4 WAY CASSETTE	PCGH-3R-AC [AC MOTOR] PCGH-3R-EC [EC MOTOR]
1 WAY SLIM CASSETTE	PCSL-EC [EC MOTOR]
COANDA EFFECT CASSETTE	CHV2 [AC MOTOR] CHV2-EC [EC MOTOR]

CASSETTE **FAN COILS**

CASSETTE
Intelligent Fan Coils

PCGH-3R-EC
PCGH-3R-AC

PRODUCT PRESENTATION

The Intelligent 4 way Cassette units have been designed to maximize product flexibility on site and in stock offering easy to remove front panels, filters and integrated drain pumps. The cassettes also feature plug and play one step access to power terminals and auxiliary contacts for quick and easy wiring, easy-to-connect external valves, which can be fitted directly onto the cassette during installation.

PRODUCT RANGE

The Intelligent 4 way Cassette 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	3.61 - 11.82 kW	3.61 - 14.78 kW	2.85 - 8.93 kW	2.85 - 11.10 kW
	3.47 - 11.77 kW	3.47 - 14.84 kW	2.97 - 9.43 kW	2.97 - 11.95 kW
	575 - 2210 m³/h	575 - 2750 m³/h	575 - 2210 m³/h	575 - 2750 m³/h
4 Pipe				

COOLING HEATING AIR FLOW

PRODUCT FEATURES

Casing. Cases made from galvanized sheet steel with integral fan mounting rails for added strength, with internally fitted fire-resistant insulation, to provide both thermal and acoustic insulation. Features high impact polystyrene RAL 9010 fascia.

Water Coils. Built with seamless copper tubes and headers, with 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 manual air vent and water purge valve.

Fan. Backward-curved centrifugal fan, statically and dynamically balanced for quiet operation. Fire-retardant plastic fan impellers for lightweight and corrosion-resistant operation.

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

AC motors are PSC, permanently lubricated type with internal thermal overload protection. The motors are 5-speed standard with 3 speeds preset to allow precise air balancing.

OPTIONAL ACCESSORIES*

Thermostat Controller

Wall Pad Controller

IR Handset + Wall Holder

Electric heater
1 - 4 kW

MERV8 | G4 HAF 3M Filter

Plastic fresh air flange

Plastic branch duct flange

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 4 way cassette, 2 pipe with **EC Motor**

UNIT GENERAL SPECS	PCG(H)-3R-[SIZE]-V-EC			04	08	12	20
	Configuration			2 PIPE			
	Number of Fan Blowers			1			
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60			
AIR	Air Flow (E)	H	m³/h	575	810	1300	2210
		M		380	722	1050	1970
		L		200	200	360	820
COOLING	Cooling Capacity (E)	H	kW	3.61	4.91	7.22	11.82
		M		2.64	4.56	6.21	10.95
		L		1.61	1.65	2.65	5.54
	Sensible Cooling Capacity (E)	H		2.53	3.45	5.13	8.44
		M		1.81	3.20	4.38	7.76
		L		1.08	1.13	1.82	3.79
HEATING	Heating Capacity (E)	H	kW	3.47	4.74	7.06	11.77
		M		2.56	4.36	6.03	10.85
		L		1.53	1.59	2.63	5.55
	Max. Electric Heater			1	2	3	4
SOUND	Sound Pressure (Out)		db(A)	43/39/27	50/40/26	56/53/32	58/53/57
	Sound Power (Out)			52/48/36	59/49/35	65/62/41	67/62/46
ELECTRICAL (Fan Motor)	Power Input (Cooling) (E) 1	H	W	21	47	82	224
		M		14.8	18	67	132
		L		11	11	16	27
	Power Input (Heating) (E) 1	H		16	42	77	219
		M		9.8	13	62	127
		L		6	6	11	22
	Running Current	H	A	0.18	0.41	0.71	1.95
HYDRONIC	Cooling Water Flow Rate	H	L/h	619	841	1238	2027
		M		452	782	1065	1877
		L		276	284	453	950
	Cooling Pressure Drop	H	kPa	37.89	42.05	51.17	42.19
		M		21.54	36.88	39.01	36.73
		L		8.85	5.94	8.39	10.79
	Heating Water Flow Rate	H	L/h	596	813	1210	2018
		M		438	747	1033	1860
		L		262	273	452	951
	Heating Pressure Drop	H	kPa	29.08	32.69	40.57	34.81
		M		16.74	28.05	30.5	30.05
		L		6.64	4.58	6.88	8.98
	Water Content		L	1.25	1.56	1.78	2.41

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: 45°C / 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 4 way cassette, (Auxiliary Heating coil), 4 pipe with **EC Motor**

UNIT GENERAL SPECS	PCG(H)-3R-[SIZE]-P-EC			04	08	12	20
	Configuration			4 PIPE			
	Number of Fan Blowers			1			
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60			
AIR	Air Flow (E)	H	m³/h	575	810	1300	2210
		M		380	722	1050	1970
		L		200	200	360	820
COOLING	Cooling Capacity (E)	H	kW	2.85	3.82	5.51	8.93
		M		2.08	3.55	4.74	8.27
		L		1.27	1.29	2.02	4.19
	Sensible Cooling Capacity (E)	H		2.03	2.74	4.01	6.50
		M		1.45	2.54	3.42	5.98
		L		0.87	0.90	1.42	2.93
HEATING	Heating Capacity (E)	H	kW	2.97	4	5.79	9.43
		M		2.18	3.68	4.94	8.69
		L		1.31	1.34	2.16	4.44
SOUND	Sound Pressure (Out)		db(A)	43/39/27	50/40/26	56/53/32	58/53/57
	Sound Power (Out)			52/48/36	59/49/35	65/62/41	67/62/46
ELECTRICAL (Fan Motor)	Power Input (Cooling) (E) 1	H	W	21	47	82	224
		M		14.8	18	67	132
		L		11	11	16	27
	Power Input (Heating) (E) 1	H		16	42	77	219
		M		9.80	13	62	127
		L		6	6	11	22
	Running Current	H	A	0.18	0.41	0.71	1.95
HYDRONIC	Cooling Water Flow Rate	H	L/h	488	655	945	1531
		M		357	609	813	1417
		L		218	221	346	718
	Cooling Pressure Drop	H	kPa	36.72	33.42	35.06	31.83
		M		20.88	29.30	26.73	27.71
		L		8.57	4.72	5.75	8.14
	Heating Water Flow Rate	H	L/h	254	343	496	809
		M		187	315	423	745
		L		112	115	185	381
	Heating Pressure Drop	H	kPa	13.09	26.95	53.29	59.70
		M		7.54	23.12	40.07	51.53
		L		2.99	3.77	9.04	15.40
	Chilled Water Content		L	0.83	1.04	1.19	1.61
	Hot Water Content			0.42	0.52	0.59	0.80

