

Lightstream Turbo

ENVIRONMENT-FRIENDLY TURBOCOR-BASED CHILLERS



300-1600kW



TURBOCOR



R134A/R1234ze



EC-FANS



MICROCHANNEL



FREECOOLING

Turbocor oil-free compressors

Excellent energy efficiency: save up to **25%** in operating costs*

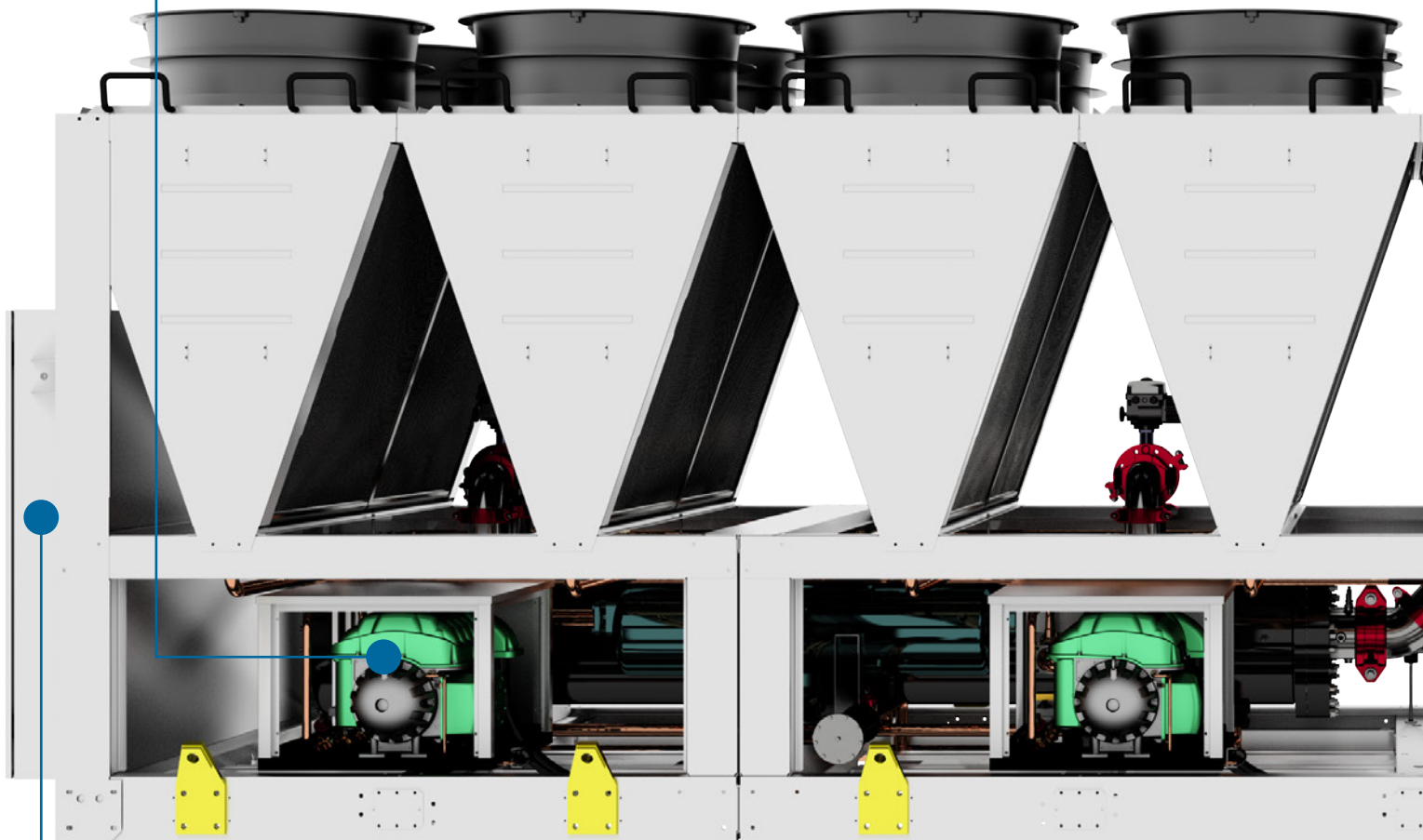


Turbocor compressors offer the outstanding energy savings from digitally controlled, frictionless two-stage centrifugal compression and guarantees significant reductions in operating cost and environmental emissions associated with energy production.

The oil-free design of Turbocor compressors eliminates the potential for efficiency robbing oil contamination and all of the oil management accessories: oil heaters, oil pumps, oil separators, oil filters, plus oil disposal.

