

Air to water chillers and heat pumps





The CDK water chillers range is an efficient and low-noise product designed for medium to big applications.

The CDK water chillers are suitable for water outlet temperatures at 7°C, commonly used in combinations with fan coils or/ and air handling units.

The use of tandem scroll compressors offer high efficiencies (especially at partial loads) and low noise levels, making suitable their use in any indoor installation. The different versions available allow the user to select the most suitable solution thanks to a wide range of accessories.

VERSIONS

- CDK, cooling only version, available in 18 different sizes.
- CDK/HP, reversible heat pump version, available in 18 different sizes.
- CDK/FC, free-cooling version, available in 18 different sizes.

ACCESSORIES

- LS Low noise version.
- Hydraulic kit A1ZZ with: pump, expansion valve, safety valve, flow switch, insulated tank.
- Hydraulic kit A2ZZ: As A1ZZ with twin pumps.
- Hydraulic kit A1NT with: pump, expansion valve, safety valve, flow switch.
- Hydraulic kit A0NP with insulated tank, no pumps.
- Low ambient condensing pressure control by modulating damper.
- Partial heat recovery.
- Evaporator antifreeze heater.
- Antifreeze kit.
- · Condensing coil protection mesh with metallic filter.
- Remote control panel.
- Rubber vibration dampers.
- Manometers.

Versions CDK ÷ CDK/HP		039	045	050	060	070	080	090	110		
Cooling capacity (1)	kW	37,0	45,0	52,0	58,0	64,0	77,6	89,6	103,2		
Compressors input power (1)	kW	12,6	15,1	17,2	19,3	21,5	26,0	30,1	34,4		
Water flow (1)	m³/h	6,2	7,7	8,9	9,8	10,8	13,4	15,6	17,9		
Heating power (2)	kW	37,5	45,6	53,3	60,5	66,5	80,7	91,5	102,9		
Compressors input power (2)	kW	12,9	15,2	17,3	19,5	21,7	26,4	30,3	34,1		
Water flow (2)	m³/h	6,6	7,9	9,2	10,4	11,5	14,0	15,9	18,0		
Power supply		400V - 3Ph - 50 Hz									
Nominal input current	Α	35,5	39,1	41,7	44,4	47,1	56,9	73,2	78,7		
Peak current	Α	122,6	149,5	157,7	197,7	202,3	235,5	272,1	284,3		
Max input current	Α	38,7	44,5	51,7	56,3	60,9	65,3	86,1	98,3		
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1		
Evaporator				Stainless ste	steel braze-welded plates heat exchanger						
Fans	n° x kW	2 x 1,1	2 x 1,1	2 x 1,5	2 x 1,5	2 x 1,5	2 x 1,5	3 x 2,2	3 x 2,2		
Total airflow	m³/h	12000	12000	19000	19000	18000	17300	30000	30000		
Sound power level (3)	dB(A)	86	86	89	89	89	89	92	92		
Sound pressure level (4)	dB(A)	58	58	61	61	61	61	64	64		
Water pump	kW	1,1	1,1	1,1	1,1	1,1	1,5	1,5	2,2		
Pump available static pressure	kPa	165	160	141	125	110	150	130	150		
Water tank	I	180	180	300	300	300	300	500	500		

