

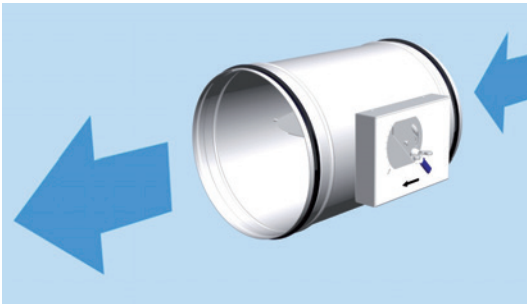


AIR TECH
SYSTEMS

Technical Brochure

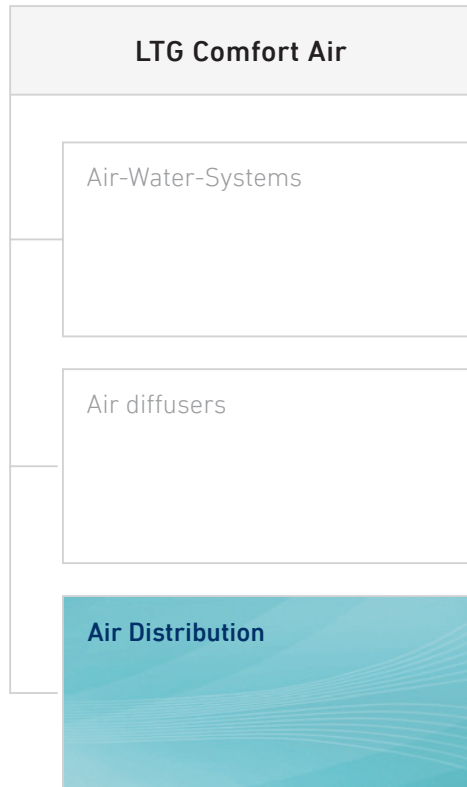
LTG Air Distribution

Constant flow rate controllers VRW



Mechanically self-operated, round

Technical brochure • Constant flow rate controllers VRW, round



Content

	Page
General description	4
Dimensions, weight	5
Technical data	7
Airborne sound transmission	8
Sound emission (casing radiated noise)	9
Installation, nomenclature, ordering code	10

Notes

Dimensions stated in this brochure are in mm.

Dimensions stated in this brochure are subject to General Tolerances according to DIN ISO 2768-vL. Possible additional details are stated in the drawings.

Straightness and twist tolerances according to DIN EN 12020-2.

The actual tender documents are available as a word document at your local distributor or at www.LTG.net.

LTG planning tools – we support you!

Visit the download area on our website www.LTG.net with helpful tools, such as dimensioning programs, streaming videos and product information!

Also available: Our product overviews about air diffusers, air-water systems and air distribution products.

DOWNLOADS

ProductNavigator & DocumentFinder



ProductNavigator
Please choose your desired product.



DocumentFinder
Please choose your desired type of documents.

Technical brochure • Constant flow rate controllers VRW, round

Flow Rate Control Basics – Which Product for which Application?

Plant Types

Variable Flow Rate V

In Anlagen mit variablem Volumenstrom (VVS) arbeiten elektronische Volumenstromregler, die jeden Raum exakt mit der Luftmenge versorgen, die er benötigt – bedarfsgerecht und energieeffizient.

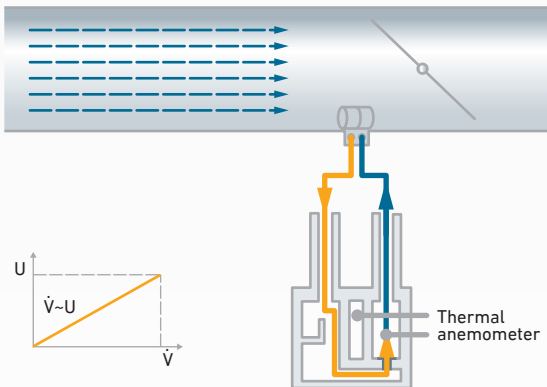
Constant Flow Rate

Units with constant flow rates (KVS) use flow rate controllers maintaining a constant flow rate mechanically self-operated. Working with no wiring or external power supply, they provide convenient and cost-saving solutions.

