



HYDROCIAT™ LW

Water chillers
Heat pump



Energy excellence

Compact and reliable

Screw compressors

Flooded shell and tubes evaporator

Self-adjusting electronic control

Touch screen control interface

Cooling capacity 269-1736 kW

Heating capacity 317-2019 kW



Cooling



Heating



Heat
recovery

HFC
R-134A



USE

The latest generation of **HYDROCIAT LW** water chillers and water-to-water heat pumps are the perfect solution for all heating and cooling applications in the Office, Healthcare, Industry, Administration, Shopping Centres and Collective Housing markets.

HYDROCIAT is optimised to use ozone-friendly HFC R134a refrigerant.

This range guarantees compliance with the most demanding requirements for high energy efficiency and CO₂ reduction to comply with the various applicable European directives and regulations.

When producing chilled water, these units can be connected to a Dry cooler or a water cooling tower.

With the heat pump option, the units can produce hot water for heating applications. They can also be used in cooling mode by reversing the cycle on the hydraulic circuits using a set of valves (hydraulic valves not supplied).

RANGE

HYDROCIAT LW ST series

Standard cooling or heating version

The product is optimised to meet the most demanding technical and economic requirements.

HYDROCIAT LW HE series

High Efficiency cooling or heating version

The product is optimised for high energy efficiency applications for which optimum SEER, SEPR and SCOP values are required, ensuring operating costs are kept to a minimum.

DESCRIPTION

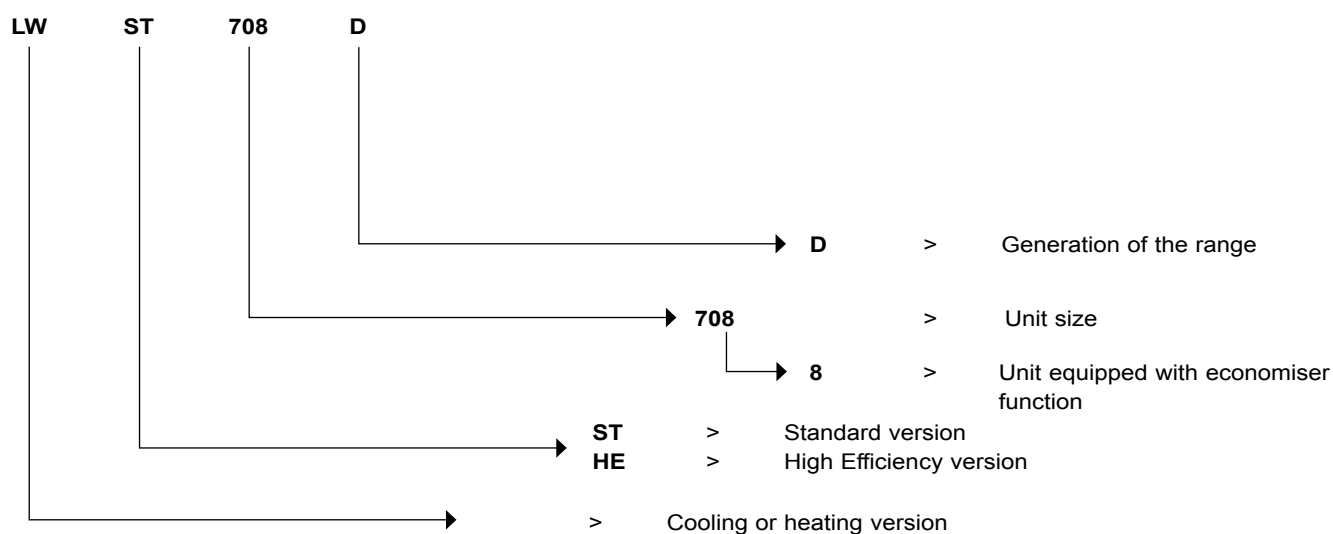
HYDROCIAT units are packaged machines supplied as standard with the following components:

- Twin-screw semi-hermetic compressors
- Shell and tube type chilled-water evaporator
- Shell and tube type hot water condenser
- Electrical power and remote control cabinet:
 - 400 V-3ph-50 Hz general power supply (+/-10%) + Earth
 - transformer fitted as standard on the machine for supplying the remote control circuit with 24 V
- Connect Touch electronic control module
- Casing for indoor installation

The entire **HYDROCIAT** range complies with the following EC directives and standards:

- Machinery Directive 2006/42/EC
- Electromagnetic Compatibility Directive 2014/30/EU
- EMC immunity and emissions EN 61800-3 'C3'
- Low Voltage Directive 2014/35/EU
- RoHS 2011/65/EU
- Pressure Equipment Directive (PED) 2014/68/EU
- Machinery Directive EN 60-204 -1
- Refrigeration systems and heat pumps EN 378-2.
- Regulation (EU) 2016/2281 implementing Directive 2009/125/EC with regard to ecodesign requirements

DESIGNATION



CONFIGURATION

ST	Standard	HE	High Efficiency
ST LN option	Standard Low Noise	HE LN option	High Efficiency Low Noise

DESCRIPTION OF THE COMPONENTS

■ Compressors

- Twin-screw semi-hermetic type
- 2 screws fitted on ball and roller bearings
- Continuous power control
- Built-in electric motor, cooled by intake gases
- Integral electronic protection of the motor against thermal and electrical overloads
- Monitoring of rotation direction, absence of phase, over and under voltage, and power supply failure
- Monitoring of lubrication under differential pressure
- Built-in oil filter
- Internal pressure surge valve and valve to prevent reverse rotation during shutdown phases
- Monitoring of maximum head pressure
- Silencer fitted at the discharge to reduce pulses from the discharged gas
- Star-delta start limiting the in-rush current

■ Shell and tube evaporator

- High performance glandless technology
- Copper tube bundle with internal and external grooves
- 19 mm thermal insulation
- Victaulic type coupling
- Maximum pressure, water side, of 10 bar (21 bar as option)

■ Shell and tube condenser

- Copper tube bundle with internal and external grooves
- 19 mm thermal insulation (option)
- Built-in oil separator
- Victaulic type coupling
- Maximum pressure, water side, of 10 bar (21 bar as option)

■ Economiser function (available on models designated by the figure 8)

- 1 brazed plate heat exchanger on each refrigerating circuit
- Refrigerant flow rate controlled by an electronic expansion valve
- The economiser function allows the cooling capacity to be significantly increased and provides considerable optimisation of the machine's energy efficiency

■ Refrigerant accessories

- Dehumidifier filters with rechargeable cartridges
- Hygroscopic sight glasses
- Electronic expansion valves

■ Regulation and safety instruments

- High and low pressure sensors
- Safety relief valves on refrigerating circuit
- Evaporator antifreeze protection sensor
- Chilled water and hot water control sensors
- Electronic evaporator water circulation controller

■ Electrical cabinet

- Electrical cabinet index of protection IP23
- Safety disconnect switch
- 24 V control circuit
- Remote control transformer circuit
- Protection of the power and control circuits

- Compressor motor contactor
- Connect Touch microprocessor-controlled electronic control module
- Electrical cabinet wire numbers
- Location of main components

■ Connect Touch control module

- User interface with 4.3 inch touchscreen (7-inch option)
- Intuitive, user-friendly navigation using icons
- Clear information display in 8 languages
- (F-GB-E-NL-I-S-P + Chinese)



- The electronic control module performs the following main functions:
- Regulation of the chilled water temperature (at the return or at the outlet)
- 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 operating time balancing
- Self-regulating and proactive functions with adjustment of settings on drift control
- Continuous power control slide system on the compressors according to the thermal requirements
- Management of compressor short cycle protection
- Phase reversal protection
- Management of occupied/unoccupied modes (according to the time schedule)
- Equalisation of compressor operating hours
- Condensing temperature limitation (option)
- Diagnosis of fault and operating statuses
- Management of a fault memory allowing a log of the last 50 incidents to be accessed, with operating readings taken when the fault occurs
- Blackbox memory
- Master/slave management of two machines with equalisation of operating hours and automatic switching
- In case of a machine fault
- Weekly and hourly time schedule for the machine, including 16 periods of absence
- Display of all machine parameters (3 access levels, User/Maintenance/Factory, password-protected): temperature, setpoints, pressures, flow rate, operation time.
- Display of trend curves for the main values
- Storage of maintenance manual, wiring diagram and spare parts list.
- Unit construction
- Electrical cabinet in graphite grey (RAL 7024)
- Compressors in grey (RAL 7037)

DESCRIPTION OF THE COMPONENTS

■ Remote management

Connect Touch is equipped as standard with an RS485 port and an ETHERNET (IP) connection, offering a range of options for remote management, monitoring and diagnostics.

Using the integrated Webserver, a simple internet connection uses the unit's IP address to access the Connect Touch interface on the PC, facilitating everyday management tasks and maintenance operations.

Numerous communication protocols are available: MODBUS/JBUS RTU(RS485) or TC/IP as standard, LONWORKS – BACNET IP optional, enabling integration with most CMS/BMS

Several contacts are available as standard, enabling the machine to be controlled remotely by wired link:

- Automatic operation control: when this contact is open, the machine stops
- Setpoint 1/setpoint 2 selector: when this contact is closed, a second cooling setpoint is activated (energy storage or unoccupied mode, for example)
- Heating/cooling operating mode selection
- Power limitation: closing the contact concerned allows the power or refrigerating consumption of the machine to be limited by stopping one or more compressors (this limit can be set with a parameter)
- Fault reporting: this contact indicates the presence of a major fault which has caused one or both refrigerating circuits to stop
- Operational status reporting indicates that the unit is in production mode
- 0-10V signal output for external variable speed pump management

Contacts available as an option:

- Setpoint adjustable via 4-20 mA signal: this input is used to adjust the setpoint in COOLING mode
- Power limitation adjustable by 4-20 mA signal
- Second power limitation level
- Power indication: analogue output (0-10 V) providing an indication of the unit's load rate.
- User fault reporting enables integration of a fault in the water loop
- General fault reporting: this contact indicates that the unit has stopped completely
- Alert reporting: this contact indicates the presence of a minor fault which has not caused the circuit affected to stop.
- End of storage signal: enables return to the second setpoint at the end of the storage cycle

■ Maintenance alert as standard

Connect Touch has two maintenance reminder functions as standard, making users aware of the need to regularly perform maintenance operations and to guarantee the service life and performance of the unit. These two functions can be activated independently.

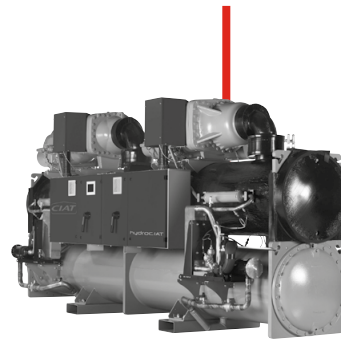
A reminder message appears on the unit's HMI screen, and stays there until it is acknowledged by the maintenance operator. The information and alert relating to these functions are available on the communication bus to be used on the CMS/BMS.

- Schedule override: closing this contact cancels the time schedule.

- Dry cooler management

Direct access to technical literature

- Instruction manual
- Electrical diagram
- Spare parts list



Web server integrate as standard

IP address



Remote management via web server

- Connection to RJ port
- Connection via IP address
- All the HMI functionalities available on the PC
- Simplified remote monitoring



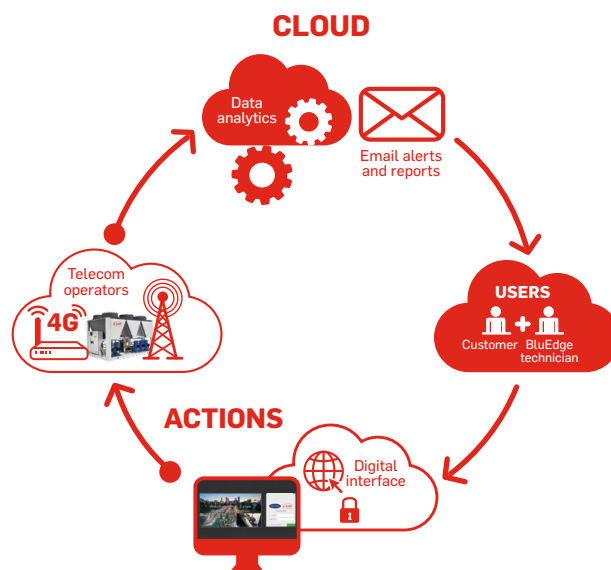
E-mail alerts
(2 addresses)

- The scheduled maintenance reminder: when activated, this function enables the period between two maintenance inspections to be set. This period may be set by the operator in either days, months or operating hours, depending on the application.

- The compulsory F-GAS sealing test maintenance reminder: when activated, this function, which is the default factory setting, enables the period between two sealing tests to be selected, according to the refrigerant charge, in compliance with the F-GAS regulations.

DESCRIPTION OF THE COMPONENTS

ABOUND



■ ABOUND HVAC Performance, the CIAT supervision solution

ABOUND HVAC Performance is a remote supervision solution dedicated to monitoring and controlling several CIAT machines in real time.

Advantages

- Access to the operating trend curves for analysis
- Improved energy performance
- Improved availability rate for the machines

Functions

ABOUND HVAC Performance will send data in real time to the supervision website.

The machine operating data can be accessed from any PC, smartphone or tablet.

Any event can be configured to trigger a mail alert.

Parameters monitored:

- Overview
- Control panel for the controllers
- Events
- Temperature curves

Monthly and annual reports are available to analyse:

- The performance and operation of the machine
- Example: operating curves and time, number of compressor start-ups, events, preventive maintenance actions to be performed, etc.

Incidents such as a drift in the measurements on a temperature sensor, incorrectly set control parameters, or even incorrect settings between one compressor stage and the other are immediately detected, and the corrective actions put in place.

Equipment

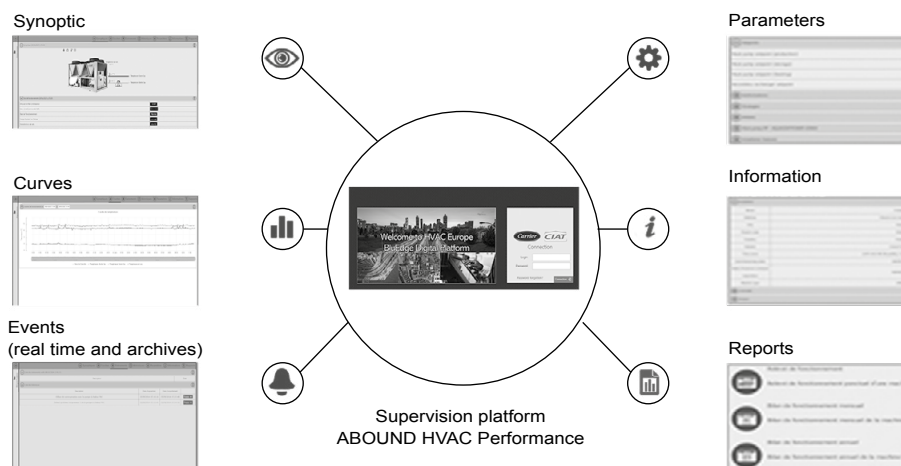
This kit can be used on both machines which are already in use (existing inventory), and on new machines.

