

LCW - LCR

Water chillers and heat pumps TECHNICAL MANUAL

GB



water - water units and motoevaporating

50 kW - 296 kW

CE

COMPANY
WITH QUALITY SYSTEM
CERTIFIED BY DNV
=ISO 9001/2000=

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1 THE SERIES

LCW water chillers and heat pumps are designed for indoor installation in both residential and industrial applications with 24 h/day operation. They are developed in a completely careened execution for an absolute noisless of the assembly.

The range is made of 15 models cooling onnly and heat pumps, realized in standrad and low noise version, with cooling capacity from 50 to 296 kW and heating capacity from 58 to 320 kW:

- **LCW CS** **water chillers, standard version**
- **LCW CL** **water chillers, low noise version**
- **LCW HS** **heat pumps, standard version**
- **LCW HL** **heat pumps, low noise version**

The innovative design philosophy drawn to the creation of a unit with very reduced height (1,5 m for all the range) and water connection to the top of the unit, where together with an already preassembled internal piping means a reduction of installation costs and of technical space.

All the sites are provided with refrigerant circuit and, starting from site 180, the units are provided with 4 compressors in tandem configuration with a very flexibility in the capacity modulation, reduced in rush currents and higher at the part loaded operation.

Derived from the **LCW** water-condensed chiller range the **LCR** motordriven evaporating units are available in standard and low-noise version for cooling function only.

The many options that complete the unit include remote condensers with axial fans, vertical or horizontal air flow, in standard or low-noise version and heat recovery function (desuperheater 40%).

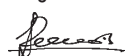
DECLARATION OF CONFORMITY

Galletti S.p.A., whose main office is in Via Romagnoli, 12/a Bentivoglio (BO) - Italy, hereby declares, under its sole responsibility, that the **LCW - LCR** water chillers, devices for air conditioning systems, conform to the specifications of EEC Directives 73/23, 89/392, 91/368, 93/44, 93/68, 89/336, 97/23.

Bentivoglio, 01.06.2002

Galletti S.p.A.

Luigi Galletti



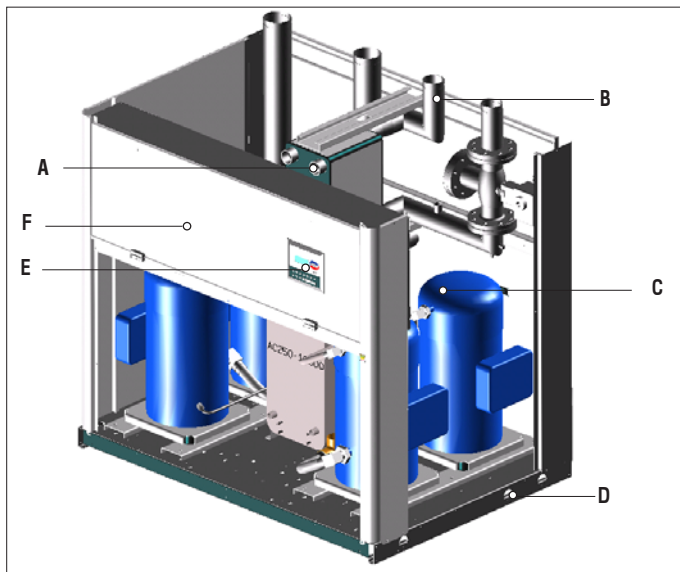
FIELD OF APPLICATION

The **LCW- LCR** units are designed to cool-heat water and solutions containing up to 30% glycol (percentage by weight) in civil, industrial and technological air-conditioning systems. In buildings with large surface areas, the air conditioning system can be expanded step by step as new floors or areas are sold/leased, by installing an **LCW- LCR** unit for every floor in a small control room. This allows you to spread your investment over time.. The possibility of keeping the evaporator indoors means there is no need to add glycol to the water inside the system. In addition, you can keep all components requiring routine or special maintenance in an easily accessible room.

The technical and dimensional data reported in this manual may be modified in view of any product improvement.

2 UNIT DESCRIPTION

- A-** Only heat exchangers with stainless steel braze-welded plates are used. Starting from model 105, all units have "cross flow" type dual circuit exchangers on the refrigerant side and a single circuit exchanger on the water side.
- B-** All the units have a single plumbing connection to the outside, whether they are equipped with a dual heat exchanger (up to model LCW090) or a single dual circuit heat exchanger on the refrigerant side. A water flow control device is included as a standard feature.
In addition to said device, the units are fitted with an outlet water temperature sensor performing the function of an antifreeze thermostat.
- C-** Only scroll-type compressors are used in the LCW units, both in single and tandem configurations.
- D-** Painted galvanised sheet steel supporting base and enclosing panels made of Peraluman to ensure effective protection against corrosive agents.
- E-** Microprocessor control; the Basic version featured on standard models is a μ Chiller2 controller. On request, the units can be equipped with Advanced microprocessor control (pCO controller), which in addition to the functions described, offers the possibility of customized software features and of managing the 4 reduction steps for units starting from model 180.
- F-** Electric control board constructed and wired in accordance with EEC Directive 73/23, Directive 89/336 on electromagnetic compatibility and related standards.
It is equipped with an air circulation system that is active when the unit is running.



The cooling circuit is built using only components of the finest quality brands produced by qualified manufacturers according to the specifications of Directive 97/23 for brazing.

3 CONSTRUCTIVE FEATURES

STRUCTURE

The **LCW-LCR** units are built with a galvanised sheet steel supporting base, coated with epoxy polyester powder paint oven cured at 180°C, and enclosing panels made of Peraluman (alloy of Aluminium and Magnesium 5005), which provides effective protection against corrosive agents.

The compressor compartment is completely sealed and may be accessed on 3 sides thanks to easy-to-remove panels that greatly simplify maintenance and/or inspection.

All the ordinary maintenance can be out from the front of the unit.

For lifting the unit, 50-mm holes are provided in the base, through which lifting pipes can be inserted and the vibration-damping feet can be accessed for fastening. All bolts and screws and fastening devices are made of non-oxidizable materials, stainless steel or carbon steel that has undergone surface-passivating treatments.

COOLING CIRCUIT

The cooling circuit is built using only components of the finest quality brands produced by qualified manufacturers according to the specifications of Directive 97/23 for brazing.

All the units are built with a dual independent cooling circuit to guarantee high standards of safety and, starting from model 105, a single circuit on the water side to ensure maximum energy efficiency under partial loads.

COMPRESSORS

Only scroll-type compressors are used in the units, both in single and tandem configurations, with thermal protection on windings and crankcase electric heater (heat pump models).

COOLING COMPONENTS

- Molecular mesh dehydration filter.
- Flow indicator with humidity indicator.
- Thermostatic valve with external equalization and integrated MOP function.
- Electronically controlled electric expansion valve, which optimises energy consumption in in-between seasons (accessory).
- Cycle-reversing valve (heat pump models only).
- Check valves (heat pump models only).
- Liquid receiver (heat pump models only).
- High and low pressure switches.
- Schrader valves for checks and/or maintenance.

HEAT EXCHANGERS, WATER SIDE

All units have heat exchangers with braze-welded AISI 304 austenitic stainless steel plates and connections made of AISI 304 L, characterised by a reduced carbon content to facilitate brazing.

Starting from model 105, all units have a "cross flow" type dual circuit exchanger on the refrigerant side and a single circuit exchanger on the water side to ensure maximum energy efficiency when the system is operating under partial loads.

REMOTE CONDENSER - OPTIONAL (ONLY FOR LCR UNITS)

It is realized in geometry 25x21.65 with 3/8" pipe, made up with aluminium fins of the thickness of 0,10 mm and copper piping expanded on the same in order to guarantee the complete contact. Low noise versions for this component are available and also the option of the condensation control by means of fan speed control.

The device of condensation control (optional) is part of the remote condenser and it does not require the electrical connection to the evaporating unit.

The finned package exchangers are realized with advanced technologies of exchange, louvered fins and inner striped tubes for the reduction of volumes and therefore of the refrigerant charges.

VENTILATION SECTION - OPTIONAL (REMOTE CONDENSER - DRY COOLER)

The used fans are axial type with airfoil-shaped blades. The fans are statically and dynamically balanced, provided with a protective outlet grille complying with the specifications of EN 60335 – DIN 31001-1-2 and with interposed rubber vibration dampers to reduce the propagation of vibrations during speed modulating phases (optional).

3 CONSTRUCTIVE FEATURES

ELECTRIC CONTROL BOARD

Constructed and wired in accordance with EEC Directive 73/23, Directive 89/336 on electromagnetic compatibility and related standards.

The electric box may be accessed by removing the outer panel; access to the components is possible only after the unit has been disconnected from the power supply by means of the main switch, which is interlocked with the door.

All the remote controls use 24 V signals powered by an insulating transformer situated on the electric control board.

All users are protected against overloads and short circuits; thermal protection is provided by chains of thermistors embedded in the windings of each electric motor.

Another standard feature of all units is a phase sequence relay, which disables the compressor in the event of an incorrect phase sequence: for scroll compressors, only one direction of rotation is possible. The protection rating of the unit is IP 44 and the control board with the panel open has a protection rating of IP20.

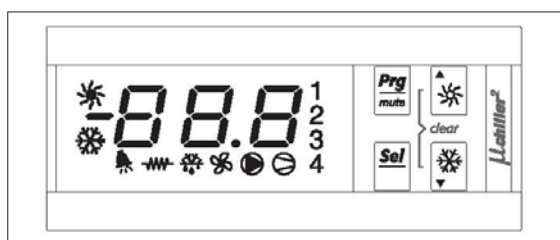
The terminal board also includes terminals for remote signalling of:

- unit on/off (24 V lamp)
- alarms (24 V lamp).

CONTROL MICROPROCESSOR

LCW water chillers and heat pumps are supplied complete with a microprocessor control. the "Basic" version installed in standard units features the following functions:

- control of the different operating parameters from a set of pushbuttons situated on the electric control board;
- switching on and off of compressors to maintain the set temperature of the water entering the water/refrigerant exchanger;
- display of operating parameters ;
- alarm management and signalling
 - high / low pressure
 - antifreeze
 - flow switch
 - pump alarm
- control of maximum number of compressor starts;
- rotation of compressors, activated in sequence to divide up their operating times;
- compressor operation hour meter;
- RS232, RS485 serial output management on request.



On request, the units can be equipped with Advanced microprocessor control, which in addition to the functions described above offers the possibility of custom software features ensuring optimal satisfaction of all system demands as well as the possibility of managing the 4 reduction steps for units from model 180 onward.

As regards remote communication options, the controls are configured for a connection to advanced BMS systems. The possibilities of interconnectivity offered by the system may be summed up as follows:

Serial ports available with **Basic** control

- RS232

- RS485

GSM Modem: with prepaid card and antenna on the unit for autonomous two-way management of alarms and/or set point adjustment.

Protocols

- Carel (incorporated)

- Modbus® (Incorporated with **Advanced** control)]

- Modbus® (With external gateway with **Basic** control)

- LonWorks® (Dedicated serial card to be requested when ordering the unit)

- BACnet™ (with external gateway)

- TCP-IP (with external gateway)

- TREND® [Dedicated serial card to be requested when ordering the unit]



4 LCW MODELS AND CONFIGURATIONS

The LCW series comprises 15 models with cooling capacities ranging from 50 to 296 kW. They are available both in models with a cooling function only and in models with heat pump operation. The numerous constructive options may be selected using the configuration scheme illustrated below.

The choice of some options can prevent the choice of others or render obligatory other fields. To contact the Galletti for verification

CODE	
It consists of 8 characters, which show the range, the model, the operation mode and the power supply	
Brand name of series	
LCW	Water condensing chilling units and reversible water/water heat pumps
Model	
055	Provides general indications as to the cooling capacity of standard models
060	
070	
080	
090	
105	
115	
130	
150	
180	
205	
235	
250	
275	
300	
Operation	
C	Water Chiller
H	Heat pump
Version	
S	Standard
L	Low Noise

OPTION AND UNIT CONFIGURATION		
15 fields which customise the unit complying with customer's requirements		
Field	Name	Description
1	Refrigerant/Power supply	
2	R407C - 400/3/50 with 230V built in transformer	
2	Microprocessor/expansion valve	
0	Basic (µChiller2) + traditional valve	
A	Basic (µChiller2) + electronic valve	
B	Advanced (pCO) + traditional valve	
C	Advanced (pCO) + electronic valve	
3	Condensation control	
0	Not present	
C	Pressure switch modulating with adjustment of water flow rate (mounted on the unit)	
4	Heat recover	
0	Not present	
5	Remote communication	
0	Not present	
1	RS232	
2	RS485	
6	Cooling accessories	
0	Not present	
M	Pressure gauges	
7	Compressor options	
0	Not present	
1	Power factor correction capacitors	
2	Soft-starter	
3	Power factor correction capacitors + Soft-starter	
8	Water condenser option	
P	Condenser for well/city water (mod. 045...115)	
R	Condenser for well/city water (mod. 130...300)	
T	Oversized condenser for DRY COOLER/TOWER application	
9	Remote control board	
0	Not present	
S	Simplified *	
M	µChiller2 microprocessor	
P	pCO microprocessor	
10	Package	
0	Standard	
1	Wooden crate	
2	Wooden box	
11	Dampers	
0	Not present	
G	base vibration dampers (rubber type)	
12	Accessories	
0	Not present	
1	Pair of vic-taulic couplings (for in-out water connection)	
2	Paddle flow switch (standard differential pressure switch)	
3	Paddle flow switch + Pair of vic-taulic couplings	
13	Dry cooler/remote condenser	
0	Not present	
A	Dry cooler	
B	Dry cooler with condensing control	
C	Remote condenser	
D	Remote condenser with condensing control	
14	Dry cooler/remote condenser	
0	Not present	
1	Standard version: horizontal air flow	
2	Standard version: vertical air flow	
3	Low-noise version: horizontal air flow	
4	Low-noise version: vertical air flow	
15	Execution	
0	Standard	
1	Special	

* In a Gewiss box with ON indicator light, low-priority alarm (e.g. pump breakdown), serious alarm (e.g. unit stopped) and ON-OFF switch. All powered at 24 Vac through an insulating transformer

5 LCR MODELS AND CONFIGURATIONS

The **LCR** series comprises 15 models, only in the cooling version.

The numerous constructive options may be selected using the configuration scheme illustrated below.

