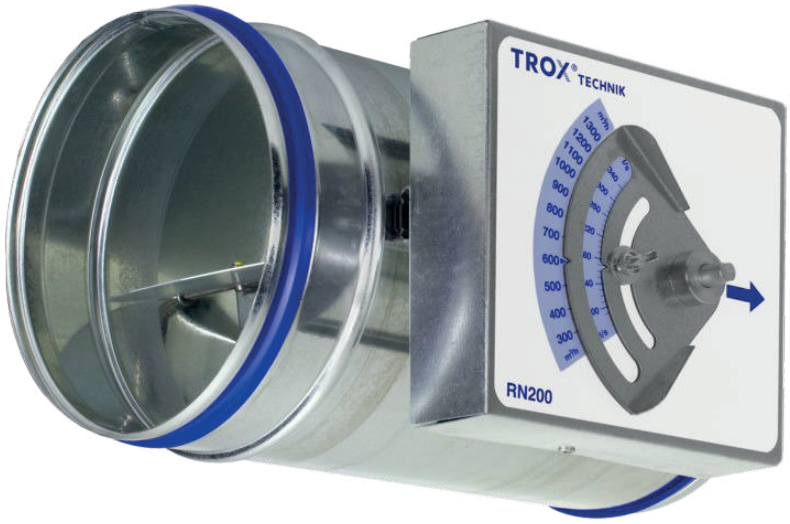


Actuator for switching between setpoint values with Type RN

Tested to VDI 6022

Constant volume flow control CAV Control units

Type 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 (2362 FPM)
- 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

TROX® TECHNIK

The art of handling air

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General information

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 q_{vmin} and q_{vmax} 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

Nominal sizes
- RN-S: 80, 100, 125 mm (3, 4, 5 in)
- RN: 80, 100, 125, 160, 200, 250, 315, 400 (3, 4, 5, 6 ½, 8, 10, 12 ½, 16 in)
- RN-FL: 100, 125, 160, 200, 250, 315, 400 (4, 5, 6 ½, 8, 10, 12 ½, 16 in)
-

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
- Variant RN-S cannot be combined with an actuator

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 and RN-A2/80 are not available with grove and lip seal)
- RN-FL: Circular flanges to EN 12220

Materials and surfaces

Galvanised sheet steel

- Casing made of galvanised sheet steel
- Interior parts, nominal sizes 80 – 125 mm (3 – 5 in): stainless steel 1.4301, nominal sizes 160 – 400mm (6 ½ - 16 in): galvanised sheet steel
- Polyurethane bellows
- Plain bearings with PTFE coating
- Leaf spring made of stainless steel

Powder-coated construction (P1)

- Casing made of galvanised sheet steel, powder-coated
- Interior parts, nominal sizes 80 – 125: stainless steel 1.4301, nominal sizes 160 – 400: galvanised sheet steel, powder- coated

Stainless steel construction (A2)

- Casing made of stainless steel 1.4301
- Interior parts made of stainless steel

Variant with acoustic cladding (-D)

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

Mineral wool

- To EN 13501, fire rating class A1, 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/EC

Standards and guidelines

- Meets the hygiene requirements of VDI 6022
- Casing air leakage to EN 1751, class C

