



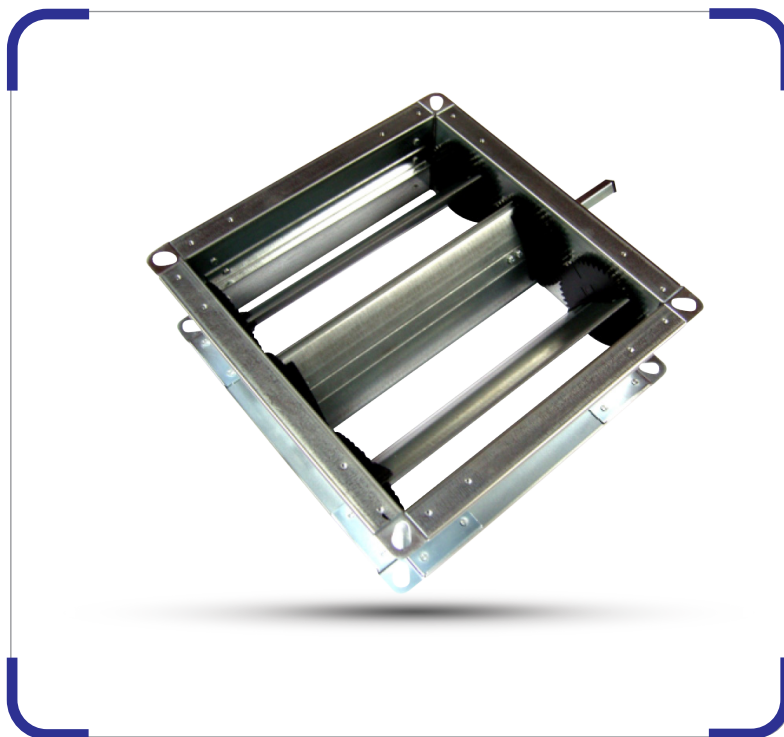
AIRTECHNIC

www.airtechnic.gr

Air-Conditioning & Ventilation Components & Systems

- **Rectangular
volume dampers
RDA**

FOR AIR DUCT INSTALLATION



www.airtechnic.gr



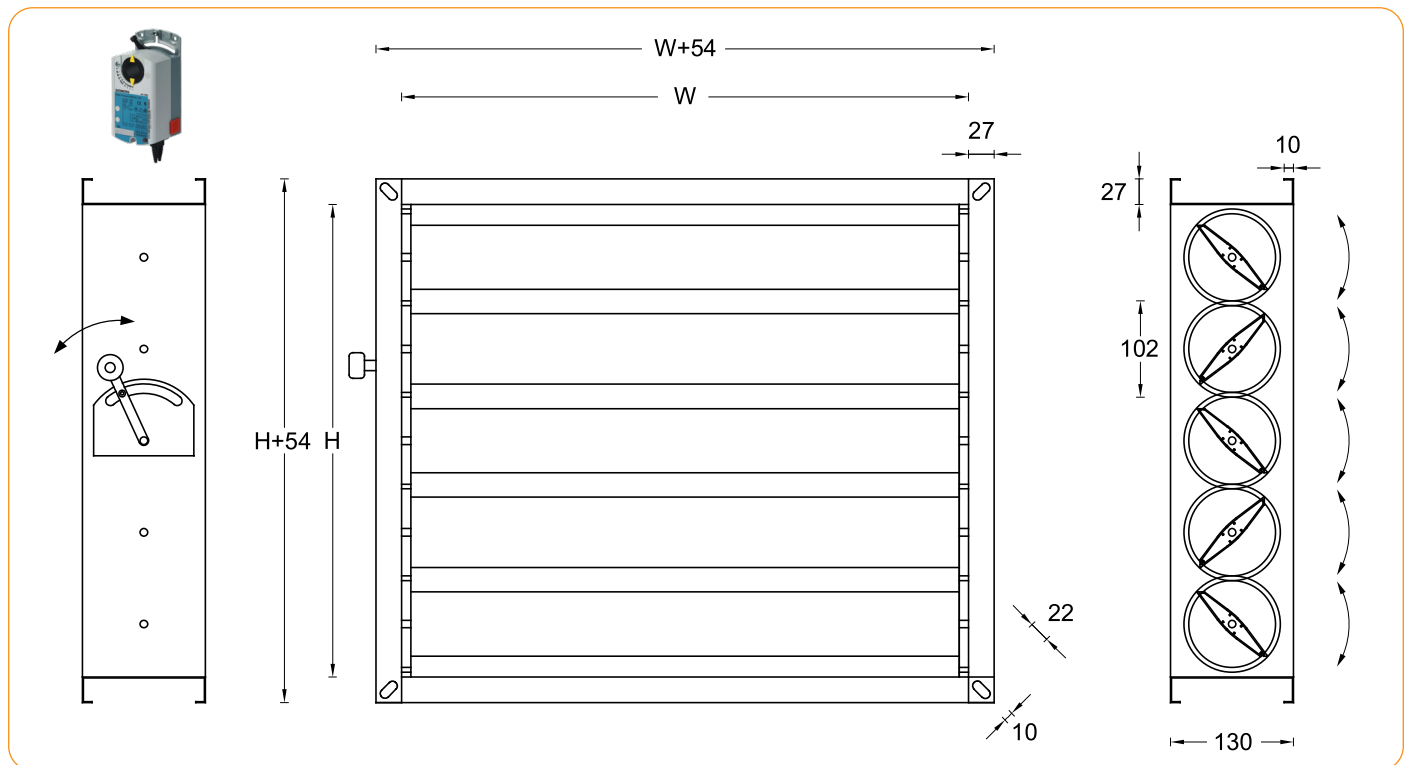
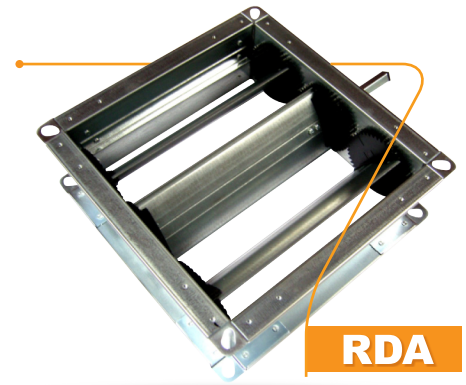
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Volume dampers **RDA**

Rectangular dampers are used in air-conditioning and ventilation systems when it is required to regulate the volume flow or for pressure control. The air volume and the blade angle can be adjusted either manually or automatically using On - Off actuators 230V (or 24V) or analog actuators 24V and it can be combined with suitable thermostats and automation systems.

The casing is manufactured from galvanised steel sheet (or from aluminium, copper and stainless steel sheet) with perimetric flanges on both sides. **It's possible to manufacture the damper from plastic PVC.** The blades are manufactured from hollow-body aluminium profile and they are rotating in opposite directions, via external plastic gear wheels.



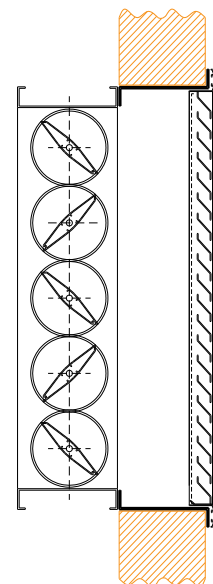
The standard dimensions for rectangular dampers are presented in a following table (page 10). However, it is possible to manufacture rectangular dampers in any dimension, under order.

The following diagrams provide data suitable for selecting dampers in open full (0°) position as well as for selecting dampers with blade angle 15° , 35° , 45° & 60° .

In case the damper is very large (with height over 1.500 mm and width over 1.600 mm) it can be divided horizontally or vertically according to requirements (page 3.).

DAMPER WITH WEATHER RESISTANT LOUVE

WALL INSTALLATION EXAMPLE



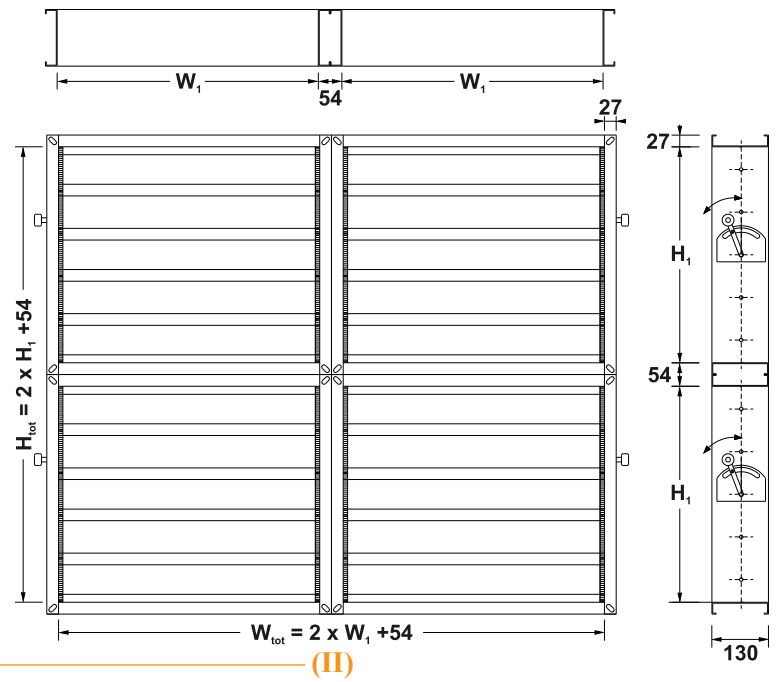
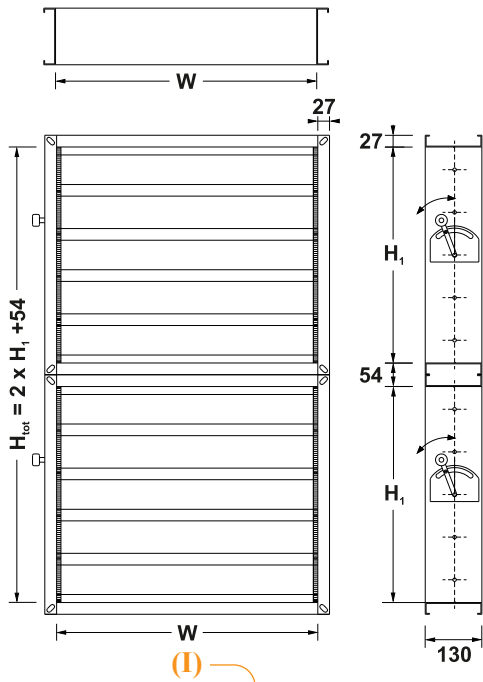
RECTANGULAR DAMPER SELECTION

The technical specifications for rectangular dampers are the following :

Damper Width	W	[mm]
Damper Height	H	[mm]
Blade Angle	α_d	
Damper Surface Factor	A_f	
Pressure drop inside the damper	ΔP	[Pa]
Maximum velocity inside the damper	U_0	[m/s]
Noise level	Θ	[dB(A)]

The selection of rectangular dampers will be made using the following diagrams and in accordance with the normative document **CR 1752:1998** (Ventilation for buildings - Design criteria for the indoor environment).