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.
(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 4 way cassette, 2 pipe with **AC Motor**

UNIT GENERAL SPECS	PCG(H)-3R-[SIZE]-V			04	08	12	20	24
	Configuration			2 PIPE				
	Number of Fan Blowers			1				
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60				
AIR	Air Flow (E)	H: 5th (E)	m³/h	575	810	1300	2250	2750
		M: 4th (E)		380	722	1050	2130	2540
		3rd		290	617	960	1970	2000
		2nd		240	522	820	1640	1850
		L: 1st (E)		190	450	700	1380	1530
COOLING	Cooling Capacity (E)	H: 5th (E)	kW	3.61	4.91	7.22	12	14.78
		M: 4th (E)		2.64	4.56	6.21	11.56	14.12
		3rd		2.16	4.20	6.07	11.60	12.40
		2nd		1.84	3.65	5.34	9.98	11.40
		L: 1st (E)		1.54	3.15	4.50	8.29	9.60
	Sensible Cooling Capacity (E)	H: 5th (E)		2.53	3.45	5.13	8.57	10.51
		M: 4th (E)		1.81	3.20	4.38	8.24	10.01
		3rd		1.40	2.75	4.01	7.69	8.22
		2nd		1.19	2.39	3.52	6.62	7.54
		L: 1st (E)		1.04	2.16	3.12	5.79	6.67
HEATING	Heating Capacity (E)	H: 5th (E)	kW	3.47	4.74	7.06	11.94	14.84
		M: 4th (E)		2.56	4.36	6.03	11.44	13.90
		3rd		1.96	3.85	5.62	10.80	11.50
		2nd		1.66	3.34	4.93	9.32	10.90
		L: 1st (E)		1.46	3.05	4.43	8.25	9.53
	Max. Electric Heater			1	2	3	4	
SOUND	Sound Pressure (Out)		db(A)	43/39/36 /33/27	49/47/43 /38/28	58/54/51 /45/42	61/58/56 /48/47	64/61/57 /53/48
	Sound Power (Out)			52/48/45 /42/36	58/56/52 /47/37	67/63/60 /54/51	70/67/65 /58/56	73/70/66 /62/57
ELECTRICAL (Fan Motor)	Power Input (E) 1	H: 5th (E)	W	63	78	138	311	372
		M: 4th (E)		51	67	113	273	330
		3rd		35	54	105	260	270
		2nd		29	48	83	173	230
		L: 1st (E)		23	30	52	135	180
	Running Current	H	A	0.22	0.34	0.60	1.35	1.62
	Starting Current			0.65	1.02	1.80	4.06	4.85
HYDRONIC	Cooling Water Flow Rate	H: 5th (E)	L/h	619	841	1238	2057	2533
		M: 4th (E)		452	782	1065	1982	2421
		3rd		371	720	1042	2113	2134
		2nd		316	627	918	1983	1959
		L: 1st (E)		264	540	772	1421	1646
	Cooling Pressure Drop	H: 5th (E)	kPa	37.89	42.05	51.17	43.32	48.05
		M: 4th (E)		21.54	36.88	39.01	40.51	44.28
		3rd		15.5	31.5	37	40	35
		2nd		11.8	24.8	29.9	31	30.2
		L: 1st (E)		8.16	14.81	21.86	22.27	22.11
	Heating Water Flow Rate	H: 5th (E)	L/h	596	813	1210	2047	2545
		M: 4th (E)		438	747	1033	1960	2384
		3rd		338	663	968	1867	1987
		2nd		287	575	850	1606	1871
		L: 1st (E)		251	524	759	1415	1634
	Heating Pressure Drop	H: 5th (E)	kPa	29.08	32.69	40.57	35.71	40.10
		M: 4th (E)		6.74	28.05	30.50	33.04	35.64
		3rd		10.70	22.60	27	30	25.7
		2nd		8.08	17.60	21.60	23	23.10
		L: 1st (E)		6.13	14.81	17.51	8.36	18.07
	Water Content		L	1.25	1.56	1.78	2.41	3

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: 45°C / 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 4 way cassette, (Auxiliary Heating coil), 4 pipe with **AC Motor**

