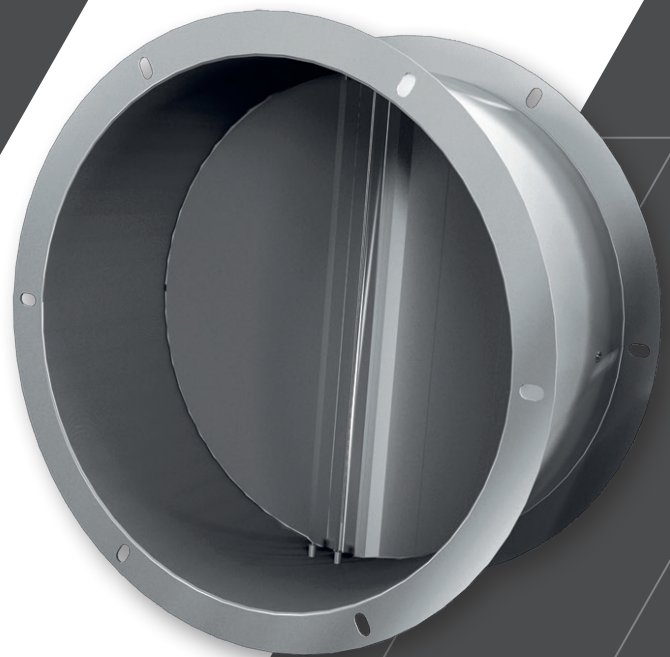




AIR OPERATED DAMPERS FOR AXIAL FLOW FANS

Selection & Installation Guidance



Air Operated Dampers for Axial Flow Fans - Selection guidance

Resistance Loss Factors

The pressure loss due to the presence of a damper, when it is located downstream of a fan, either with or without discharge duct, can be determined by multiplying the fan dynamic pressure by a K factor.

Where the fan diameter is less than or equal to 1250mm, a K factor value of 0.5 should be applied. This relates to fans tested in accordance with 1S05801, for type B and D installation measurement categories. For all other product variants, a K factor value of 1.0 should be applied.

Minimum Opening Velocities

Horizontal Air Flow

A mean air velocity of 7 m/s is required to fully open the dampers when there is no discharge duct. Satisfactory performance can still be obtained when the damper blades are partially opened, even when the mean velocity is 4 m/s, but some 'chattering' of the damper blades may occur.

Where the air velocity is low, the presence of a straight, unobstructed discharge duct will modify the airflow pattern, so that a mean air velocity of 4 m/s will then fully open the damper blades.

Vertical Air Flow

A mean air velocity of 10 m/s is required to fully open the dampers.

Air Leakage

Leakage through air operated dampers in the closed position can be calculated from the following:

$$Q_L = K_L \times \Delta P^{1/2}$$

Where Q_L is the air leakage volume flow (m^3/s), ΔP is the static pressure difference (kPa) across the damper and K_L is the leakage factor shown in the following table:

Dia (mm)	315	355	400	450	500	560	630	710	800	900	1000	1250	1400	1600
K_L	0.16	0.18	0.20	0.23	0.26	0.29	0.33	0.39	0.45	0.53	0.62	0.90	1.10	1.30

Air Operated Dampers for Axial Flow Fans - Fitting/Installation guidance

Dampers are used in applications to provide a non-return or backdraught suppressing function. An example would be where two fans are mounted in parallel as a 'duty/stand-by arrangement' with a non-return damper fitted to each uni-directional Axial flow fan.

Where dampers are required, we offer devices that are of an 'air operated' design, which do not rely on controls or actuator motors, but are instead designed so that their damper blades will open under the influence of the air flowing through them. Damper blades are arranged to close under gravity when airflow in the forward direction ceases.

