MEDIUM/HIGH ESP DOUBLE SKIN DUCTED	PDWD-EC [EC MOTOR]
MEDIUM/HIGH ESP DUCTED	PDWC [AC MOTOR] PDWC-EC [EC MOTOR]
MEDIUM/ HIGH ESP DUCTED	PDWB [AC MOTOR] PDWB-EC [EC MOTOR]

MEDIUM/ HIGH STATIC DUCTED **FAN COILS**

DUCTED MEDIUM/HIGH STATIC
Intelligent Fan Coils

PDWD-EC

PRODUCT PRESENTATION

The Polar Air Intelligent Medium & High static Ducted units have been specifically designed to satisfy very demanding markets such as the Middle East or Australia. This range has a double skin casing, which differentiates it from our PDWC and PDWB ranges.

PRODUCT RANGE

The Polar Air Intelligent Medium/ High Static Double Skin Ducted units offer the following EC motor 230V/50Hz range with the following capacities at H speed:

2 Pipe	3.08 - 23.54 kW	4 Pipe	2.86 - 22.73kW
	3.78 - 24.13 kW		3.03 - 30.79 kW
	602 - 5389 m³/h		602 - 5264 m³/h

COOLING HEATING AIR FLOW

PRODUCT FEATURES

Structure. The casing is made with steel panels painted in RAL 9010. It consists of a **double skin**, using a sandwich panel, consisting of two walls: inner and outer wall with inner insulation. The inner wall is made of plane galvanized steel of 1mm thickness, and the outer wall is made of pre-coated steel of 1mm thickness. The insulation consists of high-pressure PU foam sandwiched in between, thus producing a rigid and robust panel. The unit includes a gravity drain pan within the casing for drain pipe connection.

Water Coils. Built with seamless copper tubes and headers, the tubes mechanically expanded into corrugated aluminium fin material for a permanent primary to secondary surface bond. We test the coils at 35 bar, and the maximum operating limit we recommend is at 20 bar. It includes a manual air vent and water purge valve.

Fan Blowers. Heavy-gauge galvanized steel with die-formed inlet cones housings, double inlet forward curved centrifugal type, statically and dynamically balanced for smooth and quiet operation.

Motors. EC motors with driven controls PCB, constant torque, permanent magnet, and 3 speeds pre-set to allow precise air balancing. Filtration. Easily removable and washable filters made from self-extinguishing acrylic with EU2 (G2) (Merv 2-4) efficiency class. G4 (Merv 8) efficiency filters are optional.

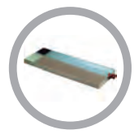
Condensate Pans. Painted steel drain pans with powder finish positively sloped, coated with self-extinguishing closed cell expanded polyethene with thermal properties. The drain pan outlet is 3/4" (standard on the same side of coil connections).

Flexibility. This Medium/ High Static Ducted range is available with left or right-hand water connections, which cannot be exchanged on site.

OPTIONAL ACCESSORIES*

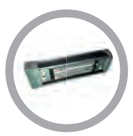
Thermostat Controller

Wall Pad Controller



Stainless steel drain pan

MERV8 | G4 Filter



Electric heater module
3 - 9 kW

Plenum
Discharge/Return Round

Valve kit
2/3 way Ball 3/4"
motorized or modulating

(*): Please refer to page 146 for further information on accessories

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted Double Skin, 3 row, 2 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWD-3R-[SIZE]-V-EC			400	800	1200	1600	2000
	Configuration			2 PIPE				
	Number of Fan Blowers			1	2			4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60				
AIR	Air Flow	H	m³/h	593	1116	2092	2510	5020
		M		445	1230	1795	2047	4094
		L		209	409	624	1122	2245
	Available ESP Pressure	H	Pa	150				
		M						
		L		90				
COOLING	Cooling Capacity	H	kW	3.31	5.98	10.14	12.25	21.96
		M		1.99	4.96	7.71	9.21	16.59
		L		1.42	2.67	3.85	6.52	11.83
	Sensible Cooling Capacity	H		2.31	4.22	7.25	8.71	16.05
		M		1.36	3.48	5.43	6.47	11.89
		L		0.99	1.87	2.7	4.53	8.35
HEATING	Heating Capacity	H	kW	3.35	6.14	10.45	12.74	22.82
		M		2.02	5.09	7.95	9.58	17.24
		L		1.44	2.74	3.97	6.78	12.29
	Max. Electric Heater			3		6	9	
SOUND	Pressure Level	Outlet	db(A)	56/53/43	58/56/47	56/52/45	60/58/50	65/63/60
		Inlet + Radiated		59/56/46	61/59/50	57/55/48	63/61/53	65/63/60
	Power Level	Outlet		65/62/52	67/65/56	65/61/54	69/67/59	74/72/69
		Inlet + Radiated		68/65/55	70/68/59	68/64/57	72/70/62	74/72/69
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	202	281	310	477	672
		M		121	208	151	304	546
		L		34	65	70	108	280
	Running Current	H	A	1.76	2.44	2.7	4.15	5.84
HYDRONIC	Cooling Water Flow Rate	H	L/h	567	1024	1738	2099	3764
		M		342	850	1322	1578	2844
		L		243	458	660	1118	2028
	Cooling Pressure Drop	H	kPa	17.51	17.12	30.36	23.15	42.94
		M		7.04	12.25	18.54	13.85	25.92
		L		3.82	4.02	5.32	7.45	14.1
	Heating Water Flow Rate	H	L/h	574	1052	1792	2183	3912
		M		346	873	1363	1642	2955
		L		246	470	681	1163	2108
	Heating Pressure Drop	H	kPa	13.46	13.71	24.59	19.03	35.22
		M		5.41	9.8	15.02	11.39	21.26
		L		2.94	3.22	4.31	6.12	11.57
	Water Content		L	1.24	1.787	2.364	3.239	3.677

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 45C / 40°C*

(1): Fan motor power includes PCB power input.
(2): Sound Power in compliance with EN9614-2.
For High ΔT Condition Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted Double Skin, 4 row, 2 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWD-4R-[SIZE]-V-EC			400	800	1200	1600	2000
	Configuration			2 PIPE				
	Number of Fan Blowers			1	2			4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60				
AIR	Air Flow	H	m³/h	558	1006	2011	2445	4890
		M		262	757	1343	1610	3220
		L		154	314	445	971	1943
	Available ESP Pressure	H	Pa	150				
		M						
		L		90				
COOLING	Cooling Capacity	H	kW	2.72	4.72	8.67	10.54	19.22
		M		1.47	3.78	6.35	7.64	14.03
		L		0.96	1.82	2.56	5.06	9.43
	Sensible Cooling Capacity	H		1.84	3.2	5.94	7.2	13.43
		M		0.97	2.52	4.29	5.13	9.58
		L		0.64	1.21	1.71	3.42	6.29
SOUND	Pressure Level	Outlet	db(A)	56/53/43	58/56/47	56/52/45	60/58/50	65/61/51
		Inlet + Radiated		59/56/46	61/59/50	59/55/48	63/61/53	67/63/53
	Power Level	Outlet		65/62/52	67/65/56	65/61/54	69/67/59	74/70/60
		Inlet + Radiated		68/65/55	70/68/59	68/64/57	72/70/62	74/70/69
ELECTRICAL (Fan Motor)	Power Input (Cooling)[1]	H	W	202	281	310	477	672
		M		121	208	151	304	546
		L		34	65	70	108	280
	Running Current	H	A	1.76	2.44	2.7	4.15	5.84
HYDRONIC	Cooling Water Flow Rate	H	L/h	259	450	826	1004	1831
		M		140	360	605	728	1336
		L		92	173	244	482	898
	Cooling Pressure Drop	H	kPa	17.26	9.59	32.7	18.24	64.29
		M		5.67	6.41	18.65	10.21	36.44
		L		2.65	1.72	3.64	4.87	17.82
	Water Content		L	1.65	2.38	3.15	4.31	4.90

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 45C / 40°C*

(1): Fan motor power includes PCB power input.
(2): Sound Power in compliance with EN9614-2.
For High ΔT Condition and Hot Water Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted Double Skin, 6 row, 2 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWD-6R-[SIZE]-V-EC			400	800	1200	1600	2000
	Configuration			2 PIPE				
	Number of Fan Blowers			1	2			4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60				
AIR	Air Flow	H	m³/h	500	823	1876	2336	4673
		M		206	612	1205	1477	2954
		L		305	575	937	1386	2773
	Available ESP Pressure	H	Pa	150				
		M						
		L		80				
COOLING	Cooling Capacity	H	kW	2.85	4.77	9.61	12.29	22.23
		M		1.39	3.73	6.75	8.64	15.71
		L		1.1	2.22	3.11	6.08	11.44
	Sensible Cooling Capacity	H		1.91	3.16	6.5	8.28	15.28
		M		0.93	2.44	4.48	5.7	10.54
		L		0.72	1.47	2.06	4.06	7.55
SOUND	Pressure Level	Outlet	db(A)	56/53/43	58/56/47	56/52/45	62/59/48	65/63/60
		Inlet + Radiated		59/56/46	61/59/50	59/55/48	64/61/50	65/63/60
	Power Level	Outlet		65/62/52	67/65/56	65/61/54	71/68/57	74/72/69
		Inlet + Radiated		68/65/55	70/68/59	68/64/57	73/70/59	74/72/69
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	202	281	310	477	672
		M		121	208	151	304	546
		L		34	65	70	108	280
	Running Current	H	A	1.76	2.44	2.7	4.15	5.84
HYDRONIC	Cooling Water Flow Rate	H	L/h	272	454	916	1170	2117
		M		133	355	643	823	1496
		L		105	211	296	579	1090
	Cooling Pressure Drop	H	kPa	4.21	4.76	8.75	16.1	55.95
		M		1.16	3.06	4.62	8.54	29.94
		L		0.76	1.2	1.15	4.54	16.94
	Water Content		L	1.65	2.38	3.15	4.31	4.90

