H.Stars Group

H.Stars Heat Recovery Chiller

H.Stars (Guangzhou) Refrigerating Equipment Group Ltd.

Heat recovery

A heat recovery unit, which is a heat recovery device connected in series to the condenser, can recover the heat generated in the refrigeration process from the refrigerant before it flows into the condenser, so that the system can supply a large amount of domestic hot water for free while it provides cold water. The amount of heat to be recovered is optional between 25% and 100% of the cooling capacity; the temperature of water at outlet point can reach up to 70℃ , and the heat recovery process can increase cooling efficiency by 5%.

H.Stars is the first in China to apply heat recovery technology (patent number: ZL03223588.7). The unit uses a heat recovery device to absorb the heat, which used to be exchanged via a condenser and dissipated into the air, to produce free domestic hot water. They are suitable to meet the needs of hotels, and shopping among others where both air-conditioning and a large amount of hot water are in demand. Compared with other methods of domestic hot water supply, it is simple in structure, consumes no energy, and has many other advantages in energy saving and environmental protection.

Water cooled heat recovery unit

Cold recovery

The cold recovery unit is a highly efficient and energy-saving product developed on the basis of standard units. A cold recovery device connected in parallel the fin evaporator in a standard air source heat pump recovers the cold generated in the heating process, so that the unit can supply a large amount of cold water for air-conditioning while it provides hot water. The amount of cold to be recovered is 80% of the heating capacity; and the temperature of water at outlet point ranges between 5 to 20℃. The production of cold water requires no additional electrical energy, and the enhanced comprehensive energy efficiency makes it a practical, energy-saving and efficient heat pump. It can be used in hotels, hospitals, villas, large commercial residential areas and other places.

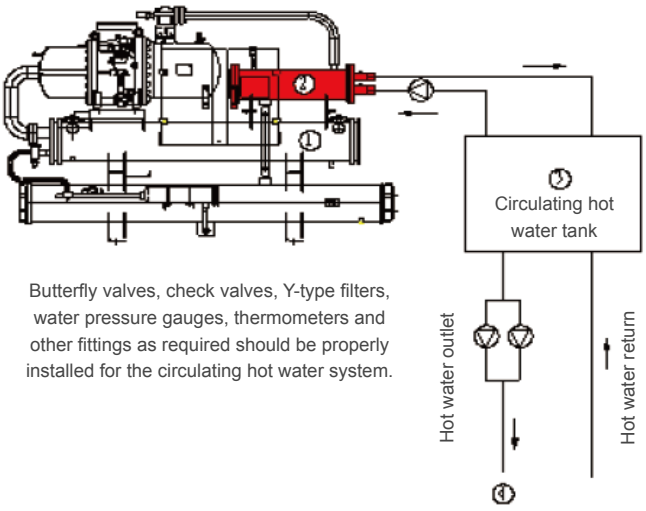
Air-cooled cold recovery unit

Description of heat recovery

1. The chiller ① produces chilled water and supplies it to the fan coil unit to keep the temperature of the room at a comfortable range;

2. When the chiller ① is producing chilled water, heat generated from the chiller is recovered by heat recovery device ② and heat the water in the circulating water tank ③ hich supplied to the users ④ ;

3. This system provides users with hot water at ultra-low costs; however, the volume of hot water supply will depend on the usage of the unit and season conditions. Another hot water system should be installed as back-up system.



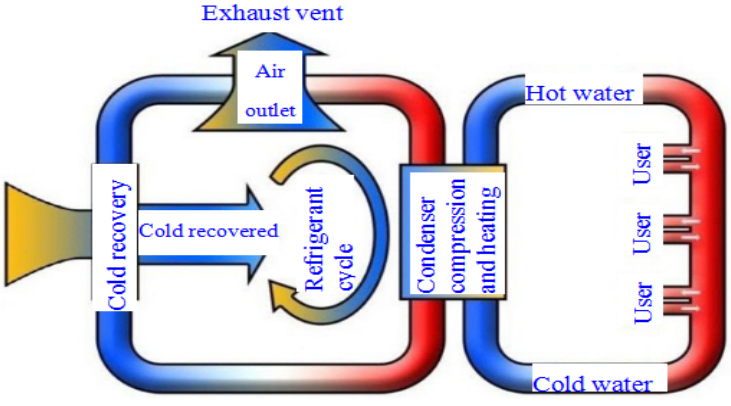
Butterfly valves, check valves, Y-type filters, water pressure gauges, thermometers and other fittings as required should be properly installed for the circulating hot water system.

