RVT-R

VAV ROUND VARIABLE FLOW REGULATOR MADE OF PLASTIC

Characteristics:
VAV variable flow regulator with a round section, operating from the flow rate of 1 m/s, equipped with an actuator and Venturi tube. Made of PVC or PPs, suitable for aggressive environment.

SO SN

version: 03/04/25

Key parameters	
Function	VAV
Operating range	approx. 1-10m/s (see details table. 3)
Material	PVC lub PPs
Opperating pressure range	15-1000Pa
Air leakage class	B1 / B2
Control accuracy	10%
Operating temperature range	0...50°C

Intended use

VAV regulators are used for the automatic control of air stream flow in the mechanical ventilation and air-conditioning systems. RVT-R 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.

Design

The housing or shutter of the regulation damper are made of PVC or PPs. This regulator, according to PN-EN1751, has the air leakage class B1 (for Dn125 mm) or B2 (for Dn160-500 mm). The regulator with a proper actuator may be used in Smaylab systems.

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

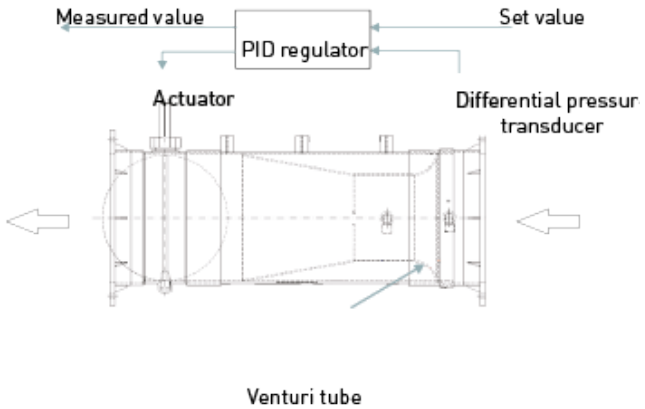


Figure 1. Diagram of RVT-R regulator operation.

Dimensions

VAV RVT-R regulator without a mounting flange.

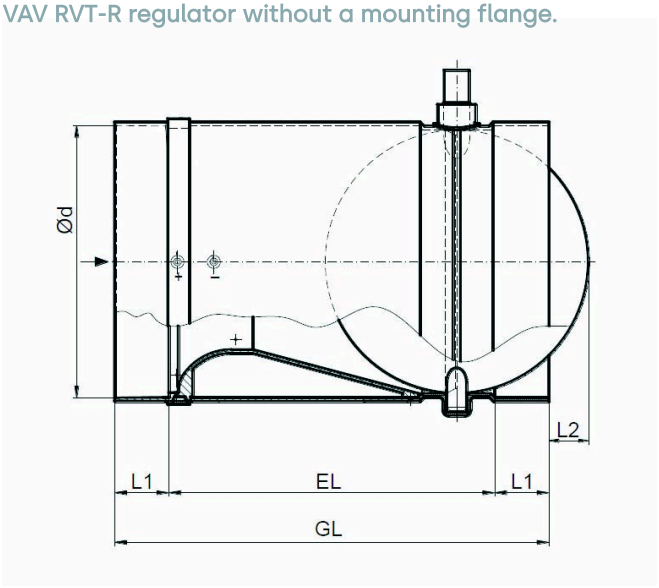


Figure 2. VAV RVT-R regulator without a mounting flange.

Table 1. Characteristic dimensions.

DN	Ød	EL	GL	L1	L2
125	126	320	400	40	73
160	161	230	310	40	0
200	201	250	340	50	11
250	251	300	400	50	36
315	316	390	490	50	68
400	401	1100	1200	50	200
500	501	1400	1540	70	280

AV RVT-R regulator with a mounting flange.

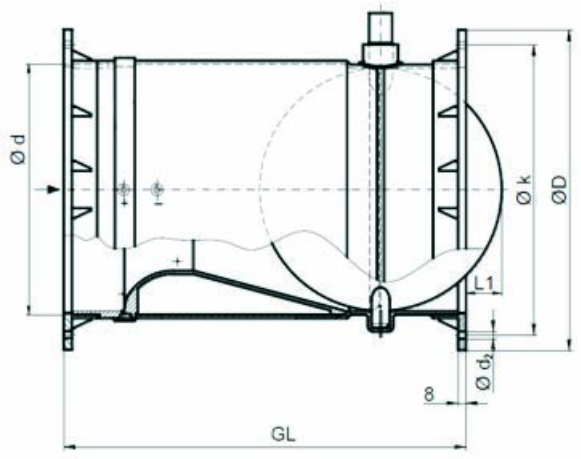


Figure 3. VAV RVT-R regulator with a mounting flange.