DIVIDING LARGE RECTANGULAR DAMPERS



CASE (I)

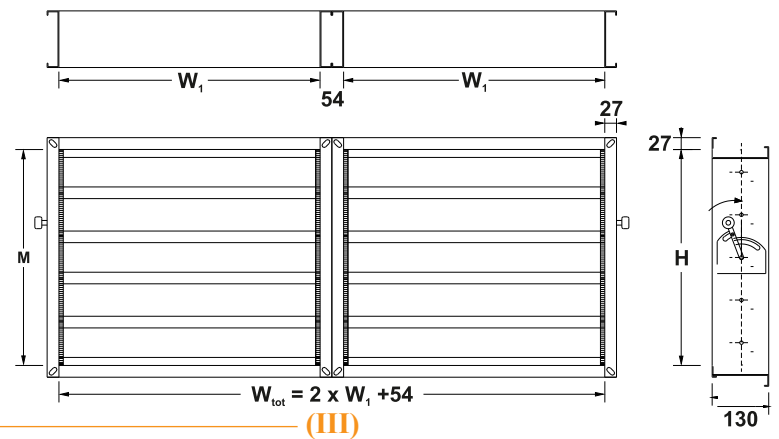
Dividing vertically if the damper is over **1.500 mm**. The damper's final design is presented in drawing (I).

CASE (II)

Dividing vertically and horizontally if the damper's height is over **1.500 mm** and the damper's width is over **1.600 mm**. The damper's final design is presented in drawing (II).

CASE (III)

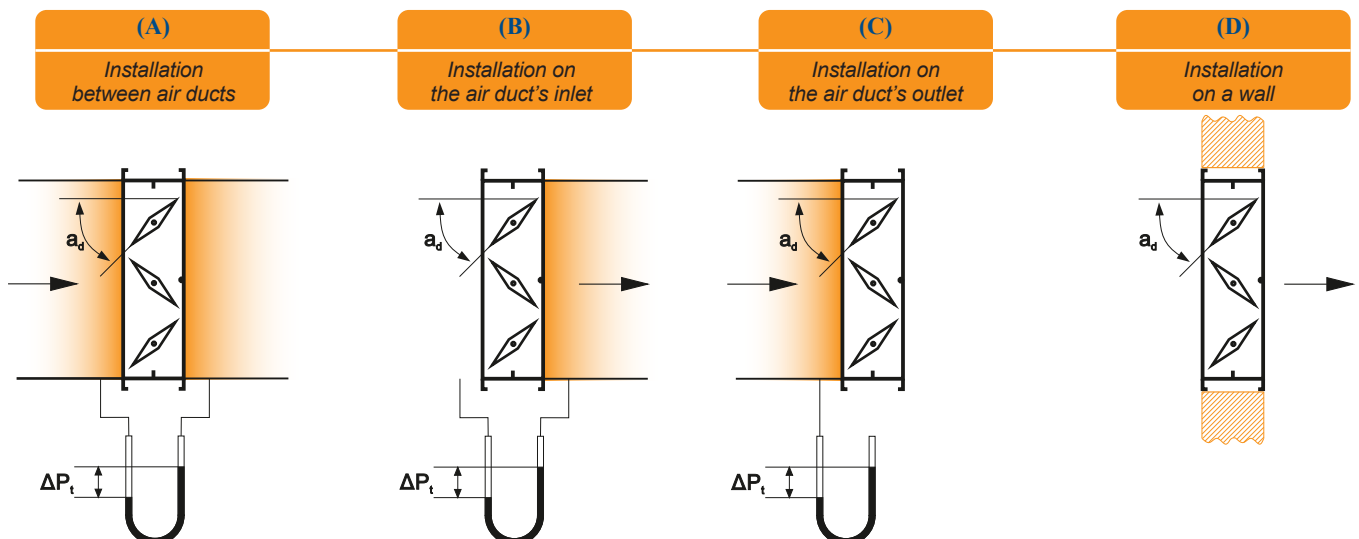
Dividing horizontally if the damper is over **1.600 mm**. The damper's final design is presented in drawing (III).



INSTALLATION

Rectangular dampers are suitable for installation:

(A) Between air-ducts | (B) On the air-duct's inlet | (C) On the air-duct's outlet | (D) On a wall.



The following diagrams provide data suitable for selecting fully open dampers (0°), for all installation types and for selecting blade angle 15°, 30°, 45° & 60° for installation between air ducts (type A). In order to calculate the pressure drop, for blade angle 15°, 30°, 45° & 60°, for installation type B, C & D, we calculate the pressure drop according to diagrams and we multiply the result using the correction factors that are provided in the following table (*). The noise produced, is not depended from the volume flow type.

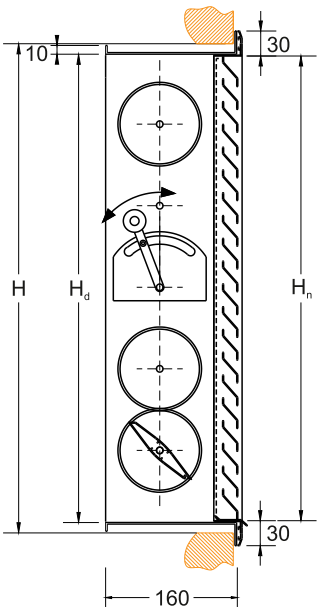
(*) See calculation example.(page 10).

PRESSURE DROP CALCULATION - CORRECTION FACTORS -	Blade angle			
	15°	30°	45°	60°
Installation type B	3,0	1,6	1,4	1,2
Installation type C	4,2	2,1	1,5	1,2
Installation type D	6,1	2,7	1,9	1,4

SPECIAL VOLUME DAMPER CONSTRUCTION

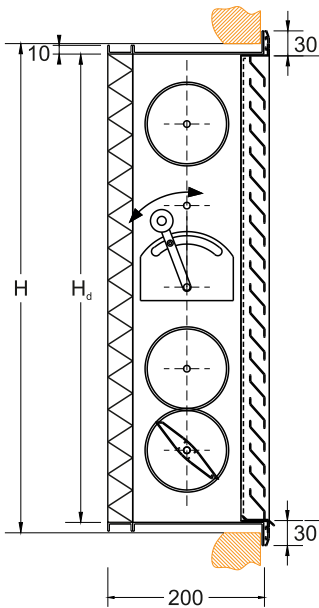
Weather resistant louvre with intergraded volume damper, weather resistant louvre with intergraded volume damper and prefilter G2, G3 or G4, weather resistant louvre with intergraded sand filter.

This special construction ensures better protection from rain, while, at the same time the intergration of prefilters G2, G3 or G4 increase the quality of the supplied air. The addition of a sand filter gives a boost at the performance of the entire air-conditioning / ventilation system as well as an increase of the life span of the other filters in the installation.



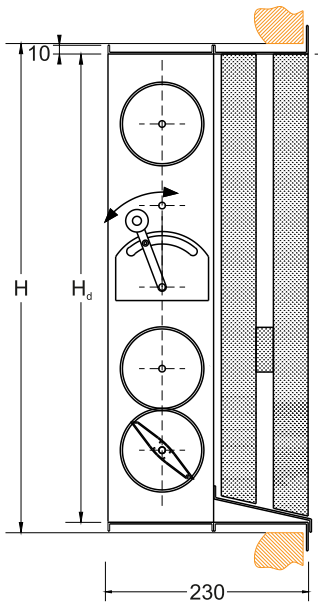
RDA.GW

Weather resistant louvre
with integrated air duct damper.



RDA.GW + F


Weather resistant louvre
with integrated air duct damper
and prefilter G2, G3 or G4.



RDA.SND

Air duct damper
with integrated sand trap louvre.

In order to calculate the pressure drop in special volume damper constructions, please contact the AIRTECHNIC technical department.

 The casing of rectangular dampers can be powder painted in any RAL color, upon request. For the full range of RAL colors please contact us.

RAL 1007 Daffodil yellow	RAL 2002 Vermillion	RAL 3017 Rose	RAL 5007 Brilliant blue	RAL 6003 Olive green	RAL 6024 Traffic green	RAL 8028 Brown
RAL 1011 Brown beige	RAL 2003 Pastel orange	RAL 3018 Strawberry red	RAL 5008 Grey blue	RAL 6004 Blue green	RAL 6025 Fern green	RAL 9001 Cream
RAL 1012 Lemon yellow	RAL 2004 Pure orange	RAL 3020 Traffic red	RAL 5009 Azure blue	RAL 6005 Moss green	RAL 6026 Opal green	RAL 9002 Grey white