Heat recovery system flow chart

Schematic diagram of cold recovery (air source)

A cold recovery device is connected in parallel the fin evaporator in a standard air source heat pump unit, which can recover the cold generated when the heating process when the heat pump is producing hot water; and the cold energy is used to reduce the temperature of the water in the circulating water tank to obtain cold water at very low costs.

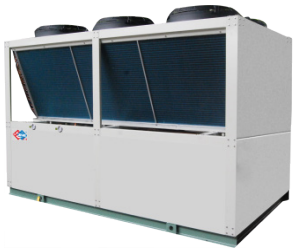
The production of cold water requires no additional electrical energy, leading to enhanced comprehensive energy efficiency of the unit. When the target of water temperature at users' end is reached or when the cold recovery fails, the system will automatically switch to the air-cooled mode and continue to ensure the hot water supply.



Heat recovery series (heat recovery)

Centrifugal series (heat recovery)

The centrifugal chiller uses two-stage centrifugal compressor, self developed high performance spray-type evaporator, and R134a refrigerant, it has a coefficient of performance (COP) up to 6.3. Suitable for large industrial and commercial sites. Refrigerating capacity range: 2000kW~10000kW; chilled water temperature at outlet: 5~20 ℃ . Heat recovered by the heat recovery device connection in series is used to produce domestic hot water without additional costs. They are suitable to meet the needs of hotels, and shopping among others where both air-conditioning and a large amount of hot water are in demand.

Screw series (heat recovery)

H.Stars 40ST series of screw type chiller has two types, water cooled screw chillers, and air cooled screw chillers. Heat recovered by the heat recovery device connection in series is used to produce domestic hot water without additional costs. They are suitable to meet the needs of hotels, and shopping among others where both air-conditioning and a large amount of hot water are in demand.


Scroll series (heat recovery)

20STB series water chillers are manufactured using compressors and electronic control components from branded suppliers, completed with high-efficiency shell and tube condensers and evaporators, and feature with multiple protection functions. Designed for comfortable air-conditioning, they can work together in parallel/module. Heat recovered by the heat recovery device connection in series is used to produce domestic hot water without additional costs. It can be used in a wild range of commercial buildings such as hotels, shopping malls, office buildings. They are suitable to meet the needs of hotels, and shopping among others where both air-conditioning and a large amount of hot water are in demand.


Cold recovery series (cold recovery)

Centrifugal series (cold recovery)

The centrifugal water source heat pump uses special centrifugal compressor for heat pump, self developed high performance spray-type evaporator, and R134a refrigerant; it has a cooling COP up to 7.7, and a heating COP up to 6.0. Suitable for large industrial and commercial sites. Refrigerating capacity range: 2000kW~7000kW; heating capacity range: 2000kW~7000kW. The outlet temperature of chilled water can be as low as 5 ℃ , and the outlet temperature of hot water can reach 50℃ .


Screw series (cold recovery)

The water source screw heat pump unit adopts twin screw compressor design. This water source heat pump system has both cooling and heating capacity, which enables it to replace the original combination of boiler and air-conditioning device; as a result, a lot of energy can be saved, and the initial equipment investment is reduced. There is neither a boiler system for heating, nor cooling tower for cooling, and there is no pollution and no emissions during use.


Scroll series (cold recovery)

The 20STB heat pump unit adopts special scroll compressor for heat pump. This water source heat pump system has both cooling and heating capacity, which enables it to replace the original combination of boiler and air-conditioning device; as a result, a lot of energy can be saved, and the initial equipment investment is reduced. There is neither a boiler system for heating, nor cooling tower for cooling, and there is no pollution and no emissions during use.


