February-2021-DYB

DAMPER

DONG YANG AIR-CONDITIONING Co., Ltd.

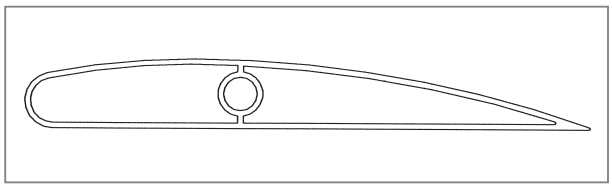
APPLICATION

- For Protection of Reverse Rotation of Blowers installed in Parallel
- For Protection of Reverse Air Flow in Heavy Duty System

FEATURES OF DYB

- Airfoil Shaped Blade

  Airfoil blade shaped like aircraft blade apparently reduces the pressure drop and sound level across the damper.



- Balance Weight installed in Airfoil Blade

  This gives simple structure and no change of weight balancing during and after installation.

- Smooth Opening

  Good balancing gives smooth operation when it opens and closes.

- Good Persistence by Using Anti-corrosive Materials

  Stainless steel and anodized aluminum materials only are used to give good operation and to prevent corrosion after time elapsed.

- Air Performance and Leakage Rate AMCA Licensed

  Ratings of leakage and pressure drop shown results from the tests based on AMCA Publication 511.

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- Use Temperature 120℃

  (For higher temperature, please contact us.)

- Max. Pressure

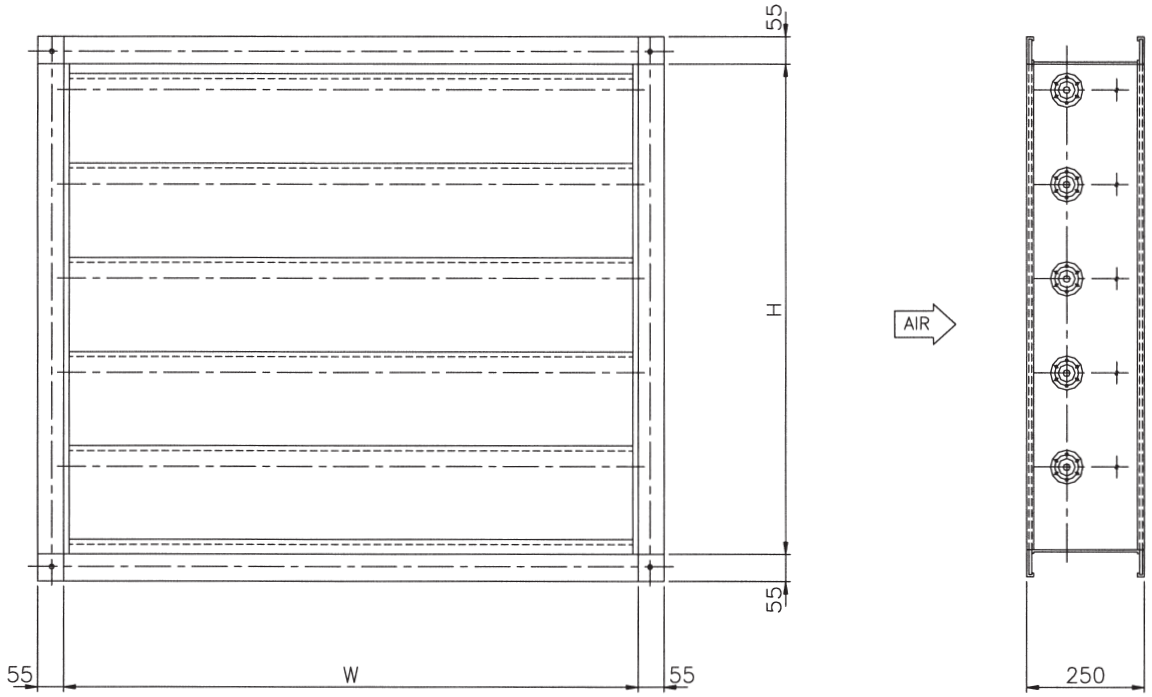
  250mmAq when damper shut-off

  (For higher pressure, please contact us.)

STANDARD CONSTRUCTION

Frame	Channel shaped extruded aluminum
Blade	Double skin airfoil shaped extruded aluminum
Shaft	Brass bar
Bearing	Ball bearing or sleeve bearing
Corner Piece	Aluminum
Finish	Anodized aluminum

STANDARD DIMENSIONS



∘ 55mm frame height for flange is a standard.

