



## RN

### FOR THE PRECISE CONTROL OF CONSTANT VOLUME FLOW RATES

Circular self-powered volume flow controllers for the control of supply air or extract air in constant air volume systems

- Volume flow rate can be set using an external scale, no tools required
- High control accuracy
- No on-site test measurements required for commissioning
- Suitable for airflow velocities of up to 12 m/s
- Any installation orientation; maintenance-free
- Casing air leakage to EN 1751, class C

#### Optional equipment and accessories

- Acoustic cladding for the reduction of case-radiated noise
- Secondary silencer Type CA, CS or CF for the reduction of air-regenerated noise
- Hot water heat exchanger Type WL and electric air heater Type EL for reheating the airflow
- Actuator for switching between setpoint values

## Application

### Application

- Circular CONSTANTFLOW CAV controllers of Type RN for the precise supply air or extract air flow control in constant air volume systems
- Mechanical self-powered volume flow control without external power supply
- Simplified project handling with orders based on nominal size
- Volume flow rate setpoint can be set on external scale
- Switching between  $V_{\min}$  and  $V_{\max}$  using optional actuator

### Special features

- Volume flow rate can be set using an external scale; no tools required
- High volume flow rate control accuracy
- Any installation orientation

## Description

### Variants

- RN-S: Compact-height volume flow controller
- RN: Volume flow controller
- RN-D: Volume flow controller with acoustic cladding
- RN-FL: Volume flow controller with flanges on both ends
- RN-D-FL: Volume flow controller with acoustic cladding and flanges on both ends
- Units with acoustic cladding and/or a secondary silencer Type CA, CS or CF for demanding acoustic requirements
- Acoustic cladding cannot be retrofitted

### Construction

- Galvanised sheet steel
- P1: Powder-coated, silver grey (RAL 7001)
- A2: Stainless steel

### Parts and characteristics

- Ready-to-commission controller
- Damper blade with low-friction bearings
- Bellows that acts as an oscillation damper

- Cam plate with leaf spring
- Scale with pointer to set the volume flow rate setpoint
- Aerodynamic function testing of each unit on a special test rig prior to shipping
- Correct operation even under unfavourable upstream conditions (1.5 D straight section required upstream)

#### Attachments

- Min/Max actuators: Actuators for switching between minimum and maximum volume flow rate setpoint values
- Modulating actuators: Actuators for the stepless adjustment of volume flow rates or to switch between minimum and maximum volume flow rate setpoint values
- Retrofit kits: Actuators and installation accessories

#### Accessories

- Lip seals on both ends (factory fitted)
- Matching flanges for both ends

#### Useful additions

- Secondary silencer Type CA, CS or CF
- Heat exchanger Type WL
- Electric air heater Type EL

#### Construction features

- Circular casing
- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (RN-P1/80 without groove)
- RN-FL: Circular flanges to EN 12220

#### Materials and surfaces

- Casing and damper blade made of galvanised sheet steel
- Leaf spring made of stainless steel
- Polyurethane bellows
- Plain bearings with PTFE coating

#### RN-D

- Acoustic cladding made of galvanised sheet steel
- Rubber profile for the insulation of structure-borne noise
- Lining is mineral wool

#### Mineral wool

- To EN 13501, fire rating class A2, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG

## INFORMACIÓN TÉCNICA

#### Functional description

The volume flow controller is a mechanical self-powered unit and works without external power supply. A damper blade with low-friction bearings is adjusted by aerodynamic forces such that the set volume flow rate is maintained within the differential pressure range.

The aerodynamic forces of the airflow create a closing torque on the damper blade. The bellows extends and increases this force while at the same time acting as an oscillation damper. The closing force is countered by a leaf spring that unrolls over a cam plate. The shape of the cam plate is such that a change in the differential pressure leads to an adjustment of the damper blade in a way that the volume flow rate is maintained almost exactly.

