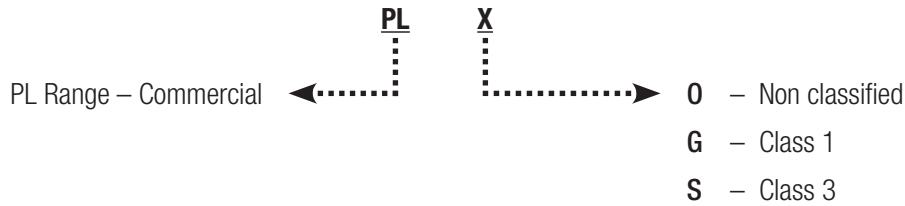


COMMERCIAL DAMPER


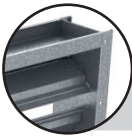


PL RANGE - LARGE SIZES

The commercial dampers type PL are designed to control or shut-off HVAC ductworks. The PL range is suitable for large-sized ventilation networks (up to 2 000 x 1 950 mm).

CODIFICATION



CONSTRUCTION

	Control		Frame
Manual	Smooth shaft Ø16 - Length 80mm Lever and manual blocking <i>In option: reinforced blocking lever</i>		Width: 160 mm <i>Option: 110 mm (JPL type)</i>
Motorised	Smooth shaft Ø16 - Length 130mm <i>In option: actuators supplied on request</i>		Galvanized steel Z275, thickness 1.2mm <i>In option: stainless steel AISI 304L - 1.4307, AISI 316L - 1.4404, painted steel (standard RAL) or aluminium</i>
			Drilling Ø10 mm in each angle <i>In option: standard drilling F2A with a pitch of 150 mm (read FT 2.4.5) or special drilling</i>
			Flanges: 40 mm <i>In option: 30 mm</i>
			
			Blades
			Galvanized steel Z275, thickness 2 x 0.7mm <i>In option: stainless steel AISI 304L - 1.4307, AISI 316L - 1.4404, painted steel (standard RAL) or aluminium</i>
			Pitch: 150mm
			Nylon bearings <i>In option: PTFE, bronze or ball bearings</i>
			Zinc-coated steel shaft Ø12 mm <i>In option: stainless steel AISI 304L - 1.4307, AISI 316L - 1.4404</i>
	Linkage		
	Linkage in zinc-coated steel Opposed blade operation <i>In option: Stainless steel AISI 304L - 1.4307 or AISI 316L - 1.4404. Parallel blade operation</i>		

