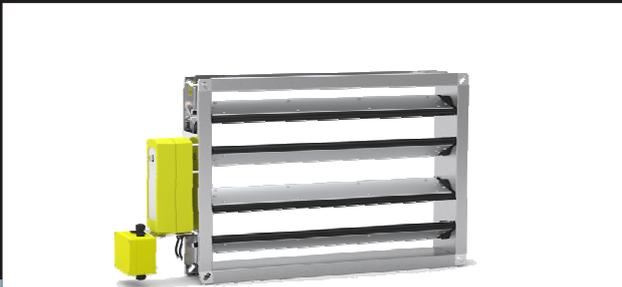


# PWIIS-EX

## RECTANGULAR DAMPER IN EXPLOSION-PROOF VERSION



### Description:

A rectangular multi-blade damper with backward blades is used for airflow control and closing in ventilation systems intended for hazardous area zones. Controlled manually or by an electric actuator.

### Intended Use

PWIIS-EX dampers are used in air systems and in ventilation systems operating in hazardous area zones.

Such hazards are present e.g. in chemical and timber processing plants, paint shops and gas production facilities – i.e. everywhere, where a hazardous area zone has been established where explosive mixtures of gases, vapours, fogs and dust with air might appear.

PWIIS-EX dampers have been tested and meet the classifications for group II of category 2 in accordance with PN-EN ISO 80079-36:2016 and PN-EN ISO 80079-37:2016, which means that they are suitable for use in zones 1 and 2, as well as 21 and 22.

Certificate no. KDB ATEX 19.0739 has been issued by the GIG Research Institute in Katowice, Poland.

The design of the damper ensures a tightness within the range of class 2 (for a surface area  $< 0.8 \text{ m}^2$ ) or class 3 (for a surface area  $\geq 0.8 \text{ m}^2$ ) in accordance with EN-1751, due to special sealing inserts installed at the ends of the blades. The respective blades are driven by the system of levers and tie rods in a backward arrangement.

Operating temperature ranges from  $-20 \text{ }^\circ\text{C}$  to  $+90 \text{ }^\circ\text{C}$  ( $+50 \text{ }^\circ\text{C}$  for the actuator version).

### Design

Housing and blades, as well as the system of driving levers and tie rods in the PWIIS-EX damper are made of galvanised sheet steel or 1.4301 sheet stainless steel (in accordance with EN 10088).

The blades are fitted, over the entire length, with EPDM gaskets and the sealing between the end of the blade and the housing is ensured by special inserts made of polypropylene. 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 mounted in slide bearings, also made of polypropylene and are embedded in the housing.

One of the axles is the driving axle and the drive transmission to other blades is implemented by means of the system of levers and tie rods. The dampers are equipped with additional elastic steel sliders attached to the driving mechanism tie rods, which ensure reliable electric connection with the housing, as well as ground terminals on the housing. Due to this solution, it has been possible to avoid any potential difference between individual elements of the damper, as well as between the damper and the ground during operation.

### Dimensions

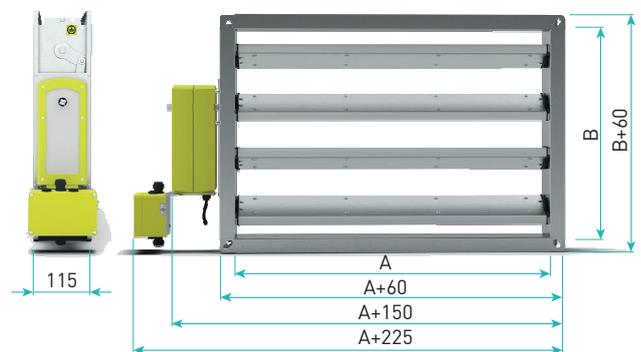


Figure 1. PWIIS-EX damper dimensions.

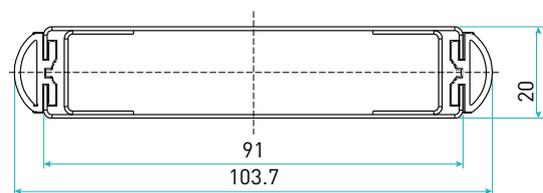


Figure 2. PWIIS-EX damper blade.

