Flow adjustment dampers
Type VFR

Variant with rotary knob

Actuator with mechanical stops

Actuator with potentiometers

Tested to VDI 6022

For the reliable balancing of volume flow rates

Circular flow adjustment dampers for the adjustment of volume flow rates and pressures in supply air and extract air systems

- Each flow adjustment damper carries a diagram with setting values that ensure rapid commissioning on site
- Suitable for duct pressures up to 1000 Pa.
- Volume flow rate can be set using a rotary knob and a scale on the outside of the casing
- Simple retrofit of an actuator
- Casing air leakage to EN 1751, class C

Optional equipment and accessories

- Actuator with potentiometer
- Actuator with mechanical stops

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Application

Application
- Circular flow adjustment dampers Type VFR for the simple balancing of volume flow rates and pressures in air conditioning systems
- Stepless adjustment of the volume flow rate using a rotary knob with position indicator
- Simple retrofit of an actuator
- At the minimum setting (closed position 0) a system pressure dependent leakage flow rate occurs

Special features
- Diagram with setting values on each flow adjustment damper
- Simple retrofit of an actuator is possible

Nominal sizes
- 80, 100, 125, 140, 150, 160, 180 , 200, 224, 250

Description

Construction
- Galvanised sheet steel
- A2: Stainless steel

Parts and characteristics
- Ready-to-install flow adjustment damper
- Rotary knob with position indicator
- Stepless adjustment from 0 to 10
- Diagram with setting values
- Lip seal

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

Construction features
- Spigot with lip seal, for circular connecting ducts to EN 1506 or EN 13180
- Very good dimensional stability due to double grooves
- Damper blade without seal but with perimeter gap of 3 mm

Materials and surfaces
- Rotary knob, damper blade and bearings made of plastic, flame retardant (V-0) to UL 94

Galvanised sheet steel construction
- Casing made of galvanised sheet steel

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

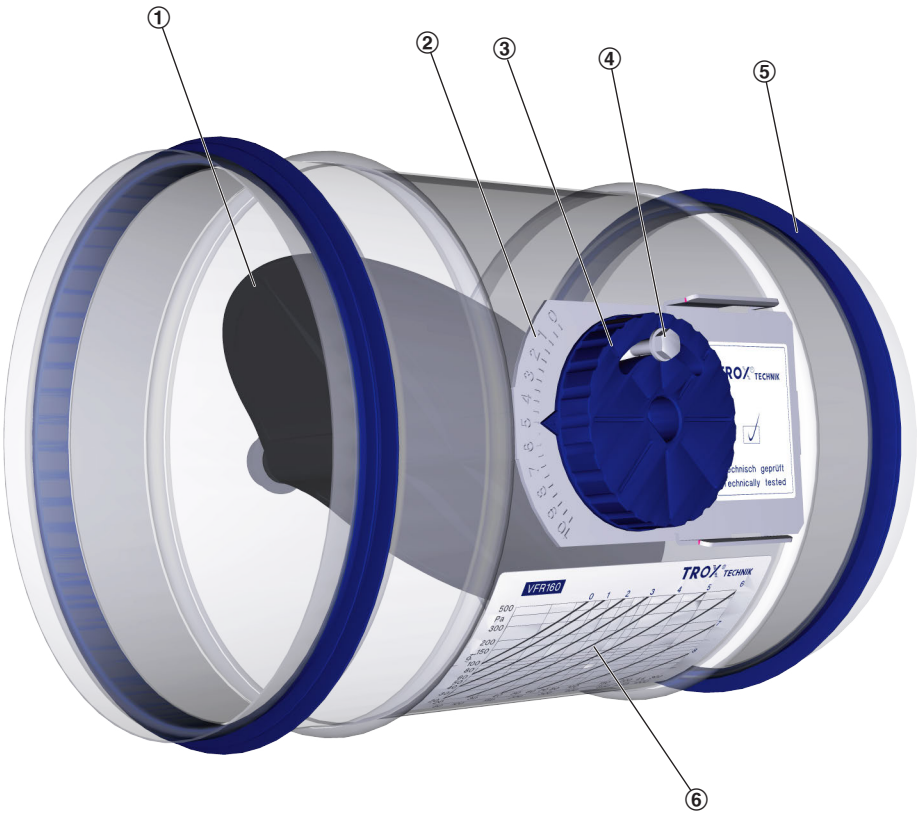
Standards and guidelines
- Hygiene conforms to VDI 6022
- Casing air leakage to EN 1751, class C

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

Functional description

For balancing the volume flow rates of duct sections and air terminal devices the differential pressure must be set on the flow adjustment dampers. The value to be set for a certain required volume flow rate at a given differential pressure can be taken from the diagram that each flow adjustment damper carries. This value can then be set using the rotary knob with the position indicator (stepless adjustment between 0 and 10).