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 65°C / 55°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition and Hot Water Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted Double Skin, 3+1 row, (Auxiliary Heating coil), 4 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWD-3+1R-[SIZE]-P-EC			400	800	1200	1600	2000
	Configuration			4 PIPE				
	Number of Fan Blowers			1	2			4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60				
AIR	Air Flow	H	m³/h	558	1006	2011	2445	4890
		M		262	757	1343	1610	3220
		L		349	650	1078	1506	3012
	Available ESP Pressure	H	Pa	150				
		M						
		L		90				
COOLING	Cooling Capacity	H	kW	3.17	5.48	9.9	12.02	21.58
		M		1.71	4.38	7.24	8.71	15.75
		L		1.12	2.11	2.92	5.77	10.58
	Sensible Cooling Capacity	H		2.22	3.86	7.05	8.53	15.76
		M		1.18	3.03	5.09	6.08	11.24
		L		0.77	1.46	2.03	4.05	7.38
HEATING	Heating Capacity	H	kW	2.68	4.57	8.16	9.95	17.98
		M		1.45	3.66	5.97	7.21	13.12
		L		0.95	1.76	2.41	4.78	8.82
	Max. Electric Heater			3		6	9	
SOUND	Pressure Level	Outlet	db(A)	57/53/43	58/56/47	56/52/45	60/58/50	65/63/60
		Inlet + Radiated		59/56/46	61/59/50	59/55/48	63/61/53	65/63/60
	Power Level	Outlet		66/62/52	67/65/56	65/61/54	69/67/59	74/72/69
		Inlet + Radiated		68/65/55	70/68/59	68/64/57	72/70/62	74/72/69
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	202	281	310	477	672
		M		121	208	151	304	546
		L		34	65	70	108	280
	Running Current	H	A	1.76	2.44	2.7	4.15	5.84
HYDRONIC	Cooling Water Flow Rate	H	L/h	544	939	1697	2061	3700
		M		293	751	1242	1493	2699
		L		192	362	501	989	1814
	Cooling Pressure Drop	H	kPa	16.28	14.64	29.07	22.38	41.62
		M		5.35	9.79	16.58	12.53	23.6
		L		2.5	2.63	3.24	5.98	11.54
	Heating Water Flow Rate	H	L/h	230	392	699	853	1541
		M		124	313	512	618	1124
		L		81	151	207	410	756
	Heating Pressure Drop	H	kPa	16.88	9.09	30.26	16.75	58.75
		M		5.55	6.08	17.25	9.38	33.31
		L		2.59	1.63	3.37	4.47	16.29
	Cooling Water Content		L	1.24	1.787	2.364	3.239	3.677
	Heating Water Content			0.413	0.596	0.788	1.08	1.226

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 65°C / 55°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted Double Skin, 4+2 row, (Auxiliary Heating coil),4 pipe with **EC Motor**

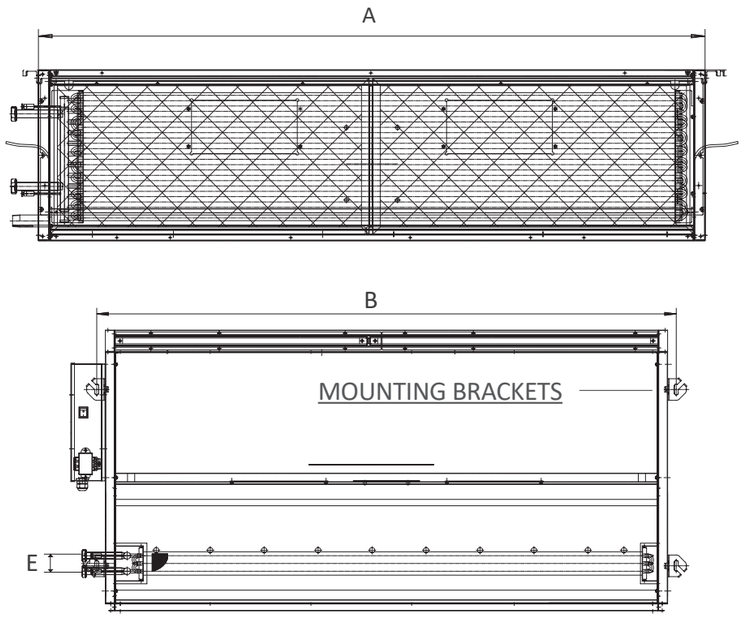
UNIT GENERAL SPECS	PDWD-4+2R-[SIZE]-P-EC				400	800	1200	1600	2000
	Configuration				4 PIPE				
	Number of Fan Blowers				1	2			4
	Power Supply (V/Ph/Hz)				230 / 1 / 50 | 220/1/60				
AIR	Air Flow		H	m³/h	500	823	1876	2336	4673
			M		206	612	1205	1477	2954
			L		159	323	462	985	1971
	Available ESP Pressure		H	Pa	150				
			M						
			L		80				
COOLING	Cooling Capacity		H	kW	2.5	4.05	8.23	10.23	18.58
			M		1.22	3.17	5.78	7.19	13.13
			L		0.96	1.98	2.66	5.06	9.57
	Sensible Cooling Capacity		H		1.68	2.72	5.62	6.98	12.94
			M		0.82	2.1	3.87	4.8	8.93
			L		0.64	1.26	1.78	3.42	6.39
HEATING	Heating Capacity		H	kW	4	6.46	12.96	16.15	29.08
			M		1.95	5.06	9.09	11.36	20.55
			L		1.54	3.01	4.19	7.99	14.97
	Max. Electric Heater				3		6	9	
SOUND	Pressure Level	Outlet		db(A)	56/53/43	58/56/47	56/52/45	60/58/50	65/63/60
		Inlet + Radiated			59/56/46	61/59/50	59/55/48	63/61/53	65/63/60
	Power Level	Outlet			65/62/52	67/65/56	65/61/54	69/67/59	74/72/69
		Inlet + Radiated			68/65/55	70/68/59	68/64/57	72/70/62	74/72/69
ELECTRICAL (Fan Motor)	Power InpuT		H	W	202	281	310	477	672
			M		121	208	151	304	546
			L		34	65	70	108	280
	Running Current @H Speed		H	A	1.76	2.44	2.7	4.15	5.84
HYDRONIC	Cooling Water Flow Rate		H	L/h	238	386	784	974	1770
			M		116	302	550	685	1250
			L		92	180	254	482	911
	Cooling Pressure Drop		H	kPa	14.75	7.29	29.77	17.27	60.46
			M		4.05	4.69	15.74	9.16	32.35
			L		2.65	1.84	3.91	4.87	18.3
	Heating Water Flow Rate		H	L/h	343	554	1111	1385	2493
			M		167	434	780	973	1761
			L		132	258	359	685	1283
	Heating Pressure Drop		H	kPa	10.07	4.95	19.97	11.55	40.46
			M		2.77	3.18	10.56	6.12	21.65
			L		1.81	1.25	2.62	3.26	12.25
	Cooling Water Content			L	1.65	2.38	3.15	4.31	4.90
	Heating Water Content				0.41	0.59	0.78	1.08	1.22

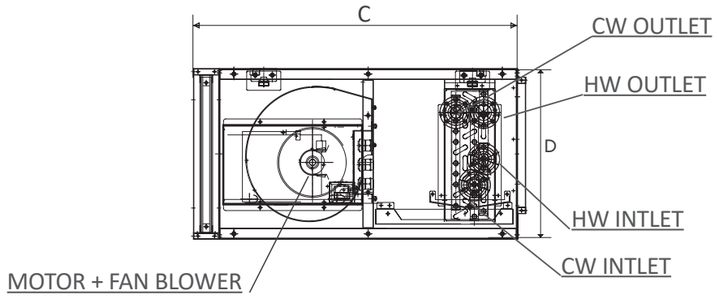
TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 65°C / 55°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition Requirements, please refer to Selection Software.

DIMENSIONAL DRAWINGS, DATA & WEIGHTS





Model	Unit Dimensions (mm)							
	A	B	C	D	E(1)	E(2)	E(3)	E(4)
PDWD-400	862	910	720	350	43.3	65	108.3	#
PDWD-800	1062	1110	780	400	43.3	65	108.3	#
PDWD-1200	1262	1310	780	400	43.3	65	108.3	#
PDWD-1600	1562	1610	780	400	43.3	65	108.3	#
PDWD-2000	1928	1976	780	400	43.3	65	108.3	54,95

PDWD				400	800	1200	1600	2000
CONNECTIONS	Water	Type		Socket (Threaded Female)				
		In	mm (in)	19.05 (3/4")				1"
		Out						
	Condensate Drainage		mm (in)	19.05 (3/4")				
WEIGHT	Net	kg		17	72	24	28	120

E(1): valid for PDWD 3R and PDWD 3+1R only.
E(2): valid for PDWD 4R and PDWD-4+2R-800 to 1600 only.
E(3):valid for PDWD 6R only.
E(4): valid for PDWD-4+2R-2000 only.

DUCTED MEDIUM/ HIGH STATIC

Intelligent Fan Coils

PDWC-EC
PDWC-AC

PRODUCT PRESENTATION

The Polar Air Medium/ High ESP Fan coil ducted ranges have been specifically designed to satisfy medium cooling capacity at medium external static pressure applications. They represent one of the most cost-effective solutions to provide a comfortable environment for both commercial and residential applications. With quiet operation, compact dimensions and low heights, these units are ideal for ceiling concealed installations even in buildings with limited ceiling spaces.

PRODUCT RANGE

The Polar Air Medium/ High ESP Fan coil ducted units offer the following EC and AC motor 230V/50Hz ranges:

	EC Motor	AC Motor	EC Motor	AC Motor
	2 Pipe		4 Pipe	
COOLING	3.45 - 16.86 kW	3.36 - 17.24 kW	3.00 - 16.86 kW	3.00 - 16.86 kW
HEATING	2.23 - 10.80 kW	2.82 - 14.34 kW	3.44 - 17.67 kW	3.38 - 17.67 kW
AIR FLOW	668 - 3642 m³/h	631 - 3668 m³/h	633 - 3651 m³/h	628 - 3668 m³/h

PRODUCT FEATURES

Structure. Made from heavy-gauge galvanized steel panels with couplings for the connection of ducting and gravity drain pan with insulation for condensation. Optional fire-resistant internal NBR insulation to provide both thermal and acoustic insulation. Insulation also fitted on the top coil. Low height dimensions for perfect low height ceiling concealed installations.

Water Coils. Built with seamless copper tubes and headers, with the tubes mechanically expanded into corrugated aluminum fin material for a permanent primary to secondary surface bond. We test the coils at 35 bar, and the maximum operating limit we recommend is at 20 bar. It includes manual air vent and water purge valve.

Fan Blowers. Galvanized steel with die-formed inlet cones housings, double inlet and double width centrifugal type, statically and dynamically balanced for smooth and quiet operation.

Condensate Pans. Steel drain pans with powder finish positively sloped, coated with self-extinguishing closed cell expanded polyethylene with thermal properties. The drain pan outlet is 3/4" (standard on the same side of coil connections).

Filtration. Easily removable and washable filters made from self-extinguishing acrylic with EU2 (G2) (Merv 2-4) efficiency class. G4 (Merv 8) efficiency filters are optional.

Performance. Built with optimized water circuit designs and tested in accredited thermal test rooms to guarantee dependable performance and low water pressure drops. These series can supply more airflow at higher External Static Pressure (ESP), with airflow ranges varying from 578 to 3160 m³/h at medium speed at 120Pa ESP.

Motors. EC motors with included driven controls PCB, constant torque, permanent magnet, with 3 speeds pre-set to allow precise air balancing.

AC motors are PSC with permanently split-capacitor with ball bearing with internal thermal overload protection.

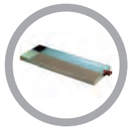
Flexibility. This Medium/ High Fan coil ducted range is available with left or right-hand water connections or easily exchanged on site.