UNIT GENERAL SPECS	PCG(H)-3R-[SIZE]-P			04	08	12	20	24
	Configuration			4 PIPE				
	Number of Fan Blowers			1				
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60				
AIR	Air Flow (E)	H: 5th (E)	m³/h	575	810	1300	2250	2750
		M: 4th (E)		380	722	1050	2130	2540
		3rd		290	617	960	1970	2000
		2nd		240	522	820	1640	1850
		L: 1st (E)		190	450	700	1380	1530
COOLING	Cooling Capacity (E)	H: 5th (E)	kW	2.85	3.82	5.51	9.06	11.10
		M: 4th (E)		2.08	3.55	4.74	8.73	10.70
		3rd		1.76	3.31	4.68	8.78	9.53
		2nd		1.51	2.90	4.15	7.64	8.75
		L: 1st (E)		1.21	2.45	3.44	6.26	7.24
	Sensible Cooling Capacity (E)	H: 5th (E)		2.03	2.74	4.01	6.61	8.12
		M: 4th (E)		1.45	2.54	3.42	6.35	7.73
		3rd		1.16	2.20	3.14	5.94	6.42
		2nd		0.99	1.92	2.78	5.16	5.88
		L: 1st (E)		0.83	1.72	2.43	4.47	5.15
HEATING	Heating Capacity (E)	H: 5th (E)	kW	2.97	4	5.79	9.57	11.95
		M: 4th (E)		2.18	3.68	4.94	9.16	11.19
		3rd		1.38	2.54	3.58	6.70	7.29
		2nd		1.19	2.25	3.20	5.87	6.94
		L: 1st (E)		1.25	2.58	3.63	6.61	7.68
SOUND	Sound Pressure (Out)		db(A)	43/39/ 36/33 /26	49/47/43/38/28	58/54/51/45/42	61/58/56/48/47	64/61/57/53/48
	Sound Power (Out)			52/48/ 45/42 /35	58/56/52/47/37	67/63/60/54/51	70/67/65/58/56	73/70/66/62/57
ELECTRICAL (Fan Motor)	Power Input (E) 1	H: 5th (E)	W	63	78	138	311	372
		M: 4th (E)		51	67	113	273	330
		3rd		35	54	105	260	270
		2nd		29	48	83	173	230
		L: 1st (E)		23	30	52	135	180
	Running Current	H	A	0.22	0.34	0.6	1.35	1.62
	Starting Current			0.65	1.02	1.8	4.06	4.85
HYDRONIC	Cooling Water Flow Rate	H: 5th (E)	L/h	488	655	945	1553	1910
		M: 4th (E)		357	609	813	1496	1825
		3rd		302	567	803	1508	1636
		2nd		259	497	712	1312	1503
		L: 1st (E)		208	420	589	1073	1241
	Cooling Pressure Drop	H: 5th (E)	kPa	36.72	33.40	35.10	32.70	32.30
		M: 4th (E)		20.88	29.30	26.70	30.60	29.80
		3rd		15.70	25.50	25.80	30.40	24.20
		2nd		12.10	20.40	21.10	23.90	20.90
		L: 1st (E)		7.91	15.10	15	16.80	14.90
	Heating Water Flow Rate	H: 5th (E)	L/h	254	343	496	820	1024
		M: 4th (E)		187	315	423	786	960
		3rd		118	219	308	577	628
		2nd		103	193	275	505	597
		L: 1st (E)		107	21	311	567	658
	Heating Pressure Drop	H: 5th (E)	kPa	13.09	26.95	53.29	61.24	51.74
		M: 4th (E)		7.54	23.12	40.07	56.67	46
		3rd		3.70	12.90	24	33.80	22.60
		2nd		2.90	10.40	19.80	26.80	20.70
		L: 1st (E)		2.76	12.21	23	31.50	23.32
	Chilled Water Content		L	0.83	1.04	1.19	1.61	2
	Hot Water Content			0.42	0.52	0.59	0.80	1

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*

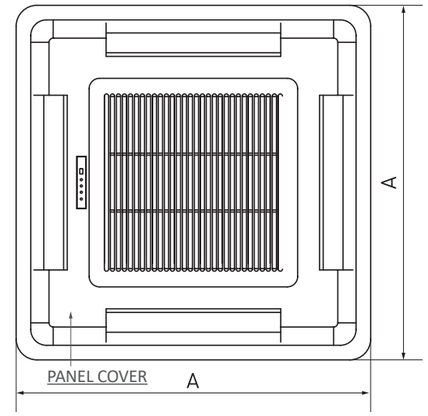
(1): Fan motor power includes PCB power input.

(e): Specifications follow Eurovent test data for the year of publication.

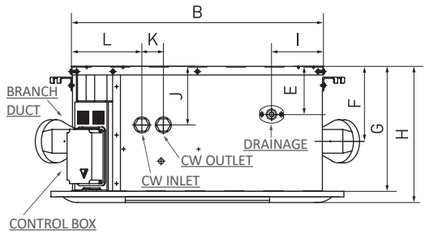
For non-standard conditions (i.e: High ΔT requirements) please refer to Eurovent certified selection software.

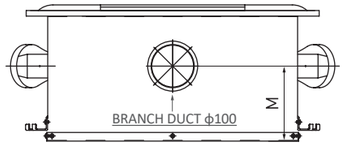
Please visit www.eurovent-certification.com for more information.

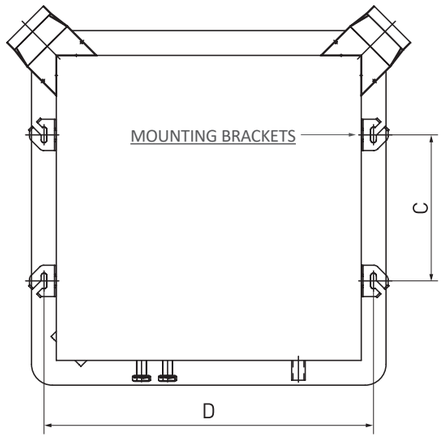
DIMENSIONAL DRAWINGS, DATA & WEIGHTS



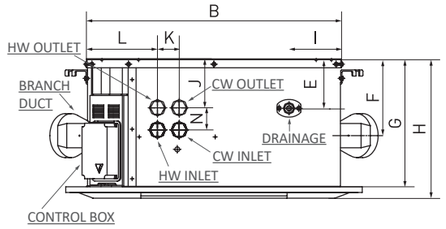
2 PIPE







4 PIPE



Model	Unit Dimensions (mm)													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N (1)
PCG-3R-04	680	582	280	627	62	124	255	283	118	110	50	162	124	50
PCG-3R-08	680	582	280	627	112	174	290	318	118	136	50	162	174	50
PCH-3R-12	830	730	344	775	84	149	260	288	125	163	50	162	132	50
PCH-3R-20	980	830	487	875	106	177	290	318	118	146	50	155	146	50
PCH-3R-24	1140	960	617	1005	106	177	290	318	118	146	50	155	146	50

PCGH-3R				04	08	12	20	24
CONNECTIONS	Water	Type		Socket (Threaded Female)				
		In / Out	mm (in)	19.05 (3/4")				
	Condensate Drainage		mm (in)	25.4 (1")				
WEIGHT	Net	kg		28	30	36	50	54

(1): Value only valid for 4-pipe units.

CASSETTE
Intelligent Fan Coils

PCSL-EC

PRODUCT PRESENTATION

The Polar Air One Way Slim Cassette Intelligent Fan Coil has an innovative design, high control flexibility, and easy maintenance. It uses tangential fans and is equipped with condensate water pump and energy efficient EC motors. With a sophisticated temperature regulator, this product guarantees thermal comfort in every season. It heats and cools extremely quickly, and once the desired temperature is reached it maintains it silently.