Standard dimensions of PWIIS-EX dampers:

- Width **A = 200 – 1400 mm** (1 mm interval),
- Height **B = 200 – 1400 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.

If it is necessary to use a damper larger than  $1400 \times 1400 \text{ mm}$ , 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).

SO

SN



## Special Notes

One of the versions of the damper makes it possible to use an electric actuator mounted on a shelf placed at the side of the damper to drive the damper. In such a case, keep in mind that the assembly as a functional unit is classified according to the group to which the device with poorer parameters belongs. Therefore, if – for example – an actuator does not meet the requirements for the products classified as the Ex-type equipment, which means devices approved for operation in hazardous area zones, then the entire unit consisting of the damper and that actuator also does not meet the requirements for this type of equipment. When designing a ventilation system on the basis of such a solution, keep in mind that the actuator has to belong to the same or higher class as the PWIIS-EX damper.

The manufacturer shall not be responsible for the use of the device contrary to the information above and any operation contrary to the valid standards that apply to the equipment approved for operation under the described conditions.

Smay offers actuators suitable for the appropriate EX group, adjusted to the damper. When ordering PWIIS-EX damper with the actuator version, both devices are tested and certified as Ex-type equipment.

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

Height B, [mm]	Width A, [mm]												
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400
200	0.032	0.048	0.064	0.080	0.096	0.112	0.128	0.144	0.160	0.176	0.192	0.208	0.224
300	0.048	0.072	0.096	0.120	0.144	0.168	0.192	0.216	0.240	0.264	0.288	0.312	0.336
400	0.064	0.096	0.128	0.160	0.192	0.224	0.256	0.288	0.320	0.352	0.384	0.416	0.448
500	0.080	0.120	0.160	0.200	0.240	0.280	0.320	0.360	0.400	0.440	0.480	0.520	0.560
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
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
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
900	0.143	0.215	0.287	0.359	0.431	0.503	0.575	0.647	0.719	0.791	0.863	0.935	1.007
1000	0.159	0.239	0.319	0.399	0.479	0.559	0.639	0.719	0.799	0.879	0.959	1.039	1.119
1100	0.175	0.263	0.351	0.439	0.527	0.615	0.703	0.791	0.879	0.967	1.055	1.143	1.231
1200	0.191	0.287	0.383	0.479	0.575	0.671	0.767	0.863	0.959	1.055	1.151	1.247	1.343
1300	0.207	0.311	0.415	0.519	0.623	0.727	0.831	0.935	1.039	1.143	1.247	1.351	1.455
1400	0.223	0.335	0.447	0.559	0.671	0.783	0.895	1.007	1.119	1.231	1.343	1.455	1.567

□ Schisczek ExMax-5.10 actuator (without a spring) or ExMax-5.10-F actuator (with a spring)

■ Schisczek ExMax-15.30 actuator (without a spring) or ExMax-15-F actuator (with a spring)

PWIIS-EX dampers are normally made in accordance with class 2 (for a surface area < 0.8 m<sup>2</sup>) or class 3 (for a surface area ≥ 0.8 m<sup>2</sup>) for baffles and for housing leakage class A. For special orders, it is possible to make PWIIS-EX dampers for housing leakage class B.