COMMERCIAL DAMPER

PL RANGE - LARGE SIZES

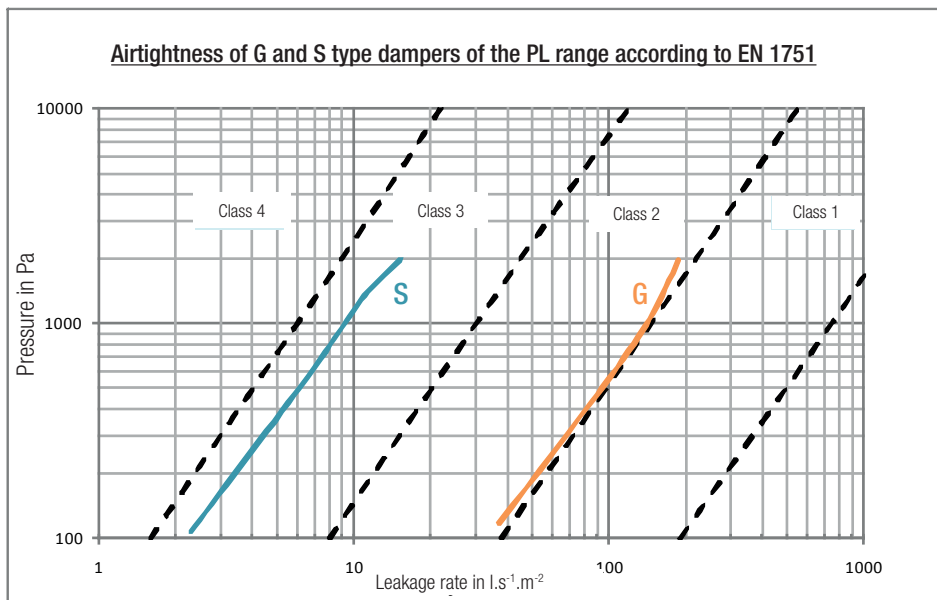
PERFORMANCES

	Volume control PLO	Anti-frost PLG	Shut-off PLS
Seals	None	Lateral stainless steel seals Top and bottom L shaped profiles	Lateral stainless steel seals Top and bottom L shaped profiles EPDM seals on the blades
Blade's airtightness	Non classified	Class 1 (EN 1751)	Class 3 (EN 1751)
Frame's airtightness	Class A (EN 1751) <i>In option: class C</i>		
Acceptable pressure	2 000 Pa for a length L of 1m (1 500 Pa for aluminium version)		
Air velocity	15 m/s max.		
Operating temperature	From -20°C to +80°C <i>In option: +200°C</i>		
Options	Subframe to seal / Assembly with louvre / Coupling of two dampers		

Blade's airtightness

The different dampers of the PL range have been tested according to EN 1751 standard in an independant laboratory (CETIAT, France).

The following graph represents the test results carried out with a 1 000 x 1 000 mm damper.



Information and data can not be considered as contractual. Design and data changes may occur without notice during F2A's continuous product development.

COMMERCIAL DAMPER

PL RANGE - LARGE SIZES

2.1.2.B

VOLUME CONTROL

DIMENSIONS

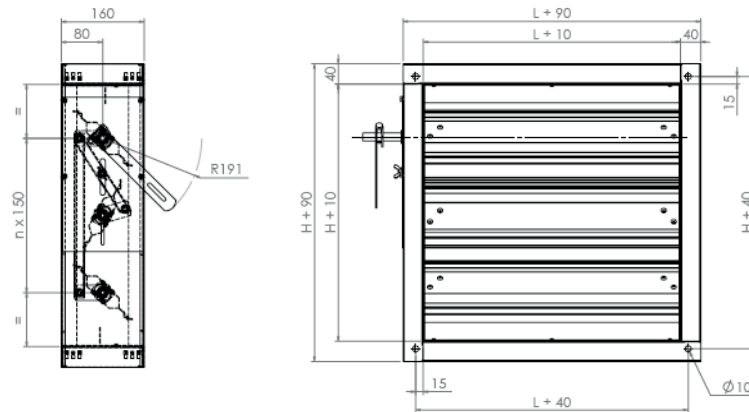
- Height H from 150 to 1950 mm with a pitch of 150 mm
- Length L from 200 to 2000 mm with a pitch of 100 mm

Note: effective sizes H+10 x L+10

In option: other dimensions on request.

Damper in two parts according to pressure constraints.

Circular transformation up to Ø1250.



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 version damper.

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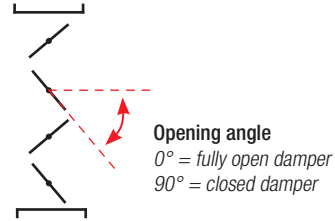
COMMERCIAL DAMPER

PL RANGE - LARGE SIZES

PRESSURE LOSSES (Pa)

The following pressure losses (Pa) are given according to the blades opening angle (in °) and air velocity (in m/s). Damper type PLO equipped with linkage, opposed blade operation.