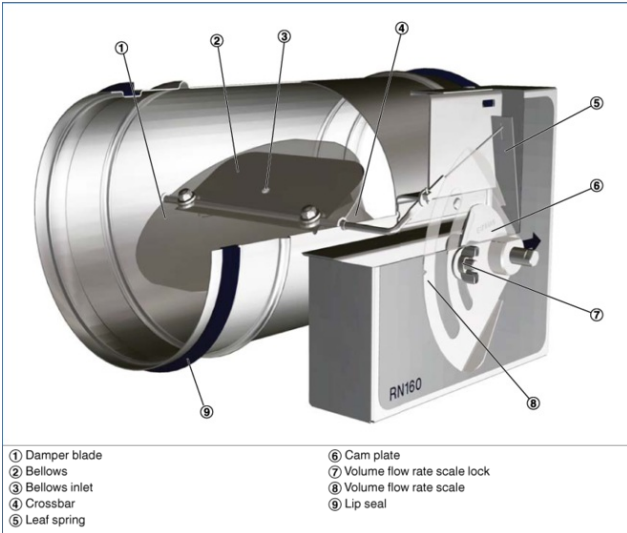
#### Efficient commissioning

The volume flow rate setpoint value can be set quickly and easily using the pointer on the external scale; no measurements are required.

The advantage over flow adjustment dampers is that there is no need for repeat measurements or adjustments by an air conditioning engineer. Should the system pressure change, e.g. by opening or closing of duct sections, the flow rates in the entire system will also change if flow adjustment dampers are used; however, this is not the case with mechanical self-powered volume flow controllers. A mechanical self-powered controller reacts immediately and

adjusts the damper blade such that the set constant volume flow rate is maintained.

Schematic illustration of the RN



<b>Nominal sizes</b>	80 – 400 mm
<b>Volume flow rate range</b>	11 – 1400 l/s
<b>Volume flow rate range</b>	40 – 5040 m <sup>3</sup> /h
<b>Volume flow rate setting range</b>	approx. 25 – 100 % of the nominal volume flow rate
<b>Scale accuracy</b>	± 4 %
<b>Differential pressure</b>	50 – 1000 Pa
<b>Operating temperature</b>	10 – 50 °C

**RN, Sound pressure level at differential pressure 150 Pa**

Nominal size	V		Air-regenerated noise				Case-radiated noise	
	①	②	③	④	①	⑤		
	L <sub>PA</sub>	L <sub>PA1</sub>	dB(A)		L <sub>PA2</sub>	L <sub>PA3</sub>		
	l/s	m³/h						
80	11	40	37	24	17	15	22	<15
	20	72	39	27	19	17	24	<15
	40	144	47	34	24	22	31	<15
	45	162	48	35	25	24	32	<15
100	22	79	37	24	17	15	22	<15
	40	144	40	29	22	20	21	<15
	70	252	47	35	27	26	29	<15
	90	324	50	38	30	29	33	<15
125	35	126	37	27	21	18	15	<15
	60	216	43	34	27	25	19	<15
	115	414	50	41	35	33	27	<15
	140	504	52	44	39	37	30	<15
160	60	216	40	32	26	24	29	<15
	105	378	45	37	32	29	33	<15
	190	684	49	41	35	33	39	<15
	240	864	50	41	36	34	41	16
200	90	324	40	31	24	22	28	<15
	160	576	43	35	28	26	32	<15
	300	1080	48	40	33	32	40	17
	360	1296	49	41	35	33	42	20
250	145	522	41	32	24	22	29	15
	255	918	42	34	28	26	33	<15
	470	1692	46	39	33	31	40	19
	580	2088	48	41	35	34	43	22
315	230	828	39	33	26	23	30	<15
	400	1440	42	35	29	27	35	<15
	750	2700	44	38	32	31	40	19
	920	3312	46	41	35	34	43	23
400	350	1260	46	39	33	29	45	<15
	610	2196	48	42	36	32	49	18
	1130	4068	50	44	38	35	54	24
	1400	5040	51	45	40	37	56	27

- ① RN
- ② RN with secondary silencer CS/CF, insulation thickness 50 mm, length 500 mm
- ③ RN with secondary silencer CS/CF, insulation thickness 50 mm, length 1000 mm
- ④ RN with secondary silencer CS/CF, insulation thickness 50 mm, length 1500 mm
- ⑤ RN-D

Circular volume flow controllers for constant air volume systems, mechanical self-powered, without external power supply, suitable for supply or extract air, available in 8 nominal sizes.

