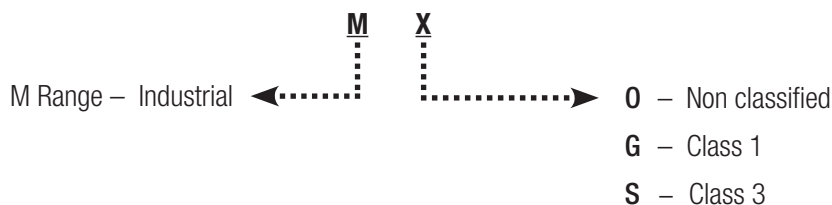


INDUSTRIAL DAMPER

M RANGE

M range dampers are reinforced and allow to shut-off or control the air volume of HVAC ductworks.
M dampers can withstand industrial constraints: high pressure (3000 Pa) and temperature (+200°C in option).

CODIFICATION



CONSTRUCTION

<p>Control</p> <p>Manual: smooth shaft Ø16 - length 70 mm Lever and blocking device <i>Option : reinforced blocking lever</i></p> <p>Motorised : Smooth shaft Ø16 - length 120 mm <i>In option : actuators supplied on request</i></p>	<p>Frame</p> <p>Width: 185 mm Thickness: 2.0 mm Galvanized steel Z275 <i>In option: stainless steel AISI 304L -AISI 316L, painted steel (standard RAL) or aluminium</i></p> <p>Drilling Ø10 mm in each angle <i>In option : standard drilling F2A with a pitch of 165 mm (read FT 2.4.5), special drilling</i></p> <p>Flanges: 50 mm</p>
<p>Linkage</p> <p>Linkage with opposed blade operation <i>In option: Stainless steel AISI 304L or AISI 316L</i> Parallel blade operation</p>	<p>Blades</p> <p>Galvanized steel - Thickness 2 x 0.8mm <i>In option: stainless steel AISI 304L AISI 316L, painted steel (standard RAL) or aluminium</i> Profiled and reinforced blades for L ≥ 1 600 mm</p> <p>Pitch: 165mm</p> <p>Nylon bearings <i>In option: PTFE, bronze or ball bearings</i></p> <p>Zinc-coated steel shafts Ø12 mm <i>In option: stainless steel AISI 304L or AISI 316L</i></p>

PERFORMANCES

	Volume Control MO	Antifrost MG	Shut-off MS
Seals	EPDM gaskets high and low	Stainless steel lateral gaskets	Stainless steel lateral gaskets EPDM gaskets on the blades
Upstream-downstream airtightness (EN 1751)	Non classified	Class 1	Class 3
Frame's airtightness (EN 1751)	Class A <i>In option: class C</i>		
Acceptable pressure	3 000 Pa for a length of 1m		
Maximum velocity	15 m / s max		
Operating temperature	From -20°C to +80°C <i>In option: from - 30°C to + 200°C (bronze bearings+ silicone gaskets)</i>		

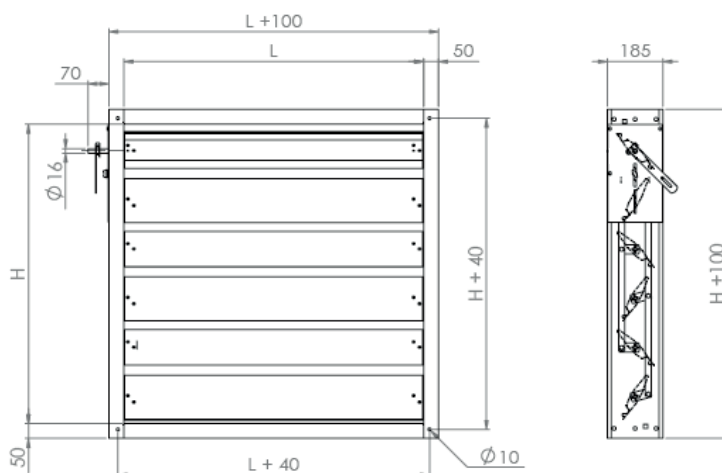
INDUSTRIAL DAMPER

M RANGE

DIMENSIONS

- Height H from 180 to 2325 mm with a pitch of 165 mm
- Length L from 200 to 2500 mm with a pitch of 100 mm

Other dimension on request



In options:

Circular transformation up to $\Phi 1250$.

Mounted with weather louvre / Can be coupled with other dampers / Actuators in the air flow.

WEIGHT (kg)

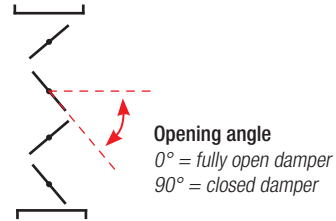
H \ L	200	400	600	800	1000	1200	1400	1600	2000	2500
180	13	17	21	25	28	32	36	40	47	56
510	21	27	32	38	43	48	54	59	70	84
840	30	37	44	51	58	65	72	80	94	112
1170	38	47	56	65	73	82	91	100	117	140
1500	46	57	67	78	88	99	110	120	141	167
1830	55	67	79	91	104	116	128	140	165	195
2160	63	77	91	105	119	133	147	161	188	223
2325	67	82	97	112	126	141	156	171	200	237

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

PRESSURE LOSSES (Pa)

