



## Product catalog

4-way fan coil cassettes with AC fan motor technology - model CWS sizes 00-06

4-way fan coil cassettes with EC fan motor technology - model CWE sizes 01-05



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**TRANE**  
TECHNOLOGIES™



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## Introduction

Innovating and beautiful design, seven different sizes, high control flexibility and easy maintenance: the Trane chilled water cassette is the result of an extended technical and design development aimed at achieving the highest level in terms of performance, silent operation and control possibilities.

The air diffuser has a highly attractive aesthetical appearance, very innovative, and is also able to offer the best air distribution performance thanks to long computer studies and laboratory tests.

The standard color is RAL 9003; other colors are available on request.

The smaller sizes are designed to fit into 600x600 mm false ceiling standard modules. The bigger sizes have a dimension of 800x800 mm which allows the best outcome in terms of sound levels and of price/performance ratio for these high capacity models.

Units can be supplied with **Electronically Commutated fan motors**, which mean:

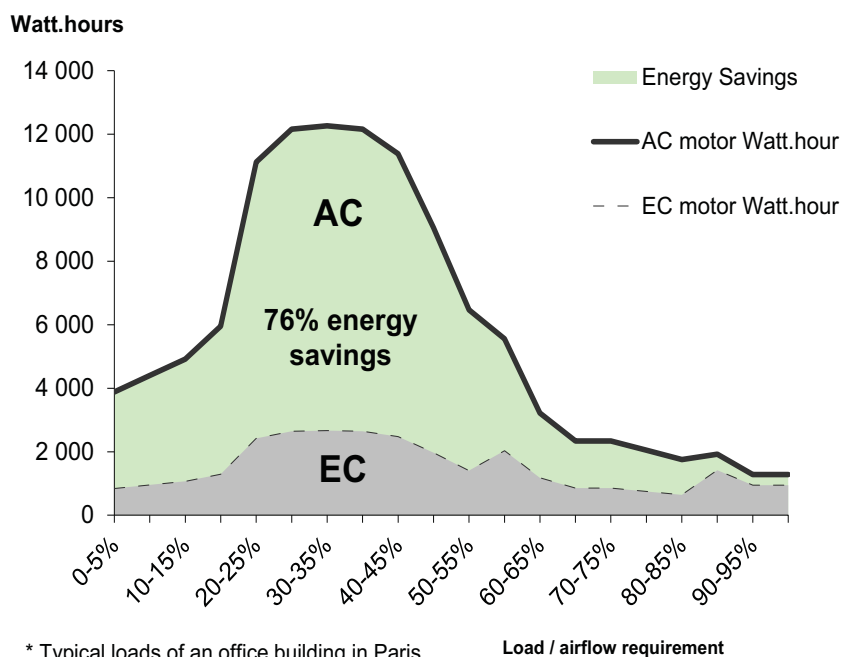
- 76% energy savings
- New electronic controllers with wall thermostat or infrared remote control.
- Variable speed ventilation which avoids shifts in sound levels by modulating the fan speed to the exact operating needs.

Every unit can be supplied with 1 coil (2-pipe system) and a possible electric heater or with 2 coils (4-pipe system). Each model can have fresh air intake and a remote air diffuser can be connected to the unit.

The condensate pump integrated into the unit as standard, is very quiet and has a maximum head of 650 mm.

In addition to the temperature and speed standard controls, automatic speed selection is also available. More than one unit can be connected to a single control, and the unit control panel is installed in a position that facilitates the maintenance operation. Every unit can also be operated by the means of an infra-red remote control. The cassettes can also be connected to the most common automatic building management systems thanks to the Trane ZN LonTalk control.

A factory-mounted and tested 2-way or 3-way valve kit can be proposed to save time on the job site.



## Main components

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### Intake grill and air distribution

Intake grills, frame and adjustable air distribution louvers on each side, made of ABS in RAL 9003 color. Adjustable louvers allow a Coanda effect when oriented 30°.

### Casing

Made of galvanized steel with inside thermal insulation (closed cell polyethylene 10 mm thick) and outside anti-condensate lining. There are three 105mm fresh air inlet locations, and one 150mm (size 01-02-03) or 180mm (size 04-05-06) outlet to air condition an adjacent room.

### Control panel

Made of an external box and the terminal board of the control electronic board is easily accessible.

### Fan assembly

The fan assembly mounted on anti-vibrating supports is extremely quiet. The single air inlet radial fan is connected to a 6-speed electric motor with:

- single phase 230V/50Hz supply;
- class B insulation; and,
- an integrated Klaxon thermal contact for the overheat protection.

The units are supplied with 3 standard wired speeds and it is possible to change them on site if necessary.

Both AC and EC (electronically commutated) fan motors are available.

### Heat exchanger

Made of copper tubes and aluminium fins bonded onto the tubes for maximum transfer contact. 1/2" water connections (when no valve), low water pressure drops and a maximum operating pressure of 8 bars.

### Condensate collection tray

High density ABS polystyrene foam condensate tray, shaped in order to optimize the air diffusion, fire retardant rating B2 to DIN 4102.

### Air filter

Synthetic washable filter, low pressure drop and easily removable without any tool.

### Condensate pump

Integrated float switch centrifugal pump with 650 mm of maximum head, wired to the control panel on the outside of the casing. It is equipped with an alarm contact for external use.



## Nomenclature

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Unit type	CW = Chilled Water Cassette
Fan motor type	S = Standard fan motor size 00 to 06 E = EC fan motor technology size 01 to 05
Unit size	00 = 1.6 kW at medium speed 2 CWS only 01 = 2.3 kW at medium speed 2 02 = 3.3 kW at medium speed 2 03 = 3.9 kW at medium speed 2 04 = 4.9 kW at medium speed 2 05 = 6.8 kW at medium speed 2 06 = 8.4 kW at medium speed 2 CWS only
Application	2-pipe cooling only or heating only 2-pipe reversible 4-pipe cooling + heating
Control type	Without for wall thermostat or free-issued controls Modbus control for wall thermostat or infrared remote controller ZNTracer LonTalk control for thermostat or return air zone ZNTracer LonTalk control for thermostat or return air + supply air cascade
Electric heater	Without electric heater With 750 W electric heater size 00 With 1500 W electric heater size 01 With 2500 W electric heater size 02 and 03 With 3000 W electric heater size 04 and 05 and 06
Valve package	Without valve package for field-mounting of valves 2 way water valve + thermal actuator 3 way water valve + thermal actuator 2 way water valve + 3 points modulating actuator for ZN control only 3 way water valve + 3 points modulating actuator for ZN control only



# General Data

## COOLING

Entering air temperature: + 27°C d.b., + 19°C w.b.

Water temperature: + 7/12°C

## HEATING

Entering air temperature: + 20°C

Water temperature: + 50°C

Water flow rate as for the cooling conditions

**Table 1 - General data - 2-pipe units - AC fan motor**

Unit size	CWS 00-2P			CWS 01-2P			CWS 02-2P			CWS 03-2P			CWS 04-2P			CWS 05-2P			CWS 06-2P			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																						
Air flow	(m <sup>3</sup> /h)	310	420	610	310	420	520	320	500	710	430	610	880	630	820	1140	710	970	1500	710	1280	1820
Cooling total capacity	(kW)	1.27	1.63	1.98	1.84	2.34	2.68	2.25	3.34	4.33	2.94	3.88	5.02	4.21	4.91	6.16	5.31	6.78	9.51	5.31	8.45	11.1
Cooling sensible capacity	(kW)	1.01	1.32	1.64	1.35	1.75	2.04	1.57	2.39	3.18	2.08	2.81	3.74	3.03	3.58	4.59	3.71	4.8	6.94	3.71	6.09	8.25
Heating capacity	(kW)	1.62	2.12	2.64	2.22	2.9	3.35	2.56	3.93	5.23	3.43	4.63	6.17	5.12	6.03	7.77	6.13	8.02	11.7	6.13	10.3	14
Water flow	(l/h)	219	280	340	316	402	461	387	574	745	506	667	863	724	845	1060	913	1166	1636	913	1453	1909
ΔP Cooling	(kPa)	4.5	7	10	4.9	7.6	9.7	4.6	9.4	15.1	7.5	12.4	19.7	10.9	14.3	21.6	9.4	14.7	26.9	9.4	21.8	35.6
ΔP Heating	(kPa)	4	6	9	4.1	6.3	8.2	3	6.2	9.7	6.7	11.2	17.7	6.7	9.9	15.1	7.9	12.4	23	7.9	18.6	30.6
Sound power	(dB(A))	33	40	49	33	40	45	33	45	53	41	49	59	33	40	48	34	40	53	34	48	58
Sound pressure	(dB(A))	24	31	40	24	31	36	24	36	44	32	40	50	24	31	39	25	31	44	25	39	49
Fan	(W)	25	32	57	25	32	44	25	44	68	32	57	90	33	48	77	42	63	120	42	95	170
Amp	(A)	0.11	0.15	0.27	0.11	0.15	0.2	0.11	0.2	0.32	0.15	0.27	0.45	0.15	0.23	0.36	0.18	0.28	0.53	0.18	0.42	0.74
Water content	(l)		0.8			1.4			2.1			2.1			3			4			4	
Dimensions	(mm)	575 x 575 x 275						820 x 820 x 303														

**Table 2 - General data - 2-pipe units - EC fan motor**

Unit size	CWE 01-2P			CWE 02-2P			CWE 03-2P			CWE 04-2P			CWE 05-2P			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																
Air flow	(m <sup>3</sup> /h)	310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling total capacity	(kW)	1.84	2.17	2.75	2.24	3.05	4.33	2.56	3.87	5.02	4.21	5.15	6.33	5.29	7.72	10.75
Cooling sensible capacity	(kW)	1.35	1.61	2.09	1.57	2.17	3.18	1.81	2.81	3.74	3.03	3.77	4.72	3.69	5.53	7.94
Water flow	(l/h)	317	373	473	385	524	744	441	666	864	723	885	1089	909	1328	1848
ΔP Cooling	(kPa)	4.9	6.6	10.1	4.6	9.4	15.1	5.9	12.4	19.7	10.9	15.9	22.7	9.4	18.5	33.6
Heating capacity	(kW)	2.22	2.67	3.44	2.55	3.58	5.24	2.96	4.63	6.2	5.11	6.35	8.01	5.89	8.83	12.73
ΔP Heating	(kPa)	4	5.5	8.7	3.6	6.6	13.1	4.7	10.5	17.7	8.7	12.8	19.5	7.2	14.9	28.8
Sound power	(dB(A))	33	39	47	33	43	54	37	50	60	33	39	48	34	47	57
Sound pressure	(dB(A))	24	30	38	24	34	45	28	41	51	24	30	39	25	38	48
Fan	(W)	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Amp	(A)	0.07	0.097	0.16	0.07	0.12	0.28	0.09	0.2	0.53	0.1	0.16	0.3	0.1	0.29	0.88
Water content	(l)		1.4			2.1			2.1			3			4	
Dimensions	(mm)	575 x 575 x 275						820 x 820 x 303								

\* Sound pressure levels apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.



# General Data

## COOLING

Entering air temperature: + 27°C d.b., + 19°C w.b.

Water temperature: + 7/12°C

## HEATING

Entering air temperature: + 20°C

Water temperature: + 70/60°C

**Table 3 - General data - 4-pipe units - AC fan motor**

Unit size	CWS 00-4P			CWS 01-4P			CWS 02-4P			CWS 03-4P			CWS 04-4P			CWS 05-4P			CWS 06-4P			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																						
Air flow	(m <sup>3</sup> /h)	310	420	610	310	420	520	320	500	710	430	610	880	630	820	1140	710	970	1500	710	1280	1820
Cooling total capacity	(kW)	1.51	1.96	2.33	1.85	2.36	2.70	1.85	2.65	3.34	2.36	3.02	3.81	4.14	5.03	6.34	4.52	5.66	7.71	4.52	6.93	8.89
Cooling sensible capacity	(kW)	1.15	1.55	1.9	1.34	1.71	1.98	1.34	1.98	2.56	1.75	2.29	2.97	2.96	3.65	4.69	3.25	4.15	5.83	3.25	5.18	6.84
Water flow	(l/h)	260	337	401	318	406	464	318	456	574	406	519	655	712	865	1090	777	974	1326	777	1192	1529
ΔP Cooling	(kPa)	6	10	13.5	4.6	6.9	8.8	4.6	8.8	13.4	7.2	11.2	17	8.8	12.5	18.9	10.3	15.4	26.9	10.3	22.1	34.7
Heating capacity	(kW)	1.96	2.54	3.03	2.43	3.02	3.46	2.43	3.46	4.4	3.1	3.97	4.95	5.91	7.19	9.1	6.45	8.1	11	6.45	9.98	12.7
Water flow	(l/h)	169	219	261	209	260	298	209	298	378	267	341	426	508	618	783	555	697	946	555	858	1092
ΔP Heating	(kPa)	6.5	10.5	14.5	5.7	8.5	10.8	5.7	10.8	16.6	8.8	13.8	20.5	9.8	14	21.4	11.5	17.4	29.9	11.5	25.3	38.8
Sound power	(dB(A))	33	40	50	33	40	45	33	45	53	41	49	59	33	40	48	34	40	53	34	48	58
Sound pressure	(dB(A))	24	31	41	24	31	36	24	36	44	32	40	50	24	31	39	25	31	44	25	39	49
Fan	(W)	25	32	57	25	32	44	25	44	68	32	57	90	33	48	77	42	63	120	42	95	170
Amp	(A)	0.11	0.15	0.27	0.11	0.15	0.2	0.11	0.2	0.32	0.15	0.27	0.45	0.15	0.23	0.36	0.18	0.28	0.53	0.18	0.42	0.74
Cooling water content	(l)		1			1.4			1.4			1.4			3			3			3	
Heating water content	(l)		0.6			0.7			0.7			0.7			1.4			1.4			1.4	
Dimensions	(mm)	575 x 575 x 275						820 x 820 x 303														