■ Standard Manufacturing Size

Description	Standard Dimensions	Max. Size	Min. Size
Height (H)	190 × Number of Blade + 30	2,500mm	600mm
Width (W)	600mm ~ 1,397mm	1,397mm	600mm

∘ Maximum size of this damper is 1,397W×2,500H and minimum size is 600W×600H.
∘ Two or more dampers are assembled on the job site for dampers larger than the standard size.
For larger dampers than upper standard size, please contact us.

■ Standard Height per Number of Blades (H mm)

No. of Blade	3	4	5	6	7	8	9	10	11	12	13
Height (H)	600	790	980	1,170	1,360	1,550	1,740	1,930	2,120	2,310	2,500

∘ For non-standard height, we use one or two smaller blade(s) to avoid big air blockage.

■ Operation of Back Draft Damper

Blades of back draft damper should be opened by small pressure in air flow direction and be closed by the weight of blade itself or additional weight without external force when the pressure is removed or back pressure is added. DYB model of Dongyang has balance weight in blade itself. So there is no extrudes inside and outside of the damper. And the reliability of maintaining balancing is better than the exterior linkage weight type damper that the balancing may be destroyed by the big back pressure during the long period operation.

PRESSURE DROP OF DYB (TEST OF CHAMBER TYPE)

■ Articles Related to the Test

- Test Standard — AMCA Standard 500
- Test Set-up — Figure 5.5
- Air Flow Measurement — Figure 6.5
- Temperature when Testing — 0℃ ~ 49℃
- Tested Damper Size — 610×610
- Air Flow Test Mode — Intake mode

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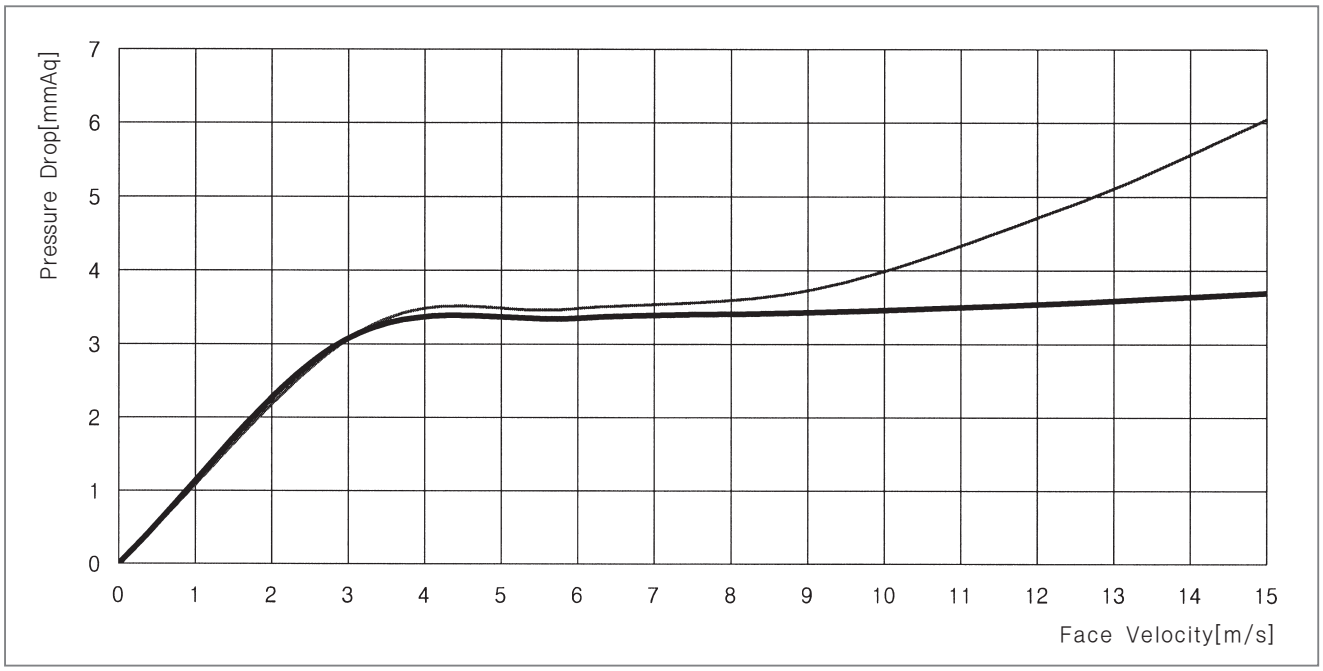
■ The Trend of Pressure Drop Across the Damper

- Dampers with higher face velocity have bigger pressure drop.
- Dampers with larger face area at a certain velocity have smaller pressure drop.
- Bigger difference between width and height makes bigger pressure drop in the dampers with same face velocity and area.
- Rapid increase in pressure drop results from the initial pressure to open the blades.

