AIRTECHNIC
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Air-Conditioning & Ventilation Components & Systems

Rectangular volume dampers

RDA

FOR AIR DUCT INSTALLATION

περισσότερα
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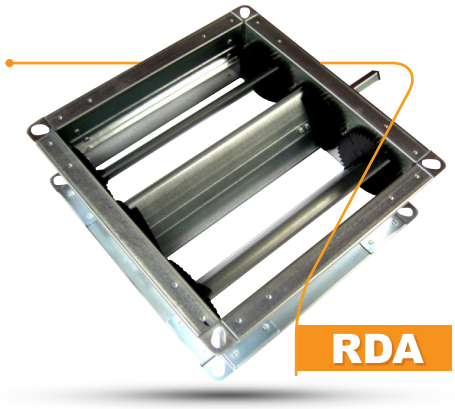
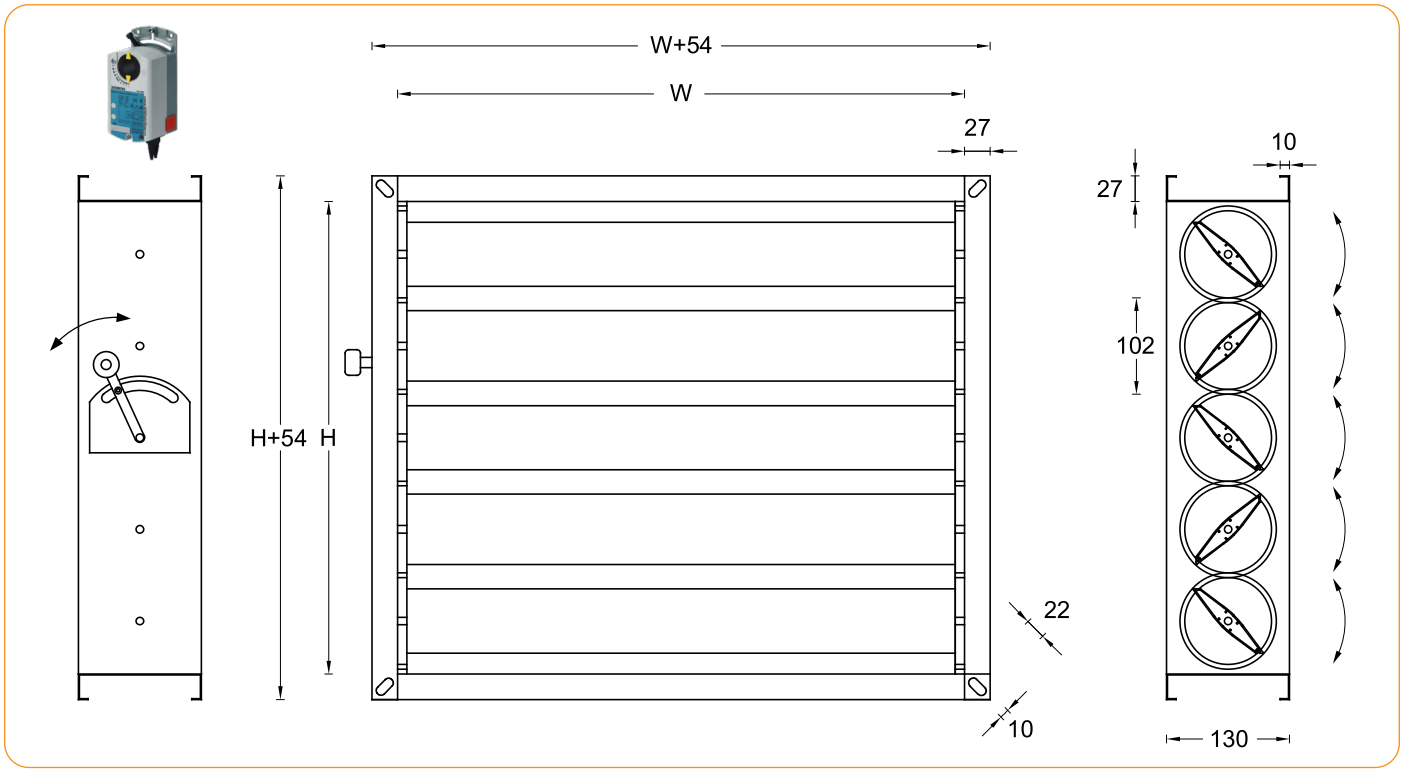
Volume dampers RDA



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.

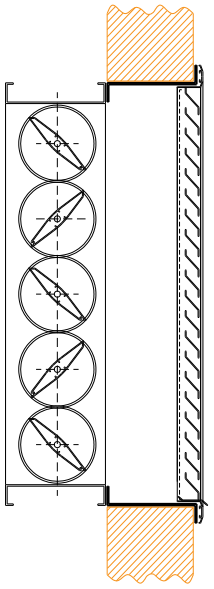


The standard dimensions for rectangular dampers are presented in a following table (page 10). However, it is possible to manufacture rectangular dampers in any dimension, under order.

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

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 LOUVRE
WALL INSTALLATION EXAMPLE



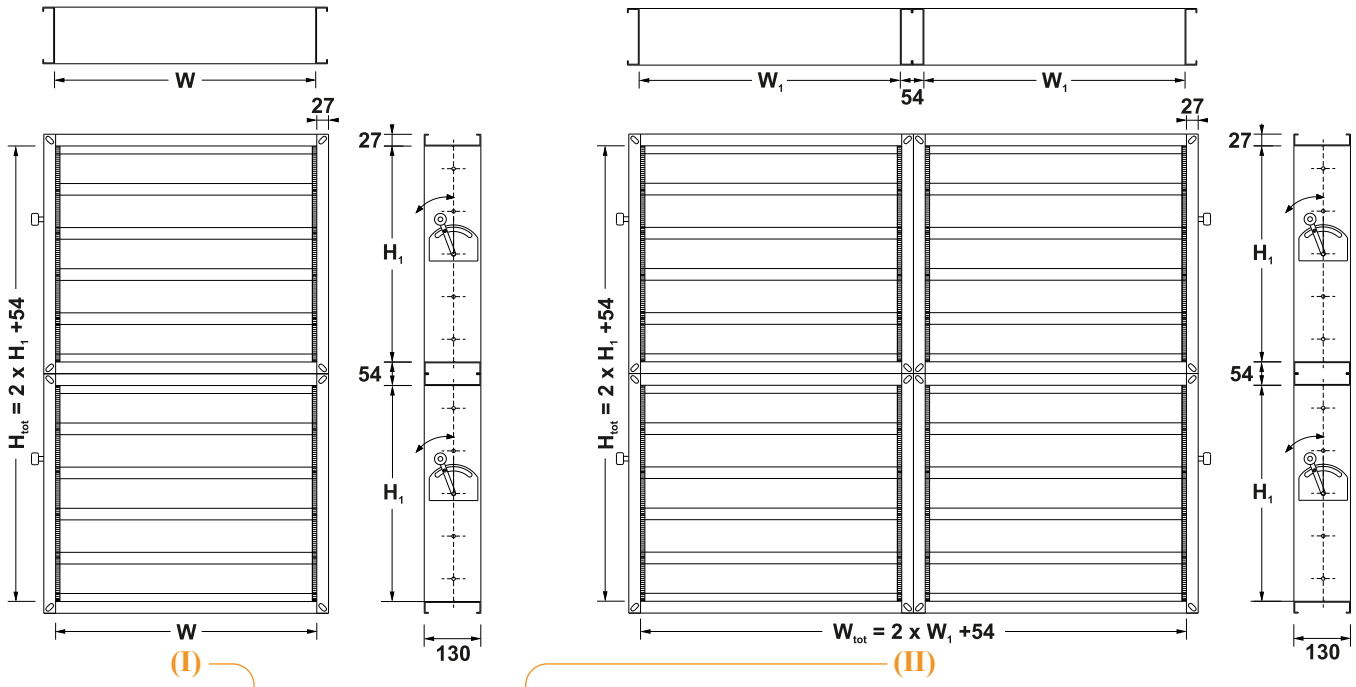
RECTANGULAR DAMPER SELECTION

The technical specifications for rectangular dampers are the following :

Damper Width	**W**	[mm]
Damper Height	**H**	[mm]
Blade Angle	a_d	
Damper Surface Factor	**Af**	
Pressure drop inside the damper	**ΔP**	[Pa]
Maximum velocity inside the damper	U_o	[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).