Composition of kit contents

- 1 GPRS / 3G modem
- 1 SIM card
- One 24 VDC power supply
- 1 power protection device
- 1 GSM antenna
- Rail mounting
- Enclosed casing to protect the equipment during transport
- Packing box for cable routing (bus, power supply, Ethernet)

Compatibility

Up to three machines per kit



OPTIONS

Options	Description	Advantages	LW ST/HE
Low Brine with turbulators down to -15°C	Redesigned evaporator including turbulators to allow chilled brine solution production with low pressure drops on the entire negative application range, down to -15°C (including turbulators, extra insulation and algorithms).	Covers specific applications such as ice storage and industrial processes	Only LW ST
Light-brine solution, down to -3°C	Implementation of new control algorithms and redesigned evaporator to allow chilled brine solution production down to -3°C when ethylene glycol is used (0°C with propylene glycol)	Matches with most application requirements for ground-sourced heat pumps and fits with many industrial processes requirements	•
90-10 Copper-Nickel condensers	- Condenser tubes 90-10 Cu/Ni. - Condenser tube sheets clad with 90-10 Cu/Ni. - Waterboxes not treated against corrosion.	Improved resistance to corrosion	•
IP44 electrical protection level	Control box tightness reinforced Electrical box enclosure and outside electrical component following IEC 60529 standard	Permits unit installation in more severe environments	•
Unit supplied in two assembled parts	The unit is equipped with flanges that allow disassembly of the unit on site	Facilitates installation in plant rooms with limited access	Only sizes: 4228/4408/4608/4628
Evap. single pump power/control circuit	Unit equipped with an electrical power and control circuit for one pump evaporator side	Quick and easy installation: the control of fixed speed pumps is embedded in the unit control	708-3428
230V electrical plug	230V AC power supply source provided with plug socket and transformer (180 VA, 0,8 Amps)	Permits connection of a laptop or an electrical device during unit commissioning or servicing	•
Evaporator with one pass less	Evaporator with one pass on the water side. Evaporator inlet and outlet on opposite sides.	Easy to install, depending on site. Reduced pressure drops	•
Master/slave operation	Unit equipped with supplementary water outlet temperature sensor kit (to be field installed) allowing master/slave operation of two units connected in parallel	Optimised operation of two units connected in parallel operation with operating time equalisation	•
Condenser with one pass less	Condenser with one pass on the water side. Condenser inlet and outlet on opposite sides.	Easy to install, depending on site. Reduced pressure drops	•
21 bar evaporator	Reinforced evaporator for extension of the maximum water-side service pressure to 21 bar (standard 10 bar)	Covers applications with a high water column evaporator side (typically high buildings)	•
Single power connection point	Unit power connection via one main supply connection	Quick and easy installation	2800/4628
21 bar condenser	Reinforced condenser for extension of the maximum water-side service pressure to 21 bar (standard 10 bar)	Covers applications with a high water column condenser side (typically high buildings)	•
Reversed evaporator water connections	Evaporator with reversed water inlet/outlet	Easy installation on sites with specific requirements	•
Reversed condenser water connections	Condenser with reversed water inlet/outlet	Easy installation on sites with specific requirements	•
Condenser insulation	Thermal condenser insulation	Minimizes thermal dispersions condenser side (key option for heat pump or heat recovery applications)	•
Service valve set	Liquid line valve (evaporator inlet) and compressor suction line valve	Allow isolation of various refrigerant circuit components for simplified service and maintenance	•
Lon gateway	Bi-directional communication board complying with Lon Talk protocol	Connects the unit by communication bus to a building management system	•
Control for low cond. temperature	Output signal (0-10 V) to control the condenser water inlet valve	Simple installation: for applications with cold water at condenser inlet (ex. ground-source, groundwater-source, superficial water-source applications) the signal permits to control a 2 or 3-way valve to maintain condenser water temperature (and so condensing pressure) at acceptable values	•
Compliance with Swiss regulations	Additional tests on the water heat exchangers: supply (additional of PED documents) supplementary certificates and test certifications	Conformance with Swiss regulations	•
Compliance with Morocco regulation	Specifics documents according Morocco regulation	Conformance with Morocco regulations	•
Dual relief valves on 3-way valve	Three-way valve upstream of dual relief valves on the evaporator and the oil separator	Valve replacement and inspection facilitated without refrigerant loss. Comforms to European standard EN378/BGVD4	•

• ALL MODELS

Refer to the selection tool to find out which options are not compatible

OPTIONS

Options	Description	Advantages	LW ST/HE
Compliance with Russian regulations	EAC certification	Conformance with Russian regulations	•
Bacnet over IP	Bi-directional high-speed communication using BACnet protocol over Ethernet network (IP)	Easy and high-speed connection by ethernet line to a building management system. Allows access to multiple unit parameters	•
High condensing temperature	Optimized compressor for operation at high condensing temperature	Increased condenser leaving water temperature up to 63°C. Allows applications with high condensing temperature (heat pumps, installations with not generously sized dry coolers or more generally, installations with dry coolers in hot climate). NOTE: to ensure control of the condenser leaving water temperature, this option must be fitted on the units.	Available for all LW HE Available for LW ST 708 / 858 / 1008, and for higher LW ST sizes only with heat pump application option
Condensing temperature limitation	Limitation of the maximum condenser leaving water temperature to 45°C	Reduced maximum power input and current absorption: power cables and protection elements can therefore be downsized	•
Flanged evaporator water connection kit	Victaulic piping connections with flanged joints	Easy installation	•
Specific dry cooler control	Control box for communication with the Dry cooler via a bus. For OPERA Dry cooler need to select the cabinet with option control cabinet manage by the chiller Connect"Touch control"	Permits the use of an energy-efficient plug-and-play system	•
Flanged condenser water connection kit	Victaulic piping connections with flanged joints	Easy installation	•
Energy Management Module	Control board with additional inputs/outputs. See Contacts available in option on control description.	Extended remote control capabilities (Set-point reset by 0-20ma input, ice storage end, demand limits, boiler on/off command...)	•
7" user interface	Control supplied with a 7 inch colour touch screen user interface	Enhanced ease of use.	•
Input contact for Refrigerant leak detection	0-10 V signal to report any refrigerant leakage in the unit directly on the controller (the leak detector itself must be supplied by the customer)	Immediate customer notification of refrigerant losses to the atmosphere, allowing timely corrective actions	•
Compliance with Australian regulations	Unit approved to Australian code	Conformance with Australian regulations	•
Low noise level	Evaporator sound insulation	3 dB(A) quieter than standard unit	1308-4608
Evap. dual pumps power/control circuit	Unit equipped with an electrical power and control circuit for two pumps evaporator side	Quick and easy installation: the control of fixed speed pumps is embedded in the unit control	708-3428
Thermal compressor insulation	The compressor is covered with a thermal insulation layer	Prevents air humidity to condensate on the compressor surface	•
Cond. single pump power/control circuit	Unit equipped with an electrical power and control circuit for one pump condenser side	Quick and easy installation: the control of fixed speed pumps is embedded in the unit control	708-3428
Anti-vibration mounts (kit)	Elastomer antivibratils mounts to be place under the unit (Material classified B2 fire class according to DIN 4102).	Isolate unit from the building, avoid transmission of vibration and associate noise to the buiding. Must be associate with flexible connection on water side	•
Free Cooling dry cooler management	Control & connections to a Free Cooling Dry cooler Opera or Vextra fitted with option FC control box	Easy system managment, Extended control capabilities to a dry cooler used in Free Cooling mode	•
Heat Pump application	Unit configured for Heat Pump application, include thermal condenser insulation	Optimisation on heating mode & minimize thermal dispersions condenser side	•

- ALL MODELS

Refer to the selection tool to find out which options are not compatible

STANDARD UNIT TECHNICAL CHARACTERISTICS

LW ST / LW ST + Heat pump application option				708	858	1008	1300	1302	1500	1508	1900	2100	2300
Heating													
Standard unit Full load performances*	HW1	Nominal capacity	kW	317	360	422	499	555	626	633	793	858	929
		COP	kW/kW	5,96	5,98	5,93	5,98	6,04	5,84	5,81	6,06	5,96	5,79
	HW2	Nominal capacity	kW	312	353	417	473	526	595	624	749	812	879
		COP	kW/kW	4,51	4,50	4,55	4,54	4,56	4,42	4,46	4,54	4,48	4,40
Standard unit Seasonal energy efficiency**	HW1	SCOP _{30/35°C}	kWh/kWh	5,98	6,02	5,99	6,45	6,60	6,58	6,31	6,16	6,15	6,13
		η _s heat _{30/35°C}	%	231	233	231	250	256	255	245	238	238	237
		P _{rated}	kW	414	426	500	595	660	742	750	945	1022	1095
Cooling													
Standard unit Full load performances*	CW1	Nominal capacity	kW	269	303	354	421	467	525	531	669	720	783
		EER	kW/kW	5,25	5,23	5,17	5,22	5,28	5,12	5,11	5,32	5,23	5,13
	CW2	Nominal capacity	kW	264	320	396	525	566	520	596	753	788	782
		EER	kW/kW	7,30	5,74	6,31	6,50	6,40	5,24	5,86	6,02	5,76	5,22
Standard unit Seasonal energy efficiency**		SEER _{12/7°C} Comfort low temp.	kWh/kWh	6,26	6,33	6,40	6,85	7,04	7,12	6,82	6,64	6,63	6,82
		η _s cool _{12/7°C}	%	247	250	253	271	279	282	270	263	262	270
		SEPR _{12/7°C} Process high temp.	kWh/kWh	8,60	8,16	8,80	8,12	8,28	7,72	7,90	8,83	8,25	8,01
Integrated Part Load Value		IPLV.SI	kW/kW	6,791	6,845	6,850	6,861	7,165	7,430	7,110	7,185	7,168	7,212
Sound levels - standard unit													
Sound power level ⁽¹⁾			dB(A)	95	95	95	99	99	99	99	99	99	99
Sound pressure level at 1 m ⁽²⁾			dB(A)	78	78	78	82	82	82	82	82	82	82
Sound levels - unit with Low Noise option													
Sound power level ⁽¹⁾			dB(A)	-	-	-	96	96	96	96	96	96	96
Sound pressure level at 1 m ⁽²⁾			dB(A)	-	-	-	78	78	78	78	78	78	78
Dimensions - standard unit													
Length			mm	2724	2724	2724	2741	2741	2741	2741	3059	3059	3059
Width			mm	928	928	928	936	936	936	936	1040	1040	1040
Height			mm	1567	1567	1567	1692	1692	1692	1692	1848	1848	1848
Operating weight ⁽³⁾			kg	2017	2036	2072	2575	2575	2613	2644	3247	3266	3282
Compressors				Semi-hermetic screw compressors, 50 r/s									
Circuit A				1	1	1	1	1	1	1	1	1	1
Refrigerant - standard unit				R-134a									
			kg	84	80	78	92	92	92	92	145	135	125
Circuit A			teqCO ₂	120	114	112	132	132	132	132	207	193	179

- * In accordance with standard EN14511-3:2022.
- ** In accordance with standard EN14825:2022, average climate
- HW1 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- HW2 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 40°C/45°C, evaporator and condenser fouling factor 0 m². kW
- CW1 Cooling mode conditions: Evaporator water entering/leaving temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- CW2 Cooling mode conditions: Evaporator water entering/leaving temperature 23°C/18°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- η_s heat_{30/35°C} & SCOP_{30/35°C} Values calculated in accordance with EN14825:2022
- η_s cool_{12/7°C} & SEER_{12/7°C} **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Comfort application**
- SEPR_{12/7°C} Values calculated in accordance with EN14825:2022
- IPLV.SI Calculations according to standard performances AHRI 551-591 (SI)
- (1) In dB ref=10⁻¹² W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)).
- (2) In dB ref 20μPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).
- (3) Weight shown is guideline only. Please refer to the unit nameplate



Eurovent certified values

STANDARD UNIT TECHNICAL CHARACTERISTICS

LW ST / LW ST + Heat pump application option	708	858	1008	1300	1302	1500	1508	1900	2100	2300
Oil - standard unit										
Circuit A	I	23,5	23,5	23,5	32	32	32	32	36	36
Capacity control	Connect Touch, electronic expansion valves (EXV)									
Minimum capacity ⁽⁴⁾	%	15	15	30	30	30	30	30	15	15
Evaporator	Shell and tube flooded type									
Water volume	l	50	56	61	70	70	70	70	109	109
Water connections (Victaulic)	in	5	5	5	5	5	5	5	6	6
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
Condenser	Shell and tube type									
Water volume	l	55	55	55	76	76	76	76	109	109
Water connections (Victaulic)	in	5	5	5	5	5	5	5	6	6
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000

(4) Minimum unit capacity corresponds to a physical state of the unit and is given for indication only. The actual capacity at this stage depends on operating conditions.

STANDARD UNIT TECHNICAL CHARACTERISTICS

LW ST / LW ST + Heat pump application option				2308	2800	3000	3008	3400	3800	4200	4600	4408	4608
Heating													
Standard unit Full load performances*	HW1	Nominal capacity	kW	981	1185	1237	1324	1457	1557	1689	1795	1913	2001
		COP	kW/kW	5,98	5,77	5,67	5,79	6,12	5,96	5,76	5,61	5,94	5,92
	HW2	Nominal capacity	kW	958	1123	1174	1297	1375	1466	1592	1687	1867	1948
		COP	kW/kW	4,60	4,40	4,33	4,46	4,63	4,53	4,41	4,33	4,61	4,64
Standard unit Seasonal energy efficiency**	HW1	SCOP _{30/35°C}	kWh/kWh	6,33	6,43	6,24	6,30	6,56	6,33	6,22	6,11	6,46	6,50
		η _s heat _{30/35°C}	%	245	249	242	244	254	245	241	236	251	252
		P _{rated}	kW	1153	1411	1473	1569	1737	1856	2013	2140	2265	2371
Cooling													
Standard unit Full load performances*	CW1	Nominal capacity	kW	829	1005	1049	1128	1242	1327	1438	1532	1637	1712
		EER	kW/kW	5,33	5,19	5,12	5,25	5,55	5,45	5,31	5,24	5,54	5,55
	CW2	Nominal capacity	kW	828	1188	1322	1220	1535	1677	1753	1865	1726	1830
		EER	kW/kW	5,43	6,93	6,30	5,75	6,72	6,71	6,30	6,36	5,95	5,91
Standard unit Seasonal energy efficiency**		SEER _{12/7°C} Comfort low temp.	kWh/kWh	7,09	7,07	7,02	6,96	7,51	7,24	7,11	7,13	7,55	7,69
		η _s cool _{12/7°C}	%	281	280	278	275	298	287	282	282	299	304
		SEPR _{12/7°C} Process high temp.	kWh/kWh	8,01	8,29	8,11	7,96	8,97	9,09	8,34	8,13	8,45	8,50
Integrated Part Load Value		IPLV.SI	kW/kW	7,289	7,478	7,367	7,435	7,804	7,725	7,666	7,504	8,000	8,020
Sound levels - standard unit													
Sound power level ⁽¹⁾			dB(A)	99	102	102	102	102	102	102	102	102	102
Sound pressure level at 1 m ⁽²⁾			dB(A)	82	84	84	84	83	83	83	83	83	83
Sound levels - unit with Low Noise option													
Sound power level ⁽¹⁾			dB(A)	96	99	99	99	99	99	99	99	99	99
Sound pressure level at 1 m ⁽²⁾			dB(A)	78	80	80	80	80	80	80	80	80	80
Dimensions - standard unit													
Length			mm	2780	4025	4025	4025	4730	4730	4730	4730	4790	4790
Width			mm	1042	1036	1036	1036	1156	1156	1156	1156	1902	1902
Height			mm	1898	1870	1870	1925	2051	2051	2051	2051	1515	1515
Operating weight ⁽³⁾			kg	3492	5370	5408	5698	7066	7267	7305	7337	8681	8699
Compressors				Semi-hermetic screw compressors, 50 r/s									
Circuit A				1	1	1	1	1	1	1	1	1	1
Circuit B				-	1	1	1	1	1	1	1	1	1
Refrigerant - standard unit				R-134a									
Circuit A	kg		158	85	85	105	120	115	110	105	195	195	
	teqCO ₂		226	122	122	150	172	164	157	150	279	279	
Circuit B	kg		-	85	85	105	120	115	110	105	195	195	
	teqCO ₂		-	122	122	150	172	164	157	150	279	279	

- * In accordance with standard EN14511-3:2022.
- ** In accordance with standard EN14825:2022, average climate
- HW1 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- HW2 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 40°C/45°C, evaporator and condenser fouling factor 0 m². kW
- CW1 Cooling mode conditions: Evaporator water entering/leaving temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². K/W
- CW2 Cooling mode conditions: Evaporator water entering/leaving temperature 23°C/18°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². K/W
- η_s heat_{30/35°C} & SCOP_{30/35°C} Values calculated in accordance with EN14825:2022
- η_s cool_{12/7°C} & SEER_{12/7°C} **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Comfort application**
- SEPR_{12/7°C} Values calculated in accordance with EN14825:2022
- IPLV.SI Calculations according to standard performances AHRI 551-591 (SI)
- (1) In dB ref=10⁻¹² W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.
- (2) In dB ref 20μPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).
- (3) Weight shown is guideline only. Please refer to the unit nameplate



Eurovent certified values

STANDARD UNIT TECHNICAL CHARACTERISTICS

LW ST / LW ST + Heat pump application option		2308	2800	3000	3008	3400	3800	4200	4600	4408	4608
Oil - standard unit											
Circuit A	l	36	32	32	32	36	36	36	36	36	36
Circuit B	l	-	32	32	32	32	36	36	36	36	36
Capacity control		Connect Touch, electronic expansion valves (EXV)									
Minimum capacity ⁽⁴⁾	%	30	30	30	30	15	15	15	30	30	30
Evaporator		Shell and tube flooded type									
Water volume	l	98	182	182	205	301	301	301	301	354	354
Water connections (Victaulic)	in	6	6	6	8	8	8	8	8	8	8
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Condenser		Shell and tube type									
Water volume	l	137	193	193	193	340	340	340	340	426	426
Water connections (Victaulic)	in	8	8	8	8	8	8	8	8	8	8
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

(4) Minimum unit capacity corresponds to a physical state of the unit and is given for indication only. The actual capacity at this stage depends on operating conditions.