PRESSURE DROP OF DYB (TEST OF DUCT TYPE)

■ Articles Related to the Test

- Test Standard — AMCA Standard 500
- Test Set-up — Figure 5.3
- Air Flow Measurement — Figure 6.5
- Temperature when Testing — 0℃ ~ 49℃
- Tested Damper Size — 305×305, 305×1,220, 610×610, 914×914, 1,220×305 (5 sets)
- Air Flow Test Mode — Intake mode



○ How to use the chart

1. Read ratings on the **thick line** for the dampers of 914mm or higher.
2. Read ratings on the thin line for the smaller height dampers than 914mm.

■ The Trend of Pressure Drop Across the Damper

○ Dampers with higher face velocity have bigger pressure drop.

○ Dampers with larger face area at a certain velocity have smaller pressure drop.

○ Bigger difference between width and height makes bigger pressure drop in the dampers with same face velocity and area.

○ Rapid increase in pressure drop results from the initial pressure to open the blades.

LEAKAGE PERFORMANCE OF DYB

■ Articles Related to the Test

- Test Standard : AMCA Standard 500
- Test Set-up : Figure 5.5
- Air Flow Measurement : Figure 6.5
- Temp. when Testing : 0℃ ~ 49℃
- Tested Damper Size : 610×2540, 1397×610, 1397×2540 (3 sets)
- Ratings Selected : Maximum value of two times

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■ Leakage Rate

(The AMCA Certified Ratings Seal applies to the following leakage values for the Back Draft Dampers.)

ㅇ How to calculate of leakage rate.

Read leakage rate on Table A at 25mmAq static pressure and appropriate size. For higher pressure multiply leakage at 25mmAq by correction factor on Table B for pressure and appropriate width. (Interpolation may be used for the values between two columns.)

Table A. Leakage Rate at 25mmAq Pressure Difference across the Damper [CMM]

Damper Width[mm]	Damper Height [mm]										
	600	790	980	1,170	1,360	1,550	1,740	1,930	2,120	2,310	2,500
610	1.92	2.07	2.35	2.59	2.83	3.07	3.30	3.51	3.64	3.81	4.38
800	2.10	2.30	2.63	2.93	3.21	3.51	3.79	4.02	4.20	4.44	5.13
900	2.19	2.41	2.76	3.10	3.40	3.73	4.04	4.30	4.50	4.77	5.53
1,000	2.28	2.52	2.89	3.27	3.59	3.95	4.29	4.58	4.80	5.10	5.92
1,100	2.34	2.63	3.02	3.44	3.78	4.17	4.54	4.86	5.10	5.43	6.32
1,220	2.42	2.76	3.18	3.65	4.03	4.44	4.84	5.20	5.47	5.83	6.79
1,300	2.46	2.85	3.28	3.78	4.18	4.61	5.04	5.42	5.70	6.08	7.11
1,397	3.21	3.64	4.07	4.50	4.92	5.35	5.78	6.21	6.64	7.06	7.49

Table B. Correction Factor

Damper Width[mm]	Pressure Difference across the Damper [mmAq]								
	25	50	60	75	90	100	125	150	175
610	1.000	1.509	1.603	1.803	1.979	2.097	2.398	2.549	2.699
800	1.000	1.536	1.622	1.822	1.998	2.116	2.505	2.699	2.893
900	1.000	1.550	1.632	1.832	2.008	2.126	2.561	2.778	2.996
1,000	1.000	1.564	1.642	1.842	2.018	2.136	2.617	2.857	3.098
1,100	1.000	1.577	1.652	1.852	2.028	2.146	2.673	2.937	3.200
1,220	1.000	1.594	1.664	1.864	2.040	2.158	2.740	3.032	3.323
1,300	1.000	1.605	1.672	1.872	2.048	2.166	2.785	3.095	3.405
1,397	1.000	1.619	1.681	1.881	2.057	2.260	2.882	3.193	3.504

※ Air volumes are based on the density of 1.2Kg/㎥.

ㅇ Example of leakage calculation : Leakage of 1300W×1360H damper at 100mmAq pressure difference ?

Find 4.18CMM in Table A and multiply this by correction factor 2.166 in Table B.

Then Leakage rate of this damper becomes 9.05CMM at 100mmAq static pressure difference.