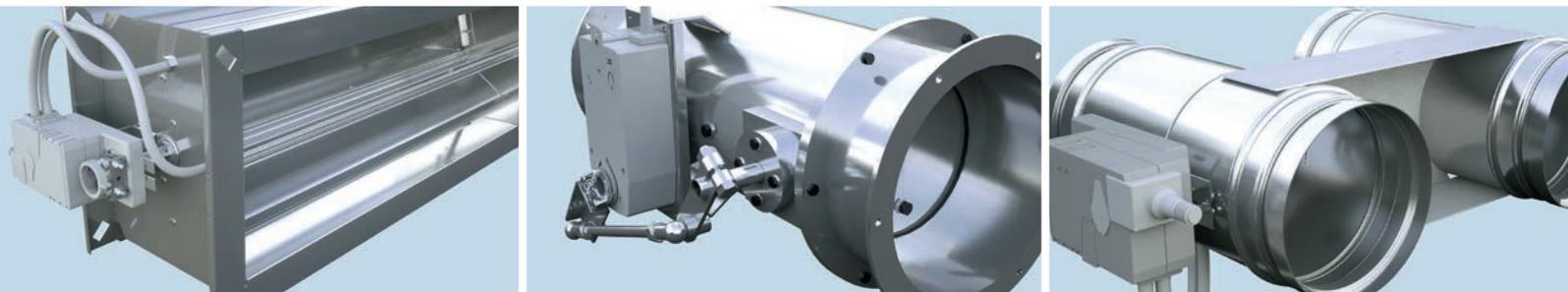




**AIR TECH  
SYSTEMS**

**Product Overview**

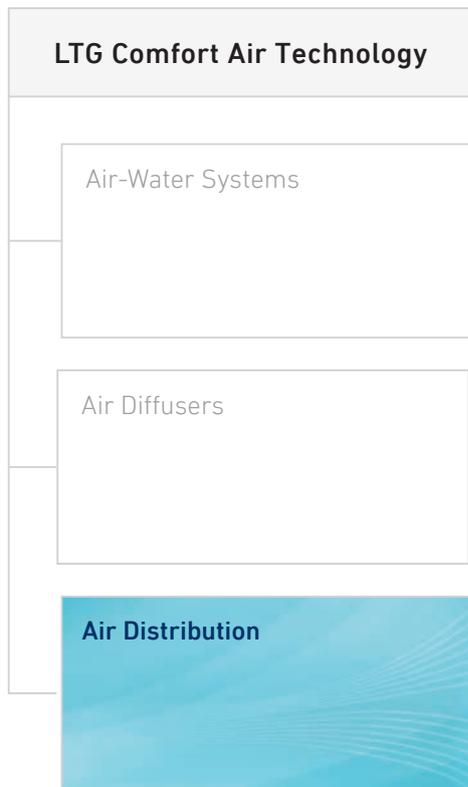
# LTG Air Distribution



High-quality air flow control components with innovative technology.  
Unsurpassed in control precision and energy efficiency.

# LTG Aktiengesellschaft

Innovative Solutions for Humans and Products.



## LTG air distribution products meet highest standards for quality and efficiency.

For almost 90 years, LTG has pioneered air and climate technology, always a step ahead with trailblazing innovations. When it is crucial to achieve ideal environmental conditions for people and processes, LTG creates inspiring, tailor-made comfort air technology solutions: These include products for air distribution (flow rate and pressure controllers as well as shut-off valves), air diffusers and air-water systems (such as induction units and fan coil units).

Air distribution products are essential for the economic and efficient operation of air conditioning and ventilation systems. They ensure optimum distribution of supply and return air while controlling and adjusting the air flow between the central AHU and space. LTG flow rate and pressure controllers function effectively, even at low air speeds, with minimum space requirement and with advanced control concepts such as ventilation on demand or hybrid ventilation.

