



Pressure Regulating Dampers

PRDS PRDE PRDD

Introduction

The Waterloo PRD pressure regulating dampers are designed to maintain a preset constant pressure differential across a partition wall or within a duct system. The damper incorporates a finely balanced aerofoil blade which is capable of regulating room or duct pressures within a tolerance band of ± 3 Pa over a wide air flow range.

Control pressures are factory set to customer requirements but may be adjusted in service by changing the blade weights. The units are available in three standard widths, with modular heights up to 1275mm, and may be combined with grilles or louvres for through the wall installations.

Typical applications include operating theatres, laboratories, or clean rooms where cascade systems may be used to regulate room pressures. They are also suitable for zone pressurisation systems for smoke control in the event of fire.

Manufacture

Waterloo pressure regulating dampers are manufactured from aluminium extrusions and assembled using screw fixing, welding and soldering techniques to form a robust construction. The blade pivot mechanism incorporates nylon bushes and stainless steel pins to ensure maintenance free operation.

Product Description

PRDS Supply pressure regulating damper

PRDE Exhaust pressure regulating damper

PRDD Duct mounted pressure regulating damper

Features

- Passive, balanced blade principle requires no power supply
- Close tolerance control with preset pressures between 15 Pa and 75 Pa
- Wide air handling capacity between 17 l/s and 2900 l/s
- Suitable for supply or exhaust applications
- Easy-clean surfaces suitable for medical applications
- May be integrated with external louvres or internal grilles for through the wall installations

Finishes

PPM9006 (RAL 9006 Matt Silver)

PPM9010 (RAL 9010 Matt White)

PPG9010 (RAL 9010 Gloss White)

Other colours available on request

Order Example

PRDS/750/525/15Pa/PPG9010

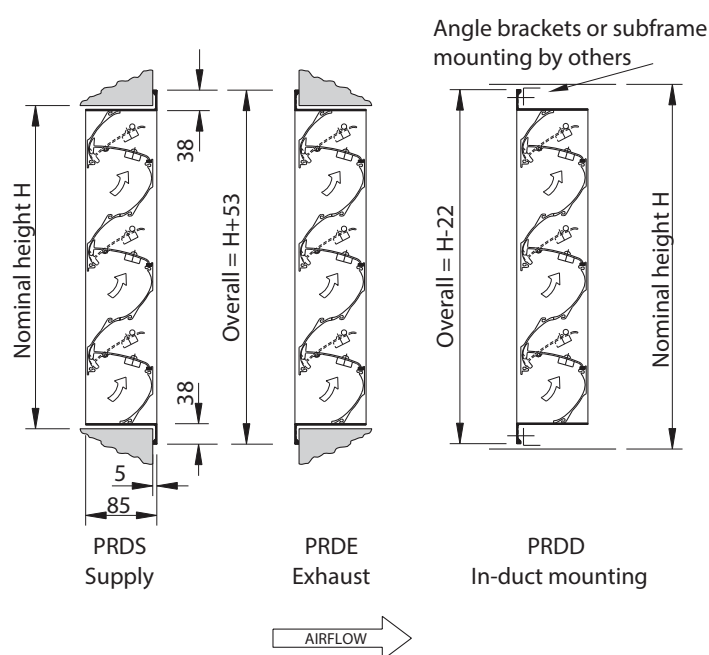
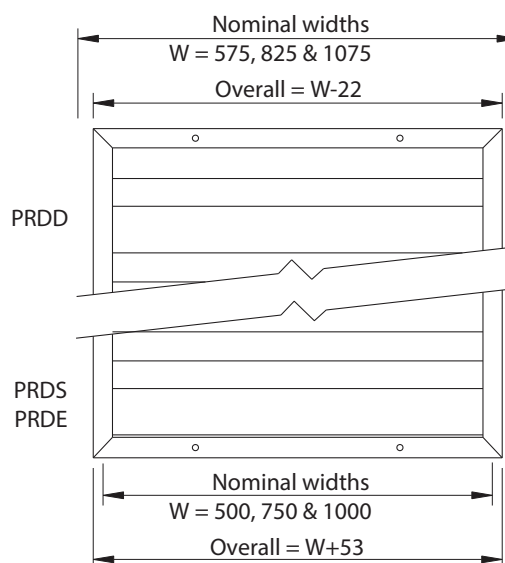
Type _____

Nominal width _____

Nominal height _____

Required pressure _____

Finish _____



No. of Damper Modules	Nominal height 'H'		Approx weight (Kg)		
	PRD (S & E)	PRD(D)	500mm	750mm	1000mm
1	150	225	2.2	3.3	4.4
2	275	350	3.0	4.5	6.0
3	400	475	3.8	5.7	7.6
4	525	600	4.6	6.9	9.2
5	650	725	5.4	8.1	10.8
6	775	850	6.2	9.3	12.4
7	900	975	7.0	10.5	14.0
8	1025	1100	7.7	11.5	15.4
9	1150	1225	8.5	12.7	17.0
10	1275	1350	9.3	14.0	18.6



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Performance Criteria

Aerodynamic data presented in tables 1-3 shows the operating flow range for each of the available pressure settings between 15Pa and 75Pa.

Damper sizes should ideally be selected to operate over the mid or upper part of the flow range to compensate for potential leakage paths from the controlled zone.