OPTIONAL ACCESSORIES*

Thermostat Controller

Wall Pad Controller

MERV8 | G4 Filter



Stainless steel drain pan

Electric heater module
3 - 9 kW

Valve kit
2 or 3-way 3/4" on/off or modulating

(*): Please refer to page 146 for further information on accessories

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 3 row, 2 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWC-3R-[SIZE]-V-EC			400	500	600	800	1000	1400	1600	2000
	Configuration			2 PIPE							
	Number of Fan Blowers			1		2					4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60							
AIR	Air Flow	H	m³/h	487	678	1128	1429	1830	2322	2694	3651
		M		264	438	872	1230	1284	1795	2047	2948
		L		213	308	489	579	621	944	1393	1713
	Available ESP Pressure	H	Pa	120							
		M									
		L		70							
COOLING	Cooling Capacity	H	kW	2.7	3.69	5.9	7.27	9.22	11.63	13.28	16.86
		M		1.66	2.61	4.86	6.49	7.01	9.52	10.82	14.29
		L		1.38	1.95	3.07	3.56	3.9	5.75	8.01	9.46
	Sensible Cooling Capacity	H		1.9	2.59	4.22	5.25	6.52	8.26	9.47	12.35
		M		1.14	1.79	3.42	4.63	4.91	6.67	7.62	10.33
		L		0.96	1.34	2.11	2.47	2.73	3.93	5.54	6.68
HEATING	Heating Capacity	H	kW	2.8	3.77	6	7.24	10.32	11.92	13.84	17.67
		M		1.73	2.67	4.94	6.46	7.88	9.82	11.09	14.97
		L		1.42	1.99	3.12	3.55	4.34	5.91	8.27	9.91
	Max. Electric Heater			3			6			9	
SOUND	Pressure Level	Outlet	db(A)	54/50/45	56/53/43	56/54/47	58/56/47	56/52/45	59/57/47	60/58/56	64/62/52
		Inlet + Radiated		57/53/48	59/56/46	59/57/50	61/59/50	59/55/48	62/60/50	63/61/59	67/65/55
	Power Level	Outlet		54/50/45	56/53/43	56/54/47	58/56/47	56/52/45	59/57/47	60/58/56	64/62/52
		Inlet + Radiated		57/53/48	59/56/46	59/57/50	61/59/50	59/55/48	62/60/50	63/61/59	67/65/55
ELECTRICAL (Fan Motor)	Power Input[1] (Cooling)	H	W	152	202	195	281	310	413	477	637
		M		84	121	137	208	151	246	304	461
		L		32	34	62	65	70	72	108	142
	Power Input[1] (Heating)	H		1.32	1.75	1.7	2.45	1.35	1.8	2.1	2.76
		M		463	633	1012	1246	1580	1993	2276	2890
		L		285	448	834	1112	1202	1633	1854	2449
	Runnig Current	H	A	237	334	527	611	669	985	1374	1622
HYDRONIC	Cooling Water Flow Rate	H	L/h	11	20.9	28.49	20.54	26.04	43.89	28.21	26.57
		M		4.6	11.21	20.1	16.73	15.91	30.65	19.51	19.72
		L		3.31	6.62	8.79	5.69	5.54	12.35	11.37	9.39
	Cooling Pressure Drop	H	kPa	480	645	1029	1240	1770	2044	2372	3029
		M		296	457	848	1108	1351	1683	1902	2567
		L		244	342	535	609	744	1014	1417	1700
	Heating Water Flow Rate	H	L/h	8.90	16.57	22.18	16.96	24.25	35.47	23.47	21.77
		M		3.73	8.91	15.65	13.84	14.92	24.99	15.77	16.16
		L		2.63	5.27	6.85	4.72	5.10	10.03	9.28	7.69
	Heating Pressure Drop	H	kPa	1.09	1.27	1.84	1.75	2.43	2.88	3.33	3.78
		M		8.03	14.04	15.65	13.84	14.92	24.99	15.77	16.16
		L		4.58	6.54	6.85	4.72	5.10	10.03	9.28	7.69
	Water Content		L	1.09	1.27	1.84	1.75	2.43	2.88	3.33	3.78

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 45C / 40°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 4 row, 2 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWC-4R-[SIZE]-V-EC			400	500	600	800	1000	1400	1600	2000
	Configuration			2 PIPE							
	Number of Fan Blowers			1		2					4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60							
AIR	Air Flow	H	m³/h	446	643	1019	1322	1729	2244	2632	3474
		M		212	393	762	1111	1149	1681	1937	2752
		L		210	302	479	569	610	926	1377	1683
	Available ESP Pressure	H	Pa	120							
		M									
		L		60							
COOLING	Cooling Capacity	H	kW	3.22	4.53	6.94	8.84	11.15	14.05	16.60	21.60
		M		1.80	3.07	5.56	7.75	8.16	11.26	13.10	18.06
		L		1.76	2.49	3.83	4.54	4.91	7.13	10.07	12.24
	Sensible Cooling Capacity	H		2.20	3.10	4.79	6.13	7.79	9.87	11.61	15.17
		M		1.22	2.05	3.79	5.32	5.59	7.78	9.01	12.49
		L		1.19	1.68	2.56	3.03	3.32	4.80	6.83	8.27
HEATING	Heating Capacity	H	kW	2.98	4.18	6.40	8.20	10.34	13.19	15.46	20.13
		M		1.67	2.83	5.12	7.19	7.56	10.57	12.21	16.83
		L		1.62	2.30	3.53	4.21	4.56	6.69	9.38	11.40
	Max. Electric Heater			3			6			9	
SOUND	Pressure Level	Outlet	db(A)	54/50/45	56/53/43	56/54/47	58/56/47	56/52/45	59/57/47	60/58/56	64/62/52
		Inlet + Radiated		57/53/48	59/56/46	59/57/50	61/59/50	59/55/48	62/60/50	63/61/59	67/65/55
	Power Level	Outlet		63/59/54	65/62/52	65/63/56	67/65/56	65/61/54	68/66/56	69/67/59	73/71/61
		Inlet + Radiated		66/62/57	68/65/55	68/66/59	70/68/59	68/64/57	71/69/59	72/70/62	76/74/64
ELECTRICAL (Fan Motor)	Power Input[1] (Cooling)	H	W	152	202	195	281	310	413	477	637
		M		84	121	137	208	151	246	304	461
		L		32	34	62	65	70	72	108	142
	Power Input[1] (Heating)	H		1.32	1.75	1.7	2.45	1.35	1.8	2.1	2.76
		M		552	776	1190	1516	1911	2409	2845	3703
		L		309	526	952	1328	1398	1930	2246	3097
	Running Current	H	A	301	427	657	778	842	1222	1726	2098
	Starting Current			55.53	112.13	100.72	83.81	136.74	76.13	113.76	201.48
HYDRONIC	Cooling Water Flow Rate	H	L/h	19.54	55.57	67.51	66.04	77.88	51.1	74.36	146.03
		M		18.65	38.27	34.58	25.24	31.27	22.43	46.25	72.46
		L		1.45	1.69	2.45	2.33	3.24	3.84	4.44	5.04
	Cooling Pressure Drop	H	kPa	1.45	1.69	2.45	2.33	3.24	3.84	4.44	5.04
		M		10.74	19.28	15.22	14.35	17.01	10.57	15.44	30.11
		L		6.06	8.92	6.56	4.8	5.92	4.25	8.79	13.73
	Water Content		L	1.45	1.69	2.45	2.33	3.24	3.84	4.44	5.04

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 45C / 40°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 3+1 row, (Auxiliary Heating coil), 4 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWC-3R+1-[SIZE]-P-EC			400	500	600	800	1000	1400	1600	2000
	Configuration			4 PIPE							
	Number of Fan Blowers			1		2					4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60							
AIR	Air Flow	H	m^3/h	446	643	1019	1322	1729	2244	2632	3474
		M		212	393	762	1111	1149	1681	1937	2752
		L		210	302	479	569	610	926	1377	1683
	Available ESP Pressure	H	Pa	120							
		M									
		L		60							
COOLING	Cooling Capacity	H	kW	2.53	3.54	5.46	6.83	8.81	11.35	13.07	16.28
		M		1.38	2.4	4.38	6.02	6.39	9.12	10.34	13.55
		L		1.38	1.95	3.02	3.56	3.79	5.62	7.88	9.32
	Sensible Cooling Capacity	H		1.78	2.48	3.88	4.9	6.22	8.04	9.3	11.9
		M		0.96	1.64	3.07	4.28	4.44	6.39	7.28	9.76
		L		0.96	1.34	2.07	2.47	2.65	3.85	5.44	6.58
HEATING	Heating Capacity	H	kW	2.16	2.97	4.57	5.46	7.29	9.2	10.73	13.75
		M		1.18	2.03	3.63	4.77	5.31	7.33	8.52	11.52
		L		1.18	1.63	1.9	2.11	2.43	3.46	4.92	5.96
SOUND	Pressure Level	Outlet	db(A)	54/50/45	56/53/43	56/54/47	58/56/47	56/52/45	59/57/47	60/58/56	64/62/52
		Inlet + Radiated		57/53/48	59/56/46	59/57/50	61/59/50	59/55/48	62/60/50	63/61/59	67/65/55
	Power Level	Outlet		63/59/54	65/62/52	65/63/56	67/65/56	65/61/54	68/66/56	69/67/59	73/71/61
		Inlet + Radiated		66/62/57	68/65/55	68/66/59	70/68/59	68/64/57	71/69/59	72/70/62	76/74/64
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	152	202	195	281	310	413	477	637
		M		84	121	137	208	151	246	304	461
		L		32	34	62	65	70	72	108	142
	Running Current	H	A	1.32	1.76	1.7	2.44	2.7	3.59	4.15	5.54
	Starting Current			434	607	937	1170	1511	1946	2240	2790
HYDRONIC	Cooling Water Flow Rate	H	L/h	237	411	750	1032	1095	1564	1773	2322
		M		237	334	517	611	650	964	1351	1598
		L		9.8	19.4	24.78	18.35	24.02	42.05	27.41	24.93
	Cooling Pressure Drop	H	kPa	3.31	9.61	16.61	14.62	13.46	28.37	17.99	17.92
		M		3.31	6.62	8.51	5.69	5.26	11.87	11.03	9.15
		L		186	255	391	468	625	788	920	1179
	Heating Water Flow Rate	H	L/h	101	174	311	409	455	628	730	988
		M		101	139	163	181	208	297	421	511
		L		10.26	20.24	8.15	11.5	24.59	13.64	20.42	35.26
	Heating Pressure Drop	H	kPa	3.43	10.15	5.39	9	13.9	9.05	13.47	25.64
		M		3.43	6.83	1.73	2.13	3.49	2.43	5.12	8.05
		L		1.09	1.27	1.84	1.75	2.43	2.88	3.33	3.78
	Cooling Water Content		L	0.36	0.42	0.61	0.58	0.81	0.96	1.11	1.26
	Heating water content			0.36	0.42	0.61	0.58	0.81	0.96	1.11	1.26

