Constant Air Volume Regulators
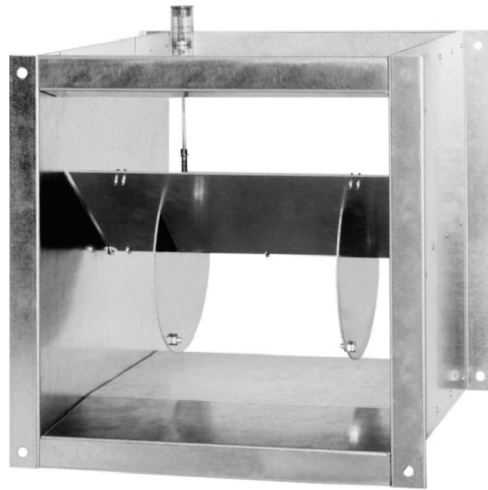
SMAV

VRRK

Application

The regulator of the permanent air stream VRRK constitute an independent regulation element, working without an external energy supply. It provides steady, desired volume of air, irrespectively of the changes of the pressures in the system, thanks to which it eliminates the need of counterbalancing the system.

It can be used in inflow and outflow systems, high or low pressure in the vertical or horizontal position. The regulator works reliably from the minimum difference of pressures, which depends on the velocity of the air (which is defined by the diagram), to the maximum difference of pressures equal to 1000[Pa].

Minimum difference of statistical pressures on the regulator:
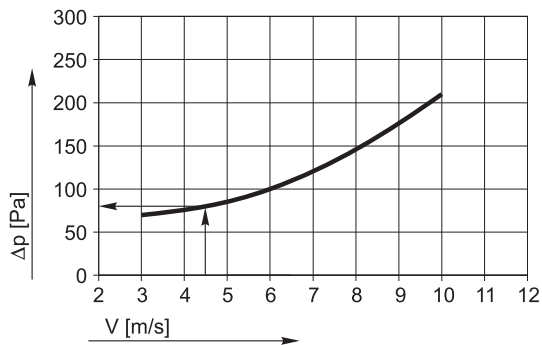
Example
Diameter:	250 [mm]
Height:	200 [mm]
Velocity of the air:	4,5 [m/s]
Intensity of the air flow:	810 [m³/h0
Sought difference of statistical pressures:	
- from the diagram	80[Pa]

Recommended velocity of the air in the ducktwork cannot be lower than 3,0 [m/s] and higher than 10,0 [m/s] (recommended velocity is 6,5 [m/s]).

The work temperature amounts to -30°C to 100°C.
Upon the special order, the version resistant to temperature can be performed up to 250°C.

Material and construction

Corpus and regulation damper:	galvanized steel
Bearings:	PTFE (Teflon)
Non-standard version foresees to perform:	
Corpus and regulation damper:	- galvanized steel
Corpus:	- galvanized steel, lacquered
	- insulated (30mm)

The generator's corpus laser welded has calibrated endings connected with gum gaskets. The regulation damper, mounted on the Teflon bearings is precisely counterbalanced and equipped with a silencing element, which prevents from trembling. The regulator has the device of manual setting, thanks to which you can select any size of the flow within its working scope.
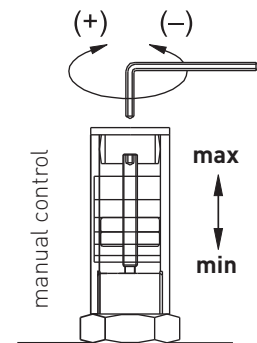
Tolerance of the regulation precision

The tolerance of correctness of the air stream intensity setting amounts to ±10%. However, if the velocity of the air is smaller than 4 [m/s] or the regulator is mounted in the horizontal position, the changes can be higher. It can happen also when there are disturbances in the form of the cold intersection of the flow, arcs, sharp edges or narrowing.

Note
The flow parameters can be set of a factory to the required flow intensity. If need be, they can be easily

VRRK

Version 1

Mechanical regulator, without the external power.
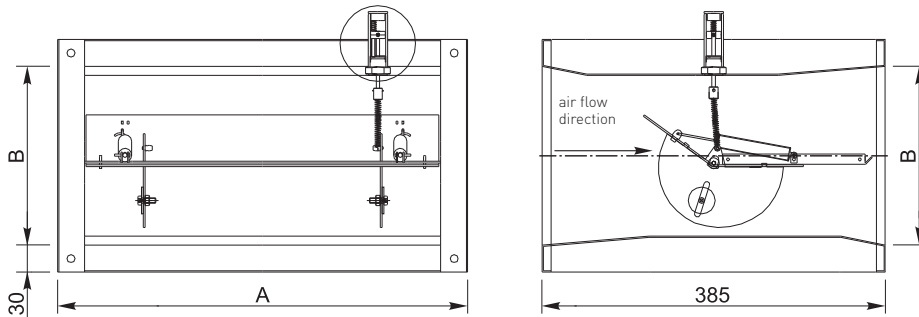
- – value of the flow set of a factory according to the specification of the client
- – manual setting of the intensity of the flow by means of the regulatory device
- - connection: periphery 30[mm]