Versions CDK ÷ CDK/HP		120	130	152	162	190	210	240	260		
Cooling capacity (1)	kW	116,8	128,9	148,7	160,0	177,5	200,8	233,8	257,5		
Compressors input power (1)	kW	39,5	44,1	46,4	51,0	61,6	70,5	75,2	83,5		
Water flow (1)	m³/h	20,5	22,4	25,8	27,8	30,5	34,4	40,1	44,2		
Heating power (2)	kW	115,5	127,1	143,2	155,7	181,2	207,6	240,1	265,1		
Compressors input power (2)	kW	38,2	42,5	50,6	54,6	56,2	63,2	71,6	79,4		
Water flow (2)	m³/h	20,6	22,6	25,5	27,5	32,2	37,0	42,7	47,2		
Power supply		400V - 3Ph - 50 Hz									
Nominal input current	Α	87,6	96,7	104,0	113,0	143,0	160,4	180,2	198,4		
Peak current	Α	309,3	317,8	340,0	396,0	357,6	380,0	421,1	438,1		
Max input current	Α	106,8	115,3	133,8	148,0	171,6	194,0	218,6	235,6		
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2	4/2		
Evaporator				Stainless ste	el braze-weld						
Fans	n°x kW	3 x 2,2	3 x 2,2	2 x 4	2 x 4	4 x 4	4 x 4	4 x 5,5	4 x 5,5		
Total airflow	m³/h	29000	29000	36000	36000	60000	60000	60000	60000		
Sound power level (3)	dB(A)	92	92	94	94	96	96	96	96		
Sound pressure level (4)	dB(A)	64	64	66	66	68	68	68	68		
Water pump	kW	2,2	2,2	2,2	3	3	3	4	4		
Pump available static pressure	kPa	120	130	105	180	140	110	170	155		
Water tank	I	500	500	500	500	600	600	600	600		

Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.
Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.
Sound power level ISO 3746.
Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 according to ISO 3746.



Version CDK/FC		039	045	050	060	070	080	090	110		
Cooling capacity (1)	kW	-	-	51,5	57,4	63,3	77,0	89,0	102,3		
Compressors input power (1)	kW	-	-	17,2	19,3	21,5	26,0	30,1	34,4		
Water flow (1)	m³/h	-	-	9,3	10,7	11,4	13,7	16,5	18,8		
Free cooling capacity (5)	kW	-	-	49,1	50,9	50,5	51,3	74,4	75,5		
Compressors input power (5)	kW	-	-	3	3	3	3	6,6	6,6		
Water flow (5)	m³/h	-	-	9,3	10,7	11,4	13,7	16,5	18,8		
Power supply		400V - 3Ph - 50 Hz									
Nominal input power	Α	-	-	41,7	44,4	47,1	56,9	73,2	78,7		
Peak current	Α	-	-	157,7	197,7	202,3	235,5	272,1	284,3		
Max input current	Α	-	-	51,7	56,3	60,9	65,3	86,1	98,3		
Compressors / Circuits	n°	-	-	2/1	2/1	2/1	2/1	2/1	2/1		
Evaporator					Stainless st	eel braze-we	ded plates h	d plates heat exchanger			
Fans	n° x kW	-	-	2 x 1,5	2 x 1,5	2 x 1,5	2 x 1,5	3 x 2,2	3 x 2,2		
Total airflow	m³/h	-	-	19000	19000	18000	17300	30000	30000		
Sound power level (3)	dB(A)	-	-	89	89	89	89	92	92		
Sound pression level (4)	dB(A)	-	-	61	61	61	61	64	64		
Water pump	kW	-	-	1,1	1,1	1,1	1,5	1,5	2,2		
Pump avalaible static pressure	kPa	-	-	141	125	110	150	130	150		
Water tank	I	-	-	300	300	300	300	500	500		

