

CDA

Air to water chillers and heat pumps



R410A



CDA water chillers and heat pumps are efficient, low-noise products designed for medium to large applications.

They are suitable for generating chilled water at temperatures in the region of 7°C, commonly used in applications with fan coils and/or air handling units.

The use of tandem scroll compressors and the centrifugal fans results in high efficiencies (especially at part loads) low noise levels, making them suitable for use in indoor applications. Differing versions and a wide range of accessories, enable the optimal solution to be selected.

VERSIONS

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

ACCESSORIES

- A1ZZ: Hydraulic kit with: pump, expansion valve, safety valve, flow switch, insulated tank
- A2ZZ: Hydraulic kit with tank and two pump
- DCCI: Low ambient inverter condensing pressure control
- FAMM: Coil protection mesh with metallic filter
- KAVG: Rubber anti-vibration mountings
- KAVM: Spring anti-vibration mountings
- LS00: Low noise version
- MAML: Refrigerant circuit pressure gauges
- PCRL: Remote control panel
- RAES: Antifreeze kit (for unit with hydraulic kit)
- RAEV: Evaporator antifreeze heater (Basic version only)
- RP00: Partial heat recovery

Versions CDA ÷ CDA/HP		039	045	050	060	070	080	090	110
Cooling capacity EN14511 ⁽¹⁾	kW	40,2	45,3	54,6	60,9	67,6	79,3	90,1	99,4
Compressor input EN14511 ⁽¹⁾	kW	15,2	17,1	21,3	22,9	24,7	28,9	33,7	36,9
E.E.R. EN14511 ⁽¹⁾	W/W	2,6	2,6	2,6	2,6	2,7	2,7	2,7	2,7
Heating capacity EN14511 ⁽²⁾	kW	44,0	48,9	58,5	67,9	77,2	87,8	104,7	113,7
Compressor input EN14511 ⁽²⁾	kW	12,0	13,2	16,7	17,4	19,1	22,3	26,6	29,4
C.O.P. EN14511 ⁽²⁾	W/W	3,7	3,7	3,5	3,9	4,0	3,9	3,9	3,8
Heating capacity EN14511 ⁽³⁾	kW	43,2	48,0	57,4	66,0	75,0	85,6	101,7	110,7
Compressor input EN14511 ⁽³⁾	kW	14,3	15,9	20,0	21,0	23,1	26,5	31,4	35,0
C.O.P. EN14511 ⁽³⁾	W/W	3,0	3,0	2,9	3,1	3,3	3,2	3,2	3,2
Power supply	V/Ph/Hz	400/3/50							
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	1x2,2	1x2,2	1x4	2x1,5	2x1,5	2x1,5	3x1,5	3x1,5
Airflow / Av. static pressure	m³/h / Pa	10800/50	10800/50	13000/50	19000/50	18000/50	18000/50	30000/50	30000/50
Sound power level ⁽⁴⁾	dB(A)	86	86	89	89	89	89	92	92
Sound pressure level ⁽⁵⁾	dB(A)	58	58	61	61	61	61	64	64
Water pump input power	kW	1,3	1,3	1,5	1,5	1,5	1,5	1,5	1,9
Pump available static pressure	kPa	174	158	198	189	171	162	140	145
Water tank volume	l	180	180	300	300	300	300	500	500

Versions CDA ÷ CDA/HP		120	130	152	162	190	210	240	260
Cooling capacity EN14511 ⁽¹⁾	kW	112,9	124,6	150,0	166,8	184,9	202,0	232,6	260,6
Compressor input EN14511 ⁽¹⁾	kW	41,0	46,7	55,0	60,0	73,3	84,3	88,8	96,0
E.E.R. EN14511 ⁽¹⁾	W/W	2,8	2,7	2,7	2,8	2,5	2,4	2,6	2,7
Heating capacity EN14511 ⁽²⁾	kW	128,4	139,6	162,8	176,6	195,7	210,3	252,1	272,5
Compressor input EN14511 ⁽²⁾	kW	32,5	35,5	44,0	48,0	56,0	61,0	68,0	75,0
C.O.P. EN14511 ⁽²⁾	W/W	4,0	3,9	3,7	3,7	3,5	3,4	3,7	3,6
Heating capacity EN14511 ⁽³⁾	kW	125,3	136,6	159,0	173,3	190,7	205,9	246,3	267,6
Compressor input EN14511 ⁽³⁾	kW	38,5	42,5	52,0	57,0	65,0	72,0	81,0	89,0
C.O.P. EN14511 ⁽³⁾	W/W	3,3	3,1	3,1	3,0	2,9	2,9	3,0	3,0
Power supply	V/Ph/Hz	400/3/50							
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2	4/2
Fans	n°x kW	3x1,5	3x1,5	2x4	2x4	4x3	4x3	4x3	4x3
Airflow / Av. static pressure	m³/h / Pa	30000/50	30000/50	36000/50	36000/50	60000/50	60000/50	60000/50	60000/50
Sound power level ⁽⁴⁾	dB(A)	92	92	94	94	96	96	96	96
Sound pressure level ⁽⁵⁾	dB(A)	64	64	66	66	68	68	68	68
Water pump input power	kW	1,9	1,9	2,2	2,2	3,0	3,0	4,0	4,0
Pump available static pressure	kPa	133	124	110	98	164	148	175	147
Water tank volume	l	500	500	500	500	600	600	600	600

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

⁽²⁾ Heating: condenser water temperature in/out 30/35 °C, ambient air temperature 7°C DB, 6°C WB.

⁽³⁾ Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

⁽⁴⁾ Sound power level in accordance with ISO 9614.

⁽⁵⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 in accordance with ISO 9614.

CDA

CDA

Version CDA/FC		039	045	050	060	070	080	090	110
Cooling capacity EN14511 ⁽¹⁾	kW	--	--	--	60,4	66,8	78,9	89,3	99,0
Compressor input EN14511 ⁽¹⁾	kW	--	--	--	22,8	24,6	28,6	33,3	36,1
E.E.R. EN14511 ⁽¹⁾	W/W	--	--	--	2,6	2,7	2,8	2,7	2,7
Free cooling capacity ⁽⁵⁾	kW	--	--	--	51,6	51,3	53,0	78,7	78,9
Compressors input EN14511 ⁽⁵⁾	kW	--	--	--	3	3	3	4,5	4,5
Water flow ⁽⁵⁾	m³/h	--	--	--	11,0	12,1	14,3	16,2	18,0
Power supply	V/Ph/Hz	400/3/50							
Compressors / Circuits	n°	--	--	--	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	--	--	--	2x1,5	2x1,5	2x1,5	3x1,5	3x1,5
Total airflow	m³/h / Pa	--	--	--	19000/50	18000/50	18000/50	30000/50	30000/50
Sound power level ⁽³⁾	dB(A)	--	--	--	89	89	89	92	92
Sound pression level ⁽⁴⁾	dB(A)	--	--	--	61	61	61	64	64
Water pump input power	kW	--	--	--	1,5	2,3	2,3	2,2	2,2
Pump available static pressure	kPa	--	--	--	129	159	137	140	127
Water tank volume	l	--	--	--	300	300	300	500	500

Version CDA/FC		120	130	152	162	190	210	240	260
Cooling capacity EN14511 ⁽¹⁾	kW	113,0	125,1	148,1	164,6	187,7	205,5	228,0	255,7
Compressor input EN14511 ⁽¹⁾	kW	39,9	45,3	54,8	59,8	70,9	81,1	89,6	97,0
E.E.R. EN14511 ⁽¹⁾	W/W	2,8	2,8	2,7	2,8	2,6	2,5	2,5	2,6
Free cooling capacity ⁽⁵⁾	kW	81,6	83,5	104,5	106,6	150,6	153,9	157,2	160,7
Compressors input EN14511 ⁽⁵⁾	kW	4,5	4,5	8	8	12	12	12	12
Water flow ⁽⁵⁾	m³/h	20,5	22,7	26,9	29,9	34,1	37,4	41,4	46,4
Power supply	V/Ph/Hz	400/3/50							
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2	4/2
Fans	n°x kW	3x1,5	3x1,5	2x4	2x4	4x3	4x3	4x3	4x3
Total airflow	m³/h / Pa	30000/50	30000/50	36000/50	36000/50	60000/50	60000/50	60000/50	60000/50
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 input power	kW	3,0	3,0	3,0	3,0	4,0	4,0	5,5	5,5
Pump available static pressure	kPa	156	142	103	80	172	146	129	97
Water tank volume	l	500	500	500	500	600	600	600	600

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C glycol 20%.

⁽³⁾ Sound power level in accordance with ISO 9614.

⁽⁴⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 in accordance with ISO 9614.

⁽⁵⁾ Free Cooling: ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal waterflow, compressors switched off.

FRAME

All CDA units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL 9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. Each refrigerant circuit is totally independent from the other. Failure of one circuit does not influence the other circuit. The refrigerant circuit includes: sight glass, filter drier, reversing valve (for heat pump version only), one way valve (for heat pump version only), liquid receiver (for heat pump version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

Also available is an electronic expansion valve with electronic control which optimises the efficiency in part load conditions (option).

COMPRESSORS

The compressors utilised are scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. They are mounted in a separate compartment within the casing in order to isolate them from the condenser air stream. The crankcase heater is always energised when the compressor is in standby. Access to the compressor compartment is by removal of a front panel and, because they are isolated from the main airstream, maintenance of the compressors is possible whilst the unit is operating.

The compressors used are all in tandem configuration. This results in much higher efficiencies at part loads compared to units with independent refrigerant circuits.

CONDENSERS

The condenser is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the condenser

design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise emission) fans. The condensers can be protected by a metallic filter that is available as an accessory.

FANS

The fans are centrifugal type, double inlet with forward curved blades manufactured from galvanized steel. They are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335. They are fixed to the unit frame via rubber anti-vibration mountings. 4 pole electric motors are used (rotation speed approx 1500 rpm). The fan drive is via pulleys and belts, all motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

EVAPORATORS

The evaporator is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. Models 039 to 162 have a single water side circuit and from size 190 a double circuit "cross flow" type is used. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube evaporator. A further advantage is a reduction in the overall dimensions of the unit. The evaporators are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each evaporator is fitted with a temperature sensor on the discharge water side for antifreeze protection.

MICROPROCESSOR

All CDA units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, volt free contact for remote general alarm, alarms and operation LED's. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The Hidros technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. All CDA units have fitted as standard, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction). The following components are supplied as standard on all units: main switch, thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt 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 building (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 and flow switch.

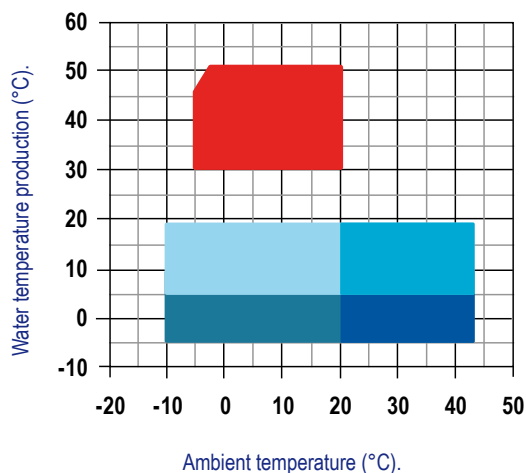
CDA

CDA

	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	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP00	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mounts	KAVG	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Spring anti-vibration mounts	KAVM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A1ZZ with tank and one pump.	A1ZZ	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A1NT with one pump without tank	A1NT	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A2ZZ with tank and two pump	A2ZZ	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hydraulic kit A0NP without tank and pump	A0NP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Inverter condensation control	DCCI	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Antifreeze kit (only for A version)	RAES	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Oversized condenser fan motors	FOSP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Horizontal air discharge	HORI	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.

OPERATION LIMITS



- Heating mode
- Cooling mode with cond. press. contr.
- Cooling mode without cond. press. contr.
- Cooling mode with cond. press. contr. and glycol
- Cooling mode without cond. press. contr. and glycol

HEAT PUMP VERSIONS (HP)

The heat pump versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 48°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor controls defrost automatically (when operating in low ambient conditions) and also the summer/winter change over.

FREE COOLING VERSION FC

If there is a requirement for the chiller to operate all year round it is possible to generate the chilled water by free cooling. The free cooling version has an extra coil through which the system water is passed if the ambient temperature is low enough to remove energy from it. This is especially useful with modern, low energy cooling systems such as high temperature fan coils, chilled beams or ceilings. If the return water temperature is, for example, 16°C, and the flow required is 12°C then it can be seen that if the ambient is below 16°C some of the cooling can be performed by free co-

oling. If the ambient is below 12°C most, if not all, of the cooling can be provided by free cooling. This process makes substantial energy savings and results in correctly designed water systems being among the most energy efficient available.

Free Cooling versions comprise the following components:

Thermal exchange coil:

An air to water heat exchanger manufactured from copper tubes with aluminium fins. It is supplied with shut-off valves.

Microprocessor control:

The "heart" of the system; By measurement of all the critical parameters, the controller ensures that the unit operates at maximum efficiency under all conditions.

3 way valve:

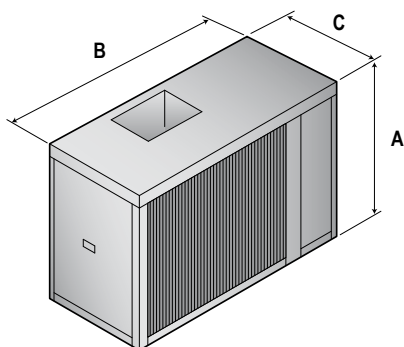
This is an ON/OFF 3 way valve which either passes the water into the free cooling coil or sends it directly to the plate exchanger.

Low ambient pressure control:

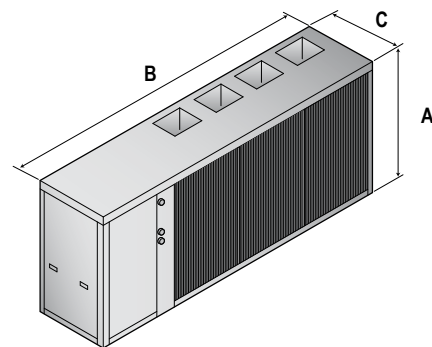
Control of the condensing pressure of the refrigerant circuit in low external conditions

is provided by this device. If free cooling is in operation, the fans must run at full speed for maximum effect. If there is insufficient duty from free cooling then the chiller circuit must also run but with the fans at full speed. This is likely to result in a low condensing pressure as the exchanger capacity is too large.

The control therefore consists of several solenoid valves that can partialise the condenser coil into 1/3rd, 2/3rd's or full coil. This enables the heat transfer surface area to be reduced thereby maintaining the correct condensing pressure.



Mod.	A (mm)	B (mm)	C (mm)	Kg
039/039A	1270	1870	850	580/900
045/045A	1270	1870	850	600/920
050/050A	1270	1870	850	610/930
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