

# F2A

Manufacturer  
Air handling components



## AIR HANDLING & ACOUSTIC EQUIPMENT MANUFACTURING

ACOUSTICS

AIR CONTROL

FLEXIBLE  
CONNECTION

TEXTILE DUCT

MOUNTING  
COMPONENTS





Pierre-Antoine Rouer  
Chief Executive Officer

*Dear customer and partner,*

*F2A is expanding each year, and our ambition is to keep on supporting you, both in France and abroad, on your various markets.*

*Manufacturers of ventilation systems, you can rely upon our capacity to develop our product ranges and respond to your service requirements.*

*The extent of our range of dampers, our new line of airtight connecting sleeves and the introduction of a line of high-efficiency air-to-air heat exchangers provides a response to new regulatory constraints and their evolution.*

*Contractors and distributors, we can support you in the optimization of your projects, the fulfilment of design office criteria and the achievement of the required results. Combining expertise in ventilation, acoustics and mechanical engineering, our solutions offer the ideal compromise, thanks to the diversity of our product range. It can be viewed on our new website.*

*Take the time to have a look.*

*Users and maintenance companies, we can help you to maintain your ventilation systems in a compliant and efficient condition. Our systems are custom-made, and take account of the technical parameters of your installation.*

*Over the years, F2A has developed a number of businesses and areas of expertise – this is where our strength lies. These skills are at your service to meet the challenges imposed on our profession.*

A handwritten signature in black ink, consisting of a large, stylized 'P' followed by a series of loops and a final flourish.



## WHO ARE WE?

Created over 25 years ago, F2A is an equipment manufacturer specialized in the design and manufacturing of ventilation and acoustic components for professionals in the HVAC sector :

- **Engineering offices**
- **Equipment manufacturers**
- **Contractors**
- **Distributors**

Our commitment is based upon the development of the optimum technical and economic response with the highest quality of service on our various markets, both in France and abroad.

## OUR MISSION

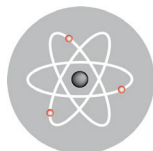
To contribute to the comfort and safety of people through the development of environment-friendly and energy-saving products which are conducive to air quality.

## OUR VALUES



### HIGH QUALITY SERVICE

- ISO 9001 and ISO 14001
- Certification by approved laboratories
- Traceability



### INNOVATION

- R&D department
- Constant monitoring of technological advances
- Use of cutting-edge simulation tools



### ADVICE

- A dedicated team
- Assistance in selecting the adapted equipment
- Support throughout your projects

## OUR EXPERTISE ACROSS THE GLOBE



📍 F2A references

# OUR KEY MARKETS

We have gained unique know-how which enables us to respond effectively to the issues and requirements encountered in numerous markets. In compliance with current standards and legislation, and technical or environmental adaptations, our knowledge of each application related to our manufacturing quality is a major advantage enabling us to offer you reliable and sustainable solutions.



## COMMERCIAL AND RESIDENTIAL

An offer that meets the criteria of comfort, energy saving and safety of commercial and public buildings

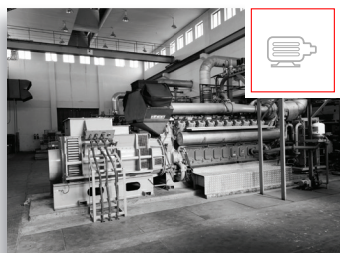
- > Acoustic treatment of ventilation systems
  - > Diffusion of balanced and homogeneous air in rooms
  - > Energy recovery by heat transfer
- 



## INDUSTRY

Solutions adapted to the constraints of industrial processes

- > Explosive, corrosive or abrasive environments
  - > Safety of products and materials
  - > Flow rate adjustment and compensation of expansion at high temperatures
  - > Mechanical resistance at high pressure
- 



## GENERATORS

Customised solutions for a market with high safety and quality standards.

- > A range of specific products (ATEX, large-scale, etc.)
- > Customised acoustic treatment



## **OIL & GAS AND MARINE**

### **Secure processes requiring controlled ventilation**

- > ATEX-certified equipment
  - > Materials resistant to corrosion in damp and saline environments
  - > Controlled operating and quality requirements
- 



## **TUNNEL**

### **Smoke exhaust solutions ensuring user safety**

- > Dampers to extract heat and smoke
  - > Approved solutions to reduce sound levels
  - > Solutions meeting national and international standards - BS476-20, interministerial circular 2000-63
- 



## **NUCLEAR**

### **A highly regulated environment**

- > Very high level of sealing with products that exceed the requirements of EN 1751 standard
- > Specific solutions: earthquake-resistant, easy maintenance, suitability of materials
- > Products that meet demanding qualitative criteria

## Calculating shipping costs

	FRANCE		EXPORT
Category	Acoustics Air Control Mounting components	Textile ducts Sleeves	
Order < EUR 300	<b>EUR 33</b> (minimum charge)	<b>CARRIAGE PAID</b> <i>Mainland France for any order</i>	<b>According to quote</b>
Order < EUR 1100	<b>11% of order amount excluding VAT</b> (single delivery)		
Order > EUR 1100	<b>CARRIAGE PAID</b> Mainland France		
Supplements	Tailgate truck: EUR 75 / Tailgate semi-trailer <i>Not possible for all pallets &gt; 2400 mm</i>		

Prices valid according to the quantities given on the quote, delivered as one consignment, not unloaded.

 Minimum invoicing amount of EUR 50



## Contact details **F2A**



70 Impasse des Barmettes  
Parc d'activités des 2B  
01360 Beligneux



Tel: +33 4 78 06 54 72  
Fax: +33 4 78 06 53 45



[export@f2a.fr](mailto:export@f2a.fr)

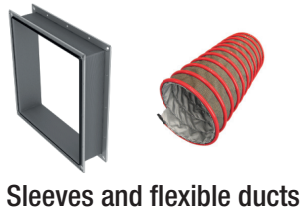


[www.f2a.fr](http://www.f2a.fr)

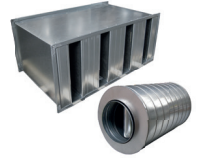


**45°51'15.31"N**  
**5°06'50.47"E**

## FLEXIBLE CONNECTION



## ACOUSTICS



Splitters and silencers



Acoustic louvres

## AIR CONTROL

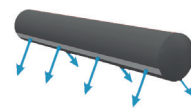


Dampers and Backdraught dampers

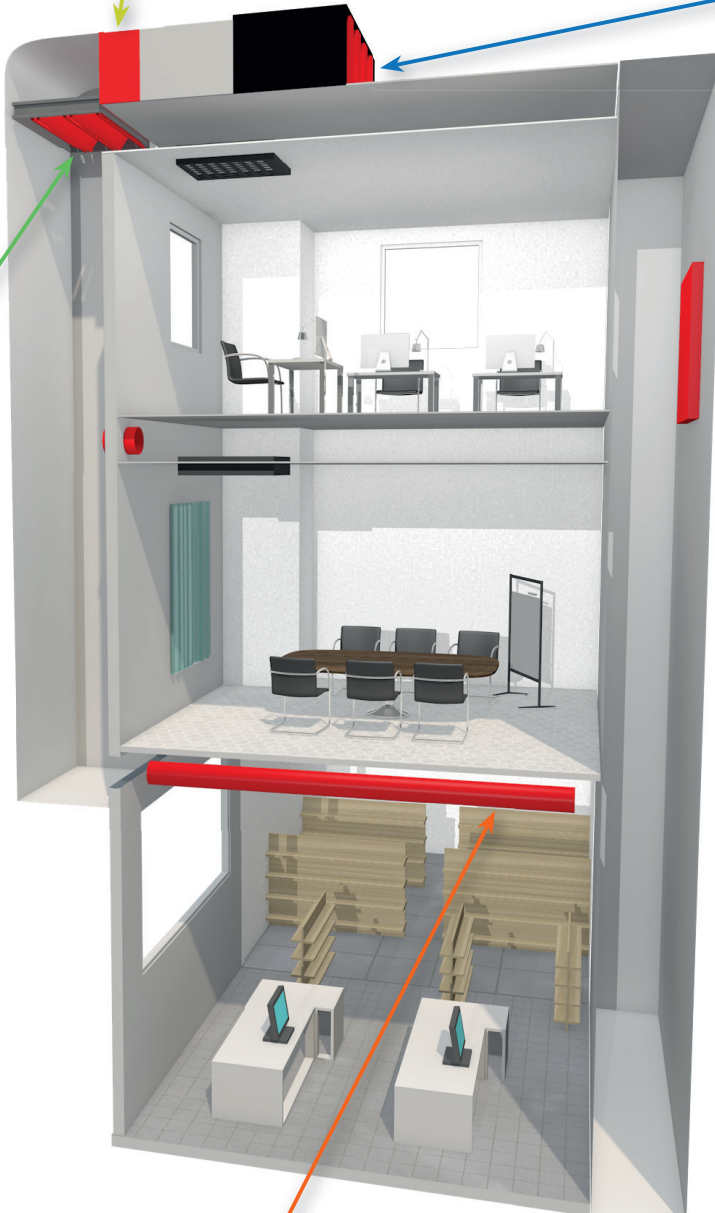


Flow regulators

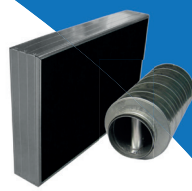
## TEXTILE DUCT



Air diffusion through fabric ducts



# CONTENTS



**ACOUSTICS**

**PAGE 13**



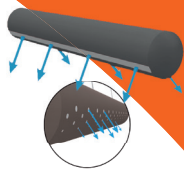
**AIR CONTROL**

**PAGE 53**



**FLEXIBLE  
CONNECTION**

**PAGE 115**



**TEXTILE DUCT**

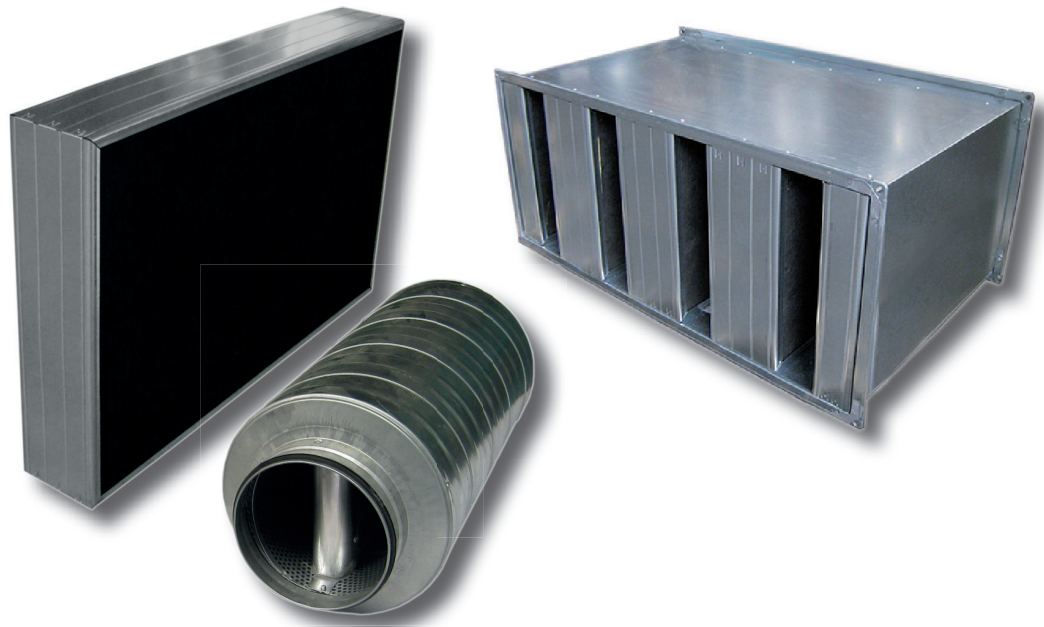
**PAGE 129**



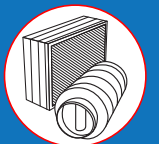
**MOUNTING  
COMPONENTS**

**PAGE 151**





# ACOUSTICS



# ACOUSTICS EXPERTISE

Changes to the regulatory and normative framework result in more stringent requirements in terms of building acoustics (notably for the low energy buildings) forcing all industry players to comply with demanding sound levels.

As a specialist in acoustic solutions, F2A provides you with its service dedicated to dynamic acoustic studies in order to support you in your projects.

Using the expectations and specifications of the design offices, our team of acoustic engineers provides you with their expertise and certifies the performance of our acoustic solutions while offering air flow optimisation.

## RECOMMENDATIONS

The acoustic performance of a silencer (sound trap) depends on the following parameters:

- **Air velocity**

The regenerated noise of a silencer is proportional to the speed in the air ways. In order to obtain an accurate result, it is necessary to determine a resulting overall sound power (after attenuation) that is 10 dB higher than regenerated noise.

- **Thickness**

For an equivalent airway width, a thicker splitter is more effective in the acoustic treatment of low frequencies (better attenuation).

- **Length**

In order to improve performance levels, it is preferable to install two silencers in series rather than increase the length of the splitters.

The attenuation of two silencers builds up whereas the attenuation of long splitters will have a tendency to level out above a length of 2400 mm.

- **Airway width (gap between splitters)**

Decreasing the air way width improves the attenuation of the silencer; however it is necessary to control the regenerated noise and pressure loss involved.

In complex situations, it is appropriate to install two silencers in series with splitters that have a different airway width in order to limit the different frequency bands.

## ACOUSTIC STUDY

The aim of an acoustic study is to determine optimal acoustic comfort for users in the rooms concerned. Besides the noise emitted directly by the ventilation equipment, the velocity of the air flow in the ductworks has a significant impact on the noise level.

Poorly managed speed or sizing that is not suited to the air flow components can result in major regenerated noise and create disturbance.

*For example, air flowing at high speed through terminal outlets which are poorly sized can create a whistling noise.*

F2A performs dynamic acoustic studies taking into account all of the equipment of the ventilation system and its components, their location and the velocity of air flow along the ductworks.

## METHOD

Our acoustic engineers use internal software developed by F2A for the acoustic studies.

It enables all of the characteristics of the HVAC ductworks to be taken into account:

- Fan flow rate and pressure,
- Type of ventilation: rooftop unit, air handling unit with heat recovery,
- Shapes and lengths of ducts,
- Number and type of dampers, louvres, pressure relief dampers, air outlets,
- Geometry and materials of the rooms to be treated,
- Reverberation time in rooms,
- Location of air outlets...

By integrating these parameters into each branch of the ventilation system concerned, our acoustic experts can determine the optimal acoustic solutions guaranteeing the noise level to be respected in your project without affecting the air flow performance of the ductworks.

## ELEMENTS TO BE PROVIDED IN ORDER TO PERFORM A STUDY

Data to be provided	Elements concerned	Format
Sound power spectrum	Ventilation equipment: <ul style="list-style-type: none"> <li>• Air handling unit</li> <li>• Fan</li> <li>• Chiller</li> </ul>	By octave bands
Acoustic characteristics	Ductworks components: <ul style="list-style-type: none"> <li>• Louvres</li> <li>• Dampers</li> <li>• Diffusers...</li> </ul>	Sound power by octave bands
Air flow rates	Air handling units HVAC branch lines Diffusion outlets	In m <sup>3</sup> /h
Plans and cross-sections	Building plans HVAC ductworks	DWG / PDF files
Acoustic objectives	Acoustic data sheet or Special Technical Specifications	

# eSonic

## On-line acoustics software

F2A shares its expertise !

- Free and user-friendly software
- Quick and easy tool for HVAC professionals
- Optimization of a silencer according to the required attenuation
- Acoustic treatment of a sound source (63Hz - 8000Hz)

### Desired attenuation:

63	125	250	500	1000	2000	4000	8000	Hz
3	10	30	38	50	45	26	14	dB

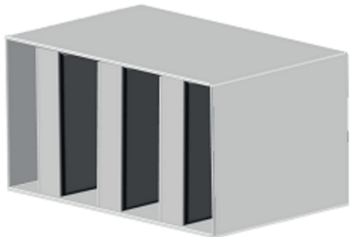
### Result:

●
●
●
●
**SONIE BS+** ( 3 Splitters, Pressure loss 53 Pa, Length 1600 mm)
 
Print to PDF file

---

**Silencer characteristics**

Width : 1000 mm  
 Height : 1000 mm  
**Length : 1600 mm**  
 Thickness of splitters : 200 mm  
**Number of splitters : 3**  
 Airway width : 133 mm



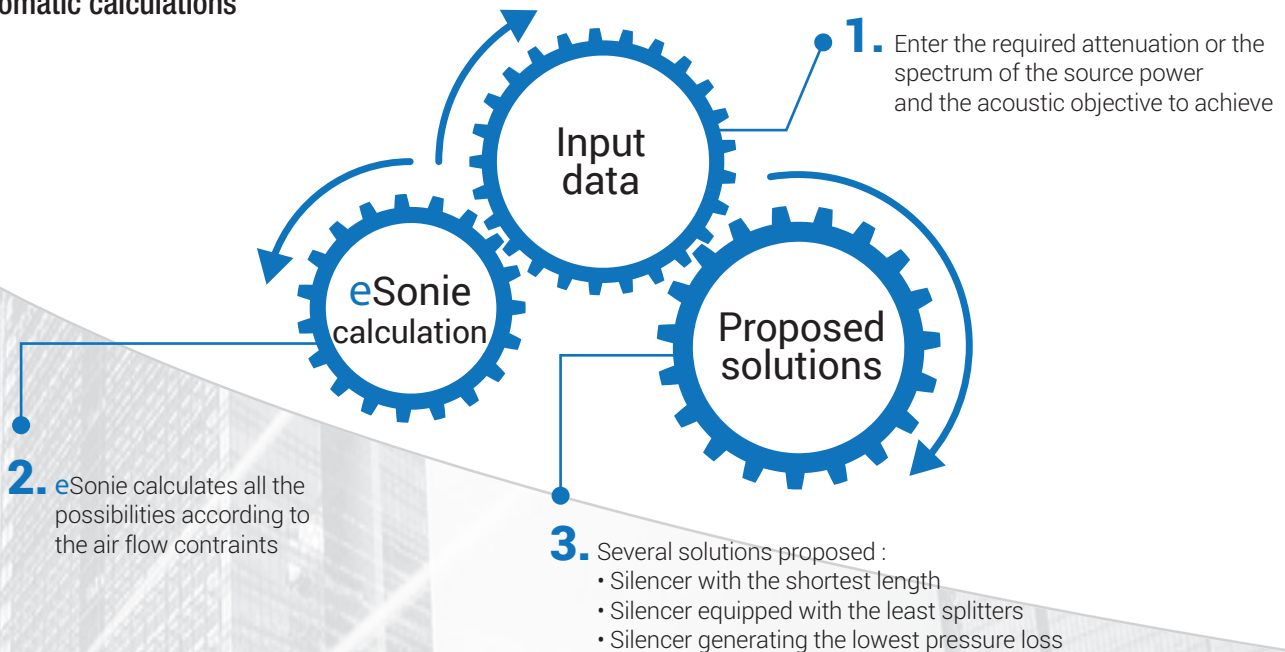
**Airflow performances**

Pressure loss : **53 Pa**  
 Face velocity : **4.2 m/s**  
 Air way velocity : **10.4 m/s**

---

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Attenuation (dB)	4.5	12	31	41	51.5	45	26.5	16.5
Regenerated noise (dB)	54.5	48.5	47.5	45.5	44.5	43.5	39	33

### Automatic calculations





Example of an acoustic calculation sheet in PDF file generated by eSonie Software:

## SOUND SOURCE

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Overall
Sound power Lw (dB)	75	75	80	80	80	80	80	80	88
Sound power LwA (dB(A))	49	59	71.5	77	80	81	81	79	87.5
Airflow (m <sup>3</sup> /h)	9000								

## ACOUSTIC OBJECTIVE

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Sound pressure Lp (dB)	71	61	54	48.5	45	42	40	38.5
Overall A-weighted sound pressure level (dB(A))	53							

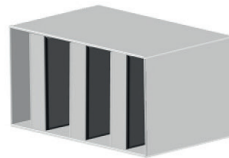
NB : valid result in case of a free-field sound source. It could not substitute a dynamic acoustic study of the ductworks.

Result :

## SONIE BS+

### Silencer characteristics

Width : 1200 mm  
 Height : 1200 mm  
 Length : 900 mm  
 Thickness of splitters : 300 mm  
 Number of splitters : 3  
 Airway width : 100 mm

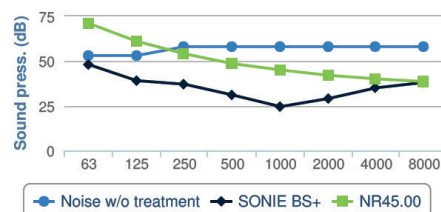


### Airflow performances

Pressure loss : 29 Pa  
 Face velocity : 1.7 m/s  
 Air way velocity : 6.9 m/s

### Acoustic performances

Results calculated under the following conditions :  
 Directivity factor : 2  
 Distance : 5 m




Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Overall (dB(A))
Sound source Lw (dB)	75	75	80	80	80	80	80	80	87.5
Silencer attenuation (dB)	5	14	21	27	34	29	23	20	
Regenerated noise (dB)	46.5	40.5	39.5	37.5	36.5	34.5	31.5	26.5	
Result Lp (dB)	48	39	37	31	24.5	29	35	38	41
Objective sound pressure level Lp (dB)	71	61	54	48.5	45	42	40	38.5	53

## SPECIFICATIONS

- High performance acoustic splitter
- A rounded aerodynamic frame in galvanized steel, grooving reinforced
- Sound-proofing in one block rockwool panel with a medium-density of 24 kg/m<sup>3</sup>, inorganic, rot-proof and water-repellent.
- 2 faces glass silk protection layer for 14 m/s max in the air ways.
- Fire rating: A2-S1-D0.
- Acoustic performances of the silencers must have been tested by an independent laboratory according to ISO 7235 standard.
- Acoustic splitter SONIE BS+ type, F2A brand.
- Rectangular silencer (casing + splitters) SONIE R-BS+ type, F2A brand.

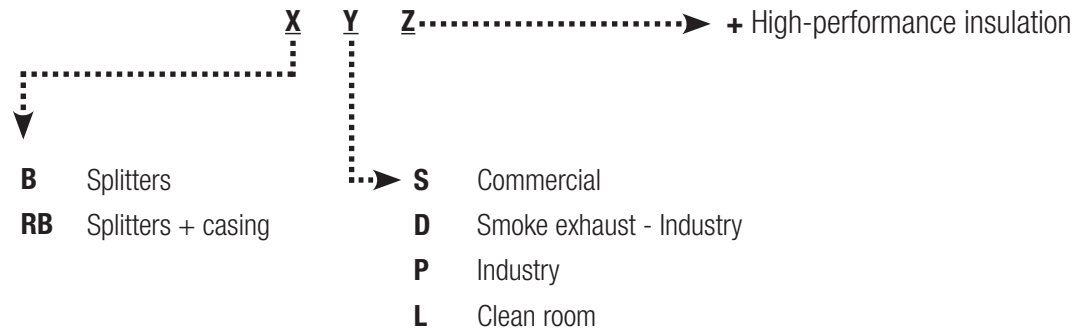
# RECOMMENDATIONS & SELECTIONS

## SELECTING AN ACOUSTIC SPLITTER ACCORDING TO THE APPLICATION

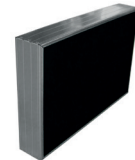
COMMERCIAL	CLEAN ROOM	SMOKE EXHAUST	INDUSTRY
			
<b>SONIE BS / BS+</b>	<b>SONIE BL</b>	<b>SONIE BD / BD+ / BP / BP+</b>	

## CODIFICATION

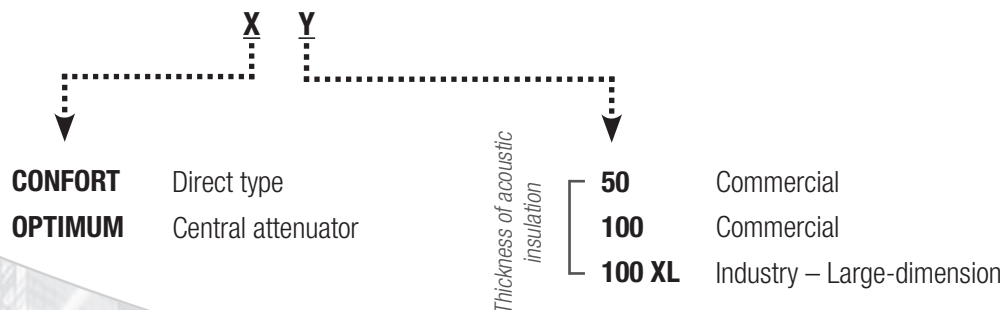
### • Acoustic splitters



Example: **BS +**  
High-performance acoustic splitter for commercial application



### • Circular silencers



Example: **OPTIMUM 100 XL**  
Large-dimension circular silencer equipped with a central attenuator  
Industrial application



# CONTENTS

## CIRCULAR SILENCERS



**CONFORT**  
page 20



**OPTIMUM**  
page 22



**OPTIMUM 100 XL**  
page 24

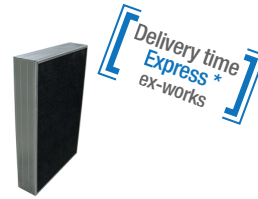
## ACOUSTIC SPLITTERS



**SONIE BS+ / BS**  
pages 28- 32



**SONIE BD+ / BD**  
pages 34 - 38

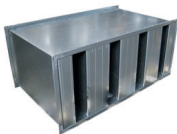


**SONIE BL**  
page 40



**SONIE BP+ / BP**  
page 42

## RECTANGULAR SILENCERS



**SONIE R-BS+ / R-BD+ / R-BL / R-BP+ / R-BP**  
page 44

## ACOUSTIC LOUVRE



**SONIE GNB**  
page 48

\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

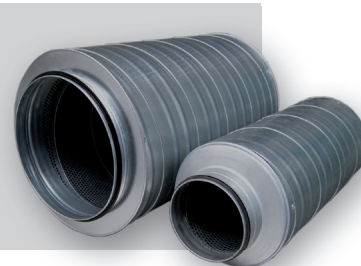
# CIRCULAR SILENCER

## CONFORT RANGE

The circular silencers in the CONFORT range are direct type silencers which reduce the noise pollution generated by the ventilation systems.

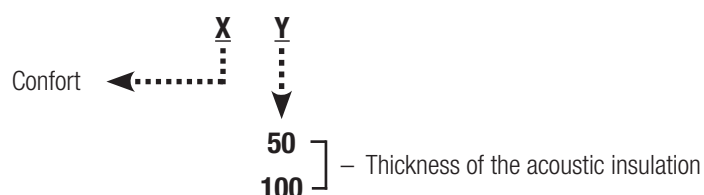
They are generally installed in the secondary networks and provide additional acoustic attenuation.

Depending on the desired performance levels, the acoustic insulation can be either 50 mm or 100 mm thick.



COMMERCIAL

### CODIFICATION



Delivery time  
**1 week**  
ex-works\*

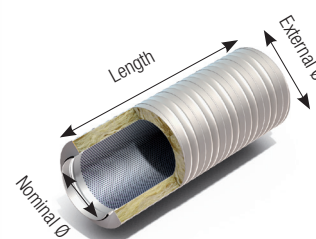
### CONSTRUCTION

		CONFORT 50 - CONFORT 100
Casing	Material	Longitudinal or spiral lockseam (depending on diameter) made of galvanised steel <i>Option only for CONFORT 100: stainless steel 304 or 316L, painted steel (RAL standard colour) or aluminium</i>
	Connection	Spigot duct connection <i>Option only for CONFORT 100: threaded flanges, rotating flanges</i>
Soundproofing	Material	Mineral wool covered with fiber glass silk <b>Euroclass A1 (M0)</b> fire rating <i>Option: insulation covered with glass fabric</i>
	Protection	Perforated galvanised steel sheet in the air flow

### DIMENSIONS

CONFORT 50			
Nominal Ø (mm)	External Ø (mm)	Length (mm)	Weight (kg)
125	225	600	5
		900	8
160	250	600	6
		900	9
200	315	600	8
		900	12
250	355	600	9
		900	14
315	400	600	10
		900	15
355	450	900	18
400	500	900	20
450	560	900	23
500	630	900	30

CONFORT 100			
Nominal Ø (mm)	External Ø (mm)	Length (mm)	Weight (kg)
250	450	1000	22
315	500	1000	24
355	560	1000	28
400	630	1000	33
450	630	1000	31
500	710	1000	42
560	710	1000	39
600	800	1000	47
630	800	1000	45
710	900	1500	79
800	1000	1500	90
900	1120	1500	114
1000	1250	2000	177
1120	1400	2000	206
1250	1400	2000	177



Other diameters and lengths available on request

\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.



F2A - 70 Impasse des Barmettes - Parc d'activités des 2B - F 01360 BELIGNEUX  
Tel. +33 (0) 4 78 06 54 72 - Fax +33 (0) 4 78 06 53 45 - E-mail: export@f2a.fr

### ACOUSTIC CHARACTERISTICS

#### CONFORT 50

Nominal Ø (mm)	Length (mm)	Attenuation (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
125	600	2	5	13	21	37	37	31	5
160		2	4	9	19	33	30	21	9
200		1	4	8	15	31	28	20	5
250		1	6	9	13	24	15	15	5
315		1	2	5	7	13	12	7	5

Nominal Ø (mm)	Length (mm)	Attenuation (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
125	900	2	4	16	28	38	38	35	16
160		1	5	9	24	34	35	25	12
200		2	8	9	20	32	35	23	9
250		2	5	10	19	27	13	8	7
315		1	1	6	12	16	12	7	7
355		1	2	6	12	18	10	9	6
400		1	3	5	10	18	8	5	7
450		1	5	6	12	17	10	9	6
500		1	6	8	14	16	13	13	6

V<sub>max</sub> = 15 m/s

Tests carried out according to ISO 7235: 2004 standard.

#### CONFORT 100

Nominal Ø (mm)	Length (mm)	Attenuation (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
315	1000	5	10	14	14	21	23	11	7
400		3	7	10	12	18	15	8	6
560		1	5	8	12	12	10	6	5
630		2	3	7	10	10	8	6	4
800		2	4	13	18	13	12	10	11
1000		3	9	15	18	12	11	10	10
1250		4	6	8	14	10	10	10	8

V<sub>max</sub> = 20 m/s

Tests carried out according to ISO 7235: 2004 standard.

### PRESSURE LOSS AND REGENERATED NOISE

Direct type circular silencers do not obstruct the air flow, therefore the pressure loss and the regenerated noise are considered to be negligible.



eSonic

On-line acoustics software



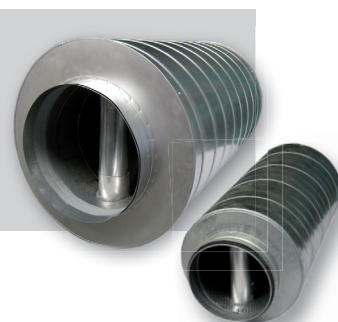
Design your silencer directly at [www.f2a.fr](http://www.f2a.fr)

# CIRCULAR SILENCER

## OPTIMUM RANGE

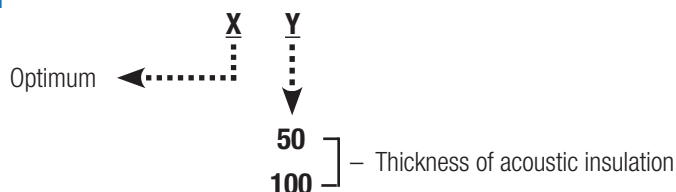
Designed for applications with high acoustic requirements, circular silencers in the OPTIMUM range are equipped with a central attenuator (splitter type).

Their acoustic and air flow performance levels are determined by tests carried out and certified by an independent laboratory (CTTM) according to ISO 7235: 2009 standard.



COMMERCIAL

## CODIFICATION



Delivery time  
**1 week**  
ex-works\*

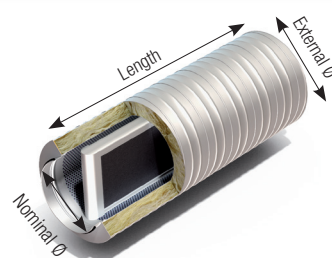
## CONSTRUCTION

		OPTIMUM 50 - OPTIMUM 100
Casing	Material	Longitudinal or spiral lockseam duct (depending on diameter) made of galvanised steel <i>Option only available for OPTIMUM 100: stainless steel 304 or 316L, painted steel (RAL standard colour) or aluminium</i>
	Connection	Spigot duct connection <i>Option only available for OPTIMUM 100: threaded flanges, rotating flanges</i>
Soundproofing	Material	Mineral wool covered with fiber glass silk <b>Euroclass A1 (M0)</b> fire rating <i>Option: insulation covered with glass fabric</i>
	Protection	Perforated galvanised steel sheet in the air flow <i>Option: stretch metal protection on the central splitter</i>

## DIMENSIONS

OPTIMUM 50				
Nominal Ø (mm)	External Ø (mm)	Length (mm)	Splitter thickness (mm)	Weight (kg)
125	225	600	50	6
		900		9
160	250	600	50	7
		900		11
200	315	600	50	9
		900		14
250	355	600	50	10
		900		16
315	400	600	50	12
		900		17
355	450	900	50	20
400	500	900	100	24
450	560	900	100	27
500	630	900	100	35

OPTIMUM 100				
Nominal Ø (mm)	External Ø (mm)	Length (mm)	Splitter thickness (mm)	Weight (kg)
250	450	1000	50	24
315	500	1000	50	26
355	560	1000	50	30
400	630	1000	100	37
450	630	1000	100	36
500	710	1000	100	47



\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

## ACOUSTIC CHARACTERISTICS



### OPTIMUM 50

Nominal Ø (mm)	Length (mm)	Attenuation (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
125	600	2	6	11	17	28	41	46	25
	900	3	7	18	25	43	48	49	25
160	600	2	4	8	15	24	36	39	26
	900	2	5	11	21	39	48	48	29
200	600	2	4	7	12	24	37	27	19
	900	2	5	11	18	32	46	41	27
250	600	1	4	6	14	25	37	18	13
	900	4	5	11	20	31	39	29	15
315	600	1	2	4	11	20	27	13	12
	900	2	2	7	15	27	36	19	10
355	900	1	2	6	14	28	32	13	12
400	900	3	4	6	16	30	30	14	10
450	900	1	2	8	17	28	21	12	12
500	900	1	3	6	15	22	19	10	11

Tests carried out according to ISO 7235: 2009 standard.

### OPTIMUM 100

Nominal Ø (mm)	Length (mm)	Attenuation (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
250	1000	4	10	21	35	45	52	38	20
315	1000	2	5	16	24	35	48	24	17
355	1000	2	7	17	23	32	39	18	14
400	1000	2	7	18	25	36	33	17	13
450	1000	2	5	15	21	32	28	13	11
500	1000	2	6	15	21	28	22	10	9

Tests carried out according to standard ISO 7235: 2009.

**[NEW]**

**eSonic**

On-line acoustics software



Design your silencer  
directly at [www.f2a.fr](http://www.f2a.fr)

# CIRCULAR SILENCER

## OPTIMUM RANGE

### PRESSURE LOSS AND REGENERATED NOISE

#### OPTIMUM 50

Diameter & length (mm)	Velocity*	63	125	250	500	1000	2000	4000	8000	Hz	Pressure loss (Pa)
Ø125 L600	3m/s	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	dB	6
	5m/s	46	37	34	32	25	19	24	30	dB	17
	7m/s	56	48	41	39	35	28	25	30	dB	34
	10m/s	65	60	50	46	44	38	32	30	dB	70
	13m/s	65	63	54	48	45	42	36	31	dB	118
Ø160 L600	3m/s	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	dB	5
	5m/s	41	34	30	27	20	19	25	31	dB	14
	7m/s	53	43	37	36	32	26	25	31	dB	27
	10m/s	58	53	45	42	40	36	30	31	dB	55
	13m/s	64	61	52	47	45	43	38	33	dB	94
Ø200 L600	3m/s	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	dB	3
	5m/s	43	35	29	27	22	20	25	31	dB	7
	7m/s	49	40	36	35	30	24	25	31	dB	14
	10m/s	56	49	42	41	39	34	28	31	dB	29
	13m/s	63	59	48	46	45	42	35	32	dB	48
Ø250 L600	5m/s	39	35	32	27	24	19	23	29	dB	5
	7m/s	50	47	43	44	41	33	27	31	dB	10
	10m/s	57	57	51	51	51	45	38	34	dB	20
	13m/s	63	64	57	57	57	54	48	43	dB	33
	16m/s	71	69	64	61	61	59	55	51	dB	50
Ø315 L600	5m/s	44	41	34	34	31	23	23	29	dB	6
	7m/s	53	47	41	43	41	34	28	31	dB	11
	10m/s	59	58	51	50	50	46	41	34	dB	22
	13m/s	65	63	56	55	56	53	50	44	dB	38
	16m/s	70	71	63	59	60	58	55	51	dB	57
Ø355 L900	5m/s	46	43	35	33	29	23	23	29	dB	7
	7m/s	54	49	43	42	38	33	27	31	dB	13
	10m/s	59	55	49	50	49	44	38	34	dB	26
	13m/s	62	61	55	56	56	53	48	43	dB	44
	16m/s	69	66	60	60	61	58	53	49	dB	67
Ø400 L900	5m/s	49	41	34	32	30	24	23	29	dB	7
	7m/s	59	54	48	44	39	30	28	31	dB	13
	10m/s	66	64	56	54	51	45	35	32	dB	27
	13m/s	71	69	62	60	58	54	46	37	dB	45
	16m/s	77	73	67	65	64	60	54	45	dB	69
Ø450 L900	5m/s	51	49	38	36	30	22	23	29	dB	7
	7m/s	54	53	46	45	39	32	26	31	dB	14
	10m/s	62	59	54	54	50	45	38	33	dB	29
	13m/s	68	64	59	60	57	53	47	40	dB	49
	16m/s	74	69	64	65	62	59	54	48	dB	74
Ø500 L900	5m/s	51	52	38	38	31	25	23	29	dB	7
	7m/s	59	54	43	43	39	35	29	31	dB	13
	10m/s	67	60	51	50	49	46	41	36	dB	27
	13m/s	73	66	57	56	56	55	50	45	dB	45
	16m/s	78	71	63	61	60	60	57	52	dB	68

\* Internal velocity in the air ways

Tests carried out in an independent laboratory according to ISO 7235: 2009 standard.