Table 2. Characteristic dimensions.

DN	Ød	ØD	GL	L1	Ød2 / quantity	Øk
125	125	185	400	107	7 / 8	165
160	160	230	310	0	7 / 8	200
200	200	270	350	11	7 / 8	240
250	250	320	400	36	7 / 12	290
315	315	395	490	58	7 / 12	350
400	400	480	1250	260	7 / 16	445
500	500	480	1400	260	9 / 20	545

Typical dimensions and application scope

Table 3. Nominal diameters and application scope.

DN	V_{min} [m³/h]	V_{max} [m³/h]
125	60	442
160	85	690
200	110	950
250	195	1766
315	310	2804
400	585	4522
500	710	7065

In order to ensure the correct device operation, during mounting, it is recommended to maintain a straight section in front of the regulator equalling 2D.

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.

The electric connection of the measurement-control-execution unit should be carried out in accordance with the pattern provided in the documentation attached to the device by a qualified person.

Pressure drop

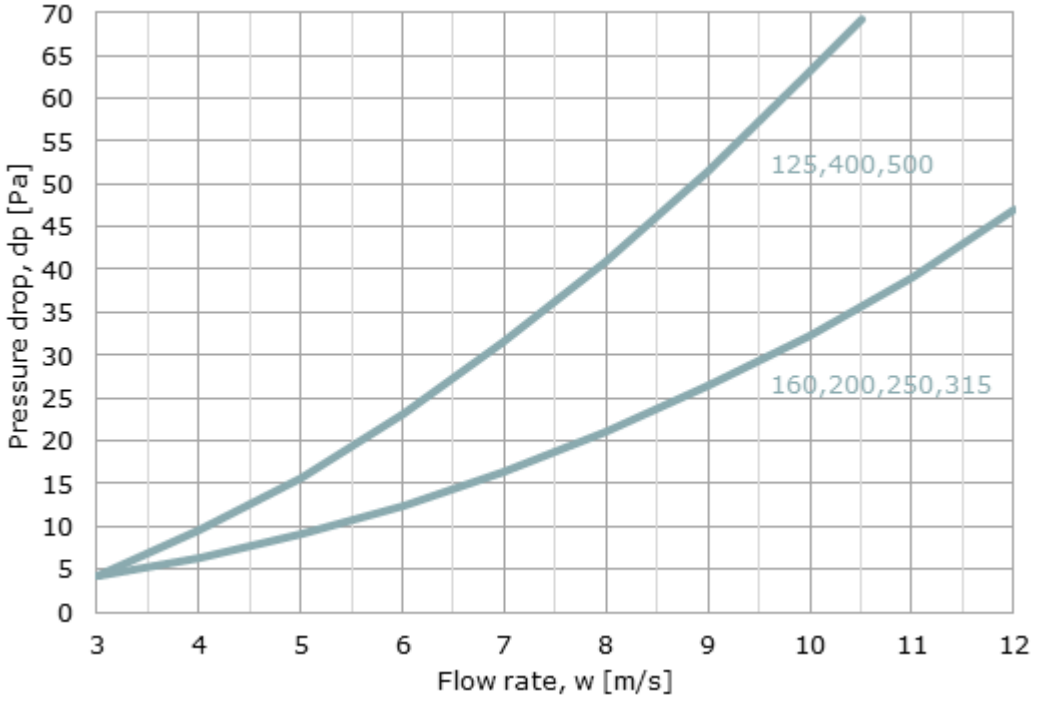


Chart 1. Pressure drop in RVT-R regulator (full damper opening).

Technical data

Table 4. Sound power level L_W [dB] and sound pressure level L_{pA} [dB(A)] emitted by RVT-R regulator.

