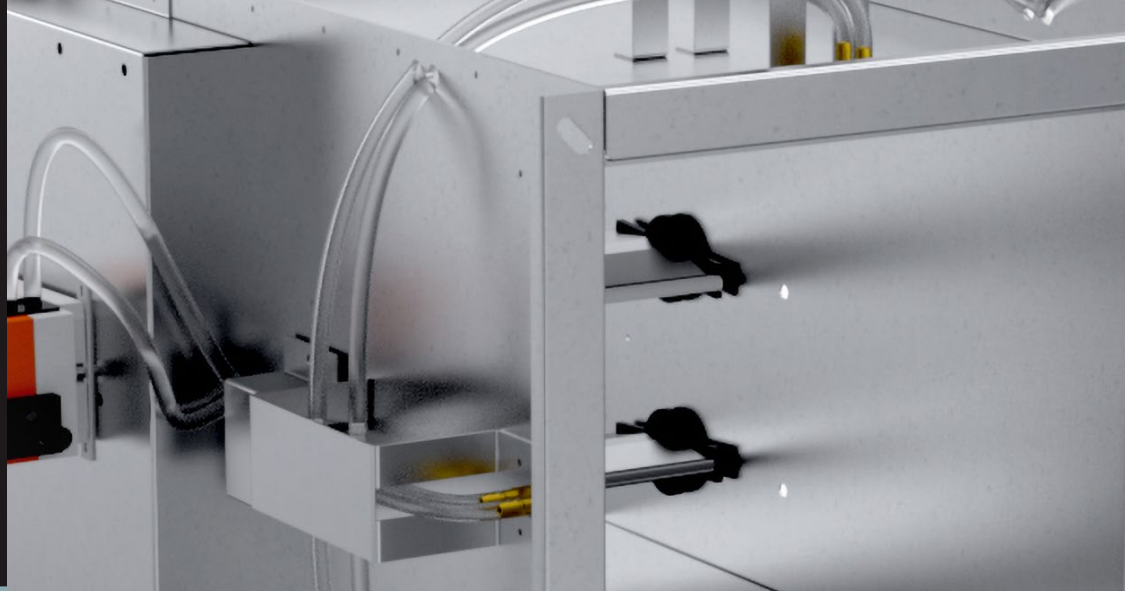


Figure 1. Diagram of VAV regulator operation.



The flow parameters are set by the manufacturer and they must not be modified by unauthorised personnel.

In the insulated version, the insulation does not protrude beyond the frame outline. For the uninsulated version $O = 30$ mm, for the insulated version $O = 60$ mm. The necessary minimum free space for dismantling the actuator is 100 mm, the recommended distance is 300 mm.



Typical dimensions and application scope

Table 2. The characteristic data of RVP-P regulator.

The application scope and dimensions of RVP-P regulator, V [m³/h]

Lc [mm]	B [mm]	A [mm]							
		200	250	315	400	500	630	800	1000
550	105	150-750	190-940	240-1190	300-1510	380-1890	x	x	x
	205	290-1480	360-1850	460-2330	590-2960	730-3690	920-4650	x	x
	305	440-2200	540-2750	690-3460	870-4400	1090-5490	1380-6920	1750-8790	2190-10980
	405	580-2920	720-3650	910-4600	1160-5840	1450-7290	1830-9190	2330-11670	2910-14580
	505	720-3640	900-4550	1140-5730	1450-7280	1810-9090	2290-11460	2900-14550	3630-18180

Legenda

5Nm

10Nm



An actuator with proper torque is selected in the manufacturing plant based on the required RVP-P regulator size.

It is possible to make a regulator on request which will have non-standard width (every 50 mm)..

Mounting recommendations

In order to ensure the correct device operation, it is recommended to abide by the following rules when mounting the regulators:

- 1) The regulator should not be mounted directly behind the elbows, behind the T-connectors branches, behind diffusers or Venturi tubes with the peak angle exceeding 15°.
- 2) The minimum distances should be as follows: 2x longer side than arches, elbows and T-connectors in front of the regulator, 1x longer side behind the regulator
- 3) If a static sensor of differential pressure is used, the only installation is allowed in which the plain to which the sensor is fastened is located vertically.

Pressure drop

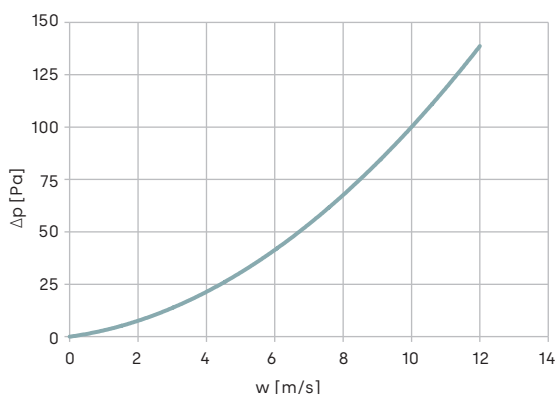


Chart 1. Pressure drop in RVP-P regulator (full damper opening).