The choice of some options can prevent the choice of others or render obligatory other fields. To contact the Galletti for verification

CODE	
It consists of 8 caracters, which show the range, the model, the operation mode and the power supply	
Series identification name	
LCR	Moto-evaporanting
Model	
055	Provides general indications as to the cooling capacity of standard models
060	
070	
080	
090	
105	
115	
130	
150	
180	
205	
235	
250	
275	
300	
Operation	
C	Cooling
Version	
S	Standard
L	Low noise

OPTION AND UNIT CONFIGURATION		
15 fields which customise the unit complying with customer's requirements		
Field	Name	Description
1	Refrigerant / Power supply	
2	R407C - 400/3/50 with 230V built in transformer	
2	Microprocessore / valvola espansione	
0	Basic (µChiller2) + traditional valve	
A	Basic (µChiller2) + electronic valve	
B	Advanced (pCO) + traditional valve	
C	Advanced (pCO) + electronic valve	
3	Condensation control	
0	Not present	
4	Heat recover	
0	Not present	
5	Remote communication	
0	Not present	
1	RS232	
2	RS485	
6	Cooling accessories	
0	Not present	
M	Pressure gauges	
7	Compressor options	
0	Not present	
1	Power factor correction capacitors	
2	Soft starter	
3	Power factor correction capacitors + Soft starter	
8	Water condenser options	
0	Not present	
9	Remote control board	
0	Not present	
S	Simplified *	
M	µChiller2 microprocessor	
P	pCO microprocessor	
10	Package	
0	Standard	
1	Wooden crate	
2	Wooden box	
11	Dampers	
0	Not present	
G	Base vibration dampers (rubber type)	
12	Accessories	
0	Not present	
1	Pair of VIC-TAULIC couplings (for in-out water connection)	
2	Paddle flow switch (standard differential pressure switch)	
3	Paddle flow switch + Pair of VIC-TAULIC couplings	
13	Dry Cooler / Remote condenser	
0	Not present	
A	Dry cooler	
B	Dry cooler with condensing control	
C	Remote condenser	
D	Remote condenser with condensing control	
14	Dry Cooler / Remote condenser	
0	Not present	
1	Standard version: horizontal air flow	
2	Standard version: vertical air flow	
3	Low-noise version: horizontal air flow	
4	Low-noise version: vertical air flow	
15	Execution	
0	Standard	
1	Special	

* In a Gewiss box with ON indicator light, low-priority alarm (e.g. pump breakdown), serious alarm (e.g. unit stopped) and ON-OFF switch. All powered at 24 Vac through an insulating transformer

6 LCW-C RATED TECHNICAL DATA water chillers

LCW - CS / CL		055	060	070	080	090	105	115	130
Operation with municipality-well water (15-30°C)									
Cooling capacity	kW	50	58,1	67,2	76,13	89,6	102,6	115,7	132,6
Rated power input	kW	11,9	13,8	16	18,2	21,2	25,1	29	32,2
Rated current absorbed	A	24,99	29,18	32,36	35,54	41,71	47,49	53,49	59,72
Evaporator water flow	l/h	8600	9993	11559	13094	15412	17648	19900	22807
Evaporator water pressure drop	kPa	27	34	48	48	52	31	30	31
Condenser water flow	l/h	3515	4083	4725	5356	6292	7250	8213	9356
Condenser water pressure drop	kPa	8	8	8	8	9	4	5	4
Operation with cooling tower (29-35°C)									
Cooling capacity	kW	48,07	55,53	64,74	72,98	85,08	97,71	109,67	126,35
Rated power input	kW	12,95	15,21	17,35	19,93	23,57	27,48	32,05	35,63
Rated current absorbed	A	26,14	30,72	33,91	37,58	44,59	50,45	57,15	63,89
Evaporator water flow	l/h	8267	9551	11135	12553	14635	16840	18864	21732
Evaporator water pressure drop	kPa	25	31	50	44	47	28	27	28
Condenser water flow	l/h	8653	10031	11641	13175	15405	11775	20083	22962
Condenser water pressure drop	kPa	50	50	50	50	56	25	31	25
Operation with dry cooler (40-45°C)*									
Cooling capacity	kW	42,5	49,6	57,7	65,9	74,7	87,6	100,6	113,4
Rated power input	kW	15,29	17,8	20,6	23,4	26,8	32,1	37,4	40,5
Rated current absorbed	A	28,72	33,43	37,27	41,15	47,99	55,82	63,38	69,17
Evaporator water flow	l/h	7310	8530	9925	11335	12849	15068	17303	19506
Evaporator water pressure drop	kPa	20	25	35	36	36	22	22	22
Condenser water flow	l/h	9809	11439	13290	15159	17228	20313	23415	26123
Condenser water pressure drop	kPa	21	28	38	50	19	27	36	32
Power supply	V - ph - Hz	400-3-50							
Maximum current absorbed	A	50,5	62,5	70,2	76,2	76,2	93	108	123,2
Starting ampere	A	146	152	198	203	206	247	252	307
Scroll compressor / refrigerant circuit	Nr.	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Plates evaporator	Nr.	2	2	2	2	2	1	1	1
Plates condenser	Nr.	2	2	2	2	2	1	1	1
Water content on user side	dm3	5,5	6,1	6,6	7,1	7,9	8,2	8,8	9,5
GAS Hydraulic connections		2"	2"	2"	2"	2"	2"	2"	3"
Dimensions: height	mm	1492	1492	1492	1492	1492	1492	1492	1492
Dimensions: length	mm	1204	1204	1204	1204	1204	1204	1204	1654
Dimensions: depth	mm	788	788	788	788	788	788	788	1168
Weight	kg	395	417	434	445	462	582	610	710
LCW-CS sound power level	dB(A)	71	71	72	72	72	73	73	75
LCW-CS sound pressure level	dB(A)	63	63	64	64	64	65	65	67
LCW-CL sound power level	dB(A)	69	69	70	70	70	71	71	73
LCW-CL sound pressure level	dB(A)	61	61	62	62	62	63	63	65

- * Performances calculated with oversized condenser option for DRY COOLER application
- **Cooling capacity:** evaporator water temperature 12°C/7°C
 - **Sound power** measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
 - **Sound pressure** calculated in free field condition, 1 m distance, directional factor equal to 2

6 LCW-C RATED TECHNICAL DATA water chillers

LCW - CS / CL		150	180	205	235	250	275	300
Operation with municipality-well water (15-30°C)								
Cooling capacity	kW	148,1	172,2	203,2	234,2	247	259,9	296,2
Rated power input	kW	35,2	42	50,1	58,18	61,3	64,4	70,4
Rated current absorbed	A	65,62	83,15	95,15	107,32	113,51	119,43	131,57
Evaporator water flow	l/h	25474	29618	34950	40282	42483	44703	50947
Evaporator water pressure drop	kPa	36	34	34	34	38	31	38
Condenser water flow	l/h	10408	12160	14379	16596	17500	18409	20817
Condenser water pressure drop	kPa	5	5	5	10	10	9	13
Operation with cooling tower (29-35°C)								
Cooling capacity	kW	141,14	163,36	191,85	221,72	234,2	248,51	282,84
Rated power input	kW	39,49	46,76	55,87	64,73	68,78	70,9	78,51
Rated current absorbed	A	70,86	88,87	102	115,25	122,64	127,42	141,62
Evaporator water flow	l/h	24277	28098	32999	38135	40283	42744	48648
Evaporator water pressure drop	kPa	33	30	30	31	35	29	34
Condenser water flow	l/h	25607	29783	35106	40593	42934	45274	51231
Condenser water pressure drop	kPa	31	31	31	62	63	57	82
Operation with dry cooler (40-45°C)*								
Cooling capacity	kW	126,1	149,1	175,2	201,3	213,4	225,4	252,1
Rated power input	kW	44,6	53,8	63,3	72,8	77	81,2	89,2
Rated current absorbed	A	76,17	96,01	109,56	123,54	130,63	138,51	152,09
Evaporator water flow	l/h	21689	25646	30135	34623	36704	38769	43361
Evaporator water pressure drop	kPa	26	25	25	25	29	23	27
Condenser water flow	l/h	28978	34436	40478	46518	49285	52037	57936
Condenser water pressure drop	kPa	16	42	34	46	51	37	46
Power supply	V - ph - Hz	400-3-50						
Maximum current absorbed	A	141,2	144,2	165,6	205,6	228	246	260
Starting ampere	A	325,3	248	301	318	377	384	384
Scroll compressor / refrigerant circuit	Nr.	2/2	2/4	2/4	2/4	2/4	2/4	2/4
Plates evaporator	Nr.	1	1	1	1	1	1	1
Plates condenser	Nr.	1	1	1	1	1	1	1
Water content on user side	dm3	10,5	10,5	11,5	12,4	12,4	13,6	14,4
GAS Hydraulic connections		3"	3"	4"	4"	4"	4"	4"
Dimensions: height	mm	1492	1492	1712	1712	1712	1712	1712
Dimensions: length	mm	1654	1654	1654	1654	1654	1654	1654
Dimensions: depth	mm	1168	1168	1168	1168	1168	1168	1168
Weight	kg	783	956	1042	1075	1097	1134	1160
LCW-CS sound power level	dB(A)	75	75	75	75	75	75	75
LCW-CS sound pressure level	dB(A)	67	67	67	67	67	67	67
LCW-CL sound power level	dB(A)	73	73	73	73	73	73	73
LCW-CL sound pressure level	dB(A)	65	65	65	65	65	65	65

- * Performances calculated with oversized condenser option for DRY COOLER application
- **Cooling capacity:** evaporator water temperature 12°C/7°C
 - **Sound power** measured according to standards ISO 3741 - ISO 3744 and EN29614-1
 - **Sound pressure** calculated in free field condition, 1 m distance, directional factor equal to 2

7 LCW-H RATED TECHNICAL DATA heat pumps

LCW - HS / HL		055	060	070	080	090	105	115	130
Operation with municipality-well water (15-30°C)									
Cooling capacity	kW	47,3	55,2	64	72,7	83,2	98,1	113	125,6
Rated power input	kW	11,9	13,8	16	18,7	21,1	25	29	32,1
Rated current absorbed	A	24,99	29,18	32,36	35,54	41,39	47,19	53,11	55,1
Evaporator water flow	l/h	8136	9495	11009	12505	14310	16837	19437	21603
Evaporator water pressure drop	kPa	46	54	37	47	45	24	32	19
Condenser water flow	l/h	3360	3917	4541	5160	5919	6986	8058	8949
Condenser water pressure drop	kPa	2	3	4	6	2	3	4	4
Operation with municipality-well water (15-10°C)									
Heating capacity	kW	56,4	65,8	76,5	87,2	99,3	117,4	135,4	151,2
Rated power input	kW	15,7	18,3	21,1	24	27,6	32,4	37,3	41,5
Rated current absorbed	A	30,27	37,46	40,67	46,3	54,04	61,03	70,08	76,49
Condenser water flow	l/h	9701	11318	13158	14999	17080	20193	23290	26006
Condenser water pressure drop	kPa	20	28	37	48	19	27	35	32
Evaporator water flow	l/h	7135	8328	9710	11077	12571	14899	17194	19225
Evaporator water pressure drop	kPa	31	42	29	37	35	19	25	15
Power supply	V - ph - Hz	400-3-50							
maximum current absorbed	A	50,5	62,5	70,2	76,2	76,2	93	108	123,2
Starting Ampere	A	146	152	198	203	206	247	252	307
Scroll compressor / refrigerant circuit	Nr.	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Plates evaporator	Nr.	2	2	2	2	2	2	1	1
Plates condenser	Nr.	2	2	2	2	2	2	1	1
Water content on user side	dm3	5,5	6,1	6,6	7,1	7,9	8,2	8,8	9,5
GAS Hydraulic connections		2"	2"	2"	2"	2"	2"	2"	3"
Dimensions: height	mm	1492	1492	1492	1492	1492	1492	1492	1492
Dimensions: length	mm	1204	1204	1204	1204	1204	1204	1204	1654
Dimensions: depth	mm	788	788	788	788	788	788	788	1168
Unit weight	kg	412	434	452	463	481	613	635	710
LCW-HS sound power level	dB(A)	71	71	72	72	72	73	73	75
LCW-HS sound pressure level	dB(A)	63	63	64	64	64	65	65	67
LCW-HL sound power level	dB(A)	69	69	70	70	70	71	71	73
LCW-HL sound pressure level	dB(A)	61	61	62	62	62	63	63	65

- **Cooling capacity:** evaporator water temperature 12°C/7°C
- **Heating capacity:** condenser water temperature 40/45°C, water temperature to the evaporator 15°C
- **Sound power** measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
- **Sound pressure** calculated in free field condition, 1 m distance, directional factor equal to 2

7 LCW-H RATED TECHNICAL DATA heat pumps

LCW - HS / HL		150	180	205	235	250	275	300
Operation with municipality-well water (15-30°C)								
Cooling capacity	kW	138,2	166,5	196,3	222,7	235	247,4	276,3
Rated power input	kW	35,2	42,5	50,1	57,9	61	64,2	70,3
Rated current absorbed	A	65,62	82,65	93,98	106,4	112,16	119,05	131,37
Evaporator water flow	l/h	23770	28638	33764	38304	40420	42553	47524
Evaporator water pressure drop	kPa	39	39	45	49	32	36	45
Condenser water flow	l/h	9841	11839	13983	15922	16796	17681	19670
Condenser water pressure drop	kPa	2	5	4	5	6	4	5
Operation with municipality-well water (15-10°C)								
Heating capacity	kW	166,9	198,7	234,8	267,8	283,4	299	333,7
Rated power input	kW	45,6	55,2	64,9	74,6	78,8	82,9	91,3
Rated current absorbed	A	88,73	108,86	122,55	138,55	146,25	154,02	171,6
Condenser water flow	l/h	28707	34176	40386	46062	48744	51428	57396
Condenser water pressure drop	kPa	16	42	34	45	49	36	45
Evaporator water flow	l/h	21256	25157	29781	33872	35868	37883	42478
Evaporator water pressure drop	kPa	31	30	35	39	25	28	36
Power supply	V - ph - Hz	400-3-50						
maximum current absorbed	A	141,2	144,2	165,6	205,6	228	246	260
Starting Ampere	A	325,3	248	301	318	377	384	384
Scroll compressor / refrigerant circuit	Nr.	2/2	4/4	4/4	4/4	4/4	4/4	4/4
Plates evaporator	Nr.	1	1	1	1	1	1	1
Plates condenser	Nr.	1	1	1	1	1	1	1
Water content on user side	dm3	10,5	10,5	11,5	12,4	12,4	13,6	14,4
GAS Hydraulic connections		3"	3"	4"	4"	4"	4"	4"
Dimensions: height	mm	1492	1492	1712	1712	1712	1712	1712
Dimensions: length	mm	1654	1654	1654	1654	1654	1654	1654
Dimensions: depth	mm	1168	1168	1168	1168	1168	1168	1168
Unit weight	kg	783	956	1042	1075	1097	1134	1160
LCW-HS sound power level	dB(A)	75	75	75	75	75	75	75
LCW-HS sound pressure level	dB(A)	67	67	67	67	67	67	67
LCW-HL sound power level	dB(A)	73	73	73	73	73	73	73
LCW-HL sound pressure level	dB(A)	65	65	65	65	65	65	65

- **Cooling capacity:** evaporator water temperature 12°C/7°C
- **Heating capacity:** condenser water temperature 40/45°C, water temperature to the evaporator 15°C
- **Sound power** measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
- **Sound pressure** calculated in free field condition, 1 m distance, directional factor equal to 2