Maintenance

- Maintenance-free as construction and materials are not subject to wear

Function

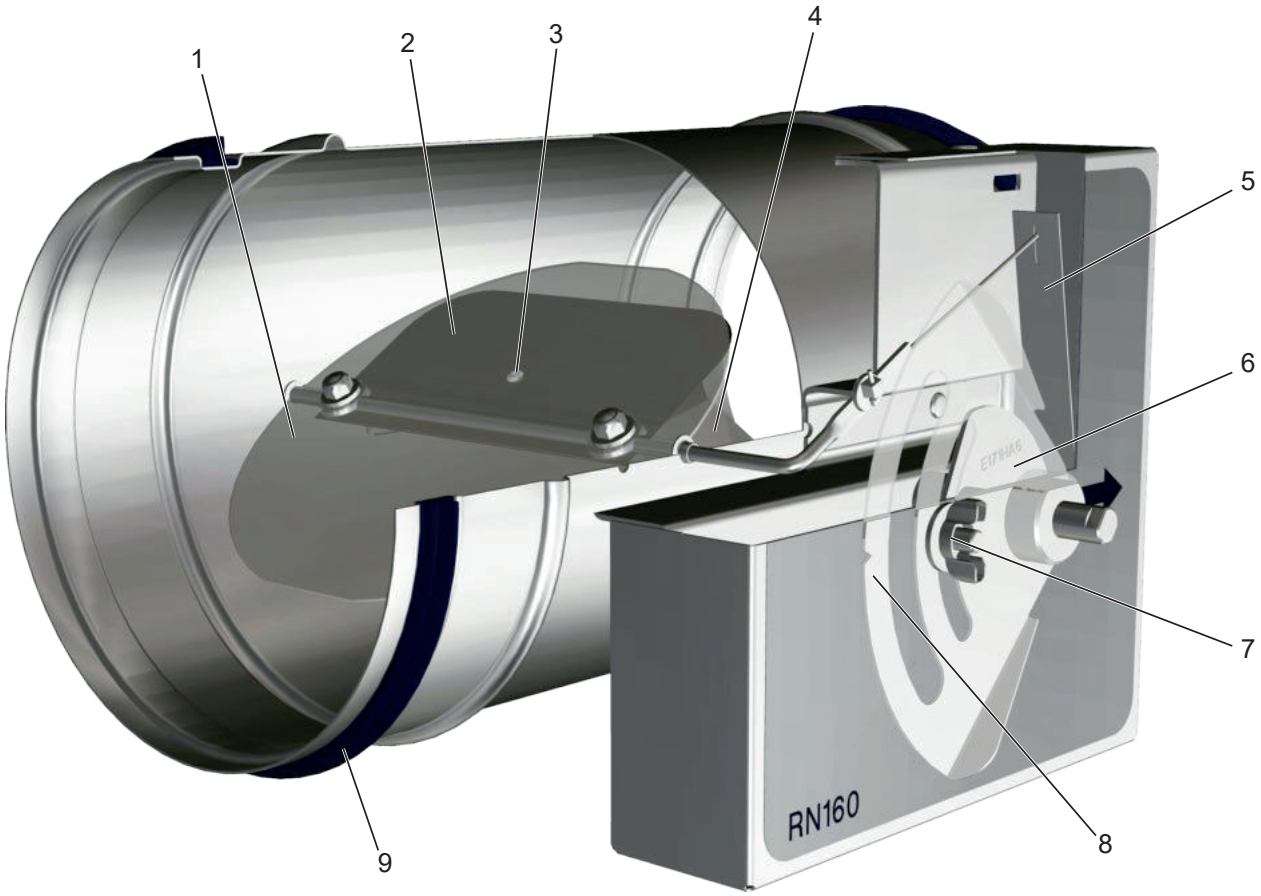
Functional description

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



① Damper blade
② Bellows
③ Bellows inlet
④ Crossbar
⑤ Leaf spring
⑥ Cam plate
⑦ Volume flow rate scale lock
⑧ Volume flow rate scale
⑨ Lip seal

Technical data

Nominal sizes	80 – 400 mm (3 – 16 in)
Volume flow rate range	11 – 1400 l/s or 40 – 5040 m³/h (24 – 2966 CFM)
Volume flow rate control range	Approx. 25 – 100% of the nominal volume flow rate
Scale accuracy	± 4 %
Minimum differential pressure	50 Pa (0,20 in w.g.); nominal size 80 mm (3 in): 100 Pa (0,40 in w.g.)
Maximum differential pressure	1000 Pa (4,01 in w.g.)
Operating temperature	10 to 50 °C (50 – 122 °F)

Quick sizing

Quick sizing tables provide a good overview of the room sound pressure levels that can be expected. Approximate intermediate values can be interpolated. Precise intermediate values and spectral data can be calculated with our Easy Product Finder design program.
The first selection criteria for the nominal size are the actual volume flow rates $q_{v_{min}}$ and $q_{v_{max}}$. The quick sizing tables are based on generally accepted attenuation levels. If the sound pressure level exceeds the required level, a larger air terminal unit and/or a silencer is required.

Volume flow rate ranges

The minimum differential pressure of CAV controllers is an important factor in designing the ductwork and in rating the fan including speed control. Sufficient duct pressure must be ensured for all operating conditions and for all control units. The measurement points for fan speed control must be selected accordingly.

RN, volume flow rate ranges and minimum differential pressures

Nom. Size		qv [l/s]	qv [m³/h]	qv [CFM]	①	②	③	④	①	②	③	④	ΔV [± %]
[mm]	[in]				$\Delta p_{st\ min}$ [Pa]				$\Delta p_{st\ min}$ [in w.g.]				
80	3	11	40	24	100	105	105	105	0,40	0,42	0,42	0,42	20
80	3	20	72	42	100	105	105	105	0,40	0,42	0,42	0,42	15
80	3	40	144	85	100	110	115	120	0,40	0,44	0,46	0,48	10
80	3	45	162	95	100	110	120	125	0,40	0,44	0,48	0,50	8
100	4	22	79	46	50	55	55	55	0,20	0,22	0,22	0,22	10
100	4	40	144	85	50	55	55	60	0,20	0,22	0,22	0,24	8
100	4	70	252	148	50	60	65	70	0,20	0,24	0,26	0,28	6
100	4	90	324	191	50	60	70	80	0,20	0,24	0,28	0,32	5
125	5	35	126	74	50	55	55	55	0,20	0,22	0,22	0,22	10
125	5	60	216	127	50	55	55	55	0,20	0,22	0,22	0,22	8
125	5	115	414	244	50	60	65	70	0,20	0,24	0,26	0,28	6
125	5	140	504	297	50	60	70	80	0,20	0,24	0,28	0,32	5
160	6 ½	60	216	127	50	55	55	55	0,20	0,22	0,22	0,22	10
160	6 ½	105	378	222	50	55	55	55	0,20	0,22	0,22	0,22	8
160	6 ½	190	684	403	50	55	60	60	0,20	0,22	0,24	0,24	6
160	6 ½	240	864	509	50	55	65	70	0,20	0,22	0,26	0,28	5
200	8	90	324	191	50	55	55	55	0,20	0,22	0,22	0,22	10
200	8	160	576	339	50	55	55	55	0,20	0,22	0,22	0,22	8
200	8	300	1080	636	50	55	60	65	0,20	0,22	0,24	0,26	6
200	8	360	1296	763	50	55	60	65	0,20	0,22	0,24	0,26	5
250	10	145	522	307	50	55	55	55	0,20	0,22	0,22	0,22	10
250	10	255	918	540	50	55	55	55	0,20	0,22	0,22	0,22	8
250	10	470	1692	996	50	55	60	60	0,20	0,22	0,24	0,24	6
250	10	580	2088	1229	50	55	60	65	0,20	0,22	0,24	0,26	5
315	12 ½	230	828	487	50	55	55	55	0,20	0,22	0,22	0,22	10
315	12 ½	400	1440	848	50	55	55	55	0,20	0,22	0,22	0,22	8
315	12 ½	750	2700	1589	50	55	60	60	0,20	0,22	0,24	0,24	6
315	12 ½	920	3312	1949	50	55	60	65	0,20	0,22	0,24	0,26	5
400	16	350	1260	742	50	55	55	55	0,20	0,22	0,22	0,22	10
400	16	610	2196	1293	50	55	55	55	0,20	0,22	0,22	0,22	8
400	16	1130	4068	2394	50	55	55	55	0,20	0,22	0,22	0,22	6
400	16	1400	5040	2966	50	55	55	60	0,20	0,22	0,22	0,24	5

