

# OPTIMA-RM

## Zone air supply / extract total ratio control system



### Ordering codes:



### Ordering code example:

Optima-RM - 40

Optima-RM, size 400, control voltage DC 10V.

## Description

The flow transmitter Optima-RM is a part of a system that maintains a proper ratio between the supply and extract of a zone with individual flow control in air supply branches. The information about the total zone supply air flow is forwarded as a request for total zone extract air flow control. This helps avoiding undesired effects like too large air exchange, air suction into zone in non standard locations or air drought. The system consists from the air flow measuring transmitter in the common zone air supply duct (the product Optima-RM itself) and an especially adjusted air flow controller (VAV Optima-R) in the common zone extract air duct. The air extract controller is proportionally adjusted by the measured flow value on the air supply by the measuring transmitter Optima-RM. This value is represented by the signal DC 0-10V.

### Optima-RM system

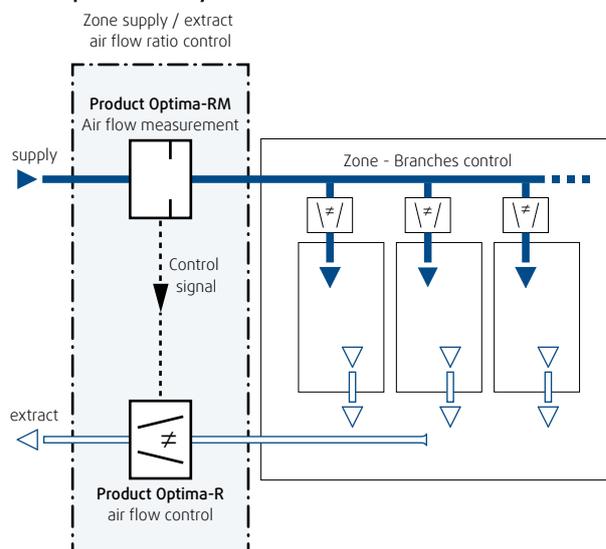


Fig. 1: Control diagram. Zone air flow control by Optima-RM system

### Main features:

- The body tightness class C acc. to EN 1751
- Hygienic certificate acc. to VDI 6022 and VDI 3803
- High accuracy up to 5%
- Flow measuring range 0 to 10974 m<sup>3</sup>/h
- Fit for static pressure of 1000 Pa

### Accessories for Optima-RM:

- Attenuators THP

Attenuators applicable for reduction of the generated noise.

## Construction

The measuring unit body is produced from galvanized steel sheet. The construction of the measuring cross assures accurate readings of the air flow also in complicated installations.

### Sizes:

inlet / outlet:  $\varnothing$  80 to  $\varnothing$  630 mm

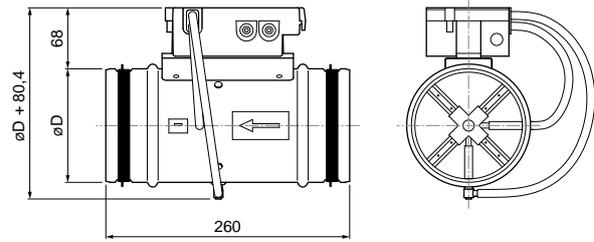


Fig. 2: Dimensions of Optima-RM

## Dimensions

Size DN	$\varnothing D$ (mm)	m (kg)	L (mm)	$V_{min}$ (m <sup>3</sup> /h)	$V_{max}$ (m <sup>3</sup> /h)
				( $U_m = 0V$ , $v = 0$ m/s)	( $U_m = 10V$ , $v = 10$ m/s)
80	78	1,15	260	0	172
100	98	1,27	260	0	272
125	123	1,49	260	0	428
140	138	1,60	260	0	538
160	158	1,73	260	0	706
180	178	1,87	260	0	896
200	198	2,00	260	0	1108
225	223	2,18	260	0	1406
250	248	2,68	260	0	1739
280	278	2,93	260	0	2185
315	313	3,21	260	0	2770
355	353	3,54	260	0	3523
400	398	3,91	260	0	4479
500	498	4,74	260	0	7012
630	623	5,80	260	0	10974

Tab. 1: Optima-RM table of dimensions and air volume range

0 - 20% of  $V_{max}$  air flow rate has an accuracy error rate of:  $\pm 25\%$   
 20 - 40% of  $V_{max}$  air flow rate has an accuracy error rate of:  $< \pm 10\%$   
 40 - 100% of  $V_{max}$  air flow rate has an accuracy error rate of:  $< \pm 4\%$

## Control

The main function of Optima-RM is maintaining the overall parameters of air flow and pressure in the controlled zone - that means maintaining the desired proportion between the air flow on the air supply and on the air extract of the zone. The actual flow value measured on the zone air supply represents a sum of air flow in all branches in the zone - so their actual control position. The zone air extract flow value is controlled according to the flow value on the zone air supply. The signal of the flow measurement on the zone air supply is linked to the VAV controller on the zone extract as the desired air flow control value.

