Lightstream Scroll

ULTRACOMPACT II FREECOOL

COMPACT FREE COOLING CHILLERS WITH SCROLL COMPRESSORS

- EXTREME EFFICIENCY WITH EER UP TO 3.29
- HIGH FREE COOLING PERFORMANCE
- MICROCHANNEL CONDENSING COILS
- COMPACT & LIGHTWEIGHT DESIGN

50-300kW

AVAILABLE IN 4 FRAME SIZES, TOTAL 11 MODELS WITH A WIDE SELECTION OF OPTIONS AND ACCESSORIES

SCROLL | R410a | EC-FANS | MICROCHANNEL | FREECOOLING | HEAT RECOVERY

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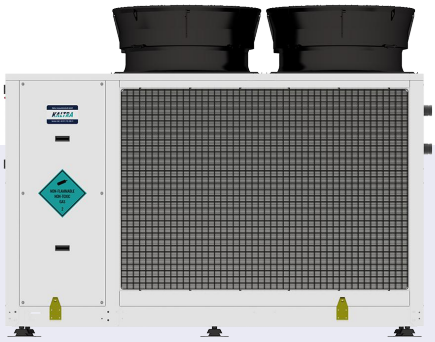
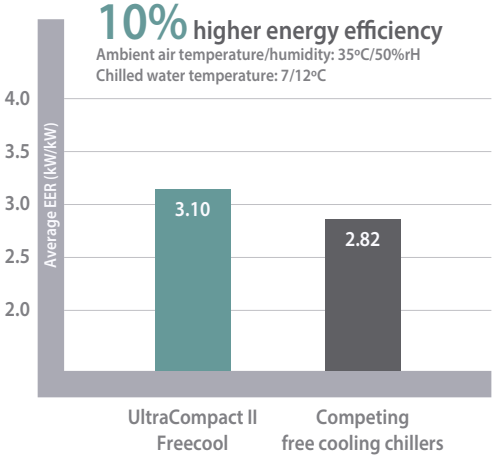
Scroll chillers with extreme efficiency

LIGHTSTREAM SCROLL ULTRACOMPACT II FREE COOLING CHILLER FAMILY PROVIDES CAPACITY-MATCHED COOLING, PRECISE THERMAL PARAMETERS, AND WATERFLOW.

These chillers display excellent performance, small footprint, and deliver best-in-class efficiency thank comprehensive engineering and first-grade components. The classic, time-approved design and built-in reliability of UltraCompact II Freecool make this machine a big league player in the field of process cooling, air conditioning, and refrigeration applications.



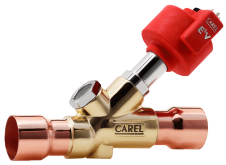


UltraCompact II Freecool

10% ENERGY SAVINGS

Compared to competing chillers with standard parameters:
- ambient air temperature/humidity: 35°C/50%rH
- chilled water temperature: 7/12°C

- EXTREME ENERGY EFFICIENCY WITH EER UP TO 3.26
- HIGH FREE COOLING PERFORMANCE
- INTELLIGENT HEAD PRESSURE CONTROL
- WATER TEMPERATURES OF UP TO -12°C



25% energy savings through the use of EEVs

The electronic expansion valve (EEV) reduces the need for high head pressure when the chiller runs at part load and lower ambient conditions. EEV is controlled by a driver which regulates its opening according to the performance levels required by the system and guarantees the minimal overheating under all operating conditions. All UltraCompact II free cooling chillers are equipped with electronic expansion valves as a standard.