① RN without silencer
② RN with circular silencer CF, insulation thickness 50 mm, length 500 mm
③ RN with circular silencer CF, insulation thickness 50 mm, length 1000 mm
④ RN with circular silencer CF, insulation thickness 50 mm, length 1500 mm

RN, sound pressure level at differential pressure 150 Pa

Nom. Size		qv [l/s]	qv [m³/h]	qv [CFM]	Air-regenerated noise [dB(A)]				Case-radiated noise [dB(A)]	
					①	②	③	④	①	⑤
[mm]	[in]				L_{PA}	L_{PA1}			L_{PA2}	L_{PA3}
80	3	11	40	24	37	24	17	15	22	<15
80	3	20	72	42	39	27	19	17	24	<15
80	3	40	144	85	47	34	24	22	31	<15
80	3	45	162	95	48	35	25	24	32	<15
100	4	22	79	46	37	24	17	15	22	<15
100	4	40	144	85	40	29	22	20	21	<15
100	4	70	252	148	47	35	27	26	29	<15
100	4	90	324	191	50	38	30	29	33	<15
125	5	35	126	74	37	27	21	18	15	<15
125	5	60	216	127	43	34	27	25	19	<15
125	5	115	414	244	50	41	35	33	27	<15
125	5	140	504	297	52	44	39	37	30	<15
160	6 ½	60	216	127	40	32	26	24	29	<15
160	6 ½	105	378	222	45	37	32	29	33	<15
160	6 ½	190	684	403	49	41	35	33	39	<15
160	6 ½	240	864	509	50	41	36	34	41	16
200	8	90	324	191	40	31	24	22	28	<15
200	8	160	576	339	43	35	28	26	32	<15
200	8	300	1080	636	48	40	33	32	40	17
200	8	360	1296	763	49	41	35	33	42	20
250	10	145	522	307	41	32	24	22	29	15
250	10	255	918	540	42	34	28	26	33	<15
250	10	470	1692	996	46	39	33	31	40	19
250	10	580	2088	1229	48	41	35	34	43	22
315	12 ½	230	828	487	39	33	26	23	30	<15
315	12 ½	400	1440	848	42	35	29	27	35	<15
315	12 ½	750	2700	1589	44	38	32	31	40	19
315	12 ½	920	3312	1949	46	41	35	34	43	23
400	16	350	1260	742	46	39	33	29	45	<15
400	16	610	2196	1293	48	42	36	32	49	18
400	16	1130	4068	2394	50	44	38	35	54	24
400	16	1400	5040	2966	51	45	40	37	56	27

① RN without silencer
② RN with circular silencer CF, insulation thickness 50 mm, length 500 mm
③ RN with circular silencer CF, insulation thickness 50 mm, length 1000 mm
④ RN with circular silencer CF, insulation thickness 50 mm, length 1500 mm
⑤ RN-D (with acoustic cladding)

Sizing example

Given data

q_{vmax} = 280 l/s (1010 m³/h; 594 CFM)
Δp_{st} = 150 Pa (0,60 in w.g.)
Specified sound pressure level in the room 35 dB(A)

Quick sizing

RN/200 (RN/8”) with circular silencer CF
050/200×1000 mm (8x40 in) Air-regenerated noise L_{PA} = 26 dB(A)
Case-radiated noise L_{PA} = 31 dB(A)

Specification text

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design program.