Control-drive system

The devices have the possibility of infinitely variable and stroke controlling - enforced.

Infinitely variable controlling - 2-10V (default) or 0-10V (K=K1). Changing the set flow value takes places in the infinitely variable and proportional manner between V_{min} (2V lub 0V) and V_{max} (10V).

Stroke controlling:

- **„Close”** – the damper shutter is in the completely closed position (only for communication 2-10V).
- **„Otwórz”** - the damper shutter is in the completely opened position (Belimo – required 1N4007 diode).
- V_{min} – minimum value of volumetric flow between V_{min} and V_{max} (applies only to Belimo devices).
- V_{mid} – posrednia wartość przepływu objętościowego między V_{min} a V_{max} (dot. tylko urządzeń firmy Belimo).
- V_{max} – maximum volumetric flow.
- V_{nom} – flow stream in the calibration process (most frequently $1,3 V_{max}$).

Regulators are manufactured in two variants:

A) Standard version – RVP-P standard version (with the time of full damper clipping equalling 150 seconds) for clean air control:

VAV – Compact

Available actuators:

- LMV-D3-... ,NMV-D3-... -made by Belimo
- GDB 181.1... ,GLB 181.1... -made by Siemens

Controlling by means of communication protocols:

- MOD-BUS,
- EIB Konnex (KNX),
- BACnet,
- MP-BUS*,

* Belimo only

B) Special performance - fast RVP-R version (with the full clipping time of the shutter equalling 3 or 150 seconds) for the control of clean air or polluted air, also for slightly aggressive environment (according to the Corrosive Environments Classification ISO 12944 max. class C3):

The control-drive system of BELIMO pressure regulator consisting of a digital PID VAV regulator (VRU- M1-BAC) with the integrated static sensor of differential pressure.

Controlling by means of communication protocols:

- BACnet
- Modbus
- MP-Bus
- KNX, by means of UK24EIB gate.

Table 4. The technical data of actuators.

The technical data of actuators				
Technical data		Standard	MP-Bus	BACnet/Modbus
		LMV-D3-MF:1 SMY, NMV-D3-MF:1 SMY	LMV-D3-MP, NMV-D3-MP	LMV-D3-MOD, NMV-D3-MOD
Nominal voltage		AC/DC 24 V, 50/60 Hz	AC/DC 24 V, 50/60 Hz	AC/DC 24 V, 50/60 Hz
Power consumption	Operation	2 [W], 3 [W]	2 [W], 3[W]	2 [W], 3[W]
	While idle	1 [W], 1,5 [W]	1 [W], 1,5 [W]	1 [W], 1,5 [W]
	Nominal power	3,5 [VA], 5 [VA]	4 [VA], 5 [VA]	4 [VA], 5 [VA]
Torque		5 [Nm], 10 [Nm]	5 [Nm], 10 [Nm]	5 [Nm], 10 [Nm]
Running time from 0 to 100%		150s.	150s.	150s.
Connection diagram			Diagram 1	

More technical data are provided in the catalogue sheets of respective actuators or in the complete catalogue sheet.

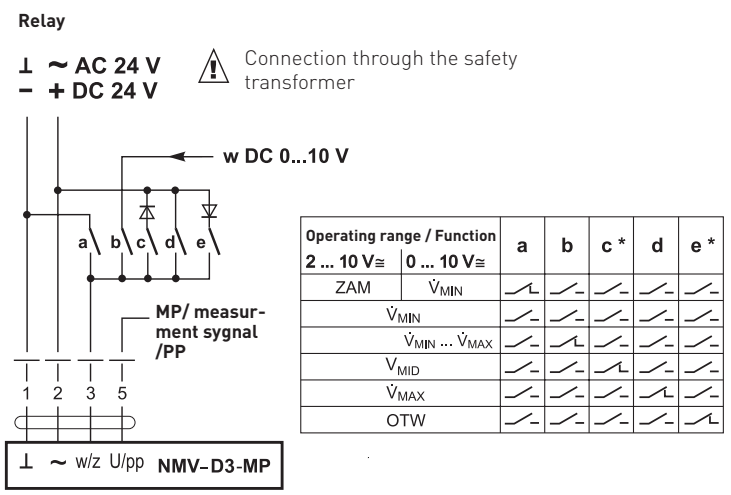


Diagram 1. The diagram of connecting NMV-D3-MP or LMV-D3-MP regulator with the compact actuator

