

# PWIIS-N

## RECTANGULAR MULTI-BLADE SPECIAL DAMPER



### Description:

Rectangular multi-blade dampers with backward or concurrent blades used for airflow control or closing. Controlled manually or by an electric actuator.

### Intended Use

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-N dampers hold hygiene certificate no. HK/K/0841/03/2017.**

### Design

The housings and the blades of the PWIIS-N dampers are made of stainless sheet metal. Special inserts with a sleeve seal are installed at the ends of the blades. The blades are fitted over the entire length with EPDM gaskets. On two sides of the blade, inside the inserts, there are embedded steel axles connected with the blade by means of a steel rivet. The blades are provided with plain bearings made of fibreglass-reinforced PP.

### 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

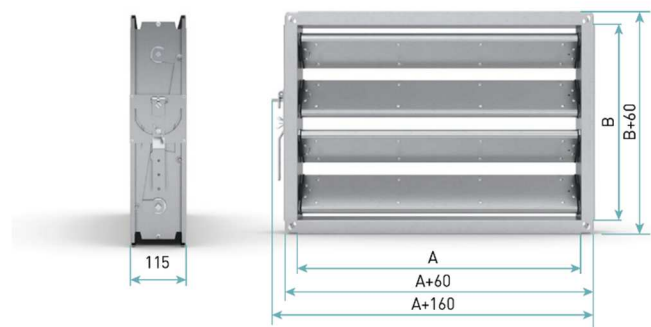


Figure 1. PWIIS-N damper dimensions.

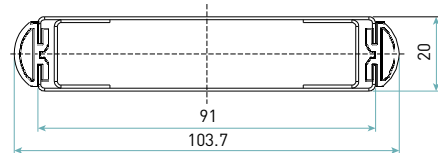


Figure 2. PWIIS-N damper blades.

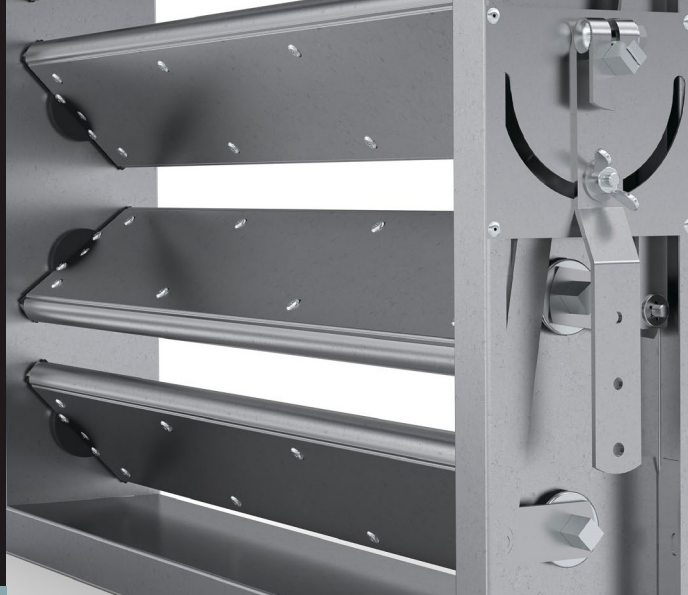
Standard dimensions of PWIIS-N dampers:

- - Width **A = 200 – 2500 mm** (1 mm interval)
- - Height **B = 200 – 2200 mm** (100 mm interval)

Due to the width of the blade, the recommended height is  $B = n \times 100$ , 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.

The damper of width  $A > 1400$  mm is divided into modules of maximum width 1400 mm. The modules are connected with a common driving axle (single manual mechanism or actuator).

If it is necessary to use a damper larger than 2500 x 2200 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).



