PRODUCT RANGE

- Round Spiral Duct.
- Round Duct Fittings.
- Flexible Alumium Ducts.
- Air Outlets.
- Sound Attenuators.
- Volume Control Dampers.
- Pre Filters.
- Sand Traps.
- Fire Dampers.
- Transverse Rectangular Duct Connector Flange System.

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Air Quality Products

Zamzam

Engineering Industries

Volume control damper

ISO 9001:2000 SYSTEM CERTIFICATION SGS

Zamzam
Air Quality Products

GLOSSARY OF TERMS AND DEFINITIONS

GRILLE : A Louvered covering for an opening through which air passes.

DIFFUSER : An outlet discharging supply air in multiple layers with a spreading pattern.

DAMPER : A device used to control the volume of air passing through a duct /or air outlet by varying the cross sectional area.

REGISTER : A grille which is equipped with a damper.

ASPECT RATIO : The ratio of the long side to the short side of a duct section/or air outlet.

CFM : A measure of volume of air in cubic feet per minute .

VELOCITY (V_k) : The velocity in feet per minute is the velocity measured with an Alnor velometer and 2220A jet on the face of the outlet .

TERMINAL VELOCITY (V_t) : The velocity 1N FPM of the air stream at the throw (T) from the air outlet. Values from 75 to 200 FPM are in common use.

EFFECTIVE AREA (A_k) : The calculated area of an outlet based on the average measured velocity at the face vk.

THROW : The distance measured in feet that the air stream travels from the outlet to the point of terminal velocity .

DROP : The vertical distance the air moves between the time it leaves the outlet and the time it reaches the end of its throw.

INDUCTION : Induction is the entrainment of room air by the air ejected from the outlet and in result of the velocity of the outlet air. The air coming directly from the outlet primary air. The room air, which is picked - up, is called secondary air. The entire stream composed of a mixture of primary and secondary air.

WALL / CEILING EFFECT : The tendency of an air stream moving along wall or ceiling surface to remain in contact with that surface. This effect extends the throw and reduces the drop of the air stream.

STATIC PRESSURE (P_s) : The outward force exerted by the air within a duct and /or collar of an air outlet device measured in inches of water .

VELOCITY PRESSURE (P_v) : The pressure in inches of water equated to a velocity that exists for a given air volume in the duct and/or air outlet collar area.

TOTAL PRESSURE (P_t) : The sum of the velocity pressure (Pv) and static pressure (Ps) measured in inches of water .

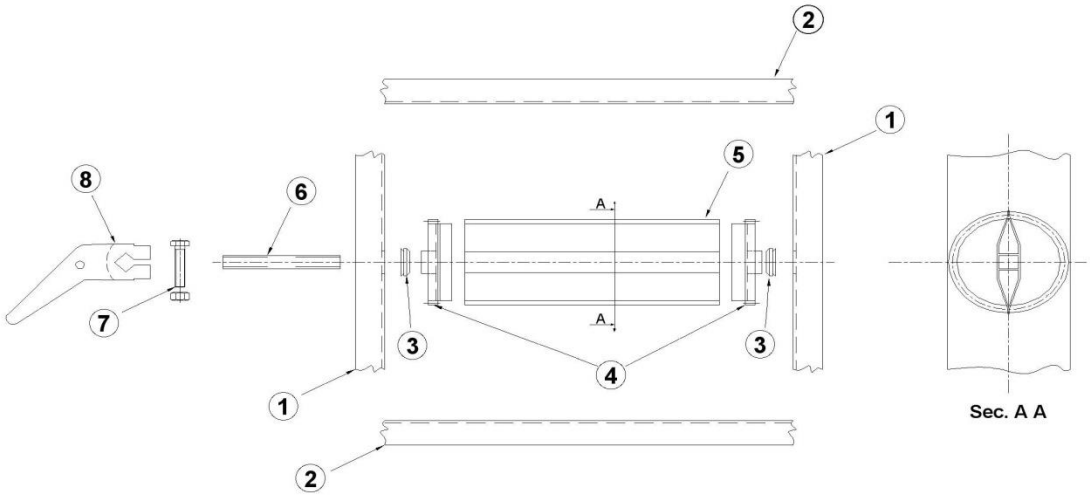
SOUND POWER LEVEL (LW) : The total sound created by a grille under a specific condition of operation not including specific room acoustic absorption value reductions per frequency octave band. The basis of LW must be stated re 10^{-13} watts, or 10^{-12} watts.