PRODUCT RANGE

The Intelligent One Way Slim Cassette units offer an EC motor 230V/50Hz range with the following capacities at H speed:

2 Pipe

- 2.56 - 3.19 kW
- 2.60 - 3.21 kW
- 450 - 600 m³/h

COOLING HEATING AIR FLOW

PRODUCT FEATURES

Casing. Cases made from galvanized sheet steel with integral fan mounting rails for added strength, with internally fitted fire-resistant insulation, to provide both thermal and acoustic insulation. Cases made from galvanized sheet steel with integral fan mounting rails for added strength, with internally fitted fire-resistant insulation, to provide both thermal and acoustic insulation. The special height of 152mm is meant for reduced space installations in hotels, apartments, offices, etc.

Water Coils. Built with seamless copper tubes and headers, with 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 manual air vent and water purge valve.

Fan. Backward-curved centrifugal fan, statically and dynamically balanced for quiet operation. Fire-retardant plastic fan impellers for lightweight and corrosion-resistant operation.

Filtration. Easy to remove and washable filters made of self-extinguishing acrylic with an efficiency of class G2 (EU2).

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

OPTIONAL ACCESSORIES*

IR Handset +
Wall Holder

Thermostat Controller

Wall Pad Controller

Electric heater
0.5 - 1 kW

Valve kits
2 or 3 way 1/2" on/off or modulating

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

TECHNICAL SPECIFICATIONS

Hydronic One Way Slim cassette, 2 pipe with **EC Motor**

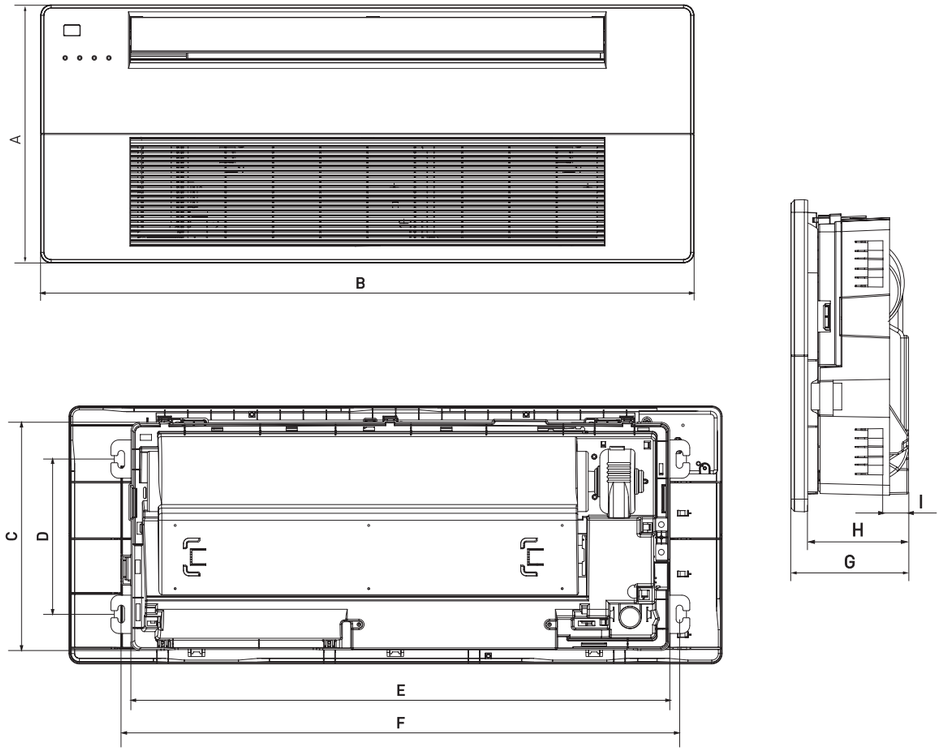
UNIT GENERAL SPECS	PCSL-[SIZE]-V-EC			01	02
	Configuration			2 PIPE	
	Number of Fan Blowers			1	
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60	
AIR	Air Flow (E)	H	m^3/h	450	600
		M		350	450
		L		150	250
COOLING	Cooling Capacity (E)	H	kW	2.56	3.19
		M		2.12	2.56
		L		1.05	1.62
	Sensible Cooling Capacity (E)	H		1.79	2.27
		M		1.47	1.79
		L		0.73	1.11
HEATING	Heating Capacity (E)	H	kW	2.60	3.21
		M		2.15	2.60
		L		1.08	1.65
	Max. Electric Heater			0.5	1.0
SOUND	Sound Pressure (Out)		db(A)	35/31/26	38/35/29
	Sound Power (Out)			50/45/35	50/47/38
ELECTRICAL (Fan Motor)	Power Input (Cooling) (E) 1	H	W	18	27
		M		13	18
		L		9	10
	Power Input (Heating) (E) 1	H		25	22
		M		15	13
		L		8	5
	Running Current	H	A	0.16	0.23
HYDRONIC	Cooling Water Flow Rate	H	L/h	439	547
		M		363	439
		L		180	278
	Cooling Pressure Drop	H	kPa	30.90	36.90
		M		22.40	25.40
		L		6.80	11.71
	Heating Water Flow Rate	H	L/h	445	551
		M		368	445
		L		185	283
	Heating Pressure Drop	H	kPa	28.50	31.27
		M		20.70	21.76
		L		6.40	10.10
	Water Content		L	0.64	0.64

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: 45°C / 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.

DIMENSIONAL DRAWINGS, DATA & WEIGHTS



Model	Unit Dimensions (mm)								
	A	B	C	D	E	F	G	H	I
PCSL 01	467	1182	412	280	975	1010	176	151	38
PCSL 02	467	1182	412	280	975	1010	176	151	38

PCSL				01	02
CONNECTIONS	Water	Type		Internal Thread	
		In / Out	mm (in)	12.7 (1/2")	
	Condensate Drainage		mm (in)	25.4 (1")	
WEIGHT	Net		kg	13.5	

CASSETTE
Intelligent Fan Coils

CHV2-EC
CHV2-AC

PRODUCT PRESENTATION

The Intelligent Polar Air Coanda Cassette units generates airflow with Coanda effect due to its exclusive air diffuser design. This effect helps to create an excellent circulation of air inside the room. The air intake comes from the bottom, while the air distribution goes parallel to the ceiling or the wall, through its practical and functional outlet grills.
The Coanda Fan coil cassettes suit horizontal installation in a suspended ceiling or in a vertical wall.

