CIAT Water chillers

AQUACIAT 2

High energy efficiency with
R410A
Compact and quiet
Scroll compressors
Brazed plate heat exchangers
Self adjusting electronic control system

Cooling capacity: 20 to 290 kW
Heating capacity: 20 to 285 kW

Cooling or heating | **Hydraulic pack** | **Heat recovery**

EUROVENT CERTIFIED PERFORMANCE

ENVIRONMENTALLY FRIENDLY HFC R410A PROTECTION DE L'ENVIRONNEMENT

USE

The **AQUACIAT 2 series LD-LDC-LDH** or **ILD-ILDC-ILDH** water chillers or heaters with air-cooled condensers are medium capacity units particularly adapted for heating and air conditioning applications in the fields of Offices, Healthcare, Industry, Administration, Commercial and Residential buildings.

These standard packaged units are designed for outdoor installation; no particular precautions have to be taken against adverse weather conditions.

An optional XTRAFAN version allows if necessary the possibiliy of mounting an air duct on the fan(s) discharge in the case of air recycling risk or for an acoustic treatment on site.

To operate in COOLING or HEATING mode, these units use outside air as the only external source; this permits the evacuation of heat in summer or the supply of thermal energy for heating in winter.

Connected to a heating or cooling floor, to fan coil units or to an air handling unit, the reversible Aquaciat 2 Series ILD-ILDC-ILDH permits easy heating and air conditioning of buildings.

Each unit is assembled, electrically wired (control and capacity), charged with refrigerant, and tested in factory.

The installation is very simple and the only operations to be carried out on site are the electrical wiring and water connections.

RANGE

AQUACIAT 2 series LD

Cooling only chillers without hydraulic equipment.

AQUACIAT 2 series LDC - LDH

Cooling only chillers with hydraulic equipment, water pump only, or pump and buffer tank.

AQUACIAT 2 series ILD

Reversible air/water cooled models without hydraulic equipment.

AQUACIAT 2 series ILDC - ILDH

Reversible air/water cooled models with hydraulic equipment (circulating water pump only or pump and buffer tank).

AQUACIAT 2

DESCRIPTION

The standard **AQUACIAT 2 series LD-LDC-LDH (cooling only) or series ILD-ILDC-ILDH (reversible)** are delivered with the following components:
- air-cooled condenser with propeller fan motor assembly,
- chilled water evaporator (or hot water condenser on reversible models),
- capacity control system on chilled or hot water,
- starting automatic control, electrical compartment:
  . Power supply : 3~50Hz 400V (+6%/- 10%) + earth
  . Control circuit: 1~50Hz 230V

(transformers are mounted on the unit in the standard version),
- cabinet for outdoor installation.

80 to 300

■ Conformity with the EC European directives

- Machines EC 98 / 37
- Electromagnetic EMC 2004/108/CE
- Under pressure equipment DESP EC 97 / 23:
  - category 2 for LD - LDC - LDH 80V à 1100V
  - category 2 for ILD - ILDC - ILDH 80V à 700V
  - category 3 for ILD - ILDC - ILDH 702V à 1100V
- Low voltage 2006/95/CE

■ Conformity to standards

- EN 60-204 , EN 378-2 (NFC15 - 100 France).

NOMENCLATURE

ILD	>	reversible version	**H**	>	hydraulic version with pump and buffer tank
LD	>	cooling only model	**540**	>	size
C	>	hydraulic version with pump	**V**	>	refrigerant R410A

STANDARD OR OPTIONAL EQUIPMENT

	LD	LDC-LDH	ILD	ILDC - ILDH
	COOLING ONLY		HEAT PUMP	
3-400V 50hz main supply without neutral with transformer	Std	Std	Std	Std
Coil protective grille	Std ➡ 300	Std ➡ 300	Std ➡ 300	Std ➡ 300
Resilient mounts	Std	Std	Std	Std
Main switch	Std	Std	Std	Std
Water flow switch	Std	Std	Std	Std
Additional potential free contacts board	O	O	O	O
Remote control (Remote console)	O	O	O	O
Phases control system (direction, absence, under & over voltage)	O	O	O	O
Progressive soft start	O	O	O	O
Anti-frost protection	O	O	O	O
All year round operation (min. outdoor temp.: -15°C)	Std	Std	Std	Std
Condenser fan speed control (min. outdoor temp.: -20°C)	O	O	O	O
Partial heat recovery -Desuperheater	O	O	O	O
BLYGOLD coil protective coating	O	O	O	O
Polyurethane fin protective coating	O	O	O	O
Water filter - 800 µm	O	Std	O	Std
Water adjustment kit (manifold, control valve, stop valve)	O	O	O	O
Flexible water connections	O	O	O	O
Twin pump	_	O / 180 ➡ 1100	_	O / 180 ➡ 1100
Additional technical compartment (without equipment)	O / 180 ➡ 300	O / 180 ➡ 300	O / 180 ➡ 300	O / 180 ➡ 300
Electric auxiliary heater kit 15 kW	_	_	O / 80 ➡ 150	O / 80 ➡ 150
Electric auxiliary heater module 15 - 30 - 45 kW	_	_	O / 180 ➡ 300	O / 180 ➡ 300
MULTICONNECT several units management	O	O	O	O
Auxiliary external heater management board (4 stages)	_	_	O	O
XTRAFAN air fans system	O / ➡ 700	O / ➡ 700	O / ➡ 700	O / ➡ 700
Low temperature glycol/water reinforced insulation (0 to -12°C)	O / 350 ➡	O / 350 ➡	O / 350 ➡	O / 350 ➡
LONWORKS communication gateaway	O	O	O	O
Handling for container	350 ➡ 1100	350 ➡ 1100	350 ➡ 1100	350 ➡ 1100
Optimised high pressure operation (all-season operation with energy optimisation)	O / 350 ➡ 1100	O / 350 ➡ 1100	_	_
Electronic expansion valve	O / 350 ➡ 1100	O / 350 ➡ 1100	_	_
Total heat recovery	O / 350 ➡ 1100	O / 350 ➡ 1100	_	_

Std: Standard feature O: Optional equipment _: Not available

Note: Some technical specifications not appearing on the above list can however be quoted on request (consult us)

COOLING ONLY - TECHNICAL CHARACTERISTICS

LD - LDC - LDH		350V	400V	500V	540V	600V	700V	702V	800V	900V	1000V	1100V
Cooling capacity ①	kW	92.5	102.6	123.9	135.9	151.1	173.3	189.3	209.9	250.9	270.6	291.5
Power input	kW	30.9	36.1	46.2	47.5	55.8	64.4	60.3	69.7	81.5	89.6	100.2
EER Efficiency ②		2.99	2.84	2.68	2.80	2.71	2.69	3.14	3.01	3.08	3.02	2.91
Seasonal efficiency ESEER		4.16	3.85	3.36	3.90	3.91	3.70	4.24	4.12	4.11	4.08	3.98
Lw / Lp ③ (High Perf. - HP)	dB(A)	89/57	90/58		90/58	91/59		89/57	90/58			
Lw / Lp ③ (Low Noise version - LN)	dB(A)	83/51		85/53				84/52	85/53	84/52		85/53
Lw / Lp ③ (Xtra Low Noise version - XLN)	dB(A)	-	-	-	-	-	-	81/49	82/50	81/49	81/49	83/51
Compressor		Polyolester SCROLL 2900 rpm										
Starting mode		Direct in series										
Quantity		2	2	2	4	4	4	4	4	4	4	4
Capacity control	%	100-57-43-0	100-63-37-0	100-50-0	100-78-72-55-50-45-28-22-0	100-75-50-25-0	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
Refrigerant oil type		Polyolester POE 3MAF (32cst)										
Oil volume	l	8.8	9.8	11.2	14.8	16.6	17.6	17.6	21.8	20.8	22.2	26.2
Refrig. circuit number		1		2								
Refrigerant fluid (GWP)		R410A (1890)										
Refrigerant load	kg	18.5	18	11.8 +11.8	13.0 +13.5	13.2 +13.7	17.8 +17.8	18.0 +18.0	17.0 +17.0	21.0 +21.0	22.0 +22.0	23.0 +23.0
Electric supply	ph/Hz/V	3~50Hz 400V (+6%/-10%) + Earth										
Unit protection index		IP 44										
Circuit control voltage	ph/Hz/V	1~50Hz 230V (+6%/-10%) - transformer mounted										
Evaporator		Brazed plates type exchanger										
Water content	l	8.68	9.88	10.66	12.48	15.42	15.42	15.8	15.8	18	20.4	20.4
Chilled water outlet min. / max.	°C	-12 / +18										
Minimum water flow	m³/h	11.7	13.3	17.3	18.1	20.8	20.8	22.1	24.4	29.3	31.6	34
Maximum water flow	m³/h	30.7	34.6	41.9	45.9	50.7	50.7	63.2	69.5	77	77	77
Water connections	≥	Male G 2"1/4			Flange DN80			Flange DN100				
Maximum pressure (water side)	bar	LD 10 bars / LDC-LDH 4 bars										
Air cooled condenser		Finned heat exchanger										
Fan ≥	mm	800										
Number x Motor rated power High Performance series- HP	nb x kW	2x1.7	2x1.7	2x1.8	2x1.7	2x1.7	2x1.7	4x1.55	4x1.55	4x1.66	4X1.66	4X1.66
Number x Motor rated power Low Noise series - LN	nb x kW	2x1.6	2x1.2	2x1.2	2x1.1	2x1.1	2x1.1	4x1.06	4x1.06	4x1.1	4x1.1	4x1.1
High Perferformance air flow - HP	m³/h	44000	42000	41000	44000	44000	44000	81200		78000		
Low Noise air flow - LN - XLN	m³/h	32000	29000	30500	35000	35000	35000	60000		58400		
Mini water content (ILD-ILDC)	l	220	213	357	164	207	203	213	212	213	290	364
Water tank content H model	l	250						500				
Expansion vessel C & H model	l	18						35				
Standard pump	n°	④										
Height without mounts	mm	2117			2117			2080 (+ 205 XLN)				
Standard series length	mm	2190			2740			3698				
C series length	mm	2190			2740			3698				
H series length	mm	2190			2740			3698				
Depth	mm	2129			2129			2200				
Std range weight without charge	kg	1046	1145	1183	1460	1596	1768	2135	2175	2215	2255	2310
C range weight without charge	kg	1144	1242	1254	1654	1775	1947	2360	2400	2455	2495	2625
H range weight without charge	kg	1207	1306	1318	1718	1838	2010	2510	2550	2605	2645	2745
Storage temperature	°C	+ 50°C										

① Capacities of HIGH PERFORMANCE series based on:EUROVENT conditions (EN 14511)
COOLING mode: +12°C/+7°C and condenser air inlet temperature +35°C
② EER in gross values
③ Total Sound power Lw, total sound pressure at 10 m from the unit, in free field, conformity with ISO 3744 norm
④ According to selection.

ELECTRICAL SPECIFICATIONS

Standard units (pump not included)

		80V	90V	100V	120V	150V	180V	200V	240V	300V	350V
Electrical supply	ph/Hz/V	3~50Hz 400V (+6%/-10%) + Earth									
Control circuit voltage	ph/Hz/V	1~50Hz 230V (+6%/-10%) - transformer mounted									
Starting current without pump	A	95	111	118	135	198	130	143	149	230	256
Starting current SOFT START option	A	57	66	70	81	118	83	90	104	146	163
Circuit breaker (Neutral condition TN-TT)	kA	15				10		15		10	
Maxi wires section	mm²	10				35		70			95
Maxi rated current ①	A	16.8	17.8	22.7	24.8	30.9	33.0	43.4	49.6	60.0	72.0

		400V	500V	540V	600V	700V	702V	800V	900V	1000V	1100V
Electrical supply	ph/Hz/V	3~50Hz 400V (+6%/-10%) + Earth									
Control circuit voltage	ph/Hz/V	1~50Hz 230V (+6%/-10%) - transformer mounted									
Starting current without pump	A	303	320	276	286	325	333	388	440	457	474
Starting current SOFT START option	A	191	209	192	202	237	243	279	317	333	350
Circuit breaker (Neutral condition TN-TT)	kA	10	35	10			50				
Maxi wires section	mm²	95					150				
Maxi rated current ①	A	82.0	104.0	110.0	120.0	138	144	161	190	207	224

① Pump rated current not included

Hydraulic pumps (C and H models)

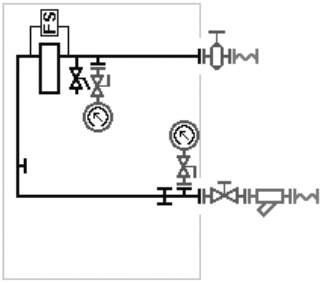
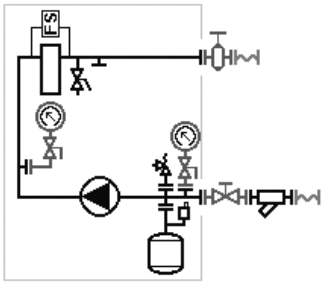
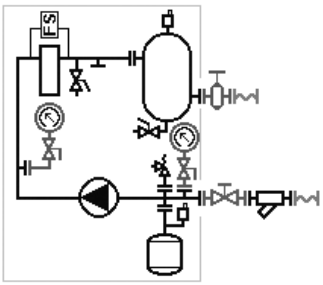
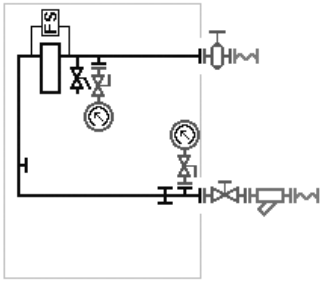
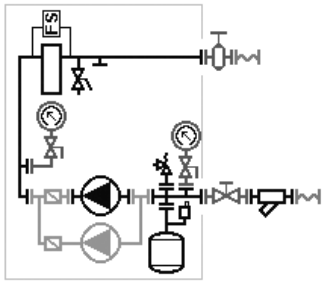
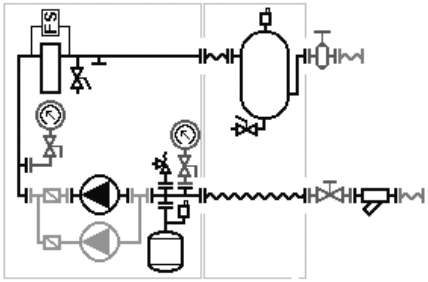
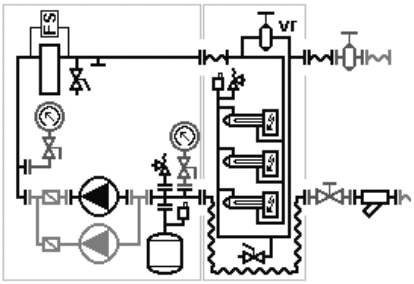
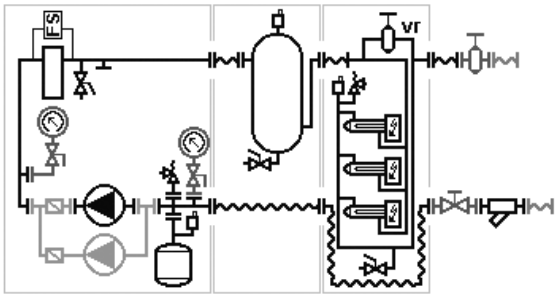
SINGLE PUMP														
Pump type	**n°**	44	45	40	41	42	43	117	118	119	102	103	105	107
Mini flow	**m³/h**	1.0	1.9	5.0	6.0	7.0	8.0	15.0	15.0	15.0	20.0	20.0	20.0	20.0
Maxi pressure	**mCE**	20.6	20.9	17.5	21.5	22.0	24.5	15.5	26.0	39.0	14.5	18.0	26.0	33.0
Maxi flow	**m³/h**	8.0	13.0	19.0	22.5	30.0	30.0	50.0	50.0	50.0	70.0	86.0	74.0	74.0
Mini pressure	**mCE**	7.3	9.7	8.5	8.0	10.0	14.0	10.0	21.0	31.0	8.0	10.0	19.5	27.0
Main supply	**V**	3ph~50Hz 400V (+6%/-10%) + Earth												
Rated output	**kW**	0.55	0.75	0.75	1.1	1.5	1.85	2.2	4.0	7.5	3.0	4.0	5.5	7.5
Maxi rated current	**A**	1.7	2.1	1.85	2.67	3.9	4.61	4.5	7.8	13.8	6.3	8.0	10.3	13.8

TWIN PUMP											
Pump type	**n°**	2 x 40	2 x 41	2 x 42	2 x 43	217	218	219	202	203	205	207
Mini flow	**m³/h**	5.0	6.0	7.0	8.0	15.0	15.0	15.0	20.0	20.0	20.0	20.0
Maxi pressure	**mCE**	17.5	21.5	22.0	24.5	15.5	26.0	39.0	14.5	18.0	26.0	33.0
Maxi flow	**m³/h**	19.0	22.5	30.0	30.0	50.0	50.0	50.0	70.0	86.0	74.0	74.0
Mini pressure	**mCE**	8.5	8.0	10.0	14.0	10.0	21.0	31.0	8.0	10.0	19.5	27.0
Main supply	**V**	3ph~50Hz 400V (+6%/-10%) + Earth										
Rated output	**kW**	0.75	1.1	1.5	1.85	2.2	4.0	7.5	3.0	4.0	5.5	7.5
Maxi rated current	**A**	1.85	2.67	3.9	4.61	4.5	7.8	13.8	6.3	8.0	10.3	13.8

HYDRAULIC FEATURES

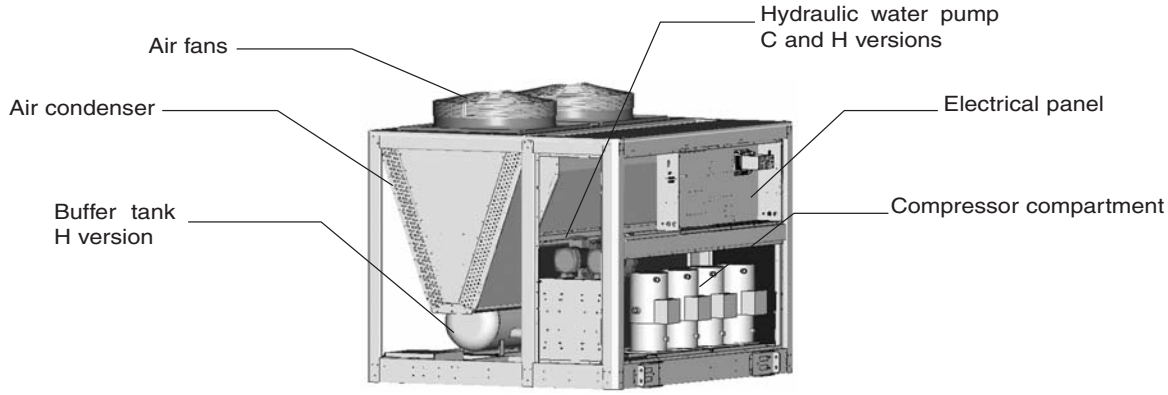
Aquaciat 2 range, heat pumps or chillers for only cooling mode are available in 3 types:

- ∅ standard machines **LD-ILD** without hydraulic equipment,
- ∅ **LDC-ILC** models with single or twin water pump,
- ∅ **LDH-ILH** hydraulic models equipped with single or twin water pump and water tank.

MODELS 80 - 300	"Standard" Version LD - ILD	"C" Version LDC - ILDC	"H" Version LDH - ILDH
80 to 150			
180 to 300		 With one or two single internal pumps (Nos. 40-41)	 With one or two single internal pumps (Nos. 40-41)
		 With ME electric module and one or two single internal pumps (Nos. 40-41)	 With ME electric module and one or two single internal pumps (Nos. 40-41)

Control functions or safety devices

- Water flow control
- Thermostatic expansion valve
- High and low refrigerant pressure safety devices
- Safety relief valves on refrigerant circuit
- Temperature sensors and pressure transducers
- Chilled water flow switch mounted
- Unit starting sequence,



Electrical box

The electrical box is fully wired and contains all the electric components and the control process unit (CPU) board. It controls all the functions of the machine and allows operation monitoring, adjustment of the water temperature settings, or the interface with an external managing system.

The electrical box includes:

- Power and control circuit
- Wiring numbering
- Main safety circuit breaker on front panel with handle
- Control circuit transformer
- Protection circuit breakers on power and control circuits
- Compressor motor contactor(s)
- Main earthing
- Microprocessor electronic control system
- Free contacts for remote information or alarms.

ELECTRONIC CONTROL SYSTEM

Connect 2

CIAT microprocessor and CPU electronic control system with centralized controls and monitoring of internal operating status.

Includes:

- Run, Stop, Reset or Remote control functions,
- COOLING or HEATING mode selection switch,
- Output. RS485 output for BMS control (ModBus-JBus),
  . Additional voltage free output adapter board ,
  . Adapter for remote control (optional).
- Analogical multi-language LCD screen and LED indicators,

Functions:

- Monitoring of operation information by:
  . direct display of messages in different languages
  . direct display of temperatures and pressures
- Global compressors control with starting sequence, counting and equalization of compressors running times
- Auto-adaptive and advanced functions with a control system adjustment on the parameters drift
- Capacity stage control system on multi compressors as a function of the cooling or heating requirements on the water temperatures
- Control of the internal operating parameters
- Second setting point control
- Direct display of water temperatures and pressures
- Diagnosis of operating status and faults:
HP/LP, water flow, compressor motor(s), anti-frost
- Anti-short cycle protection
- Remote management and remote control
- Master/slave control of two units on the same water loop with alternation of the master unit and the slave unit based on the running times.
- Setpoint adjustable via a 4-20 mA signal
- Weekly schedules

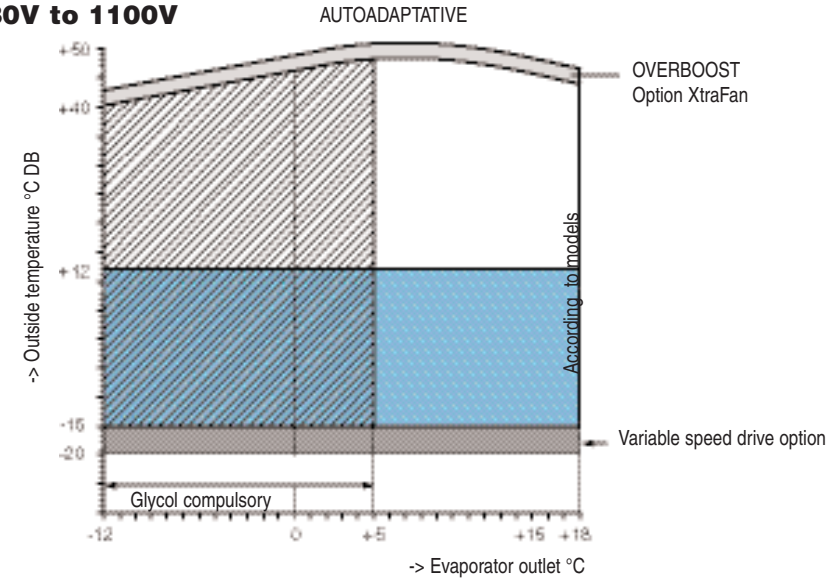
OPTIONAL EQUIPMENT (KIT FOR ON-SITE MOUNTING)

Main options

- Additional potential free contact boards,
- Remote control box,
- Phase control = rotation direction, phase absence, under and over voltage (factory mounted size 350 to 1100),
- SOFT START (factory mounted size 350 to 1100),
- Anti-freeze protection,
- Fan speed control (factory mounted for 350 to 1100 sizes),
- Water filter 800 microns as standard equipment on LD-LDC-LDH or ILDC-ILDH, and optional accessory on LD-ILD,
- Evaporator and condenser flexible connections,
- Water adjustement kit including pressure gauge manifold, control valve and stop valve,
- Twin pump on sizes 180 to 1100 (factory mounted for 350 to 1100 models).
- 15 kW extra heater kit (ILD, ILDC, ILDH 80 to 150)
- Extra heater MODULE kit 15-30-45-60 kW (ILD, ILDC, ILDH 180 to 300)
- MULTICONNECT management up to 8 units.
- Management 4 extra heater
- LONWORKS protocol (gateaway)
- Handling for container (350 to 1100)

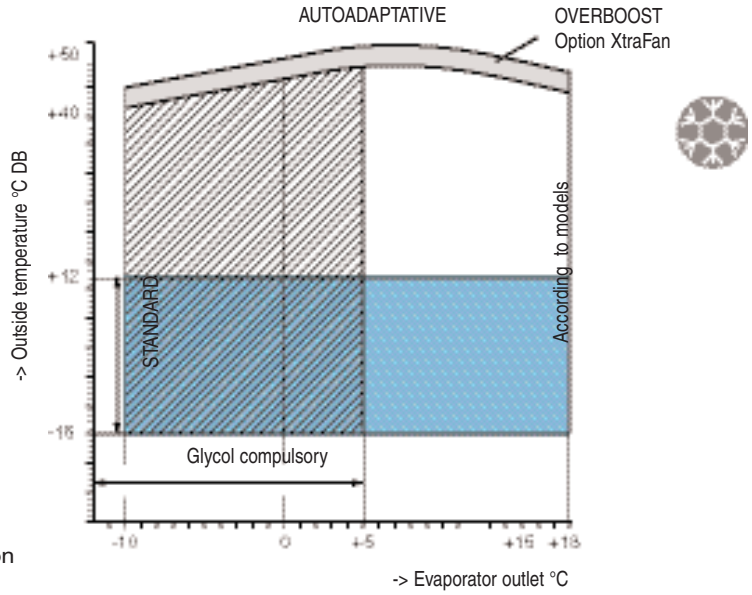
OPERATING RANGE (IN FULL LOAD)

LD - LDC - LDH 80V to 1100V

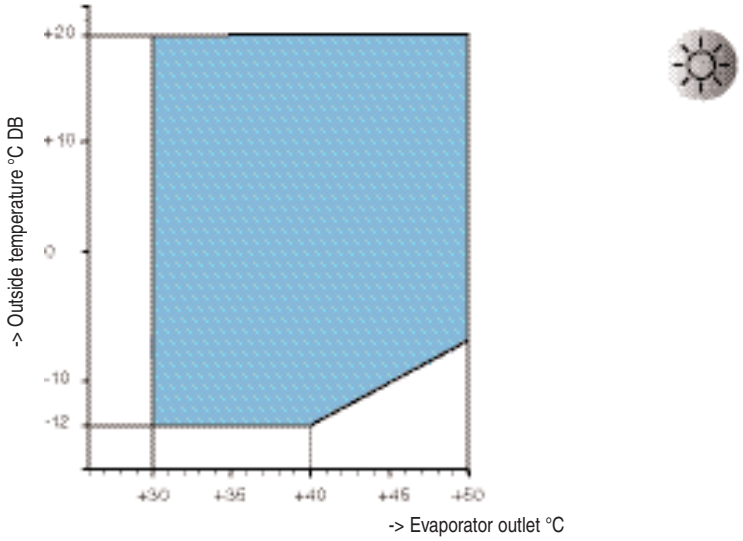


ILD - ILDC - ILDH 80\

COOLING mode operation

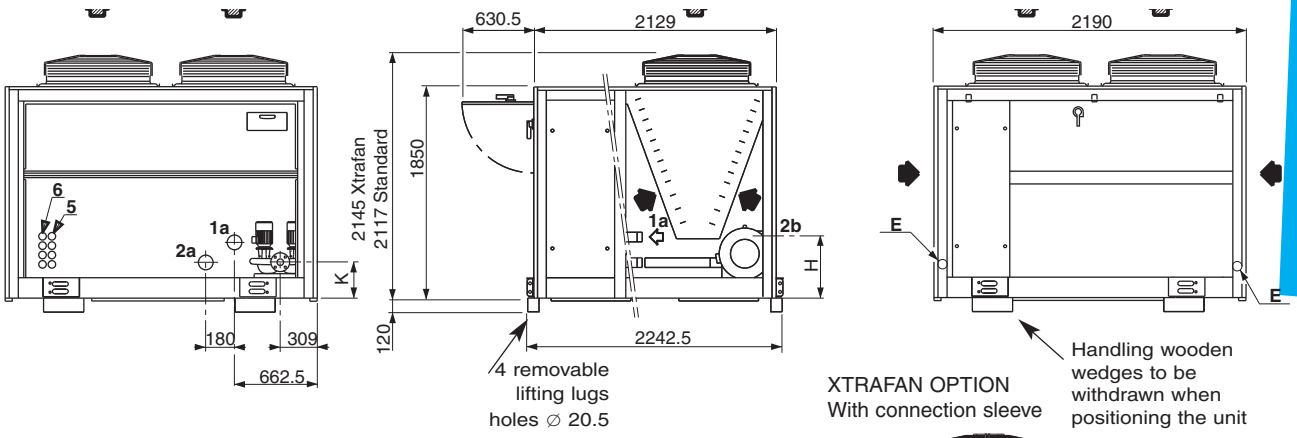


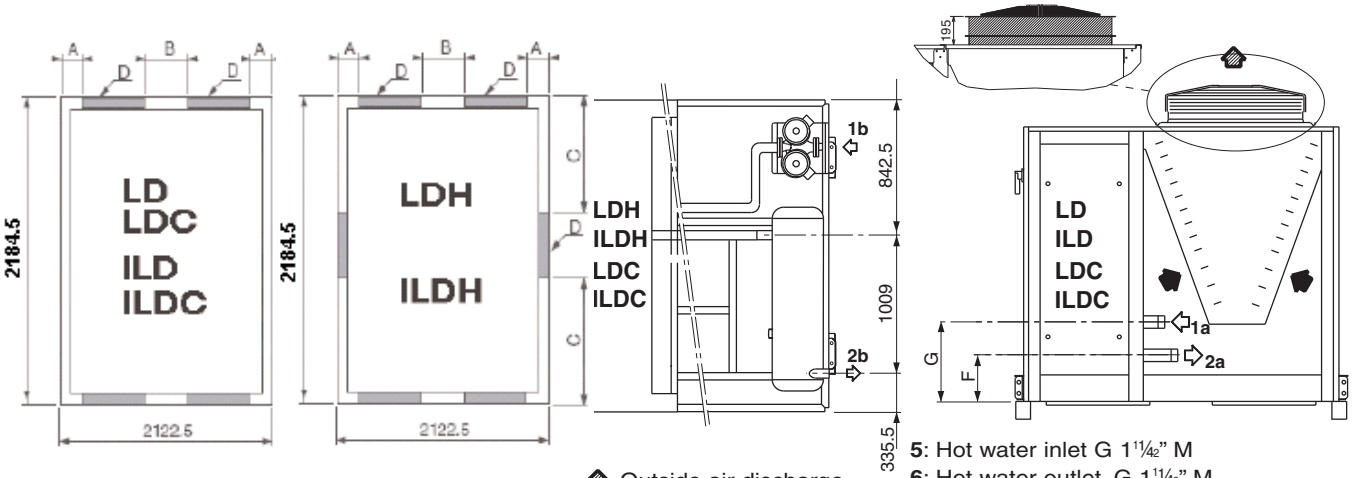
HEATING mode operation



DIMENSIONS

AQUACIAT 2 models 350 to 500





A clear space of 1 m on all sides of the units should be allowed for servicing and maintenance operations.

Outside air discharge

Outside air inlet

5: Hot water inlet G 1"1¼" M
6: Hot water outlet G 1"1¼" M
1a-1b: Chilled water inlet G 2"1¼" M
2a-2b: Chilled water outlet G 2"1¼" M
E: Electrical supply ∅ 60

Sizes	K	Pump	Chilled water inlet	Chilled water outlet
LDC-ILDC		N°40-41-42-43	1a	2a
	315	N°117-217-118-218-119-219	1b	2a
LDH-ILDH		N°40-41-42-43	1a	2b
	315	N°117-217-118-218-119-219	1b	2b

Aquaciat 2	Chilled water		Mounts position			Antivibration mounts					Mass in kg	
	Inlet	Outlet	A	B	C	D	no.	F	G	H	empty	in operation
LD 350	1a	2a	150	422.5		P25 50 x700	4	311	411		1046	1066
ILD 350											1096	1116
LD 400											1145	1165
ILD 400											1195	1215
LD 500											1183	1203
ILD 500											1283	1303
LDC 350	See table above										1144	1164
ILDC 350											1194	1224
LDC 400											1242	1272
ILDC 400											1292	1322
LDC 500											1254	1275
ILDC 500											1355	1385
LDH 350	See table above		150	422.5	742.25	P25 50 x700	6			548	1207	1477
ILDH 350											1257	1527
LDH 400											1306	1576
ILDH 400											1356	1626
LDH 500											1318	1588
ILDH 500											1418	1688

AquaCiat2	: air to water reversible heat pump	vr	: adjusting valve
psl	: pump water low pressure switch	s	: relief valve
v3v	: 3 way valve	pe	: water pump
v2v	: 2 way valve	t	: thermostatic sensor test bar
e	: expansion tank	rb	: additional water heater
c	: check valve	FS	: water flow switch
m	: pressure gauge	ds	: desuperheater
a	: water supply	STL	: cold storage tank
b	: mixing water tank	ev	: electrovanne
r	: stop valve		

In general:

p : air purge ales on all pipes high points

v : drain ales on all bottom points to extract water

Running principles depending the running mode	Position							
Water circuit components	Pd	Pch	ev1	ev2	ev3	v3v	GF	Control mode GF
Cold storage mode only	0	1	1	0	1	0	1	Night
Direct cooling mode	1	1	0	1	1	R	1	Day
Discharge only	1	0	0	0	0	R	0	-
Direct cooling + discharge	1	1	0	1	1	R	1	Day
Direct cooling + cold storage	1	1	1	0	1	R	1	Night

R -> Control ON 0 -> OFF 1 -> ON

Note: the above diagrams examples are only indicative and do not purport to show the installation details necessary.

AQUACIAT 2

Installation recommendations

Water quality criteria to be respected

Caution: A 800 microns water filter must be mounted on the machine water inlet during the installation phase.

The correct operation of the chilled/hot water production unit and a reasonable life expectancy depend directly upon the quality of the water used; make sure it is not causing scaling, corrosion, formation of algae or micro-organic growth.

An analysis of the water must be carried out to make sure that it is suitable for use in the unit; the analysis will also determine if a chemical treatment of the water results in an acceptable quality and if a water softening and demineralization system is necessary.

This analysis will confirm or not the compatibility of the water used on site with the following materials present on the circuit of this CIAT unit:

- 99.9% copper tubing with copper and silver brazing.

- Threaded bronze connectors or steel flat flanges depending upon models

- Stainless steel AISI 316-1.4401 plate heat exchangers with copper and silver brazing.

Caution: the non-respect of these instructions will immediately void the warranty of the chiller.

Lifting and handling operations

Lifting and handling operations must be carried out making sure the safety conditions are respected.

Refer and conform to the lifting diagram enclosed with the unit and to the Maintenance, Commissioning, Operating, Installation and Instructions brochure.

Before handling the unit, make sure that there is sufficient access to the room where the unit is to be installed.

Always maintain the unit in a vertical position; in no case should it lean or rest horizontally.

Positioning of the machine

The standard AQUACIAT 2 units are to be installed outdoors.

Make sure they are protected against freezing.

For maintenance purposes, particular attention will be given to the space required, also above the unit.

The unit must be positioned on perfectly flat, horizontal, non combustible ground able to support the weight of the machine in operation.

The noise pollution of the auxiliary devices, such as pumps, is to be studied with care. Therefore, before positioning, study and treat, with the assistance of a sound technician if necessary, the various possible noise transmissions, depending upon the room and its structure.

The piping must be fitted with flexible connectors (supplied as an option)

In geographical areas with a risk of snowing up or white frost, heatpumps must be elevated approximately 300 mm above ground-level.

On reversible heat pumps, the water vapor and water from defrosting must be correctly evacuated during defrost cycles.

Installation inside technical plant

The possible installation in technical room supposes some technical care, in particular:

- The evacuation of the water produced during defrost cycles including during periods of very low outside temperatures,

- to assume the possible problem of the water vapor rejected at the fan discharge during defrost periods,

- a ground supporting the machine weight and perfectly watertight and able to collect then drain defrosting water, including during freezing periods,

- the weight of a discharge air duct shall never be supported by the roof of the machine.

In accordance with the regulations on the installation spot, a fresh air supply system may be installed in case of installation in a technical room, to avoid dangerous situation or no comfort in case of refrigerant leakage from the circuit of the machine.

Mounting of accessories delivered separately

Several optional accessories delivered separately can be mounted on the machine on site.

The instructions mentioned in the Installation, Operating, Commissioning and Maintenance brochure must be respected.

Electrical connections

The recommendations mentioned in the Maintenance manual must be respected.

All the instructions relating to the electrical connections are mentioned on the electrical diagrams enclosed with the unit (they must be strictly followed).

The connections must comply with good engineering practice and be carried out in accordance with norms and regulations in force.

Electrical wiring to be carried out on site:

. main electric power supply,

. remote control of the machine (if necessary)

. free contacts information (optional).

It is important to note that the unit is not protected electrically against lightning.

Therefore appropriate protection devices will have to be planned and integrated on site in the electrical power box.

Piping connections

The Installation, Operating, Commissioning and Maintenance instructions manual must be respected.

Each pipe must be correctly aligned and sloped toward the installation drain valve. A reasonable servicing area must be kept for access to panels when mounting and connecting the pipes; the pipes will be thermally insulated.

Piping supports and braces must be independant in order to avoid vibrations and strain on the unit.

Isolating and water flow control valves must be planned when installing the unit.

- Pipe connections to be carried out on site:

. water supply with pressure reducing valve,

. evaporator, condenser and drain,

- Provide the accessories necessary for all hydraulic circuits, for example:

. a cooling water flow control thermostatic valve, mounted on the condenser water inlet or outlet (heatpump on HEATING mode),

. a water expansion vessel,

. drain holes on the lower parts of the pipes,

. isolating valves with filter on the exchangers,

. air vents at the high points of pipes,

. check the installation water contents (plan a buffer tank if necessary),

. flexible connections on the exchangers inlet and outlet,

. manual water flow adjustment valves,

. thermometers on each water inlet and outlet to allow the necessary controls when starting the unit or for maintenance purposes

Caution:

- Water circuit pressure should not exceed 4.0 bar,

- Position the expansion vessel before the water pump,

- Do not install any valve on the expansion vessel.

- Make sure the water circulating pumps are positioned right at the exchangers water inlet

- Make sure that the water pressure at the suction of each circulating pump is equal or higher than the minimum pressure NPSH required, particularly in case of an "open" type circuit.

- The water quality criteria have to be analyzed according to technical recommendations.

- Plan the necessary anti-frost protections for the unit and hydraulic installation, for example a possibility of draining the unit.

- The type and concentration of glycol, if used as a protection against freezing, must be checked before starting the unit.

- Before carrying out final hydraulic connections, the pipes should be rinsed with clean water to remove debris.

Start up

The commissioning of AQUACIAT 2 machines must be made by CIAT or by a company agreed by CIAT.

The recommendations of the Installation, Operating, Commissioning and Maintenance manual must be respected.

Non exhaustive list of operations to be carried out during commissioning:

- Check the correct location of the machine
- Verification of the electrical supply protection
- Verification of the phases and correct rotation direction
- Verification of the electrical connections on the unit
- Verification of correct sense of water circulation on the unit
- Verification of the water circuit cleanliness
- Water flow adjustment to the specified value
- Verification of the refrigeration circuit pressures
- Verification of the correct compressors rotation direction
- Verification of the water pressure drops and water flows
- Completion of running parameters check list

Maintenance operations

The machine requires specific preventive routine maintenance operations which must be provided by authorized service agents agreed by CIAT.

A report of the running parameters must be completed on a special "CHECK LIST" form to be returned to CIAT.

For this operation, refer to the Installation, Operating, Commissioning and Maintenance manual's instructions.

Take out a maintenance contract with a specialist on refrigerating machines agreed by CIAT, even during the period of warranty.

CONNECT2 CONTROL SYSTEM

80 to 300

350 to 1100

ERGONOMIC INTERFACE PANEL

- Multilanguage LCD (4 lines of 24 characters each)
- Reading of pressures and temperatures
- Operating state and fault diagnostics
- Master/slave management of two parallel-connected machines
- Fault memory management
- Pump management
- Programmable operation times

Volt-free contact card:

Inputs:
- Automatic operation control
- Selection of setpoints 1/2
- Setpoint adjustable via a 4-20 mA signal
- Heating/cooling mode selection
- Compressor load shedding

Outputs:
- General fault signalling
- Pump control

RS-485 OUTPUT AS STANDARD

Open Modbus/Jbus protocol (standard)

LonWorks protocol (option)

Ethernet gateway (optional)

RELAY BOARD (OPTION)

Available outputs:

- Water flow fault
- Frost protection fault
- Pump fault
- Fan fault (air-to-water unit)
- Low and high pressure fault
- Compressor safety fault
- Discharge temperature fault
- Compressor operation fault

REMOTE-CONTROL UNIT (OPTION)

Same operation and design as local console

MULTICONNECT MULTI-UNIT MANAGEMENT (OPTION)

Main functions available:

- Management of up to 8 units on a single water loop
- Management in COOLING mode (water chiller) or HEATING mode (heat pump)
- Management of chilled-water or ho-water pumps
- Centralised management of a backup unit
- Unit load shedding
- System time programming
- Energy storage mode management
- Unit running time balancing
- Modbus/Jbus protocol RS485 output for BMS link

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