# LTG Air Distribution

## Product Overview

### Flow Rate Controllers

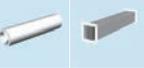
		Round		Square				
Variable		VRE <i>active</i>	LTG Map Control System ActiveControl. Highest precision, short installation length		VR <i>Factive</i>			
		VRD <i>active</i>			page 8			
		VRE	To combine with customized drives; also available in PPS		VRF			
		VRD			page 11			
Constant		VRW	Without external power supply, pollution-insensitive	page 12		VRX	Without external power supply, pollution-insensitive	page 12

All variable flow rate controllers are available with dynamic or static measuring principle.

### Pressure Controllers

		Round	Square
	DRE	To balance extreme pressure level differences	page 13
	DRF	To balance extreme pressure level differences	page 13

### Special Products

	SDE/SDF	Inline, cross-talk, and splitter silencers	pages 9 / 11
	VRC+NE	Variable flow rate controller with silencer and reheating register	page 11
	VRW-A	Constant control and shut-off unit	page 12
	KLB	Ultra-tight shut-off damper (airtight acc. to DIN EN 1751: Class 4)	page 14
	ARE/ARF	Airtight shut-off damper (airtight acc. to DIN EN 1751: Class 4)	page 14

### Engineering Services

	LTG Engineering Services Comfort Air Technology	page 15
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# Best Air Conditioning Solution for any Room Situation

LTG Aktiengesellschaft is your reliable partner in the area of room air technology. We lay the foundations for perfect room climate with innovative and unique solutions such as flow rate controllers with map control and enhanced differential pressure (System ActiveControl). LTG will provide access to our specialist know-how from the first request to detailed planning.



In the VDI 3804 all essential ventilation and air condition concepts are compared. To VDI 3804 's development LTG Aktiengesellschaft essentially contributed. On this basis, we offer high-performance products for any requirement and installation situation. These include air-water systems, air diffusers or air distribution components. LTG engineering services provide you with decades of expert know-how in comfort air and process air technology, as well as a state-of-the-art lab. We will gladly support you in selection of the best system. Contact us!

## LTG planning tools – we support you!

**Ask for your own DVD** with helpful tools, such as dimensioning programs, streaming videos and product information! Also available: our product overviews about air diffusers and air distribution products.

Visit us on [www.LTG-AG.com](http://www.LTG-AG.com) and get detailed technical information as PDF files at „Download“.



# Flow Rate Control Basics – Which Product for which Application?

## Unit Types

### Variable Flow Rate

Units with variable flow rates (VVS) use electronic flow rate controllers providing the room with exactly the required air volume – according to function and energy efficiency. See pages 8-11 for products to control variable air volumes.

### Constant Flow Rate

Units with constant flow rates (KVS) use flow rate controllers maintaining a constant flow rate mechanically system-powered. Working with no wiring or external power supply, they provide convenient and cost-saving solutions. See page 12 for products to control constant air volumes.

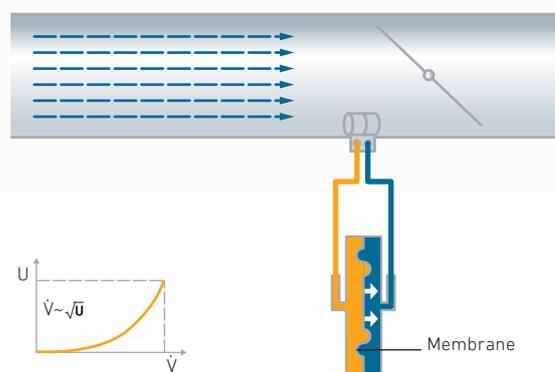
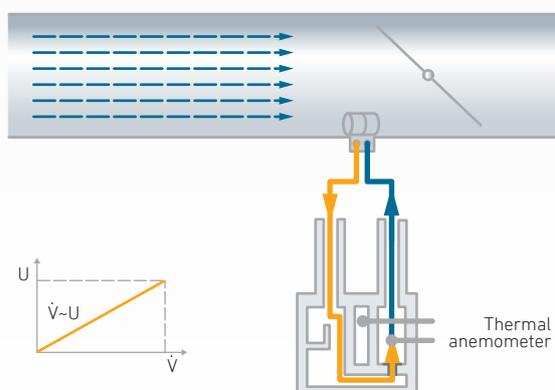
## Measuring Methods