Measuring Methods

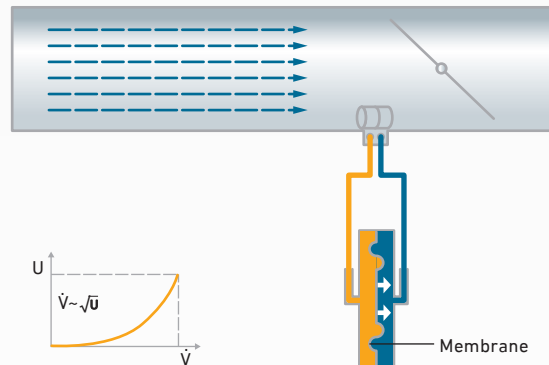
Dynamic Differential Pressure Management

Dynamic methods measure part of the air that is guided through the differential pressure transducer. Dynamic differential pressure measuring makes economical sense in plants where no dust and/or chemical pollution of the air is expected, potentially leading to the contamination of sensors (e. g. administration and office buildings, museums, etc.).



Static Differential Pressure Management

Static differential pressure measurement uses a diaphragm pressure transducer. With this method, no air is guided through the sensor, so no dust or chemical pollution by the air is possible and hence, may well be used in such environments.

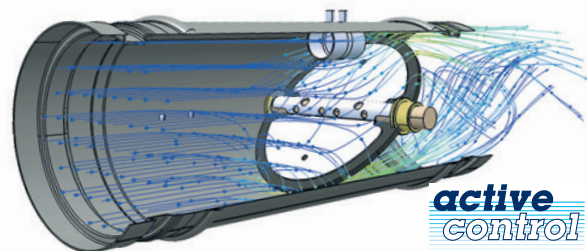


Both principles are applied in our products of VR... series: VR*active* (dynamic) and VR*active-s* (static).

LTG Map Control.

Differential pressure + Damper setting = Flow rate

Contrary to common measuring techniques, the differential pressure is not measured using an upstream element such as orifice plate or differential pressure sensor. Flow rate controllers VR*active* measure the differential pressure directly in the damper blade area (stronger signal due to locally accelerated air flow).



Locally accelerated air flow
at the measuring point

Technical brochure • Constant flow rate controllers VRW, round

View of unit



Application

Mechanically self-operated control of a constant air flow rate, i.e. without external power supply, pressure independent. Used in round air supply and discharge ducts in ventilation and air-conditioning systems.

Function

The aerodynamic forces acting on the damper blade are equalised using the control device after it has been set to the required value.

Mechanical flow rate controllers do not need any external energy sources; the required flow rate is easily set using a lever with indicator and scale.

An actuator is optionally available for remote adjustment of the required flow rate. The actuator operates in this case the lever that sets the target value.

Conditions for operation as authorised

- Max. air speed 12.7 m/s
- Max. pressure in the air duct 1000 Pa
- Air flow evenly spread over the entire casing cross-section
- No abrasive, adhesive or chemical constituents in the air
- Temperature in the air duct between
0...70 °C (version with manual adjustment)
0...50 °C (version with actuator)
- Surroundings without condensation, icing, ice formation, and without water even from sources other than rain as per EN 60 72133 Amendment A2

The flow rate controllers are protected against the effect of weather to climate classification class 3K5.

Design, constructional features

The flow rate controller consists of

- Casing
- Damper blade
- Control device with spring, vibration absorber, and cap with scale for setting the required values, scale accuracy approx. $\pm 5\%$.

Standard

- Plug-in end pieces with lip seal
- Casing Galvanized sheet steel (1 mm)
- Control device Galvanized sheet steel
- Damper blade Aluminium sheet
- Axle, sleeve, spring Stainless steel, axle in a casing of stainless steel steel (resp. bronze)
- Sealing Rubber
- Casing leakiness Class C acc. to DIN EN 1751
- Flow rate 50...4500 m³/h
- Max. air speed 12.7 m/s
- Max. pressure in the air duct 1000 Pa
- Control accuracy $\pm 10\% \dots \pm 20\%$ of set value