# CIRCULAR SILENCER

## OPTIMUM RANGE

### OPTIMUM 100

Diameter & length (mm)	Regenerated noise and pressure loss										
	Velocity*	63	125	250	500	1000	2000	4000	8000	Hz	Pressure loss (Pa)
Ø250 L1000	5m/s	39	36	34	29	23	19	23	29	dB	5
	7m/s	50	46	45	42	39	34	27	31	dB	10
	10m/s	59	56	53	51	50	47	40	34	dB	21
	13m/s	67	63	59	56	56	55	50	43	dB	35
	16m/s	73	69	66	61	61	60	56	51	dB	53
Ø315 L1000	5m/s	40	37	37	34	30	22	23	29	dB	7
	7m/s	49	47	44	43	40	34	27	31	dB	14
	10m/s	58	56	52	51	49	46	39	33	dB	28
	13m/s	63	61	57	56	55	53	49	41	dB	48
	16m/s	68	67	61	60	60	59	55	49	dB	72
Ø355 L1000	5m/s	46	43	37	33	30	23	23	29	dB	4
	7m/s	52	47	43	40	39	34	27	31	dB	9
	10m/s	56	55	50	48	49	45	39	33	dB	18
	13m/s	62	60	55	54	55	53	48	41	dB	30
	16m/s	66	63	60	58	60	59	55	49	dB	45
Ø400 L1000	5m/s	49	41	34	32	30	24	23	29	dB	9
	7m/s	53	48	41	40	39	34	27	31	dB	17
	10m/s	59	55	48	47	48	46	39	33	dB	35
	13m/s	65	61	55	53	54	53	48	41	dB	60
	16m/s	72	64	59	58	59	58	55	49	dB	91
Ø450 L1000	5m/s	48	48	35	35	30	25	23	29	dB	6
	7m/s	51	50	42	41	39	35	28	31	dB	13
	10m/s	61	57	47	48	47	47	41	35	dB	26
	13m/s	65	63	53	53	53	53	50	44	dB	44
	16m/s	73	68	58	57	57	58	57	52	dB	66
Ø500 L1000	5m/s	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	dB	7
	7m/s	51	47	37	37	31	25	25	31	dB	13
	10m/s	56	54	43	43	40	37	31	31	dB	27
	13m/s	64	58	49	50	49	48	44	37	dB	46
	16m/s	71	65	56	55	55	55	52	47	dB	70

\* Internal velocity in the air ways

Tests carried out according to ISO 7235: 2009 standard.

# CIRCULAR SILENCER

## OPTIMUM 100 XL RANGE

The OPTIMUM 100 XL circular silencers are equipped with a central attenuator (soundproofing pod) and offer excellent acoustic and air flow performance levels.

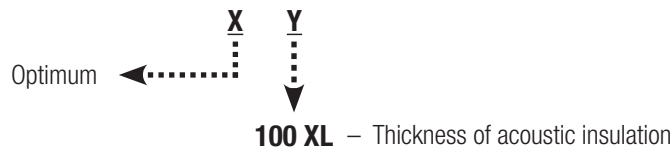
Designed mainly for industrial process and smoke exhaust applications, OPTIMUM 100 XL silencers are also available in 400°C/2h version.

Their acoustic and air flow performance levels are determined by tests carried out and validated by an independent laboratory.



SMOKE EXHAUST

### CODIFICATION



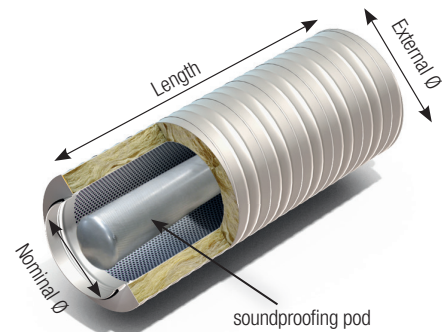
Available in  
400°C/2h version

### CONSTRUCTION

		OPTIMUM 100 XL
Casing	Material	Spiral lockseam duct made of galvanised steel <i>Option: stainless steel 304L or 316L, or painted steel according to RAL standard colour or aluminium</i>
	Connection	Spigot duct connection <i>Option: threaded flanges, rotating flanges</i>
Soundproofing	Material	Mineral wool covered with fiber glass silk <b>Euroclass A1 (M0)</b> fire rating <i>Option: insulation covered with fiber glass fabric</i>
	Protection	Perforated galvanised steel sheet in the air flow
Accessories		<i>Option: protective louvres, support stand</i>

### DIMENSIONS

OPTIMUM 100 XL				
Nominal Ø (mm)	External Ø (mm)	Length (mm)	Pod Ø (mm)	Weight (kg)
560	710	1000	250	52
630	800	1000	315	61
710	900	1500	355	109
800	1000	1500	400	126
900	1120	1500	450	159
1000	1250	2000	500	251
1120	1400	2000	560	295
1250	1400	2000	630	279



Other diameters and lengths available on request

## ACOUSTIC CHARACTERISTICS

### OPTIMUM 100 XL

Nominal Ø (mm)	Length (mm)	Attenuation (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
<b>630</b>	<b>1000</b>	2	4	10	16	22	24	15	7
<b>800</b>	<b>1500</b>	3	6	17	26	29	25	18	16
<b>1000</b>	<b>2000</b>	4	11	23	26	37	31	19	16
<b>1250</b>	<b>2000</b>	4	9	13	24	31	25	17	15

Tests carried out according to ISO 7235: 2004 standard.

## REGENERATED NOISE AND PRESSURE LOSS

Diameter & length (mm)	Velocity*	63	125	250	500	1000	2000	4000	8000	Hz	Pressure loss (Pa)
<b>Ø630 L1000</b>	3m/s	39	37	14	11	12	15	19	24	dB	< 5
	5m/s	50	40	35	25	16	15	19	24	dB	5
	8m/s	58	46	43	42	36	26	21	24	dB	10
	11m/s	64	52	48	47	43	37	30	25	dB	19
	13m/s	68	57	53	52	51	44	35	30	dB	32
<b>Ø800 L1500</b>	3m/s	37	26	< 10	< 10	< 10	< 10	< 10	13	dB	< 5
	5m/s	51	38	27	23	17	10	10	13	dB	5
	8m/s	61	50	37	35	32	26	18	13	dB	11
<b>Ø1000 L2000</b>	3m/s	45	32	20	16	11	10	10	13	dB	< 5
	6m/s	63	51	40	38	34	29	22	16	dB	10
	7m/s	65	54	43	42	38	33	28	20	dB	15
<b>Ø1250 L2000</b>	3m/s	56	47	33	30	26	19	12	13	dB	< 5
	5m/s	66	59	43	41	37	33	27	20	dB	11

\* Internal velocity in the air ways

Tests carried out according to ISO 7235: 2004 standard.

**[NEW]**

**eSonic**

On-line acoustics software

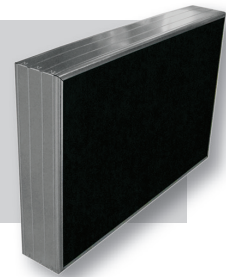


Design your silencer  
directly at [www.f2a.fr](http://www.f2a.fr)

# ACOUSTIC SPLITTER

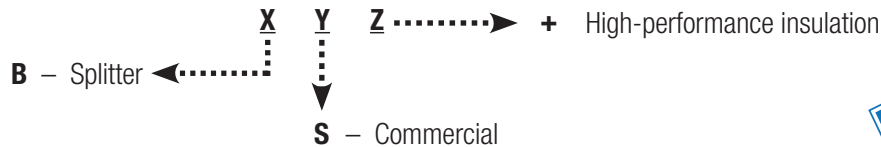
## SONIE BS+ / HIGH PERFORMANCE

**SONIE BS+ high performance** acoustic splitters are installed in HVAC ductworks to reduce the noise pollution generated by the ventilation system. Their performance levels have been tested in an independent laboratory according to ISO 7235: 2004 standard. The SONIE BS+ splitter is up to **50% lighter** than a standard splitter.



COMMERCIAL

### CODIFICATION



### CONSTRUCTION

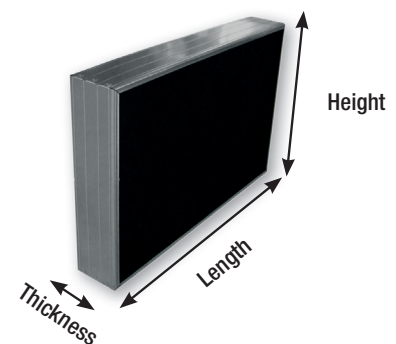
The new generation of frames include rounded edges which reduces pressure losses by 30% compared with straight edges

		SONIE BS+
Frame	Material	Galvanised steel sheet with grooving <i>Option: stainless steel 304L or 316L, painted steel (RAL standard colour) or aluminium</i>
	Metal sheet thickness	0.6 mm <i>Option: 0.8, 1.0 or 1.2 mm</i>
	Assembly	By zinc-coated steel rivets or clips <i>Option: stainless steel rivets</i>
	Reinforcement	For surface area larger than 1 m <sup>2</sup>
Soundproofing	Material	Single-unit panel of non-hydrophilic mineral wool A2-S1-D0 (M0) fire rating
	Density	24 kg/m <sup>3</sup>
	Coating	Anti-erosion glass silk on both sides ( <i>available on request for 50 mm thick splitters</i> )

### DIMENSIONS

Thickness	50, 100, 150, 200 or 300 mm
Maximum surface area*	4 m <sup>2</sup>
Maximum weight*	50 Kg

\* Maximum surface area and weight for a single-unit construction.  
For larger dimensions, acoustic splitters are provided in several units with mounting accessories.



\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

### WEIGHT (kg)

Height (mm)	Thickness (mm)	Length (mm)						
		600	900	1200	1500	1800	2100	2400
600	100	3	3	4	5	6	7	8
	200	5	6	8	9	11	12	14
	300	7	9	11	13	16	18	20
1200	100	4	5	7	8	9	11	12
	200	8	10	13	15	17	20	22
	300	11	15	18	22	25	29	33
1800	100	6	8	9	11	13	14	16
	200	11	14	17	21	24	27	30
	300	16	21	25	30	35	40	45

### PERFORMANCES

The acoustics performances levels of a silencer depend of the following parameters: air velocity, splitter thickness, length and gap between the splitters (airway width).

The performances levels of SONIE BS+ splitters are determined by tests carried out by an independent laboratory according to ISO 7235: 2004 standard.

Upon request, our acoustic engineers will support you and perform a dynamic acoustic study of your installation in order to determine the optimal solution.

**[NEW]**

**eSonie**

On-line acoustics software



Design your silencer  
directly at [www.f2a.fr](http://www.f2a.fr)

# ACOUSTIC SPLITTER

## SONIE BS+ / HIGH PERFORMANCE

### INSERTION LOSSES (dB)

#### Thickness 100 mm

Splitter length (mm)	airway width (mm)	Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
600	50	2	4	10	18	34	39	28	21
	100	1	1	5	11	24	22	13	9
900	50	2	6	15	23	42	43	36	23
	100	1	2	8	16	32	31	18	12
1200	50	3	7	20	29	49	47	43	24
	100	1	3	11	20	41	41	23	16
1500	50	4	9	20	33	52	48	47	25
	100	2	4	13	28	46	44	27	18
1800	50	4	10	20	37	54	49	50	26
	100	2	4	14	36	52	48	30	20
2100	50	5	12	26	41	57	52	52	26
	100	2	5	15	38	56	53	35	22
2400	50	5	13	32	46	59	55	53	26
	100	3	6	17	41	60	57	40	24

Tests carried out according to ISO 7235: 2004 standard.

#### Thickness 200 mm

Splitter length (mm)	airway width (mm)	Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
600	50	4	11	19	30	44	43	29	24
	100	2	5	12	21	28	27	17	12
	150	2	4	11	18	22	20	12	8
	200	1	4	9	13	17	14	7	6
1200	50	6	17	27	40	51	52	36	34
	100	4	10	29	33	49	45	26	18
	150	2	9	22	31	42	34	18	12
	200	2	7	17	25	32	24	12	8
1800	50	10	26	42	49	53	54	38	42
	100	6	14	39	46	52	50	34	22
	150	4	12	30	44	54	47	25	15
	200	4	10	24	36	45	31	16	9
2400	50	13	31	47	52	54	55	39	45
	100	6	17	44	50	55	53	37	29
	150	5	15	40	50	56	54	29	19
	200	4	12	32	45	56	37	19	11

Tests carried out according to ISO 7235: 2004 standard.

### REGENERATED NOISE

The regenerated noise values are determined by tests carried out by an independent laboratory. Regenerated noise must be 10 dB lower than the resulting sound power. If this is not the case, the gap between the splitters or the cross-section of the duct should be increased.

### Air flow noise Lw in dB

Velocity (m/s)	Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
3	19	14	11	10	9	9	7	6
6	40	33	32	31	29	27	24	19
9	50	45	42	41	40	39	35	30
12	57	52	50	49	47	47	41	35
15	73	68	67	68	64	66	56	46

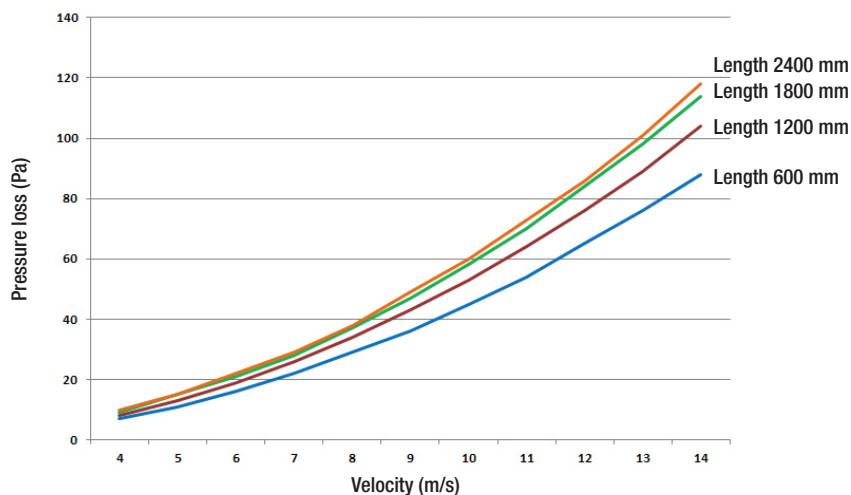
The data are valid for a frontal cross section of  $L \times H = 0.8\text{m}^2$ .

Apply a correction coefficient for different frontal cross sections (table below):

L x H (m <sup>2</sup> )	0.1	0.2	0.4	0.8	1	2	4	8	10
Correction in dB	-9	-6	-3	0	+1	+4	+7	+10	+11

### PRESSURE LOSS

The graph below shows the pressure loss for a silencer equipped with SONIE BS+ 200 mm thick splitters with 100 mm airway width:

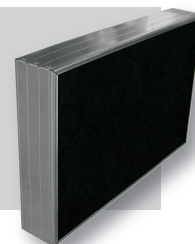


# ACOUSTIC SPLITTER

## SONIE BS - STANDARD

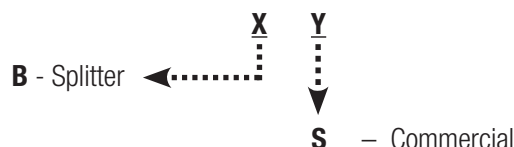
**SONIE BS standard** acoustic splitter are installed in HVAC ductworks to reduce the noise pollution generated by the ventilation system.

Their performance levels have been tested in an independent laboratory according to ISO 7235: 2004 standard.



COMMERCIAL

### CODIFICATION



*The new generation of frames include rounded edges which reduces pressure losses by 30% compared with straight edges*

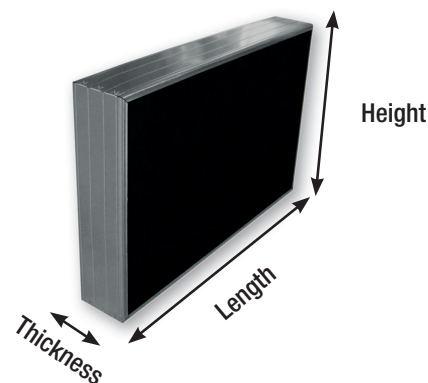
### CONSTRUCTION

		SONIE BS
Frame	Material	Galvanised steel sheet with grooving <i>Option: stainless steel 304L or 316L, or painted steel according to RAL standard colour or aluminium</i>
	Metal sheet thickness	0.6 mm <i>Option: 0.8, 1.0 or 1.2 mm</i>
	Assembly	By zinc-coated steel rivets or clips <i>Option: stainless steel rivets</i>
	Reinforcement	For surface area larger than 1 m <sup>2</sup>
Soundproofing	Material	Single-unit panel of non-hydrophilic mineral wool A1 (M0) fire rating
	Density	50 kg/m <sup>3</sup>
	Coating	Anti-erosion fiber glass silk on both sides <i>(available on request for 50 mm thick baffles)</i>

### DIMENSIONS

Thickness	50, 100, 150, 200 or 300 mm
Maximum surface area*	4 m <sup>2</sup>
Maximum weight*	50 kg

\* Maximum surface area and weight for a single-unit construction.  
 For larger dimensions, acoustic splitters are provided in several units with mounting accessories.



\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.



## WEIGHT (kg)

Height (mm)	Thickness (mm)	Length (mm)						
		600	900	1200	1500	1800	2100	2400
600	100	4	5	6	8	9	10	11
	200	7	9	12	14	17	19	22
	300	10	13	17	21	24	28	32
1200	100	6	8	11	13	15	17	19
	200	12	16	20	24	29	33	37
	300	17	23	30	36	42	49	55
1800	100	9	12	15	18	21	24	27
	200	17	23	29	35	41	47	53
	300	24	33	42	52	61	70	79

*Splitters over 50kg are supplied in several parts.*

## PERFORMANCES

The acoustics performances levels of a silencer depend on the following parameters: air velocity, splitter thickness, length and gap between the splitters (airway width).

The performance levels of SONIE BS+ splitters are determined by tests carried out by an independent laboratory according to ISO 7235: 2004 standard.

**Upon request, our acoustic engineers will support you and perform a dynamic acoustic study of your installation in order to determine the optimal solution.**

**[NEW]**

**eSonie**

On-line acoustics software



Design your silencer  
directly at [www.f2a.fr](http://www.f2a.fr)

# ACOUSTIC SPLITTER

## SONIE BS - STANDARD

### INSERTION LOSSES (dB)

#### Thickness 100 mm

Splitter length (mm)	Airway width (mm)	Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
600	50	1	3	8	15	29	30	19	12
	100	1	3	7	12	27	29	18	10
900	50	2	5	14	23	35	37	30	21
	100	2	3	10	18	34	38	25	13
1200	50	3	7	19	29	48	50	35	29
	100	2	4	12	24	47	49	30	19
1500	50	3	8	22	32	50	50	39	31
	100	2	6	15	30	50	50	36	24
1800	50	4	9	26	36	50	50	44	33
	100	3	8	20	33	50	50	39	27
2100	50	5	11	28	37	50	50	49	35
	100	3	9	22	36	50	50	43	29
2400	50	6	12	30	39	50	50	50	36
	100	4	10	23	41	50	50	44	32

Tests carried out according to ISO 7235: 2004 standard.

#### Thickness 200 mm

Splitter length (mm)	Airway width (mm)	Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
600	100	2	4	10	20	26	26	16	11
	150	2	4	9	15	23	22	13	7
	200	1	3	6	14	18	17	10	5
	250	2	2	6	8	11	11	8	7
900	100	3	6	14	19	31	30	19	13
	150	2	5	13	22	30	29	16	11
	200	1	4	10	19	24	22	14	7
	250	2	3	9	11	16	14	10	9
1200	100	4	9	18	32	46	47	28	18
	150	3	7	17	29	39	38	19	12
	200	2	5	13	26	31	27	16	8
	250	3	4	11	15	21	18	11	11
1500	100	5	10	20	39	51	50	32	20
	150	4	9	20	36	47	45	22	14
	200	2	6	16	31	37	31	18	9
	250	3	4	13	18	26	21	12	12
1800	100	7	13	24	44	52	50	34	22
	150	5	11	24	43	52	52	25	15
	200	3	8	20	37	44	36	20	12
	250	4	5	15	21	30	25	14	13
2100	100	8	15	29	47	54	52	37	26
	150	6	13	27	47	53	53	27	17
	200	4	10	25	42	49	40	22	14
	250	4	6	17	24	35	27	15	14
2400	100	8	17	33	50	56	53	38	26
	150	6	14	27	49	55	54	29	18
	200	4	10	27	47	50	45	24	14
	250	4	8	19	28	39	30	17	15

Tests carried out according to ISO 7235: 2004 standard.

### REGENERATED NOISE

The regenerated noise values must be 10 dB lower than the resulting sound power. If this is not the case, the gap between the splitters or the cross-section of the duct should be increased.

### Air flow noise Lw in dB

Velocity (m/s)	Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
3	19	14	11	10	9	9	7	6
6	40	33	32	31	29	27	24	19
9	50	45	42	41	40	39	35	30
12	57	52	50	49	47	47	41	35
15	73	68	67	68	64	66	56	46

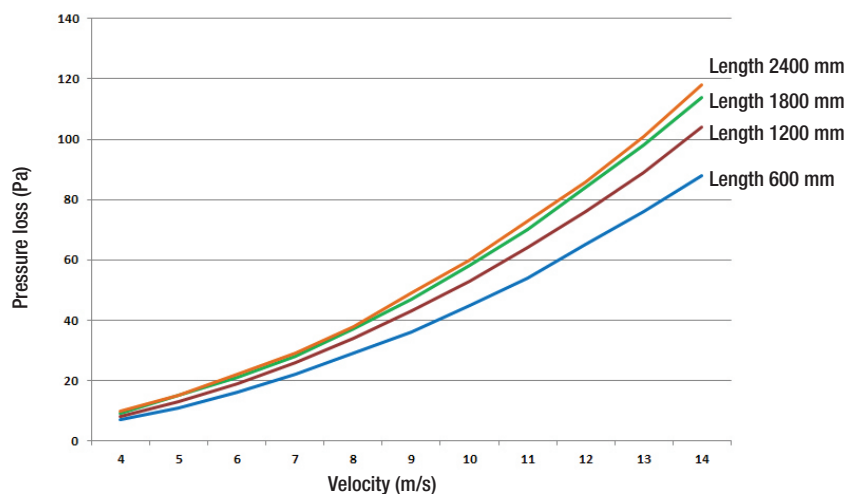
The data are valid for a frontal cross section of  $L \times H = 0.8\text{m}^2$ .

Apply a correction coefficient for different frontal cross sections (table below):

L x H (m <sup>2</sup> )	0.1	0.2	0.4	0.8	1	2	4	8	10
Correction in dB	-9	-6	-3	0	+1	+4	+7	+10	+11

### PRESSURE LOSS

The graph below shows the pressure loss for a silencer equipped with SONIE BS 200 mm thick splitters with 100 mm airway width:



# ACOUSTIC SPLITTER

## SONIE BD+ / HIGH PERFORMANCE 400°C/2H

The **SONIE BD+** acoustic splitters are installed in HVAC ductworks to reduce the noise pollution generated by the ventilation system.

The SONIE BD+ splitter is particularly adapted to smoke exhaust applications.

**400°C/2h** resistance tested in an independent laboratory.

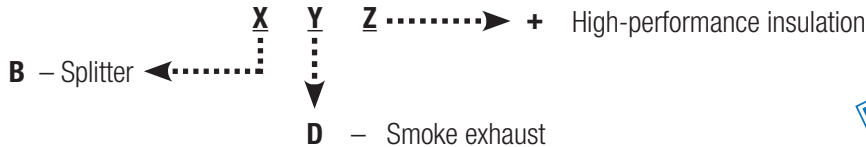


*Stretch metal protection*



SMOKE EXHAUST

### CODIFICATION



### CONSTRUCTION

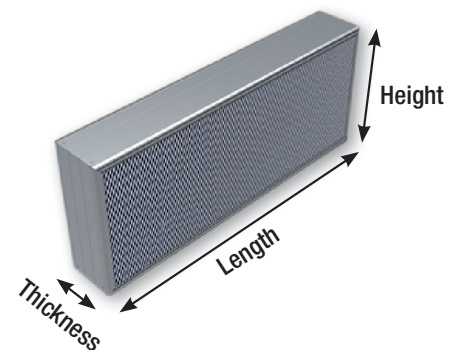
*The new generation of frames include rounded edges which reduces pressure losses by 30% compared with straight edges*

		SONIE BD +
Frame	Material	Galvanised steel sheet with grooving <i>Option: stainless steel 304L or 316L</i>
	Metal sheet thickness	0.8 mm <i>Option: 1.0 or 1.2 mm</i>
	Assembly	By zinc-coated rivets <i>Option: stainless steel rivets</i>
	Reinforcement	For surface area larger than 1 m <sup>2</sup>
Soundproofing	Material	Single-unit panel of non-hydrophilic mineral wool A2-S1-D0 (M0) fire rating
	Density	24 kg/m <sup>3</sup>
	Coating	Anti-erosion fiber glass silk on both sides
Protection	Material	Stretch metal protection in galvanised steel, 0.8 mm thick <i>Option: stainless steel</i>

### DIMENSIONS

Thickness	100, 150, 200 or 300 mm
Maximum surface area*	3 m <sup>2</sup>
Maximum weight*	50 kg

\* Maximum surface area and weight for a single-unit construction.  
For larger dimensions, acoustic splitters are provided in several units with mounting accessories.



\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

# ACOUSTIC SPLITTER

## SONIE BD+ / HIGH PERFORMANCE 400°C/2H

### WEIGHT (kg)

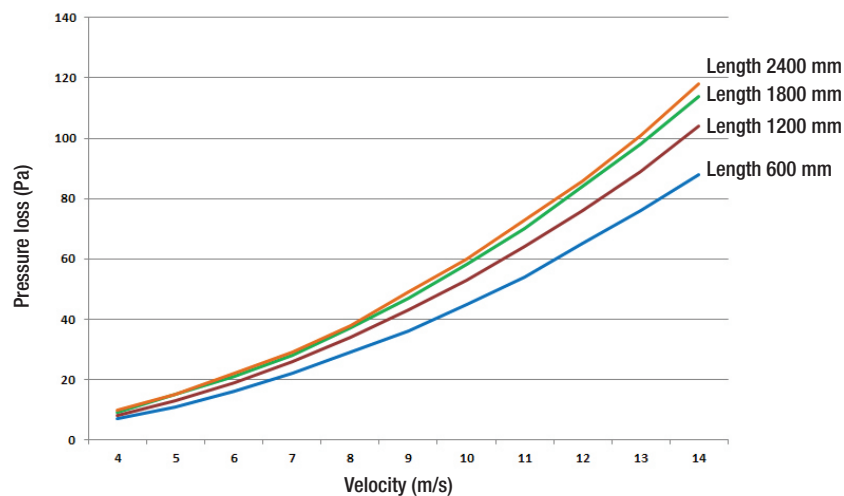
Height (mm)	Thickness (mm)	Length (mm)						
		600	900	1200	1500	1800	2100	2400
600	100	5	7	9	11	13	15	17
	200	7	10	13	16	18	21	24
1200	100	9	12	15	19	22	25	29
	200	13	17	22	27	31	36	40
1800	100	13	17	22	27	31	36	46
	200	18	24	31	37	44	50	56

Splitter over 50kg are supplied in several parts.

### PERFORMANCES

The acoustics performances levels (attenuation and regenerated noise) of the SONIE BD+ splitter are almost identical to those of the SONIE BS+ high performance splitter (see p. 28).

### PRESSURE LOSS



Upon request, our acoustic engineers will support you and perform a dynamic acoustic study of your installation in order to determine the optimal solution.

**[NEW]**

**eSonic**

On-line acoustics software



Design your silencer directly at [www.f2a.fr](http://www.f2a.fr)

# ACOUSTIC SPLITTER

## SONIE BD - 400°C/2H

The **SONIE BD** acoustic splitters are installed in HVAC ductworks to reduce the noise pollution generated by the ventilation system.

The SONIE BD splitter is particularly suited to smoke exhaust applications.

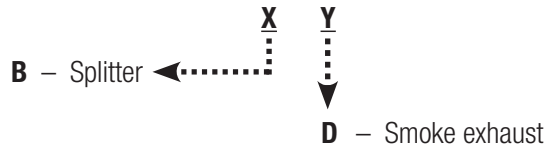
400°C/2h resistance tested in an independent laboratory.



Stretch metal protection



### CODIFICATION



SMOKE EXHAUST

### CONSTRUCTION

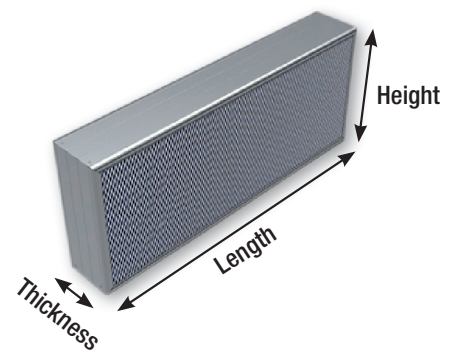
The new generation of frames include rounded edges which reduces pressure losses by 30% compared with straight edges

		SONIE BD
Frame	Material	Galvanised steel sheet with grooving <i>Option: stainless steel 304L or 316L</i>
	Metal sheet thickness	0.8 mm <i>Option: 1.0 or 1.2 mm</i>
	Assembly	By zinc-coated rivets <i>Option: stainless steel rivets</i>
	Reinforcement	For surface area larger than 1 m <sup>2</sup>
Soundproofing	Material	Single-unit panel of non-hydrophilic mineral wool A1 (M0) fire rating
	Density	50 kg/m <sup>3</sup>
	Coating	Anti-erosion fiber glass silk on both sides
Protection	Material	Stretch metal protection in galvanised steel, 0.8 mm thick <i>Option: stainless steel</i>

### DIMENSIONS

Thickness	100, 150, 200 or 300 mm
Maximum surface area*	3 m <sup>2</sup>
Maximum weight*	50 kg

\* Maximum surface area and weight for a single-unit construction.  
For larger dimensions, acoustic splitters are provided in several units with mounting accessories.



\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

### WEIGHT (kg)

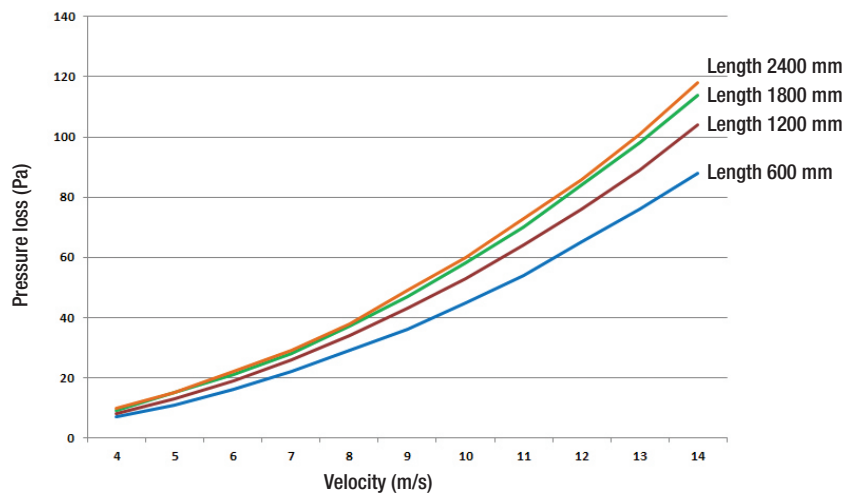
Height (mm)	Thickness (mm)	Length (mm)						
		600	900	1200	1500	1800	2100	2400
600	100	6	8.3	11	13	16	18	20
	200	9	13	17	20	24	28	31
1200	100	11	15	19	23	28	32	36
	200	17	23	30	36	42	49	55
1800	100	16	20	28	34	40	46	52
	200	24	33	42	51	61	70	79

Splitters over 50kg are supplied in several parts.

### PERFORMANCES

The acoustics performances levels (attenuation and regenerated noise) of the SONIE BD splitter are almost identical to those of the SONIE BS standard splitter (see page 32).

### PRESSURE LOSS



Upon request, our acoustic engineers will support you and perform a dynamic acoustic study of your installation in order to determine the optimal solution.

[NEW]

eSonic

On-line acoustics software



Design your silencer  
directly at [www.f2a.fr](http://www.f2a.fr)

# ACOUSTIC SPLITTER

## SONIE BL - CLEAN ROOM

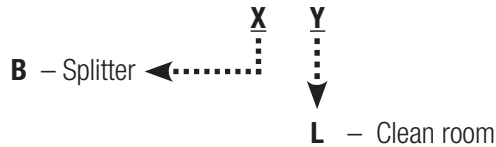
The **SONIE BL** acoustic splitters are installed in HVAC ductworks to reduce the noise pollution generated by the ventilation system.

They are particularly suited to clean rooms (laboratories, operating theatres, etc.) thanks to their anti-erosion coating made of high-density glass fabric preventing fibers from being released into the ventilation system.



CLEAN ROOM

### CODIFICATION



### CONSTRUCTION

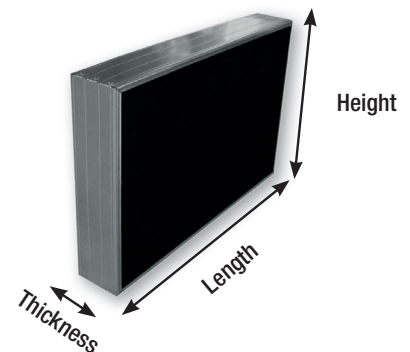
The new generation of frames include rounded edges which reduces pressure losses by 30% compared with straight edges

		SONIE BL
Frame	Material	Galvanised steel sheet with grooving <i>Option: stainless steel 304L or 316L, or painted steel according to RAL standard colour or aluminium</i>
	Metal sheet thickness	0.6 mm <i>Option: 0.8, 1.0 or 1.2 mm</i>
	Assembly	By zinc-coated steel rivets or clips <i>Option: stainless steel rivets</i>
	Reinforcement	For surface area larger than 1 m <sup>2</sup>
Soundproofing	Material	Single-unit panel of mineral wool Non-hydrophilic insulation A1 (M0) fire rating
	Density	50 kg/m <sup>3</sup>
	Coating	Anti-erosion fiber glass fabric on both sides

### DIMENSIONS

Thickness	50, 100, 150, 200 or 300 mm
Maximum surface area	4 m <sup>2</sup>
Maximum weight	50 kg

\* Maximum surface area and weight for a single-unit construction.  
For larger dimensions, acoustic splitters are provided in several units with mounting accessories.



\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.



### WEIGHT (kg)

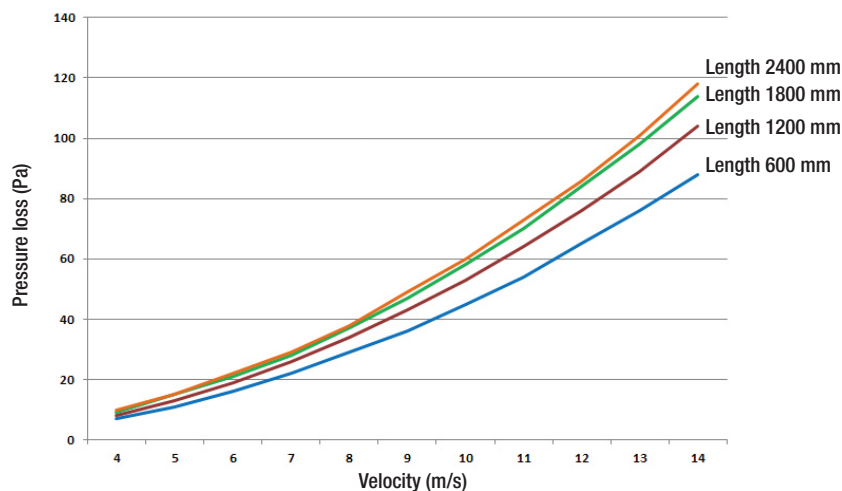
Height (mm)	Thickness (mm)	Length (mm)						
		600	900	1200	1500	1800	2100	2400
600	100	4	5	6	8	9	10	11
	200	7	9	12	14	17	19	22
	300	10	13	17	21	24	28	32
1200	100	6	8	11	13	15	17	19
	200	12	16	20	24	29	33	37
	300	17	23	30	36	42	49	55
1800	100	9	12	15	18	21	24	27
	200	17	23	29	35	41	47	53
	300	24	33	42	52	61	70	79

Splitters over 50kg are supplied in several parts.

### PERFORMANCES

The acoustics performances levels (attenuation and regenerated noise) of the SONIE BL splitter are almost identical to those of the SONIE BS standard splitter (see page 32).

### PRESSURE LOSS



Upon request, our acoustic engineers will support you and perform a dynamic acoustic study of your installation in order to determine the optimal solution.

**[NEW]**

**eSonic**

On-line acoustics software



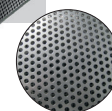
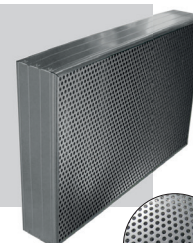
Design your silencer directly at [www.f2a.fr](http://www.f2a.fr)

# ACOUSTIC SPLITTER

## SONIE BP+ / HIGH PERFORMANCE INDUSTRY

The SONIE BP+ high performance acoustic splitters are installed in HVAC ductworks to reduce the noise pollution generated by the ventilation system.

The SONIE BP+ splitter is equipped with a mechanical protection allowing high velocity air flow. It is particularly suited for industrial applications.



Protected by perforated metal sheet

INDUSTRY

### CODIFICATION



### CONSTRUCTION

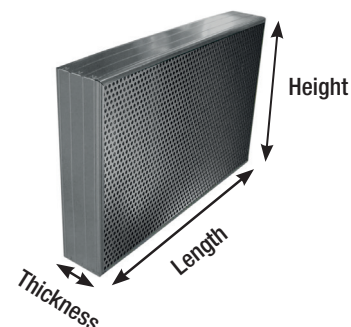
The new generation of frames include rounded edges which reduces pressure losses by 30% compared with straight edges

		SONIE BP+
Frame	Material	Galvanised steel sheet with grooving <i>Option: stainless steel 304L and 316L</i>
	Metal sheet thickness	0.8 mm <i>Option: 1.0 or 1.2 mm</i>
	Assembly	By zinc-coated rivets <i>Option: stainless steel rivets</i>
	Reinforcement	For surface area larger than 1 m <sup>2</sup>
Soundproofing	Material	Single-unit panel of non-hydrophilic mineral wool A2-S1-D0 (M0) fire rating
	Density	24 kg/m <sup>3</sup>
	Coating	Anti-erosion fiber glass silk on both sides <i>Option: polythene cover, Tedlar cover</i>
Protection	Material	R5T7 perforated galvanised steel sheet <i>Option: stainless steel 304L and 316L</i>
	Thickness	0.8 mm

### DIMENSIONS

Thickness	100, 150, 200 or 300 mm
Maximum surface area*	3 m <sup>2</sup>
Maximum weight*	50 kg

\* Maximum surface area and weight for a single-unit construction.  
For larger dimensions, acoustic splitters are provided in several units with mounting accessories.



# ACOUSTIC SPLITTER

## SONIE BP+ / HIGH PERFORMANCE INDUSTRY

### WEIGHT (kg)

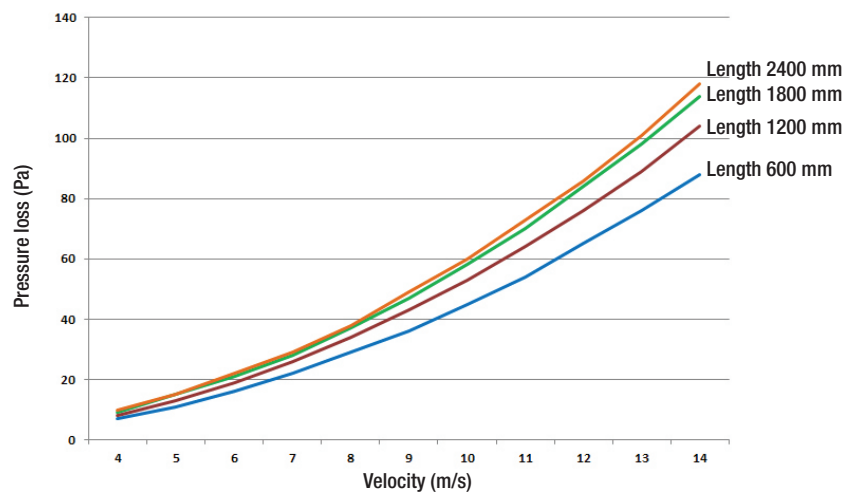
Height (mm)	Thickness (mm)	Length (mm)						
		600	900	1200	1500	1800	2100	2400
600	100	5	8	10	12	14	17	19
	200	7	10	13	16	19	22	25
1200	100	10	14	18	22	26	30	34
	200	13	19	24	29	34	39	45
1800	100	14	20	26	32	38	44	50
	200	19	27	34	42	49	56	64

Splitters over 50kg are supplied in several parts.