**Table 4 - General data - 4-pipe units - EC fan motor**

Unit size	CWE 01-4P			CWE 02-4P			CWE 03-4P			CWE 04-4P			CWE 05-4P			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																
Air flow	(m <sup>3</sup> /h)	310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling total capacity	(kW)	1.85	2.18	2.77	2.09	2.81	3.93	2.38	3.53	4.53	4.3	5.28	6.54	4.98	7.17	9.87
Cooling sensible capacity	(kW)	1.34	1.6	2.08	1.49	2.04	2.95	1.71	2.62	3.46	3.08	3.84	4.83	3.52	5.2	7.4
Water flow	(l/h)	318	375	476	359	483	676	409	608	779	740	908	1120	856	1233	1697
ΔP Cooling	(kPa)	4.6	6.2	9.5	3.5	5.7	10.5	4.1	8.4	13.1	9.4	13.6	19.8	8.8	17	30.1
Heating capacity	(kW)	2.43	2.85	3.62	1.98	2.53	3.35	2.2	3.06	3.79	6.14	7.54	9.36	5.22	7.16	9.51
Water flow	(l/h)	209	245	311	170	217	288	189	263	326	528	649	805	449	616	818
ΔP Heating	(kPa)	5.7	7.6	11.7	3.5	5.5	9	4.5	7.5	11	10.5	15.5	22.5	6.5	11	18
Sound power	(dB(A))	33	39	47	33	43	54	37	50	60	33	39	48	34	47	57
Sound pressure	(dB(A))	24	30	38	24	34	45	28	41	51	24	30	39	25	38	48
Fan	(W)	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Amp	(A)	0.07	0.097	0.16	0.07	0.12	0.28	0.09	0.2	0.53	0.1	0.16	0.3	0.1	0.29	0.88
Cooling water content	(l)		1.4			1.7			1.7			3			3.6	
Heating water content	(l)		0.7			0.5			0.5			1.4			1.1	
Dimensions	(mm)	575 x 575 x 275						820 x 820 x 303								

\*Sound pressure levels apply to the reverberant field of a 100m<sup>3</sup> room and a reverberation time of 0.5 sec.



# Performance data

## COOLING

Entering air temperature: + 27°C d.b., + 19°C w.b.

Water temperature: + 7/12°C

## HEATING

Entering air temperature: + 20°C

Water temperature: + 50°C

Water flow rate as for the cooling conditions

**Table 1 - General data - 2-pipe units - AC fan motor**

Unit size	CWS 00-2P			CWS 01-2P			CWS 02-2P			CWS 03-2P			CWS 04-2P			CWS 05-2P			CWS 06-2P			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																						
Air flow	(m <sup>3</sup> /h)	310	420	610	310	420	520	320	500	710	430	610	880	630	820	1140	710	970	1500	710	1280	1820
Cooling total capacity	(kW)	1.27	1.63	1.98	1.84	2.34	2.68	2.25	3.34	4.33	2.94	3.88	5.02	4.21	4.91	6.16	5.31	6.78	9.51	5.31	8.45	11.1
Cooling sensible capacity	(kW)	1.01	1.32	1.64	1.35	1.75	2.04	1.57	2.39	3.18	2.08	2.81	3.74	3.03	3.58	4.59	3.71	4.8	6.94	3.71	6.09	8.25
Heating capacity	(kW)	1.62	2.12	2.64	2.22	2.9	3.35	2.56	3.93	5.23	3.43	4.63	6.17	5.12	6.03	7.77	6.13	8.02	11.7	6.13	10.3	14
Water flow	(l/h)	219	280	340	316	402	461	387	574	745	506	667	863	724	845	1060	913	1166	1636	913	1453	1909
ΔP Cooling	(kPa)	4.5	7	10	4.9	7.6	9.7	4.6	9.4	15.1	7.5	12.4	19.7	10.9	14.3	21.6	9.4	14.7	26.9	9.4	21.8	35.6
ΔP Heating	(kPa)	4	6	9	4.1	6.3	8.2	3	6.2	9.7	6.7	11.2	17.7	6.7	9.9	15.1	7.9	12.4	23	7.9	18.6	30.6
Sound power	(dB(A))	33	40	49	33	40	45	33	45	53	41	49	59	33	40	48	34	40	53	34	48	58
Sound pressure	(dB(A))	24	31	40	24	31	36	24	36	44	32	40	50	24	31	39	25	31	44	25	39	49
Fan	(W)	25	32	57	25	32	44	25	44	68	32	57	90	33	48	77	42	63	120	42	95	170
Amp	(A)	0.11	0.15	0.27	0.11	0.15	0.2	0.11	0.2	0.32	0.15	0.27	0.45	0.15	0.23	0.36	0.18	0.28	0.53	0.18	0.42	0.74
Water content	(l)		0.8			1.4			2.1			2.1			3			4			4	
Dimensions	(mm)						575 x 575 x 275												820 x 820 x 303			

**Table 2 - General data - 2-pipe units - EC fan motor**

Unit size	CWE 01-2P			CWE 02-2P			CWE 03-2P			CWE 04-2P			CWE 05-2P					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3			
Speed																		
Air flow		(m <sup>3</sup> /h)		310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling total capacity		(kW)		1.84	2.17	2.75	2.24	3.05	4.33	2.56	3.87	5.02	4.21	5.15	6.33	5.29	7.72	10.75
Cooling sensible capacity		(kW)		1.35	1.61	2.09	1.57	2.17	3.18	1.81	2.81	3.74	3.03	3.77	4.72	3.69	5.53	7.94
Water flow		(l/h)		317	373	473	385	524	744	441	666	864	723	885	1089	909	1328	1848
ΔP Cooling		(kPa)		4.9	6.6	10.1	4.6	9.4	15.1	5.9	12.4	19.7	10.9	15.9	22.7	9.4	18.5	33.6
Heating capacity		(kW)		2.22	2.67	3.44	2.55	3.58	5.24	2.96	4.63	6.2	5.11	6.35	8.01	5.89	8.83	12.73
ΔP Heating		(kPa)		4	5.5	8.7	3.6	6.6	13.1	4.7	10.5	17.7	8.7	12.8	19.5	7.2	14.9	28.8
Sound power		(dB(A))		33	39	47	33	43	54	37	50	60	33	39	48	34	47	57
Sound pressure		(dB(A))		24	30	38	24	34	45	28	41	51	24	30	39	25	38	48
Fan		(W)		5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Amp		(A)		0.07	0.097	0.16	0.07	0.12	0.28	0.09	0.2	0.53	0.1	0.16	0.3	0.1	0.29	0.88
Water content		(l)			1.4			2.1			2.1			3			4	
Dimensions		(mm)						575 x 575 x 275										820 x 820 x 303

\* Sound pressure levels apply to the reverberant field of a 100 m<sup>3</sup> room and a reverberation time of 0.5 sec.



# Performance data

## COOLING

Entering air temperature: + 27°C d.b., + 19°C w.b.

Water temperature: + 7/12°C

## HEATING

Entering air temperature: + 20°C

Water temperature: + 70/60°C

**Table 3 - General data - 4-pipe units - AC fan motor**

Unit size	CWS 00-4P			CWE 01-4P			CWE 02-4P			CWE 03-4P			CWE 04-4P			CWE 05-4P			CWS 06-4P			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																						
Air flow	(m <sup>3</sup> /h)	310	420	610	310	420	520	320	500	710	430	610	880	630	820	1140	710	970	1500	710	1280	1820
Cooling total capacity	(kW)	1.51	1.96	2.33	1.85	2.36	2.70	1.85	2.65	3.34	2.36	3.02	3.81	4.14	5.03	6.34	4.52	5.66	7.71	4.52	6.93	8.89
Cooling sensible capacity	(kW)	1.15	1.55	1.9	1.34	1.71	1.98	1.34	1.98	2.56	1.75	2.29	2.97	2.96	3.65	4.69	3.25	4.15	5.83	3.25	5.18	6.84
Water flow	(l/h)	260	337	401	318	406	464	318	456	574	406	519	655	712	865	1090	777	974	1326	777	1192	1529
ΔP Cooling	(kPa)	6	10	13.5	4.6	6.9	8.8	4.6	8.8	13.4	7.2	11.2	17	8.8	12.5	18.9	10.3	15.4	26.9	10.3	22.1	34.7
Heating capacity	(kW)	1.96	2.54	3.03	2.43	3.02	3.46	2.43	3.46	4.4	3.1	3.97	4.95	5.91	7.19	9.1	6.45	8.1	11	6.45	9.98	12.7
Water flow	(l/h)	169	219	261	209	260	298	209	298	378	267	341	426	508	618	783	555	697	946	555	858	1092
ΔP Heating	(kPa)	6.5	10.5	14.5	5.7	8.5	10.8	5.7	10.8	16.6	8.8	13.8	20.5	9.8	14	21.4	11.5	17.4	29.9	11.5	25.3	38.8
Sound power	(dB(A))	33	40	50	33	40	45	33	45	53	41	49	59	33	40	48	34	40	53	34	48	58
Sound pressure	(dB(A))	24	31	41	24	31	36	24	36	44	32	40	50	24	31	39	25	31	44	25	39	49
Fan	(W)	25	32	57	25	32	44	25	44	68	32	57	90	33	48	77	42	63	120	42	95	170
Amp	(A)	0.11	0.15	0.27	0.11	0.15	0.2	0.11	0.2	0.32	0.15	0.27	0.45	0.15	0.23	0.36	0.18	0.28	0.53	0.18	0.42	0.74
Cooling water content	(l)		1			1.4			1.4			1.4		3			3			3		
Heating water content	(l)		0.6			0.7			0.7			0.7		1.4			1.4			1.4		
Dimensions	(mm)							575 x 575 x 275						820 x 820 x 303								

**Table 4 - General data - 4-pipe units - EC fan motor**

Unit size	CWE 01-4P			CWE 02-4P			CWE 03-4P			CWE 04-4P			CWE 05-4P			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Speed																
Air flow	(m <sup>3</sup> /h)	310	380	535	310	445	710	360	610	880	630	870	1165	710	1130	1770
Cooling total capacity	(kW)	1.85	2.18	2.77	2.09	2.81	3.93	2.38	3.53	4.53	4.3	5.28	6.54	4.98	7.17	9.87
Cooling sensible capacity	(kW)	1.34	1.6	2.08	1.49	2.04	2.95	1.71	2.62	3.46	3.08	3.84	4.83	3.52	5.2	7.4
Water flow	(l/h)	318	375	476	359	483	676	409	608	779	740	908	1120	856	1233	1697
ΔP Cooling	(kPa)	4.6	6.2	9.5	3.5	5.7	10.5	4.1	8.4	13.1	9.4	13.6	19.8	8.8	17	30.1
Heating capacity	(kW)	2.43	2.85	3.62	1.98	2.53	3.35	2.2	3.06	3.79	6.14	7.54	9.36	5.22	7.16	9.51
Water flow	(l/h)	209	245	311	170	217	288	189	263	326	528	649	805	449	616	818
ΔP Heating	(kPa)	5.7	7.6	11.7	3.5	5.5	9	4.5	7.5	11	10.5	15.5	22.5	6.5	11	18
Sound power	(dB(A))	33	39	47	33	43	54	37	50	60	33	39	48	34	47	57
Sound pressure	(dB(A))	24	30	38	24	34	45	28	41	51	24	30	39	25	38	48
Fan	(W)	5	8	16	5	11	31	7	21	62	10	17	33	10	32	108
Amp	(A)	0.07	0.097	0.16	0.07	0.12	0.28	0.09	0.2	0.53	0.1	0.16	0.3	0.1	0.29	0.88
Cooling water content	(l)		1.4			1.7			1.7			3			3.6	
Heating water content	(l)		0.7			0.5			0.5			1.4			1.1	
Dimensions	(mm)							575 x 575 x 275						820 x 820 x 303		

\*Sound pressure levels apply to the reverberant field of a 100m<sup>3</sup> room and a reverberation time of 0.5 sec.



