TAHVIEHSAM
Cooling System Solutions

EKDC Series Water-cooled Centrifugal Falling Film Chilling Water Unit

Model: EKDC500~EKDC3000
Cooling Capacity: 1793kW~10498kW

EKDC Series

Water-cooled Centrifugal Falling Film Chilling Water Unit

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SINCE 1963
Give life to building , bring us back to nature

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EUROKLIMAT Air Conditioner, Environmental & Energy-saving Technology from Europe.

EUROKLIMAT (EK) was established in 1963 in Italy. For the past half a century, it has become famous as an energy-saving air-conditioning manufacturer in Italy and globally. Continuous innovation, new product development and top manufacturing quality are the driving force behind this growth.

EUROKLIMAT (EK) pursues the ideals of protecting the environment, providing physical comfort and adopting energy-saving into the whole process of product R&D, manufacturing and service. Our products covering residential, commercial and close control air-conditioner are manufactured according to the global generally accepted standards.

Berlin - Allianz Assurance

ISO9001: 2008 corporate certification

ISO14001: 2004 Environmental management system certification

Product Manufacturing License (XK06-015-00361)

CNAS L5123

State-certified Lab

BMW Central Data Center, Munich

Helsinki- Nokia R&D centers worldwide headquarters

EK Italia Headquarters

3M Central office, UK

DHL Central Data Center

ZTE Central Office, Shenzen

EK China Factory

EK China Factory

Canon Factory

Apple Central Shopping, Shanghai

Renault Automotive Factory

Coca Cola Factory

Overview and Unit Nomenclature

The EKDC series water-cooled centrifugal falling film chilling water units inherit the brand philosophy of energy conservation and environment protection. They can provide cold water for central air conditioning systems at sites such as hotels, hospitals, pharmaceutical factories, cinemas, gyms, entertainment centers, commercial buildings, office buildings, and industrial and mining enterprises, and supply process cold water to the textile, chemical food, e-science and other departments.

Unit nomenclature

EKDC	500	A	3 - F	AA
1	2	3	4 5	6

1.	EKDC	EKDC water-cooled centrifugal falling film chilling water unit
2.	500	Code of cooling capacity
3.	A	Design SN
4.	3	Refrigerant code, 3:R134a
5.	F	Power feature: F indicates 380 V/3N~/50 Hz, L indicates 6kV/3~/50Hz; T indicates 10kV/3~/50Hz
6.	AA	Specific description of changes in product specification

Product advantages

- The unit uses the R134a refrigerant of HFC working medium, which is an internationally recognized environmental refrigerant.
- R134a is positive pressure refrigerant and does not require any air exhaust system. The ventilation design is simple in the equipment room.
- A built-in oil cooler is set in the unit and cooled down with refrigerant, not requiring maintenance.
- The independent oil return system (oil return by the ejector pump) can ensure timely oil return under any load.
- The oil pump is built in the oil groove for the unit compressor, so users do not need to worry about leakage of the oil pump.
- The unit adopts the fixed orifice plate throttle apparatus, without any moving part. When the load and working condition change, the refrigerant volume can be timely adjusted to avoid hysteresis and ensure stable operation of the unit.
- The low voltage unit enables the soft startup cabinet to start at the reduced voltage, without impacting the user's power grid in the startup process.
- The high voltage unit uses the high voltage power supply cabinet with a synthetical protector configured inside, covering functions such as stalling, phase loss, overcurrent, and overvoltage.
- The microcomputer control system of unit adopts English interfaces to clearly display all the operating data and implement simple operations.

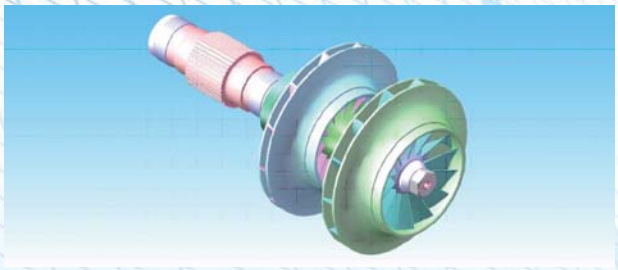
Characteristics

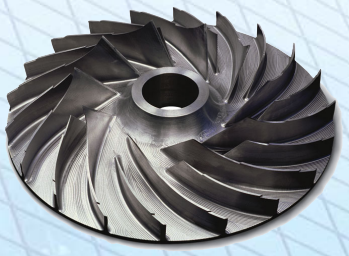
Environmental refrigerant

To protect the ozonosphere, alleviate the greenhouse effect of atmosphere and satisfy people's desire for protecting the environment, the unit selects the R134a environmental refrigerant with the ozone depletion potential of 0, safe, nontoxic, nonflammable and environmental friendly, adaptive to the current international development trend of environmental protection.

Efficient two-stage compression design

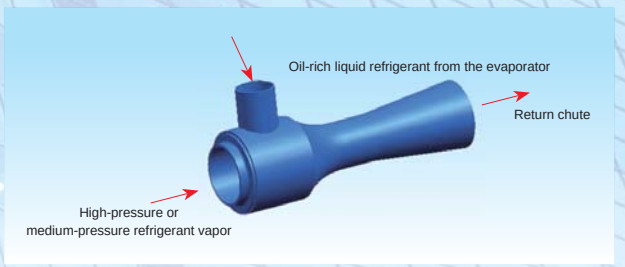
The efficient two-stage closed impeller compression improves the efficiency by over 6%, with the relatively low speed, low noises, low vibration and high reliability. The efficient aluminum closed impeller design of three-dimensional flow greatly reduces the gas leakage amount of impeller; the five-axis machining center implements the high machining precision, effectively reduces the axial loss and separation loss of impeller, and substantially improves the impeller efficiency. As a result, energy efficiency of the entire unit exceeds the national level-1 energy-saving standard.





