RVL-R

CIRCULAR VARIABLE AIR FLOW REGULATORS DESIGNED FOR LOW AIR VELOCITIES

Intended Use:
The device regulates the air flow within the pressure range from 30 Pa to 1,000 Pa, maintaining the declared accuracy of regulation.

Intended Use

As a consequence, the regulator becomes an indispensable element of continuous installation balancing, ensuring constant volumetric air flow. Thanks to a precise measuring tube it can attain requested air flows since air velocity 0.45 m/s.

Application

The regulator can be used in both supply and exhaust ventilation ducts, positioned both vertically or horizontally.

Operating range up to 50°C.

Advantages

The RVL regulator is primarily intended for buildings where volumetric flow control with low air velocity is utmost importance, often due to the requirement of maintaining a low level of regenerated noise or sound pressure emitted to the environment, e.g. in hospitals, operating rooms and concert halls. Thanks to its Venturi tube flow measuring element the device ensures precise regulation of volumetric air flow starting from air velocity in duct 0.45 m/s.

The regulator can be fitted with compact / standard actuators (150 s). Modern construction makes this unit air tight and ready for energy savings. It has air leakage class C on the body and 3 on the control blade according to PN-EN 1751.

- Easy setpoint adjustment by user through an NFC communication
- Low air velocities for volumetric air flow control (starting from 0.45 m/s)
- Fast opening times due to the control blade design (110 s)

Dimensions

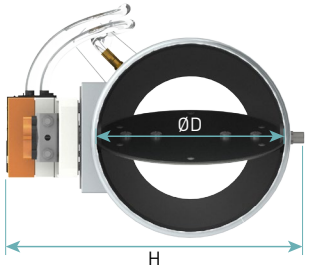


Figure 1. RVL-R regulator dimensions.

Table 1. RVL-R regulator dimensions.

Dimension	Diameter ØD [mm]	L [mm]	H	Weight [kg]
125	122	325	205	0,38
160	156	370	244	0,6
200	196	435	288	0,79
250	246	505	341	1,1

Design

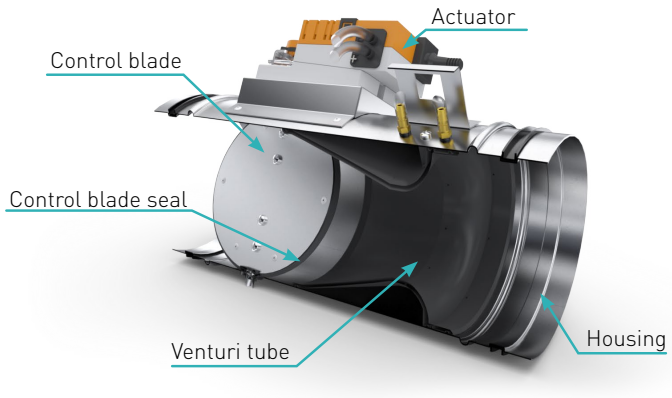


Figure 2. RVL-R design.