Accessories, special versions

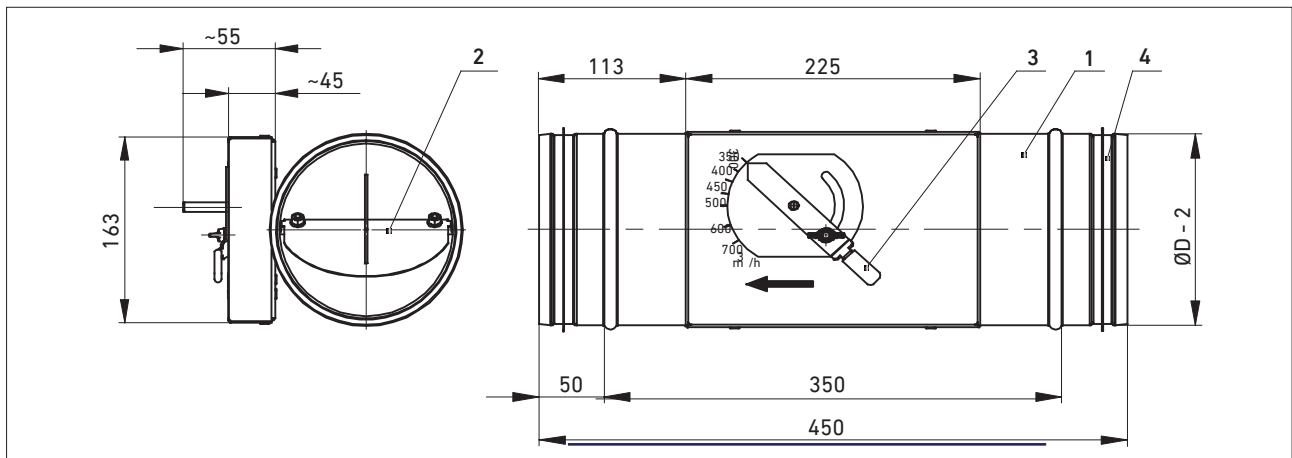
- Stainless steel
- 50 mm thick insulating case of mineral wool as per DIN 4102, material class A2, non-combustible, density 25 kg/m³
- Coated casing
- Plug-in end piece without lip seal
- Flanges on both sides
- Actuator
- Flexible silencer SDE-AO of aluminium
- Rigid silencer SDE-SO of galvanised sheet steel

Technical brochure • Constant flow rate controllers VRW, round

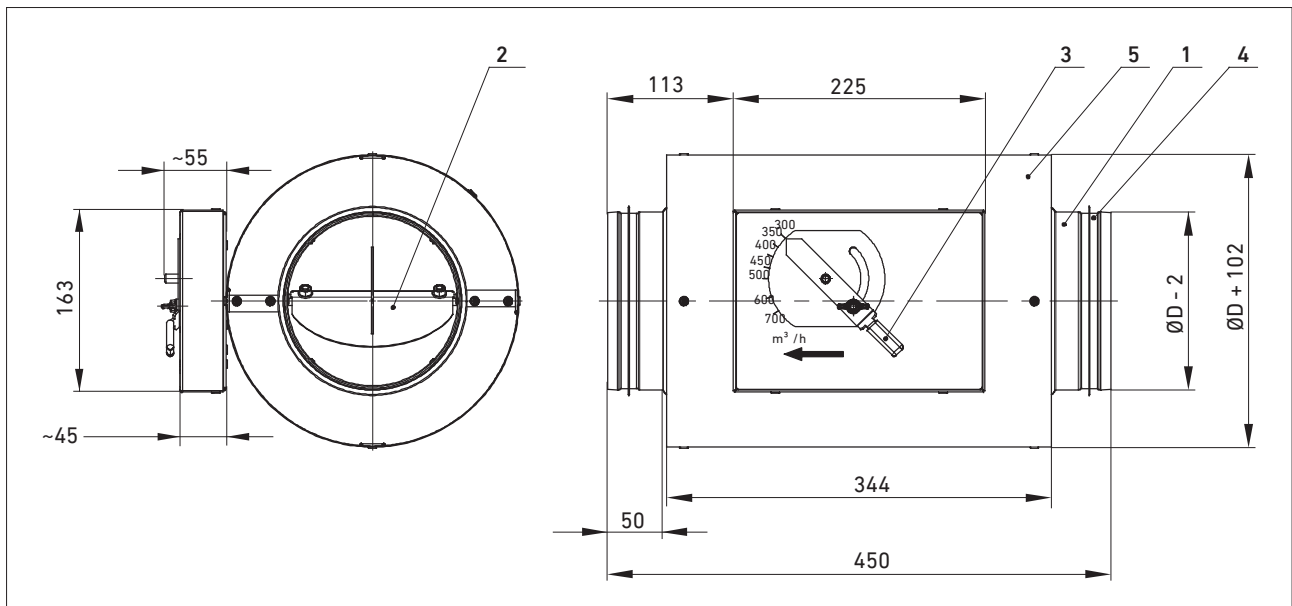
Dimensions, weight (version with manual adjustment)