HIGH EFFICIENCY UNIT TECHNICAL CHARACTERISTICS

LW HE / LW HE + Heat pump application option				1328	1528	1928	2128	2328	2628	3028	3428	3828	4228	4628
Heating														
Standard unit Full load performances*	HW1	Nominal capacity	kW	586	667	851	912	995	1201	1327	1522	1680	1863	2019
		COP	kW/kW	6,36	6,30	6,52	6,29	6,27	6,35	6,24	6,29	6,06	6,38	6,27
	HW2	Nominal capacity	kW	573	654	836	896	970	1179	1296	1489	1643	1823	1964
		COP	kW/kW	4,82	4,78	4,92	4,74	4,78	4,85	4,77	4,82	4,66	4,84	4,81
Standard unit Seasonal energy ef- ficiency**	HW1	SCOP _{30/35°C}	kWh/kWh	6,58	6,59	6,48	6,27	6,48	6,72	6,85	6,75	6,38	6,73	6,71
		η _s heat _{30/35°C}	%	255	256	251	243	251	261	266	262	247	261	260
		P _{rated}	kW	694	791	1009	1081	1180	1424	1572	1805	1993	2210	2395
Cooling														
Standard unit Full load performances*	CW1	Nominal capacity	kW	502	569	727	776	850	1025	1143	1308	1435	1606	1736
		EER	kW/kW	5,63	5,57	5,75	5,55	5,59	5,67	5,71	5,74	5,53	5,80	5,72
	CW2	Nominal capacity	kW	546	643	788	859	886	1217	1251	1554	1687	1802	1865
		EER	kW/kW	6,36	6,38	6,62	6,44	6,28	7,29	6,30	8,19	6,69	6,75	6,54
Standard unit Seasonal energy efficiency**	SEER _{12/7°C} Comfort low temp.		kWh/kWh	7,00	7,12	7,05	6,82	7,24	7,34	7,78	7,69	7,29	7,79	7,86
	η _s cool _{12/7°C}		%	277	282	279	270	287	291	308	304	289	309	311
	SEPR _{12/7°C} Process high temp.		kWh/kWh	8,42	8,50	9,23	8,33	8,54	8,50	8,85	9,00	8,89	8,82	8,83
Integrated Part Load Value		IPLV.SI	kW/kW	7,391	7,473	7,556	7,301	7,538	7,639	8,053	8,150	7,485	7,757	8,089
Sound levels - standard unit														
Sound power level ⁽¹⁾			dB(A)	99	99	99	99	99	102	102	102	102	102	102
Sound pressure level at 1 m ⁽²⁾			dB(A)	82	82	81	81	81	83	83	83	83	83	83
Sound levels - standard unit + Low noise level option														
Sound power level ⁽¹⁾			dB(A)	96	96	96	96	96	99	99	99	99	99	99
Sound pressure level at 1 m ⁽²⁾			dB(A)	78	78	78	78	78	80	80	80	80	80	80
Dimensions - standard unit														
Length			mm	3059	3059	3290	3290	3290	4730	4730	4730	4730	4832	4832
Width			mm	936	936	1069	1069	1069	1039	1039	1162	1162	2129	2129
Height			mm	1743	1743	1950	1950	1950	1997	1997	2051	2051	1562	1562
Operating weight ⁽³⁾			kg	2981	3020	3912	3947	3965	6872	6950	7542	7752	10910	10946
Compressors				Semi-hermetic screw compressors, 50 r/s										
Circuit A				1	1	1	1	1	1	1	1	1	1	1
Circuit B				-	-	-	-	-	1	1	1	1	1	1
Refrigerant - standard unit				R-134a										
Circuit A	kg		130	130	180	175	177	120	120	130	130	240	250	
	teqCO ₂		186	186	257	250	253	172	172	186	186	343	358	
Circuit B	kg		-	-	-	-	-	120	120	150	130	240	250	
	teqCO ₂		-	-	-	-	-	172	172	215	186	343	358	

- * In accordance with standard EN14511-3:2022.
- ** In accordance with standard EN14825:2022, average climate
- HW1 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- HW2 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 40°C/45°C, evaporator and condenser fouling factor 0 m². kW
- CW1 Cooling mode conditions: Evaporator water entering/leaving temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². K/W
- CW2 Cooling mode conditions: Evaporator water entering/leaving temperature 23°C/18°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². K/W
- η_s heat_{30/35°C} & SCOP_{30/35°C} Values calculated in accordance with EN14825:2022
- η_s cool_{12/7°C} & SEER_{12/7°C} **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Comfort application**
- SEPR_{12/7°C} Values calculated in accordance with EN14825:2022
- IPLV.SI Calculations according to standard performances AHRI 551-591 (SI)
- (1) In dB ref=10⁻¹² W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.
- (2) In dB ref 20μPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).
- (3) Weight shown is guideline only. Please refer to the unit nameplate



Eurovent certified values



HIGH EFFICIENCY UNIT TECHNICAL CHARACTERISTICS

LW HE / LW HE + Heat pump application option		1328	1528	1928	2128	2328	2628	3028	3428	3828	4228	4628
Oil - standard unit												
Circuit A	l	32	32	36	36	36	32	32	36	36	36	36
Circuit B	l	-	-	-	-	-	32	32	32	36	36	36
Capacity control		Connect Touch, electronic expansion valves (EXV)										
Minimum capacity ⁽⁴⁾	%	30	30	15	15	30	30	30	15	15	15	30
Evaporator		Shell and tube flooded type										
Water volume	l	101	101	154	154	154	293	293	321	321	473	473
Water connections (Victaulic)	in	6	6	8	8	8	8	8	8	8	10	10
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Condenser		Shell and tube type										
Water volume	l	103	103	148	148	148	316	316	340	340	623	623
Water connections (Victaulic)	in	6	6	8	8	8	8	8	8	8	10	10
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

(4) Minimum unit capacity corresponds to a physical state of the unit and is given for indication only. The actual capacity at this stage depends on operating conditions.

TECHNICAL CHARACTERISTICS FOR LOW TEMPERATURE UNITS

STANDARD AND HIGH-EFFICIENCY LW UNITS (LOW TEMPERATURE BRINE SOLUTION)

LW ST		708	858	1008	1300	1302	1500	1508	2100	2300
Operating weight	kg	2041	2063	2102	2609	2609	2647	2678	3492	3516
Refrigerant charge ⁽¹⁾		R-134a								
Circuit A	kg	91	86	84	99	99	99	99	146	135
	teqCO ₂	129730	123552	120463	142085	142085	142085	142085	208494	193050
Circuit B	kg	0	0	0	0	0	0	0	0	0
	teqCO ₂	0	0	0	0	0	0	0	0	0
Evaporator		Single pass, multi-pipe flooded type								
Water volume	l	50	56	61	70	70	70	70	109	109
Water connections (Victaulic)	in	5	5	5	6	6	6	6	6	6
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000

LW ST		2308	2800	3000	3008	3400	4200	4600	4408	4608
Operating weight	kg	3720	5467	5505	5806	7392	7781	7829	9193	9219
Refrigerant charge ⁽¹⁾		R-134a								
Circuit A	kg	171	92	92	113	130	119	113	211	211
	teqCO ₂	244015	131274	131274	162162	185328	169884	162162	301158	301158
Circuit B	kg	0	92	92	113	130	119	113	211	211
	teqCO ₂	0	131274	131274	162162	185328	169884	162162	301158	301730
Evaporator		Single pass, multi-pipe flooded type								
Water volume	l	98	182	182	205	301	301	301	354	354
Water connections (Victaulic)	in	6	6	6	8	8	8	8	8	8
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000

(1) Weights are guidelines only. The refrigerant charge is given on the unit nameplate.

ELECTRICAL DATA NOTES FOR STANDARD UNITS

LW ST		708	858	1008	1300	1302	1500	1508	1900	2100	2300	2308	2800	3000	3008	3400	3800	4200	4600	4408	4608
Power circuit																					
Nominal voltage		V-ph-Hz		400-3-50																	
Voltage range		V		360-440																	
Control circuit		24 V via the built-in transformer																			
Nominal start-up current ⁽¹⁾																					
Circuit A	A	233	233	303	414	414	414	414	587	587	587	587	414	414	414	587	587	587	587	587	587
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	414	414	414	414	587	587	587	587	587
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	558	574	574	747	780	801	819	819	819
Maximum start-up current ⁽²⁾																					
Circuit A	A	233	233	303	414	414	414	414	587	587	587	587	414	414	414	587	587	587	587	587	587
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	414	414	414	414	587	587	587	587	587
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	631	656	656	829	882	904	938	938	938
Cosine phi																					
Nominal ⁽³⁾		0,83	0,85	0,83	0,87	0,88	0,89	0,89	0,88	0,89	0,90	0,90	0,88	0,89	0,89	0,88	0,88	0,89	0,9	0,9	0,9
Maximum ⁽⁴⁾		0,89	0,89	0,88	0,90	0,90	0,91	0,91	0,90	0,91	0,92	0,92	0,90	0,91	0,91	0,90	0,90	0,91	0,92	0,92	0,92
Total harmonic distortion ⁽⁴⁾		%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum power input*																					
Circuit A	kW	76	89	97	128	135	151	151	184	200	223	223	150	151	151	184	184	200	223	223	223
Circuit B	kW	-	-	-	-	-	-	-	-	-	-	-	135	151	151	151	184	200	223	202	223
Single power connection point option	kW	-	-	-	-	-	-	-	-	-	-	-	284	301	301	334	367	399	447	425	447
Nominal input current ⁽³⁾																					
Circuit A	A	84	96	113	136	144	162	162	193	214	232	232	162	162	162	193	193	214	232	232	232
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	144	162	162	162	193	214	232	214	232
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	306	324	324	355	386	427	464	446	464
Maximum input current (Un)*																					
Circuit A	A	123	145	160	206	217	242	242	295	317	351	351	242	242	242	295	295	317	351	351	351
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	217	242	242	242	295	317	351	317	351
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	459	484	484	537	590	634	702	668	702
Maximum input current (Un -10%) ⁽⁴⁾																					
Circuit A	A	138	162	178	218	230	260	260	304	340	358	358	260	260	260	304	304	340	358	358	358
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	230	260	260	260	304	340	358	340	358
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	490	520	520	564	608	680	716	698	716
Maximum input power with condensing temperature limitation option*																					
Circuit A	kW	67	79	87	114	118	133	134	173	183	205	205	133	133	133	173	173	183	207	207	207
Circuit B	kW	-	-	-	-	-	-	-	-	-	-	-	118	133	133	133	173	183	207	185	207
Single power connection point option	kW	-	-	-	-	-	-	-	-	-	-	-	251	265	265	305	346	365	414	391	414
Maximum input current (Un) with condensing temperature limitation option*																					
Circuit A	A	109	129	142	183	191	212	212	278	290	325	325	212	212	212	278	278	290	325	325	325
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	191	212	212	212	278	290	325	290	325
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	403	424	424	490	556	580	650	615	650

(1) Instantaneous start-up current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced start-up current of the largest compressor). Values obtained at standard Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

(2) Instantaneous start-up current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced start-up current of the largest compressor). Values obtained at operation point with maximum unit power input.

(3) Values obtained at standard Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

(4) Values obtained at operation point with maximum unit power input.

* Values obtained in operation with maximum unit power input. Values given on the unit name plate.

High Efficiency Unit Electrical Data Notes

LW HE		1328	1528	1928	2128	2328	2628	3028	3428	3828	4228	4628
Power circuit												
Nominal voltage	V-ph-Hz	400-3-50										
Voltage range	V	360-440										
Control circuit		24 V via the built-in transformer										
Nominal start-up current ⁽¹⁾												
Circuit A	A	414	414	587	587	587	414	414	587	587	587	587
Circuit B	A	-	-	-	-	-	414	414	414	587	587	587
Single power connection point option	A	-	-	-	-	-	556	574	747	780	801	819
Maximum start-up current ⁽²⁾												
Circuit A	A	414	414	587	587	587	414	414	587	587	587	587
Circuit B	A	-	-	-	-	-	414	414	414	587	587	587
Single power connection point option	A	-	-	-	-	-	631	656	829	882	904	938
Cosine phi												
Nominal ⁽³⁾		0,88	0,89	0,88	0,89	0,90	0,86	0,87	0,88	0,88	0,89	0,90
Maximum ⁽⁴⁾		0,90	0,90	0,90	0,91	0,92	0,89	0,90	0,90	0,90	0,91	0,92
Total harmonic distortion ⁽⁴⁾	%	0	0	0	0	0	0	0	0	0	0	0
Maximum power input*												
Circuit A	kW	135	151	184	200	223	134	151	184	184	200	223
Circuit B	kW	-	-	-	-	-	134	151	151	184	200	223
Single power connection point option	kW	-	-	-	-	-	267	301	334	367	399	447
Nominal input current ⁽³⁾												
Circuit A	A	144	162	193	214	232	144	162	193	193	214	232
Circuit B	A	-	-	-	-	-	144	162	162	193	214	232
Single power connection point option	A	-	-	-	-	-	288	324	355	386	427	464
Maximum input current (Un)*												
Circuit A	A	217	242	295	317	351	217	242	295	295	317	351
Circuit B	A	-	-	-	-	-	217	242	242	295	317	351
Single power connection point option	A	-	-	-	-	-	434	484	537	590	634	702
Maximum input current (Un -10%) ⁽⁴⁾												
Circuit A	A	230	260	304	340	358	230	260	304	304	340	358
Circuit B	A	-	-	-	-	-	230	260	260	304	340	358
Single power connection point option	A	-	-	-	-	-	460	520	564	608	680	716
Maximum input power with condensing temperature limitation option*												
Circuit A	kW	118	133	173	183	207	118	133	173	173	183	207
Circuit B	kW	-	-	-	-	-	118	133	133	173	183	207
Single power connection point option	kW						235	265	305	346	365	414
Maximum input current (Un) with condensing temperature limitation option*												
Circuit A	A	191	212	278	290	325	191	212	278	278	290	325
Circuit B	A	-	-	-	-	-	191	212	212	278	290	325
Single power connection point option	A	-	-	-	-	-	382	424	490	556	580	650

(1) Instantaneous start-up current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced start-up current of the largest compressor). Values obtained at standard Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

(2) Instantaneous start-up current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced start-up current of the largest compressor). Values obtained at operation with maximum unit power input.

(3) Values obtained at standard Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

(4) Values obtained at operation with maximum unit power input.

* Values obtained in operation with maximum unit power input. Values given on the unit name plate.

TECHNICAL CHARACTERISTICS

STANDARD UNITS FOR HIGH CONDENSING TEMPERATURES

LW ST + High condensing option				708	858	1008	1300	1302	1500	1508	1900	2100	2300	
Heating														
Unit with high condens- ing option Full load performances*	HW1	Nominal capacity	kW	328	366	413	502	536	597	618	756	845	869	
		COP	kW/kW	5,49	5,48	5,44	5,11	5,41	5,27	5,41	5,31	5,37	5,17	
	HW2	Nominal heating capacity	kW	319	356	402	470	501	559	599	706	789	812	
		COP	kW/kW	4,54	4,51	4,47	4,21	4,45	4,36	4,48	4,39	4,44	4,31	
	HW3	Nominal capacity	kW	310	347	391	440	469	523	582	659	738	760	
		COP	kW/kW	3,80	3,78	3,75	3,47	3,67	3,61	3,76	3,62	3,68	3,57	
Unit with high condensing option Seasonal energy efficiency**	HW1	SCOP _{30/35°C}	kWh/kWh	5,77	5,94	5,86	5,54	5,77	5,75	5,72	5,55	5,79	5,01	
		ηs heat _{30/35°C}	%	223	230	226	214	223	222	221	214	223	193	
	HW3	SCOP _{47/55°C}	kWh/kWh	4,58	4,63	4,56	4,20	4,42	4,45	4,50	4,26	4,45	3,86	
		ηs heat _{47/55°C}	%	175	177	175	160	169	170	172	163	170	146	
		P _{rated}	kW	411	415	467	535	571	637	697	803	898	926	
		Cooling												
Unit with high condens- ing option Full load performances*	CW1	Nominal capacity	kW	278	309	348	NA	NA	NA	NA	NA	NA	NA	
		EER	kW/kW	4,83	4,80	4,76	NA	NA	NA	NA	NA	NA	NA	
Unit with high condensing option Seasonal energy efficiency**		SEER _{12/7°C} Comfort low temp.	kWh/kWh	6,19	6,29	6,22	NA	NA	NA	NA	NA	NA	NA	
		ηs cool _{12/7°C}	%	245	249	246	NA	NA	NA	NA	NA	NA	NA	
		SEPR _{12/7°C} Process high temp.	kWh/kWh	6,67	6,72	6,57	NA	NA	NA	NA	NA	NA	NA	
Integrated Part Load Value		IPLV.SI	kW/kW	6,364	6,527	6,531	5,928	6,176	6,287	6,185	5,931	6,433	5,575	
Sound levels - standard unit														
Sound power level ⁽¹⁾				dB(A)	95	95	95	99	99	99	99	102	102	102
Sound pressure level at 1 m ⁽²⁾				dB(A)	78	78	78	82	82	82	82	84	84	84
Sound levels - standard unit + low noise level option														
Sound power level ⁽¹⁾				dB(A)	-	-	-	96	96	96	96	100	100	100
Sound pressure level at 1 m ⁽²⁾				dB(A)	-	-	-	78	78	78	78	82	82	82
Dimensions														
Length				mm	2724	2724	2724	2741	2741	2741	2741	3059	3059	3059
Width				mm	928	928	928	936	936	936	936	1090	1090	1090
Height				mm	1567	1567	1567	1692	1692	1692	1692	1858	1858	1858
Operating weight ⁽³⁾				kg	2017	2036	2072	2575	2575	2613	2644	3407	3438	3462
Compressors				Semi-hermetic screw compressors, 50 r/s										
Circuit A				1	1	1	1	1	1	1	1	1	1	1
Refrigerant ⁽³⁾				R-134a										
Circuit A				kg	84	80	78	92	92	92	92	145	135	125
				teqCO ₂	120	114	112	132	132	132	132	207	193	179