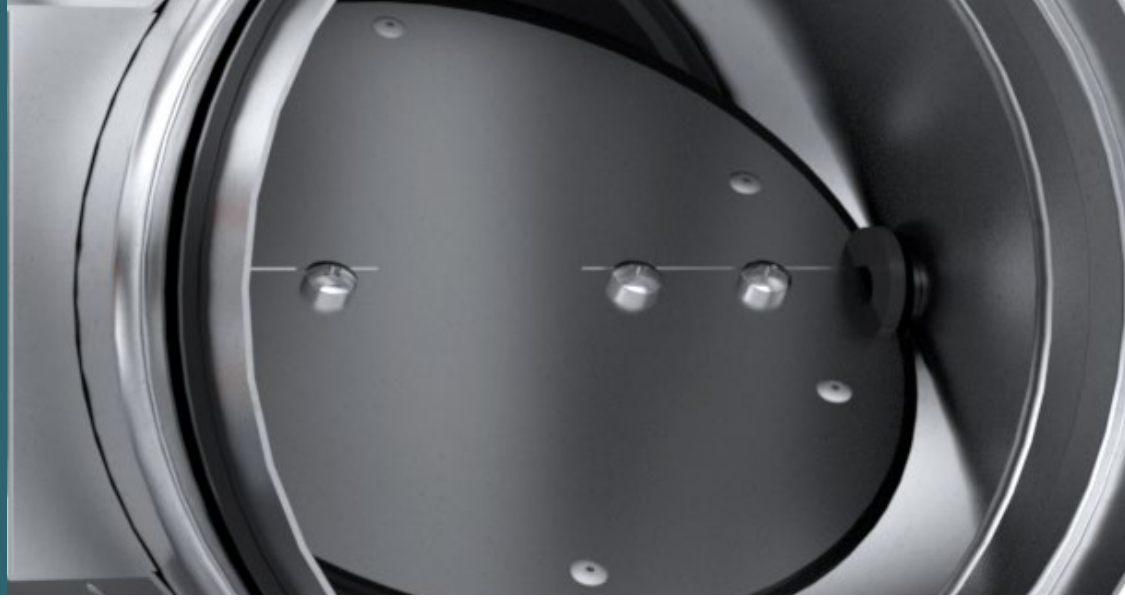
The regulator housing is made of galvanized steel. Special version made of stainless steel (AISI 304L) is also available. The air flow measuring element is a Venturi tube made of polypropylene. Control blade can be made of galvanized or stainless steel with a rubber seal around, to ensure air tightness of the regulator. Air leakage class is C on the body and 3 on the blade according to PN-EN 1751.

Operating Range

Table 2. RVL-R regulator operating range.

RVL-R	Air flow [m³/h]			
	Range I 0,45-5 m/s (A)		Range II 0,6-8m/s (B)	
	V_{min}	V_{max}	V_{min}	V_{max}
125	20	220	26	352
160	32	360	43	576
200	51	565	68	905
250	80	880	106	1408

SO SN



Installation

The RVL-R flow regulator is designed for installation in both supply and exhaust ducts, positioned both vertically or horizontally.

The regulator may also have a gaskets located on both connectors of the housing, allowing for a tight connection to duct installation.

The regulator should be installed in accordance with air flow direction given on the housing.

In order to ensure correct operation of the device observe the following rules:

Straight duct section before the regulator:

- installed after elbow duct > **not required**
- installed after tee duct > **not required**

Straight duct section after the regulator:

- **not required**

Please note that maintaining as long as possible straight duct section before the regulator always improves its regulation accuracy.

Proper installation ensures the following regulation accuracy:
- 0,45m/s-1m/s - 10%
- 1m/s - 8m/s 5%

(Accuracy deviation is calculated with reference to air flow setpoint value)

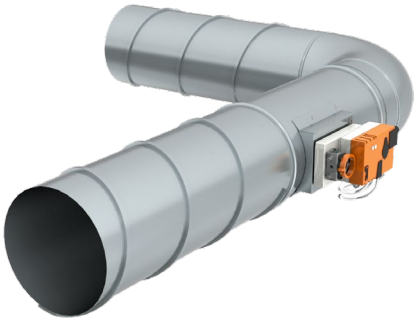


Figure 3. RVL-R regulator installation.

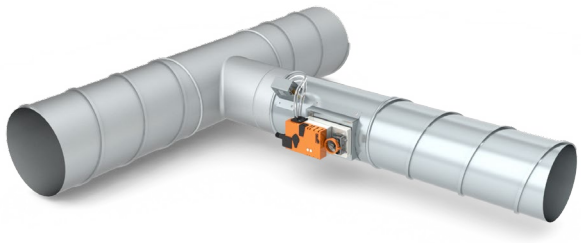


Figure 4. RVL-R regulator installation.

Table 3. Sound power level of regenerated noise.

