Lightstream Scroll

AIR-COOLED CHILLERS WITH SCROLL COMPRESSORS

- CLASS A ENERGY EFFICIENCY
- PROVEN RELIABILITY
- HEAT RECOVERY OPTIONS

190-880kW

AVAILABLE IN 7 FRAME SIZES, TOTAL 66 MODELS WITH A WIDE SELECTION OF OPTIONS AND ACCESSORIES

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

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High-efficient chilled water production

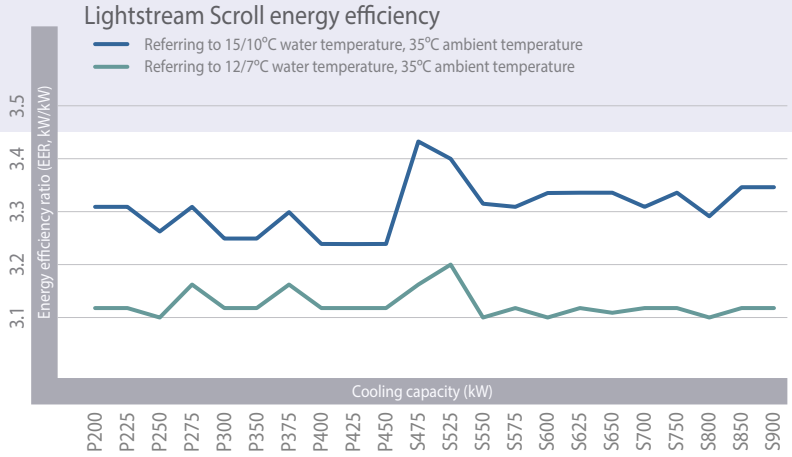
AN EXCEPTIONALLY EFFICIENT AIR-COOLED CHILLER RANGE OFFERING DIVERSE COOLING CAPACITIES AND FEATURING A WIDE SELECTION OF OPTIONS, INCLUDING PARTIAL AND TOTAL HEAT RECOVERY. WITH ITS COMPACT AND RELIABLE SCROLL COMPRESSORS, MICROCHANNEL CONDENSERS, AND QUIET AXIAL FANS, IT'S THE PERFECT SOLUTION FOR AIR CONDITIONING AND PROCESS COOLING APPLICATIONS.

The benefits at a glance:

- ENERGY EFFICIENCY RATIO UP TO 3.20
- ESEER UP TO 4.70
- INTELLIGENT HEAD PRESSURE CONTROL
- WATER TEMPERATURES OF UP TO -12°C
- LOW CONDENSING TEMPERATURES
- HEAT RECOVERY OPTIONS

ESEER OF UP TO

4.70



Scroll compressors

Proven reliability and performance

Lightstream Scroll chillers are based on scroll compressors in tandem configuration, which offer part-load efficiency and increased load-matching capabilities, as well as quiet operation and diagnostic capabilities, and enable two-stage capacity by running compressors individually or simultaneously.

Lightstream's refrigerant side consists of one to four gas circuits - depending on unit capacity, each equipped with electronic expansion valve (EEV) to ensure optimum system efficiency.

Depending on their demands, customers can choose from partial or total heat recovery features installed on each gas circuit.

Leading cooling technologies

Improved heat transfer and long service life

For Lightstream Scroll chillers we use microchannel condenser coils of a new design - with optimized louvered fin geometry and microchannel tubes with reduced port size - both made from long-life aluminium alloys. This new design enhances the overall heat transfer while reducing airside pressure drop as compared to coils of the previous generation, thus enabling fan energy savings.

The chillers characterized by noticeably reduced refrigerant charge as new coils have reduced internal volume, and this translates to lower initial and maintenance costs. High heat transfer ratios lead to considerable lower condensing temperatures, which in turn enables the savings on compressor energy.

For installations in aggressive or highly-polluted environments, as well as for seashore installations, we recommend e-coated coils with high corrosion resistance to ensure long service life.

Optimum air flow for partial load efficiency

Lighstream Scroll's new generation fan system not only reduces power consumption by up to 30% while efficiently managing the extraordinarily high volume flows – it also works at much reduced operating noise. The smart fan system includes the unique fan impellers with bionic wing concept, the most advanced EC motor technology, and multifunctional air diffusers, resulting in an extra economic efficiency for the customers.

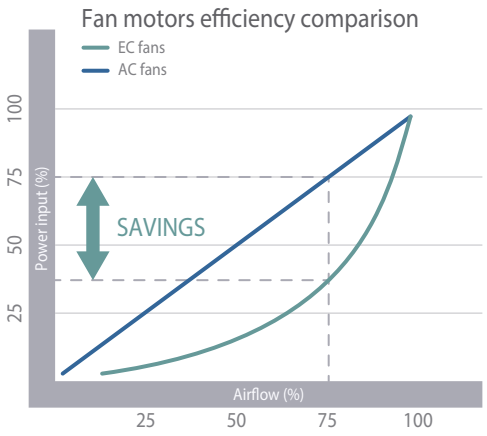
EC motors use commutation electronics to sense the rotor position and adjust supply current, thus eliminating the need for mechanical brushes to deliver current to the motor windings. Elimination of physical contact reduces internal wear within the fan motor and significantly increases reliability.

