

H.Stars Variable-frequency Speed Drive Chiller



H.Stars (Guangzhou) Refrigerating Equipment Group Ltd.

Frequency conversion is a technology that adjusts the working load of equipment by changing the frequency of power supply, and consequently reduces power consumption and losses, and extends the service life of the unit. At the heart of the frequency conversion technology is the frequency converter, which changes the fixed grid frequency of 50Hz to any variable frequency ranging from 30 to 130Hz, and consequently realize automatic adjustment of the motor running speed.

Rotating speed of the compressor, which is the most important energy-consuming component of the unit, directly affects the unit's power consumption. A variable frequency speed drive chiller that can directly adjusts the compressor speed during partial load operation has higher energy efficiency than an ordinary unit that can only adjust working load with capacity regulating valve but cannot change the motor speed. And since all units operate at partial load for more than 95% of their working time, variable frequency speed drive chillers enable continuous energy saving, and their investment costs can be recovered in a relatively short time.

Variable frequency speed drive chillers adopt the built-in variable frequency drive technology, which combined with specially designed variable-frequency compressor, can greatly improves the unit's energy efficiency during partial load operation, achieving integrated part load value (IPLV) as high as more than 10.

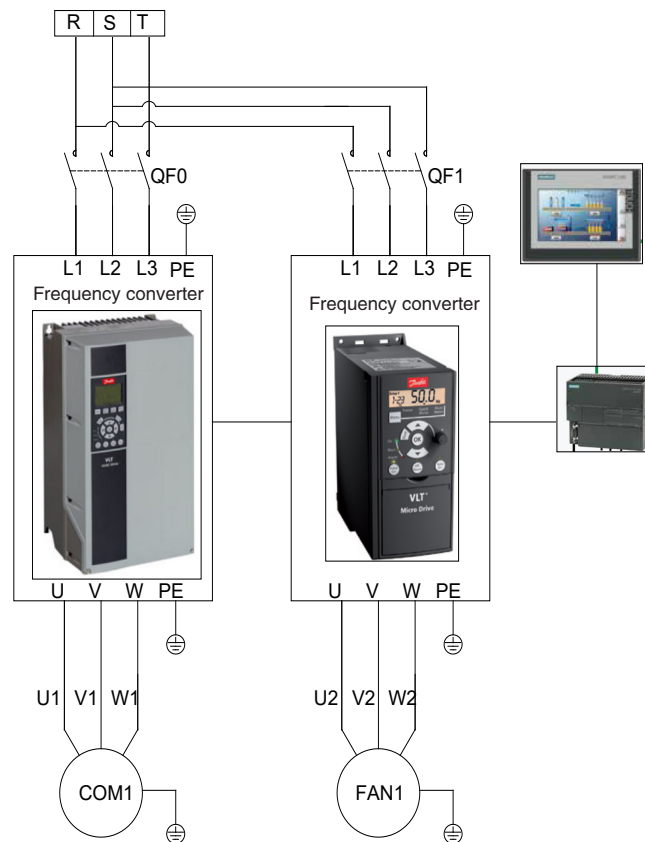
Variable frequency speed drive chillers offer soft start function to reduce the impact of starting current; the frequency converter comes with a DC reactor that can minimize harmonic interference; and there is also an optional low harmonic filter which, under the input power of the frequency converter, is in line with IEEE-519 specification for harmonic distortion, and equipped with functions of harmonic filter over-temperature protection and capacitor switching.

Variable frequency speed drive chillers have a wide range of applications, and are diversified in product types, including variable-frequency centrifugal chillers, variable-frequency screw chillers, variable-frequency scroll chillers, variable-frequency air conditioning chillers, variable-frequency industrial (integrated) chillers, variable-frequency hot water (high temperature large, scroll) chillers and many others.

Functions and features of variable–frequency chillers

A variable frequency speed drive chiller not only can save energy by reducing the frequency, but also can configure the unit to work at load other than the maximum one. When the cooling demand is at

the maximum level, the frequency will be raised to increase the cooling capacity to fill the demand gap of cooling capacity.