# Performance data

## Cooling capacity

Entering air temperature 27°C db, 19°C wb

EWT: Entering Water Temperature

LWT: Leaving Water Temperature

**Table 5 - Cooling capacity - 2-pipe units - AC fan motor**

Unit size	Speed	Air flow (m <sup>3</sup> /h)	EWT 5 - LWT 10°C			EWT 6 - LWT 12°C			EWT 9 - LWT 14°C			EWT 12 - LWT 17°C		
			Total capacity (kW)	Sensible capacity (kW)	Water flow (l/h)	Total capacity (kW)	Sensible capacity (kW)	Water flow (l/h)	Total capacity (kW)	Sensible capacity (kW)	Water flow (l/h)	Total capacity (kW)	Sensible capacity (kW)	Water flow (l/h)
CWS 00-2P	High	610	2.45	1.83	421	1.98	1.64	340	1.47	1.45	254	1.16	1.16	199
	Med	420	2.01	1.48	346	1.63	1.32	280	1.22	1.16	210	0.93	0.93	160
	Low	310	1.57	1.14	236	1.27	1.01	219	0.96	0.89	165	0.71	0.71	123
CWS 01-2P	High	520	3.22	2.22	554	2.68	1.98	462	2.10	1.75	362	1.47	1.47	252
	Med	420	2.80	1.91	482	2.34	1.71	403	1.84	1.50	317	1.28	1.28	220
	Low	310	2.42	1.64	417	1.84	1.32	317	1.61	1.29	276	1.09	1.09	188
CWS 02-2P	High	710	5.38	3.64	926	4.33	3.18	745	3.59	2.87	617	2.44	2.44	420
	Med	500	4.15	2.77	715	3.34	2.39	575	2.81	2.18	483	1.86	1.86	319
	Low	320	2.95	1.94	508	2.25	1.57	387	2.03	1.53	349	1.31	1.31	225
CWS 03-2P	High	880	6.10	4.17	1049	5.02	3.66	863	4.03	3.29	694	2.79	2.79	479
	Med	610	4.85	3.26	835	3.88	2.76	667	3.25	2.57	559	2.19	2.19	376
	Low	430	3.68	2.44	633	2.94	2.05	506	2.50	1.92	430	1.65	1.65	283
CWS 04-2P	High	1140	7.35	5.00	1264	6.16	4.48	1060	4.88	3.95	840	3.33	3.33	573
	Med	820	5.83	3.92	1003	4.91	3.50	845	3.92	3.09	674	2.63	2.63	453
	Low	630	4.99	3.32	858	4.21	2.97	722	3.37	2.62	580	2.23	2.23	384
CWS 05-2P	High	1500	11.30	7.59	1943	9.51	6.48	1635	7.57	5.99	1301	5.12	5.12	880
	Med	970	7.99	5.27	1374	6.78	4.48	1166	5.46	4.15	939	3.56	3.56	612
	Low	710	6.22	4.06	1070	5.31	3.46	913	4.30	3.20	740	2.52	2.52	434
CWS 06-2P	High	1820	13.24	9.01	2277	11.10	8.07	1909	8.78	7.11	1511	6.07	6.07	1044
	Med	1280	10.01	6.68	1722	8.45	5.98	1454	6.75	5.27	1162	4.51	4.51	775
	Low	710	6.22	4.06	1070	5.31	3.64	913	4.30	3.20	740	2.52	2.52	434

**Table 6 - Cooling capacity - 2-pipe units - EC fan motor**

Unit size	Speed	Air flow (m <sup>3</sup> /h)	EWT 5 - LWT 10°C			EWT 6 - LWT 12°C			EWT 9 - LWT 14°C			EWT 12 - LWT 17°C		
			Total capacity (kW)	Sensible capacity (kW)	Water flow (l/h)	Total capacity (kW)	Sensible capacity (kW)	Water flow (l/h)	Total capacity (kW)	Sensible capacity (kW)	Water flow (l/h)	Total capacity (kW)	Sensible capacity (kW)	Water flow (l/h)
CWE 01-2P	High	535	3.32	2.33	570	2.75	2.09	473	2.14	1.84	368	1.54	1.54	266
	Med	380	2.60	1.80	448	2.17	1.61	373	1.70	1.42	293	1.21	1.21	207
	Low	310	2.20	1.51	379	1.84	1.35	317	1.45	1.18	250	1.01	1.01	174
CWE 02-2P	High	710	5.17	3.55	888	4.33	3.18	744	3.42	2.80	588	2.38	2.38	410
	Med	445	3.61	2.43	621	3.05	2.17	524	2.43	1.91	419	1.63	1.63	281
	Low	310	2.63	1.75	453	2.24	1.57	385	1.81	1.38	311	1.18	1.18	204
CWE 03-2P	High	880	6.02	4.18	1035	5.02	3.74	864	3.94	3.30	678	2.80	2.80	482
	Med	610	4.61	3.15	793	3.87	2.81	666	3.07	2.48	528	2.11	2.11	363
	Low	360	3.02	2.02	520	2.56	1.81	441	2.06	1.59	354	1.37	1.37	235
CWE 04-2P	High	1165	7.58	5.27	1304	6.33	4.72	1089	4.98	4.17	857	3.51	3.51	604
	Med	870	6.13	4.21	1055	5.15	3.77	885	4.07	3.32	701	2.81	2.81	483
	Low	630	4.99	3.39	859	4.21	3.03	723	3.35	2.67	576	2.28	2.28	392
CWE 05-2P	High	1770	12.85	8.88	2210	10.75	7.94	1848	8.47	7.00	1456	5.99	5.99	1031
	Med	1130	9.15	6.18	1574	7.72	5.53	1328	6.16	4.86	1059	4.18	4.18	718
	Low	710	6.21	4.12	1068	5.29	3.69	909	4.27	3.24	734	2.80	2.80	482



# Performance data

## Heating capacity

Entering air temperature: 20°C

EWT: Entering Water Temperature

LWT: Leaving Water Temperature

**Table 7 - Heating capacity - 2-pipe units - AC fan motor**

Unit size	Speed	Air flow	EWT 45 - LWT 40°C		EWT 50 - LWT 40°C		EWT 60 - LWT 50°C		EWT 70 - LWT 60°C		EWT 80 - LWT 70°C	
			Capacity	Water flow	Capacity	Water flow	Capacity	Water flow	Capacity	Water flow	Capacity	Water flow
		(m <sup>3</sup> /h)	(kW)	(l/h)	(kW)	(l/h)	(kW)	(l/h)	(kW)	(l/h)	(kW)	(l/h)
CWS 00-2P	High	610	2.24	386	2.37	203	3.46	298	4.56	393	5.67	488
	Med	420	1.8	310	1.91	164	2.78	239	3.66	315	4.55	391
	Low	310	1.38	237	1.46	126	2.13	183	2.8	240	3.47	298
CWS 01-2P	High	520	2.80	482	3.10	266	4.39	377	5.68	488	6.97	599
	Med	420	2.42	417	2.69	232	3.80	327	4.91	422	5.96	513
	Low	310	2.07	356	2.31	198	3.25	279	4.19	360	5.12	441
CWS 02-2P	High	710	4.57	787	5.12	440	7.19	619	9.25	795	11.30	972
	Med	500	3.45	593	3.89	334	5.43	467	6.96	598	8.48	730
	Low	320	2.39	412	2.73	235	3.79	326	4.83	415	5.87	505
CWS 03-2P	High	880	5.25	903	5.86	504	8.25	709	10.63	914	13.00	1118
	Med	610	4.08	702	4.58	394	6.42	552	8.25	709	10.07	866
	Low	430	3.02	520	3.42	294	4.77	410	6.10	524	7.43	639
CWS 04-2P	High	1140	6.50	1118	7.26	624	10.21	878	13.14	1130	16.08	1383
	Med	820	5.03	865	5.65	486	7.92	681	10.16	874	12.41	1067
	Low	630	4.27	734	4.82	415	6.72	578	8.61	741	10.50	903
CWS 05-2P	High	1500	9.78	1683	11.06	951	15.43	1327	19.76	1699	24.08	2071
	Med	970	6.67	1146	7.62	655	10.54	906	13.43	1155	16.32	1403
	Low	710	5.09	876	5.87	505	8.07	694	10.25	882	12.42	1068
CWS 06-2P	High	1820	11.72	2015	13.17	1132	18.45	1586	23.68	2037	28.91	2486
	Med	1280	8.55	1471	9.70	834	13.50	1161	17.26	1484	21.01	1807
	Low	710	5.09	876	5.87	505	8.07	694	10.25	882	12.42	1068

**Table 8 - Heating capacity - 2-pipe units - EC fan motor**

Unit size	Speed	Air flow	EWT 45 - LWT 40°C		EWT 50 - LWT 40°C		EWT 60 - LWT 50°C		EWT 70 - LWT 60°C		EWT 80 - LWT 70°C	
			Capacity	Water flow	Capacity	Water flow	Capacity	Water flow	Capacity	Water flow	Capacity	Water flow
		(m <sup>3</sup> /h)	(kW)	(l/h)	(kW)	(l/h)	(kW)	(l/h)	(kW)	(l/h)	(kW)	(l/h)
CWE 01-2P	High	535	2.87	493	3.17	272	3.83	330	4.49	387	5.82	500
	Med	380	2.22	383	2.48	213	2.99	257	3.49	300	4.51	387
	Low	310	1.85	318	2.07	178	2.49	214	2.91	250	3.75	322
CWE 02-2P	High	710	4.36	749	4.89	420	5.87	505	6.85	589	8.81	758
	Med	445	2.98	512	3.38	290	4.04	347	4.70	404	6.01	517
	Low	310	2.12	365	2.43	209	2.90	249	3.36	289	4.28	368
CWE 03-2P	High	880	5.15	886	5.75	494	6.92	595	8.09	696	10.42	896
	Med	610	3.85	663	4.34	373	5.20	448	6.07	522	7.79	670
	Low	360	2.46	423	2.81	241	3.35	288	3.89	335	4.96	427
CWE 04-2P	High	1165	6.70	1152	7.47	642	9.00	774	10.51	904	13.54	1165
	Med	870	5.30	912	5.95	512	7.15	615	8.34	717	10.72	922
	Low	630	4.27	734	4.82	415	5.78	497	6.72	578	8.61	741
CWE 05-2P	High	1770	10.56	1817	11.81	1015	14.21	1222	16.60	1428	21.37	1837
	Med	1130	7.34	1262	8.29	713	9.93	854	11.56	994	14.82	1274
	Low	710	4.90	842	5.60	481	6.67	574	7.74	666	9.87	849

# Performance data

## Correction factors for cooling capacities

Capacity correction factors for different operating conditions. Multiply the factors by the figures in the Performance Data tables.

**Table 13 - Correction factors**

Total capacity				
Water (°C)	Air (°C)	25-18	26-18.5	28-20
7/12 °C	K	0.82	0.89	1.11
10/15 °C	K	0.56	0.63	0.82
14/18 °C	K	0.35	0.41	0.52
Sensible capacity				
Water (°C)	Air (°C)	25-18	26-18.5	28-20
7/12 °C	K	0.90	0.94	1.06
10/15 °C	K	0.72	0.78	0.90
14/18 °C	K	0.50	0.58	0.72

## Sound levels

**Table 14 - Sound levels - CWS**

Model	Speed	m3/h	Frequency octave band							dB(A)			
			125	250	500	1000	2000	4000	8000	Global	Lp (A) (*)	NR guide	NC guide
CWS 00-2P	1	310	20	25	29	24	24	23	16	33	24	20	18
CWS 00-2P-E15	2	420	25	33	36	33	28	24	17	40	31	24	22
CWS 00-4P	3	610	33	42	45	43	39	29	19	49	40	34	33
CWS 01-2P	1	320	20	25	29	24	24	23	16	33	24	20	18
CWS 01-2P-E15	2	420	25	33	36	33	28	24	17	40	31	24	22
CWS 01-4P	3	520	30	38	41	39	34	27	19	45	36	30	28
CWS 02-2P	1	320	20	25	29	24	24	23	16	33	24	20	18
CWS 02-2P-E25	2	500	30	38	41	39	34	27	19	45	36	30	28
CWS 02-4P	3	710	34	45	50	46	42	33	24	53	44	37	36
CWS 03-2P	1	430	26	34	37	34	29	25	18	41	32	25	23
CWS 03-2P-E25	2	610	33	42	45	43	39	29	19	49	40	34	33
CWS 03-4P	3	880	41	51	54	54	52	43	30	59	50	45	43
CWS 04-2P	1	630	22	27	31	22	15	8	6	33	24	17	15
CWS 04-2P-E30	2	820	25	33	35	36	18	8	4	40	31	27	26
CWS 04-4P	3	1140	32	40	43	45	29	16	8	48	39	36	34
CWS 05-2P	1	710	21	29	30	27	20	11	5	34	25	18	16
CWS 05-2P-E30	2	970	26	34	35	35	28	13	7	40	31	26	25
CWS 05-4P	3	1500	31	40	50	47	44	42	26	53	44	38	37
CWS 06-2P	1	710	21	29	30	27	20	11	5	34	25	18	16
CWS 06-2P-E30	2	1280	33	42	43	42	40	23	13	48	39	34	32
CWS 06-4P	3	1820	41	51	53	52	50	41	31	58	49	43	42

(\*) Lp = The sound pressure levels and Nr values are referred to an installation in a 100m<sup>2</sup> room with a reverberation time of 0,5 s

**Table 15 - Sound levels - CWE**

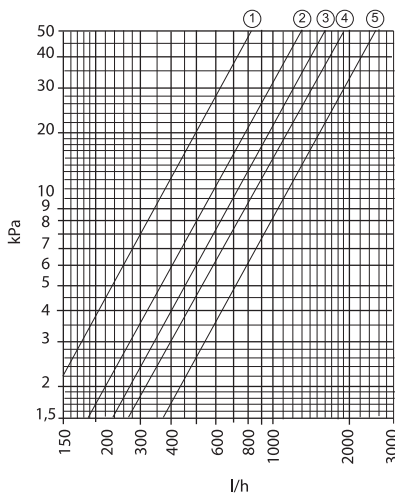
Model	Speed	m3/h	Frequency octave band L(A)							dB(A)			
			125	250	500	1000	2000	4000	8000	Global	Lp (A) (*)	NR guide	NC guide
CWE 01-2P	1	310	20	27	29	24	23	17	15	33	24	18	17
CWE 01-2P-E15	2	380	27	35	35	28	28	18	18	39	30	22	21
CWE 01-4P	3	535	35	42	43	38	36	23	19	47	38	30	28
CWE 02-2P	1	310	20	27	29	24	23	17	15	33	24	17	16
CWE 02-2P-E25	2	445	31	38	39	33	33	22	18	43	34	27	25
CWE 02-4P	3	710	40	49	50	46	43	30	26	54	45	37	36
CWE 03-2P	1	360	26	33	33	27	26	18	17	37	28	20	18
CWE 03-2P-E25	2	610	36	44	46	42	40	27	23	50	41	34	32
CWE 03-4P	3	880	47	54	56	53	51	41	31	60	51	45	43
CWE 04-2P	1	630	24	29	28	24	17	11	13	33	24	15	14
CWE 04-2P-E30	2	870	29	34	35	32	23	14	15	39	30	22	21
CWE 04-4P	3	1165	39	43	44	40	35	25	20	48	39	31	29
CWE 05-2P	1	710	24	29	28	24	17	11	13	33	24	15	14
CWE 05-2P-E30	2	1130	37	42	43	39	33	23	19	47	38	30	28
CWE 05-4P	3	1770	49	53	51	47	46	37	28	57	48	40	38

(\*) Lp = The sound pressure levels and Nr values are referred to an installation in a 100m<sup>2</sup> room with a reverberation time of 0,5 s

# Water pressure drop

Water pressure drop for average water temperature of 10°C in cooling and 65°C in heating. For other temperatures, multiply the pressure drop figure by the K correction factors below the graph.