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

Galvanised sheet steel
- Casing made of galvanised sheet steel
- Interior parts, nominal sizes 80 – 125 mm (3 – 5 in): stainless steel 1.4301, nominal sizes 160 – 400 mm (6 ½ - 16 in): galvanised sheet steel
- Polyurethane bellows
- Plain bearings with PTFE coating
- Leaf spring made of stainless steel

Powder-coated construction (P1)
- Casing made of galvanised sheet steel, powder-coated
- Interior parts, nominal sizes 80 – 125 mm (3 – 5 in): stainless steel 1.4301, nominal sizes 160 – 400 mm (6 ½ - 16 in): galvanised sheet steel, powder- coated

Stainless steel construction (A2)
- Casing made of stainless steel 1.4301
- Interior parts made of stainless steel

Variant with acoustic cladding (-D)
- Acoustic cladding made of galvanised sheet steel
- Rubber seal for the insulation of structure-borne noise
- Lining is mineral wool

Mineral wool
- To EN 13501, fire rating class A1, 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/EC

Construction

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

Technical data

- Nominal sizes: 80 to 400 mm (3 to 16 in)
- Volume flow rate range: 11 to 1400 l/s, 40 to 5040 m³ /h or 24 to 2966 CFM
- Volume flow rate control range: approx. 25 – 100 % of the nominal volume flow rate
- Minimum differential pressure: 50 Pa (0,20 in w.g.); nominal size 80 mm (3 in): 100 Pa (0,40 in w.g.)
- Maximum differential pressure: 1000 Pa (4,01 in w.g.)

Auslegungsdaten

- qv [m³/h]; [CFM]
- Δp_{st} [Pa]; [in w.g.]

Air-regenerated noise
- L_{PA} [dB(A)]

Case-radiated noise
- L_{PA} [dB(A)]

Order code

RN-S – P1 / 100 / D2
1 2 3 4

1 Type
RN-S Compact-height volume flow controller

2 Material
No entry: galvanised sheet steel
P1 Powder-coated RAL 7001 (silver grey)
A2 Stainless steel construction

3 Nominal size [mm]
80, 100, 125

3 Nominal size [in]
3”, 4”, 5”

4 Accessories
No entry: without accessories
D2 Double lip seal both ends

Order example: RN-S-P1/100/D2

Type	RN-S
Material	Powder-coated RAL 7001 (silver grey)
Nominal size [mm]	100
Accessories	Double lip seal both ends

Remark:
RN-S-A2/80 not with double lip seal (D2)

RN – D – P1 – FL / 160 / G2 / B50 / **300 – 800 [m³/h]**
1 2 3 4 5 6 7 8

1 Type
RN Volume flow controller
2 Acoustic cladding
No entry: none
D With acoustic cladding
3 Material
No entry: galvanised sheet steel

P1 Powder-coated RAL 7001 (silver grey)
A2 Stainless steel construction
4 Flange
No entry: none
FL Flanges both ends
5 Nominal size [mm]
80, 100, 125, 160, 200, 250, 315, 400

5 Nominal size [in]
3”, 4”, 5”, 6 ½’’, 8”, 10”, 12 ½’’, 16”

6 Accessories
No entry: without accessories

Order example: RN-D-P1-FL/160/G2/B50/300-800[m³/h]

D2 Double lip seal both ends (only for FL constructions, i.e. without flanges)
G2 Matching flanges for both ends (only with FL)
7 Actuator for setpoint value adjustment
No entry: none
B50 24 V AC/DC, 3-point (min/max)
B52 24 V AC/DC, 3-point (min/max), with auxiliary switch

B60 230 V AC, 3-point (min/max)
B62 230 V AC, 3-point (min/max), with auxiliary switch
B70 24 V AC/DC, modulating, 2 – 10 V
DC 8 Operating values for factory setting
Volume flow rate [m3/h or l/s]
Only with actuator
$q_v$min – $q_v$max

Type	RN
Acoustic cladding	With acoustic cladding
Material	Powder-coated RAL 7001 (silver grey)
Flange	Flanges both ends
Nominal size	160 mm (6 ½ in)
Accessories	Matching flanges for both ends
Actuator for setpoint adjustment	24 V AC/DC, 3-point (min/max)
Operating values for factory setting	300 – 800 m^3/h (177 – 471 CFM)

Remark:
RN/80 not with flange (FL) or with counter flange (G2)
RN-A2/80 not with double lip seal (D2)

Variants

CAV controller variant RN-S, compact height

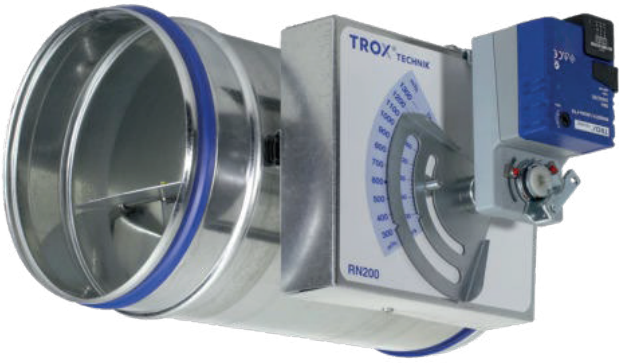


- Compact-height volume flow controller for constant volume flow rate control
- Spigot to make connections to the ducting

CAV controller variant RN

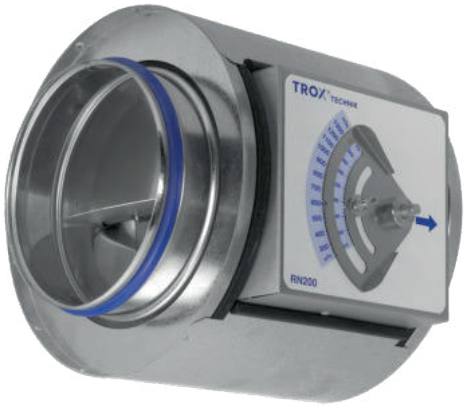


CAV controller variant RN, with actuator for switching between setpoint values



- Volume flow controller for constant air volume flow control
- Spigot to make connections to the ducting