### PERFORMANCES

The acoustics performances levels (attenuation and regenerated noise) of the SONIE BP+ splitter are almost identical to those of the SONIE BS+ high performance splitter (see page 28).

### PRESSURE LOSS



Upon request, our acoustic engineers will support you and perform a dynamic acoustic study of your installation in order to determine the optimal solution.

**[NEW]**

**eSonic**

On-line acoustics software



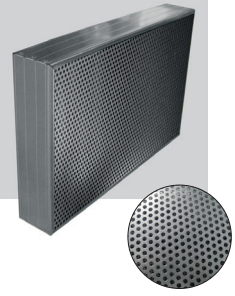
Design your silencer  
directly at [www.f2a.fr](http://www.f2a.fr)

# ACOUSTIC SPLITTER

## SONIE BP - INDUSTRY

The SONIE BP acoustic splitters are installed in HVAC ductworks to reduce the noise pollution generated by the ventilation system.

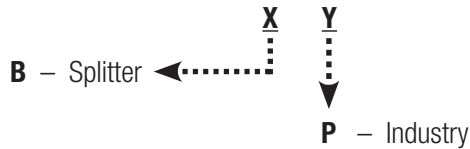
The SONIE BP splitter is equipped with a mechanical protection allowing high velocity air flow. It is particularly suited to industrial applications.



Protected by perforated metal sheet

INDUSTRY

### CODIFICATION



### CONSTRUCTION

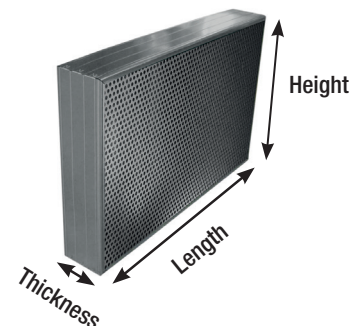
The new generation of frames include rounded edges which reduces pressure losses by 30% compared with straight edges

		SONIE BP
Frame	Material	Galvanised steel sheet with grooving <i>Option: stainless steel 304L and 316L</i>
	Metal sheet thickness	0.8 mm <i>Option: 1.0 or 1.2 mm</i>
	Assembly	By zinc-coated rivets <i>Option: stainless steel rivets</i>
	Reinforcement	For surface area larger than 1 m <sup>2</sup>
Soundproofing	Material	Single-unit panel of non-hydrophilic mineral wool A1 (M0) fire rating
	Density	50 kg/m <sup>3</sup> <i>Option: others available on request (depending on quantity)</i>
	Protection	Anti-erosion fiber glass silk on both sides <i>Option: polythene cover, Tedlar cover</i>
Protection	Material	Perforated galvanised steel sheet <i>Option: stainless steel 304L and 316L</i>
	Thickness	0.8 mm

### DIMENSIONS

Thickness	100, 150, 200 or 300 mm
Maximum surface area*	3 m <sup>2</sup>
Maximum weight	50 kg

\* Maximum surface area and weight for a single-unit construction.  
 For larger dimensions, acoustic splitters are provided in several units with mounting accessories.



### WEIGHT (kg)

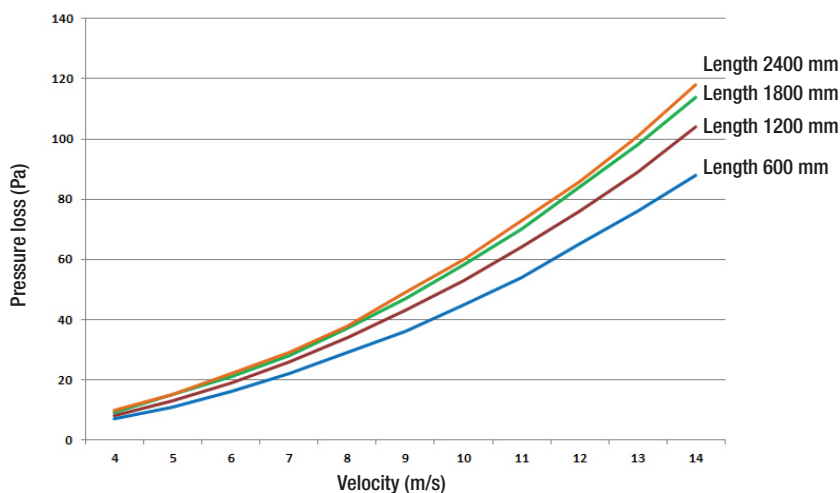
Height (mm)	Thickness (mm)	Length (mm)						
		600	900	1200	1500	1800	2100	2400
600	100	7	10	13	15	18	21	24
	200	10	14	19	23	27	31	35
1200	100	13	18	23	28	33	38	43
	200	19	26	33	41	48	55	62
1800	100	18	26	33	41	48	55	63
	200	27	37	48	58	69	79	90

\*Splitters over 50kg are supplied in several parts.

### PERFORMANCES

The acoustics performances levels (attenuation and regenerated noise) of the SONIE BP splitter are almost identical to those of the SONIE BS standard glass fiber splitter (see page 32).

### PRESSURE LOSS



Upon request, our acoustic engineers will support you and perform a dynamic acoustic study of your installation in order to determine the optimal solution.

[NEW]

eSonic

On-line acoustics software



Design your silencer  
directly at [www.f2a.fr](http://www.f2a.fr)

# RECTANGULAR SILENCER

**SONIE R-BS+ / R-BS / R-BD+ / R-BD / R-BL / R-BP+ / R-BP**

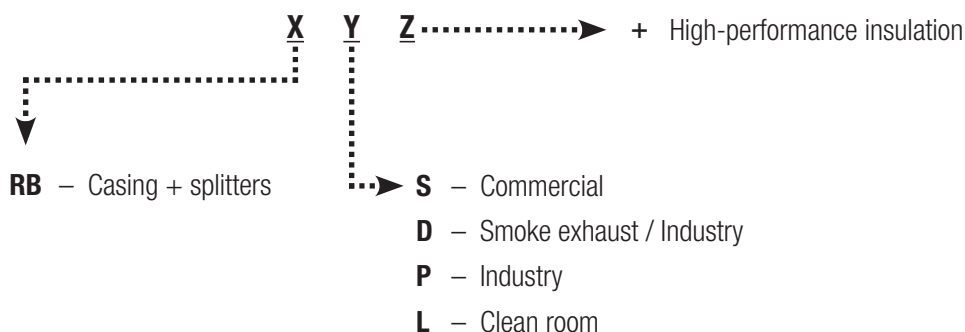
Composed of a rectangular casing and acoustic splitters, rectangular silencers are available in standard with four metal sheet thicknesses in order to adapt to the dimensional constraints and specific characteristics of use.

The configuration and type of splitters installed in the silencer depend of the acoustic performance levels required and the application.



ALL APPLICATIONS

## CODIFICATION



## CONSTRUCTION

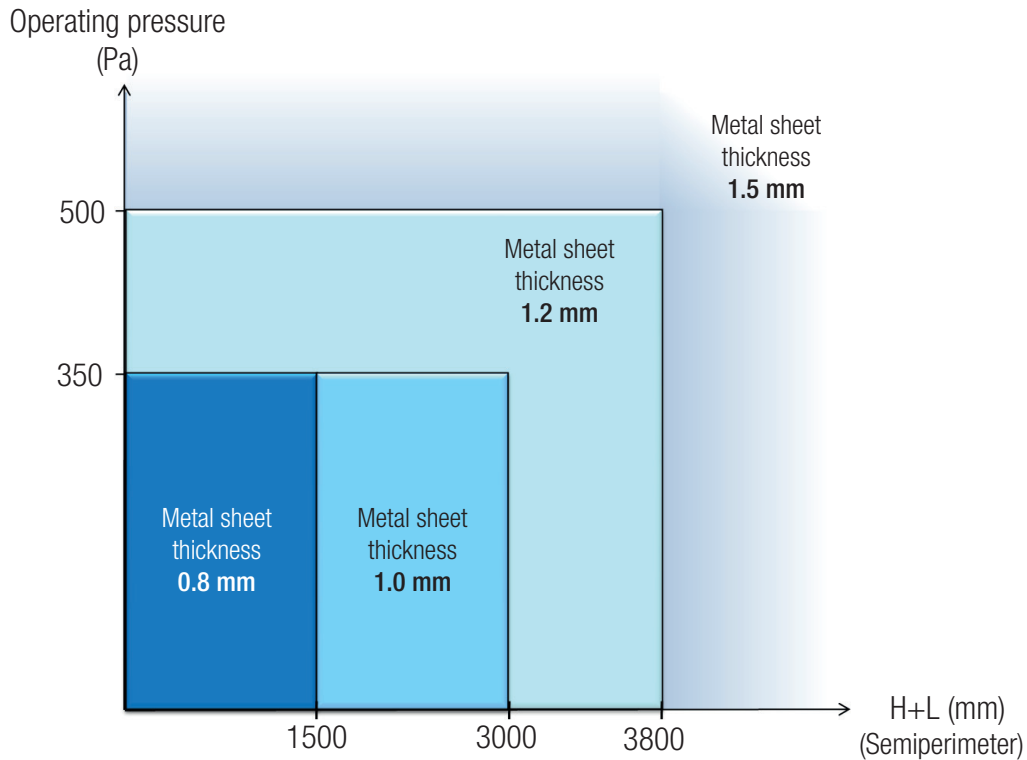
		SONIE rectangular silencer
Casing	Section	Min.: 200 mm x 200 mm Max.: 1800 mm x 1800 mm <i>Option: larger cross-section available on request</i>
	Material	Galvanised steel <i>Option: stainless steel 304L and 316L, steel painted according to RAL standard colour, aluminium, black or electro-galvanised sheet</i>
	Metal sheet thickness	0.8, 1.0, 1.2 or 1.5 mm <i>Option: other thicknesses available on request</i>
	Assembly	Lock seaming <i>Option: welding</i>
	Connection	Flanges of 20 or 30 mm, METU type frame Supply of connection clips <i>Option: mounting frames</i>
	Drilling	Oblong Ø 13 mm in the corners <i>Option: special drilling</i>

# RECTANGULAR SILENCER

## SONIE R-BS+ / R-BS / R-BD+ / R-BD / R-BL / R-BP+ / R-BP

### CONSTRUCTION GUIDELINES

Graph summarising the recommended metal sheet thicknesses according to the operating pressure in the system (Psr) and the semiperimeter:



Upon request, our acoustic engineers will support you and perform a dynamic acoustic study of your installation in order to determine the optimal solution.

[NEW]

eSonic

On-line acoustics software



Design your silencer  
directly at [www.f2a.fr](http://www.f2a.fr)

# ACOUSTIC LOUVRE

## SONIE GNB

The SONIE GNB acoustic louvre is used to reduce static or dynamic ventilation noises, mostly at the air discharge point.

It is designed to provide two levels of protection:

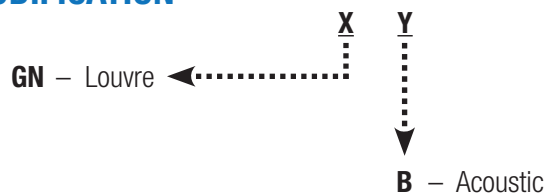
- Rain shield thanks to the profile of the blade which has been specially designed.
- Noise protection thanks to the insulating material fitted inside the blades.



Image with mounting sub-frame option

COMMERCIAL

### CODIFICATION



### CONSTRUCTION

		SONIE GNB
Frame	Material	Galvanised steel sheet <i>Option: stainless steel 304L or 316L, or painted steel according to RAL standard colour or aluminium</i>
	Thickness	1.2 mm
	Width	300 mm
	Assembly	By zinc-coated rivets
Blades	Material	Galvanised steel sheet <i>Option: stainless steel 304L or 316L, or painted steel according to RAL standard colour or aluminium</i>
	Thickness	0.8 mm
	Assembly	By zinc-coated rivets <i>Option: stainless steel rivets</i>
Soundproofing	Material	Non-hydrophilic single-unit panel
	Density	50 kg/m <sup>3</sup>
	Thickness	50 mm
	Protection	Anti-erosion fiber glass silk
Bird protection		Anti-bird mesh on the back frame
Miscellaneous		<i>Option: Mounting sub-frame, louvre with directional blades, flanges 50 mm</i>



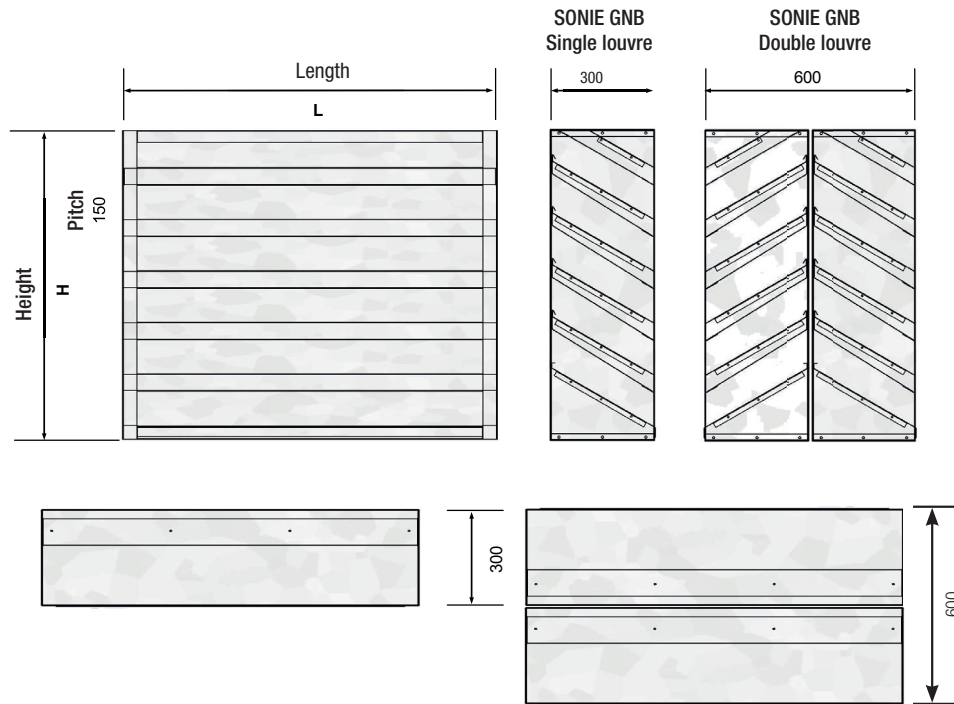
### DIMENSIONS

Height H from 450 mm to 2400 mm

Length L from 400 mm to 1800 mm

Heights are with a pitch of 150 mm and 100 mm for the lengths (other dimensions available on request).

Larger dimensions are achieved by juxtaposing several units.



### WEIGHT (kg)

Height \ Length	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
450	10	13	17	17	21	24	25	28	31	32	35	39	39	43	46
600	12	16	20	21	25	29	30	34	39	39	43	48	48	52	57
750	14	19	24	25	30	35	36	41	46	47	52	57	57	62	67
900	17	22	28	29	35	41	41	47	53	54	60	66	66	72	78
1050	19	25	32	33	40	46	47	54	60	61	68	75	75	82	89
1200	21	29	36	37	44	52	53	60	68	69	76	84	84	92	100
1350	23	32	40	41	49	58	58	67	75	76	84	93	93	102	110
1500	25	35	44	45	54	63	64	73	82	83	92	102	102	112	121
1650	28	38	48	49	59	69	69	80	90	90	101	111	111	122	132
1800	30	41	52	52	63	74	75	86	97	98	109	120	120	131	142
1950	32	44	56	56	68	80	81	93	104	105	117	129	129	141	153
2100	34	47	60	60	73	86	86	99	112	112	125	138	138	151	164
2250	36	50	63	64	78	91	92	105	119	120	133	147	147	161	175
2400	39	53	67	68	82	97	98	112	126	127	141	156	156	171	185

Height and length in mm

# ACOUSTIC LOUVRE

## SONIE GNB

### ACOUSTIC CHARACTERISTICS

The GNB louvres have been tested in a laboratory according to ISO 7235: 2004 standard.

### INSERTION LOSSES

Type of louvre	Frequencies								
	63	125	250	500	1000	2000	4000	8000	[Hz]
Single GNB	3	3	4	9	14	17	13	13	[dB]
Double GNB	4	5	6	13	25	27	21	23	[dB]

### REGENERATED NOISE (Lw)

#### Single louvre

Face velocity (m/s)	Frequencies									Overall dB(A)
	63	125	250	500	1000	2000	4000	8000	[Hz]	
1.5	42	41	35	36	31	23	24	30	[dB]	37
2.0	50	46	43	40	42	39	30	30	[dB]	46
2.5	57	52	49	44	47	48	41	33	[dB]	53
3.0	63	58	54	49	51	53	50	40	[dB]	58
3.5	68	62	59	53	54	56	57	48	[dB]	62
4.0	73	67	62	57	56	59	62	53	[dB]	66
4.5	77	71	66	60	59	61	65	58	[dB]	69
5.0	79	74	69	63	61	63	67	63	[dB]	72

#### Double louvre

Face velocity (m/s)	Frequencies									Overall dB(A)
	63	125	250	500	1000	2000	4000	8000	[Hz]	
1.5	45	47	41	39	39	33	26	30	[dB]	37
2.0	53	54	48	45	47	47	38	32	[dB]	46
2.5	60	60	54	50	52	54	49	39	[dB]	53
3.0	66	65	60	54	56	58	58	47	[dB]	58
3.5	70	69	64	58	58	61	62	54	[dB]	62
4.0	74	73	67	62	61	64	66	59	[dB]	66
4.5	77	76	71	65	63	66	68	65	[dB]	69
5.0	80	78	73	68	65	69	70	68	[dB]	72

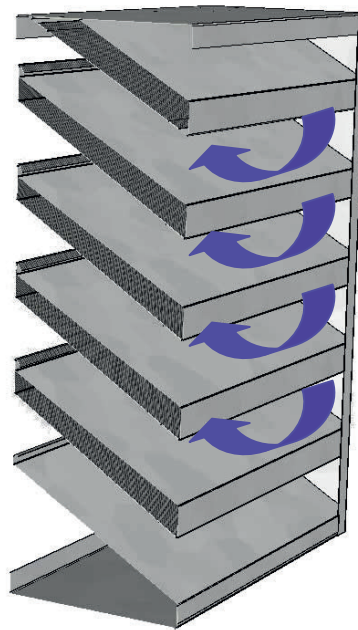
### AIR FLOW CHARACTERISTICS: AIR VELOCITY

The maximum face velocity at the air intake is 2 m/s.  
At the air exhaust, the maximum velocity is 5 m/s.

### AIR FLOW SECTION

It represents the free area section of the louvre (in %).

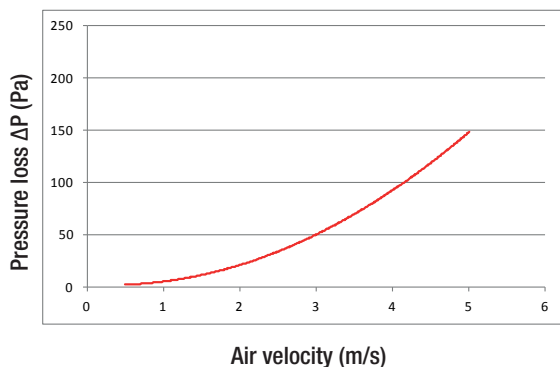
Height (mm)	% of free area
450	17%
600	25%
750	30%
900	33%
1050	36%
1200	38%
1350	39%
1500	40%
1650	41%
1800	42%
1950	42%
2100	43%
2250	43%
2400	44%



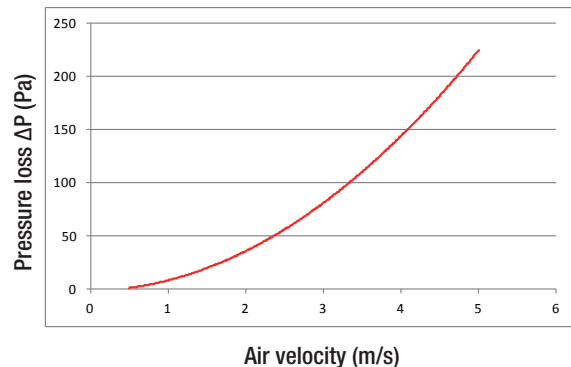
### PRESSURE LOSS

The pressure loss can be read on the graphs below, according to the face velocity.

**Single louvre**



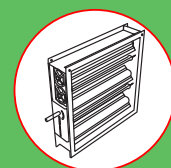
**Double louvre**







# AIR CONTROL



# AIR CONTROL EXPERTISE

An unbalanced ventilation system results in the air flow being distributed unevenly and prevents the objectives set in the specifications from being achieved.

This phenomenon can notably result in poor air change rates in certain sections of the system or the air velocity being too fast, causing noise pollution and "draught" effects.

In order to resolve these issues, F2A has been designing and manufacturing dampers and backdraught dampers for over 30 years. Our Air Control solutions enable the air flow to be mechanically regulated by creating a controlled pressure loss.

## BACKDRAUGHT DAMPERS



The backdraught dampers are air handling components designed for a one-way air flow direction. The blades prevent reverse flow in the HVAC ductworks. They are composed of a frame and blades (independent or otherwise) which shut off the ductworks by gravity.

## DAMPERS



The dampers are circular or rectangular and enable ventilation ductworks to be regulated or isolated by controlling the opening of the blades (motorised or manual control). Our Air Control solutions are custom-made according to several criteria which are analysed by our design office: environment, mechanical resistance, airtightness, etc.

### 1. Environment

Our solutions comply with the specifications for each project, enabling optimum conditions of use to be met. The materials used to manufacture the dampers are selected according to the constraints of the installation:

- ATEX zone
- High pressures
- High temperatures
- Saline environments
- Presence of hydrocarbons
- etc...

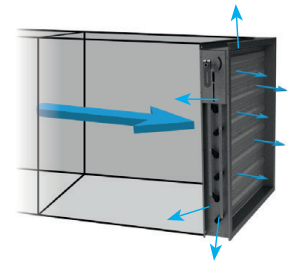
## 2. Mechanical resistance

The mechanical resistance of a damper is determined by its pressure resistance. It is directly related to the length of the equipment and the thickness of the metal sheet and materials used. F2A supplies dampers suited to HVAC ductworks which are subject to high pressures and negative pressures up to 10 000 Pa.

## 3. Airtightness

The airtightness classes of dampers are regulated by the EN 1751 standard. The air flow equipment is characterised by two types of airtightness:

- *Upstream/downstream airtightness (Class 1 to 4)*
- *Frame's airtightness (Class A to C)*



*For a pressure of 500 Pa, the standard defines the following leakage rates:*

Upstream/downstream airtightness	Class 1	Class 2	Class 3	Class 4
Leakage rate	< 450 l.s <sup>-1</sup> .m <sup>2</sup>	< 85 l.s <sup>-1</sup> .m <sup>2</sup>	< 18 l.s <sup>-1</sup> .m <sup>2</sup>	< 3.8 l.s <sup>-1</sup> .m <sup>2</sup>
Frame's airtightness	Class A	Class B	Class C	
Leakage rate	< 1.6 l.s <sup>-1</sup> .m <sup>2</sup>	< 0.50 l.s <sup>-1</sup> .m <sup>2</sup>	< 0.17 l.s <sup>-1</sup> .m <sup>2</sup>	

F2A provides solutions that comply with various airtightness classes:

- Balancing damper - **Non classified**: no specific airtightness
- Anti-frost damper - **Class 1**: low airtightness
- Shut-off damper - **Class 3**: this type of damper is perfect for shutting off a section of the HVAC ductwork.
- Airtight damper - **Class 4**: this type of damper is particularly suited to clean room applications requiring a high level of insulation.

## ACTUATION

F2A works in close collaboration with numerous actuator manufacturers. Our experts select the model best suited to you:

- *Type of actuator: electric, pneumatic, electro-pneumatic*
- *Operating mode: On/off or modulating*
- *Supply: 24V, 110V, 230V...*
- *Motor torque*

# CODIFICATION & SELECTION

## BACKDRAUGHT DAMPERS

### CODIFICATION



- S** Standard – Commercial Application
- R** Reinforced – Commercial/Industry Application
- E** Airtight – Commercial/Industry Application
- I** Industry – Industry Application

Example:



Airtight – Commercial/Industry Application



### CHOOSING A BACKDRAUGHT DAMPER



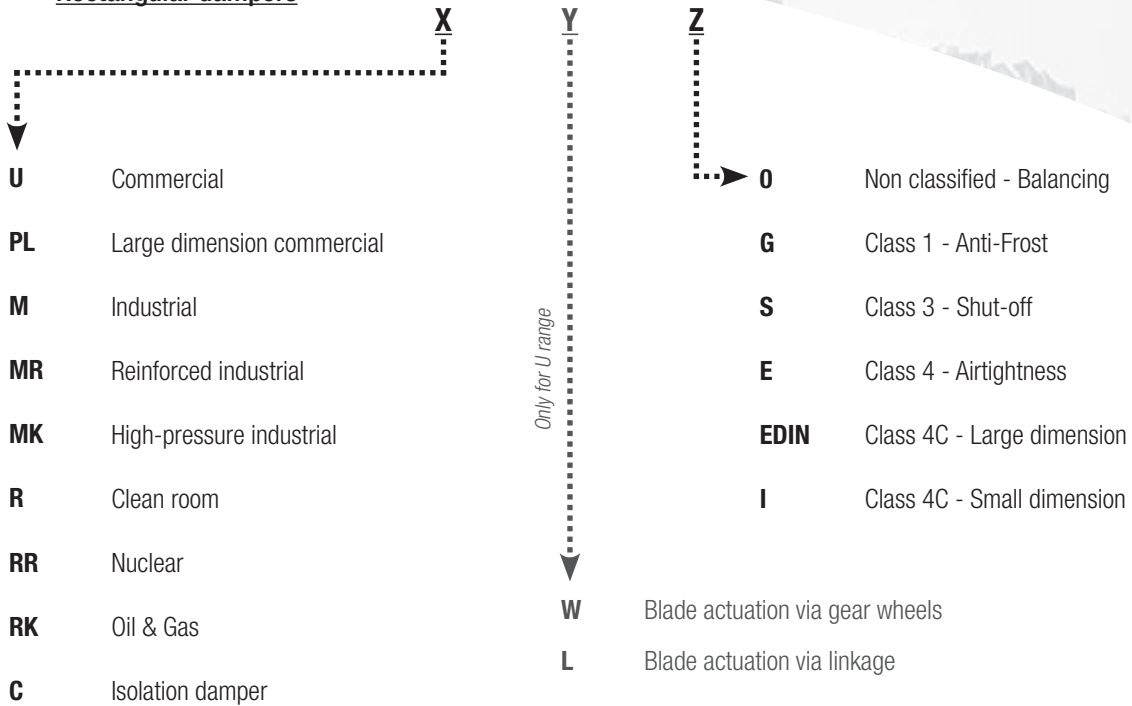
Type	Frame material			Blade material			Frame width in mm		Acceptable pressure in Pa (L=1m)				Temperature in °C		Operating velocity in m/s		
	Galvanised steel	Stainless steel	Aluminium	Galvanised steel	Stainless steel	Aluminium	125	185	150	1000	1800	5000	-20 to +80	-30 to +200	2 to 5	5 to 15	8 to 20
AS	●	●	●		●	●	●		●				●		●		
AR	●	●	●	●	●	●		●	●				●	●		●	
AE	●	●		●	●			●		●			●	●		●	
AI	●	●		●	●			●				●	●	●			●

- Standard
- Optional

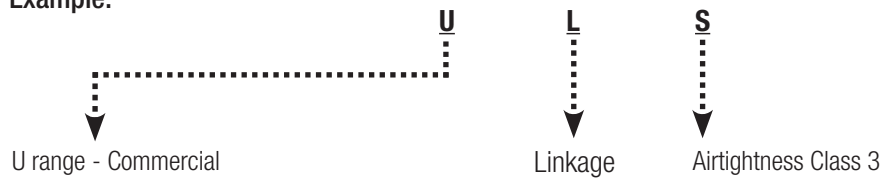


# CODIFICATION DAMPERS

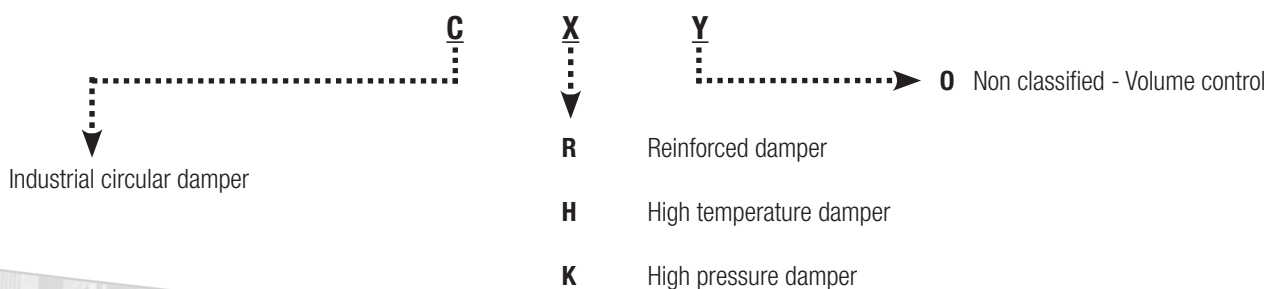
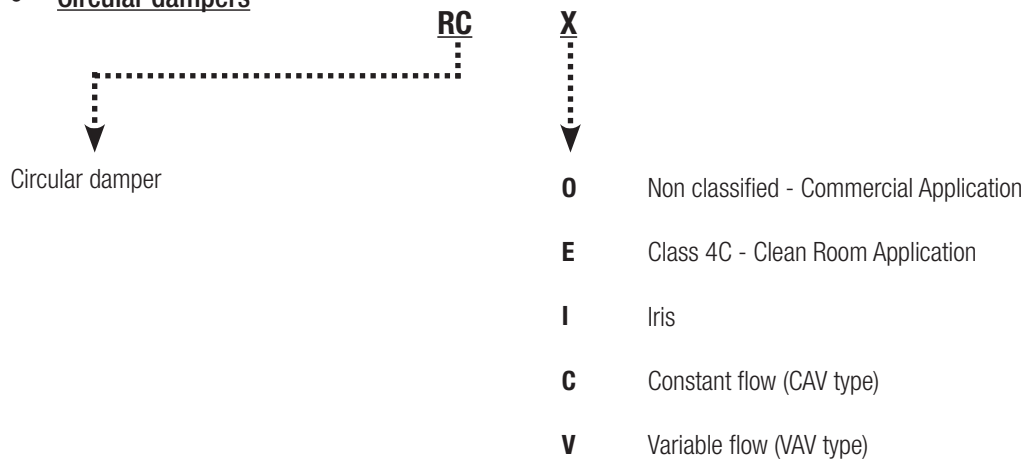
## • Rectangular dampers



### Example:



## • Circular dampers








# SELECTION GUIDE

## RECTANGULAR DAMPERS

● Standard

● Optional

		Material			Blade actuation mechanism		Frame width in mm						
		Galvanised steel	Stainless steel	Aluminium	Gear wheels	Linkage	110	130	160	185	210	280	350
 <b>COMMERCIAL</b>	U range	●	●	●	●	●	●	●					
	PL range	●	●	●		●			●				
 <b>CLEAN ROOM</b>	R range	●	●			●			●				
 <b>INDUSTRY</b>	M range	●	●	●		●			●				
	MR / MK range	●	●			●			●				
 <b>TUNNEL</b>	M range Smoke exhaust	●	●			●			●				
	TRS range	●	●			●					●		
 <b>OIL &amp; GAS</b>	RK range	●	●			●				●			
 <b>NUCLEAR</b>	CI	●	●			●							●
	RR range	●	●			●			●				

# SELECTION GUIDE

## RECTANGULAR DAMPERS

Upstream/downstream airtightness class (EN 1751)			Frame's airtightness class (EN 1751)			Acceptable pressure in Pa (L=1m)				Temperature in °C			
NC	3	4	A	B	C	< 1000	< 2000	< 3000	> 3000	-20 to +80	-30 to +200	+300	400°C / 2h
●	●	●	●	●	●	●				●			
●	●		●		●		●			●	●		
		●			●		●			●	●		
●	●		●		●			●		●	●		
●	●		●		●				●		●	●	
●	●		●					●			●		●
	●		●						●		●		●
●	●		●		●				●		●		
		●			●				●	●			
●	●		●		●				●	●	●		

# CONTENTS

## RECTANGULAR DAMPERS



**U range / Kit**  
page 62 - 64



**PL range**  
page 66



**M range**  
page 68



**MR/MK range**  
page 70



**M - D range**  
page 72



**R range**  
pages 74 - 76

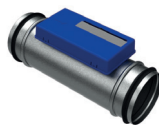
## CIRCULAR DAMPERS



**RC range - O / E**  
page 78



**RC range - I**  
page 80



**RC range - C**  
page 82



**RC range - V**  
page 84



**CR range - O**  
page 86

## BACKDRAUGHT DAMPERS



**A range - S**  
page 88



**A range - R / E / I**  
page 90



**B range - S / D**  
page 92



**V range - S / D**  
page 94

# CONTENTS



## WEATHER LOUVRES



**G range - N**  
page 96



**G range - H**  
page 98



**G range - B**  
page 100



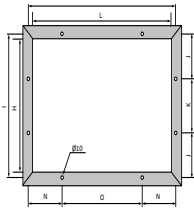
**G range - S**  
page 102



**G range - A**  
page 104

Delivery time  
48 h\*

## DRILLING



**Dampers / Louvres**  
pages 106-109

## SPECIFIC MARKETS



**Tunnel**  
page 110



**Oil & Gas**  
page 111



**Nuclear**  
page 112



**Industrial process**  
page 113

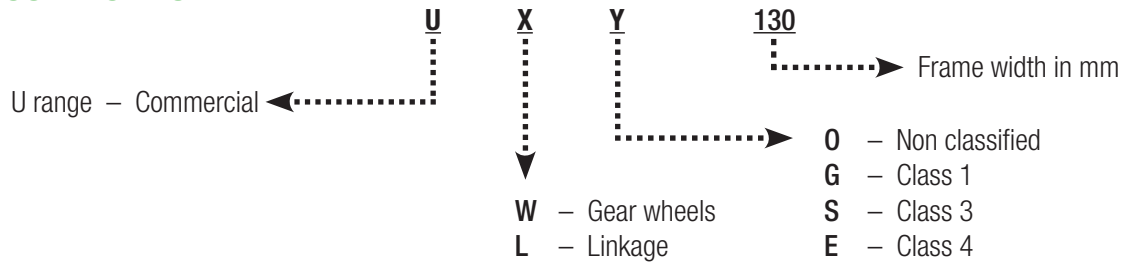
\* Delivery time EXW from receipt of order confirmation, according to quantities & dimensions; consult us.

# COMMERCIAL DAMPER

## U RANGE

U range dampers have been designed to mechanically regulate the air flow or isolate the ventilation ductworks with airtightness classes ranging from class 0 to class 4 according to EN 1751 standard. They are perfectly suited to HVAC commercial applications.

### CODIFICATION



### CONSTRUCTION

**Control**

<b>Manual</b>	12 mm square shaft Effective length 100 mm Lever and manual locking
<b>Motorised</b>	12 mm square shaft Effective length 100 mm <i>Option: actuator supplied and mounted in our factory</i>

**Frame**

Width: 130 mm  
*Option: width 110 mm*  
Metal sheet thickness: 1.0 mm  
Galvanised steel  
*Option: aluminium, stainless steel 316L or 304L frame*  
Drilling Ø10 mm in corners  
*Option: special drilling*  
Flanges: 30 mm

**Linkage**

Gear wheels for UW  
Linkage for UL  
Opposed blade operation  
*Option: parallel blade operation*

**Blades**

Galvanised steel  
*Option: aluminium profiled blades*  
Pitch: 100mm

*Delivery time 72h ex-works\**

### PERFORMANCE

	Volume Control Version O	Anti-Frost Version G	Shut-off Version S	Airtight Version E (aluminium blades only)
<b>Airtightness (upstream/downstream)</b>	Non classified	<b>Class 1</b> (EN 1751)	<b>Class 3</b> (EN 1751)	<b>Class 4</b> (EN 1751)
<b>Frame's airtightness</b>	Class A (EN 1751) <i>Option: Class B or Class C</i>			Class C (EN 1751)
<b>Acceptable pressure (L=1m)</b>	1 000 Pa			
<b>Operating temperatures</b>	-20°C to +80°C			

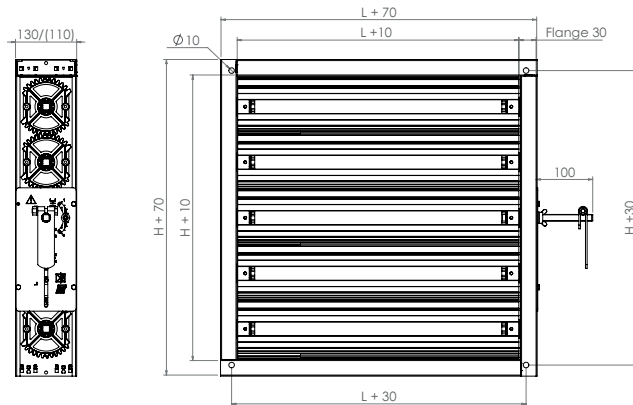
\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

# COMMERCIAL DAMPER

## U RANGE

### DIMENSIONS

- Height H from 200 to 1400 mm
- Length L from 200 to 1400 mm



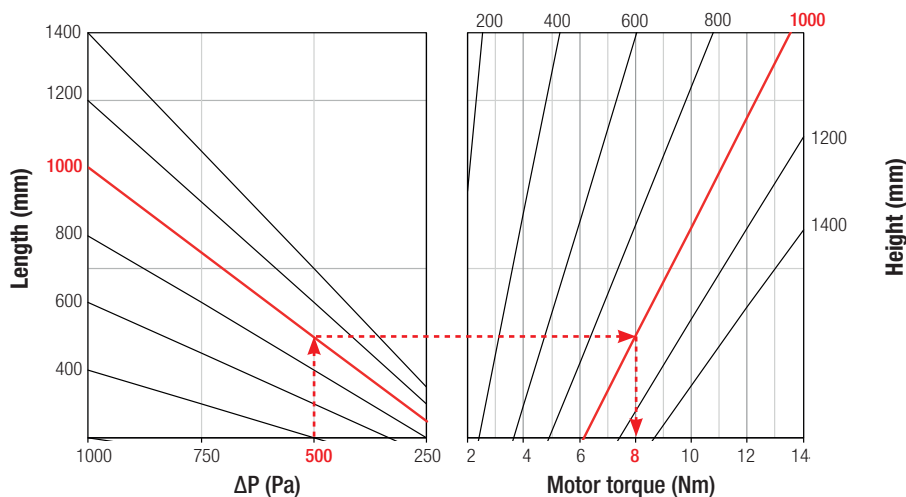
### WEIGHT (kg)

H \ L	200	400	600	800	1000	1200	1400
200	3	5	6	7	8	9	11
400	5	6	8	9	11	13	14
600	6	8	10	12	14	16	18
800	7	10	12	14	17	19	21
1000	9	11	14	17	19	22	25
1200	10	13	16	19	22	25	28
1400	11	15	18	22	25	28	32

Weights are given for a galvanized steel damper

### MOTOR TORQUES

The motor torques below are given in Nm for a UWO or ULO type volume control damper. For G, S or E versions, a coefficient of 1.3 should be applied to the result given.