### 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.

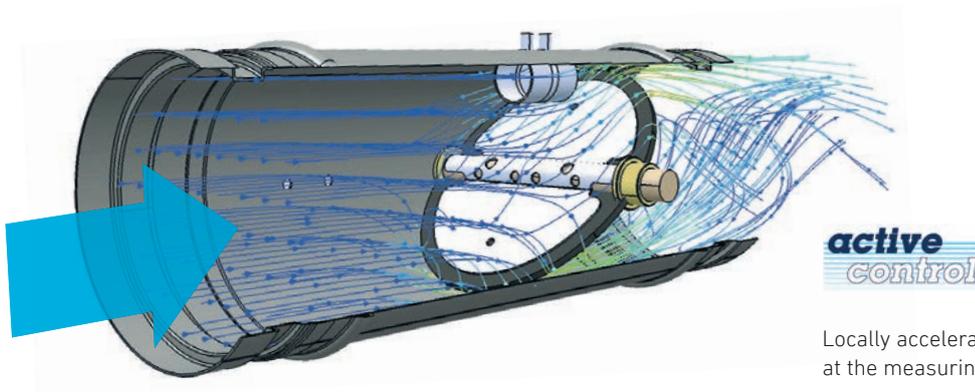


Both principles are applied in our products of VR... series: VR*active* (dynamic) and VR*active-s* (static).

## Unique and Brilliant – LTG Map Control

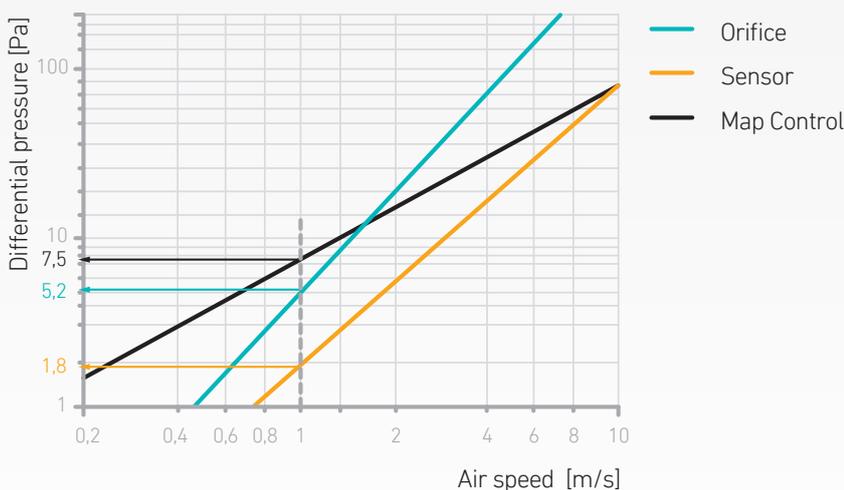
Differential pressure + Damper setting = Flow rate

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 *VREactive* and *VRFactive* 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