Color examples

BLADE ANGLE - 0°

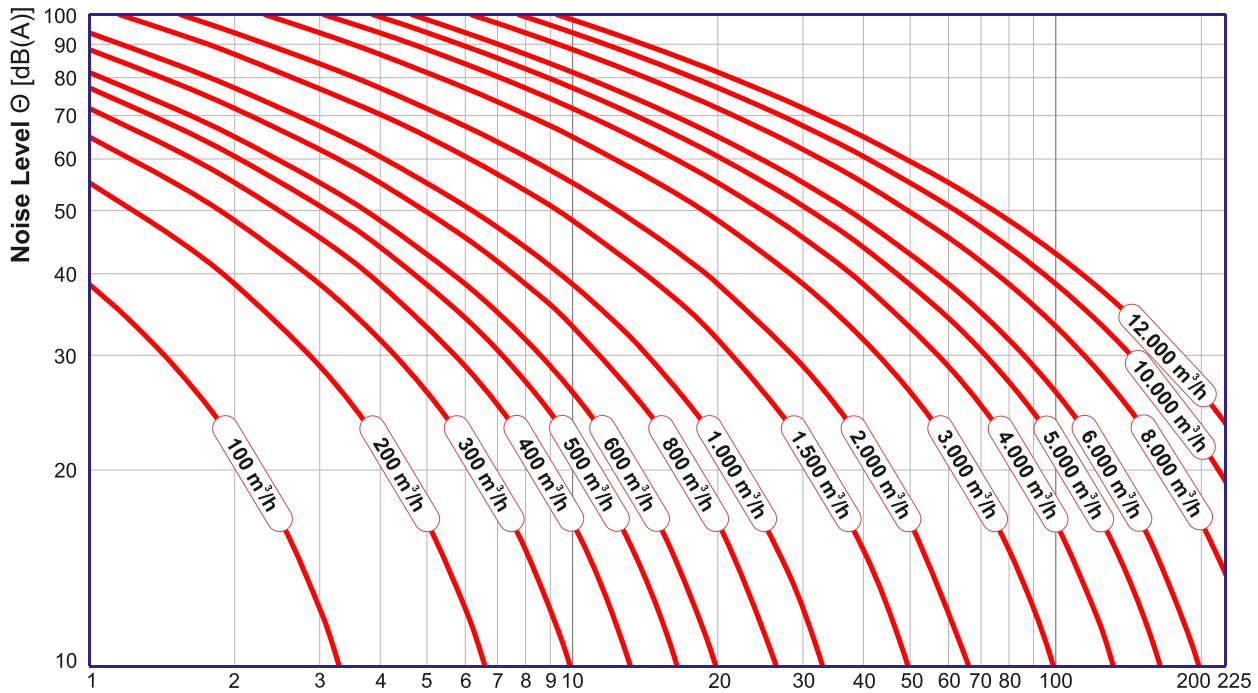


DIAGRAM 1.3

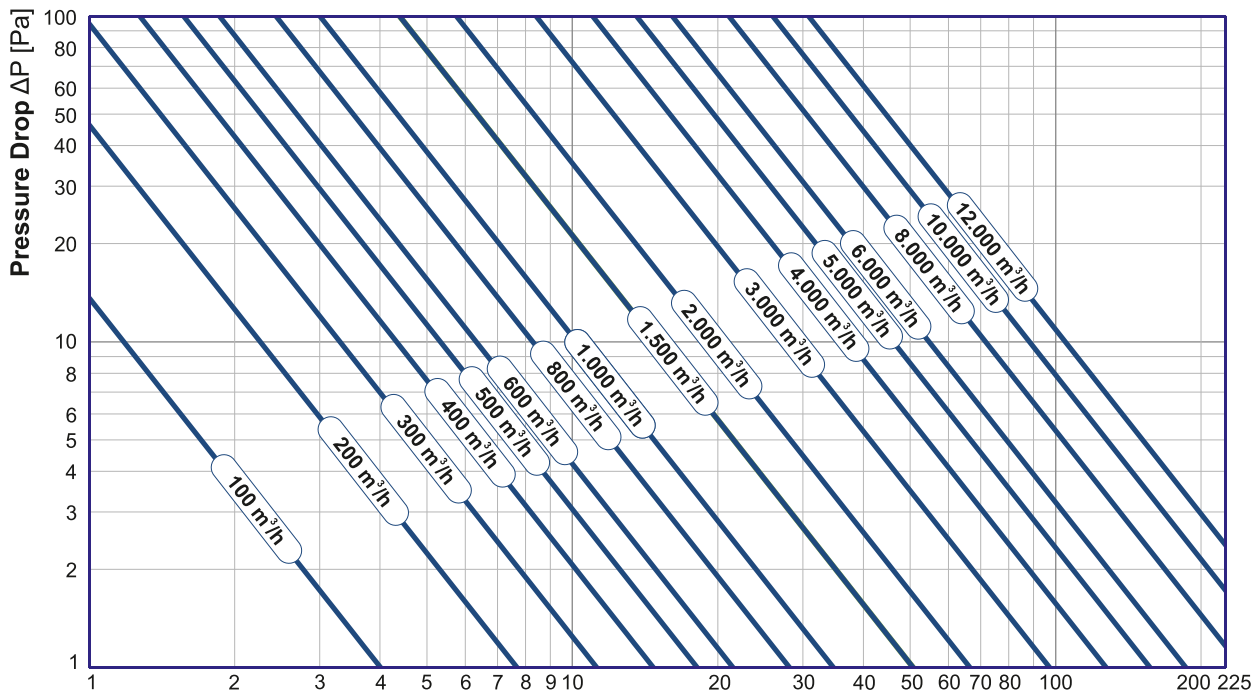


DIAGRAM 1.2

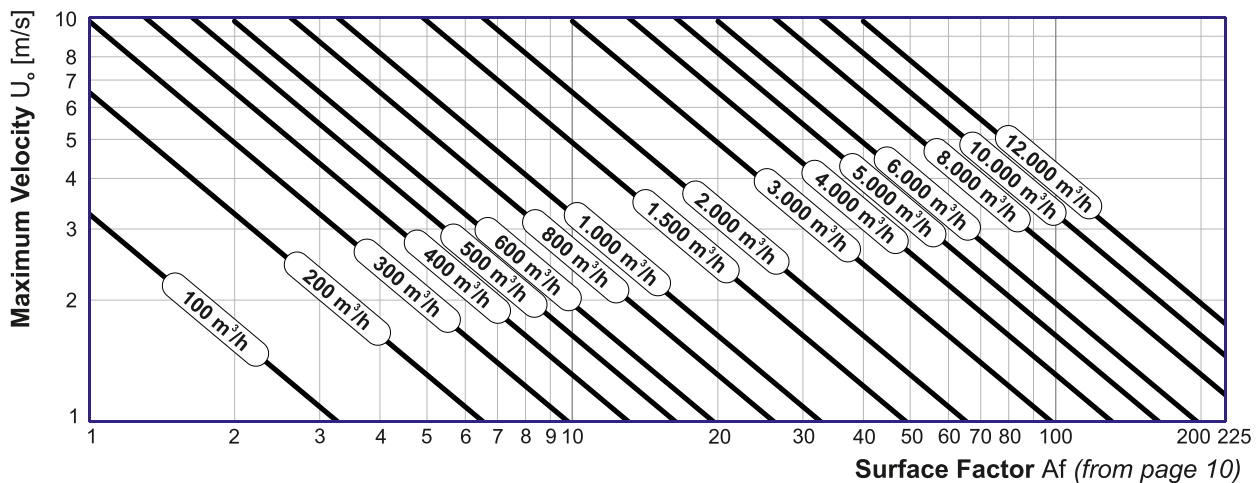


DIAGRAM 1.1

BLADE ANGLE - 15°

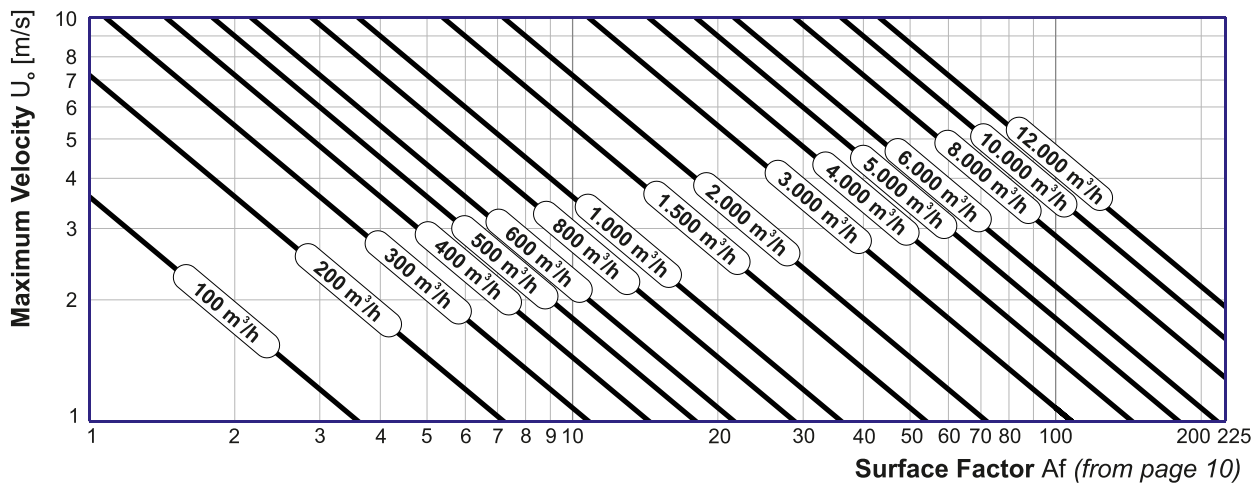
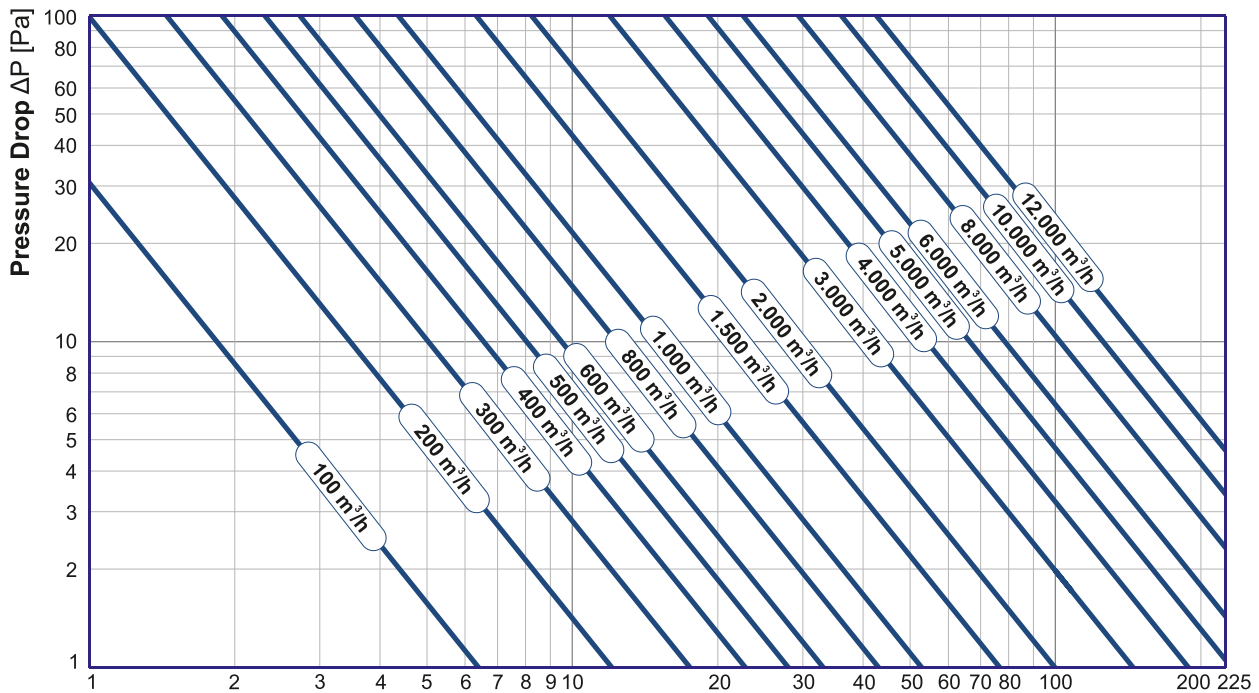
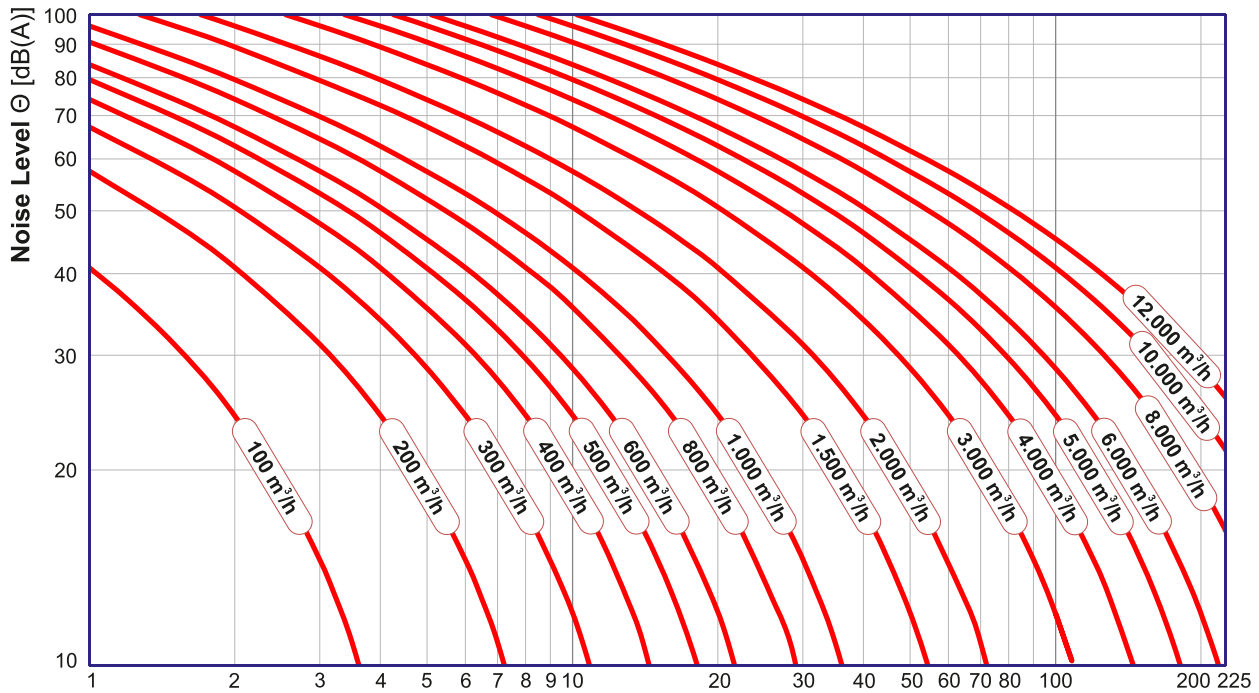