#### Example:

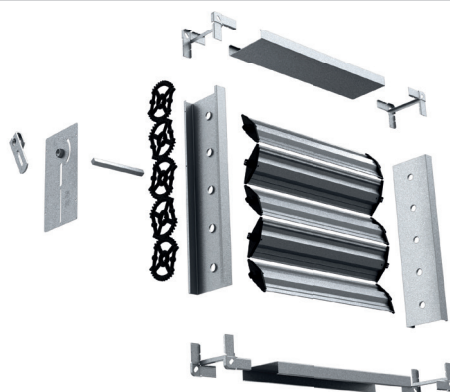
$\Delta P = 500$  Pa

UWO 130 damper – L = 1000 mm, H = 1000 mm  $\Rightarrow$  motor torque = **8 Nm**

# COMMERCIAL DAMPER

## U RANGE - KIT VERSION

Dampers of the U range are designed to adjust the volume of airflow or to shut off the ventilation ductworks. The frame's airtightness classification is going from class A to class C according to EN1751. U dampers are suitable for commercial HVAC applications. The kit version is equipped with a new mounting system including angle pieces: fast and easy to assembly.



### CONSTRUCTION

	Galvanized steel version	Aluminium version
Frame	Width 130 mm - Flanges of 30 mm Oblong drilling Ø10 in each angle	Width 110 mm - Flanges of 30 mm Undrilled
Blades	Galvanized steel or aluminium Pitch of 100 mm	
Linkage	Gear wheels	
Control shaft	Square shaft of 12mm in aluminium	
Operating temperatures	From -20°C to +80°C	
Dimensions	Height H from 200 to 1200 mm Length L from 200 to 1200 mm Note : Effective sizes H+10 x L+10	

### ASSEMBLY

- Galvanized steel version :  
The frame is assembled with 4 angle pieces (between top/bottom and sides)
- Aluminium version :  
The frame is assembled with self drilling screws (no angle pieces)

### DIMENSIONS

The kit version damper is delivered in spare parts.  
Blades, top/bottom and sides are available in four dimensions :

- 400 mm
- 600 mm
- 900 mm
- 1200 mm

Those elements can be cut at your required dimensions.



### CUTTING RULES CALCULATION

**Note:**

Dampers **effective dimensions** L x H = Dampers **Nominal dimensions** L x H + 10 mm

Example: Kit-UWS nominal dimensions = L x H 500 x 500 => + 10mm => Effective L x H = 510 x 510mm

The components (sides - tops & bottoms) are delivered according to the dimensions below:

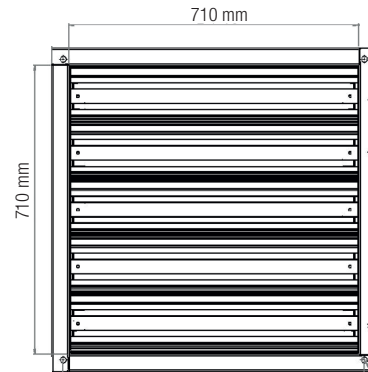
Nominal sizes (mm)	Effective sizes (mm)
400	410
600	610
900	910
1200	1210

**How to manufacture a damper 700 x 700 mm ?**

700 x 700 nominal = 710 x 710 mm see the following drawing =>

**To assemble the damper, you need:**

- 2 x tops & bottoms L900 mm (effective length 910 mm)
- 2 x sides H900 mm (effective height 910 mm)
- 7 x blades L900 mm (effective length 898 mm)



**The components must be cut at dimension to assemble the damper**

- Tops and bottoms => Cut the tops and bottoms at 710 mm
- Sides => Cut the sides at 710 mm
- Blades => Cut the blades at 698 mm

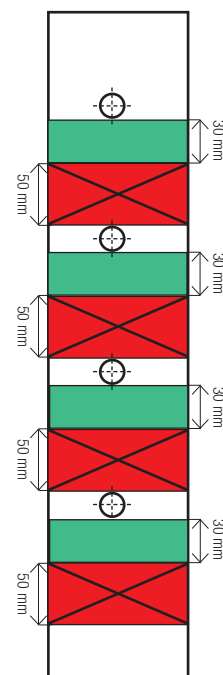


**Note:**

The sides can only be cut on a 30mm area from the edge of the blades shafts holes (see the following drawing)

 Area possible cutting

 Impossible cutting



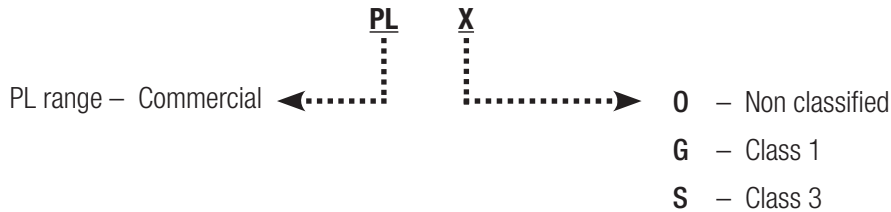
Sides

# COMMERCIAL DAMPER

## PL RANGE - LARGE DIMENSIONS

PL range dampers are designed to regulate or isolate large dimensions ventilation ductworks (up to 2000 x 1950 mm).

### CODIFICATION



### CONSTRUCTION

	Control		Frame
<b>Manual</b>	Smooth shaft Ø16 Effective length 80 mm Lever and manual locking <i>Option: reinforced locking quadrant</i>		Width: 160 mm Metal sheet thickness: 1.2 mm Galvanised steel <i>Option: aluminium, stainless steel 304L or 316L, or painted steel (RAL standard colour)</i>
<b>Motorised</b>	Smooth shaft Ø16 Effective length 130 mm <i>Option: actuator supplied and mounted in our factory</i>		Drilling Ø10 mm in corners <i>Option: F2A standard drilling with a pitch of 150 mm (see p.106), special drilling</i>
	<b>Linkage</b>	<b>Blades</b>	
	Opposed blade operation linkage in zinc-coated steel <i>Option: stainless steel 304L or 316L, parallel blade operation</i>	Galvanised steel <i>Option: aluminium, stainless steel 304L or 316L or painted steel (RAL standard)</i> Pitch: 150mm	

### PERFORMANCE

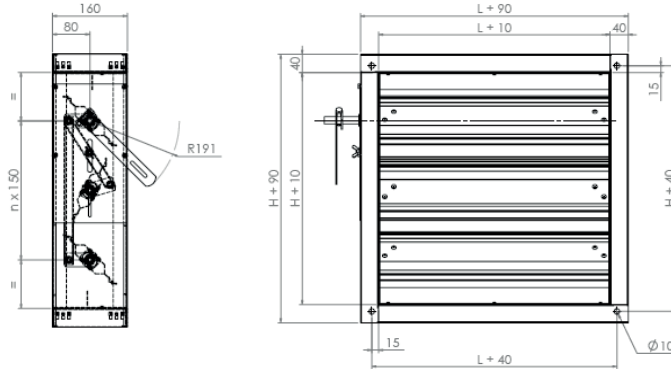
	Volume Control PLO	Anti-Frost PLG	Shut-off PLS
Upstream/downstream airtightness	Non classified	Class 1 (EN 1751)	Class 3 (EN 1751)
Frame's airtightness	Class A (EN 1751) <i>Option: Class C (EN 1751)</i>		
Acceptable pressure (L=1m)	2 000 Pa (1 500 Pa for the aluminium version)		
Operating temperatures	-20°C to +80°C <i>Option: +200°C</i>		

# COMMERCIAL DAMPER

## PL RANGE - LARGE-SCALE

### DIMENSIONS

- Height H from 150 to 1950 mm
- Length L from 200 to 2000 mm



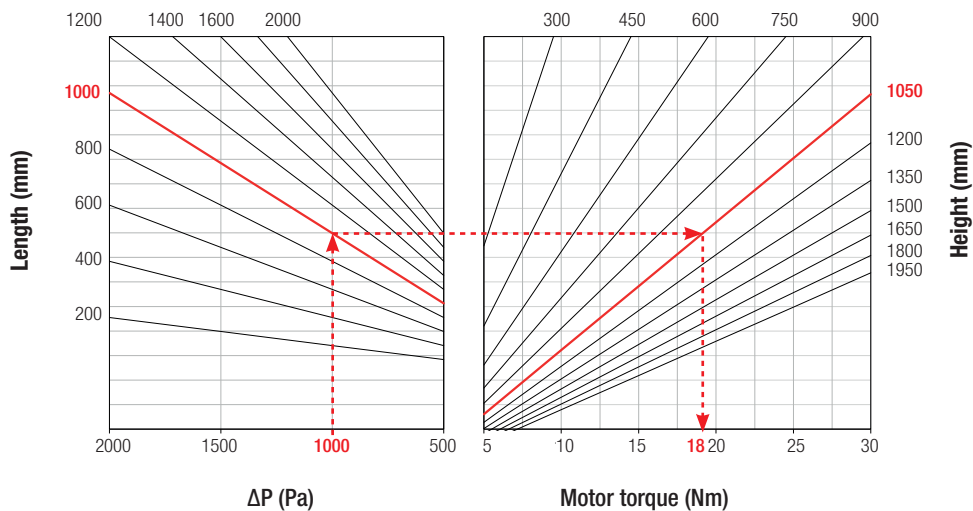
### WEIGHT (kg)

H \ L	200	400	600	800	1000	1200	1400	1600	1800	2000
150	5	7	8	10	11	12	14	16	17	19
450	10	12	14	16	18	20	22	27	29	32
750	14	17	20	23	25	28	31	39	42	44
1050	18	22	26	29	33	36	40	50	54	57
1350	23	27	31	36	40	45	49	62	66	70
1650	27	32	37	42	47	53	58	73	78	83
1950	31	37	43	49	55	61	67	84	90	96

Weights are given for a galvanized steel damper

### MOTOR TORQUES

The motor torques below are given in Nm for a PLO type volume control damper. For a anti-frost damper (PLG) or an shut-off damper (PLS), a coefficient of 1.3 should be applied to the result given.



#### Example:

$\Delta P = 1000$  Pa

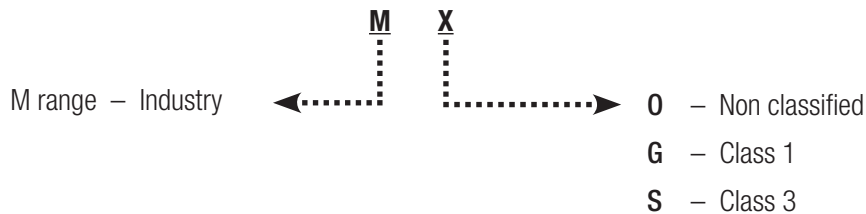
PLO damper – L = 1000 mm x H = 1050 mm => motor torque = **18 Nm**

# INDUSTRIAL DAMPER

## M RANGE

M range dampers are reinforced and designed to control or shut off large dimension HVAC ductworks (up to 2500 x 2325 mm) subject to high pressures.  
M dampers are suited to constraining commercial and industrial applications.

### CODIFICATION



### CONSTRUCTION

Control	
<b>Manual</b>	Smooth shaft Ø16 Effective length 70 mm Lever and manual locking <i>Option: reinforced locking quadrant</i>
<b>Motorised</b>	Smooth shaft Ø16 Effective length 120 mm <i>Option: actuator supplied and mounted in factory</i>

Frame	
Width: 185 mm Metal sheet thickness: 2.0 mm	
Galvanised steel <i>Option: stainless steel 304L or 316L, painted steel (RAL standard colour) or aluminium</i>	
Drilling Ø10 mm in corners <i>Option: F2A standard drilling with a pitch of 165 mm (see p.106), special drilling</i>	
Flanges: 50 mm	

Linkage	
Opposed blade operation linkage in zinc-coated steel <i>Option: stainless steel 304L or 316L, parallel blade operation</i>	

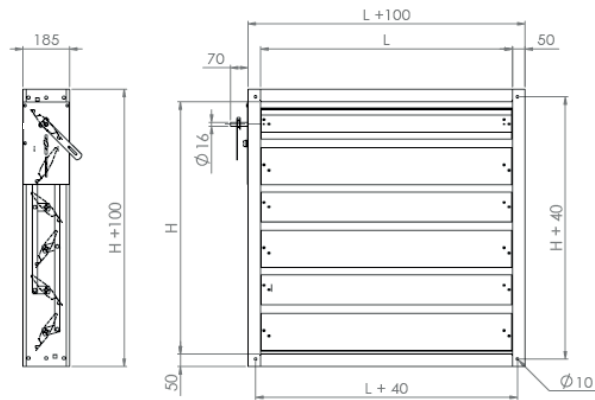
Blades	
Galvanised steel <i>Option: stainless steel 304L or 316L or painted steel (RAL standard colour)</i>	
Pitch: 165mm	

### PERFORMANCE

	Volume Control MO	Anti-Frost MG	Shut-off MS
Upstream/downstream airtightness	Non classified	<b>Class 1</b> (EN 1751)	<b>Class 3</b> (EN 1751)
Frame's airtightness	Class A (EN 1751) <i>Option: Class C (EN 1751)</i>		
Acceptable pressure (L=1m)	3 000 Pa		
Operating temperatures	-20°C to +80°C <i>Option: - 30°C to + 200°C</i>		

### DIMENSIONS

- Height H from 180 to 2325 mm
- Length L from 200 to 2500 mm



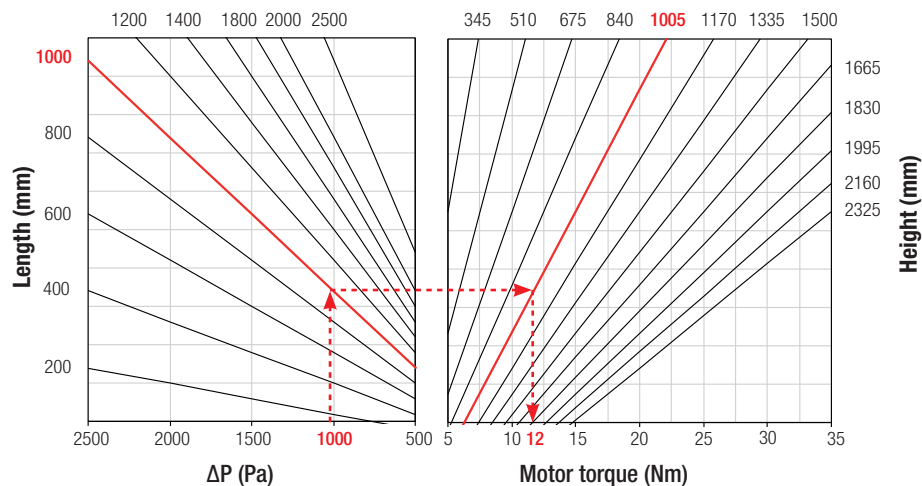
### WEIGHT (kg)

H \ L	200	400	600	800	1000	1200	1400	1600	2000	2500
180	13	17	21	25	28	37	40	44	51	61
510	21	27	32	38	43	58	64	69	80	93
840	30	37	44	51	58	80	87	95	109	127
1170	38	47	56	65	73	102	111	120	138	160
1500	46	57	67	78	88	125	135	146	167	193
1830	55	67	79	91	104	147	159	171	196	226
2160	63	77	91	105	119	169	183	197	224	259
2325	67	82	97	112	126	180	195	209	239	276

Weights are given for a galvanized steel damper

### MOTOR TORQUES

The motor torques below are given in Nm for an MO type volume control damper. For an anti-frost damper (MG) or an shut-off damper (MS), a coefficient of 1.3 should be applied to the result given.



#### Example:

$\Delta P = 1000 \text{ Pa}$

MO damper – L = 1000 mm x H = 1005 mm => motor torque = **12 Nm**

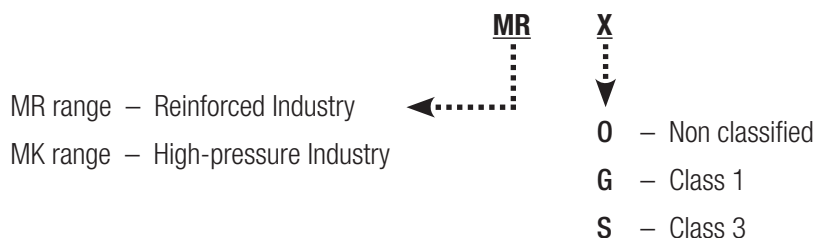
# INDUSTRIAL DAMPER

## MR / MK RANGE

MR and MK type industrial dampers are designed to withstand substantial HVAC constraints (high pressure and high temperature).

MR / MK dampers are suitable for industrial applications such as furnaces, chemical industries, tunnels...

### CODIFICATION



### CONSTRUCTION

Control	
<b>Manual</b>	Smooth shaft Ø16 Effective length 150 mm Lever and manual locking
<b>Motorised</b>	Smooth shaft Ø16 Effective length 150 mm <i>Option: actuator supplied and mounted in factory</i>

Frame	
Width: 185 mm Metal sheet thickness: 3.0 mm	
Galvanised steel <i>Option: stainless steel 304L or 316L, painted steel (RAL standard)</i>	
Drilling Ø12 mm in corners <i>Option: F2A standard drilling with a pitch of 165 mm (see p.106), special drilling</i>	
Flanges: 55 mm	

Linkage	
Opposed blade operation linkage in zinc-coated steel <i>Option: stainless steel 304L or 316L, parallel blade operation</i>	

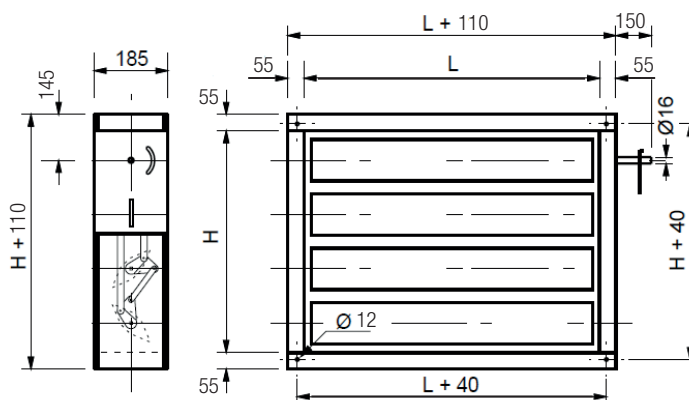
Blades	
Galvanised steel <i>Option: stainless steel 304L or 316L, painted steel (RAL standard)</i>	
Pitch: 165 mm	

### PERFORMANCE

	Volume Control		Anti-Frost		Shut-off	
	MRO	MKO	MRG	MKG	MRS	MKS
<b>Upstream/downstream airtightness</b>	Non classified		Class 1 (EN 1751)		Class 3 (EN 1751)	
<b>Frame's airtightness</b>	Non classified <i>Option: Class C (EN 1751)</i>		Non classified <i>Option: Class C (EN 1751)</i>		Non classified <i>Option: Class C (EN 1751)</i>	
<b>Acceptable pressure (L = 1m)</b>	4 000 Pa	6 000 Pa	4 000 Pa	6 000 Pa	4 000 Pa	6 000 Pa
<b>Operating temperatures</b>	-20 to +300°C		-20 to +300°C		-20°C to +100°C <i>Option: +250°C</i>	

### DIMENSIONS

- Height H from 180 to 2490 mm
- Length L from 200 to 2500 mm



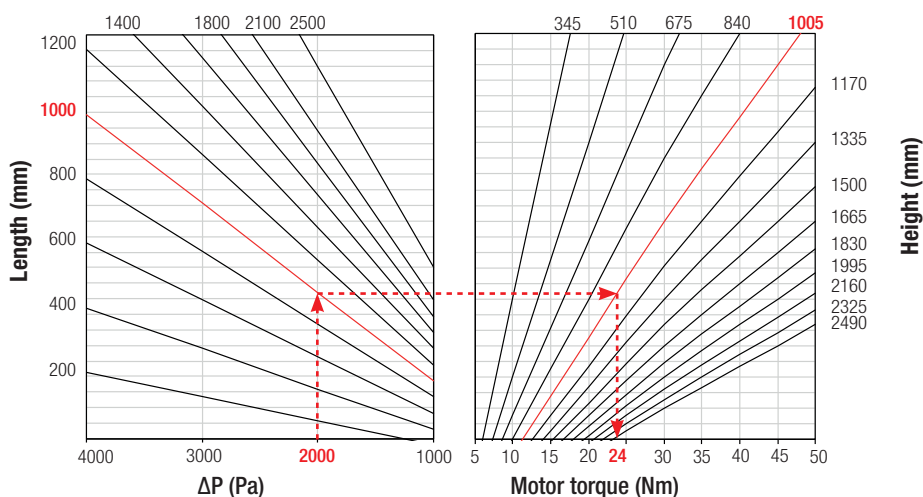
### WEIGHT (kg)

H \ L	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2500
345	24	30	36	42	48	64	70	76	82	88	94	100	103
510	30	37	43	50	57	78	84	91	98	105	111	118	121
840	41	49	57	66	74	105	113	121	130	138	147	155	159
1170	51	61	72	82	92	131	142	152	162	172	182	192	197
1500	62	74	86	97	109	158	170	182	194	206	217	229	235
1830	73	86	100	113	127	185	199	212	226	239	253	266	273
2160	83	99	114	129	144	212	227	242	258	273	288	303	311
2325	89	105	121	137	153	225	241	258	274	290	306	322	330
2490	94	111	128	145	162	239	256	273	290	307	324	341	349

Weights are given for a galvanized steel damper

### MOTOR TORQUES

The motor torques below are given in Nm for an MRO-MKO type volume control damper. For an anti-frost damper (MRG-MKG) or a shut-off damper (MRS-MKS), a coefficient of 1.3 should be applied to the result given.



#### Example:

$\Delta P = 2000 \text{ Pa}$

MRO-MKO damper –  $L = 1000 \text{ mm} \times H = 1005 \text{ mm} \Rightarrow$  motor torque = **24 Nm**

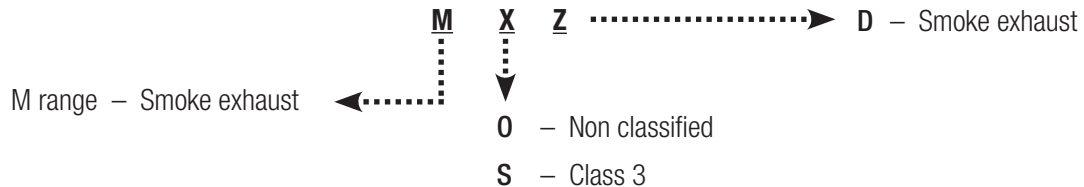
# SMOKE DAMPER

## M RANGE SMOKE EXHAUST - 400°C/2H

Designed to withstand pressures of 3000 Pa, the MOD / MSD damper is particularly suited to smoke exhaust systems in commercial or industrial buildings, car parks and road tunnels.

The MOD / MSD damper has been tested by an independent laboratory and certified at 400°C/2h.

### CODIFICATION



### CONSTRUCTION

	Control	Frame
<b>Manual</b>	Smooth shaft Ø16 Effective length 70 mm Lever and manual locking <i>Option: reinforced locking quadrant</i>	Width: 185 mm Metal sheet thickness: 2.0 mm Galvanised steel <i>Option: stainless steel 304L or 316L, painted steel (RAL standard colour) or aluminium</i>
<b>Motorised</b>	Smooth shaft Ø16 Effective length 120 mm <i>Option: actuator supplied and mounted in factory</i>	Drilling Ø10 mm in corners <i>Option: F2A standard drilling with a pitch of 165 mm (see p.106), special drilling</i> Flanges: 50 mm
	<b>Linkage</b>	<b>Blades</b>
	Opposed blade operation linkage in galvanised steel and zinc-coated steel <i>Option: stainless steel 304L or 316L, parallel blade operation linkage</i>	Galvanised steel <i>Option: stainless steel 304L or 316L</i> Pitch: 165mm

### PERFORMANCE

	Volume Control MOD	Shut-off MSD
Upstream/downstream airtightness	Class 1 (EN 1751)	<b>Class 3</b> (EN 1751)
Frame's airtightness	Class A (EN 1751)	
Acceptable pressure (L=1m)	3 000 Pa	
Operating temperatures	200°C (constant), 400°C/2h	

F2A also manufactures fireproof enclosures dedicated to actuator protection.





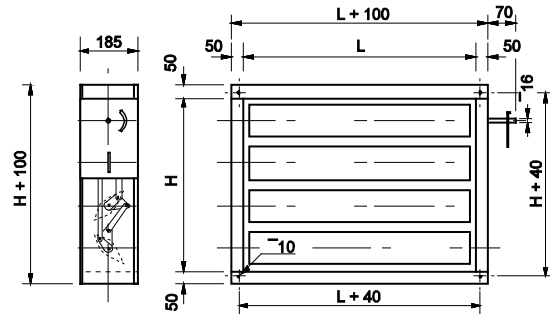
# SMOKE DAMPER

## M RANGE SMOKE EXHAUST - 400°C/2h

### DIMENSIONS

- Height H from 180 to 2490 mm
- Length L from 200 to 2100 mm

Larger sizes with vertical / horizontal coupling of several dampers.



Vertical intermediate stiffener when blade's length is above 1000 mm.

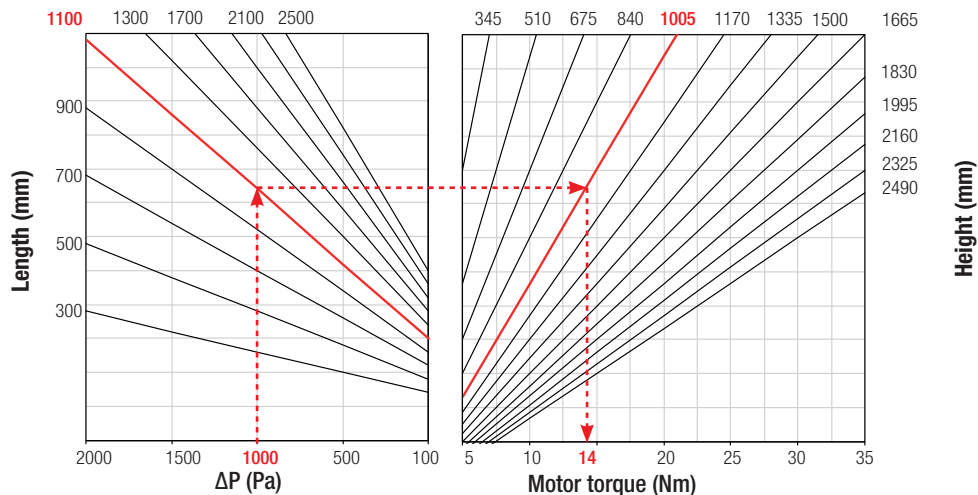
### WEIGHT (kg)

H \ L	200	400	600	800	1000	1200	1400	1600	1800	2000	2100
180	14	18	22	27	31	39	44	48	52	56	58
510	23	30	37	44	51	67	74	80	87	94	98
840	32	42	52	61	71	94	104	114	123	133	138
1170	41	54	66	79	91	122	134	147	159	171	178
1500	51	66	81	96	111	149	165	180	195	210	218
1830	60	78	96	114	132	177	195	213	231	249	258
2160	69	90	111	131	152	205	225	246	267	287	297
2490	79	102	125	149	172	232	256	279	302	326	337

Weights are given for a galvanized steel damper

### MOTOR TORQUES

The motor torques below are given in Nm for a MOD type volume control damper. For a shut-off damper (MSD), a coefficient of 1.3 should be applied to the result given.



#### Example:

$\Delta P = 1000 \text{ Pa}$

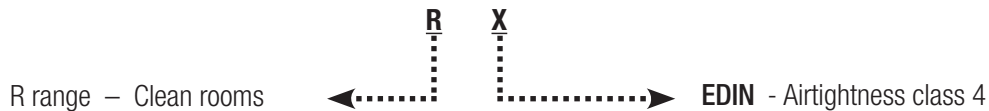
MOD damper -  $L = 1100 \text{ mm} \times H = 1005 \text{ mm} \Rightarrow$  motor torque = **14 Nm**

# AIRTIGHT DAMPER


## R RANGE - REDIN

The REDIN damper is an airtight damper certified as class 4C according to EN1751 standard. It is the ideal solution for the sealing requirements of clean room applications.

### CODIFICATION



### CONSTRUCTION



	Control	Frame
<b>Manual</b>	Smooth shaft Ø16 Effective length 84 mm Lever and manual locking <i>Option: reinforced locking quadrant</i>	Width: 185 mm Metal sheet thickness: 2.0 mm Galvanised steel <i>Option: stainless steel 304L or 316L, painted steel (RAL standard) or aluminium</i>
<b>Motorised</b>	Smooth shaft Ø16 Effective length 125 mm <i>Option: actuator supplied and mounted in factory</i>	Drilling Ø10 mm in corners <i>Option: F2A standard drilling with a pitch of 165 mm (see p.106), special drilling</i>
		Flanges: 36 mm
	<b>Linkage</b>	<b>Blades</b>
	Opposed blade operation linkage in zinc-coated steel <i>Option: stainless steel 304L or 316L</i>	Galvanised steel <i>Option: stainless steel 304L or 316L</i>
		Pitch: 165mm

### PERFORMANCE

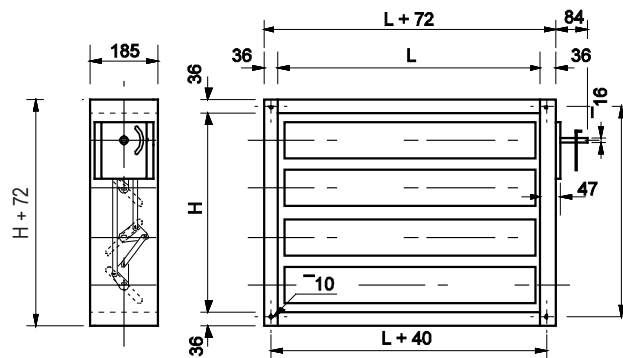
	REDIN
Upstream/downstream airtightness	Class 4 (EN 1751)
Frame's airtightness	Class C (EN 1751)
Acceptable pressure (L=1m)	1 200 Pa
Operating temperatures	-20°C to +80°C <i>Option: - 30°C to + 200°C</i>

# AIRTIGHT DAMPER

## R RANGE - REDIN

### DIMENSIONS

- Height H from 345 to 1500 mm
- Length L from 400 to 1500 mm



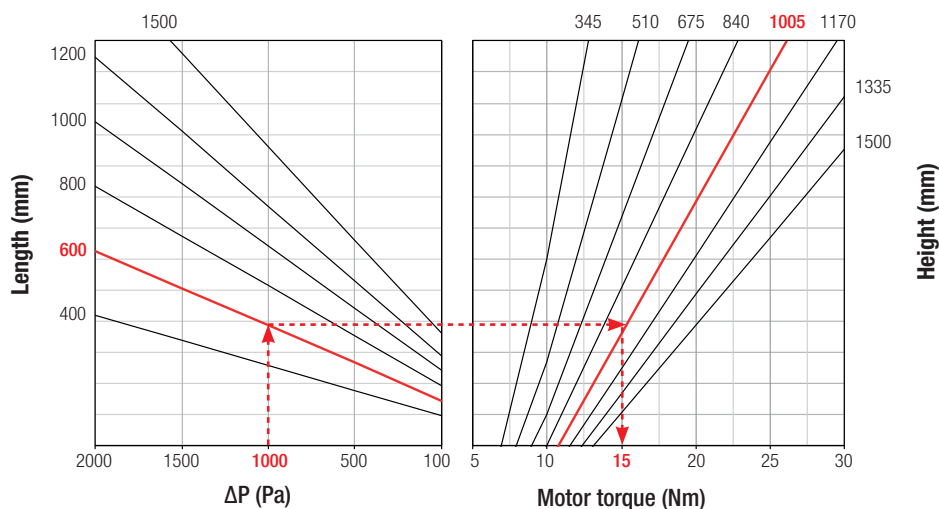
### WEIGHT (kg)

H \ L	400	600	800	1000	1200	1400	1500
345	15	18	22	25	28	31	33
510	19	23	28	32	36	40	42
675	24	29	34	38	43	48	50
840	28	34	40	45	51	56	59
1005	33	39	46	52	58	65	68
1170	37	44	52	59	66	73	76
1335	42	50	58	65	73	81	85
1500	46	55	64	72	81	89	94

Weights are given for a galvanized steel damper

### MOTOR TORQUES

The motor torques below are given in Nm for a REDIN type damper.



#### Example:

$\Delta P = 1000 \text{ Pa}$

REDIN damper –  $L = 600 \text{ mm} \times H = 1005 \text{ mm} \Rightarrow$  motor torque = **15 Nm**

# HIGH AIRTIGHTNESS DAMPER

## R RANGE - RI

The RI damper is an airtight damper certified as class 4C according to EN1751 standard. It is designed to shut off the cross-sections of HVAC ductworks. RI dampers is suitable for clean room applications and biosafety level 4 laboratory.

### CODIFICATION



### CONSTRUCTION

	Control	Frame
<b>Manual</b>	Smooth shaft Ø16 Effective length 84 mm Lever and manual locking <i>Option: reinforced locking quadrant</i>	Width: 185 mm Metal sheet thickness: 2.0 mm Galvanised steel <i>Option: stainless steel 304L or 316L</i>
<b>Motorised</b>	Smooth shaft Ø16 Effective length 125 mm <i>Option: actuator supplied and mounted in factory</i>	Drilling Ø10 mm in corners <i>Option: F2A standard drilling with a pitch of 165 mm (see p.106), special drilling</i>
		Flanges: 36 mm
	<b>Linkage</b>	<b>Blades</b>
	Opposed blade operation linkage in zinc-coated steel <i>Option: stainless steel 304L or 316L</i>	Galvanised steel <i>Option: stainless steel 304L or 316L</i>
		Pitch: 175mm

### PERFORMANCE

	RI
Upstream/downstream airtightness	Class 4 (EN 1751)
Frame's airtightness	Class C (EN 1751)
Acceptable pressure (L=1m)	1 200 Pa
Operating temperatures	-20°C to +80°C <i>Option: - 30°C to + 200°C</i>

# HIGH AIRTIGHTNESS DAMPER

## R RANGE - RI

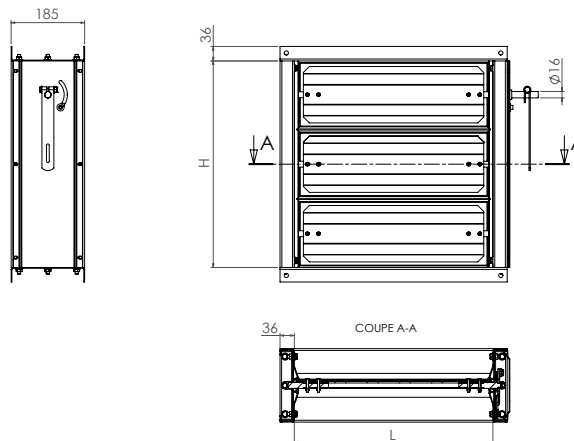
### UPSTREAM / DOWNSTREAM AIRTIGHTNESS

Tests carried out in an independent laboratory according to EN 1751 standard.

Pressure (Pa)	Leakage rate (l.s <sup>-1</sup> .m <sup>-2</sup> )	Class 4 requirements (l.s <sup>-1</sup> .m <sup>-2</sup> )
250	0.47	< 2.7
500	0.71	< 4.0
1000	1.13	< 6.0

### DIMENSIONS

- Height from 180 to 695 mm
- Length from 200 mm to 700 mm



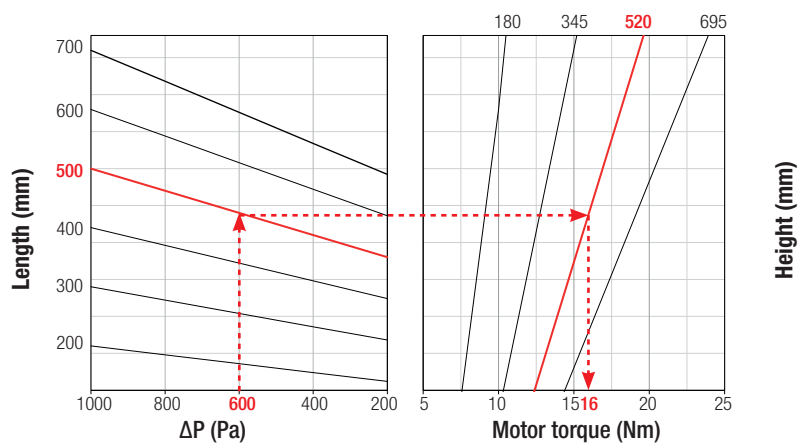
### WEIGHT (kg)

H \ L	200	300	400	500	600	700
180	4	5	7	9	11	13
345	6	8	10	12	14	16
520	9	11	13	15	17	19
695	12	14	16	18	20	22

Weights are given for a galvanized steel damper

### MOTOR TORQUES

The motor torques below are given in Nm for an RI type damper.



#### Example:

$\Delta P = 600$  Pa

RI damper – L = 500 mm x H = 520 mm => motor torque = **16 Nm**

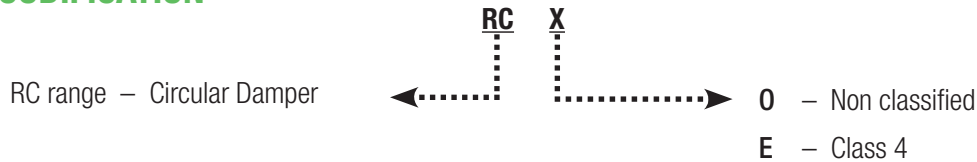
# CIRCULAR DAMPER

## RC RANGE - RCE / RCO

The RCO - RCE circular dampers are installed in the ventilation duct to mechanically regulate the air flow in the HVAC ductwork.

- **RCO**: circular volume control damper
- **RCE**: airtight circular damper. It is particularly suited to ventilation systems in clean rooms (laboratories, operating theatres, electronic applications, etc.)