Version 2

Mechanical regulator, initially set of a factory,
with the possibility to change the default settings
by means of a pneumatic actuator.
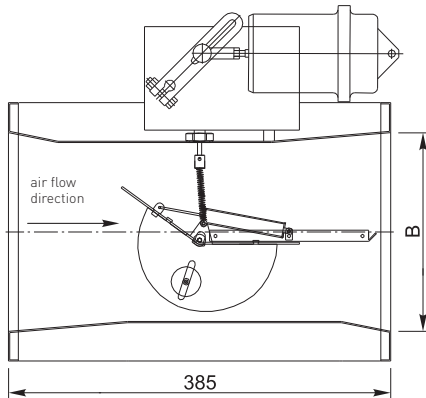
Width [mm]	Height [mm]	Length [mm]
150 - 200	150 - 200	220
210 - 250	150 - 200 201 - 250	220 385
251 - 300	150 - 200 201 - 300	220 385
301 - 350	150 - 200 201 - 300	220 385
351 - 400	150 - 200 201 - 300	220 385
401 - 500	200 - 300	385
501 - 600	200 - 300	385

Regulation pressure   0,2 to 1,0 [bar]
Maximum pressure   1,3 [bar]

Version 3

Mechanical regulator, initially set of a factory, with the possible of changing
the default settings by means of an electrical actuator.
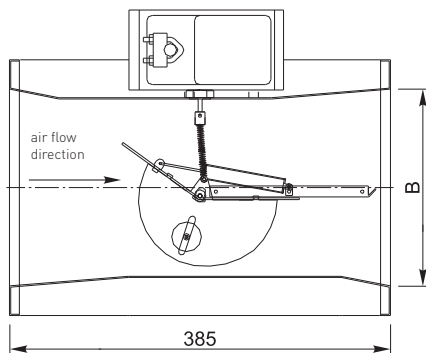
3. Two settings – supply voltage 230V.
4. As above, but with an additional switch
   which allows for supplementing launching.
5. As (3) or   - supply voltage 24V
6. As (5) or   - but with a constant regulation
   with a line signal 2-10V

The scope of efficiency depending on the intersection of the controler:
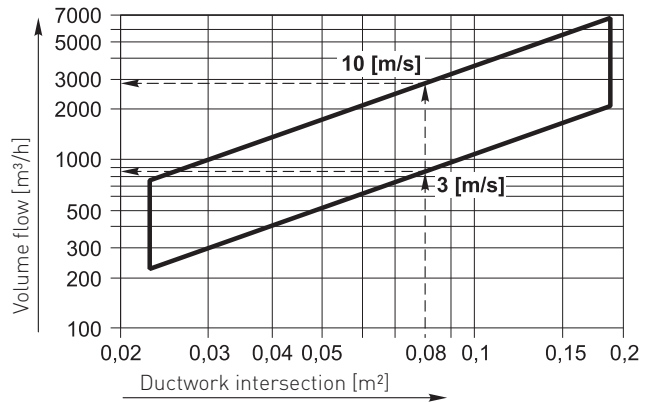
Example:

Data:
Width: 400 [mm]
Height: 200 [mm]

The area of the channel's intersection:
          0,08 [m²]

It results from the diagram:
for 3   [m/s] V_t = 865 [m³/h]
for 10 [m/s] V_t = 2880 [m³/h]

Sound power level

The level of the acoustic power emitted into the environment through the regulator VRS 233 for the frequency L_{wa} [dB $_{(A)}$] depending on the volume air flow and pressure.

The level of the acoustic power at the outlet of the regulator.

A x B	100 [Pa]			250 [Pa]			500 [Pa]		
V_t [m³/h] / **L_{wa} [dB$_{(A)}$]** 150 x 150	243	486	729	243	486	729	243	486	729
	49	55	58	57	63	66	63	69	72
300 x 150	486	972	1458	486	972	1458	486	972	1458
	50	57	60	58	65	68	64	71	74
200 x 200	432	864	1296	432	864	1296	432	864	1296
	50	57	60	58	65	68	64	71	74
300 x 200	648	1296	1944	648	1296	1944	648	1296	1944
	51	58	61	59	66	69	65	72	75
400 x 200	864	1728	2592	864	1728	2592	864	1728	2592
	52	58	62	60	66	70	66	72	76
300 x 300	972	1944	2916	972	1944	2916	972	1944	2916
	53	59	63	61	67	71	67	73	77
450 x 300	1458	2916	4374	1458	2916	4374	1458	2916	4374
	54	60	64	62	68	72	68	74	78
600 x 300	1944	3888	5832	1944	3888	5832	1944	3888	5832
	54	61	64	62	69	72	68	75	78

The information provided, calculated on the basis of the laboratory tests is only of informative nature.

