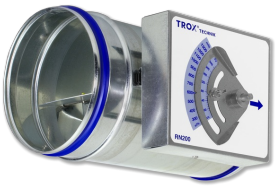
TROX® TECHNIK
The art of handling air



CAV CONTROLLER
VARIANT RN

TESTED TO VDI 6022

ACTUATOR FOR
SWITCHING BETWEEN
SETPOINT VALUES

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

Nominal sizes

- RN-S: 80, 100, 125
- RN: 80, 100, 125, 160, 200, 250, 315, 400

- RN-FL: 100, 125, 160, 200, 250, 315, 400

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
- 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 without groove)
- RN-FL: Circular flanges to EN 12220

Materials and surfaces

Galvanised sheet steel construction

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

- Hygiene conforms to VDI 6022
- Casing air leakage to EN 1751, class C

Maintenance

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

TECHNICAL INFORMATION

Function, TECHNICAL DATA, Quick sizing, Specification text, Order code, Produktbeziehungen

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.

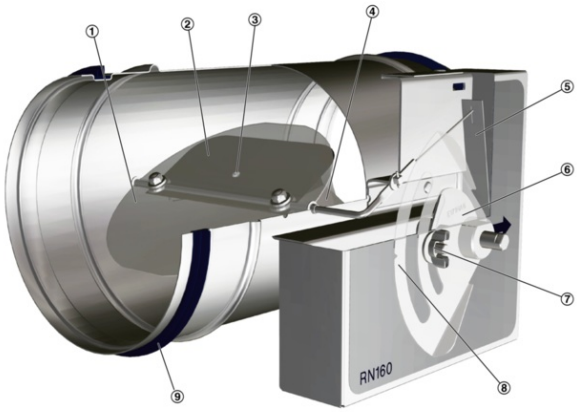
The aerodynamic forces of the airflow create a closing torque on the damper blade. The bellows extends and increases this force while at the same time acting as an oscillation damper. The closing force is countered by a leaf spring that unrolls over a cam plate. The shape of the cam plate is such that 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

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.

Nominal sizes	80 – 400 mm
Volume flow rate range	11 – 1400 l/s or 40 – 5040 m³/h
Volume flow rate control range	Approx. 25 to 100 % of the nominal volume flow rate
Scale accuracy	± 4 %
Minimum differential pressure	50 Pa (nominal size 80: 100 Pa)
Maximum differential pressure	1000 Pa
Operating temperature	10 – 50 °C

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 programme.

The first selection criteria for the nominal size are the actual volume flow rates V_{min} and 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.

Sizing example

Given data

V_{max} = 280 l/s (1010 m^3/h)

Δp_{st} = 150 Pa

Required sound pressure level in the room 35 dB(A)

Quick sizing

RN/200 with circular silencer CS 050/200×1000

Air-regenerated noise L_{PA} = 26 dB(A)

Case-radiated noise L_{PA} = 31 dB(A)

RN, Sound pressure level at differential pressure 150 Pa

Nominal size	V		Air-regenerated noise				Case-radiated noise	
			①	②	③	④	①	⑤
Nominal size	V		L_{PA}	L_{PA1}			L_{PA2}	L_{PA3}
	l/s	m^3/h	dB(A)					
80	**11**	**40**	37	24	17	15	22	<15
	20	**72**	39	27	19	17	24	<15
80	**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
100	**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
125	**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
160	**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
200	**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

250	**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
315	**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
400	**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

Galvanised sheet steel construction

- Casing made of galvanised sheet steel
- Interior parts, nominal sizes 80 – 125: stainless steel 1.4301, nominal sizes 160 – 400: 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 profile 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
- Volume flow rate range: 11 to 1400 l/s or 40 to 5040 m^3/h
- Volume flow rate control range: approx. 25 – 100 % of the nominal volume flow rate
- Minimum differential pressure: 50 Pa (nominal size 80: 100 Pa)
- Maximum differential pressure: 1000 Pa