For the proportional control the basic parameters of the air flow measurement on the zone supply are identical with the basic parameters of the control at the zone extract and defined as follows:

### Zone air supply:

Measuring transmitter Optima-RM

- Signal of the measured flow value DC 0 - 10 V
- Lower limit of measured flow  $V_{\min} = 0\%$  of measuring range (signal DC 0 V) corresponds to the flow velocity 0 m/s
- Upper limit of measured flow  $V_{\max} = 100\%$  of the measuring range (signal DC 10 V) corresponds to the flow velocity 10 m/s

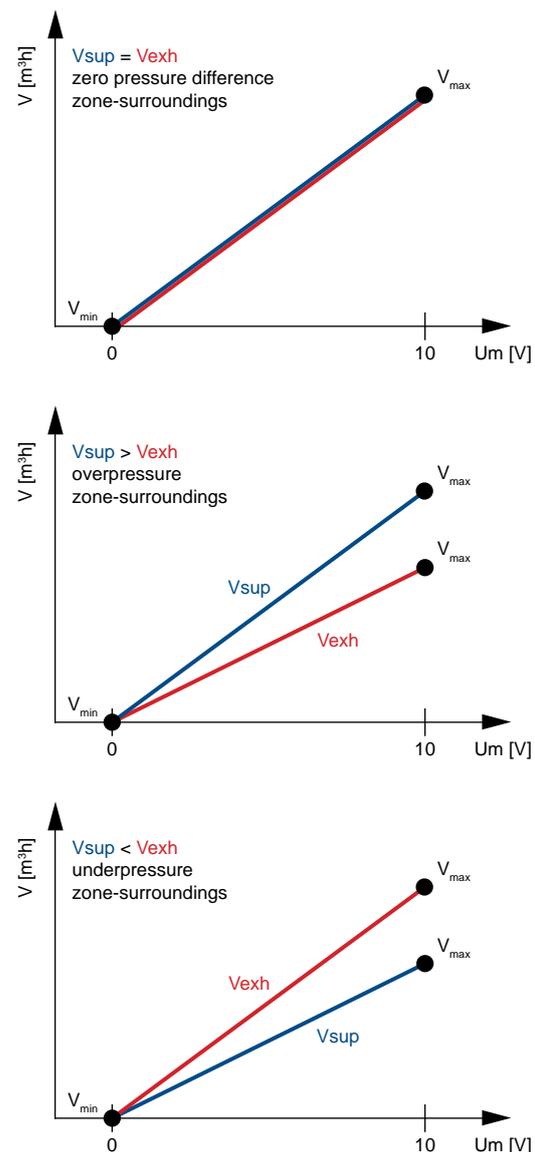
### Zone air exhaust:

VAV controller Optima-R, Optima-R-GO (or other)

- Desired flow value signal DC 0 - 10 V
- Lower limit of flow control  $V_{\min} = 0\%$  of the control range (signal DC 0 V) corresponds to flow velocity 0 m/s
- Upper limit of flow control  $V_{\max} = 100\%$  of the control range (signal DC 10 V) corresponds to flow velocity 10 m/s

These are the factory settings regarding the use of Systemair products Optima-RM and Optima-R or Optima-R-GO with identical nominal sizes. So for the chosen flow velocities the identical values of the air flow on supply and extract are achieved (Tab.1).

By adjusting the parameters of minimal and maximal air flow volume of the VAV-controller on the air extract it is possible to set the proportion supply/extract. This generates zero pressure difference between zone and surroundings, overpressure or underpressure.



### Legend

<b>Vsup</b>	- Zone supply flow (measurement Optima-RM)
<b>Vexh</b>	- Zone extract flow (VAV control)

Fig. 3: Settings for zone air flow ratio supply / extract

## Mounting

Measuring track length after Elbow or a T-branch etc. installations, L to be min. 3 times duct diameter. If L can not be respected, then minimum of 2 × diameter with perforated equalizing grid should be installed.

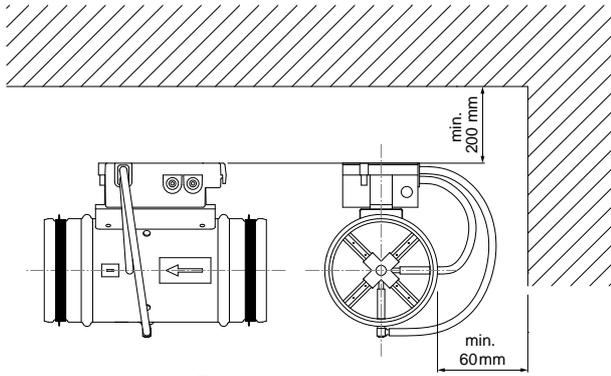


Fig. 4: Optima-RM installation

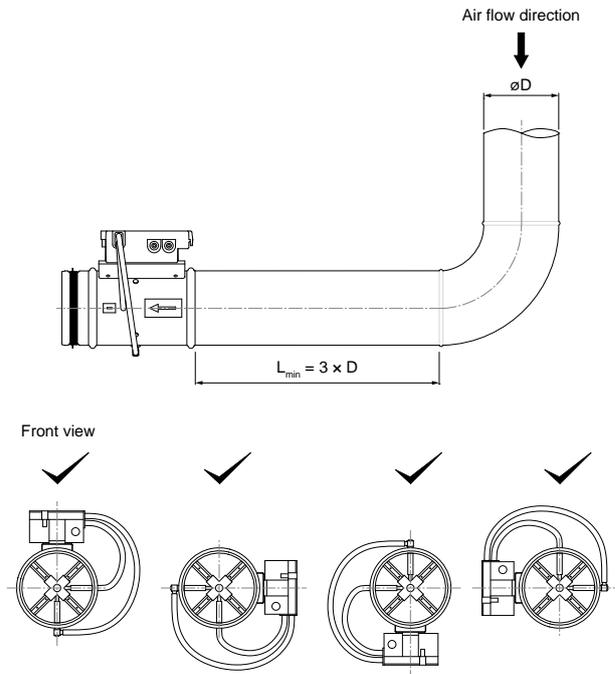


Fig. 5: Optima-RM positioning and definition of measuring track length