### CODIFICATION



### CONSTRUCTION

Casing
Galvanised steel Option: stainless steel 304L or 316L



Delivery time  
**72 h**  
ex-works\*

Blade
Galvanised steel Option: stainless steel 304L or 316L

### CONTROLS

Manual control Ø ≤ 315 mm	Manual control Ø > 315 mm	Suitable for actuator control	Motorised control
Adjustment dial Locking screw	Adjustment handle Locking screw	Smooth shaft Ø16 Effective length 110 mm	Actuator determined according to the torque required

### PERFORMANCE

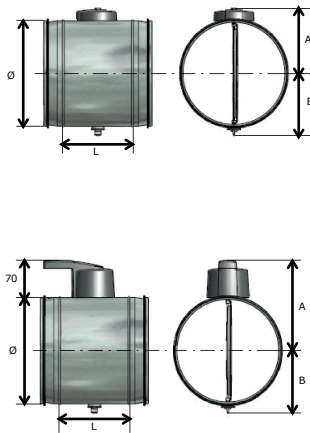
	Volume Control RCO	Shut-off RCE
Upstream/downstream airtightness	Non classified	Class 4 according to EN1751
Frame's airtightness	Class C according to EN1751	Class C according to EN1751
Acceptable pressure	500 Pa	
Operating temperatures	-20°C to +80°C	

\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

# CIRCULAR DAMPER

## RC RANGE - RCE / RCO

### DIMENSIONS AND MOTOR TORQUE

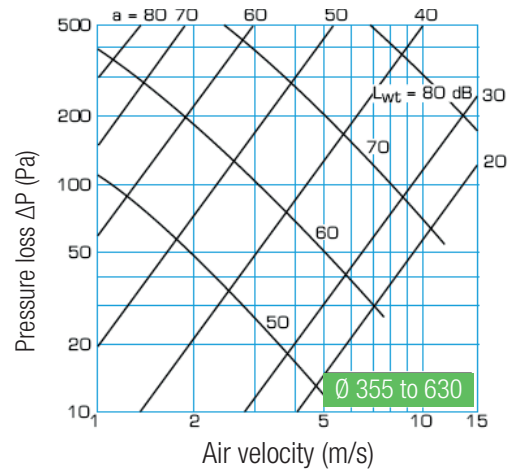
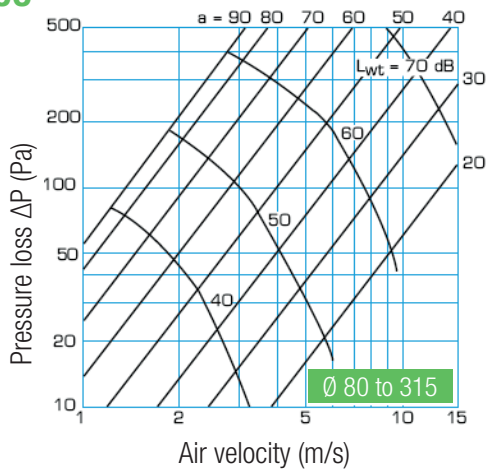


Ø (mm)	L (mm)	A (mm)	B (mm)	Weight (kg)	Torque (Nm)
80	135	65	40	0,30	2
100	135	75	50	0,34	2
125	135	85	65	0,42	2
160	135	105	100	0,46	2
200	135	125	120	0,82	2
250	125	150	145	1,2	2
315	125	180	175	1,5	4
355	160	250	200	2,5	4
400	160	270	220	2,7	5
450	160	295	245	3,3	5
500	160	320	270	3,9	6
630	160	385	335	5,2	10

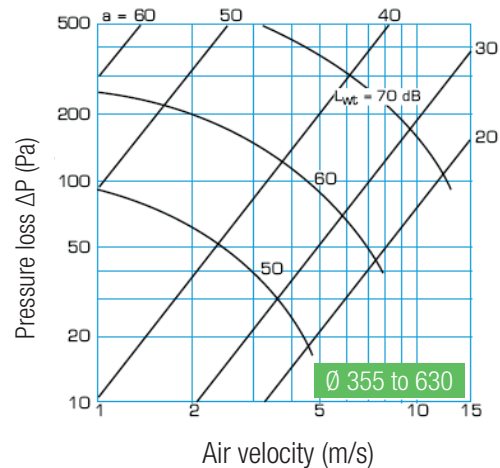
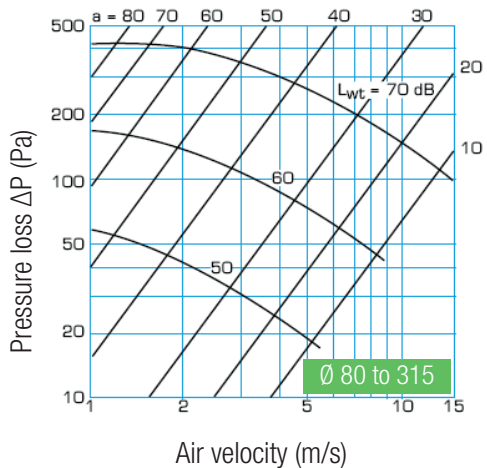
### PRESSURE LOSS

The pressure loss can be read on the graphs below, according to the opening angle, the diameter of the damper and the air velocity (max. speed = 12 m/s).

#### RCO



#### RCE



# IRIS DAMPER

## RC RANGE - RCI

The RCI iris circular damper is specially designed to measure and adjust the air flows in HVAC systems. The upstream/downstream pressure connections are used to accurately determine the air flow. The iris circular damper is equipped with a gasket in order to ensure an airtight connection with the ductworks.

### CODIFICATION



### CONSTRUCTION

Delivery time  
**72 h**  
ex-works\*

Adjustment
Ø100 to 800: manual adjustment of the iris using a spanner
Ø80: adjustment using a side lever



Upstream/downstream PVC pressure connections

Characteristics
Galvanised steel
Rubber seal rings

### PERFORMANCE

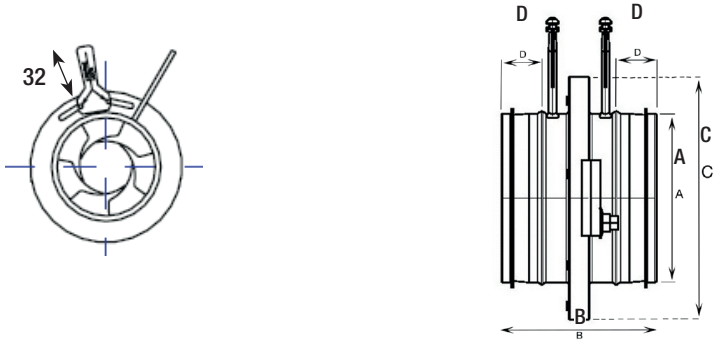
	RCI
Frame's airtightness	Class C (EN1751)
Acceptable pressure (L=1m)	500 Pa
Operating temperatures	-10°C to +80°C

\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

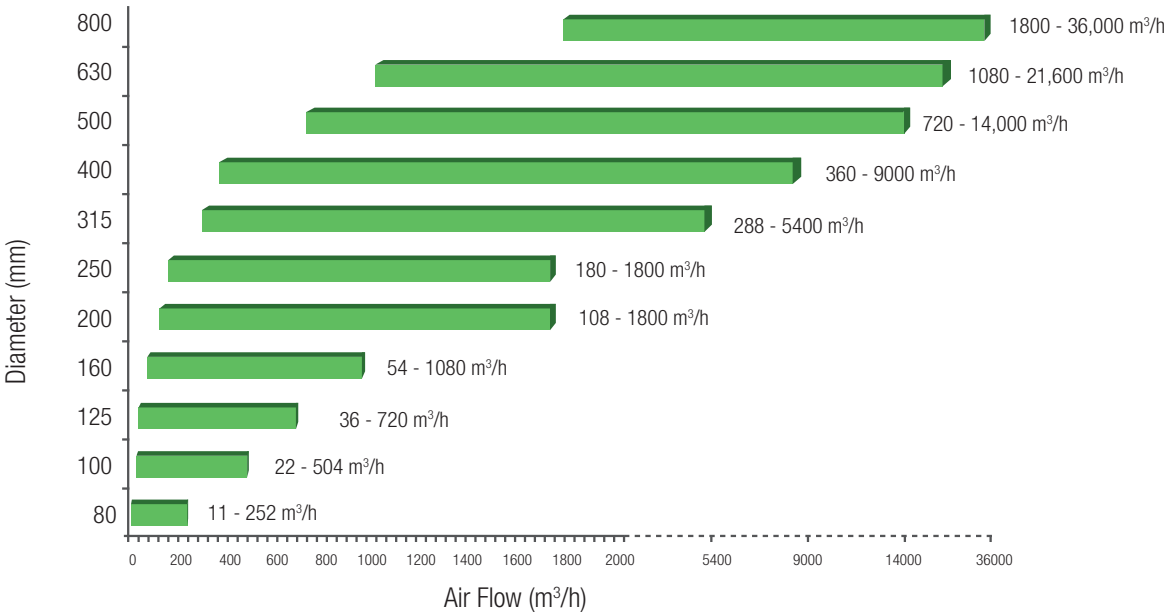


### DIMENSIONS AND WEIGHTS

Model	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)	Air Flow range (m³/h)
Ø80	79	115	125	35	0,5	11 - 252
Ø100	99	115	165	30	0,5	22 - 504
Ø125	124	115	188	30	0,7	36 - 720
Ø160	159	115	230	30	0,9	54 - 1080
Ø200	199	120	285	30	1,4	108 - 1800
Ø250	249	135	335	40	2,1	180 - 1800
Ø315	314	140	405	40	3,5	288 - 5400
Ø400	399	150	525	55	6,4	360 - 9000
Ø500	499	150	655	52	9,6	720 - 14400
Ø630	629	160	815	60	15,6	1080 - 21600
Ø800	799	290	1015	120	25,0	1800 - 36000



### SELECT A DIAMETER ACCORDING TO THE AIR FLOW

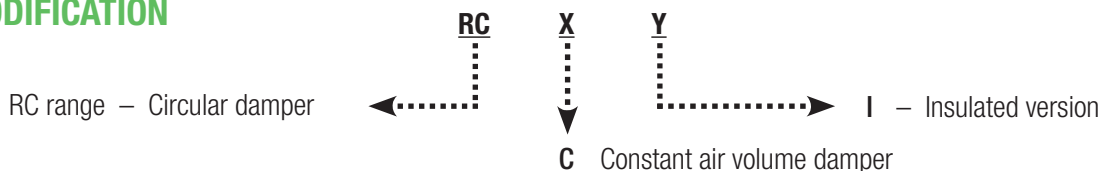


# CONSTANT AIR VOLUME DAMPER

## RC RANGE - RCC

The RCC damper is an air flow regulation system and does not require any auxiliary power supply. It is designed to maintain a constant volume flow rate despite the pressure variations in the installation. It does not require any maintenance and is equipped with gaskets on each end of the connection.

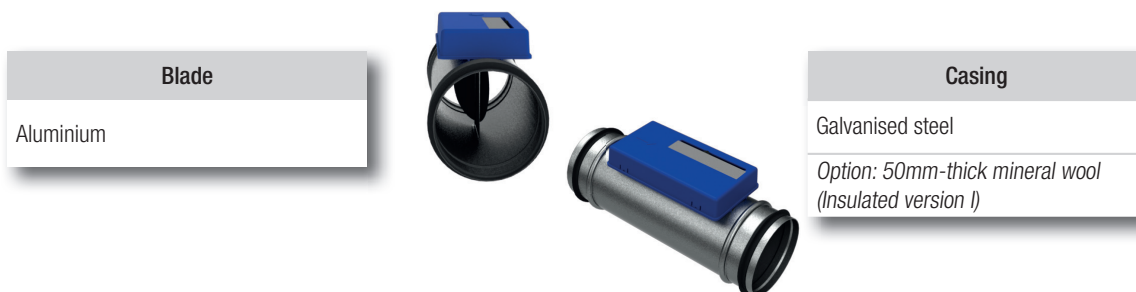
### CODIFICATION



### ADJUSTMENT

The flow is adjusted using a screw on the damper.

### CONSTRUCTION



### PERFORMANCE

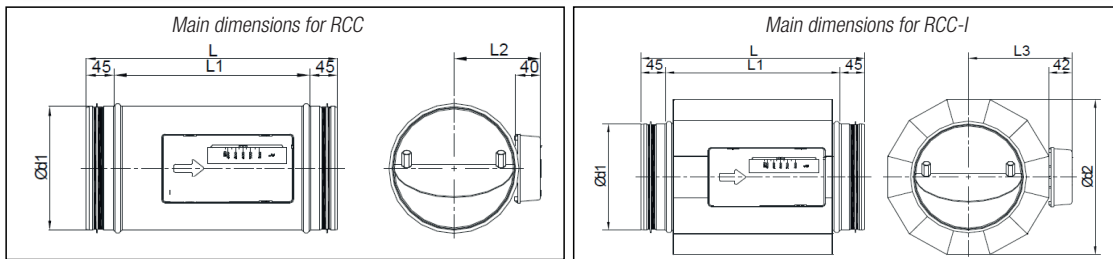
	RCC
Recommended Air Velocity	3 to 8 m/s
Acceptable pressure (L=1m)	50 Pa to 1 000 Pa
Operating temperatures	-20°C to +80°C

# CONSTANT AIR VOLUME DAMPER

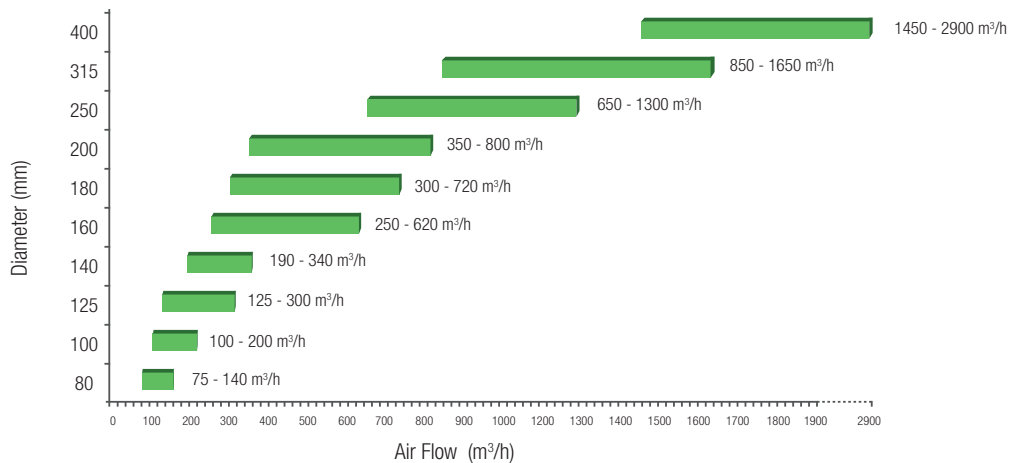
## RC RANGE - RCC

### DIMENSIONS

	Ød1 (mm)	Ød2 (mm) (Version 1)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm) (Version 1)	Air Flow Range (m³/h)
RCC 80	78	170	350	260	76	123	75 - 140
RCC 100	97	190	350	260	86	136	100 - 200
RCC 125	122	215	360	270	100	148	125 - 300
RCC 140	137	230	370	280	107	156	190 - 340
RCC 160	157	250	380	290	117	166	250 - 620
RCC 180	177	270	390	300	128	176	300 - 720
RCC 200	197	290	400	310	138	186	350 - 800
RCC 250	247	340	425	355	164	208	650 - 1300
RCC 315	312	405	500	410	196	243	850 - 1650
RCC 400	397	490	500	410	239	286	1450 - 2900

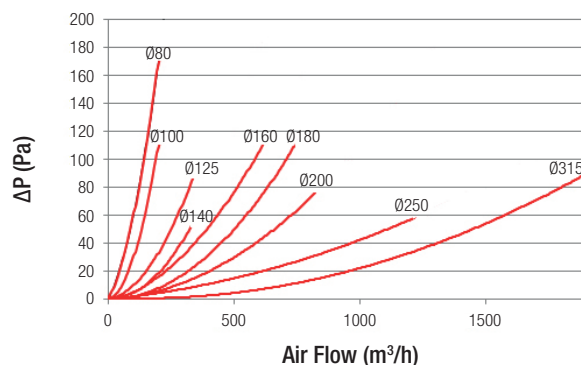


### SELECT A DIAMETER ACCORDING TO THE AIR FLOW



### PRESSURE LOSS

The pressure loss can be read on the graphs below according to the diameter of the damper and the air flow (m³/h).

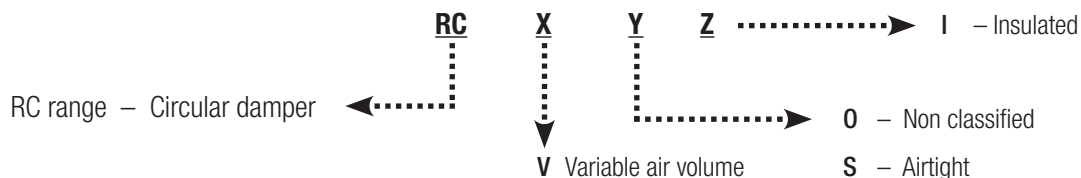


# VARIABLE AIR VOLUME DAMPER

## RC RANGE - RCV

The RCV damper is an auto-regulated variable air flow system (VAV type). It is designed to regulate the air flow in an area of a building in line with a specific setpoint. It is equipped with separate pressure connections for control or maintenance purposes. The RCV damper is also available as an insulated version (thermal insulation).

### CODIFICATION



### CONSTRUCTION

Blades
Galvanised steel



Casing
Galvanised steel Option: painted steel (RAL standard), stainless steel 316L In option: mineral wool, thickness 50 mm (Insulated version I)

### PERFORMANCE

	RCV	
	Volume Control RCVO	Shut-off RCVS
Upstream/downstream airtightness	Non classified	Class 3 (EN 1751)
Airtightness of the casing	Class B (EN1751)	
Acceptable pressure (L=1m)	500 Pa	
Operating temperatures	-20°C to +80°C	
Control signal	Signal 0 - 10V (non-communicating) via actuator Option: MP BUS or LON	
Option	Provision of a remote control to modify the regulation range on site Circular silencer to be installed downstream of the damper: CONFORT or OPTIMUM range	

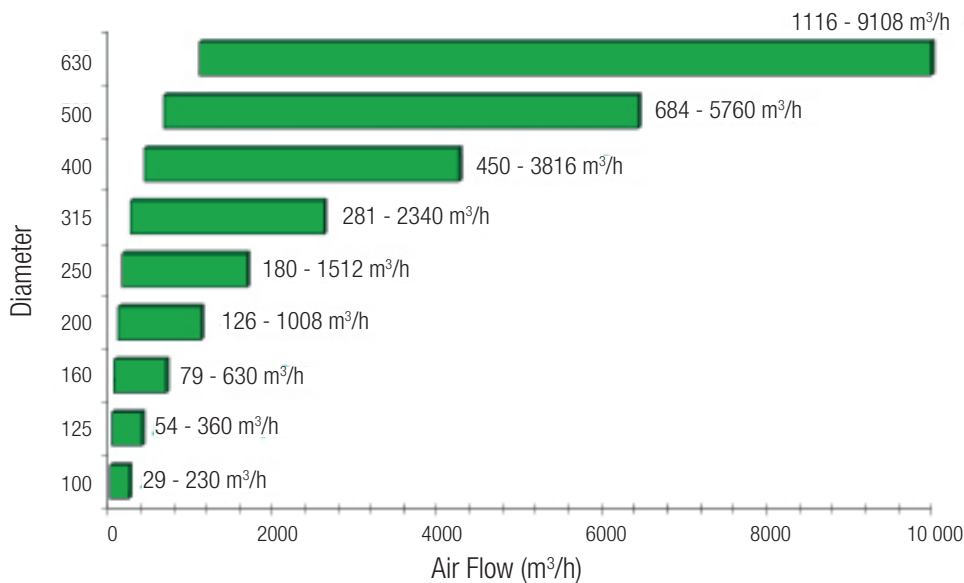
# VARIABLE AIR VOLUME DAMPER

## RC RANGE - RCV

### DIMENSIONS AND WEIGHTS

	Ø (mm)	L (mm)	Weight (kg)	Air Flow range (m <sup>3</sup> /h)
RCV 100	99	400	1,4	29 - 230
RCV 125	124	400	1,7	54 - 360
RCV 160	159	400	2,2	79 - 630
RCV 200	199	400	2,7	126 - 1008
RCV 250	249	580	4,1	180 - 1512
RCV 315	314	580	5,4	281 - 2340
RCV 400	399	650	9,3	450 - 3816
RCV 500	499	850	14,2	684 - 5760
RCV 630	629	850	19,5	1116 - 9108

### SELECT A DIAMETER ACCORDING TO THE FLOW RATE



### ACTUATION

The actuators are installed in the factory and adjusted according to the range of required air flow.

Model	Actuator reference	Torque (Nm)
RCV 100	LMV-D3	5
RCV 125	LMV-D3	5
RCV 160	LMV-D3	5
RCV 200	LMV-D3	5
RCV 250	LMV-D3	5
RCV 315	LMV-D3	5
RCV 400	LMV-D3	5
RCV 500	NMV-D3	10
RCV 630	NMV-D3	10

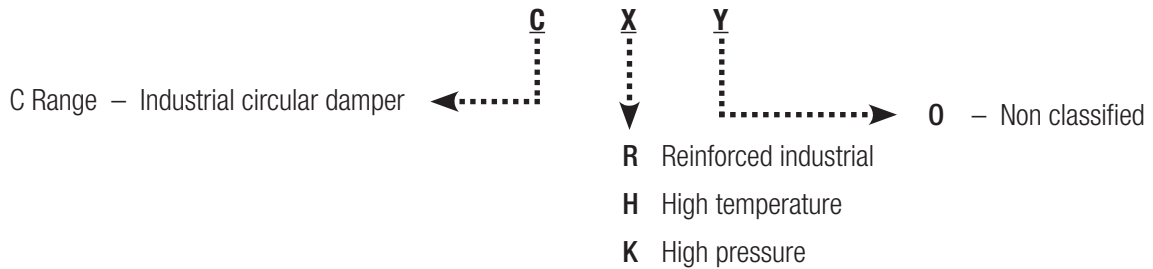
# INDUSTRIAL CIRCULAR DAMPER

## C RANGE - CRO / CKO / CHO




Circular dampers CRO - CKO - CHO are used to mechanically adjust the air flow rate in the ventilation systems.

C range dampers are designed to withstand the specific constraints encountered in industrial applications: high temperatures, high pressures, high air velocity, etc.

### CODIFICATION



### CONSTRUCTION

	Control		Casing
<b>Manual</b>	Smooth shaft Ø20 Lever and reinforced locking quadrant		Black metal sheet <i>Option: galvanisation, stainless steel 321, 304L or 316L, passivation, paint</i>
<b>Motorised</b>	Smooth shaft Ø20 Adaptation depending on actuation (Electric actuator or pneumatic cylinder) <i>Option: actuator supplied and mounted in factory</i>		Metal sheet thickness: 3.0 mm  Drilling: Eurovent standard (see p. 109) <i>Option : ISO 13351 (see p.109), special drilling available on request</i>  Flanges: see p.109
			<b>Blades</b> Galvanised steel <i>Option: stainless steel 304L, 316L, 321 or 309 painted steel (RAL standard colour)</i>  Thickness from 3.0 to 5.0 mm <i>Option: reinforcement from Ø500</i>

### PERFORMANCE

	Reinforced industrial CRO	High pressure CKO	High temperature CHO
Upstream/downstream airtightness	Non classified		
Frame's airtightness	Non classified		
Acceptable pressure	2 000 Pa	6 000 Pa	
Operating temperatures	-20°C to +200°C	-20°C to +300°C	-20°C to +600°C
Acceptable velocity	20 m/s	25 m/s	

# INDUSTRIAL CIRCULAR DAMPER

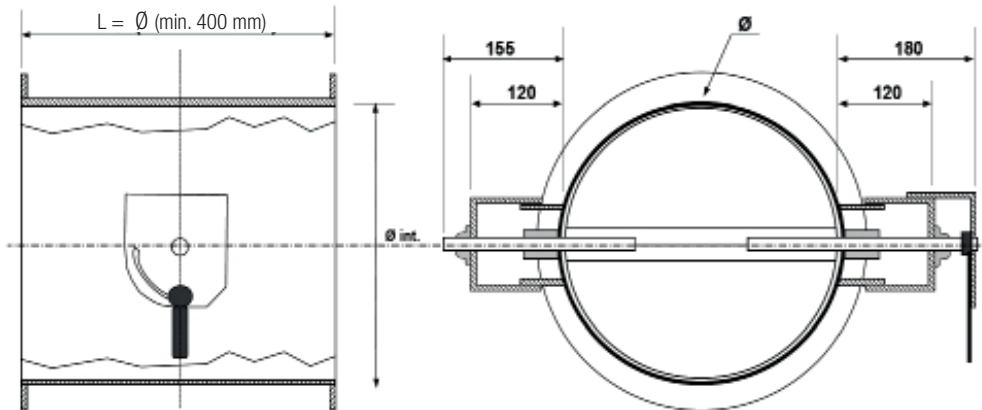
## C RANGE - CRO / CKO / CHO

### DIMENSIONS

Dimensions given for a manually controlled CRO circular damper.

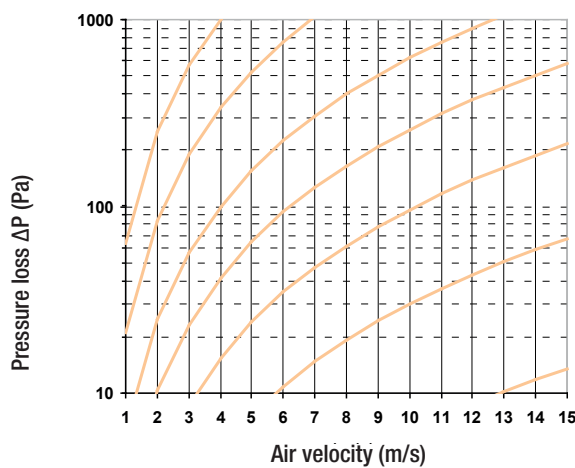
Nominal Ø	250	300	315	355	400	450	500	560	630	710	800	900	1000	1120	1250
Length (L)	400	400	400	400	400	450	500	560	630	710	800	900	1000	1120	1250

Other dimensions available on request. Consult us.



### PRESSURE LOSS

The pressure loss can be read on the graphs below, according to the opening angle and air flow velocity.



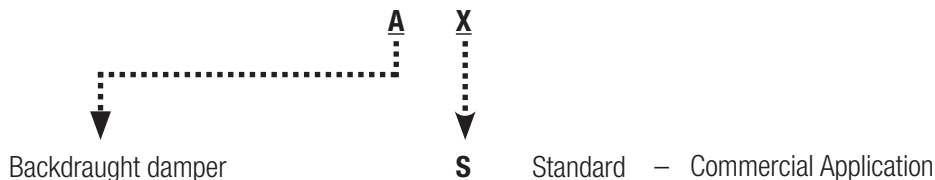
0° = damper open

# BACKDRAUGHT DAMPER

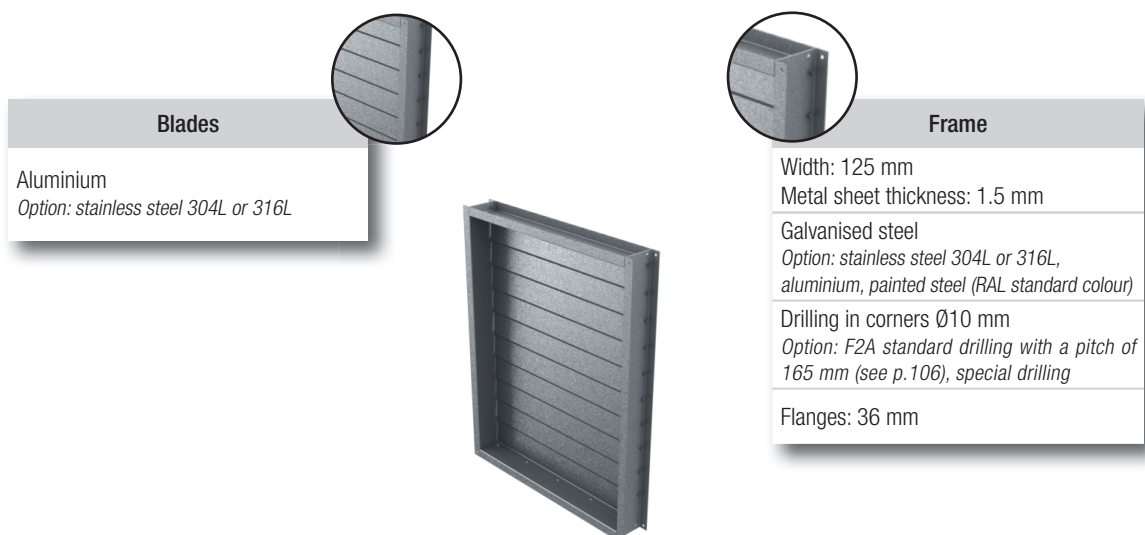
## A RANGE - AS

The AS backdraught damper is designed for a one-way air flow direction. The blades prevent reverse flow in the HVAC ductworks. It is suitable for commercial applications.

### CODIFICATION



### CONSTRUCTION



### PERFORMANCE

	AS
Upstream/downstream airtightness	Non classified
Frame's airtightness	Non classified
Acceptable pressure (L=1m)	150 Pa
Operating temperatures	- 20°C to + 80°C
Operating velocity	2 to 5 m/s
Miscellaneous	Assembly with louvre Can be adapted for horizontal mounting (vertical air flow)



# BACKDRAUGHT DAMPER

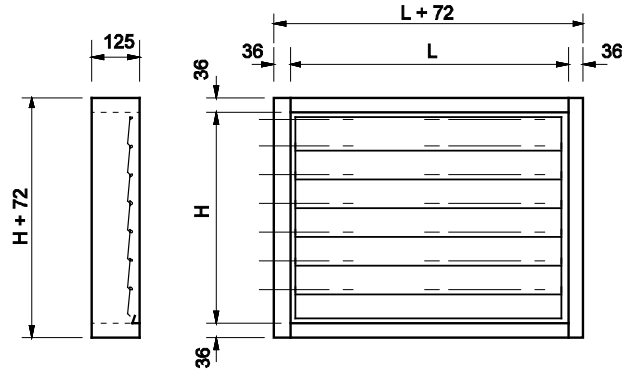
## A RANGE - AS

### DIMENSIONS

- Height from 180 to 1995 mm
- Length from 200 to 2000 mm

Options:

- Special dimensions available on request
- Circular transformations up to  $\varnothing$  1250



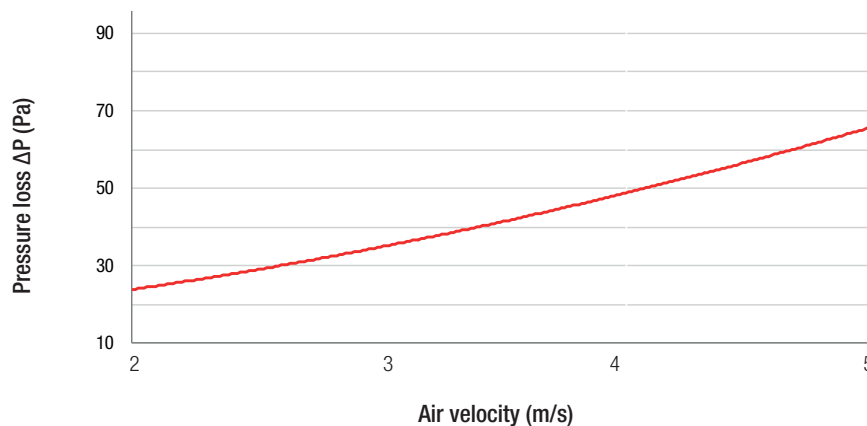
### WEIGHT (kg)

H \ L	200	500	1000	1500	2000
180	3	5	8	11	13
345	5	7	10	14	17
510	7	9	13	17	21
675	8	11	15	21	25
840	10	13	18	24	29
1005	12	15	20	28	33
1170	13	17	23	31	37
1335	15	19	25	34	41
1500	17	21	28	38	45
1665	18	23	30	41	49
1830	20	25	33	45	52
1995	22	27	35	48	56

Weights are given for a galvanized steel damper

### PRESSURE LOSS

The pressure loss can be read below, according to the face velocity.



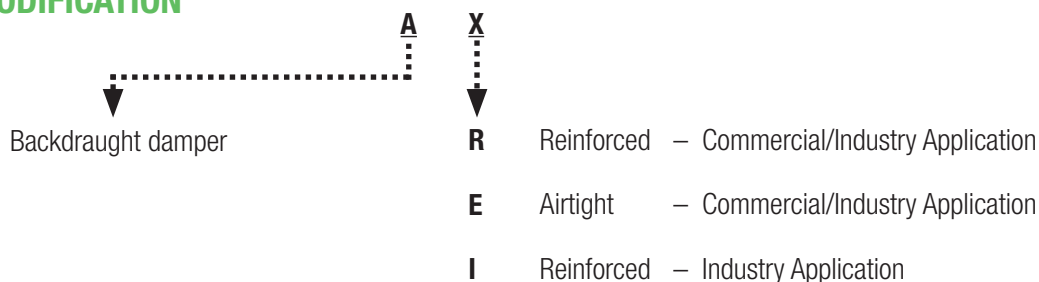
# BACKDRAUGHT DAMPER

## A RANGE - AR / AE

The AR - AE backdraught dampers allow air to flow in one direction only. The blades prevent movement in the opposite direction.

- **AR**: reinforced backdraught damper to withstand pressure up to 1 000 Pa,
- **AE**: reinforced and airtight backdraught damper equipped with gaskets on the blades.

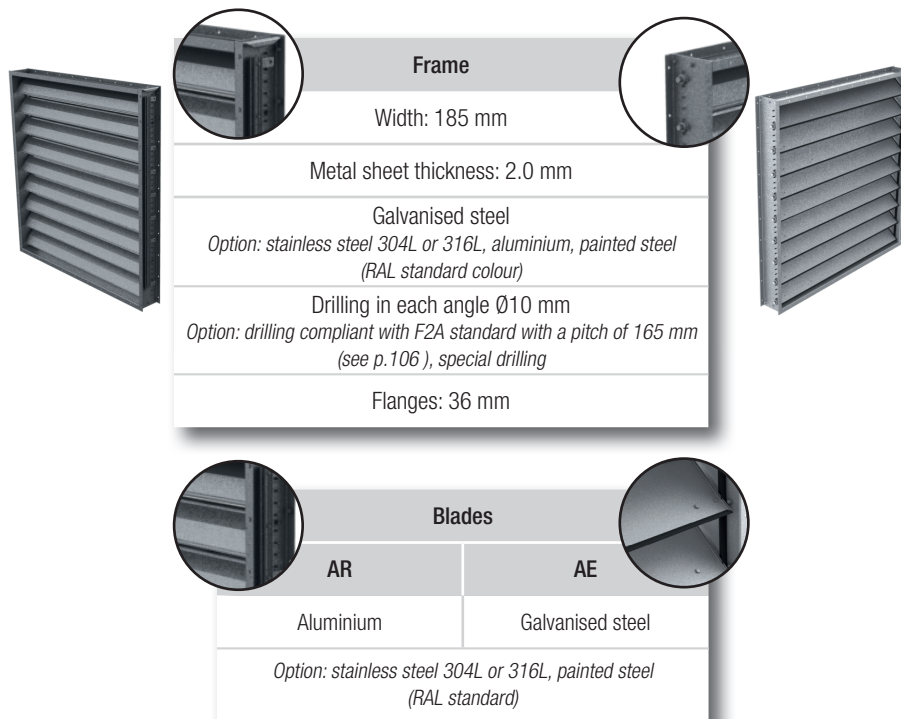
### CODIFICATION



### CONSTRUCTION

#### • AR backdraught damper

#### • AE backdraught damper



### PERFORMANCE

	Backdraught Damper AR	Backdraught Damper AE
Upstream/downstream airtightness	Non classified	Class 3 (EN 1751) with a back pressure of 900 Pa
Frame's airtightness	Non classified <i>Option: Class C (EN 1751)</i>	
Acceptable pressure (L=1m)	1 000 Pa	1 800 Pa*
Operating temperatures	-20 to +80°C <i>Option: -30°C to + 200°C</i>	
Operating velocity	5 to 15 m/s*	
Option	<i>Option: possibility of fitting the backdraught damper horizontally (for a rising vertical air flow)</i>	

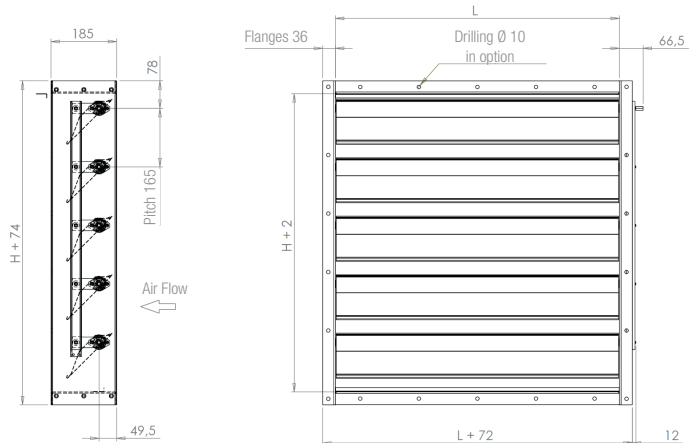
\* Available in reinforced AI version which withstands up to 5000 Pa, and allows air velocity ranging from 8 to 20 m/s.

# BACKDRAUGHT DAMPER

## HIGH PRESSURE - AR/AE

### DIMENSIONS

- Height H from 180 to 1500 mm
- Length L from 200 to 1500 mm



### WEIGHT (kg)

The weights are given for a galvanised steel AR backdraught damper.

A coefficient of **1.3** must be applied to obtain the weights for an **AE** backdraught damper.

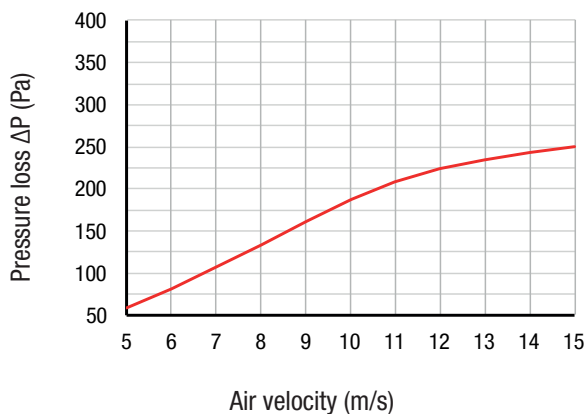
A coefficient of **1.8** must be applied to obtain the weights for an **AI** backdraught damper.

H \ L	200	400	600	800	1000	1200	1400	1500
180	7	9	11	13	16	18	20	21
510	13	16	19	22	25	28	31	33
675	16	19	23	26	29	33	36	38
840	18	22	26	30	34	38	42	44
1170	24	29	34	38	43	48	53	55
1500	30	35	41	47	52	58	63	66

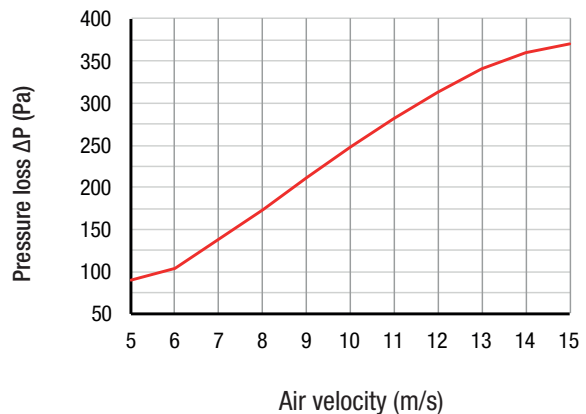
### PRESSURE LOSS

The pressure loss can be read on the graphs below, according to the face velocity.