DIAGRAM 2.3

DIAGRAM 2.2

DIAGRAM 2.1

BLADE ANGLE - 30°

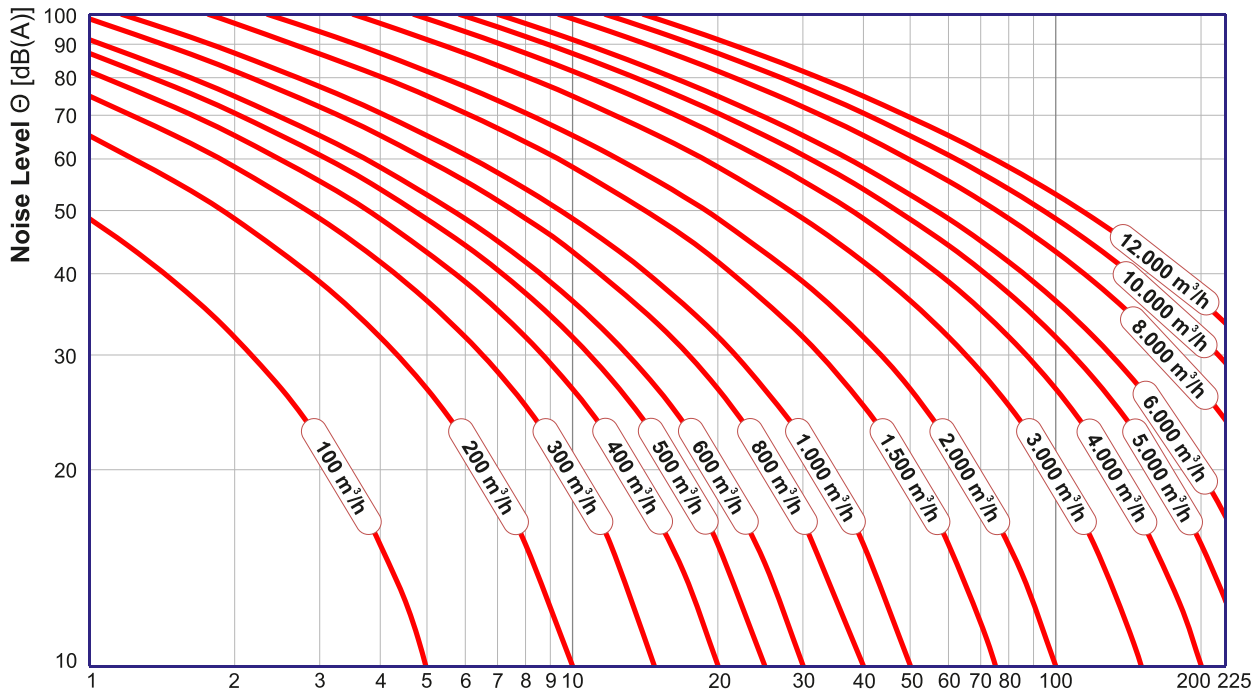


DIAGRAM 3.3

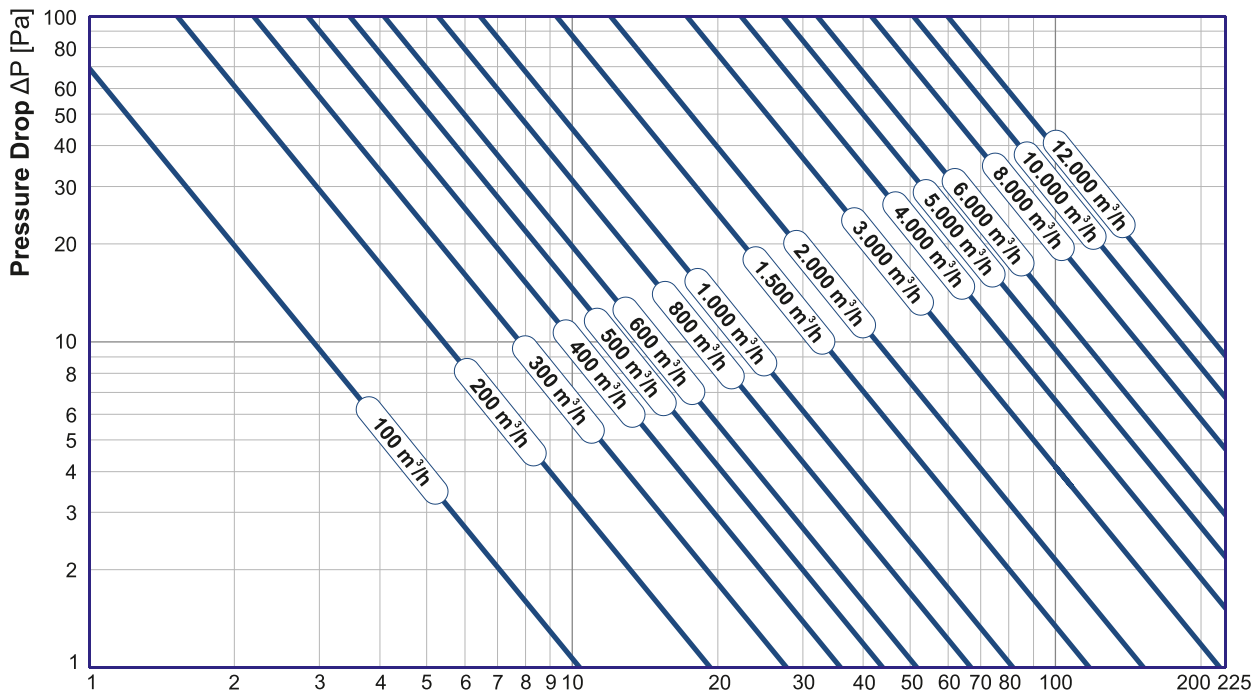


DIAGRAM 3.2

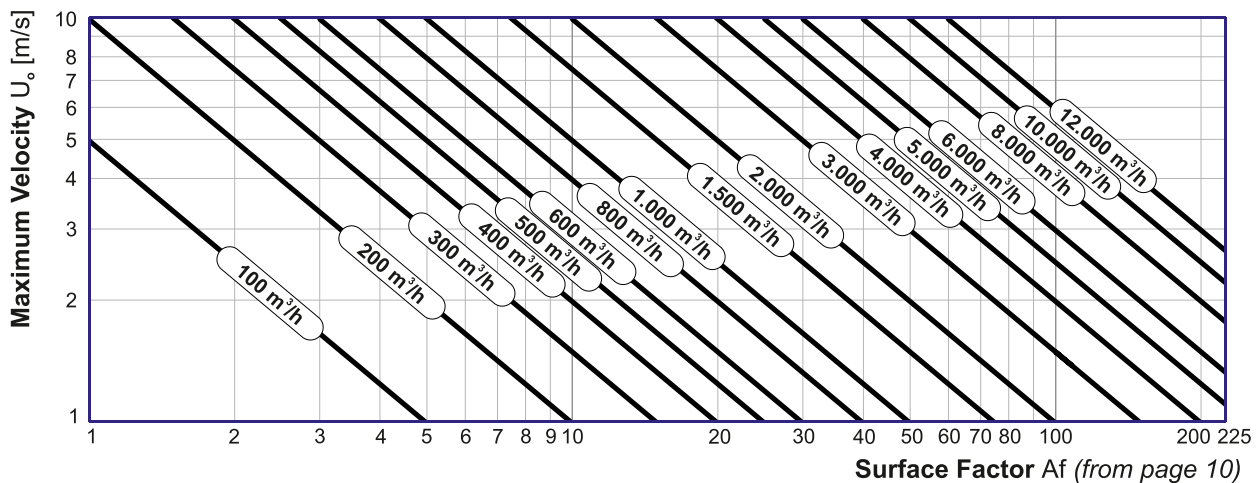


DIAGRAM 3.1

BLADE ANGLE - 45°

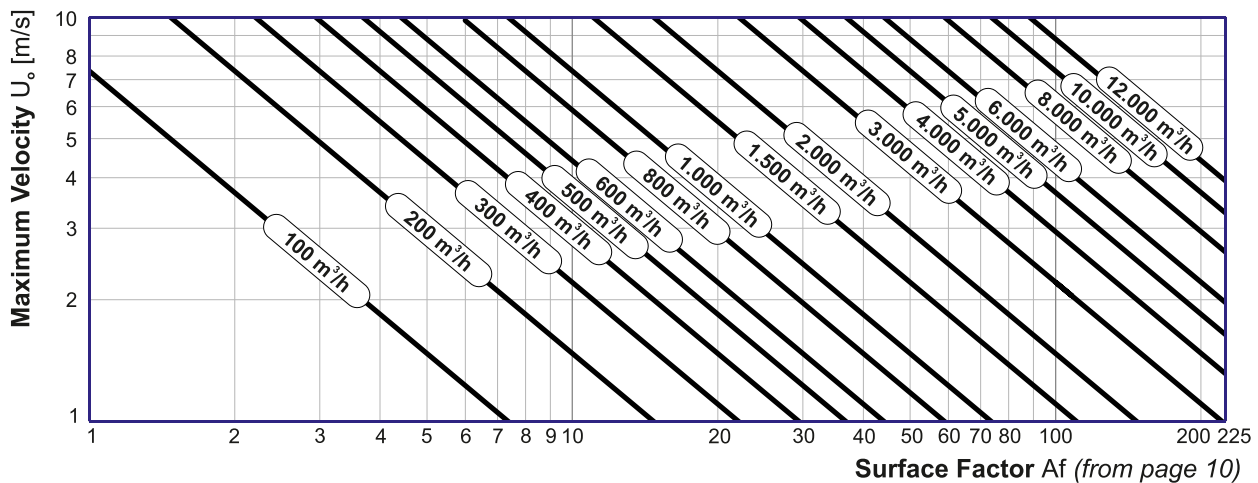
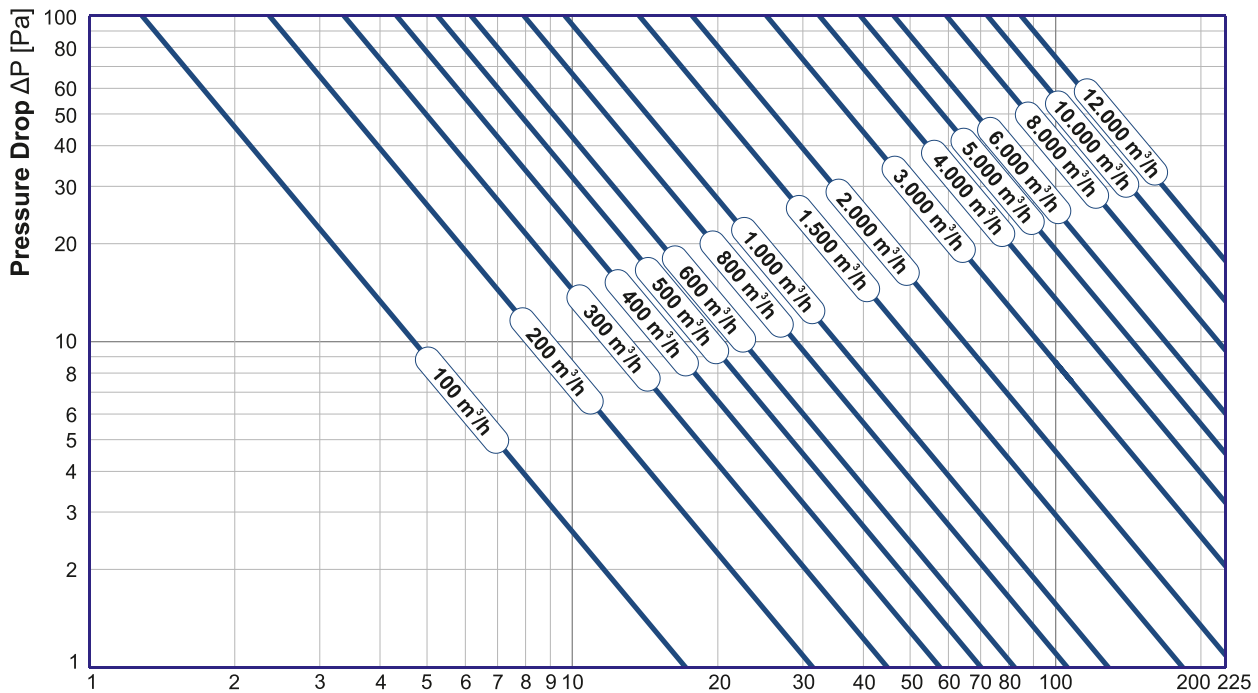
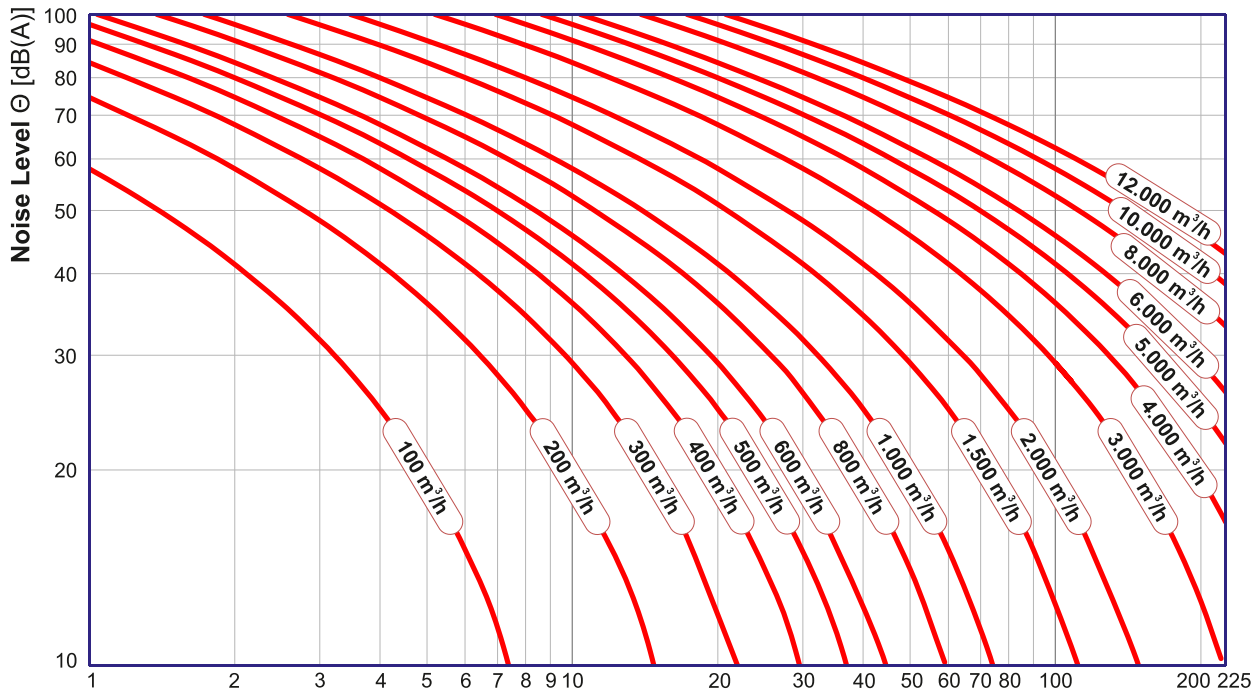