PRODUCT RANGE

The Intelligent Coanda Cassette units offer the following EC and AC motor 230V/50Hz range with the following capacities at H speed:

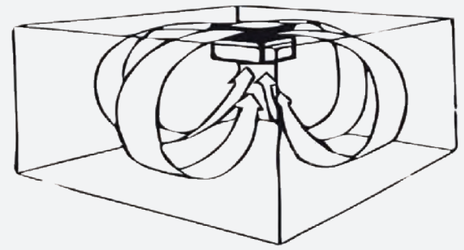
	EC Motor	AC Motor		EC Motor	AC Motor
2 Pipe	1.64 - 3.03 kW	1.54 - 3.26 kW	4 Pipe	1.64 - 3.23 kW	1.55 - 3.26 kW
	1.62 - 3.09 kW	1.57 - 3.23 kW		1.35 - 1.80 kW	1.31 - 2.61 kW
	287 - 524 m³/h	275 - 545 m³/h		287 - 524 m³/h	275 - 545 m³/h

COOLING HEATING AIR FLOW

PRODUCT FEATURES

Casing. Cases made from galvanized sheet steel with integral fan mounting rails for added strength, with internally fitted fire-resistant insulation, to provide both thermal and acoustic insulation.

Round diffuser. Designed to generate the "Coanda" effect, the diffuser direction can be manually adjusted to drive the airflow as per user requirements.



"Coanda effect" airflow in a room.

When the air is diffused in contact with a flat surface such as a dropped ceiling, it determines a depression between the flow and the surface, which causes the tendency of the fluid to adhere to the surface avoiding its immediate dropping below. This phenomenon, known as the Coanda effect, is of great interest for the correct diffusion of cold air.

Water Coils. Built with seamless copper tubes and headers, with 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 manual air vent and water purge valve.

Fan. Backward-curved centrifugal fan, statically and dynamically balanced for quiet operation. Fire-retardant plastic fan impellers for lightweight and corrosion-resistant operation.

Filtration. Easy to remove and washable filters made of self-extinguishing acrylic with an efficiency of class G2 (EU2).

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

AC motors are PSC, permanently lubricated type with internal thermal overload protection.

OPTIONAL ACCESSORIES*

Thermostat Controller

Wall Pad Controller

IR Handset + Wall Holder

G4 (MERV8) Filter 3M HAF

Plastic branch duct flange

Electric heater 0.75 - 1.5 kW

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

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

TECHNICAL SPECIFICATIONS

Hydronic Coanda Effect Cassette, 2 pipe with **EC Motor**

UNIT GENERAL SPECS	CHV2-[SIZE]-V-EC			01	02	03
	Configuration			2 PIPE		
	Number of Fan Blowers			1	2	
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60		
AIR	Air Flow (E)	H	m³/h	287	365	524
		M		220	288	373
		L		150	230	290
COOLING	Cooling Capacity (E)	H	kW	1.64	2.07	3.03
		M		1.26	1.73	2.36
		L		0.98	1.50	1.99
	Sensible Cooling Capacity (E)	H		1.17	1.46	2.13
		M		0.88	1.21	1.63
		L		0.67	1.04	1.36
HEATING	Heating Capacity (E)	H	kW	1.62	2.13	3.09
		M		1.33	1.80	2.41
		L		0.99	1.51	1.97
	Max. Electric Heater			0.75	1	1.5
SOUND	Sound Pressure (Out)		db(A)	40/34/30	36/33/27	44/35/28
	Sound Power (Out)			52/46/41	47/42/37	54/46/38
ELECTRICAL (Fan Motor)	Power Input (Cooling) (E) 1	H	W	25	20	28
		M		14	12	15
		L		9.5	10	10
	Power Input (Heating) (E) 1	H		25	20	28
		M		14	12	15
		L		9.5	10	10
	Running Current	H	A	0.22	0.17	0.24
HYDRONIC	Cooling Water Flow Rate	H	L/h	281	355	520
		M		217	296	404
		L		167	257	341
	Cooling Pressure Drop	H	kPa	12.71	10.75	22.40
		M		9.78	8.99	17.40
		L		7.56	7.81	14.70
	Heating Water Flow Rate	H	L/h	277	366	530
		M		228	309	413
		L		169	259	338
	Heating Pressure Drop	H	kPa	10.01	7.87	18.30
		M		8.24	6.64	14.30
		L		6.12	5.56	11.70
	Water Content		L	0.22	0.35	0.49

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: 45°C / 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 Coanda Effect Cassette, (Auxiliary Heating coil), 4 pipe with **EC Motor**

UNIT GENERAL SPECS	CHV2-[SIZE]-P-EC			01	02	03B
	Configuration			4 PIPE		
	Number of Fan Blowers			1	2	
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60		
AIR	Air Flow (E)	H	m³/h	287	365	524
		M		220	288	373
		L		150	230	290
COOLING	Cooling Capacity (E)	H	kW	1.64	2.07	3.23
		M		1.26	1.73	2.52
		L		0.98	1.50	2.12
	Sensible Cooling Capacity (E)	H		1.17	1.46	2.07
		M		0.88	1.21	1.58
		L		0.67	1.04	1.32
HEATING	Heating Capacity (E)	H	kW	1.35	1.88	1.80
		M		1.11	1.58	1.40
		L		0.83	1.34	1.15
SOUND	Sound Pressure (Out)		db(A)	40/34/30	36/33/27	44/35/28
	Sound Power (Out)			52/46/41	47/42/37	54/46/38
ELECTRICAL (Fan Motor)	Power Input (Cooling) (E) 1	H	W	25	20	28
		M		14	12	15
		L		10	10	10
	Power Input (Heating) (E) 1	H		20	30	34
		M		9	14	14
		L		5	10	7
	Running Current	H	A	0.22	0.17	0.24
HYDRONIC	Cooling Water Flow Rate	H	L/h	59	74	108
		M		45	62	84
		L		35	53	71
	Cooling Pressure Drop	H	kPa	12.70	10.80	22.40
		M		8.10	7.90	14.60
		L		5.30	6.20	10.90
	Heating Water Flow Rate	H	L/h	115	161	217
		M		96	136	169
		L		71	115	138
	Heating Pressure Drop	H	kPa	5	12.50	19.70
		M		3.60	9.30	12.80
		L		2.20	7	9.20
	Chilled Water Content		L	0.22	0.35	0.49
	Hot Water Content			0.07	0.12	0.16