Compressor soft-start draws only 2 amps and reduces mechanical stress, as well as the electrodynamic stresses on the power cables and electrical distribution network, extending the overall lifespan of the system.

* compared to leading competitor screw chiller over an annual running in Nuremberg, Germany



Advanced control software

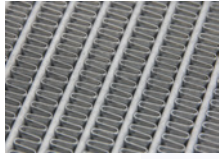


The control hub of Lightstream Turbo chillers is a sophisticated controller and advanced software developed for efficient operation of Turbocor-based chillers. It manages and optimizes the chiller's performance, giving the complete control over the system for plant operator.

For the efficient operation of multiple units on a single chilled water plant, the sequencing software permits interlinked operation of the complete system, thus providing optimal temperature control and minimal energy consumption.

Microchannel condensing coils

Better heat transfer. Lower condensing temperatures. Higher efficiency.



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



MODELS

55

AVAILABLE

High-efficient solution

Extra condenser sections in H-series models

Lightstream Turbo H-series chillers feature extra condenser banks which enable lower condensing temperatures, 15% higher energy efficiency rates (EER) compared to standard Lightstream Turbo models and reduced noise emission level.

Intelligent fan system

EC-type fans with reduced power consumption



Lighstream Turbo'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.

ENERGY EFFICIENCY
UP TO

4.30

Coolant temperatures: 10/15°C; Ambient temperature: 35°C



Flooded evaporator

The flooded evaporator enables to operate at the higher saturated evaporating temperature when compared to many others evaporator types and allows achieving higher cooling capacity with correspondingly higher efficiency.

The refrigerant pool behaves as a flywheel, allowing the controls of the flooded evaporator to track the varying load of a batch process, while optimized tube geometry ensures optimal refrigerant distribution.



Freecooling

Generates energy savings all year round

The Lightstream Turbo chillers can supply chilled water with fairly high temperatures, thus maximizing the amount of time the system can produce chilled water without running mechanical cooling mode. Compared to conventional chillers, Lightstream Turbo equipped with freecooling system generates the energy savings of up to 50% and return the investments within a short timeframe.

When running in concurrent freecooling and mechanical cooling mode, the control system constantly monitors the condensing temperature and keep it within the compressor envelope to allow the maximum possible fan speed and achieve the most freecooling. During the periods when the fan speed must be reduced to a minimum, the chilled water temperature is controlled via motorized valves.

Model identification

Lightstream Turbo

	T	800	F	6	/	1	-	F
Compressors type	T	Turbocor oil-free centrifugal						
Nominal capacity		kW						
Evaporator type	F	Flooded shell-and-tube						
Condenser size		No. of V-banks						
Refrigerant circuits		No. of refrigerant circuits						
Series	S	Standard condensers						
	F	Freecooling						
	H	High-efficient condensers						



R1234ze

Low-GWP refrigerant option

Refrigerants with low global warming potential (GWP) are becoming more and more important in the refrigeration and air conditioning industry in Europe and beyond.

R1234ze features low GWP of one and zero ozone depletion potential, thus providing the environmental leadership while achieving the best energy performance levels for applications.

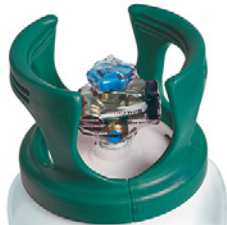
Lightstream Turbo has been designed for year-round mission-critical service in data centers, telecom facilities, and process cooling applications. Low noise emission also enables Lightstream Turbo to be used in noise-sensitive environments such as inner cities, hospitals, etc.

Due to its excellent efficiency at part-load conditions, Lightstream Turbo is an excellent economy solution for applications where the heat load is not constant and/or expected to grow.

The synergy of modern technology, efficiency and reliability enables Lightstream Turbo to be used in the most demanding applications.