- * In accordance with standard EN14511-3:2022.
- ** In accordance with standard EN14825:2022, average climate
- HW1 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- HW2 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 40°C/45°C, evaporator and condenser fouling factor 0 m². kW
- HW3 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 47°C/55°C, evaporator and condenser fouling factor 0 m². kW
- CW1 Cooling mode conditions: Evaporator water entering/leaving temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- ηs heat_{30/35°C} & SCOP_{30/35°C} Values calculated in accordance with EN14825:2022
- ηs heat_{47/55°C} & SCOP_{47/55°C} Values calculated in accordance with EN14825:2022
- ηs cool_{12/7°C} & SEER_{12/7°C} **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Comfort application**
- SEPR_{12/7°C} Values calculated in accordance with EN14825:2022
- IPLV.SI Calculations according to standard performances AHRI 551-591 (SI)
- NA Non Authorized for the specific application for CEE market
- (1) In dB ref=10⁻¹² W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.
- (2) In dB ref 20μPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).
- (3) Weight shown is guideline only. Please refer to the unit nameplate



Eurovent certified values

TECHNICAL CHARACTERISTICS

STANDARD UNITS FOR HIGH CONDENSING TEMPERATURES

LW ST + High condensing option		708	858	1008	1300	1302	1500	1508	1900	2100	2300
Oil											
Circuit A	l	23,5	23,5	23,5	32	32	32	32	36	36	36
Capacity control		Connect Touch, electronic expansion valves (EXV)									
Minimum capacity ⁽⁴⁾	%	30	30	30	30	30	30	30	25	25	25
Evaporator		Shell and tube flooded type									
Net water volume	l	50	56	61	70	70	70	70	109	109	109
Water connections (Victaulic)	in	5	5	5	5	5	5	5	6	6	6
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Condenser		Shell and tube type									
Net water volume	l	55	55	55	76	76	76	76	109	109	109
Water connections (Victaulic)	in	5	5	5	5	5	5	5	6	6	6
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

(4) Minimum unit capacity corresponds to a physical state of the unit and is given for indication only. The actual capacity at this stage depends on operating conditions.

TECHNICAL CHARACTERISTICS

STANDARD UNITS FOR HIGH CONDENSING TEMPERATURES

LW ST + High condensing option				2308	2800	3000	3008	3400	3800	4200	4600	4408	4608
Heating													
Unit with high condensing option Full load performances*	HW1	Nominal capacity	kW	963	1163	1228	1338	1432	1551	1671	1776	1928	1991
		COP	kW/kW	5,36	5,37	5,28	5,38	5,56	5,32	5,23	5,12	5,34	5,27
	HW2	Nominal heating capacity	kW	939	1085	1146	1290	1329	1445	1558	1649	1873	1936
		COP	kW/kW	4,46	4,46	4,40	4,48	4,63	4,45	4,38	4,34	4,50	4,46
	HW3	Nominal capacity	kW	915	1012	1068	1249	1244	1345	1452	1543	1821	1882
		COP	kW/kW	3,73	3,71	3,66	3,77	3,83	3,68	3,64	3,63	3,81	3,77
Unit with high condensing option Seasonal energy efficiency**	HW1	SCOP _{30/35°C}	kWh/kWh	5,66	5,86	5,86	5,78	6,09	5,69	5,79	5,43	5,93	5,92
		ηs heat _{30/35°C}	%	218	226	226	223	236	220	224	209	229	229
	HW3	SCOP _{47/55°C}	kWh/kWh	4,47	4,73	4,73	4,61	4,68	4,38	4,45	4,35	4,74	4,76
		ηs heat _{47/55°C}	%	171	181	181	176	179	167	170	166	182	182
		P _{rated}	kW	1094	1234	1303	1497	1518	1641	1770	1882	2179	2253
Cooling													
Unit with high condensing option Full load performances*	CW1	Nominal capacity	kW	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		EER	kW/kW	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unit with high condensing option Seasonal energy efficiency**		SEER _{12/7°C} Comfort low temp.	kWh/kWh	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		ηs cool _{12/7°C}	%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		SEPR _{12/7°C} Process high temp.	kWh/kWh	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Integrated Part Load Value		IPLV.SI	kW/kW	6,351	6,572	6,595	6,522	6,873	6,211	6,615	6,366	6,939	7,136
Sound levels - standard unit													
Sound power level ⁽¹⁾			dB(A)	102	102	102	102	105	105	105	105	105	105
Sound pressure level at 1 m ⁽²⁾			dB(A)	84	84	84	84	86	86	86	86	86	86
Sound levels - standard unit + low noise level option													
Sound power level ⁽¹⁾			dB(A)	100	99	99	99	103	103	103	103	103	103
Sound pressure level at 1 m ⁽²⁾			dB(A)	82	80	80	80	84	84	84	84	84	84
Dimensions													
Length			mm	2780	4025	4025	4025	4730	4730	4730	4730	4790	4790
Width			mm	1090	1036	1036	1036	1201	1201	1201	1201	1947	1947
Height			mm	1920	1870	1870	1925	2071	2071	2071	2071	1535	1535
Operating weight ⁽³⁾			kg	3672	5370	5408	5698	7233	7554	7622	7670	9006	9032
Compressors				Semi-hermetic screw compressors, 50 r/s									
Circuit A				1	1	1	1	1	1	1	1	1	1
Circuit B				-	1	1	1	1	1	1	1	1	1
Refrigerant ⁽³⁾				R-134a									
Circuit A	kg	158	85	85	105	120	115	110	105	195	195		
	teqCO ₂	226	122	122	150	172	164	157	150	279	279		
Circuit B	kg	-	85	85	105	120	115	110	105	195	195		
	teqCO ₂	-	122	122	150	172	164	157	150	279	279		

* In accordance with standard EN14511-3:2022.

** In accordance with standard EN14825:2022, average climate

HW1 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW

HW2 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 40°C/45°C, evaporator and condenser fouling factor 0 m². kW

HW3 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 47°C/55°C, evaporator and condenser fouling factor 0 m². kW

CW1 Cooling mode conditions: Evaporator water entering/leaving temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW

η_{s heat}_{30/35°C} & SCOP_{30/35°C} Values calculated in accordance with EN14825:2022

η_{s heat}_{47/55°C} & SCOP_{47/55°C} Values calculated in accordance with EN14825:2022

IPLV.SI Calculations according to standard performances AHRI 551-591 (SI)

(1) In dB ref=10⁻¹² W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.

(2) In dB ref 20μPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).

(3) Weight shown is guideline only. Please refer to the unit nameplate

TECHNICAL CHARACTERISTICS

STANDARD UNITS FOR HIGH CONDENSING TEMPERATURES

LW ST + High condensing option		2308	2800	3000	3008	3400	3800	4200	4600	4408	4608
Oil											
Circuit A	l	36	32	32	32	36	36	36	36	36	36
Circuit B	l	-	32	32	32	32	36	36	36	36	36
Capacity control		Connect'Touch, electronic expansion valves (EXV)									
Minimum capacity ⁽⁴⁾	%	25	15	15	15	15	10	10	10	10	10
Evaporator		Multi-pipe flooded type									
Net water volume	l	98	182	182	205	301	301	301	301	354	354
Water connections (Victaulic)	in	6	6	6	8	8	8	8	8	8	8
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Condenser		Multi-pipe flooded type									
Net water volume	l	137	193	193	193	340	340	340	340	426	426
Water connections (Victaulic)	in	8	8	8	8	8	8	8	8	8	8
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

(4) Minimum unit capacity corresponds to a physical state of the unit and is given for indication only. The actual capacity at this stage depends on operating conditions.

TECHNICAL CHARACTERISTICS

HIGH EFFICIENCY UNITS FOR HIGH CONDENSING TEMPERATURES



LW HE + high condensing option				1328	1528	1928	2128	2328	2628	3028	3428	3828	4228	4628
Heating														
Unit with high condensing option Full load performances*	HW1	Nominal capacity	kW	600	670	840	910	975	1188	1375	1514	1698	1890	1983
		COP	kW/kW	5,89	5,90	5,72	5,58	5,72	5,61	5,77	5,55	5,40	5,78	5,73
	HW2	Nominal heating capacity	kW	580	646	815	885	950	1147	1322	1465	1648	1834	1929
		COP	kW/kW	4,85	4,86	4,72	4,61	4,75	4,65	4,80	4,62	4,52	4,80	4,79
	HW3	Nominal capacity	kW	561	625	790	862	925	1110	1275	1419	1598	1783	1874
		COP	kW/kW	4,02	4,04	3,92	3,83	3,97	3,86	4,01	3,88	3,81	4,00	4,00
Unit with high condensing option Seasonal energy efficiency**	HW1	SCOP _{30/35°C}	kWh/kWh	6,15	6,22	6,40	6,11	5,99	5,97	6,24	6,18	6,18	6,50	6,21
		ηs heat _{30/35°C}	%	238	241	248	236	231	231	242	239	239	252	240
		SCOP _{47/55°C}	kWh/kWh	4,78	4,86	4,97	4,76	4,73	4,63	4,88	4,88	4,94	5,07	4,92
	HW3	ηs heat _{47/55°C}	%	183	186	191	182	181	177	187	187	189	195	189
		P _{rated}	kW	673	749	947	1030	1106	1330	1531	1701	1915	2133	2243
Cooling														
Unit with high condensing option Full load performances*	CW1	Nominal cooling capacity	kW	510	569	715	770	833	1011	1178	1287	1437	1613	1706
		EER	kW/kW	5,14	5,17	5,02	4,88	5,09	4,98	5,23	4,96	4,84	5,15	5,21
Unit with high condensing option Seasonal energy efficiency**		SEER _{12/7°C} Comfort low temp.	kWh/kWh	6,53	6,68	6,81	6,56	6,45	6,51	6,95	6,76	6,66	7,13	6,90
		ηs cool _{12/7°C}	%	258	264	269	259	255	258	275	267	264	282	273
		SEPR _{12/7°C} Process high temp.	kWh/kWh	6,90	6,93	7,23	6,68	6,38	6,71	6,97	6,88	7,03	7,15	6,63
Integrated Part Load Value	IPLV.SI		kW/kW	6,612	6,804	7,029	6,703	6,782	6,505	6,997	6,946	7,131	7,302	7,308
Sound levels - standard unit														
Sound power level ⁽¹⁾			dB(A)	99	99	102	102	102	102	102	105	105	105	105
Sound pressure level at 1 m ⁽²⁾			dB(A)	82	82	84	84	84	83	83	86	86	86	86
Sound levels - standard unit + low noise level option														
Sound power level ⁽¹⁾			dB(A)	96	96	100	100	100	99	99	103	103	103	103
Sound pressure level at 1 m ⁽²⁾			dB(A)	78	78	82	82	82	80	80	84	84	84	84
Dimensions														
Length	mm		3059	3059	3290	3290	3290	4730	4730	4730	4730	4832	4832	
Width	mm		936	936	1105	1105	1105	1039	1039	1202	1202	2174	2174	
Height	mm		1743	1743	1970	1970	1970	1997	1997	2071	2071	1585	1585	
Operating weight ⁽³⁾	kg		2981	3020	4072	4117	4145	6872	6950	7721	8059	11225	11279	
Compressors				Semi-hermetic screw compressors, 50 r/s										
Circuit A				1	1	1	1	1	1	1	1	1	1	1
Circuit B				-	-	-	-	-	1	1	1	1	1	1

- * In accordance with standard EN14511-3:2022.
- ** In accordance with standard EN14825:2022, average climate
- HW1 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- HW2 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 40°C/45°C, evaporator and condenser fouling factor 0 m². kW
- HW3 Heating mode conditions: Evaporator entering/leaving water temperature 10°C/7°C, condenser entering/leaving water temperature 47°C/55°C, evaporator and condenser fouling factor 0 m². kW
- CW1 Cooling mode conditions: Evaporator water entering/leaving temperature 12°C/7°C, condenser entering/leaving water temperature 30°C/35°C, evaporator and condenser fouling factor 0 m². kW
- η_s heat_{30/35°C} & SCOP_{30/35°C} Values calculated in accordance with EN14825:2022
- η_s heat_{47/55°C} & SCOP_{47/55°C} Values calculated in accordance with EN14825:2022
- η_s cool_{12/7°C} & SEER_{12/7°C} **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Comfort application**
- SEPR_{12/7°C} Values calculated in accordance with EN14825:2022
- IPLV.SI Calculations according to standard performances AHRI 551-591 (SI).
- (1) In dB ref=10⁻¹² W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)).
- (2) In dB ref 20μPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).
- (3) Weight shown is guideline only. Please refer to the unit nameplate



Eurovent certified values

TECHNICAL CHARACTERISTICS

HIGH EFFICIENCY UNITS FOR HIGH CONDENSING TEMPERATURES



LW HE + high condensing option		1328	1528	1928	2128	2328	2628	3028	3428	3828	4228	4628
Refrigerant ⁽³⁾		R-134a										
Circuit A	kg	130	130	180	175	177	120	120	130	130	240	250
	teqCO ₂	186	186	257	250	253	172	172	186	186	343	358
Circuit B	kg	-	-	-	-	-	120	120	150	130	240	250
	teqCO ₂	-	-	-	-	-	172	172	215	186	343	358
Oil												
Circuit A	l	32	32	36	36	36	32	32	36	36	36	36
Capacity control		Connect'Touch, electronic expansion valves (EXV)										
Minimum capacity ⁽⁴⁾	%	30	30	20	20	20	15	15	15	10	10	10
Evaporator		Multi-pipe flooded type										
Net water volume	l	101	101	154	154	154	293	293	321	321	473	473
Water connections (Victaulic)	in	6	6	8	8	8	8	8	8	8	10	10
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Condenser		Multi-pipe flooded type										
Net water volume	l	103	103	148	148	148	316	316	340	340	623	623
Water connections (Victaulic)	in	6	6	8	8	8	8	8	10	10	10	10
Drain and vent connections (NPT)	in	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

(4) Minimum unit capacity corresponds to a physical state of the unit and is given for indication only. The actual capacity at this stage depends on operating conditions.

ELECTRICAL DATA NOTES

STANDARD UNITS FOR HIGH CONDENSING TEMPERATURES

LW ST		708	858	1008	1300	1302	1500	1508	1900	2100	2300	2308	2800	3000	3008	3400	3800	4200	4600	4408	4608
Power circuit																					
Nominal voltage	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via the built-in transformer																			
Nominal start-up current ⁽¹⁾																					
Circuit A	A	303	388	388	587	587	587	587	772	772	772	772	587	587	587	772	772	772	772	772	772
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	772	772	772	772	772
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	757	757	757	943	965	986	1004	1004	1004
Maximum start-up current ⁽²⁾																					
Circuit A	A	303	388	388	587	587	587	587	772	772	772	772	587	587	587	772	772	772	772	772	772
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	772	772	772	772	772
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	887	887	887	1072	1172	1202	1232	1004	1232
Cosine phi																					
Nominal ⁽³⁾		0,79	0,78	0,79	0,83	0,85	0,85	0,85	0,84	0,86	0,87	0,87	0,85	0,85	0,85	0,86	0,85	0,86	0,87	0,86	0,87
Maximum ⁽⁴⁾		0,88	0,87	0,88	0,90	0,90	0,91	0,91	0,90	0,90	0,90	0,90	0,90	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91
Total harmonic distortion ⁽⁴⁾	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum power input*																					
Circuit A	kW	97	111	122	156	173	191	191	249	268	286	286	191	191	191	252	252	271	290	290	290
Circuit B	kW	-	-	-	-	-	-	-	-	-	-	-	173	191	191	191	252	271	290	271	290
Single power connection point option	kW	-	-	-	-	-	-	-	-	-	-	-	364	382	382	443	504	542	580	562	580
Nominal input current ⁽³⁾																					
Circuit A	A	95	109	125	150	162	171	171	193	214	232	232	171	171	171	210	210	230	250	250	250
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	162	171	171	171	210	230	250	230	250
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	333	342	342	381	420	460	500	480	500
Maximum input current (Un)*																					
Circuit A	A	160	185	200	250	275	300	300	400	430	460	460	300	300	300	400	400	430	460	460	460
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	275	300	300	300	400	430	460	430	460
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	575	600	600	700	800	860	920	890	920
Maximum input current (Un -10%) ⁽⁴⁾																					
Circuit A	A	176	206	224	270	300	330	330	419	455	476	476	330	330	330	419	419	455	476	476	476
Circuit B	A	-	-	-	-	-	-	-	-	-	-	-	300	330	330	330	419	455	476	455	476
Single power connection point option	A	-	-	-	-	-	-	-	-	-	-	-	630	660	660	749	838	910	952	931	952

(1) Instantaneous start-up current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced start-up current of the largest compressor).
Values obtained at standard Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

(2) Instantaneous start-up current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced start-up current of the largest compressor).
Values obtained at operation with maximum unit power input.