8 LCR RATED TECHNICAL DATA heat pumps

LCR - CS/CL		055	060	070	080	090	105	115	130
Cooling capacity	kW	43,49	51,07	58,63	66,97	76,39	90,82	105,47	117,58
Power supply	V - ph - Hz	400-3-50							
Rated power input	kW	14,74	16,73	20,18	22,51	25,89	30,95	34,83	38,95
Rated current absorbed	A	27,31	31,38	36,19	39,56	46,48	53,7	59,39	66,47
Maximum current absorbed	A	50,5	62,5	70,2	76,2	76,2	93	108	123,2
Starting ampere	A	146	152	198	203	206	247	252	307
Evaporator water flow	l/h	7480	8784	10084	11519	13139	15622	18141	20223
Evaporator water pressure drop	kPa	20	26	37	37	38	24	25	24
Scroll compressor / refrigerant circuit	Nr.	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Plates evaporator	Nr.	2	2	2	2	2	1	1	1
Dimensions: height	mm	1534	1534	1534	1534	1534	1534	1534	1594
Dimensions: length	mm	1204	1204	1204	1204	1204	1204	1204	1654
Dimensions: depth	mm	788	788	788	788	788	788	788	1168
LCR-CS sound power level	dB(A)	71	71	72	72	72	73	73	75
LCR-CS sound pressure level	dB(A)	63	63	64	64	64	65	65	67
LCR-CL sound power level	dB(A)	69	69	70	70	70	71	71	73
LCR-CL sound pressure level	dB(A)	61	61	62	62	62	63	63	65
LCR - CS/CL		150	180	205	235	250	275	300	
Cooling capacity	kW	129,11	151,2	181,37	205,3	220,16	235,46	257,26	
Power supply	V - ph - Hz	400-3-50							
Rated power input	kW	42,62	51,82	61,43	72,69	73,94	77,14	85,24	
Rated current absorbed	A	72,98	92,9	106,8	122,76	126,08	132,01	145,98	
Maximum current absorbed	A	141,2	144,2	165,6	205,6	228	246	260	
Starting ampere	A	325,3	248	301	318	377	384	384	
Evaporator water flow	l/h	22208	26006	31195	35312	37867	40499	44248	
Evaporator water pressure drop	kPa	27	26	27	26	31	26	28	
Scroll compressor / refrigerant circuit	Nr.	2/2	2/4	2/4	2/4	2/4	2/4	2/4	
Plates evaporator	Nr.	1	1	1	1	1	1	1	
Dimensions: height	mm	1594	1594	1594	1594	1594	1594	1594	
Dimensions: length	mm	1654	1654	1654	1654	1654	1654	1654	
Dimensions: depth	mm	1168	1168	1168	1168	1168	1168	1168	
LCR-CS sound power level	dB(A)	75	75	75	75	75	75	75	
LCR-CS sound pressure level	dB(A)	67	67	67	67	67	67	67	
LCR-CL sound power level	dB(A)	73	73	73	73	73	73	73	
LCR-CL sound pressure level	dB(A)	65	65	65	65	65	65	65	

- **Cooling capacity** in the matching with the remote condenser indicate in the manual: evaporator water temperature 12°C/7°C , condensing air temperature 35°C
- **Sound pressure** calculated in free field condition, 1 m distance, directional factor equal to 2
- **Sound power** measured according to standards ISO 3741 - ISO 3744 and EN 29614-1

9 LCW C COOLING CAPACITY

Twe₁ Evaporator water inlet temperature (user side)
Twe₂ Evaporator water outlet temperature (user side)
Twc₁ Condenser water inlet temperature (dissipator side)
Twc₂ Condenser water outlet temperature (dissipator side)
PF Cooling capacity
PA Power input
PD Capacity at condenser
40/45 (35% glycol)

LCW C	Twc ₁	Twc ₂	15 / 30			29 / 35			40 / 45 (35% glicole)		
	Twe1	Twe2	PF	PA	PD	PF	PA	PD	PF	PA	PD
	°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW
LCW 055 C	10	5	46,41	11,91	58,32	44,67	12,91	57,58	39,15	15,43	54,58
	12	7	50,00	11,90	61,90	48,07	12,95	61,02	42,18	15,47	57,65
	14	9	53,81	11,88	65,69	51,60	13,02	64,62	45,37	15,52	60,89
	16	11	57,80	11,85	69,65	55,33	13,00	68,33	48,72	15,55	64,27
	18	13	61,98	11,81	73,79	59,24	13,05	72,29	52,26	15,58	67,84
LCW 060 C	10	5	53,99	13,83	67,82	51,63	15,18	66,81	45,70	17,97	63,67
	12	7	58,10	13,80	71,90	55,53	15,21	70,74	49,21	18,01	67,22
	14	9	62,49	13,77	76,26	59,56	15,28	74,84	52,90	18,05	70,95
	16	11	67,71	13,73	81,44	63,81	15,26	79,07	56,78	18,07	74,85
	18	13	71,89	13,68	85,57	68,29	15,30	83,59	60,85	18,09	78,94
LCW 070 C	10	5	62,44	16,00	78,44	60,26	17,27	77,53	53,20	20,78	73,98
	12	7	67,20	16,00	83,20	64,74	17,35	82,09	57,26	20,86	78,12
	14	9	72,27	16,00	88,27	69,46	17,50	86,96	61,55	20,94	82,49
	16	11	77,55	15,99	93,54	74,43	17,43	91,86	66,05	21,01	87,06
	18	13	83,15	15,97	99,12	79,65	17,56	97,21	70,78	21,07	91,85
LCW 080 C	10	5	70,76	18,18	88,94	67,95	19,81	87,76	60,79	23,58	84,37
	12	7	76,13	18,20	94,33	72,98	19,93	92,91	65,42	23,70	89,12
	14	9	81,89	18,22	100,11	78,33	20,17	98,50	70,29	23,82	94,11
	16	11	87,93	18,25	106,18	83,98	20,06	104,04	75,44	23,94	99,38
	18	13	94,29	18,27	112,56	89,88	20,29	110,17	80,86	24,05	104,91
LCW 090 C	10	5	83,28	21,18	104,46	79,21	23,42	102,63	68,83	26,98	95,81
	12	7	89,60	21,20	110,80	85,08	23,57	108,65	74,07	27,13	101,20
	14	9	96,26	21,21	117,47	91,21	23,81	115,02	79,58	27,27	106,85
	16	11	103,33	21,21	124,54	97,74	23,70	121,44	85,39	27,43	112,82
	18	13	110,70	21,20	131,90	104,56	23,94	128,50	91,47	27,56	119,03
LCW 105 C	10	5	95,30	25,02	120,32	91,15	27,24	118,39	80,78	32,24	113,02
	12	7	102,60	25,10	127,70	97,91	27,48	125,39	86,88	32,51	119,39
	14	9	110,25	25,18	135,43	104,98	27,97	132,95	93,31	32,79	126,10
	16	11	118,35	25,24	143,59	112,39	27,73	140,12	100,06	33,06	133,12
	18	13	126,86	25,30	152,16	120,21	28,20	148,41	107,19	33,34	140,53
LCW 115 C	10	5	107,40	28,85	136,25	102,04	31,71	133,75	92,69	37,51	130,20
	12	7	115,70	29,00	144,70	109,67	32,05	141,72	99,75	37,89	137,64
	14	9	124,39	29,15	153,54	117,65	32,75	150,40	107,20	38,27	145,47
	16	11	133,64	29,28	162,92	126,05	32,40	158,45	114,99	38,66	153,65
	18	13	143,35	29,40	172,75	134,88	33,09	167,97	123,23	39,08	162,31

9 LCW C COOLING CAPACITY

Twe₁ Evaporator water inlet temperature (user side)
Twe₂ Evaporator water outlet temperature (user side)
Twc₁ Condenser water inlet temperature (dissipator side)
Twc₂ Condenser water outlet temperature (dissipator side)
PF Cooling capacity
PA Power input
PD Capacity at condenser
40/45 (35% glycol)

LCW C	Twc ₁	Twc ₂	15 / 30			29 / 35			40 / 45 (35% glicole)		
	Twe1	Twe2	PF	PA	PD	PF	PA	PD	PF	PA	PD
	°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW
LCW 130 C	10	5	123,25	32,01	155,26	117,79	35,18	152,97	104,51	40,51	145,02
	12	7	132,60	32,20	164,80	126,35	35,63	161,98	112,41	41,04	153,45
	14	9	142,52	32,39	174,91	135,63	35,97	171,60	120,77	41,42	162,19
	16	11	152,98	32,57	185,55	145,48	36,43	181,91	129,58	41,94	171,52
	18	13	163,98	32,73	196,71	155,46	36,87	192,33	138,83	42,33	181,16
LCW 150 C	10	5	137,68	34,97	172,65	131,50	38,97	170,47	116,41	44,62	161,03
	12	7	148,10	35,20	183,30	141,14	39,49	180,63	125,13	45,15	170,28
	14	9	159,21	35,43	194,64	151,40	40,00	191,40	134,39	45,69	180,08
	16	11	170,94	35,66	206,60	162,22	40,50	202,72	144,19	46,22	190,41
	18	13	183,25	35,88	219,13	173,53	41,00	214,53	154,41	46,76	201,17
LCW 180 C	10	5	160,10	41,97	202,07	152,23	46,45	198,68	137,38	54,18	191,56
	12	7	172,20	42,00	214,20	163,36	46,76	210,12	147,74	54,54	202,28
	14	9	184,95	42,02	226,97	175,05	47,08	222,13	158,60	54,88	213,48
	16	11	198,36	42,03	240,39	187,33	47,37	234,70	170,01	55,20	225,21
	18	13	212,46	42,02	254,48	200,21	47,65	247,86	181,95	55,52	237,47
LCW 205 C	10	5	188,62	49,93	238,55	178,50	55,34	233,84	161,41	63,61	225,02
	12	7	203,20	50,10	253,30	191,85	55,87	247,72	173,64	64,16	237,80
	14	9	218,64	50,26	268,90	205,99	56,39	262,38	186,49	64,72	251,21
	16	11	234,95	50,40	285,35	220,81	56,90	277,71	199,99	65,28	265,27
	18	13	252,03	50,53	302,56	236,32	57,41	293,73	214,15	65,84	279,99
LCW 235 C	10	5	217,39	57,89	275,28	206,33	64,01	270,34	185,59	72,96	258,55
	12	7	234,20	58,18	292,38	221,72	64,73	286,45	199,66	73,70	273,36
	14	9	251,26	58,48	309,74	237,99	64,73	302,72	214,50	74,45	288,95
	16	11	270,74	58,76	329,50	254,98	66,19	321,17	230,13	75,22	305,35
	18	13	290,55	59,04	349,59	272,93	66,91	339,84	246,60	75,98	322,58
LCW 250 C	10	5	229,37	60,97	290,34	218,20	67,96	286,16	197,13	77,09	274,22
	12	7	247,00	61,30	308,30	234,20	68,78	302,98	211,45	78,02	289,47
	14	9	265,62	61,62	327,24	251,05	69,61	320,66	227,55	78,72	306,27
	16	11	285,27	61,94	347,21	268,75	70,43	339,18	243,47	79,67	323,14
	18	13	305,98	62,26	368,24	287,89	71,08	358,97	261,36	80,38	341,74
LCW 275 C	10	5	241,71	64,05	305,76	231,64	70,11	301,75	208,18	81,31	289,49
	12	7	259,90	64,40	324,30	248,51	70,90	319,41	223,64	82,18	305,82
	14	9	279,07	64,75	343,82	266,27	71,70	337,97	239,97	83,07	323,04
	16	11	299,29	65,01	364,30	284,93	72,51	357,44	257,17	83,95	341,12
	18	13	320,57	65,45	386,02	304,49	73,33	377,82	275,27	84,85	360,12
LCW 300 C	10	5	275,79	69,95	345,74	263,86	77,55	341,41	233,03	89,29	322,32
	12	7	296,20	70,40	366,60	282,84	78,51	361,35	250,13	90,31	340,44
	14	9	317,80	70,86	388,66	323,85	80,46	404,31	268,14	91,33	359,47
	16	11	340,54	71,32	411,86	302,83	79,48	382,31	287,14	92,36	379,50
	18	13	364,53	71,77	436,30	345,99	81,44	427,43	307,15	93,39	400,54

10 LCW H COOLING CAPACITY

Twe₁ Evaporator water inlet temperature (user side)
Twe₂ Evaporator water outlet temperature (user side)
Twc₂ Condenser water outlet temperature (dissipator side)
PF Cooling capacity
PA Power input
PD Capacity at condenser
40/45 (35% glycol)

LCW H	Twc ₂		15 / 30			29 / 35			40 / 45 (35% glycol)		
	Twe1	Twe2	PF	PA	PD	PF	PA	PD	PF	PA	PD
	°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW
LCW 055 H	10	5	43,90	11,91	55,81	42,00	13,04	55,04	36,42	16,55	52,97
	12	7	47,30	11,90	59,20	45,13	13,12	58,25	39,21	16,62	55,83
	14	9	50,91	11,88	62,79	48,42	13,18	61,60	42,14	16,69	58,83
	16	11	54,67	11,85	66,52	51,90	13,23	65,13	45,26	16,74	62,00
	18	13	58,64	11,81	70,45	55,53	13,28	68,81	48,51	16,81	65,32
LCW 060 H	10	5	51,24	13,83	65,07	48,64	15,38	64,02	42,12	19,61	61,73
	12	7	55,20	13,80	69,00	52,24	15,46	67,70	45,32	19,69	65,01
	14	9	59,37	13,77	73,14	56,01	15,53	71,54	48,67	19,75	68,42
	16	11	63,69	13,73	77,42	60,00	15,58	75,58	52,25	19,80	72,05
	18	13	68,30	13,68	81,98	64,15	15,63	79,78	55,97	19,85	75,82
LCW 070 H	10	5	59,43	16,00	75,43	55,81	18,16	73,97	48,41	23,10	71,51
	12	7	64,00	16,00	80,00	59,90	18,29	78,19	52,09	23,21	75,30
	14	9	68,81	16,00	84,81	64,22	18,40	82,62	55,92	23,33	79,25
	16	11	73,78	16,02	89,80	68,78	18,51	87,29	59,98	23,44	83,42
	18	13	78,95	16,97	95,92	73,56	18,61	92,17	64,24	23,54	87,78
LCW 080 H	10	5	67,50	18,18	85,68	62,95	20,92	83,87	54,76	26,55	81,31
	12	7	72,70	18,20	90,90	67,56	21,08	88,64	58,95	26,70	85,65
	14	9	78,16	18,22	96,38	72,45	21,25	93,70	63,28	26,87	90,15
	16	11	83,78	18,31	102,09	77,64	21,40	99,04	67,85	27,04	94,89
	18	13	89,56	18,48	108,04	83,05	21,56	104,61	72,68	27,21	99,89
LCW 090 H	10	5	77,57	20,93	98,50	71,52	24,44	95,96	61,50	30,81	92,31
	12	7	83,30	21,10	104,40	76,77	24,63	101,40	66,15	31,04	97,19
	14	9	89,09	21,28	110,37	82,28	24,82	107,10	71,08	31,24	102,32
	16	11	95,21	21,44	116,65	88,06	25,00	113,06	76,17	31,46	107,63
	18	13	101,69	21,60	123,29	94,18	25,16	119,34	81,60	31,64	113,24
LCW 105 H	10	5	91,37	24,80	116,17	84,83	28,37	113,20	73,32	35,51	108,83
	12	7	98,10	25,00	123,10	91,02	28,07	119,09	78,81	35,87	114,68
	14	9	105,20	25,20	130,40	97,49	29,00	126,49	84,57	36,23	120,80
	16	11	112,62	25,40	138,02	104,33	29,32	133,65	90,63	36,60	127,23
	18	13	120,40	25,61	146,01	111,51	29,62	141,13	97,00	36,96	133,96
LCW 115 H	10	5	105,38	28,61	133,99	97,17	32,97	130,14	84,11	41,07	125,18
	12	7	113,00	29,00	142,00	104,33	33,42	137,75	90,41	41,56	131,97
	14	9	121,01	29,38	150,39	111,79	33,84	145,63	97,08	42,04	139,12
	16	11	129,40	29,78	159,18	119,70	34,27	153,97	104,09	42,54	146,63
	18	13	138,20	30,18	168,38	128,02	34,70	162,72	111,48	43,05	154,53

10 LCW H COOLING CAPACITY

Twe₁ Evaporator water inlet temperature (user side)
Twe₂ Evaporator water outlet temperature (user side)
Twc₂ Condenser water outlet temperature (dissipator side)
PF Cooling capacity
PA Power input
PD Capacity at condenser
40/45 (35% glycol)