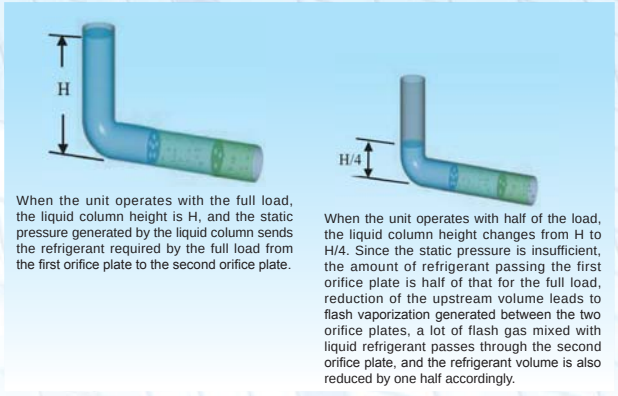
Reliable oil return device - ejection pump

The unit uses the ejection pump as an oil return component and the medium-pressure flash gas as motive power, and completes the low-pressure side return oil function in the status without unit energy loss.



Refrigerant volume control component - orifice plate

- The unit uses the orifice plate as a refrigerant volume control device. Each group of orifice plates are tailored according to performance of the centrifuge and unit and best match the unit performance.
- Since the orifice plate has no moving part, its reliability is naturally superior to that of all kinds of power-operated throttle valves.



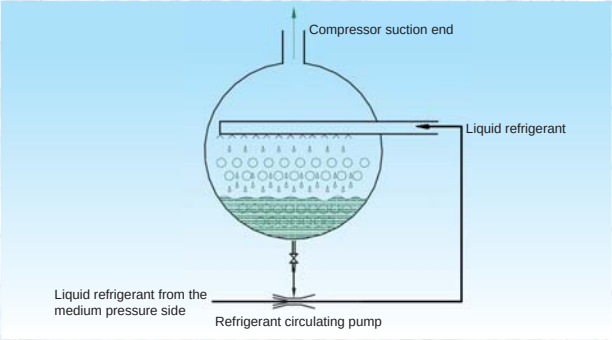
When the unit operates with the full load, the liquid column height is H, and the static pressure generated by the liquid column sends the refrigerant required by the full load from the first orifice plate to the second orifice plate.

When the unit operates with half of the load, the liquid column height changes from H to H/4. Since the static pressure is insufficient, the amount of refrigerant passing the first orifice plate is half of that for the full load, reduction of the upstream volume leads to flash vaporization generated between the two orifice plates, a lot of flash gas mixed with liquid refrigerant passes through the second orifice plate, and the refrigerant volume is also reduced by one half accordingly.

Characteristics

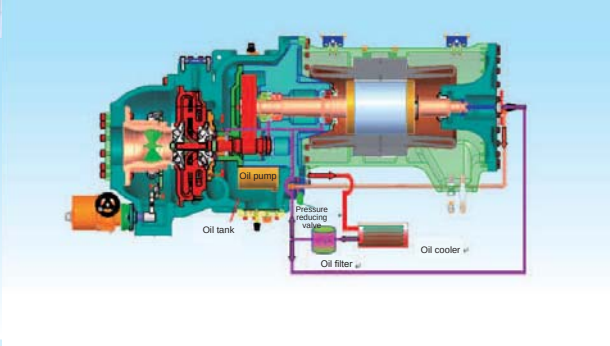
Spray type (falling film) evaporator

- The refrigerant entering the evaporator is sprayed downward from the top of the heat exchange tube array. The liquid refrigerant forms a thin film on the tube wall and flows downward, so the evaporator is also called a falling film evaporator. Since only one layer of thin film of liquid refrigerant is covered on the heat exchange tube surface, the heat transfer effect is excellent.
- The refrigerant circulating pump is used as a refrigerant throttling device from the economizer to the evaporator. Meanwhile, the liquid refrigerant at the evaporator bottom is extracted for recycling to increase the refrigerant supply amount above the tube array in the evaporator and ensure that all the copper tubes can cover the liquid refrigerant. The unit does not require the accurate calibration level, and only general positioning can implement the normal high-efficiency function of the evaporator.
- Only a small amount of liquid refrigerant exists at the evaporator bottom, so the refrigerant charging amount is small for the unit and meets the environmental protection requirements.
- After a lot of refrigerant is evaporated, the lubricant is condensed at the evaporator bottom, and the scavenge pump can smoothly extract oil here and return it to the oil groove of compressor.



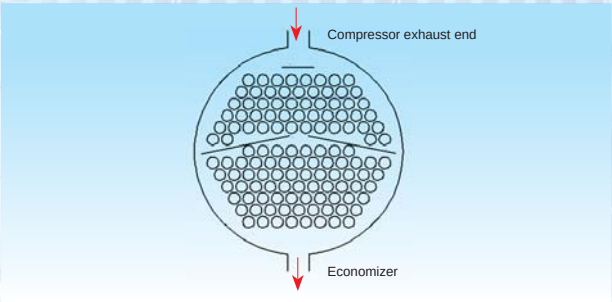
Efficient and advanced centrifugal compressor design

The centrifugal compressor of two-stage compression uses the principal axis of high strength alloy, closed impeller of high-strength aluminum alloy material and the high-precision gear inside. The adopted bearing is high-strength ball bearing/roller bearing, but not a plane bearing, so the user does not need to worry about emergency stop of the compressor. The power-on interval can be shortened to 10 minutes, and the bearing service life is as high as 80,000 hours.