Nominal size ØD [mm]	Weight [kg]	
	without insulating case	with insulating case
400	6.7	10.3

Type VRW/2/.../-/..., without insulating case



Type VRW/2/.../D/..., with insulating case



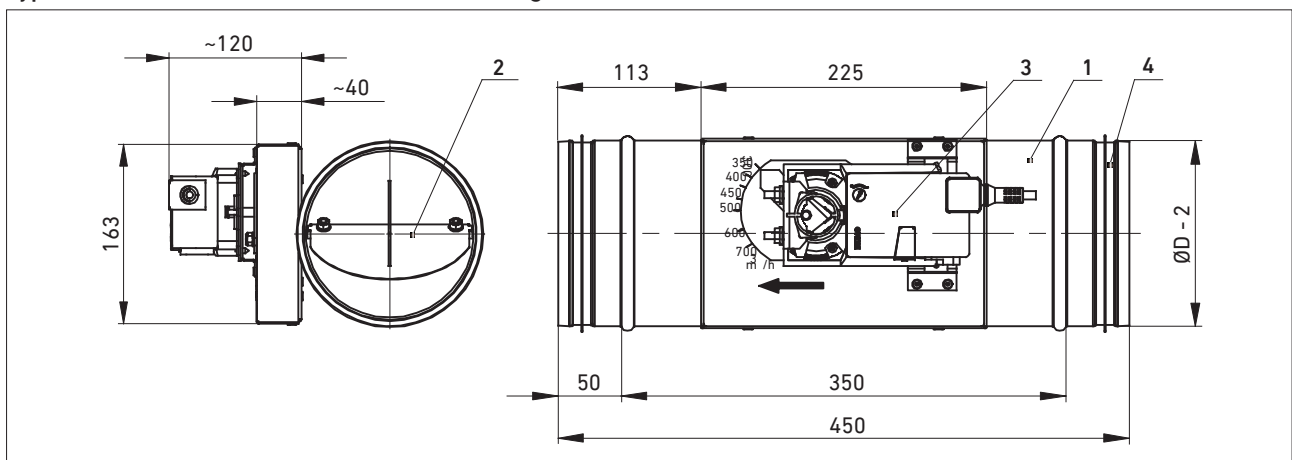
- 1 Casing 2 Damper blade 3 Lever 4 Lip seal 5 Insulating case

Technical brochure • Constant flow rate controllers VRW, round

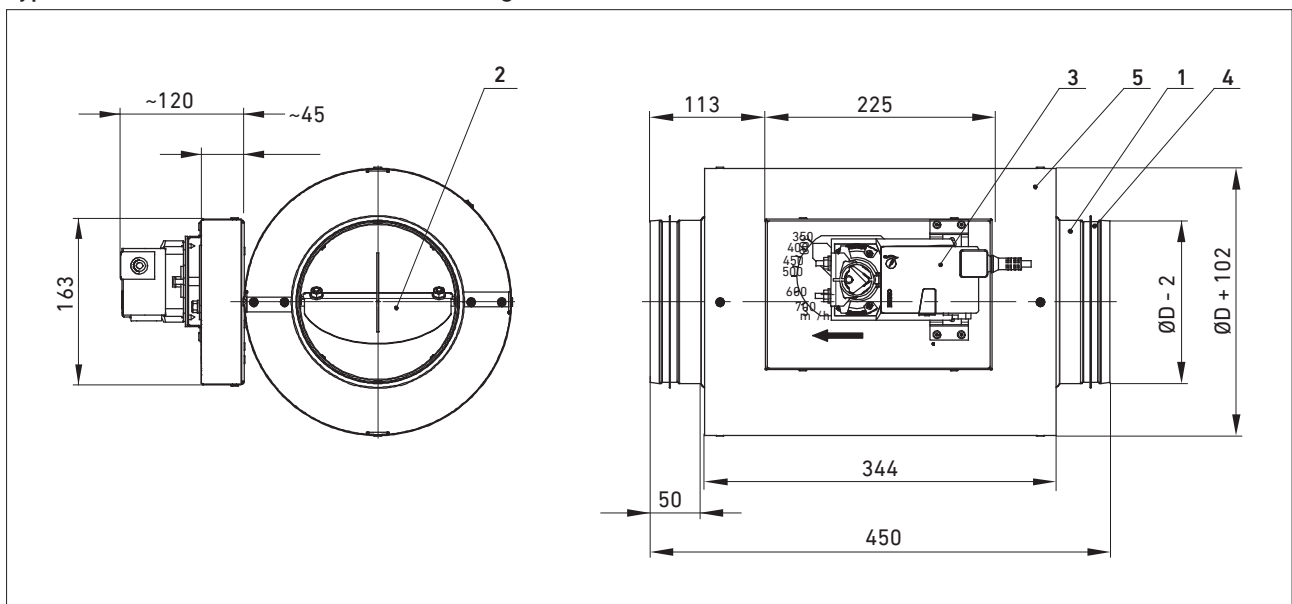
Dimensions, weight (with actuator)