LCW H	Twc ₂		15 / 30			29 / 35			40 / 45 (35% glicole)		
	Twe1	Twe2	PF	PA	PD	PF	PA	PD	PF	PA	PD
	°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW
LCW 130 H	10	5	116,74	31,91	148,65	109,76	36,13	145,89	95,88	44,92	140,80
	12	7	125,60	32,10	157,70	117,74	36,59	154,33	103,15	45,49	148,64
	14	9	134,99	32,28	167,27	126,46	37,07	163,53	110,59	46,06	156,65
	16	11	144,91	32,46	177,37	135,09	37,66	172,75	118,69	46,64	165,33
	18	13	155,04	32,77	187,81	144,38	38,12	182,50	126,90	47,22	174,12
LCW 150 H	10	5	128,47	34,97	163,44	120,59	40,30	160,89	105,59	50,13	155,72
	12	7	138,20	35,20	173,40	129,35	40,90	170,25	113,39	50,82	164,21
	14	9	148,55	35,45	184,00	138,65	41,50	180,15	121,67	51,51	173,18
	16	11	158,91	36,03	194,94	148,42	42,10	190,52	130,41	52,20	182,61
	18	13	169,71	36,61	206,32	158,62	42,69	201,31	139,54	52,91	192,45
LCW 180 H	10	5	155,48	41,67	197,15	143,13	48,67	191,80	122,81	61,40	184,21
	12	7	166,50	42,10	208,60	153,51	49,11	202,62	131,93	61,90	193,83
	14	9	178,06	42,50	220,56	166,37	49,54	215,91	141,50	62,40	203,90
	16	11	190,17	42,89	233,06	175,77	49,96	225,73	151,52	62,89	214,41
	18	13	202,83	43,28	246,11	187,71	50,36	238,07	162,06	63,34	225,40
LCW 205 H	10	5	183,06	49,48	232,54	168,67	57,28	225,95	145,73	71,76	217,49
	12	7	196,30	50,10	246,40	181,13	57,94	239,07	156,59	72,49	229,08
	14	9	210,32	50,71	261,03	194,25	58,61	252,86	168,03	73,23	241,26
	16	11	225,01	51,33	276,34	208,02	59,26	267,28	180,01	73,99	254,00
	18	13	240,40	51,93	292,33	222,38	59,93	282,31	192,62	74,75	267,37
LCW 235 H	10	5	207,63	57,19	264,82	191,50	65,98	257,48	166,07	82,16	248,23
	12	7	222,70	57,90	280,60	205,53	66,82	272,35	178,53	83,13	261,66
	14	9	238,44	58,68	297,12	220,29	67,70	287,99	191,64	84,10	275,74
	16	11	254,96	58,47	313,43	235,85	68,56	304,41	205,48	85,09	290,57
	18	13	272,32	60,25	332,57	252,19	69,43	321,62	220,04	86,10	306,14
LCW 250 H	10	5	219,39	59,89	279,28	202,66	69,60	272,26	176,04	86,63	262,67
	12	7	235,00	61,00	296,00	217,37	70,45	287,82	189,37	87,68	277,05
	14	9	251,66	61,73	313,39	233,36	71,32	304,68	202,95	88,73	291,68
	16	11	269,16	62,46	331,62	249,64	72,18	321,82	217,26	89,80	307,06
	18	13	287,18	63,62	350,80	266,80	73,31	340,11	232,82	90,91	323,73
LCW 275 H	10	5	230,07	63,84	293,91	215,46	72,87	288,33	187,88	90,70	278,58
	12	7	247,40	64,20	311,60	230,98	73,83	304,81	201,69	91,83	293,52
	14	9	265,69	64,55	330,24	247,30	74,79	322,09	216,27	92,96	309,23
	16	11	284,47	65,15	349,62	264,43	75,78	340,21	231,58	94,13	325,71
	18	13	303,55	66,07	369,62	282,37	76,78	359,15	247,71	95,31	343,02
LCW 300 H	10	5	257,21	69,84	327,05	240,34	81,09	321,43	210,09	101,17	311,26
	12	7	276,30	70,30	346,60	257,44	82,24	339,68	225,32	102,48	327,80
	14	9	295,45	71,35	366,80	275,42	83,40	358,82	241,36	103,82	345,18
	16	11	315,47	72,47	387,94	294,31	84,58	378,89	258,25	105,16	363,41
	18	13	336,49	73,61	410,10	314,20	85,75	399,95	276,05	106,51	382,56

11 LCW H HEATING CAPACITY

Twc₁ Condenser water inlet temperature (user side)
Twc₂ Condenser water outlet temperature (user side)
Twe₂ Evaporator water outlet temperature (dissipator side)
PT Heating capacity
PA Power input

LCW H	Twe ₂		8°C		9°C		10°C		11°C		12°C	
	Twc ₁	Twc ₂	PT	PA	PT	PA	PT	PA	PT	PA	PT	PA
	°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
LCW 055 H	35	30	56,30	12,64	57,93	12,67	59,66	12,70	61,38	12,72	63,16	12,74
	40	35	54,84	14,05	56,40	14,08	58,06	14,10	59,69	14,13	61,42	14,16
	45	40	53,37	15,64	54,90	15,66	56,40	15,70	58,01	15,72	59,63	15,75
	50	45	51,95	17,42	53,33	17,46	54,80	17,48	56,29	17,51	57,78	17,53
LCW 060 H	35	30	65,92	14,69	67,79	14,73	69,71	14,76	71,71	14,78	73,72	14,81
	40	35	64,14	16,36	65,92	16,40	67,77	16,40	69,66	16,43	71,58	16,45
	45	40	62,38	18,26	64,10	18,26	65,80	18,30	67,58	18,30	69,39	18,32
	50	45	60,66	20,35	62,24	20,36	63,86	20,35	65,48	20,35	67,16	20,35
LCW 070 H	35	30	76,11	16,98	78,35	17,02	80,61	17,07	82,93	17,12	85,31	17,16
	40	35	74,27	18,86	76,37	18,91	78,55	18,96	80,75	19,01	83,04	19,06
	45	40	72,45	21,00	74,46	21,06	76,50	21,10	78,63	21,15	80,78	21,20
	50	45	70,74	23,44	72,63	23,48	74,52	23,53	76,50	23,50	78,54	23,60
LCW 080 H	35	30	86,54	19,33	89,09	19,40	91,62	19,48	94,30	19,55	96,99	19,61
	40	35	84,54	21,46	86,91	21,52	89,39	21,61	91,92	21,67	94,49	21,75
	45	40	82,58	23,87	84,88	23,94	87,20	24,00	89,58	24,07	92,04	24,15
	50	45	80,82	26,56	82,92	26,62	85,08	26,68	87,33	26,74	89,64	26,79
LCW 090 H	35	30	99,13	22,30	101,98	22,39	104,89	22,47	107,91	22,53	110,96	22,61
	40	35	96,63	24,69	99,34	24,79	102,11	24,88	104,98	24,96	107,88	25,05
	45	40	94,07	27,40	96,65	27,49	99,30	27,60	102,00	27,68	104,76	27,76
	50	45	91,55	30,42	93,95	30,51	96,40	30,60	98,95	30,69	101,56	30,77
LCW 105 H	35	30	117,14	26,30	120,53	26,43	124,02	26,57	127,59	26,72	131,21	26,86
	40	35	114,11	29,03	117,36	29,18	120,68	29,33	124,09	29,48	127,60	29,63
	45	40	111,13	34,09	114,22	32,24	117,40	32,40	120,64	32,56	123,95	32,73
	50	45	108,18	35,46	111,13	35,62	114,11	35,78	117,18	35,94	120,29	36,12
LCW 115 H	35	30	134,93	30,39	138,86	30,60	142,93	30,78	147,02	30,99	151,25	31,17
	40	35	131,49	33,45	135,23	33,67	139,10	33,87	143,06	34,07	147,12	34,27
	45	40	128,17	36,87	131,74	37,09	135,40	37,30	139,16	37,52	143,04	37,75
	50	45	124,92	40,55	128,31	40,74	131,76	40,96	135,38	41,18	139,03	41,39
LCW 130 H	35	30	150,27	33,75	154,68	33,97	159,07	34,29	163,84	34,39	168,41	34,72
	40	35	146,53	37,13	150,88	37,49	155,19	37,73	159,61	37,96	164,42	38,21
	45	40	143,09	40,98	147,10	41,24	151,20	41,50	155,40	41,76	159,97	42,03
	50	45	139,37	45,25	143,14	45,53	147,27	45,82	151,39	45,95	155,29	46,38

11 LCW H HEATING CAPACITY

Twc₁ Condenser water inlet temperature (user side)
Twc₂ Condenser water outlet temperature (user side)
Twe₂ Evaporator water outlet temperature (dissipator side)
PT Heating capacity
PA Power input

LCW H	Twe ₂		8°C		9°C		10°C		11°C		12°C	
	Twc ₁	Twc ₂	PT	PA	PT	PA	PT	PA	PT	PA	PT	PA
	°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
LCW 150 H	35	30	165,89	37,21	170,74	37,49	175,71	37,75	180,80	38,02	185,98	38,29
	40	35	161,98	40,93	166,65	41,22	171,41	41,50	176,28	41,78	181,23	42,07
	45	40	157,92	44,99	162,35	45,30	166,90	45,60	171,54	45,90	176,28	46,20
	50	45	153,81	49,31	158,02	49,62	162,33	49,92	166,73	50,22	171,24	50,52
LCW 180 H	35	30	198,84	44,60	204,45	44,80	210,02	44,98	216,07	45,16	222,06	45,35
	40	35	193,67	49,41	199,03	49,62	204,51	49,81	210,11	50,01	215,85	50,20
	45	40	188,48	54,78	193,52	55,00	198,70	55,20	203,99	55,40	209,39	55,59
	50	45	183,30	60,56	188,00	60,76	192,81	60,95	197,76	61,14	202,81	61,32
LCW 205 H	35	30	233,96	52,67	240,81	52,96	247,81	53,26	254,94	53,56	262,23	53,85
	40	35	228,23	58,14	234,70	58,44	241,32	58,77	248,08	59,07	254,98	59,39
	45	40	222,48	64,25	228,57	64,58	234,80	64,90	241,20	65,22	247,75	65,56
	50	45	216,58	70,89	222,33	71,21	228,25	71,51	234,31	71,84	240,51	72,15
LCW 235 H	35	30	266,56	60,71	274,36	61,10	282,38	61,49	290,58	61,87	298,96	62,27
	40	35	259,89	66,87	267,36	67,29	275,02	67,70	282,87	68,11	290,90	68,52
	45	40	253,37	73,74	260,50	74,17	267,80	74,60	275,27	75,03	282,95	75,48
	50	45	247,07	81,31	253,80	81,73	260,74	82,16	267,82	82,60	275,11	83,05
LCW 250 H	35	30	281,89	64,05	290,01	64,43	298,34	64,82	306,87	65,22	315,86	65,84
	40	35	275,08	70,49	282,83	70,92	290,77	71,34	299,14	72,02	307,78	72,22
	45	40	268,51	77,87	276,13	78,07	283,40	78,80	291,41	79,02	299,03	79,76
	50	45	261,80	85,61	268,74	86,10	276,32	86,62	283,62	87,12	291,40	87,36
LCW 275 H	35	30	297,11	67,37	305,70	67,80	314,52	68,24	323,54	68,69	332,74	69,14
	40	35	290,15	74,29	298,38	74,76	306,85	75,24	315,48	75,71	324,38	76,19
	45	40	283,04	81,88	290,91	82,38	299,00	82,90	307,29	83,40	315,77	83,91
	50	45	275,93	90,21	283,43	90,76	291,12	91,30	299,00	91,82	307,07	92,35
LCW 300 H	35	30	330,72	74,06	340,20	74,58	349,92	75,10	359,85	75,62	370,02	76,14
	40	35	323,63	81,78	332,72	82,33	342,04	82,87	351,60	83,43	361,36	83,97
	45	40	316,13	90,15	324,80	90,73	333,70	91,30	342,81	91,88	352,16	92,46
	50	45	308,33	99,21	316,57	99,81	325,03	100,41	333,70	101,01	342,60	101,61

12 LCR C COOLING CAPACITY

Tw₁ Water inlet temperature
Tw₂ Water outlet temperature
Tbs₁ Dry bulb air temperature (remote condenser)
PF Cooling capacity
PA Absorbed power input
PD Capacity at condenser