The most prominent feature of a variable frequency speed drive chiller is the frequency converter that is added to drive the compressor; its starting current is 60% lower than that of the driver of a traditional unit. In addition to compressor control, convertible frequency technology can also be used to control fans, and water pumps among others.

The frequency converter helps the unit to achieve stepless load adjustment of 1Hz each time; and its frequency conversion range of 30-130Hz and adaptive control logic enable it to accurately control outlet water temperature to a tolerance of ± 0.3 degrees, making it perfectly suitable for scenarios requiring high-precision temperature control.

Variable-frequency Chillers (Water Cooled Series)

Variable-frequency centrifugal chillers

The water-cooled variable-frequency centrifugal chiller applies Hanbell variable-frequency centrifugal compressor, proprietary developed and manufactured high-efficiency heat exchanger, and precise liquid level control technology to ensure that the evaporator is always in a high-efficiency heat exchange state.

The condenser's droplet separation technology ensures

efficient and sufficient heat exchange of the heat exchange tube of the condenser. The chiller has an IPLV up to 10. Chilled water outlet temperature range: 5-20°C . Besides standard specifications, various non-standard chillers can also be available by customization.

Compressor frequency range: 30Hz-50Hz Compressor rated frequency: 50Hz

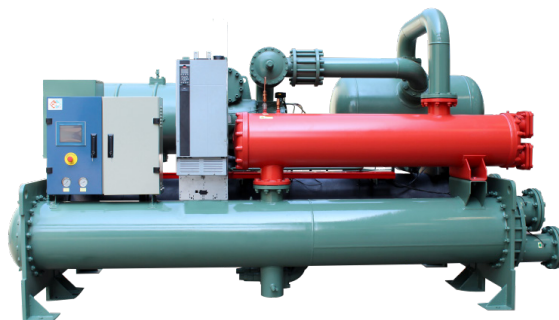


Variable-frequency screw chillers

The water-cooled variable frequency drive screw chiller uses twin-screw compressor specially designed for frequency conversion, which is completed with proprietary produced high-efficiency condenser and evaporator, and branded expansion valve. Applications of the chiller: various large and medium-sized industrial and commercial places where air-conditioning and cooling is needed, as well as industrial places for chemical,

pharmaceutical, industrial processing, food processing and others.

Chilled water outlet temperature 5°C -20°C ; cooled water temperature range 15 °C -40 °C . Compressor frequency range: 20Hz-80Hz Compressor rated frequency: 65Hz. Contact the manufacturer if operation at higher frequency is needed.



Variable-frequency scroll chillers

The water-cooled variable-frequency scroll chiller adopts branded compressor specially designed for frequency conversion and branded frequency converters, and is equipped with high-efficiency shell-and-tube condenser and evaporator. It performs with high reliability thanks to its microcomputer control, and various protection functions.

Designed for comfortable air conditioning, they are suitable for various commercial buildings, including hotels, shopping malls, and office buildings. The product is available in two series, WO open type and WC case type.

Compressor frequency range: 20Hz-80Hz Compressor rated frequency: 65Hz. Contact the manufacturer if operation at higher frequency is needed.



Variable-frequency air conditioning chillers

The air-cooled variable-frequency chillers use enhanced air-cooled compressor specially designed for frequency conversion, and proprietarily developed and produced high-efficiency condenser and evaporator, which endow the chillers an energy efficiency of more than 3.2. The chillers are available in single-loop and double-loop designs to meet different requirements of customers. When one compressor of a dual-loop chiller fails, the

other compressor may operate normally to minimize the impact on the chiller in the event of a failure. Heat recovery is optional. The chillers are suitable for various commercial buildings, including hotels, shopping malls, and office buildings.

Compressor frequency range: 20Hz-80Hz Compressor rated frequency: 65Hz. Contact the manufacturer if operation at higher frequency is needed.



Variable-frequency industrial chillers

Variable-frequency industrial chillers are an integrated product designed for industrial applications. The chiller is an integration of variable-frequency main engine, chilled water storage tank, chilled water circulating pump, process pump, water pipe system, various valves, and engineering control cabinet.