Screw type water-cooled heat recovery chiller technical parameters(R22)

Refrigerant：R22 Power Supply：380V-3P-50Hz

Model	Nominal Cooling Capacity		Input Power kW	30% Heat Recovery Capacity KW	100% Heat Recovery Capacity KW	Energy Control %	Refrigerant Charge kg	Condenser				Evaporator				30% Heat Recovery Capacity				100% Heat Recovery Capacity KW				Operating Noise dB(A)	Operating Sound kg	Shipping Weight kg
	KW	USRT						Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa			
40STD-F100WSB4	103	29	22	31	125	0 66 100	23	2″	21	1	41	2″	18	1	68	1″	5	1	39	2″	21	1	41	73	1020	1130
40STD-F140WSB4	143	41	29	43	172		32	2-1/2″	30	1	47	2-1/2″	25	1	70	1″	7	1	40	2-1/2″	30	1	47	74	1060	1170
40STD-F190WSB4	188	53	37	56	225		41	3″	39	1	45	3″	32	1	69	1-1/2″	10	1	41	3″	39	1	45	75	1250	1410
40STD-F260WSB4	250	71	48	75	298	0 50 75 100	54	3″	51	1	53	3″	43	1	70	1-1/2″	13	1	42	3″	51	1	53	75	1400	1580
40STD-F280WSB4	270	77	53	81	323		60	3″	56	1	52	3″	46	1	72	1-1/2″	14	1	43	3″	56	1	52	76	1580	1730
40STD-F440WSB4	438	125	83	131	521		92	5″	90	1	53	4″	75	1	68	2-1/2″	23	1	44	5″	90	1	53	76	2840	3060
40STD-F530WSB4	532	151	100	160	632		109	5″	109	1	56	5″	91	1	70	2-1/2″	27	1	45	5″	109	1	56	77	3100	3380
40STD-F610WSB4	615	175	115	185	730		126	5″	126	1	54	5″	106	1	69	2-1/2″	32	1	46	5″	126	1	54	77	4100	4410
40STD-F690WSB4	691	196	128	207	819		140	5″	141	1	56	5″	119	1	70	2-1/2″	36	1	47	5″	141	1	56	77	4520	4890
40STD-F800WSB4	805	229	146	242	951		163	5″	164	1	58	5″	138	1	72	2-1/2″	42	1	48	5″	164	1	58	78	4740	5190

Note:

1. Nominal cooling capacity reference: Evaporator inlet and outler temperature 12 ℃ /7 ℃ , Condenser inlet and outlet remperature 30 ℃ /35 ℃ ; fouling factor 0.088 ㎡ ·℃ /kW;
2. Chilled water temperature range: 5℃ ~ 20℃
3. Cooling water temperature range: 15℃ ~ 40℃ ;
4. Specifications and dimensions will be subjesct to improvement change without notice.

50STD series conventional centrifugal heat recovery chiller technical parameters

Refrigerant：R134a Power Supply：380V-3P-50Hz

Model	Nominal Cooling Capacity		Input Power	30% Heat Recovery Capacity KW	100% Heat Recovery Capacity KW	Energy Control %	Refrigerant Charge kg	Condenser				Evaporator				30% Heat Recovery Capacity				100% Heat Recovery Capacity KW				Operating Noise dB(A)	Operating Sound kg	Shipping Weight kg
	KW	USRT	kW					Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa			
50STD-PM600WB4	2088	594	340	626	2428	25%~100%	700	8″	418	1	74	8″	359	1	74	4″	108	1	45	8″	418	1	74	82	12000	12500
50STD-PM700WB4	2320	660	385	696	2705		800	10″	465	1	74	10″	399	1	74	5″	120	1	46	10″	465	1	74	84	13000	13500
50STD-PM800WB4	2785	792	448	836	3233		950	10″	556	1	76	10″	479	1	76	5″	144	1	47	10″	556	1	76	85	14000	14500
50STD-PM900WB4	3200	910	525	960	3725		1100	12″	641	1	78	12″	550	1	78	6″	165	1	48	12″	641	1	78	86	15000	15500
50STD-PM1000WB4	3550	1009	582	1065	4132		1200	12″	711	1	80	12″	610	1	80	6″	183	1	49	12″	711	1	80	87	16000	16500
50STD-PM1200WB4	4175	1187	672	1253	4847		1400	12″	834	1	82	12″	718	1	82	6″	215	1	50	12″	834	1	82	88	18000	18500
50STD-PM1300WB4	4570	1299	732	1371	5302		1500	14″	912	1	82	14″	786	1	82	7″	236	1	51	14″	912	1	82	89	19000	19500
50STD-PM1400WB4	4777	1358	769	1433	5546		1600	14″	954	1	84	14″	821	1	84	7″	246	1	52	14″	954	1	84	90	20000	20500
50STD-PM2000WB4	7100	2019	1164	2130	8264		2400	16″	1421	1	84	16″	1221	1	84	8″	366	1	53	16″	1421	1	84	92	30000	30500
50STD-PM2800WB4	9554	2717	1538	2866	11092		3200	18″	1907	1	84	18″	1643	1	84	9″	493	1	54	18″	1907	1	84	94	38000	38500

