

LVK

Air to water chillers and heat pumps



The LVK water chillers range is an efficient and low-noise product designed for large applications.

The LVK water chillers are suitable for water outlet temperatures at 7°C, commonly used in combinations with fan coils or/ and air handling units.

The use of semi hermetic screw compressors offer high efficiencies, and low noise levels, making suitable their use in any application.

The different versions available allow the user to select the most suitable solution thanks to a wide range of accessories.

VERSIONS

- LVK, cooling only version, available in 11 different sizes.
- LVK-HP, reversible heat pump version, available in 11 different sizes.
- LVK-FC, free-cooling version, available in 11 different sizes.

ACCESSORIES

- LS low noise version.
- Partial heat recovery.
- Hydraulic kit A1ZZ with: pump, expansion valve, safety valve, flow switch, insulated tank.
- Hydraulic kit A2ZZ: As A1ZZ with twin pumps.
- Hydraulic kit A1NT with: pump, expansion valve, safety valve, flow switch.
- Hydraulic kit A0NP with insulated tank, no pumps.
- Evaporator antifreeze heater.
- Condensing coil protection mesh with metallic filter.
- Rubber or spring vibration dampers.
- Low ambient condensing pressure control (-20°C).
- Compressors suction manual valves.
- Antifreeze kit.
- Manometers.
- Liquid line solenoid valve.
- Remote control panel.
- Serial interface card RS485.

Versions LVK ÷ LVK/HP		1901	2301	2701	3202	3602
Cooling capacity ⁽¹⁾	kW	183,0	225,0	254,0	318,0	360,0
Compressors input power ⁽¹⁾	kW	65,1	78,4	94,5	113,0	130,2
Water flow ⁽¹⁾	m³/h	31,4	38,6	43,6	54,6	61,8
Heating capacity ⁽²⁾	kW	188,2	257,6	287,3	351,4	371,0
Compressors input power ⁽²⁾	kW	58,2	69,9	85,8	102,8	118,4
Water flow ⁽²⁾	m³/h	33,4	45,9	51,2	62,6	78,7
Power supply		400V / 3Ph / 50Hz				
Nominal input current	A	119,0	146,0	168,0	204,0	246,0
Peak current	A	205,0	270,0	334,0	273,0	332,0
Max input current	A	152,0	184,0	212,0	272,0	312,0
Compressors type / n° / circuits		Screw / 1 / 1			Screw / 2 / 2	
Capacity steps	n°	3	3	3	6	6
Fans	n°x kW	3 x 2	4 x 2	4 x 2	8 x 2	8x 2
Total airflow	m³/h	55800	58800	58800	88500	118000
Sound power level ⁽³⁾	dB(A)	88	91	91	93	93
Sound pressure level ⁽⁴⁾	dB(A)	60	63	63	65	65
Water pump	kW	3	4	4	5,5	7,5
Pump available static pressure	kPa	150	180	148	170	175
Water tank	l	600	600	600	1000	1000

Versions LVK ÷ LVK/HP		4502	5202	6402	7202	8202	9002
Cooling capacity ⁽¹⁾	kW	450,0	520,0	640,0	720,0	820,0	900,0
Compressors input power ⁽¹⁾	kW	156,8	189,0	222,6	245,0	268,0	296,4
Water flow ⁽¹⁾	m³/h	77,2	89,2	109,8	123,5	140,7	154,4
Heating capacity ⁽²⁾	kW	463,0	545,8	663,3	721,2	806,2	878,8
Compressors input power ⁽²⁾	kW	150,4	160,7	193,0	238,0	260,9	285,2
Water flow ⁽²⁾	m³/h	78,7	48,4	59,1	61,3	68,6	74,8
Power supply		400V / 3Ph / 50Hz					
Nominal input current	A	292,0	344,0	394,0	424,0	480,0	526,0
Peak current	A	416,0	510,0	575,0	610,0	721,0	838,0
Max input current	A	368,0	440,0	498,0	538,0	596,0	664,0
Compressors type / n° / circuits		Screw / 2 / 2					
Capacity steps	n°	6	6	6	6	6	6
Fans	n°x kW	8 x 2	10 x 2	12 x 2	12 x 2	14 x 2	16 x 2
Total airflow	m³/h	118000	150000	178000	178000	207000	236000
Sound power level ⁽³⁾	dB(A)	94	94	97	98	99	100
Sound pressure level ⁽⁴⁾	dB(A)	66	66	69	70	71	72
Water pump	kW	7,5	7,5	11	11	15	15
Pump available static pressure	kPa	130	85	205	175	220	195
Water tank	l	1000	1000	1000	1000	1000	1000

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

⁽²⁾ Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

⁽³⁾ Sound power level ISO 3746.

⁽⁴⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 according to ISO 3746.