Sound power level of regenerated noise			p = 50 Pa									p = 100 Pa								
RVL-R	Q [m³/h]	Q [l/s]	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	LW - dB(A)	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	LW - dB(A)
Ø 125	40	11	29	29	30	37	32	26	20	21	37	37	37	37	44	40	33	28	29	44
	67	19	31	31	31	38	34	27	22	23	38	38	38	39	46	41	35	29	30	46
	89	25	32	32	32	39	35	28	23	24	39	39	39	40	47	42	36	30	31	47
	130	36	33	33	33	40	36	30	24	25	41	40	40	41	48	44	37	31	33	48
	192	53	34	34	34	42	37	31	25	26	42	41	42	42	49	45	38	33	34	49

Sound power level of regenerated noise			p = 50 Pa									p = 100 Pa								
RVL-R	Q [m³/h]	Q [l/s]	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	LW - dB(A)	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	LW - dB(A)
Ø 160	61	17	36	34	36	34	34	28	22	23	37	43	41	44	41	41	35	30	31	45
	81	23	36	34	37	34	34	28	23	24	38	44	42	45	42	42	36	30	32	46
	145	40	37	35	38	36	35	29	24	25	39	45	43	46	43	43	37	32	33	47
	210	58	38	36	39	36	36	30	25	26	40	46	44	47	44	44	38	33	34	48
	282	78	39	37	40	37	37	31	25	26	40	47	45	48	45	45	39	33	34	48
Ø 200	98	27	35	33	35	33	32	27	21	22	36	43	41	44	41	41	35	29	31	45
	125	35	35	33	36	33	33	27	22	23	37	44	42	45	42	42	36	30	31	45
	225	63	37	34	37	35	34	29	23	24	38	45	43	46	43	43	37	31	33	47
	326	91	37	35	38	35	35	29	24	25	39	46	44	47	44	44	38	32	33	47
	466	129	38	36	39	36	36	30	25	26	40	47	45	48	45	45	39	33	34	48
Ø 250	168	47	34	32	35	32	32	26	20	21	35	42	40	43	40	40	34	28	29	43
	254	71	35	33	35	33	32	27	21	22	36	43	41	43	41	41	35	29	30	44
	392	109	35	33	36	33	33	27	22	23	37	43	41	44	42	41	35	30	31	45
	500	139	36	34	37	34	34	28	22	23	37	44	42	45	42	42	36	30	31	45
	723	201	37	34	37	35	34	29	23	24	38	45	43	45	43	43	37	31	32	46

Table 4. Sound power level of regenerated noise.

Sound power level of regenerated noise			p = 150 Pa									p = 200 Pa								
RVL-R	Q [m³/h]	Q [l/s]	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	LW - dB(A)	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	LW - dB(A)
Ø 125	40	11	41	41	41	49	44	38	32	33	49	44	44	45	52	47	41	35	36	52
	67	19	43	43	43	50	46	39	34	35	50	46	46	46	53	49	43	37	38	54
	89	25	43	43	44	51	47	40	35	36	51	47	47	47	54	50	43	38	39	54
	130	36	45	45	45	52	48	42	36	37	52	48	48	48	55	51	45	39	40	56
	192	53	46	46	46	54	49	43	37	38	54	49	49	49	57	52	46	40	41	57
Ø 160	61	17	48	46	49	46	46	40	34	36	50	51	49	52	49	49	43	38	39	53
	81	23	49	47	50	47	47	41	35	36	50	52	50	53	50	50	44	38	39	53
	145	40	50	48	51	48	48	42	36	37	51	53	51	54	51	51	45	40	41	55
	210	58	51	49	52	49	49	43	37	38	52	54	52	55	52	52	46	40	41	55
	282	78	51	49	52	49	49	43	38	39	53	55	53	55	53	53	47	41	42	56
Ø 200	98	27	48	46	49	46	46	40	34	36	50	52	49	52	50	49	44	38	39	53
	125	35	49	47	49	47	47	41	35	36	50	52	50	53	50	50	44	39	40	54
	225	63	50	48	51	48	48	42	36	37	52	53	51	54	52	51	46	40	41	55
	326	91	51	49	52	49	49	43	37	38	52	54	52	55	52	52	46	41	42	56
	466	129	52	50	53	50	50	44	38	39	53	55	53	56	53	53	47	42	43	57
Ø 250	168	47	47	45	47	45	44	39	33	34	48	50	48	51	48	48	42	36	37	51
	254	71	47	45	48	45	45	39	34	35	49	51	49	52	49	49	43	37	38	52
	392	109	48	46	49	46	46	40	35	36	50	51	49	52	50	49	44	38	39	53
	500	139	49	47	49	47	47	41	35	36	50	52	50	53	50	50	44	38	39	53
	723	201	49	47	50	47	47	41	36	37	51	53	51	54	51	51	45	39	40	54

