CFC-free Refrigerant Air-cooled Water Chiller

SIC-12A-R2

Refer carefully to this manual before operation.

SIC-A-R2 Series

Coding Principle

SIC - xA -R2- xx- xx

- Opions
  - None=Low Pressure Pump (380V 50Hz Only)
  - P=Medium Pressure Pump
  - HP=High Pressure Pump
- R2= R410A
- Cooling Capacity-only when current frequency is 50Hz (kW), A=Air-cooled
- Shini Industrial Water Chiller

Features

- Cooling range 7~25℃/44.6°F~77°F.
- Stainless steel insulated water tank.
- Equipped with anti-freeze thermostat.
- Adopt R410A refrigerant, used to improve coefficient of performance (COP) and R410A is ozone-friendly.
- Refrigerant loop controlled by high and low pressure switches to ensure stable operation.
- Compressor and pump overload protection.
- Adopt precise high-precision temperature controller with an accuracy of ±1℃/1.8°F.
- Single compressor system series are equipped with low pressure pump,and models with two or more systems are equipped with medium pressure pump.

Control Panel

- All adopt well known and quality compressors.
- Adopt fin style condenser design. Without any need of cooling water for excellent heat transfer and rapid cooling.
- Equipped with hot-gas bypass value to balance refrigerating capacity for accurate temprature control and machine frequent start and stop protection.
- Equipped with RS485 communication interface to realize centralized monitoring.

Options

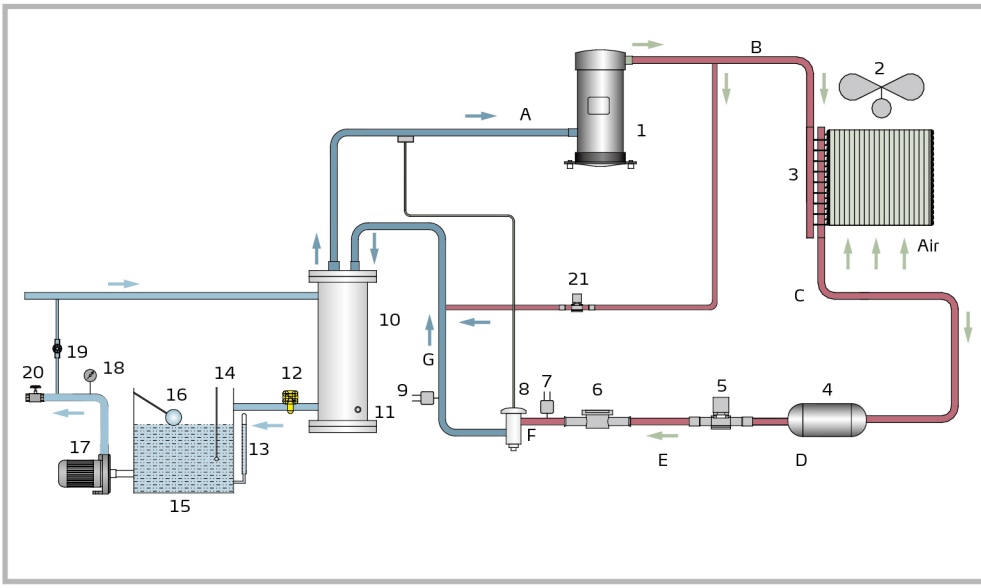
- For models optional with medium pressure pump, add "P" at the end of the model code, and for models optional with high pressure pump, add "HP" at the end of the model code.
- The level indicator in water tank is optional to check whether the water level is within normal range, and add "SG" at the end of the model code.
- The liquid pipe solenoid valve is optional to cut off the refrigerant supply to effectively prevent liquid hammer phenomenon after restart, and add "LS" at the end of the model code.
- Optionalrefigerant checks the refrigerant moisture content, and add "LSG" at the end of the model code.
- The flow switch is optional to ensure that the unit runs under sufficient water amount, and add "FW" at the end of the model code.