DIAGRAM 4.3

DIAGRAM 4.2

DIAGRAM 4.1

BLADE ANGLE - 60°

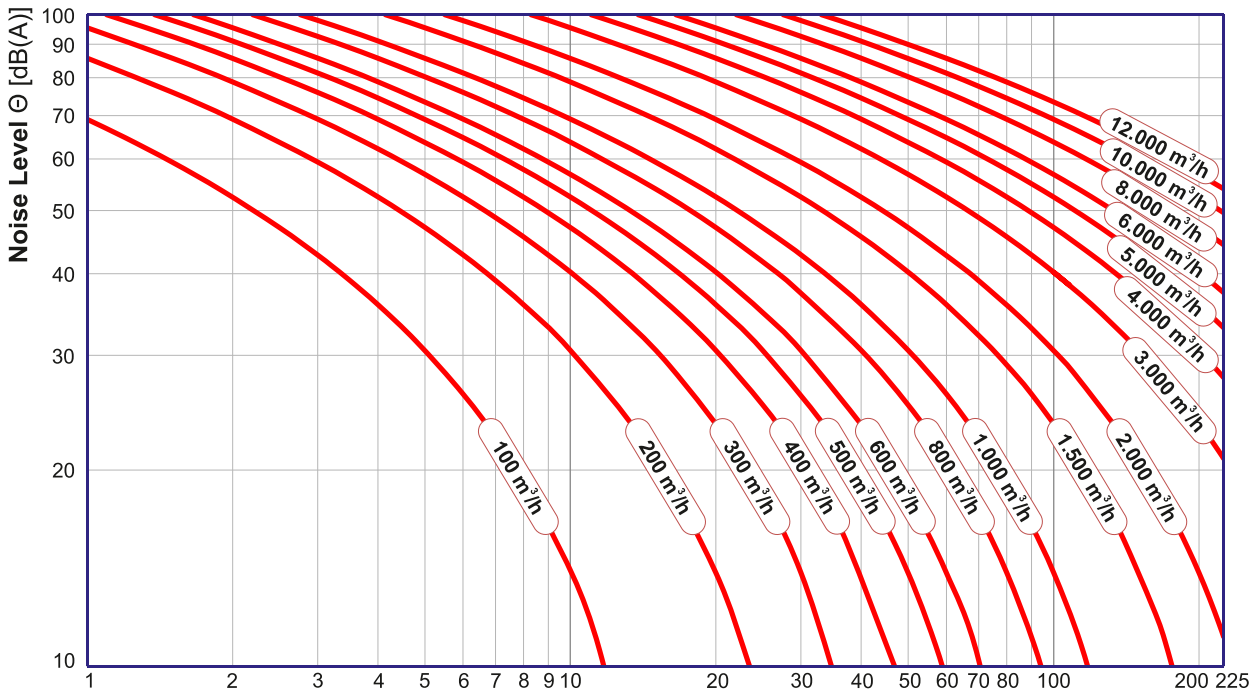


DIAGRAM 3.3

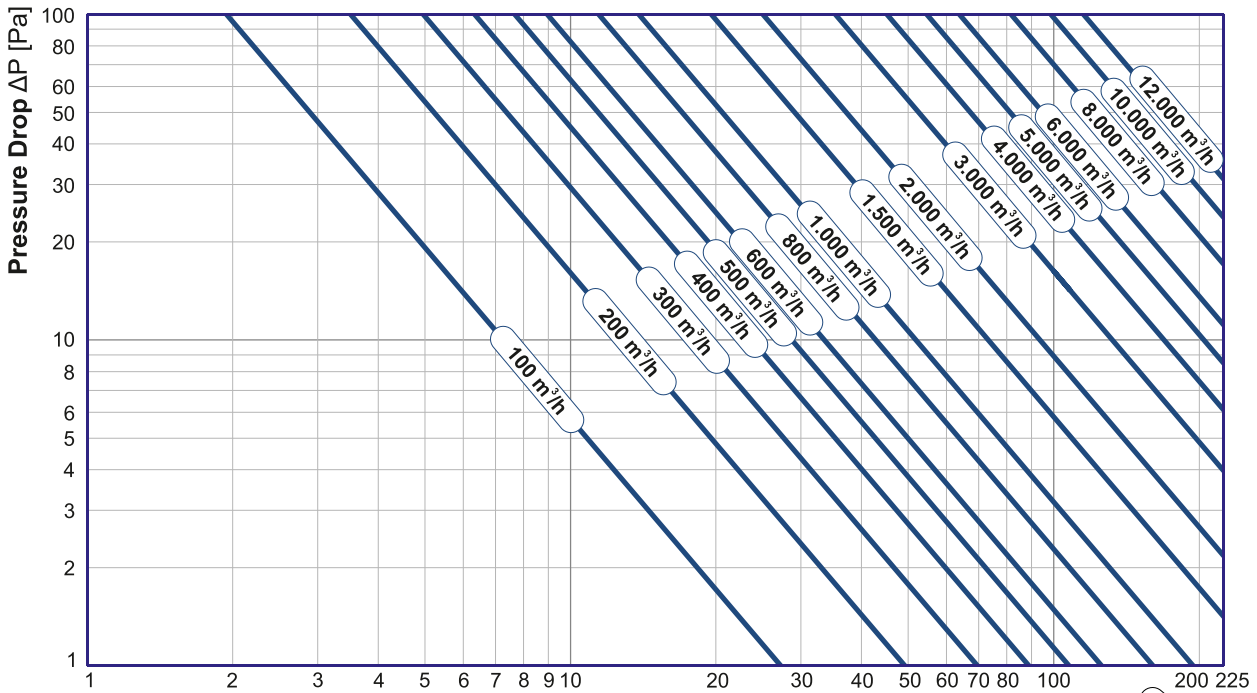


DIAGRAM 3.2

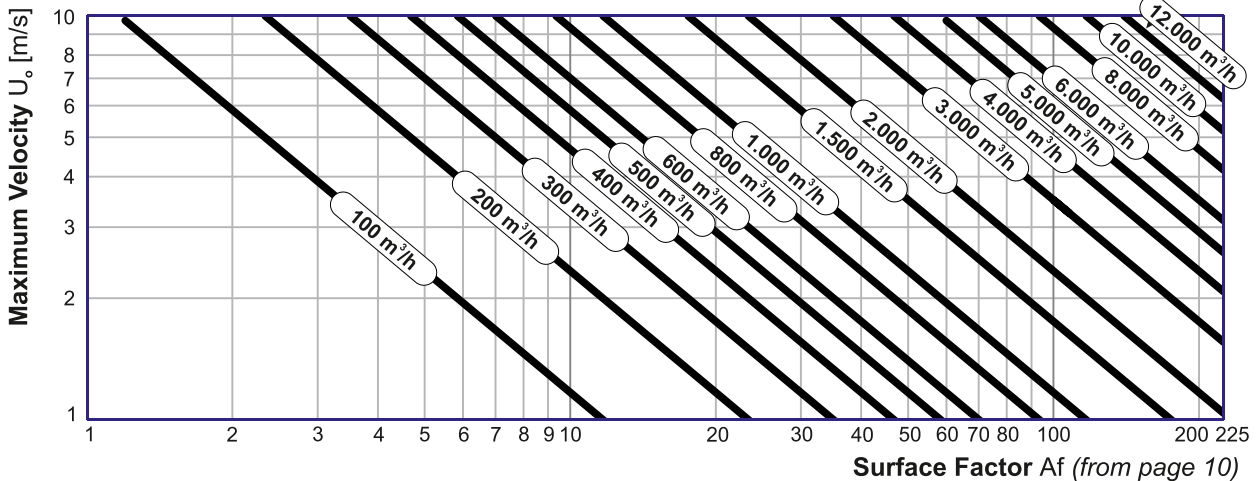


DIAGRAM 3.1

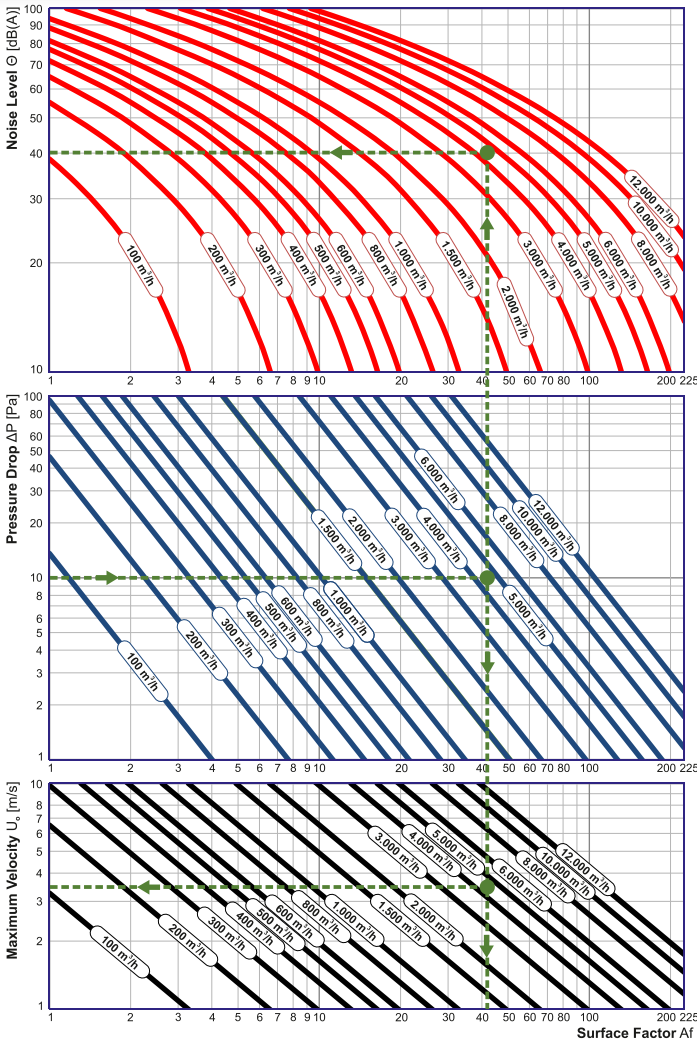


DIAGRAM 1.3

DIAGRAM 1.2

DIAGRAM 1.1

Selection example 1 :

Which are the dimensions of a rectangular damper for air duct installation type A when the air flow is 4.500 m³/h?

From diagram 1.2 we notice that for 4.500 m³/h the range of the pressure drop is from 1 to 100 Pa using surface factors Af from 11 to 150. Assuming that, for fully open damper, a pressure drop of 10 Pa, in the air duct system is satisfying, we establish from diagram 1.2, that the surface factor Af is 42. The dimensions of the damper are usually selected according to the dimensions of the connecting air duct, in order to have at least one dimension, preferably the height, identical and avoid installing additional adaptors. Therefore, if the desired height is 600 mm then, from the surface factor selection table, we conclude that for damper height equal to 600 mm the damper width must be 700 mm. From diagram 1.1 we calculate that the maximum air velocity inside the damper 700 x 600 is equal to 3,5 m/s, while from diagram 1.3 we calculate that the produced noise is equal to 40 dB(A).

Selection example 2 :

How much will the pressure drop increase if the blades of the volume damper, of example 1, change from fully open position to angle 30°?

In example 1, we calculated that volume damper 700 x 600, has a pressure drop of 10 Pa when its blades are in fully open position (0°), and the air flow is 4.500 m³/h. If the blade angle changes to 30° then, according to diagram 3.2 (page 7) the new pressure drop will be 38,5 Pa.

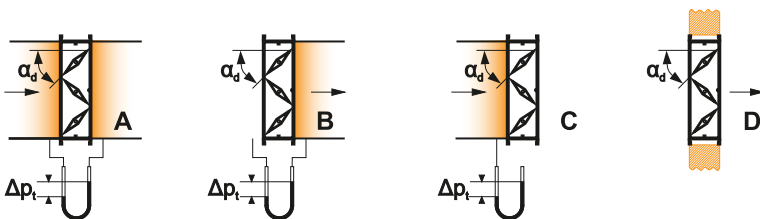
Selection example 3 :

How much would the pressure drop be, if the volume damper, of example 1, was installed on the air duct's outlet (type C) and the blade angle was 45°?

In example 1, we calculated that volume damper 700 x 600, has a pressure drop of 10 Pa when its blades are in fully open position (0°), and the air flow is 4.500 m³/h. If the blade angle changes to 45° then, according to diagram 4.2 (page 8) the new pressure drop will be 76 Pa. We then multiply the result using the proper correction factor, for type C installation and blade angle 45° (1,5) and we calculate that the pressure drop is equal to 114 Pa.

The diagrams above, are an approximate selection method for volume dampers. For more precise calculation, please use the volume damper calculation software KlimaCalc from AIRTECHNIC or contact us.

PRESSURE DROP CALCULATION - CORRECTION FACTORS -	Blade angle			
	15°	30°	45°	60°
Installation type B	3,0	1,6	1,4	1,2
Installation type C	4,2	2,1	1,5	1,2
Installation type D	6,1	2,7	1,9	1,4



SURFACE FACTOR SELECTION TABLE

	100	200	300	400	500	600	700	800	900	1.000	1.100	1.200	1.300	1.400	1.500
100	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