**Figure 1 - 2- pipe installation**

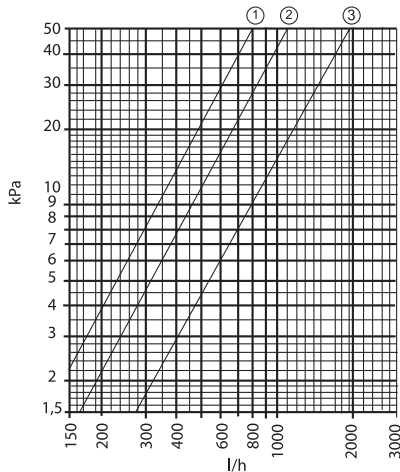


- 1 = CWS 00-2P
- 2 = CWS/CWE 01-2P
- 3 = CWS/CWE 02-2P/03-2P
- 4 = CWS/CWE 04-2P
- 5 = CWS/CWE 05-2P, CWS 06-2P

**Correction factors**

C	20	30	40	50	60	70	80
K	0.94	0.90	0.86	0.82	0.78	0.74	0.70

**Figure 2 - 4-pipe installation - Cooling**

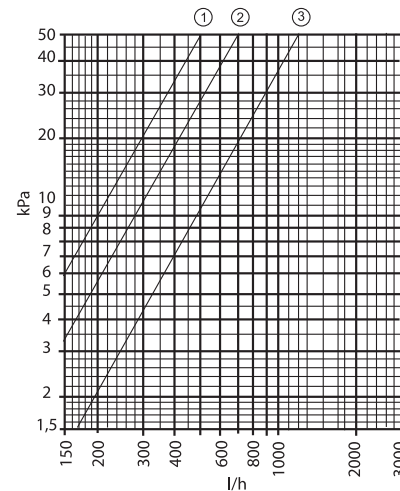


- 1 = CWS 00-4P
- 2 = CWS/CWE 01-4P / 02-4P / 03-4P
- 3 = CWS/CWE 04-4P / 05-4P/ CWS 06-4P

**Correction factors**

C	20	30	40	50	60	70	80
K	0.94	0.90	0.86	0.82	0.78	0.74	0.70

**Figure 3 - 4-pipe installation - Heating**



- 1 = CWS 00-4P
- 2 = CWS/CWE 01-4P / 02-4P / 03-4P
- 3 = CWS/CWE 04-4P / 05-4P/ CWS 06-4P

**Correction factors**

C	40	50	60	70	80
K	1.14	1.08	1.02	0.96	0.90

**Working conditions**

Water flow: Maximum working pressure 8 bar

Airflow: Suitable relative humidity 15-75%

Supply: Single phase 230V/50Hz

Installation: Maximum height: see Air throw

Minimum entering water temperature: 5°C

Maximum entering water temperature: 80°C

Minimum entering air temperature: 6°C

Maximum entering air temperature: 40°C

# Dimensions

Figure 4 - CWS 00-2P&4P / 01-2P&4P / 02-2P&4P / 03-2P&4P  
CWE 01-2P&4P / 02-2P&4P / 03-2P&4P

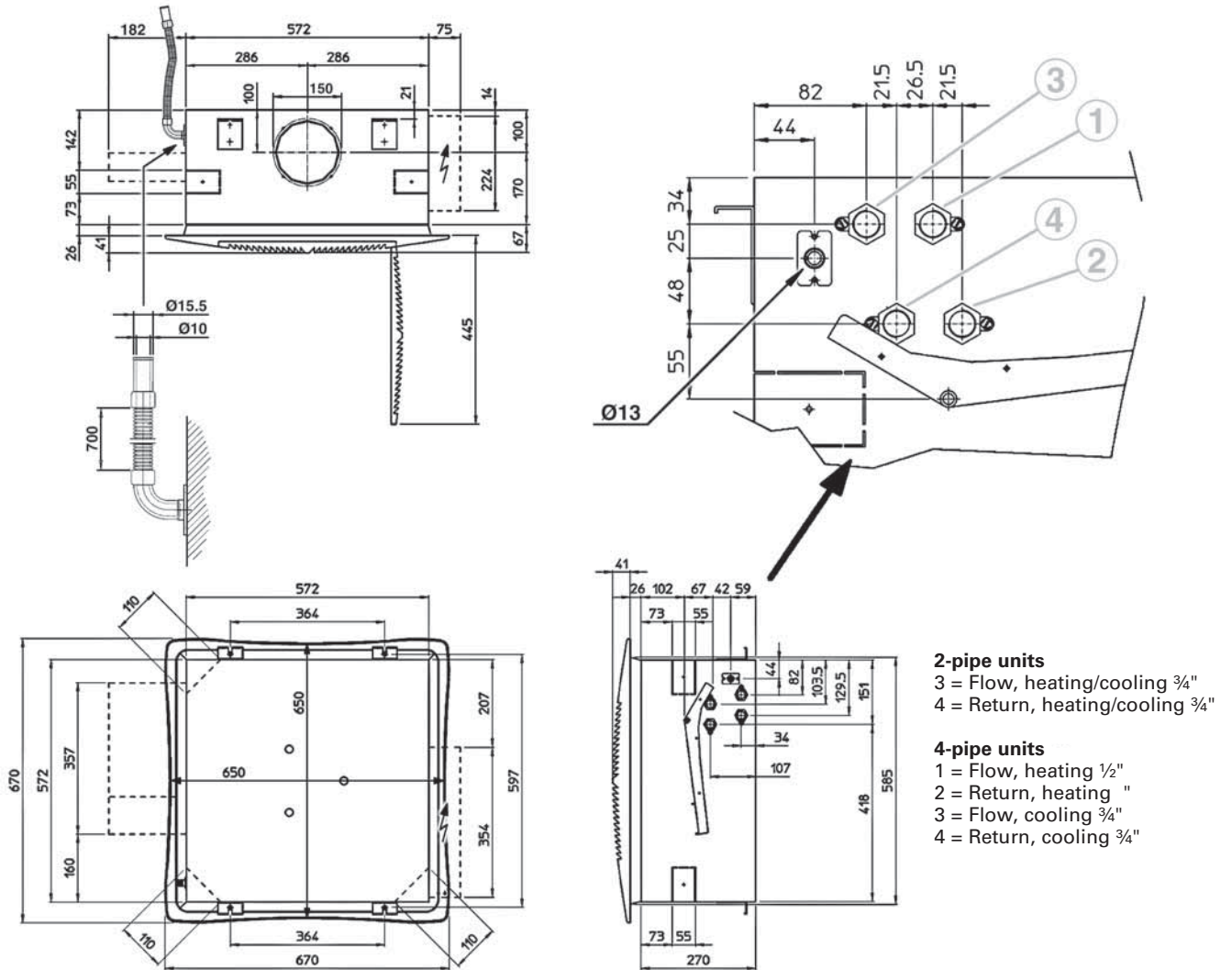
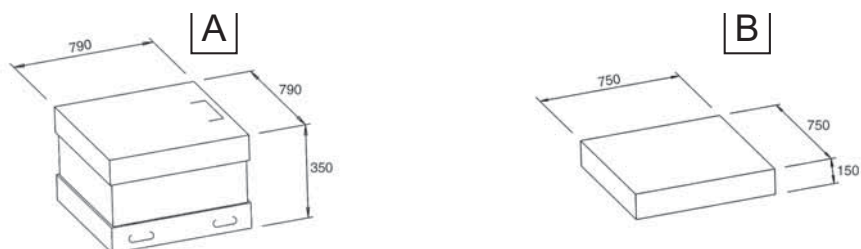


Figure 5 - CWS 00-2P&4P / 01-2P&4P / 02-2P&4P / 03-2P&4P (Packed units)  
CWE 01-2P&4P / 02-2P&4P / 03-2P&4P



# Dimensions

Figure 6 - CWS 04-2P&4P / 05-2P&4P / 06-2P&4P  
CWE 04-2P&4P / 05-2P&4P

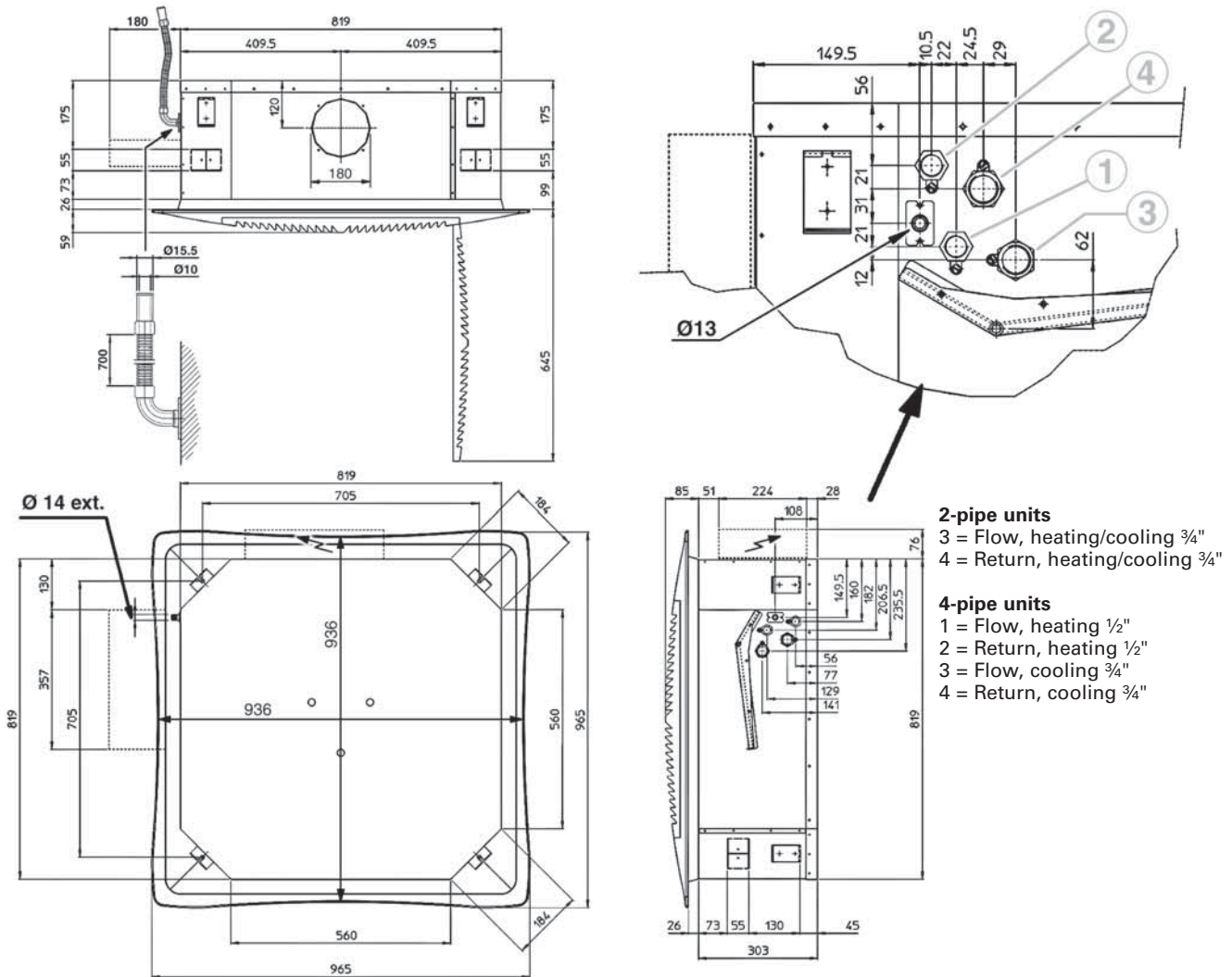
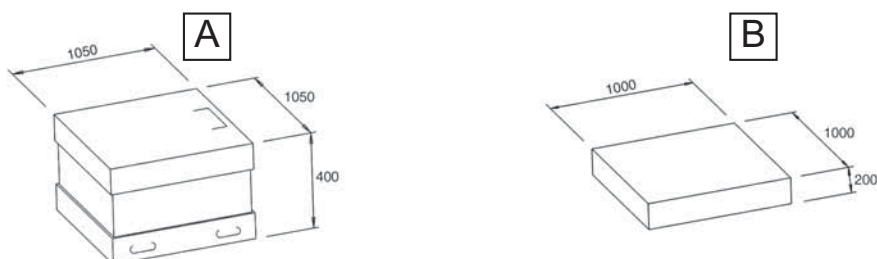


