Lightstream Screw V

AIR-COOLED CHILLERS WITH SCREW COMPRESSORS

- CLASS A+ ENERGY EFFICIENCY
- AVAILABLE WITH R1234ZE AND R134A
- OPTIONAL FREE COOLING SYSTEM
- OPTIONAL HEAT RECOVERY

200-1800kW

AVAILABLE IN 9 FRAME SIZES, TOTAL 140 MODELS WITH A BROAD SELECTION OF OPTIONS AND ACCESSORIES

SCREW | R134A/R1234ZE | EC-FANS | MICROCHANNEL | FREECOOLING | HEAT RECOVERY

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Uncompromising performance

LIGHTSTREAM SCREW V IS A RELIABLE SOLUTION FOR WIDE RANGE OF COOLING PLANT CAPACITIES, EFFICIENCY REQUIREMENTS, AND ENVIRONMENTAL POLICIES. THE HIGH LEVEL OF CUSTOMISABILITY AND ADDITIONAL OPTIONS ALLOW THE USERS TO ADOPT THESE CHILLERS TO THEIR PRECISE APPLICATION, BE IT INDUSTRIAL PROCESS, AIR CONDITIONING, OR DATA CENTER FACILITY.

Key advantages and benefits:

- ENERGY EFFICIENCY RATIO UP TO 3.42
- ESEER UP TO 4.52
- INTELLIGENT HEAD PRESSURE CONTROL
- WIDE CUSTOMIZATION POSSIBILITIES
- LOW MAINTENANCE COSTS

Lightstream Screw V has been designed with attention to every detail to maximize its reliability, and fits ideally to the requirements of such applications like industrial and commercial cooling, data centers, telecom facilities and cleanrooms, and in every area where reliability is a key factor.

With the ability to provide high temperature stabilities, Lightstream Screw V chillers are bringing outstanding precision to the industrial and commercial markets.

ESEER OF UP TO

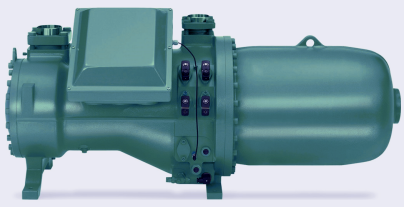
4.52

Evaporators

Innovative shell-and-tube heat exchangers

For shell-and-tube evaporators, thermal performance and pressure drop are considered as major factors which are directly related to operating costs and overall chiller efficiency. Both thermal performance and pressure drop are dependent on the flow paths and types of baffles used to increase the fluid velocity - by diverting the flow across the tube bundle to obtain higher heat transfer coefficient.

The shell-and-tube evaporators used in Lightstream Screw V chillers feature both high heat transfer performance, close approach temperatures, and low pressure drops, as it combines an innovative tube bundle design and optimized baffle geometry. The net result is improved system performance, as well as tight control of return water temperatures.



Latest screw compressors

Increased chiller reliability and efficiency

Lightstream's compact semi-hermetic screw compressors are distinguished by a further improvement in energy efficiency at full and part load conditions. Moreover, the application limits have been substantially extended towards low condensing temperatures as well as to high pressure ratios – without compromises regarding operating reliability.

Accordingly, these compressors exceed the international efficiency standard of compact screws with respect to the seasonally weighted energy requirements to an even higher degree than before. This results in particularly high ESEER/IPLV and SCOP values.

Microchannel condensing coils

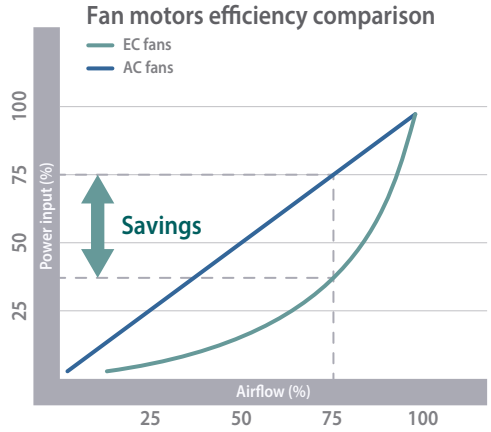
Better heat transfer. Lower condensing temperatures. Higher efficiency.

Microchannel condensers used in Lighstream Screw V 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 Lightstream Screw V chillers are true HVAC coils developed and optimized especially for refrigeration applications and enable remarkable low condensing temperatures.