200	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
300	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
400	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
500	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
600	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
700	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
800	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
900	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
1.000	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
1.100	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165
1.200	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
1.300	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195
1.400	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210
1.500	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225

DAMPER ACTUATOR SELECTION

The basic actuator types are distinguished to those with return spring and to those with no return spring.

Regardless of type, they offer the following, typical, control options:

- (1) On / Off control using actuators 230V or 24V
- (2) 3 Position control using actuators 230V or 24V
- (3) Modulating control using actuators 24V (signal 0...10V)

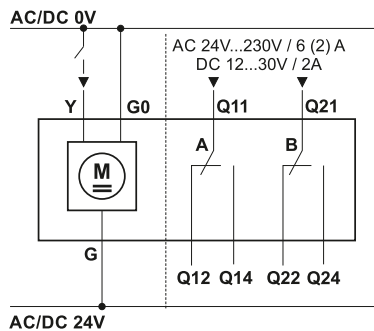
Under order, AIRTECHNIC can also provide actuators with **special specifications**:

- (1) Fast-acting actuators **2 sec.**
- (2) Actuators with **integrated controller** and **differential pressure sensor** for zoning systems which require constant air supply. They do not require additional automation installation.

For technical data and special actuator selection, please contact with AIRTECHNIC technical department.

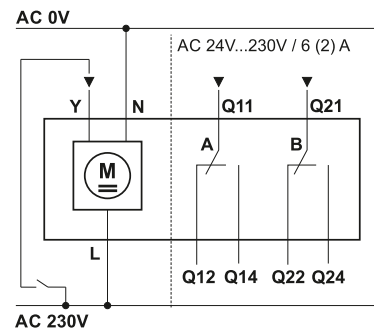


DAMPER ACTUATORS - NON-SPRING RETURN (SIEMENS)



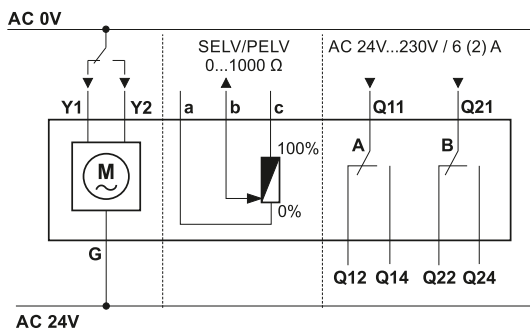
On / Off - ACTUATORS AC / DC 24V

G	Operating voltage AC / DC 24V
G0	Neutral
Y	Control signal AC 0V - Rotation counter-clockwise



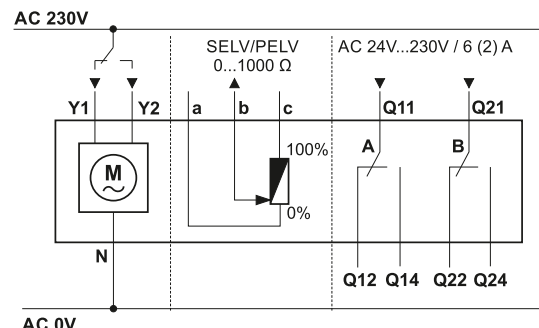
On / Off - ACTUATORS AC 230V

L	Operating voltage AC 230V
N	Neutral
Y	Control signal AC 230V - Rotation counter-clockwise



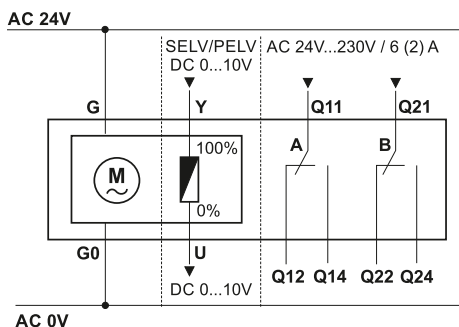
3 POSITION CONTROL - ACTUATORS AC 24V

Y1	Control signal AC 0V - Rotation clockwise
Y2	Control signal AC 0V - Rotation counter-clockwise
G	Operating voltage AC 24V



3 POSITION CONTROL - ACTUATORS AC 230V

Y1	Control signal AC 230V - Rotation clockwise
Y2	Control signal AC 230V - Rotation counter-clockwise
N	Neutral



MODULATING CONTROL - ACTUATORS AC 24V

G	Operating voltage AC 24V
G0	Neutral
Y	Control signal DC 0...10V
U	Position signal DC 0...10V



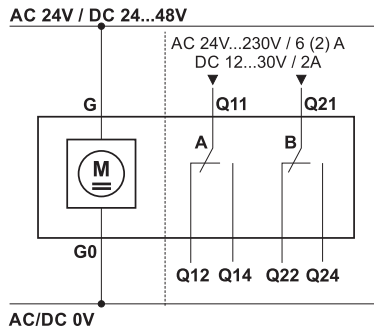
AUXILIARY SWITCH

Q11 / Q21	Inputs
Q12 / Q22	Normally Closed Contacts
Q14 / Q24	Normally Open Contacts

POTENTIOMETER

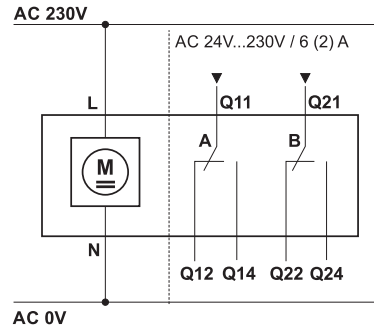
a	Potentiometer 0...100% (a-b)
b	Position Selection
c	Potentiometer 100...0% (b-c)

DAMPER ACTUATORS - SPRING RETURN (SIEMENS)



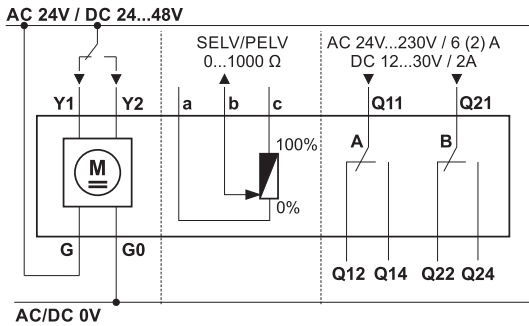
On / Off - ACTUATORS AC 24V / DC 24...48V