Scroll compressors

Proven performance and reliability

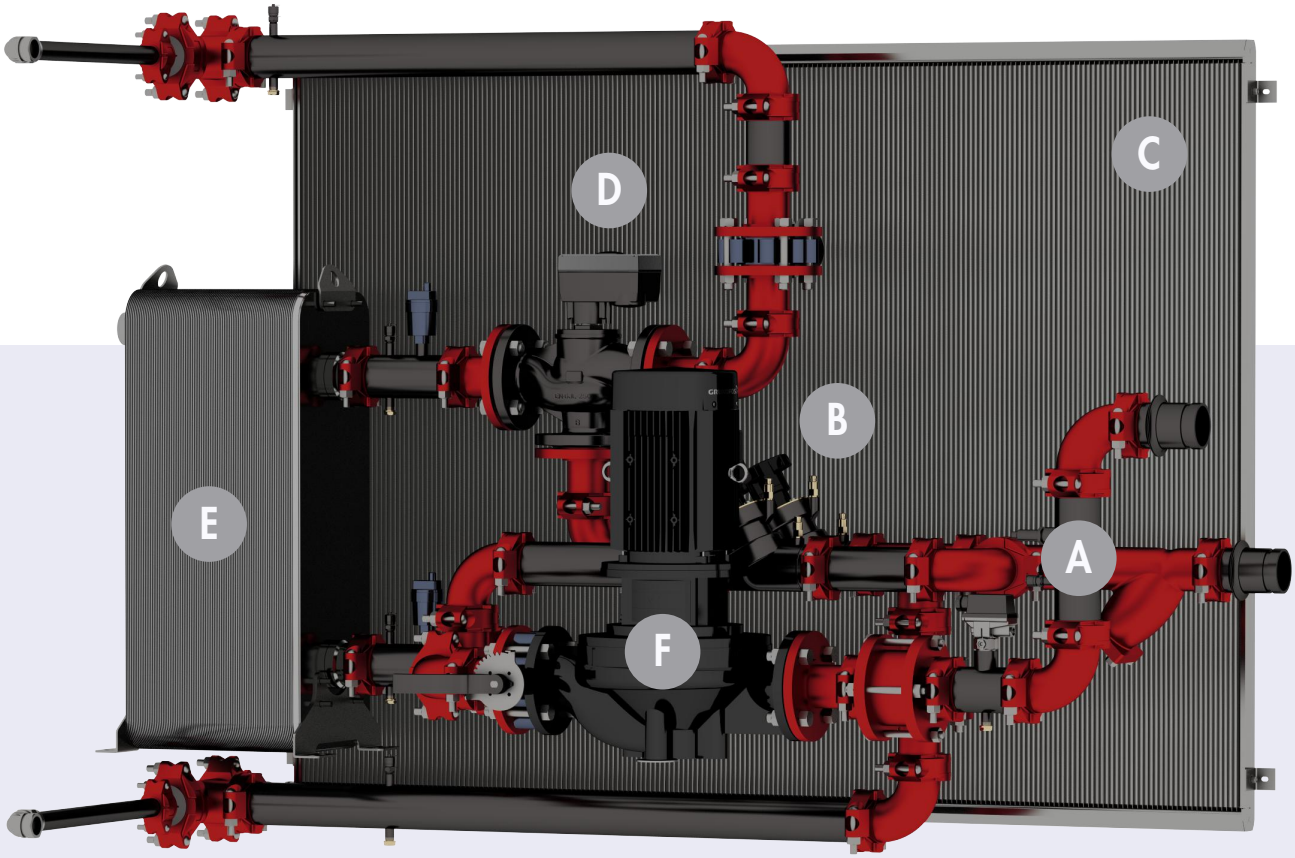
The combination of an energy efficient motor and an optimized scroll wrap for refrigeration applications delivers high efficiency in UltraCompact II's fixed-speed compressors.

Reliability is built into this compressor range, from the compliant scroll design and the engineered bearings to the simplified design. The thermal fault protection also contributes to excellent reliability.

The customers of Lightstream UltraCompact II systems with fixed-speed compressors can benefit from proven reliability, low sound levels, low vibration and low operating and maintenance costs.

High-end free cooling system

Any chilled water application can benefit from free cooling, and the colder the climate, the more benefit can be achieved. Free cooling system offers energy saving by incorporating an air-to-water heat exchanger, also called a free cooling coil, into a chiller design. Free cooling coils cool down the water returning from the process before it enters the chiller evaporator when the ambient temperature is lower than water temperature. Driven by a synergy of high heat transfer rate of microchannel heat exchangers and advantages of free cooling concept, our chillers demonstrate outstanding performance and promise high power savings.



A Water pipework

The chillers feature the pipework with grooved couplings which offers high rigidity, flexibility, and vibration damping, and characterized by its low maintenance costs and reduced weight. The pipework is equipped with mesh strainer as a standard and flushing/regulating bypass as an option.

B Double regulating valve

Double regulating valve is a Y-pattern globe valve which offers the smallest pressure loss to the system when fully open. Adjustment of this valve will add resistance to the system and hence reduce the water flow as needed.

C Free cooling coils

Microchannel coils is a key component of UltraCompact II's free cooling system. These coils have excellent heat transfer characteristics and ensure more than 20% of chiller capacity starting from the temperature difference of 0.5K between ambient air and supply water. Field measurements suggest the full free cooling become available with Delta T of 7K which is about 3 degrees lower compared to leading solutions.

D 3-way mixing valve

A motorized 3-way valve is used to mix return plant water with the flow from free cooling coils by means of an electric actuator which modulates the valve opening in response to changing free cooling coil capacity. At winter time when the fan speed is reduced to a minimum, mixing valve controls water flow thru the free cooling coils in order to prevent freezing.

E Evaporator

Brazed plate heat exchangers work well with small temperature differences between water and refrigerant and this translates to the remarkable high efficiency of the chiller. These heat exchangers feature compact configuration which makes it the best choice for chillers with a small footprint.