### Enhanced differential pressure in low air speed ranges



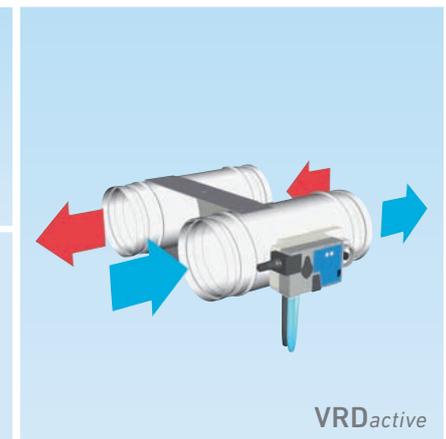
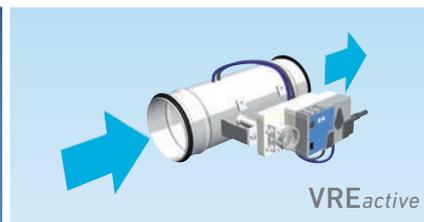
This measuring technique provides the most precise measurements among all known systems in low air speed ranges.

- Measuring element at damper blade: **Extremely short installation length** (refer to pages 9/10)
- **Minimum pressure loss** due to small differential pressure element
- **Entryflow-insensitive** due to optimized air flow bias to the measuring element
- **Max. 5 % deviation** from  $\cdot V_{nenn}$  across the entire control range 1:10

Variable Flow Rate Controllers with LTG Map Control



# VREactive / VRFactive / VRDactive



Variable Flow Rate Controllers of VR*active* series are designed for supply pressure-independent control of constant or variable air flows. For dynamic (VR*active*) and static (VR*active*-s) measuring.

## Advantages

**Optimum use** of your plant's energy-saving potential

**Highest precision** of all known measuring systems due to LTG map control

**Manages even lowest air speeds** due to enhanced differential pressure

One system for **round and rectangular ducts**, available with **dynamic or static** measuring principle

**Easy integration** due to entryflow-insensitivity and very short installation length

Optimized design with **particularly airtight closure**

## Product Data

Product Data		VREactive	VRFactive	VRDactive
<b>Features / Use</b>		Highest precision	Highest precision	2 dampers for supply / return air control in parallel air ducts (e.g. hotel rooms)
<b>Measuring principle</b>		<input checked="" type="checkbox"/> dynamic (for non-polluted air) <input type="checkbox"/> static (for polluted air) <sup>1)</sup>		
<b>Design</b>		round	rectangular	round
<b>Version</b>	<b>Galvanized steel</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>Coated</b>	<input type="checkbox"/>	<input type="checkbox"/>	—
	<b>Stainless steel</b>	<input type="checkbox"/>	<input type="checkbox"/>	—
<b>Sizes [mm]</b>		∅ 100 to 400	200x100 to 1200x400	∅ 100 to 200
<b>Installation length* [mm]</b>		195 to 355	135 to 420	195 to 215
<b>Flow rate range [m<sup>3</sup>/h]</b>		27 to abt. 4500	72 to abt. 17 300	27 to abt. 1100
<b>Control ratio <math>\dot{V}_{max} : \dot{V}_{min}</math></b>		10:1		
<b>Differential pressure range [Pa]</b>		up to 1000		
<b>Box leakage</b> acc. to DIN EN 1751		<input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class C	<input checked="" type="checkbox"/> Class C	<input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class C
<b>Airtight shut-off</b> acc. to DIN EN 1751		<input checked="" type="checkbox"/> Class 4 (DN 100 + 125: Class 3)	<input checked="" type="checkbox"/> Class 4 (200 x 100: Class 3)	<input checked="" type="checkbox"/> Class 4 (DN 100 + 125: Class 3)
<b>Deviation</b>		max. 5% of $\dot{V}_{nenn}$		
<b>Input / control signal</b>	<b>analog</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>digital (Bus)</b>	<input type="checkbox"/> MP <input type="checkbox"/> LON	<input type="checkbox"/> MP <input type="checkbox"/> LON	<input type="checkbox"/> MP <input type="checkbox"/> LON
<b>Insulated case</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Silencer</b>		<input type="checkbox"/> SDE	<input type="checkbox"/> SDF	<input type="checkbox"/> SDE
<b>Manual Operation</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Standard   
  optional   
 — not available

\* Only one length per nominal width available

1) VRactive-s



### Selection Guide

The right flow rate controller – quick and easy. Simply select the right model size from each table based on diameter, shape (rectangular or round) and required flow rate.