Schematic illustration of the VFR



① Damper blade
② Scale
③ Rotary knob
④ Rotary knob locking screw
⑤ Lip seal
⑥ Diagram with setting values

Nominal sizes	80 – 250 mm
Volume flow rate range	20 – 485 l/s or 72 – 1746 m³/h
Minimum differential pressure	20 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 – 50 °C

Closed blade air leakage

Nominal size	Δp_{st} [Pa]					
	100		200		500	
	l/s	m³/h	l/s	m³/h	l/s	m³/h
80	9	32	13	46	20	72
100	13	45	18	64	28	101
125	16	58	23	82	36	130
140	17	61	25	89	39	140
150	18	66	26	93	41	148
160	21	76	30	107	47	169
180	19	69	27	98	43	155
200	21	74	29	105	46	166
224	22	80	32	114	50	180
250	25	89	35	125	55	198

Quick sizing tables provide a good overview of the room sound pressure levels that can be expected. Approximate intermediate values can be interpolated.

Quick sizing: Sound pressure level

Nominal size	Volume flow rate	Volume flow rate	Δp_{st} [Pa]						
			10	20	30	50	80	100	200
			L_{PA}						
	l/s	m^3/h	dB(A)						
80	20	72	25	28	30	32	35	36	41
	30	108	30	33	35	37	40	41	45
	40	144	33	36	38	41	43	45	49
	50	180	36	40	42	44	47	48	53
100	30	109	27	29	31	34	36	38	44
	45	163	32	35	37	39	42	43	48
	60	217	36	39	41	44	46	48	52
	75	272	40	43	45	48	50	52	56
125	50	180	28	31	33	36	39	41	47
	70	252	33	36	38	41	44	46	51
	95	342	37	41	43	46	49	50	55
	120	432	41	45	47	50	53	54	59
140	60	215	25	29	31	34	38	40	47
	90	323	31	34	37	40	44	45	51
	120	431	35	39	42	45	48	50	56
	150	538	39	43	45	49	52	54	59
150	70	252	26	30	32	36	39	41	48
	105	378	31	35	37	41	44	46	52
	140	504	35	39	42	45	48	50	56
	170	612	37	42	44	48	51	53	58
160	80	288	27	30	33	36	39	41	48
	120	432	33	37	39	42	45	47	53
	155	558	38	41	44	47	50	51	57
	195	702	41	45	47	50	53	54	59
180	100	358	25	29	32	35	39	41	48
	150	540	31	35	38	41	45	47	53
	200	720	35	39	42	45	48	50	56
	250	900	38	42	45	48	51	53	59
200	125	450	26	30	33	37	41	43	51
	185	665	32	36	39	42	46	48	55
	245	882	36	40	43	47	50	52	59
	310	1116	39	44	46	50	54	56	62
224	155	557	24	28	31	35	39	41	47
	230	828	28	32	35	39	42	44	50
	310	1115	32	36	38	42	45	47	53
	385	1386	34	38	41	44	48	49	55
250	195	702	24	28	32	36	41	43	52
	290	1043	28	33	36	40	45	47	56
	385	1386	31	36	40	44	49	51	59
	485	1746	34	39	43	47	52	54	62

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

Circular flow adjustment dampers for the simple balancing of volume flow rates in air conditioning systems, for supply air and extract air, available in 10 nominal sizes.
Suitable for duct pressures up to 1000 Pa.
Ready-to-install unit consists of the casing with damper blade and rotary knob for the stepless adjustment of volume flow rates.
Spigot with lip seal, for circular connecting ducts to EN 1506 or EN 13180.
Casing air leakage to EN 1751, class C.

Special features
- Diagram with setting values on each flow adjustment damper
- Simple retrofit of an actuator is possible

Materials and surfaces
- Rotary knob, damper blade and bearings made of plastic, flame retardant (V-0) to UL 94

Galvanised sheet steel construction
- Casing made of galvanised sheet steel

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

Construction
- Galvanised sheet steel
- A2: Stainless steel

Technical data
- Nominal sizes: 80 to 250 mm
- Volume flow rate range: 9 to 615 l/s or 32 to 2215 m^3/h
- Minimum differential pressure: 20 Pa
- Maximum differential pressure: 1000 Pa

Sizing data
- $\dot{V}$ _____ _____ $[m^3/h]$
- Δp_{st} _____ _____ [Pa]

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

VFR

VFR – A2 / 160 / E01
1 2 3 4

1 Type
VFR Flow adjustment damper

2 Material
No entry: galvanised sheet steel
A2 Stainless steel

3 Nominal size [mm]
80
100
125
140
150
160
180
200
224
250

4 Actuator
No entry: manual operation
For example
E01 24 V AC/DC, 3-point, potentiometer
E03 24 V AC/DC, modulating, 0 – 10 V DC, potentiometer
M01 24 V AC/DC, 3-point, mechanical stops