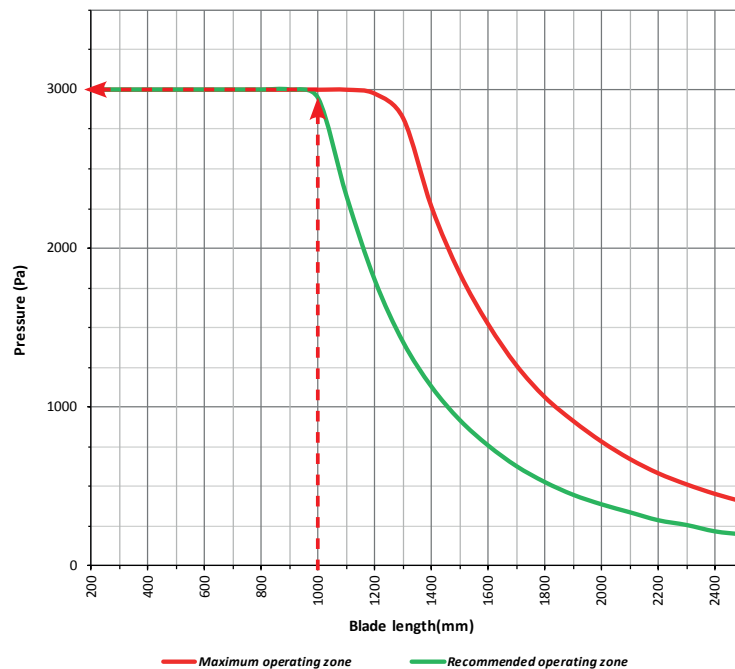
The following pressure losses (Pa) are given according to the blades opening angle (in °) and air velocity (in m/s). Damper type MO equipped with linkage, opposed blade operation.

Air velocity (m/s)	Opening angle		
	0°	30°	60°
2	< 5	10	175
4	< 5	35	630
6	< 5	75	
8	10	135	
10	15	210	
12	20	305	
15	30	485	



USE LIMITS (Galvanized steel damper)

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



We recommend that the differential pressure does not exceed 3000Pa for a 1000-mm long M damper in galvanized steel. Beyond the limitation use, construction is possible with intermediate backing.

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

INDUSTRIAL DAMPER

M RANGE

REGENERATED NOISE (dB)

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 MO (opposed blade operation):

Air velocity (m/s)	Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	Overall
2	33.5	37.8	39.0	40.7	32.2	27.2	34.8	39.0	46.1
4	42.9	46.1	48.8	56.1	53.4	47.3	38.3	39.1	59.2
6	53.7	53.0	54.0	62.0	62.3	58.7	50.9	42.2	66.9
8	65.3	61.2	59.2	66.5	68.0	66.2	59.8	50.4	73.4
10	74.3	70.1	63.8	70.1	72.3	71.6	66.2	57.6	79.3
12	78.7	77.4	68.1	73.4	75.9	76.2	71.3	63.3	84.0
15	81.9	83.4	76.0	77.8	80.4	82.0	77.8	70.5	89.1

Data are given for a damper 500 x 500 mm.

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

$$L_{w_{63}} = x_{63} + 10 \log \left(\frac{S}{0.25} \right)$$

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

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

Example – Calculation of regenerated noise for a damper MO 1200 x 1500 mm (HxL)

- Damper section: $S = 1.2 \times 1.5 = 1.8 \text{ m}^2$

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

$$L_{w_{63}} = 42.9 + 10 \log \left(\frac{1.8}{0.25} \right) = 51.5 \text{ dB}$$

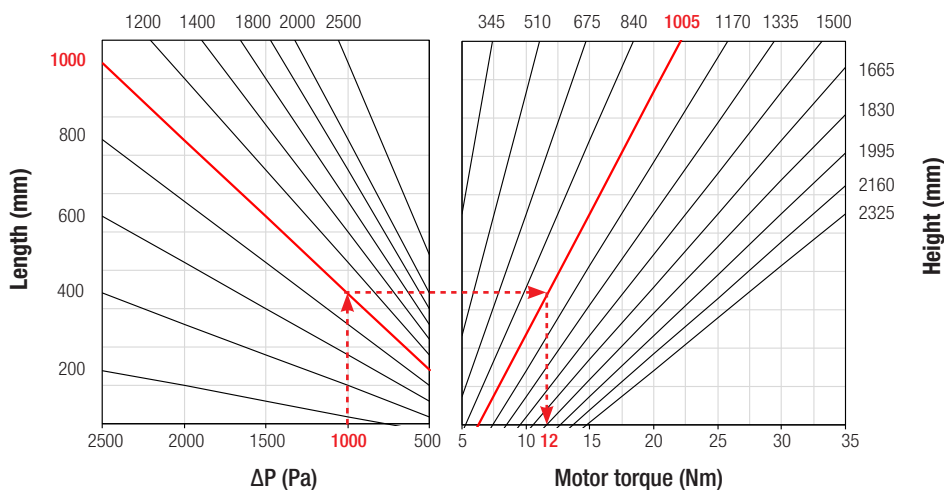
Value in the table at a frequency of 63Hz
and for an air velocity of 4 m/s.

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 MO according to pressure differences and damper's dimensions.

A coefficient of 1,3 must be applied to the mentioned data for an anti-frost damper (MG) or a shut-off damper (MS).



Coefficient to apply on the result for a damper with intermediate backing = 1.5

Example:

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

Damper MO – L = 1000 mm x H = 1005 mm => Motor torque = **12 Nm**