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 55°C / 45°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 3 row, 2 pipe with AC Motor

UNIT GENERAL SPECS	PDWC-3R-[SIZE]-V			400	500	600	800	1000	1400	1600	2000
	Configuration			2 PIPE							
	Number of Fan Blowers			1		2	1	2			4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60							
AIR	Air Flow	H	m³/h	457	606	1126	1438	1845	2331	2700	3652
		M		278	423	846	1214	1277	1782	2037	2927
		L		237	343	355	522	910	1018	1175	1344
	Available ESP Pressure	H	Pa	120							
		M									
		L									
COOLING	Cooling Capacity	H	kW	2.56	3.39	5.9	7.32	9.22	11.63	13.28	16.86
		M		1.73	2.57	4.72	6.43	6.92	9.52	10.7	14.29
		L		1.52	2.14	2.36	3.25	5.36	6.1	6.95	7.72
	Sensible Cooling Capacity	H		1.8	2.37	4.22	5.29	6.52	8.26	9.47	12.35
		M		1.19	1.76	3.32	4.59	4.84	6.67	7.54	10.33
		L		1.05	1.46	1.64	2.27	3.68	4.18	4.78	5.4
HEATING	Heating Capacity	H	kW	2.64	3.48	6	7.24	10.41	12.02	13.84	17.67
		M		1.8	2.62	4.8	6.4	7.88	9.7	11.09	14.97
		L		1.57	2.2	2.4	3.23	6.02	6.32	7.24	8.09
	Max. Electric Heater				3			6		9	
SOUND	Pressure Level	Outlet	db(A)	54/50/47	56/53/49	56/54/50	58/56/50	56/52/48	59/57/52	60/58/53	64/62/55
		Inlet + Radiated		57/53/51	59/56/52	59/57/53	61/59/53	59/55/51	62/60/55	63/61/56	67/65/58
	Power Level	Outlet		63/59/57	65/62/58	65/63/59	67/65/59	65/61/57	68/66/61	69/67/62	73/71/64
		Inlet + Radiated		66/62/60	68/65/61	68/66/62	70/68/62	68/64/60	71/69/64	72/70/65	76/74/67
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	180	230	286	350	320	356	616	995
		M		162	207	258	315	288	320	542	855
		L		140	176	220	270	245	275	463	770
	Running Current	H	A	0.78	1	1.24	1.52	1.39	1.55	2.68	4.32
	Starting Current	H	A	2.35	3	3.73	4.57	4.17	4.64	8.03	12.98
HYDRONIC	Cooling Water Flow Rate	H	L/h	439	582	1012	1255	1580	1993	2276	2890
		M		296	440	809	1102	1186	1633	1834	2449
		L		261	367	404	558	919	1046	1191	1324
	Cooling Pressure Drop	H	kPa	10	17.95	28.49	20.82	26.04	43.89	28.21	26.57
		M		4.92	10.88	19.03	16.47	15.55	30.65	19.13	19.72
		L		3.94	7.82	5.46	4.84	9.82	13.76	8.8	6.52
	Heating Water Flow Rate	H	L/h	453	596	1029	1240	1784	2061	2372	3029
		M		308	450	822	1098	1351	1663	1902	2567
		L		270	376	411	554	1031	1084	1241	1387
	Heating Pressure Drop	H	kPa	8.0	14.4	22.2	17.0	24.6	36.0	23.5	21.8
		M		4.0	8.6	14.8	13.6	14.9	24.5	15.8	16.2
		L		3.2	6.3	4.3	4.0	9.2	11.3	7.3	5.3
	Water Content		L	1.09	1.27	1.84	1.75	2.43	2.88	3.33	3.78

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 45C / 40°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 4 row, 2 pipe with AC Motor

UNIT GENERAL SPECS	PDWC-4R-[SIZE]-V			400	500	600	800	1000	1400	1600	2000
	Configuration			2 PIPE							
	Number of Fan Blowers			1	2						4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60							
AIR	Air Flow	H	m³/h	417	561	1060	1405	1778	2263	2629	3539
		M		252	394	805	1194	1222	1721	1972	2818
		L		222	327	331	508	882	978	1132	1274
	Available ESP Pressure	H	Pa	120							
		M									
		L									
COOLING	Cooling Capacity	H	kW	3.07	4.04	7.16	9.19	11.41	14.16	16.60	21.93
		M		2.08	3.07	5.81	8.12	8.55	11.49	13.37	18.42
		L		1.85	2.67	2.84	4.15	6.68	7.39	8.6	9.9
	Sensible Cooling Capacity	H		2.09	2.75	4.96	6.4	7.98	9.95	11.61	15.41
		M		1.39	2.05	3.97	5.59	5.87	7.94	9.2	12.74
		L		1.25	1.79	1.93	2.79	4.51	4.99	5.78	6.7
SOUND	Pressure Level	Outlet	db(A)	54/50/47	56/53/49	56/54/50	58/56/50	56/52/48	59/57/52	60/58/53	64/62/55
		Inlet + Radiated		57/53/51	59/56/52	59/57/53	61/59/53	59/55/51	62/60/55	63/61/56	67/65/58
	Power Level	Outlet		63/59/57	65/62/58	65/63/59	67/65/59	65/61/57	68/66/61	69/67/62	73/71/64
		Inlet + Radiated		66/62/60	68/65/61	68/66/62	70/68/62	68/64/60	71/69/64	72/70/65	76/74/67
ELECTRICAL (Fan Motor)	Power Input (Cooling)[1]	H	W	180	230	286	350	320	356	616	995
		M		162	207	258	315	288	320	542	855
		L		140	176	220	270	245	275	463	770
	Running Current	H	A	0.78	1	1.24	1.52	1.39	1.55	2.68	4.33
	Starting Current	H	A	2.35	3	3.73	4.57	4.17	4.64	8.03	12.98
HYDRONIC	Cooling Water Flow Rate	H	L/h	526	692	1228	1576	1955	2427	2845	3759
		M		356	526	995	1392	1466	1970	2292	3157
		L		317	458	487	711	1145	1267	1474	1697
	Cooling Pressure Drop	H	kPa	50.9	91.2	106.6	89.9	142.4	77.2	113.8	207.0
		M		25.2	55.6	73.1	71.9	84.8	53.0	77.1	151.2
		L		20.44	43.41	20.17	21.46	54.36	23.94	34.84	49.48
	Water Content		L	1.45	1.69	2.45	2.33	3.24	3.84	4.44	5.04

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 45C / 40°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition and Hot Water Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 3+1 row, (Auxiliary Heating coil), 4 pipe with **AC Motor**

UNIT	PDWC-3+1R-[SIZE]-P			400	500	600	800	1000	1400	1600	2000
	Configuration			4 PIPE							
	Number of Fan Blowers			1		2	1	2			4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60							
AIR	Air Flow	H	m³/h	417	561	1060	1405	1778	2263	2629	3539
		M		252	394	805	1194	1222	1721	1972	2818
		L		222	327	331	508	882	978	1132	1274
	Available ESP Pressure	H	Pa	120							
		M									
		L									
COOLING	Cooling Capacity	H	kW	2.39	3.2	5.64	7.16	8.97	11.44	13.07	16.51
		M		1.6	2.4	4.57	6.31	6.74	9.22	10.46	13.79
		L		1.45	2.09	2.24	3.18	5.17	5.88	6.82	7.41
	Sensible Cooling Capacity	H		1.67	2.23	4.02	5.16	6.34	8.11	9.3	12.08
		M		1.1	1.64	3.21	4.5	4.71	6.46	7.37	9.95
		L		1.01	1.43	1.56	2.22	3.55	4.01	4.69	5.19
HEATING	Heating Capacity	H	kW	2.03	2.67	4.7	5.7	7.49	9.28	10.73	13.88
		M		1.37	2.03	3.77	5.02	5.6	7.5	8.63	11.65
		L		1.24	1.71	1.86	2.52	4.36	4.79	5.51	6.14
SOUND	Pressure Level	Outlet	db(A)	54/50/47	56/53/49	56/54/50	58/56/50	56/52/48	59/57/52	60/58/53	64/62/55
		Inlet + Radiated		57/53/51	59/56/52	59/57/53	61/59/53	59/55/51	62/60/55	63/61/56	67/65/58
	Power Level	Outlet		63/59/57	65/62/58	65/63/59	67/65/59	65/61/57	68/66/61	69/67/62	73/71/64
		Inlet + Radiated		66/62/60	68/65/61	68/66/62	70/68/62	68/64/60	71/69/64	72/70/65	76/74/67
ELECTRICAL (Fan Motor)	Power Input (Cooling) [1]	H	W	180	230	286	350	320	356	616	995
		M		162	207	258	315	288	320	542	855
		L		140	176	220	270	245	275	463	770
	Power Input (Heating) [1]	H		0.78	1	1.24	1.52	1.39	1.55	2.68	4.33
		M		2.35	3	3.73	4.57	4.17	4.64	8.03	12.98
		L		409	548	967	1227	1538	1962	2240	2830
	Running Current	H	A	273	411	784	1082	1156	1581	1793	2365
	Starting Current			249	358	383	545	886	1007	1168	1270
HYDRONIC	Cooling Water Flow Rate	H	L/h	8.81	16.14	26.24	19.98	24.82	42.66	27.41	25.58
		M		4.27	9.61	17.98	15.94	14.84	28.93	18.37	18.51
		L		3.62	7.51	4.96	4.63	9.19	12.85	8.49	6.05
	Cooling Pressure Drop	H	kPa	174	229	403	488	642	795	920	1189
		M		117	174	323	430	480	643	739	999
		L		106	146	159	216	373	411	473	526
	Heating Water Flow Rate	H	L/h	9.17	16.62	8.58	12.41	25.78	13.86	20.42	35.82
		M		4.48	10.15	5.78	9.89	15.26	9.46	13.77	26.15
		L		3.77	7.46	1.62	2.87	9.73	4.21	6.15	8.26
	Heating Pressure Drop	H	kPa	1.09	1.27	1.84	1.75	2.43	2.88	3.33	3.78
		M		0.36	0.42	0.61	0.58	0.81	0.96	1.11	1.26
		L		8.34	14.03	3.68	4.26	12.91	6.29	9.01	14.17
	Cooling water content		L	1.09	1.27	1.84	1.75	2.43	2.88	3.33	3.78
	Heating water content			0.36	0.42	0.61	0.58	0.81	0.96	1.11	1.26

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*

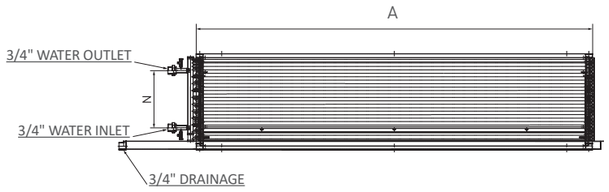
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 65C / 55°C*

(1): Fan motor power includes PCB power input.