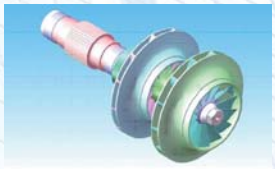


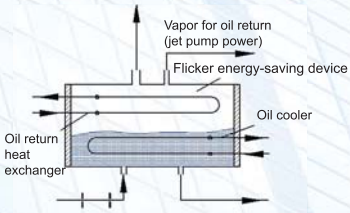
High efficient condenser

The condenser is divided into the upper part and lower part, with the air deflector set in the middle. The liquid refrigerant is diverted to the shell edge to greatly improve the heat transfer efficiency of the copper tube at the lower half layer. For the large-tonnage unit, this design is rather efficient and can reduce the condensing temperature by 0.5ºC to 1ºC.



Economizer, oil cooler and oil return heat exchanger





- The technology of combining the economizer, oil cooler and oil return heat exchanger is used to improve the separation efficiency of the medium-pressure saturated flash gas generated during system operation from the medium-pressure saturated liquid refrigerant in the economizer. Two-stage compression is completed when the separated medium-pressure saturated flash gas is imported into the compressor.
- The oil-rich liquid refrigerant from the evaporator is heated to refrigerant vapor and oil in the economizer and then returned to the compressor tank.
- The high temperature refrigerant oil from the compressor first enters the economizer and cools down to the proper oil temperature, and then injected into the compressor parts for lubrication.

Authoritative certification

EUROKLIMAT boasts the cutting-edge large-scale online test platform for centrifugal units in the field, which has passed the review and assessment conducted by the China National Accreditation Service for Conformity Assessment (CNAS L5123). This test platform is implemented strictly according to requirements of the national standards such as GB/T10870-2001 and GB/T18430.1-2007, and the testing capability reaches 3000RT. Before delivery, every unit has undergone the strict full performance test to ensure performance of the delivered unit.

Advanced control

• Microcomputer controller

The EK centrifugal chilling water unit is configured with an advanced microcomputer controller, which employs the dual-CPU core part, requires the arithmetic speed of 0.25 ms only for execution of the 1K Words program, and ensures safe and stable operation of the unit.

• Unit protection function

The power supply provided by the client for the unit is protected against overvoltage, undervoltage, three-phase unbalance, phase failure protection, and reverse phase protection. Moreover, the unit provides as many as 30 protection functions.

• Multi-anti-surge function

The unit provides the advanced multi-anti-surge function and combines prevention, control and alarm to ensure that the unit can meet the customer's cooling capacity requirement in the range of safe operation.
(1) Prevention – Based on accurate calculation of the surge curve, the unit automatically adjusts the status when it operates to approach the surge curve.
(2) Control – When detecting surge, the unit timely adjusts the operating status to effectively control occurrence of surge.
(3) Alarm – In case of surge, the unit will report an alarm and execute the stop action.

• Man-machine interface

The touch screen is provided with a storage space, implements a higher reaction speed, and helps users master the complete unit operating status in real time. The visual operation screen enables users to select Chinese or English, and touch the screen to perform unit operations and settings.

• PID control function

The microcomputer controller adopts the advanced PID control function, automatically adjusts the unit load according to the setting values of the cold water outlet temperature and target temperature so that the water temperature can reach the requirement in the shortest time, and stabilizes the water temperature within the target temperature ±0.2ºC.

• Reserving user's connection points

(1) The cooling tower fan, cooling water pump and chilled water pump control points are reserved for the user so as to control the fan and water pump through the unit and optimize the user's system structure.
(2) The alarm output points is reserved for the unit and used to display remote alarms.
(3) The central monitoring connection point (Modbus-RTU communication protocol) is reserved so that the unit can be seamlessly connected to the building monitoring system.

Table of Unit Specifications

Model: EKDC500~EKDC950

Model			EKDC500	EKDC550	EKDC600	EKDC650	EKDC700	EKDC750	EKDC800	EKDC850	EKDC900	EKDC950
Nominal cooling	Cooling capacity	U.S.RT	510	561	612	663	714	765	816	867	917	968
		kW	1793	1972	2152	2331	2510	2690	2869	3048	3226	3406
		x10⁴kCal/h	154	170	185	200	216	231	247	262	277	293
	Input power	kW	293	321	351	381	409	437	469	497	529	554
	COP	kW / kW	6.12	6.14	6.13	6.12	6.14	6.16	6.12	6.13	6.10	6.15
	Chilled water flow rate	m³/h	308	339	370	401	432	463	493	524	555	586
	Chilled water pressure drop	kPa	62	61	74	73	73	84	90	96	90	97
	Chilled water flow rate	m³/h	359	394	431	466	502	538	574	610	646	681
	Chilled water pressure drop	kPa	68	66	77	76	77	88	96	98	95	98
Cooling*	Cooling capacity	U.S.RT	498	547	597	647	697	746	796	846	895	945
		kW	1750	1925	2100	2275	2450	2625	2800	2975	3149	3324
		x10⁴kCal/h	151	166	181	196	211	226	241	256	271	286
	Input power	kW	303	332	363	394	423	451	484	513	546	572
	COP	kW / kW	5.78	5.80	5.79	5.77	5.79	5.82	5.79	5.80	5.77	5.81
	Chilled water flow rate	m³/h	301	331	361	391	421	452	482	512	542	572
	Chilled water pressure drop	kPa	59	58	70	69	69	80	86	92	86	92
	Cooling water flow rate	m³/h	353	388	424	459	494	529	565	600	636	670
	Cooling water pressure drop	kPa	66	64	75	74	75	85	93	95	92	95
Compressor	Type		Two-stage semi-hermetic centrifugal type									
	Starting mode		Y-Δ (low voltage)/direct startup (high voltage)									
Power supply			380V/3N~/50Hz						380V/3N~/50Hz 6kV,10kV/3~/50Hz			
Condenser	Type		Shell and tube									
	Qty		1	1	1	1	1	1	1	1	1	1
Evaporator	Type		Spray type									
	Qty		1	1	1	1	1	1	1	1	1	1
Refrigerant type			R134a									
Temperature control			Water temperature PID control									
Evaporator inlet/outlet pipe diameter		DN	250	250	250	250	250	250	300	300	300	300
Condenser inlet/outlet pipe diameter		DN	250	250	250	250	250	250	300	300	300	300
Heat insulating material			Flexible closed-cell elastomeric heat insulating material									
Unit weight		kg	9100	9600	10100	10600	11200	11200	11800	11800	12500	12500
Operating weight		kg	10050	10550	11100	11700	12350	12350	13100	13100	14000	14000
Rated current (nominal cooling)	380V	A	518	570	661	729	802	854	853	905	949	995
	6kV	A	-	-	-	-	-	-	54	58	61	63
	10kV	A	-	-	-	-	-	-	32	34	36	37
Rated current (cooling*)	380V	A	536	590	684	754	829	881	880	934	979	1027
	6kV	A	-	-	-	-	-	-	56	60	63	65
	10kV	A	-	-	-	-	-	-	33	35	37	38
Starting current	380V	A	2835	2835	2902	3119	3308	3308	3780	3780	4489	4489
	6kV	A	-	-	-	-	-	-	299	299	355	355
	10kV	A	-	-	-	-	-	-	193	193	230	230