Technical Specs

R1234ze air-cooled chillers



R1234ze

Lightstream Turbo S-series air-cooled		T300	T350	T400	T500	T600	T700	T800	T900	T1000	T1200	T1400
		F3/1	F3/1	F4/1	F5/1	F6/1	F7/1	F7/1	F8/1	F9/1	F11/1	F12/1
		S	S	S	S	S	S	S	S	S	S	S
Cooling capacity ¹	kW	280	340	430	550	680	755	830	960	1080	1285	1350
Frame size		F3	F3	F4	F5	F6	F7	F7	F8	F9	F11	F12
Energy efficiency (EER)	kW/kW	3.80	3.50	3.69	3.72	3.50	3.67	3.68	3.53	3.65	3.59	3.68
ESEER		4.92	5.46	4.89	5.28	5.70	5.08	5.16	5.77	5.12	5.60	5.94
Net weight	kg	3250	3300	4300	5370	6030	7460	7630	8380	9720	11030	11700
Compressors								Turbocor oil-free				
Quantity		1	1	2	2	2	3	3	3	4	4	4
Power input	kW	60.0	83.5	98.3	125.0	167.0	174.0	194.0	236.0	255.0	308.0	312.0
Absorbed current	A	96.5	134.0	158.0	200.0	270.0	280.0	310.0	380.0	410.0	495.0	500.0
Fans								EC-type axial				
Quantity		6	6	8	10	12	14	14	16	18	22	24
Airflow	m³/h	156000	156000	208000	260000	312000	364000	364000	416000	468000	572000	624000
Power input	kW	13.6	13.6	18.1	22.7	27.2	31.7	31.7	36.3	40.8	49.9	54.4
Absorbed current	A	26.4	26.4	35.2	44.0	52.8	61.6	61.6	70.4	79.2	96.8	105.6
Evaporator								Flooded shell-and-tube				
Water flow rate	m³/h	48	58	73	95	118	130	143	165	186	220	232
Water volume	l	44.5	44.5	57.0	85.2	85.2	146.0	146.0	146.0	276.5	276.5	276.5
Refrigerant circuits								R1234ze				
Quantity		1	1	1	1	1	1	1	1	1	1	1
Charge	kg	190	190	180	215	215	360	360	360	480	480	480

(1) Coolant: Water 100%; Coolant temperatures: 10/15°C; Ambient temperature: 35°C

R1234ze freecooling chillers

Lightstream Turbo F-series freecooling		T400	T500	T600	T700	T800	T900	T1000	T1200	T1400
		F4/1	F5/1	F6/1	F7/1	F7/1	F8/1	F9/1	F11/1	F12/1
		F	F	F	F	F	F	F	F	F
Cooling capacity ¹	kW	425	545	650	745	815	945	1085	1260	1325
Freecooling capacity ²	kW	430	540	645	750	775	890	1010	1210	1300
Frame size		F4	F5	F6	F7	F7	F8	F9	F11	F12
Energy efficiency (EER)	kW/kW	3.22	3.52	3.36	3.32	3.43	3.32	3.40	3.40	3.36
ESEER		4.62	5.08	5.52	4.84	5.12	5.52	5.07	5.43	5.60
Net weight	kg	4860	6070	6870	8460	8630	9520	11000	12590	13400
Compressors								Turbocor oil-free		
Quantity		2	2	2	3	3	3	4	4	4
Power input	kW	112.0	130.0	164.0	190.0	203.0	245.0	275.0	316.0	335.0
Absorbed current	A	180.0	210.0	264.0	306.0	326.0	392.0	442.0	508.0	537.0
Fans								EC-type axial		
Quantity		8	10	12	14	14	16	18	22	24
Airflow	m³/h	190000	237500	285000	332500	332500	380000	427500	522500	570000
Power input	kW	19.8	24.8	29.7	34.7	34.7	39.6	44.6	54.5	59.4
Absorbed current	A	35.2	44.0	52.8	61.6	61.6	70.4	79.2	96.8	105.6
Evaporator								Flooded shell-and-tube		
Water flow rate	m³/h	73	95	114	130	143	165	190	220	232
Water volume	l	57.0	85.2	85.2	146.0	146.0	146.0	276.5	276.5	276.5
Refrigerant circuits								R1234ze		
Quantity		1	1	1	1	1	1	1	1	1
Charge	kg	180	215	215	360	360	360	480	480	480

(1) Coolant: Water 80%/Glycol 20%; Coolant temperatures: 10/15°C; Ambient temperature: 35°C

(2) At ambient temperature +1°C

Frame sizes

Frame size		F3	F4	F5	F6	F7	F8	F9	F11	F12
Length	mm	3825	4945	6065	7185	8305	9425	10545	12785	13905
Width	mm	2250	2250	2250	2250	2250	2250	2250	2250	2250
Height	mm	2375	2375	2375	2375	2375	2375	2375	2375	2375