Order example: VFR/160/M01

Nominal size	160 mm
Actuator	24 V AC/DC, mechanical stops

① Flow adjustment damper, variant VFR, with rotary knob

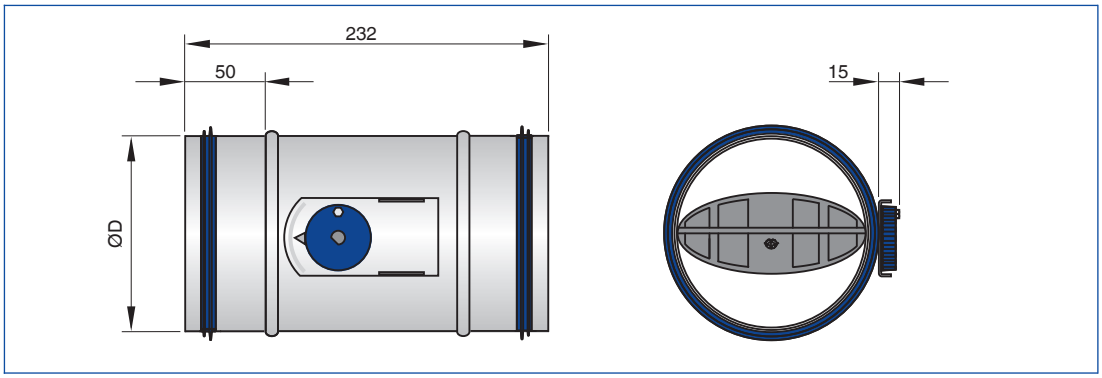
Flow adjustment damper, variant VFR, with actuator (potentiometer)

Flow adjustment damper, variant VFR, with actuator (mechanical stops)

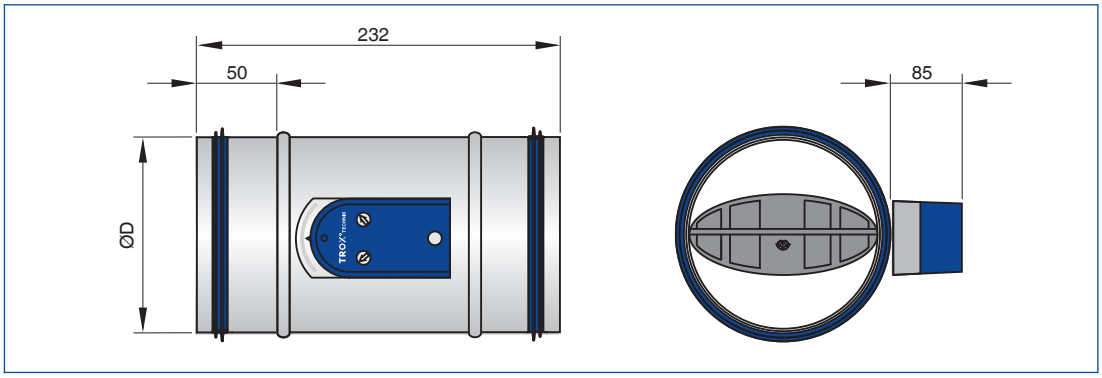
Attachments

Order code detail	Actuator	Supply voltage	Auxiliary switch
Min/Max actuators			
E01	Actuator with potentiometers TROX/Gruner	24 V AC/DC	–
E02	Actuator with potentiometers TROX/Gruner	230 V AC	–
M01	Actuator with mechanical stops TROX/Belimo	24 V AC/DC	–
M02	Actuator with mechanical stops TROX/Belimo	230 V AC	–
Modulating actuators			
E03	Actuator with potentiometers TROX/Gruner	24 V AC/DC	–