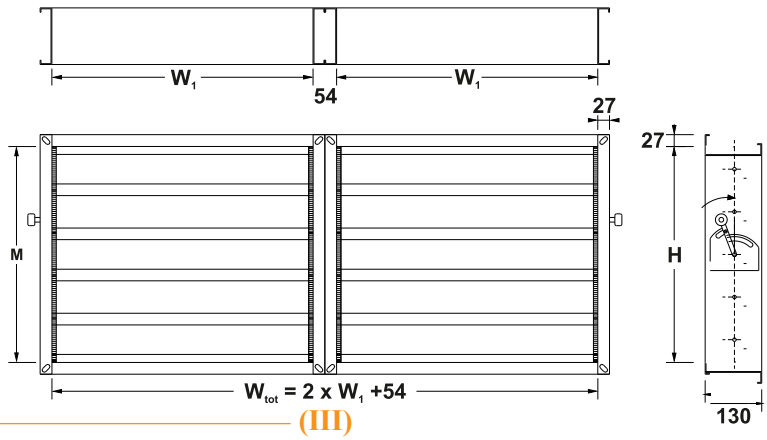
DIVIDING LARGE RECTANGULAR DAMPERS



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**).

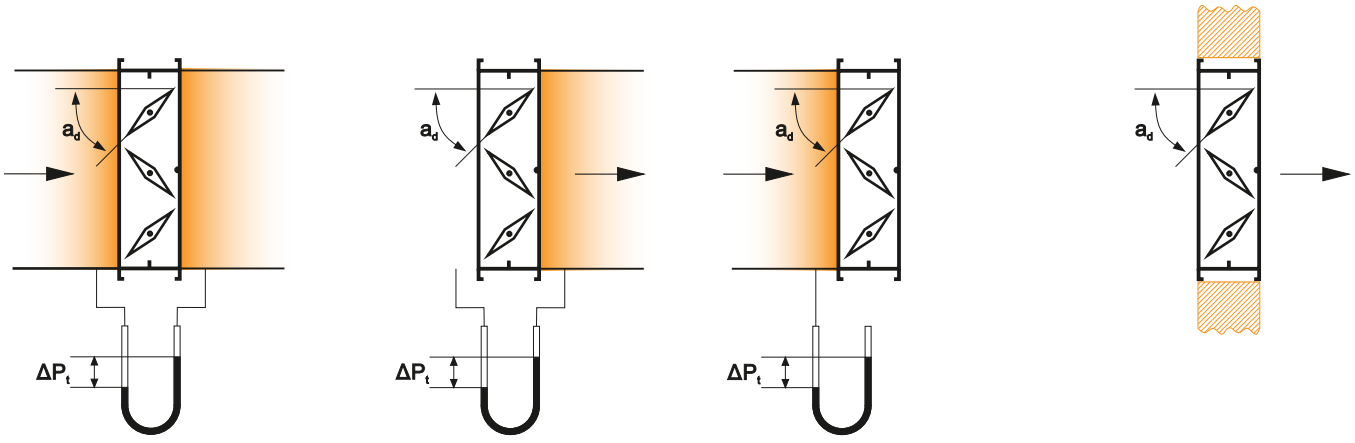
CASE (III)
Dividing horizontally if the damper is over **1.600 mm**. The damper's final design is presented in drawing (**III**).



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.

(A)	(B)	(C)	(D)
Installation between air ducts	*Installation on the air duct's inlet*	*Installation on the air duct's outlet*	*Installation on a wall*



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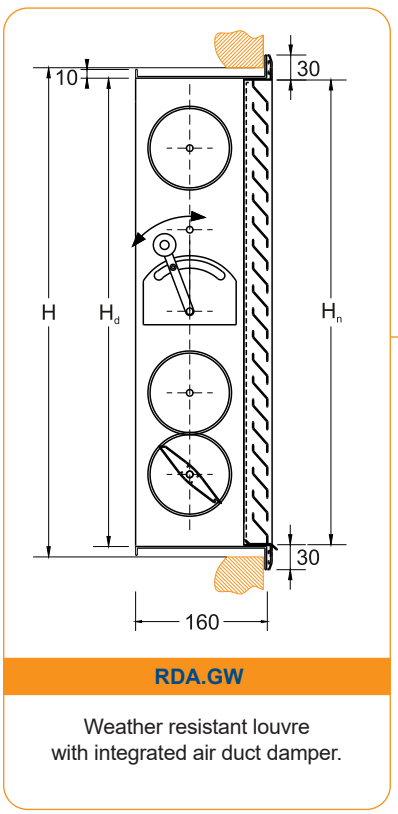
The following diagrams provide data suitabe for selecting fully open dampers (**0⁰**), for all installation types and for selecting blade angle **15⁰**, **30⁰**, **45⁰** & **60⁰** for installation between air ducts (**type A**). In order to calculate the pressure drop, for blade angle **15⁰**, **30⁰**, **45⁰** & **60⁰**, 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			
	15⁰	30⁰	45⁰	60⁰
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

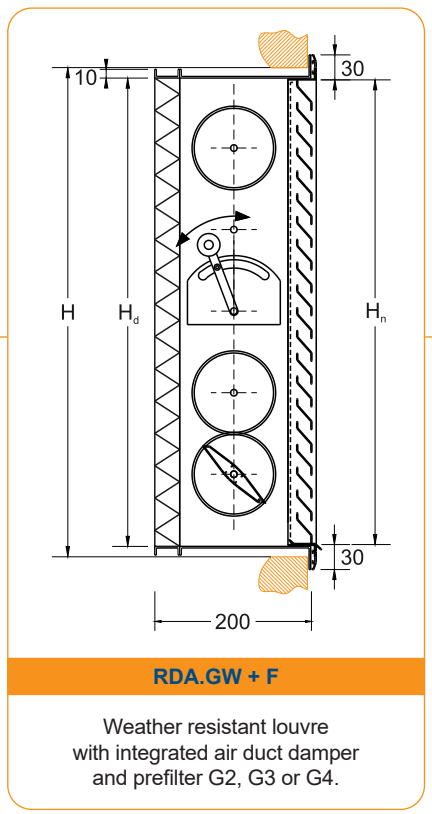
SPECIAL VOLUME DAMPER CONSTRUCTION

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.



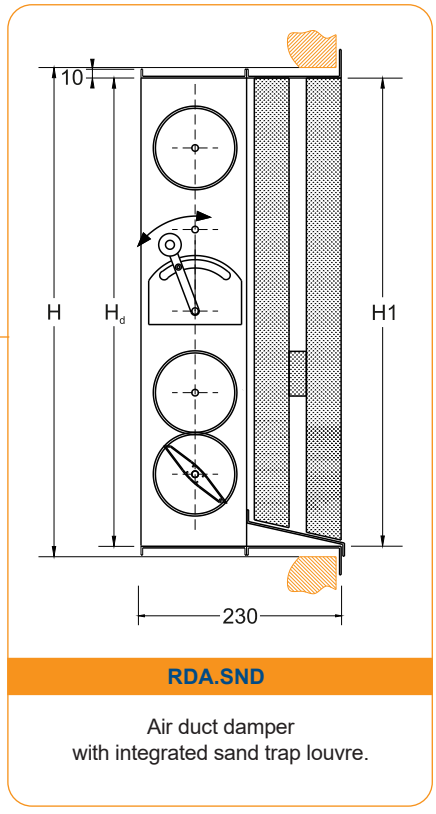
RDA.GW

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 Brillant blue	RAL 6003 Olive green	RAL 6024 Traffic green	RA Bas	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 70 Brown gre	AL 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 7015 Slate grey	RAL 9002 Grey white