Notes:

- Working condition of "Nominal cooling": The water inlet/outlet temperature of the evaporator is 12/7ºC, and the water inlet/outlet temperature of the condenser is 30/35ºC.
- Working condition of "Cooling*": The water inlet/outlet temperature of the evaporator is 12/7ºC, and the water inlet/outlet temperature of the condenser is 32/37ºC. For other working condition parameters, see the correction factors.
- The water pressure drop of the evaporator and condenser does not include the resistance of any externally connected water pipe or part. Pipe connecting flange is adopted for both the evaporator and the condenser.
- Power distribution and wiring on the unit installation site are subject to unit nameplates or installation instructions.
- The standard pressure bearing at the unit water side is 1.0 MPa.

Model: EKDC1000~EKDC1900

Model			EKDC1000	EKDC1100	EKDC1200	EKDC1300	EKDC1400	EKDC1500	EKDC1600	EKDC1700	EKDC1800	EKDC1900
Nominal cooling	Cooling capacity	U.S.RT	1019	1121	1223	1325	1427	1529	1632	1733	1835	1937
		kW	3585	3944	4302	4661	5019	5378	5738	6095	6453	6811
		x10⁴kCal/h	308	339	370	401	432	463	493	524	555	586
	Input power	kW	586	646	698	760	822	879	937	997	1057	1114
	COP	kW / kW	6.12	6.11	6.16	6.13	6.11	6.12	6.12	6.11	6.11	6.11
	Chilled water flow rate	m³/h	617	678	740	802	863	925	987	1048	1110	1171
	Chilled water pressure drop	kPa	90	94	95	95	96	98	77	77	77	77
	Cooling water flow rate	m³/h	717	789	860	932	1005	1076	1148	1220	1292	1363
	Cooling water pressure drop	kPa	95	98	97	98	98	98	86	86	86	86
Cooling*	Cooling capacity	U.S.RT	995	1094	1194	1293	1393	1492	1592	1691	1791	1890
		kW	3499	3849	4199	4549	4899	5249	5600	5949	6298	6648
		x10⁴kCal/h	301	331	361	391	421	451	482	512	542	572
	Input power	kW	605	667	721	785	849	908	968	1030	1092	1151
	COP	kW / kW	5.78	5.77	5.82	5.79	5.77	5.78	5.79	5.78	5.77	5.78
	Chilled water flow rate	m³/h	602	662	722	782	843	903	963	1023	1083	1143
	Chilled water pressure drop	kPa	86	90	90	90	92	93	73	73	73	73
	Cooling water flow rate	m³/h	706	777	846	917	989	1059	1130	1200	1271	1341
	Cooling water pressure drop	kPa	92	95	94	95	95	95	83	83	83	83
Compressor	Type		Two-stage semi-hermetic centrifugal type									
	Starting mode		Y-Δ (low voltage)/direct startup (high voltage)									
Power supply			380V/3N~/50Hz 6kV,10kV/3~/50Hz		6kV,10kV/3~/50Hz				380V/3N~/50Hz 6kV,10kV/3~/50Hz			
Condenser	Type		Shell and tube									
	Qty		1	1	1	1	1	1	1	1	1	1
Evaporator	Type		Spray type									
	Qty		1	1	1	1	1	1	1	1	1	1
Refrigerant type			R134a									
Temperature control			Water temperature PID control									
Evaporator inlet/outlet pipe diameter		DN	300	350	350	350	350	350	400	400	400	450
Condenser inlet/outlet pipe diameter		DN	300	350	350	350	350	350	400	400	400	450
Heat insulating material			Flexible closed-cell elastomeric heat insulating material									
Unit weight		kg	13200	14500	15500	16500	18000	18000	23600	24300	25000	25700
Operating weight		kg	14800	16350	17500	18600	20000	20000	26500	27100	28000	28800
Rated current (nominal cooling)	380V	A	1076	1120	-	-	-	-	1707	1803	1899	2025
	6kV	A	68	70	76	87	97	104	109	115	121	128
	10kV	A	40	43	46	52	59	63	64	68	72	76
Rated current (cooling*)	380V	A	1111	1156	-	-	-	-	1763	1863	1962	2092
	6kV	A	70	72	79	90	100	107	113	119	125	132
	10kV	A	41	44	48	54	61	65	66	70	74	79
Starting current	380V	A	5009	5670	-	-	-	-	3780	4489	4489	5009
	6kV	A	397	449	494	524	555	555	299	355	355	397
	10kV	A	256	290	319	338	359	359	193	230	230	256