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.
(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 Coanda Effect Cassette, 2 pipe with AC Motor

UNIT GENERAL SPECS	CHV2-[SIZE]-V			01B	02	03
	Configuration			2 PIPE		
	Number of Fan Blowers			1	2	
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60		
AIR	Air Flow (E)	H	m³/h	275	451	545
		M		219	346	413
		L		195	307	365
COOLING	Cooling Capacity (E)	H	kW	1.54	2.55	3.26
		M		1.29	2.06	2.60
		L		1.17	1.87	2.35
	Sensible Cooling Capacity (E)	H		1.10	1.82	2.29
		M		0.92	1.46	1.82
		L		0.83	1.32	1.64
HEATING	Heating Capacity (E)	H	kW	1.57	2.58	3.23
		M		1.30	2.07	2.56
		L		1.18	1.88	2.31
	Max. Electric Heater			0.75	1	1.5
SOUND	Sound Pressure (Out)		db(A)	42/36/33	45/36/33	42/36/32
	Sound Power (Out)			53/45/42	56/51/48	57/54/46
ELECTRICAL (Fan Motor)	Power Input (Cooling) (E) 1	H	W	36.8	56	62
		M		27.6	40	47
		L		24	35	41
	Power Input (Heating) (E) 1	H		32.2	51	57
		M		23	36	42
		L		18	31	36.1
	Running Current	H	A	0.16	0.22	0.22
	Starting Current			0.48	0.66	0.67
HYDRONIC	Cooling Water Flow Rate	H	L/h	267	432	555
		M		226	355	456
		L		204	325	413
	Cooling Pressure Drop	H	kPa	12.20	13.20	25.50
		M		9	9.20	17.40
		L		7.56	7.81	14.50
	Heating Water Flow Rate	H	L/h	269	431	545
		M		226	353	444
		L		208	324	405
	Heating Pressure Drop	H	kPa	10.40	11.20	21
		M		7.50	7.60	14.20
		L		6.40	6.40	11.70
	Water Content		L	0.22	0.35	0.49

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: 45°C / 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 Coanda Effect Cassette, (Auxiliary Heating coil), 4 pipe with AC Motor

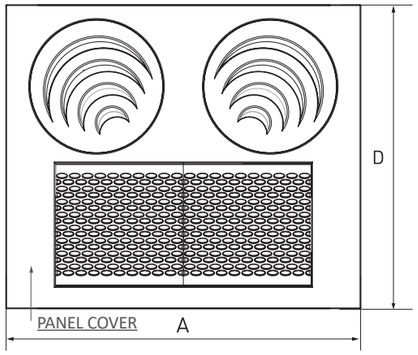
UNIT GENERAL SPECS	CHV2-[SIZE]-P			01B	02	03
	Configuration			4 PIPE		
	Number of Fan Blowers			1	2	
	Power Supply (V/Ph/Hz)			230 / 1 / 50 | 220/1/60		
AIR	Air Flow (E)	H	m³/h	275	451	545
		M		219	346	413
		L		195	307	365
COOLING	Cooling Capacity (E)	H	kW	1.55	2.52	3.26
		M		1.32	2.07	2.60
		L		1.19	1.89	2.35
	Sensible Cooling Capacity (E)	H		1.10	1.80	2.29
		M		0.92	1.46	1.82
		L		0.83	1.33	1.64
HEATING	Heating Capacity (E)	H	kW	1.31	2.21	2.61
		M		1.10	1.81	2.12
		L		1.01	1.67	1.93
SOUND	Sound Pressure (Out)		db(A)	42/36/33	45/36/33	42/36/32
	Sound Power (Out)			53/45/42	56/51/48	57/54/46
ELECTRICAL (Fan Motor)	Power Input (Cooling) (E) 1	H	W	37	56	62
		M		28	40	47
		L		24	35	41
	Power Input (Heating) (E) 1	H		32	51	57
		M		23	36	42
		L		18	30	36
	Running Current	H	A	0.16	0.22	0.22
	Starting Current			0.48	0.66	0.67
HYDRONIC	Cooling Water Flow Rate	H	L/h	267	432	555
		M		226	355	456
		L		204	325	413
	Cooling Pressure Drop	H	kPa	11.60	15.10	25.50
		M		8.80	10.80	17.40
		L		7.40	9.30	14.50
	Heating Water Flow Rate	H	L/h	112	189	223
		M		95	155	181
		L		87	143	165
	Heating Pressure Drop	H	kPa	4.70	16.40	20.70
		M		3.60	11.70	14.50
		L		3.10	10.20	12.40
	Chilled Water Content		L	0.22	0.35	0.50
	Hot Water Content			0.07	0.12	0.16

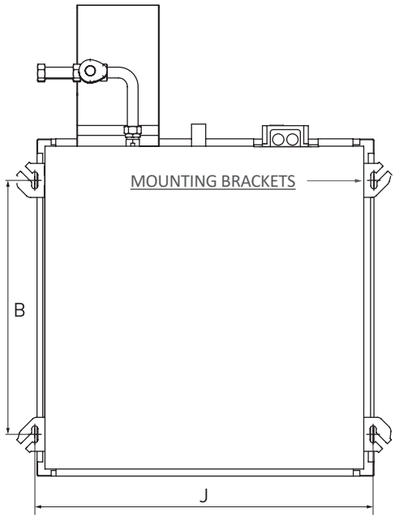
TESTING CONDITIONS

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*

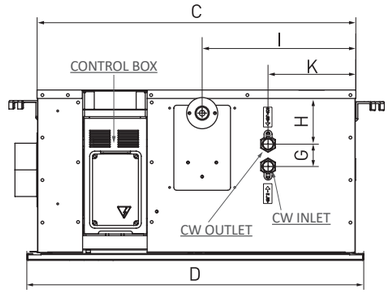
(1): Fan motor power includes PCB power input.
(e): Specifications follow Eurovent test data for the year of publication.
For non-standard conditions (i.e: High ΔT requirements) please refer to Eurovent certified selection software.
Please visit www.eurovent-certification.com for more information.