Figure 7 - CWS 04-2P&4P / 05-2P&4P / 06-2P&4P (Packed units)  
CWE 04-2P&4P / 05-2P&4P





# Weights

**Table 16 - Weights (kg)**

	Unit (A)		Diffuser (B)	
	Packed	Unpacked	Packed	Unpacked
CWS 00-2P / 01-2P	28	22		
CWS 00-4P / 01-4P				
CWS/CWE 02-2P / 02-4P	30	24	6	3
CWS/CWE 03-2P / 03-4P				
CWS/CWE 04-2P	44	36		
CWS/CWE 04-4P				
CWS/CWE 05-2P / 05-4P	47	39	10	6
CWS 06-2P / 06-4P				

# Air throw

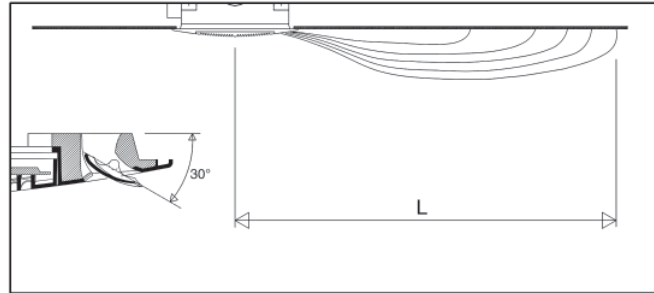
The air throw indicated in the tables must only be considered as the maximum value, as it may change significantly depending on the dimensions of the room in which the unit is installed and the positioning of the furniture in the room.

The useful throw  $L$  refers to the distance between the unit and the point where the air speed is 0.2 m/sec; if the louver has a gradient of 30° (recommended in cooling mode), the so-called "Coanda" effect will occur, illustrated in Figure 6, while at a gradient of 45° (recommended in heating mode), there will be a downwards throw, as illustrated in Figure 7.

### Note

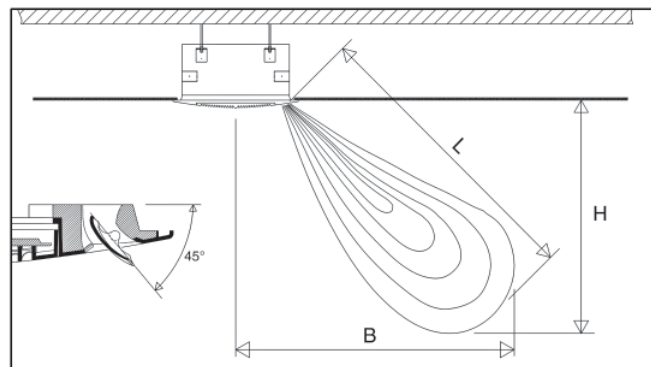
In heating mode, you must pay attention to rooms where the floor temperature is particularly low (for example less than 5°C). In this situation the floor can cool the lower layer of air to a level that stop the uniform diffusion of the hot air coming from the unit, decreasing the throw figures shown in the table.

**Figure 8 - With adjustable air diffusion louvers at 30°**



CWS/CWE	00-2P/00-4P/ 01-2P/01-4P			02-2P / 02-4P			03-2P / 03-4P			04-2P / 04-4P			05-2P / 05-4P			06-2P / 06-4P		
Speed	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air throw (L) (m)	3.0	3.5	3.8	3.0	3.8	4.5	3.5	4.2	5.0	3.2	3.7	4.3	3.4	4.0	5.0	3.4	4.6	5.5

**Figure 9 - With adjustable air diffusion louvers at 45°**



CWS/CWE	00-2P/00-4P/ 01-2P/01-4P			02-2P / 02-4P			03-2P / 03-4P			04-2P / 04-4P			05-2P / 05-4P			06-2P / 06-4P		
Speed	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Air throw (L) (m)	3.3	3.9	4.2	3.3	4.2	4.8	3.9	4.5	4.5	3.5	4.1	4.8	3.8	4.6	5.4	3.8	5.1	5.8
Height (H) (m)	2.2	2.6	2.8	2.2	2.8	3.2	2.6	3.0	3.4	2.2	2.6	3.0	2.4	2.8	3.4	2.4	3.1	3.6
Distance (B) (m)	2.5	2.9	3.1	2.5	3.1	3.6	2.9	3.4	3.9	2.7	3.2	3.8	3.0	3.6	4.2	3.0	4.0	4.6

## Fresh air inlet

The unit is fitted with inlets for fresh air to be mixed with return air inside the unit. The fresh airflow is limited to 20% of the total fan coil airflow at medium speed and 100 m<sup>3</sup>/h for each treated air inlet.

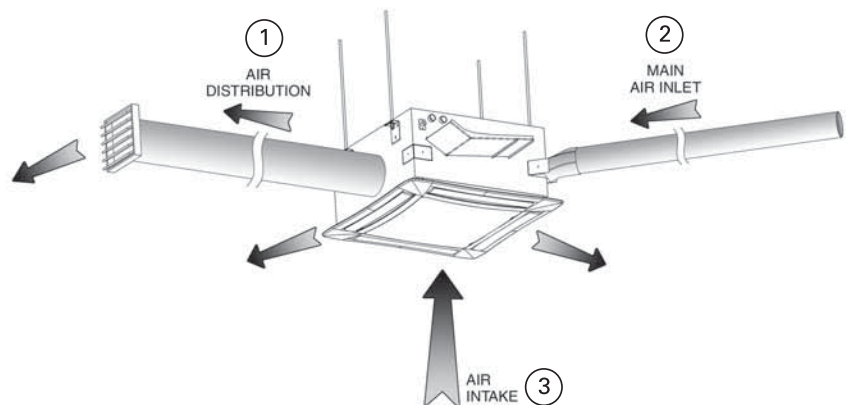
The units feature fresh air inlets on three corners (no inlet on the fourth corner because of the condensate pump inside the unit).

The fresh air inlets are designed for the insertion of standard 110 x 55 mm rectangular ducts.

The air duct is connected quickly and easily. After removing the blank and the insulation inside the unit, the mounting plate is rolled back and the air duct with its V-shaped section must be pushed into the unit. The duct is then fixed to the mounting plate.

**Note:** Fresh air must be filtered.

**Figure 10 - Air flow**

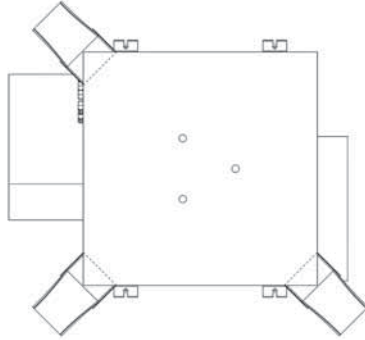


- 1 = Air distribution
- 2 = Main air inlet
- 3 = Air intake

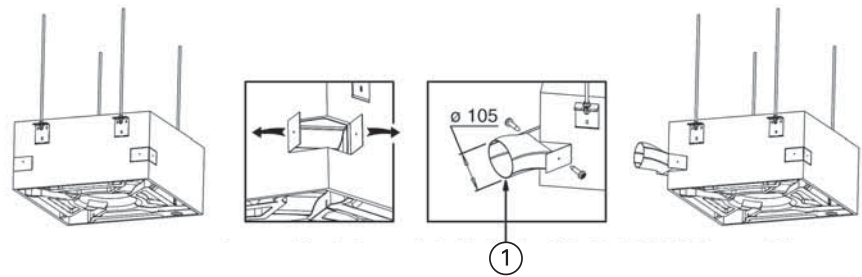
# Fresh air inlet

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**Figure 11 - Fresh air inlet positions**



**Figure 12 - Fresh air connection installation**



1 = Fresh air connection "FAC" (Please refer to "Accessories" section)

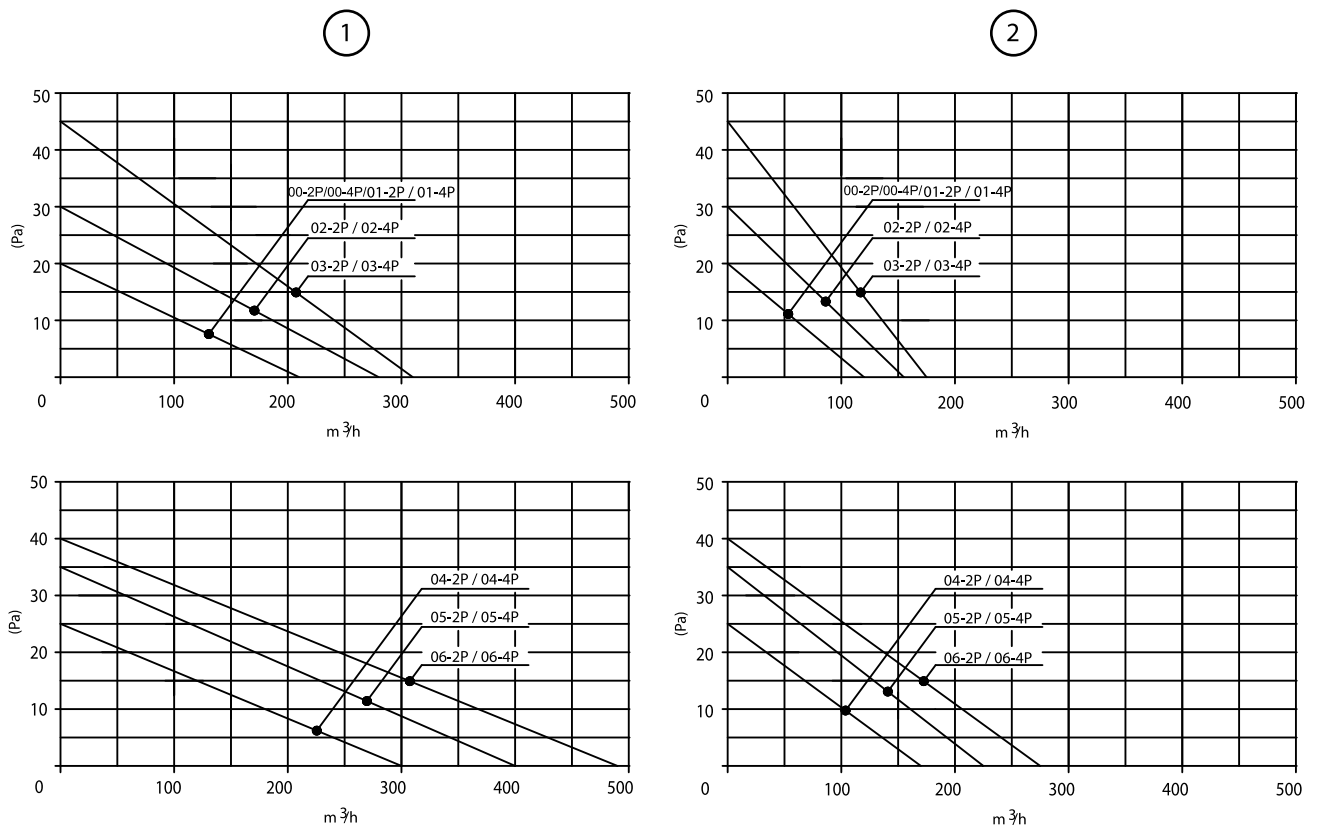
# Air distribution

Two air outlets are provided on the side of the unit for connection to separate supply air outlets.

They can be used to supply air from the fan coil unit to distant areas of a room or even to a different room. The total airflow does not change. The air flow at high speed depending on the air duct pressure drop is shown in the tables below.

**Note:** All air ducts must be insulated in order to avoid condensation.

Figure 13 - Airflow at high speed



1 = 1 outlet used  
2 = 2 outlets used



# Controls options

Several choices of electro-mechanical and electronic controls are available.