CAV controller variant RN-D



- Volume flow controller with acoustic cladding for constant air volume flow control
- Spigot to make connections to the ducting
- For rooms where the case-radiated noise of the unit is not sufficiently reduced by a false ceiling
- The circular ducts for the room under consideration must have adequate acoustic insulation (provided by others) on the fan and room ends
- Acoustic cladding cannot be retrofitted

- Volume flow controller for constant air volume flow control
- With flanges to make detachable connections to the ductwork

Materials

Order code detail	Part	Material	Notes
–	Casing	Galvanised sheet steel	
	Damper blade	Stainless steel, material no. 1.4301	Nominal size 80 mm (3 in)
		Stainless steel, material no. 1.4310	Nominal sizes: 100, 125 mm (4, 5 in)
		Galvanised sheet steel	Nominal sizes from 160 mm (6 ½ in)
	Shaft	Stainless steel, material no. 1.4301	Nominal sizes 80 to 200 mm (3 to 8 in)
		Stainless steel, material no. 1.4104	Nominal sizes 250 to 400 mm (10 to 16 in)
	Plain bearings	Steel with PTFE coating	
D	Acoustic cladding	Galvanised sheet steel	
	Rubber profile for the insulation of structure-borne noise	Rubber	
	Lining	Mineral wool	
P1	Casing	Galvanised sheet steel	Powder-coated
	Damper blade	Stainless steel, material no. 1.4301	Nominal size 80 mm (3 in)
		Stainless steel, material no. 1.4310	Nominal sizes: 100, 125 mm (4, 5 in)
		Galvanised sheet steel	Powder-coated, nominal sizes from 160 mm (6 ½ in)
	Shaft	Stainless steel, material no. 1.4301	Nominal sizes 80 to 200 mm (3 to 8 in)
		Stainless steel, material no. 1.4305	Nominal sizes 250 to 400 mm (10 to 16 in)
	Plain	Bronze with PTFE coating	
A2	Casing	Stainless steel, material no. 1.4301	Nominal size 80 mm (3 in)
	Damper blade	Stainless steel, material no. 1.4310	Nominal sizes: 100, 125 mm (4, 5 in)
		Stainless steel, material no. 1.4301	Nominal sizes from 160 mm (6 ½ in)
	Shaft		Nominal sizes 80 to 200 mm (3 to 8 in)
		Stainless steel, material no. 1.4305	Nominal sizes 250 to 400 mm (10 to 16 in)
	Plain bearings	Bronze with PTFE coating	

Surfaces

Order code detail	Part	Surface
–	Casing	Galvanised steel
P1	Casing	Powder-coated, RAL 7001, silver grey
A2	Casing	Stainless steel construction

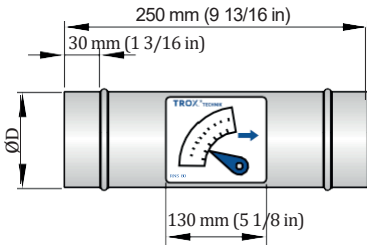
Attachments

RN, actuators

Order code detail	Actuator	Supply voltage	Auxiliary switch
Min/Max actuators			
B5	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	–
0	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	2
B5	Actuator with mechanical stops TROX/Belimo	230 V AC	–
2	Actuator with mechanical stops TROX/Belimo	230 V AC	2
B60			
B62	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	–
Modulating actuators	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	2
B70			
B72			

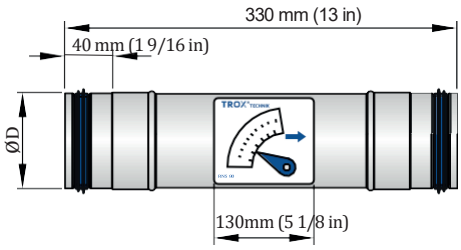
Dimensions and weight

RN-S, nominal size 80 mm (3”)



RN-S/80 (3”), RN-S-P1/80 (3”), RN-S-A2/80 (3”)

RN-S, nominal size 80 mm (3”), lip seal

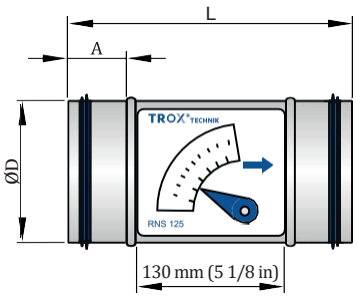


RN-S/80(3”)/D2, RN-S-P1/80(3”)/D2

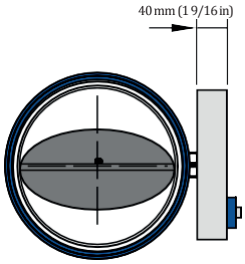
RN-S

Nominal Size		ØD		m	
[mm]	[in]	[mm]	[in]	[kg]	[lb]
80	3	79	3 1/8	1,4	3,1

RN-S, nominal size 100, 125 mm (4”, 5”)