Notes:

- Working condition of "Nominal cooling": The water inlet/outlet temperature of the evaporator is 12/7ºC, and the water inlet/outlet temperature of the condenser is 30/35ºC.
- Working condition of "Cooling*": The water inlet/outlet temperature of the evaporator is 12/7ºC, and the water inlet/outlet temperature of the condenser is 32/37ºC. For other working condition parameters, see the correction factors.
- The water pressure drop of the evaporator and condenser does not include the resistance of any externally connected water pipe or part. Pipe connecting flange is adopted for both the evaporator and the condenser.
- Power distribution and wiring on the unit installation site are subject to unit nameplates or installation instructions.
- The standard pressure bearing at the unit water side is 1.0 MPa.

Table of Unit Specifications

Model: EKDC2000~EKDC3000

Model			EKDC2000	EKDC2100	EKDC2200	EKDC2300	EKDC2400	EKDC2500	EKDC2600	EKDC2700	EKDC2800	EKDC3000
Nominal cooling	Cooling capacity	U.S.RT	2039	2141	2243	2345	2447	2548	2651	2752	2854	2985
		kW	7170	7529	7887	8246	8605	8963	9322	9680	10039	10498
		x10⁴kCal/h	617	647	678	709	740	771	802	832	863	903
	Input power	kW	1171	1231	1291	1344	1396	1458	1520	1582	1644	1715
	COP	kW / kW	6.12	6.12	6.11	6.14	6.16	6.15	6.13	6.12	6.11	6.12
	Chilled water flow rate	m³/h	1233	1295	1357	1418	1480	1542	1603	1665	1727	1806
	Chilled water pressure drop	kPa	95	94	95	94	95	94	94	97	99	103
	Cooling water flow rate	m³/h	1435	1507	1579	1649	1720	1792	1865	1937	2009	2101
	Cooling water pressure drop	kPa	97	97	96	96	96	96	96	99	101	102
Cooling*	Cooling capacity	U.S.RT	1990	2089	2189	2288	2388	2487	2587	2686	2786	2913
		kW	6998	7348	7698	8048	8398	8748	9098	9448	9798	10246
		x10⁴kCal/h	602	632	662	692	722	752	782	813	843	881
	Input power	kW	1210	1272	1334	1388	1442	1506	1570	1634	1698	1772
	COP	kW / kW	5.78	5.78	5.77	5.80	5.82	5.81	5.79	5.78	5.77	5.78
	Chilled water flow rate	m³/h	1204	1264	1324	1384	1444	1505	1565	1625	1685	1762
	Chilled water pressure drop	kPa	91	90	90	90	90	90	90	92	94	98
	Cooling water flow rate	m³/h	1412	1483	1554	1623	1692	1764	1835	1906	1977	2067
	Cooling water pressure drop	kPa	94	94	93	93	93	93	93	96	98	99
Compressor	Type		Two-stage semi-hermetic centrifugal type									
	Starting mode		Y-Δ (low voltage)/direct startup (high voltage)									
Power supply			380V/3N~/50Hz 6kV,10kV/3~/50Hz			6kV,10kV/3~/50Hz						
Condenser	Type		Shell and tube									
	Qty		1	1	1	1	1	1	1	1	1	1
Evaporator	Type		Spray type									
	Qty		1	1	1	1	1	1	1	1	1	1
Refrigerant type			R134a									
Temperature control			Water temperature PID control									
Evaporator inlet/outlet pipe diameter		DN	450	450	450	450	450	500	500	500	500	500
Condenser inlet/outlet pipe diameter		DN	450	450	450	450	450	500	500	500	500	500
Heat insulating material			Flexible closed-cell elastomeric heat insulating material									
Unit weight		kg	26400	27700	29000	30000	31000	32000	33000	34500	36000	36000
Operating weight		kg	29600	31150	32700	33850	35000	36100	37200	38600	40000	40000
Rated current Rated current	380V	A	2151	2194	2240	-	-	-	-	-	-	-
	6kV	A	135	138	141	147	153	163	173	184	194	203
	10kV	A	81	83	86	89	93	98	104	111	117	122
Rated current (cooling*)	380V	A	2223	2267	2315	-	-	-	-	-	-	-
	6kV	A	139	143	146	152	158	168	179	190	200	210
	10kV	A	84	86	89	92	96	101	107	115	121	126
Starting current	380V	A	5009	5670	5670	-	-	-	-	-	-	-
	6kV	A	397	449	449	494	494	524	524	555	555	555
	10kV	A	256	290	290	319	319	338	338	359	359	359

Notes:

- Working condition of "Nominal cooling": The water inlet/outlet temperature of the evaporator is 12/7ºC, and the water inlet/outlet temperature of the condenser is 30/35ºC.
- Working condition of "Cooling*": The water inlet/outlet temperature of the evaporator is 12/7ºC, and the water inlet/outlet temperature of the condenser is 32/37ºC. For other working condition parameters, see the correction factors.
- The water pressure drop of the evaporator and condenser does not include the resistance of any externally connected water pipe or part. Pipe connecting flange is adopted for both the evaporator and the condenser.
- Power distribution and wiring on the unit installation site are subject to unit nameplates or installation instructions.
- The standard pressure bearing at the unit water side is 1.0 MPa.