Sizing data

- V _____ [m^3/h]
- Δp_{st} _____ [Pa]

Air-regenerated noise

- L_{PA} _____ [dB(A)]

Case-radiated noise

- L_{PA} _____ [dB(A)]

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

Notes on the order code

RN-S

- RN-S-A2/80: no lip seal (D2)

RN

- RN/80: no flange (FL), no matching flange (G2)
- RN-A2/80: no lip seal (D2)

Order example: RN/160/D2

Nominal size	160
Material	Galvanised sheet steel
Accessories	Lip seal on both ends

Order example: RN-D-FL/250/G2/B50

Acoustic cladding	With
Flange	Both ends
Material	Galvanised sheet steel
Nominal size	250
Accessories	Matching flanges for both ends
Actuator	B50

RN – D – P1 – FL / 160 / G2 / B50 / 300 – 800

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

4 Flange

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: without
For example
B50 24 V AC/DC, 3-point
B52 24 V AC/DC, 3-point, with auxiliary switch
B70 24 V AC/DC, modulating 2 – 10 V DC

8 Volume flow rates [m^3/h or l/s]

only actuators 7

$V_{min\ –\ max}$ for factory setting

RN-S – P1 / 100 / D2

1 2 3 4

1 Type

RN-S Volume flow controller

2 Material

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

3 Nominal size [mm]

80
100
125

4 Accessories

No entry: none
D2 Lip seals on both ends

Variants, Attachments, Dimensions and weight

RN-S

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

RN

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

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

RN-FL

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

RN-D-FL

- Volume flow controller with acoustic cladding for constant air volume flow control
- With flanges to make detachable connections to the ductwork
- 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
- Powder-coated surface (P1) or stainless steel construction (A2) not possible

Materials

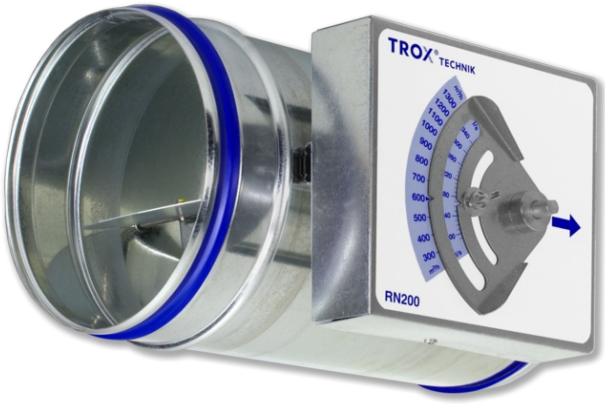
Order code detail	Part	Material	Notes
–	Casing	Galvanised sheet steel	
	Damper blade	Stainless steel, material no. 1.4301	Nominal size 80
–	Damper blade	Stainless steel, material no. 1.4310	Nominal sizes: 100, 125
	Damper blade	Galvanised sheet steel	Nominal sizes from 160
–	Shaft	Stainless steel, material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

Surfaces

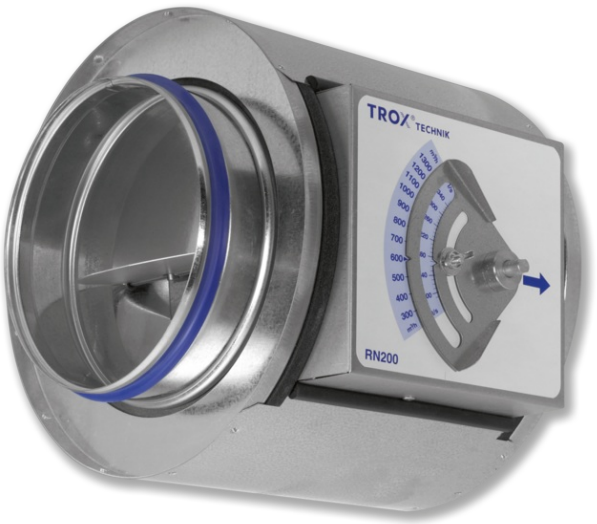
Order code detail	Part	Surface	Notes
–	Casing	Untreated	
P1	Casing	Powder-coated, RAL 7001, silver grey	