RVT-R				dp= 100 Pa												dp= 300 Pa												dp= 500 Pa											
				Noise of the air flowing to the duct									through the housing			Noise of the air flowing to the duct									through the housing			Noise of the air flowing to the duct									through the housing		
DN [mm]	Flow	Rate		in frequency bands, LW [dB]								Total	without insul.	with insul.		in frequency bands, LW [dB]								Total	without insul.	with insul.		in frequency bands, LW [dB]								Total	without insul.	with insul.	
	v [m/s]	V [m^3/h]	V [l/s]	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	LpA [dB(A)]	LpA [dB(A)]	LpA [dB(A)]	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	LpA [dB(A)]	LpA [dB(A)]	LpA [dB(A)]	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	LpA [dB(A)]	LpA [dB(A)]	LpA [dB(A)]
125	2	88	25	43	43	45	48	46	43	35	30	42	25	<20	49	48	51	53	54	56	54	46	53	36	21	52	51	54	55	58	62	63	54	60	41	25
	4	177	49	47	47	49	52	48	45	39	33	45	28	<20	54	54	56	58	58	57	55	49	55	38	24	57	57	59	61	62	63	62	56	61	43	28
	6	265	74	50	50	51	54	50	46	41	35	47	29	<20	56	57	58	61	59	58	55	49	57	39	24	59	60	62	64	64	64	61	55	61	44	28
	8	353	98	52	52	52	56	51	47	42	36	48	30	<20	58	59	60	63	61	59	55	49	58	40	24	61	63	64	66	65	64	60	55	62	44	28
	10	442	123	53	53	53	57	52	48	43	37	49	31	<20	60	61	62	65	62	59	55	50	59	40	24	62	65	65	68	66	65	60	55	63	45	28
160	2	145	40	45	46	47	49	47	45	35	31	43	27	<20	52	53	54	55	56	57	55	47	54	38	24	55	57	57	58	60	62	64	54	60	43	28
	4	289	80	50	51	51	53	50	47	40	34	47	30	<20	57	59	59	60	59	58	56	49	56	40	27	61	62	62	63	63	63	63	56	61	45	31
	6	434	121	53	53	53	56	52	48	43	37	49	32	<20	60	62	62	63	61	59	56	50	58	42	27	64	66	65	66	65	64	62	56	62	47	32
	8	579	161	55	55	55	58	53	48	45	38	50	33	<20	63	64	63	65	62	59	56	51	59	43	28	66	68	67	68	66	65	61	56	63	48	32
	10	723	201	57	56	56	59	54	49	46	39	51	34	<20	64	66	65	66	63	60	56	51	60	44	28	68	70	69	69	67	65	60	56	64	49	33
200	2	226	63	46	50	49	49	48	47	36	31	45	29	<20	54	58	57	56	58	58	55	48	55	40	26	57	61	61	60	62	63	64	55	61	45	31
	4	452	126	52	54	53	54	51	48	41	35	48	32	20	60	63	62	61	60	59	56	50	57	43	30	64	67	66	64	65	64	63	57	62	48	34
	6	678	188	55	56	56	57	53	49	44	38	50	34	20	64	66	65	64	62	59	57	51	59	45	30	68	71	69	67	66	64	62	57	63	50	35
	8	904	251	58	58	57	59	54	49	47	40	52	35	21	67	68	66	66	63	60	57	52	60	46	31	71	73	71	69	67	65	61	57	64	51	36
	10	1130	314	60	59	58	61	55	50	48	41	53	37	21	69	70	68	68	64	60	57	52	61	47	32	73	75	72	71	68	65	61	57	65	52	37
250	2	353	98	48	53	51	50	50	48	36	32	46	31	20	56	62	60	58	59	58	56	48	56	42	29	60	66	64	62	63	63	65	56	62	48	33
	4	707	196	54	57	55	55	53	49	43	36	49	34	23	64	67	65	63	62	59	57	51	59	46	33	68	72	69	66	66	64	64	58	63	51	38
	6	1060	294	58	60	58	59	54	50	46	39	52	37	23	68	70	67	65	63	60	57	52	60	48	34	73	75	72	69	67	65	63	58	65	53	39
	8	1413	393	61	61	60	61	56	50	49	41	53	38	24	71	73	69	67	64	60	58	53	62	49	35	76	78	74	70	68	65	62	58	66	55	40
	10	1766	491	63	62	61	63	57	51	51	43	55	39	24	73	74	71	69	65	61	58	53	63	51	36	78	80	76	72	69	66	61	58	67	56	41
315	2	561	156	50	57	53	51	51	50	37	32	47	33	22	59	67	63	60	61	59	56	49	57	45	31	63	71	67	64	65	63	65	56	63	50	36
	4	1122	312	57	61	58	57	54	51	44	37	51	37	25	67	72	68	64	63	60	58	52	60	49	36	72	77	72	68	67	64	64	59	65	54	41
	6	1682	467	61	63	60	60	56	51	48	41	53	39	26	72	75	71	67	64	61	58	53	62	51	38	77	80	75	70	68	65	63	59	66	57	43
	8	2243	623	63	64	62	63	57	51	51	43	55	41	27	75	77	73	69	66	61	59	54	63	53	39	81	83	77	72	69	65	62	59	67	59	44
	10	2804	779	66	66	64	64	58	52	53	45	57	43	27	78	79	74	70	66	61	59	55	64	55	40	84	85	79	73	70	66	62	59	69	61	45
400	2	904	251	52	60	55	52	52	52	37	33	49	35	24	61	71	66	61	62	60	56	49	59	47	34	65	76	71	66	67	63	65	57	64	53	39
	4	1809	502	59	64	60	58	56	52	45	38	52	40	28	70	76	71	66	65	61	59	53	62	52	40	76	82	76	69	69	65	65	59	67	58	45
	6	2713	754	63	66	63	62	57	52	50	42	55	42	29	76	79	74	68	66	61	59	54	64	55	41	82	86	79	72	70	65	64	60	68	61	47
	8	3617	1005	66	68	65	64	59	52	53	45	57	44	30	80	82	76	70	67	62	60	55	65	57	43	86	88	81	73	70	66	63	60	70	63	49
	10	4522	1256	69	69	66	66	60	53	55	47	59	46	30	83	83	77	72	67	62	60	56	67	59	44	89	90	82	74	71	66	62	60	71	65	50