**Table 17 - Thermostat use summary**

	Installation	Control type	Architecture	2 pipe				4 pipes	Water valve(s) factory mounted	
				Cool	Changeover type(s)			Cool / Heat	Hotwax	3 points
					Cool / Heat	Cool + Electric Heat	Cool / Heat + Electric heat			
AC fan	Standalone	N	Wall thermostat (wires)	x	Manual	Manual		Manual		
		P	Wall thermostat (wires)	x	Auto (SP*+WT*)	Auto (SP)	Auto (SP+WT)	auto (SP)		
		R	Wall thermostat (wires)	x	Manual	Manual		Manual		
					External	External		External		
					Auto (WT)					
		T	Wall thermostat (wires)	x	Manual	Manual		Manual		
					External	External		External		
					Auto (WT)	Auto (SP)		Auto (SP)		
		U	Unit controller + wall LCD thermostat (bus)	x	Manual	Manual		Manual		
					External	External		External		
	Auto (WT)				Auto (SP)		Auto (SP)			
	Group control	MB-AC + T-MB	Unit controller + wall thermostat (bus) or infrared remote controller	x	Manual	Manual	Manual	Manual	x	
x				External	External	External	External			
x				Auto (WT)	Auto (SP)	Auto (SP+WT)	Auto (SP)			
BMS	ZN523	Unit controller + wall thermostat (bus)	x	Auto (WT)	Auto (SP)	Auto (WT)	Auto (SP)	x	x	
EC fan	Standalone	T-EC	Unit controller + wall thermostat (bus)	x	Manual	Manual		Manual	x	
				x	External	External		External		
				x	auto (WT)	N/A		N/A		
	Group control	MB-EC+ T-MB	Unit controller + wall thermostat (bus) or infrared remote controller	x	Manual	Manual	Manual	Manual	x	
				x	External	External	External	External		
					Auto (WT)	Auto (SP)	Auto (SP+WT)	Auto (SP)		
	BMS	ZN525	Unit controller + wall thermostat (bus)	x	Auto (WT)	Auto (SP)	Auto (WT)	Auto (SP)	x	x

### Free-issued controls

Control boxes for standalone applications are designed for the mounting of any free-issued controls on the market. The electrical characteristics of the entries shall be verified for compatibility prior to assembly. Any 230V/1Ph/50Hz controller will generally be suitable.

# Standalone controls

	Installation	Control type	Architecture	Master/slave communication			Extra features							
				Accessory	Type	Number of units	Return air temperature sensor	MHW	Economy override	Window contact	Remote on/off	Time of day scheduler	Control external equipment	
AC fan	Standalone	N	Wall thermostat (wires)	Relay card	REL03	Wires	10							
		P	Wall thermostat (wires)	Relay card	REL03	Wires								
		R	Wall thermostat (wires)	Relay card	REL03	Wires	10		x					
		T	Wall thermostat (wires)	Relay card	REL03	Wires	10		x					
		U	Unit controller + wall LCD thermostat (bus)	Relay card	REL02	Proprietary RS485	10		x	x				
	Group control	MB-AC + T-MB	Unit controller + wall thermostat (bus) or infrared remote controller	Unit controller		ModBus RS485	20	x	x	X	x	x	TODS	ECC
	BMS	ZN523	Unit controller + wall thermostat (bus)	ZN523		LonTalk RS485	30+	x	x	x	x			
EC fan	Standalone	T-EC	Unit controller + wall thermostat (bus)	Relay card	REL04	Proprietary RS485	16	x				x		
	Group control	MB-EC+T-MB	Unit controller + wall thermostat (bus) or infrared remote controller	Unit controller		ModBus RS485	20	x		x	x	x	TODS	ECC
	BMS	ZN525	Unit controller + wall thermostat (bus)	ZN525		LonTalk RS485	30+	x		x	x			

S/W: Summer/Winter

(1) Application possible only if the unit is connected to a reversible unit and the maximum entering water temperature is 45 C in heating mode.

## Standalone controls

---

### Thermostat N - AC fan motor

(Accessory 35169830-001)

#### CONTROL WITH ELECTROMECHANIC THERMOSTAT

Figure 1 - Thermostat N



#### Main characteristics:

- On/off switch.
- Manual speed switch.
- Manual Summer/Winter switch.
- Temperature setting

#### Operation:

- 1-step heating
- 1-step cooling
- Controls one water valve ON-OFF for cooling
- Controls one electric heater or one water valve ON-OFF for heating
- Fan runs continuously regardless of water valve operation when the thermostat is turned ON.



## Standalone controls

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### Thermostat P - AC fan motor

#### ELECTROMECHANIC THERMOSTAT

#### AUTO CHANGEOVER + ELECTRIC HEATER

(Accessory 35169831-001)

Figure 2 - Thermostat P



#### Main characteristics:

- On/off switch.
- Manual speed switch.
- Automatic Summer/Winter change-over.
- Temperature setting

#### Operation:

- 2-step heating
- 1-step cooling
- Controls one water valve ON-OFF for cooling
- Controls one water valve ON-OFF for heating
- Controls one electric heater as second step heating
- Fan runs continuously regardless of water valve operation when the thermostat is turned ON.

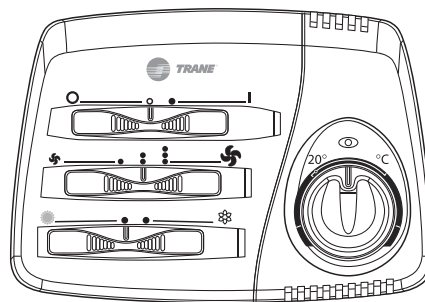
## Standalone controls

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### Thermostat R - AC fan motor

#### STANDALONE CONTROL WITH ELECTRONIC THERMOSTAT MANUAL CHANGEOVER

(Accessory 35169833-001)



#### Main characteristics:

- On/off switch.
- Manual speed switch.
- Manual change mode switch.
- Temperature setting
- Water temperature sensor to avoid cold air drafts in heating mode.

#### Operation:

- 1-step heating
- 1-step cooling
- Controls one water valve ON/OFF for cooling
- Controls one water valve ON/OFF or one electric heater for heating
- Fan runs continuously regardless of water valve operation when the thermostat is turned ON.
- With the water temperature sensor accessory MHW, cold air drafts are avoided in cases where the hot water temperature is lower than 38°C.

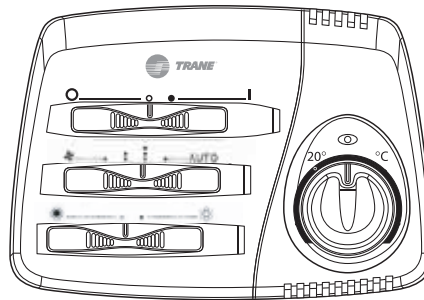
## Standalone controls

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### Thermostat T - AC fan motor

#### CONTROL WITH ELECTRONIC THERMOSTAT

(Accessory 35169834-001)



#### Main characteristics:

Same characteristics as the R control, adding:

- Manual or automatic speed switch.
- Electronic thermostat for fan control (on/off).
- Electronic thermostat for valve(s) control (on/off).
- Simultaneous thermostatic control on the valves and fan (on/off).
- It allows installation of the Summer/Winter switch centralized and remote, or to control it with an automatic change-over fitted on the water pipe (for 2 pipe installations only). The last case needs the adjustment of the jumper on the control board (see the instruction leaflet supplied with the control).

## Standalone controls

### Thermostat T-EC - EC fan motor

#### Thermostat accessory 35169884-001

#### Relay card REL04 accessory 35169885-001

#### Thermostat T-EC + relay card REL04 accessory 35169886-001

The thermostat is connected to a unit controller REL04 with 2 wires. One thermostat can be used for up to 16 units equipped with the REL04 control card creating a Master/Slave configuration with interconnection between all REL04 control cards.

#### Main characteristics

- On/Off button
- Manual 3 speed switch or automatic continuous speed control
- Manual winter / summer switch
- Temperature setting button
- Control up to 16 units in Master / Slave configuration



#### Operation

- 1 step cooling for water valve control On/Off
- 1 step heating for water valve or electric heater control On/Off
- Simultaneous control of the water valves / electric heater and fan operation based on the difference of the room temperature and set point
- It allows controlling the summer / winter cycle with a centralized and remote switch or with an automatic change over switch fitted on the water pipe
- With 4 pipe installation it can be configured as an automatic change over winter / summer with a neutral dead band of 2°C around set point
- Fan runs continuously and for auto fan mode the speed varies based on the difference of the room temperature and set point



## Standalone controls

### Thermostat U - AC fan motor

#### CONTROL WITH ELECTRONIC THERMOSTAT

(Accessory 35169835-001)



#### Main characteristics:

- Manual or automatic speed switch.
- Manual or automatic Summer/Winter switch.
- Electronic thermostat for fan control (on/off).
- Electronic thermostat for valve(s) control (on/off).
- It allows to control the minimum water temperature sensor (MWT).
- It allows to control the chilled water valve (on/off) and the electric resistance in the CWS-E version.
- It allows to control the fan and the heating electric resistance.
- It allows to control up to 10 units with the REL02 relay board.

Note: with 4 pipe installations and continuous chilled and hot water supply, it allows the automatic summer/winter change-over in accordance to the room temperature (-1,6°C = Winter, +1,6°C = Summer, Dead Zone 3,2°C).

## Group controls

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*Figure 16 - CWS grille with infra-red receiver for units with AC fan motor*



### **Group control via ModBus communication protocol through RS485 serial link**

The MB controller is suitable for AC and EC fan motor technology. It can be connected to one T-MB thermostat or RT03 infrared remote controller field installed. One device can control up to 20 units in a Master/Slave configuration with ambient temperature controlled based on thermostat or on return air temperature sensor. When connected to the centralized time of day scheduler TODS controller, up to 60 units can operate together on the same agenda for 7 days each operating on individual set points and fan control. For rooms where set points and fan operation is left to occupants the MB controller can be connected to one T-MB thermostat or RT03 infrared remote control. In this case the latest command from any of the connected devices thermostat T-MB / RT03 or TODS is executed by the MB controller. If more than 60 units have to be installed in the building operating under the same TODS agenda, some terminal units serving the same zone in an open space shall be installed without control. It will be connected to a unit with MB controller using a relay card REL03 for units with AC fan motor or in a wired daisy chain arrangement for EC fan motor but with a limitation to 10 units in this case. The same strategy shall be used for zones where several units shall be installed so only one user interface T-MB or RT03 is required per zone for several units.

### **System configuration**

More over, the TODS centralized controller is capable to pilot up to 8 external devices like a chiller or an air handler using the external control card ECC. Each external device can provide the state of operation to the TODS controller to provide a diagnosis about the installation. Such the MB control using ModBus communication protocol is a powerful device that can operate a small building in a system configuration.

### **Configuration and commissioning**

The MB controllers are factory configured for the application. The terminal address and operating parameters are configured on the controller using dip switches which make the commissioning accessible to anyone reading simple instructions in the installation manual.

# Group controls

## T-MB thermostat

### (Accessory 35169876-001)

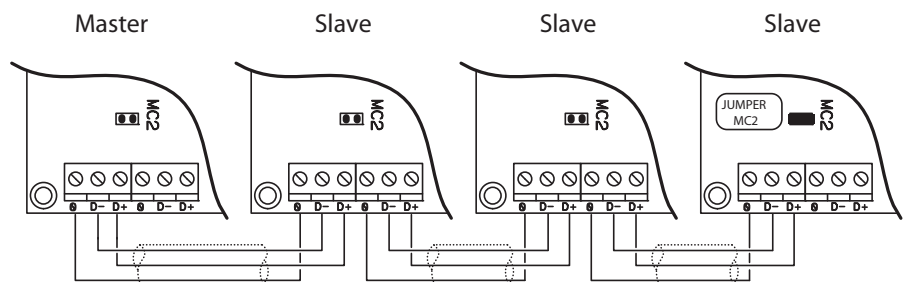
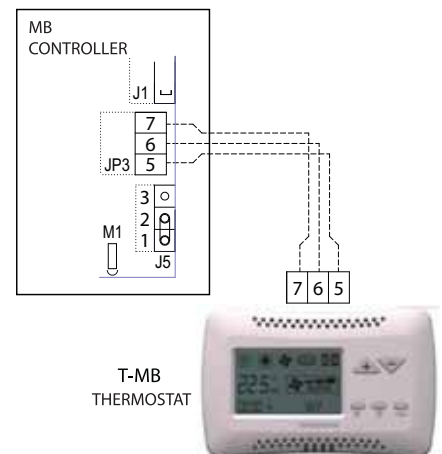
The T-MB thermostat and the Modbus controller suit all types of system applications.

- 2 or 4 pipe
- 2-pipe with auto changeover
- 2-step heating with electric heater
- Fan operation with continuous or alternate with destratification.

It is connected to the factory-mounted unit controller MB and configured for the customer's requirements. The MB controller can be connected in a Master/Slave configuration with up to 20 units.

External devices: window contact, cold air draft protection with T3 sensor.

The T-MB wall-mounted thermostat is used with the Modbus controller fitted on the cassette. The Modbus controller is factory-configured for the customer's application. The T-MB thermostat is configured by default to control air ambient temperature based on the temperature sensor of the thermostat. In the case that return air temperature is used, it can be configured using the dipswitch 2 in position ON during installation.



TYPE BELDEN 9841, RS-485, 1x2x24 AWG SFTP, 120 Ohm

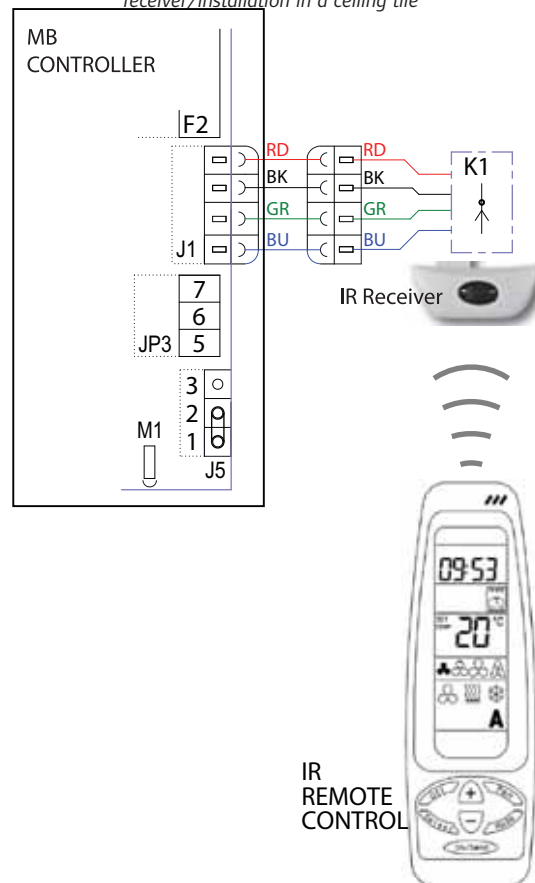


# Group controls

## RT03 remote control (accessory 35169889-001)

The RT03 is a remote controller handset that can be fitted with the MB electronic board as an accessory. There is a remote sensor to install on site and some configuration dipswitches to turn on. It is possible to connect up to 20 units with a serial link RS485 for a master/slave configuration. It is recommended to install the infra-red receiver on the master unit.