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Versions LVK/FC		1901	2301	2701	3202	3602
Cooling capacity ⁽¹⁾	kW	179,5	228,1	256,5	311,9	353,1
Compressors input power ⁽¹⁾	kW	65,1	76,0	92,1	113,0	130,2
Water flow ⁽¹⁾	m³/h	32,6	41,4	46,6	56,6	64,1
Free cooling capacity ⁽⁵⁾	kW	143,4	155,5	158,9	241,3	307,7
Compressors input power ⁽⁵⁾	kW	6	8	8	16	16
Water flow ⁽⁵⁾	m³/h	32,6	41,4	46,6	56,6	64,1
Power supply		400V / 3Ph / 50Hz				
Nominal input current	A	119,0	146,0	168,0	204,0	246,0
Peak current	A	205,0	270,0	334,0	273,0	332,0
Max input current	A	152,0	184,0	212,0	272,0	312,0
Compressors / n° / circuits		Screw / 1 / 1			Screw / 2 / 2	
Capacity steps	n°	3	3	3	6	6
Fans	n°x kW	3 x 2	4 x 2	4 x 2	8 x 2	8x 2
Airflow	m³/h	55800	58800	58800	88500	118000
Sound power level ⁽³⁾	dB(A)	88	91	91	93	93
Sound pressure level ⁽⁴⁾	dB(A)	60	63	63	65	65
Water pump	kW	3	4	4	5,5	7,5
Pump available static pressure	kPa	150	180	148	170	175
Water tank	l	600	600	600	1000	1000

Version LVK/FC		4502	5202	6402	7202	8202	9002
Cooling capacity ⁽¹⁾	kW	441,4	510,0	627,7	692,5	804,3	882,7
Compressors input power ⁽¹⁾	kW	156,8	189,0	222,6	245,0	268,0	296,4
Water flow ⁽¹⁾	m³/h	80,1	92,6	114,0	125,7	146,0	160,2
Free cooling capacity ⁽⁵⁾	kW	325,0	365,9	452,6	461,9	534,8	591,2
Compressors input power ⁽⁵⁾	kW	16	20	24	24	28	32
Water flow ⁽⁵⁾	m³/h	80,1	92,6	114,0	125,7	146,0	160,2
Power supply		400V / 3Ph / 50Hz					
Nominal input current	A	292,0	344,0	394,0	424,0	480,0	526,0
Peak current	A	416,0	510,0	575,0	610,0	721,0	838,0
Max input current	A	368,0	440,0	498,0	538,0	596,0	664,0
Compressors / n° / circuits		Screw / 2 / 2					
Capacity steps	n°	6	6	6	6	6	6
Fans	n°x kW	8 x 2	10 x 2	12 x 2	12 x 2	14 x 2	16 x 2
Airflow	m³/h	118000	150000	178000	178000	207000	236000
Sound power level ⁽³⁾	dB(A)	94	94	97	98	99	100
Sound pressure level ⁽⁴⁾	dB(A)	66	66	69	70	71	72
Water pump	kW	7,5	7,5	11	11	15	15
Pump available static pressure	kPa	130	85	205	175	220	195
Water tank	l	1000	1000	1000	1000	1000	1000

⁽¹⁾ Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C glycol 20%.

⁽³⁾ Sound power level according to ISO 3746.

⁽⁴⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 according to ISO 3746.

⁽⁵⁾ Free Cooling: ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal waterflow, compressors switched off.

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FRAME

All LVK units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. All screws and rivets for outdoor installations are in stainless steel. The colour of the units is RAL 9018.

REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. Each refrigerant circuit is totally independent from the other. Any incorrect operation of one circuit does not influence the other circuit. The refrigerant circuit includes: liquid line manual shut-off valve, sight glass, filter drier, thermal expansion valve with external equalizer, electric expansion valve with electronic control to optimize the efficiency in part load conditions (option), reverse cycle valve (for heat pump version only), one way valve (for heat pump version only), liquid receiver (for heat pump version only), Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

COMPRESSORS

The compressors are screw type, Star-Delta starting, double rotor with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate chamber in order to be separated from the air stream. The crankcase heater is always powered when the compressors are in stand-by. Each compressor is standard equipped with 3 capacity steps. The inspection is possible through the frontal panel of the unit that allows the maintenance of the compressors even if the unit is working.

CONDENSERS

The condensers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and

then the use of low rotation (and low noise emission) fans. The condensers can be protected by a metallic filter to be installed on request.

FANS

The fans are axial type with aerofoil blades. They are statically and dynamically balanced and supplied complete of the safety fan guard according to EN 60335. They are mounted on the unit frame by interposition of rubber vibration dampers. The electric motors are all at 6 poles (about 900 rpm). The motors are directly driven with an integrated thermal overload protection. The protection class of the motors is IP 54.

EVAPORATORS

From size 1601 to 4502 they are made of AISI 316 stainless steel braze-welded plates type; from size 5202 to 9002 are shell in tube type. Each evaporator is factory insulated with flexible close cell material and can be equipped with antifreeze heater (optional). Each evaporator is provided standard with a temperature sensor as antifreeze protection.

MICROPROCESSORS

All LVK units are supplied standard with microprocessor controls. The microprocessor controls the following functions: regulation of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, potential free contact for remote general alarm, alarms and operation leds. Upon request any microprocessor can be connected to a BMS system for the remote control and management. The technical department is available to study, together with the customer, different solutions using MODBUS; LONWORKS; BACNET or TREND protocols.

ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all LVK units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one. The following components are also standard

installed: main switch, magnetic-thermal switches (as a protection of compressors, pumps and fans), control circuit automatic breakers, compressor contactors, fan contactors, pump contactors. The terminal board is supplied with voltage free contacts for remote ON-OFF, Summer / winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return water temperature sensor, installed on the return water line from the plant (12°C), antifreeze protection sensor installed on the outlet water temperature (7°C), high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection, flow switch.

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HEAT PUMPS VERSIONS (HP)

The heat pump versions are provided with a 4 way reverse cycle valve and are suitable to produce hot water up to a temperature of 45-50°C. They are always supplied with liquid receiver and a second thermostatic valve to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor is set for automatic defrost (in case of operation in severe ambient conditions) and for summer/winter change over.

FREE COOLING VERSION FC-FC100%

The Free Cooling system is designed to grant important energy savings in case the unit has to work during the whole year. These applications are required, for example, in computers or telephone rooms. The Free Cooling uses the external low temperature to cool the water in the system. In favorable conditions the Free Cooling can grant the correct refrigerant capacity even without the operation of the compressors, granting an important energy saving. The Free Cooling systems is available in 2 different versions:
FC; Standard Free Cooling capacities;
FC100; 100% Free Cooling capacities;
The Free Cooling systems are composed by the following components:

Thermal exchange coil:

It's basically an air to water heat exchanger built in copper pipes and aluminium fins. It's supplied with shut-off valves.

Microprocessor control:

It's the "heart" of the system; It permits the control of all the parameters allowing the best performance of the system in different conditions.

3 way valve:

It's an ON/OFF 3 way valve which gives power to the Free Cooling system according to the signals arriving from the microprocessor.

Low ambient pressure control:

It's a device which controls the condensing pressure of the refrigerant circuit in low external conditions.

This device is composed by the solenoid valve which intercept some refrigerant circuits in the condensing coil. In this way the thermal exchange is reduced and a certain condensing pressure is maintained.

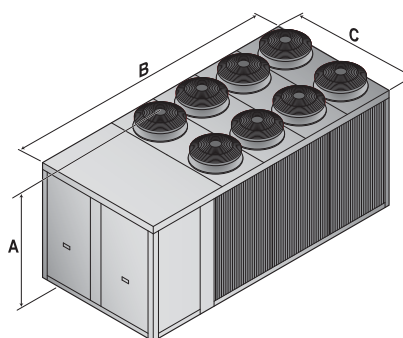
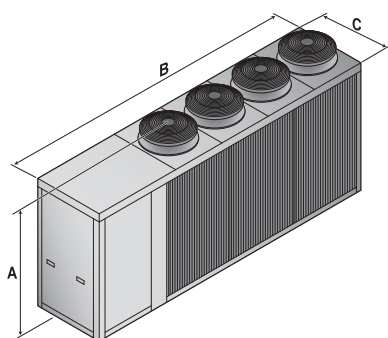


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	Code	Version LVK	Version LVK/HP	Version LVK/FC
Main switch	–	●	●	●
Flow switch	–	●	●	●
LS low noise version	LS00	○	○	○
Partial heat recovery	RP00	○	○	○
Hydraulic kit A1ZZ with tank and one pump	A1ZZ	○	○	○
Hydraulic kit A1NT with one pump without tank	A1NT	○	○	○
Hydraulic kit A2NT with two pump without tank	A2NT	○	○	○
Hydraulic kit A0NP without tank and pump	A0NP	○	○	○
Low ambient condensing pressure control (-20°C)	DCCF	○	○	○
Compressors linear capacity control	MOCO	○	○	○
Rubber vibration dampers	KAVG	○	○	○
Spring vibration dampers	KAVM	○	○	○
Evaporator antifreeze heater	RAEV	○	-	-
Antifreeze kit (only for A versions)	RAES	○	○	○
Manometers	MAML	○	○	○
Electronic expansion valve	–	○	○	○
Liquid line solenoid valve	VSLI	○	●	○
Compressors suction manual valves	MVCS	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○
Remote control panel	PCRL	○	○	○
Serial interface card RS485	INSE	○	○	○

● Standard, ○ Optional, – Not available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
1901/1901A	2262	4708	1105	2090/2690
2301/2301A	2262	4708	1105	2290/2910
2701/2701A	2262	4708	1105	2680/3300
3202/3202A	2350	4708	2200	4100/4720

Mod.	A (mm)	B (mm)	C (mm)	Kg
3602/3602A	2350	5200	2200	4500/5120
4502/4502A	2350	5200	2200	4800/5820
5202/5202A	2350	6200	2200	5600/6620
6402/6402A	2350	7200	2200	6200/7220
7202/7202A	2350	7200	2200	6800/7820
8202/8202A	2350	9300	2200	8570/9590
9002/9002A	2350	9800	2200	10200/11800