



# Water chillers Heat pumps

High **energy efficiency**  
Compact and **quiet**  
Scroll compressors  
High efficiency **brazed plate** heat exchangers  
CIAT self-adjusting electronic control



Cooling capacity: 190 to 640 kW  
Heating capacity: 190 to 500 kW



Cooling only



Heat pump



Hydraulic module



Partial and total heat recovery



HFC R410A



## USE

The latest generation of **AQUACIATPOWER** air-to-water heat pumps and water chillers offers an optimal solution for all cooling or heating applications used for the Office, Healthcare, Industry, Administration, Retail and collective housing sectors.

These units are designed for outdoor installation and require no special protection against adverse weather conditions.

The range has been optimised to use ozone-friendly **HFC R410A** refrigerant. The use of this refrigerant guarantees compliance with the most demanding requirements for environmental protection and increased seasonal energy efficiency (ESEER).

## RANGE

### **AQUACIATpower LD series**

Cooling only version without hydraulic system.

### **AQUACIATpower LDC - LDH series**

Cooling only version with hydraulic system (circulation pump only or pump and buffer tank).

### **AQUACIATpower ILD series**

Reversible heat pumps without hydraulic system.

### **AQUACIATpower ILDC - ILDH series**

Reversible heat pump version with hydraulic system (circulation pump only or pump and buffer tank).



### DESCRIPTION

The **AQUACIAT<sup>power</sup>** units are packaged machines supplied as standard with the following components:

- hermetic SCROLL compressors
- water-cooled evaporator or hot water condenser with brazed plates
- air-cooled exchanger with axial fan motor assembly
- Electrical power and remote control cabinet:
  - general electrical power supply 400V-3ph-50Hz (+10% / -10%) + earth
  - transformer fitted as standard on the machine for supplying the remote control circuit with 230V-1ph-50Hz (+10% / -10%)
- CIAT CONNECT 2 electronic control module
- casing for outdoor installation

The entire **AQUACIAT<sup>power</sup>** range conforms to standards EN 60-204 and EN 378-2 and the following European Directives:

- Machinery 2006/42 EC
- EMC 2004/108/EC electromagnetics
- 2006/95/EC low voltage
- Pressure equipment directive 97/23/EC. category 2 for the cooling only series  
category 3 for the heat pump series

### NOMENCLATURE

<b>ILD</b>	>	heat pump version	<b>H</b>	>	hydraulic with pump and buffer tank
<b>LD</b>	>	cooling only version	<b>1800</b>	>	unit size
<b>C</b>	>	hydraulic with pump only	<b>V</b>	>	R410A refrigerant

### CONFIGURATION

<b>STD</b>	>	Standard (ventilation 905 rpm)
<b>STDLN</b>	>	Standard Low Noise (ventilation 715 rpm + acoustic insulation of compressors)
<b>STDXLN</b>	>	Standard Xtra Low Noise (specific ventilation 715 rpm + acoustic insulation of compressors)



**LDC - ILDC 1400V - 1500 V models**



# Water chillers Heat pumps

## DESCRIPTION OF THE MAIN COMPONENTS

### ■ Compressors

- Hermetic SCROLL
- built-in electric motor cooled by suction gases
- motor protected by internal winding thermostat
- placed on anti-vibration mounts

### ■ Evaporator

- brazed plate exchanger
- stainless steel plates (AISI 316)
- plate patterns optimised for high-efficiency
- armaflex thermal insulation

### ■ Condenser

- high efficiency air-cooled exchanger, aluminium fins with optimised profiles and grooved copper, tubes
- condenser or evaporator mode heat exchanger on ILDC-ILDH reversible heat pump versions
- axial fans with profiled blades
- IP 54 class F motors

### ■ Cooling accessories

- dehumidifier filters with rechargeable cartridges
- hygroscopic sight glasses
- solenoid valves on refrigerant lines (reversible heat pump version)
- thermostatic expansion valves heat pump and cooling only versions models 702 to 1100V
- electronic expansion valves (cooling only models 1200V to 2400V)

### ■ Control and safety instruments

- low and high pressure sensors
- safety valves on refrigeration circuit
- water temperature regulation sensors
- evaporator frost protection sensor
- factory-assembled evaporator water flow controller

### ■ Electrics box

- IP 44
- 400V-3Ph-50 Hz power supply + earth (+10% / -10%)
- main safety switch with handle on front
- control circuit transformer
- fan and compressor motor circuit breaker
- fan and compressor motor contactors
- CONNECT 2 microprocessor-controlled electronic control module
- wire numbering
- marking of the main electrical components
- RAL 7035

### ■ CONNECT 2 electronic control module

The CIAT electronic control module performs the following main functions:

- regulation of the chilled or hot water temperature
- regulation of the water temperature based on the outdoor temperature (water law)
- regulation for low temperature energy storage
- second setpoint management

- complete management of compressors with start-up sequence, timer and runtime balancing
- self-adjusting and proactive functions with adjustment of settings on drift control
- series stage system on compressors lowers power according to cooling and heating demands
- management of compressor short-cycle protection
- management of the machine operation limit according to outdoor temperature
- automatic switching between hot and cold according to outside temperature
- diagnosis of operation and fault states
- management of a fault memory allowing a log of the last 20 incidents to be accessed, with an operational reading taken when the fault occurs
- master/slave management of the two machines in parallel with balancing of the running times and automatic changeover if a fault occurs on one machine
- machine timer programming
- display and access to the operating parameters via a multilingual LCD screen with 4 lines of 24 characters

### ■ Remote control

CONNECT 2 is equipped as standard with an RS485 serial port offering a range of remote management, monitoring and diagnostic options via the communication bus.

Several contacts are available as standard which enable the **AQUACIAT<sup>POWER</sup>** to be controlled remotely by cabled link:

- automatic operation control: when this contact is open, the machine stops
- setpoint 1/setpoint 2 selection: when this contact is closed, a second cold setpoint is activated (energy storage mode, for example)
- HEATING/COOLING mode selection: this input switches from one operating mode to another.

Contact closed = HEATING mode

Contact open = COOLING mode

- setpoint adjustable by 4-20 mA signal: this input allows the setpoint to be adjusted in HEATING or COOLING mode
- compressor load shedding: closing the contact or contacts concerned allows the power or cooling consumption of the machine to be limited by stopping one or more compressors
- water pump 1 and 2 control: these outputs control the contact switches for one or two water pumps
- fault reporting: this contact indicates the presence of a major fault which has caused one or both cooling circuits to stop

### ■ Power control

Series stage output control system on the compressors

### ■ Frame

Frame made from RAL 7024 and RAL 7035 painted panels

### VERSION WITH HYDRAULIC PACK

#### LDC - LDH - ILDC - ILDH series

#### The All-in-One solution

#### The PLUG & COOL solution offered by AQUACIAT<sup>power</sup> LDC - LDH - ILDC - ILDH

The hydraulic module contains all the water circuit components needed for the system to operate correctly:

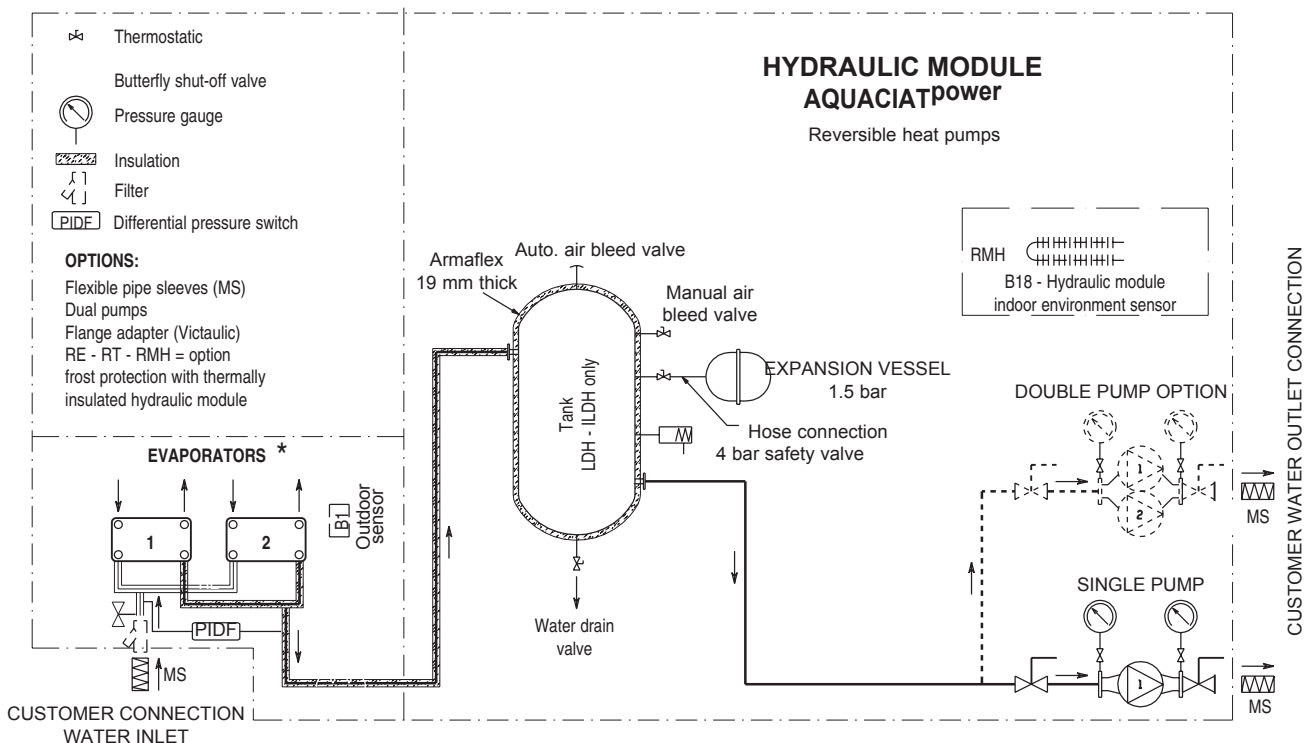
- Insulated buffer tank (LDH - ILDH only)
  - . 500 litres for models 702V to 1100V
  - . 950 litres for models 1200V to 2400V
- Expansion vessel:
  - . 35 litres for (I)LD(H-C) 702V to 1100V
  - . 50 litres for (I)LDC 1200V to 2400V
  - . 80 litres for (I)LDH 1200V to 2400V
- Water filter
- Wide selection of single and dual pumps for your system's flow and pressure requirements (1).
- Gauges with shut-off valves;
- 4 bar safety valve.
- Drain circuit.
- Manual and automatic air bleed valve.
- System regulation.
- Frost protection (option).

The components in the hydraulic system are carefully selected and factory assembled and tested to make the installation of the units simple and economical.

Preparation times, implementation times and space requirements are thus kept to a minimum.

(1) Our pumps are designed to operate on closed water loops (low NPSH). Please consult us for other applications (open water loop, high NPSH).

#### ■ LDH - ILDH series hydraulic module



\* 1 dual refrigerating circuit evaporator for cooling only versions



# Water chillers Heat pumps

## TECHNICAL SPECIFICATIONS - COOLING ONLY



AQUACIAT <sup>Power</sup> LD - LDC - LDH			702V	800V	900V	1000V	1100V
<b>Standard version</b>	Net cooling capacity (1)	kW	188	210	245	268	289
	Net power input (1) (2)	kW	61.5	71.2	82.8	91.9	102.7
	net EER/ESEER		3,07/ 4,08	2,95/ 4,04	2,96/ 4,05	2,92/ 4,04	2,82/ 4
	Lw / Lp (3)	dB(A)	91/59	92/60	92/60	92/60	93/61
<b>Xtra Low Noise Version</b>	Net cooling capacity (1)	kW	185	206	239	261	281
	Net power input (1) (2)	kW	60,5	70,7	83,5	93,1	104,4
	net EER/ESEER		3,06/ 4,15	2,92/ 4,11	2,87/ 4,11	2,81/ 4,09	2,7/ 4,04
	Lw / Lp Low Noise (3)	dB(A)	84/52	84/52	84/52	84/52	84/52
	Lw / Lp Xtra Low Noise (3)	dB(A)	81/49	81/49	81/49	81/49	81/49
<b>Refrigeration circuit</b>	Refrigerant (GWP)		R410A (2088)				
	Quantity		2				
	Refrigerant circuit 1	kg	20	20	23	25	25
	Refrigerant circuit 2	kg	20	20	23	25	26
<b>Compressor</b>	Type		HERMETIC SCROLL				
	Quantity		4				
	Rotation speed	rpm	2900				
	Power control	%	100-78-71-57-50-43-28-21-0	100-81-69-62.5-50-37.5-31-19-0	100-83-66-55-33-16-0	100-80-70-60-50-40-30-20-0	100-77-73-54-50-45-27-23-0
	Type of oil for R410A		POLYOLESTER POE 3MAF				
	Oil capacity circuit 1	litres	3.4 + 4.7	3.4 + 6.8	3.4 + 6.3	4.7 + 6.3	6.8 + 6.3
	Oil capacity circuit 2	litres	3.4 + 4.7	3.4 + 6.8	3.4 + 6.3	4.7 + 6.3	6.8 + 6.3
<b>Evaporator</b>	Type		BRAZED PLATES				
	Quantity		1				
	Water capacity	litres	20.30	20.30	23.00	29.30	29.30
	Hydraulic connection		VICTAULIC DN 100				
	Max. pressure. water end	bar	10 bar (LOD)/4 bar (LDC-LDH)				
	Min/max water flow	m <sup>3</sup> /h	22/70	22/70	26/81	33/105	33/105
<b>Air-cooled condenser</b>	Fans		DIRECT-DRIVE AXIAL- DIAMETER 800 mm				
	Number of fans		4				
	Rotation speed	rpm	HIGH PERFORMANCE 905 rpm VERSION				
	Air flow	m <sup>3</sup> /h	84000		80800		
	Motor output power	kW	1.64				
	Rotation speed	tr/mn	LOW NOISE - XTRA LOW NOISE 715 rpm VERSION				
	Air flow	m <sup>3</sup> /h	68800		64800		
	Motor output power	kW	1.13				
<b>Dimensions</b>	Length versions LD-LDC	mm	2820				
	Length version LDH	mm	3850				
	Width	mm	2200				
	Height	mm	2260 (XTRA LOW NOISE VERSION: 2450)				
<b>Weight</b>	LD version (empty/in operation)	kg	2330 / 2350	2395 / 2415	2550 / 2570	2730 / 2755	2800 / 2825
	LDC version (empty/in operation)	kg	2515 / 2565	2605 / 2655	2770 / 2820	2960 / 3015	3025 / 3080
	LDH version (empty/in operation)	kg	3060 / 3580	3145 / 3665	3320 / 3840	3505 / 4030	3575 / 4100

(1) Net capacity for chilled water temperature 12°C/7°C and condenser air inlet temperature 35°C-EN14511 EUROVENT conditions

(2) Net power input = compressors + fans

(3) Lw: Overall sound power level, as per ISO standard 3744, at nominal operating conditions EN 14511

Lp: Overall pressure levels measured at 10m in a free field, calculated using the formula LP=Lw-10 log S



# Water chillers Heat pumps

## ELECTRICAL CHARACTERISTICS

### ■ Basic unit (excluding pump)

AQUACIATpower		702V	800V	900V	1000V	1100V
<b>COMPRESSORS (1)</b>						
Maximum rated current	A	135	154	181	192	210
Starting current (3)	A	324	380	431	442	461
Starting current with Soft Start option (3)	A	234	271	307	318	337
<b>FAN MOTORS (1)</b>						
STANDARD VERSION: 905 rpm						
Maximum rated current	A	17,2 (4 x 4,3)				
LOW NOISE - XTRA LOW NOISE 715 rpm VERSIONS						
Maximum rated current	A	8,4 (4 x 2,1)				
<b>LDC FROST PROTECTION (OPTION) (2)</b>						
Evaporator heating element power	W	380				
Maximum rated current	A	1.65				
<b>LDH FROST PROTECTION (OPTION)</b>						
Evaporator heating element power + piping + expansion vessel	W	580				
Maximum rated current	A	2.52				
<b>LDH FROST PROTECTION (OPTION)</b>						
Evaporator heating element power + piping	W	400				
Maximum rated current	A	1.74(2)				
Hydraulic module heating element power	W	1500				
Maximum rated current	A	2.3(1)				
<b>DESUPERHEATER FROST PROTECTION – TOTAL-RECOVERY CONDENSER (OPTION) (2)</b>						
Heat exchanger heating element power	W	200				
Maximum rated current	A	0.81				
<b>REMOTE CONTROL AUXILIARY CIRCUIT (2)</b>						
Maximum rated current	A	4				
Transformer power	VA	1000				
Machine protection rating		IP 44				

AQUACIATpower		1200V	1400V	1500V	1600V	1650V	1800V	2000V	2100V	2400V		
<b>COMPRESSORS (1)</b>												
Maximum rated current	A	237	266	275	295	315	356	369	399	443		
Starting current (3)	A	488	586	501	615	566	607	689	720	763		
Starting current with Soft Start option (3)	A	364	429	392	458	442	483	532	562	562		
<b>FAN MOTORS (1)</b>												
STANDARD VERSION: 905 rpm												
Maximum rated current	A	20.4 (6 x 3.4)				27.2 (8 x 3.4)			34 (10 x 3.4)			
LOW NOISE - XTRA LOW NOISE 715 rpm VERSIONS												
Maximum rated current	A	12.6 (6 x 2.1)				16.8 (8 x 2.1)			21 (10 x 2.1)			
<b>LD FROST PROTECTION (OPTION) (2)</b>												
Evaporator heating element power	W	240										
Maximum rated current	A	1.05										
<b>LDC FROST PROTECTION (OPTION) (2)</b>												
Evaporator heating element power + piping + expansion vessel	W	480										
Maximum rated current	A	2.1										
<b>LDH FROST PROTECTION (OPTION)</b>												
Evaporator heating element power + piping	W	360										
Maximum rated current	A	1.6 (2)										
Hydraulic module heating element power	W	1500										
Maximum rated current	A	2,3 (1)										
<b>DESUPERHEATER FROST PROTECTION – TOTAL-RECOVERY CONDENSER (OPTION) (2)</b>												
Heat exchanger heating element power	W	240										
Maximum rated current	A	1.05										
<b>REMOTE CONTROL AUXILIARY CIRCUIT (2)</b>												
Maximum rated current	A	4					5					
Transformer power	VA	1600					2000					
Machine protection rating		IP 44										



# Water chillers Heat pumps

## COOLING CAPACITIES



### COOLING ONLY units

AQUACIAT POWER

LD LDC LDH	Evaporator water outlet temperature °C	CONDENSER AIR INLET TEMPERATURE (°C)												
		25		30		35		40		44		48		
		Pf kW	Pa kW	Pf kW	Pa kW	Pf kW	Pa kW	Pf kW	Pa kW	Pf kW	Pa kW	Pf kW	Pa kW	
<b>702V</b>	Glycol water necessary	-12	100	44.8	94	48.7	87	53.1	81	58.4	74	63		
		-10	108	45.3	101	49.2	95	53.7	88	58.9	82	63.6		
		-8	117	45.9	110	49.8	103	54.3	96	59.5	90.7	64.34	83	69.4
		-4	137	47.2	129	51.1	121	55.6	113	60.8	106	65.4	99	70.6
		0	162	48.8	153	52.8	145	57.4	136	62.6	128	67.2	120	72.3
	Pure water	2	174	49.5	165	53.7	155	58.3	145	63.5	137	68	129	73
		5	198	51	188	55.2	177	59.9	166	65.2	157	69.8	148	74.9
		7	211	51.8	200	56.1	189	60.9	177	66.1	168	70.7	158	75.7
		12	245	53.8	232	58.3	219	63.2	206	68.6	195	73.2	185	78.1
		15	266	55.1	253	59.8	239	64.8	225	70.2	213	74.8	202	79.7
<b>800V</b>	Glycol water necessary	-12	113	51.25	107	55.8	100	61.1	93	67	85	72.09		
		-10	123	51.9	116	56.6	109	61.8	101	67.8	94	72.9		
		-8	133	52.6	126	57.3	118	62.6	110	68.5	103	73.7	94	79.2
		-4	154	54.2	146	58.9	137	64.2	128	70.1	121	75.3	113	80.9
		0	182	56.2	173	61.1	164	66.5	153	72.4	144	77.6	136	83
	Pure water	2	195	57.1	185	62	175	67.4	164	73.3	154	78.6	145	84
		5	221	58.9	210	64	198	69.4	186	75.28	176	80.5	166	85.9
		7	235	59.9	223	64.9	211	70.5	198	76.4	187	81.5	176	86.9
		12	272	62.4	258	67.7	243	73.5	229	79.3	217	84.3	205	89.6
		15	296	64	281	69.4	265	75.1	249	81.1	236	86.1	224	91.3
<b>900V</b>	Glycol water necessary	-12	133	59.2	126	65	118	71.6	109	78.9	100	85.1		
		-10	144	59.9	135	65.8	127	72.3	119	79.6	110	85.8		
		-8	156	60.8	147	66.5	138	73	129	80.4	121	86.6	111	93.1
		-4	180	62.5	171	68.3	161	74.7	150	81.9	142	88.2	133	94.9
		0	214	65	202	70.8	191	77.2	179	84.3	170	90.5	160	97.1
	Pure water	2	228	66.1	216	71.9	204	78.3	192	85.4	182	91.5	171	98.1
		5	259	68.4	245	74.3	232	80.8	218	87.8	206	93.9	194	100.4
		7	275	69.6	261	75.6	246	82	231	89.1	219	95.2	207	101.6
		12	318	72.9	301.9	79.22	285	85.7	268	92.8	254	98.9	240	105.2
		15	346	75.1	328	81.4	310	88.1	291	95.3	276	101.4	262	107.4
<b>1000V</b>	Glycol water necessary	-12	142	65	134	71.4	126	78.5	116	86.4	107	93		
		-10	154	66	145	72.2	137	79.3	127	87.5	118	94.1		
		-8	167	66.8	157	73.1	148	80.2	138	88.2	130	95.2	120	102.4
		-4	195	68.9	184	75.2	173	82.2	162	90.2	153	97.2	143	104.7
		0	232	71.7	220	78.1	207	85.2	194	93.1	183	99.9	172	107.5
	Pure water	2	249	73	235	79.4	221	86.5	207	94.5	196	101.4	185	108.8
		5	284	75.9	268	82.3	253	89.5	236	97.5	224	104.4	211	111.7
		7	302	77.3	286	83.9	269	91.2	252	99.1	238	106.2	225	113.3
		12	350	81.4	331	88.1	312	95.6	293	103.7	278	110.5	263	117.7
		15	380	84.2	360	91	340	98.5	319	106.6	303	113.5	288	120.5
<b>1100V</b>	Glycol water necessary	-12	157	72.2	148	79.4	140	87.3	129	95.9	119	103.1		
		-10	170	73.3	161	80.4	151	88.3	141	96.9	131	104.2		
		-8	184	74.4	174	81.5	164	89.3	153	98.1	143	105.5	132	113.27
		-4	213	76.8	202	83.9	190	91.8	178	100.5	168	108.2	157	115.7
		0	253	80	239	87.1	225	95.09	210	103.6	198	111.2	187	118.8
	Pure water	2	270	81.5	255	88.6	240	96.6	225	105.2	212	112.5	200	120
		5	306	84.6	290	91.9	273	100	256	108.6	242	115.9	228	123.5
		7	325	86.3	308	93.7	290	101.8	272	110.4	257	117.7	243	125.2
		12	375	90.9	355	98.4	335	106.6	315	115.3	298	122.4	283	129.8
		15	407	94	386	101.6	364	109.8	342	118.4	325	125.5	308	132.8

Cc: Acceptable gross cooling capacity for temperature difference, based on operating limits  
Pi : Gross power input of compressors and fans

Low temperature option necessary  
Basic standard condition