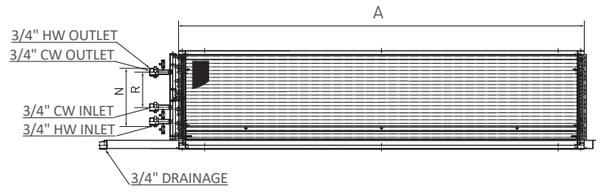
For High ΔT Condition Requirements, please refer to Selection Software.

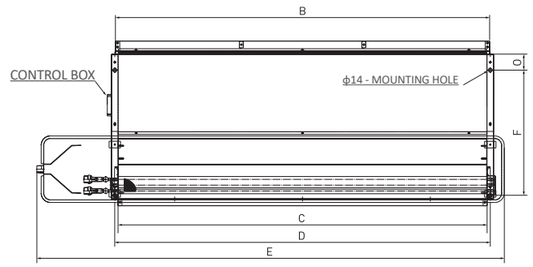
DIMENSIONAL DRAWINGS, DATA & WEIGHTS

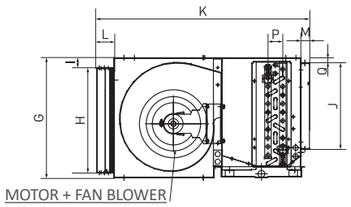
2 PIPE



4 PIPE







Model	Unit Dimensions (mm)																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R[(1)]
PDWC 400	635	605	585	610	1055	470	300	256	30	202	620	50	25	150	60	43.3	15	100
PDWC 500	735	705	685	710	1155	470	300	256	30	202	620	50	25	150	60	43.3	15	100
PDWC 600	935	905	885	910	1355	470	300	256	30	202	620	50	25	150	60	43.3	15	100
PDWC 800	935	905	885	710	1355	470	350	306	30	252	620	50	25	175	60	65	15	125
PDWC 1000	1035	1005	985	1010	1455	470	350	306	30	252	620	50	25	175	60	65	15	125
PDWC 1400	1235	1205	1185	1210	1655	470	350	306	30	252	620	50	25	175	60	65	15	125
PDWC 1600	1435	1405	1385	1410	1855	470	350	306	30	252	620	50	25	175	60	65	15	125
PDWC 2000	1695	1665	1645	1670	2215	470	350	306	30	252	620	50	25	175	60	65	15	125

PDWC				400	500	600	800	1000	1400	1600	2000
CONNECTIONS	Water	Type		Socket (Female Threaded)							
		In / Out	mm (in)	19.05 (3/4")							
	Condensate Drainage		mm (in)								
WEIGHT	Net		kg	28	37	44	46	48	55	63	83

E[(1)]: valid for 4 pipe units only.

DUCTED MEDIUM STATIC
Intelligent Fan Coils

PDWB-EC
PDWB-AC

PRODUCT PRESENTATION

The Polar Air High ESP ducted fan coil units have been specifically designed to satisfy high cooling capacity at high external static pressure applications. They represent one of the most cost-effective solutions to provide a comfortable environment for both commercial and residential applications. With quiet operation, compact dimensions and low heights, these units are ideal for ceiling concealed installations even in buildings with limited ceiling spaces.

PRODUCT RANGE

The Intelligent medium/ high Static Ducted units offer the following EC and AC motor 230V/50Hz range with the following capacities at H speed:

	EC Motor	AC Motor	EC Motor	AC Motor
	2 Pipe		4 Pipe	
COOLING	6.49 - 22.22 kW	6.49 - 22.22 kW	5.09 - 24.06 kW	6.35 - 21.97 kW
HEATING	6.53 - 21.96 kW	6.53 - 21.96 kW	4.05 - 18.47 kW	5.06 - 19.96 kW
AIR FLOW	1425 - 4998 m³/h	1425 - 4998 m³/h	1044 - 5533 m³/h	1396 - 4291 m³/h

PRODUCT FEATURES

Structure. Made from heavy-gauge galvanized steel panels with couplings for the connection of ducting and gravity drain pan with insulation for condensation. Optional fire-resistant internal NBR insulation to provide both thermal and acoustic insulation. Insulation also fitted on the top coil. Low height dimensions for perfect low height ceiling concealed installations.

Water Coils. Built with seamless copper tubes and headers, with tubes mechanically expanded into corrugated aluminium fin material for a permanent primary to secondary surface bond. We test the coils at 35 bar, and the maximum operating limit we recommend is at 20 bar. It includes manual air vent and water purge valve.

Fan Blowers. Galvanized steel with die-formed inlet cones housings, double inlet and double width centrifugal type, statically and dynamically balanced for smooth and quiet operation.

Condensate Pans. Steel drain pans with powder finish positively sloped, coated with self-extinguishing closed cell expanded polyethene with thermal properties. The drain pan outlet is 3/4" (standard on the same side of coil connections).

Filtration. Easily removable and washable filters made from self-extinguishing acrylic with EU2 (G2) (Merv 2-4) efficiency class. G4 (Merv 8) efficiency filters are optional.

Performance. Built with optimized water circuit designs and tested in accredited thermal test rooms to guarantee dependable performance and low water pressure drops. These series can supply more airflow at higher External Static Pressure (ESP), with airflow ranging from 1769 to 4044 m3/h at medium speed at 50 Pa ESP.

Motors. EC motors with driven controls PCB, constant torque, permanent magnet, and 3 speeds pre-set to allow precise air balancing. AC motors are PSC with a permanently split-capacitor with ball bearing with internal thermal overload protection.

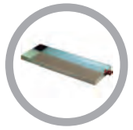
Flexibility. This Medium/ High Static Fan coil ducted range is available with left or right-hand water connections, which cannot be exchanged on site.

OPTIONAL ACCESSORIES*

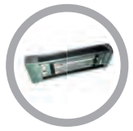
Thermostat Controller

Wall Pad Controller

MERV14 / MERV 8 Filter

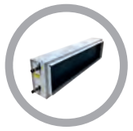


Stainless steel drain pan



Electric heater module
3 - 9 kW

Plenum
Return Air / Adjustable Damper / Round



1 or 2 row auxiliary heating coil

Valve kit
2 or 3-way 3/4" or 1" on/off or modulating

(*): Please refer to page 146 for further information on accessories

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 3 row, 2 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWB-3R-[SIZE]-V-EC			1000	1200	1600	1800	2400
	Configuration			2 PIPE				
	Number of Fan Blowers			2				4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220 / 1 / 60				
AIR	Air Flow	H	m³/h	1569	1845	2602	3101	4857
		M		1088	1425	2181	2365	4053
		L		473	814	1563	1347	2921
	Available ESP Pressure	H	Pa	100				
		M						
		L						
COOLING	Cooling Capacity (E)	H	kW	6.97	8.19	11.62	14.74	21.84
		M		5.25	6.75	10.2	11.95	18.92
		L		2.71	4.39	7.82	7.64	14.81
	Sensible Cooling Capacity (E)	H		5.1	6.03	8.43	10.57	15.94
		M		3.77	4.92	7.32	8.51	13.71
		L		1.91	3.12	5.54	5.35	10.55
HEATING	Heating Capacity (E)	H	kW	7	8.46	12.28	14.68	21.59
		M		5.29	6.99	10.77	11.9	18.7
		L		2.78	4.51	8.25	7.61	14.64
SOUND	Pressure Level (E)	Outlet	db(A)	54/51/46	56/53/48	55/51/47	56/54/49	58/54/50
		Inlet + Radiated		57/54/49	59/56/51	58/54/50	59/57/52	61/57/53
	Power Level (E)	Outlet		63/60/55	65/62/57	64/60/56	65/63/58	67/63/59
		Inlet + Radiated		66/63/58	68/65/60	67/63/59	68/66/61	70/66/62
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	276	384	420	480	840
		M		244	347	310	380	620
		L		110	140	160	210	320
	Running Current	H	A	2.51	3.49	3.82	4.36	7.64
HYDRONIC	Cooling Water Flow Rate	H	L/h	1195	1405	1992	2526	3744
		M		901	1158	1749	2048	3244
		L		464	752	1340	1309	2539
	Cooling Pressure Drop	H	kPa	11.22	16.21	14.33	20.14	29.05
		M		6.74	11.45	11.33	13.81	22.44
		L		2.05	5.27	7.01	6.17	14.43
	Heating Water Flow Rate	H	L/h	1199	1450	2105	2517	3701
		M		906	1199	1846	2041	3206
		L		476	774	1415	1304	2509
	Heating Pressure Drop	H	kPa	9.54	14.3	19.91	16.65	23.86
		M		5.76	10.16	15.71	11.41	18.43
		L		1.81	4.62	9.74	5.1	11.85
	Water Content		L	1.705	1.932	2.879	3.864	4.735

TESTING CONDITIONS

Cooling mode: Return air temperature: 27°C DB / 19°C WB Inlet / outlet water temperature: 7°C / 12°C
Heating mode: Return air temperature: 20°C Inlet / outlet water temperature: 45C / 40°C

(1): Fan motor power includes PCB power input.
(e): Specifications follow Eurovent test data for the year of publication.
For non-standard conditions (i.e: High ΔT requirements) please refer to Eurovent certified selection software.
Please visit www.eurovent-certification.com for more information.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 3+1 row, (Auxiliary Heating coil),4 pipe with **EC Motor**

UNIT GENERAL SPECS	PDWB-3+1R-[SIZE]-P-EC			1000	1200	1600	1800	2400
	Configuration			4 PIPE				
	Number of Fan Blowers			2				4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220 / 1 / 60				
AIR	Air Flow	H	m³/h	1489	1776	2514	2963	4700
		M		1018	1367	2111	2249	3926
		L		414	763	1504	1249	2814
	Available ESP Pressure	H	Pa	100				
		M						
		L						
COOLING	Cooling Capacity	H	kW	6.68	7.96	11.35	14.2	21.32
		M		4.99	6.5	9.9	11.36	18.5
		L		2.44	4.16	7.6	7.11	14.34
	Sensible Cooling Capacity	H		4.88	5.85	8.2	10.17	15.53
		M		3.57	4.72	7.09	8.07	13.39
		L		1.74	2.94	5.38	5.01	10.21
HEATING	Heating Capacity	H	kW	5.3	6.3	9.36	10.82	16.27
		M		3.97	5.17	8.19	8.75	14.19
		L		1.91	3.28	6.31	5.46	11.06
SOUND	Pressure Level	Outlet	db(A)	55/53/48	57/55/51	57/53/48	56/55/51	60/55/51
		Inlet + Radiated		58/56/51	60/58/54	60/56/51	59/58/54	63/58/54
	Power Level	Outlet		64/62/57	66/64/60	66/62/57	65/64/60	69/64/60
		Inlet + Radiated		67/65/60	69/67/63	69/65/60	68/67/63	72/67/63
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	276	384	420	480	840
		M		244	347	310	380	620
		L		110	140	160	210	320
	Running Current	H	A	3	4.09	4.41	4.58	8.82
HYDRONIC	Cooling Water Flow Rate	H	L/h	1145	1365	1945	2435	3655
		M		855	1115	1697	1948	3171
		L		418	713	1303	1219	2458
	Cooling Pressure Drop	H	kPa	10.4	15.39	13.72	18.86	27.82
		M		6.14	10.7	10.73	12.62	21.54
		L		1.7	4.78	6.68	5.42	13.62
	Heating Water Flow Rate	H	L/h	454	540	802	928	1395
		M		340	443	702	750	1217
		L		163	281	541	468	948
	Heating Pressure Drop	H	kPa	10.5	15.49	16.49	11.04	27.09
		M		6.25	10.83	12.96	7.53	21.19
		L		1.67	4.78	8.1	3.22	13.52
	Chilled Water Content		L	1.705	1.932	2.879	3.864	4.735
	Hot Water Content			0.568	0.644	0.966	1.288	1.591