Application

SIC-A-R2 series are applicable for cooling moulds to reduce products molding cycle; also they are available in the cooling of equipments in order to maintain a normal temperature. Besides, they are suitable for other industries with the need of cooling.

Working Principle

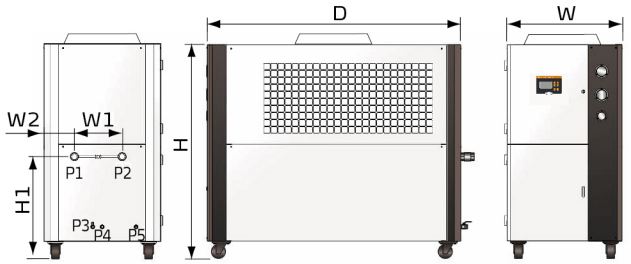
When SIC-A-R2 air-cooled water chiller starting-up, compressor starts working. Refrigerant is compressed into high temperature high pressure gas in the process form B to C, and then be cooled when passing through condenser and changed into liquid. Heat is taken away by the cooling air. In the process from C to D to E and F, liquid refrigerant is dried and filtered by the drier filter. After that, it passes through solenoid valve, level sensor and then reaches the expansion valve. In the process from F to G, the high pressure liquid refrigerant is throttled and depressurized by heat expansion valve and temperature goes down. In the process from G to A, chilled water absorbs the heat of process water in evaporator and returns back to the compressor. This heat exchange process repeats until process water is cooled down to requirement temperature.
Hot-gas bypass function: the compressor continues working when the process water is cooled down to required temperature, then the hot-air bypass valve opens as the temperature drops to its set value. A part of the refrigerant from compressor passes through by-pass valve and then reaches evaporator, balancing out part of the machine refrigerating capacity and then goes back to compressor without passing through condenser. With the help of hot-air bypass valve, system can stay in balanced condition and meanwhile can keep control accuracy within ±1℃/1.8°F.



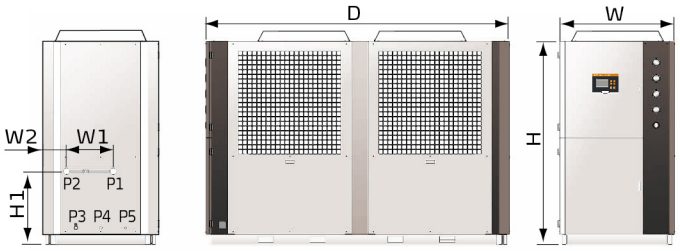
No.	Name	Remark
1	Compressor	
2	Fan	
3	Fin type condenser	
4	Drier filter	
5	Solenoid valve	Option
6	Refrigerant indicator	Option
7	High pressure switch	
8	Expansion valve	
9	Low pressure switch	
10	Evaporator	
11	Anti-freezing switch	
12	Flow switch	Option
13	Level sensor of water tank	Option
14	Temp.sensor	
15	Water tank	
16	Floating-ball valve	
17	Pump	
18	Water pressure guage	
19	By-pass valve	
20	Sluice valve	For medium and high pressure pumps
21	Hot-gas by-pass valve	