Color examples

BLADE ANGLE - 0°

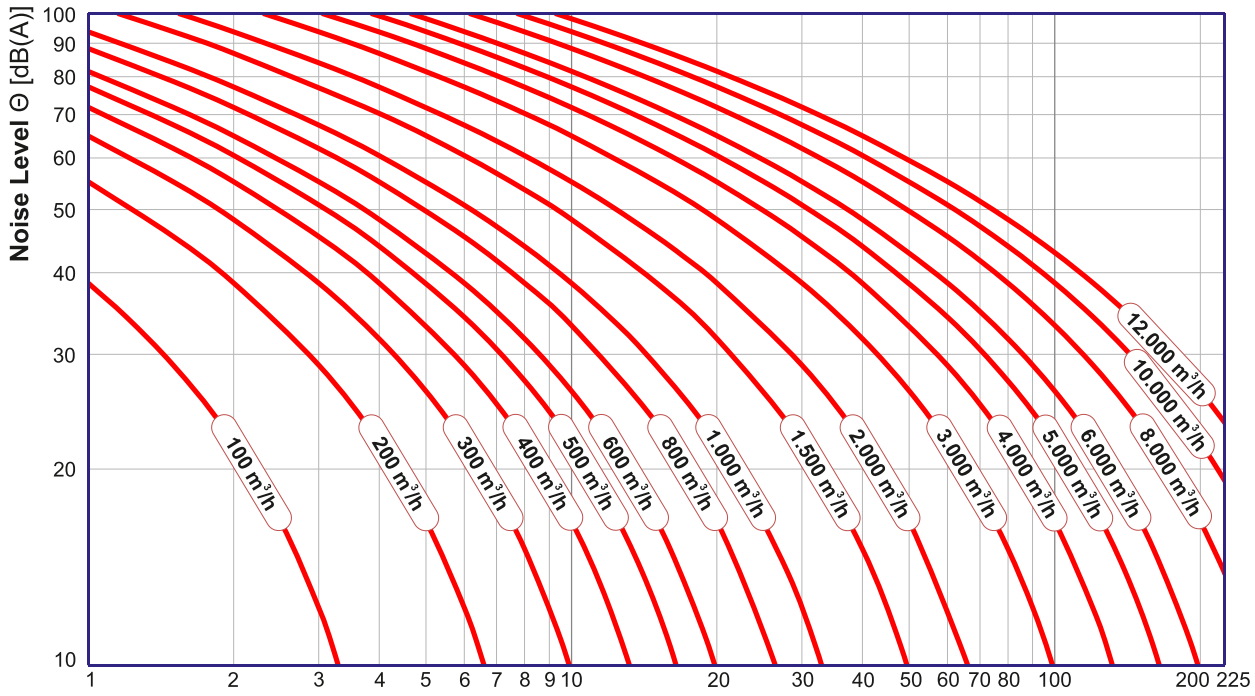


DIAGRAM 1.3

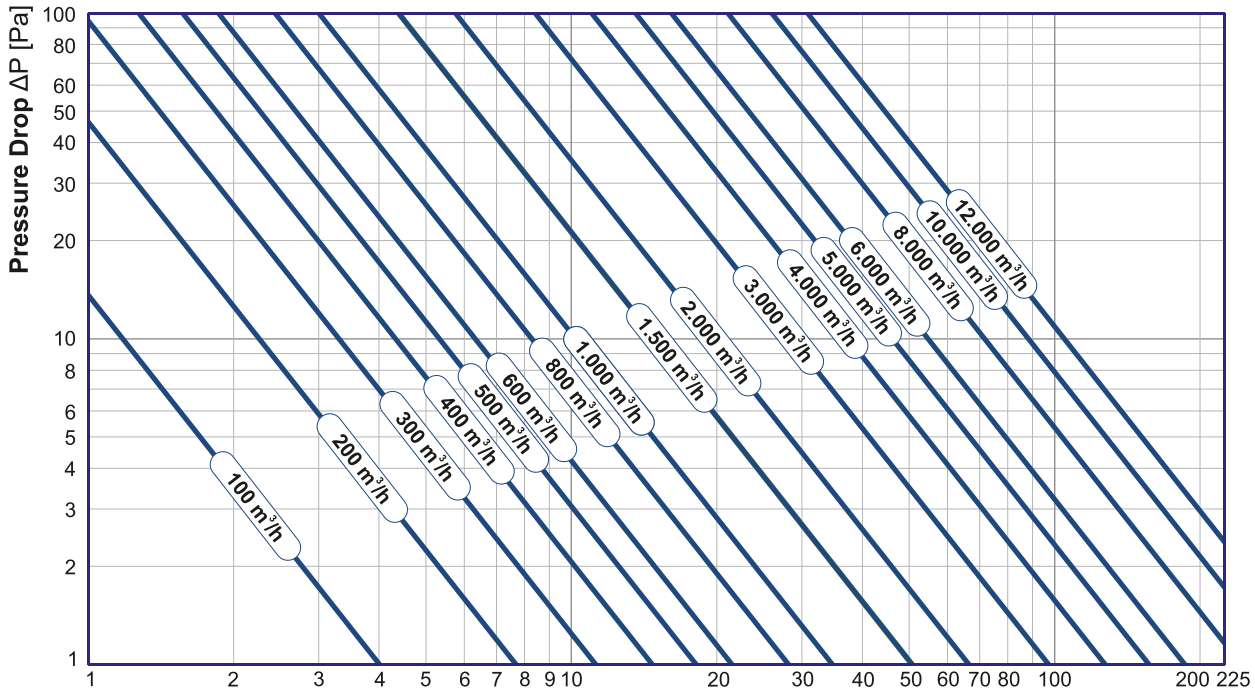


DIAGRAM 1.2

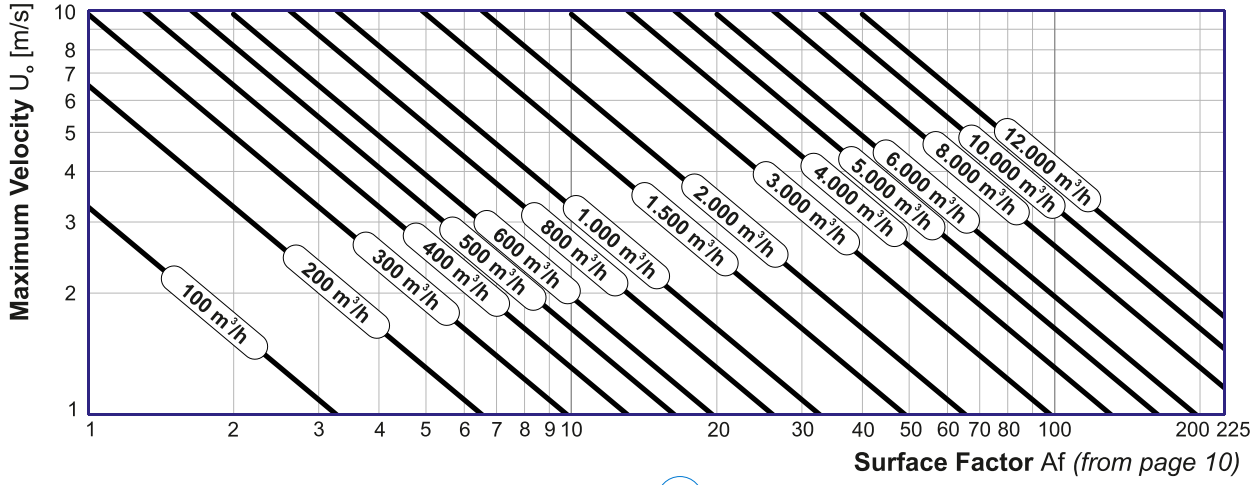


DIAGRAM 1.1

Surface Factor Af *(from page 10)*

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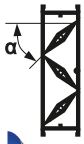
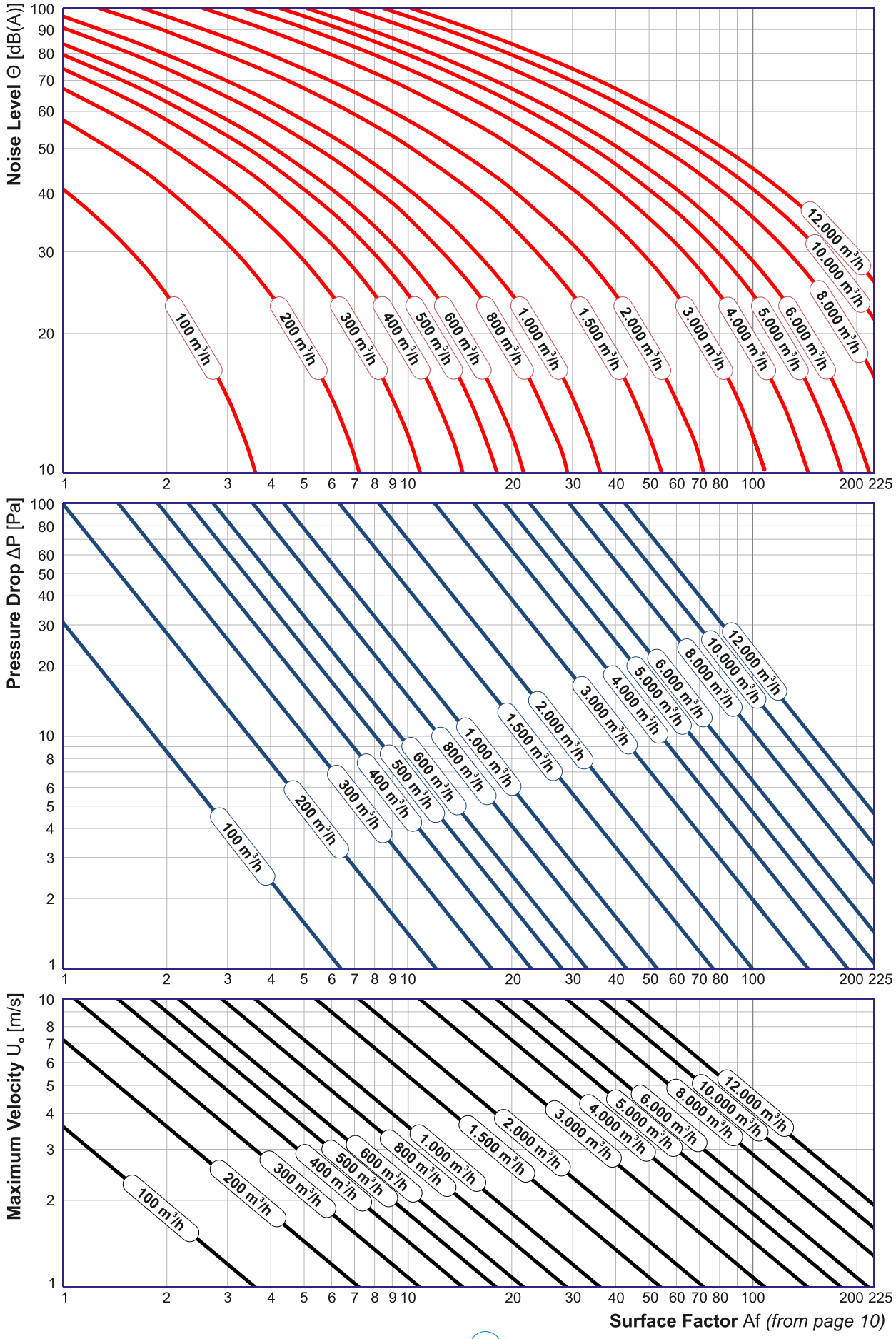
BLADE ANGLE - 15°