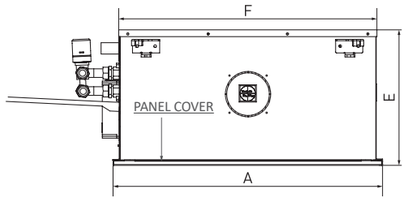
DIMENSIONAL DRAWINGS, DATA & WEIGHTS



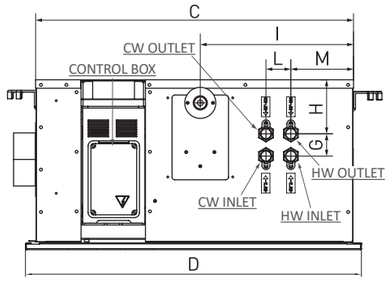


2 PIPE





4 PIPE

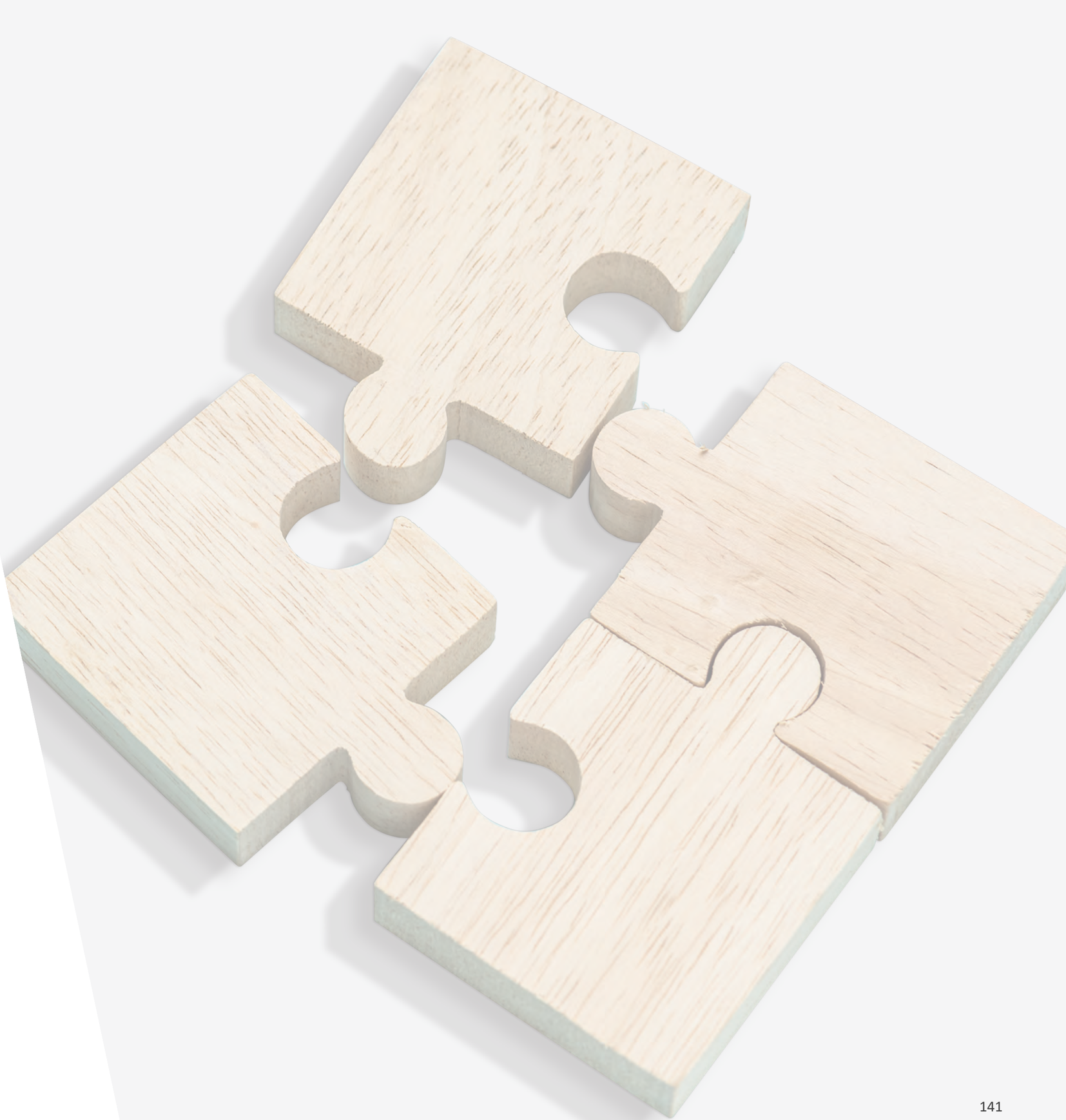


Model	Unit Dimensions (mm)												
	A	B	C	D	E	F	G	H	I	J	K	L (1)	M (1)
CHV2-01 / 01B	595	450	560	595	277	567	40	96	270	606	155	44	111
CHV2-02	895	750	560	595	277	867	40	96	270	606	155	44	111
CHV2-03 / 03B	1195	1050	560	595	277	1167	40	96	270	606	155	44	111

CHV2				01 / 01B	02	03 / 03B
CONNECTIONS	Water	Type		Socket (Threaded Female)		
		In / Out	mm (in)	12.7 (1/2")		
	Condensate Drainage		mm (in)	25.4 (1")		
WEIGHT	Net	kg		21	31	37

(1): Value only valid for 4-pipe units.