The noise of the flow depends to a large extent on the local conditions.
In practice, additional silencing takes place resulting from the silencing at the outlet of the duct and silencing the room, the effect of which is the lowering of the sound's level.
Silencing the room and the outlet can be to a large extent adopted on the level of about 8dB.
The application of the silencer in the system, will result in lowering the noise level by other up to a dozen or so dB, mainly depending on the type and the length of the silencer.
If there is an additional source of the noise nearby (e.g. ventilator) or there are unfavorable conditions of the air flow, the level of the noise can increase. The effect of the increased noise will not occur, if the intensity of the noise coming from the additional source does not exceed 10 dB.

Regulators with the height exceeding 300 [mm],
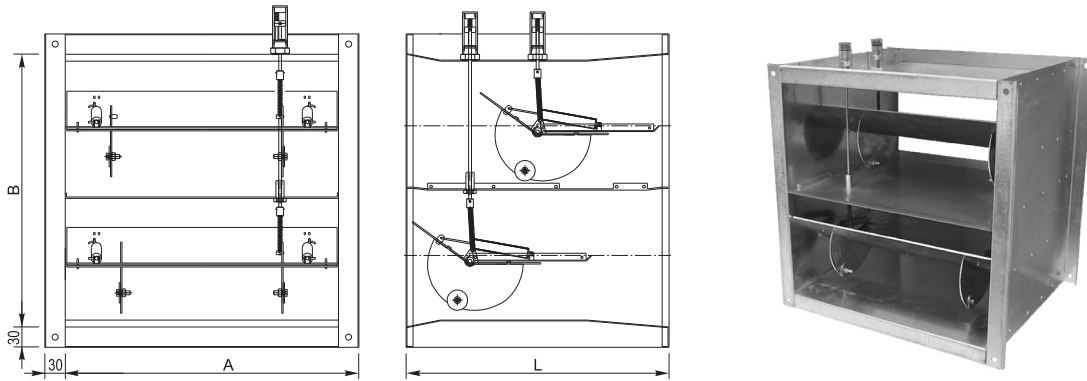
All double regulators are equipped with two regulation dampers, each with its own setting device, with the flow scale. While summing these values on both scales, we have a result in the form of a total volume intensity of the flow.

Sound power level

The level of the acoustic power emitted into the environment by the regulator VRRK for the frequency Lwa [dB(A) depending on the volume flow of air and pressure.

Level of the acoustic power at the outlet of the regulator

A x B	100 [Pa]			250 [Pa]			500 [Pa]		
Vt [m³/h] / L_{wa} [dB$_{[A]}$] **400 x 400** L = 385	1728	486	5184	1728	486	5184	1728	486	5184
	54	61	-	62	69	72	68	75	78
500 x 400 L = 385	21260	4320	6480	21260	4320	6480	21260	4320	6480
	55	61	-	63	69	73	69	75	79
600 x 400 L = 385	2592	5184	7776	2592	5184	7776	2592	5184	7776
	55	62	-	63	69	73	69	76	79
500 x 500 L = 425	2700	5400	8100	2700	5400	8100	2700	5400	8100
	55	62	-	63	70	73	69	76	79
600 x 500 L = 425	3240	6480	9720	3240	6480	9720	3240	6480	9720
	56	62	-	64	70	74	70	76	80
600 x 600 L = 470	3888	7776	11664	3888	7776	11664	3888	7776	11664
	56	63	-	64	71	74	70	77	80

VRRKt-200x200-L220-500

VRRK **I** - **A** x **B** - L **L** - **V_{nom}** - **S** - **P**

I insulation*
- **not insulated**
t insulated

A width [mm]

B height [mm]

L length
220 **standard**
385 special version

V_{nom} nominal air flow rate [m³/h]

S version*
1 **no external power supply**
2 with pneumatic actuator
3.1 with electric actuator 230 - two settings
3.2 with electric actuator 230V - Two sets of additional switch
3.3 with electric actuator 24V - two settings
3.4 with electric actuator 24V with continuous analog control 2..10V

P material*
- **galvanized sheet**
SN stainless steel sheet
SL coated sheet steel
* optional values – lack of them will cause application of default values