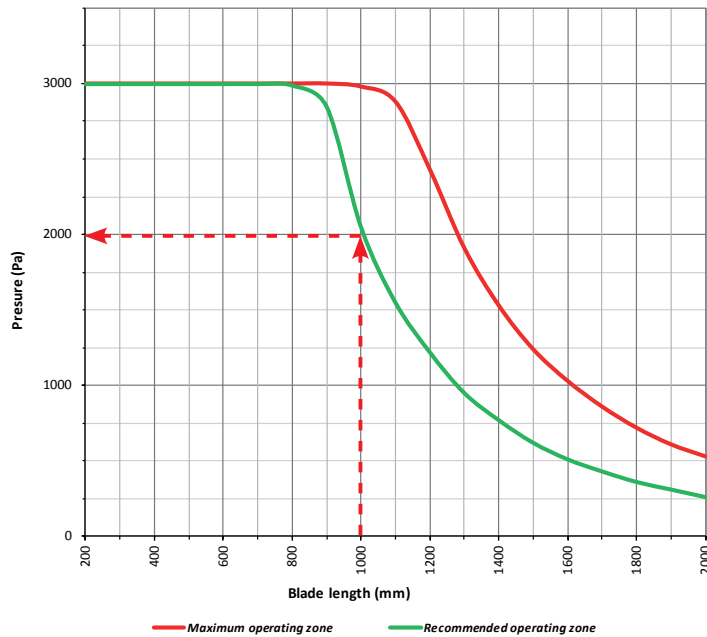
Air velocity (m/s)	Opening angle		
	0°	30°	60°
2	< 5	5	70
4	< 5	25	245
6	6	55	570
8	10	100	
10	20	150	
12	25	215	
15	40	335	



USE LIMITS

They correspond to the difference between the upstream and downstream pressure that dampers of the PL range can withstand in closed position according to the blade length.

Galvanized steel version



We recommend that the differential pressure does not exceed 2000Pa for a 1000-mm long PL damper in galvanized steel. Beyond the limitation use, construction is possible with intermediate backing.

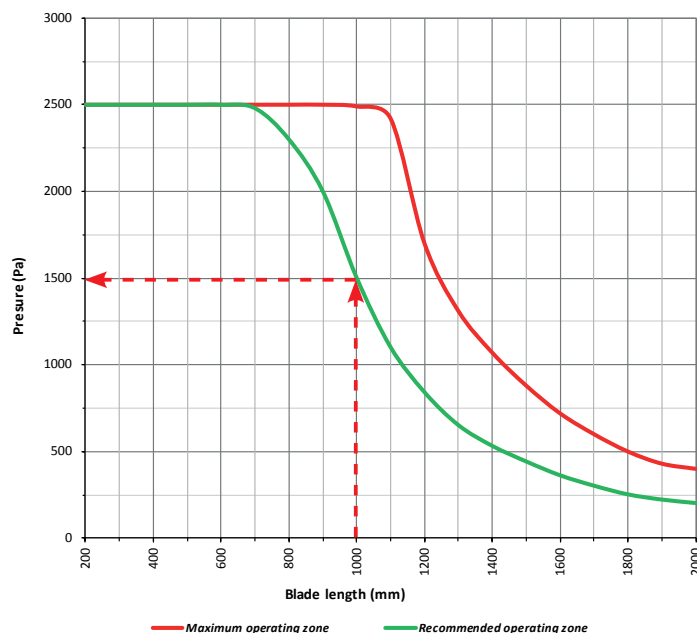
COMMERCIAL DAMPER

PL RANGE - LARGE SIZES

2.1.2.B

VOLUME CONTROL

Aluminium version



We recommend that the differential pressure does not exceed 1500Pa for a 1000-mm long PL damper in aluminium. Beyond the limitation use, construction is possible with intermediate backing.

REGENERATED NOISE

The acoustic performances of our dampers have been tested in an independent laboratory (CTTM) according to ISO 7235:2009 standard.

