RVT-R
VAV ROUND VARIABLE FLOW REGULATOR MADE OF PLASTIC

Product 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.

Table 1. Key parameters.

Key parameters	
Function	**VAV**
Operating range	**approx. 1-10m/s (see details table 3)**
Material	**PVC or PPs**
Operating 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.

Performance

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.

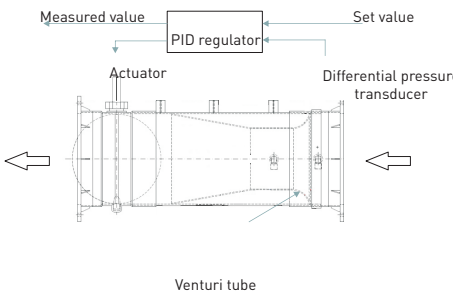


Figure 1. Diagram of RVT-R regulator operation.

Dimensions

VAV RVT-R plastic regulator without a mounting flange

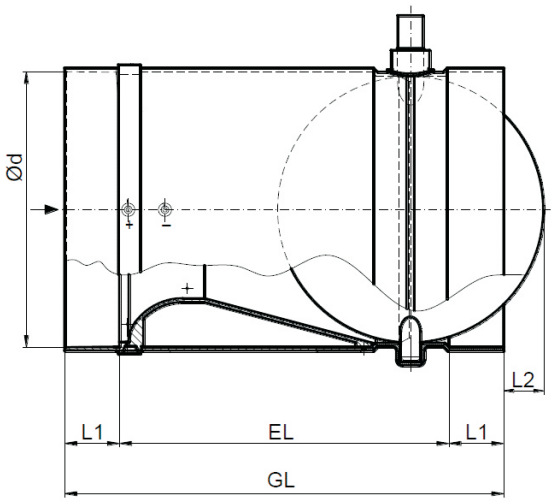
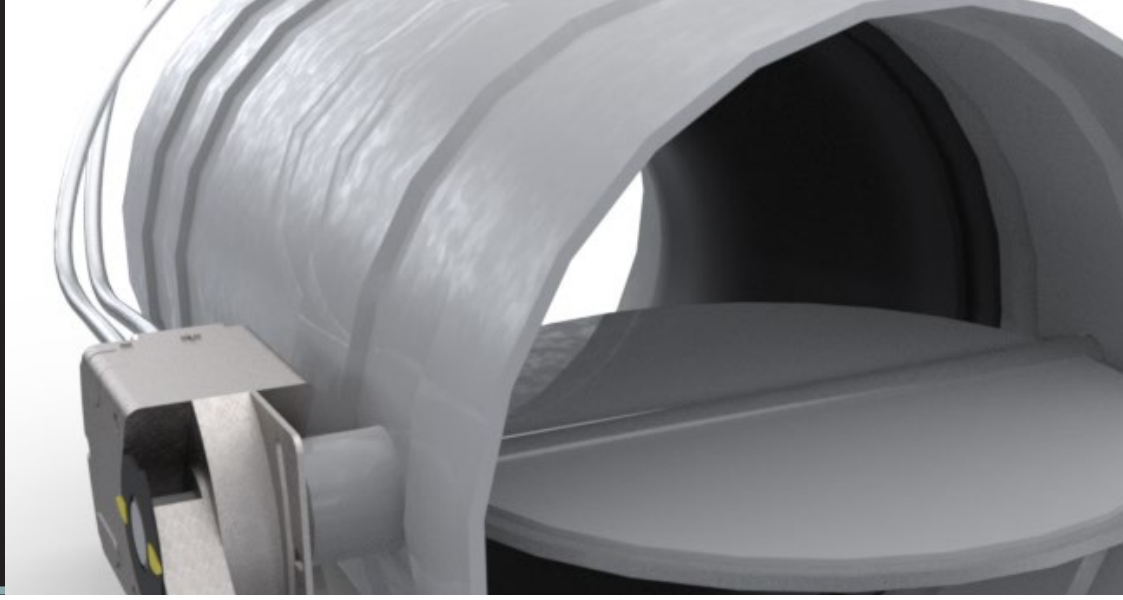


Figure 2. VAV RVT-R regulator without a mounting flange.