#### Rectangular

$\dot{V}$  [m³/h] at 5 m/s

Height [mm]	400			2880	3600	4320	5760	7200	8640	Length [mm]
	300		1385	2160	2700	3240	4320	5400		
	250		1350	1800	2250	2700	3600			
	200	720	1080	1440	1800	2160	2880			
	150		810	1080	1350	1620				
	100	360	540	720	900	1080				
		200	300	400	500	600	800	1000	1200	
Width [mm]										
$\dot{V}_{\min} = 0,2 \times \dot{V}$										
$\dot{V}_{\text{nenn}} = \dot{V}_{\max} = 2 \times \dot{V}$										

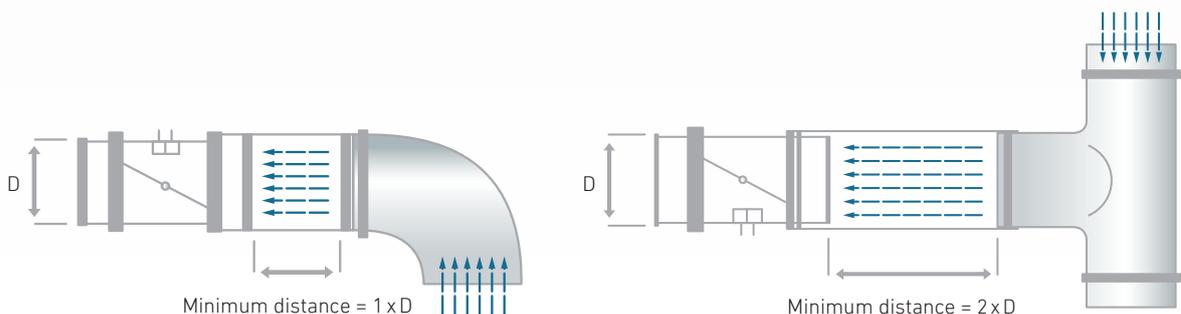
#### Round

$\dot{V}$  [m³/h] at 5 m/s

Nominal width [mm]	400	2240	315
	315	1385	260
	250	870	260
	200	554	215
	160	353	215
	125	214	195
	100	136	195
Length [mm]			
$\dot{V}_{\min} = 0,2 \times \dot{V}$			
$\dot{V}_{\text{nenn}} = \dot{V}_{\max} = 2 \times \dot{V}$			