Technical Specs

R134a air-cooled chillers



R134a

Lightstream Turbo S-series air-cooled		T300	T350	T400	T500	T600	T700	T800	T900	T1000	T1100	T1200	T1300	T1500	T1600
		F3/1	F3/1	F4/1	F4/1	F5/1	F6/1	F6/1	F7/1	F8/1	F8/1	F9/1	F10/1	F12/1	F12/1
		S	S	S	S	S	S	S	S	S	S	S	S	S	S
Cooling capacity ¹	kW	300	370	410	520	610	680	790	870	930	1040	1150	1290	1490	1580
Frame size		F3	F3	F4	F4	F5	F6	F6	F7	F8	F8	F9	F10	F12	F12
Energy efficiency (EER)	kW/kW	3.86	3.69	3.85	3.56	3.62	3.70	3.90	3.64	3.75	3.56	3.57	3.48	3.71	3.59
ESEER		4.95	5.38	5.10	5.32	5.39	5.30	5.88	5.18	5.62	5.42	5.32	5.65	5.56	5.58
Net weight	kg	2560	2630	3380	3660	4200	5060	5240	5750	6780	7070	7650	8020	9430	9540
Compressors		Turbocor oil-free													
Quantity		1	1	2	2	2	2	3	3	3	4	4	3	4	4
Power input	kW	64.4	86.8	88.7	128.0	146.0	157.0	176.0	208.0	212.0	256.0	282.0	326.0	348.0	386.0
Absorbed current	A	102.0	139.0	142.0	205.0	234.0	252.0	282.0	334.0	340.0	410.0	452.0	522.0	558.0	620.0
Fans		AC-type axial													
Quantity		6	6	8	8	10	12	12	14	16	16	18	20	24	24
Airflow	m³/h	144000	144000	192000	192000	240000	288000	288000	336000	384000	384000	432000	480000	576000	576000
Power input	kW	13.4	13.4	17.9	17.9	22.4	26.8	26.8	31.3	35.8	35.8	40.2	44.7	53.6	53.6
Absorbed current	A	23.4	23.4	31.2	31.2	39.0	46.8	46.8	54.6	62.4	62.4	70.2	78.0	93.6	93.6
Evaporator		Flooded shell-and-tube													
Water flow rate	m³/h	52	63	70	90	105	117	135	150	160	180	198	222	256	272
Water volume	l	47.0	60.0	60.0	84.0	84.0	84.0	125.0	125.0	198.0	253.0	253.0	253.0	300.0	300.0
Refrigerant circuits		R134a													
Quantity		1	1	1	1	1	1	1	1	1	1	1	1	1	1

(1) Coolant: Water 100%; Coolant temperatures: 10/15°C; Ambient temperature: 35°C

R134a freecooling chillers

Lightstream Turbo F-series freecooling		T400	T500	T600	T700	T800	T900	T1000	T1100	T1200	T1300	T1500	T1600
		F4/1	F4/1	F5/1	F6/1	F6/1	F7/1	F8/1	F8/1	F9/1	F10/1	F12/1	F12/1
		F	F	F	F	F	F	F	F	F	F	F	F
Cooling capacity ¹	kW	400	510	600	715	770	855	930	1020	1125	1260	1455	1550
Freecooling capacity ²	kW	420	460	560	675	690	790	855	915	1025	1140	1350	1380
Frame size		F4	F4	F5	F6	F6	F7	F8	F8	F9	F10	F12	F12
Energy efficiency (EER)	kW/kW	3.70	3.46	3.52	3.38	3.75	3.53	3.71	3.46	3.45	3.36	3.53	3.49
ESEER		5.07	5.06	5.15	5.35	5.34	5.03	5.24	5.20	5.27	5.83	5.76	5.60
Net weight	kg	3780	4060	4700	5660	5840	6450	7580	7870	8550	9020	10630	10740
Compressors		Turbocor oil-free											
Quantity		2	2	2	2	3	3	3	4	4	3	4	4
Power input	kW	88.7	128.0	146.0	182.0	176.0	208.0	212.0	256.0	282.0	326.0	354.0	386.0
Absorbed current	A	142.0	205.0	234.0	290.0	282.0	334.0	340.0	410.0	452.0	522.0	568.0	620.0
Fans		AC-type axial											
Quantity		8	8	10	12	12	14	16	16	18	20	24	24
Airflow	m³/h	170000	170000	212500	255000	255000	297500	340000	340000	382500	425000	510000	510000
Power input	kW	19.5	19.5	24.4	29.3	29.3	34.1	39.0	39.0	43.9	48.8	58.5	58.5
Absorbed current	A	31.2	31.2	39.0	46.8	46.8	54.6	62.4	62.4	70.2	78.0	93.6	93.6
Evaporator		Flooded shell-and-tube											
Water flow rate	m³/h	72	92	107	128	138	153	163	183	201	226	260	277
Water volume	l	60.0	84.0	84.0	84.0	125.0	125.0	198.0	253.0	253.0	253.0	300.0	300.0
Refrigerant circuits		R134a											
Quantity		1	1	1	1	1	1	1	1	1	1	1	1