Table 2. 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



VAV RVT-R plastic regulator with a mounting flange

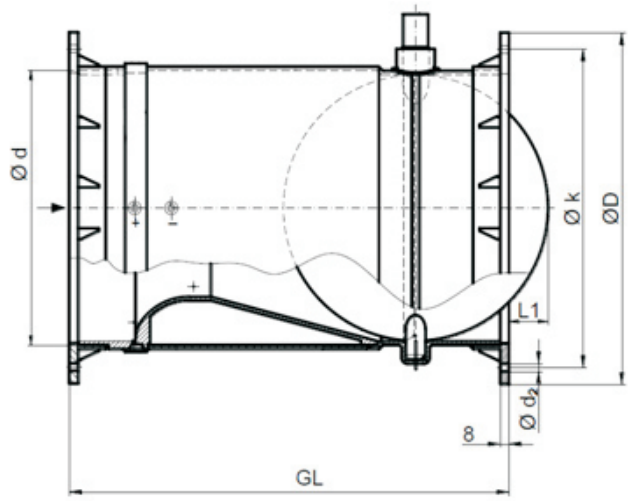


Figure 3. VAV RVT-R regulator with a mounting flange.

Table 3. 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	580	1400	260	9 / 20	545

Typical dimensions and application scope

Table 4. Nominal diameters and application scope.

DN	Vmin [m3/h]	Vmax [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

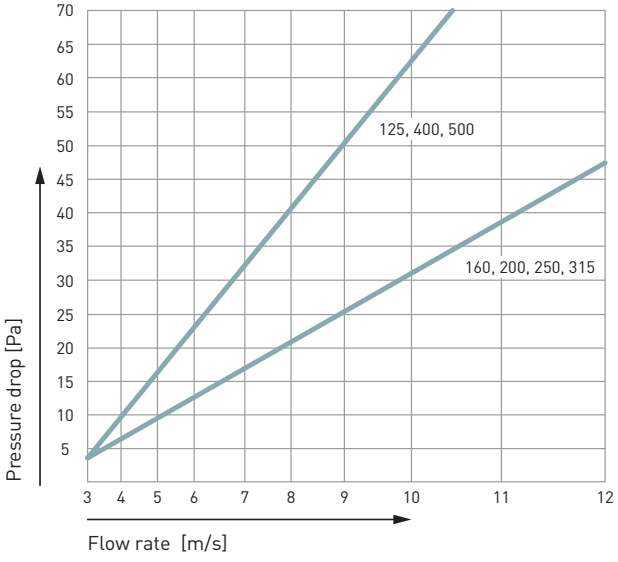


Chart 1. Pressure drop in RVT-R regulator (full damper opening).

Technical data

Table 5. Sound power level L_W [dB] and sound pressure level L_{pA} [dB(A)] emitted by RVT-R regulator.