EC motor technology does not provide savings only during full-load operation - it is exactly when operating under partial load that EC motors lose much less of their efficiency compared to AC fans.

25% energy savings through the use of EEV

The electronic expansion valve (EEV) reduces the need for high head pressure when running at part load and under low 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.

Precise control is guaranteed by chiller's controller and assured by the unique geometry of the valve elements, ensuring flow with an equal percentage characteristic, stroke length, achieved by using stainless steel bearings and high precision mechanical components.



Brazed plate heat exchangers

Brazing the plates together eliminate the need for gaskets and thick frame plates, which makes the heat exchanger compact. The brazing material seals and holds the plates together at the contact points ensuring optimal heat transfer efficiency and pressure resistance. Using advanced design technologies and extensive verification guarantees the highest performance and longest possible service lifetime.

Shell-and-tube heat exchangers

With innovative refrigerant distributor and optimized plastic baffles designed to improve the brine side heat transfer performances, Lightstream's shell and tube evaporator guarantee maximum efficiency and compactness. The tubes have a specific inner grooved pattern to maximize the heat transfer coefficient and to limit the pressure drop negative effects.

Package, options and accessories

Description					
General					
Soundproof compressor enclosures	□	Anti-vibration mounts	□	Mesh guards for coils	□
Low noise design (grades 1 to 3)	□	High-ambient kit	□	Partial heat recovery system	□
E-coated condenser coils	□	Brine kit (to -6°C)	□	Total heat recovery system	□
Hi-sided paneling	□	Brine kit (to -12°C)	□	Thermal insulation	■
Waterside					
Water tank	□	Flowmeter	□	Grooved water connections	■
Pump 1x fixed-speed, 2-pole motor, low head	□	Pump 2x fixed-speed, 2-pole motor, low head	□	Pump 2x fixed-speed, 4-pole motor, low head	□
Pump 1x fixed-speed, 2-pole motor, high head	□	Pump 2x fixed-speed, 2-pole motor, high head	□	Pump 2x fixed-speed, 4-pole motor, high head	□
Pump 1x variable-speed, 2-pole motor, low head	□	Pump 2x variable-speed, 2-pole motor, low head	□	Pump 2x variable-speed, 4-pole motor, low head	□
Pump 1x variable-speed, 2-pole motor, high head	□	Pump 2x variable-speed, 2-pole motor, high head	□	Pump 2x variable-speed, 4-pole motor, high head	□
Refrigerant side					
Electronic expansion valves	■	Evaporator immersion heater (for S&T models)	■	Gas leakage detection	□
Service valves on compr. suction/discharge	□	Safety valves on high/low sides	■	Pressure indication on high/low sides	■
Airside					
AC fans	■	EC fans	□	High-efficient fan diffusers	□
Electric and controls					
Touch screen HMI	■	Dual power supply w/ ATS	□	Sequence management	□
Electric panel heater	□	BMS connectivity	■	Compressor operation indication	■
Compressor power factor capacitor	□	SNMP connectivity	■	Remote monitoring software	■
Automatic circuit breakers on loads	□	GSM connectivity	□	Soft-start system	□
Phase sequence control	□	Energy monitoring	□	Electric heater for pump(s)	□

■ Standard feature
□ Optional feature

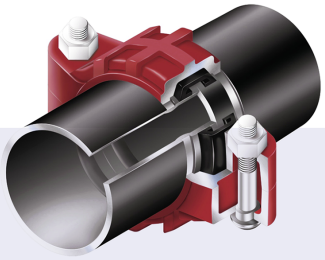
Model identification

Lightstream Scroll	S	600	V	6	/	3	-	N	-	R410a

Type of evaporator	P	Brazed plate heat exchanger
	S	Shell-and-tube heat exchanger
Nominal cooling capacity		kW
Type of condensing coils	V	V-bank microchannel coils
Condenser size		Number of V-banks
Number of refrigeration circuits		
Noise level	N	Normal
	L	Low
	U	Ultra-low
Refrigerant type		ASHRAE number

Frame sizes

Frame size		F1	F2	F3	F4	F5	F6	F7
Length	mm	2475	3595	4715	5835	6955	8075	9195
Width	mm	2250	2250	2250	2250	2250	2250	2250
Height	mm	2315	2315	2315	2315	2315	2315	2315



Grooved connections

We use a piping system with grooved couplings because of its rigidity, flexibility, noise and vibration attenuation, and ease 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 Specifications