(1) Coolant: Water 80%/Glycol 20%; Coolant temperatures: 10/15°C; Ambient temperature: 35°C

(2) At ambient temperature +1°C

Frame sizes

Frame size		F3	F4	F5	F6	F7	F8	F9	F10	F12
Length	mm	3525	4645	5765	6885	8005	9125	10245	11365	13605
Width	mm	2250	2250	2250	2250	2250	2250	2250	2250	2250
Height	mm	2295	2295	2295	2295	2295	2295	2295	2295	2295

Technical Specs

H-series air-cooled chillers



R134a

Lightstream Turbo H-series air-cooled		T300	T400	T500	T600	T700	T800	T900	T1000	T1200
		F4/1	F4/1	F5/1	F6/1	F8/1	F8/1	F10/1	F12/1	F12/1
		H	H	H	H	H	H	H	H	H
Cooling capacity ¹	kW	320	380	455	530	635	760	890	955	1140
Frame size		F4	F4	F5	F6	F8	F8	F10	F12	F12
Energy efficiency (EER)	kW/kW	4.30	3.83	3.94	4.12	4.27	3.84	3.99	4.28	3.84
ESEER		5.78	4.97	5.18	5.62	5.90	5.30	5.48	5.90	5.48
Net weight	kg	4150	4150	4915	6180	7710	7940	9720	11385	11385
Compressors		Turbocor oil-free								
Quantity		1	1	1	2	2	2	2	3	3
Power input	kW	62.0	87.6	100.0	110.0	124.0	173.0	192.0	186.0	260.0
Absorbed current	A	99.5	139.0	161.0	179.0	199.0	277.0	308.0	296.0	416.0
Fans		EC-type axial								
Quantity		8	8	10	12	16	16	20	24	24
Airflow	m³/h	178000	178000	222500	276000	356000	356000	445000	534000	534000
Power input	kW	12.4	12.4	15.5	18.6	24.8	24.8	31.0	37.2	37.2
Absorbed current	A	35.2	35.2	44.0	52.8	70.4	70.4	88.0	105.6	105.6
Evaporator		Flooded shell-and-tube								
Water flow rate	m³/h	55	65	78	92	110	130	153	164	196
Water volume	l	44.0	57.0	57.0	85.2	85.2	120.0	247.0	147.0	190.0
Refrigerant circuits		R134a								
Quantity		1	1	1	1	1	1	1	1	1

(1) Coolant: Water 100%; Coolant temperatures: 10/15°C; Ambient temperature: 35°C

Frame sizes

Frame size		F4	F5	F6	F8	F10	F12
Length	mm	4945	6065	7185	9425	11665	13905
Width	mm	2250	2250	2250	2250	2250	2250
Height	mm	2375	2375	2375	2375	2375	2375

Package, option and accessories

Description	S-series R1234ze	S-series R134a	F-series R1234ze	F-series R134a	H-series	Description	S-series R1234ze	S-series R134a	F-series R1234ze	F-series R134a	H-series
General						General					
Freecooling	□	□	■	■	□	Anti-vibration supports	□	□	□	□	□
Low noise design	□	□	□	□	■	Anti-vibration springs	□	□	□	□	□
Ultra-low noise design					□	Soundproof compressor boxes	■	■	■	■	■
MCHE e-coating	□	□	□	□	□	High-sided paneling	□	□	□	□	□
Airside						Airside					
EC-type axial fans	■	□	■	□	■	Fan diffusers	□	□	□	□	□
AC-type axial fans	□	■	□	■	□	Fan guide vanes	■	□	■	□	■
Waterside						Waterside					
Single pump w/ heater (opt.)	□	□				Grooved water connections	■	■	■	■	■
Dual pump w/ heater (opt.)	□	□				Flanged water connections	□	□	□	□	□
Flowmeter	□	□	□	□	□	2x 2-way freecooling valves			■	■	
Refrigerant side						Refrigerant side					
Electronic expansion valve (EEV)	■	■	■	■	■	Safety valves on high/low sides	■	■	■	■	■
Electronic bypass valve	■	■	■	■	■	Service valves on high/low sides	■	■	■	■	■
Thermal insulation	■	■	■	■	■	Gas leakage detection	■		■		
Pressure indication on high/low sides	■	■	■	■	■	High-efficient refrigerant filter	□		□		
Electric and controls						Electric and controls					
BMS connectivity	■	■	■	■	■	Energy monitoring	□	□	□	□	□
SNMP connectivity	□	□	□	□	□	Sequence management	□	□	□	□	□
GSM connectivity	□	□	□	□	□	Electric panel heater	□	□	□	□	□

- Standard feature
- Optional feature