TESTING CONDITIONS

Cooling mode: Return air temperature: 27°C DB / 19°C WB Inlet / outlet water temperature: 7°C / 12°C
Heating mode: Return air temperature: 20°C Inlet / outlet water temperature: 65C / 55°C

(1): Fan motor power includes PCB power input.
For High ΔT Condition Requirements, please refer to Selection Software.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 3 row, 2 pipe with AC Motor

UNIT GENERAL SPECS	PDWB-3R-[SIZE]-V			1000	1200	1600	1800	2400
	Configuration			2 PIPE				
	Number of Fan Blowers			2				4
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220 / 1 / 60				
AIR	Air Flow	H	m³/h	1365	1754	2807	3902	4565
		M		1258	1476	2463	2949	3803
		L		1094	1289	2163	2379	2283
	Available ESP Pressure	H	Pa	100				
		M						
		L						
COOLING	Cooling Capacity (E)	H	kW	6.25	7.87	12.35	17.54	20.76
		M		5.91	6.9	11.16	14.2	18.08
		L		5.31	6.25	10.1	11.95	12.22
	Sensible Cooling Capacity (E)	H		4.55	5.78	9.01	12.77	15.1
		M		4.27	5.03	8.06	10.17	13.05
		L		3.81	4.52	7.24	8.51	8.63
HEATING	Heating Capacity (E)	H	kW	6.32	8.13	13.01	17.48	20.52
		M		5.93	7.16	11.77	14.15	17.87
		L		5.33	6.44	10.68	11.9	12.08
SOUND	Pressure Level (E)	Outlet	db(A)	49/47/44	56/54/53	56/53/51	56/49/45	57/54/51
		Inlet + Radiated		51/49/46	58/56/55	58/55/53	58/51/47	59/56/53
	Power Level (E)	Outlet		58/56/53	65/63/62	65/62/60	65/58/54	66/63/60
		Inlet + Radiated		60/58/55	67/65/64	67/64/62	67/60/56	68/65/62
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	310	471	611	884	988
		M		261	396	505	614	885
		L		223	370	448	495	745
	Running Current	H	A	1.35	2.05	2.66	3.84	4.3
	Starting Current	H		4.04	6.14	7.97	11.53	12.89
HYDRONIC	Cooling Water Flow Rate	H	L/h	1071	1350	2118	3007	3558
		M		1014	1184	1914	2435	3099
		L		910	1072	1732	2048	2096
	Cooling Pressure Drop	H	kPa	9.22	15.08	15.99	27.57	26.5
		M		8.34	11.91	13.33	18.86	20.66
		L		6.87	9.97	11.13	13.81	10.22
	Heating Water Flow Rate	H	L/h	1083	1393	2230	2997	3517
		M		1016	1227	2018	2426	3063
		L		913	1104	1831	2041	2071
	Heating Pressure Drop	H	kPa	7.94	13.31	22.09	22.79	21.77
		M		7.09	10.59	18.46	15.58	16.97
		L		5.85	8.76	15.49	11.41	8.39
	Water Content		L	1.705	1.932	2.879	3.864	4.735

TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 45C / 40°C*

(1): Fan motor power includes PCB power input.
(e): Specifications follow Eurovent test data for the year of publication.
For non-standard conditions (i.e: High ΔT requirements) please refer to Eurovent certified selection software.
Please visit www.eurovent-certification.com for more information.

TECHNICAL SPECIFICATIONS

Hydronic Medium/ High Static Ducted, 3+1 row, (Auxiliary Heating coil),4 pipe with AC Motor

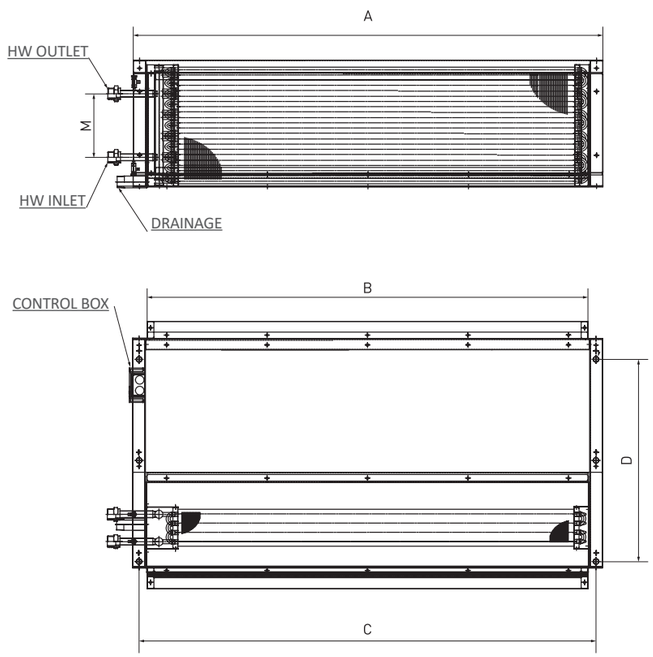
UNIT GENERAL SPECS	PDWB-3+1R-[SIZE]-P			1000	1200	1600	1800	2400
	Configuration			4 PIPE				
	Number of Fan Blowers			2				
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220 / 1 / 60				
AIR	Air Flow	H	m³/h	1272	1704	2739	3818	4483
		M		1213	1450	2423	2912	3744
		L		1062	1276	2138	2353	2251
	Available ESP Pressure	H	Pa	100				
		M						
		L						
COOLING	Cooling Capacity	H	kW	5.96	7.74	12.08	17.16	20.47
		M		5.71	6.8	10.97	14.07	17.93
		L		5.15	6.2	10	11.8	12.06
	Sensible Cooling Capacity	H		4.31	5.67	8.8	12.48	14.89
		M		4.12	4.96	7.91	10.06	12.93
		L		3.69	4.48	7.17	8.4	8.51
HEATING	Heating Capacity	H	kW	4.72	6.13	9.99	13.18	15.69
		M		4.55	5.41	9.11	10.73	13.72
		L		4.1	4.89	8.27	9.07	9.19
SOUND	Pressure Level	Outlet	db(A)	49/47/44	56/54/53	56/53/51	56/49/45	57/54/51
		Inlet + Radiated		51/49/46	58/56/55	58/55/53	58/51/47	59/56/53
	Power Level	Outlet		58/56/53	65/63/62	65/62/60	65/58/54	66/63/60
		Inlet + Radiated		60/58/55	67/65/64	67/64/62	67/60/56	68/65/62
ELECTRICAL (Fan Motor)	Power Input[1]	H	W	310	471	611	884	988
		M		261	396	505	614	885
		L		223	370	448	495	745
	Running Current	H	A	1.34	2.05	2.66	3.84	4.3
	Starting Current	H		4.02	6.14	7.97	11.53	12.9
HYDRONIC	Cooling Water Flow Rate	H	L/h	1022	1327	2071	2942	3510
		M		979	1166	1881	2412	3074
		L		882	1064	1714	2023	2068
	Cooling Pressure Drop	H	kPa	8.47	14.62	15.36	26.51	25.86
		M		7.84	11.6	12.92	18.54	20.37
		L		6.5	9.82	10.93	13.51	9.97
	Heating Water Flow Rate	H	L/h	404	525	856	1130	1345
		M		390	464	781	920	1176
		L		351	419	709	777	788
	Heating Pressure Drop	H	kPa	8.52	14.7	18.55	15.73	25.39
		M		8	11.75	15.72	10.86	19.92
		L		6.61	9.8	13.2	8.03	9.69
	Chilled Water Content		L	1.705	1.932	2.879	3.864	4.735
	Hot Water Content			0.568	0.644	0.966	1.288	1.591

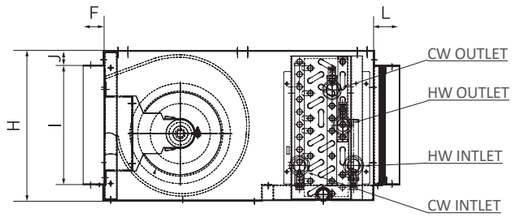
TESTING CONDITIONS

Cooling mode: *Return air temperature: 27°C DB / 19°C WB* *Inlet / outlet water temperature: 7°C / 12°C*
Heating mode: *Return air temperature: 20°C* *Inlet / outlet water temperature: 65C / 55°C*

(1): Fan motor power includes PCB power input.
For High ΔT Condition Requirements, please refer to Selection Software.