Horizontal Airflow

- Where airflow is horizontal and the fan is floor [or structure] mounted via our mounting feet and anti-vibration mounts, then to ensure correct operation, the damper blade bearing axis should be vertical. See Fig 1 and Fig 2.
- If the damper blade bearing axis is significantly angled away from the vertical, then this is likely to cause one or both damper blades to remain open or closed, regardless of airflow. Normal operation of the damper would therefore be adversely impacted.
- Where air operated dampers are small in size (i.e. 1000mm in diameter or less), it is normally possible to attach the damper flange directly to the fan flange, using suitable fixings (nuts, bolts and washers). If in doubt, please seek advice.
- If there is a particular concern related to the support of an air operated damper which has been attached directly to the fan flange, then an additional mounting foot and associated anti-vibration mounts should be used to support the end of the damper which is furthest away from the fan.
- Where the air operated damper is larger than 1000mm in diameter, then the damper should be suitably supported and mounted on appropriately sized antivibration mounts. Where necessary, if the damper is not attached directly to the fan, it should be securely supported. See Fig. 3

Vertical Airflow

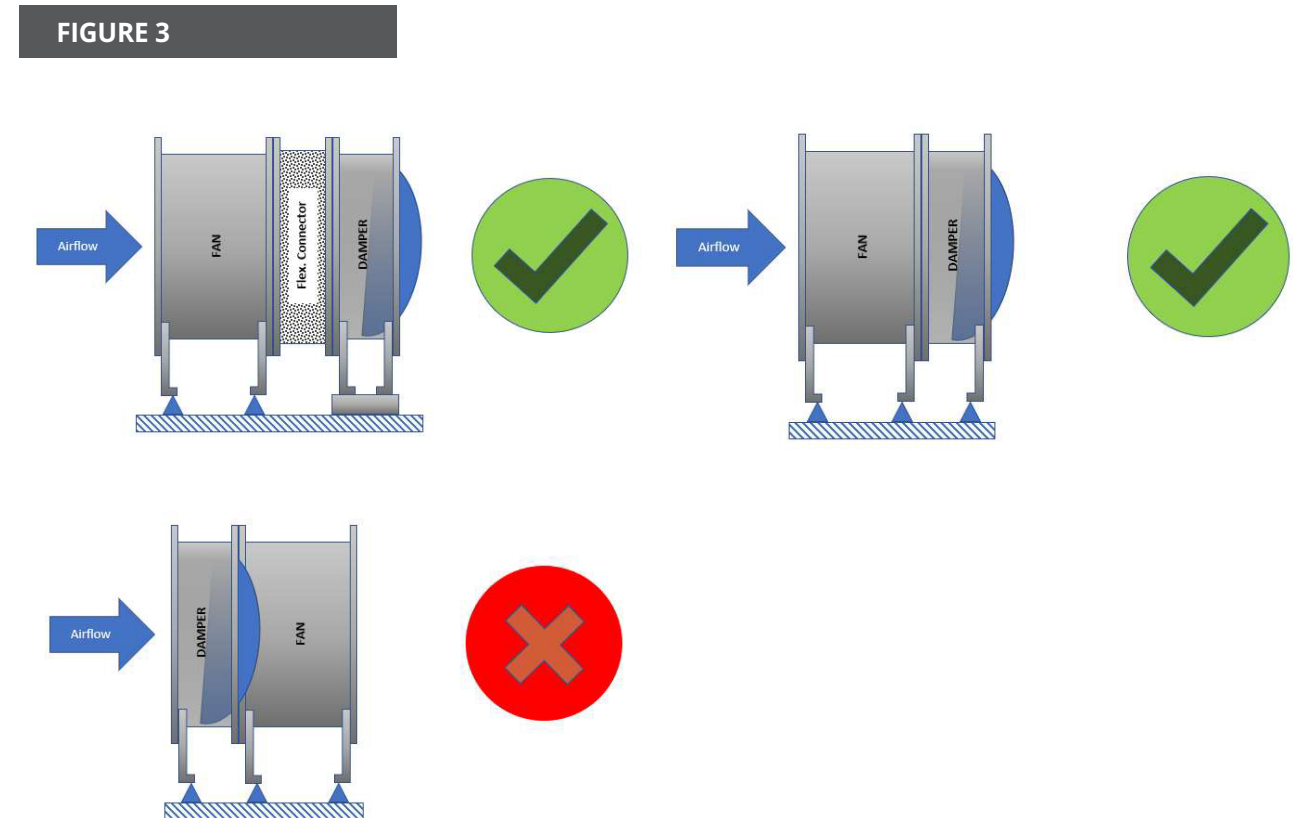
- Where the airflow through the air operated damper unit is vertical, the damper should have counter weights fitted to ensure correct blade operation [these are available at an extra cost for customer installation).
- Where air operated dampers are small in size [i.e. 1000mm in diameter or smaller], it is possible to bolt the damper flange directly to the fan flange, using suitable fixings. As this additional weight could affect the overall fan mounting arrangement, please seek advice.
- Where the air operated damper is larger than 1000mm in diameter, then the damper should be suitably supported and mounted on appropriately sized antivibration mounts. Where necessary, if the damper is not bolted directly to the fan, it should be securely supported.