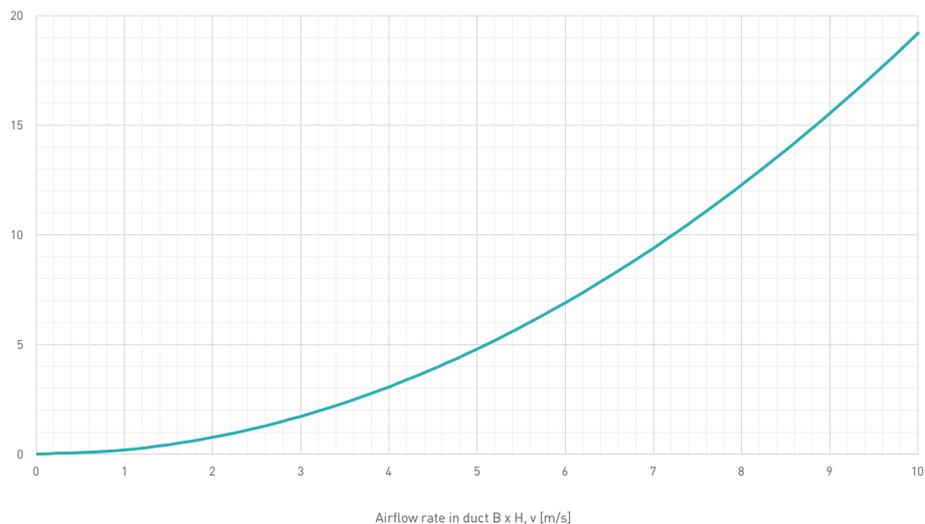


Chart 1. Pressure loss for a standard-height PWIS-EX damper (in a fully open position).



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.

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

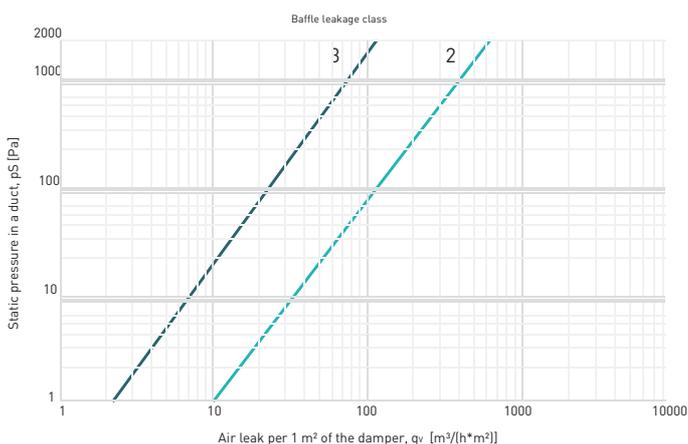


Chart 2. Air leaks through the PWIS-EX damper baffle (in a fully closed position).

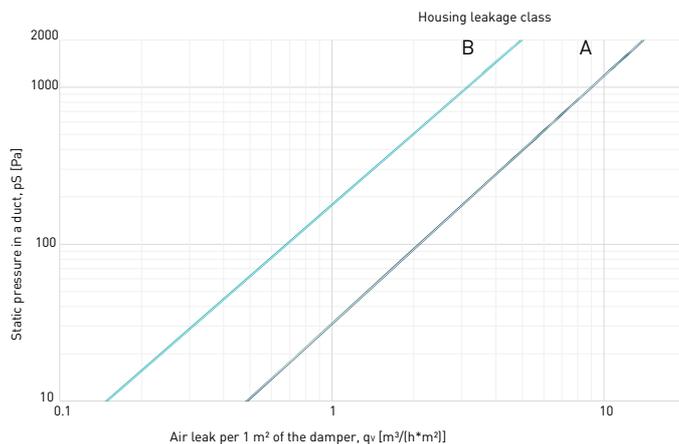


Chart 3. Air leaks through the PWIS-EX damper housing (in a fully closed position).

Table 2. Approximate weight of PWIS-EX dampers.

Height B, [mm]	Width A, [mm]												
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400
200	3.8	4.4	5.1	5.7	6.4	7.0	7.6	8.3	8.9	9.5	10.2	10.8	11.4
300	4.9	5.7	6.5	7.3	8.1	8.9	9.7	10.5	11.2	12.0	12.8	13.6	14.4
400	6.0	7.0	7.9	8.9	9.8	10.8	11.7	12.7	13.6	14.6	15.5	16.5	17.4
500	7.0	8.1	9.2	10.3	11.4	12.5	13.7	14.8	15.9	17.0	18.1	19.2	20.3
600	8.0	9.3	10.5	11.8	13.1	14.3	15.6	16.9	18.1	19.4	20.7	21.9	23.2
700	9.0	10.4	11.9	13.3	14.7	16.1	17.6	19.0	20.4	21.8	23.3	24.7	26.1
800	10.2	11.7	13.3	14.9	16.5	18.1	19.6	21.2	22.8	24.4	26.0	27.6	29.1
900	11.2	12.9	14.6	16.4	18.1	19.9	21.6	23.3	25.1	26.8	28.6	30.3	32.0
1000	12.2	14.1	16.0	17.9	19.8	21.7	23.5	25.4	27.3	29.2	31.1	33.0	34.9
1100	13.2	15.2	17.3	19.3	21.4	23.4	25.5	27.6	29.6	31.7	33.7	35.8	37.8
1200	14.2	16.4	18.6	20.8	23.0	25.2	27.5	29.7	31.9	34.1	36.3	38.5	40.7
1300	15.2	17.6	19.9	22.3	24.7	27.0	29.4	31.8	34.2	36.5	38.9	41.3	43.6
1400	16.2	18.7	21.2	23.8	26.3	28.8	31.4	33.9	36.4	38.9	41.5	44.0	46.5