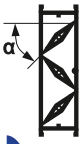
15°





BLADE ANGLE - 30°

30°



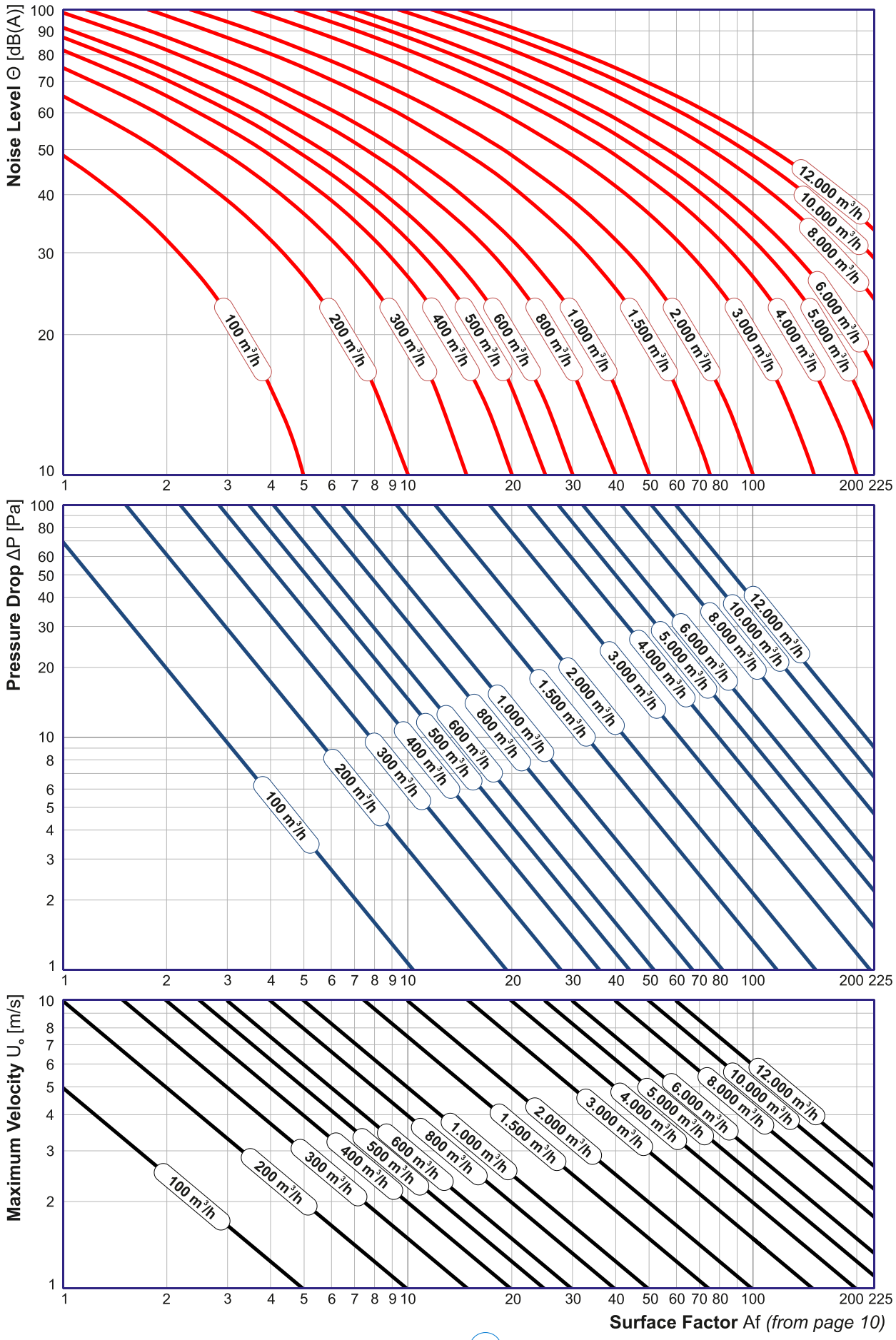


DIAGRAM 3.3

DIAGRAM 3.2

DIAGRAM 3.1

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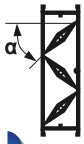
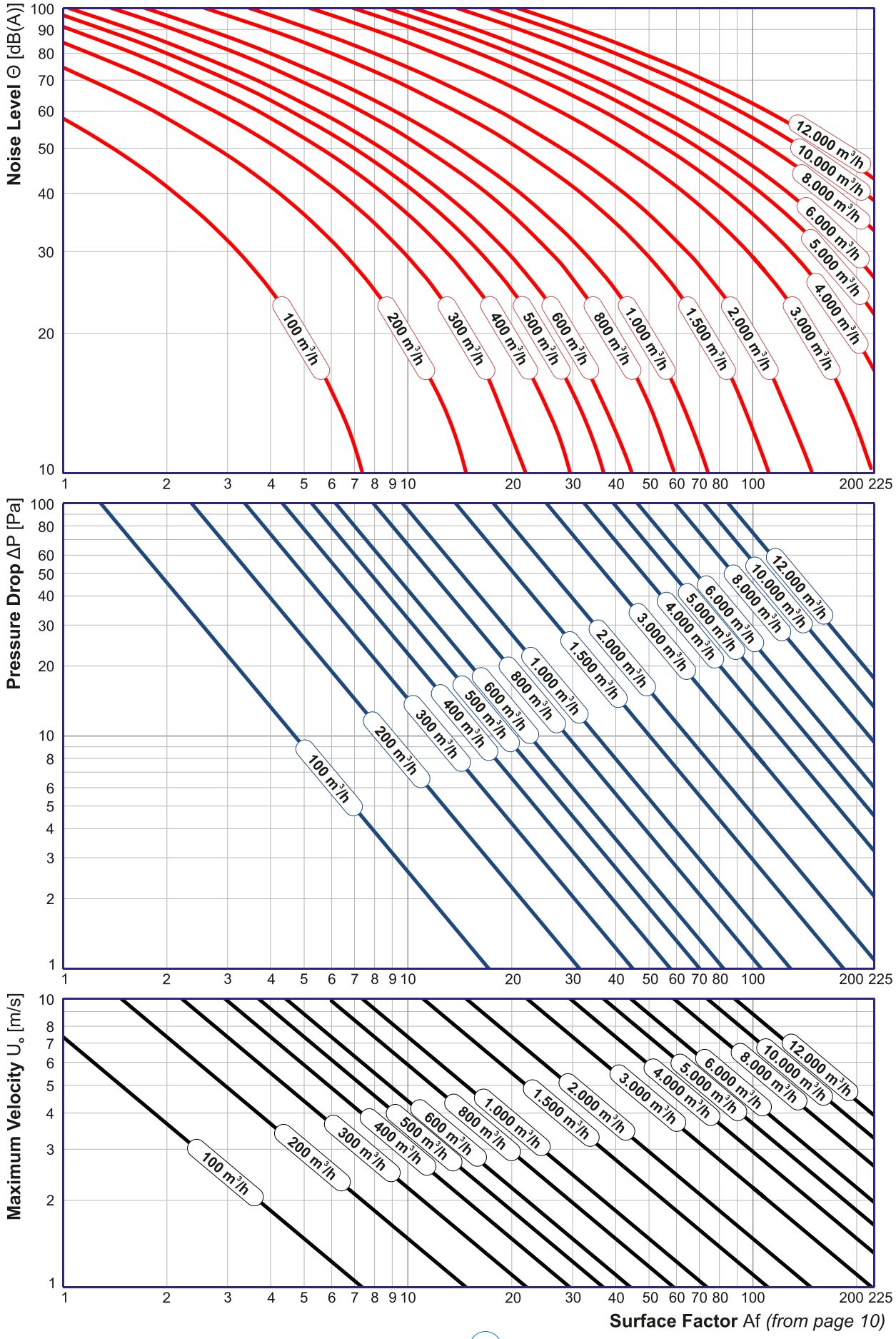
BLADE ANGLE - 45°