Note:

1. Nominal cooling capacity reference: Evaporator inlet and outler temperature 12℃ /7℃ , Condenser inlet and outlet remperature 30℃ /35℃ ; fouling factor 0.088 ㎡ ·℃ /kW;
2. Chilled water temperature range: 5℃ ~ 20℃
3. Cooling water temperature range: 15℃ ~ 40℃ ;
4. Specifications and dimensions will be subjesct to improvement change without notice.

Water-cooled scroll heat recovery water unit technical parameters

Refrigerant：R22 Power Supply：380V-3P-50Hz

Model	Nominal Cooling Capacity kW	Compressure Input Power kW	30% Heat Recovery Capacity KW	100% Heat Recovery Capacity KW	Unit operating current A	Energy Control %	Condenser				Evaporator				30% Heat Recovery Capacity				100% Heat Recovery Capacity KW				Operating Noise dB(A)	Operating Sound kg
							Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop kPa		
20STB-10WSOB4	31	6	9	37	14	0 100	1-1/2"	6	1	29	1-1/2"	5	1	23	1"	2	1	9	1-1/2"	6	1	29	60	260
20STB-12.5WSOB4	36	7	11	43	15		2"	7	1	31	2"	6	1	28	1"	2	1	10	2"	7	1	31	61	300
20STB-15WSOB4	45	10	14	55	20		2"	9	1	41	2"	8	1	30	1"	2	1	11	2"	9	1	41	62	390
20STB-20WDOB4	62	13	19	74	28	0 50 100	2"	13	1	56	2"	11	1	28	1"	3	1	12	2"	13	1	56	63	470
20STB-25WDOB4	72	14	22	86	30		2"	15	1	56	2"	12	1	28	1"	4	1	13	2"	15	1	56	64	520
20STB-30WDOB4	90	19	27	110	40		2-1/2"	19	1	58	2-1/2"	16	1	32	1-1/2"	5	1	14	2-1/2"	19	1	58	65	690
20STB-40WTOB4	108	22	32	129	45	0 33 66 100	2-1/2"	22	1	55	2-1/2"	19	1	32	1-1/2"	6	1	15	2-1/2"	22	1	55	66	850
20STB-45WTOB4	136	29	41	164	60		2-1/2"	28	1	56	2-1/2"	23	1	31	1-1/2"	7	1	16	2-1/2"	28	1	56	67	1030