Assembled in the production line, they offer reliable quality, compact structure and high integration. Their installation is simple, and convenient, with reduced costs.

Compressor frequency range: 20Hz-80Hz Compressor rated frequency: 65Hz. Contact the manufacturer if operation at higher frequency is needed.



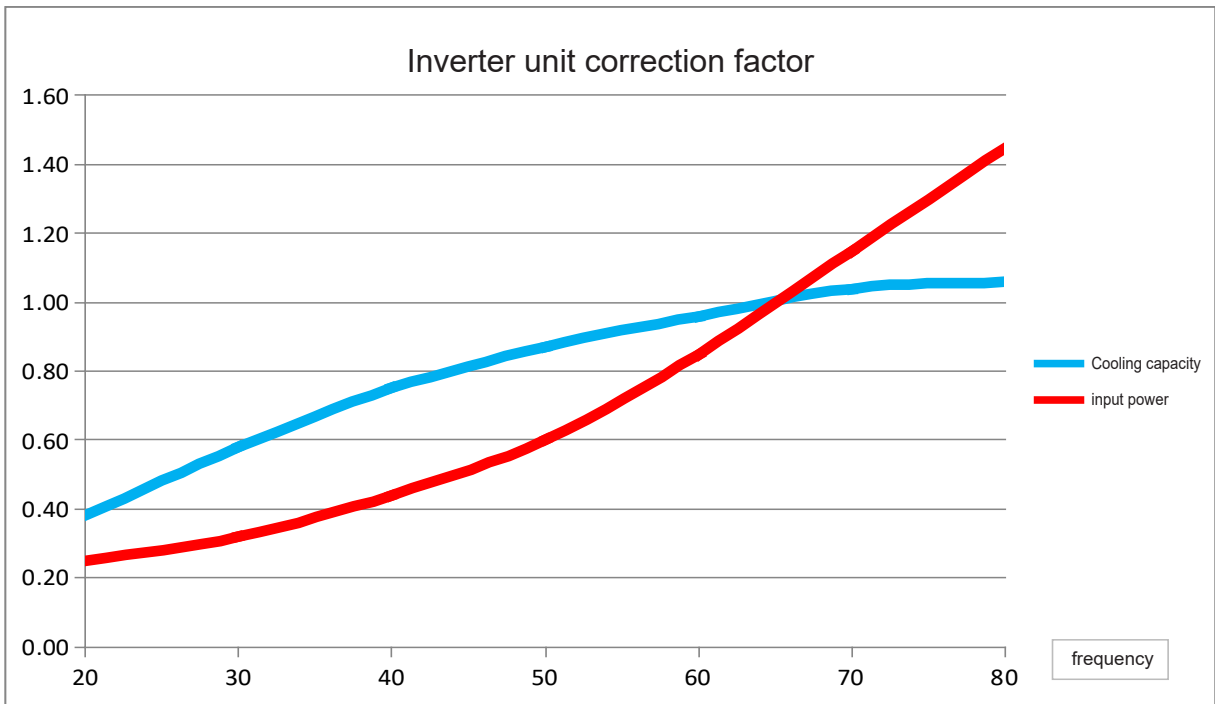
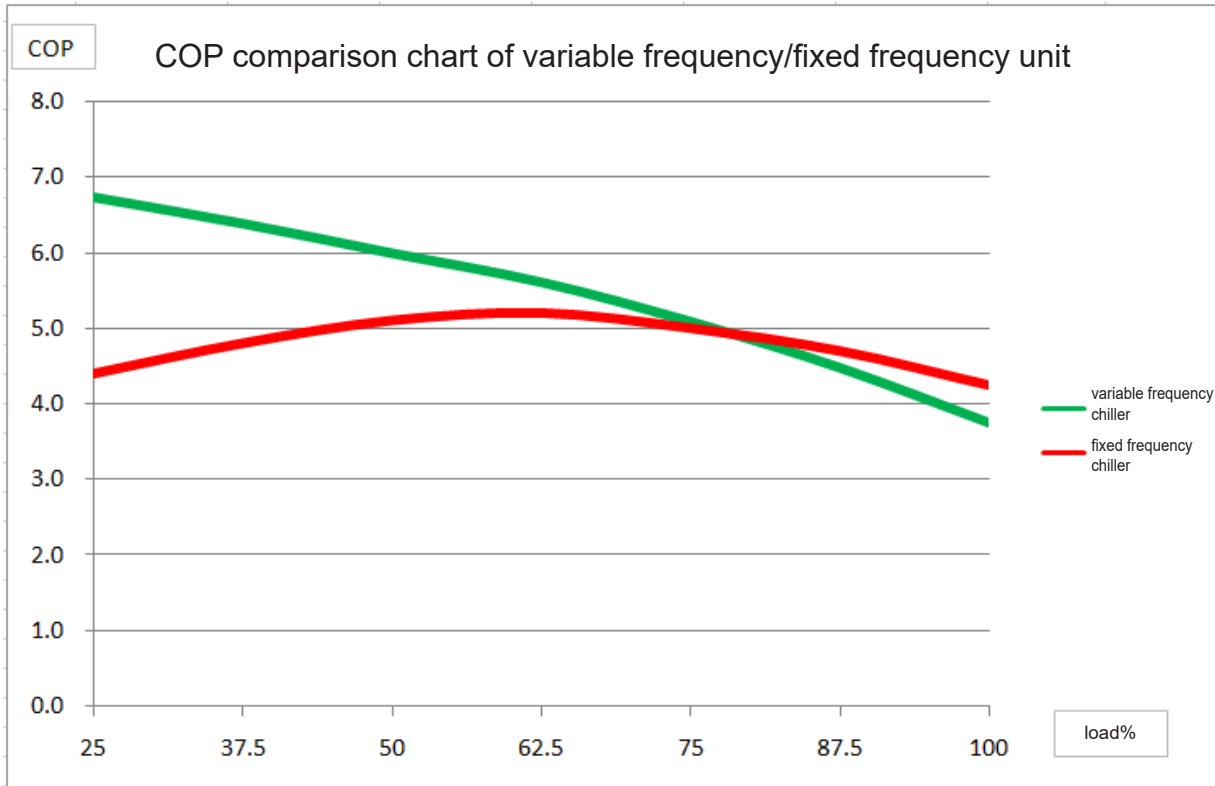
Variable-frequency hot water chillers