Air flow noise L_w in dB (blades opening angle 30°)

- Damper type PL (opposed blade operation):



Air velocity (m/s)	Fréquence (Hz)								
	63	125	250	500	1000	2000	4000	8000	Global
2	34.5	37.2	39.4	33.4	27.6	26.7	34.5	38.8	44.8
4	41.2	46.9	48.1	50.2	48.3	41.2	35.5	38.9	55.1
6	52.1	53.1	52.8	55.5	55.1	50.2	42.8	39.4	61.4
8	60.0	59.9	60.9	62.6	63.4	59.9	53.3	44.8	69.3
10	67.4	68.5	65.5	66.5	68.1	65.2	59.6	51.4	75.0
12	72.1	75.6	69.3	70.3	72.3	69.6	64.7	57.3	80.0
15	77.6	78.2	73.3	77.0	76.8	75.5	70.6	63.8	84.7

Data are given for a damper 450 x 500 mm.

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COMMERCIAL DAMPER

PL RANGE - LARGE SIZES

REGENERATED NOISE

From the data in the previous table, you can calculate the regenerated noise of a damper of different dimensions by applying the formula below for every frequency band:

$$Lw_{63} = x_{63} + 10 \log \left(\frac{S}{0.225} \right)$$

x_{63} = Air flow noise for a damper 450 x 500 mm at 63 Hz (in dB) for a given air velocity => read the data in the table
 S = Damper section (in m²).

Lw_{63} = Air flow noise required at 63 Hz (in dB) for a given air velocity.

Example – Calculation of regenerated noise for a damper PL 1050 x 1000 mm (HxL)

- Damper section : $S = 1.05 \times 1 = 1.05 \text{ m}^2$

Calculation of the regenerated noise at 63Hz for an air velocity of 4 m/s:

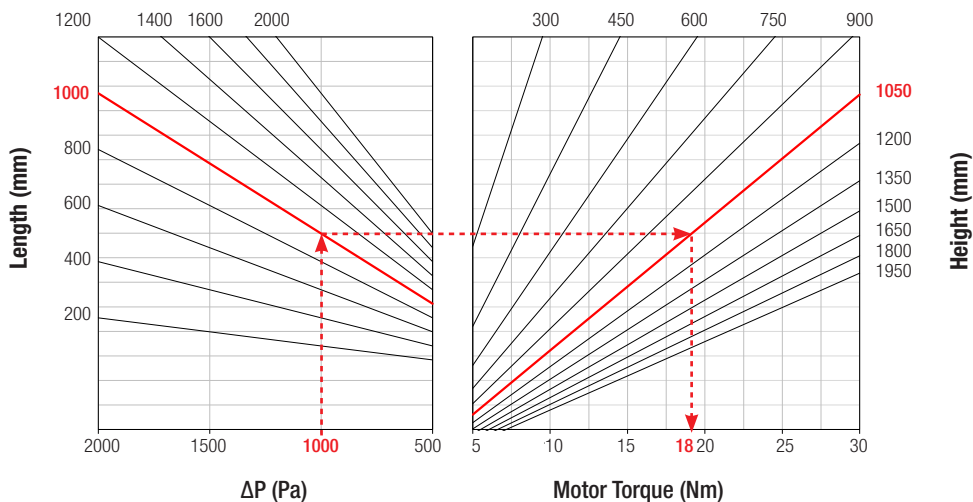
$$Lw_{63} = 41.2 + 10 \log \left(\frac{1.05}{0.225} \right) = 47.9 \text{ dB}$$

Value in the table at a frequency of 63Hz
and for an air velocity of 4 m/s.

Repeat this calculation rules to get the regenerated noise for all frequencies (63Hz - 8kHz).

MOTOR TORQUES

The following torques are given in Nm for a volume control damper type PLO under different pressures. A coefficient of 1,3 must be applied to the mentioned data for an anti-frost damper shut-off damper.



Example :

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

Damper PLO – $L = 1000 \text{ mm} \times H = 1050 \text{ mm} \Rightarrow$ motor torque = **18 Nm**