DIMENSIONAL DRAWINGS, DATA & WEIGHTS

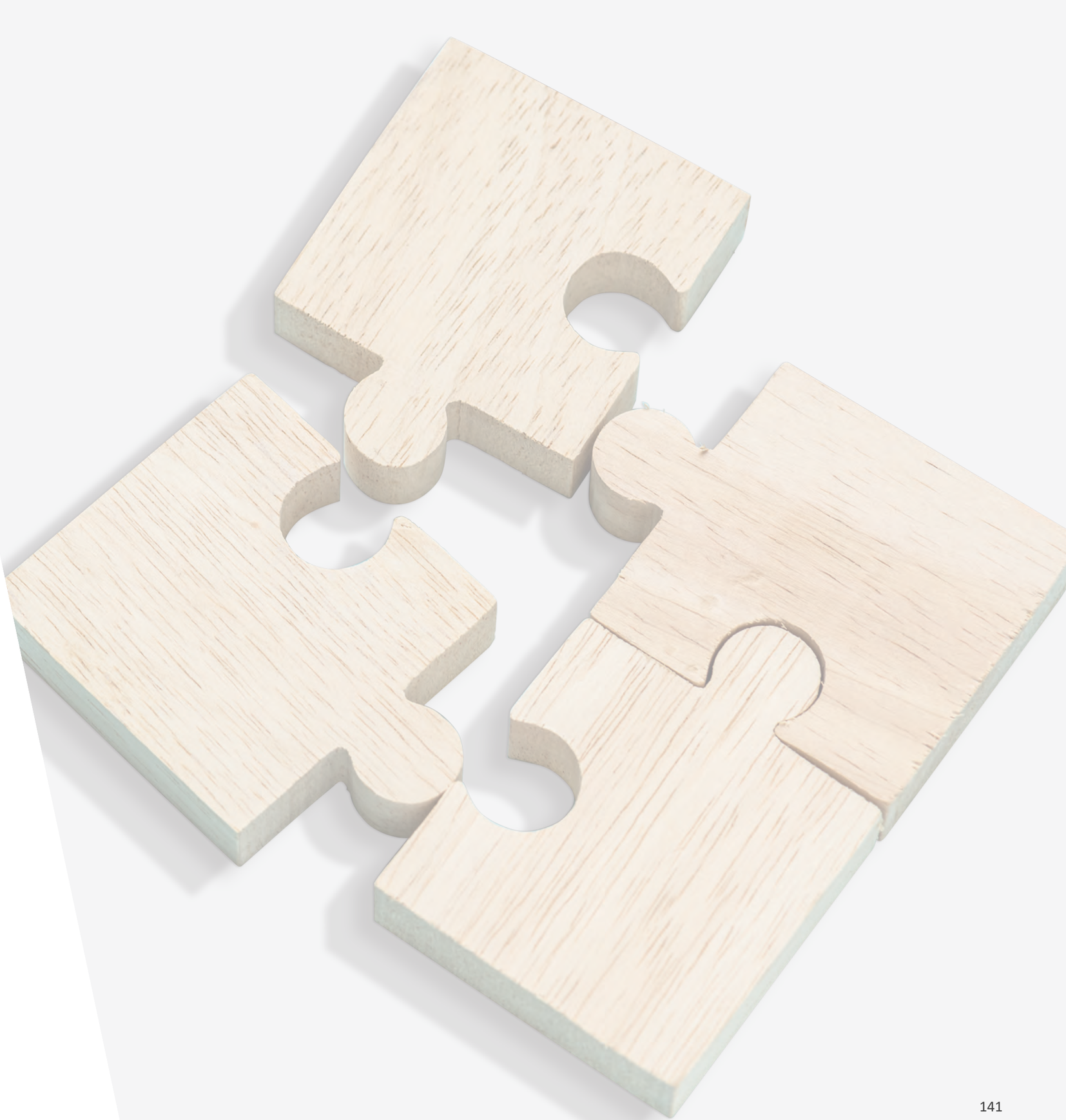




Model	Unit Dimensions (mm)										
	A	B	C	D	F	H	I	J	K	L	M
PDWB-1000	1010	942	980	475	60	300	240	30	40	50	630
PDWB-1200	1110	1042	1080	475	60	300	240	30	40	50	630
PDWB-1600	1460	1392	1430	495	60	380	320	30	40	50	650
PDWB-1800	1460	1392	1430	595	70	430	370	30	40	50	750
PDWB-2400	1760	1692	1730	595	70	430	370	30	40	50	750

PDWB				1000	1200	1600	1800	2400
CONNECTIONS	Water	Type		Socket (Threaded Male)				
		In / Out	mm (in)	19.05 (3/4")			25.4 (1")	
	Condensate Drainage		mm (in)	19.05 (3/4")				
WEIGHT	Net	kg		45	50	58	65	75

ACCESSORIES FOR **FAN COILS**



01. CONTROLLERS

[WWP-V3] WIRED WALL PAD CONTROL (FOR TOTAL CONTROL)

Features: 7 days ON/OFF timer program | Addressable Main and Secondary units allowing control of up to 32 Secondary units via a single Main Unit with set or check of each unit parameters individually | Error display with addressable error diagnostic (Main unit Wall Pad displays Secondary unit address and error type) | One-Touch Global Control (Global Control Main Unit Wall Pad controls all units in the group) | Onboard Room Air Temperature Sensor.

[IRHS-V1] REMOTE INFRARED HANDSET (FOR TOTAL CONTROL)

With Global Control functionality for Main and Secondary Unit groups.

02. CONTROL OPTIONS

ABS LED RECEIVER

IR receiver in ABS housing with up to 180cm (70in) length prewiring, which can be connected with TOTAL controls only. LED lights show working mode or error mode.

DIFERENTIAL PRESSURE TRANSDUCER

This device converts the air pressure difference to a proportional electrical output (0-10 VDC/0-5 VDC/4-20 mA). It is suitable for detecting abnormal airflow at the fan coil unit for safety (cutting off electric heater) or maintenance (air filter cleaning) purposes.

03. VALVE KITS

2 or 3 WAY BYPASS THERMOELECTRIC VALVES

2-way or 3-way valve bodies with ON/OFF or modulating actuators integrated with copper piping connection kits.

** Piping connection kits vary among the different ranges.*

2 or 3 WAY BYPASS BALL VALVES

2-way or 3-way bypass ball valve bodies with motorized or 24VAC modulating actuators integrated with Copper Piping Connection Kits.

** Piping connection kits vary among the different ranges.*

04. UPGRADED FILTERS

All our fan coils come with an standard nylon filter installed as standard.
If you want an upgrade on those filters, you can choose between:

G4 (MERV 8)

Available with 3M HAF grade.

F8 (MERV 14)

Range	G4 (MERV 8)		F8 (MERV 14)
	STANDARD	WITH 3M HAF GRADE	
PCGH-3R EC and AC	X	X	
CHV2 EC and AC	X	X	
PDWA EC and AC	X	X	
PDL EC	X	X	
PDWD EC	X	X	
PDWC EC and AC	X	X	
PDWB EC and AC	X	X	X
HAHU EC and AC	X	X	X
VAHU EC	X	X	X
PFWB(C) EC and AC	X	X	

05. ELECTRIC HEATERS

PTC ELECTRIC HEATER KIT(1)

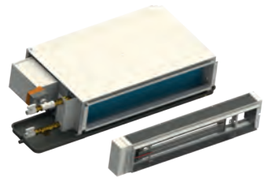
With 2-stage safety cut-out and can be configured as booster heaters or primary heaters.

TUBE ELECTRIC HEATER KIT(1)

With 2-stage safety, cut-outs can be configured as booster heaters or primary heaters. It can be easily installed on-site or in stock via plug-and-play wiring and brackets.

MODULE ELECTRIC HEATER KIT(1)

The electric heater module is supplied for winter heating as an alternative to the auxiliary hot water coil. We offer a complete range of electric heaters kits, easy to connect to control box, with mounting fixture. The electric heater configuration is selectable by the DIP switch on the internal control board.



Range	Module EH Kit	PTC EH Kit	Tube EH Kit
SWC EC	-	From 0.75 to 1.5 KW	-
PCGH-3R EC	-	-	From 1 to 4 KW
PCSL EC	-	From 0.5 to 1 KW	-
PDWA EC	From 1 to 6 KW	-	-
PDL EC	From 3 to 9 KW	-	-
PDWSL EC	From 1.5 to 3 KW	-	-
PDWB EC	From 3 to 9 KW (380V/3Ph)	-	-
HAHU EC	From 4.5 to 24 KW (400V/3Ph)	-	-
VAHU EC	From 4.5 to 9 KW (400V/3Ph)	-	-
PFWB(C) EC	-	From 1 to 3 KW	-

** Non-standard electric heater sizes available under request. Contact us for further information.*
***The Electric Reheater Kits can be retrofited to the Ducted 4-Pipe ranges on special request.*

(1) ***ELECTRIC HEATER SAFETIES*** *Each Heater Kit includes an Auto-Klixon Thermal Switch, a Fuse & Contact Relay factory wired & tested. Additional Safeties including Manual Overheat Stat & Air Pressure Safety are available under request*

06. DRAIN PANS

STAINLESS STEEL DRAIN PAN

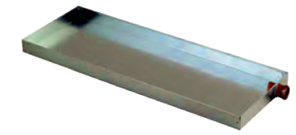
To choose between left or right side coil connections.

PAINTED STEEL DRAIN PAN

For Horizontal installations: Painted steel drain pans for built-in horizontal floor standing fixed wall installations with right or left-sided coil connections.

For Vertical installations: Painted steel drain pans for suspended ceiling installations with right or left-sided coil connections.

Range	Stainless Steel	Painted Steel for Horizontal Installations	Painted Steel for Vertical Installations
PDWA EC and AC	X		
PDL EC	X		
PDWSL EC	X		
PDWD EC	X		
PDWC EC and AC	X		
PDWB EC and AC	X		
HAHU EC and AC	X		
PFWB(C) EC and AC	X	X	X



07. FLANGES

FLANGES

For Fresh Air: Allows up to 15% of unit airflow up to a maximum of 100m³/h (59CFM) as fresh air intake (per connection). Cassette comes with knock out fresh air connection holes. ABS plastic flanges use only two screws for fixture to unit. Available for PCGH-3R Cassette range.

For Branch Duct: For delivery of treated air to adjacent spaces with 2 connectors per single fan model. Available for PCGH-3R Cassette ranges.

OUR
FAN COILS

INTELLIGENT FAN COIL SYSTEMS

With more than 20 years specialized in the design, production and commercialization worldwide of hydronic products, we have the firm conviction that the fan coil terminals are one of the most critical parts of a water-based HVAC system, as they provide comfort and energy conditions directly demanded by the end-users.

This conviction led us to create the intelligent fan coils, a new fan coil generation conceived as an individual intelligent point of control, designed to provide reliable performance and the highest efficiency operation with ultimate design flexibility.

The Intelligent fan coils are produced with the highest quality materials, the most efficient components and best manufacturing practices to make them the best comfort and efficiency solution for water-based HVAC projects.

THE WIDEST RANGE

Polar Global HVAC Systems has the widest range of fan coils in the world, adapted to each specific market requirement with a wide variety of accessories and options.

We have a complete range of EC and AC hydronic fan coils, Eurovent and AHRI performance and sound listed, as well as CE and ETL approvals. Note within the +1800 models/sizes we produce, ducted unit designs vary between the USA, EU and the Middle East.

We understand the need that many projects require special solutions, and we do our best to offer the maximum levels of flexibility to customize products according to the project requirements.

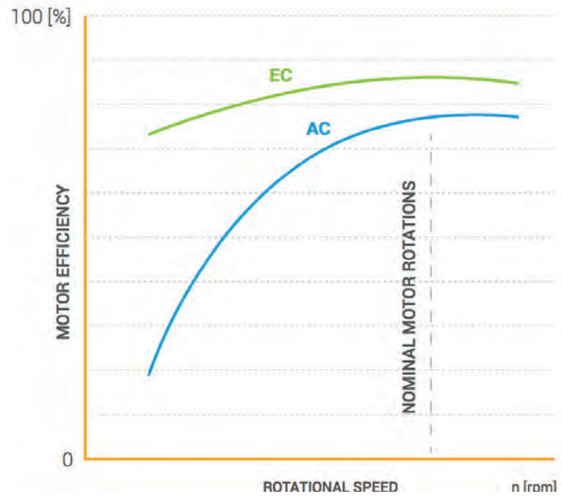
INTELLIGENT EFFICIENT MOTORS

The Intelligent fan coils offer energy-efficient products that use DC motors with variable speed modulation using an integrated EC motor driver.