G	Operating voltage AC 24V / DC 24...48V
G0	Neutral



On / Off - ACTUATORS AC 230V

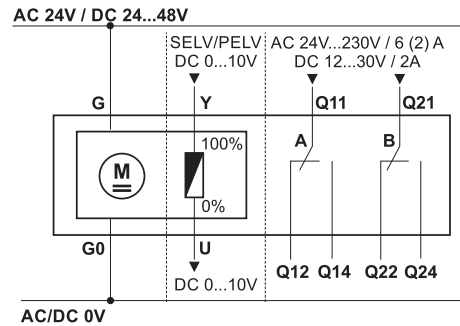
L	Operating voltage AC 230V
N	Neutral



3 POSITION CONTROL - ACTUATORS AC 24V / DC 24...48V

Y1	Control signal AC 24V / DC 24...48V "OPEN" (*)
Y2	Control signal AC 24V / DC 24...48V "CLOSE" (*)
G	Operating voltage AC 24V / DC 24...48V
G0	Neutral

(*) Alternative control signal AC 0V "OPEN / CLOSE"



MODULATING CONTROL - ACTUATORS AC 24V / DC 24...48V

G	Operating voltage AC 24V
G0	Neutral
Y	Control signal DC 0...10V
U	Position signal DC 0...10V

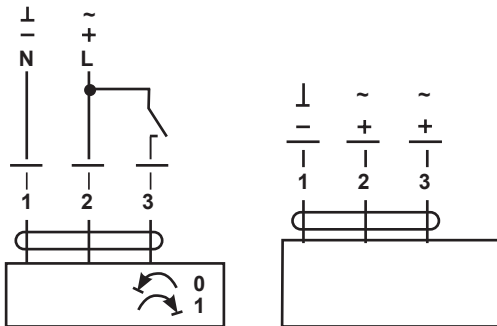
AUXILIARY SWITCH

Q11 / Q21	Inputs
Q12 / Q22	Normally Closed Contacts
Q14 / Q24	Normally Open Contacts

POTENTIOMETER

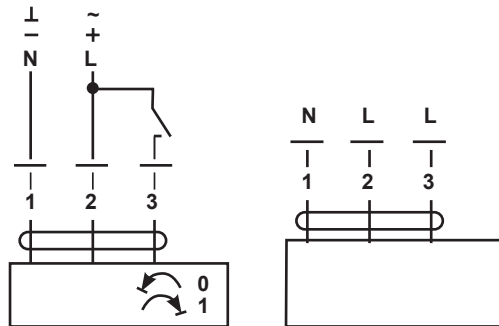
a	Potentiometer 0...100% (a-b)
b	Position Selection
c	Potentiometer 100...0% (b-c)

DAMPER ACTUATORS - NON-SPRING RETURN (BELIMO)



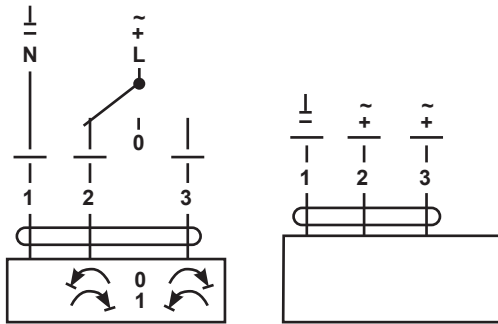
On / Off - ACTUATORS AC / DC 24V

1	Neutral
2	Control signal 24V - Rotation counter-clockwise
3	Control signal 24V - Rotation clockwise



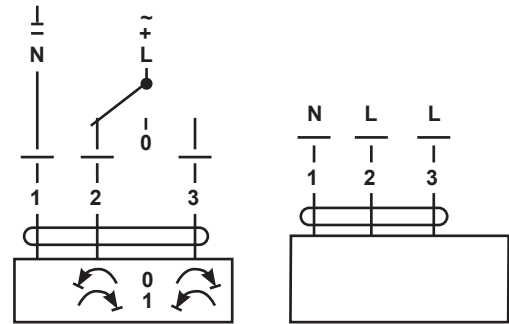
On / Off - ACTUATORS AC 230V

1	Neutral
2	Control signal 230V - Rotation counter-clockwise
3	Control signal 230V - Rotation clockwise



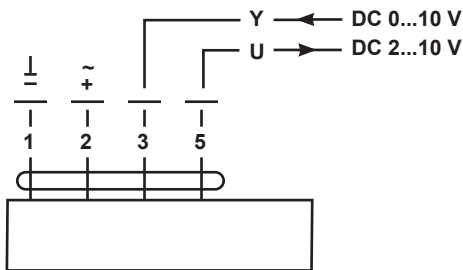
3 POSITION CONTROL - ACTUATORS AC / DC 24V

- | | |
|---|-------------------------------------------------|
| 1 | Neutral |
| 2 | Control signal 24V - Rotation counter-clockwise |
| 3 | Control signal 24V - Rotation clockwise |



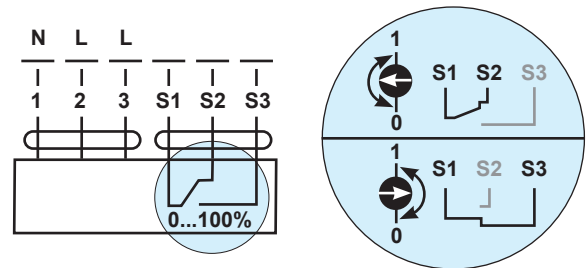
3 POSITION CONTROL - ACTUATORS AC 230V

- | | |
|---|--------------------------------------------------|
| 1 | Neutral |
| 2 | Control signal 230V - Rotation counter-clockwise |
| 3 | Control signal 230V - Rotation clockwise |



MODULATING CONTROL - ACTUATORS AC / DC 24V

- | | |
|---|--------------------------|
| 1 | Neutral |
| 2 | Operating voltage 24V |
| 3 | Input signal DC 0...10V |
| 5 | Output signal DC 2...10V |

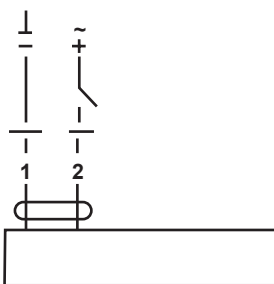


AUXILIARY SWITCH

	Rotation counter-clockwise	Rotation clockwise
S1	Input	Input
S2	Normally Closed Contact	Normally Open Contact
S3	Normally Open Contact	Normally Closed Contact

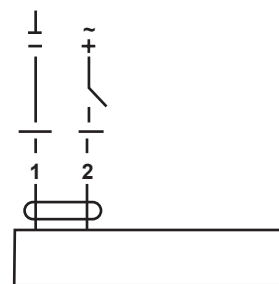
DAMPER ACTUATORS - SPRING RETURN (BELIMO)

AC/DC 24 V, open-close



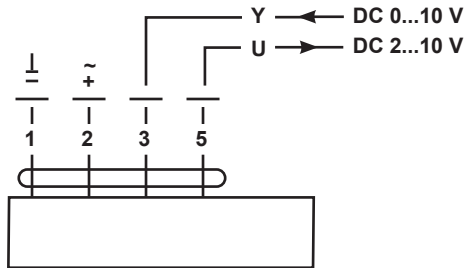
On / Off - ACTUATORS AC / DC 24V

- | | |
|---|-----------------------|
| 1 | Neutral |
| 2 | Operating voltage 24V |



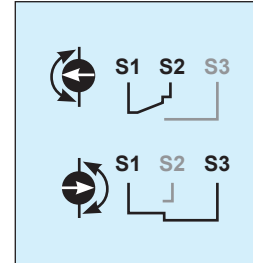
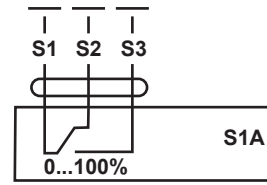
On / Off - ACTUATORS AC 230V

- | | |
|---|------------------------|
| 1 | Neutral |
| 2 | Operating voltage 230V |



MODULATING CONTROL - ACTUATORS AC / DC 24V

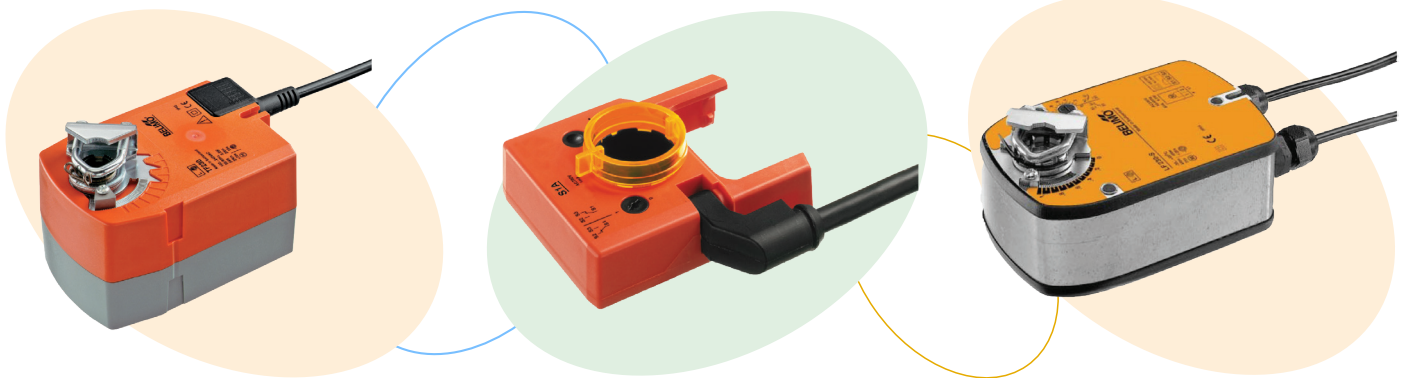
1	Neutral
2	Operating voltage 24V
3	Input signal DC 0...10V
5	Output signal DC 2...10V



Cable colours:
S1 = violet
S2 = red
S3 = white

AUXILIARY SWITCHES

	Rotation counter-clockwise	Rotation clockwise
S1	Input	Input
S2	Normally Closed Contact	Normally Open Contact
S3	Normally Open Contact	Normally Closed Contact



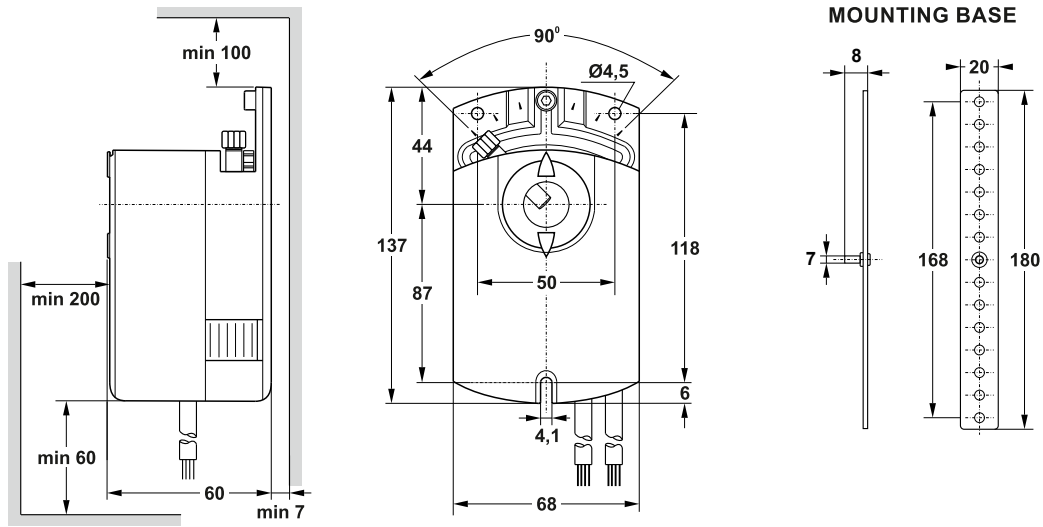
DAMPER ACTUATOR SELECTION

The selection for damper actuator is based on the torque required for the rotation of the damper's blades. The following table gives the necessary torque, according to the damper's surface.