(3) Values obtained at standard Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

(4) Values obtained at operation with maximum unit power input.

* Values obtained in operation with maximum unit power input. Values given on the unit name plate.

ELECTRICAL DATA NOTES

HIGH EFFICIENCY UNITS FOR HIGH CONDENSING TEMPERATURES



LW HE		1328	1528	1928	2128	2328	2628	3028	3428	3828	4228	4628
Power circuit												
Nominal voltage	V-ph-Hz	400-3-50										
Voltage range	V	360-440										
Control circuit		24 V via the built-in transformer										
Nominal start-up current⁽¹⁾												
Circuit A	A	587	587	772	772	772	587	587	772	772	772	772
Circuit B	A	-	-	-	-	-	587	587	587	772	772	772
Single power connection point option	A	-	-	-	-	-	749	757	943	965	986	1004
Maximum start-up current⁽²⁾												
Circuit A	A	587	587	772	772	772	587	587	772	772	772	772
Circuit B	A	-	-	-	-	-	587	587	587	772	772	772
Single power connection point option	A	-	-	-	-	-	862	887	1072	1172	1202	1232
Cosine phi												
Nominal ⁽³⁾		0,88	0,88	0,84	0,86	0,87	0,87	0,88	0,86	0,85	0,86	0,87
Maximum ⁽⁴⁾		0,91	0,92	0,90	0,90	0,90	0,91	0,92	0,91	0,91	0,91	0,91
Total harmonic distortion ⁽⁴⁾	%	0	0	0	0	0	0	0	0	0	0	0
Maximum power input*												
Circuit A	kW	173	191	252	271	290	173	191	252	252	271	290
Circuit B	kW	-	-	-	-	-	173	191	191	252	271	290
Single power connection point option	kW	-	-	-	-	-	346	382	443	504	542	580
Nominal input current⁽³⁾												
Circuit A	A	162	171	210	230	250	162	171	210	210	230	250
Circuit B	A	-	-	-	-	-	162	171	171	210	230	250
Single power connection point option	A	-	-	-	-	-	324	342	381	420	460	500
Maximum input current (Un)*												
Circuit A	A	275	300	400	430	460	275	300	400	400	430	460
Circuit B	A	-	-	-	-	-	275	300	300	400	430	460
Single power connection point option	A	-	-	-	-	-	550	600	700	800	860	920
Maximum input current (Un -10%)⁽⁴⁾												
Circuit A	A	300	330	419	455	476	300	330	419	419	455	476
Circuit B	A	-	-	-	-	-	300	330	330	419	455	476
Single power connection point option	A	-	-	-	-	-	600	660	749	838	910	952

(1) Instantaneous start-up current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced start-up current of the largest compressor).
Values obtained at standard Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

(2) Instantaneous start-up current (maximum operating current of the smallest compressor(s) + locked rotor current or reduced start-up current of the largest compressor).
Values obtained at operation with maximum unit power input.

(3) Values obtained at standard Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

(4) Values obtained at operation with maximum unit power input.

* Values obtained in operation with maximum unit power input. Values given on the unit name plate.

ELECTRICAL DATA NOTES

■ Standard and high efficiency units

Notes, electrical data and operating conditions **HYDROCIAT** LW

- As standard:
LW 708 to 2328 units have a single power connection point located immediately upstream of the main disconnect switch.
HYDROCIAT LW 2800 to 4628 units have two connection points located immediately upstream of the main disconnect switches.
- The control box includes the following standard features:
 - One main disconnect switch per circuit⁽¹⁾,
 - Starter and motor protection devices for each compressor
 - Anti-short cycle protection devices⁽¹⁾,
 - Control devices
- Field connections:
All connections to the system and the electrical installations must be in full accordance with all applicable codes.
- The CIAT LW units are designed and built to ensure conformance with local codes. The recommendations of European standard EN 60204-1 (corresponds to IEC 60204-1) (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.
- The absence of power supply disconnect switch(es) and short-cycle protection devices in option : Non disconnect switch, but short circuit protection, is an important factor that has to be taken into consideration at the installation site.
Units equipped with one of these two options are supplied with a declaration of incorporation, as required by the machinery directive.

Notes:

- **Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60204-1 is the best means of ensuring compliance with the Machines Directive.**
- **Annex B of EN 60204 1 describes the electrical characteristics used for the operation of the machines.**

1. The operating environment for the **HYDROCIAT** LW units is specified below:
 - Environment(2): Environment as classified in EN 60721 (corresponds to IEC 60721):
 - Indoor installation
 - Ambient temperature range: minimum temperature +5°C to +42°C, class AA4
 - Altitude: lower than or equal to 2000 m
 - Presence of water: class AD2 (possibility of water droplets)
 - Presence of hard solids, class 4S2 (no significant dust present)
 - Presence of corrosive and polluting substances, class 4C2 (negligible)
2. Power supply frequency variation: ± 2 Hz.
3. The neutral (N) line must not be connected directly to the unit (if necessary use a transformer).
4. Overcurrent protection of the power supply conductors is not provided with the unit.
5. The factory installed disconnect switch(es)/circuit breaker(s) is (are) of a type suitable for power interruption in accordance with EN 60947-3 (corresponds to IEC 60947-3).
6. The units are designed for connection to TN networks (IEC 60364). For IT networks the earth connection must not be at the network earth. Provide a local earth, consult competent local organisations to complete the electrical installation.

NOTE: If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local CIAT representative.

- (1) Not provided for units equipped with no disconnect switch but short circuit protection option.
- (2) The required protection level for this class is IP21B or 1PX1B (according to reference document IEC 60529). All **HYDROCIAT** LW units fulfil this protection condition. In general the casings fulfil class IP23 or IPX3B.

PARTIAL LOAD PERFORMANCE

With the rapid increase in energy costs and the care about environmental impacts of electricity production, power consumption of air conditioning equipment has become an important topic.

The energy efficiency of a unit at full load is rarely representative of the actual performance of the units, as on average a unit works less than 5% of the time at full load.

■ IPLV (in accordance with AHRI 550/590)

The IPLV (integrated part load value) allows evaluation of the average energy efficiency based on four operating conditions defined by the AHRI (Air Conditioning, Heating and Refrigeration Institute). The IPLV is the average weighted value of the energy efficiency ratios (EER) at different operating conditions, weighted by the operating time.

■ IPLV (integrated part load value)

Load %	Condenser entering water temperature, °C	Energy efficiency	Operating time, %
100	29,4	EER ₁	1
75	23,9	EER ₂	42
50	18,3	EER ₃	45
25	18,3	EER ₄	12
IPLV = EER ₁ x 1% + EER ₂ x 42% + EER ₃ x 45% + EER ₄ x 12%			

Note: Constant leaving chilled water temperature 6.67°C (44°F).

Condenser fouling factor: 0.44×10^{-4} (m² K)/W, evaporator fouling factor: 0.18×10^{-4} (m² K)/W.

The heat load of a building depends on many factors, such as the outdoor air temperature, the exposure to the sun and its occupancy.

Consequently, it is preferable to use the average seasonal energy efficiency, calculated at several operation points that are representative of unit use.

■ SEER for comfort chillers (in accordance with EU ECODESIGN)

The **SEER** (Seasonal Energy Efficiency Ratio) measures the seasonal energy efficiency of comfort **chillers** by calculating the ratio between annual cooling demand of the building and annual energy demand of the chiller. It takes into account the energy efficiency achieved for each outdoor temperature weighted by the number of hours observed for each of these temperatures, using actual climate data.

SEER is a new way of measuring the true energy efficiency of chillers for **comfort cooling** over an entire year.

This new indicator gives a more realistic indication of the real energy efficiency and environmental impact of a cooling system (Ecodesign Regulation 2016/2281).

■ SCOP (In accordance with EU ECODESIGN)

The **SCOP** (Seasonal Coefficient of Performance) permits evaluation of the average energy efficiency at part load, based on multipoint conditions (16°C to -10°C for average climate) and number of hours occurring at each air temperature (Bin hours).

To be able to compare the energy efficiency of boilers using a primary energy source (gas or fuel) with heat pumps using a final energy source (electricity), the seasonal efficiency criteria used by the Ecodesign regulations is known as it is based on the use of primary energy sources and expressed in % (Ecodesign Regulation 813/2013)

The heat load of a building depends on many factors, such as the outside air temperature, the exposure to the sun and the building occupancy.

Consequently it is preferable to use the average energy efficiency, calculated at several operating points that are representative for the unit utilisation.

■ SEPR for process chillers (in accordance with EU ECODESIGN)

The **SEPR** (Seasonal Energy Performance Ratio) measures the seasonal energy efficiency of **process chillers** by calculating the ratio between annual cooling demand of the process and annual energy demand of the chiller. It takes into account the energy efficiency achieved at each outdoor temperature of an average climate weighted by the number of hours observed for each of these temperatures.

SEPR is a new way of measuring the true energy efficiency of chillers for **process cooling** over an entire year. This new indicator gives a more realistic indication of the real energy efficiency and environmental impact of the cooling system (Ecodesign Regulation 2015/1095 or 2016/2281).

SOUND LEVELS

Standard ST - High Efficiency HE versions

■ Sound power levels ref 10⁻¹² W ±3 dB (Lw)

Standard unit

LW ST	Sound power level spectrum, dB						Overall sound power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
708	56	81	86	93	88	70	95
858	56	81	86	93	88	70	95
1008	56	81	86	93	88	70	95
1300	76	85	94	97	87	75	99
1302	76	85	94	97	87	75	99
1500	76	85	94	97	87	75	99
1508	76	85	94	97	87	75	99
1900	72	84	94	97	89	74	99
2100	72	84	94	97	89	74	99
2300	72	84	94	97	89	74	99
2308	72	84	94	97	89	74	99
2800	79	88	97	100	90	78	102
3000	79	88	97	100	90	78	102
3008	79	88	97	100	90	78	102
3400	79	88	97	100	90	78	102
3800	77	88	97	100	91	78	102
4200	75	87	97	100	92	77	102
4600	75	87	97	100	92	77	102
4408	75	87	97	100	92	77	102
4608	75	87	97	100	92	77	102

Standard units with high condensing temperature option

LW ST	Sound power level spectrum, dB						Overall sound power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
708	55	80	89	92	88	77	95
858	55	80	89	92	88	77	95
1008	55	80	89	92	88	77	95
1300	76	85	94	97	87	75	99
1302	76	85	94	97	87	75	99
1500	76	85	94	97	87	75	99
1508	76	85	94	97	87	75	99
1900	69	89	97	99	92	77	102
2100	69	89	97	99	92	77	102
2300	69	89	97	99	92	77	102
2308	69	89	97	99	92	77	102
2800	79	88	97	100	90	78	102
3000	79	88	97	100	90	78	102
3008	79	88	97	100	90	78	102
3400	79	88	97	100	90	78	102
3800	74	92	100	102	95	79	105
4200	74	92	100	102	95	79	105
4600	74	92	100	102	95	79	105
4408	74	92	100	102	95	79	105
4608	74	92	100	102	95	79	105

High efficiency units



LW HE	Sound power level spectrum, dB						Overall sound power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
1328	76	85	94	97	87	75	99
1528	76	85	94	97	87	75	99
1928	72	84	94	97	89	74	99
2128	72	84	94	97	89	74	99
2328	72	84	94	97	89	74	99
2628	79	88	97	100	90	78	102
3028	79	88	97	100	90	78	102
3428	77	88	97	100	91	78	102
3828	75	87	97	100	92	77	102
4228	75	87	97	100	92	77	102
4628	75	87	97	100	92	77	102

High efficiency Units with high condensing temperature option



LW HE	Sound power level spectrum, dB						Overall sound power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
1328	76	85	94	97	87	75	99
1528	76	85	94	97	87	75	99
1928	69	89	97	99	92	77	102
2128	69	89	97	99	92	77	102
2328	69	89	97	99	92	77	102
2628	79	88	97	100	90	78	102
3028	79	88	97	100	90	78	102
3428	74	92	100	102	95	79	105
3828	74	92	100	102	95	79	105
4228	74	92	100	102	95	79	105
4628	74	92	100	102	95	79	105

Note: The sound levels by octave bands are given for information only and not contractually binding.
Only the overall power level is contractual.

SOUND LEVELS

Standard ST - High Efficiency HE Low Noise option versions

■ Sound power levels ref 10⁻¹² W ±3 dB (Lw)

Standard unit

LW ST	Sound power level spectrum, dB						Overall sound power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
1300	76	85	90	93	85	75	96
1302	76	85	90	93	85	75	96
1500	76	85	90	93	85	75	96
1508	76	85	90	93	85	75	96
1900	72	84	90	93	87	74	96
2100	72	84	90	93	87	74	96
2300	72	84	90	93	87	74	96
2308	72	84	90	93	87	74	96
2800	79	88	93	96	88	78	99
3000	79	88	93	96	88	78	99
3008	79	88	93	96	88	78	99
3400	79	88	93	96	88	78	99
3800	77	87	93	96	89	77	99
4200	77	87	93	96	89	77	99
4600	77	87	93	96	89	77	99
4408	77	87	93	96	89	77	99
4608	77	87	93	96	89	77	99

Standard units with high condensing temperature option

LW ST	Sound power level spectrum, dB						Overall sound power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
1300	76	85	90	93	85	75	96
1302	76	85	90	93	85	75	96
1500	76	85	90	93	85	75	96
1508	76	85	90	93	85	75	96
1900	69	89	93	98	91	76	100
2100	69	89	93	98	91	76	100
2300	69	89	93	98	91	76	100
2308	69	89	93	98	91	76	100
2800	79	88	93	96	88	78	99
3000	79	88	93	96	88	78	99
3008	79	88	93	96	88	78	99
3400	79	88	93	96	88	78	99
3800	74	92	96	101	94	78	103
4200	74	92	96	101	94	78	103
4600	74	92	96	101	94	78	103
4408	74	92	96	101	94	78	103
4608	74	92	96	101	94	78	103

High efficiency units



LW HE	Sound power level spectrum, dB						Overall sound power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
1328	76	85	90	93	85	75	96
1528	76	85	90	93	85	75	96
1928	72	84	90	93	87	74	96
2128	72	84	90	93	87	74	96
2328	72	84	90	93	87	74	96
2628	79	88	93	96	88	78	99
3028	79	88	93	96	88	78	99
3428	77	87	93	96	89	77	99
3828	77	87	93	96	89	77	99
4228	77	87	93	96	89	77	99
4628	77	87	93	96	89	77	99

High efficiency Units with high condensing temperature option



LW HE	Sound power level spectrum, dB						Overall sound power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
1328	76	85	90	93	85	75	96
1528	76	85	90	93	85	75	96
1928	69	89	93	98	91	76	100
2128	69	89	93	98	91	76	100
2328	69	89	93	98	91	76	100
2628	79	88	93	96	88	78	99
3028	79	88	93	96	88	78	99
3428	74	92	96	101	94	78	103
3828	74	92	96	101	94	78	103
4228	74	92	96	101	94	78	103
4628	74	92	96	101	94	78	103

Note: The sound levels by octave bands are given for information only and not contractually binding.
Only the overall power level is contractual.

OPERATING LIMITS AND OPERATING RANGES

■ LW ST and LW HE units

LW ST / HE	Minimum	Maximum
Evaporator		
Entering temperature at start-up	-	35,0°C
Leaving temperature during operation	3,3°C ⁽¹⁾	20,0°C
Entering/leaving temperature difference at full load	2,8 K	11,1 K
Condenser		
Entering temperature at start-up	13,0°C ⁽²⁾	-
Leaving temperature during operation	19,0°C ⁽²⁾	50,0°C ⁽³⁾
Entering/leaving temperature difference at full load	2,8 K	11,1 K

- (1) For low-temperature applications, where the leaving water temperature is below 3.3°C, a frost protection solution must be used.
- (2) For lower condenser temperatures, a water flow control valve must be used at the condenser (two or three-way valve). Please refer to Control for low condensing temperature systems option to ensure the correct condensing temperature.
- (3) Please refer to High condensing temperature option for applications with a high condenser leaving temperature (up to 63°C).