F Inline pump

As plant water leaves the evaporator where it is cooled down in accordance with unit settings, it pumped back to the system. We offer a wide variety of inline pumps in both single and twin designs, including those with inverter technology.

Powered by trendsetting technologies

Optimum air flow for maximum efficiency

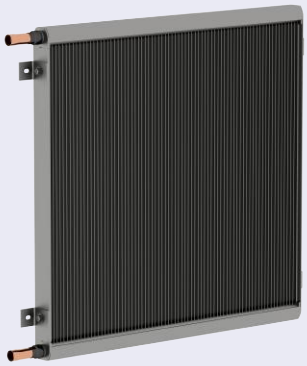
Axial fans used in UltraCompact II design have outstanding characteristics in every respect, including performance and efficiency, weight, noise pollutions, and robustness.

EC fan technology is an excellent solution for demand responsive cooling, and we equip UltraCompact II chillers with the latest EC motors which demonstrate impressive performance, low energy consumption, high torque, and durable design. EC fans with integrated electronic control can easily be varied in speed to match airflow demand. For the same air volume, they consume distinctly less energy than AC motors.

The most common cause of fan motor failure and consequent capacity reduction of the chiller is overheating. EC fans of UltraCompact II chiller have temperature sensors built into the internal electronics package that act as a safety device in the case of overheating.

Microchannel condensers

Enhanced heat transfer and low condensing temperature



Microchannel condensers used in UltraCompact II design give a number of advantages, including higher heat transfer rate, low airside pressure drops, and closer approach temperatures. The end result is up to 40% higher energy efficiency in comparison to traditional fin/tube heat exchanger design.

Smaller coil face, thin design, up to 50% less weight, and less refrigerant charge translate to lower system cost. Microchannel condensers used in UltraCompact II chiller range are true HVAC coils developed and optimized especially for refrigeration applications and enable remarkable low condensing temperatures.

Shut-off valves

Lug-type butterfly valves ensure reliable operation of Lightstream UltraCompact II waterside system. The design of these valves, diversity of used materials, and high-grade quality result in absolutely tight sealing with the flow in either direction. The valve body and disc are accurately machined and deliver low operating torque and long service life, while triple shaft bearings prevent shaft deflection and guarantee optimum guidance even if the valve is actuated frequently.

Remote control

The control hub of UltraCompact II chillers is a sophisticated controller and advanced software developed for efficient operation of scroll-based chillers. It manages and optimizes the chiller's performance, giving the complete control over the system for plant operator, either directly or remotely.

Circulation pumps

UltraCompact chillers can be equipped with high-quality single-stage single or twin pumps in inline design. The pumps feat reduced life cycle costs, optimized efficiency, and high standard of corrosion protection thanks to cataphoretic coating. Inverter-driven pumps are available optionally. Inverter-driven pumps have broad performance range, which enables them perform efficiently under widely varied conditions and to meet a wide range of requirements.

Package, options and accessories

Description					
General					
Water tank (F2/F3/F4 enclosure sizes)	□	MCHE e-coating	□	Low noise design (grades 1-4)	□
ClimateProfile™	□	MCHE mesh guard	□	Max. -6°C brine kit	□
Soundproof compressor compartment	■	Anti-vibration mounts/springs	□	Max. -12°C brine kit	□
Waterside					
Free cooling system	■	Pump coolant heater	□	3-way mixing valve	■
Pump (single/twin inline pumps - fixed-speed/inverter)	□	Bypass with double regulating valve	□	Double regulating valve on water return	■
Strainer 20 mesh	■	Bypass with butterfly shut-off valve	□	Automatic air vents	■
Flanged water connections	□	Pressure transducers	■	Differential pressure transducer	■
Grooved water connections	■	Temperature transducers/gauges	□	Pressure gauges	□
Refrigerant side					
Electronic expansion valve(s)	■	High-efficient refrigerant filters	■	Safety valves on high/low pressure sides	□
Service valves (compressor suction/discharge)	■	Pressure indication on high/low pressure sides	□	Thermal insulation	■
Airside					
EC fans	■	AC fans	□	High-efficient fan diffusers	□
Electric and controls					
Electric panel heater	□	BMS connectivity	■	Touch screen HMI	□
Phase sequence relay	□	SNMP connectivity	□	Remote monitoring software	□
Variable flow control	□	Energy monitoring	□	Pumping group control system	□

■ Standard feature
□ Optional feature

Frame sizes and model identification

Lightstream Scroll UltraCompact II Freecool S 150 P 2 / 1 - E

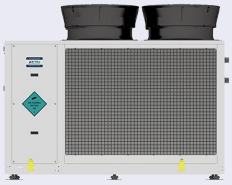
Compressors	S	Scroll
Nominal capacity		kW
Evaporator type	P	Brazed plate
Fans		No. of fans
Refrigerant circuits		No. of refrigerant circuits
Model-specific	F	Free cooling system