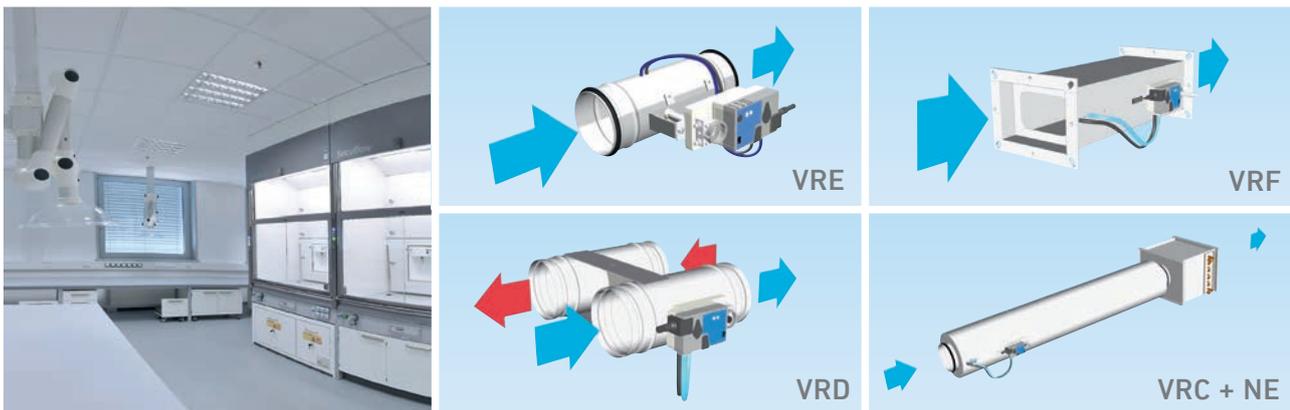
### Required straight inflow distances

A straight, undisturbed inflow distance of at least 1 x D in front of the flow rate controller is required. There are, however, no restrictions regarding the outflow side. Please ensure a perfect positioning of the measuring nipples with respect to the air flow. Avoid turbulent air flow and short radius bends or T-branches before the damper. Given control accuracy applies to straight inflow. Fittings as bends, T-branches or changes of cross-section cause turbulent air flow that may influence the measurement.



## Variable Flow Rate Controllers

## VRE / VRD / VRF / VRC+NE



With VRE, VRD and VRF flow rate controllers, both constant and variable flow rate control are easy. Type VRC + NE additionally includes a reheating feature. All controllers are suitable for use in polluted or chemically laden environments.

## Advantages

Possible **combination with spring return or high-speed drives**

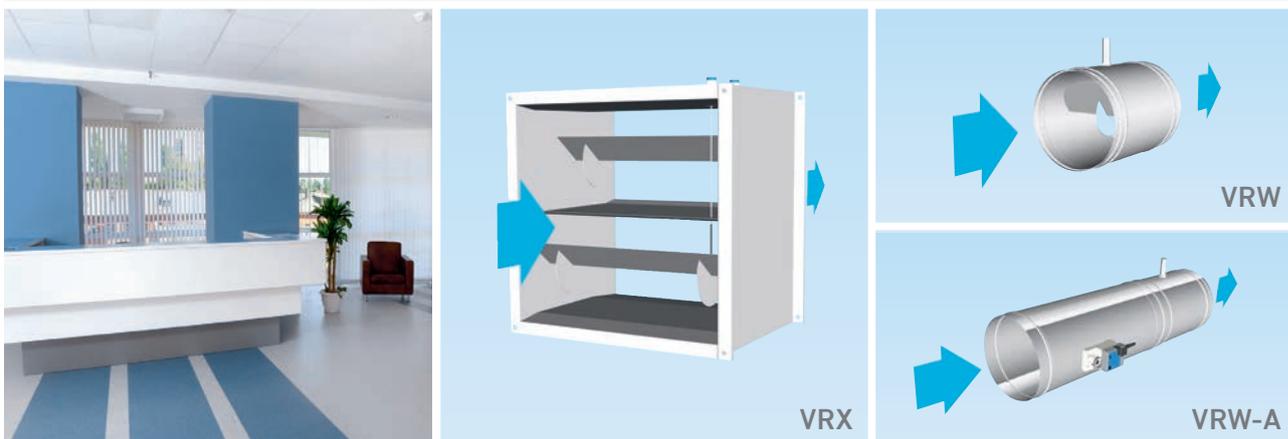
**Corrosion resistant** versions available

Product Data	VRE / VRD	VRF	VRC+NE
<b>Sizes</b> [mm]	ø 100 to 630 (200 for VRD)	200 x 140 to 800 x 400	VRC: ø 125 to 250 NE: ø 125 to 250
<b>Version</b>	Galvanized steel, coated, stainless steel, or PPS		Galvanized steel
<b>Silencer</b>	<input type="checkbox"/> SDE	<input type="checkbox"/> SDF	<input checked="" type="checkbox"/>
<b>Measuring principle</b>	<input checked="" type="checkbox"/> dynamic (for non-polluted air) <input type="checkbox"/> static (for polluted air)		
<b>Flow rate range</b> [m <sup>3</sup> /h]	19 to abt. 11 200 (ca. 1100 for VRD)	70 to abt. 11 500	30 to abt. 1750
<b>Diff. pressure range</b> [Pa]	up to 1000		
<b>Box leakage</b> acc. to DIN EN 1751	<input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class C	<input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class C	<input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class C
<b>Airtight shut-off</b> acc. to DIN EN 1751	<input checked="" type="checkbox"/> Class 4 (DN 100 + 125: Class 3)	Class 3	<input checked="" type="checkbox"/> Class 4 (DN 100 + 125: Class 3)