Figure 3 - Infra-red remote control/field-installed receiver/installation in a ceiling tile



## Note

For more details, please refer to the infra-red remote control manual.

### Control operations

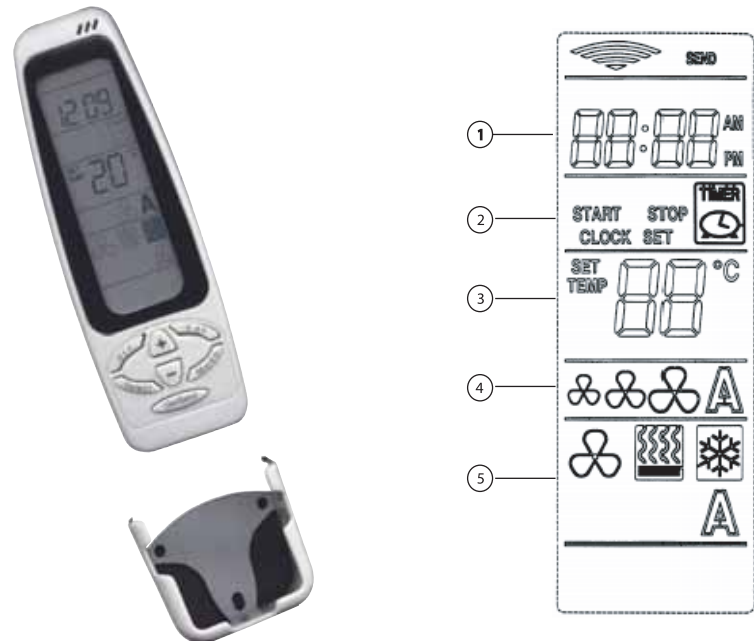
- Temperature set.
- Fan speed switch with possible automatic speed selection.
- 24 hours on/off program.
- on/off cooling valve control.
- on/off heating valve control.
- Control of the valves only or of the valves and the fan together.
- Valve control of 2 or 4 pipe systems with winter/summer switch on the infra-red control.
- Valve control of 4 pipe systems with automatic heating/cooling mode selection with 2°C dead zone.
- Activating the COE sensor connected to the T2 contact of the board (non active in the standard configuration), it works like a minimum water temperature sensor: fitted between the coil fins it stops the fan when the water temperature is lower than 38°C and it starts the fan when the water temperature reaches 42°C



# Options

## Main functions of the remote control

Figure 18 - Remote control display



1. Clock : 24 hours
2. Timer : the program switches the device on and off
3. Displays the temperature setpoint
4. Fan speed setting: 3 speed plus automatic selection
5. Operating mode: heat, cool, fan only plus and automatic mode selection.

### Timer function:

Used to start or stop the unit over a 12 hour period.

### Set display:

Used to display the temperature set point.

### Fan speed setting:

Used to select the 3 operating speeds of the fan, or alternatively select automatic control. In the latter case, the fan speed will change automatically based on the ambient temperature reading and the set point. The temperature difference to switch from one speed to the next is 0.7 °K.

### Operating mode:

Used to select the desired operating mode, that is, fan only, cooling, heating or automatic mode selection.

Automatic selection allows, in 4 pipe systems, the unit to switch automatically from heating to cooling and vice-versa based on the ambient temperature reading and the set point, with a dead zone of 2 °K inside which the unit remains in fan only mode.



# Options

## Intelligent LonTalk® ZN523 control for AC fan motor

The Tracer® ZN unit controller is a micro-processor based direct digital controller that is dedicated to the control and the optimization of the units. It is designed to provide improved comfort with minimum energy consumption through the use of custom proportional integral derivative (PID) control algorithms as well as intelligent fan speed and set point control strategies. It is factory installed, pre-commissioned and tested, resulting in a highly integrated product, reduced installation and commissioning time.

The following configurations are supported by the controller:

- 2-pipe cooling;
- 2-pipe heating;
- 2-pipe cooling + electric heater;
- 2-pipe changeover (manual or automatic);
- 2-pipe changeover + electric heater;
- 4-pipe.

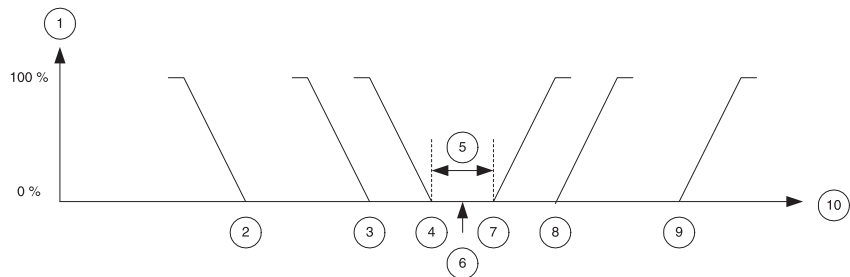
Figure 19 - LonTalk ZN523 control



The intelligent control offers the following benefits:

- Intelligent management of valve position and fan speeds. Valve is fully open before changing the fan speed (acoustic comfort optimization).
- Control algorithms based on ambient and discharge air temperatures.
- Discharge air temperature (low and high limit control).
- Automatic intelligent changeover based on ambient air - entering water temperatures differential (+/-%2.5K).
- Automatic intelligent changeover with sampling function for 2-way valves use.
- Filter timer for preventive maintenance
- Adjustable local set point max - min limits.
- Built-in electrical protection.
- 2 operating modes in stand-alone application: comfort and reduce. After a power up in the building, units automatically staggered from 5 to 32 seconds.
- Built-in adjustable timed override function.
- Built-in condensate overflow protection.
- Built-in output test capability.
- o Built-in diagnostic indicator.

Figure 20 - Normal operating mode



1. Control output
2. Unoccupied heating setpoint
3. Occupied standby heating setpoint
4. Occupied heating setpoint
5. Dead band
6. Local setpoint
7. Occupied cooling setpoint
8. Occupied standby cooling setpoint
9. Unoccupied cooling setpoint
10. Temperature

For more details about the LonTalk® ZN control, please refer to the controller's manual.

## Options

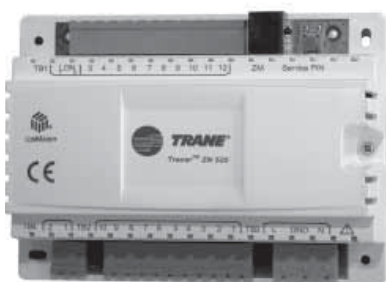
### Intelligent LonTalk® ZN525 control for EC fan motor

The Tracer® ZN unit controller is a micro-processor based direct digital controller. ZN525 is dedicated to control units equipped with EC motor. Controller is designed to provide improved comfort by reducing cassette sound level with minimum energy consumption through the use of custom proportional integral derivative (PID) control algorithms as well as intelligent fan speed and set point control strategies. It is factory installed, pre-commissioned and tested, resulting in a highly integrated product, reduced installation and commissioning time.

The following configurations are supported by the controller:

- 2-pipe cooling;
- 2-pipe heating;
- 2-pipe cooling + electric heater;
- 2-pipe changeover (manual or automatic);
- 2-pipe changeover + electric heater;
- 4-pipe.

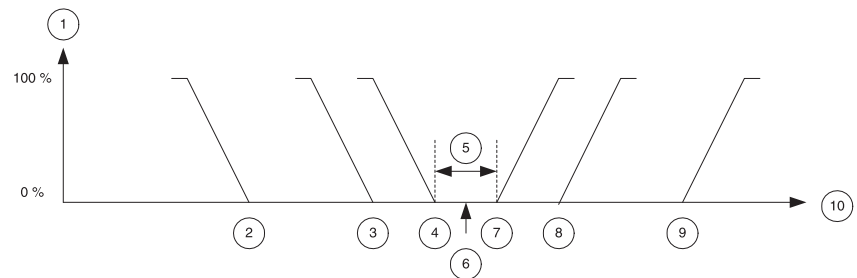
Figure 21 - LonTalk ZN525 control



The intelligent control offers the following benefits:

- Intelligent management of valve position and fan speeds. Valve is fully open before changing the fan speed (acoustic comfort optimization).
- Control algorithms based on ambient and discharge air temperatures.
  - o Discharge air temperature (low and high limit control).
- Automatic intelligent changeover based on ambient air - entering water temperatures differential (+/-%2.5K).
- Automatic intelligent changeover with sampling function for 2-way valves use.
- Filter timer for preventive maintenance
- Adjustable local set point max - min limits.
- Built-in electrical protection. 2 operating modes in stand-alone application: comfort and reduce.
- After a power up in the building, units automatically staggered from 5 to 32 seconds.
- Built-in adjustable timed override function.
- Built-in condensate overflow protection.
- Built-in output test capability.
- Built-in diagnostic indicator.

Figure 22 - Normal Operating mode



1. Control output
2. Unoccupied heating setpoint
3. Occupied standby heating setpoint
4. Occupied heating setpoint
5. Dead band
6. Local setpoint
7. Occupied cooling setpoint
8. Occupied standby cooling setpoint
9. Unoccupied cooling setpoint
10. Temperature

For more details about the LonTalk® ZN525 control, please refer to the controller's manual.



# Options

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## Unit with electric heater - AC fan motor

The CWS and CWE 2 pipe models are available with an electric heater. The electric heater is controlled in place of the hot water valve and not as integrated to it.

The resistance is hermetically sealed and supplied inside the battery pipes and therefore can be only factory mounted.

The electric resistance of the CWS and CWE 00-01-02-03 units are for single phase 230V supply.

The electric resistances of the CWS and CWE 04-05-06 units are for single phase 230V or three phase 400V supply.

A specific electronic board is fitted in the unit control panel and it is connected to the resistance and to the safety thermostat.

When the safety thermostat operates, it keeps open the resistance supply relays on the electronic board.

The rearmament is by electric means, cutting off the main supply to the unit.

On the top, a manual reset thermostat prevents the electric heater from overheating.

**Table 18 - EC voltage range - without electric heater**

Speed	Low speed	Med speed	High speed
Voltage	1V	5V	10V
CWE 01-2P/4P	390	540	730
CWE 02-2P/4P	390	635	940
CWE 03-2P/4P	500	820	1225
CWE 04-2P/4P	290	370	475
CWE 05-2P/4P	290	470	688

RPM range is a built-in feature for the CWE BLAC control card. It cannot be changed, thus any 0-10V controller can operate the unit without violating the RPM range.



# Options

**Table 19 - Electric heater capacities**

Unit size		CWS 00-2P-E7	CWS 01-2P-E15	CWS 02-2P-E25 CWS 03-2P-E25	CWS 04-2P-E30 CWS 05-2P-E30 CWS 06-2P-E30
Emission	(W)	750	1500	2500	3000
Supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	400/3/50 +N
Number and Dia. Of connecting wires	(mm )	3 x 1.5	3 x 1.5	3 x 2.5	5 x 1.5

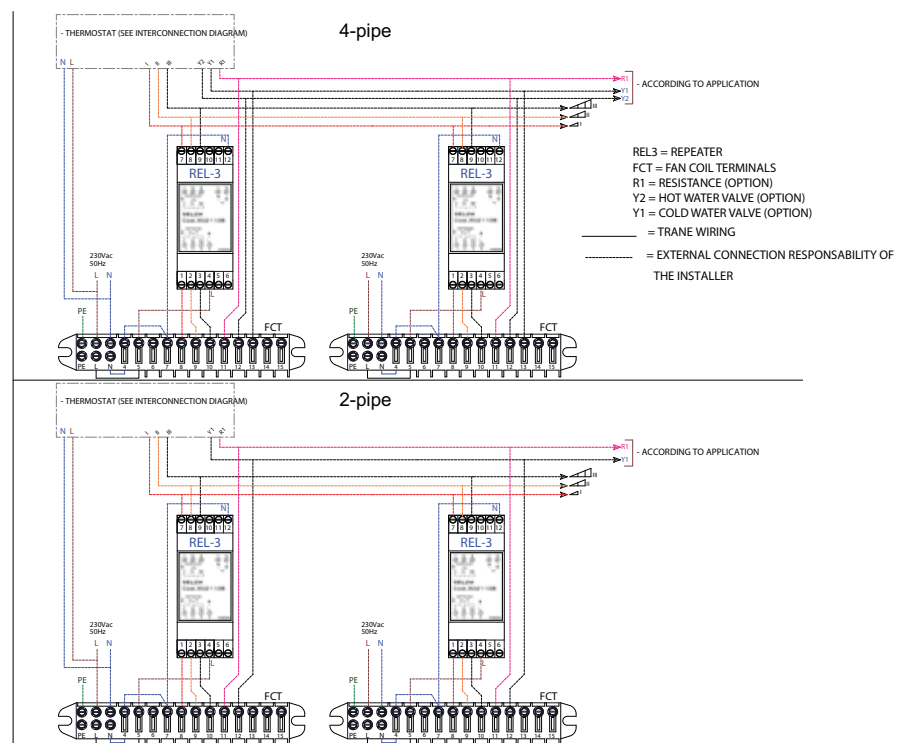
Unit size		CWE 01-2P-E15	CWE 02-2P-E25 CWE 03-2P-E25	CWE 04-2P-E30 CWE 05-2P-E30
Emission	(W)	1500 Watt	2500 Watt	3000 Watt
Supply	(V/Ph/Hz)	230/1/50	230/1/50	400/3/50 +N
Number and Dia. Of connecting wires	(mm )	3 x 1.5	3 x 2.5	5 x 1.5

**Note:** The cooling emission of the units is 95% of the emission in tables 3 and 4.

# Accessories

## REL03 Relay card for master/slave configuration - AC fan motor (accessory 35169875-001)

Fitted in the control panel of the master and slave cassettes, this enables up to eight units to be controlled by the signal from a single remote control unit.