The units with EC motors have energy savings at set H/M/L speeds between 30% to 50% compared to traditional on/off AC motors. In auto mode, as airflow continuously varies between 20% and 100% of the maximum high-speed airflow (step-less progression), energy savings are between 50 – 70% , while precisely meeting the required cooling and heating loads of the space.

This innovation eliminates the need for the motor to turn off and on periodically to maintain the desired temperature of the environment, leading to total energy savings of up to 50% on an installation/project basis. Modulation of airflow to meet the heating and cooling requirements of the space will also result in reducing temperature fluctuations within the space and reducing fan noise.

COMPARISON OF MOTOR EFFICIENCY

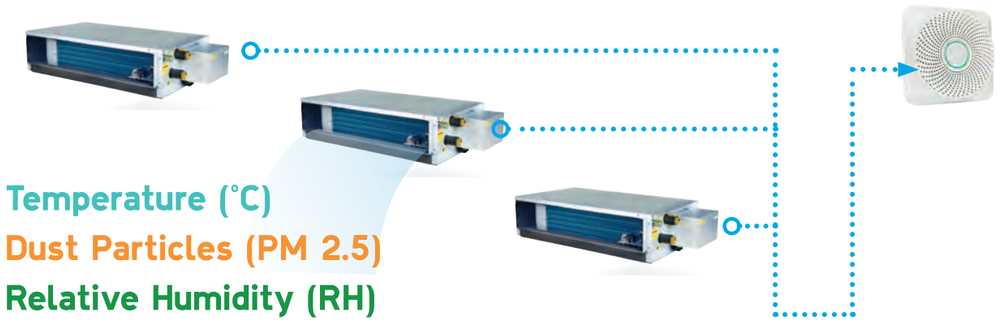


A 0-5VDC signal originated from an inverter board integrated into the onboard unit controller drives the motor, using PID logic to modulate within 0-10V speed RPMs in Energy Saving Auto - Mode (ESM).

INTELLIGENT AIR QUALITY CONTROL

The Intelligent fan coil system's integrated control logic continuously checks air quality data such as PM2.5 or CO^2 coming from the AQI transducer to provide the utmost air quality comfort.

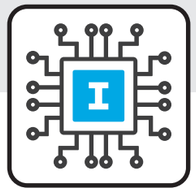
Polar Air fan coil systems also offer high-efficiency filter options to ensure efficient air cleaning and allow fresh air ducts to be connected directly to the units.



DIFFERENT CONTROL OPTIONS TO OFFER FLEXIBILITY

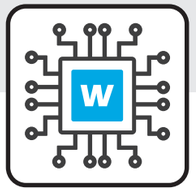
All Polar Air fan coil units offer maximum levels of control flexibility, allowing configuration by two types of control logic to satisfy specific application requirements.

Both types of controls are built-in. We offer user-friendly controllers, such as wall pads, remote handsets or thermostats as optional accessories to control the units, depending on the selected control type and project requirements.



[I-TYPE CONTROL]

CONTROLLED WITH POLAR AIR WALL PAD AND IR HANDSET



[W-TYPE CONTROL]

CONTROLLED WITH EXTERNAL 3RD PARTY THERMOSTAT.

TOTAL CONTROL PCB WITH INTELLIGENT FUNCTIONALITY [I-TYPE]

The PCB (printed circuit board) microprocessor intelligent control board controls the operation of the indoor fan motor, ON/OFF or modulating water valves, and electric heaters (if fitted) to maintain room conditions at a user-defined set point.

This control type is field programmable using easy to set configuration directly through the wired wall pad or dipswitches (on specific models) and controlled via infra-red handset and/or the wired wall pad (optional items).

- Full control logic connectivity via Modbus RTU with a BMS/PMS or using a gateway with other communication protocols, allowing local configurations.
- Auto Fan Speed control for EC motor adjusting motor signal input from O to 5VDC by PID calculation every IO seconds, and airflow adjustment from I5 to IOO%.
- Modulating Valve Control Under Energy Saving Mode to adjust the water flow IOO% according to the room temperature and set temperature. The controller adjusts the modulating valve signal via Modbus.
- Auto Restart function using non-volatile memory to save the set operation parameters when the system is turned off or in case of system failure or cessation of power supply.
- Master-Slave connectivity with up to 255 terminal units network connection using Modbus open protocol and controlled via our Wired Wall Pad controller. (Global or Addressable)
- Drain Pump control (If installed)
- Autodynamic balancing function for Variable Water Flow system installations. The water flow is controlled with temperature difference ΔT between the water inlet and outlet to ensure correct heat transfer from water to air.

FLEXIBLE CONTROL PCB [W-TYPE]

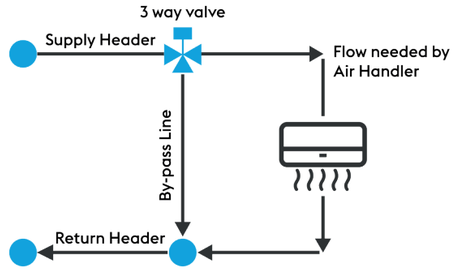
This control option features flexible functionality for external thermostat applications, allowing the independent control of drain pumps, offering zone control product operations, and limited LED diagnostics. In products where louvers are required, this control allows the stepping motors to open the louver at the maximum position or close them when the power of the unit is OFF.

- Independent control of drain pumps (if installed)
- Zone control operations
- Limited LED Diagnostics
- Louver control (when applicable).

CONSTANT VS VARIABLE FLOW APPLICATIONS

In Constant flow installations, typically using 3-way valves, the amount of water flowing through the system does not change as the load changes. When the load on the system is 100%, all of the water flows through the terminal unit coil. When less cooling or heating is needed, the 3-way valve starts to divert the water flow to the bypass and away from the terminal unit coil. As a result, there is less flow going through the terminal unit coil, but the total volume of water going through the fan coil “circuit” is the same. This system design negatively affects the overall energy efficiency of chillers and boilers because the differential temperature in the system remains low. The water leaving the coils blends with the water bypassed, which results in the low temperature differential (delta T). Furthermore, since the flow in the system remains constant at ALL loads, there is no opportunity to use a speed-controlled pump to save energy. Constant flow designs are not suitable for energy-efficient buildings with the current energy efficiency regulations.

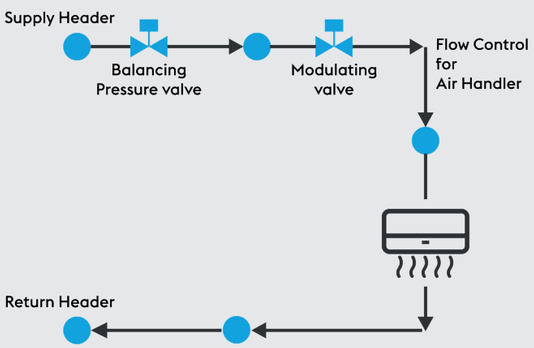
CONSTANT FLOW DIAGRAM



The suitable design for new installations requires the use of variable water flow systems.

In Variable flow installation, 2-way valves control the water through the terminal units. When the load is 100%, the valve is fully opened, and when less cooling or heating is needed, it closes to reduce the flow. Variable flow systems can be very energy efficient because there is a flow reduction in the installation when there is no need for full capacity. On average, an installation runs on 40 to 60% of its capacity most of the time, and pumping costs have significant savings when there is efficient pump speed control. Variable flow can also maximize the differential temperature in the system, which means that chillers and boilers run at optimal efficiency. Proper design and good commissioning (balancing) of a system with 2-way valves are critical to its operation. The system must be appropriately balanced to ensure the correct flows during full and partial load conditions using pressure compensating balancing valves (not manual circuit setters). This process adds additional components, added material cost and additional labour to install and balance.

VARIABLE FLOW DIAGRAM

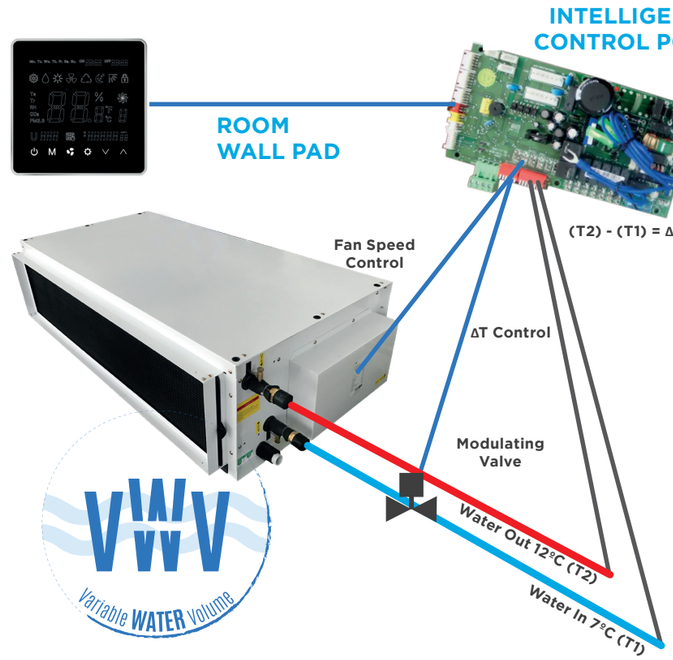


AUTODYNAMIC BALANCING SYSTEMS

Variable water flow system designs depend on differential pressure control valves (DPCV) to maximize energy savings and operational benefits. This type of system design aims to match the system's energy output to the building's load requirements in real-time. When a room thermostat indicates a comfort need in an area, the control system drives the valve actuators to open or close accordingly.

As the valves open or close, the flow rate changes, allowing the system pump to adjust the speed according to the new demand. With the variation of pump speed, the overall energy output of the entire system also changes, which affects the output of the heat pump or the chiller.

From the pump perspective, energy savings are easily understood since they represent about 6% of the total energy consumption of the HVAC system. Pumping energy is proportional to the cube of pump speed so reducing the speed of the pump to 50% can reduce the energy input by 87.5%! Characterized Modulating 2-way valves have been designed to operate on a direct linear relationship between the required energy output and valve position (50% open equals 50% output) but only when the differential pressure in the system is kept constant. This becomes difficult in a system with constantly variable pumping.



The Polar Air intelligent FCUs control logic includes auto dynamic-balancing function to compensate for the pressure differential by measuring the delta (Δ) at the inlet and outlet water temperature points. The water flow is controlled with temperature difference ΔT between the water inlet and outlet to ensure correct heat transfer from water to air. Keeping water temperature ΔT constant keeps the unit running efficiently and reduces the overall installation system's operating costs.

The autodynamic balancing function uses an inlet-outlet coil sensor that allows the unit to maintain a constant water temperature delta T and manage the water demand. The algorithms of the unit controller modify the fan motor speed and the opening of the valves accordingly. Therefore, the fan coil will adjust its operation most efficiently to reach comfort space requirements. This allows the optimization of the 2-way valve modulation and increases the energy efficiency of the variable flow system while eliminating the need to add expensive DPCVs.