Standard     optional

Constant Flow Rate Controllers (mechanically self-operated)

# VRX / VRW / VRW-A



The mechanically self-operated flow rate controllers VRW, VRX, and VRW-A (with shut-off feature) are designed for supply pressure-independent constant flow rate control without external power supply (except VRW-A shut-off damper option).

## Advantages

Flow rate control without external power supply – **no wiring required**

**Maximum flexibility** – free setting of flow rates

Insensitive to dust or environmental influences – **maintenance-free with reliable precision control**

Product Data	VRW	VRX	VRW-A
<b>Sizes</b> [mm]	ø 80 to 400	200x100 to 600x600	ø 100 to 400
<b>Version</b>	Galvanized steel		
<b>Silencer</b>	<input type="checkbox"/> SDE	<input type="checkbox"/> SDF	<input type="checkbox"/> SDE
<b>Flow rate range</b> [m <sup>3</sup> /h]	40 to 4000	200 to 13000	70 to 4000
<b>Airtight shut-off</b> acc. to DIN EN 1751	—	—	Class 4 (DN 100 + 125: Class 3)
<b>Box leakage</b> acc. to DIN EN 1751	<input checked="" type="checkbox"/> Class C	<input checked="" type="checkbox"/> Class C	<input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class C

Special versions upon request.

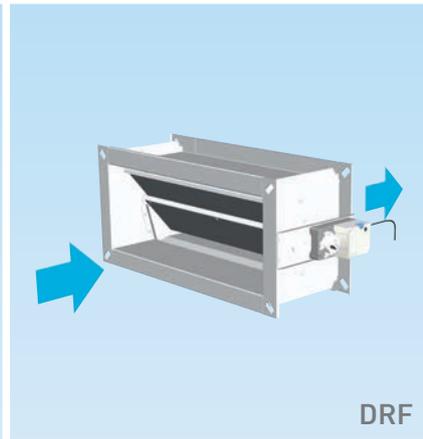
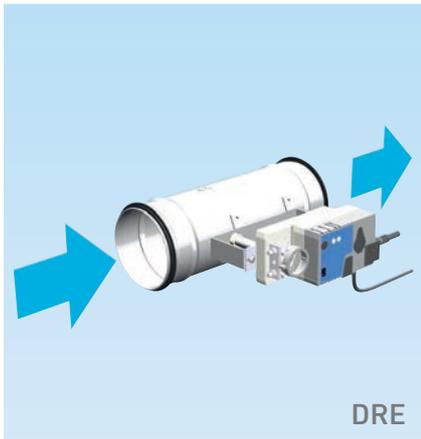
Standard

optional

— not available

Pressure Controllers

# DRE / DRF



Pressure controllers DRE and DRF are designed to maintain a required constant pressure inside a room or supply air/return air duct. Both are suitable for use with polluted or chemically laden air.