CAV controller variant RN-S, compact height

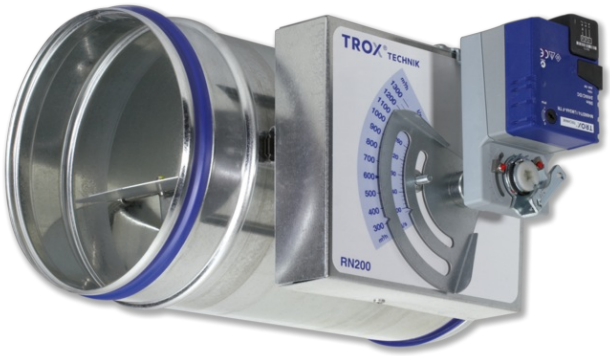
CAV controller variant RN



CAV controller variant RN-D



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



RN, actuators

Order code detail	Actuator	Supply voltage	Auxiliary switch
Min/Max actuators			
B50	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	–
B52	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	2
B60	Actuator with mechanical stops TROX/Belimo	230 V AC	–
B62	Actuator with mechanical stops TROX/Belimo	230 V AC	2
Modulating actuators			
B70	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	–
B72	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	2

Anbauteile: VARYCONTROL Regelkomponenten

☒	Regel- größe	Schnittstelle	V_{min} -/ V_{max} - Verstellung	Differenzdruck-transmitter	Stellantrieb	Fabrikat	LVC	TVR	TVJ	TVT	TZ-S	TA-S	TVZ	TVA	TVM	TVRK	TVLK
	Easyregler		**Dynamisch**														
Easy	V			Integriert	Integriert	①	●	●	●	●	●	●	●	●			
		Compactregler		**Dynamisch**													
BC0	V	MP-Bus		Integriert	Integriert	②	●	●	●	●	●	●	●	●			
BF0	V	MP-Bus		Integriert	Integriert	②									●		
BL0	V	LonWorks		Integriert	Integriert	②		●	●	●	●	●	●	●			
BM0	V	Modbus		Integriert	Integriert	②											

BM0-J6	V	Modbus und steckerfertiger Anschlussleitung		Integriert	Integriert	②											
XG0	V			Integriert	Integriert	③									●		
XB0	V			Integriert	Integriert	③		●	●	●	●	●	●	●			
LN0	V			Integriert	Integriert	⑤		●	●	●	●	●	●	●			
LK0	V	KNX				⑤											
LY0	V			Integriert	Integriert	⑤									●		
		Compactregler		**Statisch**													
SA0	V			Integriert	Integriert	④											
SC0	Δp			Integriert	Schnelllaufender Stellantrieb integriert	④											
		Universalregler		**Dynamisch**													
B11	V			Integriert	Stellantrieb, Drehmoment für TVT	②				●							
B13	V			Integriert	Stellantrieb	②		●	●		●	●	●	●			
B27	V			Integriert	Stellantrieb	②									●		
B1B	V			Integriert	Federrücklaufantrieb	②		●	●	●	●	●	●	●			
XC3	V			Integriert	Federrücklaufantrieb	③		●	●	●	●	●	●	●			
		Universalregler		**Statisch**													
BP1	V	MP-Bus		Separates Bauteil	Stellantrieb, Drehmoment für TVT	②				●							
BP3	V	MP-Bus		Separates Bauteil	Stellantrieb	②		●	●		●	●	●	●		●	●
BPB	V	MP-Bus		Separates Bauteil	Federrücklaufantrieb	②		●	●	●	●	●	●	●		●	
BPG	V	MP-Bus		Separates Bauteil	Schnelllaufender Stellantrieb	②		●	●	●	●	●	●	●		●	●
BB1	V			Separates Bauteil	Stellantrieb, Drehmoment für TVT	②				●							
BB3	V			Separates Bauteil	Stellantrieb	②		●	●		●	●	●	●		●	●
BBB	V			Separates Bauteil	Federrücklaufantrieb	②			●	●	●	●	●	●		●	
XD1	V			Integriert	Stellantrieb	③		●	●	●	●	●	●	●		●	
XD3	V			Integriert	Federrücklaufantrieb	③		●	●	●	●	●	●	●		●	
BR1	Δp	MP-Bus		100 Pa	Stellantrieb, Drehmoment für TVT	②				●							
BR3	Δp	MP-Bus		100 Pa	Stellantrieb	②		●	●		●	●	●	●		●	
BRB	Δp	MP-Bus		100 Pa	Federrücklaufantrieb	②		●	●	●	●	●	●	●		●	