Nominal size ØD [mm]	Weight [kg]		Actuator
	Without insulating case	With insulating case	
400	8.9	11.2	NM 24A

Type VRW/2/.../.../.../...M24A/..., without insulating case



Type VRW/2/.../.../.../...M24A/..., with insulating case



- 1 Casing 2 Damper blade 3 Actuator 4 Lip seal 5 Insulating case

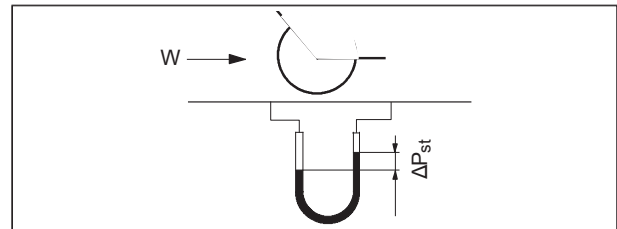
Technical brochure • Constant flow rate controllers VRW, round

Technical data

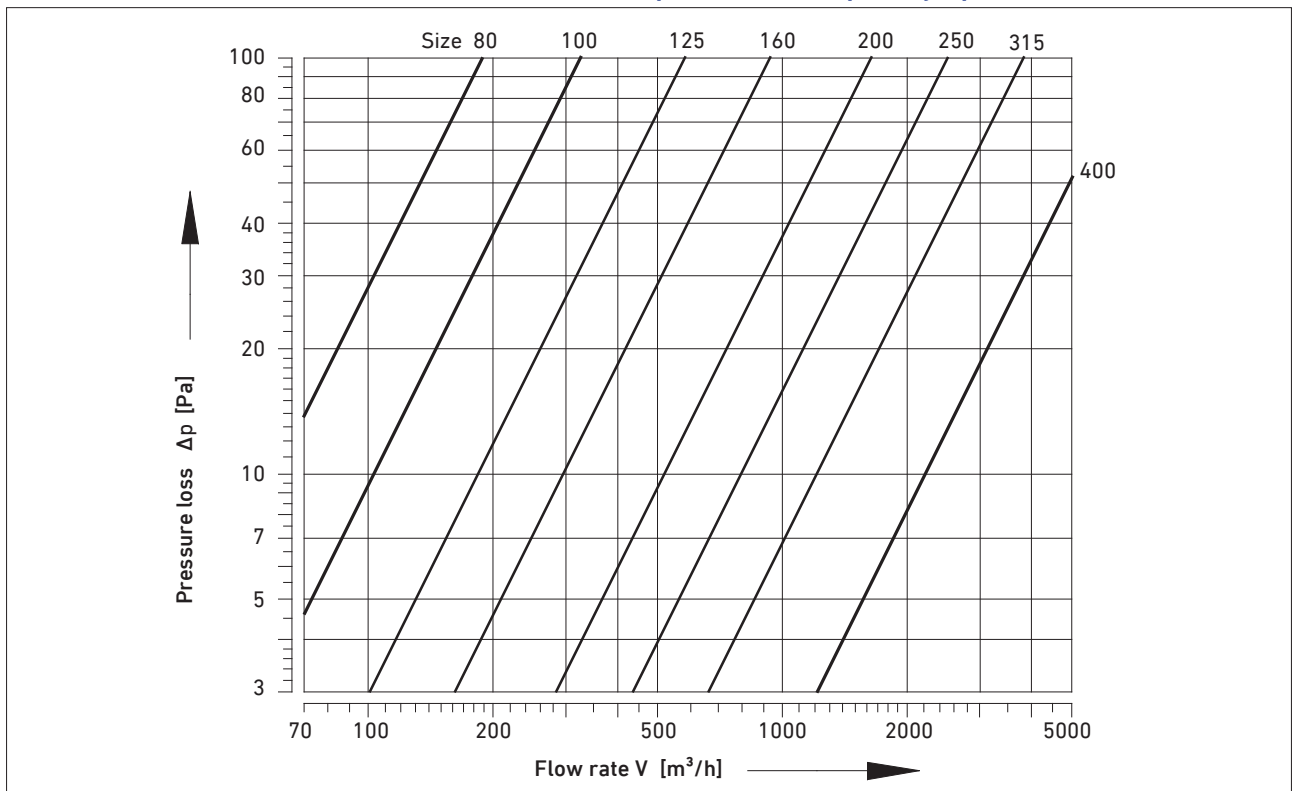
Nominal size ØD [mm]	Flow rate [m ³ /h]	Max. control error ± [%] *	Min. pressure difference Δp_{st} [Pa]
400	1200 (min)	12	50
	2000	10	70
	3000	10	80
	4500 (max)	10	90