RVT-R				dP=100Pa										dP=300Pa										dP=500Pa									
				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, L_W [dB]								total	without insulation	in frequency bands, L_W [dB]								total	without insulation	in frequency bands, L_W [dB]								total	without insulation
	v [m/s]	V [m³/h]	V [l/s]	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	L_{pA} [dB(A)]	L_{pA} [dB(A)]	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	L_{pA} [dB(A)]	L_{pA} [dB(A)]	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	L_{pA} [dB(A)]	L_{pA} [dB(A)]
125	2	88	25	43	43	45	48	46	43	35	30	**42**	**25**	49	48	51	53	54	56	54	46	**53**	**36**	52	51	54	55	58	62	63	54	**60**	**41**
	4	177	49	47	47	49	52	48	45	39	33	**45**	**28**	54	54	56	58	58	57	55	49	**55**	**38**	57	57	59	61	62	63	62	56	**61**	**43**
	6	265	74	50	50	51	54	50	46	41	35	**47**	**29**	56	57	58	61	59	58	55	49	**57**	**39**	59	60	62	64	64	64	61	55	**61**	**44**
	8	353	98	52	52	52	56	51	47	42	36	**48**	**30**	58	59	60	63	61	59	55	49	**58**	**40**	61	63	64	66	65	64	60	55	**62**	**44**
	10	442	123	53	53	53	57	52	48	43	37	**49**	**31**	60	61	62	65	62	59	55	50	**59**	**40**	62	65	65	68	66	65	60	55	**63**	**45**
160	2	145	40	45	46	47	49	47	45	35	31	**43**	**27**	52	53	54	55	56	57	55	47	**54**	**38**	55	57	57	58	60	62	64	54	**60**	**43**
	4	289	80	50	51	51	53	50	47	40	34	**47**	**30**	57	59	59	60	59	58	56	49	**56**	**40**	61	62	62	63	63	63	63	56	**61**	**45**
	6	434	121	53	53	53	56	52	48	43	37	**49**	**32**	60	62	62	63	61	59	56	50	**58**	**42**	64	66	65	66	65	64	62	56	**62**	**47**
	8	579	161	55	55	55	58	53	48	45	38	**50**	**33**	63	64	63	65	62	59	56	51	**59**	**43**	66	68	67	68	66	65	61	56	**63**	**48**
	10	723	201	57	56	56	59	54	49	46	39	**51**	**34**	64	66	65	66	63	60	56	51	**60**	**44**	68	70	69	69	67	65	60	56	**64**	**49**
200	2	226	63	46	50	49	49	48	47	36	31	**45**	**29**	54	58	57	56	58	58	55	48	**55**	**40**	57	61	61	60	62	63	64	55	**61**	**45**
	4	452	126	52	54	53	54	51	48	41	35	**48**	**32**	60	63	62	61	60	59	56	50	**57**	**43**	64	67	66	64	65	64	63	57	**62**	**48**
	6	678	188	55	56	56	57	53	49	44	38	**50**	**34**	64	66	65	64	62	59	57	51	**59**	**45**	68	71	69	67	66	64	62	57	**63**	**50**
	8	904	251	58	58	57	59	54	49	47	40	**52**	**35**	67	68	66	66	63	60	57	52	**60**	**46**	71	73	71	69	67	65	61	57	**64**	**51**
	10	1130	314	60	59	58	61	55	50	48	41	**53**	**37**	69	70	68	68	64	60	57	52	**61**	**47**	73	75	72	71	68	65	61	57	**65**	**52**
250	2	353	98	48	53	51	50	50	48	36	32	**46**	**31**	56	62	60	58	59	58	56	48	**56**	**42**	60	66	64	62	63	63	65	56	**62**	**48**
	4	707	196	54	57	55	55	53	49	43	36	**49**	**34**	64	67	65	63	62	59	57	51	**59**	**46**	68	72	69	66	66	64	64	58	**63**	**51**
	6	1060	294	58	60	58	59	54	50	46	39	**52**	**37**	68	70	67	65	63	60	57	52	**60**	**48**	73	75	72	69	67	65	63	58	**65**	**53**
	8	1413	393	61	61	60	61	56	50	49	41	**53**	**38**	71	73	69	67	64	60	58	53	**62**	**49**	76	78	74	70	68	65	62	58	**66**	**55**
	10	1766	491	63	62	61	63	57	51	51	43	**55**	**39**	73	74	71	69	65	61	58	53	**63**	**51**	78	80	76	72	69	66	61	58	**67**	**56**
315	2	561	156	50	57	53	51	51	50	37	32	**47**	**33**	59	67	63	60	61	59	56	49	**57**	**45**	63	71	67	64	65	63	65	56	**63**	**50**
	4	1122	312	57	61	58	57	54	51	44	37	**51**	**37**	67	72	68	64	63	60	58	52	**60**	**49**	72	77	72	68	67	64	64	59	**65**	**54**
	6	1682	467	61	63	60	60	56	51	48	41	**53**	**39**	72	75	71	67	64	61	58	53	**62**	**51**	77	80	75	70	68	65	63	59	**66**	**57**
	8	2243	623	63	64	62	63	57	51	51	43	**55**	**41**	75	77	73	69	66	61	59	54	**63**	**53**	81	83	77	72	69	65	62	59	**67**	**59**
	10	2804	779	66	66	64	64	58	52	53	45	**57**	**43**	78	79	74	70	66	61	59	55	**64**	**55**	84	85	79	73	70	66	62	59	**69**	**61**
400	2	904	251	52	60	55	52	52	52	37	33	**49**	**35**	61	71	66	61	62	60	56	49	**59**	**47**	65	76	71	66	67	63	65	57	**64**	**53**
	4	1809	502	59	64	60	58	56	52	45	38	**52**	**40**	70	76	71	66	65	61	59	53	**62**	**52**	76	82	76	69	69	65	65	59	**67**	**58**
	6	2713	754	63	66	63	62	57	52	50	42	**55**	**42**	76	79	74	68	66	61	59	54	**64**	**55**	82	86	79	72	70	65	64	60	**68**	**61**
	8	3617	1005	66	68	65	64	59	52	53	45	**57**	**44**	80	82	76	70	67	62	60	55	**65**	**57**	86	88	81	73	70	66	63	60	**70**	**63**
	10	4522	1256	69	69	66	66	60	53	55	47	**59**	**46**	83	83	77	72	67	62	60	56	**67**	**59**	89	90	82	74	71	66	62	60	**71**	**65**