BRG	Δp	MP-Bus		100 Pa	Schnelllaufender Stellantrieb	②		●			●	●	●	●		●	
BS1	Δp	MP-Bus		600 Pa	Stellantrieb, Drehmoment für TVT	②				●							
BS3	Δp	MP-Bus		600 Pa	Stellantrieb	②		●	●					●		●	
BSB	Δp	MP-Bus		600 Pa	Federrücklaufantrieb	②		●	●	●						●	
BSG	Δp	MP-Bus		600 Pa	Schnelllaufender Stellantrieb	②		●	●	●						●	
BG1	Δp			100 Pa	Stellantrieb, Drehmoment für TVT	②				●							
BG3	Δp			100 Pa	Stellantrieb	②		●	●		●	●	●	●		●	
BGB	Δp			100 Pa	Federrücklaufantrieb	②		●	●	●	●	●	●	●		●	
BH1	Δp			600 Pa	Stellantrieb, Drehmoment für TVT	②				●							
BH3	Δp			600 Pa	Stellantrieb	②		●	●							●	
BHB	Δp			600 Pa	Federrücklaufantrieb	②		●	●	●						●	
XE1	Δp			Integriert, 100 Pa	Stellantrieb	③		●	●	●	●	●	●	●		●	
XE3	Δp			Integriert, 100 Pa	Federrücklaufantrieb	③		●	●	●	●	●	●	●		●	
XF1	Δp			Integriert, 600 Pa	Stellantrieb	③		●	●	●						●	
XF3	Δp			Integriert, 600 Pa	Federrücklaufantrieb	③		●	●	●						●	

① TROX, ② TROX/Belimo, ③ TROX/Gruner, ④ Sauter, ⑤ Siemens

☒ Bestellschlüsseldetail, V Volumenstrom, Δp Differenzdruck

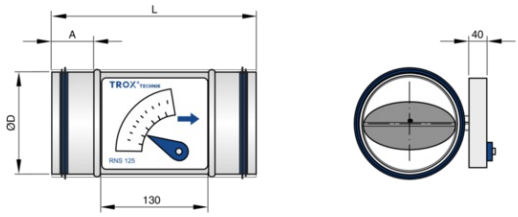
Anbauteile: VARYCONTROL Regelkomponenten