■ Units with High condensing temperature option

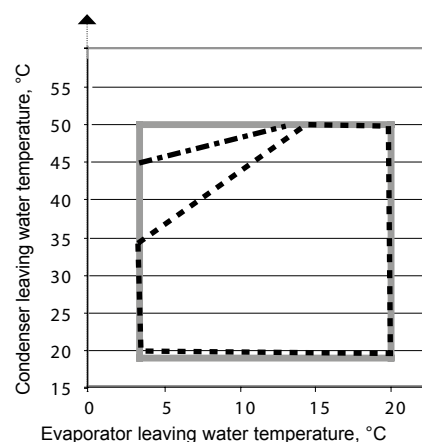
Units with High condensing temperature option	Minimum	Maximum
LW ST / HE		
Evaporator		
Entering temperature at start-up	-	35,0°C
Leaving temperature during operation	3,3°C ⁽¹⁾	15,0°C
Entering/leaving temperature difference at full load	2,8 K	11,1 K
Condenser		
Entering temperature at start-up	13,0°C ⁽²⁾	-
Leaving temperature during operation	23,0°C ⁽²⁾	63,0°C
Entering/leaving temperature difference at full load	2,8 K	11,1 K

- (1) For low-temperature applications, where the leaving water temperature is below 3.3°C, a frost protection solution must be used.
- (2) For lower condenser temperatures, a water flow control valve must be used at the condenser (two-way or three-way). Please refer to option 152 to ensure the correct condensing temperature.

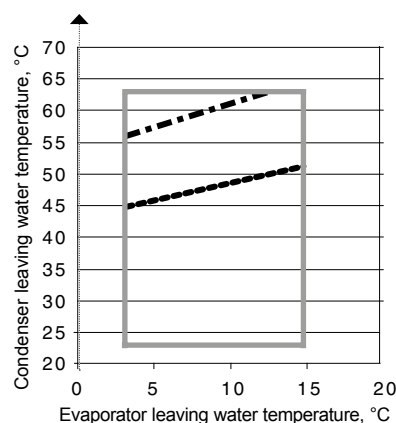
■ Operating range, units with low brine temperature solution

	Minimum	Maximum
Evaporator		
Entering water temperature at start-up	-	35°C
Leaving temperature during operation ⁽¹⁾		
Low brine temperature limits with ethylene glycol	-15°C	15°C
Low brine temperature limits with propylene glycol	-10°C	15°C
Condenser		
Entering water temperature at start-up	13°C ⁽²⁾	-
Leaving temperature during operation ⁽²⁾	5°C	50°C/55°C/63°C ⁽³⁾
Entering/leaving temperature difference at full load ⁽³⁾	-	-

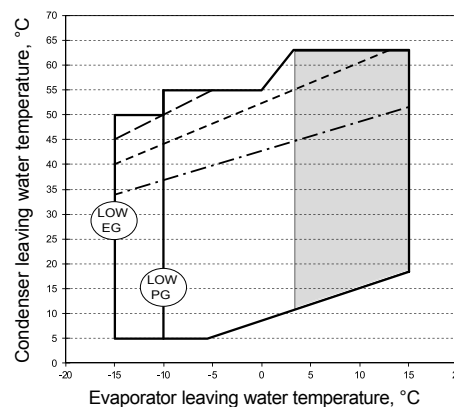
- (1) The operating range with evaporator leaving temperatures above 3°C is permitted, but the performances are not optimised.
- (2) For lower condenser temperatures a water flow control valve must be installed at the condenser (two-way or three-way). Please refer to option 152 to ensure the correct condensing temperature.
- (3) Depends on the conditions at the evaporator and the load conditions.



- Approx. 45% at full load
- - - Part load limit approx. 35%
- ... Minimum load limit approx. 15%



- Approx. 60% at full load
- - - Part load limit approx. 50%
- ... Minimum load limit approx. 30%



- Operating range permitted, but performances are not optimised
- Full load with low brine temperature option and ethylene glycol
- - - Part load limit approx. 80%
- ... Part load limit approx. 50%
- . - . Part load limit approx. 30%

SYSTEM WATER VOLUME - EXCHANGER WATER FLOW RATE

The Connect Touch controller is equipped with anticipation logic making it highly flexible in adjusting operation to parameter drift, particularly on hydraulic systems with low water volumes. By adjusting compressor running times, it prevents short-cycle protection cycles from starting and, in most cases, eliminates the need for a buffer tank.

Note: The minimum volumes of water are calculated on EUROVENT rated conditions:

- Chilled water temperature =12°C/7°C
- Condenser water temperature =30°C/35°C

This value is applicable for most air conditioning applications (unit with fan coil units).

Note: For installations running with a low volume of water (unit with air handling unit) or for industrial processes, the buffer tank is essential.

LW ST	708	858	1008	1300	1302	1500	1508	1900	2100	2300	2308	2800	3000	3008	3400	3800	4200	4600	4408	4608
-------	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Minimum installation volume (l)


Air conditioning	890	1000	1170	1500	1540	1730	1750	2210	2380	2580	2730	3310	3450	3710	4090	4370	4730	5030	5380	5620
Process	1780	2000	2340	2990	3080	3460	3500	4410	4750	5150	5460	6620	6890	7420	8180	8730	9450	10060	10760	11240

Evaporator water flow rate (m³/h)

Minimum	22	22	22	25	25	25	25	32	32	32	32	47	47	54	65	65	65	65	79	79
Maximum	140	140	140	140	155	155	155	205	205	205	220	241	241	281	302	302	302	302	418	418

Condenser water flow rate (m³/h)

Minimum	14	14	14	14	14	14	14	22	22	22	29	29	29	32	43	43	43	43	50	50
Maximum	104	104	104	104	169	169	169	198	198	198	295	295	295	392	428	428	428	428	482	482

LW HE		1328	1528	1928	2128	2328	2628	3028	3428	3828	4228	4628
-------	--	------	------	------	------	------	------	------	------	------	------	------

Minimum installation volume (l)

Air conditioning	1660	1880	2400	2560	2800	3380	3770	4300	4720	5290	5710
Process	3310	3760	4800	5110	5600	6760	7530	8600	9440	10570	11420

Evaporator water flow rate (m³/h)

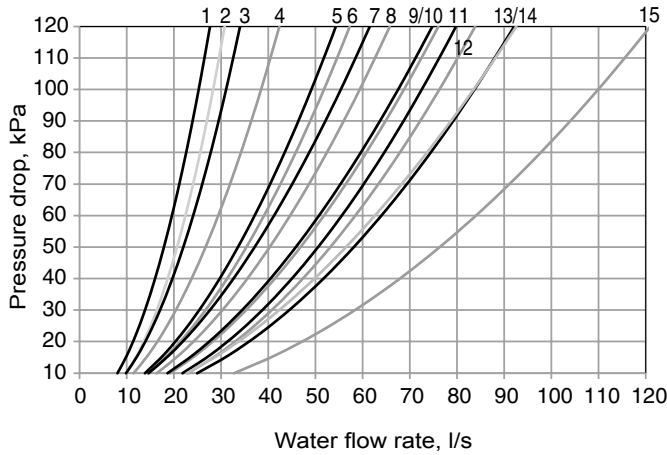
Minimum	36	36	47	47	47	65	65	79	79	101	101
Maximum	205	205	274	274	274	302	302	418	418	436	436

Condenser water flow rate (m³/h)

Minimum	22	22	29	29	29	43	43	65	65	79	79
Maximum	198	198	266	266	266	428	428	468	468	536	536

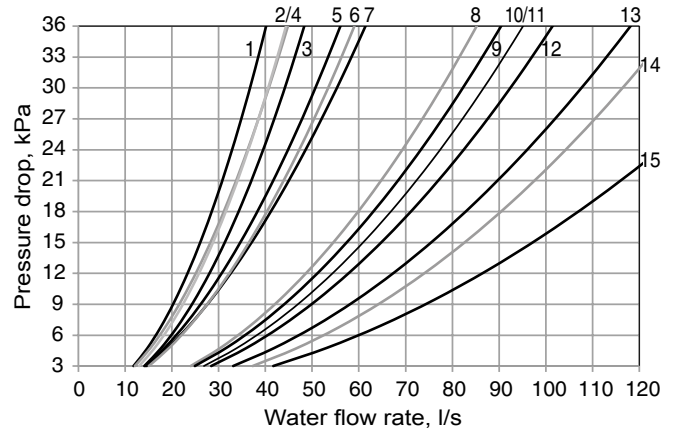
EVAPORATOR PRESSURE DROP CURVES

■ Units with two evaporator passes (standard)



Key		
1. LW ST 708	10. LW HE 1928, 2128, 2328	
2. LW ST 858	11. LW HE 2628, 3028	
3. LW ST 1008	12. LW ST 3400, 3800, 4200, 4600	
4. LW ST 1300, 1302, 1500, 1508	13. LW HE 3428, 3828	
5. LW HE 1328, 1528	14. LW ST 4408, 4608	
6. LW ST 1900, 2100, 2300	15. LW HE 4228, 4628	
7. LW ST 2308		
8. LW ST 2800, 3000		
9. LW ST 3008		

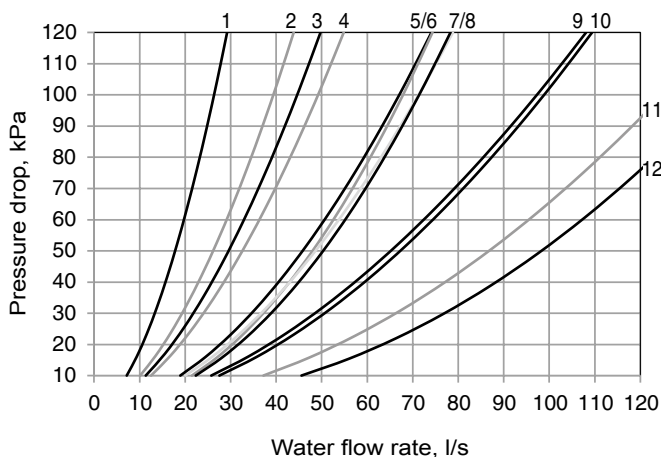
■ Units with evaporator with one pass less (evaporator with one pass less option)



Key		
1. LW ST 708	9. LW HE 2628, 3028	
2. LW ST 858	10. LW HE 1928, 2128, 2328	
3. LW ST 1008	11. LW ST 3400, 3800, 4200, 4500C	
4. LW ST 1300, 1302, 1500, 1508	12. LW ST 3008	
5. LW HE 1328, 1528	13. LW HE 3428, 3828	
6. LW ST 1900, 2100, 2300	14. LW ST 4408, 4508	
7. LW ST 2308	15. LW HE 4228, 4628	
8. LW ST 2800, 3000		

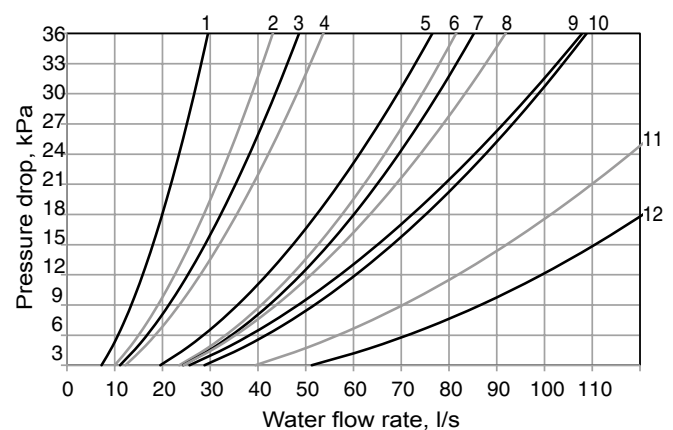
CONDENSER PRESSURE DROP CURVES

■ Units with two condenser passes (standard)



Key		
1. LW ST 708, 858, 1008	9. LW HE 2628, 3028	
2. LW ST 1300, 1302, 1500, 1508	10. LW ST 3400, 3800, 4200, 4600	
3. LW HE 1328, 1528	LW HE 3428, 3828	
4. LW ST 1900, 2100, 2300	11. LW ST 4408, 4608	
5. LW HE 1928, 2128, 2328	12. LW HE 4228, 4628	
6. LW ST 2308		
7. LW ST 3008		
8. LW ST 2800, 3000		

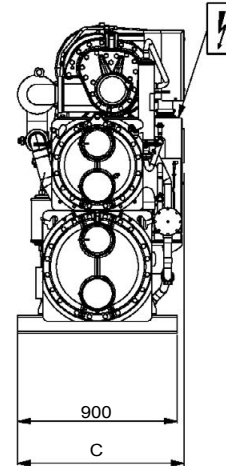
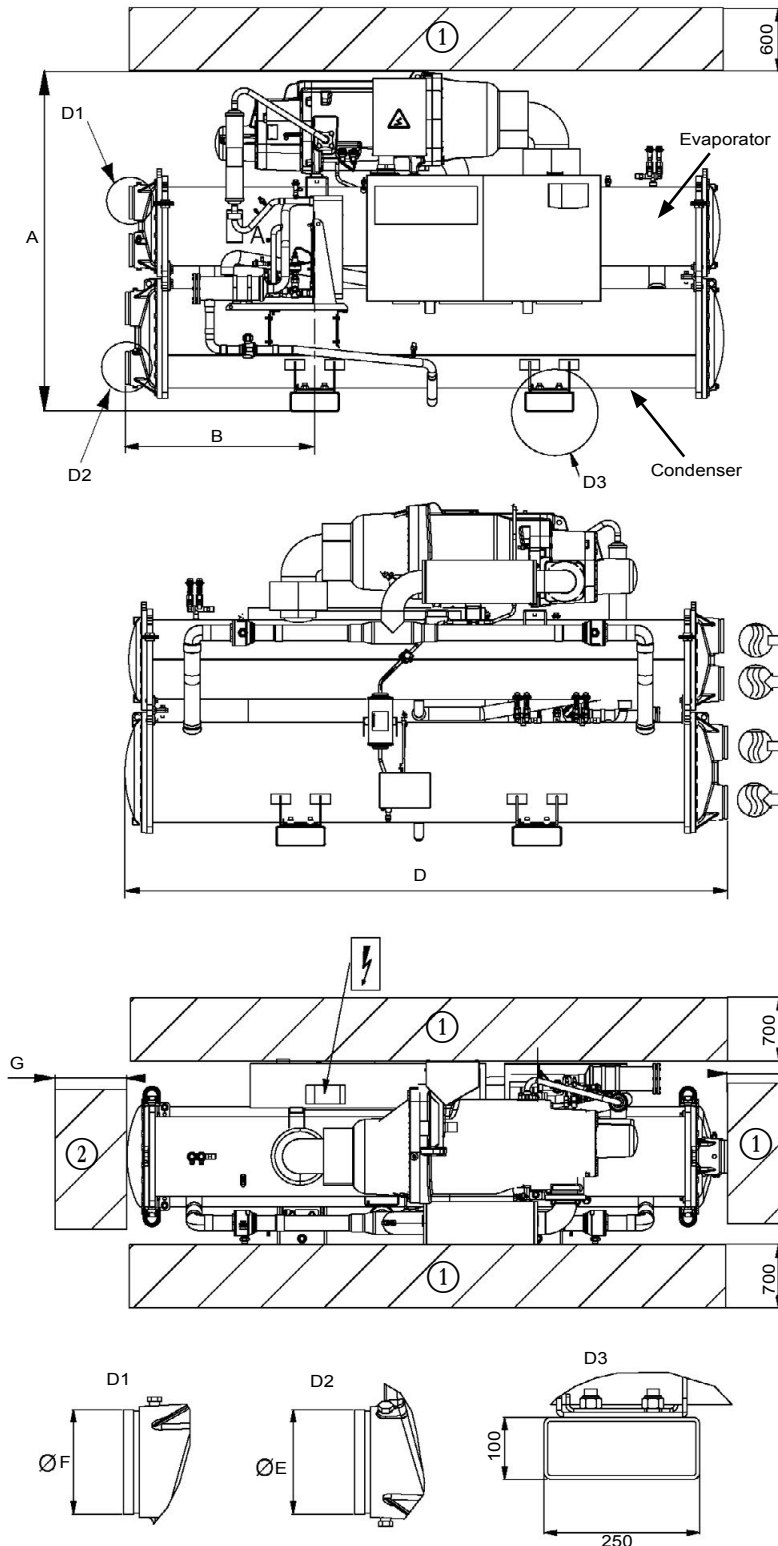
■ Units with condenser with one pass less (condenser with one pass less option)



Key		
1. LW ST 708, 858, 1008	8. LW ST 3008	
2. LW ST 1300, 1302, 1500, 1508	9. LW HE 2628, 3028	
3. LW HE 1328, 1528	10. LW ST 3400, 3800, 4200, 4600	
4. LW ST 1900, 2100, 2300	LW HE 3428, 3828	
5. LW HE 1928, 2128, 2328	11. LW ST 4408, 4508	
6. LW ST 2308	12. LW HE 4228, 4628	
7. LW ST 2800, 3000		

DIMENSIONS

■ LW ST - 708-2308 LW HE - 1328-2328



Units sizes	Dimensions in mm						
	A	B	C	D	E	F	G
LW ST standard units							
708	1567	800	928	2724	141,3	141,3	2600
858	1567	800	928	2724	141,3	141,3	2600
1008	1567	800	928	2724	141,3	141,3	2600
1300	1693	810	936	2742	141,3	141,3	2600
1302	1693	810	936	2742	141,3	141,3	2600
1500	1693	810	936	2742	141,3	141,3	2600
1508	1693	810	936	2742	141,3	141,3	2600
1900	1848	968	1044	3059	168,3	168,3	2800
2100	1848	968	1044	3059	168,3	168,3	2800
2300	1848	968	1044	3059	168,3	168,3	2800
2308	1898	828	1044	2780	219,1	168,3	2600
LW HE high efficiency units							
1328	1743	968	936	3059	168,3	168,3	2800
1528	1743	968	936	3059	168,3	168,3	2800
1928	1950	1083	1065	3290	219,1	219,1	3100
2128	1950	1083	1070	3290	219,1	219,1	3100
2328	1950	1083	1070	3290	219,1	219,1	3100
LW ST with high condensing option							
708	1567	800	928	2724	141,3	141,3	2600
858	1567	800	928	2724	141,3	141,3	2600
1008	1567	800	928	2724	141,3	141,3	2600
1300	1693	810	936	2742	141,3	141,3	2600
1302	1693	810	936	2742	141,3	141,3	2600
1500	1693	810	936	2742	141,3	141,3	2600
1508	1693	810	936	2742	141,3	141,3	2600
1900	1868	968	1090	3059	168,3	168,3	2800
2100	1868	968	1090	3059	168,3	168,3	2800
2300	1868	968	1090	3059	168,3	168,3	2800
2308	1920	828	1090	2780	168,3	219,1	2600
LW HE with high condensing option							
1328	1743	968	936	3059	168,3	168,3	2800
1528	1743	968	936	3059	168,3	168,3	2800
1928	1970	1083	1105	3290	219,1	219,1	3100
2128	1970	1083	1105	3290	219,1	219,1	3100
2328	1970	1083	1105	3290	219,1	219,1	3100

Key:

All dimensions are in mm.