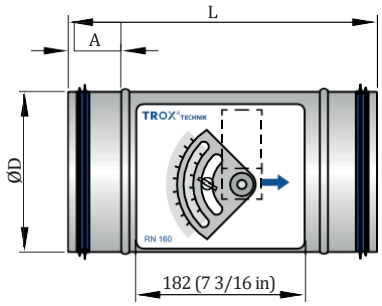
RN-S



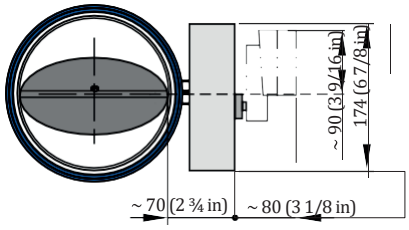
RN-S

Nominal Size		ØD	L	A	ØD	L	A	m	
[mm]	[in]	[mm]			[in]			[kg]	[lb]
100	4	99	250	50	3 7/8	9 13/16	1 15/16	1,8	4,0
125	5	124	250	50	4 7/8	9 13/16	1 15/16	2	4,4

RN



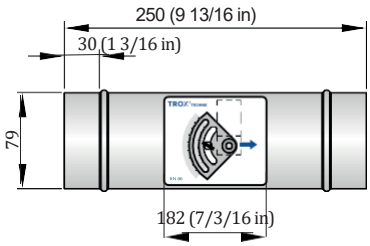
RN



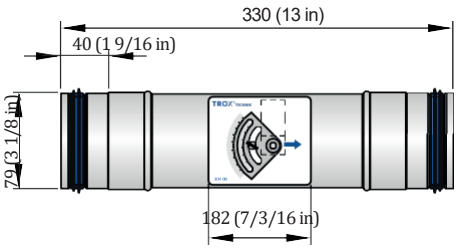
RN

Nominal Size		ØD	L	A	ØD	L	A	m	
[mm]	[in]	[mm]			[in]			[kg]	[lb]
80	3	79	310	50	3 1/8	12 3/16	1 15/16	1,4	3,1
100	4	99	310	50	3 7/8	12 3/16	1 15/16	1,8	4,0
125	5	124	310	50	4 7/8	12 3/16	1 15/16	2	4,4
160	6 ½	159	310	50	6 1/4	12 3/16	1 15/16	2,5	5,5
200	8	199	310	50	7 13/16	12 3/16	1 15/16	3	6,6
250	10	249	400	50	9 13/16	15 3/4	1 15/16	3,5	7,7
315	12 ½	314	400	50	12 3/8	15 3/4	1 15/16	4,8	10,6
400	16	399	400	50	15 11/16	15 3/4	1 15/16	5,7	12,6

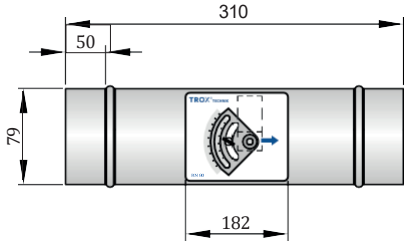
RN-P1/80(3”)



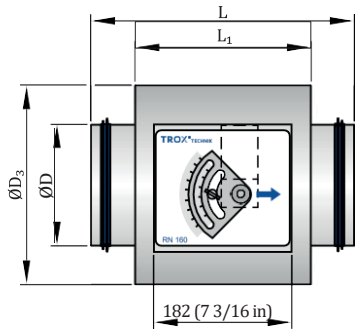
RN-P1/80(3”)/D2



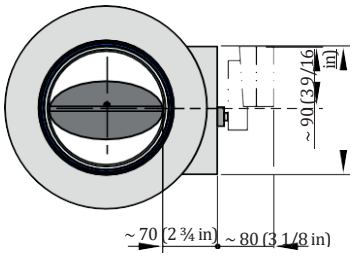
RN-A2/80(3”)



RN-D



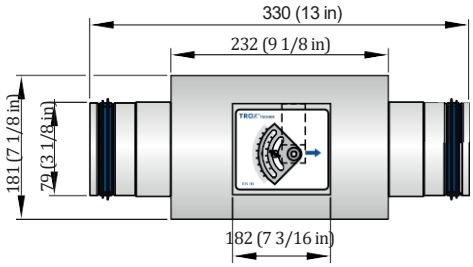
RN-D



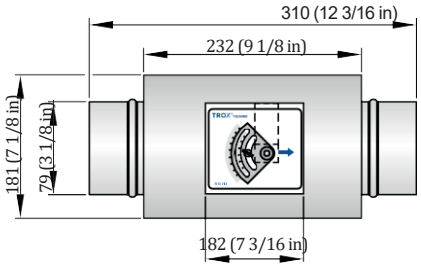
RN-D

Nominal Size		ØD	L	ØD3	L1	ØD	L	ØD3	L1	m	
[mm]	[in]	[mm]				[in]				[kg]	[lb]
80	3	79	310	181	232	3 1/8	12 3/16	7 1/8	9 1/8	2,2	4,9
100	4	99	310	200	232	3 7/8	12 3/16	7 7/8	9 1/8	3,6	7,9
125	5	124	310	220	232	4 7/8	12 3/16	8 11/16	9 1/8	4	8,8
160	6 ½	159	310	262	232	6 1/4	12 3/16	10 5/16	9 1/8	5	11,0
200	8	199	310	300	232	7 13/16	12 3/16	11 13/16	9 1/8	6	13,2
250	10	249	400	356	312	9 13/16	15 3/4	14	12 5/16	7,3	16,1
315	12 ½	314	400	418	312	12 3/8	15 3/4	16 7/16	12 5/16	9,8	21,6
400	16	399	400	500	312	15 11/16	15 3/4	19 11/16	12 5/16	11,8	26,0