☒	Regel- größe	Schnittstelle	V_{min} -/ V_{max} - Verstellung	Differenzdruck- transmitter	Stellantrieb	Fabrikat
		Easylabregler		Statisch		
Elab	RS, RE, PC, C	TCU3		Integriert	Schnelllaufender Stellantrieb	
	RS, PC, C	TCU3		Integriert	Schnelllaufender Stellantrieb	
Elab	RE, PC, C	TCU3		Integriert	Schnelllaufender Stellantrieb	
	RS, RE, PC, FH, C	TCU3		Integriert	Schnelllaufender Stellantrieb	
		Elektronischer Regler		Statisch	Elektronischer Regler	
TMA	RS, RE, PC	TCU-LON-II mit LonWorks-Schnittstelle		Integriert	Schnelllaufender Stellantrieb	
TMB	RS, RE, PC	TCU-LON-II mit LonWorks-Schnittstelle		Integriert	Schnelllaufender Stellantrieb (bürstenloser Motor)	
TMA	RS, RE,	TCU-LON-II mit LonWorks-Schnittstelle		Integriert	Schnelllaufender Stellantrieb	
TMB	RS, RE,	TCU-LON-II mit LonWorks-Schnittstelle		Integriert	Schnelllaufender Stellantrieb (bürstenloser Motor)	
TMA	RE ,PC	TCU-LON-II mit LonWorks-Schnittstelle		Integriert	Schnelllaufender Stellantrieb	
TMB	RE ,PC	TCU-LON-II mit LonWorks-Schnittstelle		Integriert	Schnelllaufender Stellantrieb (bürstenloser Motor)	
TMA	RS, RE ,PC, FH	TCU-LON-II mit LonWorks-Schnittstelle		Integriert	Schnelllaufender Stellantrieb	
TMB	RS, RE ,PC, FH	TCU-LON-II mit LonWorks-Schnittstelle		Integriert	Schnelllaufender Stellantrieb (bürstenloser Motor)	
XF3	Δp			Integriert, 600 Pa	Federrücklaufantrieb	③
BB3	V			Separates Bauteil	Stellantrieb	②

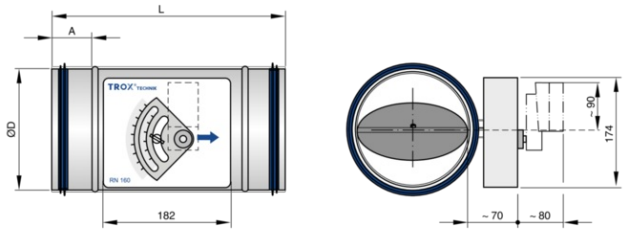
① TROX, ② TROX/Belimo, ③ TROX/Gruner, ④ Sauter, ⑤ Siemens

☒ Bestellschlüsseldetail, V Volumenstrom, Δp Differenzdruck

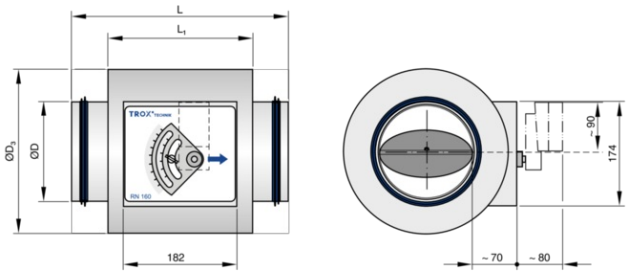
RN-S, nominal size 100, 125



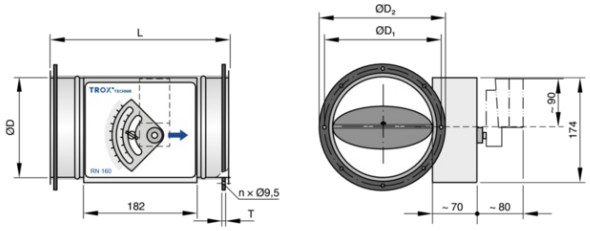
RN



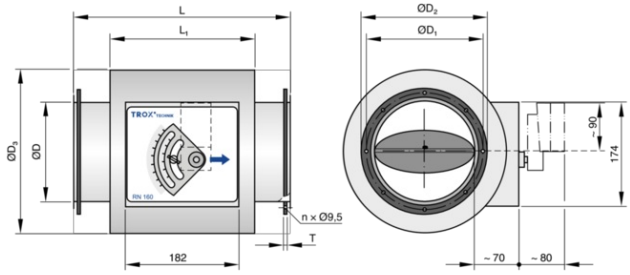
RN-D



RN-FL



RN-D-FL



Installation details, Basic information and nomenclature

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.

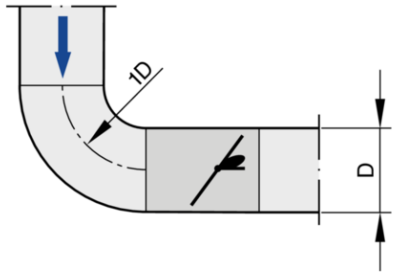
Space required for commissioning and maintenance

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.