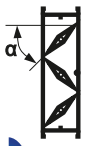
45°





BLADE ANGLE - 60°

60°



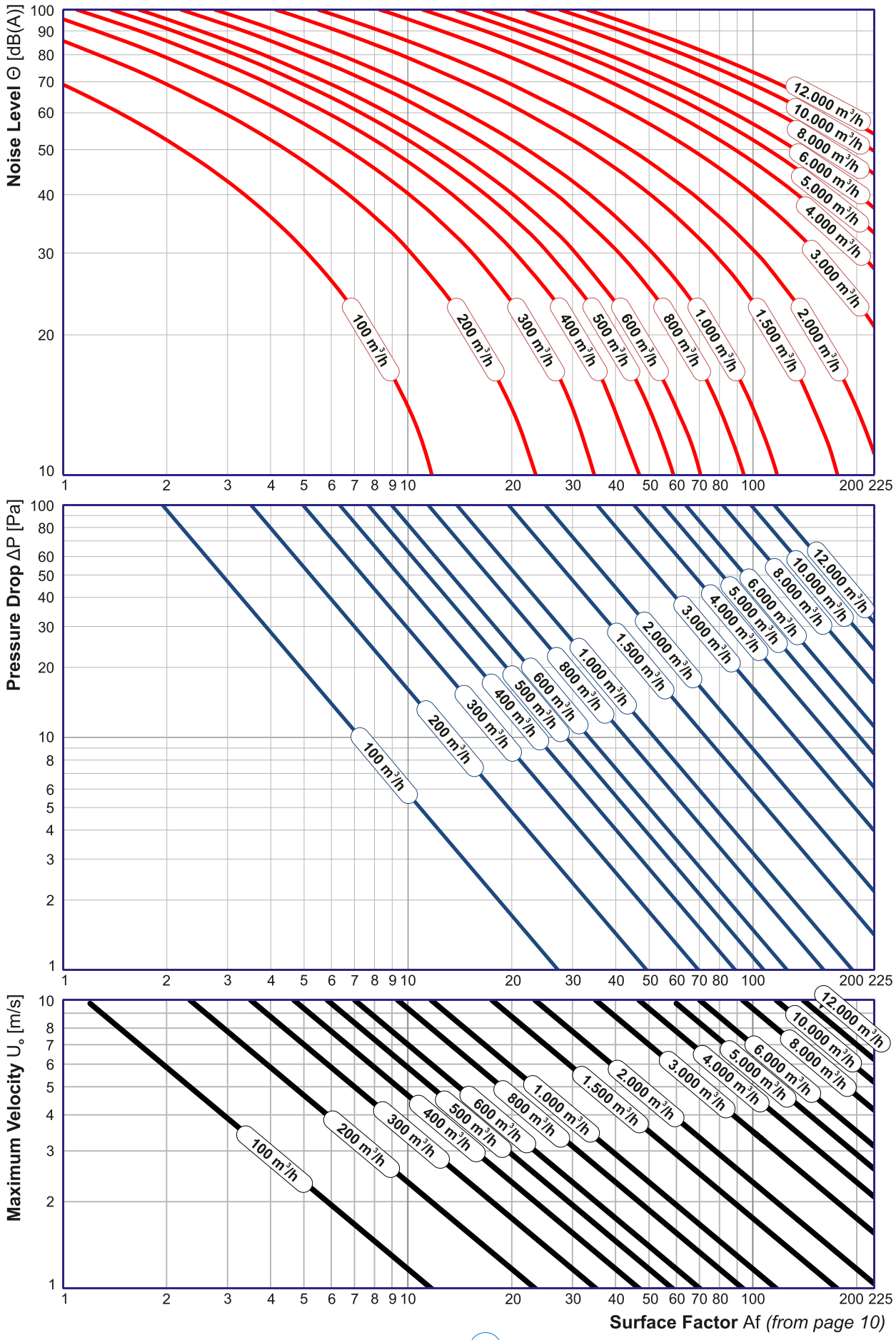


DIAGRAM 3.3

DIAGRAM 3.2

DIAGRAM 3.1

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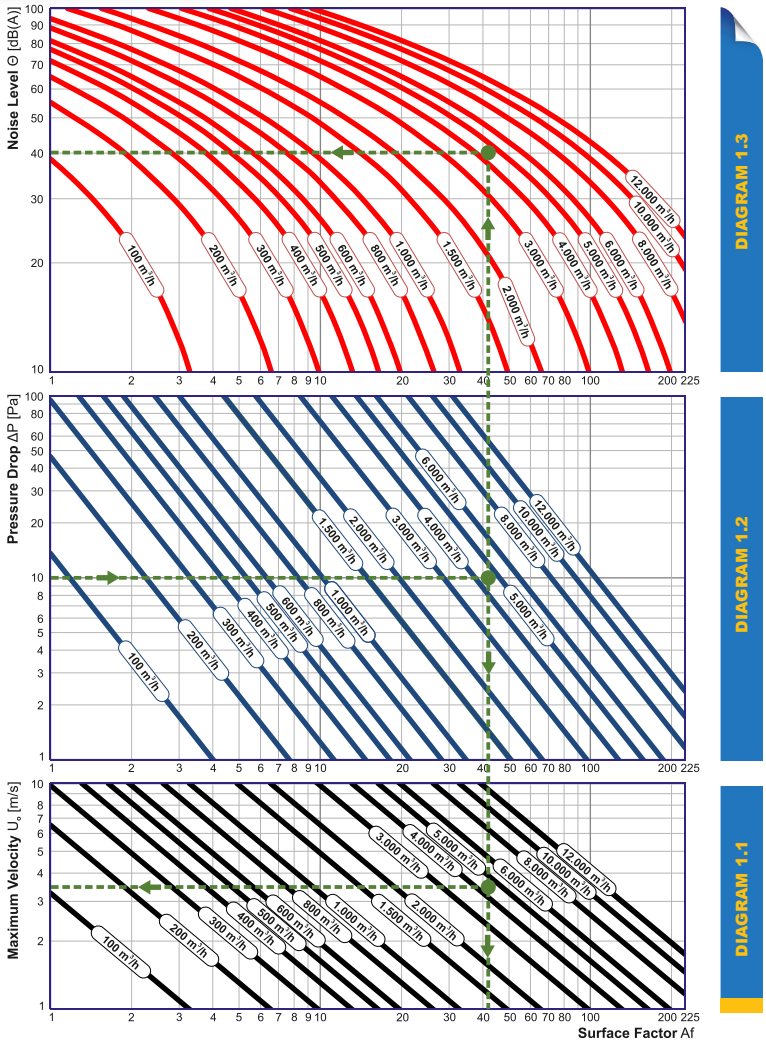


Selection example 1 :

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 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 30⁰?

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 (**0⁰**), and the air flow is 4.500 m³/h. If the blade angle changes to **30⁰** then, according to diagram 3.2 (page 7) the new pressure drop will be 38,5 Pa.

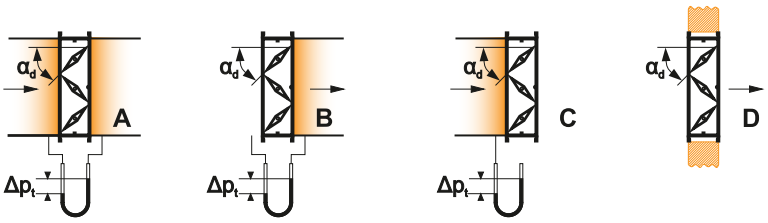
Selection example 3 :

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 45⁰?

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 (**0⁰**), and the air flow is 4.500 m³/h. If the blade angle changes to **45⁰** 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 45⁰ (1,5) and we calculate that the pressure drop is equal to 114 Pa.

PRESSURE DROP CALCULATION - CORRECTION FACTORS -	Blade angle			
	15⁰	30⁰	45⁰	60⁰
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

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.



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

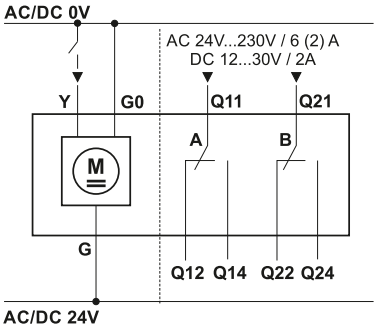
DAMPER ACTUATOR SELECTION

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:

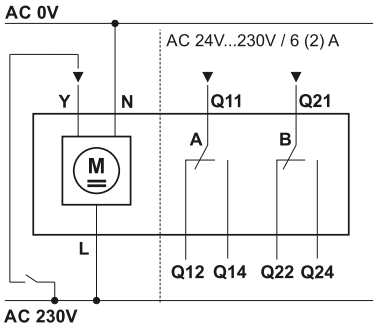
(1) On / Off control using actuators 230V or 24V
(2) 3 Position control using actuators 230V or 24V
(3) Modulating control using actuators 24V (signal 0...10V)

Under order, AIRTECHNIC can also provide actuators with **special specifications**:
(1) Fast-acting actuators **2 sec**.
(2) Actuators with **integrated controller** and **differencial 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.

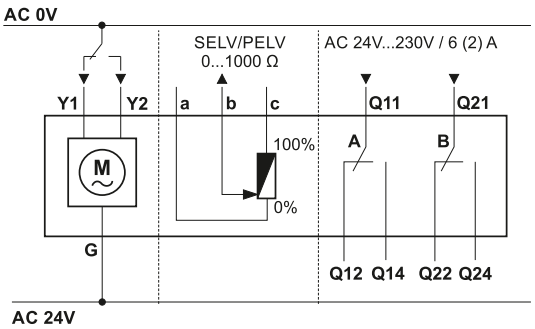
DAMPER ACTUATORS - NON-SPRING RETURN (SIEMENS)



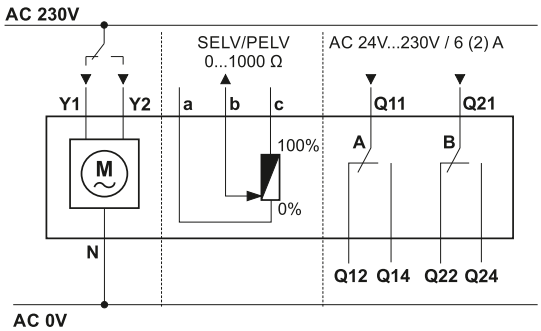
On / Off - ACTUATORS AC / DC 24V	
G	Operating voltage AC / DC 24V
G0	Neutral
Y	Control signal AC 0V - Rotation counter-clockwise



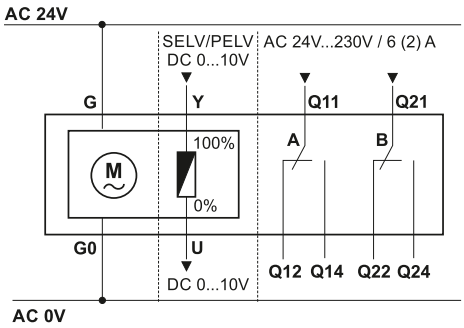
On / Off - ACTUATORS AC 230V	
L	Operating voltage AC 230V
N	Neutral
Y	Control signal AC 230V - Rotation counter-clockwise



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

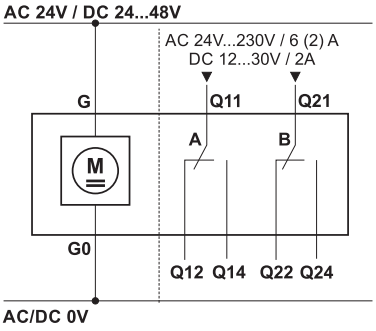


MODULATING CONTROL - ACTUATORS AC 24V	
G	Operating voltage AC 24V
G0	Neutral
Y	Control signal DC 0...10V
U	Position signal DC 0...10V

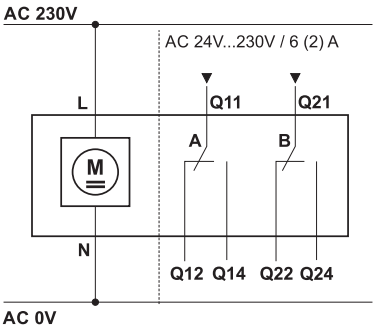
AUXILIARY SWITCH	
Q11 / Q21	Inputs
Q12 / Q22	Normally Closed Contacts
Q14 / Q24	Normally Open Contacts

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

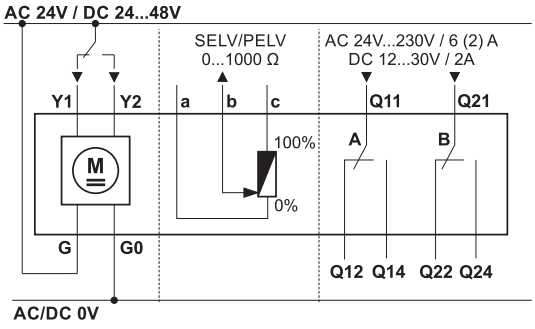
DAMPER ACTUATORS - SPRING RETURN (SIEMENS)