- Performance evaluated in combination with our remote condenser

LCR C	Tbs ₁		25			30			35			40			45		
	Tw ₁	Tw ₂	PF	PA	PD	PF	PA	PD	PF	PA	PD	PF	PA	PD	PF	PA	PD
	°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
LCR 055 C	10	5	46,12	11,67	57,79	43,50	13,01	56,51	40,66	14,51	55,17	37,81	16,16	53,97	34,84	17,93	52,77
	11	6	47,71	11,74	59,45	44,93	13,12	58,05	42,05	14,63	56,68	39,11	16,28	55,39	36,05	18,08	54,13
	12	7	49,44	11,82	61,26	46,37	13,26	59,63	43,49	14,74	58,23	40,41	16,43	56,84	37,22	18,20	55,42
	13	8	51,10	11,89	62,99	47,86	13,40	61,26	44,88	14,86	59,74	41,80	16,51	58,31	38,47	18,34	56,81
	14	9	52,86	11,96	64,82	49,38	13,51	62,89	46,35	14,99	61,34	43,06	16,68	59,74	39,76	18,42	58,18
	15	10	54,59	12,03	66,62	50,97	13,65	64,62	47,77	15,15	62,92	44,44	16,82	61,26	40,98	18,60	59,58
	16	11	56,36	12,10	68,46	52,55	13,76	66,31	49,22	15,30	64,52	45,76	16,99	62,75	42,26	18,72	60,98
	17	12	58,17	12,17	70,34	54,08	13,90	67,98	50,76	15,43	66,19	47,18	17,11	64,29	43,64	18,79	62,43
LCR 060 C	10	5	55,21	12,65	67,86	14,75	14,75	29,50	47,78	16,47	64,25	44,47	18,44	62,91	41,20	20,55	61,75
	11	6	57,28	12,64	69,92	52,62	14,90	67,52	49,44	16,55	65,99	46,02	18,53	64,55	42,43	20,77	63,20
	12	7	59,40	12,63	72,03	54,55	14,97	69,52	51,07	16,73	67,80	47,60	18,61	66,21	43,88	20,86	64,74
	13	8	61,58	12,62	74,20	56,21	15,13	71,34	52,81	16,80	69,61	49,13	18,81	67,94	45,48	20,94	66,42
	14	9	63,96	12,60	76,56	57,90	15,28	73,18	54,50	16,98	71,48	50,89	18,89	69,78	46,77	21,14	67,91
	15	10	63,23	13,85	77,08	59,82	15,35	75,17	56,09	17,15	73,24	52,35	19,09	71,44	48,42	21,21	69,63
	16	11	65,11	13,98	79,09	61,71	15,50	77,21	57,94	17,23	75,17	54,06	19,17	73,23	49,76	21,39	71,15
	17	12	67,16	14,12	81,28	63,49	15,66	79,15	59,72	17,40	77,12	55,69	19,35	75,04	51,48	21,45	72,93
LCR 070 C	10	5	62,49	15,75	78,24	58,67	17,73	76,40	54,98	19,78	74,76	51,14	22,12	73,26	47,33	24,67	72,00
	11	6	64,61	15,86	80,47	60,50	17,93	78,43	56,73	20,01	76,74	52,85	22,32	75,17	48,96	24,79	73,75
	12	7	66,87	15,96	82,83	62,51	18,09	80,60	58,63	20,18	78,81	54,50	22,57	77,07	50,50	24,98	75,48
	13	8	69,17	16,07	85,24	64,41	18,29	82,70	60,49	20,36	80,85	56,47	22,69	79,16	52,18	25,16	77,34
	14	9	71,54	16,18	87,72	66,49	18,49	84,98	62,47	20,57	83,04	58,22	22,88	81,10	53,88	25,33	79,21
	15	10	73,87	16,28	90,15	68,56	18,65	87,21	64,38	20,75	85,13	59,89	23,12	83,01	55,56	25,48	81,04
	16	11	74,68	17,02	91,70	70,66	18,85	89,51	66,41	20,92	87,33	61,84	23,30	85,14	57,24	25,66	82,90
	17	12	76,83	17,22	94,05	72,70	19,06	91,76	68,39	21,15	89,54	63,71	23,46	87,17	59,07	25,73	84,80
LCR 080 C	10	5	72,88	16,68	89,56	66,70	19,84	86,54	62,66	22,11	84,77	58,63	24,70	83,33	54,39	27,58	81,97
	11	6	75,61	16,69	92,30	68,79	20,07	88,86	64,83	22,25	87,08	60,67	24,84	85,51	56,27	27,72	83,99
	12	7	75,08	18,25	93,33	71,31	20,20	91,51	66,97	22,51	89,48	62,50	25,13	87,63	58,33	27,86	86,19
	13	8	77,40	18,47	95,87	73,49	20,43	93,92	69,00	22,78	91,78	64,62	25,28	89,90	60,04	28,15	88,19
	14	9	79,76	18,68	98,44	75,71	20,67	96,38	71,48	22,91	94,39	66,67	25,57	92,24	61,91	28,44	90,35
	15	10	82,35	18,90	101,25	77,98	20,91	98,89	73,60	23,18	96,78	68,76	25,87	94,63	63,95	28,58	92,53
	16	11	85,00	19,12	104,12	80,47	21,16	101,63	75,75	23,45	99,20	71,01	26,02	97,03	65,89	28,86	94,75
	17	12	87,51	19,34	106,85	82,82	21,40	104,22	78,11	23,72	101,83	73,02	26,32	99,34	68,02	29,00	97,02
LCR 090 C	10	5	83,66	19,30	102,96	76,16	23,01	99,17	71,52	25,43	96,95	66,64	28,15	94,79	61,40	31,34	92,74
	11	6	86,77	19,31	106,08	78,78	23,15	101,93	73,87	25,73	99,60	68,80	28,49	97,29	63,51	31,53	95,04
	12	7	86,10	21,09	107,19	81,17	23,42	104,59	76,39	25,89	102,28	70,83	28,83	99,66	65,51	31,88	97,39
	13	8	88,72	21,33	110,05	83,90	23,56	107,46	78,65	26,20	104,85	73,38	29,01	102,39	67,53	32,23	99,76
	14	9	91,60	21,57	113,17	86,60	23,83	110,43	81,27	26,36	107,63	75,47	29,36	104,83	69,76	32,41	102,17
	15	10	94,32	21,81	116,13	89,34	24,10	113,44	83,81	26,67	110,48	77,94	29,54	107,48	72,03	32,59	104,62
	16	11	97,09	22,06	119,15	91,92	24,38	116,30	86,20	26,98	113,18	80,28	29,89	110,17	74,16	32,94	107,10
	17	12	99,90	22,30	122,20	94,56	24,66	119,22	88,81	27,29	116,10	82,65	30,24	112,89	76,17	33,28	109,45
LCR 105 C	10	5	96,67	24,53	121,20	90,57	27,44	118,01	85,18	30,24	115,42	79,34	33,56	112,90	73,53	36,94	110,47
	11	6	99,96	24,73	124,69	93,79	27,63	121,42	88,01	30,63	118,64	82,08	33,80	115,88	75,73	37,38	113,11
	12	7	103,27	25,01	128,28	96,61	28,07	124,68	90,82	30,95	121,77	84,63	34,22	118,85	78,31	37,74	116,05
	13	8	106,70	25,21	131,91	99,68	28,36	128,04	93,55	31,34	124,89	87,40	34,58	121,98	80,96	37,99	118,95
	14	9	110,20	25,42	135,62	102,90	28,72	131,62	96,60	31,66	128,26	90,04	35,01	125,05	83,48	38,43	121,91
	15	10	113,79	25,63	139,42	105,95	29,08	135,03	99,52	32,06	131,58	92,80	35,35	128,15	86,03	38,78	124,81
	16	11	117,39	25,92	143,31	108,99	29,47	138,46	102,69	32,39	135,08	95,57	35,79	131,36	88,76	39,12	127,88
	17	12	118,82	27,08	145,90	112,14	29,84	141,98	105,72	32,80	138,52	98,54	36,14	134,68	91,53	39,48	131,01
LCR 115 C	10	5	114,33	26,63	140,96	105,24	30,86	136,10	98,87	34,10	132,97	92,61	37,54	130,15	85,78	41,58	127,36
	11	6	118,65	26,70	145,35	108,56	31,26	139,82	102,32	34,37	136,69	95,47	38,04	133,51	88,78	41,88	130,66
	12	7	123,09	26,77	149,86	112,31	31,51	143,82	105,47	34,83	140,30	98,76	38,34	137,10	91,69	42,40	134,09
	13	8	122,2	29,09	29,09	115,76	31,93	147,69	108,93	35,29	144,22	101,98	38,85	140,83	94,83	42,71	137,54
	14	9	125,95	29,46	155,41	119,29	32,35	151,64	112,62	35,57	148,19	105,43	39,15	144,58	97,63	43,22	140,85
	15	10	130,08	29,85	159,93	123,16	32,78	155,94	115,97	36,04	152,01	108,78	39,67	148,45	101,16	43,54	144,70
	16	11	133,99	30,23	164,22	126,83	33,21	160,04	119,39	36,52	155,91	111,94	40,20	152,14	104,08	44,08	148,16
	17	12	137,97	30,62	168,59	130,56	33,64	164,20	123,14	37,01	160,15	115,16	40,74	155,90	107,30	44,62	151,92

12 LCR C COOLING CAPACITY

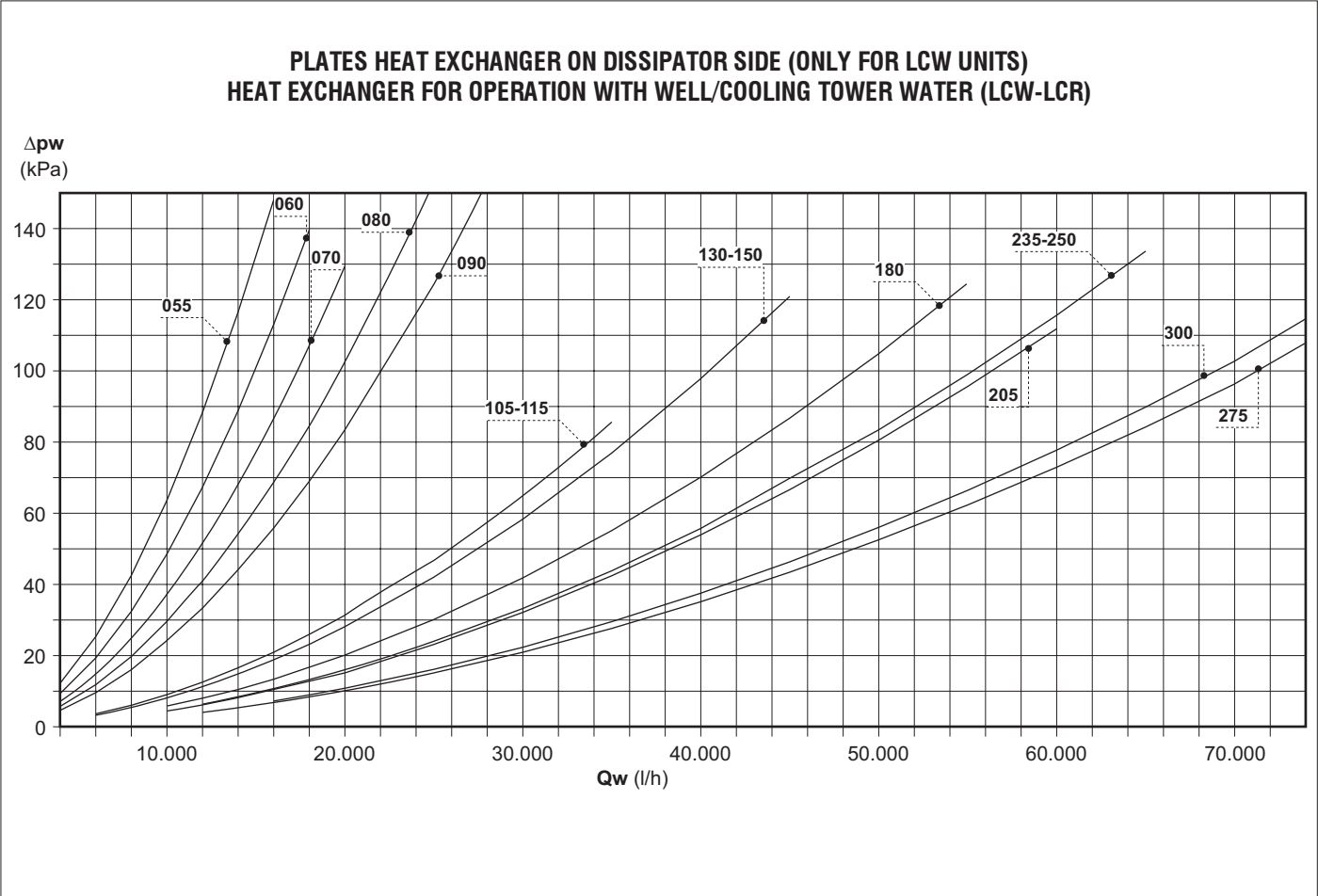
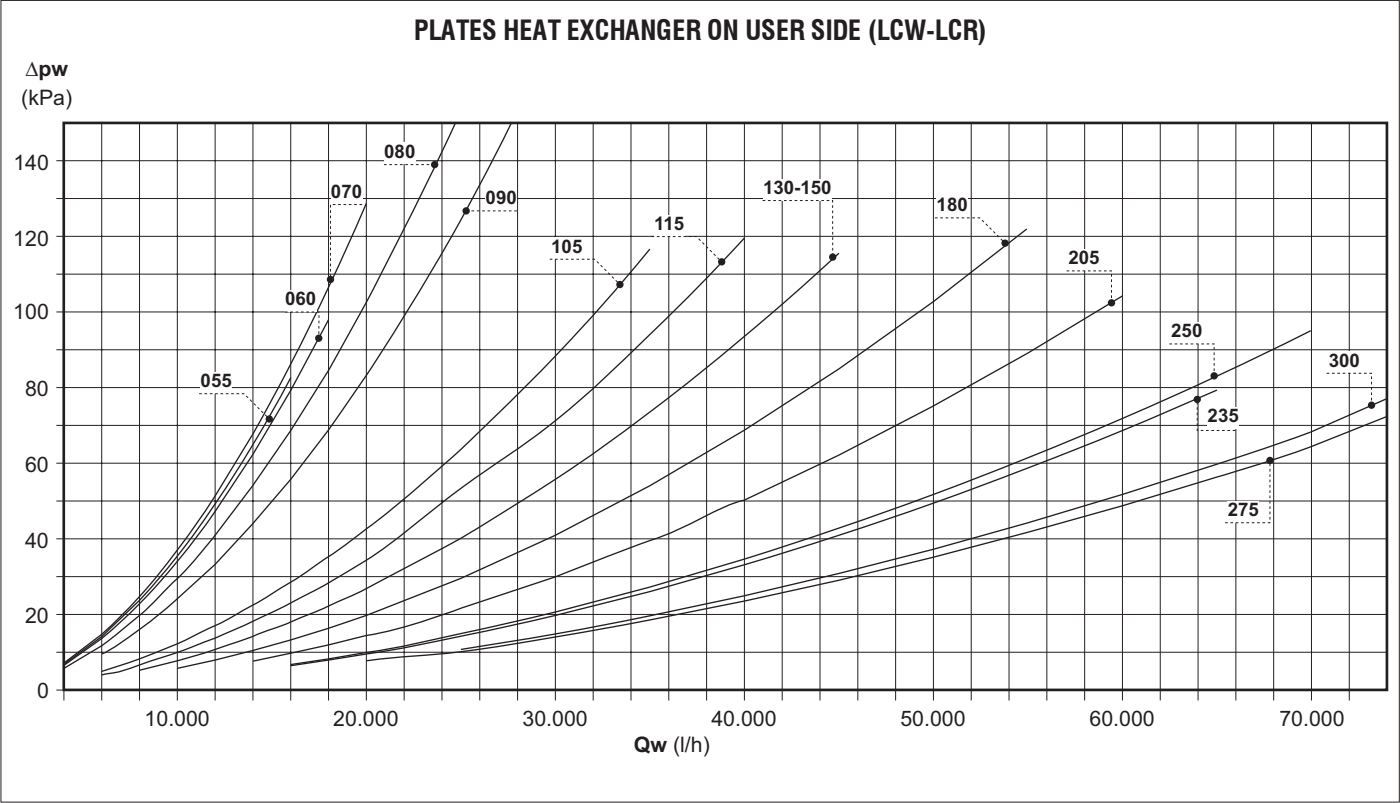
T_{w1} Water inlet temperature
T_{w2} Water outlet temperature
T_{bs1} Dry bulb air temperature (remote condenser)
PF Cooling capacity
PA Absorbed power input
PD Capacity at condenser