① Required clearance for maintenance

② Recommended clearance for tube removal

Water inlet

Water outlet

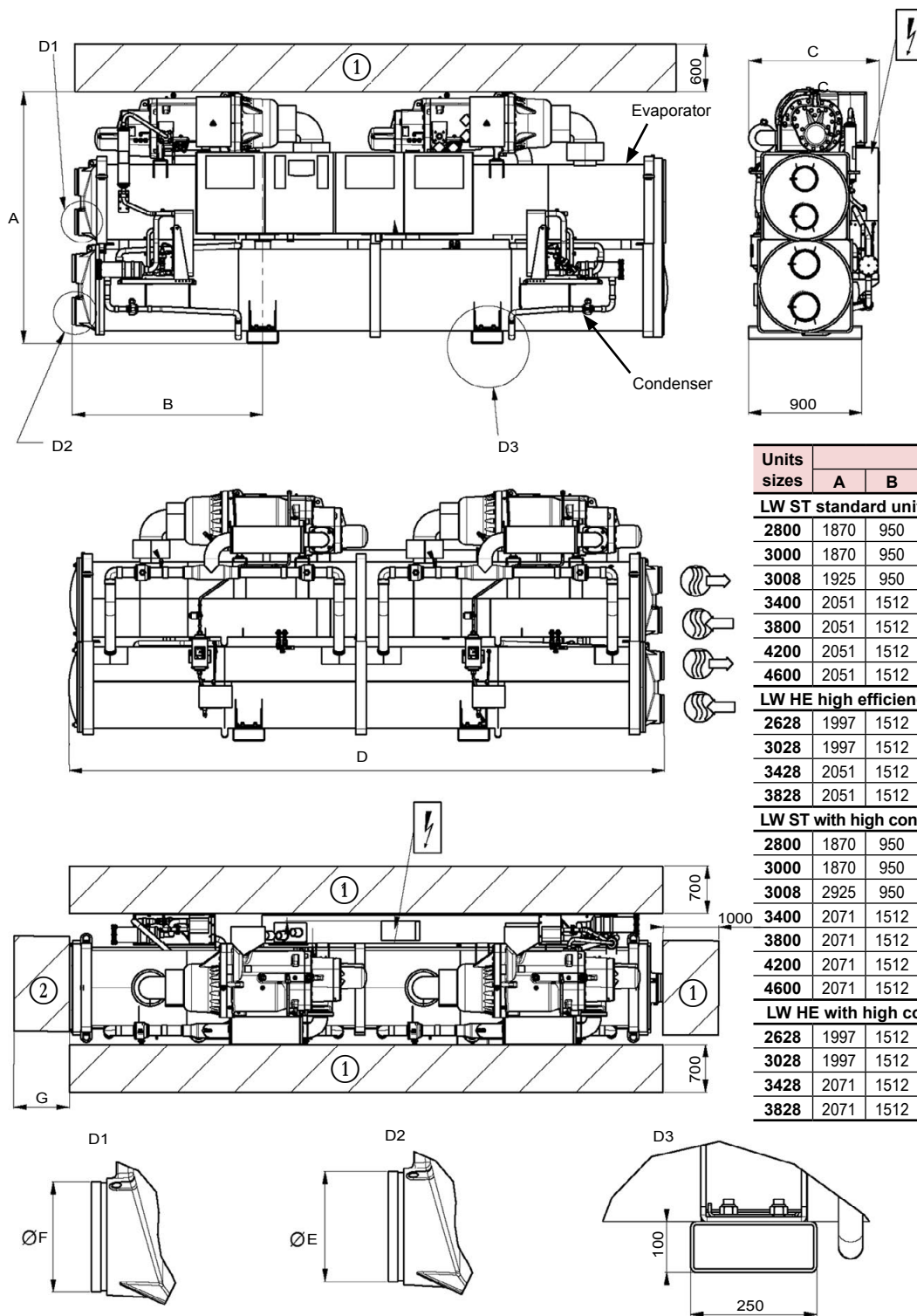
Electrical cabinet

- Low brine option has same dimensions as high condensing option.
- IP44 option has same dimensions as high condensing option on units 1900, 1928, 2300, 2308, 2328. IP44 option has same dimensions as standard on the other units.

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.




DIMENSIONS

- LW ST - 2800-4600**
LW HE - 2628-3828



Key:

All dimensions are in mm.

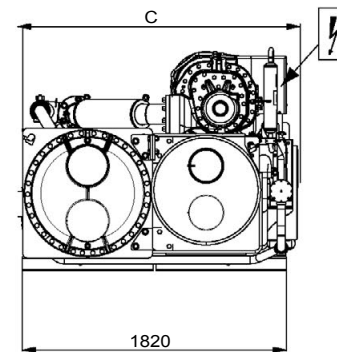
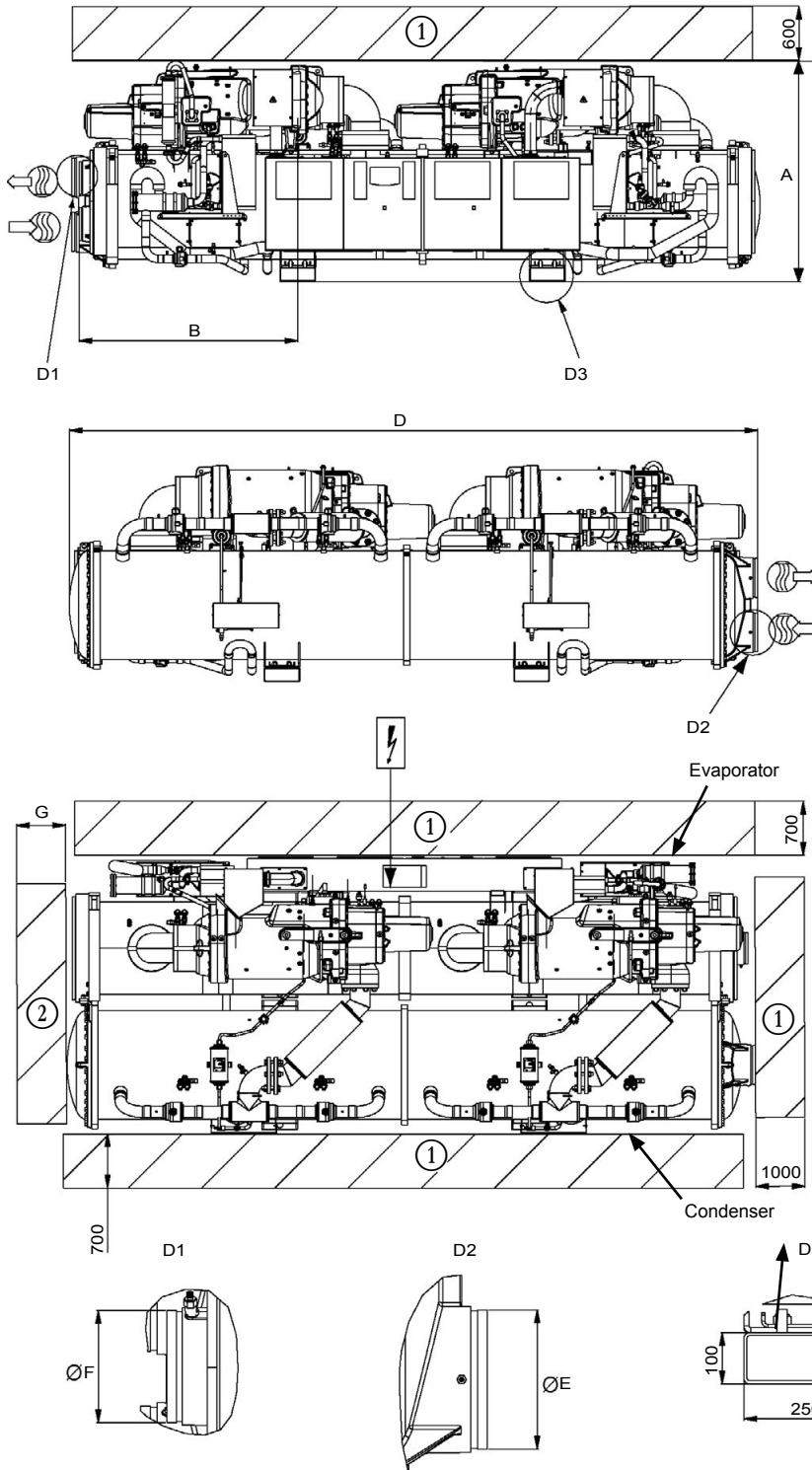
- ① Required clearance for maintenance
- ② Recommended clearance for tube removal
-  Water inlet
-  Water outlet
-  Electrical cabinet

- Low brine option has same dimensions as high condensing option.
- IP44 option has same dimensions as high condensing option on units 1900, 1928, 2300, 2308, 2328. IP44 option has same dimensions as standard on the other units.

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

DIMENSIONS

- LW ST - 4408-4608
- LW HE - 4228-4628



Units sizes	Dimensions in mm						
	A	B	C	D	E	F	G
LW ST standard units							
4408	1515	1568	1902	4790	219,1	219,1	4500
4608	1515	1568	1902	4790	219,1	219,1	4500
LW HE high efficiency units							
4228	1562	1591	2129	4832	273	273	4600
4628	1562	1591	2129	4832	273	273	4600
LW ST with high condensing option							
4408	1535	1568	1947	4790	219	219	4500
4608	1535	1568	1947	4790	219	219	4500
LW HE with high condensing option							
4228	1585	1591	2174	4832	273,1	273,1	4600
4628	1585	1591	2174	4832	273,1	273,1	4600

Key:

All dimensions are in mm.

① Required clearance for maintenance

② Recommended clearance for tube removal

Water inlet

Water outlet

Electrical cabinet

- Low brine option has same dimensions as high condensing option.
- IP44 option has same dimensions as high condensing option on units 1900, 1928, 2300, 2308, 2328. IP44 option has same dimensions as standard on the other units.

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

SPECIFICATION GUIDE

■ General

Chilled and hot water will be produced by a **CIAT HYDROCIAT LW-type** water-to-water unit, which is a single unit assembly designed for indoor installation

The chiller (or heat pump) will use environmentally-friendly **R134a** refrigerant. It will include 1 or 2 independent cooling circuits and will be equipped with 1 or 2 SCREW compressors, depending on the model

The unit will be designed, produced and tested at a production plant with a quality-assurance system which is certified according to **ISO 9001, 14001 and 50001**. Performance levels will be certified by the **EUROVENT association within the limits of the certification programme**

The machine will be covered by an EC declaration of conformity and will comply with the following European regulations and standards:

- Machinery Directive 2006/42/EC and EN 60-204 -1
- Electromagnetic Compatibility Directive 2014/30/EU
- EMC Immunity and Emissions EN 61800-3 "C3"
- Low Voltage Directive 2014/35/EU
- RoHS 2011/65/EU
- Pressure Equipment Directive (PED) 2014/68/EU
- Refrigeration systems and heat pumps EN 378-2.
- Regulation (EU) 2016/2281 implementing Directive 2009/125 EC with regard to ecodesign requirements

■ Performance levels

Cooling capacity (kW):

Total electrical power used: kW

Heating capacity: kW

Minimum EER coefficient of performance at full load according to the EN14511:3-2013 standard:....

Minimum SEER_{12/7°C} seasonal coefficient of performance according to Ecodesign Regulation (EU) 2016/2281 certified by the independent association Eurovent (mandatory):....

Evaporator chilled water entering/leaving temperature: .../...°C

Pressure drops for the evaporator:

Secondary fluid:

Condenser hot water entering/leaving temperature: .../...°C

Pressure drop for the condenser:

Secondary fluid:

Type of refrigerant: R134a (ODP=0 / GWP=1430)

CO₂ equivalent tonne:

Dimensions (length x width x height):x.....x..... mm

Unit operating weight: Kg

The environmental report including the analysis of the life cycle of the unit must be supplied by the manufacturer

The unit shall be capable of starting up with a condenser entering water temperature of **13°C with the control option for low condensing temperature**. The unit must be capable of starting up with an evaporator entering water temperature of **35°C**.

The unit will be able to operate with a condenser leaving water temperature of **63°C with the high condensing temperature option**

■ Compressors

These components are semi-hermetic double screw-type compressors with a motor cooled by suction refrigerant gas, and protected against overheating.

They will include the following standard components:

- 2 screws fitted on ball and roller bearings.
- The ball bearings will be designed to last for a minimum of 73,000 hours under maximum operating conditions.
- Continuous capacity control of 15% to 100% on each compressor
- Monitoring of rotation direction, absence of phase, over and under voltage, and power supply failure
- Monitoring of maximum head pressure
- Controlled lubrication under differential pressure **requiring no oil pump**
- The oil circuit must include a filter with a filtration capacity of 5 microns with service shut-off valves to facilitate its replacement
- The oil separator must be built into the design of the condenser and include an oil level safety switch.
- **Silencer fitted at the discharge to reduce pulses from the discharged gas**

Compressor electric motor

- Large motor with **star-delta** starting to reduce the starting current of each compressor
- Motor cooled by intake gas
- Integral electronic protection of the motor against thermal and electrical overloads
- **Service valves (option)**
Shut-off valves on the liquid line (evaporator inlet) and on the compressor suction line to facilitate maintenance
- **Compressor thermal insulation (option)**
Thermal insulation used to prevent the formation of condensation on the surface of the compressor.

■ Evaporator

A single, high-performance, glandless-type evaporator with copper tube bundle with internal and external grooves

The design includes 1 or 2 independent cooling circuits.

Two entering and leaving water temperature sensors on the exchanger are used to regulate the 'return water' or 'leaving water'.

The heat insulation is made from shaped cellular foam, **at least 19 mm thick**.

The hydraulic unions will be "VICTAULIC"-type unions to ensure quick connection between the unit and hydraulic system.

The maximum operating pressure on the water side is **10 bar (21 bar as an option)**

The evaporator will be equipped with an electronic flow controller. Paddle-type sensors or differential pressure controllers shall not be acceptable.

Several choices of hydraulic connections will be available on the evaporator to adapt to all possible constraints (see options available)

• Evaporator flexible sleeves (option)

The manufacturer will supply flexible connection sleeves to insulate the unit and limit the transmission of vibrations to the hydraulic network.

• Sound level reduction (option)

The evaporator and suction pipework will be fitted with soundproofing to reduce the noise radiated from the machine to 3 dB

SPECIFICATION GUIDE

■ Condenser

A single condenser with copper tube bundle with internal and external grooves

The design includes 1 or 2 independent cooling circuits in addition to the oil separator

Two entering and leaving water temperature sensors on the exchanger are used to regulate the 'return water' or 'leaving water'.

The heat insulation is made from shaped cellular foam, **at least 19 mm thick (optional)**

The hydraulic unions will be "VICTAULIC"-type unions to ensure quick connection between the unit and hydraulic system.

The maximum operating pressure on the water side is **10 bar (21 bar as an option)**

Several choices of hydraulic connections will be available on the evaporator to adapt to all possible constraints (see options available)

● Condenser flexible sleeves (option)

The manufacturer will supply flexible connection sleeves to insulate the unit and limit the transmission of vibrations to the hydraulic network.