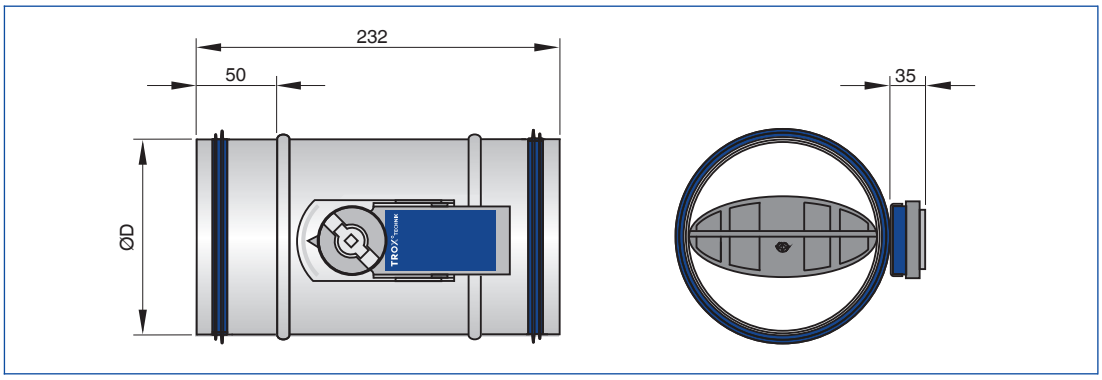
VFR



VFR/.../E0*



VFR/.../M0*



VFR

Nominal size	VFR	VFR/.../E0*	VFR/.../M0*	
	m			ØD
	kg	kg	kg	mm
80	0.5	0.8	0.7	79
100	0.6	0.9	0.8	99
125	0.7	1.0	0.9	124
140	0.8	1.1	1.0	139
150	0.8	1.1	1.0	149
160	0.8	1.1	1.0	159
180	0.9	1.2	1.1	179
200	1.0	1.3	1.2	199
224	1.2	1.4	1.4	223
250	1.3	1.6	1.5	249

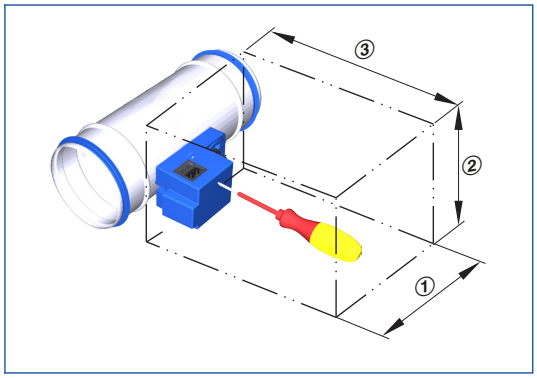
Type VFR – The System

① Flow adjustment damper VFR with rotary knob
② Actuator E0* with potentiometers
③ Actuator M0* with mechanical stops

Installation and commissioning

- Any installation orientation
- Volume flow rate setpoint can be set on external scale

Access to attachments, attached on one side



Space required

Attachments	①	②	③
	mm		
Without actuator	200	200	200
With actuator E0*	200	200	300
With actuator M0*	200	200	230

Diagram with setting values

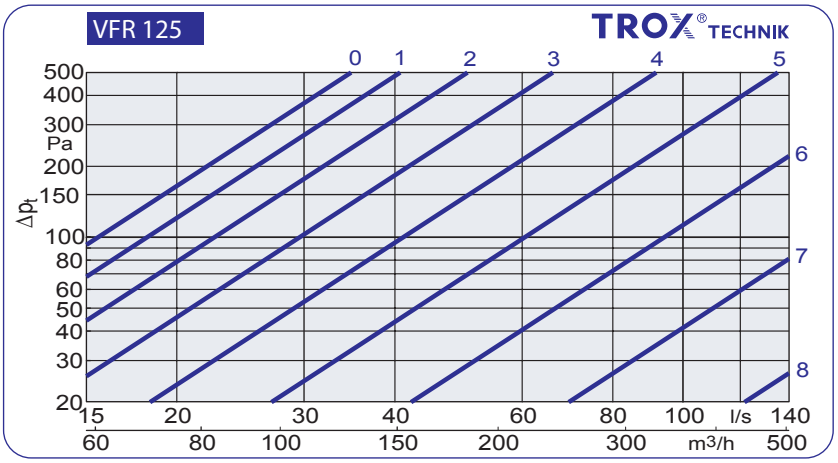


Diagram to determine the setting values on site (example for nominal size 125)

Principal dimensions

ØD [mm]
Shut-off and flow adjustment dampers made of stainless steel: Outer diameter of the connecting spigot
Shut-off dampers made of plastic: Inside diameter of the connecting spigot

$ØD_1$ [mm]
Pitch circle diameter of flanges

$ØD_2$ [mm]
Outer 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

n [ ]
Number of flange screw holes

T [mm]
Flange thickness

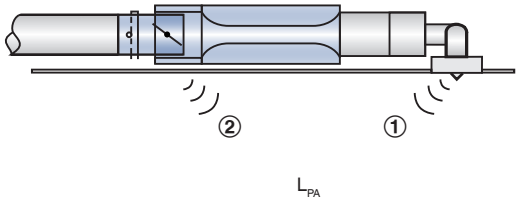
m [kg]
Unit weight including the minimum required attachments

Acoustic data

L_{PA} [dB(A)]
A-weighted sound pressure level of air-regenerated noise of the shut-off or flow adjustment damper, system attenuation taken into account

All sound pressure levels are based on 20 µPa.

Definition of noise



① Air-regenerated noise
② Case-radiated noise

Volume flow rates

$\dot{V}$ [m³/h] and [l/s]

Volume flow rate

Differential pressure

Δp_{st} [Pa]

Static differential pressure

Static differential pressure