Ready-to-commission unit consists of the casing containing a damper blade with low-friction bearings, bellows, external cam plate and leaf spring.

Volume flow controllers without actuators are factory set to a reference volume flow rate (customers can set the required volume flow rate on site).

Spigot with groove for lip seal, suitable for connecting ducts according to EN 1506 or EN 13180.

Casing air leakage to EN 1751, class C.

#### Special features

- Volume flow rate can be set using an external scale; no tools required
- High volume flow rate control accuracy
- Any installation orientation

#### Materials and surfaces

- Casing and damper blade made of galvanised sheet steel
- Leaf spring made of stainless steel
- Polyurethane bellows
- Plain bearings with PTFE coating

#### RN-D

- Acoustic cladding made of galvanised sheet steel
- Rubber profile for the insulation of structure-borne noise
- Lining is mineral wool

#### Mineral wool

- To EN 13501, fire rating class A2, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG

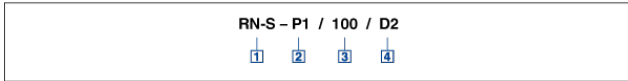
#### Construction

- Galvanised sheet steel
- P1: Powder-coated, silver grey (RAL 7001)
- A2: Stainless steel

#### Technical data

- Nominal sizes: 80 – 400 mm
- Volume flow rate range: 11 to 1400 l/s or 40 to 5040 m<sup>3</sup>/h
- Volume flow rate control range: approx. 25 – 100 % of the nominal volume flow rate
- Differential pressure: 50 – 1000 Pa

## RN-S



### 1 Type

**RN-S** Volume flow controller

### 2 Material

**P1** No entry: galvanised sheet steel  
**A2** Powder-coated, silver grey (RAL 7001)  
**A2** Stainless steel

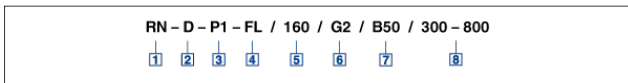
### 3 Nominal size [mm]

80  
 100  
 125

### 4 Accessories

**D2** No entry: none  
**D2** Lip seals on both ends

## RN



### 1 Type

**RN** Volume flow controller

### 2 Acoustic cladding

**D** No entry: none  
**D** With acoustic cladding

### 3 Material

**P1** No entry: galvanised sheet steel  
**A2** Powder-coated, silver grey (RAL 7001)  
**A2** Stainless steel

### 4 Flange

**FL** No entry: none  
**FL** Flanges on both ends

### 5 Nominal size [mm]

80  
 100  
 125  
 160  
 200  
 250  
 315  
 400

### 6 Accessories

No entry: none  
**D2** Lip seals on both ends  
**G2** Matching flanges for both ends

### 7 Actuator

No entry: none  
**B50** Min/Max switching, 24 V AC/DC supply voltage  
**B52** Min/Max switching, 24 V AC/DC supply voltage, with auxiliary switch  
**B60** Min/Max switching, 230 V AC supply voltage  
**B62** Min/Max switching, 230 V AC supply voltage, with auxiliary switch  
**B70** Variable adjustment, 24 V AC/DC supply voltage  
**B72** Variable adjustment, 24 V AC/DC supply voltage, with auxiliary switch

### 8 Volume flow rates [m³/h or l/s]

only actuators 7  
 $\dot{V}_{min} - \dot{V}_{max}$  for factory setting