Variable-frequency hot water chillers include two types of chillers: screw type and scroll type. Low quality heat energy collected from ambient air is transformed by the convertible frequency chiller into high quality heat energy that can be used to produce hot water above 50 degrees. The chillers are suitable for indoor swimming pools, hotels, villas, bathing and pedicure sites, factories, farms and other places that need hot water.

With built-in low temperature enhanced heat transfer technology, the chiller decreases with the ambient temperature in heating volume but not much in temperature. They can also replace boilers.

Compressor frequency range: 20Hz-80Hz Compressor rated frequency: 65Hz. Contact the manufacturer if operation at higher frequency is needed.





Variable-frequency Chillers Parameters (Water Cooled Series)

Water-cooled Centrifugal Variable Frequency Chiller Technical Parameters

Refrigerant: R134a Power supply: 3 φ -380V-50Hz

Model	Nominal cooling capacity		Input power kW	Energy control %	Refrigerant charge kg	Condenser				Evaporator				Running noisedB (A)	Shipping Weight kg	Operating weight kg
	kW	USRT				Diameter of inlet and outlet pipes in	Water flow rate m ³ /h	MPaMaximum water side pressure MPa	Water pressure drop kPa	Diameter of inlet and outlet pipes in	Water flow rate m ³ /h	MPaMaximum water side pressure MPa	Water pressure drop kPa			
50STD-M600WF4	2088	594	340	stepless variable speed	700	8"	418	1	74	8"	359	1	74	82	12000	12500
50STD-M700WF4	2320	660	385		800	10"	465	1	74	10"	399	1	74	84	13000	13500
50STD-M800WF4	2785	792	448		950	10"	556	1	76	10"	479	1	76	85	14000	14500
50STD-M900WF4	3200	910	525		1100	12"	641	1	78	12"	550	1	78	86	15000	15500
50STD-M1000WF4	3550	1009	582		1200	12"	711	1	80	12"	610	1	80	87	16000	16500
50STD-M1200WF4	4175	1187	672		1400	12"	834	1	82	12"	718	1	82	88	18000	18500