● Condenser thermal insulation (option)

To minimise heat losses, the condenser will be equipped with insulation made from 19-mm-thick shaped cellular foam. This option will be included as standard for heat pump applications

■ Refrigerating components - Safety devices

Each cooling circuit will include the following accessories as a minimum:

- One electronic expansion valve
- An economiser function (HE version) comprising a brazed plate heat exchanger and supplied with refrigerant by an **electronic expansion valve**
- One liquid sight glass to show the refrigerant condition
- One filter drier with refillable cartridge
- High and low pressure sensors
- Relief valves
- Evaporator antifreeze protection sensor
- **Factory-fitted electronic water flow controller**

■ Electrical cabinet

The electrical cabinet is made from painted steel sheet metal with an **IP23 protection** rating

The power supply is 400 V (+10/-10%) 3-ph 50 Hz + earth without neutral.

The electrical cabinet includes a main external safety switch and a 24-V control circuit supply transformer

The internal wiring of the electrical panel is numbered and all the electrical components are marked.

● Pump power/control circuit (option)

The unit is equipped with a control/power supply circuit to control one external single or dual pump on the evaporator side and/or one single pump on the condenser side

■ Connect Touch electronic control, regulation and display module

The control module features a 5-inch (or optional 7-inch) touchscreen with a user-friendly operator interface enabling intuitive navigation using icons.

User interface

- 4.3-inch (optional 7-inch) colour screen
- Display of all machine parameters (3 access levels, User Maintenance/Factory, password-protected)
- Display of trend curves for main values
- **8 languages available**
- Possibility to load a custom translation file
- Access to the interface through the web browser

Control

This performs the following functions:

- Regulation of the water temperature (at the return or at the outlet)
- Option of varying the setpoint according to the outdoor temperature
- Regulation for optimised energy storage with the CRISTOPIA installation
- Second setpoint management
- Management of compressors with start-up sequence, metering and operating time balancing
- Self-regulating and proactive functions with adjustment of drift control for parameters
- Management of compressor short cycle protection
- Protection against phase inversion
- Weekly and hourly time schedule for the machine, including 16 periods of absence
- Condensing pressure limitation (option)
- Diagnosis of fault and operating statuses
- Management of a fault memory allowing a log of the last 50 incidents to be accessed, with operating readings taken when the fault occurs
- Blackbox memory
- Master/slave management of the two machines in parallel with operating time balancing and automatic changeover if a fault occurs on one machine
- **The maintenance manual, wiring diagram** and list of spare parts for the machine are available in electronic format

Maintenance function

The controller will have two maintenance reminder functions as standard, making the user aware of the need to regularly perform maintenance operations and to guarantee the service life and performance of the machine

- **Periodic reminder:** this function is used to select the period between two maintenance checks. This period may be set by the operator in either days, months or operating hours, depending on the application
- **Mandatory F-GAS sealing test reminder:** this function is activated by default in the factory and is used to select the period between two sealing tests depending on the refrigerant charge of the machine in accordance with F-GAS regulations

SPECIFICATION GUIDE

Remote control

- Communication with BMS via RS485 MODBUS/JBS or TC/IP output as standard.
- **Control via built-in web server to remotely access all HMI functions via a PC with alarm notification via email alerts**
 - **Communication gateway for other protocols (option)**
 - LON communication gateway**
Factory-fitted bi-directional communication board enabling the machine to be connected via communication bus to a centralised LonWorks management system.
 - BACnet/IP communication gateway**
Factory-fitted bi-directional communication using the BACnet over Ethernet IP network protocol. This option is used to integrate the machine into a BACnet IP centralised building management system.

Volt-free contacts available as standard for remote control of the machine

- Automatic operation control: switches machine on/off
- Heating/cooling operating mode selection
- Selection of setpoint 1/setpoint 2: activates a second setpoint
- Power limitation: allows the power or refrigerating consumption of the machine to be limited by stopping one or more compressors (this limit can be set with a parameter)
- Fault reporting: indicates the presence of a major fault which has caused one or both refrigerating circuits to stop
- Operational status reporting: indicates that the unit is in production mode
- **Volt-free contacts available via control board for remote control of the machine (option)**
 - Setpoint adjustable via 4-20 mA signal: used to adjust the control setpoint
 - Power limitation adjustable by 4-20 mA signal
 - Power indication: analogue output (0-10 V) providing an indication of the machine's load rate
 - General fault reporting: indicates that the machine has stopped completely
 - Alert reporting: this contact indicates the presence of a minor fault which has not caused the affected circuit to stop
 - User fault reporting
 - End of storage signal: enables return to the second setpoint at the end of the storage cycle
 - Time schedule override: cancels the time schedule
 - Dry cooler management
 - **Master/slave operation (option)**
Unit equipped with an additional leaving water temperature sensor to be fitted on site, to optimise the operation of two units with operating time balancing

• **1 - 3 ABOUND HVAC Performance supervision units (option)**

Remote supervision solution enabling customers to track, monitor and optimise the operation of one or more machines.

Operating data is available in real time from the ABOUND HVAC Performance supervision website (overview screen, control panel for the controllers, events and temperature curves)

Any event can be configured to trigger an email alert. Monthly and annual reports are available with analysis and recommendations from CIAT experts.

Choosing this solution combined with a maintenance contract enables customers to optimise the performance of their installation, reduce their operating costs and extend the service life of their equipment.

■ **Frame and casing**

The machine chassis must include heat exchangers and compressors in an autonomous structure

The electrical cabinet will be in RAL 7035 light grey

• **Anti-vibration mounts (option)**

The manufacturer will supply anti-vibration mounts to insulate the unit and limit vibrations and associated noise transmitted to the building.

INSTALLATION RECOMMENDATIONS

■ Water quality requirements

The quality of the water used has a direct impact on the correct operation of the unit and its service life. This holds particularly true if the water used may clog or corrode components or promote the growth of algae or microorganisms.

The water must be tested to determine whether it is suitable for use with the unit.

Determine whether or not chemical treatment is necessary and sufficient to bring the water to an acceptable quality.

The results of the test must confirm whether the water is compatible with the materials used on the unit's circuit.

Important: failure to follow these instructions will result in the immediate voiding of the unit warranty.

■ Lifting and handling operations

The utmost safety precautions must be taken when lifting and handling the unit.

Always follow the lifting diagram on the unit and in the installation, operation, commissioning and maintenance manual.

Before attempting to lift the unit, make sure the path leading to its intended location is free from obstacles.

Always keep the unit vertical when moving it. Never tip it or place it on its side.

■ Location

HYDROCIAT units are designed for installation inside equipment rooms.

Precautions should be taken to protect it from freezing temperatures.

Special attention should be paid to ensure sufficient free space (including at the top) to allow maintenance.

The unit must be placed on a perfectly level surface strong enough to support it once ready for operation.

Noise pollution from auxiliary equipment such as pumps should be studied thoroughly.

Potential noise transmission routes should be studied, with assistance from an acoustical engineer if necessary, before installing the unit.

Flexible couplings must be placed over pipes (available as options).

■ Machine room ventilation

Local regulations may require a supply of fresh air inside equipment rooms to prevent the build-up of unpleasant or hazardous vapours in the event of a refrigerant leak.

■ Installation of accessories delivered separately

A number of optional accessories may be delivered separately and installed on the unit at its location.

Always follow the instructions in the installation, operation, commissioning and maintenance manual.

■ Electrical connections

Always follow the instructions in the installation, operation, commissioning and maintenance manual.

All information concerning electrical connections is stated on the wiring diagrams provided with the unit. Always follow this information.

Electrical connections must be made in accordance with best current practices and applicable standards and regulations.

Electrical cable connections to be made on-site:

- The unit's electrical power supply
- Contacts available as standard and optional for controlling the machine remotely.

It should be noted that the unit's electrical system is not protected against lightning strikes.

Components to protect against transient voltage surges must be installed on the system and inside the electrical power supply unit.

■ Pipe connections

Always follow the instructions in the installation, operation, commissioning and maintenance manual.

All pipes must be correctly aligned and slope toward the system's drain valve.

Pipes must be installed to allow sufficient access to the panels and fitted with heat insulation.

Pipe hangers and clamps must be separate to avoid vibrations and placing pressure on the unit.

Water flow shut-off and control valves must be fitted when the unit is installed.

Pipe connections to be made on site:

- Water supply with pressure-reducing valve
- Evaporator, condenser and drain

The following are a few examples of accessories essential to any hydraulic system and which must also be installed:

- Thermostatic valve on the condenser water inlet or outlet to regulate the flow of cooling water.
- Water expansion vessel
- Drain nozzles at pipe low points
- Exchanger shut-off valves equipped with filters
- Air vents at pipe high points
- Check the system's water capacity (install a buffer water tank if necessary)
- Flexible couplings on exchanger inlets and outlets
- Thermometers on each water inlet and outlet to allow all the necessary checks during start-up and maintenance.

Important:

- Pressure in the water circuits below 10 bar.
- Place the expansion vessel before the pump.
- Do not place any valves on the expansion vessel.
- Make sure the pressure of the water drawn in by the circulation pumps is greater than or equal to the required minimum NPSH, particularly if the water circuits are open".
- Test the water quality in accordance with the relevant technical requirements.
- Protect the unit and hydraulic system from freezing temperatures (such as by including a drain. If glycol is added to prevent freezing, check its type and concentration beforehand.
- Before making any final hydraulic connections, flush the pipes with clean water to remove any impurities from the system.

INSTALLATION RECOMMENDATIONS

■ System start-up

CIAT or a CIAT-approved firm must perform system start-up on the units.

Always follow the instructions in the installation, operation, commissioning and maintenance manual.

Partial list of precommissioning checks:

- Correct positioning of unit
- Power supply protections
- Phases and direction of rotation
- Wiring connections on unit
- Direction of water circulation in unit
- Cleanliness of water circuit
- Water flow rate at specified value
- Pressure in the refrigerating circuit
- Direction of rotation of compressors
- Water pressure drops and flow rates
- Operating readings

■ Maintenance

Specific preventive maintenance operations must be regularly performed on the unit by

CIAT-approved firms.

Read the operating parameters and note them down on a checklist to be sent to CIAT.

Refer to and follow the installation, operation, commissioning and maintenance manual when doing so.

You must take out a maintenance contract with a CIAT-approved refrigeration equipment specialist. Such a contract is required even during the warranty period.

DRY COOLERS

CIAT's **OPERA** and **VEXTRA** dry coolers are compatible with **HYDROCIAT** water-cooled water chillers.

OPERA and **VEXTRA** are available in a wide selection of sizes and with various fan speeds to meet the size and acoustic requirements of any site.

OPERA

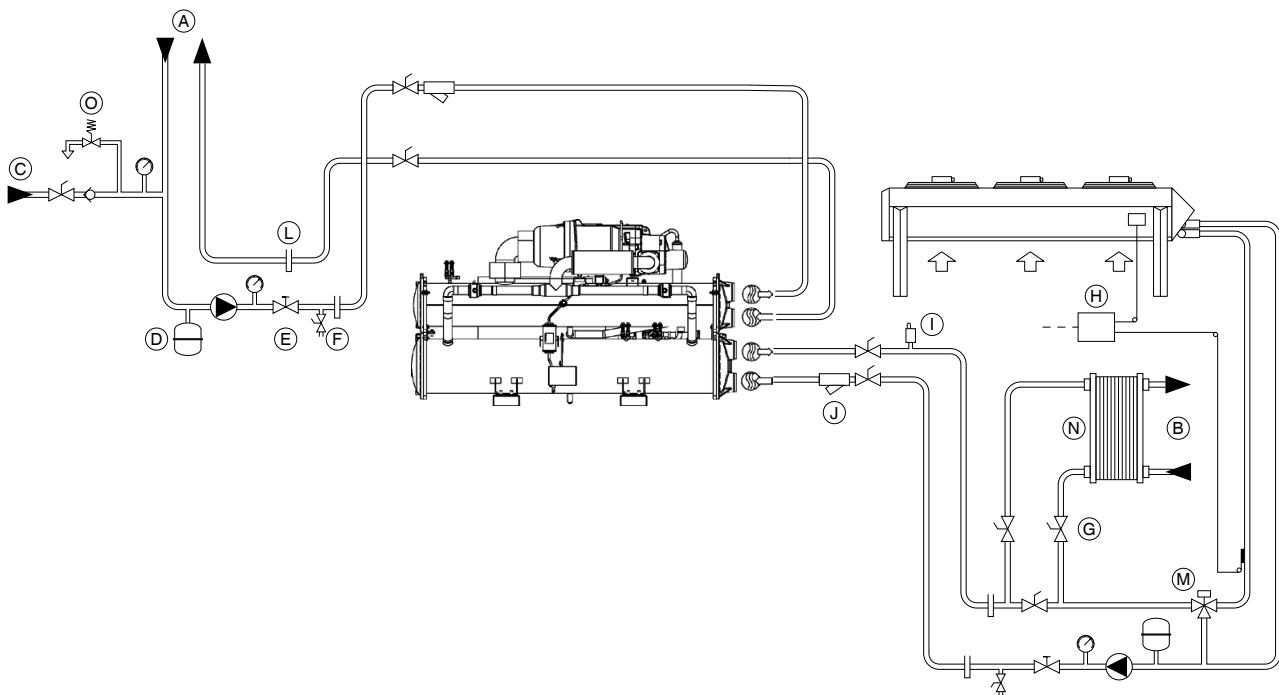


VEXTRA



COOLING SCHEMATIC INSTALLATION DIAGRAM

■ Cooling installation with Dry cooler



Chilled water circuit
Recovery water circuit
Water supply valve
Expansion vessel
Control valve

Drain
Shut-off valve
Temperature controller
Air bleed valve
Water filter

Thermowell
3-way hydraulic valve
Cleanable heat exchanger
Relief valve

CONTROL

USER-FRIENDLY INTERFACE CONSOLE

- User-friendly 4.3 inch touchscreen (option 7").
- Technical literature include on the controller
- Information displayed in a choice of languages.
- Temperature and pressure readings.
- Operating and fault status diagnostics.
- Master/slave control of two machines in parallel.
- Fault memory management.
- Pump management.
- Time schedule.
- **IP Web server connectivity.**
- Programmable maintenance.
- FGAS maintenance.
- **E-mail alerts.**



ABOUND HVAC Performance, the CIAT supervision solution

Two years of Full Serenity with:

- Monitoring of machine operation (operation overviews and curves, alarm logs).
- E-mail alerts for alarms (optional SMS alerts).
- Remote update of the ABOUND HVAC Performance.
- Access to a log of machine operation data.
- Remote advice for using ABOUND HVAC Performance.
- System start-up and operating readings.
- Up to 3 units per kit

ABOUND



PRODUCT FUNCTIONALITY

Dry cooler Control

Connect Touch management for CIAT OPERA or VEXTRA Dry cooler via a simple bus

Dry cooler used as

- Heat rejection
- Free cooling source



POTENTIAL-FREE (DRY) CONTACTS AVAILABLE AS STANDARD

- Inputs:**
- Automatic operation control
 - Heating/cooling mode selection
 - Selection of setpoints 1 / 2
 - Power limitation adjustable by 4-20 mA signal

- Outputs:**
- General fault reporting
 - Operational status
 - 0-10V signal output for external variable speed pump management

Additional inputs available as options:

- Setpoint adjustable by 4-20 mA signal
- Power limitation adjustable by 4-20 mA signal
- Second power limitation level
- End of storage cycle signal
- User fault reporting
- Time schedule override

Additional outlets available as options:

- Power indication on analogue output (0-10 V)
- Unit shutdown general fault reporting
- Minor alert reporting

AVAILABLE OUTPUTS

- MODBUS-JBUS RTU (RS485) or TC/IP (standard) open protocol
- LONWORKS protocol (option)
- BACNET IP protocol (option)

COMMUNICATION Customer BMS

Via dry contact

Via BUS
communication

CIAT SYSTEM FUNCTIONALITY

Communication with CIAT Energy pool controlled by Power'Control.

Integrated Power'Control:

- Energy optimisation of refrigeration and heating using several generators,
- Manages free cooling capacity
- Uses heat recovery to supply domestic hot water.



The quality management system of this product's assembly site has been certified in accordance with the requirements of the ISO 9001 standard (latest current version) after an assessment conducted by an authorized independent third party.
The environmental management system of this product's assembly site has been certified in accordance with the requirements of the ISO 14001 standard (latest current version) after an assessment conducted by an authorized independent third party.
The occupational health and safety management system of this product's assembly site has been certified in accordance with the requirements of the ISO 45001 standard (latest current version) after an assessment conducted by an authorized independent third party.
Please contact your sales representative for more information.

Order No: NA23.752B, 11.2023 - Supersedes order No: NA23.752A, 10.2023.

Carrier, Montluel, France.

Manufacturer reserves the right to change any product specifications without notice.

The illustrations in this document are for illustrative purposes only and not part of any offer for sale or contract.

The manufacturer reserves the right to change the design at any time without notice.