Pressure difference at the flow rate controller

- * At pressure differences of ≤ 100 Pa or ≥ 500 Pa, greater divergences are possible.



Pressure losses of flow rate controller with damper blade completely opened



Technical brochure • Constant flow rate controllers VRW, round

Airborne sound transmission

Nominal size ØD	Flow rate [m³/h]	Pressure difference Δp _{st} [Pa]																											
		100									250									500									
		Octave power level L _W [dB/Octave]								Sum sound power level L _{WA} A-weighted [dB(A)]	Octave power level L _W [dB/Octave]								Sum sound power level L _{WA} A-weighted [dB(A)]	Octave power level L _W [dB/Octave]								Sum sound power level L _{WA} A-weighted [dB(A)]	
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz		
400	1200	67	58	54	51	52	48	41	30	56	73	64	58	58	60	57	50	37	64	79	70	65	66	68	62	53	42	71	
	2300	70	62	58	54	55	51	45	33	59	75	67	63	61	62	58	50	38	66	83	74	70	68	69	65	58	47	73	
	3400	73	65	60	57	58	53	49	36	62	77	69	66	63	65	59	51	41	68	86	76	73	70	71	66	59	48	75	
	4500	76	68	64	60	59	55	51	39	64	81	74	70	66	65	61	56	44	70	88	81	77	73	72	68	64	51	77	

Technical brochure • Constant flow rate controllers VRW, round

Sound emission (casing radiated noise)

Nominal size ØD	Flow rate [m ³ /h]	Sum sound power level L _{WA} A-weighted [dB(A)]					
		without insulating case			with insulating case		
		Pressure difference Δp_{st} [Pa]			Pressure difference Δp_{st} [Pa]		
		100	250	500	100	250	500
400	1200	42	50	57	22	28	32
	2300	47	54	60	27	33	37
	3400	51	57	62	33	39	43
	4500	55	60	64	36	42	46

Technical brochure • Constant flow rate controllers VRW, round

Installation

The flow rate controllers must be mounted in consideration of and compliance with general rules of engineering, relevant regulations and mandatory construction supervision provisions.

Mounting consists of installation of the flow rate controller into the air piping system and, where applicable, electrical connection of the actuator.

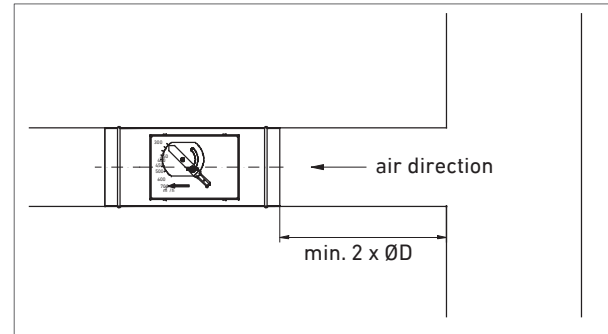
The flow rate controller can be installed with horizontal or vertical valve axis in vertically and horizontally routed air ducts.

During mounting, the flow direction must match the arrow on the casing.