SIC-A-R2 Series

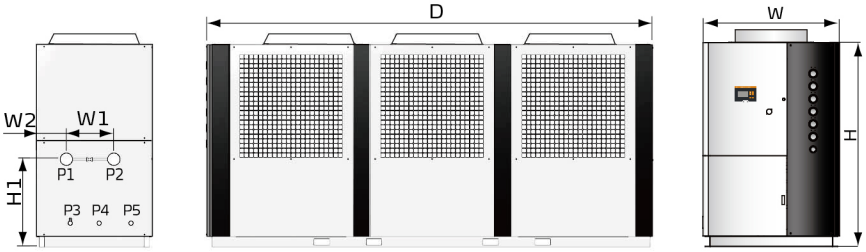
Outline Drawings



SIC-7.5A-R2~SIC-38A-R2



SIC-48A-R2~SIC-75A-R2

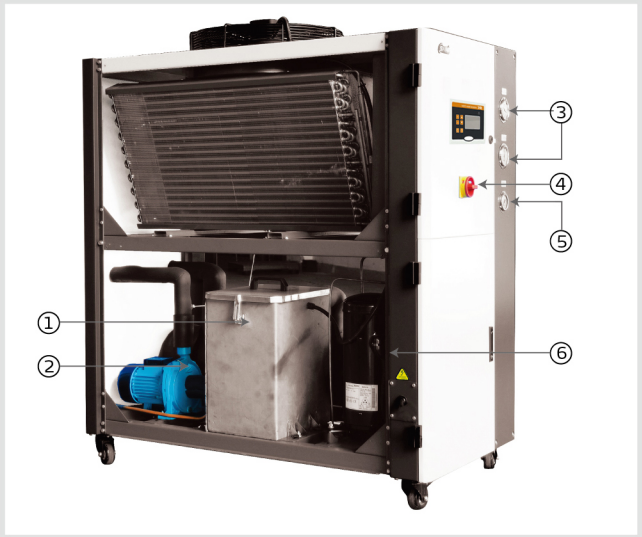


SIC-100A-R2~SIC-114A-R2

Outline Drawings

Model		SIC-7.5A-R2	SIC-12A-R2	SIC-18A-R2	SIC-24A-R2	SIC-28A-R2	SIC-38A-R2	SIC-48A-R2	SIC-58A-R2	SIC-75A-R2	SIC-100A-R2	SIC-114A-R2
H	mm	1200	1490	1430	1440	1560			1942			
	inch	47.2	58.7	56.3	56.7	61.4			76.5			
H1	mm	625	640			726		755			641	
	inch	24.6	25.2			28.6		29.7			25.2	
W	mm	685	735			905		1208			1300	
	inch	27	28.9			35.6		47.6			51.1	
W1	mm	277	360	300		390		400		418	800	900
	inch	10.9	14.1	11.8		15.4		15.7		16.5	31.5	35.4
W2	mm	200	174	204		223		257			243	255
	inch	7.9	6.9	8		8.8		10.1			9.6	10
D	mm	1190	1320	1610		1782		2922			3475	
	inch	46.9	52	63.4		70.2		115			136.8	
P1 (inch) Cooling Water Inlet		1		$1^{1}/_{2}$		2				$2^{1}/_{2}$		
P2 (inch) Cooling Water Outlet		1		$1^{1}/_{2}$		2				$2^{1}/_{2}$		
P3 (inch) Water Tank Outlet Port		1/2						1				
P4 (inch) Water Tank Overflow Port		1/2									1	
P5 (inch) Water Tank Refill Port		1/2									1	
Weight	kg	305	315	400	420	530	540	775	800	840	1400	1600
	lb	672	695	882	926	1,168	1,191	1,709	1,764	1,852	3,087	3,527

Structure of Air-cooled Models



① Stainless steel water tank for storage of circulating water.
② Large flow 3-phase pump ensures no blockage and high torque.
③ High/low pressure gauges to display system pressure.
④ Main power switch.
⑤ Pump pressure gauge to display pump pressure.
⑥ Scroll-type compressor(s) for super high efficiency and low noise.
⑦ Expansion valve for accurate adjustment of refrigerant flow.
⑧ Tube-fin condenser features quick heat transfer and heat radiation.
⑨ Shell-and-tube type evaporator ensures efficient cooling.
⑩ Powder coating coated frame and control box.