AR Backdraught damper



AE Backdraught damper

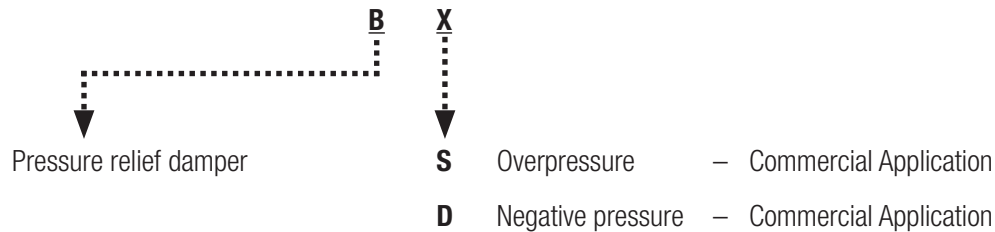


# PRESSURE RELIEF DAMPER

## B RANGE

Pressure relief dampers BS and BD are used to maintain a slight negative pressure or overpressure in a room. They are suitable for wall mounting. Pressure relief dampers BS and BD are manufactured with a frame width of 95 mm.

### CODIFICATION



### CONSTRUCTION

**Blades**

Aluminium  
Option: stainless steel 304L or 316L

**Frame**

Width: 95 mm  
Metal sheet thickness: 1.5 mm

Galvanised steel  
Option: stainless steel 304L or 316L, aluminium, painted steel (RAL standard colour)

Undrilled  
Option: drilling compliant with F2A standard with a pitch of 330 mm (see p.107), special drilling

Flanges: 50 mm

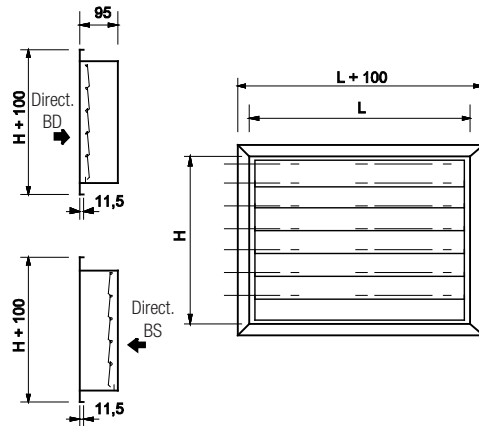
### PERFORMANCE

	BS - BD
Acceptable pressure (L=1m)	150 Pa
Operating temperatures	- 20°C to + 80°C Option: +120°C
Acceptable velocity	5 m/s maximum
Miscellaneous	Option: sub-frame

# PRESSURE RELIEF DAMPER B RANGE

## DIMENSIONS

- Height H from 180 to 1995 mm
- Length L from 200 to 2000 mm

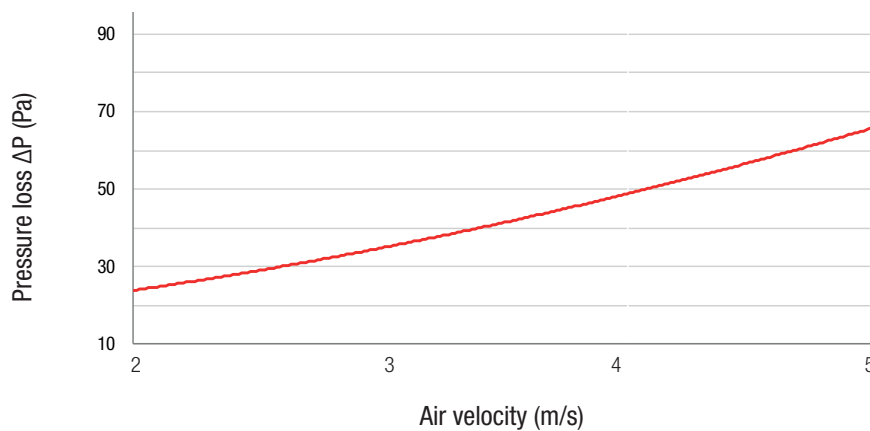


## WEIGHT (kg)

H \ L	200	400	600	800	1000	1200	1400	1600	1800	2000
180	4	6	7	8	10	12	14	15	17	18
510	7	9	11	13	15	20	22	24	26	28
840	10	13	15	18	21	28	30	33	35	38
1170	13	16	20	23	26	35	39	42	45	48
1500	16	20	24	28	31	43	47	51	54	58
1830	19	24	28	32	37	51	55	59	64	68
1995	21	26	30	35	39	54	59	64	68	73

## PRESSURE LOSS

The pressure loss can be read below, according to the face velocity.

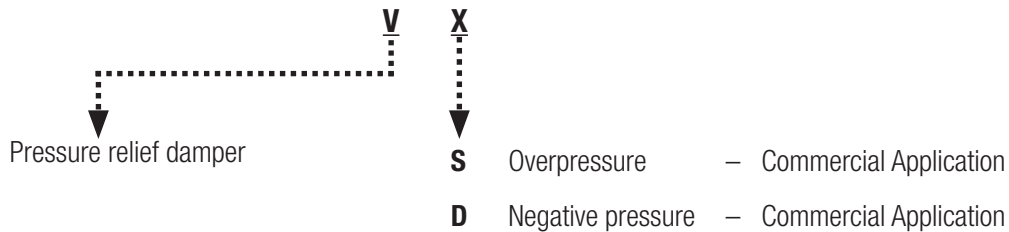


# PRESSURE RELIEF DAMPER

## V RANGE

Pressure relief dampers VS and VD are used to maintain a slight negative pressure or overpressure in a room. They are suitable for wall mounting. Pressure relief dampers VS and VD are manufactured with a frame width of 41 mm.

### CODIFICATION



### CONSTRUCTION

Blades	Frame
Aluminium <i>Option: stainless steel 304L or 316L, painted steel (RAL standard colour)</i>	Width: 41 mm Metal sheet thickness: 1.0 mm
	Galvanised steel <i>Option: stainless steel 304L or 316L, aluminium, painted steel (RAL standard colour)</i>
	Undrilled <i>Option: special drilling</i>
	Flanges: 40 mm

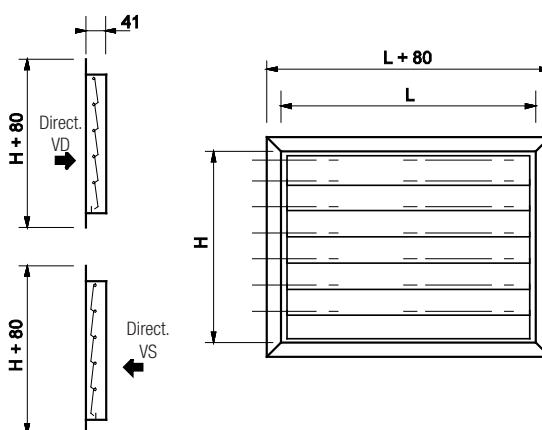
### PERFORMANCE

	VS - VD
Acceptable pressure	400 Pa (L= 300 mm) 150 Pa (L=1 000 mm)
Operating temperatures	- 20°C to + 80°C
Acceptable velocity	5 m/s maximum

# PRESSURE RELIEF DAMPER V RANGE

## DIMENSIONS

- Height H from 200 to 1000 mm
- Length L from 200 to 1000 mm

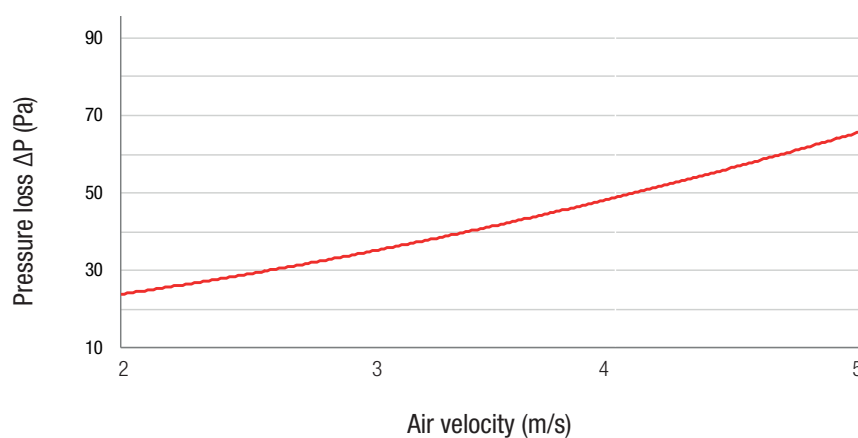


## WEIGHT (kg)

H \ L	100	200	300	400	500	600	700	800	900	1000
100	3	3	4	4	5	6	6	7	7	8
300	4	5	6	6	7	8	9	9	10	11
500	5	6	7	8	9	10	11	12	13	14
600	6	7	8	9	10	11	12	13	14	15
800	8	9	10	11	12	14	15	16	17	18
900	8	10	11	12	13	15	16	17	19	20
1000	9	10	12	13	14	16	17	19	20	21

## PRESSURE LOSS

The pressure loss can be read below, according to the face velocity.



# WEATHER LOUVRE

## G RANGE - GN

The GN external louvre can be used for air intake or air exhaust. It is suitable for external wall mounting and is dedicated to HVAC commercial applications.

### CODIFICATION



### CONSTRUCTION

Blades	Frame
Galvanised steel <i>Option: painted steel (RAL standard)</i>	Width: 95 mm Metal sheet thickness: 1.5 mm
Pitch: about 80 mm	Galvanised steel <i>Option: painted steel (RAL standard)</i>
Anti-bird mesh: galvanised steel	Undrilled <i>Option: F2A standard drilling (see p.108)</i>
	Flanges: 47.5 mm

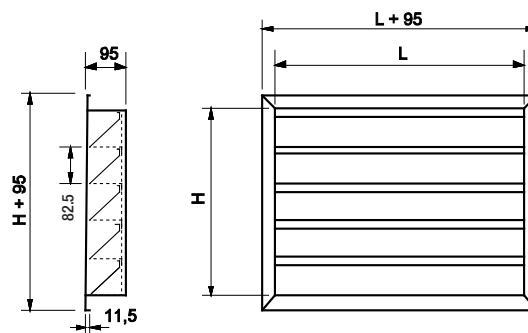
### PERFORMANCE

	GN
Recommended velocity	Air exhaust: up to 5 m/s Air intake: up to 2.5 m/s
Dimensions of wall opening	(L + 15 mm) x (H + 15 mm)
Miscellaneous	Sub-frame to be sealed, assembled with damper or backdraught damper, assembled with acoustic silencer

### DIMENSIONS

- Height H from 400 to 2500 mm
- Length L from 395 to 2495 mm

*Option: larger dimensions*  
For a section larger than 4m<sup>2</sup>, the louvre is manufactured in several modules





### WEIGHT (kg)

H \ L	395	595	795	995	1195	1395	1595	1795	1995
400	7	9	11	14	16	18	20	23	25
600	9	11	14	17	20	23	26	29	32
1000	12	16	20	25	28	33	37	42	46
1400	16	20	25	32	37	44	48	55	60
1800	19	25	31	39	45	54	60	68	74
2000	21	27	34	43	50	59	65	75	81

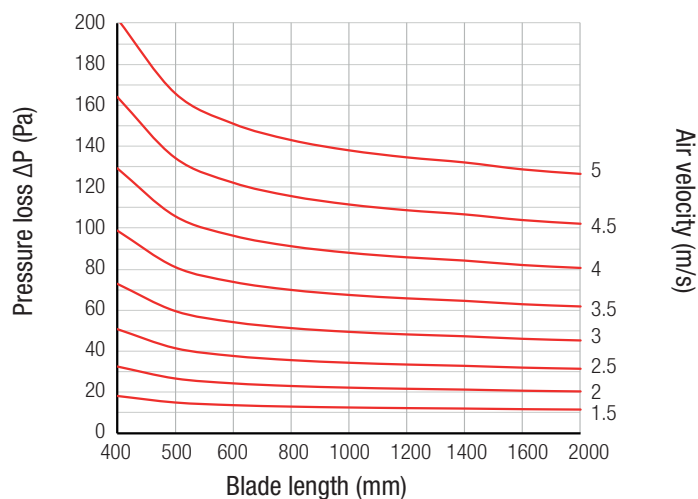
### SELECTION

Airflow (m<sup>3</sup>/h) and free area velocity between the blades (m/s) for a face velocity of 2.5 m/s:

H \ L	395		595		795		995		1195		1395		1595		1795		1995	
400	1422	6	2142	6	2862	6	3582	6	4302	6	5022	6	5742	6	6462	6	7182	6
600	2133	4.5	3213	4.5	4293	4.5	5373	4.5	6453	4.5	7533	4.5	8613	4.5	9693	4.5	10773	4.5
800	2844	3.6	4284	3.6	5724	3.6	7164	3.6	8604	3.6	10044	3.6	11484	3.6	12924	3.6	14364	3.6
1000	3555	3.5	5355	3.5	7155	3.5	8955	3.5	10755	3.5	12555	3.5	14355	3.5	16155	3.5	17955	3.5
1200	4266	3.6	6426	3.6	8586	3.6	10746	3.6	12906	3.6	15066	3.6	17226	3.6	19386	3.6	21546	3.6
1400	4977	3.7	7497	3.7	10017	3.7	11277	3.7	15057	3.7	17577	3.7	20097	3.7	22617	3.7	25137	3.7
1600	5688	3.6	8568	3.6	11448	3.6	14328	3.6	17208	3.6	20088	3.6	22968	3.6	25848	3.6	28728	3.6
1800	6399	3.7	9639	3.7	12879	3.7	16119	3.7	19359	3.7	22599	3.7	25839	3.7	29079	3.7	32319	3.7
2000	7110	3.6	10710	3.6	14310	3.6	17910	3.6	21510	3.6	25110	3.6	28710	3.6	32310	3.6	35910	3.6

### PRESSURE LOSS

The pressure loss can be read below, according to the face velocity.

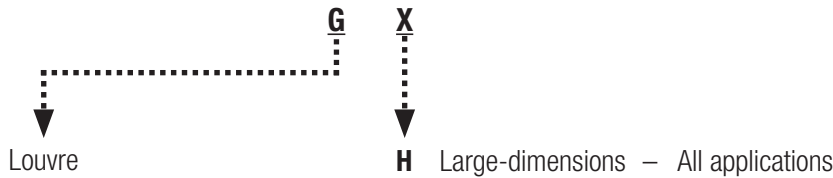


# WEATHER LOUVRE

## G RANGE - GH

The GH weather louvre can be used for air intake or air exhaust. It is suitable for external wall mounting and is dedicated to HVAC commercial applications.

### CODIFICATION



### CONSTRUCTION

Blades	Frame
Galvanised steel <i>Option: painted steel (RAL standard colour), stainless steel 304L or 316L</i>	Width: 95 mm Metal sheet thickness: 1.5 mm
Pitch: 82.5 mm	Galvanised steel <i>Option: stainless steel 304L or 316L, raw aluminium or painted steel (RAL standard colour)</i>
Anti-bird mesh: galvanised steel <i>Option: without Anti-bird mesh</i>	Undrilled <i>Option: F2A standard drilling (see p.108)</i> Special drilling
	Flanges: 47.5 mm

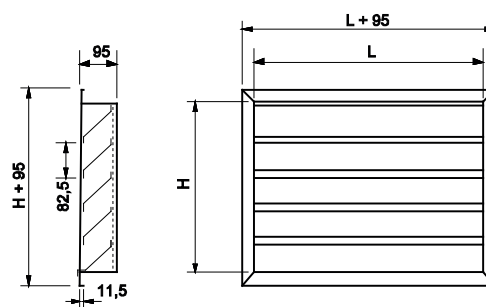
### PERFORMANCE

	GH
Recommended velocity	Air exhaust: up to 5 m/s Air intake: up to 2.5 m/s
Dimension of wall opening	(L + 15 mm) x (H + 15 mm)
Miscellaneous	Sub-frame to be sealed, assembled with damper or backdraught damper, assembled with acoustic silencer

### DIMENSIONS

- Height H from 340 to 1990 mm
- Length L from 395 to 1995 mm
- H x L section limited to 4 m<sup>2</sup>

*Option: larger dimensions*  
 For a section larger than 4m<sup>2</sup>, the louvre is manufactured in several modules



### WEIGHT (kg)

H \ L	395	595	695	895	1095	1295	1495	1695	1995
400	8	10	11	13	15	17	19	21	23
600	9	12	14	16	18	21	23	26	28
1000	13	16	19	22	25	29	32	36	39
1200	15	18	22	25	28	33	36	41	44
1600	19	23	28	33	37	43	47	53	57
1800	28	36	45	53	61	71	79	90	97
1990	31	39	50	58	66	78	86	98	106

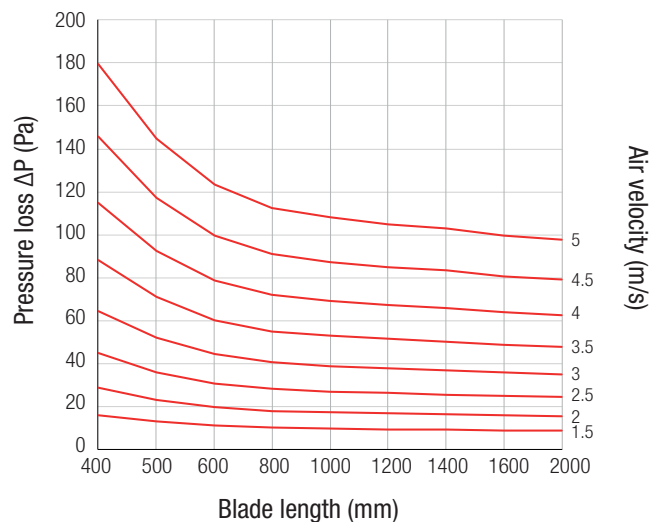
### SELECTION

Airflow (m<sup>3</sup>/h) and free area velocity between the blades (m/s) for a face velocity of 2.5 m/s:

H \ L	395		595		695		895		1095		1295		1495		1695		1995	
400	683	5.2	1028	5.2	1201	5.2	1547	5.2	1892	5.2	2238	5.2	2583	5.2	2929	5.2	3447	5.2
600	1024	5.2	1542	5.2	1801	5.2	2320	5.2	2838	5.2	3357	5.2	3875	5.2	4393	5.2	5171	5.2
800	1706	5.2	2570	5.2	3002	5.2	3866	5.2	4730	5.2	5594	5.2	6458	5.2	7322	5.2	8618	5.2
1000	2133	4.2	3213	4.2	3753	4.2	4833	4.2	5913	4.2	6993	4.2	8073	4.2	9153	4.2	10679	4.2
1200	2560	4.2	3856	4.2	4504	4.2	5800	4.2	7096	4.2	8392	4.2	9688	4.2	10984	4.2	12582	4.2
1400	2985	4.2	4498	4.2	5254	4.2	6766	4.2	8278	4.2	9790	4.2	11302	4.2	12814	4.2	14596	4.2
1600	3413	4.2	5141	4.2	6005	4.2	8022	4.2	10038	4.2	12054	4.2	14070	3.6	16086	3.6	18102	3.6
1800	3840	4.2	5783	4.2	6755	4.2	9019	4.2	11283	4.2	13547	4.2	15811	3.6	18075	3.6	20339	3.6
1990	4952	4.2	7460	4.2	8713	4.2	11221	4.2	13728	4.2	16235	4.2	18743	3.6	21250	3.6	24011	3.6

### PRESSURE LOSS

The pressure loss can be read below, according to the face velocity.

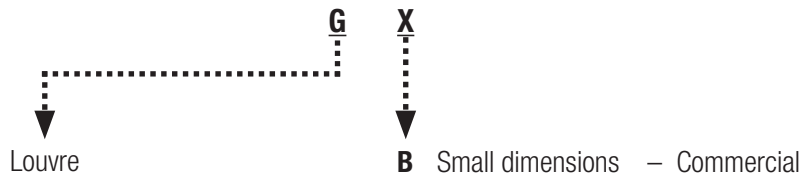


# WEATHER LOUVRE

## G RANGE - GB

The GB weather louvre can be used for air intake or air exhaust. It is suitable for external wall mounting and is dedicated to HVAC commercial applications.

### CODIFICATION



### CONSTRUCTION

**Blades**

- Galvanised steel
- Anti-bird mesh: galvanised steel
- Option: without anti-bird mesh

**Frame**

- Width: 60 mm
- Metal sheet thickness: 1.0 mm
- Galvanised steel
- F2A standard drilling (see p.109)
- Option: Undrilled
- Flanges: 32.5 mm

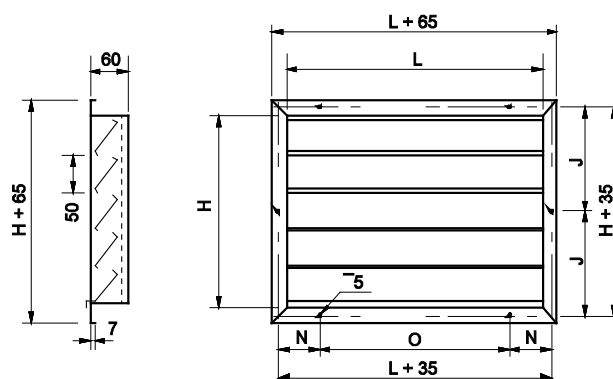
Delivery time  
**48 h**  
ex-works\*

### PERFORMANCE

	GB
Recommended velocity	Air exhaust: up to 5 m/s Air intake: up to 2.5 m/s

### DIMENSIONS

- Height H from 185 to 985 mm with a pitch of 100 mm
- Length L from 185 to 985 mm with a pitch of 100 mm



\* Delivery time from receipt of order confirmation, according to quantities & dimensions; consult us.

### WEIGHT (kg)

H \ L	185	285	385	485	585	685	785	885	985
200	2	3	4	4	5	6	6	6	7
600	5	6	7	9	11	12	14	16	17
1000	7	9	12	15	17	19	22	24	27

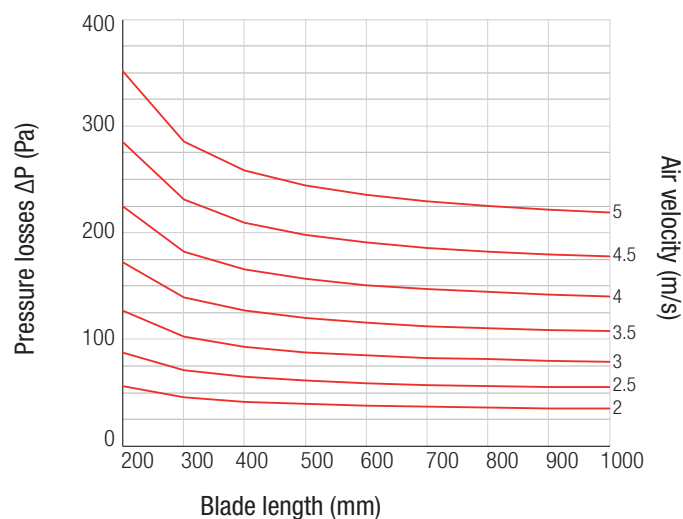
### SELECTION

The air flows (m<sup>3</sup>/h) in the table below are given for a **face velocity of 2.5**

H \ L	185	285	385	485	585	685	785	885	985
185	150	245	340	435	530	625	723	818	913
285	248	408	568	725	885	1043	1203	1363	1520
385	348	570	793	1015	1238	1460	1685	1908	2130
485	448	733	1020	1305	1593	1878	2165	2453	2738
585	545	895	1245	1595	1945	2295	2645	2995	3345
685	645	1060	1473	1888	2300	2713	3128	3540	3955
785	745	1245	1700	2178	2655	3130	3608	4085	4563
885	845	1385	1925	2468	3008	3548	4090	4630	5173
985	943	1548	2153	2758	3363	3965	4570	5175	5780

### PRESSURE LOSS

The pressure loss can be read below, according to the face velocity.



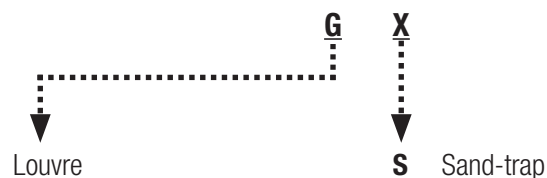
# SAND-TRAP LOUVRE

## G RANGE - GS

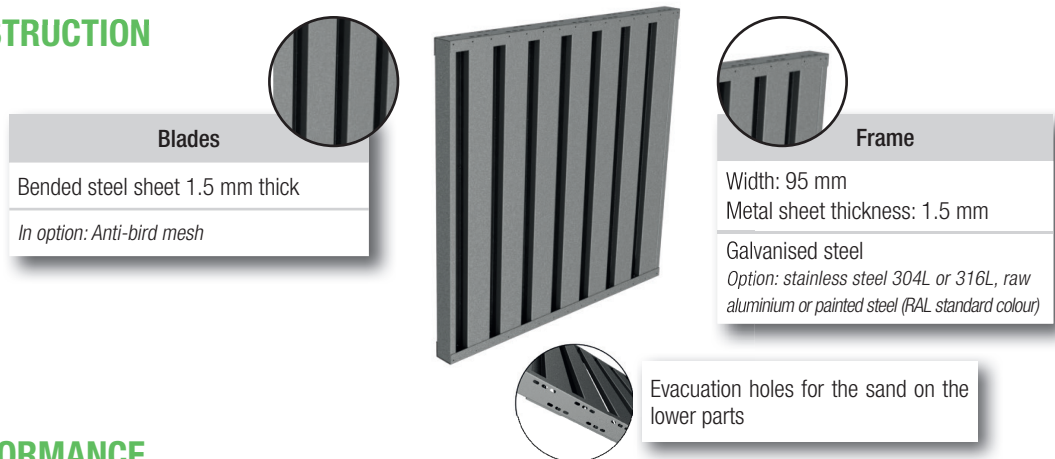
The GS sand-trap louvre is designed to remove the bulk of airborne sand and dust from inlet air in dry environments.

Sand-trap louvre is used as a prefilter but can not be intended as a substitute for conventional filters.

### CODIFICATION



### CONSTRUCTION

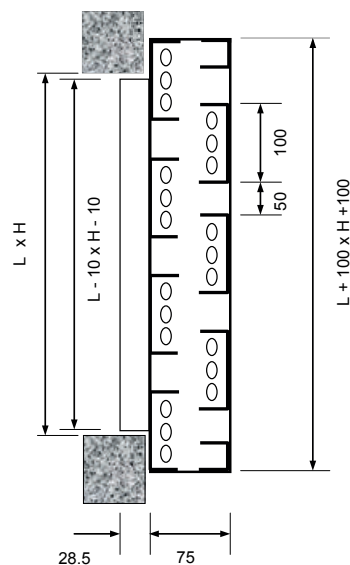


### PERFORMANCE

	GS
Maximum recommended velocity	2 m/s

### DIMENSIONS

- Height H from 150 to 2300 mm with a pitch of 50 mm
- Length L from 150 to 2300 mm with a pitch of 50 mm



### WEIGHT (kg)

H \ L	400	600	800	1000	1200	1400	1600	1800	2000	2300
200	8	10	13	15	17	20	22	25	27	30
400	12	15	18	22	25	29	32	35	39	44
600	14	19	23	27	31	35	39	43	47	53
800	18	23	28	33	38	44	49	54	59	66
1000	22	28	34	40	46	52	58	65	71	80
1200	25	31	38	45	52	58	65	72	79	89
1400	28	36	44	52	59	67	75	83	91	102
1600	32	41	50	58	67	76	85	94	103	116
1800	35	44	54	63	73	82	92	101	111	125
2000	38	49	59	70	80	91	102	112	123	138

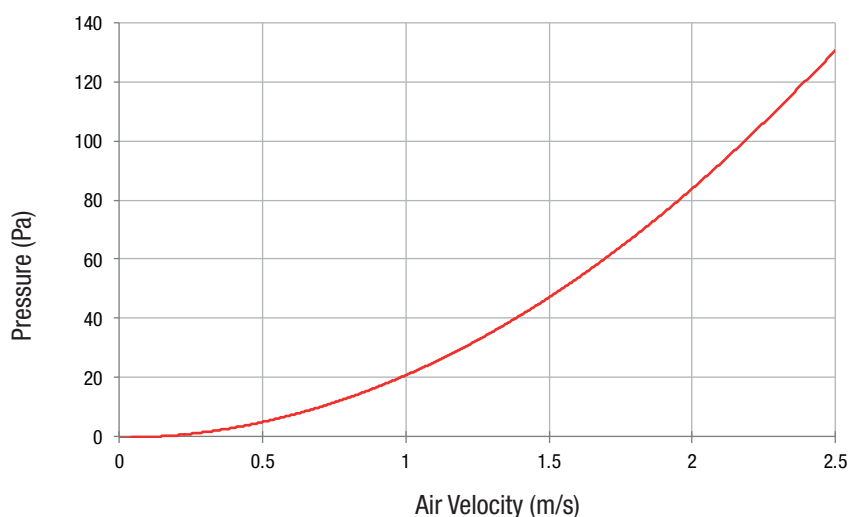
### SELECTION

Airflow (m<sup>3</sup>/h) and free area velocity between the blades (m/s) for a face velocity of 2 m/s:

H \ L	400		600		800		1000		1200		1400		1600		1800		2000		2300	
200	576	6.1	864	3.3	1152	4.1	1440	6.1	1728	3.3	2016	4.1	2304	6.1	2592	3.3	2880	4.1	3312	4.1
400	1152	6.1	1728	3.3	2304	4.1	2880	6.1	3456	3.3	4032	4.1	4608	6.1	5184	3.3	5760	4.1	6624	4.1
600	1728	6.1	2592	3.3	3456	4.1	4320	6.1	5184	3.3	6048	4.1	6912	6.1	7776	3.3	8640	4.1	9936	4.1
800	2304	6.1	3456	3.3	4608	4.1	5760	6.1	6912	3.3	8064	4.1	9216	6.1	10368	3.3	11520	4.1	13248	4.1
1000	2880	6.1	4320	3.3	5760	4.1	7200	6.1	8640	3.3	10080	4.1	11520	6.1	12960	3.3	14400	4.1	16560	4.1
1200	3456	6.1	5184	3.3	6912	4.1	8640	6.1	10368	3.3	12096	4.1	13824	6.1	15552	3.3	17280	4.1	19872	4.1
1400	4032	6.1	6048	3.3	8064	4.1	10080	6.1	12096	3.3	14112	4.1	16128	6.1	18144	3.3	20160	4.1	23184	4.1
1600	4608	6.1	6912	3.3	9216	4.1	11520	6.1	13824	3.3	16128	4.1	18432	6.1	20736	3.3	23040	4.1	26496	4.1
1800	5184	6.1	7776	3.3	10368	4.1	12960	6.1	15552	3.3	18144	4.1	20736	6.1	23328	3.3	25920	4.1	29808	4.1
2000	5760	6.1	8640	3.3	11520	4.1	14400	6.1	17280	3.3	20160	4.1	23040	6.1	25920	3.3	28800	4.1	33120	4.1

### PRESSURE LOSSES

The pressure loss can be read below, according to the face velocity.

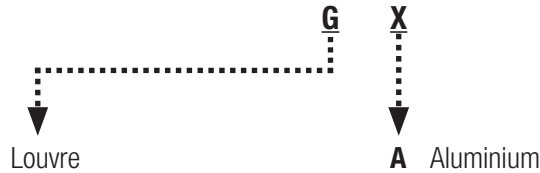


# ALUMINIUM LOUVRE


## G RANGE - GA

The GA weather louvre can be used for air intake or air exhaust. It is suitable for external wall mounting and is dedicated to commercial applications.

### CODIFICATION



### CONSTRUCTION

Blades			Frame	
GA 40	GA 80		GA 40	GA 80
Fixed blades tilted at 45°C, anti-rain device	Fixed blades tilted at 45°C, anti-rain device, resistant to wind driven rain		Width 41 mm	Width 75 mm
Pitch of 40 mm	Pitch of 80 mm		15 microns anodized aluminum louvre <i>In option: RAL paint as required</i>	
Anti-bird / rodent mesh galvanized steel (12,7 x 12,7 mm meshes)			Undrilled <i>In option: Special drilling</i>	
<i>In option: Mosquito net</i>			<i>In option: Special drilling, Counter frame to screw, Filters + Filters holders</i>	

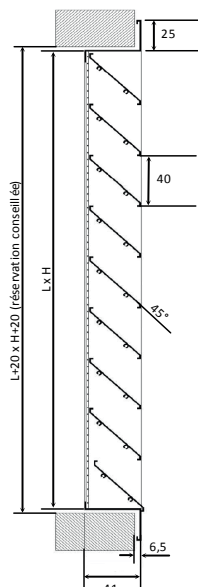
### PERFORMANCE

	GA
Recommended velocity	Air exhaust: up to 5 m/s Air intake: up to 2.5 m/s

### DIMENSIONS

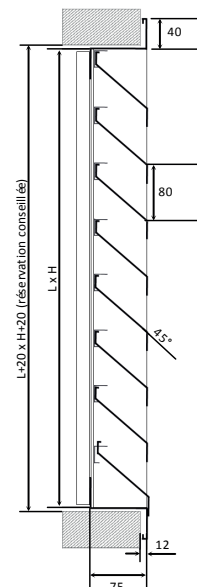
#### GA 40

- Height H from 200 mm to 2000 mm
- Length L from 200 mm to 2000 mm



#### GA 80

- Height : from 400 mm to 2000 mm
- Length : from 400 mm to 2000 mm





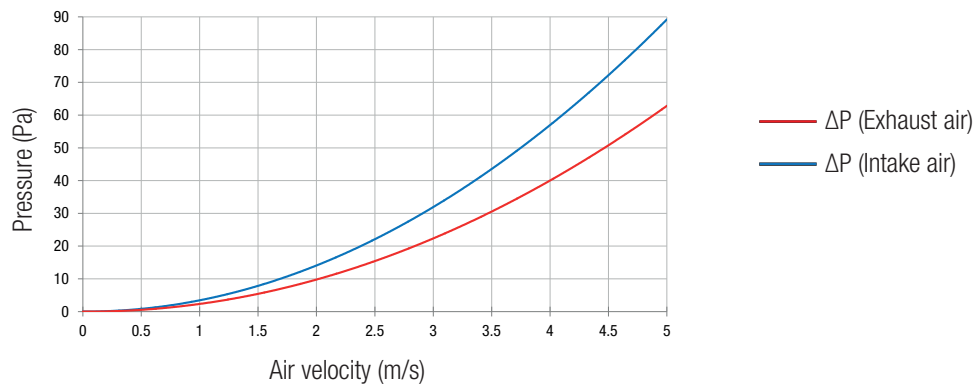
### SELECTION AND PRESSURE LOSSES

#### GA 40 Louvre

Airflow (m<sup>3</sup>/h) and free area velocity between the blades (m/s) for a face velocity of 2.5 m/s:

H \ L	200		300		400		500		600		700		800	
100	180	7.2	270	7.1	360	7.0	450	6.9	540	6.9	630	6.9	720	6.8
200	360	4.8	540	4.7	720	4.6	900	4.6	1080	4.5	1260	4.5	1440	4.5
300	540	4.5	810	4.4	1080	5.1	1350	4.3	1620	4.3	1890	4.3	2160	4.2
400	720	4.2	1080	4.1	1440	4.1	1800	4.0	2160	4.0	2520	4.0	2880	4.0

The pressure loss can be read below, according to the face velocity.

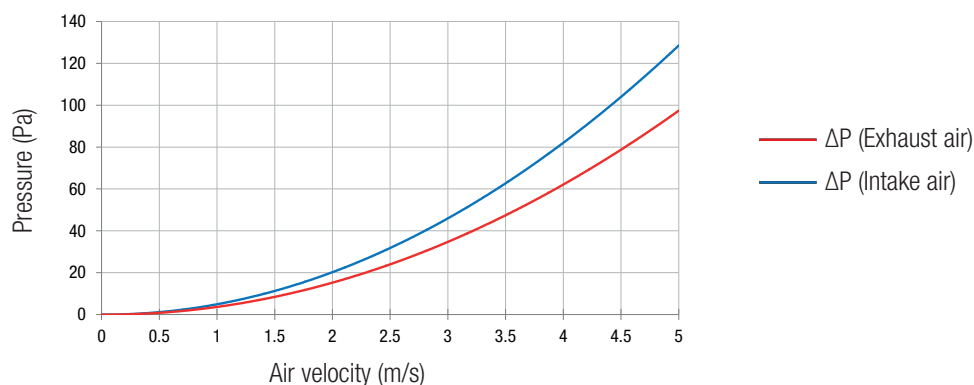


#### GA 80 Louvre

Airflow (m<sup>3</sup>/h) and free area velocity between the blades (m/s) for a face velocity of 2.5 m/s:

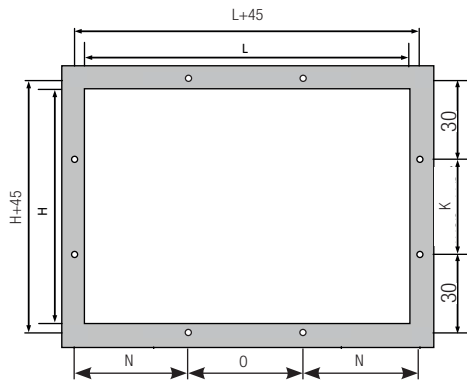
H \ L	400		800		1000		1200		1400		1600		1800		2000	
400	1440	4.5	2880	3.8	3600	3.7	4320	3.6	5040	3.5	5760	3.5	6480	2.9	7200	3.4
600	2160	4.3	4320	3.7	5400	3.6	6480	3.5	7560	3.5	8640	3.4	9720	3.4	10800	3.4
800	2880	4.4	5760	3.7	7200	3.6	8640	3.5	10080	3.5	11520	3.4	12960	3.4	14400	3.3
1000	3600	4.3	7200	3.6	9000	3.6	10800	3.5	12600	3.4	14400	3.4	16200	3.4	18000	3.3
1200	4320	4.3	8640	3.6	10800	3.6	12960	3.4	15120	3.4	17280	3.4	19440	3.4	21600	3.3
1400	5040	4.3	10080	3.6	12600	3.5	15120	3.4	17640	3.4	20160	3.4	22680	3.3	25200	3.3
1600	5760	4.3	11520	3.6	14400	3.6	17280	3.4	20160	3.4	23040	3.3	25920	3.3	28800	3.3
1800	6480	4.3	12960	3.6	16200	3.5	19440	3.4	22680	3.4	25920	3.3	29160	3.3	32400	3.3
2000	7200	4.3	14400	3.6	18000	3.5	21600	3.4	25200	3.4	28800	3.3	32400	3.3	36000	3.3

The pressure loss can be read below, according to the face velocity.