The parameters given in the table apply to the dampers made of galvanised sheet steel and without an actuator.

## Drive type

PWIIS-EX dampers are equipped with a manual mechanism or one of the following actuators, depending on their supposed function:

Table 3. Actuators without a return spring

Type	Torque [Nm]*	Function	Control	Power supply*	Connection box	Rotation angle [°]	Connection [mm]	Movement time* [s]	Direction of rotation*	Rating of housing
<b>ExMax-5.10</b>	5/10	closed/open or 3 points	-	AC/DC 24...230V	ExBox-3P	95°	12x12	3/15/30/60/120	Selectable	IP66
<b>ExMax-15.30</b>	15/30									
<b>ExMax-5.10-S</b>	5/10	closed/open or 3 points	Limit switch	AC/DC 24...230V	ExBox-Y/S	95°	12x12	3/15/30/60/120	Selectable	IP66
<b>ExMax-15.30-S</b>	15/30									
<b>ExMax-5.10-Y</b>	5/10	analog	DC 0...10V	AC/DC 24...230V	ExBox-Y/S	95°	12x12	7,5/15/30/60/120	selectable	IP66
<b>ExMax-15.30-Y</b>	15/30									

Table 4. Actuators with a return spring

Type	Torque [Nm]*	Function	Control	Power supply*	Connection box	Rotation angle [°]	Connection [mm]	Movement time* [s]	Direction of rotation*	Rating of housing
<b>ExMax-5.10-F</b>	5/10	closed/open or 3 points	-	AC/DC 24...230V	ExBox-3P	95°	12x12	3/15/30/60/120	Selectable	IP66
<b>ExMax-15.30-F</b>	15									
<b>ExMax-5.10-S-F</b>	5/10	closed/open or 3 points	Limit switch	AC/DC 24...230V	ExBox-Y/S	95°	12x12	3/15/30/60/120	Selectable	IP66
<b>ExMax-15.30-S-F</b>	15									
<b>ExMax-5.10-Y-F</b>	5/10	analog	DC 0...10V	AC/DC 24...230V	ExBox-Y/S	95°	12x12	3/15/30/60/120	selectable	IP66
<b>ExMax-15.30-Y-F</b>	15									

# PWIIS-EX – Rectangular damper in explosion-proof version

When ordering, please provide information as follows:

**PWIIS-EX <K> - <P> - <A> x <B> - T<N> - <KL>**

Where:

<b>K</b>	Kinematics*
	<b>p – Backward blades</b>
<b>P</b>	Version*
	<b>0 – Blades and housing made of galvanised sheet metal</b>
	N – Blades and housing made of stainless sheet metal
<b>A</b>	Damper inner clearance width [mm]
<b>B</b>	Damper inner clearance height [mm]
<b>N</b>	Drive type*
	1 – With an actuator
	<b>2 – Manual mechanism</b>
<b>KL</b>	EN 1751 leakage class*
	<b>A2 – Housing: A, baffle: 2 (surface area A x B &lt; 0.8 m²)</b>
	<b>A3 – Housing: A, baffle: 3 (surface area A x B ≥ 0.8 m²)</b>
	B2 – Housing: B, baffle: 2 (surface area A x B < 0.8 m²)
	B3 – Housing: B, baffle: 3 (surface area A x B ≥ 0.8 m²)

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

Sample order: **PWIIS-EX p-0-400X400-T1-A2**