Sound pressure level provides the attenuation of the room and ceiling for a model room accepted at the level of 8 dB. The actual parameters may differ depending on the conditions.

Acoustic data for other pressure and consumption values, including sound power level in respective frequency bands, are available in the design department of SMAY.

Control-drive system

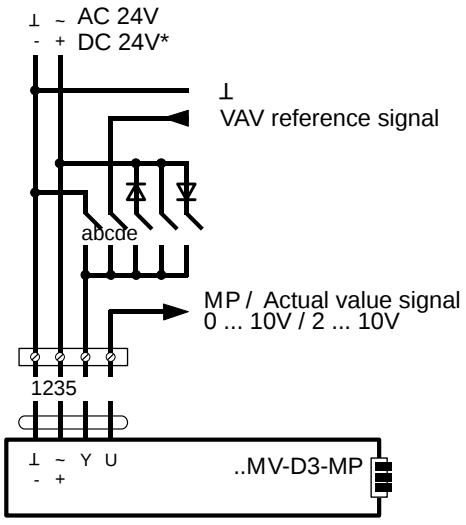
The regulators may be divided into two variants in terms of the operation speed of actuators.

1. Performance with standard automatics - with the time of full damper clipping equalling 150 seconds, used in process extraction lines, extraction arms, etc. In this variant, the control-drive system of the device is a compact unit containing in one housing a dynamic pressure difference sensor, actuator and the damper drive. Available types: LMV-D3-... ,NMV-D3-... or GDB 181.1... ,GLB 181.1...

The drive-control system is connected through wires by the manufacturer; the purchaser is obliged to supply power and the control signals from the controller to the regulator and to the driver. The electric connections of the units should be carried out in accordance with the automatics diagram attached to the documentation of the designed system by a properly qualified person.