## Technical Data

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

		Width A, [mm]																							
		200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
Height B, [mm]	200	0.032	0.048	0.064	0.08	0.096	0.112	0.128	0.144	0.16	0.176	0.192	0.208	0.224	0.234	0.25	0.266	0.282	0.298	0.314	0.33	0.346	0.362	0.378	0.394
	300	0.047	0.071	0.095	0.119	0.143	0.167	0.191	0.215	0.239	0.263	0.287	0.311	0.335	0.351	0.375	0.399	0.423	0.447	0.471	0.495	0.519	0.543	0.567	0.591
	400	0.063	0.095	0.127	0.159	0.191	0.223	0.255	0.287	0.319	0.351	0.383	0.415	0.447	0.469	0.501	0.533	0.565	0.597	0.629	0.661	0.693	0.725	0.757	0.789
	500	0.079	0.119	0.159	0.199	0.239	0.279	0.319	0.359	0.399	0.439	0.479	0.519	0.559	0.586	0.626	0.666	0.706	0.746	0.786	0.826	0.866	0.906	0.946	0.986
	600	0.095	0.143	0.191	0.239	0.287	0.335	0.383	0.431	0.479	0.527	0.575	0.623	0.671	0.703	0.751	0.799	0.847	0.895	0.943	0.991	1.039	1.087	1.135	1.183
	700	0.111	0.167	0.223	0.279	0.335	0.391	0.447	0.503	0.559	0.615	0.671	0.727	0.783	0.82	0.876	0.932	0.988	1.044	1.1	1.156	1.212	1.268	1.324	1.38
	800	0.127	0.191	0.255	0.319	0.383	0.447	0.511	0.575	0.639	0.703	0.767	0.831	0.895	0.937	1.001	1.065	1.129	1.193	1.257	1.321	1.385	1.449	1.513	1.577
	900	0.142	0.214	0.286	0.358	0.43	0.502	0.574	0.646	0.718	0.79	0.862	0.934	1.006	1.054	1.126	1.198	1.27	1.342	1.414	1.486	1.558	1.63	1.702	1.774
	1000	0.158	0.238	0.318	0.398	0.478	0.558	0.638	0.718	0.798	0.878	0.958	1.038	1.118	1.172	1.252	1.332	1.412	1.492	1.572	1.652	1.732	1.812	1.892	1.972
	1100	0.174	0.262	0.35	0.438	0.526	0.614	0.702	0.79	0.878	0.966	1.054	1.142	1.23	1.289	1.377	1.465	1.553	1.641	1.729	1.817	1.905	1.993	2.081	2.169
	1200	0.19	0.286	0.382	0.478	0.574	0.67	0.766	0.862	0.958	1.054	1.15	1.246	1.342	1.406	1.502	1.598	1.694	1.79	1.886	1.982	2.078	2.174	2.27	2.366
	1300	0.206	0.31	0.414	0.518	0.622	0.726	0.83	0.934	1.038	1.142	1.246	1.35	1.454	1.523	1.627	1.731	1.835	1.939	2.043	2.147	2.251	2.355	2.459	2.563
	1400	0.221	0.333	0.445	0.557	0.669	0.781	0.893	1.005	1.117	1.229	1.341	1.453	1.565	1.64	1.752	1.864	1.976	2.088	2.2	2.312	2.424	2.536	2.648	2.76
	1500	0.237	0.357	0.477	0.597	0.717	0.837	0.957	1.077	1.197	1.317	1.437	1.557	1.677	1.757	1.877	1.997	2.117	2.237	2.357	2.477	2.597	2.717	2.837	2.957
1600	0.253	0.381	0.509	0.637	0.765	0.893	1.021	1.149	1.277	1.405	1.533	1.661	1.789	1.875	2.003	2.131	2.259	2.387	2.515	2.643	2.771	2.899	3.027	3.155	
1700	0.269	0.405	0.541	0.677	0.813	0.949	1.085	1.221	1.357	1.493	1.629	1.765	1.901	1.992	2.128	2.264	2.4	2.536	2.672	2.808	2.944	3.08	3.216	3.352	
1800	0.285	0.429	0.573	0.717	0.861	1.005	1.149	1.293	1.437	1.581	1.725	1.869	2.013	2.109	2.253	2.397	2.541	2.685	2.829	2.973	3.117	3.261	3.405	3.549	
1900	0.301	0.453	0.605	0.757	0.909	1.061	1.213	1.365	1.517	1.669	1.821	1.973	2.125	2.226	2.378	2.53	2.682	2.834	2.986	3.138	3.29	3.442	3.594	3.746	
2000	0.316	0.476	0.636	0.796	0.956	1.116	1.276	1.436	1.596	1.756	1.916	2.076	2.236	2.343	2.503	2.663	2.823	2.983	3.143	3.303	3.463	3.623	3.783	3.943	
2100	0.332	0.5	0.668	0.836	1.004	1.172	1.34	1.508	1.676	1.844	2.012	2.18	2.348	2.46	2.628	2.796	2.964	3.132	3.3	3.468	3.636	3.804	3.972	4.14	
2200	0.348	0.524	0.7	0.876	1.052	1.228	1.404	1.58	1.756	1.932	2.108	2.284	2.46	2.578	2.754	2.93	3.106	3.282	3.458	3.634	3.81	3.986	4.162	4.338	

- 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. Belimo SM24A (without a spring) or SF24A (with a spring)
  - Actuator minimum: **40 Nm**, e.g. GM24A (without a spring) or **combined damper 2x 20 Nm** SF24A (with a spring)
  - Combined damper** consisting of several smaller dampers.  
**For a custom design – please contact Smay**
- The combined damper 2 x 20 Nm** requires the use of two smaller dampers with separate actuators.

