PWIIS
RECTANGULAR MULTI-BLADE AIRTIGHT DAMPER

Description:
A rectangular multi-blade damper with backward blades and a high level of tightness used for airflow control or closing. Controlled manually or by an electric actuator.

Intended Use

PWIIS dampers are used for airflow control or closing in rectangular ventilation ducts. They can be installed in air handling units or in a wall. The design of the damper ensures leakage class **2 or 4 in accordance with EN-1751**. Special sealing inserts installed at the blade ends ensure high integrity. The respective blades are driven by the system of levers and tie rods in a backward arrangement.

Operating temperature: -20 °C to +90 °C, (+50 °C for the actuator version).

PWIIS dampers hold hygiene certificate no. HK/K/0841/03/2017.

Design

The PWIIS damper housing is made of galvanised sheet steel and the blades are made of an aluminium profile. Special inserts with a sleeve seal are installed at the ends of the blades. The blades are provided with plain bearings made of fibreglass-reinforced PP.

Drive:

1. Damper with an actuator
2. Damper with a manual mechanism
3. Damper with an extended axle

The aluminium profile shape is protected as a utility design and was registered with the Patent Office of the Republic of Poland.

Manufacturing Versions

Drive:

- **T1** – Damper with an actuator
- **T2** – Damper with a manual mechanism
- **T3** – Damper with an extended axle (for the actuator installation)

Dimensions

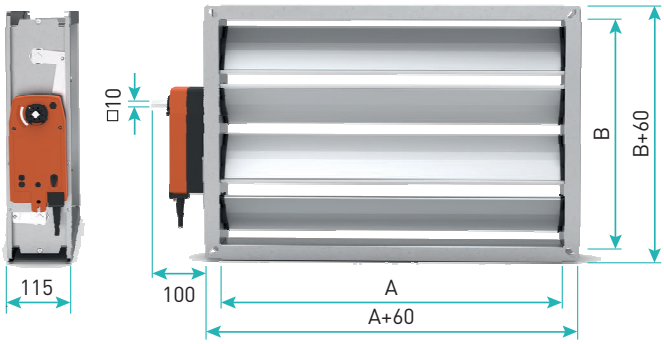

Figure 1. PWIIS damper dimensions.

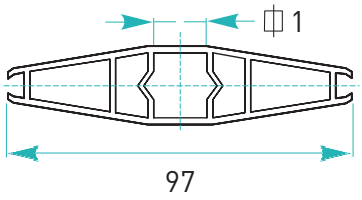

Figure 2. PWIIS damper blade.

Standard dimensions of PWIIS dampers:

- Width **A = 100 – 1400 mm** (1 mm interval)
- Height **B = 105 – 1405 mm** (100 mm interval)

Due to the width of the blade, the recommended height is B = n x 100 + 5, where n is the number of the blades. It is possible to make the damper another height (1 mm interval), with a masking frame covering the clearance partially.

A damper with insulated blades and width A > 1200 mm is divided into 1200 mm wide modules. The modules are connected with a common driving axle (single manual mechanism or actuator).

If it is necessary to use a damper larger than 1400 x 1405 mm, a combined damper consisting of two smaller dampers is made. The dampers have independent driving axles (two separate manual mechanisms or actuators on opposite sides).

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Technical Data

Table 1. Types of actuators and the net surface area for the PWIIS damper in a fully open position.