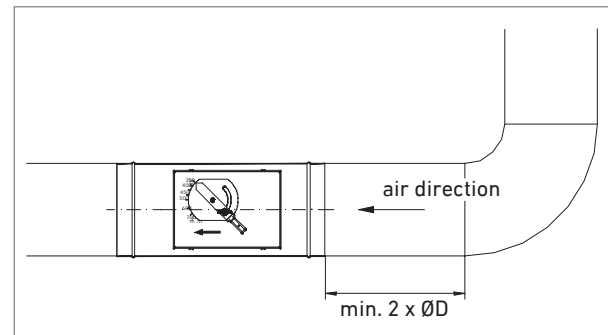
Mounting must not result in any deformations of the casing.

To ensure correct operation of the flow rate controller, the air flow must be spread evenly over the damper blade.

The spacing of shaped parts (bend, branch etc.) must be at least $2 \times \text{ØD}$.



Recommended distance to a branch



Recommended distance to a bend

Nomenclature, ordering code







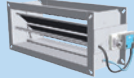
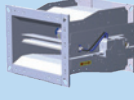
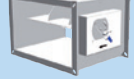
VRW / 2 / 400 / S / D / L / - /-....

(1) (2) (3) (4) (5) (6) (7) (8)

(1) Series	VRW	= constant flow rate controller, round
(2) Type	2	= new standard from 2017
(3) Nominal size	400	= 400
(4) Design	S	= galvanised steel
	E2	= stainless steel V2A
	E4	= stainless steel V4A
	K	= coated (casing only, polyester powder coating RAL 9010)
(5) Insulating case	-	= without insulating case (standard)
	D	= with insulating case
(6) Connection	L	= plug-in end pieces with lip seal (standard)
(7) Actuator	-	= without actuator (standard)
	.M24A	= with actuator Belimo LM24A or NM24A, 24 V AC/DC, 2 target values
	.M24A-S	= with actuator Belimo LM24A-S or NM24A-S, 24 V AC/DC, 2 target values, position feedback
	.M24A-SR	= with actuator Belimo LM24A-SR or NM24A-SR, 24 V AC/DC, continuous activation of target values DC (0)2...10 V
	.M230A	= with actuator Belimo LM230A or NM230A, 230 V AC/DC, 2 target values
	.M230A-S	= with actuator Belimo LM230A-S or NM230A-S, 230 V AC/DC, 2 target values
(8) Setting range-....	= Flow rate range [m ³ /h]-[m ³ /h]

Product Overview • LTG Air Distribution

Flow rate controllers

Round		Square	
Variable		VREactive	LTG Map Control System <i>ActiveControl</i> ; highest precision, short installation length
		VRDactive	
		VRE	To combine with customized drives; VRE also available in PPs
		VRD	
Constant		VRW	Without external power supply, pollution-insentive
		VRZ	
Variable		VRFactive	LTG Map Control System <i>ActiveControl</i> ; highest precision, short installation length
		VRFvent	LTG control principle- <i>VenturiControl</i> ; high precision with low pressure loss, to combine with customized drives
		VRX	Without external power supply, pollution-insentive

All variable controllers are available with dynamic or static measuring principle

Pressure controllers

Round	Square
 <p>DRE DREactive</p> <p>To balance extreme pressure level differences; optionally with flow rate measuring</p>	 <p>DRF DRFactive</p> <p>To balance extreme pressure level differences; optionally with flow rate measuring</p>

Shut-off units

Round	Square
 <p>KLB</p> <p>Ultra-tight shut-off damper</p>	 <p>ARF</p> <p>Air-tight shut-off damper</p>
 <p>ARE</p> <p>Air-tight shut-off damper</p>	

Air-tight shut-off according to DIN EN 1751: Class 4

Engineering Services



LTG Engineering Services Comfort Air Technology

Portfolio



For our complete portfolio of air distribution products with suitable accessories see www.ltg.de/en/products-services/ltg-comfort-air-technology/air-distribution/



**AIR TECH
SYSTEMS**

Comfort Air Technology

Air-Water-Systems
Air Diffusers
Air Distribution

Process Air Technology

Fans
Filtration Technology
Humidification Technology

Engineering Services

Laboratory Test / Experiment
Field Measurement / Optimisation
Simulation / Expertise
R&D / Start-up

LTG Aktiengesellschaft

Grenzstraße 7
70435 Stuttgart
Germany
Tel.: +49 711 8201-0
Fax: +49 711 8201-720
info@LTG.net
www.LTG.net

LTG Incorporated

105 Corporate Drive, Suite E
Spartanburg, SC 29303
USA
Tel.: +1 864 599-6340
Fax: +1 864 599-6344
info@LTG-INC.net
www.LTG-INC.net