SIC-A-R2 Series

■ Specifications (50Hz)

Item \ Parameter \ Model SIC-			7.5A-R2	12A-R2	18A-R2	24A-R2	28A-R2	38A-R2	48A-R2	58A-R2	75A-R2	100A-R2	114A-R2
Refrigerant[1] Capacity	kW		7.5	12	18	24	28	38	48	58	75	100	114
Refrigerant[2] Capacity	kW		9.5	14	24	32	38	45	64	76	90	121	135
Compressor	Type		Scroll										
	Power(kW)		2.9	4.2	6.4	8.72	9.36	12.25	17.44	18.72	24.86	33.58	37.29
Refrigerant	Filling Volume	kg	3.5	5.0	5.5		9.0	12.5	7.5×2	8×2		7.8×2+6.8	8.7×3
		lb	7.7	11	12.1		19.8	27.6	16.5×2	17.6×2		17×2+15	19.2×3
	Control Mode		Thermostatic expansion valve										
	Type		R410A										
Evaporator	Type		Tube-in-shell style										
Condenser	Type		Fin style										
	Blower (kW)		0.19	0.55	2×0.23	2×0.385	2×0.6	2×0.78	2×1.03	2×0.85	2×1.92	2×2.2+1.5	3×2.2
Water Tank Capacity	L		30		65		80		186		230	316	
	gal		7.9		17.2		21.1		49.1		60.8	83.5	
Pump[4]	Power (kW)		0.75 / 0.75 / 1.1		1.1 / 1.1 / 1.1		1.1 / 1.5 / 2.2		- / 1.8 / 2.4		- / 3.0 / 4.0		-/4.0/5.5
	Pump Flow	L/min	21.5	34.4	51.6	68.8	80.3	108.9	137.6	166.3	215.0	286.7	326.8
		gal/min	5.7	9.0	13.6	18.2	21.2	28.8	36.4	43.9	56.8	75.7	86.3
	Working Pressure (kgf/cm²)[3]		3.3/3.7/4.5	3.2/3.5/4.4	2.8/4.1/4.9	2.7/3.85/4.5	3.1/3.9/4.9	2.4/3.8/4.6	-/3.4/4.5	-/3.2/4.3	-/3.5/4.1	-/3.1/3.9	-/3.7/4.9
Total Power (kW)[5]			3.8/3.8/4.2	5.5/5.5/5.9	7.8/7.8/7.8	10.6/10.6/10.6	11.7/12/12.8	14.9/15.3/16	-/21.3/21.9	-/22.2/22.8	-/31.7/32.7	-/42.5/43.5	-/47.9/49.4
Pipe Coupling (female thread)	Chilled Water Outlet		1"G		$1\frac{1}{2}$"G		2"G				$2\frac{1}{2}$"G		
	Chilled Water Inlet		1"G		$1\frac{1}{2}$"G		2"G				$2\frac{1}{2}$"G		
	Water Tank Drainage Port		1/2"G						1"G				
	Water Tank Overflow Port		1/2"G									1"G	
Protective Devices	Compressor		Overload relay										
	Pump		Overload relay										
	Cooling Water Circuit		High and low pressure switches/Anti-freeze switch										
	Water Circuit		Flow switch/Water level switch (Optional)/By-pass valve										
Operation Noise dB(A)			78	75	74	78	81	86	84	82	86	90	90
Power(VAC)[6]			3Φ, 400VAC, 50Hz										
Measures Exchange			1 kW = 860 kcal/hr 1 RT = 3,024 kcal/hr 10,000 Btu/hr = 2,520 kcal/hr										

Notes: 1) Refrigeration capacity 1 is based on the flow of 0.172m³/(h.k W), the chilled water outlet temperature of 7°C/44.6°F and the environment temperature of 35°C/95°F.

2) Refrigeration capacity 2 is based on the flow of 0.172m³/(h.k W), the chilled water outlet temperature of 15°C/59°F and the environment temperature of 25°C/77°F.

3) It is the working pressure of water pump when negative pressure of inlet water is 0.

4) Low pressure pump is standard, customers can change for medium pressure pumps (use P for short; e.g.: SIC-and A-R2-P) or high pressure pumps (use HP for short; e.g.: SIC-and A-R2-HP), specific parameters in turn as shown above.

5) Pump power is included in total power.

6) Special orders of machine voltage can be acceptable according to customers's request.