The regulator can be fitted with a compact actuator with a full runtime of 150 s (the time to open the regulator control blade is 110 s). The regulation and control drive is a compact unit comprising a dynamic differential pressure transducer, a PI controller and a damper drive all located in a single housing: NMV-D3-MP or LMV-D3-MP.

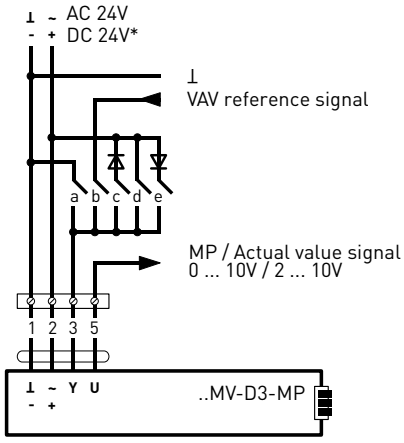
Technical Data: LMV-D3-MP (NMV-D3-MP)

Photo 1. LMV-D3-MP (NMV-D3-MP).

Voltage rating 24 V AC/DC, 50/60 Hz
Supply voltage range
19,2...28,8 V AC
21,6...26,4 V DC
Power rating 5 V A max. 5 A@5 ms (5.5 V A max. 5A@5ms)
Power consumption
Running 3 W (3.5 W)
Idle 1.25 [W]
Power rating 5.5 [VA]
Torque 5 Nm (10 Nm)
Direction of rotation Switch selectable
Rotation angle Max. 95°, adjustable mechanical limiters
Protection class III (safe voltage – low)
Acoustic power level Max. 35 dB
Housing Ingress Protection Rating IP54
Ambient temperature range 0...+50 [°C]
Storage temperature range -20...+80 [°C]
Humidity 5...95%; relative hum., no condensation
Maintenance: maintenance-free
Weight 500 g (700 g)

Wiring Diagrams

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



Operating range / Functionality		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. Connection of the regulator and relay control for the RTS-R with a L(N)MV-D3-MP compact actuator.

RVL-R – Circular variable air flow regulators designed for low air velocities

When ordering, please provide information in accordance with the following ordering code:

<RVL-R> <I> - <D> - <V_{MAX}> / <Za> <V_{MIN}> - <K> - <N> - <P> - <G>

Where:

I	insulation*
	none - non-insulated
	t - insulated
D	diameter [mm]
V_{MAX}	maximum volumetric flow [m3/h]
Za	The regulator is to have a full closing function*
	none - no
	(0) - yes
V_{MIN}	minimum volumetric flow [m3/h]
	Additional marking of the selected flow range
	A - Range I 0.45–5 m/s
	B - Range II 0.6–8 m/s
K	communication*
	none - 2...10[V]
	K1 - 0...10[V]
	MP - MP BUS
	MOD - Modbus
	LON - LonWorks
	KNX - KNX
N	MP-BUS regulator address (iFlow) 1..8
P	material*
	none - galvanised steel
	SN - stainless steel
G	seal on the service line*
	none - no seal
	UP - seal on the services lines

*optional values – if blank, default values will be used

Example product marking: **RVL-Rt 125 130/85 – SN – UP**