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 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.



The control hub of Lightstream Screw V chillers is a sophisticated controller and advanced software developed for efficient operation of the chillers based on screw compressors. It manages and optimizes the chiller's performance, giving the complete control over the system for plant operator.

Intelligent fan system

EC-type fans with reduced power consumption

Lighstream Screw V's new generation fan system not only reduces power consumption by up to 30% while easily managing the extraordinary high volume flows – it also works at much reduced operating noise.

The smart fan system includes the unique fans with bionic wing concept, the most advanced EC motor technology, and multifunctional air diffusers, resulting in an extra economic efficiency for the customers.

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.

Package, options and accessories

Description					
General					
Anti-vibration mounts	□	MCHE electrocoat	□	High ambient kit	□
Anti-vibration springs	□	MCHE thermoguard	□	Low ambient kit	□
Soundproof compressor enclosures	■	MCHE mesh guard	□	Low noise design (grades 1-4)	□
High-sided paneling	□	-8°C brine kit	□	Partial heat recovery system	□
Free cooling system[1]	□	High-efficiency kit	□	Full heat recovery system	□
Waterside					
Flooded-type shall-and-tube evaporator	□	Pump(s) antifreeze heater	□	Flowmeter	□
Pumping group (single/twin fixed-speed/variable-speed)	□	Water tank	□	Flow switch	□
Refrigerant side					
Solenoid valves (liquid lines)	□	Service valves (compr. suction/discharge)	□	Safety valves on high/low pressure sides	□
Electronic expansion valves	■	Pressure indication on high/low pressure sides	□	Thermal insulation	■
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	□
Phase control relay	■	SNMP connectivity	□	Remote monitoring software	□
Soft-start system	□	Energy monitoring	□	Pumping group control system	□

■ Standard feature

□ Optional feature

(1) Options specific to free cooling system available on request

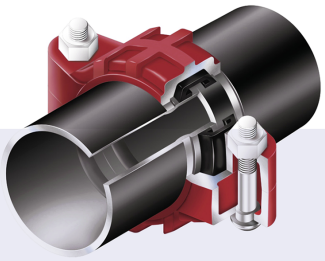
Frame sizes

Frame size		F2	F3	F4	F5	F6	F7	F8	F9	F10
Length	mm	2745	3995	5245	6495	7745	8995	10395	11645	12895
Width	mm	2250	2250	2250	2250	2250	2250	2250	2250	2250
Height[1]	mm	2495	2495	2495	2495	2495	2495	2495	2495	2495

(1) For units with AC-type fans w/o diffusers

Model identification

Lightstream Screw V			X	F	600	V	6	/	2	-	FC	-	HP	-	R1234ze
Efficiency grade	S	Standard													
	H	High													
	X	Extra high													
Compressors type	F	Fixed-speed compact screw													
Nominal capacity		kW													
Condenser type	V	V-bank microchannel													
Condenser size		No. of condenser banks													
Refrigerant circuits		No. of refrigerant circuits													
Optional	FC	Free cooling													
Optional	HP	Partial heat recovery													
	HT	Full heat recovery													
Refrigerant		Refrigerant type													



Grooved connections

We use grooved end connections 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.