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)

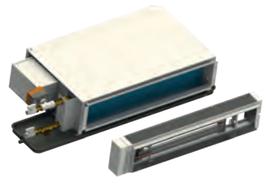
With 2-stage safety cut-out and can be configured as booster heaters or primary heaters.

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

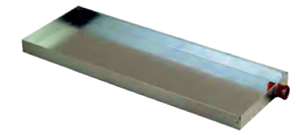
To choose between left or right side coil connections.

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.

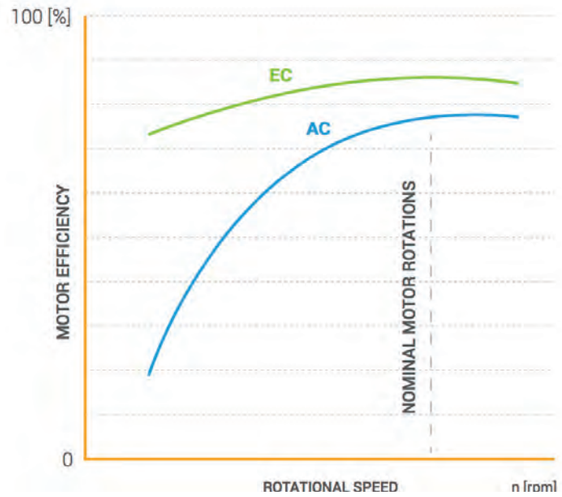
INTELLIGENT EFFICIENT MOTORS

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

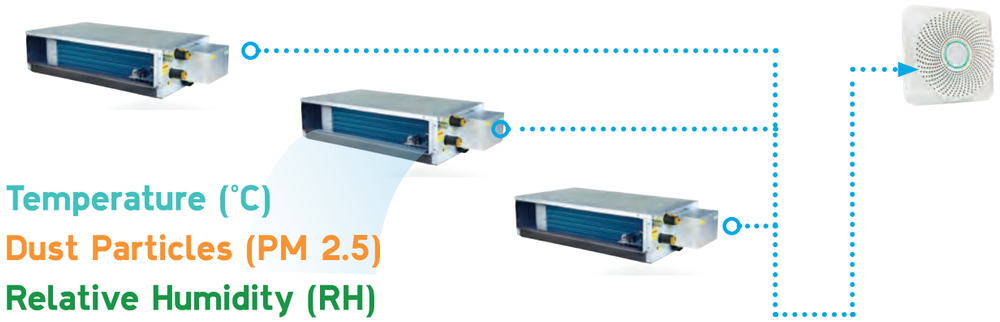


A 0-5VDC signal originated from an inverter board integrated into the onboard unit controller drives the motor, using PID logic to modulate within 0-10V speed RPMs in Energy Saving Auto - Mode (ESM).

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.

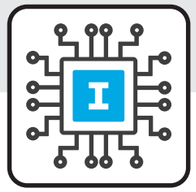
Polar Air fan coil systems also offer high-efficiency filter options to ensure efficient air cleaning and allow fresh air ducts to be connected directly to the units.



DIFFERENT CONTROL OPTIONS TO OFFER FLEXIBILITY

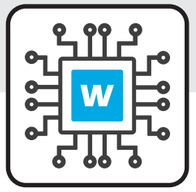
All Polar Air fan coil units offer maximum levels of control flexibility, allowing configuration by two types of control logic to satisfy specific application requirements.

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]

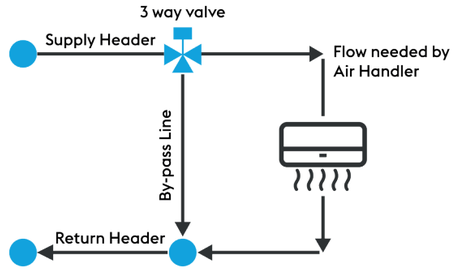
This control option features flexible functionality for external thermostat applications, allowing the independent control of drain pumps, offering zone control product operations, and limited LED diagnostics. In products where louvers are required, this control allows the stepping motors to open the 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.

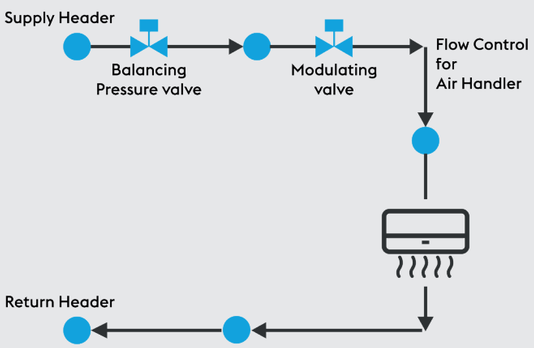
CONSTANT FLOW DIAGRAM



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

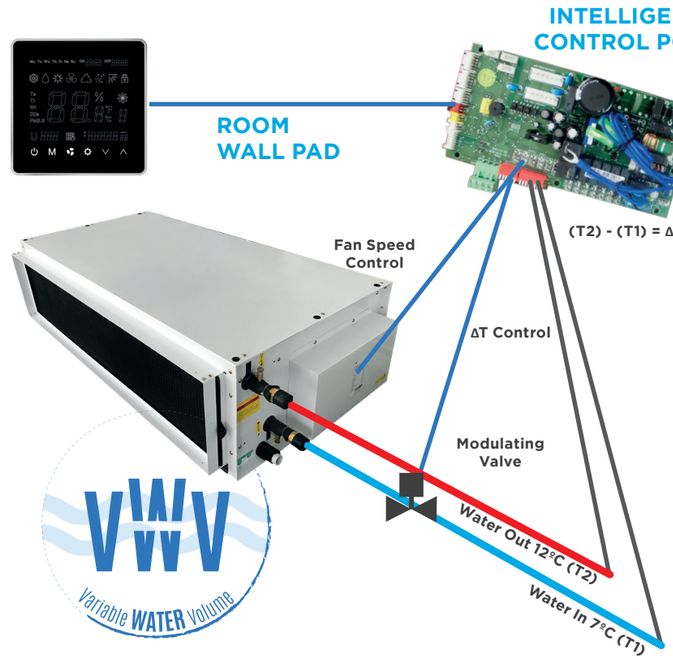


AUTODYNAMIC BALANCING SYSTEMS

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.