Air-source Screw Type Hot Water Unit Technical Parameters

Refrigerant：R22 Power supply：380V-3P-50Hz

Model	Nominal Cooling Capacity		Cold Recovery Capacity kW	Input power kW	Energy Control %	Refrigerant Charge kg	Condenser				Evaporator/Fan			Cold Recovery				Operating Noise dB(A)	Operating Sound kg	Shipping Weight kg
	kW	USRT					Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure Drop kPa	Quantity	Air Volume m3/h	Power kW	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure Drop kPa			
80HW-330S4	283	81	283	74	10 50 100	57	3″	49	1	53	6	93000	7.2	3″	49	1	53	75	1850	1990
80HW-420S4	357	102	357	92		62	3″	61	1	52	6	120600	12	3″	61	1	52	75	1930	2085
80HW-480S4	419	119	419	107	0 50 75 100	68	4″	72	1	50	8	115200	9.6	4″	72	1	50	75	2010	2180
80HW-580S4	493	140	493	128		85	4″	85	1	50	8	160800	16	4″	85	1	50	75	2440	2780
80HW-720D4	612	174	612	162		120	5″	105	1	52	12	172800	14.4	5″	105	1	52	75	3410	3700
80HW-840D4	715	203	715	184		124	3″ *2	123	1	52	12	241200	24	6″	123	1	52	75	3840	4160
80HW-960D4	838	238	838	214		136	4″ *2	144	1	50	16	230400	19.2	8″	144	1	50	75	4010	4330
80HW-1050D4	904	257	904	232		153	4″ *2	155	1	50	16	321600	32	8″	155	1	50	75	4460	4920
80HW-1160D4	986	280	986	255		170	4″ *2	170	1	51	16	321600	32	8″	170	1	51	75	4860	5510

Note:

1. Nominal working conditions: Air DB/WB temperature 20℃ /15℃ , hot water inlet and outlet water temperature 50℃ /55℃ ; fouling factor 0.088 ㎡ · ℃ /kW;
2. Ambient temperature range: −10 ~ 43℃ , if the anbient temperature is lower than −10℃ , please contact the H.Stars Group;
3. Specifications and dimensions will be subjesct to improvement change without notice.

50STE series magnetic suspension air-cooled cold water heat recovery centrifugal unit technical parameters

Refrigerant：R134a Power Supply：380V-3P-50Hz

Model	Nominal Cooling Capacity		Input Power	30% Heat Recovery Capacity KW	100% Heat Recovery Capacity KW	Energy Control %	Refrigerant Charge kg	Condenser/ Fan			Evaporator				30% Heat Recovery Capacity				100%Heat Recovery Capacity				Operating Noise dB(A)	Operating Sound kg	Shipping Weight kg
	kW	USRT	kW					Quantity	Air Volume m3/h	Power kW	Water Side MAX. Pressure Mpa	Pipe connection inch	Water Flow m3/h	Water Pressure drop KPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop KPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop KPa			
50STE-M120APB4	425	121	135	128	560	10 ~ 100%, DC frequency adjustment	190	8	170000	11	1	5″	73.1	35	2-1/2″	22	1	11	5″	96	1	32	84	3650	4000

Note:

1.Nominal cooling capacity reference: Ambient temperature range 35℃ , Chilled water outlet remperature 7℃ ; Water Flow 0.172m³/(h·kW) ; fouling factor 0.088 ㎡ ·℃ /kW;

2. Chilled water temperature range: 5℃ ~ 20℃

3. Lowest ambient temperature range: -5℃ ;

4. Specifications and dimensions will be subjesct to improvement change without notice.

Air-cooled Scroll Cold Water Heat Recovery Unit Technical Parameters

Refrigerant：R22 Power Supply：380V-3P-50Hz

Model	Nominal Cooling Capacity kW	Compressure Input Power kW	30% Heat Recovery Capacity KW	100% Heat Recovery Capacity KW	Unit Operating Current A	Energy Control %	Evaporator				30% Heat Recovery Capacity				100% Heat Recovery Capacity				Operating Noise dB(A)	Operating Sound kg	Dimensions		
							Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop KPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop KPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop KPa			long	wide	high
20STB-10ASB4	30	8	9	37	18	0 100	1-1/2"	5	1	23	1"	2	1	7	1-1/2"	6	1	23	63	400	1200	600	1200
20STB-12.5ASB4	35	9	10	43	19		2"	6	1	28	1"	2	1	8	2"	7	1	28	64	450	1300	600	1200
20STB-15ASB4	43	12	13	55	27		2"	7	1	30	1"	2	1	9	2"	9	1	30	65	540	1500	600	1320
20STB-20ADB4	60	15	18	75	35	0 50 100	2"	10	1	28	1"	3	1	10	2"	13	1	28	66	760	1900	675	1200
20STB-25ADB4	69	17	21	86	39		2"	12	1	28	1"	4	1	11	2"	15	1	28	67	800	1900	600	1220
20STB-30ADB4	87	24	26	110	53		2-1/2"	15	1	32	1-1/2"	4	1	12	2-1/2"	19	1	32	68	1000	2200	600	1430
20STB-40ATB4	104	26	31	129	58	0 33 66 100	2-1/2"	18	1	32	1-1/2"	5	1	13	2-1/2"	22	1	32	69	1200	2250	800	1350
20STB-45ATB4	130	35	39	166	80		2-1/2"	22	1	31	1-1/2"	7	1	14	2-1/2"	28	1	31	70	1350	2250	800	1570