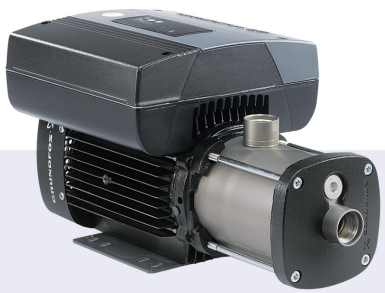
Technical specifications - VS series

Lightstream Screw VS		F200	F225	F250	F275	F300	F325	F350	F375	F400	F425	F450	F500	F550	F600	F650	F700
		V2/1	V2/1	V2/1	V2/1	V2/2	V2/2	V3/1	V3/2	V3/1	V3/2	V3/2	V4/2	V4/2	V4/2	V4/2	V5/2
Frame size		F2	F2	F2	F2	F2	F2	F3	F3	F3	F3	F3	F4	F4	F4	F4	F5
Cooling capacity[1]	kW	204	223	240	275	300	327	350	385	398	433	482	534	560	602	660	725
Total power input	kW	63.6	73.2	85.0	88.0	101.0	116.8	112.0	131.0	135.0	142.9	168.6	185.0	193.5	204.0	233.0	250.0
EER	kW/kW	3.21	3.05	2.82	3.13	2.97	2.80	3.13	2.94	2.95	3.03	2.86	2.89	2.89	2.95	2.83	2.90
ESEER	kW/kW	4.04	4.07	4.09	4.07	4.26	4.26	4.02	4.29	4.05	4.32	4.25	4.28	4.28	4.31	4.30	4.29
Operating weight	kg	2100	2140	2450	2500	3160	3170	3110	3720	3550	3810	4610	5050	5060	5130	5520	6450
Compressor(s)		Semi-hermetic compact screw															
Quantity		1	1	1	1	2	2	1	2	1	2	2	2	2	2	2	2
Power input	kW	58.0	67.6	79.5	80.4	93.0	108.8	102.0	121.0	126.0	132.0	158.0	172.0	180.5	188.0	218.0	233.0
Min capacity	%	40.0	40.0	40.0	40.0	20.0	20.0	40.0	20.0	40.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Condenser bank(s)		MCHE + AC axial fans															
Quantity		2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	5
Airflow	m^3/h	57000	57000	57000	76000	76000	76000	95000	95000	95000	114000	114000	133000	133000	152000	152000	171000
Evaporator		Shell-and-tube															
Water flow	m^3/h	34.9	38.2	41.0	47.3	51.6	56.1	59.9	66.0	68.1	74.4	82.7	91.8	96.2	103.4	113.3	124.9
Pressure drop	kPa	30.2	36.2	41.6	42.5	24.0	28.3	29.5	33.6	38.2	42.7	32.3	39.8	34.9	40.3	38.5	46.8
Water volume	L	90.0	90.0	90.0	90.0	90.0	90.0	116.0	90.0	116.0	90.0	140.0	140.0	125.0	125.0	230.0	230.0
Refrigeration circuit(s)		R134a															
Quantity		1	1	1	1	2	2	1	2	1	2	2	2	2	2	2	2
Refrigerant charge	kg	28	31	33	38	44	47	49	55	55	63	69	76	80	88	94	104

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

Lightstream Screw VS		F800	F850	F900	F950	F1000	F1050	F1150	F1200	F1250	F1300	F1400	F1500	F1600	F1650	F1700	F1800
		V5/2	V6/2	V6/2	V6/2	V6/2	V7/2	V7/2	V7/2	V8/2	V8/2	V9/3	V9/3	V9/3	V10/3	V10/3	V10/3
Frame size		F5	F6	F6	F6	F6	F7	F7	F7	F8	F8	F9	F9	F9	F10	F10	F10
Cooling capacity[1]	kW	804	874	928	984	1024	1060	1148	1178	1240	1306	1402	1485	1550	1658	1714	1805
Total power input	kW	267.0	289.0	309.0	336.0	362.0	348.0	388.0	413.0	425.0	465.0	465.0	514.0	546.0	569.0	592.0	598.0
EER	kW/kW	3.01	3.02	3.00	2.93	2.83	3.05	2.96	2.85	2.92	2.81	3.02	2.89	2.84	2.91	2.90	3.02
ESEER	kW/kW	4.26	4.26	4.29	4.27	4.27	4.28	4.31	4.27	4.27	4.31	4.27	4.29	4.25	4.28	4.32	4.32
Operating weight	kg	6950	7440	7560	7800	7820	8250	8360	8660	9200	9310	11890	11950	11960	12490	12570	12850
Compressor(s)		Semi-hermetic compact screw															
Quantity		2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
Power input	kW	247.0	268.2	286.6	312.6	339.5	321.0	361.2	387.6	395.3	435.7	431.7	478.8	511.3	531.1	554.0	560.0
Min capacity	%	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	13.3	13.3	13.3	13.3	13.3	13.3
Condenser bank(s)		MCHE + AC axial fans															
Quantity		5	6	6	6	6	7	7	7	8	8	9	9	9	10	10	10
Airflow	m^3/h	190000	209000	228000	228000	228000	266000	266000	266000	304000	304000	342000	342000	342000	380000	380000	380000
Evaporator		Shell-and-tube															
Water flow	m^3/h	138.2	150.1	159.5	169.1	175.8	182.3	197.3	202.5	213.3	224.2	241.2	254.9	266.4	284.8	294.4	315.6
Pressure drop	kPa	40.9	42.6	48.1	41.8	45.1	48.5	53.3	42.2	46.9	51.8	45.4	50.7	39.0	44.6	51.2	50.8
Water volume	L	230.0	210.0	210.0	275.0	275.0	275.0	260.0	310.0	310.0	310.0	575.0	575.0	550.0	550.0	500.0	575.0
Refrigeration circuit(s)		R134a															
Quantity		2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
Refrigerant charge	kg	117	127	135	140	146	150	164	168	180	186	205	212	222	236	250	264