Connection diagrams

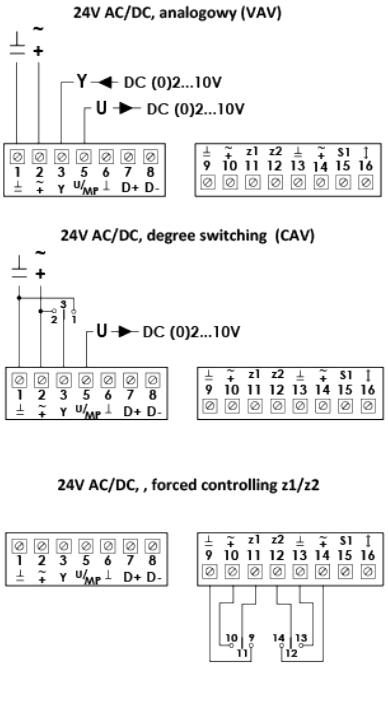
LMV-D3-MP (NMV-D3-MP)



Operating range/Functions 2 ... 10 V ≙	0 ... 10 V ≙	a	b	c*	d	e*
zam	V_{min}					
V_{min}						
V_{min} ... V_{max}						
V_{mid}						
V_{max}						
otw						

Figure 4. Connecting the regulator and relay control for RVT-R with L(N)MV-D3-MP compact actuator.

LMQ24A-VST (NMQ24A-VST) + VRU-M1-BAC



Priority rule - Analogue controlling VAV (a)
1. z1
2. z2
3. a) adaptation
   b) synchronisation
4. Y-analogue: Min....Max

Priority rule - Analogue controlling of degree switching CAV (b)
1. z1
2. z2
3. a) adaptation
   b) synchronisation
4. Y-degrees: closed-Min.-Max

Contact 2-3 = MAX.
3 unshielded = MIN.
Contact 1-3 = Closed (Mode 2...10 V)
MIN. (Mode 0...10 V)

Forced controlling z1

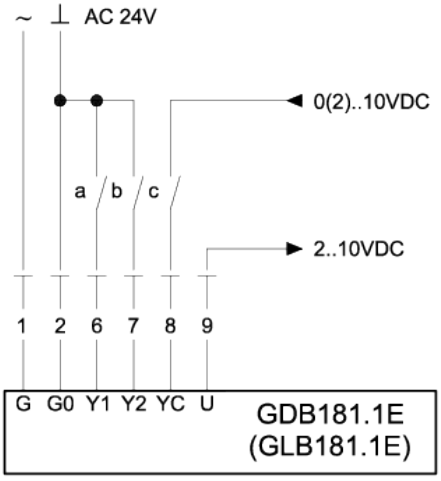
Contact 11-9 = Engine STOP
Contact 11-10 = OPENED

Forced controlling z2

Contact 12-13 =CLOSED
Contact 12-14 = MAX

Figure 5. The diagram of connecting with fast automatics (VRU).

GDB 181.1 lub GLB181.1



Controlling function	a (Y1)	b (Y2)	c (YC)
Closed			
V_{min}			
Infinitely veriable V_{min} ... V_{max}			
V_{max}			
Open			

Figure 6. The diagram of connecting GDB 181.1 or GLB181.1 compact actuator with the regulator.

RVT-R - VAV round variable flow regulator made of plastic

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

RVT-R <Ta> - <D> - <J> - <Vmax>/<Za> <Vmin> - <Ts> - <K> - <Z> - <M> - <Kd>

Where:

Ta	Automatics type*
	BL - belimo
	S - Siemens
	SL - SmayLab
D	Diameter
J	Connection type*
	none - coupler
	PSK - flange
V_{max}	Maximum flow stream [m³/h]
Za	The complete closing function of the regulator*
	none - no
	(0) - yes
V_{min}	minimum flow stream [m³/h]
Ts	Drive type* (in the event of a regulator for fume hoods, it is possible to order a regulator only with a fast actuator)
	none - standard (150s.)
	Q - fast
K	communication*
	none - 2…10V (with an option of forcing the CLOSE position)
	K1 - 0...10V
	MP BUS - total value MP BUS (Belimo only)
	MOD - Modbus
	KNX - KNX
	BAC - BACnet (Siemens only or Belimo in the special performance)
Z	Application*
	N/W - air supply/air exhaust
	O - process extraction
	D - fume hood
M	Material
	PPs - polypropylene
	PVC - polyvinylchloride
Kd	Additional communication (only Belimo [none, K1, MP])
	none - standard
	NFC -communication via NFC

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

Sample order: **RVT-R - 250 - 1100/200 - N/W - PPs**