Height B, [mm]	Width A, [mm]													
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400
105	0.009	0.017	0.026	0.035	0.043	0.052	0.061	0.070	0.078	0.087	0.096	0.104	0.113	0.122
205	0.017	0.034	0.051	0.067	0.084	0.101	0.118	0.135	0.152	0.169	0.186	0.203	0.220	0.236
305	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.201	0.226	0.251	0.276	0.301	0.326	0.351
405	0.033	0.066	0.100	0.133	0.166	0.199	0.233	0.266	0.299	0.333	0.366	0.399	0.433	0.466
505	0.041	0.083	0.124	0.166	0.207	0.249	0.290	0.332	0.373	0.415	0.456	0.498	0.539	0.581
605	0.049	0.099	0.149	0.198	0.248	0.298	0.347	0.397	0.447	0.496	0.546	0.596	0.646	0.695
705	0.057	0.115	0.173	0.231	0.289	0.347	0.405	0.463	0.520	0.578	0.636	0.694	0.752	0.810
805	0.065	0.131	0.198	0.264	0.330	0.396	0.462	0.528	0.594	0.660	0.726	0.792	0.859	0.925
905	0.073	0.148	0.222	0.296	0.371	0.445	0.519	0.594	0.668	0.742	0.816	0.891	0.965	1.039
1005	0.082	0.164	0.247	0.329	0.412	0.494	0.577	0.659	0.742	0.824	0.907	0.989	1.072	1.154
1105	0.090	0.180	0.271	0.362	0.452	0.543	0.634	0.725	0.815	0.906	0.997	1.087	1.178	1.269
1205	0.098	0.197	0.296	0.394	0.493	0.592	0.691	0.790	0.889	0.988	1.087	1.186	1.285	1.383
1305	0.106	0.213	0.320	0.427	0.534	0.641	0.749	0.856	0.963	1.070	1.177	1.284	1.391	1.498
1405	0.114	0.229	0.345	0.460	0.575	0.691	0.806	0.921	1.036	1.152	1.267	1.382	1.498	1.613

Note: the parameters given in the table apply to the version with blades with no insulation.

- Actuator minimum: **4 Nm,** e.g. Belimo LM24A (without a spring) or LF24 (with a spring)
- Actuator minimum: **10 Nm,** e.g. Belimo NM24A (without a spring) or NF24A (with a spring)
- Actuator minimum: **20 Nm,** e.g. SM24A (without a spring) or SF24A (with a spring)

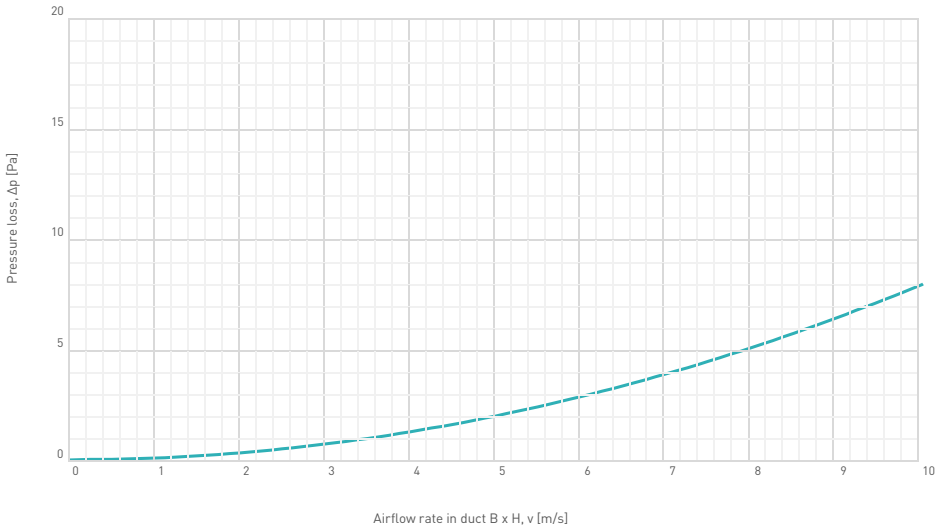

Chart 1. Pressure loss in a standard-height PWIIS damper (in a fully open position).

Pressure loss in a custom-height damper (with a masking frame covering the clearance partially) is comparable to the pressure loss for the nearest smaller standard height damper read from Chart 1.

Δp (600 x 460) ≈ Δp (600 x 405) from Chart 1

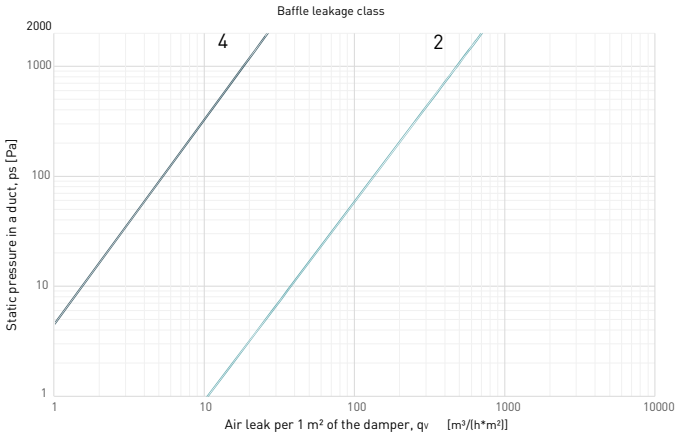

Chart 2. Air leaks through the PWIIS damper baffle (in a fully closed position).