Unit correction factors and outline dimensional drawings

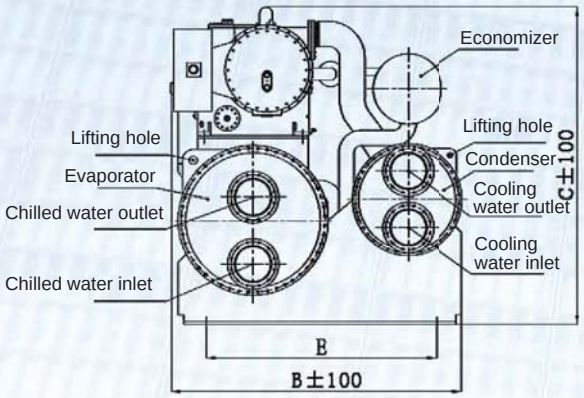
Cooling capacity correction factors

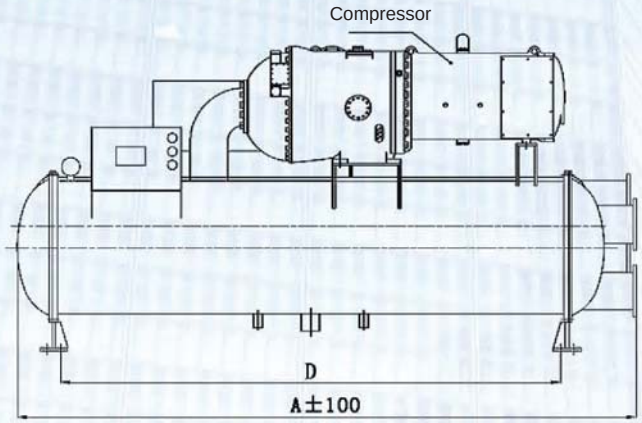
Condenser water outlet temperature (℃)		25	28	30	32	35	37	40
Evaporator water outlet temperature (℃)	4	0.909	0.882	0.864	0.847	0.820	0.802	0.775
	5	0.968	0.941	0.922	0.904	0.876	0.858	0.830
	6	1.043	1.015	0.996	0.977	0.948	0.929	0.901
	7	1.098	1.069	1.049	1.029	1.000	0.976	0.951
	8	1.165	1.135	1.115	1.095	1.064	1.044	1.014
	9	1.224	1.192	1.172	1.151	1.120	1.099	1.068
	10	1.302	1.269	1.248	1.227	1.195	1.173	1.141
	11	1.388	1.355	1.333	1.311	1.278	1.256	1.223
	12	1.408	1.374	1.352	1.329	1.295	1.272	1.239
	13	1.482	1.447	1.424	1.401	1.366	1.343	1.308
	14	1.553	1.517	1.493	1.470	1.434	1.410	1.374
	15	1.617	1.581	1.556	1.532	1.495	1.471	1.434

Power correction factors

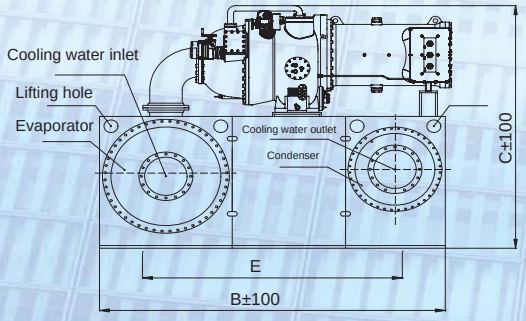
Condenser water outlet temperature (℃)		25	28	30	32	35	37	40
Evaporator water outlet temperature (℃)	4	0.769	0.816	0.848	0.880	0.928	0.960	1.007
	5	0.790	0.837	0.868	0.900	0.946	0.978	1.024
	6	0.825	0.871	0.901	0.932	0.978	1.008	1.054
	7	0.850	0.895	0.925	0.955	1.000	1.033	1.075
	8	0.876	0.920	0.949	0.979	1.023	1.052	1.096
	9	0.904	0.947	0.976	1.005	1.048	1.077	1.120
	10	0.932	0.974	1.002	1.030	1.073	1.101	1.143
	11	0.955	0.996	1.024	1.052	1.093	1.121	1.162
	12	0.980	1.020	1.047	1.074	1.115	1.142	1.182
	13	1.008	1.048	1.074	1.100	1.140	1.166	1.206
	14	1.036	1.074	1.100	1.126	1.165	1.191	1.229
	15	1.062	1.100	1.125	1.151	1.188	1.214	1.251

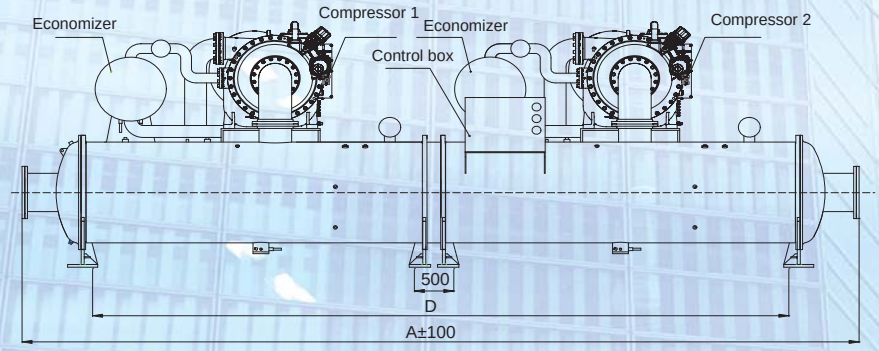
Unit outline dimensional drawings





Model	EKDC500	EKDC550	EKDC600	EKDC650	EKDC700	EKDC750	EKDC800	EKDC850	EKDC900	EKDC950	EKDC1000	EKDC1100	EKDC1200	EKDC1300	EKDC1400	EKDC1500
A	3920	3920	4120	4120	4120	4120	4570	4570	4570	4570	4570	4780	4780	4780	4780	4780
B	2320	2320	2380	2380	2380	2380	2550	2550	2550	2550	2550	2800	2800	2800	2800	2800
C	2450	2450	2500	2500	2500	2500	2900	2900	2900	2900	2900	2950	2950	2950	2950	2950
D	2944	2944	3144	3144	3144	3144	3384	3384	3384	3384	3384	3384	3384	3384	3384	3384
E	1800	1800	1800	1800	1800	1800	2000	2000	2000	2000	2000	2300	2300	2300	2300	2300