## Advantages

**Optimum use of your plant's energy-saving potential** by reducing required pressures

**Reduction of control expenditures**

Possible **combination of spring return / high-speed drives**

Optional with additional **flow rate measurement**

## Product Data

	DRE	DRF
<b>Sizes [mm]</b>	ø 100 to 400	200 x 100 to 1200 x 400
<b>Version</b>	Galvanized steel, coated, stainless steel or PPS	
<b>Silencer</b>	<input type="checkbox"/> SDE	<input type="checkbox"/> SDF
<b>Diff. pressure range [Pa]</b>	up to 1000	
<b>Airtight shut-off</b> acc. to DIN EN 1751	<input checked="" type="checkbox"/> Class 4 (DN 100 + 125: Class 3)	<input checked="" type="checkbox"/> Class 4 (200 x 100: Class 3)
<b>Measuring principle</b>	<input checked="" type="checkbox"/> dynamic (for non-polluted air) <input type="checkbox"/> static (for polluted air)	

Special versions upon request.

Standard     optional

Shut-off Dampers

# KLB and ARE / ARF



The ultra-tight shut-off damper and the air-tight shut-off dampers ARE und ARF ensure reliable and airtight shut-off of air flows.

## Advantages

**Meets highest sanitation standards** such as the ones required in clean-rooms and hospitals

**Performance:** Blade positive seal – seals more effectively as pressure increases (KLB)

**Corrosion resistant** due to version of galvanized or stainless steel

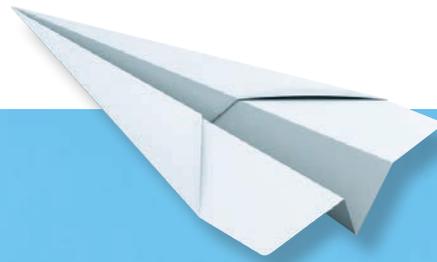
## Product Data

	KLB	ARE	ARF
<b>Sizes [mm]</b>	ø 224 to 1000	ø 100 to 630	200 x 100 to 1200 x 400
<b>Version</b>	Galvanized steel or stainless steel	Galvanized steel, coated and stainless steel	
<b>Airtight shut-off</b> acc. to DIN EN 1751	Class 4 (ultra tight)	Class 4 (DN 100 + 125: Class 3)	Class 4 (200 x 100: Class 3)
<b>Available drive systems</b>	<input checked="" type="checkbox"/> Manually operated <input type="checkbox"/> Electrically adjustable		

Special versions upon request.

Standard

optional



## LTG Engineering Services – more security for your investment!

LTG Engineering Services offer reliable and detailed reports with recommendations for optimizing function and cost for comfort air technology installations prior to final design. As early as the design proposal for a new building or a renovation, we determine the facts and data precisely for you to secure your investment.

### Your advantages

- **Cost-optimized from the very start:** Investment costs, energy consumption and operation costs can be minimized at the planning stage.
- **Implementation risks** can be significantly **reduced**
- **Comfortable and user-friendly:** the greatest possible thermal and olfactory comfort through simulation and testing
- **Security** when renovating indoor air technology systems
- No time-wasting adjustments when commissioning the devices in the room, because **presets are made at the factory**
- **Choice of the best climate system** for each building type
- Benefit from our **modern development centre with various flow laboratories, an echo chamber, a calorimetric test stand and simulation tools** for optimizing your project

### Our services

- **Realistic room flow tests** in various scales (model test or full scale)
- **Comfort parameter measurements and room climate evaluation** in the lab and on site
- **Evaluation and optimization** of existing ventilation systems and devices
- Evaluation and **visualization of air flows, heat flows, ventilation efficiency** and much more, including Computational Fluid Dynamics (CFD) simulation
- Acoustic and aerodynamic investigations **for assessing noise, sound level, attenuation characteristics, flow rate and pressure loss** of climate-control products and devices
- **Comparative studies of various room climate systems** as to costs of investment, operation and life cycle



Echo chamber



Laboratory



**AIR TECH  
SYSTEMS**

### **Comfort Air Technology**

Air-Water Systems  
Air Diffusers  
Air Distribution

### **Process Air Technology**

Fans  
Filtration Technology  
Humidification Technology

### **Engineering Services**

Air Flow Tests  
Thermodynamics  
Acoustics / Comfort  
Customized Solutions

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