Frame size		F1	F2	F3	F4
Length	mm	2075	2675	3675	5275
Width	mm	1200	1200	1200	1200
Height[1]	mm	1825	1825	1825	1825

(1) with standard fans/no diffusers

F1

F2



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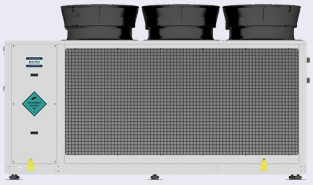

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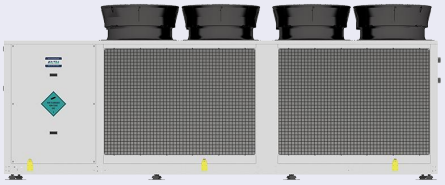
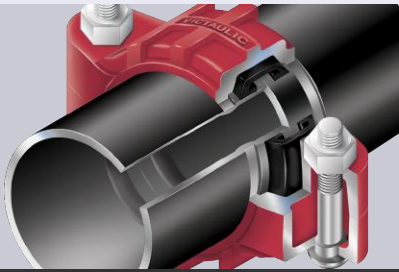


Grooved connections

We use grooved couplings because of their rigidity, flexibility, noise and vibration attenuation, and easy of installation and maintenance. The groove is made by cold forming or machining a groove into the end of a pipe. A gasket encompassed by the coupling housing is wrapped around the two grooved pipe ends, and the key sections of the coupling housing engage the grooves. The bolts and nuts are tightened with a socket wrench or impact wrench.



Technical Specs

Lightstream Scroll UltraCompact II Freecool		S50 P1/1-F F1	S75 P1/1-F F1	S100 P2/1-F F2	S125 P2/1-F F2	S150 P2/1-F F2	S175 P3/1-F F3	S200 P3/1-F F3	S225 P3/1-F F3	S250 P4/2-F F4	S275 P4/2-F F4	S300 P4/2-F F4
Cooling capacity[1]	kW	50.4	72.7	97.9	118.5	141.8	169.1	192.8	215.1	237.3	261.0	283.3
EER		3.26	3.08	3.22	3.16	2.97	3.17	3.07	2.96	3.17	3.02	2.97
Net weight	kg	750	770	1210	1240	1270	1400	1440	1480	2260	2280	2390
Min 100% FC ambient	°C	0.7	0.4	0.3	0.2	0.0	0.2	0.1	0.0	0.2	0.1	0.0
Compressors							Scroll					
Quantity		2	2	2	2	2	2	2	2	4	4	4
Power input	kW	14.6	20.9	28.2	34.2	40.9	48.6	55.3	62.0	68.5	76.0	81.9
Absorbed current	A	28.7	41.3	51.1	59.6	70.6	84.4	95.4	106.3	119.2	133.8	141.1
Capacity steps		2	2	2	2	2	2	2	2	4	4	4
Fans							EC-type axial					
Quantity		1	1	2	2	2	3	3	3	4	4	4
Airflow	m^3/h	17500	26250	34750	43200	53200	60900	70800	81000	86000	96000	106000
Power input	kW	0.9	2.7	2.1	3.3	6.9	4.7	7.5	10.7	6.5	10.3	13.4
Evaporator							BPHE					
Water flow rate	m^3/h	8.6	12.4	16.8	20.3	24.3	29.0	33.0	36.8	40.6	44.7	48.5
Pressure drop	kPa	5.9	7.3	18.2	19.1	19.9	20.8	31.8	30.4	24.1	26.5	29.0
Evaporation temp.	°C	5	5	5	5	5	5	5	5	5	5	5
Refrigerant circuits							R410a					
Quantity		1	1	1	1	1	1	1	1	2	2	2
Charge	kg	5.5	5.5	8.0	8.0	8.0	12.5	12.5	12.5	16.0	16.0	16.0

(1) Coolant: Water 100%; Coolant temperatures: 7/12°C; Ambient temperature: 35°C

About Kaltra

***Kaltra Innovativtechnik** is a provider of innovative thermal management technologies and advanced cooling equipment for mission-critical applications, such as data centers, cleanrooms, contaminant-free areas, processing plants, and other facilities where the reliability and energy efficiency are key factors.*

Many of our researches have transitioned into practice, thus driving systematic improvements of Kaltra's cooling equipment and solutions, and providing our customers the most advanced cooling systems in the market.

Kaltra's production facilities have the mission of providing innovative and high-quality air conditioning and refrigeration systems and impressive both in terms of size and output and the associated options covered by the 54,000m² of administrative and production areas.

The true strengths though lie in the combination of years of manufacturing expertise and in the quality management that are leading features for the HVAC sector.

MODELS
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AVAILABLE

The development of Kaltra products and services is continuous and the information in this document may not be up to date. Please check the current position with Kaltra.

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