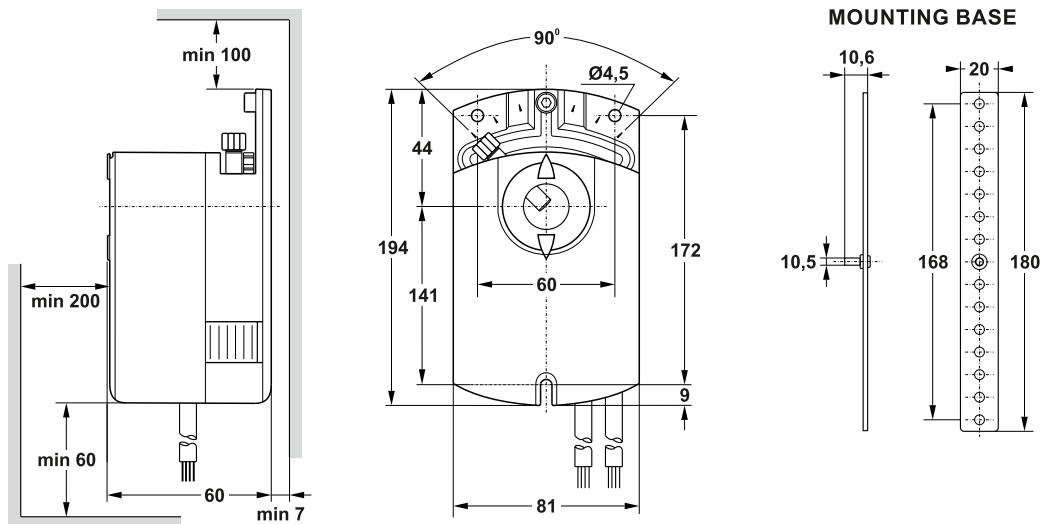
		DAMPER ACTUATOR REQUIRED TORQUE													
		100	200	300	400	500	600	700	800	900	1.000	1.100	1.200	1.300	1.400
100															
200															
300															
400															
500															
600															
700															
800															
900															
1.000															
1.100															
1.200															
1.300															
1.400															
1.500															
		REQUIRED TORQUE 5 Nm					REQUIRED TORQUE 10 Nm					REQUIRED TORQUE 20 Nm			

DAMPER ACTUATORS INDICATIVE DIMENSIONS

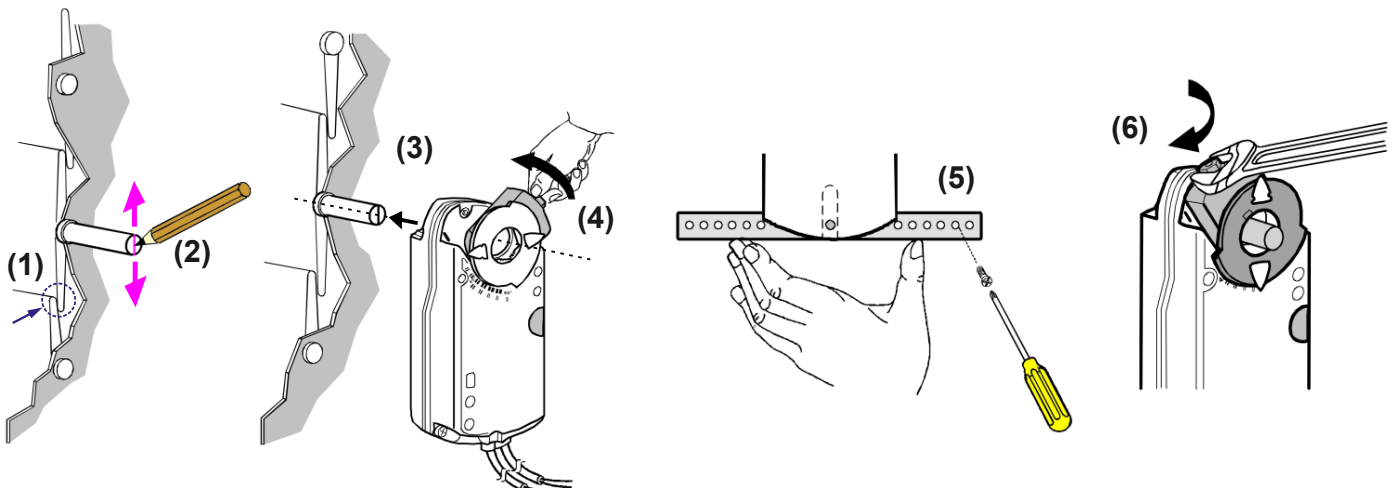
ACTUATORS FOR TORQUE 5 Nm & 10 Nm



ACTUATORS FOR TORQUE 20 Nm



DAMPER ACTUATORS INSTALLATION



Damper in fully closed position

Fitting the actuator on the damper's drive axis

Mounting base installation

Locking the actuator on the damper's drive axis

RECTANGULAR DAMPERS ORDER

For the proper order of rectangular dampers please use the following code :

RDA | **400** x **250** + **G** | **PN20** | **FR.AL** | **BL.GL**

Blank = blades from aluminium
BL.CN = blades from copper
BL.GL = blades from galvanized steel
BL.I = blades from stainless steel

Blank = frame from galvanized steel
FR.AL = frame from aluminium
FR.CN = frame from copper
FR.I = frame from stainless steel
FR.RAL = frame powder painted in RAL color

Blank = without air duct profile
PN20 = with air duct profile No 20
PN30 = with air duct profile No 30
PN40 = with air duct profile No 40
PN30I = with air duct profile No 30 INOX

MA = with analog actuator 24V
MO = with ON / OFF actuator 230V
M.../3 = with 3-position actuator
M../A = with actuator with auxiliary switches
G = with grid
Blank = without additional components

Damper **Height** [mm]

Damper **Width** [mm]

RDA = standard construction

Examples

RDA 600 x 600 +G + MA | PN20 =

Rectangular, multi-leaf air duct damper, 600 mm in width and in height, with protection grid, air duct profile No20, frame from galvanized steel and blades from aluminium. The damper will be controlled with analog actuator 24V.

RDA 500 x 400 | PN30I | FR.I | BL.I =

Rectangular, multi-leaf air duct damper 500 mm in width & 400 mm in height, with air duct profile No30 INOX, frame and blades from stainless steel. The damper will be controlled manually.

RDA 700 x 500 +MO | FR.7015 | GL.GL =

Rectangular, multi-leaf air duct damper 700 mm in width & 500 mm in height, without air duct profile, frame powder painted in RAL 7015 and blades from galvanized steel. The damper will be controlled with On / Off actuator 230V.

SPECIFICATION



Rectangular, multi-leaf air duct damper, RDA

Rectangular, multi-leaf air duct damper, indicative type **RDA** by **AIRTECHNIC**, manufactured of galvanized steel / painted in RAL... color / aluminium / copper / stainless steel / plastic PVC, with opposite moving blades manufactured of hollow-body aluminium profile / galvanized steel / copper / stainless steel. The blade movement will be achieved via plastic gears. The blade angle adjustment will be achieved manually (**RDA**) / automatically via actuator On/Off 230V (**RDA+MO**) / automatically via analog actuator 24V (**RDA+MA**). It will be possible to install 3-position actuator [M.../3] / actuator with auxiliary contacts [M../A]. The manufacturer will have performed measurements of the technical characteristics of the grille, in an independent laboratory according to the standard ELOT EN 1751:1998. It will not have air duct profile / It will have air duct profile No 20, 30, 40, 30 INOX [**PN20, PN30, PN40, PN30I**]. It will have grid [**G**]. It will be suitable for placement within an air duct system, for indoor air exhaust or fresh air intake. The factory will be certified according to **ISO 9001:2015** (Quality Management Systems) and according to **ISO 14001:2015** (Environmental Management Systems).

It will be manufactured by **AIRTECHNIC** type **RDA / RDA +G / RDA | PN20, PN30, PN40, PN30I**

It will be manufactured by **AIRTECHNIC** type **RDA+MO**

It will be manufactured by **AIRTECHNIC** type **RDA+MA**



ISO 9001:2015



ISO 14001:2015

ΚΕΝΤΡΙΚΕΣ ΜΟΝΑΔΕΣ ΚΛΙΜΑΤΙΣΜΟΥ

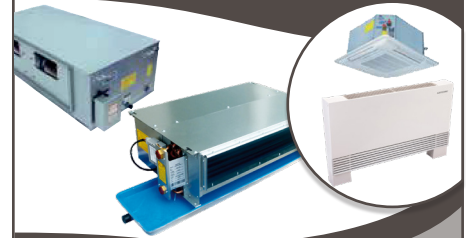


ΕΝΑΛΛΑΚΤΕΣ ΑΕΡΑ - ΑΕΡΑ

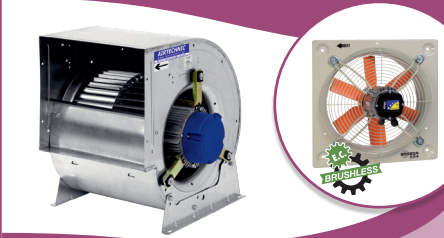


EC MOTORS

FAN COIL UNITS

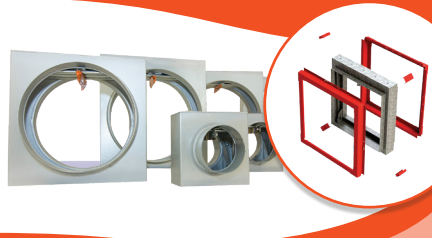


ΑΝΕΜΙΣΤΗΡΕΣ & FAN SECTIONS



BRUSHLESS

ΔΙΑΦΡΑΓΜΑΤΑ ΠΥΡΚΑΓΙΑΣ



ΣΤΟΜΙΑ ΑΕΡΑ



ΥΓΡΑΝΤΗΡΕΣ ΑΤΜΟΥ - ΑΦΥΓΡΑΝΤΗΡΕΣ



ΚΕΝΤΡΙΚΗ ΗΛΕΚΤΡΙΚΗ ΣΚΟΥΠΑ



ΤΥΒΟ
THINK CLEAN

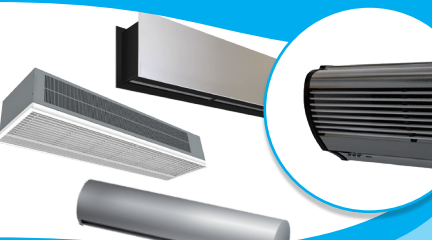
ΑΝΟΞΕΙΩΤΕΣ ΚΑΜΙΝΑΔΕΣ



ΦΙΛΤΡΑ



ΑΕΡΟΚΟΥΡΤΙΝΕΣ



ΔΡΟΣΙΣΜΟΣ



ΕΔΡΑ - ΑΘΗΝΑ

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22620 - 89.006
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