On / Off - ACTUATORS AC 24V / DC 24...48V	
G	Operating voltage AC 24V / DC 24...48V
G0	Neutral

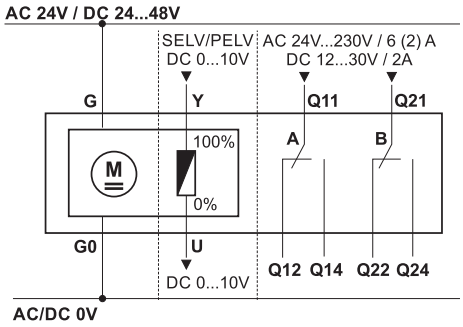


On / Off - ACTUATORS AC 230V	
L	Operating voltage AC 230V
N	Neutral



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”

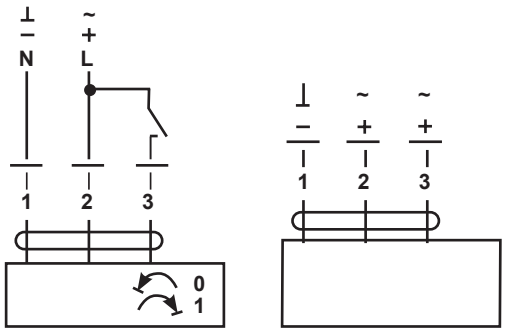


MODULATING CONTROL - ACTUATORS AC 24V / DC 24...48V	
G	Operating voltage AC 24V
G0	Neutral
Y	Control signal DC 0...10V
U	Position signal DC 0...10V

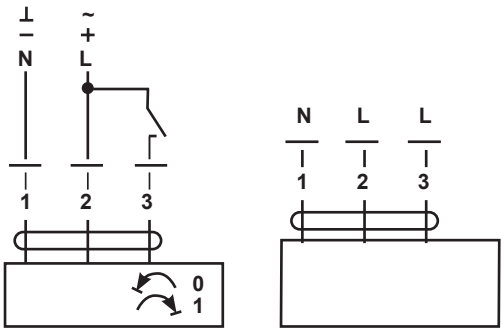
AUXILIARY SWITCH	
Q11 / Q21	Inputs
Q12 / Q22	Normally Closed Contacts
Q14 / Q24	Normally Open Contacts

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

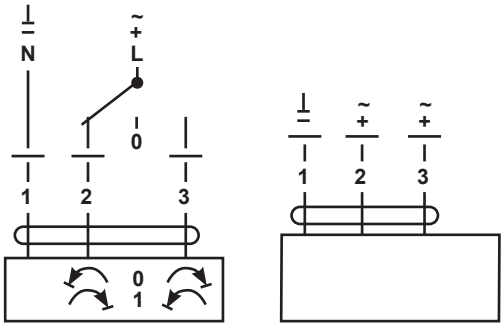
DAMPER ACTUATORS - NON-SPRING RETURN (BELIMO)



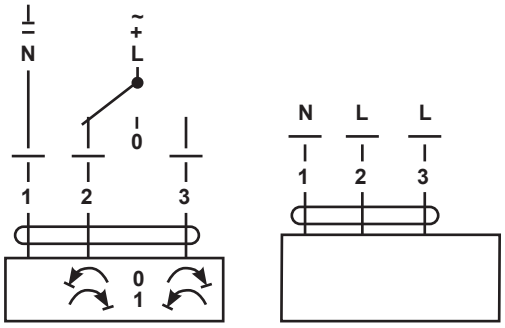
On / Off - ACTUATORS AC / DC 24V	
1	Neutral
2	Control signal 24V - Rotation counter-clockwise
3	Control signal 24V - Rotation clockwise



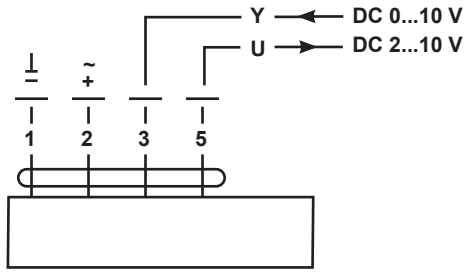
On / Off - ACTUATORS AC 230V	
1	Neutral
2	Control signal 230V - Rotation counter-clockwise
3	Control signal 230V - Rotation clockwise



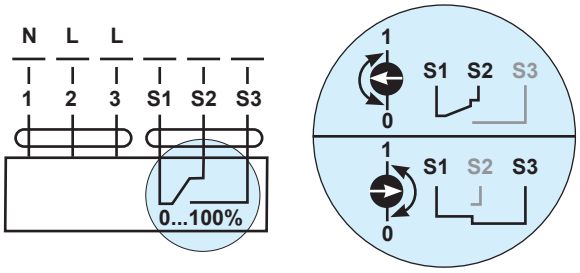
3 POSITION CONTROL - ACTUATORS AC / DC 24V	
1	Neutral
2	Control signal 24V - Rotation counter-clockwise
3	Control signal 24V - Rotation clockwise



3 POSITION CONTROL - ACTUATORS AC 230V	
1	Neutral
2	Control signal 230V - Rotation counter-clockwise
3	Control signal 230V - Rotation clockwise



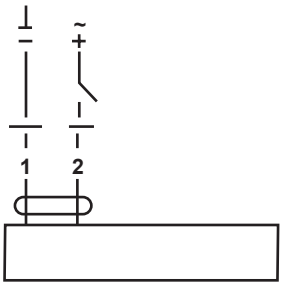
MODULATING CONTROL - ACTUATORS AC / DC 24V	
1	Neutral
2	Operating voltage 24V
3	Input signal DC 0…10V
5	Output signal DC 2…10V



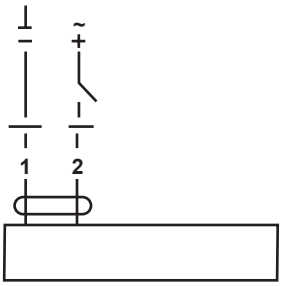
AUXILIARY SWITCH		
	Rotation counter-clockwise	Rotation clockwise
S1	Input	Input
S2	Normally Closed Contact	Normally Open Contact
S3	Normally Open Contact	Normally Closed Contact

DAMPER ACTUATORS - SPRING RETURN (BELIMO)

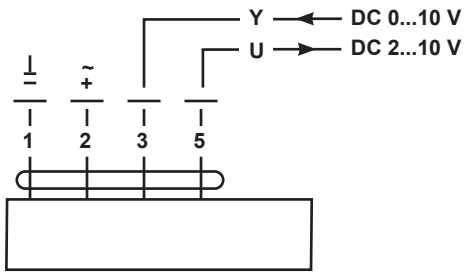
AC/DC 24 V, open-close

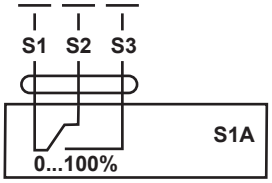


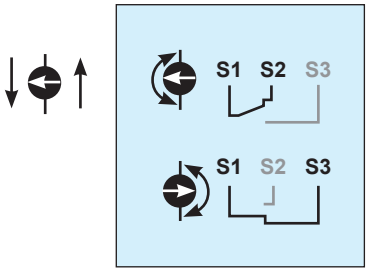
On / Off - ACTUATORS AC / DC 24V	
1	Neutral
2	Operating voltage 24V