Version CDK/FC		120	130	152	162	190	210	240	260			
Cooling capacity (1)	kW	116,4	128,2	147,6	159,1	174,4	196,9	229,3	252,6			
Compressors input power (1)	kW	39,5	44,0	46,5	50,7	61,6	70,5	75,2	83,5			
Water flow (1)	m³/h	21,5	23,5	27,0	29,4	31,7	35,7	41,6	45,9			
Free cooling capacity (5)	kW	76,0	77,3	109,1	110,5	132,5	136,0	163,9	167,1			
Compressors input power (5)	kW	6,6	6,6	8	8	16	16	22	22			
Water flow (5)	m³/h	21,5	23,5	27,0	29,4	31,7	35,7	41,6	45,9			
Power supply		400V - 3Ph - 50 Hz										
Nominal input power	Α	87,6	96,7	104,0	113,0	143,0	160,4	180,2	198,4			
Peak current	Α	309,3	317,8	340,0	396,0	357,6	380,0	421,1	421,1			
Max input current	Α	106,8	115,3	133,8	148,0	171,6	194,0	218,6	235,6			
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2	4/2			
Evaporator		Stainless steel braze-welded plates heat exchanger										
Fans	n°x kW	3 x 2,2	3 x 2,2	2 x 4	2 x 4	4 x 4	4 x 4	4 x 5,5	4 x 5,5			
Total airflow	m³/h	29000	29000	36000	36000	60000	60000	60000	60000			
Sound power level (3)	dB(A)	92	92	94	94	96	96	96	96			
Sound pression level (4)	dB(A)	64	64	66	66	68	68	68	68			
Water pump	kW	2,2	2,2	2,2	3	3	3	4	4			
Pump avalaible static pressure	kPa	120	130	105	180	140	110	170	155			
Water tank	I	500	500	500	500	600	600	600	600			

Cooling: ambient air temperature 35°C, eavaporator water temperature in/out 12/7 °C glycol 20%.

Sound power level according to ISO 3746.

Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 according to ISO 3746.

Free Cooling: ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal waterflow, compressors switched off.

FRAME

All CDK units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. All screws and rivets for outdoor installations are in stainless steel. The colour of the units is RAL 9018.

REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. Each refrigerant circuit is totally independent from the other. Any incorrect operation of one circuit does not influence the other circuit. The refrigerant circuit includes: liquid line manual shut-off valve, sight glass, filter drier, thermal expansion valve with external equalizer, electric expansion valve with electronic control to optimize the efficiency in part load conditions (option), reverse cycle valve (for heat pump version only), one way valve (for heat pump version only), liquid receiver (for heat pump version only), Schrader valves form maintenance and control, pressure safety device (according to PED regulation).

COMPRESSORS

The compressors are scroll type, with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate chamber in order to be separated from the air stream. The crankcase heater is always powered when the compressors are in stand-by. The inspection is possible through the frontal panel of the unit that allows the maintenance of the compressors even if the unit is working. The compressors used are all in tandem execution. This solution allows much higher efficiencies in partial loads compared to the units with independent refrigerant circuits.

CONDENSERS

The condensers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor.

The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. The condensers can be protected by a metallic filter to be installed on request.

FANS

The fans are made of galvanized steel, centrifugal type, double inlet with forward curved blades. They are statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. They are mounted on the unit frame by interposition of rubber vibration dampers. The electric motors are 4 poles (about 1500 rpm), three-phase power supply. The motors are connected to the fans by pulleys and belts. The protection class of the motors is IP 54.

EVAPORATORS

The evaporators are made of AISI 316 stainless steel braze-welded plates type. From size 039 to size 162 are single water side circuit, from the size 190 they are double circuit "cross flow" type. The use of these kinds of evaporators allows a massive reduction of the refrigerant charge of the unit compared to the traditional shell-in-tube evaporators and increases the efficiency of the refrigerant cycle in partial loads. The evaporators are factory insulated with flexible close cell material and can be equipped with antifreeze heater (optional). Each evaporator is provided with a temperature sensor as antifreeze protection.

MICROPROCESSORS

All CDK units are supplied standard with microprocessor controls. The microprocessor controls the following functions: regulation of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, potential free contact for remote general alarm, alarms and operation leds. Upon request any microprocessor can be connected to a BMS system for the remote control and management. The technical department is available to study, together with the customer, different solutions using MO-DBUS; LONWORKS; BACNET or TREND protocols.

ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. The moisture protection degree is IP55. In all CDK units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches (as a protection of pumps and fans), compressors fuses, control circuit automatic breakers, compressor contactors, fan contactors, pump contactors. The terminal board is supplied with voltage free contacts for remote ON-OFF, Summer / winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return water temperature sensor, installed on the return water line from the plant (12°C), antifreeze protection sensor installed on the outlet water temperature (7°C), high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection, plate mechanical flow switch.



	Code	039	045	050	060	070	080	090	110	120	130	152	162	190	210	240	260
Main switch	_	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Flow switch	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Microprocessor control	_	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
LS low noise versions	LS00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Partial heat recovery	RP00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubber vibration dampers	KAVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spring vibration dampers	KAVM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydraulic kit A1ZZ with tank and one pump.	A1ZZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydraulic kit A1NT with one pump without tank.	A1NT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydraulic kit A2ZZ with tank and two pump.	A2ZZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydraulic kit A0NP without tank and pump.	A0NP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Low ambient condensing pressure control by modulating damper (-20°C)	DCCF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Evaporator antifreeze heater	RAEV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Antifreeze kit (only for A version)	RAES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manometers	MAML	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Condensing coil protection mesh with metallic filter	FAMM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oversized condenser fan motors	FOSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remote control panel	PCRL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serial interface card RS485	INSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horizontal air discharge	HORI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Condensate discharge drip tray with antifreeze heater	BRCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[•] Standard, o Optional, - Not available.

HEAT PUMPS VERSIONS (HP)

The heat pump versions are provided with a 4 way reverse cycle valve and are suitable to produce hot water up to a temperature of 45-50°C. They are always supplied with liquid receiver and a second thermostatic valve to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor is set for automatic defrost (in case of operation in severe ambient conditions) and for summer/winter change over.

FREE COOLING VERSION FC

The Free Cooling is a system designed to grant important energy savings in case the unit has to work the whole year.

These applications are required, for example, in computers of telephone rooms. The Free Cooling uses the external low temperature to cool the water in the system. In favorable conditions the Free Cooling can grant the correct refrigerant capacity even without the operation of the compressors, granting an important energy saving.

The Free Cooling system is composed by the following components:

Thermal exchange coil:

It's basically an air to water heat exchanger built in copper pipes and aluminium fins.It's supplied with shut-off valves.

Microprocessor control:

It's the "heart" of the system; It permits the control of all the parameters allowing the best performance of the system in different conditions.

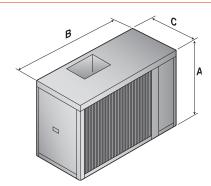
3 way valve:

It's a ON/OFF 3 way valve which gives power to the Free Cooling system according to the signals arriving from the microprocessor.

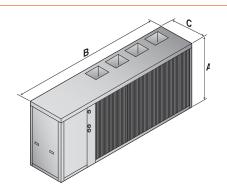
Low ambient pressure control:

It's a device which controls the condensing pressure of the refrigerant circuit in low external conditions.

This device is composed by the solenoid valve which intercept some refrigerant circuits in the condensing coil. In this way the thermal exchange is reduced and a certain condensing pressure is mantained.



Mod.	A (mm)	B (mm)	C (mm)	Kg
039/039A	1270	1870	850	580/900
045/045A	1270	1870	850	600/920
050/050A	1566	2608	1105	720/1040
060/060A	1566	2608	1105	736/1056
070/070A	1566	2608	1105	770/1090
080/080A	1566	2608	1105	820/1140
090/090A	1566	3608	1105	1110/1630
110/110A	1566	3608	1105	1190/1710
120/120A	1566	3608	1105	1240/1760



Mod.	A (mm)	B (mm)	C (mm)	Kg
130/130A	1566	3608	1105	1270/1790
152/152A	1966	3608	1105	1640/2160
162/162A	1966	3608	1105	1700/2220
190/190A	1966	4708	1105	2070/2690
210/210A	1966	4708	1105	2180/2800
240/240A	1966	4708	1105	2290/2910
260/260A	1966	4708	1105	2590/3210