If the damper is to be used in conjunction with a grille or louvre, the maximum flow rate at which

control can be maintained will be derated by the factors shown in table 5. The minimum (lift off) flow rate will not be affected.

The acoustic data presented in table 4 is indicative of the potential range of dBA levels generated by a 500mm wide damper at each pressure control setting. For critical applications, the upper figure should be assumed.

Performance tables

PRD Table 1	Air flow range (l/s) for 500mm nominal width													
	ΔP = 15Pa		ΔP = 25Pa		ΔP = 35Pa		ΔP = 45Pa		ΔP = 55Pa		ΔP = 65Pa		ΔP = 75Pa	
Nominal height (mm)	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
150	17	62	22	80	27	98	30	110	34	124	36	135	40	146
275	21	124	27	160	33	196	37	215	42	245	45	265	50	290
400	26	186	33	235	40	290	45	325	51	367	55	400	60	440
525	30	148	38	315	47	385	52	435	59	490	64	530	70	580
650	34	310	44	390	53	480	60	540	68	610	73	670	80	735
775	38	372	49	470	60	580	67	650	76	735	82	800	90	875
900	43	434	54	550	66	678	75	760	84	860	92	940	100	1020
1025	47	496	60	640	73	778	82	890	93	980	100	1070	110	1160
1150	51	560	65	710	80	875	90	990	102	1130	110	1200	120	1300
1275	55	620	70	800	87	975	97	1100	110	1240	120	1350	130	1460

PRD Table 2	Air flow range (l/s) for 750mm nominal width													
	ΔP = 15Pa		ΔP = 25Pa		ΔP = 35Pa		ΔP = 45Pa		ΔP = 55Pa		ΔP = 65Pa		ΔP = 75Pa	
Nominal height (mm)	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
150	30	83	38	113	47	144	52	163	59	184	64	201	70	220
275	38	184	49	236	60	288	67	328	76	370	82	404	90	440
400	47	297	60	365	73	434	82	493	93	555	100	606	110	660
525	55	370	70	475	86	580	97	659	110	740	119	808	130	880
650	64	460	82	590	100	720	112	819	127	920	137	1003	150	1090
775	72	550	92	710	112	870	127	988	144	1110	156	1208	170	1310
900	80	640	102	820	125	1000	141	1143	160	1290	174	1407	190	1530
1025	89	740	114	940	139	1140	157	1307	178	1480	193	1613	210	1750
1150	98	830	125	1065	152	1300	172	1478	194	1660	211	1814	230	1970
1275	106	920	135	1180	165	1440	182	1637	210	1840	228	2017	250	2200

PRD Table 3	Air flow range (l/s) for 1000mm nominal width													
	ΔP = 15Pa		ΔP = 25Pa		ΔP = 35Pa		ΔP = 45Pa		ΔP = 55Pa		ΔP = 65Pa		ΔP = 75Pa	
Nominal height (mm)	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
150	47	124	60	160	73	192	82	220	93	246	100	270	110	290
275	59	246	76	315	93	384	105	435	118	490	130	530	140	580
400	72	372	92	480	112	580	125	660	143	740	155	800	170	870
525	85	496	108	640	132	770	150	880	167	980	180	1050	200	1160
650	97	620	125	800	152	964	170	1100	193	1230	210	1340	230	1450
775	111	742	142	950	173	1150	195	1300	220	1470	240	1600	260	1740
900	124	865	158	1100	192	1350	220	1550	246	1720	265	1850	290	2030
1025	136	990	175	1250	211	1540	240	1750	270	1960	290	2100	320	2320
1150	150	1100	190	1400	237	1730	260	1950	296	2200	320	2400	350	2610
1275	161	1230	205	1600	251	1920	285	2200	321	2450	350	2650	380	2900

PRD Table 4	Noise rating for a 500mm width (Lp)													
	ΔP = 15Pa		ΔP = 25Pa		ΔP = 35Pa		ΔP = 45Pa		ΔP = 55Pa		ΔP = 65Pa		ΔP = 75Pa	
Nominal height (mm)	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
150				23		27	21	30	25	33	28	35	31	37
275		21	20	26	20	30	24	33	28	36	31	38	34	40
400		23	22	27	22	32	26	35	30	38	33	40	36	42
525		24	23	29	23	33	27	36	31	39	34	41	37	43
650		25	23	30	24	34	28	37	32	40	35	42	38	44
775		26	23	31	25	35	29	38	33	41	36	43	39	45
900		27	24	32	26	36	30	39	34	42	37	44	40	46
1025		27	24	32	26	36	30	39	34	42	37	44	40	46
1150	20	28	24	33	27	37	31	40	35	43	38	45	41	47
1275	20	28	24	33	27	37	31	40	35	43	38	45	41	47

For a 750mm wide damper add 2dB and for a 1000mm wide damper add 3dB

Selection example PRD/1000 wide to maintain a 25Pa room pressure

Air Volume 1000 l/s

From table 3 the minimum damper height would be 900mm, and from table 4, the maximum potential noise level would be dBA 37 + 3 = dBA 40

Table 5	Type of grille over outlet	
	0° blade grilles (e.g. type 3HG)	45° blade grilles (e.g. type WG)
Grille 500mm away from PRD	0.7	0.7
Grille 250mm away from PRD	0.64	0.64
Grille directly over PRD outlet	0.7	0.45