On / Off - ACTUATORS AC 230V	
1	Neutral
2	Operating voltage 230V



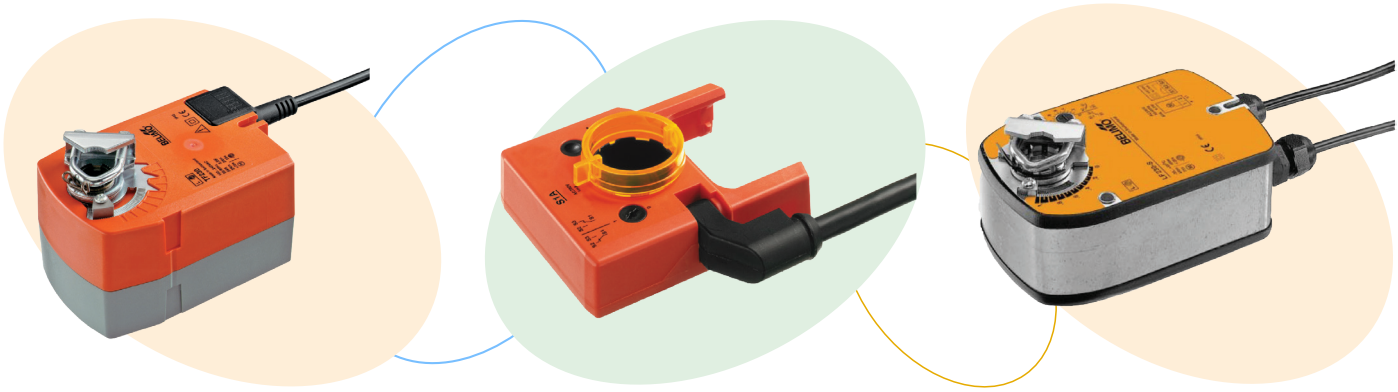




Cable colours:
S1 = violet
S2 = red
S3 = white

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



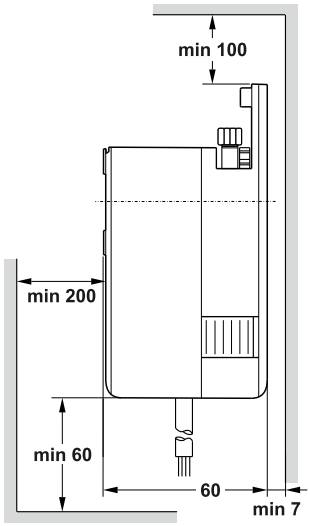
DAMPER ACTUATOR SELECTION

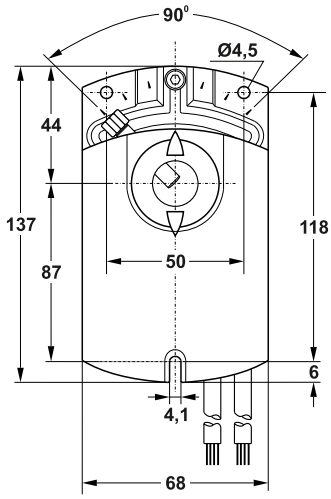
The selection for damper actuator is based on the torque required for the rotation of the damper's blades. The following table gives the necessary torque, according the damper's surface.

	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**						

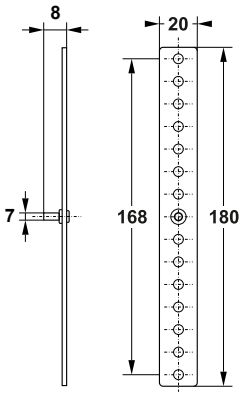
DAMPER ACTUATORS INDICATIVE DIMENSIONS

ACTUATORS FOR TORQUE 5 Nm & 10 Nm

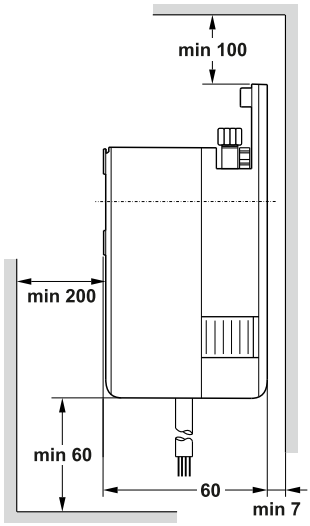


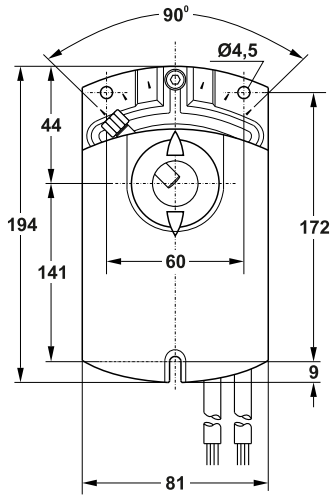


MOUNTING BASE

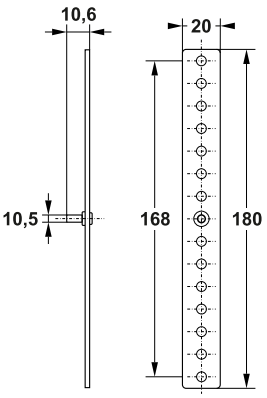


ACTUATORS FOR TORQUE 20 Nm

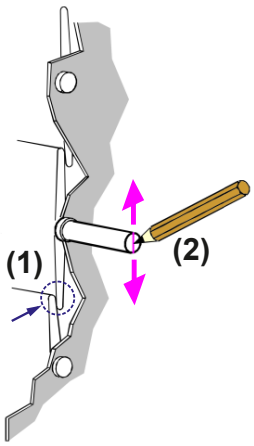




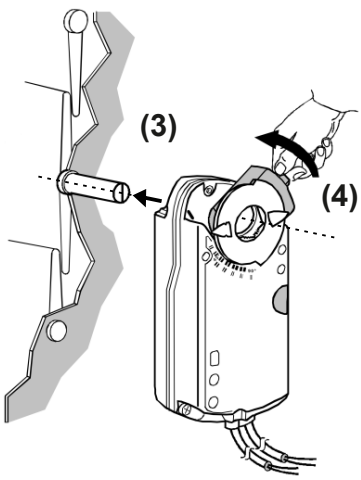
MOUNTING BASE



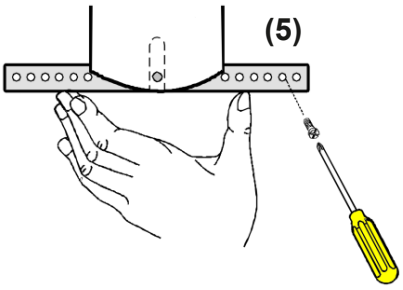
DAMPER ACTUATORS INSTALLATION



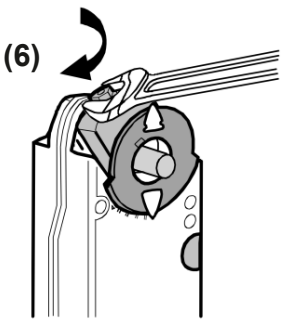
Damper in fully closed position



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**

BL.GL	**Blank** = blades from aluminium **BL.CN** = blades from copper **BL.GL** = blades from galvanized steel **BL.I** = blades from stainless steel
FR.AL	**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
PN20	**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
G	**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
250	Damper **Height** [mm]
400	Damper **Width** [mm]
RDA	**RDA** = standard construction

Examples

RDA 600 x 600 +G + MA | PN20 =
Rectangular, multi-leaf airduct 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 airduct damper, RDA
Rectangular, multi-leaf airduct 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**

AIRTECHNIC

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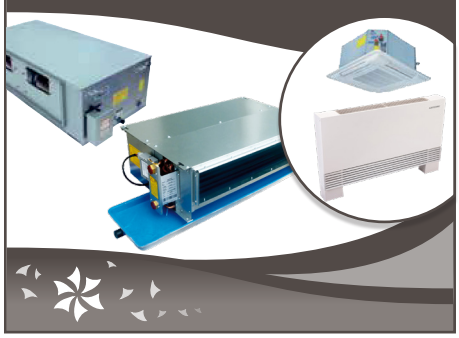
Air-Conditioning & Ventilation Components & Systems

ISO 9001:2015 ISO 14001:2015

AIR HANDLING UNITS

HEAT EXCHANGERS

FAN COIL UNITS



FANS & FAN SECTIONS

FIRE DAMPERS

AIR OUTLETS

STEAM HUMIDIFIERS - DEHUMIDIFIERS

CENTRAL VACUUM SYSTEMS

STAINLESS STEEL CHIMNEYS

AIR FILTERS

AIR CURTAINS

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211 - 705.55.00
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4th km Thiva - Chalkida Hwy,
32200, Thiva
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factory@airtechnic.gr

Factory - THESSALONIKI
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57013, Oraiokastro, Thessaloniki
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