## PRESSURE RELIEF DAMPERS: B RANGE



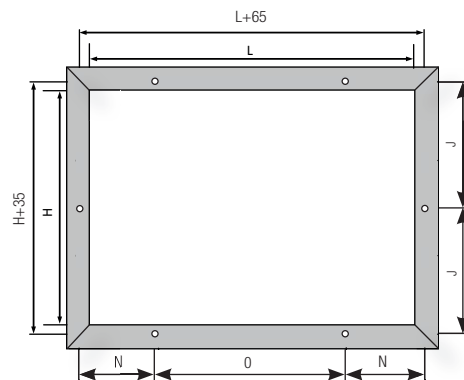
Height drilling

H	K
180	165
345	330
510	495
675	2 x 330
840	2 x 412.5
1005	2 x 495
1170	330 + 495 + 330
1335	2 x 660
1500	2 x 495
1665	495 + 660 + 495
1830	660 + 495 + 660
1995	3 x 660
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Length drilling

L	N	O
200	122,5	-
300	172,5	-
400	222,5	-
500	272,5	-
600	322,5	-
700	372,5	-
800	257,5	330
900	307,5	330
1000	192,5	660
1100	242,5	660
1200	292,5	660
1300	177,5	2 x 495
1400	227,5	2 x 495
1500	277,5	2 x 495
1600	162,5	2 x 660
1700	212,5	2 x 660
1800	262,5	2 x 660
1900	312,5	2 x 660
2000	362,5	2 x 660

## GB LOUVRES



Height drilling

H	J
185	-
285	-
385	210
485	260
585	310
685	360
785	410
885	460
985	510

Length drilling

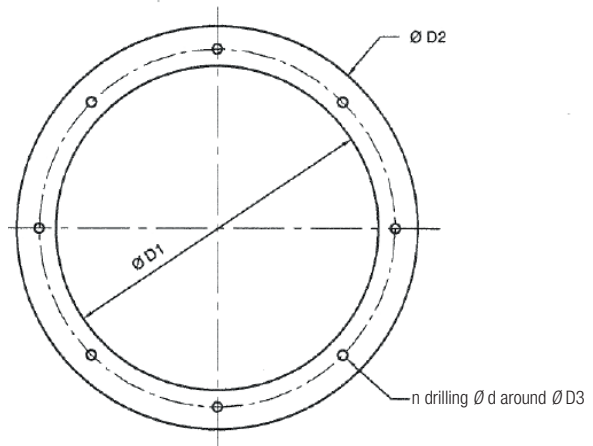
L	N	O
185	35	150
285	35	250
385	60	300
485	60	400
585	60	500
685	110	500
785	110	600
885	110	700
985	110	800



## CIRCULAR DAMPERS WITH CRO - CKO - CHO FLANGES

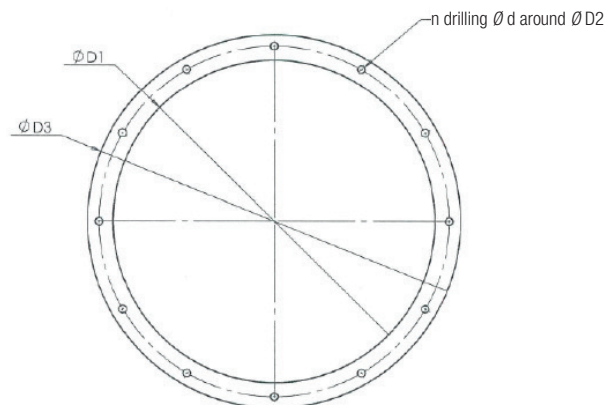
### Drilling according to Eurovent standard

Nominal	D1	D2	D3	n	d
200	207	267	225	4	7
224	231	291	254	4	7
250	257	317	280	4	10
280	287	367	320	4	10
315	322	402	355	8	10
355	362	442	395	8	10
400	407	507	450	8	12
450	457	557	500	8	12
500	507	607	560	12	12
560	567	667	620	12	12
600	607	707	690	12	12
630	637	737	690	12	12
710	717	817	770	16	12
800	807	907	860	16	12
900	907	1027	970	16	15
1000	1007	1127	1070	16	15
1120	1127	1247	1190	20	15
1250	1257	1377	1320	20	15
1400	1407	1527	1470	20	15



### Drilling according to ISO 13 351 standard

Nominal	D1	D2	D3	n	d
200	207	241	287	8	12
224	231	265	311	8	12
250	257	292	337	8	12
280	287	332	367	8	12
315	322	366	402	8	12
355	362	405	442	8	12
400	407	448	487	12	12
450	457	497	537	12	12
500	507	551	587	12	12
560	567	629	667	16	14
630	637	698	737	16	14
710	717	775	817	16	14
800	807	869	907	24	14
900	907	958	1007	24	14
1000	1007	1067	1107	24	14
1120	1127	1200	1247	32	18
1250	1257	1337	1377	32	18
1400	1407	1475	1527	32	18

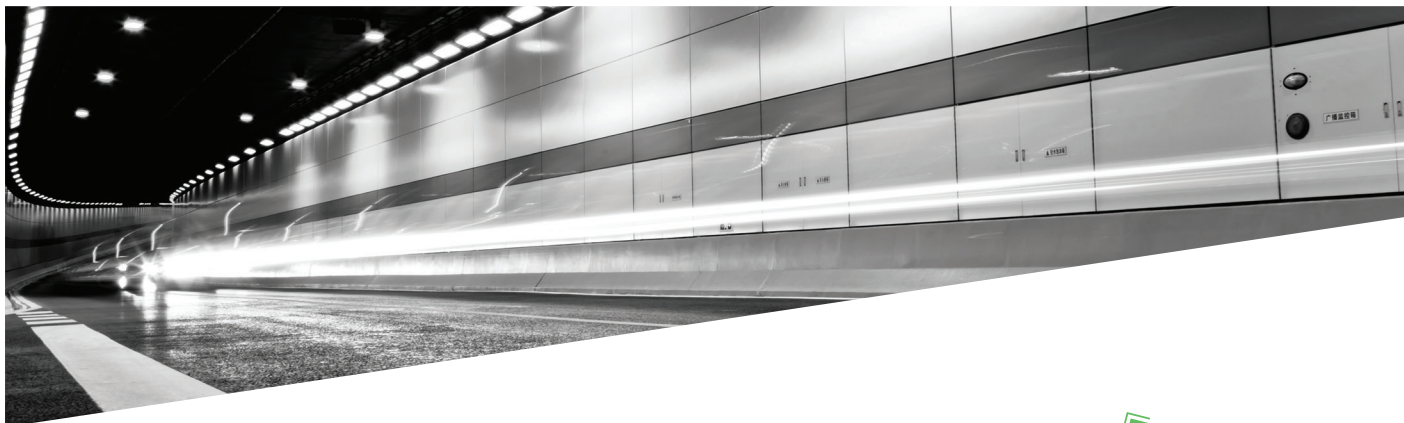


# TUNNEL RANGE

A road tunnel can see as many as 200,000 vehicles pass through every day, resulting in a very high fire risk. When a fire breaks out in a tunnel, the smoke can quickly reach a propagation speed of 4m/s exposing users to suffocation and loss of visibility.

In the event of a fire, the ventilation system used in a tunnel is a strategic component.

**F2A designs innovative solutions dedicated to smoke exhaust.**

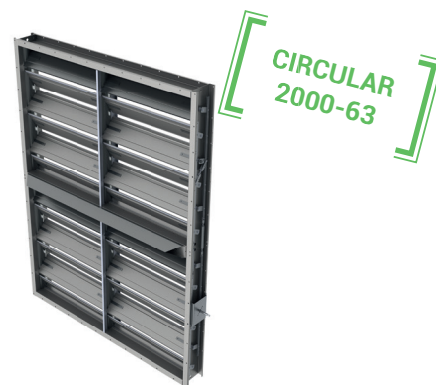


**CERTIFIED**  
BS 476-20  
400°C / 2h

**TRS**

**SMOKE DAMPER**

- > Constant temperature: 200°C
- > Pressure: 10 000 Pa
- > Leakage rate: < 30 l.s<sup>-1</sup>.m<sup>-2</sup> at 3000 Pa



**CIRCULAR**  
2000-63

**TRS-T**

**SMOKE EXHAUST DAMPER**

- > Constant temperature: 200°C
- > Pressure: 7500 Pa
- > Leakage rate: < 30 l.s<sup>-1</sup>.m<sup>-2</sup> at 3000 Pa



**ACTUATORS**

- > Electric, pneumatic or electrohydraulic
- > Factory assembly
- > Motor torque up to 500 Nm
- > With or without fail-safe condition (spring return or battery)



**400°C / 2h**

**FIREPROOF ENCLOSURE**

- > Custom-made manufacture
- > Fire tests in independent laboratories

# OIL & GAS RANGE

The Oil&Gas installations are subject to two major challenges: safety and efficiency. Poor ventilation can produce oxygen-deficient air resulting in: reduced concentration levels of workers, general increase in stress and tension

F2A designs innovative solutions dedicated to ventilation systems for Oil&Gas installations



## AKE-ATEX

### • BACKDRAUGHT DAMPER

Allows one-way airflow direction

### • PRESSURE RELIEF DAMPER

Used to control the overpressure in a room or a ventilation system.

- > Temperature: -50°C to 180°C
- > Pressure: 8 000 Pa
- > Certification: ATEX II 2GD IIB - T6



## RKE-ATEX

### SHUT-OFF DAMPER

Damper designed to shut off the ventilation systems.

- > Temperature: -50°C to 180°C
- > Pressure: 8 000 Pa
- > Leakage rate: < 30 l.s<sup>-1</sup>.m<sup>-2</sup> at 3000 Pa
- > Certification: ATEX II 2GD IIC - T6



## RKO-ATEX

### BALANCING / MODULATING DAMPER

Designed to control airflow in the ventilation ductworks.

- > Temperature: -50°C to +180°C
- > Pressure: 8 000 Pa
- > Certification: ATEX II 2GD IIB or IIC - T6

Our products are certified:  
ATEX and EAC



## ACTUATORS

- > Electric, pneumatic
- > Factory assembly
- > Motor torque up to 500 Nm
- > Quick failsafe <1s



## WEATHER LOUVRE GH

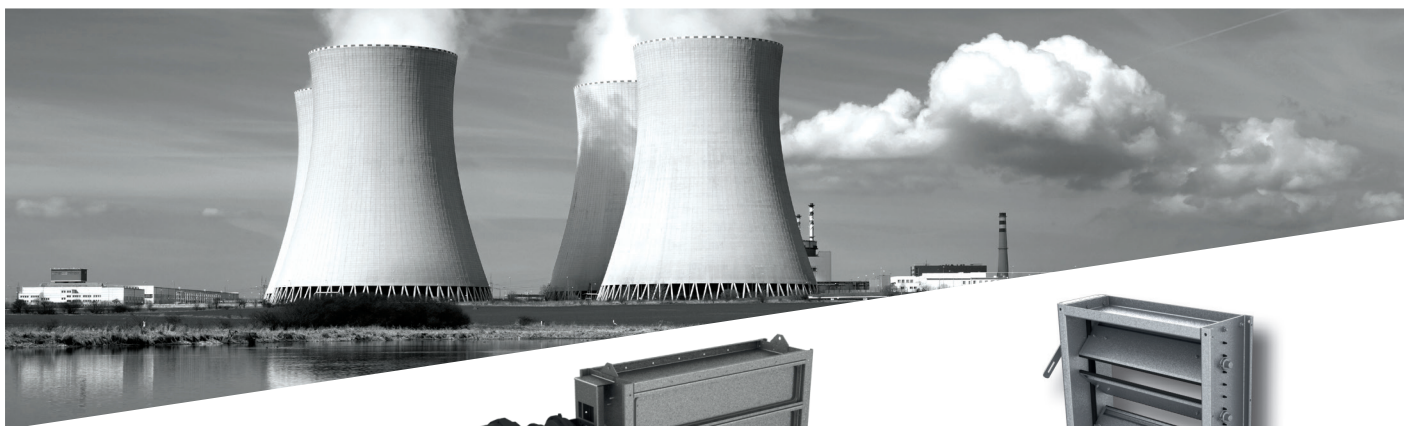
In option:

- > Assembly with windshield
- > Assembly on damper

# NUCLEAR RANGE

Nuclear installations are subject to highly stringent safety and conformity requirements. The equipment must be checked according to the requirements of the project and those of international standards; internal quality tests and equipment inspection processes have been implemented.

F2A and its LTI factory have worked for over 35 years on designing ventilation components for the nuclear industry.



**ARE**  
**BACKDRAUGHT DAMPER**

Used to isolate a fan.

- > Temperature: -20°C to 200°C
- > Pressure: 2000 Pa
- > Leakage rate:  $1.7 \times 10^{-5} \text{ l.s}^{-1} \cdot \text{m}^2$  at 2000 Pa



**CO - CI**

**BALANCING AND AIRTIGHT DAMPER**

Damper designed to shut off and control air flow in the ventilation systems.

- > Temperature: -20°C to 70°C
- > Pressure: 5000 Pa
- > Leakage rate:  $< 6 \times 10^{-3} \text{ l.s}^{-1} \cdot \text{m}^2$  at 3000 Pa



**RRO - RRE**

**BALANCING AND SHUT-OFF DAMPER**

Used to regulate the air flow, seal off or shut off a section.

- > Temperature: -20°C to 200°C
- > Pressure: 5000 Pa
- > Leakage rate:  $< 30 \text{ l.s}^{-1} \cdot \text{m}^2$  at 3000 Pa

Referenced by EDF



**ACTUATORS**

- > Electric, pneumatic
- > Factory assembly
- > Motor torque up to 500 Nm
- > Qualified actuators



**GH LOUVRE**

In option:

- > Assembly with windshield
- > Assembly on damper

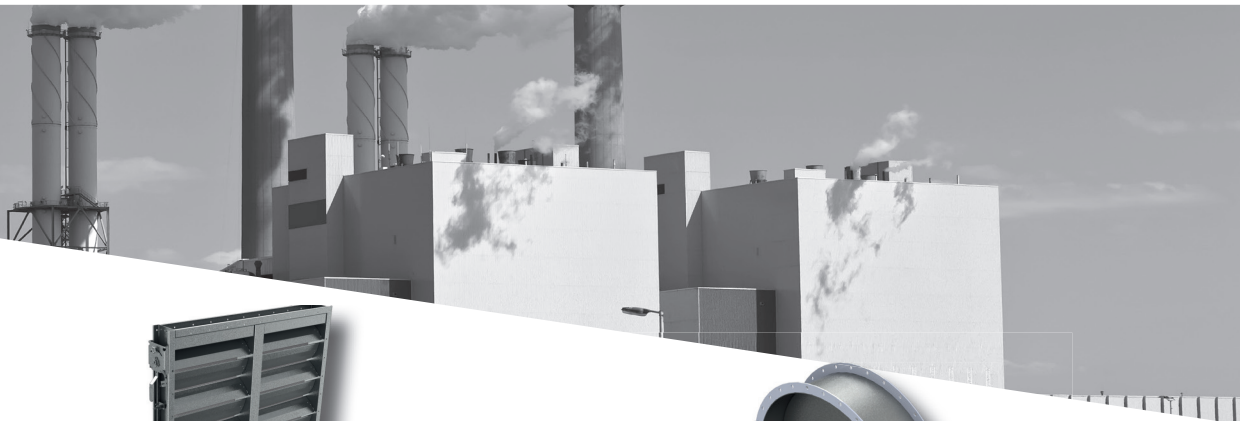


# INDUSTRIAL PROCESS RANGE

The industry sector is subject to numerous constraints:

- Safety
- Efficiency
- Service life - Maintenance

Dust removal applications, heating through a textile duct or even agri-food applications require precision and engineering that withstands wear and tear and ensures resistance to extreme environmental conditions.

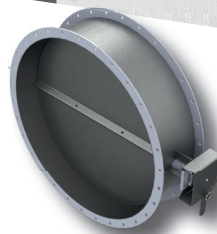


## MRS - MKS | MRO - MKO

### BALANCING AND SHUT-OFF DAMPER

Designed to shut off and mechanically balance the ventilation systems in industrial applications

- > **Temperature:** -50°C to +300°C
- > **Pressure:** 6000 Pa for 1m
- > **Airtightness:** Class 3C according to EN 1751



## CRO - CHO - CKO

### BALANCING DAMPER

Designed to mechanically adjust the industrial circular ventilation systems.

- > **Temperature:** -20°C to +600°C
- > **Pressure:** 6000 Pa



## ACTUATORS

- > Electric, pneumatic
- > Factory assembled on the damper
- > Motor torque up to 500 Nm
- > Quick failsafe <1s



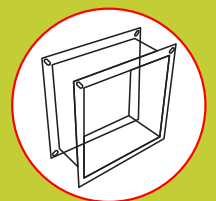
## FIREPROOF ENCLOSURE

- > Custom-made design
- > Fire resistance tests in an independent laboratory





# FLEXIBLE CONNECTION



# FLEXIBLE CONNECTION

## EXPERTISE

The HVAC ductworks are subject to mechanical stress resulting from thermal expansion and vibrations generated by the ventilation systems. These phenomena cause the systems to deteriorate and create noise pollution.

To resolve these issues, F2A has spent over 25 years designing and manufacturing flexible connections such as sleeves and ducts to separate the ductworks from the ventilation systems.

### FLEXIBLE DUCT (ELYTUB)

Flexible ducts are circular hoses with spirals and are generally used for long lengths.



### FLEXIBLE SLEEVES (ELYT)

Flexible sleeves are essential components in ventilation systems and are used to absorb movements due to vibrations and thermal expansion. They are made-to-measure from technical materials assembled by stitching or by high-frequency welding.



Our design office analyses your project's specifications in order to determine the technical materials necessary and to design the flexible connections which will meet the requirements of your application.

## OPERATING CONDITIONS

Fluid involved	Type of movement	Environment
<ul style="list-style-type: none"> <li>• Clean or polluted air</li> <li>• Organic or chemical abrasive material</li> <li>• Pressure</li> <li>• Constant and accidental temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Vibrations</li> <li>• Thermal expansion</li> <li>• Displacement (compression, stretching, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Inside or outside: UV, adverse weather, temperature, salt spray</li> <li>• Environment: clean room, ATEX, food-industry, industry...</li> </ul>

## DIMENSIONAL SPECIFICATIONS

Shape	Connection type	Dimensions
All shapes can be achieved including offsetting.	<ul style="list-style-type: none"> <li>• Smooth,</li> <li>• Reinforced smooth,</li> <li>• Hemmed smooth edges,</li> <li>• 90° edges...</li> </ul>	Height of connection according to the space available, between the two components to be connected and movements to be compensated for

*After these elements have been analysed by our design office, all our flexible connections are custom-made in our factory.*

# CONTENTS

## SLEEVES



**ELYKIT**  
page 118



**ELYT+**  
page 119



**MCE**  
page 121



**ELYFORM**  
page 122

## FLEXIBLE DUCTING



**ELYT PM1**  
page 123



**ELYT CLIP M0**  
page 124



**ELYT PU**  
page 125



**ELYT AS**  
page 126

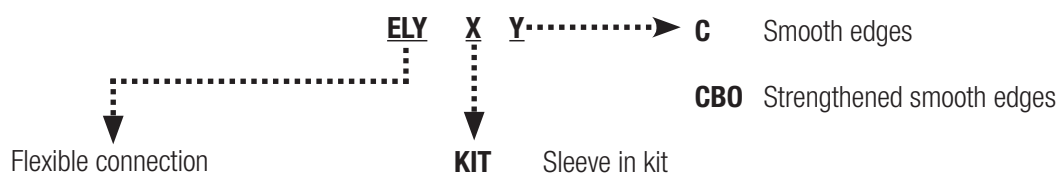
# STANDARD FLEXIBLE SLEEVE

## ELYKIT

The flexible sleeve **ELYKIT**, supplied as a kit, includes the supply of a circular sleeve and two clamps made of zinc-coated steel. It is designed to connect HVAC ductworks with circular fans and is easy to install.

COMMERCIAL

### CODIFICATION



### CONSTRUCTION



### PERFORMANCE

	ELYKIT
Fire rating	Euroclass A2-S2-D0
Certification	400°C/2h
Resistance to pressure	1 000 Pa <i>Option: 2 500 Pa</i>
Operating temperatures	-30°C to +130°C
Miscellaneous	<i>Option: personalised labels</i>

### DIMENSIONS

Nominal Ø	80 to 1250 mm
Height	160 mm (other heights available on request)

# AIRTIGHT FRAMED SLEEVE

**ELYT+**

The ELYT+ is an airtight framed sleeve developed to connect HVAC equipment to ductworks.

- Airtightness requirements of low energy buildings
- Quick and easy to fit and assemble: perfect squareness, adaptable to all types of commercial frames, ...

## CODIFICATION



## CONSTRUCTION

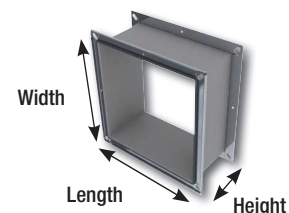
Frame	Material
Galvanised steel profiled bars <i>Option: stainless steel 304L or aluminium</i>	Polyurethane coated fiber glass fabric or PVC-coated polyester <i>Other materials available on request</i>
Width 30 mm <i>Option: 20 mm</i>	
Clips Assembly – <b>F2A patented system</b>	Height 130 mm <i>Option: other heights available on request</i>
Drilling: oblong in the corners <i>Option: Other drilling available on request</i>	
90° edges with an airtight seal <i>Option: Compatible with smooth edges</i>	

## PERFORMANCE

	ELYT+ sleeve	
	Glass fabric	Polyester fabric
Fire rating	<b>Euroclass A2-S2-D0</b>	<b>M1</b> <i>(Equivalent to B Euroclass)</i>
Airtightness	<b>Class B</b> according to EN 15727 <i>(Equivalent to Class B according to EN 1751)</i>	<b>Class D</b> according to EN 15727 <i>(Equivalent to Class C according to EN 1751)</i>
Pressure resistance	2 000 Pa as negative and positive pressure	
Operating temperatures	-20°C to +110°C	-30°C to +70°C

## DIMENSIONS

Length*	240 to 2200 mm
Width*	240 to 2200 mm
Height	130 mm



\*Bars supplied as a single component; above these dimensions, bars supplied in several parts

# AIRTIGHT FRAMED SLEEVE

ELYT+

COMMERCIAL

## ELYT+ A: "READY TO BE ASSEMBLED" VERSION

Simple and quick assembly in complete safety



As the bars are equipped with an exclusive patented clip system, the frame is assembled by simply fitting the bars into each other, without any need to add extra parts or use special equipment.

The body of the sleeve is then secured to the frame using a gasket which slides into a groove in the bars (ultra-fast assembly).



Watch the video to learn how to assemble ELYT+ by scanning this code.



Bars with curved edges that are not sharp in order to avoid any risk of injury and damage to the fabric.

## ELYT+ K: "CUT-TO-SIZE" KIT VERSION

### Material

#### 3 types of material available:

- **A2-S2-D0** polyurethane-coated glass fabric
- **M1** PVC-coated polyester (Equivalent to B Euroclass)
- Non classified

*Other materials available on request*

**Width:** 130 mm

**Length:** roll of 50 m

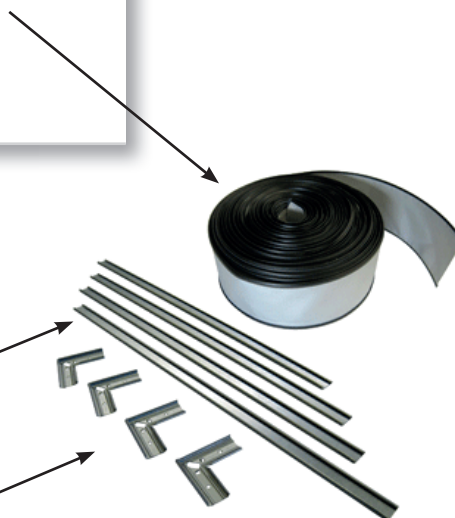
### Frame

Galvanised steel profiled bars

Width: 30 mm

Length: 5 m

Galvanised steel corner pieces





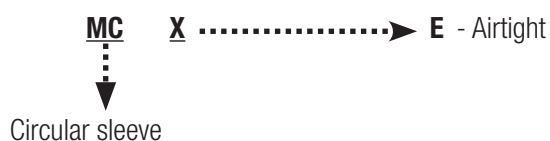
# AIRTIGHT CIRCULAR SLEEVE

## MCE

The MCE sleeve is used to connect the ventilation equipment (Air Handling Units, fans, etc.) to HVAC ductworks in order to limit vibrations and noise pollution. The MCE sleeve has been developed to limit energy loss from buildings. Its low leakage rate enables to reach a **airtightness class C** according to EN 15727.

- **Rapid installation** : very simple fitting design
- **Compensation up to 5 cm of offsetting**

## CODIFICATION



## CONSTRUCTION



## PERFORMANCE

	MCE	
	Silicone-coated glass fabric	PVC-coated glass fabric
Fire rating	Euroclass A2-S1-D0	M1 (Equivalent to B Euroclass)
Airtightness	Class B according to EN 15727	Class C according to EN 15727
Pressure resistance	- 750 Pa to + 2 000 Pa	
Operating temperatures	-20°C to +80°C	

## DIMENSIONS

Nominal Ø (mm)	125	160	200	250	315	355	400	450	500	560	630
Height (mm)	240										

Other dimensions available on request

# CUSTOM-MADE SLEEVE

## ELYFORM

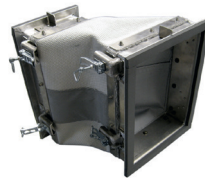
In contrast to standard sleeves, the ELYFORM is a 100% custom-made sleeve available in several materials and in all possible shapes:

- Circular
- Rectangular
- Conical / offset conical
- Square/round conversion...

## CODIFICATION



## CONSTRUCTION



### Connections

Depending on the application, all connection types are possible:

- Smooth edges,
- 90° edges,
- Hemmed edges with flanges,
- Clamping collars,...

### Materials

Materials available for all types of application:

- Anti-static
- Anti-abrasive
- Anti-corrosive
- ATEX
- Food industry

*Out of all of the materials available, our design office will recommend the appropriate material and design according to the constraints of you application.*

## PERFORMANCE

	ELYFORM
Airtightness	<b>Class A to D</b> according to EN 15727 <i>(equivalent to Class A to C according to EN 1751)</i>
Pressure resistance	Up to 0.5 bar
Operating temperatures	-50°C to +600°C

## DIMENSIONS

All dimensions possible, depending on the application and properties of the sleeve.

# ELYTUB FLEXIBLE DUCT

## ELYT PM1 - INDUSTRIAL VENTILATION

The ELYT PM1 flexible duct is used in workstations ventilate and exhaust of fumes or gas through laboratory hoods where an M1 (Equivalent to B Euroclass) fire rating is required.

**Special features:**

- Very light, flexible, easy to handle and easily compressed
- Good resistance to repeated bending
- High resistance to vapours from acids, bases and solvents

### CODIFICATION



### CONSTRUCTION



Material
Flexible PVC with M1 fire rating (Equivalent to Euroclass B) Thickness: 0.4 mm
<b>Spiral:</b> galvanised steel

### PERFORMANCE

	ELYT PM1
Pressure resistance	From - 0.55 bar to +1.9 bar depending on the diameter
Operating temperatures	From 0°C to +70°C

### DIMENSIONS

Nominal Ø	20 to 500 mm
Length	10 m (standard) <i>Option: other lengths available on request</i>

# ELYTUB FLEXIBLE DUCT

## ELYT CLIP M0 - PUBLIC BUILDING

The ELYT CLIP M0 flexible duct is used in heating, air conditioning and ventilation systems in buildings where M0 fire rating is required (Equivalent to Euroclass A2-S1-D0).

**Special features:**

- Compressible
- Protection against abrasion by external spiral

COMMERCIAL

### CODIFICATION



### CONSTRUCTION



Material
M0 silicone-coated glass fabric <i>(Equivalent to Euroclass A2-S1-D0)</i>
<b>Spiral:</b> galvanised steel

### PERFORMANCE

	ELYT CLIP M0
Pressure resistance	From -0.32 bar to +0.85 bar depending on the diameter
Operating temperatures	-60°C to +300°C

### DIMENSIONS

Nominal Ø	51 to 1000 mm
Length	10 m (standard) <i>Option: other lengths available on request</i>

# ELYTUB FLEXIBLE DUCT

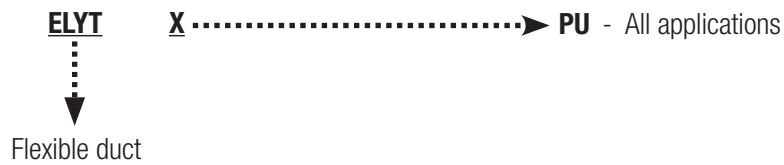
## ELYT PU

The ELYT PU flexible duct is used to transport abrasive particles in all types of applications: food industry, pharmaceutical, oil vapour, wood industry, road maintenance, anti-static...

**Special features:**

- Food grade (FDA), anti-static ( $R \leq 104 \text{ Ohm}$ ), anti-abrasion,
- Good resistance to abrasion
- Smooth internal side

### CODIFICATION



### CONSTRUCTION



Material
100% polyurethane Thickness 0.5 to 2.1 mm (depending on the product)
<b>Spiral:</b> steel

### PERFORMANCE

	ELYT PU
Pressure resistance	From -0.90 bar to +0.40 bar depending on the diameter
Operating temperatures	From -40°C to +90°C

### DIMENSIONS

Nominal Ø	16 to 500 mm
Length	10 or 15 m (standard) <i>Option: other lengths available on request</i>

# ELYTUB FLEXIBLE DUCT

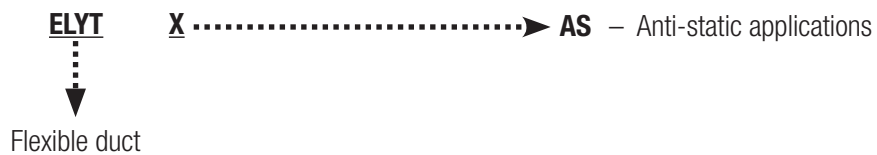
## ELYT AS - ANTI-STATIC

The ELYT AS flexible duct is used for air intake and discharge in explosive atmospheres or to transport electrostatic particles such as paper, textile fibres, polystyrene,...

**Special features:**

- Good resistance to friction during handling
- Good resistance to UV

### CODIFICATION



### CONSTRUCTION



Material
Polyester fabric with PVC coating through-treated with an anti-static agent Coating compliant with french standards <ul style="list-style-type: none"><li>• NF M 82-011</li><li>• NF M 82-013</li></ul>
<b>Spiral:</b> copper-coated steel

### PERFORMANCE

	ELYT AS
Pressure resistance	From -0.04 bar to + 0.25 bar depending on the diameter
Operating temperatures	From -10°C to +80°C

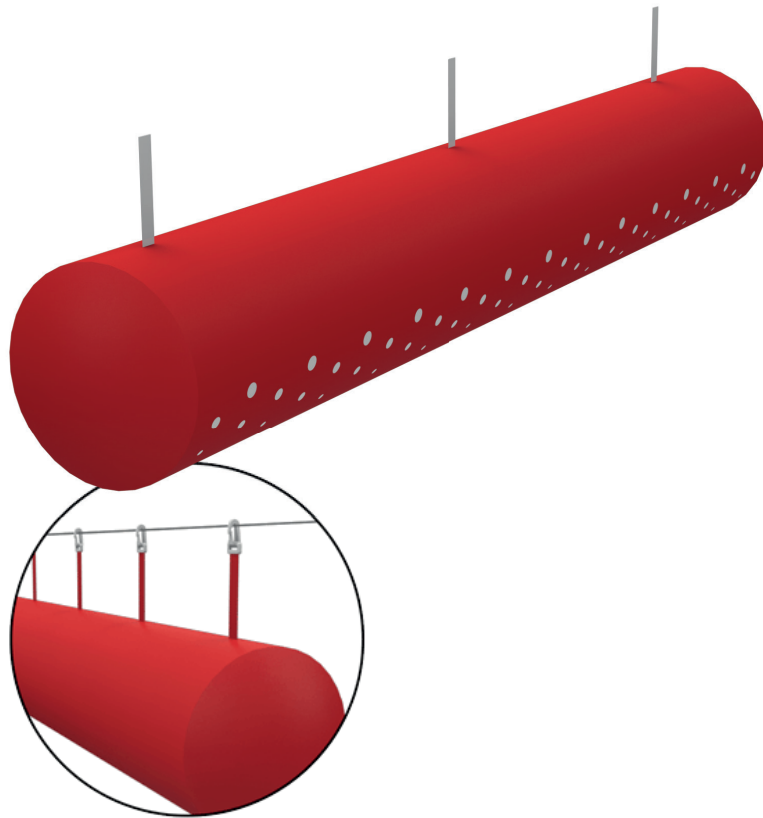
### DIMENSIONS

Nominal Ø	30 to 450 mm
Length	10 m (standard) <i>Option: other lengths available on request</i>

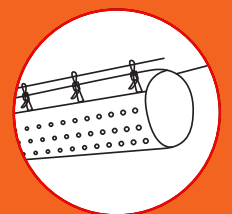








# TEXTILE DUCT



# TEXTILE DUCT

## EXPERTISE

### OBJECTIVES

There are three main objectives for air handling installations in commercial or public premises:

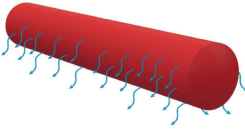
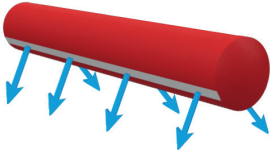
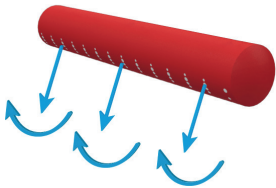
- Comfort,
- Air quality,
- Energy efficiency.

Moreover, in the industrial sector, mastering working or process environments becomes a major economic and technical imperative. The textile duct, due to its flexibility, the range of available solutions and the uniformity of its diffusion, provides an effective response to all of these challenges.

### CUSTOM-MADE DIFFUSION

The textile duct represents a customised diffusion solution, i.e a specific study must be carried out on your project to determine the textile duct best suited to your application.

*Three technics of diffusion are possible in order to adapt to the specific constraints of each project.*

Low-speed diffusion	Medium-induction diffusion	High-induction diffusion
		
<ul style="list-style-type: none"><li>• Air diffused through a porous fabric</li></ul>	<ul style="list-style-type: none"><li>• Air diffused through strips of meshed fabric (diffusing slots)</li></ul>	<ul style="list-style-type: none"><li>• Air diffused through rows of perforations</li></ul>
<b>Special note:</b> very low speed ( $S < 1$ m/s)	<b>Special note:</b> medium speed between 4 and 10 m/s	<b>Special note:</b> high speed between 7 and 15 m/s

## FABRICS, HIGH-PERFORMANCE MATERIALS AND AESTHETICS

The technical nature and variety of the materials available to manufacture diffusing textile ducts offer a response suited to all types of application.

### Fire resistance class:

- A2-S2-D0 Euroclass fire rating (fiberglass fabric)
- M1 fire rating (equivalent to B Euroclass)

### Technical performance:

- Permeability of the material for efficient diffusion control.
- Pressure and breaking strength
- Specific characteristic: chemical resistance, antibacterial, anti-static...

## FROM DESIGN TO DIGITAL SIMULATION

### 100% custom-made sizing:

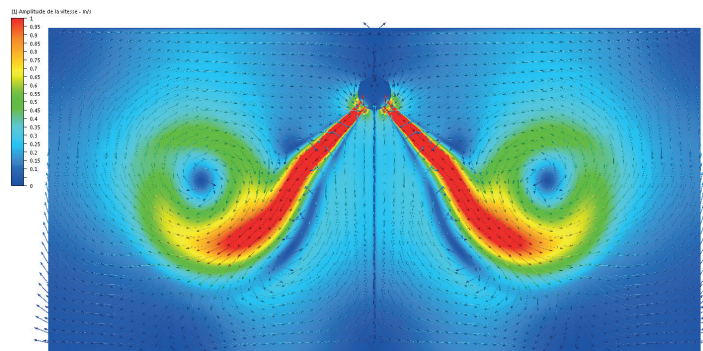
- Several designs of textile ducts
- Customised design of transformation pieces
- Manufacture of airtight collectors to ensure a balanced airflow along the fabric ducting

*The diffusion device (permeability of the fabric, perforations plan or sizing of slots) is meticulously calculated by our design office in order to optimise the air flow and acoustic performance levels of the textile duct\**

## VALIDATION BY DIGITAL SIMULATION

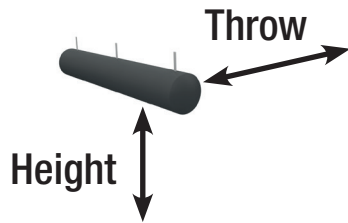
For specific applications, digital simulation allows to validate the suited diffusion solutions. Therefore, using Computational Fluid Dynamics (CFD) software, it is possible to:

- Simulate air flow under real conditions (2D-3D)
- Analyse speed and temperature gradients
- Perform potential scenarios taking into account external or internal heat input



\* Available on request depending on the type of diffusion

# RECOMMENDATIONS & SELECTIONS



		Heating only		
		Throw < 3m	3m < Throw < 7m	Throw > 7m
Public room	Height < 4m	TEXI-JET		
	4m < Height < 8m	TEXI-JET		
	Height > 8m	<del>TEXI-JET</del>		
Controlled dust accumulation zone	Height < 4m	TEXI-SOFT	TEXI-PULSE	<del>TEXI-JET</del>
	4m < Height < 8m	<del>TEXI-JET</del>		
	Height > 8m	<del>TEXI-JET</del>		
Commercial & industrial premises	Height < 4m	TEXI-SOFT	TEXI-PULSE	TEXI-JET
	4m < Height < 8m	TEXI-JET		
	Height > 8m	<del>TEXI-JET</del>		
Industrial process & storage rooms	Height < 4m	TEXI-SOFT	TEXI-PULSE	TEXI-JET
	4m < Height < 8m	TEXI-JET		
	Height > 8m	TEXI-JET		

# RECOMMENDATIONS & SELECTIONS

Cooling only			Heating and cooling (reversible mode)		
Throw < 3m	3 < Throw < 7	Throw > 7m	Throw < 3m	3m < Throw < 7m	Throw > 7m
TEXI-JET			TEXI-JET		
TEXI-JET			TEXI-JET		
TEXI-SOFT	TEXI-PULSE		TEXI-SOFT	TEXI-PULSE	
TEXI-SOFT	TEXI-PULSE	TEXI-PULSE	TEXI-SOFT	TEXI-PULSE	TEXI-JET
TEXI-PULSE			TEXI-JET		
TEXI-SOFT	TEXI-PULSE	TEXI-PULSE	TEXI-SOFT	TEXI-PULSE	TEXI-JET
TEXI-PULSE			TEXI-JET		
TEXI-JET			TEXI-JET		

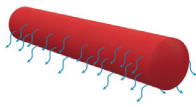


The grey areas correspond to very rare cases. Following a consultation, our design office will propose a solution suited to your situation.