- Performance evaluated in combination with our remote condenser

LCR C	Tbs ₁		25			30			35			40			45		
	Tw ₁	Tw ₂	PF	PA	PD	PF	PA	PD	PF	PA	PD	PF	PA	PD	PF	PA	PD
	°C	°C	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
LCR 130 C	10	5	126,82	29,37	156,19	116,82	34,47	151,29	109,99	38,10	148,09	103,15	41,90	145,05	95,81	46,31	142,12
	11	6	131,56	29,46	161,02	120,77	34,95	155,72	113,80	38,42	152,22	106,56	42,47	149,03	98,71	46,95	145,66
	12	7	136,44	29,55	165,99	124,54	35,43	159,97	117,58	38,95	156,53	110,22	42,82	153,04	102,11	47,27	149,38
	13	8	135,55	32,47	168,02	128,79	35,72	164,51	121,16	39,48	160,64	113,53	43,40	156,93	105,86	47,64	153,50
	14	9	140,15	32,75	172,90	132,73	36,21	168,94	125,10	40,02	165,12	117,17	44,00	161,17	108,98	48,24	157,22
	15	10	144,77	33,20	177,97	136,75	36,70	173,45	129,29	40,35	169,64	121,10	44,36	165,46	112,16	48,84	161,00
	16	11	149,16	33,65	182,81	141,16	37,20	178,36	133,10	40,90	174,00	124,61	44,96	169,57	116,17	49,22	165,39
	17	12	153,62	34,10	187,72	145,79	37,51	183,30	136,97	41,45	178,42	128,46	45,57	174,03	119,48	49,83	169,31
LCR 150 C	10	5	137,83	32,09	169,92	128,35	37,48	165,83	121,20	41,45	162,65	113,47	45,78	159,25	105,49	50,54	156,03
	11	6	142,94	32,20	175,14	132,39	38,02	170,41	125,25	42,04	167,29	117,20	46,42	163,62	109,12	50,96	160,08
	12	7	148,22	32,30	180,52	136,86	38,56	175,42	129,11	42,62	171,73	121,22	46,82	168,04	112,66	51,64	164,30
	13	8	153,67	32,41	186,08	141,12	39,11	180,23	133,53	42,99	176,52	125,16	47,47	172,63	116,52	52,07	168,59
	14	9	153,14	35,80	188,94	145,48	39,66	185,14	137,58	43,59	181,17	129,39	47,88	177,27	119,96	52,74	172,70
	15	10	157,89	36,31	194,20	150,72	40,01	190,73	142,04	44,20	186,24	133,21	48,54	181,75	124,29	53,18	177,47
	16	11	163,16	36,03	199,19	155,26	40,56	195,82	146,94	44,80	191,74	137,08	49,21	186,29	127,88	53,86	181,74
	17	12	168,10	37,15	205,25	159,87	41,12	200,99	151,04	45,18	196,22	141,89	49,63	191,52	131,54	54,54	186,08
LCR 180 C	10	5	165,63	38,54	204,17	151,30	45,75	197,05	141,58	50,89	192,47	132,19	56,33	188,52	121,50	62,66	184,16
	11	6	171,78	38,56	210,34	155,97	46,29	202,26	146,79	51,21	198,00	136,15	57,00	193,15	125,67	63,03	188,70
	12	7	170,88	42,13	213,01	161,26	46,57	207,83	151,20	51,82	203,02	140,77	57,36	198,13	129,61	63,72	193,33
	13	8	176,07	42,61	218,68	166,49	47,12	213,61	156,28	52,13	208,41	145,18	58,04	203,22	133,93	64,08	198,01
	14	9	181,35	43,10	224,45	171,43	47,66	219,09	160,85	52,75	213,60	149,98	58,40	208,38	138,65	64,44	203,09
	15	10	186,73	43,59	230,32	176,84	48,21	225,05	165,85	53,36	219,21	154,19	59,08	213,27	142,48	65,12	207,60
	16	11	192,79	43,84	236,63	181,95	48,77	230,72	170,56	53,99	224,55	158,81	59,77	218,58	146,36	65,80	212,16
	17	12	198,37	44,34	242,71	187,79	49,05	236,84	176,42	54,30	230,72	163,87	60,12	223,99	151,36	66,15	217,51
LCR 205 C	10	5	198,60	45,94	244,54	180,53	54,35	234,88	169,61	60,23	229,84	158,65	66,47	225,12	146,61	73,73	220,34
	11	6	206,12	46,01	252,13	186,28	55,03	241,31	175,54	60,66	236,20	163,86	67,32	231,18	151,01	74,60	225,61
	12	7	203,49	50,36	253,85	192,60	55,72	250,32	181,37	61,43	242,80	169,46	67,80	237,26	156,18	75,09	231,27
	13	8	209,91	50,98	260,89	198,58	56,42	255,00	186,67	62,21	248,88	174,45	68,66	243,11	161,86	75,58	237,44
	14	9	216,95	51,61	268,56	205,34	56,82	262,16	192,43	63,00	255,43	179,92	69,54	249,46	166,52	76,45	242,97
	15	10	223,63	52,24	275,87	211,54	57,53	269,07	198,52	63,80	262,32	185,07	70,42	255,49	171,66	77,33	248,99
	16	11	230,41	52,89	283,30	217,83	58,25	276,08	205,05	64,25	269,30	191,11	70,92	262,03	177,31	77,83	255,14
	17	12	237,81	53,54	291,35	224,69	58,99	283,68	210,89	65,06	275,95	196,89	71,82	268,71	182,26	78,72	260,98
LCR 235 C	10	5	217,42	58,27	275,69	204,97	64,33	269,30	192,74	70,79	263,53	179,77	78,40	258,17	166,78	86,12	252,90
	11	6	224,31	59,03	283,34	212,12	64,84	276,96	199,20	71,74	270,94	186,04	79,01	265,05	171,86	87,14	259,00
	12	7	231,87	59,81	291,68	219,22	65,71	284,93	205,30	72,69	277,99	191,68	80,04	271,72	177,46	88,18	265,64
	13	8	239,04	60,60	299,64	225,94	66,59	292,53	212,32	73,26	285,58	197,88	81,11	278,99	183,56	88,79	272,35
	14	9	246,36	61,39	307,75	232,78	67,47	300,25	218,68	74,23	292,91	204,58	81,73	286,31	189,41	89,85	279,26
	15	10	253,82	62,20	316,02	240,30	68,38	308,68	225,67	75,23	300,90	210,56	82,81	293,37	195,79	90,48	286,27
	16	11	261,42	63,02	324,44	247,42	69,28	316,70	232,28	76,22	308,50	217,14	83,91	301,05	201,43	91,55	292,98
	17	12	269,17	63,85	333,02	254,67	70,20	324,87	239,54	77,25	316,79	223,37	84,98	308,35	207,65	92,66	300,31
LCR 250 C	10	5	238,05	55,96	294,01	219,11	65,45	284,56	206,50	72,38	278,88	192,74	80,07	272,81	179,24	88,05	267,29
	11	6	246,95	56,10	303,05	225,97	66,33	292,30	212,87	73,35	286,22	199,40	80,71	280,11	185,09	89,17	274,26
	12	7	256,11	56,25	312,36	233,49	67,22	300,71	220,16	73,94	294,10	205,88	81,79	287,67	191,44	89,83	281,27
	13	8	254,49	61,64	316,13	240,62	68,12	308,74	226,80	74,93	301,73	212,86	82,45	295,31	197,10	90,95	288,05
	14	9	262,28	62,46	324,74	248,70	68,67	317,37	234,10	75,95	310,05	219,12	83,55	302,67	204,22	91,64	295,86
	15	10	270,20	63,29	333,49	256,71	69,60	326,31	241,89	76,56	318,45	225,50	84,66	310,16	210,13	92,78	302,91
	16	11	279,11	63,80	342,91	264,29	70,53	334,82	248,95	77,58	326,53	233,46	85,36	318,82	216,15	93,92	310,07
	17	12	287,37	64,65	352,02	272,02	71,05	343,07	256,75	78,63	335,38	240,11	86,50	326,61	223,75	94,64	318,39
LCR 275 C	10	5	252,49	58,76	311,25	234,05	68,25	302,30	221,27	75,09	296,36	206,95	83,00	289,95	191,95	91,70	283,65
	11	6	261,81	58,92	320,73	242,05	68,81	310,86	228,03	76,10	304,13	213,18	84,12	297,30	198,51	92,42	290,93
	12	7	271,37	59,08	330,45	250,03	69,75	319,78	235,46	77,14	312,60	220,90	84,82	305,72	204,85	93,63	298,48
	13	8	281,20	59,25	340,45	257,60	70,70	328,30	243,34	77,77	321,11	227,41	85,96	313,37	211,73	94,38	306,11
	14	9	279,96	64,75	344,71	266,15	71,27	337,42	250,54	78,82	329,36	234,94	86,66	321,60	218,35	95,59	313,94
	15	10	288,36	65,63	353,99	274,04	72,24	346,28	258,77	79,46	338,23	242,27	87,85	330,12	225,56	96,33	321,89
	16	11	296,92	66,52	363,44	282,69	73,22	355,91	266,86	80,55	347,41	250,16	88,57	338,73	231,96	97,55	329,51
	17	12	306,29	67,43	373,72	290,88	74,21	365,09	274,50	81,63	356,13	257,23	89,76	346,99	240,02	98,32	338,34
LCR 300 C	10	5	275,09	64,10	339,19	255,44	75,24	330,68	241,94	82,90	324,84	226,53	91,68	318,21	210,11	101,19	311,30
	11	6	285,08	64,31	349,39	264,45	75,91	340,36	249,24	84,06	333,30	233,77	92,96	326,73	217,69	102,05	319,74
	12	7	295,35	64,52	359,87	272,69	76,98	349,67	257,26	85,24	342,50	241,55	93,75	335,30	224,00	103,39	327,39
	13	8	305,90	64,73	370,63	280,89	78,07										

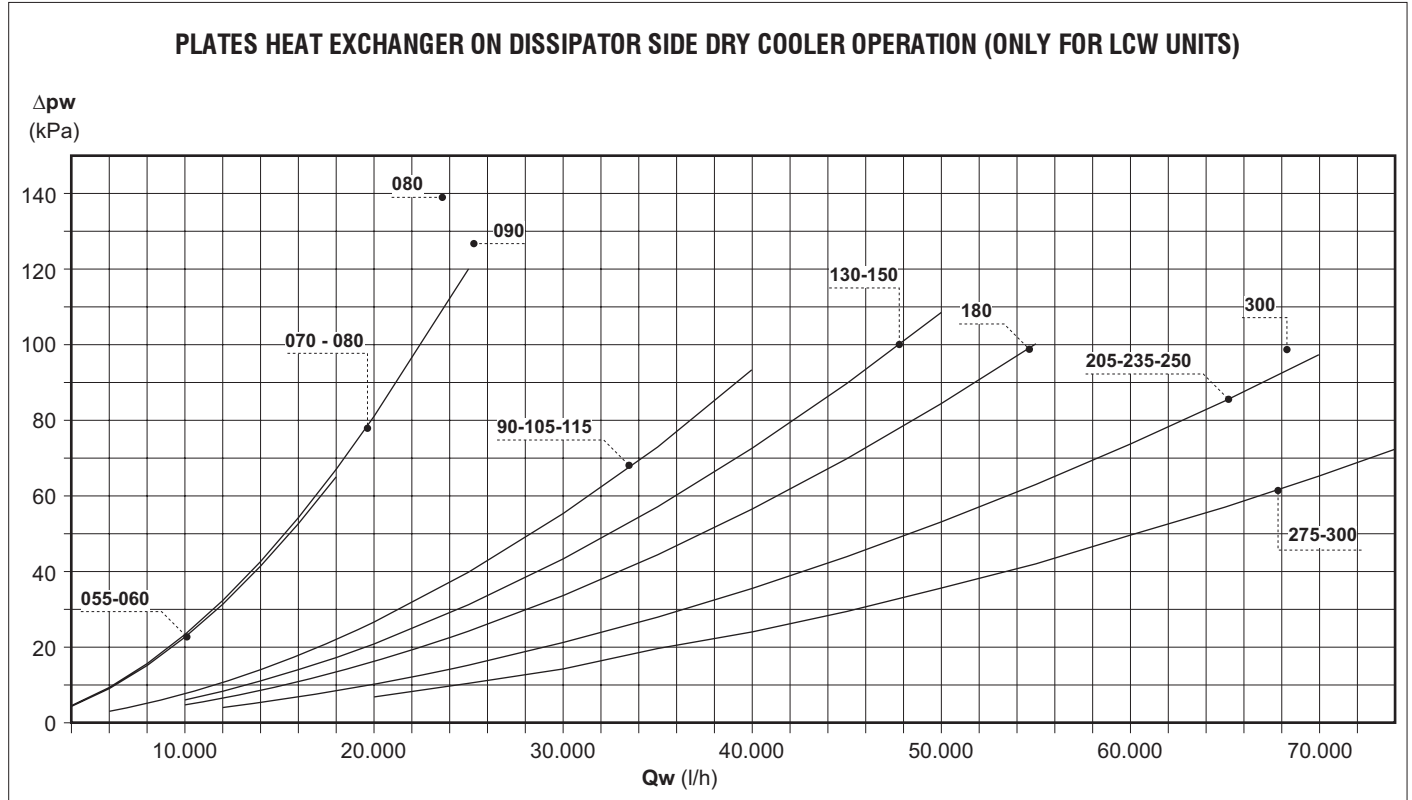
13 WATER PRESSURE DROPS

The diagram shows the pressure drops on the water side (Δp_w) as a function of the water flow rate (Q_w), assuming an average water temperature of 10°C.



13 WATER PRESSURE DROPS

The diagram shows the pressure drops on the water side (Δp_w) as a function of the water flow rate (Q_w), assuming an average water temperature of 10°C



14 CALCULATION FACTORS

WATER TEMPERATURE DROP/RISE DIFFERENT THAN 5						
Water temperature drop/rise	3	4	5	6	7	8
Capacity correction factor	0,975	0,99	1	1,015	1,03	1,04
Power input correction factor	1	1	1	1	1	1
Water flow correction factor	1,63	1,24	1	0,85	0,74	0,65
Water pressure drop correction factor	2,64	1,53	1	0,72	0,54	0,42

OPERATION WITH ETHYLEN GLYCOL AND WATER SOLUTION					
Percentage of glycol	0%	10%	20%	30%	40%
Minimum water outlet temperature	5°C	2°C	-5°C	-10°C	-15°C
Mixture freezing temperature (°C)	0°C	-4°C	-14°C	-18°C	-24°C
Capacity correction factor	1	0,998	0,994	0,989	0,983
Water flow correction factor	1	1,047	1,094	1,14	1,199
Water pressure drop correction factor	1	1,157	1,352	1,585	1,86

OPERATION WITH PROPYLEN GLYCOL AND WATER SOLUTION					
Percentage of glycol	0%	10%	20%	30%	40%
Minimum water outlet temperature	5°C	2°C	-5°C	-10°C	-15°C
Mixture freezing temperature (°C)	0°C	-4°C	-14°C	-18°C	-24°C
Capacity correction factor	1	0,996	0,985	0,971	0,96
Water flow correction factor	1	1,022	1,043	1,07	1,098
Water pressure drop correction factor	1	1,111	1,307	1,532	1,777

FOULING FACTORS			
Fouling factors (m ² °C / W)	4,4 x 10 ⁻⁵	8,8 x 10 ⁻⁵	17,6 x 10 ⁻⁵
Capacity correction factor	1	0,97	0,94
Power input correction factor	1	0,99	0,99

15 OPERATING LIMITS

15.1 LCW OPERATING LIMITS

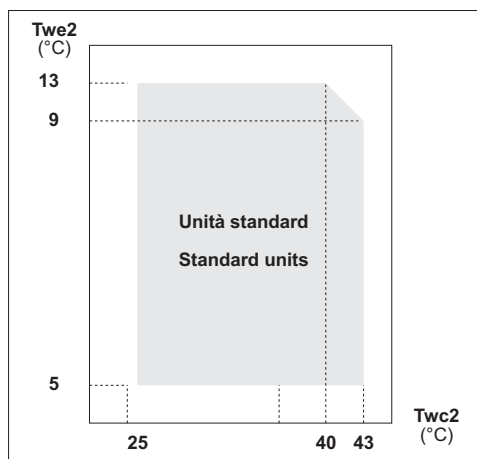
Supply voltage: $\pm 10\%$ of rated voltage.

The operating limits shown in the diagrams are valid for thermal differentials of water between 3 and 8°C

Legend:

T_{we2} Evaporator water outlet temperature

T_{wc2} Condenser water outlet temperature



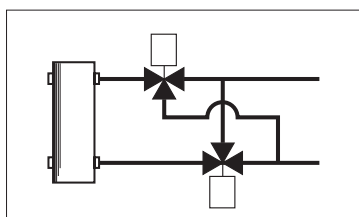
COOLING MODE

In order to work with outlet water temperatures on condenser side below 25 °C it is essential to install a condensation control device (optional).

The control works by modulating the water flow with a 2-way valve of pressostatic type or managed directly by the microprocessor control.

If the unit is to be operated with water temperature on condenser side above 43°C and/or used to cool fluids at temperatures (T_{we2}) above 13°C, it will be necessary to rely on models with **R134a**, available on request, which raise the limit of the condenser outlet water temperature T_{wc1} to + 60°C in continuous operation.