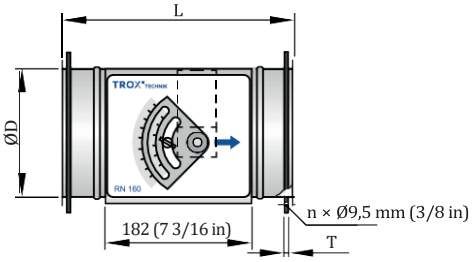
RN-D-P1/80(3")/D2



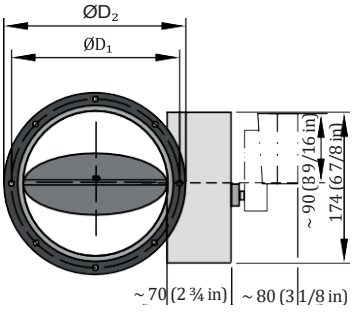
RN-D-A2/80(3")



RN-FL



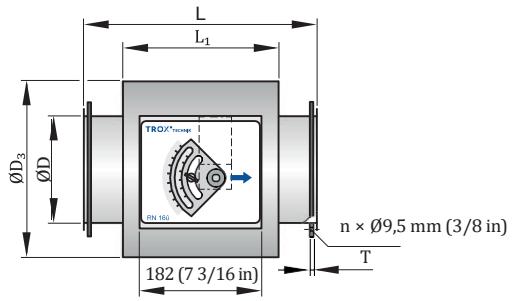
RN-FL



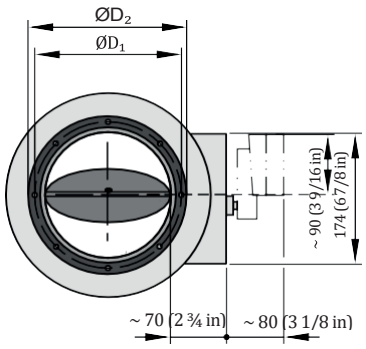
RN-FL

Nominal Size		ØD	L	ØD1	ØD2	T	ØD	L	ØD1	ØD2	T	n	m	
[mm]	[in]	[mm]					[in]						[kg]	[lb]
100	4	99	290	132	152	4	3 7/8	11 7/16	5 3/16	6	3/16	4	2,4	5,3
125	5	124	290	157	177	4	4 7/8	11 7/16	6 3/16	6 15/16	3/16	4	2,7	6,0
160	6 ½	159	290	192	213	4	6 1/4	11 7/16	7 9/16	8 3/8	3/16	6	3,5	7,7
200	8	199	290	233	253	4	7 13/16	11 7/16	9 3/16	9 15/16	3/16	6	4,4	9,7
250	10	249	380	283	303	4	9 13/16	14 15/16	11 1/8	11 15/16	3/16	6	5,3	11,7
315	12 ½	314	380	352	378	4	12 3/8	14 15/16	13 7/8	14 7/8	3/16	8	7,3	16,1
400	16	399	380	438	464	4	15 11/16	14 15/16	17 1/4	18 1/4	3/16	8	9,6	21,2

RN-D-FL



RN-D-FL



RN-D-FL

Nominal Size		ØD	L	ØD1	ØD2	ØD3	L1	T	ØD	L	ØD1	ØD2	ØD3	T	n	m	
[mm]	[in]	[mm]							[in]							[kg]	[lb]
100	4	99	370	132	152	200	232	4	3 7/8	14 9/16	5 3/16	6	7 14/16	9 1/8	4	4,2	9,3
125	5	124	370	157	177	220	232	4	4 7/8	14 9/16	6 3/16	6 15/16	8 11/16	9 1/8	4	4,7	10,4
160	6 ½	159	370	192	212	262	232	4	6 1/4	14 9/16	7 9/16	8 3/8	10 5/16	9 1/8	4	6	13,2
200	8	199	370	233	253	300	232	4	7 13/16	14 9/16	9 3/16	9 15/16	11 13/16	9 1/8	4	7,4	16,3
250	10	249	460	283	303	356	312	4	9 13/16	18 1/8	11 1/8	11 15/16	14	12 5/16	6	9,1	20,1
315	12 ½	314	460	352	378	418	312	4	12 3/8	18 1/8	13 7/8	14 14/16	16 7/16	12 5/16	8	12,3	27,1
400	16	399	460	438	464	500	312	4	15 11/16	18 1/8	17 1/4	18 1/4	19 11/16	12 5/16	8	15,7	34,6