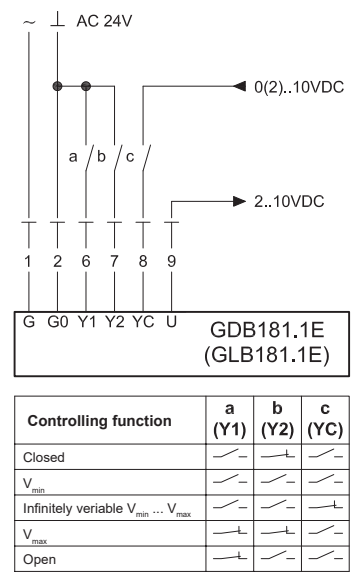


Diagram 2. The diagram of connecting GDB 181.1 or GLB181.1 regulator with the compact actuator

! Power supply must be connected through the safety transformer!
- In order to enable the performance of diagnostic and service works by means of PC-Tool software, wires 1, 2 (24V AC/DC) and 5 (signal U5) must be supplied to accessible terminal blocks (switching station, control cabinet, etc.)

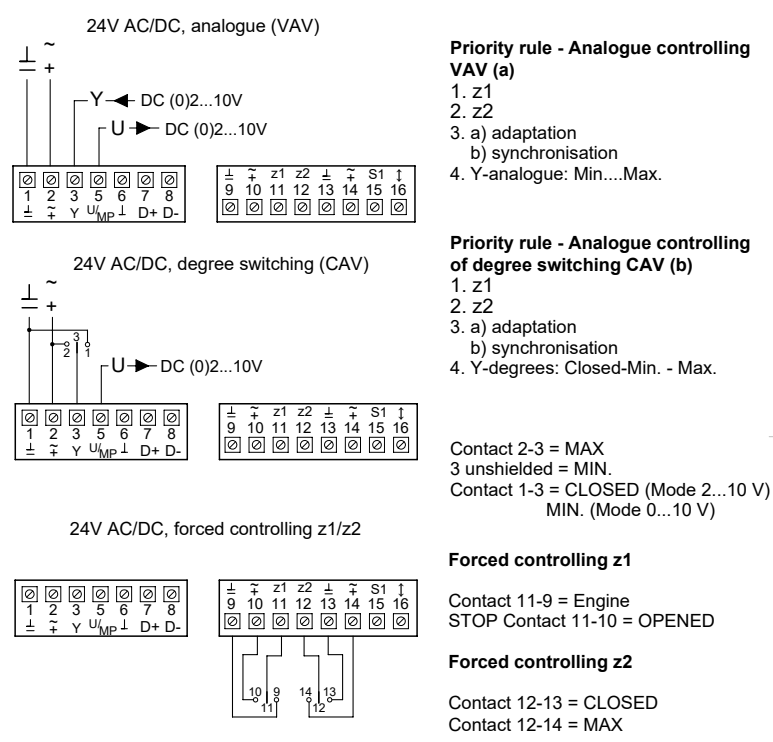


Diagram 3. The diagram of connecting with fast automatics (VRU).

RVP-P - VAV rectangular variable air flow regulator

When placing an order, provide information according to the below pattern:

RVP-P<I> - <A> x - <V_{MAX}> / <Za> <V_{MIN}> <Ta> - <Ts> - <Tp> - <K> - <N> - <S> - <P> - <Kd>

Where:

I	insulation*
	none - non-insulated t - insulated
A	clearance width [mm]
B	clearance height [mm]
V_{MAX}	maximum flow stream [m ³ /h]
Za	The complete closing function of the regulator?*
	-none - no (0) - Yes (available closing option)
V_{MIN}	Minimum flow stream [m ³ /h]
Ta	Automatics type*
	none - standard (Belimo) Sim - Siemens
Ts	Drive type*
	none - standard Q - fast (Belimo only)
Tp	Connection type*
	none - classic MST - communication Master/Slave function Master SLV - communication Master/Slave function Slave
K	communication*
	none - 2...10V (with an option of forcing the CLOSE position) K1 - 0...10V MP BUS - general value MP BUS (Belimo only). MOD - Modbus KNX - KNX BAC - BACnet (Siemens only or Belimo in the special)

N	system regulator number (only for communication MP BUS or Modbus)
	from 1 to 8 - the range of numbers for MP BUS communication from 1 to 32 - the range of numbers for Modbus (iFlow)
S	environment*
	none - clean air C3 - environment with max. C3 class
P	material*
	SO - zinc plated steel SN - stainless steel
Kd	additional communication (only Belimo [none, K1, MP])
	none - standard NFC - communication via NFC

*Optional values - if they are missing, default values are applied

Exemplary marking of the product: **RVP-P-500x305-1100/700-Q-MP BUS-7**