HEATING MODE

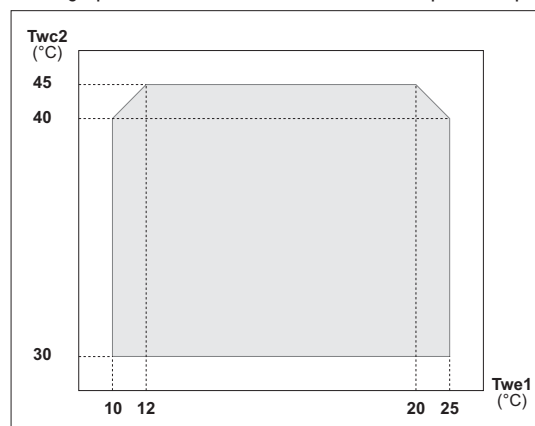


The heat pump units are set up so that the water exchanger is connected in reverse flow in the cooling mode. For installations where the temperatures of the water produced (T_{wc2}) exceed the values indicated, an exclusive water-side reverse cycle - which always maintains a reverse flow - and an R134a version are available on request (optional).

R134a is a high-boiling fluid characterised by low operating pressures; therefore, the volume of flow handled being equal, it requires higher capacity compressors (+60%) compared to R407C versions.

The limits indicated in the diagram are referring to a continuous running of the unit, without any use of water mixed with glycol in the source circuit.

For cooling operation the reference should be the previous paragraph.



15.2 LCR OPERATING LIMITS

Supply voltage: $\pm 10\%$ of rated voltage.

The operating limits shown in the diagrams are valid for thermal differentials of water between 3 and 8°C

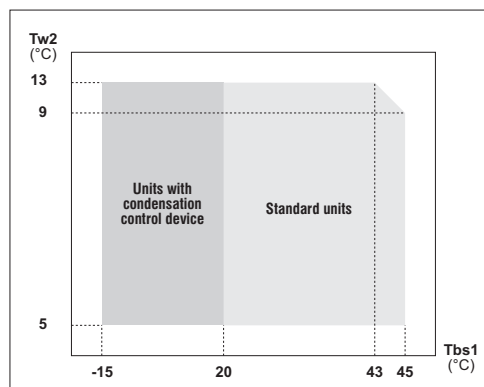
LEGEND

T_{bs1} Outdoor temperature (dry bulb)

T_{w2} Outlet water temperature

COOLING MODE

In order to work with outdoor temperatures below 20 °C it is essential to install a condensation control device (optional).



16 WATER CIRCUIT (USER SIDE)

When setting up the water circuit of the unit, it is advisable to follow the directions below and in any case comply with local or national regulations. Connect the pipes to the chiller using flexible couplings to prevent the transmission of vibrations and to compensate thermal expansions.

It is recommended to install the following components on the pipes:

- Temperature and pressure indicators for routine maintenance and monitoring of the unit.
Checking the pressure on the water side will enable you to verify whether the expansion tank is working efficiently and to promptly detect any water leaks within the equipment.
- Traps on incoming and outgoing pipes for temperature measurements, which can provide a direct reading of the operating temperatures.
- Regulating valves (gate valves) for isolating the unit from the water circuit.
- **Metal mesh filter (incoming pipes), with a mesh not to exceed 1 mm, to protect the exchanger from scale or impurities present in the pipes.**
- Air vent valves, to be placed at the highest points of the water circuit for the purpose of bleeding air.
(The internal pipes of the unit are fitted with small air vent valves for bleeding the unit itself: this operation may only be carried out when the unit is disconnected from the power supply).
- Drainage valve and, where necessary, a drainage tank for emptying out the equipment for maintenance purposes or when the unit is taken out of service at the end of the season.
(A 1" drainage valve is provided on the optional inertial storage reservoir: this operation may only be carried out when the unit is disconnected from the power supply).

It is of fundamental importance that the incoming water supply is hooked up to the connection marked "Water Inlet".

Otherwise the evaporator would be exposed to the risk of freezing since the antifreeze thermostat would not be able to perform its function; moreover the reverse cycle would not be respected in the cooling mode, resulting in additional risks of malfunctioning.

The dimensions and position of plumbing connections are shown in the dimension tables at the back of the manual.

The water circuit must be set up in such a way as to guarantee that the nominal flow rate of the water supplied to the evaporator remains constant (+/- 15%) in all operating conditions.

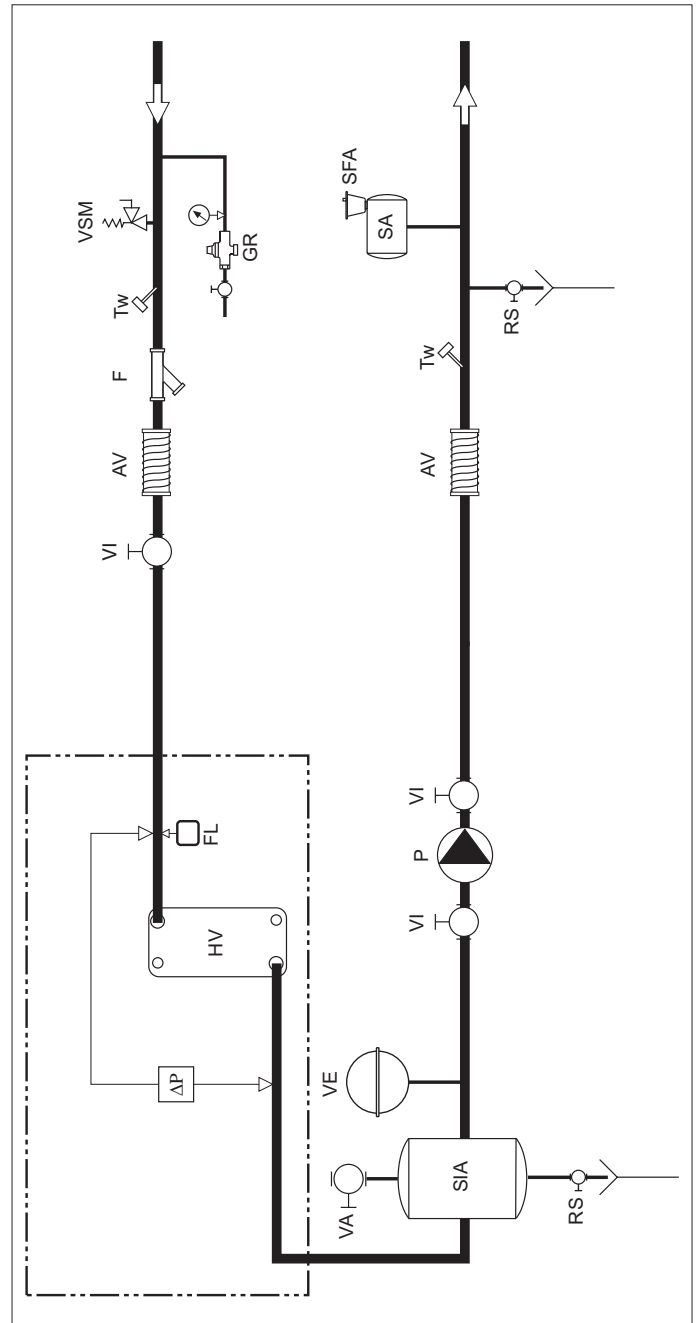
A standard feature of LCW units is a device for controlling the flow rate (differential pressure switch) in the water circuit in the immediate vicinity of the evaporator.

Any tampering with said device will immediately invalidate the warranty.

It is strongly recommended to install a safety valve in the water circuit. In the event of serious equipment faults (e.g. fire) it will enable water to be drained from the system, thereby preventing possible bursts.

Always connect the drain outlet to a pipe with a diameter at least as large as that of the valve opening and direct it toward an area where the discharge of water cannot harm people.

The plumbing diagram at the bottom of the page represents a typical water circuit to which an unit is connected to a circulation pump and inertial storage reservoir.



LEGEND:

Δp	Differential pressure switch, water side
HV	Evaporator
FL	Flow switch
VE	Membrane expansion tank
VA	Manual air valve
SIA	Inertial water storage reservoir
RS	Emptying tap
VI	Regulating valve
P	Circulation pump
AV	Vibration damper
F	Metal filter
VSM	Spring-activated safety valve
GR	Filling unit
SA	Air separator
TW	Trap for reading water temperature

17 SOUND LEVELS

Legend:

L_{pA} A - weighted sound pressure level (1 m distance, 2 directional factor)
L_w Octave band sound power level
L_{wA} A - weighted sound power level

LCW - LCR	VERSION	L _p						L _{pA}	L _{wA}
		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)		
LCW/R 055	Standard	21,0	33,9	55,1	58,0	59,4	52,3	63,0	71,0
LCW/R 055	Low Noise	19,0	31,9	53,1	56,0	57,4	50,3	61,0	69,0
LCW/R 060	Standard	21,0	33,9	55,1	58,0	59,4	52,3	63,0	71,0
LCW/R 060	Low Noise	19,0	31,9	53,1	56,0	57,4	50,3	61,0	69,0
LCW/R 070	Standard	20,8	33,2	56,9	59,6	58,7	55,4	64,0	72,0
LCW/R 070	Low Noise	18,8	31,2	54,9	57,6	56,7	53,4	62,0	70,0
LCW/R 080	Standard	20,8	33,2	56,9	59,6	58,7	55,4	64,0	72,0
LCW/R 080	Low Noise	18,8	31,2	54,9	57,6	56,7	53,4	62,0	70,0
LCW/R 090	Standard	20,9	39,3	56,3	58,3	59,8	56,7	64,0	72,0
LCW/R 090	Low Noise	19,9	37,3	54,3	56,3	57,8	54,7	62,0	70,0
LCW/R 105	Standard	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 105	Low Noise	19,0	38,2	58,9	57,0	56,1	54,8	63,0	71,0
LCW/R 115	Standard	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 115	Low Noise	19,0	38,2	58,9	57,0	56,1	54,8	63,0	71,0
LCW/R 130	Standard	23,0	42,2	62,9	61,0	60,1	58,8	67,0	75,0
LCW/R 130	Low Noise	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 150	Standard	23,0	42,2	62,9	61,0	60,1	58,8	67,0	75,0
LCW/R 150	Low Noise	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 180	Standard	23,0	42,2	62,9	61,0	60,1	58,8	67,0	75,0
LCW/R 180	Standard	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 205	Low Noise	23,0	42,2	62,9	61,0	60,1	58,8	67,0	75,0
LCW/R 205	Standard	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 235	Low Noise	23,0	42,2	62,9	61,0	60,1	58,8	67,0	75,0
LCW/R 235	Standard	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 250	Low Noise	23,0	42,2	62,9	61,0	60,1	58,8	67,0	75,0
LCW/R 250	Standard	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 275	Low Noise	23,0	42,2	62,9	61,0	60,1	58,8	67,0	75,0
LCW/R 275	Standard	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0
LCW/R 300	Low Noise	23,0	42,2	62,9	61,0	60,1	58,8	67,0	75,0
LCW/R 300	Standard	21,0	40,2	60,9	59,0	58,1	56,8	65,0	73,0

18 PLACING THE UNIT AND TECHNICAL SPACE

You should bear in mind the following aspects when choosing the best site for installing the unit and the relative connections:

- size and origin of water pipes;
- location of power supply;
- accessibility for maintenance or repairs;
- solidity of the supporting surface;
- possible reverberation of sound waves.

All models belonging to the **LCW/LCR** series are designed and built for indoor installation.

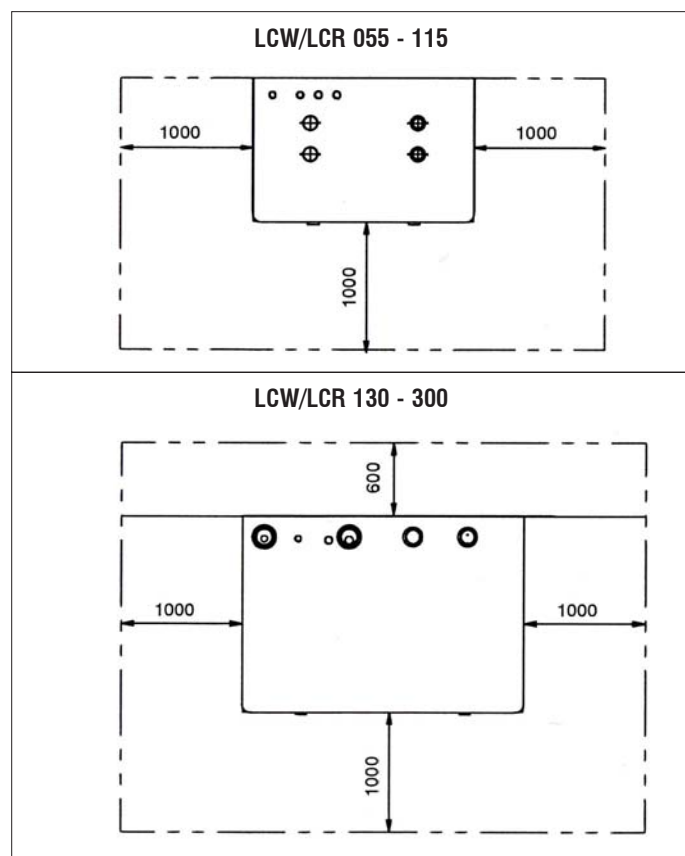
It is advisable to place a rigid rubber strip between the base frame and the supporting surface.

Whenever more effective insulation is required, it is recommended to use vibrating-damping spring supports.

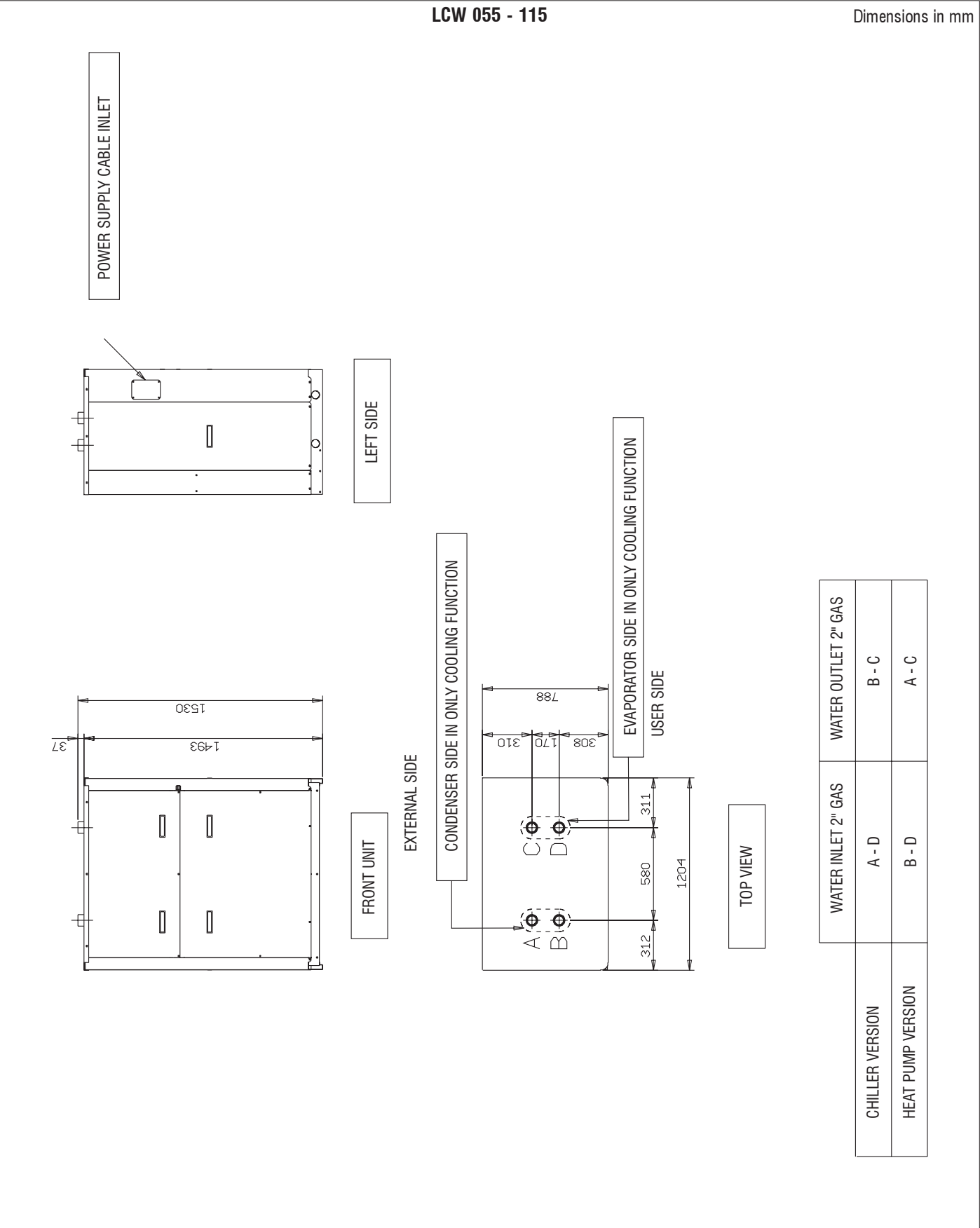
It is necessary to guarantee the clearances reported in the pictures below.