Note:

1. Nominal cooling capacity reference: evaporator inlet and outlet water temperature 12°C /7°C , condenser inlet and outlet water temperature 30°C /35°C ; fouling factor 0.088 m² · °C /Kw, compressor operating frequency 50 Hz;
2. Chilled water temperature range: 5°C ~20°C
3. Cooling water temperature range: 15°C ~40°C ;
4. Operating frequency range: 30~50 Hz;
5. Specifications and dimensions will be subject to improvement change without notice.

Water-cooled Scroll Variable Frequency Chiller Technical Parameters

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

Model	Nominal cooling capacity	Compressor Input Power kW	Energy control %	Condenser				Evaporator				Running noisedB (A)	Shipping Weight kg	Operating weight kg
				Diameter of inlet and outlet pipes in	Water flow rate m ³ /h	MPaMaximum water side pressure MPa	Water pressure drop kPa	Diameter of inlet and outlet pipes in	Water flow rate m ³ /h	MPaMaximum water side pressure MPa	Water pressure drop kPa			
20STB-10WSOF4	31	6	stepless variable speed	1-1/2"	6	1	29	1-1/2"	5	1	23	60	260	300
20STB-12.5WSOF4	36	7		2"	7	1	31	2"	6	1	28	61	300	340
20STB-15WSOF4	45	10		2"	9	1	41	2"	8	1	30	62	390	430
20STB-20WDOF4	62	13		2"	13	1	56	2"	11	1	28	63	470	510
20STB-25WDOF4	72	14		2"	15	1	56	2"	12	1	28	64	520	560
20STB-30WDOF4	90	19		2-1/2"	19	1	58	2-1/2"	16	1	32	65	690	730
20STB-40WTOF4	108	22		2-1/2"	22	1	55	2-1/2"	19	1	32	66	850	890
20STB-45WTOF4	136	29		2-1/2"	28	1	56	2-1/2"	23	1	31	67	1030	1070

Note:

1. Nominal cooling capacity reference: evaporator inlet and outlet water temperature 12°C /7°C , condenser inlet and outlet water temperature 30°C /35°C ; fouling factor 0.088 m² · °C /Kw, Compressor operating frequency 65 Hz;
2. Chilled water temperature range: 5°C ~20°C
3. Cooling water temperature range: 15°C ~40°C ;
4. Operating frequency range: 20~80 Hz;
5. Specifications and dimensions will be subject to improvement change without notice.

Variable-frequency Chillers Parameters (Water Cooled Series)

Water-cooled Screw Variable Frequency Chiller Technical Parameters

Refrigerant: R134a Power supply: 3 φ -380V-50Hz

Model	Nominal cooling capacity		Input power kW	Energy control %	Refrigerant charge kg	Condenser				Evaporator				Running noisedB (A)	Shipping Weight kg	Operating weight kg
	kW	USRT				Diameter of inlet and outlet pipes in	Water flow rate m ³ /h	MPaMaximum water side pressure MPa	Water pressure drop kPa	Diameter of inlet and outlet pipes in	Water flow rate m ³ /h	MPaMaximum water side pressure MPa	Water pressure drop kPa			
40STD-FM100WSF4	88	25	18	infinite Variable-frequency	17	2"	18	1	41	2"	15	1	65	73	1020	1130
40STD-FM190WSF4	168	48	30		31	3"	34	1	45	3"	29	1	65	75	1250	1410
40STD-FM260WSF4	227	64	42		41	3"	46	1	53	3"	39	1	68	75	1400	1580
40STD-FM280WSF4	233	66	43		45	3"	47	1	52	3"	40	1	70	76	1580	1730
40STD-FM440WSF4	386	110	68		68	5"	78	1	50	4"	66	1	65	76	2700	2930
40STD-FM530WSF4	440	125	76		75	5"	89	1	52	5"	76	1	68	77	2880	3150
40STD-FM610WSF4	518	147	89		81	5"	104	1	52	5"	89	1	65	77	3600	3960
40STD-FM800WSF4	668	190	114		119	5"	134	1	56	5"	115	1	70	78	4410	4910
40STD-FM940WSF4	796	226	135		149	6"	160	1	55	6"	137	1	70	79	5360	5590
40STD-FM1060WSF4	931	265	154		162	6"	187	1	58	6"	160	1	75	79	5670	6190