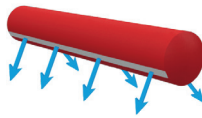


# CONTENTS

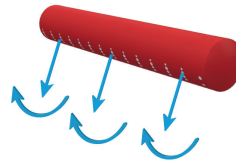
## DIFFUSION



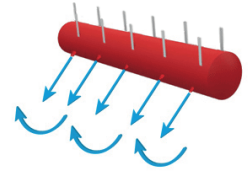
**TEXI-SOFT**  
Porosity  
page 136



**TEXI-PULSE**  
Slots  
page 138



**TEXI-JET**  
Perforations  
page 140



**TEXI-BUZ**  
Nozzles  
page 142

## SPECIFICATIONS



**Shapes and geometry**  
page 144



**Assembly and support systems**  
page 146

## MAINTENANCE

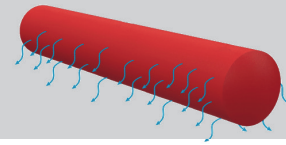


**Maintenance**  
page 148

# TEXTILE DUCT

## TEXI-SOFT

The TEXI-SOFT textile duct has been designed to diffuse air at a very low speed (< 1 m/s). It is particularly suited to low-height applications.



### OPERATION

This diffusion is achieved using a porous material which covers all or part of the duct. Based on the air flow movement phenomenon resulting from the differences in temperature, this diffusion is particularly used for cooling. The diffused air, which is colder than the ambient air and therefore heavier, will gradually fill the treated area.

### APPLICATIONS

 Clean room - ISO 6 to 8	 Food industry (cooling)	 Commercial
Pharmaceutical industry	Low-height rooms (small drying/packaging rooms)	Air conditioning in low-height rooms (height < 4m)
Laboratories, metrology...		

### ADVANTAGES

- + **Comfort:** very low residual air speeds ( $Sr < 0.3$  m/s).
- + **Cooling or air conditioning effectiveness:** rooms with low ceiling height (under 4 m) where high comfort levels are required.
- + **High possible flow rates:** between 200 and 2500 m<sup>3</sup>/h/m<sup>2</sup> of duct.
- + **Easy maintenance:** machine-washable duct



## LIMITS OF USE

- **Not advised in the following cases:**
  - Only heating required,
  - Rooms with height under duct over 4 m,
  - Not available in A2-S2-D0 Euroclass fire rating
- **Low diffusion throw:** never exceeds 5 m (often less than 3 m).
- **Filtration:** risk of clogged duct, minimum filtration of F7 is recommended.

## POSSIBLE FABRICS

All porous fabrics for which the permeability is known, stable over time and with a uniform surface:

- **Polyester rated as M1** (equivalent to B Euroclass) or **not classified**
- Several levels of porosity are available as standard
- Anti-bacterial or anti-static technical materials
- Wide range of colours available (colour chart with 120 colours available on request)

**Our experts select the material best suited to the specifications of your applications**

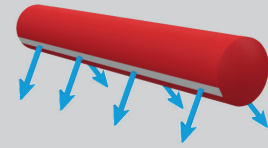
## DATA TO BE PROVIDED FOR DUCT SIZING

General information	Type of room
Dimensions	Height of textile duct installation
	Length of textile duct
Diffusion	HVAC mode: heating, air conditioning or both (reversible)
	Throws (range) to be covered on either side of the duct (in m)
	Flow rate per duct (in m <sup>3</sup> /h)
Location	Drawing or sketch of ducts implementation
	Type of support requested (see p.147)
	Fabric colour
Safety	Fire rating requirements

# TEXTILE DUCT

## TEXI-PULSE

The TEXI-PULSE textile duct has been designed to diffuse air at medium speed ( $4 < S < 10\text{m/s}$ ). It is ideal for medium-height rooms that require a high flow rate per linear meter.



### OPERATION

This diffusion is achieved through diffusing slots that are sized according to your project by our design office. This technique, based on induction and the Coanda effect, allows for the uniform distribution of new air in the room and effective destratification of the air (the hot air, which is less dense than the cold air, rises and remains higher resulting in poor distribution of air).

### APPLICATIONS



Logistics	Food industry (cooling)	Industry
Workshops	Draining and finishing rooms	Automotive, mechanical, aeronautic
Storage buildings	Process and packaging areas	Electronic
	Storage rooms	Surface treatment

### ADVANTAGES

- + **Homogeneous diffusion:** cooling or heating of large rooms under 4 m in height
- + **Air destratification:** good distribution of temperatures in the room
- + **Long throw:** over 7 m range and flow rates per linear meter above 500 m<sup>3</sup>/h/ml

## LIMITS OF USE

- **Comfort:** average in a room with a ceiling height above 5 m, in reversible mode (heating and cooling)  
High residual speeds
- **Rooms with high ceilings (H>8m):** average efficiency if the heating needs are high  
( $\Delta T > 10^{\circ}\text{C}$  or Heating requirements  $> 120 \text{ W /m}^2$ )
- **Safety:** slots no fire-rated A2-S2-D0 Euroclass

## DIFFUSING STRIPS OR SLOTS

Meshed fabric made of high-tenacity white polyester with PVC coating. This fabric is food grade, washable and has excellent mechanical strength.

## POSSIBLE FABRICS

- Airtight or low permeability **polyester** fabrics (porosity  $< 100 \text{ m}^3/\text{h}/\text{m}^2$  at 120 Pa).
- Technical **PVC** flexible and airtight materials.
- Anti-bacterial or anti-static technical materials.

Our experts select the material best suited to the specifications of your applications

White*	Black*	Orange similar to RAL 2001	Yellow similar to RAL 1023	Blue similar to RAL 5005	Red similar to RAL 3020	Green similar to RAL 6032	Blue similar to RAL 5012	Grey* similar to RAL 7040
--------	--------	----------------------------------	----------------------------------	--------------------------------	-------------------------------	---------------------------------	--------------------------------	---------------------------------

Standard colour chart (Polyester)

\*Colours available in M0-rated material

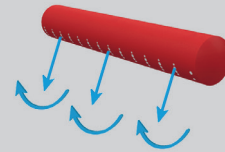
## DATA TO BE PROVIDED FOR DUCT SIZING

<b>General information</b>	Type of room
<b>Dimensions</b>	Height of textile duct installation
	Length of textile duct
<b>Diffusion</b>	HVAC mode: heating, air conditioning or both (reversible)
	Throws (range) to be covered on either side of the duct (in m)
	Flow rate per duct (in $\text{m}^3/\text{h}$ )
<b>Location</b>	Drawing or sketch of ducts implementation
	Type of support requested (see p.147)
	Fabric colour
<b>Safety</b>	Fire rating requirements

# TEXTILE DUCT

## TEXI-JET

The TEXI-JET textile duct has been designed to diffuse air at high speed ( $7 < S < 15\text{m/s}$ ). Its flexibility enables it to be adapted to all applications in rooms with medium or high ceiling heights (over 4m).



## OPERATION

This diffusion is achieved through perforations rows determined according to your project by our design office. This technique, based on high induction (rate  $> 20$ ), offers excellent air distribution efficiency (heating and air conditioning) combined with control of residual speeds which avoids any "draught effect".

## APPLICATIONS

Commercial & public buildings (heating & cooling)	Industry (heating & cooling)	Clean room
Large and medium-sized sales areas	Storage rooms with high ceilings	Sensitive industrial production rooms
Theatres, concert halls	Large-scale factories	Printing houses, metallurgy
Multi-purpose rooms, exhibition halls		Electronic, plastic injection

## ADVANTAGES

- + **High induction rate ( $>20$ ):** control of residual air speeds and excellent comfort even with high  $\Delta T$
- + **Heating:** very effective for rooms with high ceilings ( $>4\text{m}$ )
- + **Comfort:** low residual air speeds
- + **High flow rate:** up to  $450\text{ m}^3/\text{h/ml}$ , heating requirements up to  $200\text{ W/m}^2$  and cooling requirements up to  $300\text{ W/m}^2$
- + **No clogging**

## LIMITS OF USE

- NOT to be used in rooms with low ceilings (below 4m).
- NOT to be used for short lateral throws

## POSSIBLE FABRICS

- Airtight or low permeability **polyester** fabrics (porosity <math><100\text{ m}^3/\text{h}/\text{m}^2</math> at 120 Pa)
- Technical **PVC** flexible and airtight fabrics
- Anti-bacterial or anti-static technical fabrics
- Airtight technical fabrics: **PVC and A2-S2-D0 Euroclass rated glass fabric**

Our experts select the material best suited to the specifications of your applications

White*	Black*	Orange similar to RAL 2001	Yellow similar to RAL 1023	Blue similar to RAL 5005	Red similar to RAL 3020	Green similar to RAL 6032	Blue similar to RAL 5012	Grey* similar to RAL 7040
--------	--------	----------------------------------	----------------------------------	--------------------------------	-------------------------------	---------------------------------	--------------------------------	---------------------------------

Standard colour chart

\*Colours available in A2-S2-D0 Euroclass-rated material

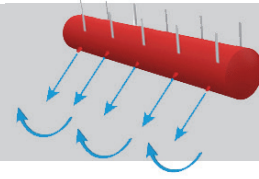
## DATA TO BE PROVIDED FOR DUCT SIZING

General information	Type of room
Dimensions	Height of textile duct installation
	Length of textile duct
Diffusion	HVAC mode: heating, air conditioning or both (reversible)
	Throws (range) to be covered on either side of the duct (in m)
	Flow rate per duct (in $\text{m}^3/\text{h}$ )
Location	Drawing or sketch of ducts implementation
	Type of support requested (see p.147)
	Fabric colour
Safety	Fire rating requirements

# TEXTILE DUCT

## TEXI-BUZ

The TEXI-BUZ textile duct has been designed to diffuse air at very high speeds ( $15 < S < 25\text{m/s}$ ). It is ideal for rooms with very high ceilings.



## OPERATION

This diffusion is achieved through rows of conical nozzles determined according to your project by our design office. This technique, based on very high induction (rate  $> 50$ ), offers excellent air distribution efficiency (heating and air conditioning) even for rooms with very high ceilings.

## APPLICATIONS



### Industry (heating & cooling)

Large-scale factories

### Logistics

Heating rooms with very high ceilings

Cooling buildings with high ceilings

## ADVANTAGES

- + **High induction rate in heating mode ( $>50$ ):** control of residual air speeds and excellent comfort even with high  $\Delta T$ .
- + **Heating:** very effective for rooms with very high ceilings ( $>10\text{m}$ ) even with mixing rates below 2 volumes per hour
- + **Long throw** in cooling mode
- + **No clogging**

### LIMITS OF USE

- Additional perforations to guarantee homogeneous diffusion
- NOT to be used if low residual speeds are required
- NOT to be used for heights under 8m
- NOT to be used for throws under 10m

### POSSIBLE FABRICS

- Airtight or low permeability **polyester** fabrics (porosity <100 m<sup>3</sup>/h/m<sup>2</sup> at 120 Pa)
- Airtight technical fabrics: **PVC and A2-S2-D0 Euroclass rated glass fabric**

Our experts select the material best suited to the specifications of your applications

White	Black	Orange similar to RAL 2001	Yellow similar to RAL 1023	Blue similar to RAL 5005	Red similar to RAL 3020	Green similar to RAL 6032	Blue similar to RAL 5012	Grey similar to RAL 7040
-------	-------	----------------------------------	----------------------------------	--------------------------------	-------------------------------	---------------------------------	--------------------------------	--------------------------------

Standard colour chart

\*Colours available in A2-S2-D0 Euroclass-rated material

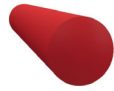
### DATA TO BE PROVIDED FOR DUCT SIZING

<b>General information</b>	Type of room
<b>Dimensions</b>	Height of textile duct installation
	Length of textile duct
<b>Diffusion</b>	HVAC mode: heating, air conditioning or both (reversible)
	Throws (range) to be covered on either side of the duct (in m)
	Flow rate per duct (in m <sup>3</sup> /h)
<b>Location</b>	Drawing or sketch of ducts implementation
	Type of support requested (see p.147)
	Fabric colour
<b>Safety</b>	Fire rating requirements

# TEXTILE DUCT

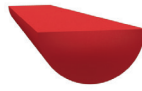
## SHAPE OF DUCTS & GEOMETRY OF DUCTWORKS

### DUCT SHAPES



**CIRCULAR**

Standard solution



**SEMI-CIRCULAR**

Easily integrated into rooms with low ceilings



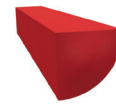
**LOW PROFILE SEMI-CIRCULAR**

Minimal height



**OBLONG**

Alternative solution to circular duct for very high flow rates



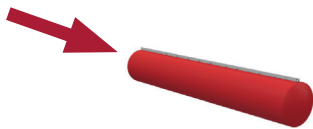
**QUARTER-CIRCULAR**

Discrete integration of low flow rate ducts

### GEOMETRY OF DUCT

Simple system: duct with air supply at its beginning

- **Constant diameter**



"In-line" air supply, at the beginning of the duct



Perpendicular air supply with elbow

- **Duct with reduction** (generally for duct length > 30m)



Symmetrical reduction



Asymmetrical reduction

 : Direction of air flow



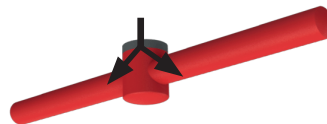
**Simple system:** duct with supply via a transformation piece

- Air supply via the connection hole (usually used with semi-circular ducts)



- Air supplied laterally, from above or from below via a «T-fitting» or a dome

**T-fitting or dome**



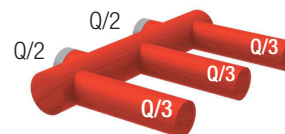
**Complex system:** several ducts with one air supply via an airtight collector

**Collector supplied at the beginning**

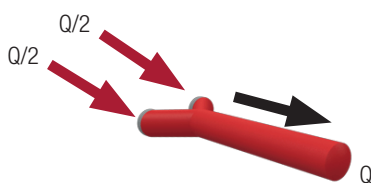


"Airtight" collector

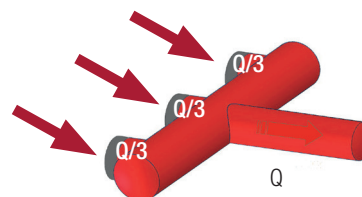
**2 perpendicular supplies**



**Special case of a duct connected to an evaporator**



2 air intakes



3 air intakes

Q: air flow direction

# TEXTILE DUCT

## SUPPORT SYSTEM

### SUSPENDED BY A SINGLE OR DOUBLE CABLE (120° & 180°)



**Single cable:** Simple and economical, the single cable suspension system is perfectly suited to small diameters, lightweight products and public building applications where the system must be as small as possible.

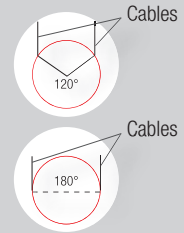


**Double cable 120° and 180°:**

The double cable suspension system is suitable for large diameters and heavy products.

**Advantages:**

- Limits the size when the duct is deflated,
- Keeps the duct in position,
- Prevents the duct from swaying in case of asymmetrical diffusion.



### Supplied Parts



Cable Ø 3.0 mm

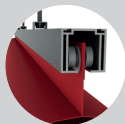


Wall mounting plate

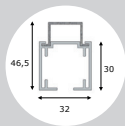
**Single:** Length of duct + 5m

**Double:** Length of duct + 10m

### SUSPENDED BY AN ALUMINIUM RAIL



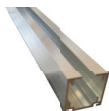
When the building's structure prevents cables from being tensioned, we suggest to use a system with an aluminium rail.



**Aluminium rail:** exclusive click connection system:

- Ease of assembly
- No external parts
- Perfect alignment

### Supplied Parts



Aluminium rail

Standard length: 2 m

### SUSPENDED BY PVC PROFILE SECTION

We recommend to suspend the textile duct using a PVC profile section for improved hygiene. Our PVC profile sections can be cleaned.



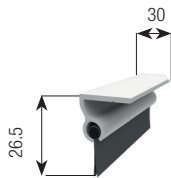
#### Usage:

The textile diffusion duct is inserted into the PVC profile section

- Light ducts (polyester fabric): by a snap ring
- Heavy ducts (glass fabric and PVC): by slides every 500 mm



### Supplied Parts



PVC profile section

Standard length: 2 m

PVC profile section *F2A recommends the rails to be mounted every 60 cm*

### DOUBLE SUSPENSION SYSTEM USING PVC PROFILE SECTION OR ALUMINIUM RAIL

#### Semi-circular duct:



- For light fabric: 2 PVC profile sections have a continuous snap ring attached to the duct
- For other fabrics (PVC or MO glass fabric): 2 aluminium rails are equipped with mini-slides in the eyelets positioned every 500 mm along the duct

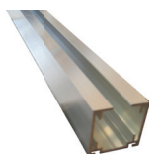
#### Quarter-circular duct:



- Commercial applications
- Small size
- Better aesthetics
- Quarter-circular ducts are kept in position by two snap rings which slide in 2 PVC profile sections or 2 aluminium rails

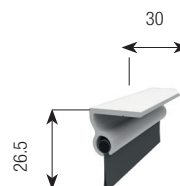
### Supplied Parts

Mounted using an aluminium rail



**Aluminium rail**  
Standard length: 2 m

Mounted by a PVC profile section



**PVC profile section**  
Standard length: 2 m

OR

*F2A recommends the rails to be mounted every 60 cm*

# TEXTILE DUCT

## MAINTENANCE

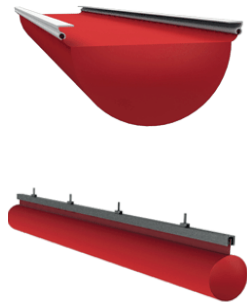
F2A proposes a washing service for your textile ducts

### WHY IS IT IMPORTANT TO WASH A TEXTILE DUCT?

**Performance:** Clogging affects the air flow performance levels of your equipment. In fact, it increases the pressure losses and the homogeneous diffusion of the air flow is no longer guaranteed.

**Hygiene:** A clogged duct favours the growth of bacteria and must be washed using an anti-bacterial product suited to the polyester fabric.

In order to provide solutions to these issues and to ensure that all textile ducts are kept impeccably clean, F2A offers a professional service involving **washing** and **repairing** your equipment.



### POLYESTER TEXTILE DUCTS

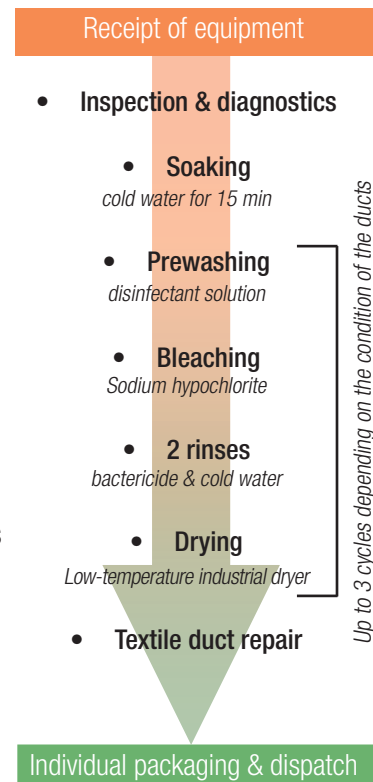
The **washing powders and bactericidal liquids** used are specially adapted to the polyester fabric used to manufacture textile ducts.

Our textile department carries out the **repairs of your textile ducts** in case of minor damage, particularly on the seams.

In order to ensure that your equipment is kept in an optimal condition of cleanliness, a **set of replacement ducts** can be provided.

#### + F2A

- Use of professional disinfectants: neutralisation of strains of *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Enterococcus faecium*, *Escherichia coli*
- Personalised monitoring using a progress sheet for complex cases
- Fabric with permanent antibacterial effect (Ref. PM1/E - AB)
- Reduced clogging due to the supply of filters and filtering surfaces to be installed upstream of the textile duct.



### FIBER GLASS FABRIC TEXTILE DUCT

The textile duct must be cleaned:

- Whilst laid flat,
- Using a vacuum or a compressed air blower.



A2-S2-D0 Euroclass rated fabric duct

Specific treatment:

- The end of the duct must be open to draw in dust particles.
- The collar must be open in order to remove the overpressure cone to wash it in cold water using a sponge or cloth.

Note: Due to the manufacture of A2-S2-D0 Euroclass rated fabric (fiberglass + polyurethane coating), **machine washing or use of high pressure water cleaners is strictly prohibited.**

### PVC TEXTILE DUCT

The textile duct must be cleaned and rinsed:

- Whilst laid flat,
- With warm water (30°C maximum),
- Using a water jet/high pressure cleaner,
- Using a cloth or soft sponge.



PVC duct

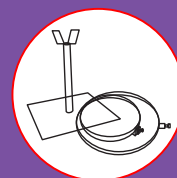
Note:

- A gentle, non-aggressive detergent can be used.
- In the case of slotted ducts, it is possible to use a compressed air blower or a vacuum.





# MOUNTING COMPONENTS



# DUCT ACCESSORIES

## ACCESS RANGE

### INSULATED CLIP (CI)

Rigid galvanised steel clips to fit galvanised or PVC spiral ventilation ducts.



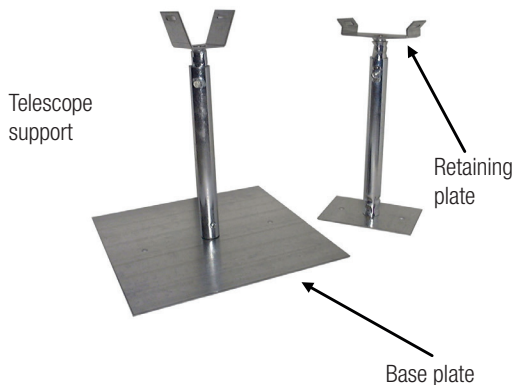
		C1 (Ø 80 to 315 mm)	C2 (Ø 355 to 1000 mm)
Shielding strip	Material	Galvanised steel	
	Thickness / Width	1.5 / 20 mm	2.0 / 20mm
Strengthening rod		Yes	No
Base		M8 / M10 double thread clipped onto strip	
Closing system		Quick closing using a bolt with a retaining washer in the open position	
Screws		M6 x 20	M6 x 34
Gasket		EPDM	
Temperature limits in °C		-40°C/+120°C	
Maximum weight (radial traction)		150 kg before deformation 300 kg before rupture	170 kg before deformation 320 kg before rupture
Option		Material: Stainless steel, larger diameters available on request	

### TELESCOPIC SUPPORTS - PS ACCESS

Telescopic supports made of galvanised steel to install HVAC systems on a terrace.

They are designed to support a vertical load of 280 daN. Not recommended for use when pulling or bending.

They are supplied in 3 parts:



	Specification
Material	White electro-galvanised steel
Construction	Tubes Ø28 and 22 mm Crimped mounting screw Ø8 Locking screw Ø6
Movement	Min. height: 250 mm Movement: 210 mm



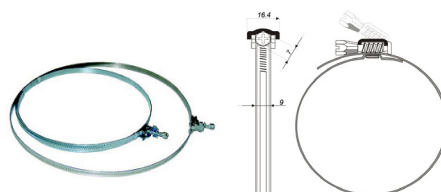
### SINGLE-WIRE CLAMP - CF ACCESS

- Material: galvanised steel
- Width: 2 mm
- Packaging: set of 10 clips in a bag
- Diameter: 80 to 630 mm



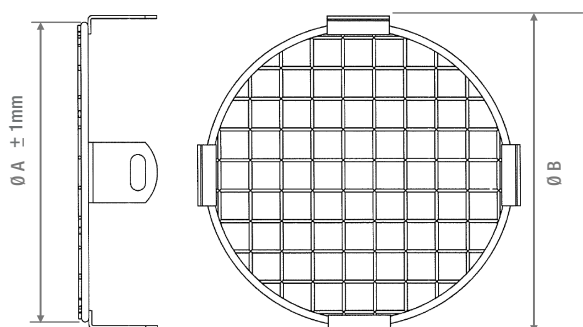
### WORM DRIVE HOSE CLAMPS - BC ACCESS

- Material: galvanised steel, 0.8 mm thick
- Width: 9 mm
- Packaging: set of 2 clips in a bag
- Diameter: 125 to 1250 mm



### PROTECTION LOUVRES - ACCESS GP

- Material: Zinc-plated steel after welding
- Protection louvre: mesh of 12.7 mm x 12.7 mm (+1mm) / wire  $\varnothing$  1.5 mm
- Circle:  $\varnothing$  3 mm
- Mounting: 3 to 6 mounting brackets depending on the diameter
- Diameter from 80 to 1250 mm



# DUCT ACCESSORIES

## ACCESS RANGE

### CONNECTION FLANGES

Connection flanges compliant with the EUROVENT standard or manufactured on request.

Standard raw steel version (ACCESS-BN), galvanised steel (ACCESS-BG), stainless steel 1.4301 (AISI 304) or painted steel.

The oblong holes are set at 45° (ELYT3 patent) in order to facilitate assembly in the event of the mounting holes being off-centered.

Diameter: Ø180 to Ø2000 mm



### PERFORATED BAND - BP ACCESS

Used to suspend HVAC ductworks systems.

Possibility fixing on telescopic support



		Specification	Option
Width		17 mm	25 mm
Material		Galvanised steel	
Ø of holes	Central	6 x 12 mm	8 x 21 mm
	Per side	3 mm	4 mm
Thickness		0.6 mm	0.8 mm
Recommended load (kg)		100	220
Breaking load (kg)		200	440



# A FEW REFERENCES



## Philharmonie de Paris

City: Paris  
Country: France  
Date of the work: 2013



## Museum of Fine Arts

City: Dijon  
Country: France  
Date of the work: 2012



## Mobile Datacenter

Date of the work: 2013



## Logistics Platform - Transalliance

Town: Saint-Georges d'Esperanches  
Country: France  
Date of the work: 2010

# A FEW REFERENCES



## University Hospital Centre Argenteuil

Town: Argenteuil  
Country: France  
Date of the work: 2012

---



## IMEBIO mobile laboratories

Date of the work: 2014

---



## Water treatment plant

Town: Mantes - Rosny  
Country: France  
Date of the work: 2011

---

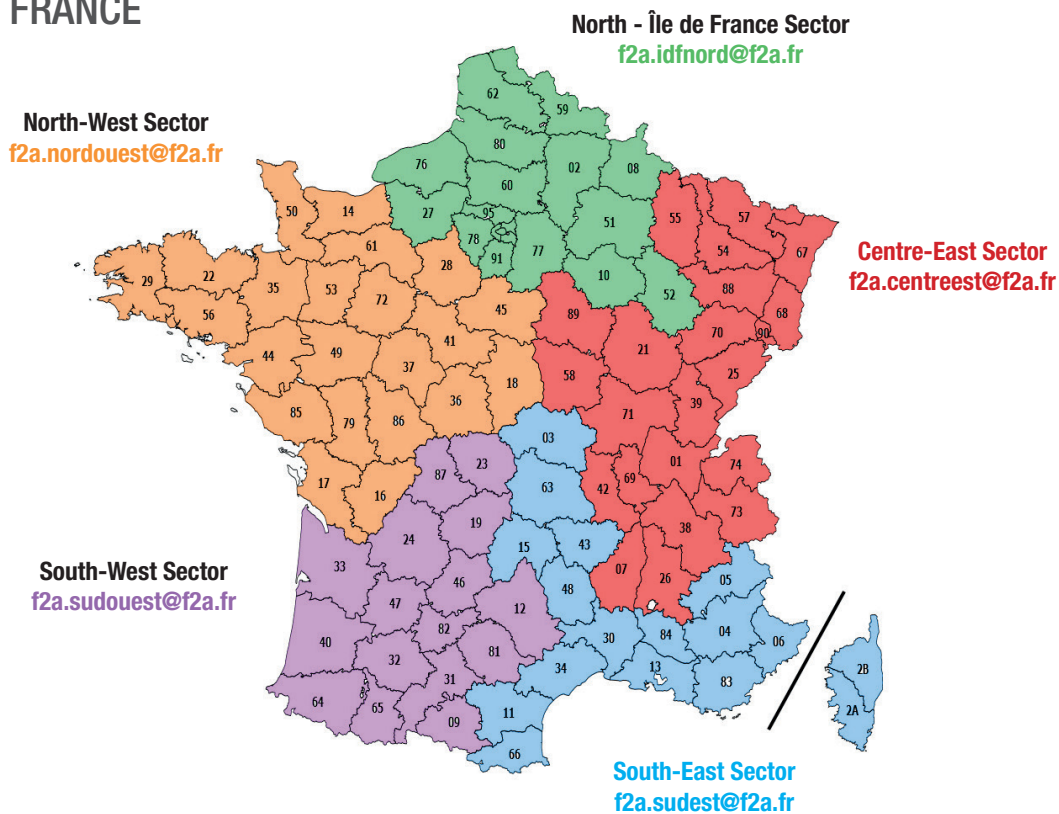


## Vitam'Parc Leisure Centre

Town: Neydens  
Country: France  
Date of the work: 2009

# ORGANISATION

## FRANCE



## EXPORT

e-mail: [export@f2a.fr](mailto:export@f2a.fr)





# **GENERAL TERMS AND CONDITIONS OF SALE**

With effect from 1 May 2016, these General Terms and Conditions of Sale cancel and replace the General Terms and Conditions of Sale notified previously.

## **Article 1 - Applicability**

By placing an order, the Customer fully and unreservedly accepts these General Terms and Conditions of Sale, to the exclusion of any other documents issued by F2A such as technical documents or sheets, which are solely indicative. Unless F2A has accepted it in writing, any contrary, supplementary or other condition imposed by the Customer shall therefore be unenforceable on F2A, regardless of when it may have been informed of it. The fact that F2A does not enforce any one of these General Terms and Conditions of Sale at a given moment shall not be interpreted as a waiver of its right to enforce any of said conditions at a later date.

## **Article 2 - Acceptance of orders**

Unless indicated otherwise, F2A shall send the Customer an offer valid for one (1) month including, *inter alia*, details of the products selected by the Customer, their prices and lead times and these General Terms and Conditions of Sale. Orders are subsequently confirmed when the Customer signs a written order containing the details of the offer. For complex orders, the written order may include a specification to be signed and dated by the Customer by way of acceptance. The written order becomes firm and definitive on acceptance by F2A, subject to the payment of any initial prepayment by the Customer. The order is accepted in favour of the Customer alone, and cannot be transferred without the prior written consent of F2A. As an informed professional, the Customer must ensure that the products it orders conform in every aspect to the requirements of its production facilities, environment and process.

## **Article 3 - Acceptance of orders**

Once an order has been accepted by F2A, the Customer may not ask F2A to change or cancel the order for any reason whatsoever. If it does, other than in cases of force majeure F2A reserves the right to claim damages and, where appropriate, to keep any prepayments already paid as compensation.

## **Article 4 - Prices**

The offer submitted by F2A mentions the prices in force and their validity period in relation to that of the offer, which runs from the date of submission. The prices indicated are net, excluding taxes, and including standard packaging where applicable. Additional charges will be made for specific packaging such as SEI (Syndicat de l'Emballage Industriel) packaging or NIMP15-treated pallets. Unless otherwise indicated in our offers, our prices do not include goods reception costs at the factory, and any document other than our catalogue technical sheets.

Transport terms and conditions are indicated in our offers or in the current fee schedule. They do not constitute a firm offer and are subject to change without notice, especially in the event of a change of economic data.

## **Article 5 - Delivery - Delivery terms**

A delivery is deemed to have been definitively made either:

- When goods are ready for collection in F2A's factories
- By handing over goods directly to the Customer at the factory,
- By releasing the goods to the transporter appointed by the Customer or chosen by F2A's factories.

As risk is transferred on collection of products from F2A's premises, products and packaging are shipped at the Customer's risk. The Customer confirms acceptance of the goods by signing a delivery note and handing it to F2A or its transporter. If the Customer accepts the delivery without reservations it shall have no subsequent recourse against F2A. If the Customer or its transporter postpones or delays collection of the goods, the Customer shall be invoiced for the resulting additional costs, especially for storage.

## **Article 6 - Delivery - Lead times**

F2A undertakes to make the products ordered available as soon as possible. These lead times are indicative and are set out for the Customer in the offer. Under no circumstances shall the

Customer postpone or cancel the order or any other pending order, or claim compensation of any kind whatsoever, if these lead times are not met. In any event, F2A may be released from its obligation to make the goods available as a result of the occurrence of an unforeseeable and unavoidable force majeure event, and shall not be held liable for compensation as a result thereof. No delivery shall be made unless the Customer is up to date with all its obligations vis-à-vis F2A, of any kind whatsoever, and even if they are unconnected with this agreement.

## **Article 7 - Conditions for product returns**

Any product return must be accepted in writing beforehand by F2A. Any goods returned without such agreement shall be held at the disposition and at the risk of the Customer, irrespective of where the goods are stored. Under no circumstances shall a credit note be issued for such returned goods. In this written agreement, F2A shall set out the terms and conditions for returns (original packaging, transport costs, etc.) and shall provide a goods return sheet which must be enclosed with the parcel without fail. An allowance of at least 30% shall be deducted from the original invoice amount to cover handling charges. Reimbursements are subject to strict compliance with the terms and conditions for returns.

## **Article 8 - Contractual warranty**

The goods are guaranteed by F2A against all operational defects resulting from a manufacturing, design or materials fault. Claims against warranty shall be accepted subject to the following conditions:

- F2A must be notified immediately as soon as the defect is discovered, by recorded delivery letter with acknowledgement of receipt,
- F2A shall only replace or merely repair parts that it accepts are defective. The cost of dismantling, reassembling and transporting the equipment shall be for the account of the Customer,
- Equipment must be installed and maintained in accordance with our instructions,



installation guides or recommendations, and in accordance with industry standards and practice,

- The warranty does not cover defects and deterioration caused by wear and tear, accident or third party intervention (modifications, maintenance, use, unsuitable environment, etc.). The warranty is valid for twelve (12) months from the date of invoice.

Moreover, the Customer may not suspend, postpone or cancel its payments in connection with a claim against the warranty.

In the event of an on-site inspection, F2A may claim an attendance fee if its liability is not proven. The warranty shall not be extended if repairs are carried out during the warranty period.

#### **Article 9 - Responsibilities and liability**

In any event, in the case of losses resulting from the full or partial execution or non-execution of the order by F2A, F2A shall not be held liable for direct or indirect losses of any kind whatsoever such as dismantling and assembly costs, the cost of making good coatings or cladding, intangible losses such as unavailability, loss of profit, lost production, loss of earnings or harm to brand image suffered by the Customer and/or third parties. This also excludes losses resulting from a force majeure event or an action by the Customer for which F2A is not liable in any way.

#### **Article 10 - Payments - Terms**

Payment terms are purely indicative on F2A offers and confirmed on our acknowledgements. Unless otherwise indicated in the offer, invoices must be paid in cash on receipt. No discount shall be given for such payments. The minimum invoice amount is EUR 50 excluding taxes.

#### **Article 11 - Payments - Late payment or payment default**

In the event of late payment, pursuant to the legal provisions F2A may decide automatically and without further formality to apply late payment interest of 15% of the unpaid amount. This interest shall run from the original due date until payment is

received in full. A flat rate fee of EUR 40 shall also be charged to cover collection costs. In addition to late payment interest, F2A may also automatically and without further formality cancel the relevant order, suspend any pending orders as well as any previous orders that have not been paid for in full, regardless of whether they have been delivered or are currently being delivered, and whether payment is due or not, without prejudice to any other course of action. In the case of an order to be paid for in instalments, if one instalment remains unpaid after the Customer has been served notice under the conditions set out above, the full debt shall become payable immediately or said order shall be cancelled by F2A automatically and without further formality. In all of the above cases, sums due in connection with other deliveries or for any other reason shall become payable immediately if F2A does not choose to cancel the corresponding orders. The Customer must repay all costs arising from the legal collection of the sums due, including legal costs and fees charged by judicial officers and officers of the court, on presentation of the corresponding receipts. Under no circumstances can payments be suspended, or netted in any way, without the prior written consent of F2A. If the Customer's credit score is downgraded, F2A may demand guarantees or a payment in cash before executing the orders received.

#### **Article 12 – Retention of title**

Title to the products sold under this agreement shall pass to the Customer only after the price has been paid in full. The delivery of an instrument comprising an obligation to pay (draft, etc.) shall not constitute a payment under this clause. If the Customer defaults on any of its due payments, F2A may claim back the goods.

#### **Article 13 - Product compatibility**

The Customer confirms that it has received from F2A all the information it requires to choose equipment that is perfectly suited to its environment and requirements, and that it has provided F2A with full, accurate information as

regards the plans, measurements, distances, specific characteristics, specific environment and other essential information required by F2A. The Customer thus confirms that it has chosen its equipment in full knowledge of the facts.

#### **Article 14 – Miscellaneous information**

All the information relating to the use, maintenance and installation of the equipment appears in the package inserts supplied with the equipment by F2A. If a package insert is missing or the Customer is unable to understand it, the Customer is strongly advised to contact F2A's staff and not to handle the equipment on its own initiative under any circumstances without the advice or involvement of a professional.

#### **Article 15 – Intellectual property**

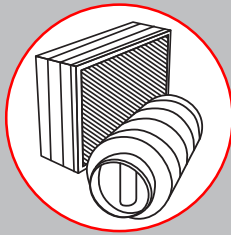
Any document issued such as technical documentation, price offers, technical specifications or fee schedules, technology or know-how incorporated in existing or future products, whether patented or not, as well as any information sent to the Customer by F2A, is and shall remain the exclusive property of F2A. Accordingly, the Customer shall refrain from reproducing such items or disclosing them to third parties, and undertakes to use them only for the operating and maintenance requirements of the site for which the products were sold.

#### **Article 16 – Jurisdiction and governing law**

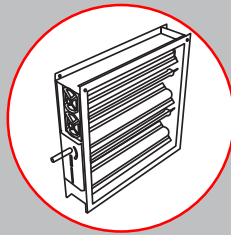
These General Terms and Conditions of Sale are governed by French law. The Parties shall endeavour to settle amicably any dispute arising in connection with the interpretation, performance or termination of this and any subsequent agreements. If the dispute cannot be settled amicably, the parties shall refer it to the Bourg en Bresse Commercial Court (Tribunal de Commerce de Bourg en Bresse).



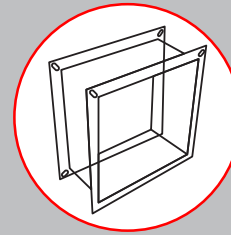
**Manufacturer**  
Air handling components



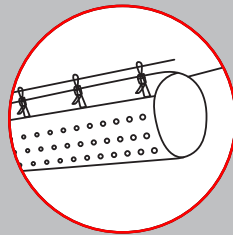
**Acoustics**



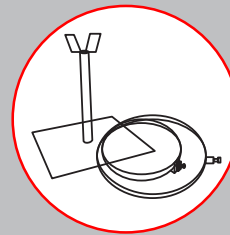
**Air Control**



**Flexible connection**



**Textile duct**



**Mounting components**

**DISCOVER OUR EXPERTISE IN  
THE COMMERCIAL MARKET**



70 Impasse des Barmettes – Parc d'activités des 2B  
01360 BÉLIGNEUX – France  
Tel +33 (0)4 78 06 54 72 – Fax +33 (0)4 78 06 53 45  
export@f2a.fr

[www.f2a.fr](http://www.f2a.fr)