Note from Model LCW/LCR 130 to the size LCW/LCR 300:

- with water connections to the top there is no minimum technical space requested to the rear side of the unit.
- with water connections on the rear side of the unit (model without pressostatic valve), the minimum technical space requested is 800 mm



19 LCW OVERALL DIMENSIONS



LCW 130 - 300

Dimensions in mm

The diagram shows the front and left side views of the LCW 130-300 unit. The front view is a rectangle with a height dimension of 100 mm. The left side view shows the unit's profile with a power supply cable inlet on the left side.

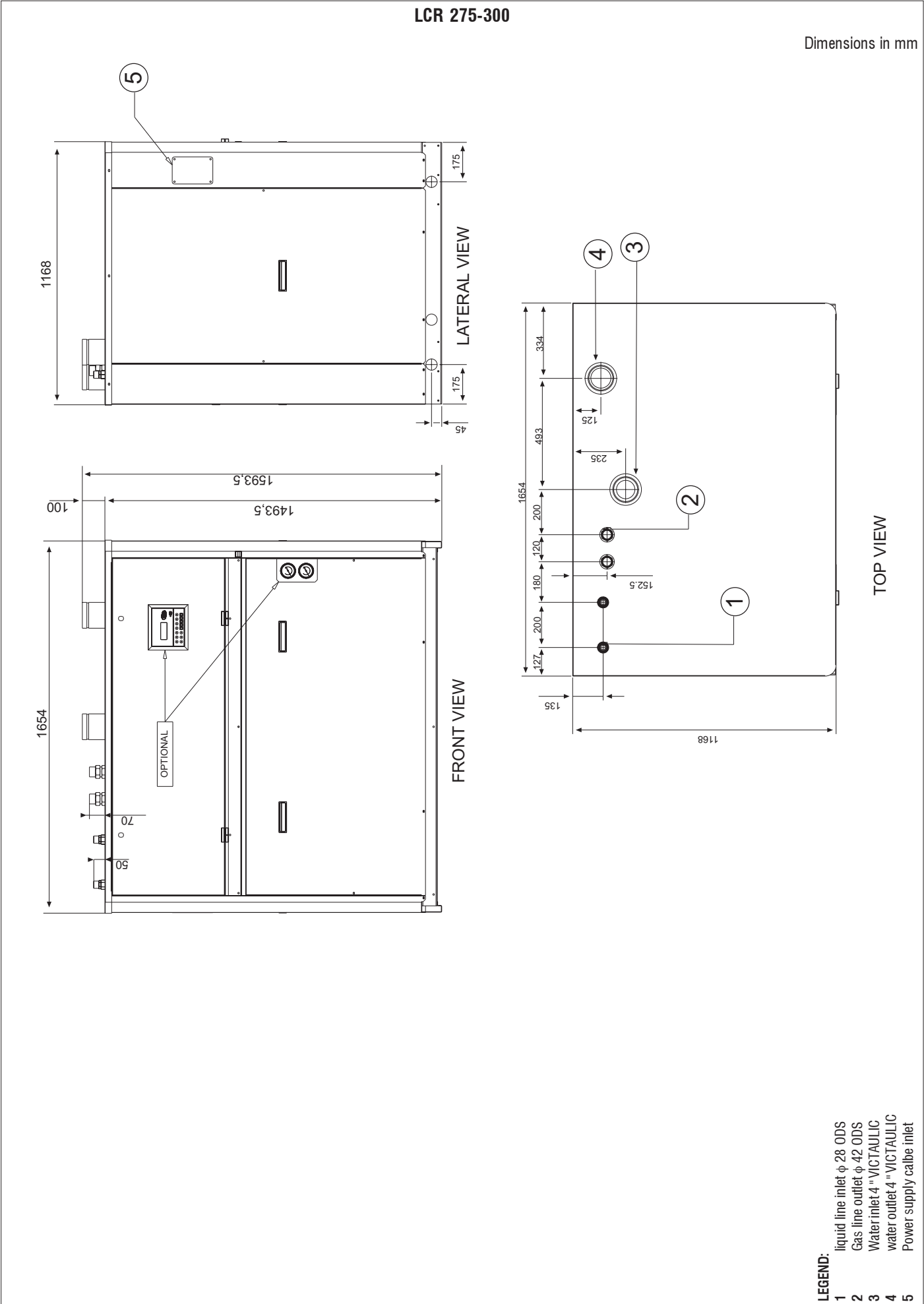
LEFT SIDE

The top view shows the unit's footprint with dimensions: 1168 mm (width) and 1654 mm (depth). It includes four connection points labeled A, B, C, and D. Point A is the condenser side in only cooling function, and point B is the evaporator side in only cooling function. Points C and D are also indicated.

TOP VIEW

USER CIRCUIT	CHILLER VERSION		HEAT PUMP VERSION	
	A = Water outlet	B = Water inlet	A = Water outlet	B = Water inlet
EXTERNAL CIRCUIT	C = Water outlet	D = Water inlet	C = Water inlet	D = Water outlet
MODEL FROM - TO	130...180	205...250 standard condenser	205...250 oversized condenser for 275 cooler	275...300
HYDRAULIC CONNECTIONS	3 "GAS	3 "GAS	4 "GAS	4 "GAS
HEIGHT (mm)	1492	1492	1712	1712

20 LCR OVERALL DIMENSIONS



21 DRY COOLER

It is possible to combine **DRY COOLERS** produced By **LUVE CONTARDO** with the Galletti water to water chillers and Galletti moto-evaporating units. In the table at the bottom of the page, are reported the combinations between **GALLETTI** and **LUVE** units, already selected to operate in the nominal conditions; to operate in different conditions than nominal, contact Galletti office to verify the combination.

The available versions are the following:

- **DRY COOLER** standard version, horizontal outlet air flow ,complete with ON/OFF switch board and wiring.
- **DRY COOLER** standard version, horizontal outlet air flow ,complete with condensing control ,ON/OFF switch board ,temperature probe and wiring.
- **DRY COOLER** standard version, vertical outlet air flow ,complete with feet kit, ON/OFF switch board and wiring.
- **DRY COOLER** standard version, vertical outlet air flow ,complete with condensing control , feet kit, ON/OFF switch board, air probe and wiring.
- **DRY COOLER** silent version, horizontal outlet air flow ,complete with ON/OFF switch board and wiring
- **DRY COOLER** silent version, horizontal outlet air flow ,complete with condensing control ,ON/OFF switch board ,temperature probe and wiring
- **DRY COOLER** silent version, vertical outlet air flow ,complete with feet kit, ON/OFF switch board and wiring
- **DRY COOLER** silent version, vertical outlet air flow ,complete with condensing control , feet kit, ON/OFF switch board, temperature probe and wiring

21.1 DRY COOLER TABLE MATCHING

MODEL	LCW CS LCW HS	Code for Remote Condenser with vertical air flow	Code for Remote Condenser with horizontal air flow	Power Supply V - ph - Hz
SINGLE CIRCUIT	055	SHLN 73 C H	SHLN 73 C V	230-1-50 hz / 400-3-50 hz
	060	SHLN 83 C H	SHLN 73 C V	230-1-50 hz / 400-3-50 hz
	070	SHLN 98 C H	SHLN 98 C V	230-1-50 hz / 400-3-50 hz
	080	SHLN 110 D H	SHLN 110 D V	230-1-50 hz / 400-3-50 hz
	090	SHLN 118 F H	SHLN 118 F V	230-1-50 hz / 400-3-50 hz
	105	SHLN 147 C H	SHLN 147 C V	230-1-50 hz / 400-3-50 hz
	115	SHLN 182 C H	SHLN 182 C V	230-1-50 hz / 400-3-50 hz
	130	SHLN 182 C H	SHLN 182 C H	230-1-50 hz / 400-3-50 hz
	150	SHLN 208 B H	SHLN 208 B V	230-1-50 hz / 400-3-50 hz
	180	SHLN 242 B H	SHLN 242 B V	230-1-50 hz / 400-3-50 hz
	205	SHLN 302 A H	SHLN 302 A V	230-1-50 hz / 400-3-50 hz
	235	SHLN 335 A		400-3-50 hz
	250	SHLN 380 A		400-3-50 hz
	275	SHLN 402 B		400-3-50 hz
	300	SHLN 456 B		400-3-50 hz
MODEL	LCW CL LCW HL	Code for Remote Condenser with vertical air flow	Code for Remote Condenser with horizontal air flow	Power Supply V - ph - Hz
SINGLE CIRCUIT	055	SHLS 72 C H	SHLS 72 C V	230-1-50 hz / 400-3-50 hz
	060	SHLS 87 D H	SHLS 87 D V	230-1-50 hz / 400-3-50 hz
	070	SHLS 97 C H	SHLS 97 C V	230-1-50 hz / 400-3-50 hz
	080	SHLS 114 D H	SHLS 114 D V	230-1-50 hz / 400-3-50 hz
	090	SHLS 117 B H	SHLS 117 B V	230-1-50 hz / 400-3-50 hz
	105	SHLS 141 D H	SHLS 141 D V	230-1-50 hz / 400-3-50 hz
	115	SHLS 173 B H	SHLS 173 B V	230-1-50 hz / 400-3-50 hz
	130	SHLS 188 B H	SHLS 188 B V	230-1-50 hz / 400-3-50 hz
	150	SHLS 213 B H	SHLS 213 B V	230-1-50 hz / 400-3-50 hz
	180	SHLS 235 B H	SHLS 235 B V	230-1-50 hz / 400-3-50 hz
	205	SHLS 301 B H	SHLS 301 B V	400-3-50 hz
	235	SHLS 324 B H	SHLS 324 B V	400-3-50 hz
	250	SHLS 360 F H	SHLS 360 F V	400-3-50 hz
	275	SHLS 360 F H	SHLS 360 F V	400-3-50 hz
	300	SHLS 432 B H	SHLS 432 B V	400-3-50 hz

22 REMOTE CONDENSER

It is possible to combine **REMOTE CONDENSERS** produced By **LUVE CONTARDO** with the Galletti water to water chillers and Galletti moto-evaporating units.

In the table at the bottom of the page, are reported the combinations between **GALLETTI** and **LUVE** units, already selected to operate in the nominal conditions; to operate in different conditions than nominal, contact Galletti office to verify the combination.

The available versions are the following:

- **REMOTE CONDENSER** standard version, horizontal outlet air flow, complete with ON/OFF switch board and wiring.
- **REMOTE CONDENSER** standard version, horizontal outlet air flow, complete with condensing control, ON/OFF switch board, pressure probe and wiring.
- **REMOTE CONDENSER** standard version, vertical outlet air flow, complete with feet kit, ON/OFF switch board and wiring.
- **REMOTE CONDENSER** standard version, vertical outlet air flow, complete with feet kit, ON/OFF switch board pressure probe and wiring
- **REMOTE CONDENSER** silent version, horizontal outlet air flow ,complete with ON/OFF switch board and wiring
- **REMOTE CONDENSER** silent version, horizontal outlet air flow ,complete with ON/OFF switch board ,pressure probe and wiring
- **REMOTE CONDENSER** silent version, vertical outlet air flow ,complete with feet kit, ON/OFF switch board and wiring
- **REMOTE CONDENSER** silent version, vertical outlet air flow ,complete with feet kit, ON/OFF switch board pressure probe and wiring

22.1 REMOTE CONDENSER TABLE MATCHING

MODEL	LCR CS	Code for Remote Condenser with vertical air flow	Code for Remote Condenser with horizontal air flow	Power Supply V - ph - Hz
DOUBLE CIRCUIT	055	SHVN 61 H	SHVN 61 V	230-1-50 hz / 400-3-50 hz
	060	SHVN 73 H	SHVN 73 V	230-1-50 hz / 400-3-50 hz
	070	SHVN 79 H	SHVN 79 V	230-1-50 hz / 400-3-50 hz
	080	SHVN 94 H	SHVN 94 V	230-1-50 hz / 400-3-50 hz
	090	SHVN 106 H	SHVN 106 V	230-1-50 hz / 400-3-50 hz
	105	SHVN 122 H	SHVN 122 V	230-1-50 hz / 400-3-50 hz
	115	SHVN 147 H	SHVN 147 V	230-1-50 hz / 400-3-50 hz
	130	SHVN 158 V/H		230-1-50 hz / 400-3-50 hz
	150	SHVN 186 V/H		230-1-50 hz / 400-3-50 hz
	180	SHVN 212 V/H		230-1-50 hz / 400-3-50 hz
	205	SHVN 244 V/H		230-1-50 hz / 400-3-50 hz
	235	SHVN 265 V/H		230-1-50 hz / 400-3-50 hz
	250	SHVN 310 V/H		230-1-50 hz / 400-3-50 hz
	275	SHVN 335 H	SHVN 335 V	400-3-50 hz
	300	SHVN 380 H	SHVN 380 V	400-3-50 hz
MODEL	LCR CL	Code for Remote Condenser with vertical air flow	Code for Remote Condenser with horizontal air flow	Power Supply V - ph - Hz
DOUBLE CIRCUIT	055	SHVS 70 H	SHVS 70 V	230-1-50 hz / 400-3-50 hz
	060	SHVS 72 H	SHVS 72 V	230-1-50 hz / 400-3-50 hz
	070	SHVS 87 H	SHVS 87 V	230-1-50 hz / 400-3-50 hz
	080	SHVS 97 H	SHVS 97 V	230-1-50 hz / 400-3-50 hz
	090	SHVS 111 H	SHVS 111 V	230-1-50 hz / 400-3-50 hz
	105	SHVS 117 H	SHVS 117 V	230-1-50 hz / 400-3-50 hz
	115	SHVS 141 H/V		230-1-50 hz / 400-3-50 hz
	130	SHVS 173 H/V		230-1-50 hz / 400-3-50 hz
	150	SHVS 173 H/V		230-1-50 hz / 400-3-50 hz
	180	SHVS 213 H/V		230-1-50 hz / 400-3-50 hz
	205	SHVS 235 H/V		230-1-50 hz / 400-3-50 hz
	235	SHVS 271 H	SHVS 271 V	400-3-50 hz
	250	SHVS 301 H	SHVS 301 V	400-3-50 hz
	275	SHVS 324 H	SHVS 324 V	400-3-50 hz
	300	SHVS 360 H	SHVS 360 V	400-3-50 hz



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