Note:

1. Nominal cooling capacity reference: evaporator inlet and outlet water temperature 12°C /7°C , condenser inlet and outlet water temperature 30°C /35°C ; fouling factor 0.088 m² · °C /Kw, Compressor operating frequency 65 Hz;
2. Chilled water temperature range: 5°C ~20°C
3. Cooling water temperature range: 15°C ~40°C ;
4. Operating frequency range: 20~80 Hz;
5. Specifications and dimensions will be subject to improvement change without notice.

Variable-frequency Chillers Parameters (Air Source Series)

Air-source Screw Variable Frequency Chiller Technical Parameters

Refrigerant: R134a Power supply: 3 φ -380V-50Hz

Model	Nominal cooling capacity	Compressor Input Power kW	Energy control %	Refrigerant charge kg	Condenser/Fan			Evaporator				Running noisedB (A)	Shipping Weight kg	Operating weight kg
					Type	air flow x1000m3/h	Power* quantity kW	Diameter of inlet and outlet pipes in	Water flow rate m3/h	MPaMaximum water side pressure MPa	Water pressure drop kPa			
40STE-M110ASF4	98	30	infinite Variable-frequency	30	Copper tube with corrugated aluminum fins	28	2.0 × 2	2-1/2"	17	1	28	68	1160	1270
40STE-M160ASF4	139	43		42		40	2.0 × 2	3"	24	1	33	68	1730	1920
40STE-M240ASF4	183	53		68		80	2.0 × 4	3"	31	1	55	68	2670	2900
40STE-M310ASF4	282	80		84		85	1.2 × 6	4"	48	1	64	72	2930	3240
40STE-M380ADF4	361	109		104		121	2.0 × 6	5"	62	1	68	73	4430	4750
40STE-M420ADF4	372	112		112		114	1.2 × 8	5"	64	1	68	73	4550	4970
40STE-M480ADF4	438	128		136		161	2.0 × 8	5"	75	1	70	73	5340	5800
40STE-M560ADF4	508	148		142		161	2.0 × 8	4" *2	87	1	70	75	5500	6040
40STE-M620ADF4	564	159		156		170	1.2 × 12	4" *2	97	1	72	75	5860	6480
40STE-M1000ASF4	935	255		206		322	2.0 × 16	8"	161	1	75	78	7950	8840

Note:

1. Nominal cooling capacity reference: DB/WB ambient temperature 35°C /24°C , chilled water inlet and outlet temperature 12°C /7°C ; fouling factor 0.088 m² ·°C /kW, compressor operating frequency 65 Hz;
2. Chilled water temperature range: 5°C -20°C
3. Ambient temperature range: 15°C -43°C ;
4. Operating frequency range: 20-80 Hz;
5. Specifications and dimensions will be subject to improvement change without notice.