Screw air-cooled heat recovery chiller technical parameters (R22)

Refrigerant：R22 Power Supply：3φ-380V-50Hz

Model	Nominal Cooling Capacity kW	Compressure Input Power kW	30% Heat Recovery Capacity KW	100% Heat Recovery Capacity KW	Energy Control %	Refrigerant Charge kg	Condenser/Fan			Evaporator				30% Heat Recovery Capacity				100% Heat Recovery Capacity				Operating Noise dB(A)	Operating Sound kg	Shipping Weight kg
							Structure Type	Air Volume ×1000 m3/h	Power kW×The Numbers	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop KPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop KPa	Pipe connection inch	Water Flow m3/h	Water Side MAX. Pressure MPa	Water Pressure drop KPa			
40STE-110ASB4	113	36	34	149	0 66 100	30	Copper tube corrugated aluminum fin	40	2.0×2	2-1/2″	19	1	28	1″	6	1	8	2-1/2″	26	1	28	68	1160	1270
40STE-160ASB4	160	50	48	210	0 50 75 100	42		57	1.2×4	3″	28	1	33	1-1/2″	8	1	9	3″	36	1	33	68	1730	1920
40STE-210ASB4	214	65	64	279		56		80	2.0×4	3″	37	1	48	1-1/2″	11	1	10	3″	48	1	48	68	2590	2810
40STE-240ASB4	252	74	76	326		68		85	1.2×6	3″	43	1	55	1-1/2″	13	1	11	3″	56	1	55	68	2670	2900
40STE-280ASB4	297	86	89	383		78		121	2.0×6	4″	51	1	61	2″	15	1	12	4″	66	1	61	72	2750	3020
40STE-310ASB4	319	93	96	412		84		121	2.0×6	4″	55	1	64	2″	16	1	13	4″	71	1	64	72	2930	3240
40STE-340ASB4	347	103	104	450		93		161	2.0×8	4″	60	1	66	2″	18	1	14	4″	77	1	66	72	3160	3450
40STE-380ADB4	397	120	119	517	0 25 37.5 50 62.5 75 87.5 100	104		161	2.0×8	5″	68	1	68	2-1/2″	20	1	15	5″	89	1	68	73	4430	4750
40STE-420ADB4	428	130	128	558		112		161	2.0×8	5″	74	1	68	2-1/2″	22	1	16	5″	96	1	68	73	4550	4970
40STE-480ADB4	504	148	151	652		136		170	1.2×12	5″	87	1	70	2-1/2″	26	1	17	5″	112	1	70	73	5340	5800
40STE-560ADB4	594	172	178	766		142		241	2.0×12	4″ *2	102	1	70	4″	31	1	18	4″ *2	132	1	70	75	5500	6040
40STE-620ADB4	638	186	191	824		156		241	2.0×12	4″ *2	110	1	72	4″	33	1	19	4″ *2	142	1	72	75	5860	6480
40STE-1000ASB4	1087	300	326	1387		206		322	2.0×16	8″	187	1	75	4″	56	1	20	8″	239	1	75	78	7950	8840

Note:

1. Nominal cooling capacity reference: Air DB/WB temperature 35℃ /24℃ , chilled water inlet and outlet temperature 12℃ /7℃ ; fouling factor 0.088 $m^2 \cdot ℃ /kW$;
2. Chilled water temperature range: 5℃ ~ 20℃
3. Ambient temperature range: 15 ~ 43℃
4. Specifications and dimensions will be subjesct to improvement change without notice.

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