7) The air-cooled water chiller is applicable to the conditions under the environment temperature of 43℃.

Specifications (60Hz)

Item \ Parameter \ Model SIC-			12A-R2	24A-R2	28A-R2	38A-R2	48A-R2	58A-R2	75A-R2	100A-R2	114A-R2
Refrigerant[1] Capacity	kW		15	30	35.5	45	60	70	90	122	136
Refrigerant[2] Capacity	kW		17.5	37.5	41	48	75	82	96	133.5	144
Compressor	Type		Scroll								
	Power(kW)		5.28	10.2	11.73	14.8	20.4	23.76	29.6	39.8	44.4
Refrigerant	Filling Volume	kg	5.0	5.5	9.0	12.5	7.5×2	8×2		7.8×2+6.8	8.7×3
		lb	11	12.4	19.8	27.6	16.5×2	17.6×2		17.2×2+15	19.2×3
	Control Mode		Thermostatic expansion valve								
	Type		R410A								
Evaporator	Type		Plate style							Tube-in-shell style	
Condenser	Type		Fin style								
	Blower (kW)		0.91	2×0.57	2×0.91	2×1.1	2×2.2		2×2.2	2×2.2+2.2	3×2.2
Water Tank Capacity	L		50	85	150		180	200	270	400	
	gal		13.2	22.5	39.6		47.6	52.8	71.3	105.7	
Pump[4]	Power (kW)		0.75/1.5	1.1/1.5	2.2/3.0		3.0/3.0		5.5/5.5		
	Pump Flow	L/min	43.1	86.2	102	129.3	172.3	201.1	258.5	350.4	390.7
		gal/min	11.4	22.8	26.9	34.2	45.5	53.1	68.3	92.6	103.2
	Working Pressure (kgf/cm²)[3]		-/3.1/5.1	-/3.0/4.2	-/2.7/4.1	-/2.5/3.9	-/4.5/5.6	-/3.9/4.8	-/2.8/2.8	-/4.5/4.5	-/4.1/4.1
Total Power (kW)[5]			-/6.9/7.6	-/12.4/12.8	-/15.7/16.5	-/19.2/20	27.8	31.1	39.5	51.9	56.5
Pipe Coupling (female thread)	Chilled Water Outlet		1"G	1 1/2"G	2"G				2.5"G		
	Chilled Water Inlet		1"G	1 1/2"G	2"G				2.5"G		
	Water Tank Drainage Port		1/2"G				1"G				
	Water Tank Overflow Port		1/2"G							1"G	
Protective Devices	Compressor		Overload relay								
	Pump		Overload relay								
	Cooling Water Circuit		High and low pressure switches/Anti-freeze switch								
	Water Circuit		Flow switch/Water level switch (Optional)/By-pass valve								
Operation Noise dB(A)			75	78	81	86	84	82	86	90	90
Power(VAC)[6]			3Φ, 230/400/460/575VAC, 60Hz								
Measures Exchange			1 kW = 860 kcal/hr 1 RT = 3,024 kcal/hr 10,000 Btu/hr = 2,520 kcal/hr								

Notes:
1) Refrigeration capacity 1 is based on the flow of 0.172m³/(h.kW), the chilled water outlet temperature of 7℃/44.6°F and the environment temperature of 35℃/95°F.
2) Refrigeration capacity 2 is based on the flow of 0.172m³/(h.kW), the chilled water outlet temperature of 15℃/59°F and the environment temperature of 25℃/77°F.
3) It is the working pressure of water pump when negative pressure of inlet water is 0.
4) Low pressure pump is standard, customers can change for medium pressure pumps (use P for short; e.g.: SIC-and A-R2-P) or high pressure pumps (use HP for short; e.g.: SIC-and A-R2-HP), specific parameters in turn as shown above.
5) Pump power is included in total power.
6) Special orders of machine voltage can be acceptable according to customers's request.
7) The air-cooled water chiller is applicable to the conditions under the environment temperature of 43℃/109.5°F.