SOUND PRESSURE LEVEL (LP) : Sound pressure measured in the test room or occupied room with a sound level meter referenced to. 0002 microbar. Sound pressure may be measured in octave band with octave band analyzer or total sound pressure in all octaves can be measured.

NOISE CRITERIA : The air outlet device sound rating in pressure level at given condition of operation based on established criteria and specific room acoustic absorption value. Catalog NC rating are base on sound power level (LW) re 10^{-13} watts minus An 18-db room attenuation in all octave bands.

General

ZamZam Volume control dampers ADV-R series are designed for regulation of air flow and pressure drop in ventilating ducts and air conditioning devices.



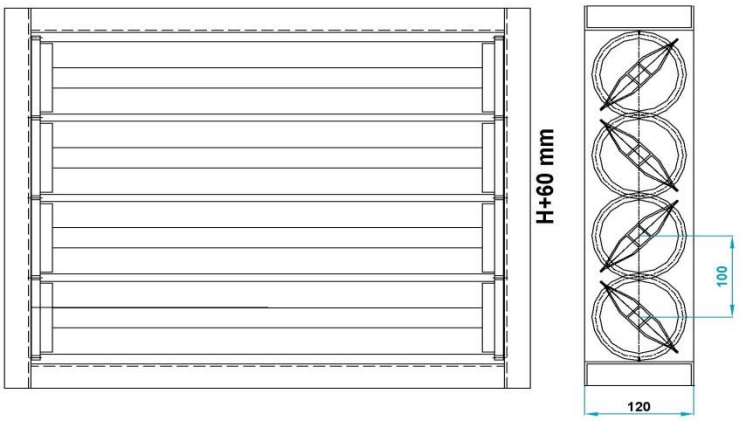
1	Frame sides Alu. section	5	Aerofoil blade
2	Frame top & bottom Alu. section	6	Square section connecting arm
3	Rubber seal	7	Tightening steel bolt
4	ABS plastic gear wheel	8	Galvanized steel control arm

Feature

Frame made of channel shape extruded aluminum sections. Blades are aerofoil hollow sections inserted in ABS plastic gear wheels assembled in the frame section with plastic holders. Rubber seals fitted between the wheels and frame provide better sealing and insure minimum leakage. Blades open in opposed direction and the damper can be manually (standard version) or power operated by electric or pneumatic actuator Gears and seals are heat resistant up to 70 C°.
The inclined control arm easily indicates the opening – closing status while rotating on a press stamped steel scale.

Sizes and dimensions

Tailored sizes are available to suit all ranges of duct work and AHU's.
Starting from WXH = 4X4 inches, any combination of WxH is available as a single unit up to 40X40 inches.
For either W or H > 40 inches multiple units may be provided



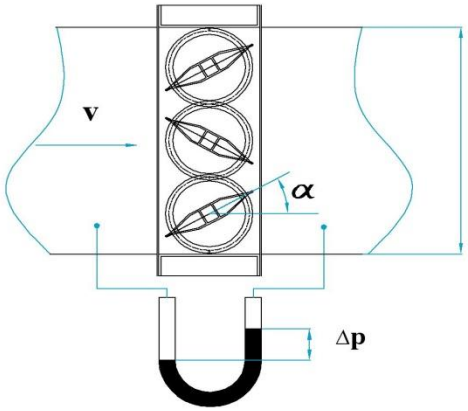
Number of blades for the different sizes are shown below