Air-source Screw Variable Frequency Chiller Industrial Chiller Technical Parameters

Refrigerant: R134a Power supply: 3 φ -380V-50Hz

Model	Nominal cooling capacity		Compressor Input Power kW	Energy control %	Refrigerant charge kg	Condenser	Evaporator				Axial Fan		Running noisedB (A)	Shipping Weight kg	Operating weight kg
	kW	USRT					Diameter of inlet and outlet pipes in	Chilled Water flow rate m3/h	MPaMaximum water side pressure MPa	Water pressure drop kPa	Air flow×1000 m3/h	Power*quantity kW			
40STE-M140ASIF4	120	34	31	infinite Variable-frequency	30	Copper tube with corrugated aluminum fins	2-1/2"	21	1	28	40	2.0 × 2	68	1160	1270
40STE-M200ASIF4	170	48	43		42		3"	29	1	33	58	1.2 × 4	68	1730	1920
40STE-M320ASIF4	268	76	65		68		3"	46	1	55	86	1.2 × 6	68	2670	2900
40STE-M400ASIF4	344	98	81		84		4"	59	1	64	121	2.0 × 6	72	2930	3240
40STE-M500ADIF4	441	125	111		104		4"	76	1	42	161	2.0 × 8	72	4430	4750
40STE-M640ADIF4	536	152	130		136		4"	92	1	44	241	2.0 × 12	72	5340	5800
40STE-M680ADIF4	570	162	139		142		4"	98	1	52	241	2.0 × 12	72	5420	5950
40STE-M740ADIF4	620	176	150		156		4"	107	1	54	241	2.0 × 12	75	5500	6040
40STE-M800ADIF4	689	196	162		168		4"	118	1	55	241	2.0 × 12	75	5860	6480
40STE-M900ADIF4	750	213	181		186		4" *2	129	1	65	322	2.0 × 16	75	6320	6900

Note:

1. Nominal cooling capacity reference: DB/WB ambient temperature 35°C /24°C , chilled water inlet and outlet temperature 17°C /12°C ; fouling factor 0.088 m² ·°C /kW, compressor operating frequency 65 Hz;
2. Chilled water temperature range: 5°C -20°C
3. Ambient temperature range: -5°C -43°C ;
4. Operating frequency range: 20-80 Hz;
5. Specifications and dimensions will be subject to improvement change without notice.

Variable-frequency Chillers Parameters (Air Source Series)

Air-source Screw Variable Frequency Chiller Hot Water Unit Technical Parameters

Refrigerant: R134a Power supply: 380V-3P-50HZ

Model	Nominal cooling capacity		Input power kW	Energy control %	Refrigerant charge kg	Condenser				Evaporator/Fan			Running noisedB (A)	Shipping Weight kg	Operating weight kg
	kW	USRT				Diameter of inlet and outlet pipes in	Chilled Water flow rate m ³ /h	MPaMaximum water side pressure MPa	Water pressure drop kPa	quantity	air flow m ³ /h	Power kW			
80HW-M330SF4	195	55	69	infinite Variable-frequency	57	3"	33	1	53	4	80400	8	75	1500	1750
80HW-M420SF4	237	67	81		62	3"	41	1	52	4	80400	8	75	1850	2050
80HW-M480SF4	274	78	93		68	4"	47	1	50	6	86400	7.2	75	2010	2180
80HW-M580SF4	332	94	112		85	4"	57	1	50	6	120600	12	75	2440	2780
80HW-M720DF4	401	114	141		120	5"	69	1	52	8	160800	16	75	3410	3700
80HW-M840DF4	474	135	162		124	3" *2	81	1	52	8	160800	16	75	3840	4160
80HW-M960DF4	548	156	186		136	4" *2	94	1	50	12	172800	14.4	75	4010	4330
80HW-M1050DF4	608	173	200		153	4" *2	105	1	50	12	172800	14.4	75	4460	4920
80HW-M1160DF4	663	189	224		170	4" *2	114	1	51	12	241200	24	75	4860	5510

Note:

1. Nominal cooling capacity reference: DB/WB ambient temperature 20°C /15°C , hot water temperature inlet and outlet temperature 50°C /55°C ; fouling factor 0.088 m² ·°C /kW, compressor operating frequency 65 Hz;
2. Ambient temperature range: -10°C ~43°C , please contact the manufacturer when the ambient temperature is lower than -10°C ;
3. Operating frequency range: 20~80 Hz;
4. Specifications and dimensions will be subject to improvement change without notice.

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