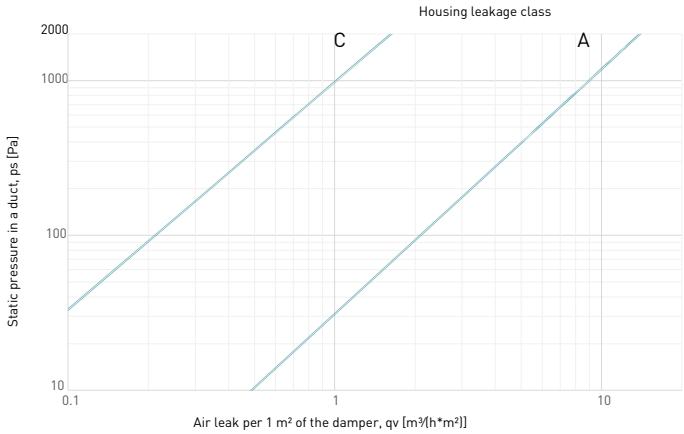

Chart 3. Air leaks through the PWIIS damper housing (in a fully closed position).

Table 2. Approximate weight of PWIIS dampers.

Height B, [mm]	Width A, [mm]											
	100	200	300	400	500	600	700	800	900	1000	1200	1400
105	1.6	2.1	2.5	2.9	3.4	3.8	4.3	4.7	5.2	5.6	6.5	7.4
205	2.2	3.0	3.5	4.1	4.6	5.2	5.7	6.2	6.8	7.3	8.4	9.4
305	3.0	3.9	4.5	5.1	5.8	6.4	7.1	7.7	8.4	9.0	10.3	11.6
405	3.7	4.7	5.4	6.2	6.9	7.7	8.5	9.2	10.0	10.7	12.2	13.7
505	4.4	5.4	6.3	7.2	8.0	8.9	9.7	10.6	11.5	12.3	14.0	15.8
605	5.0	6.2	7.2	8.1	9.1	10.1	11.0	12.0	13.0	13.9	15.9	17.8
705	5.7	6.9	8.0	9.1	10.2	11.3	12.3	13.4	14.5	15.6	17.7	19.9
805	6.5	7.8	9.0	10.2	11.4	12.6	13.7	14.9	16.1	17.3	19.7	22.0
905	7.1	8.6	9.9	11.2	12.5	13.7	15.0	16.3	17.6	18.9	21.5	24.1
1005	7.8	9.3	10.7	12.1	13.5	14.9	16.3	17.7	19.1	20.5	23.3	26.2
1205	9.1	10.8	12.4	14.1	15.7	17.3	18.9	20.5	22.2	23.8	27.0	30.3
1405	10.6	12.5	14.4	16.3	18.2	20.1	22.0	23.8	25.7	27.6	31.4	35.2

Note: the parameters given in the table apply to the dampers with the blades with no insulation and without an actuator.

PWIIS – Rectangular multi-blade airtight damper

When ordering, please provide information as follows:

PWIIS - <I> - <A> x <B> - W<W> - T<N> - <KL>

Where:

I	Damper blade insulation*
	None – Without insulating foam filling
	t – Filled with insulating foam
A	Damper inner clearance width [mm]
B	Damper inner clearance height [mm]
W	Number of damper cross divisions [0 – none]*
N	Drive type*
	1 – With an actuator
	2 – Manual mechanism
	3 – For an actuator
KL	EN 1751 leakage class*
	A2 – Housing: A, baffle: 2
	C4 – Housing: C, baffle: 4

* Optional values, if not specified, the default values will be used

Sample order: **PWIISt-400x405-W0-T2-A2**