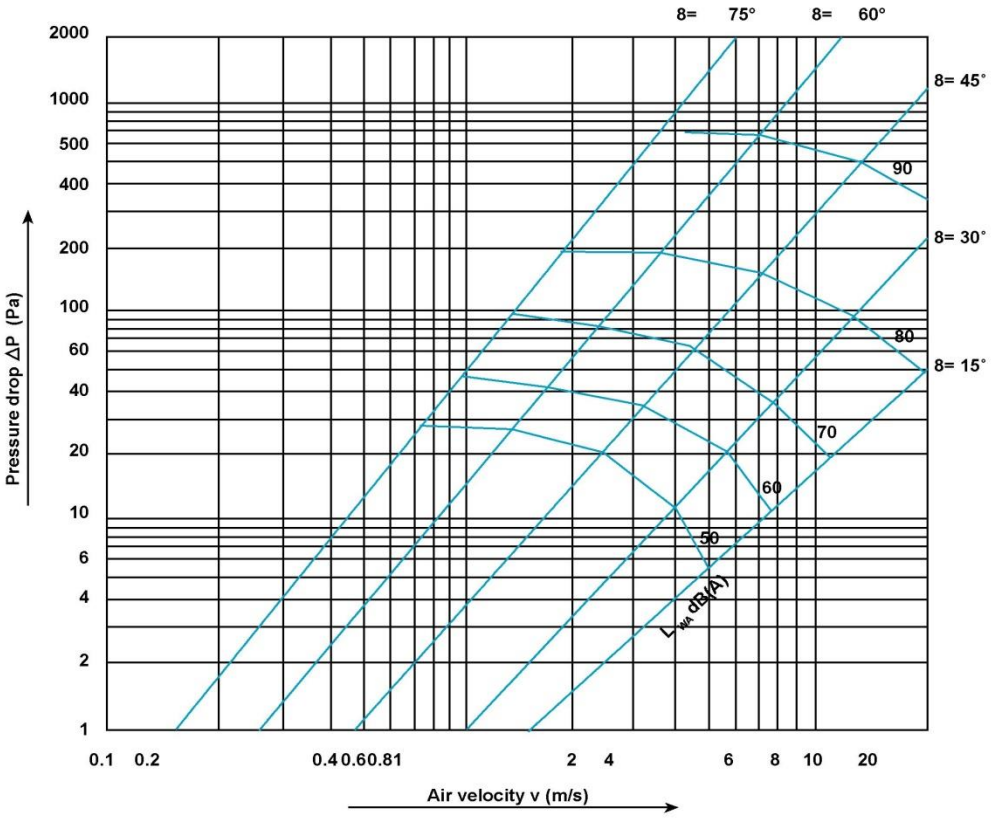
For W equal or less than 40"	H "	Blades	H "	Blades
	4	1	24	6
	6		26	
	8	2	28	7
	10		30	
	12	3	32	8
	14		34	
	16	4	36	9
	18		38	
	20	5	40	10
	22			
for H" not listed above, Number of blades will be the nearest less number				

Performance Data

Pressure drop vs. air velocity through the damper in various blade angels plotted in the
shown diag where:

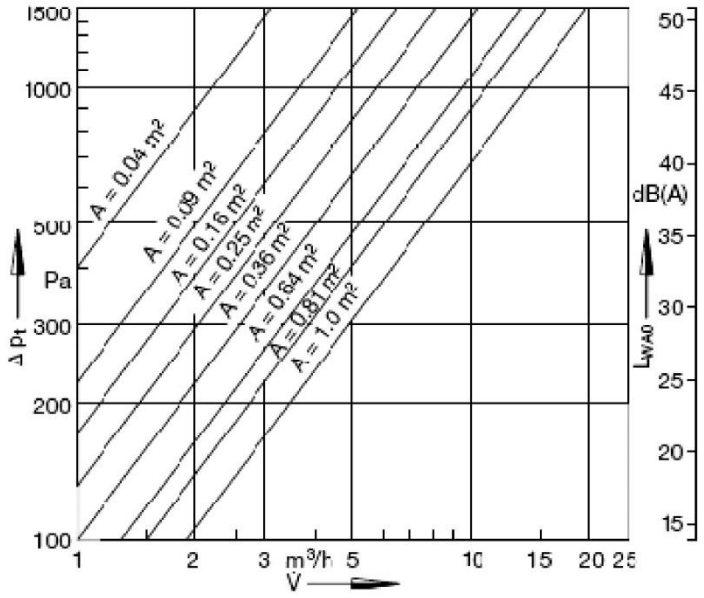
α blade angle
Damper fully open for $\alpha \leq 10$
Δp pressure drop in Pascal's
V air velocity in meter/ sec.
dw sound power level in dB





Leakage Ratio

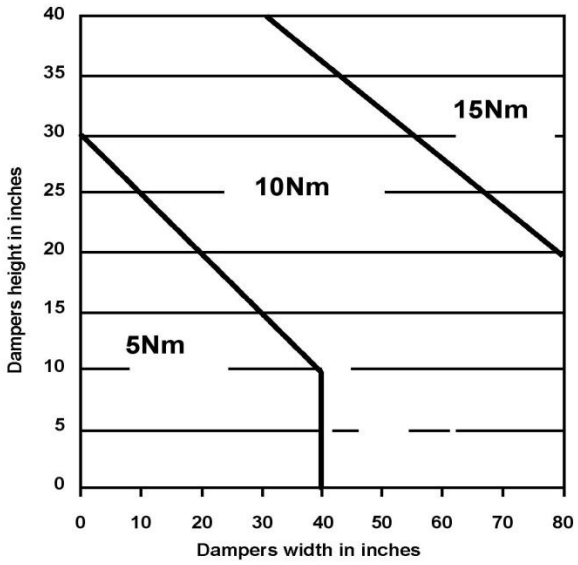
The rubber seals insure air leakage through the damper is kept minimal. The amount of air leaks vs. face area A of the damper at different static pressures was recorded as follows when the dampers were fully closed.



Δp t total pressure in Pascal's
V air leaks in m3/ hr
A damper face area in m^3

Motor Torque

The diagram below is a guide to select the motor actuator for different sizes of Dampers range .