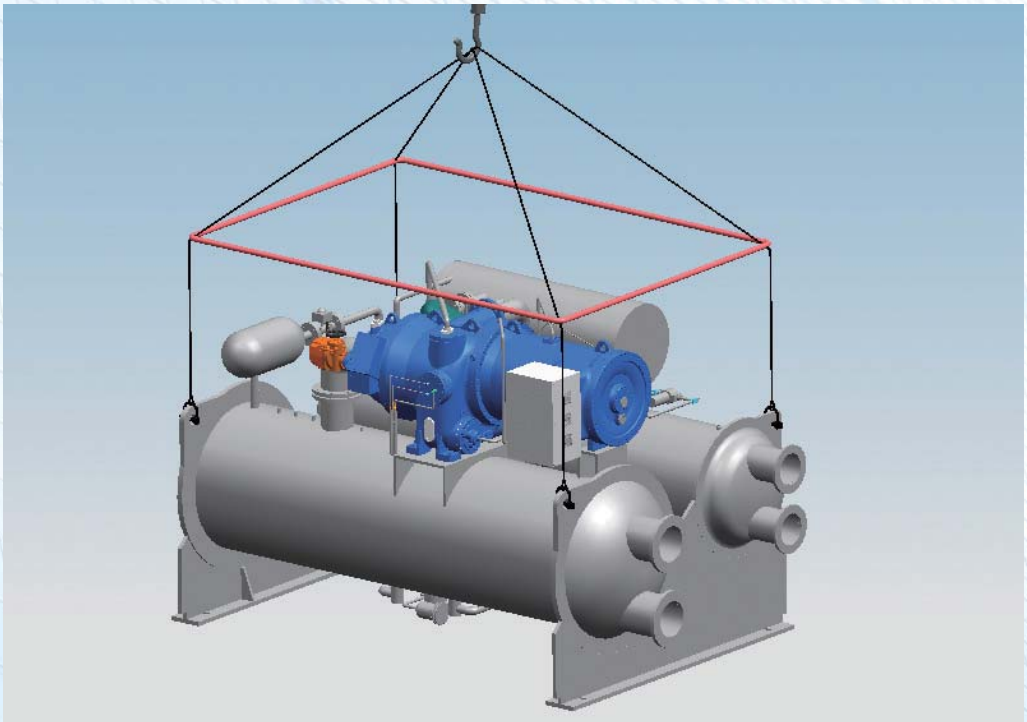




Unit: mm

Model	EKDC1600	EKDC1700	EKDC1800	EKDC1900	EKDC2000	EKDC2100	EKDC2200	EKDC2300	EKDC2400	EKDC2500	EKDC2600	EKDC2700	EKDC2800	EKDC3000
A	8300	8300	8300	8500	8500	8950	8950	8950	8950	9000	9000	9000	9000	9000
B	3600	3650	3650	3650	3650	3680	3680	3680	3680	3680	3680	3700	3700	3700
C	2900	2900	2900	2950	2950	2980	2980	2980	2980	3000	3000	3000	3000	3000
D	6678	6678	6678	6678	6678	7278	7278	7278	7278	7278	7278	7278	7278	7278
E	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600

Unit installation



Installation environment

- The cooling unit must be kept away from fire sources and combustibles. If it is installed together with a heating unit such as a boiler, pay full attention to the influence of heat radiation.
- The preferred site is well ventilated and at a room temperature lower than 45ºC (because the high temperature may cause a failure and speed up corrosion). The relative humidity at 45ºC should be lower than 90%, and outdoor or open-air installation and storage is forbidden.
- A site with less dust is preferred (because dust may lead to an electrical accident).
- Lighting must be good on the site to facilitate maintenance and check.
- To satisfy the requirements for maintaining, overhauling and cleaning the evaporator-condenser heat exchange tube, a sufficient space must be reserved around the unit.
- For the sake of easy machine lifting and overhauling, a sufficient height must be ensured in the equipment room.
- There should be a good drainage system around the unit and in the entire equipment room.
- Direct sunlight must be avoided.

Installation foundation

The rotor for the centrifugal cooling compressor has undergone strict static balance and dynamic balance, so its dynamic load for the foundation is very low. To prevent corrosion at the unit footing, drainage must be smooth around the unit, and the foundation plane corresponding to the machine base plate should be smooth and flat. Detailed requirements are as follows:

- The foundation should be level.
- To facilitate maintenance and check of the cooling unit, the foundation height should be 250 mm higher than the ground.
- A drainage ditch should be set around the cooling unit.
- No gap is allowed between the steel base plate and the cooling unit body baseboard. An adjustable pad should be inserted between the steel base plate and the concrete foundation.
- Level the steel base plate.
- Place the damping rubber pad on the steel base plate, and then place the cooling unit on the damping rubber pad.