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



Circulation pumps

Lightstream Screw V chillers can be equipped with high-quality single-stage single or twin pumps in inline design. The pumps feature 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 to perform efficiently under widely varied conditions and to meet a wide range of requirements.

Technical specifications - VH series

Lightstream Screw VH		F300 V3/2	F350 V3/2	F400 V3/2	F450 V4/2	F500 V4/2	F550 V4/2	F600 V5/2	F650 V5/2	F700 V5/2	F750 V6/2
Frame size		F3	F3	F3	F4	F4	F4	F5	F5	F5	F6
Cooling capacity[1]	kW	302	352	396	463	514	552	592	630	685	768
Total power input	kW	95.3	108.6	124.8	144.0	160.0	174.8	184.0	196.0	217.6	241.6
EER	kW/kW	3.17	3.24	3.17	3.22	3.21	3.16	3.22	3.21	3.15	3.18
ESEER	kW/kW	4.38	4.39	4.40	4.37	4.40	4.39	4.40	4.39	4.42	4.39
Operating weight	kg	3660	3720	3760	4660	5040	5090	5830	5690	6110	6970
Compressor(s)		Semi-hermetic compact screw									
Quantity		2	2	2	2	2	2	2	2	2	2
Power input	kW	85.8	96.8	113.8	131.0	145.0	158.8	167.0	177.0	198.6	220.6
Min capacity	%	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Condenser bank(s)		MCHE + AC axial fans									
Quantity		3	3	3	4	4	4	5	5	5	6
Airflow	m^3/h	95000	114000	114000	133000	152000	152000	171000	190000	190000	209000
Evaporator		Shell-and-tube									
Water flow	m^3/h	52.1	60.2	68.0	79.5	88.3	94.9	101.7	108.3	117.7	131.9
Pressure drop	kPa	24.4	32.6	35.7	29.8	36.8	34.0	39.0	44.2	41.6	37.2
Water volume	L	90.0	90.0	90.0	140.0	140.0	125.0	125.0	125.0	230.0	220.0
Refrigeration circuit(s)		R134a									
Quantity		2	2	2	2	2	2	2	2	2	2
Refrigerant charge	kg	48	54	58	68	79	82	87	92	100	113

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

Lightstream Screw VH		F850 V6/2	F900 V7/2	F950 V7/2	F1000 V8/2	F1100 V8/2	F1200 V8/2	F1250 V9/2	F1350 V10/3	F1450 V10/3	F1500 V10/3
Frame size		F6	F7	F7	F8	F8	F8	F9	F10	F10	F10
Cooling capacity[1]	kW	840	906	958	1032	1100	1178	1238	1344	1460	1524
Total power input	kW	260.0	280.0	298.8	320.0	338.8	374.4	390.7	414.0	458.6	483.8
EER	kW/kW	3.23	3.24	3.21	3.23	3.25	3.15	3.17	3.25	3.18	3.15
ESEER	kW/kW	4.39	4.40	4.42	4.40	4.43	4.40	4.41	4.35	4.37	4.39
Operating weight	kg	7440	7890	8000	8700	8780	9040	10120	12160	12330	12640
Compressor(s)		Semi-hermetic compact screw									
Quantity		2	2	2	2	2	2	2	3	3	3
Power input	kW	237.0	255.0	272.2	291.0	308.2	343.6	356.3	378.0	420.4	446.2
Min capacity	%	20.0	20.0	20.0	20.0	20.0	20.0	20.0	13.3	13.3	13.3
Condenser bank(s)		MCHE + AC axial fans									
Quantity		6	7	7	8	8	8	9	10	10	10
Airflow	m^3/h	228000	247000	266000	285000	304000	304000	342000	361000	380000	380000
Evaporator		Shell-and-tube									
Water flow	m^3/h	144.2	155.7	164.6	177.4	189.1	202.7	212.9	231.0	251.3	261.8
Pressure drop	kPa	44.5	45.8	51.2	46.0	50.2	42.3	46.7	41.6	34.7	37.7
Water volume	L	220.0	210.0	210.0	275.0	275.0	310.0	310.0	575.0	550.0	500.0
Refrigeration circuit(s)		R134a									
Quantity		2	2	2	2	2	2	2	3	3	3
Refrigerant charge	kg	122	132	140	150	160	173	182	197	226	226

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

Low-GWP refrigerant option

The portfolio of Lightstream Screw V chillers includes the models that use low-GWP alternatives to R134a. The customers may choose from zero ozone depletion potential refrigerants R1234ze and R513a with the GWP values of less than 1 and 573, respectively.