Space required

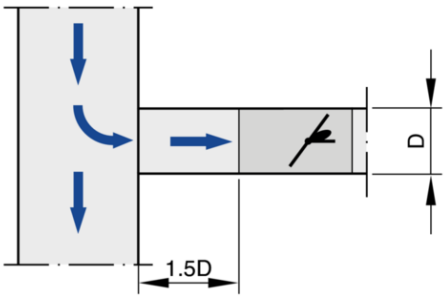
Attachments	①	②	③
	mm		
Without actuator	200	200	200
With actuator	200	320	300

Bend



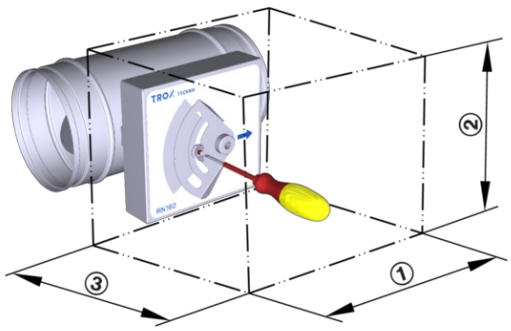
A bend with a curvature radius of at least 1D – without an additional straight duct section upstream of the CAV controller – has only a negligible effect on the volume flow rate accuracy.

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.

Access for commissioning and maintenance



Prinipal dimensions

ØD [mm]

Outside diameter of the spigot

$ØD_1$ [mm]

Pitch circle diameter of flanges

$ØD_2$ [mm]

Outside diameter of flanges

$ØD_4$ [mm]

Inside diameter of the screw holes of flanges

L [mm]

Length of unit including connecting spigot

L_1 [mm]

Length of casing or acoustic cladding

B [mm]

Duct width

B_1 [mm]

Screw hole pitch of flange (horizontal)

B_2 [mm]

Outside dimension of flange (width)

B_3 [mm]

Width of device

H [mm]

Duct height

H_1 [mm]

Screw hole pitch of flange (vertical)

H_2 [mm]

Outside dimension of flange (height)

H_3 [mm]

Unit height

n [ ]

Number of flange screw holes

T [mm]

Flange thickness

m [kg]

Unit weight including the minimum required attachments for manual adjustment

Acoustic data

f_m [Hz]

Octave band centre frequency

L_{PA} [dB(A)]

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A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit, system attenuation taken into account

L_{PA1} [dB(A)]

A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit with secondary silencer, system attenuation taken into account

L_{PA2} [dB(A)]

A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit, system attenuation taken into account

L_{PA3} [dB(A)]

A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit with acoustic cladding, system attenuation taken into account

All sound pressure levels are based on 20 µPa.

Volume flow rates

V_{nom} [m³/h] and [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

V [m³/h] and [l/s]

Volume flow rate

ΔV [± %]

Volume flow rate tolerance from setpoint value

Differential pressure

Δp_{st} [Pa]

Static differential pressure

$\Delta p_{st\ min}$ [Pa]

Static differential pressure, minimum

- The static minimum differential pressure is equal to the pressure loss of the CAV controller when the damper blade is open, caused by flow resistance (bellows, crossbar)
- 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 duct 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

Construction

Galvanised 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

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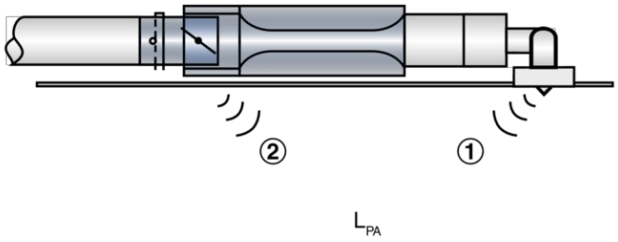
Definition of noise



① Air-regenerated noise
② Case-radiated noise

Static differential pressure