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

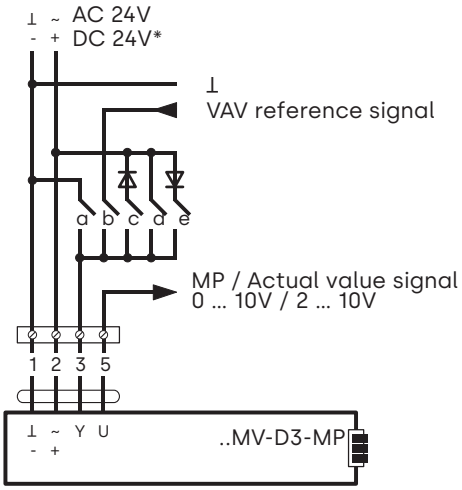
The regulators may be divided into two variants in terms of the operation speed of actuators.

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: NMV-D3-MP(LMV-D3-MP) or GDB 181.1E.

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

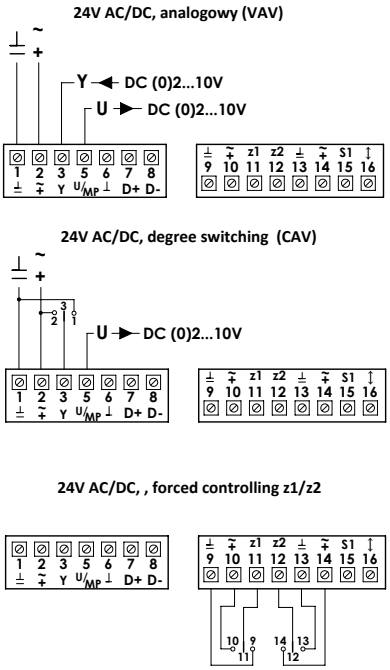
LMV-D3-MP (NMV-D3-MP)



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

Diagram 1. 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

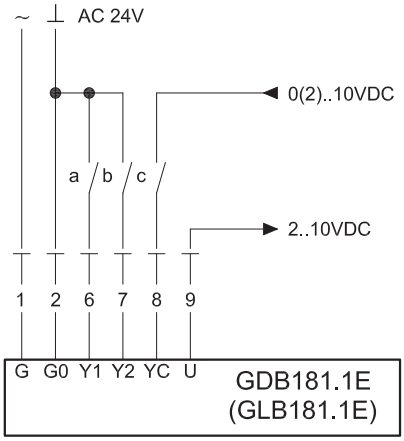
Contact 11-9 = Engine STOP
Contact 11-10 = OPENED

Forced controlling z2

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

Diagram 2. 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			

Diagram 3. The diagram of connecting GDB 181.1 or GLB181.1 compact actuator with the regulator.

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

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

RVT-R <Ta> - <D> - <J> - <V_{MAX}> / <Za> <V_{MIN}> - <Ts> - <K> - <Z> - <M>

Where:

Ta	Automatics type*	
	none	**- belimo**
	Sim	- Siemens
	SL	- SmayLab
D	diameter	
J	connection type*	
	none	**- coupler**
	K	- flange
V_{MAX}	maximum flow stream [m^3/h]	
Za	the complete closing function of the regulator *	
	none	**- no**
	(0)	- yes
V_{MIN}	minimum flow stream [m^3/h]	
Ts	actuator type* (in the event of a regulator for fume hoods, it is possible to order a regulator only with a fast actuator)	
	none	**- standard (150 s.)**
	Q	- fast (3 s.)
K	communication*	
	none	**- 2...10V (with an option of forcing the CLOSE position)**
	1	- 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/exhaust**
	O	- process extraction
	D	- fume hood
M	material	
	PPs	- polypropylene
	PVC	- PVC polyvinylchloride

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

Exemplary marking of the product: **RVT-R - 250 - 1100/200 - N/W - PPs**

Notatki