Installation details

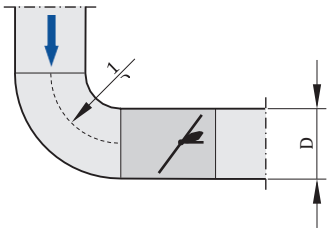
Installation and commissioning

- Any installation orientation
- Volume flow rate can be set using an external scale; no tools required
- No repeat measurements or adjustments by an air conditioning engineer are necessary
- RN-D: For constructions with acoustic cladding, ducts on the room side should have cladding up to the acoustic cladding of the controller

Upstream conditions

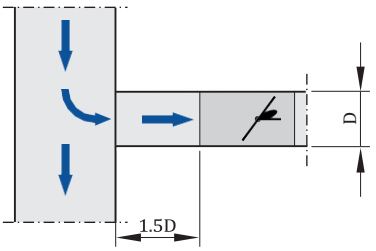
The volume flow rate accuracy ΔV applies to a straight upstream section of the duct. Bends, junctions or a narrowing or widening of the duct cause turbulence that may affect measurement. Duct connections, e.g. branches off the main duct, must comply with EN 1505. Some installation situations require straight duct sections upstream. Free air intake only with a straight duct section of 1D upstream.

Bend



A bend with a curvature radius of at least 1D – without an additional straight duct section upstream of the CAV controller – has only a negligible effect on the volume flow rate accuracy.

Junction

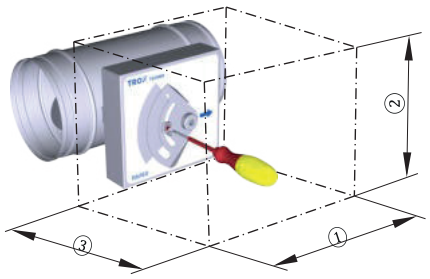


A junction causes strong turbulence. The stated volume flow rate accuracy ΔV can only be achieved with a straight duct section of at least 1.5D upstream. Shorter upstream sections require a perforated plate in the branch and before the CAV controller. If there is no straight upstream section at all, the control will not be stable, even with a perforated plate.

Space required for commissioning and maintenance

Sufficient space must be kept clear near any attachments to allow for commissioning and maintenance. It may be necessary to provide sufficiently sized inspection access openings.

Access for commissioning and maintenance



Space required

Attachments	①	②	③
	mm		
Without actuator	200 (8 in)	200 (8 in)	200 (8 in)
With actuator	200 (8 in)	320 (12 ½ in)	300 (12 ½ in)

Nomenclature

ØD [mm]; [in]
Outer diameter of the spigot

$ØD_1$ [mm]; [in]
Pitch circle diameter of flanges

$ØD_2$ [mm]; [in]
Outer diameter of flanges

$ØD_4$ [mm]; [in]
Inside diameter of the screw holes of flanges

L [mm]; [in]
Length of unit including connecting spigot

L_1 [mm]; [in]
Length of casing or acoustic cladding

H_1 [mm] ; [in]
Screw hole pitch of flange (vertical)

n [ ]
Number of flange screw holes

T [mm]
Flange thickness

m [kg]
Unit weight including the minimum required attachments for manual adjustment

f_m [Hz]
Octave band centre frequency

L_{PA} [dB(A)]
A-weighted sound pressure level of air-regenerated noise of the CAV controller, system attenuation taken into account

L_{PA1} [dB(A)]
A-weighted sound pressure level of air-regenerated noise of the CAV controller with secondary silencer, system attenuation taken into account

L_{PA2} [dB(A)]
A-weighted sound pressure level of case-regenerated noise of the CAV controller, system attenuation taken into account

L_{PA3} [dB(A)]
A-weighted sound pressure level of case-regenerated noise of the CAV controller with acoustic cladding, system attenuation taken into account

q_{vNom} [m³/h]; [l/s]
Nominal volume flow rate (100 %)
- The value depends on product type and nominal size
- Values are published on the internet and in technical leaflets, and stored in the Easy Product Finder design software.
- Upper limit of the setting range and maximum volume flow rate setpoint value for the CAV controller

q_v [m³/h]; [l/s] Volume flow rate

Δq_v [± %]
Volume flow rate accuracy in relation to the setpoint (tolerance)

Δp_{st} [Pa]; [in w.g.]
Static differential pressure

$\Delta_{pst\ min}$ [Pa]; [in w.g.]
Static minimum differential pressure: The static minimum differential pressure is equal to the pressure loss of the terminal unit when the damper blade is open, caused by flow resistance (damper blade). If the pressure on the CAV controller is too low, the setpoint volume flow rate may not be achieved, not even when the damper blade is open. Important factor in designing the ductwork and in rating the fan including speed control.
Sufficient differential pressure must be ensured for all operating conditions and for all controllers, and the measurement point or points for speed control must have been selected accordingly to achieve this.

Galvanized sheet steel
- Casing made of galvanised sheet steel
- Parts in contact with the airflow as described for the product type
- External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel

Powder coated surface (P1)
- Casing made of galvanised sheet steel, powder-coated RAL 7001, silver grey
- Parts in contact with the airflow are powder-coated or made of plastic
- Due to production, some parts that come into contact with the airflow may be stainless steel or aluminium, powder-coated
- External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel

Stainless steel (A2)
- Casing made of stainless steel 1.4201
- Parts in contact with the airflow are powder-coated or made of stainless steel
- External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel