



# Water cooled chillers

HYDROCIAT LW R134a

Screw compressors  
CIAT shell and tubes  
*direct expansion* evaporator  
*HPS* (High Power System) equipment



Cooling or heating



Heat recovery



Cooling capacity : 370 to 1170 kW  
Heating capacity : 500 to 1400 kW

## USE

The latest generation of HYDROCIAT LW water-cooled water chillers offers an optimum solution for all cooling applications used in air conditioning and industrial processes.

These units are designed to be installed in mechanical rooms that are protected against freezing temperatures and inclement weather.

They feature the latest technological advances: accessible twin-screw hermetic compressors, continuous capacity control, XtraCONNECT microprocessor for networked control and management, and components optimised for ozone-friendly refrigerant R134a.

The use of **HFC R134a** refrigerant fluid means that the units respond to the most stringent specifications for environmental protection, high efficiency and low electrical consumption

The units conform to regulations EN 60.204 EN 378-2 and the following European directives:

- Machine (98 / 37 CEE) modified
- Electromagnetic CEM (89 / 336 CEE) modified 92/31 CEE - 93/68 CEE
- Low voltage (73/23 CEE) modified 92/31 CEE - 93/68 CEE
- Pressure equipment PED 97/23/EC
  - category 3: models 1800BX (HPS) to 2800BX (HPS)
  - category 4: models 3050BX HPS to 4800BX HPS

## RANGE

### HYDROCIAT serie LW-LWP

Cooling-only or heating-only models with water-cooled condenser

### HYDROCIAT LWP

The design of the water/water heat pumps range **HYDROCIAT LWP** is identical to that of HYDROCIAT LW.

These machines produce hot water for heating applications.

They can also be used in the cooling operation by reversing cycle on the hydraulic circuits.

### Acoustic configuration

a - **STANDARD** version

b - **LOW NOISE** version

Compressor noise insulation



### DESCRIPTION

#### HYDROCIAT LW - LWP

##### ■ Compressors

- Accessible hermetic twin screw type
- Optimised profile of rotors ensuring a high efficiency
- Electrical motor incorporated with :
  - part-winding starter  
(models 1800BX (HPS) to 2800BX (HPS))
  - star-delta starter  
(models 3050BX HPS to 4800BX (HPS))
- Integral electronic protection of motor
- Control of the phase balance and rotation direction
- Integrated overpressure valve
- Discharge temperature control
- Lubrication under controlled pressure
- 3-stage integrated oil separator
- Crankcase heater
- Thin filter at suction
- Discharge valve
- Slide for modulating continued output capacity control
- Assembly on antivibration mounts

##### ■ Evaporator

- direct-expansion shell and tube
- high-efficiency copper tube bundle
- steel shell
- corrosion-resistant baffles
- closed-cell thermal insulation foam

##### ■ Water cooled condenser

- High performance copper tubes bundle
- Carbon steel shell
- Carbon steel tubular plates
- Removable cast iron headers
- Safety valves on the refrigerant circuits

##### ■ HPS (High Power System) on models LW/LWP...HPS

■ The HPS system allows a significant increase in cooling capacity, improving the performance coefficients EER and ESEER of your installation, particularly in part load, and therefore ensuring an optimal operation of the unit all year round.



##### ■ Refrigerant accessories

- Filter dryers with rechargeable cartridges
- Liquid sight glasses
- Solenoid valves on liquid refrigerant lines
- Thermostatic expansion valves  
(models 1800BX(HPS) to 2800BX (HPS))
- Electronic expansion valves  
(models 3050BX HPS to 4800BX HPS)

##### ■ Safety and regulation devices

- HP/LP pressure sensors
- Low and high pressure safety valves
- Chilled water control sensor (inlet or outlet)
- External temperature sensor
- Evaporator antifreeze sensor
- Compressors discharge sensor
- Evaporator water flow switch

##### ■ Electrical panel

- IP 21
- Electrical supply 400 V - 3 ph. - 50 Hz + earth (-10% / +10%)
- Main fused isolator with outside handle
- Transformer for control circuit
- Compressor motors contactors
- Compressor motors protection by fused circuit breakers (depending on sizes of compressors).
- General earth connection
- Phase controller (reversal, loss, over and under voltage)

##### ■ Electronic module with microprocessor XTRA CONNECT

with the following main functions :

- 2 remote switchable set points
- chilled water temperature control
- Possibility of water temperature variation according to the outside temperature (water law)
- Low temperature ice storage control
- Compressors discharge temperature control
- Compressors anti-short cycle control
- Control and optimisation of operating parameters
- Counting and balancing of compressors operating time
- Automaticity control
- LCD display panel, 2 lines of 20 characters allowing :
  - Configuration of the unit
  - Direct reading of all information: settings, water inlet/outlet temperatures, outside temperature, HP/LP pressures, unit operating status...
  - Faults control with memorization of the last 9 faults and operating reading of when those faults occurred
  - Weekly management of the unit
  - Unit general fault display on terminals
- Automaticity control on terminals
- RS 485 output for bus connection with centralized Building Management System.

##### ■ Capacity control

- continuous capacity control from 25 to 100%

##### ■ Frame

- Frame made of painted (RAL 7024) metal panels.



# Water cooled chillers

## DESCRIPTION

**LW** > cooling-only version

**X** > R134a refrigerant

**P** > heating-only version

**HPS** > High Power System version

**1050B** > unit size



Models LW - LWP 3050BX HPS to 4800BX HPS



# Water cooled chillers

## HYDROCIAT LW R134a

### TECHNICAL CHARACTERISTICS

HYDROCIAT LW-LWP			3050BX HPS	3500BX HPS	3600BX HPS	3900BX HPS	4200BX HPS	4500BX HPS	4800BX HPS
<b>Standard Low Noise</b>	Cooling capacity (1)	kW	814	921	957	1044	1078	1133	1168
	Absorbed power (2)	kW	166	193	195	215	224	242	251
	EER/ESEER		4.9/5.98	4.77/5.63	4.91/6	4.86/5.92	4.81/5.87	4.68/5.71	4.65/5.67
	Lw / Lp Standard (3)	dB(A)	92/60	94/62	93/61	94/62		95/63	
	Lw / Lp Low Noise (3)	dB(A)	89/57	90/58	89/57	90/58		91/59	
<b>Refrigeration circuit</b>	Refrigerant (GWP)		R134a (1300)						
	Number		2						
<b>Compressor</b>	Type		Hermetic twin screw						
	Number		2						
	Rotation speed	tr/mn	2900						
	R134a refrigerant charge kg	circ. 1	71	74	71	73	75	75	75
		circ. 2	60	60	71	72	73	74	75
	Capacity control		Modulating from 25 to 100% (50 to 100% on each compressor)						
	Type of oil for R134a		BITZER BSE 170						
	Oil charge for compressor	litres	35 + 19			2 x 35			
<b>Evaporator</b>	Type		Direct expansion shell and tubes						
	Number		1						
	Water content	litres	180	335	180	335	391		
	Hydraulic connections		VICTAULIC DN 200						
	Maximum pressure on water side	bar	10						
	Mini / maxi water flow	m³/h	80 / 231	80 / 246	80 / 231	80 / 246	80 / 293		
	<b>Water cooled condenser</b>	Type		Shell and tubes					
Number			2						
Water content		litres	36 + 57			2 x 57			
Hydraulic connections			VICTAULIC DN 150						
Maximum pressure on water side		bar	10						
Mini / maxi water flow		m³/h	43 / 232			54 / 288			
<b>Dimensions</b>	Length	mm	4538	4567	4538	4567			
	Width	mm	1500						
	Standard height	mm	1895						
<b>Weight</b>	Low-profile design	kg	4691	4719	5106	5234	5293	5302	5362
	Weight (empty)	kg	5064	5235	5502	5772	5820	5841	5901

(1) Cooling capacity for 12 / 7°C evaporator chilled water and 30 / 35 °C condenser hot water - EN 14511 and EUROVENT conditions

(2) Compressors absorbed power

(3) **Lw** : Global sound power level

**Lp** : Global sound pressure level at 10 meters, in free field, following ISO 3744 regulation



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## ELECTRICAL CHARACTERISTICS

HYDROCIAT LW - LWP			1800BX	1800BX HPS	2150BX	2150BX HPS	2500BX	2500BX HPS	2800BX	2800BX HPS
<b>Compressors (1)</b>	Maximum nominal current	A	324 (2 x 162)		358 (196 + 162)		392 (2 x 196)		428 (2 x 214)	
	Part winding starting current (3)	A	585		774		808		879	
	Starting current with Soft start option (3)		437		560		614		647	
<b>Remote controlled auxiliary circuit (2)</b>	Maximum nominal current	A	4							
	Transformer power	VA	1000							

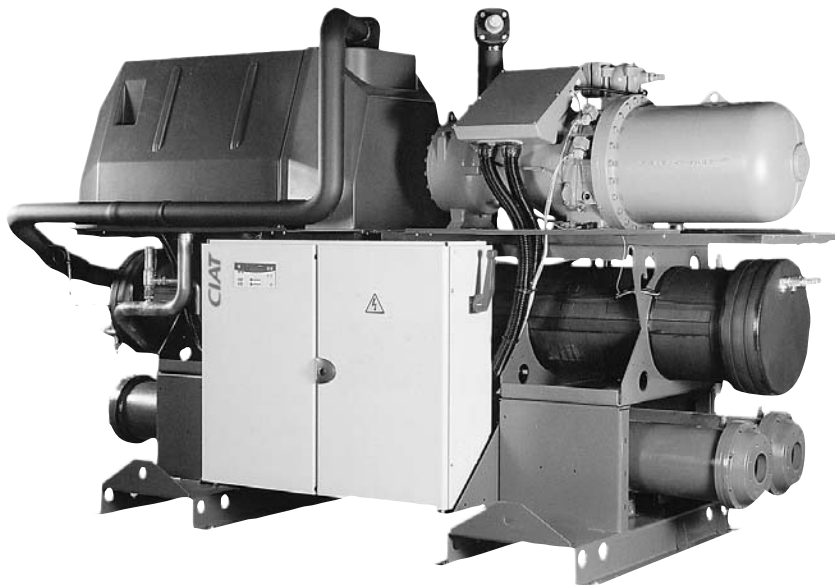
HYDROCIAT LW - LWP			3050BX HPS	3500BX HPS	3600BX HPS	3900BX HPS	4200BX HPS	4500BX HPS	4800BX HPS	
<b>Compressors (1)</b>	Maximum nominal current	A	506 (310+196)	534 (320+214)	620 (2x310)	630 (320+310)	670 (360+310)	680 (360+320)	720 (2x360)	
	Star-delta starting current (3)	A	661	800	775	896	960	970	1010	
<b>Remote controlled auxiliary circuit (2)</b>	Maximum nominal current	A	5							
	Transformer power	VA	1600							

(1) Current for 400V / 3Ph / 50Hz voltage

(2) Current for 230V / 1Ph / 50Hz voltage

(3) Starting current of the biggest compressor + maximum current of others compressors in full load

Nominal current for cables selection = add the maximum nominal currents indicated in the above tables

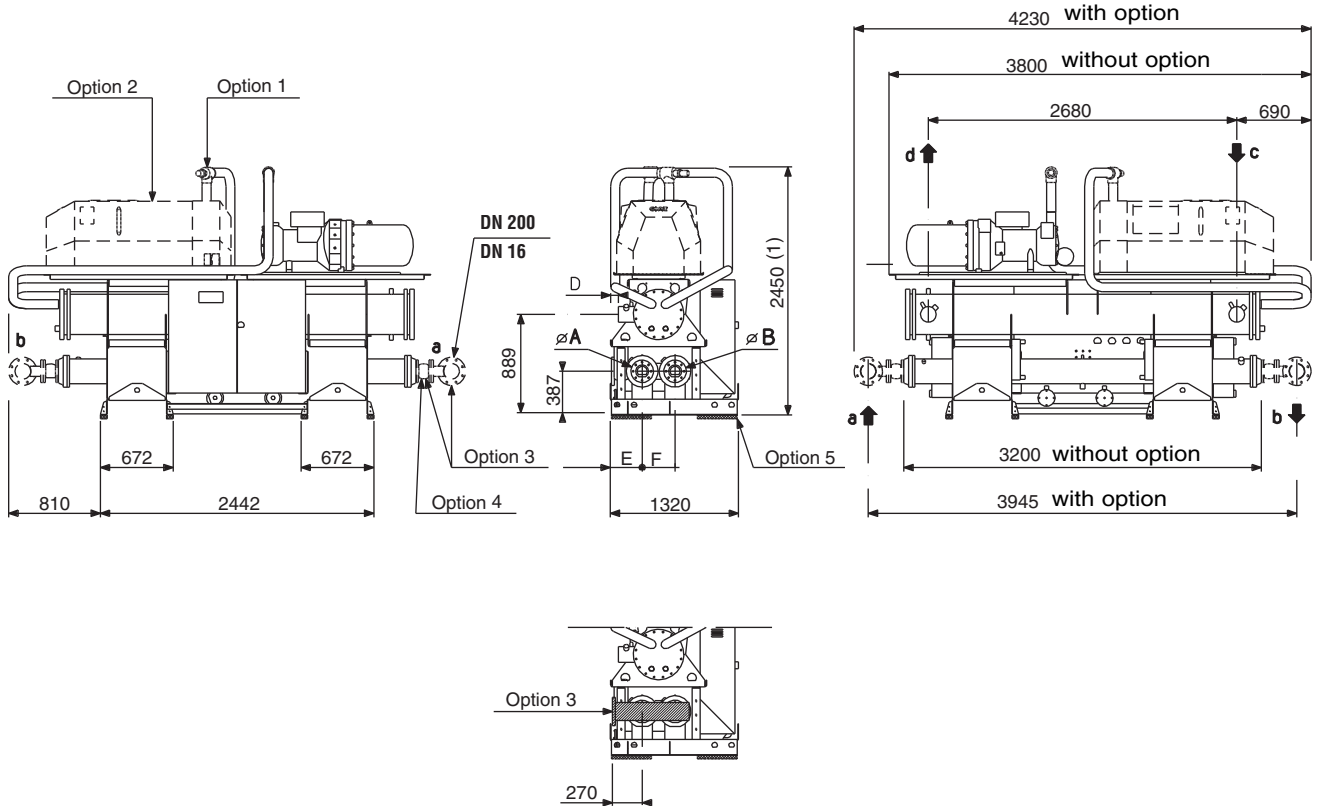


Models LW - LWP 1800BX (HPS) to 2800BX (HPS)



### DIMENSIONS

#### Model 1800BX (HPS)



- a** : cooling water inlet
- b** : cooling water outlet
- c** : chilled water inlet
- d** : chilled water outlet

- Option 1** : compressor suction valve
- Option 2** : acoustically lined housing
- Option 3** : condensers headers (flexible hydraulic sleeves and flange/Victaulic adapter included)
- Option 4** : hydraulic flexible connections (flange/Victaulic adapter included)
- Option 5** : 8 antivibration mounts 400 x 70 x 25

**NOTE** : the electrical wiring is on the right of the panel through the bottom  
Dimensions in mm

(1) 1860 for reduced height version. Compressor suction valve mounted as standard and acoustically lined housing not available for this version.

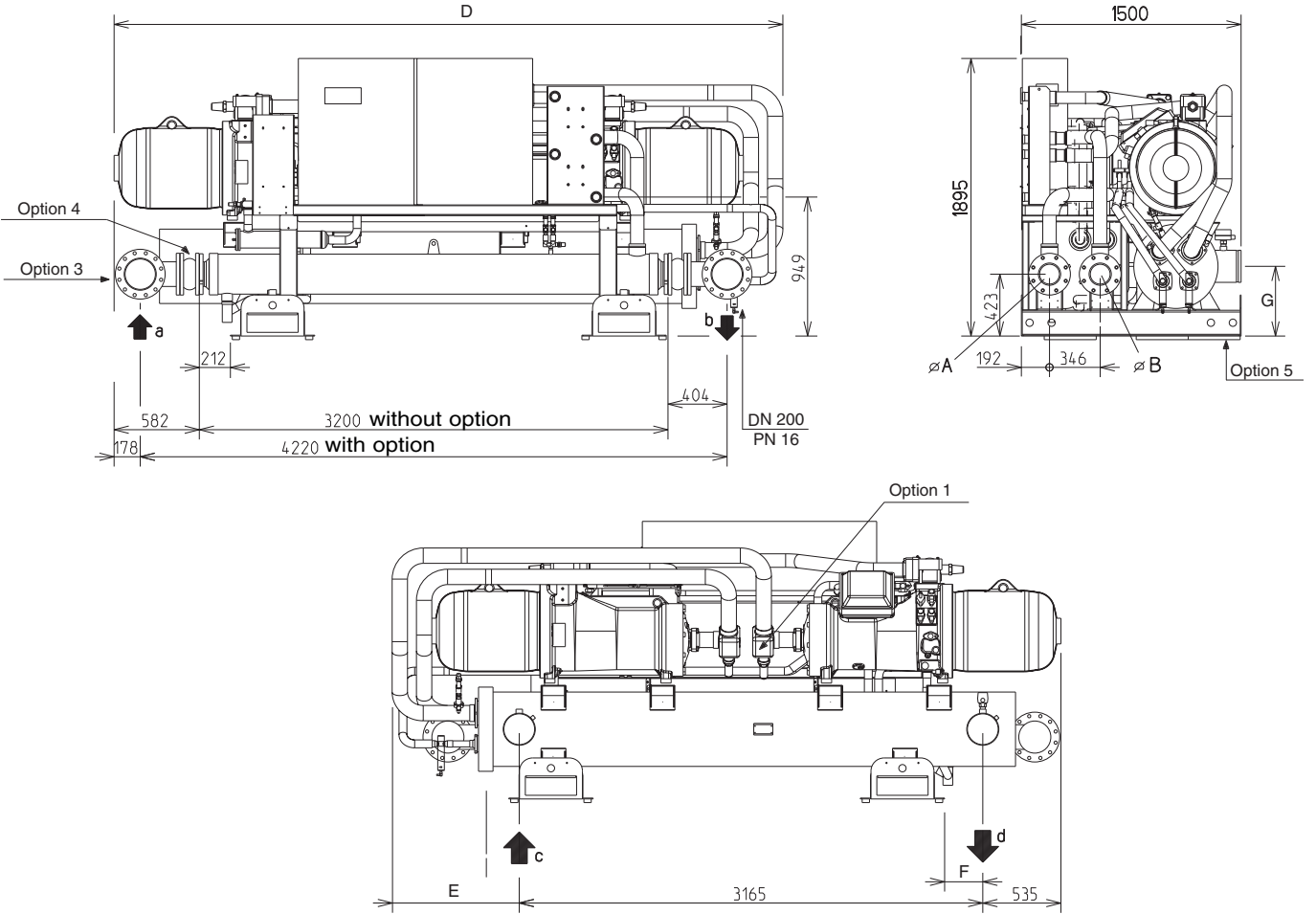
LW - LWP	A - B Victaulic	c - d Victaulic	D	E	F	Weight in kg	
						empty	in operation
1800BX (HPS)	PN 16 DN 150	PN 16 DN 150	180	411	290	3130	3360





### DIMENSIONS

#### Models 3050BX HPS to 4800BX HPS



- a :** cooling water inlet
- b :** cooling water outlet
- c :** chilled water inlet
- d :** chilled water outlet

**Option 1 :** compressor suction valve

**Option 3 :** condensers headers (flexible hydraulic sleeves and flange/Victaulic adapter included)

**Option 4 :** hydraulic flexible connections (flange/Victaulic adapter included)

**Option 5 :** 12 antivibration mounts 35 x 50 x 25

**NOTE :** the electrical connection is on the right of the panel through the bottom  
Dimensions in mm

LW - LWP	A - B Victaulic	c - d Victaulic	D	E	F	G	Weight in kg	
							empty	in operation
3050BX HPS	PN 16 DN 150	PN 16 DN 200	4538	838	267	451	4691	5064
3500BX HPS	PN 16 DN 150	PN 16 DN 200	4567	868	260	476	4759	5275
3600BX HPS	PN 16 DN 150	PN 16 DN 200	4538	838	267	451	5106	5502
3900BX HPS	PN 16 DN 150	PN 16 DN 200	4567	868	260	476	5274	5812
4200BX HPS	PN 16 DN 150	PN 16 DN 200	4567	868	260	476	5293	5820
4500BX HPS	PN 16 DN 150	PN 16 DN 200	4567	868	260	476	5342	5905
4800BX HPS	PN 16 DN 150	PN 16 DN 200	4567	868	260	476	5362	5925





### XTRACONNECT CONTROL



#### ERGONOMIC INTERFACE PANEL

- LDC multilingual screen (2 lines of 20 characters)
- Pressures and temperatures reading
- Pump control
- Communication

#### Available free contacts inputs / outputs

- Inputs :**
- External ON/OFF contact
  - Chilled water pump external ON/OFF contact
  - Setpoint 1/2 selection
  - General fault
  - Emergency stop
  - Compressors load shedding
  - 0 - 20 mA remote control
- Output :**
- General fault of the unit
  - General fault per circuit
  - Pump control

#### RS 485 OUTPUT IN STANDARD

- MODBUS-JBUS open Protocol (standard)**
- LONWORKS Protocol (option)**
- ETHERNET gateway**

#### FREE CONTACTS RELAY CARD (OPTION)

##### Available outputs :

- Water flow fault
- Antifreeze fault
- Pump fault
- Fans fault
- Emergency stop fault
- Low and high pressure fault
- Compressors safety fault
- Compressors superheating fault
- Compressors lubrication fault
- Discharge temperature fault
- Compressors running

#### REMOTE CONTROL BOX (OPTION)

**Operation and design same as display 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 hot-water pumps
- Centralised management of a backup unit
- Unit load shedding
- System time programming
- Energy storage mode management
- Fault management on each unit
- Unit running time balancing
- Integrated Modbus BMS link for obtaining information on unit operation and faults

Non contractual document. With the thought of material improvement always in mind, CIAT reserves the right, without notice, to proceed with any technical modification.

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QUALITY SYSTEM



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