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.



$$\Delta p (600 \times 460) \approx \Delta p (600 \times 400) \text{ from Chart 1}$$

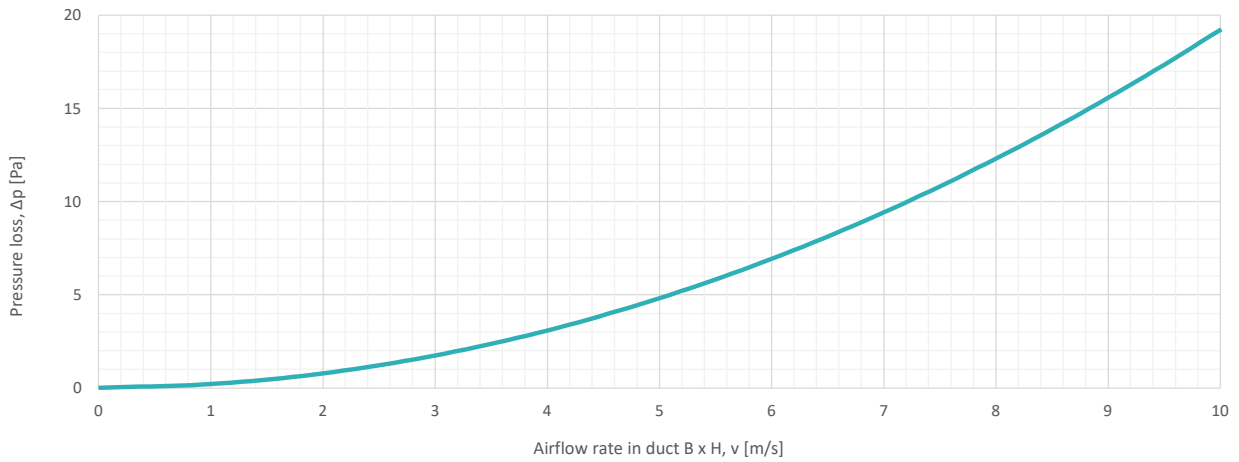


Chart 1. Pressure loss in a standard-height PWIS-N damper (in a fully open position).



Chart 2. Air leaks through PWIS-N damper baffle (in a fully closed position).

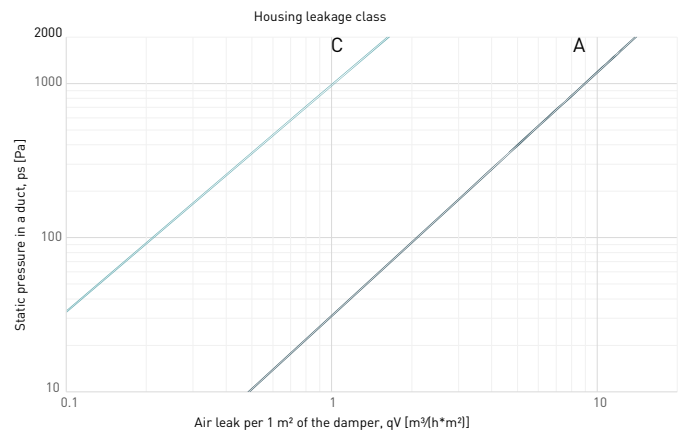


Chart 3. Air leaks through the PW3S damper housing (in a fully closed position).

# PWIS-N – Rectangular multi-blade special damper

When ordering, please provide information as follows:

PWIS-N <K> - <A>x<B> - W <W> - T <N> - <KL>

Where:

<b>K</b>	Kinematics*
	<b>p – Backward blades</b>
<b>A</b>	Damper inner clearance width [mm]
<b>B</b>	Damper inner clearance height [mm]
<b>W</b>	Number of damper cross divisions [0 – none]* (at most 2)

<b>N</b>	Drive type*
	1 – With an actuator
	<b>2 – Manual mechanism</b>
	3 – For an actuator
<b>KL</b>	EN 1751 leakage class*
	<b>A2 – Housing: A, baffle: 2</b>
	C4 – Housing: C, baffle: 4

\* Optional values – if blank, default values will be used

Sample order: **PWIS-Np-400x400-W0-T2-A2**