Lightstream Scroll		P200 V2/2	P225 V2/2	P250 V2/2	P275 V3/2	P300 V3/2	P350 V3/2	P375 V4/2	P400 V4/2	P425 V4/2	P450 V4/2	S475 V5/3
Frame size		F1	F1	F1	F2	F2	F2	F3	F3	F3	F3	F4
Cooling capacity[1]	kW	190	220	235	270	310	345	375	395	415	440	470
Energy efficiency (EER)	kW/kW	3.12	3.12	3.10	3.16	3.12	3.12	3.16	3.12	3.12	3.12	3.16
ESEER	kW/kW	4.45	4.49	4.37	4.41	4.53	4.53	4.37	4.40	4.43	4.48	4.55
Power input	kW	59.8	69.0	75.2	84.5	97.3	108.8	116.9	124.7	130.8	138.8	145.9
Absorbed current	A	115	131	137	157	178	195	211	225	234	246	267
Net weight	kg	1910	1960	2140	2640	2690	2730	3220	3270	3290	3310	4360
Compressors		Scroll compressors										
Quantity		4	4	4	4	4	4	4	4	4	4	6
Power input	kW	53.4	62.6	68.8	75.0	87.8	99.3	104.2	112.0	118.1	126.1	130.0
Absorbed current	A	99.8	115.1	121.0	134.0	154.1	172.0	180.2	194.0	203.2	215.2	228.0
Fans		AC-motor axial fans										
Quantity		4	4	4	6	6	6	8	8	8	8	9
Airflow	m^3/h	85000	85000	85000	127500	127500	127500	170000	170000	170000	170000	212500
Power input	kW	6.4	6.4	6.4	9.5	9.5	9.5	12.7	12.7	12.7	12.7	15.9
Absorbed current	A	15.6	15.6	15.6	23.4	23.4	23.4	31.2	31.2	31.2	31.2	39.0
Evaporator		Brazed plate / Shell-and-tube										
Water flow	m^3/h	32.5	37.5	40.2	46.5	53.0	59.0	64.0	67.5	70.8	75.2	89.5
Water volume	L	13.3	15.1	15.1	18.6	26.0	30.0	31.6	133.4	133.4	124.7	113.5
Refrigeration circuits		R410a										
Quantity		2	2	2	2	2	2	2	2	2	2	3
Charge	kg	19.0	19.5	20.2	27.8	27.8	28.3	36.2	36.2	36.2	36.2	41.8

(1) Fluid: water 100%; Fluid inlet/outlet temperatures: 12/7°C; Ambient temperature: 35°C

Lightstream Scroll		S525 V5/3	S550 V5/3	S575 V5/3	S600 V6/3	S625 V6/3	S650 V6/3	S700 V6/4	S750 V7/4	S800 V7/4	S850 V8/4	S900 V8/4
Frame size		F4	F4	F4	F5	F5	F5	F5	F6	F6	F7	F7
Cooling capacity[1]	kW	525	540	565	590	615	655	690	745	770	830	880
Energy efficiency (EER)	kW/kW	3.20	3.10	3.12	3.10	3.12	3.11	3.12	3.12	3.10	3.12	3.12
ESEER	kW/kW	4.70	4.57	4.60	4.48	4.50	4.55	4.66	4.56	4.56	4.58	4.60
Power input	kW	160.9	171.9	178.9	189.0	194.0	207.0	219.0	236.2	247.2	262.2	277.2
Absorbed current	A	292	309	319	339	348	367	393	425	440	470	492
Net weight	kg	4560	4580	4600	5150	5170	5200	5570	6470	6510	6590	6620
Compressors		Scroll compressors										
Quantity		6	6	6	6	6	6	8	8	8	8	8
Power input	kW	145.0	156.0	163.0	170.0	175.0	188.0	200.0	214.0	225.0	237.0	252.0
Absorbed current	A	253.0	270.0	280.0	292.0	301.0	320.0	346.0	370.0	385.0	408.0	430.0
Fans		AC-motor axial fans										
Quantity		9	10	10	12	12	12	12	14	14	16	16
Airflow	m^3/h	212500	212500	212500	255000	255000	255000	255000	297500	297500	340000	340000
Power input	kW	15.9	15.9	15.9	19.0	19.0	19.0	19.0	22.2	22.2	25.2	25.2
Absorbed current	A	39.0	39.0	39.0	46.8	46.8	46.8	46.8	54.6	54.6	62.4	62.4
Evaporator		Shell-and-tube										
Water flow	m^3/h	101.0	101.0	103.0	124.0	124.0	124.0	140.0	140.0	145.0	164.0	168.0
Water volume	L	221.7	221.7	221.7	206.5	206.5	206.5	184.4	184.4	184.4	225.0	225.0
Refrigeration circuits		R410a										
Quantity		3	3	3	3	3	3	4	4	4	4	4
Charge	kg	42.4	46.5	46.5	54.4	54.4	54.4	56.6	64.6	64.6	72.5	72.5

(1) Fluid: water 100%; Fluid inlet/outlet temperatures: 12/7°C; Ambient temperature: 35°C

TOTAL
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MODELS

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.