How to order

AVD	R	36X20	S

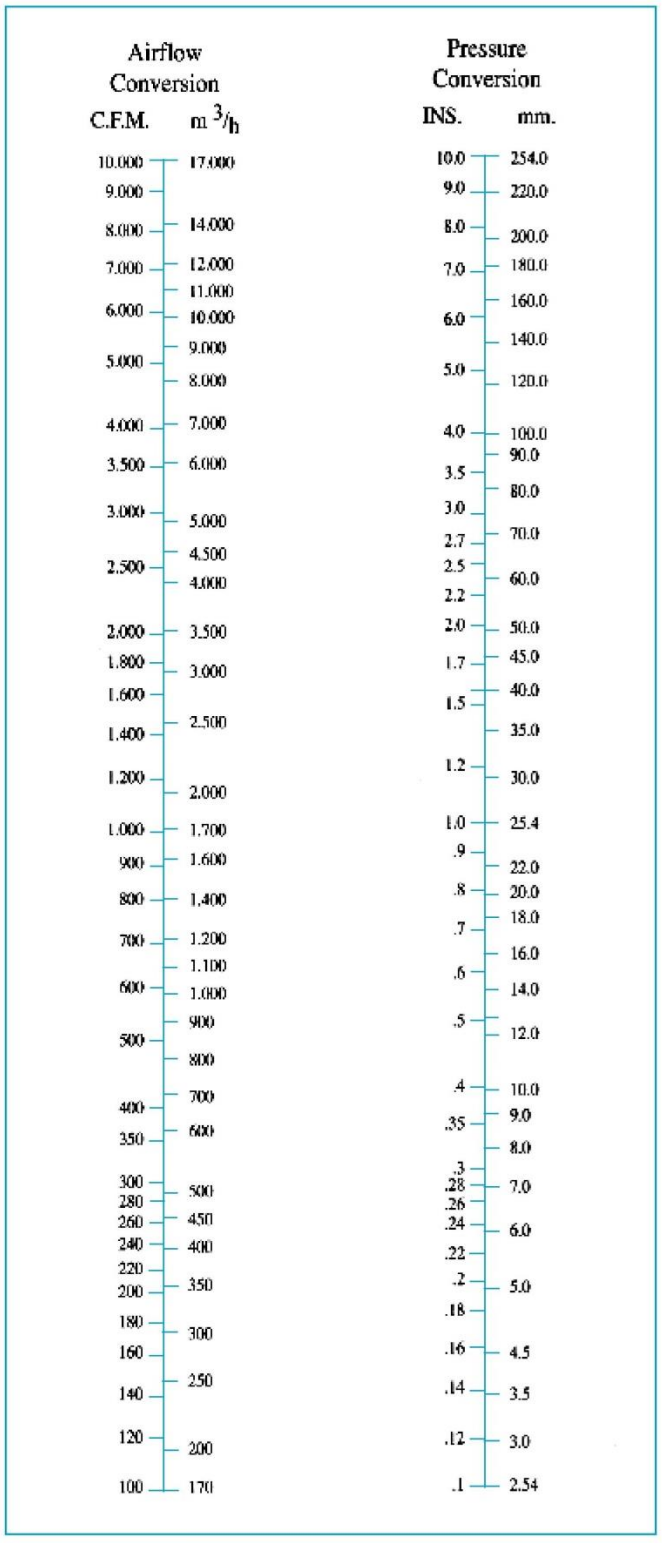
S with control arm
A without control arm

36 X 20 nominal width and height in inches (WXH)

R rectangular

ADV aluminum volume damper

AIRFLOW-/PRESSURE CONVERSION CHART



RECOMMENDED AIR CHANGES PER HOUR (FOR VENTILATION)

Assembly rooms	4 - 8
Bakeries	20 - 30
banks / building societies	4 - 8
Bathrooms	6 - 10
Bedrooms	2 - 4
■ Billiard rooms	6 - 8
Boiler rooms	15 - 30
Cafes and coffee bars	10 - 12
Canteens	8 - 12
Cellars	3 - 10
Churches	1 - 3
■ Cinemas and theatres	10 - 15
Club rooms	12 minimum
Compressor rooms	10 - 12
Conference rooms	8 - 12
Dance halls	12 minimum
Electroplating shops	10 - 12
Engine rooms	15 - 30
Entrance halls, corridors	3 - 5
Factories and workshops	8 - 10
Foundries	15 - 30
Garages	6 - 8
Glasshouses	25 - 60
Gymnasiums	6 minimum
Hairdressing salons	10 - 15
Hospitals - sterilising	15 - 25
Kitchens - domestic	15 - 20
- commercial	30 minimum
Laboratories	6 - 15
Laundries	10 - 30
Lavatories	6 - 15
Lecture theatres	5 - 8
Libraries	3 - 5
Living rooms	3 - 6
Offices	6 - 10
Paint shops (not cellulose)	10 - 20
Photo and X-ray darkrooms	10 - 15
Public house bars	12 minimum
Recording control rooms	15 - 25
Recording studios	10 - 12
Restaurants	8 - 12
Schoolrooms	5 - 7
Shops and supermarkets	8 - 15
Shower baths	15 - 20
Stores and warehouses	3 - 6
Squash courts	4 minimum
Swimming baths	10 - 15
Utility rooms	15 - 20
Welding shops	15 - 30

■ Increase by 50% where heavy smoking occurs or if the room is underground.