General Advice

- Our preferred mounting (positioning) arrangement is to fit the air operated damper downstream of the fan.
- It is not advisable to position an air operated damper directly upstream of the fan inlet. If however an installation requires this, there should be a spacer duct between the damper and the fan, which is at least 2D in length. The damper should never be bolted directly to the fan on the inlet or suction side.
- We do not recommend the fitting of an air operated damper directly upstream of a form B fan, where the air inlet is into the impeller end of the fan. This will result in a performance reduction and an increase in operating noise levels.
- Please note that damper blades fitted to some product variants protrude from the end of the damper casing. This is especially important, if the damper is fitted directly upstream of the fan inlet. If installed in this manner, this could result in damage to the damper or the fan.
- If mounting the damper separately from the fan (i.e. on the downstream side), then please ensure that the flexible connector is fitted correctly to ensure that it is not too stretched or too loose, as this could cause damage to the flexible connector, or an obstruction in the airstream which could affect fan performance.
- Air Operated dampers should not be fitted to reversible fans.

Air Operated Damper installation arrangements

NOTE: Our recommended installation method is to have the damper downstream of the fan



Advice for installations where air is flowing vertically, is similar to that shown above.

Air Operated Dampers - Pivot Adjustment

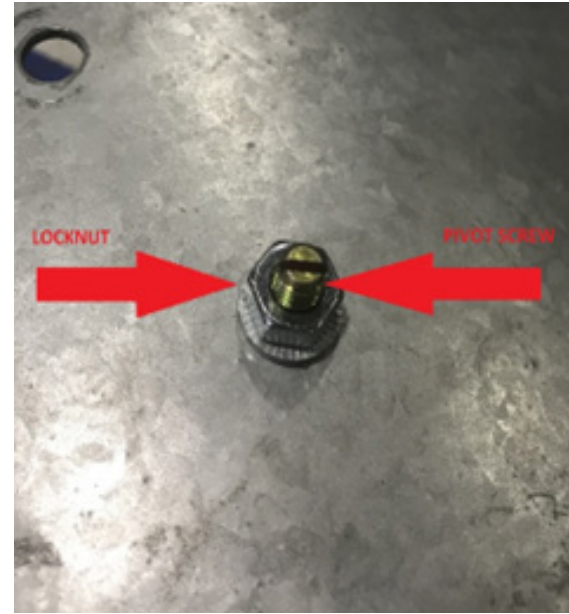
The pivots of the air operated dampers can be adjusted to allow for the correct gap in the blades both at the top and bottom. The pivot cup ball joint contains grease to reduce friction with an outer sleeve to stop contamination. It is recommended that re-greasing is carried out every 12 months using Unirex N3 grease.

To adjust the blade position or loosen the pivots please follow the steps below:-

1. Loosen inner pivot bolt nut



2. Loosen outer Locknut



3. Adjust pivot screw



4. Holding pivot screw tighten locknut.





Woods Air Movement Ltd. delivers smart and energy efficient Air Movement and Fire Safety solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than fifty years of accumulated industry application experience. The widest range of Air Movement and Ventilation products in the market, and strong market presence with over 100 years of experience and manufacturing of products, guarantees that we are always by your side, ready to deliver Excellence in Solutions.

**Contact our friendly sales team today
for more information**

Call: +44 (0) 1206 222 555

Email: quotations.woods@flaktgroup.com
www.woodsairmovement.com