Table of Frequently-used Data

Unit Conversion Table

	Meter (m)	Millimeter (mm)	Inch (in)	Foot (ft)	Mile
length	1	$1x10^{3}$	39.37	3.281	$6.214x10^{-4}$
	0.3048	304.8	12	1	$1.894x10^{-4}$
	$1x10^{-3}$	1	0.0394	$3.281x10^{-3}$	$6.214x10^{-7}$
	0.0254	25.4	1	0.0833	$1.58x10^{-5}$
	$1.609x10^{3}$	$1.609x10^{6}$	$6.336x10^{4}$	5280	1
	Square meter (m^2)	Hectare (hm^2)	Square inch (in^2)	Square foot (ft^2)	Square mile ($milk^2$)
Area	1	$1x10^{-4}$	$1.55x10^{3}$	10.764	$3.861x10^{-7}$
	0.0929	$9.29x10^{-6}$	144	1	$3.587x10^{-8}$
	$2.59x10^{6}$	258.999	$4.0145x10^{9}$	$2.7878x10^{7}$	1
	Stere (m^3)	Liter (L)	US gallon (US gal)	British gallon (UK gal)	Cubic foot (ft^3)
	1	1000	264.17	219.97	35.315
Volume	$1x10^{-3}$	1	0.2642	0.22	0.0353
	$3.785x10^{-3}$	3.7854	1	0.8327	0.1337
	$4.546x10^{-3}$	4.546	1.20095	1	0.1605
	$2.832x10^{-2}$	28.316	7.481	6.229	1
	Gram (g)	Kilogram (kg)	Ton (t)	Pound (lb)	Ounce (oz)
	1	$1x10^{-3}$	$1x10^{-6}$	$2.205x10^{-3}$	0.0353
Weight	$1x10^{3}$	1	$1x10^{-3}$	2.205	35.274
	$1x10^{6}$	$1x10^{3}$	1	$2.205x10^{3}$	$3.527x10^{4}$
	453.592	0.4536	$4.536x10^{-4}$	1	16
	28.35	0.0283	$2.83x10^{-5}$	0.0625	1
	Pascal (Pa)	Millimeter of water (mmH_2O)	Atmosphere (atm)	Pound/Square inch (lb/in^2)	Inch of mercury (in.Hg)
	1	0.102	$9.8692x10^{-6}$	$1.4504x10^{-4}$	$2.953x10^{-4}$
Pressure	9.807	1	$9.678x10^{-5}$	$1.422x10^{-3}$	$2.89x10^{-3}$
	101325	10332	1	14.696	29.921
	6894.8	703.06	0.068	1	2.036
	3386.39	345.32	0.0334	0.4911	1
	Joule (J)	Kilojoule (kJ)	Kilowatt hour (kW•h)	Kilocalorie (kcal)	British thermal unit (Btu)
	1	$1x10^{-3}$	$2.778x10^{-7}$	$2.389x10^{-4}$	$9.478x10^{-4}$
Energy	$1x10^{3}$	1	$2.778x10^{-4}$	0.2389	0.9478
	$3.6x10^{6}$	3600	1	860.1	3411
	4186.8	4.1868	$1.163x10^{-3}$	1	3.968
	1055.1	1.0551	$2.93x10^{-4}$	0.252	1
	Watt (W)	Kilowatt (kW)	Kilocalorie/hour (kcal/h)	British thermal unit/hour (Btu/h)	Ton of refrigeration (RT) (US)
	1	$1x10^{-3}$	0.8604	3.412	$2.843x10^{-4}$
Power	$1x10^{3}$	1	860.4	3412	0.2843
	1.163	$1.163x10^{-3}$	1	3.9657	$3.30x10^{-4}$
	0.293	$2.93x10^{-4}$	0.2522	1	$8.33x10^{-5}$
	3517	3.517	3024	12000	1
	Liter/second (L/s)	Stere/second (m^3/s)	Stere/hour (m^3/h)	Cubic foot/second (ft^3/s)	British gallon/second (UK gal/s)
	1	$1x10^{-3}$	3.6	0.0353	0.22
Flow rate	$1x10^{3}$	1	3600	35.3147	219.97
	0.2778	$2.778x10^{-4}$	1	$9.81x10^{-3}$	0.611
	28.317	0.0283	101.941	1	6.2288
	4546	$4.546x10^{-3}$	16.416	0.1605	1

Table of Frequently-used Data

Budget targets of cooling load

Building		Cooling load W/m²		Stayer	Lighting	Air supply
		Sensible cooling load	Total cooling load	(m²/person)	(W/m²)	L/(s.m²)
Office	Middle area	65	95	10	60	5
	Periphery	110	160	10	60	6
	Private office	160	240	15	60	8
	Conference room	185	270	3	60	9
School	Classroom	130	190	2.5	40	9
	Library	130	190	6	30	9
	Cafeteria	150	260	1.5	30	10
Apartment	High floors, southward	110	160	10	20	10
	Low floors, northward	80	130	10	20	9
Theater and hall		110	260	1	20	12
Laboratory		150	230	10	50	10
Library and museum		95	150	10	40	8
Hospital	Operating room	110	380	6	20	8
	Public place	50	150	10	30	8
Clinic		130	200	10	40	10
Barber shop and beauty salon		110	200	4	50	10
Department store	Underground floor	150	250	1.5	40	12
	Middle floor	130	225	2	60	10
	High floor	110	200	3	40	8
Pharmacy		110	210	3	30	10
Retail store		110	160	2.5	40	10
Boutique		110	160	5	30	10
PC room		100	200	8	40	5.5
Gym		180	320	1	30	6
Theater		130	220	1	20	7
Single-bed room		90	120	10	60	15
Twin-bed room		100	150	10	60	15
Ballroom (disco)		280	400	1	100	8
Bar		130	260	2	15	10
Chinese restaurant		220	400	2	60	10
Western restaurant and cafe		160	320	2	60	10
Hotel	Room	80	130	10	15	7
	Public place	110	160	10	15	8
Factory	Assembly room	150	260	3.5	45	9
	Light industry area	160	260	15	30	10
Stadium	Drawing room	160	240	6	20	8
	General competition	110	220	5	40	12
	Open competition	110	240	3	80	12

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