Technical specifications - VX series

Lightstream Screw VX		F300	F350	F400	F450	F500	F550	F600	F650	F700
		V3/2	V4/2	V4/2	V4/2	V5/2	V5/2	V6/2	V6/2	V6/2
Frame size		F3	F4	F4	F4	F5	F5	F6	F6	F6
Cooling capacity[1]	kW	318	364	415	453	533	577	614	650	705
Total power input	kW	94.5	108.0	123.0	136.6	156.0	170.7	180.9	192.0	212.6
EER	kW/kW	3.37	3.37	3.37	3.32	3.42	3.38	3.39	3.39	3.32
ESEER	kW/kW	4.43	4.45	4.45	4.46	4.45	4.45	4.45	4.48	4.45
Operating weight	kg	3720	4240	4360	4430	5580	5920	6400	6490	6600
Compressor(s)		Semi-hermetic compact screw								
Quantity		2	2	2	2	2	2	2	2	2
Power input	kW	83.1	93.2	108.0	121.4	136.9	151.2	160.0	169.0	189.5
Min capacity	%	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Condenser bank(s)		MCHE + AC axial fans								
Quantity		3	4	4	4	5	5	6	6	6
Airflow	m^3/h	114000	152000	152000	152000	190000	190000	209000	228000	228000
Evaporator		Shell-and-tube								
Water flow	m^3/h	54.5	62.4	71.2	77.7	91.3	99.1	105.5	112.0	121.1
Pressure drop	kPa	22.9	30.1	24.0	28.5	35.8	29.5	33.4	37.5	31.4
Water volume	L	90.0	90.0	140.0	140.0	135.0	230.0	230.0	230.0	230.0
Refrigeration circuit(s)		R134a								
Quantity		2	2	2	2	2	2	2	2	2
Refrigerant charge	kg	48	56	64	71	82	89	95	101	110

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

Lightstream Screw VX		F800	F850	F950	F1000	F1050	F1100	F1200	F1300	F1400
		V7/2	V7/2	V8/2	V8/2	V9/2	V9/2	V9/2	V10/2	V10/3
Frame size		F7	F7	F8	F8	F9	F9	F9	F10	F10
Cooling capacity[1]	kW	786	855	932	988	1056	1125	1222	1278	1398
Total power input	kW	235.8	256.0	276.9	297.7	316.8	336.7	372.9	390.8	421.2
EER	kW/kW	3.33	3.34	3.37	3.32	3.33	3.34	3.28	3.27	3.32
ESEER	kW/kW	4.44	4.45	4.52	4.46	4.50	4.49	4.42	4.44	4.45
Operating weight	kg	7400	7880	8420	8660	9180	9270	10340	11180	12340
Compressor(s)		Semi-hermetic compact screw								
Quantity		2	2	2	2	2	2	2	2	3
Power input	kW	210.2	229.0	248.8	266.8	284.1	302.8	339.0	352.7	387.2
Min capacity	%	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	13.3
Condenser bank(s)		MCHE + AC axial fans								
Quantity		7	7	8	8	9	9	9	10	10
Airflow	m^3/h	247000	266000	285000	304000	323000	342000	342000	380000	380000
Evaporator		Shell-and-tube								
Water flow	m^3/h	135.3	147.0	160.3	169.8	181.4	193.3	209.9	219.8	240.2
Pressure drop	kPa	34.6	40.9	53.0	42.1	46.1	51.2	34.4	37.7	40.0
Water volume	L	210.0	210.0	210.0	275.0	275.0	260.0	575.0	575.0	575.0
Refrigeration circuit(s)		R134a								
Quantity		2	2	2	2	2	2	2	2	3
Refrigerant charge	kg	122	132	144	153	163	174	189	198	224

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

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.