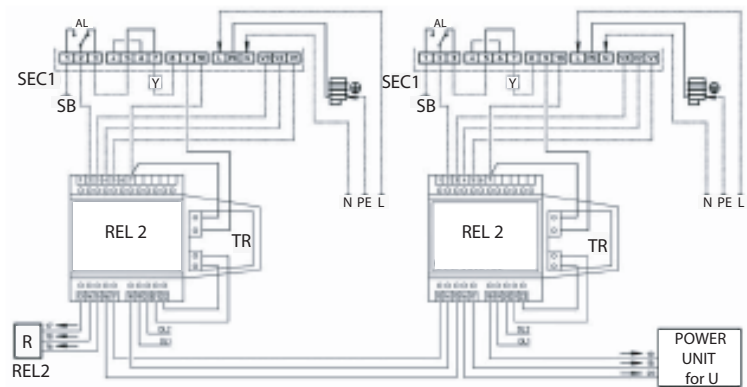


# Accessories

## REL02 for U-type thermostat - AC fan motor (accessory 35169836-001)

It allows to control up to 10 units with RS485 serial link.

Figure 8 - REL02 connection with 1 valve



## REL04 for T-EC thermostat - EC fan motor Accessory 35169885-001

It allows control of up to 16 units with RS485 serial link.





## Accessories

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### TODS (Time Of Day Scheduler) Accessory 35169878-001

Designed to control up to 60 units in 2 zones within 7 days of operation plus with the external control board it can start and stop 8 other equipment's as:

- Chiller for cooling and heating water supply
- Boiler for hot water supply
- Air handler unit for fresh air supply
- Lamps
- Other devices

Each unit connected to the TODS will need to be identified with an alias number from 1 to 60 configured by dip switch on the MB unit control board. Each unit will dialogue with the TODS through the RS485 serial link using ModBus communication protocol. Each unit is controlled individually or all at a time per zone and from the TODS the following actions can be taken:

- View the unit operation mode as heating or cooling, fan operation, the ambient temperature
- Run the air-conditioning in comfort or economy mode or winter freeze control when off
- Turn On/Off each unit individually or all together
- Modify the operation parameters and temperature control of each individual unit or all units together
- Operate the Air-conditioning installation within 4 schedule range per day each with its own temperature setting over 2 zones maximum
- Run the system in Economy or Off mode during holidays. The number of days off needs to be entered the day before the start of the holiday period using the "Menu" button.

**Note:** the length of the RS485 cable cannot exceed 700 to 800 meters depending upon the cable quality and electromagnetic environment

## Accessories

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### **ECC System control board Accessory 35169887-001**

The ECC control board is designed to control up to 8 external equipment within the association of the weekly scheduler TODS such as:

- Chillers
- Cooling and heating mode for the chillers
- Air handlers
- Dampers
- Lamps
- Extractor fans

It has 8 digital inputs that can be associated with any of the other 8 outputs.

The utilization of the TODS with the external control board ECC can really run efficiently the air-conditioning of any building configuration to reduce the cost of ownership.

## Accessories

### MWT Minimum Water Temperature T3 sensor (35169496-001) - AC fan motor

Suitable for wall thermostats R, T, and U only (not for infra-red remote control). To be fitted between the coil fins, it is measuring the water temperature in the coil.



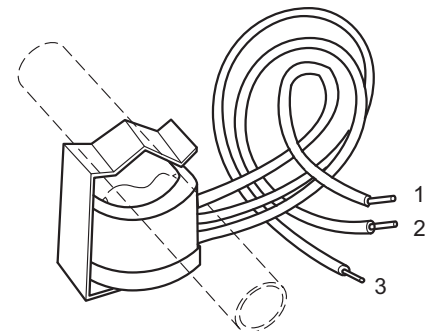
In heating mode, it stops the fan when the water temperature is lower than 38°C and it starts the fan when it is higher than 42°C.

### MWT Minimum Water Temperature T3 sensor - EC fan motor

On units with EC fan motors, T3 sensor is mounted as standard feature. The function is activated by dip switch configuration 2.

### Automatic changeover pipe thermostat (35169820-001) for units with AC fan motors

Suitable for wall thermostats N, P, R, T and U only (not for infra-red remote control). Automatic summer/winter switch to be installed in contact with the entering water circuit and before the control valve (for 2-pipe installations only). The cooling mode is allowed if the water temperature is below 15°C and the heating mode is allowed if the water temperature is above 25°C.



1. Blue
2. White
3. Black

## Accessories

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### Infra-red remote control with receiver W-type RT03/ ECM-IR - EC fan motor (35169877-001)

- Valve control of 2 or 4 pipe systems with winter/summer switch on the infra-red control.
- Valve control of 4 pipe systems with automatic heating/cooling mode selection with 2°C dead zone.



#### Control operations:

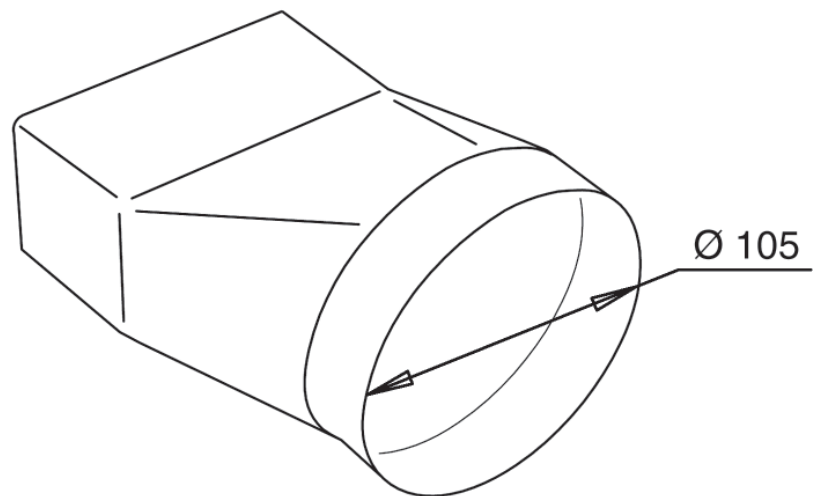
- Temperature set.
- Fan speed switch with possible automatic speed selection.
- 24 hours on/off program.
- on/off cooling valve control.
- on/off heating valve control.
- Control of the valves only or of the valves and the fan together.

## Accessories

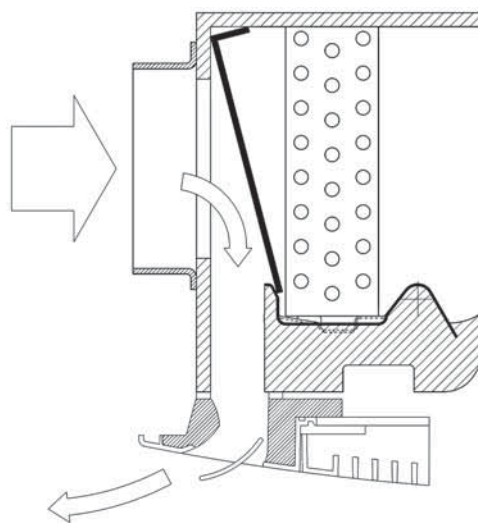
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### Fresh air connection (FAC 35169490-001)

To be connected to one of the three fresh air inlets available on the cassette.  
This is used to introduce primary air into the cassette from a 100 mm diameter duct



### Fresh air kit (FAK 600=35169497-001, FAK 800=35169498-001)



## Accessories

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This is used to introduce primary air into the environment directly through the diffuser. The kit includes a flow separator to be fitted inside the cassette, and a circular fitting for connection to the flexible system ducting.

The flow of air is sent directly to just one of the outlet louvers, without passing through the coil. The air flow of fresh air introduced into the environment depends on the inlet static pressure.

The diameter of the fitting for sizes 1-2-3 is 150mm. The diameter of the fitting for sizes 4-5-6 is 180mm.

**Table 20 - Correlation between flow-rate / static pressure**

<b>CWS/CWE 00-01-02-03</b>		<b>CWS/CWE 04/05 - CWS 06</b>	
m <sup>3</sup> /h	Pa	m <sup>3</sup> /h	Pa
80	3	160	3
120	8	200	8
160	15	300	15
200	25	400	25
240	36	500	36

## Accessories

### On/off valves with hot wax actuator

In order to save time on the job site, on/off 2 way and 3 way valves are available as a pre-assembled kits including pipes and connections.

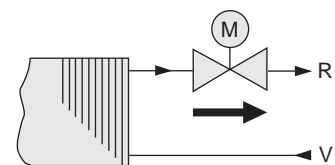
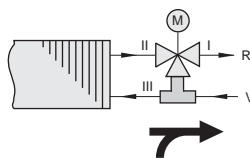
#### 3 Way / 4 ports



#### 2 Way / 2 ports



#### (35169820-001)



### Connections for field-mounted water valves

Kits are made of copper tubes, a female nut and a flat gasket, allowing direct connection of a 3-way water valve with 40 mm distance between entering and leaving water valve ports.

- 2-pipe accessory size 00 to 03: 35169889-001; 3/4"
- 2-pipe accessory size 04 to 06: 35169891-001; 1"
- 4-pipe accessory size 00 to 03: 35169901-001; 3/4" main coil, 3/4" auxiliary coil
- 4-pipe accessory size 04 to 06: 35169902-001; 1" main coil, 3/4" auxiliary coil

## Accessories

**Table 21 - Technical data**

Rated pressure	16 bar
Max. ambient temperature	50 C
Max. water flow temperature	110 C
Power	230 V - 50/60 Hz
Rating	3 VA
Protection	IP 43
Travel time	approx. 3min.
Max. glycol content water	50%

**Table 22 - Valves characteristics**

Battery type	Model	2 way valves			3 way valves		
		Kvs m <sup>3</sup> /h	pmax kPa *	Valve ** connection	Kvs m <sup>3</sup> /h	pmax kPa *	Valve ** connection
Main	00-2P/01-2P/02-2P/03-2P	2.8	50	3.4"	2.5	50	3/4"
	01-4P/02-4P/03-4P						
	04-2P/05-2P/06-2P	5.2	60	1"	4.5	50	1"
04-4P/05-4P/06-4P							
Auxiliary	00-4P/01-4P/02-4P/03-4P	2.8	50	3/4"	2.5	50	3/4"
	04-4P/05-4P/06-4P						

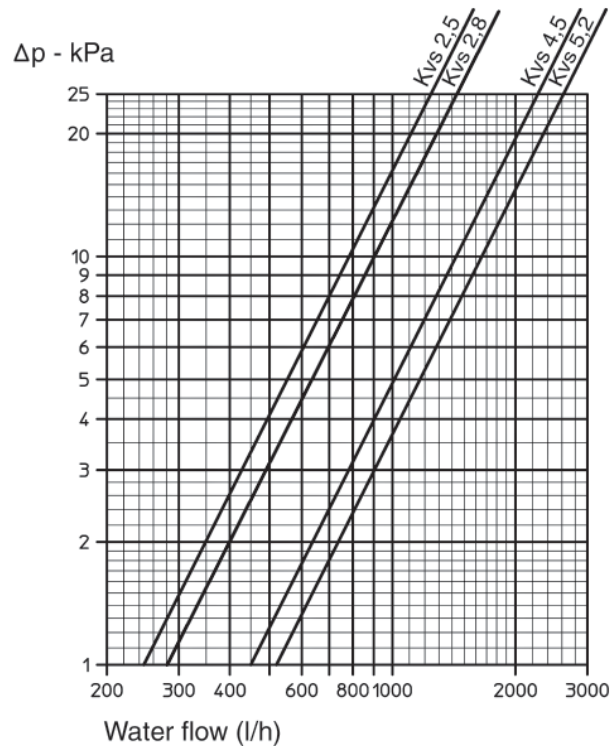
\* maximum pressure difference for valve to close

\*\* external thread, flat seal



# Accessories

Figure 27 - Water pressure drop



Valve set, 2 or 3 ways, on/off, with hot wax actuator. The set includes connection pipes and holders.

**Notes**

- The main battery valve connection is 1/2" for CWS-01-02-03 sizes and " for CWS 04-05-06 sizes. The auxiliary battery valve connection is 1/2" on all unit sizes.
- The maximum pressure drop across the fully open valve should not exceed 25 kPa for cooling operation and 15 kPa for heating operation.



## Notes

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## Notes

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