



## CFC-free Refrigerant Air-cooled Water Chiller

SIC-12A-R2

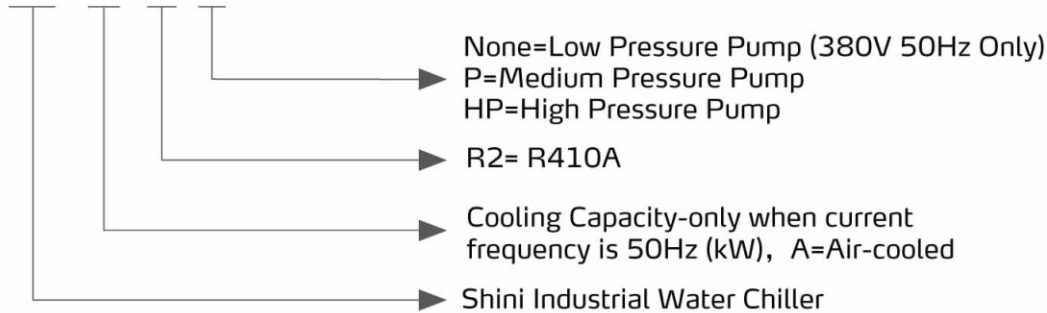


Refer carefully to this manual before operation.

# SIC-A-R2 Series

## ■ Coding Principle

SIC - xA - R2- xx



## ■ Features

- Cooling range 7~25°C/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  $\pm 1^{\circ}\text{C}/0.18^{\circ}\text{F}$ .
- Low pressure pump is standard configuration.
- All adopt quality compressors from major supplier.
- Adopt fin style condenser design. Without any need of cooling water for excellent heat transfer and rapid cooling.
- Equipped with RS485 communication interface to realize centralized monitoring.



Control Panel

## ■ Options

- Medium and high pressure pumps are optional to meet any requirements.
- Lever sensor of water tank is available to detect water level.
- Solenoid valve is optional to prevent compressor re-start and the liquid impact phenomenon by cutting the refrigerant immediately after downtime.
- Refrigerant indicator can be opted to detect the refrigerant and the water ratio.
- Optional flow switches to ensure compressor works in sufficient water quantity.

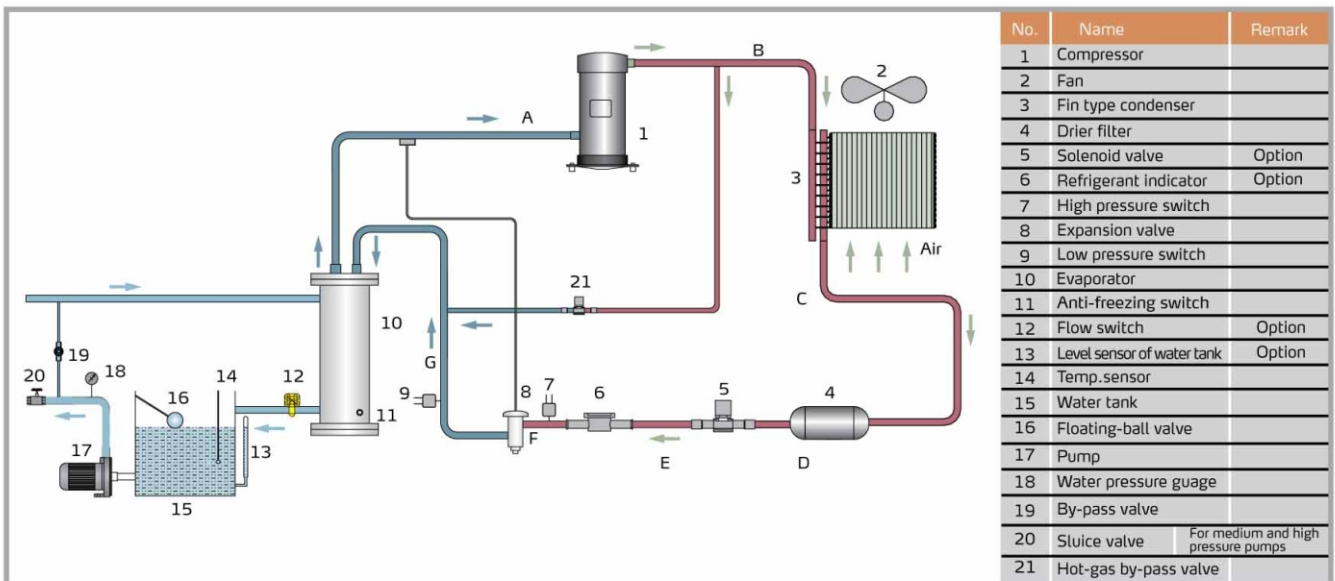
## Application

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

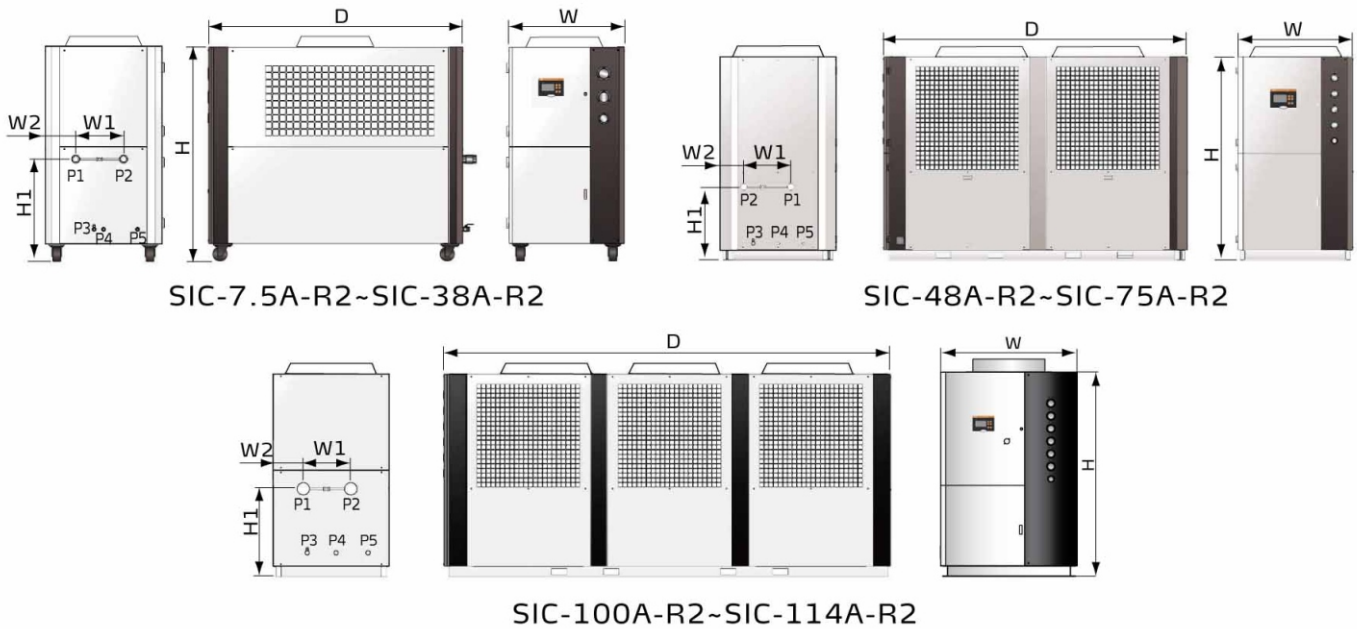
When SIC-A-R2 air-cooled water chiller starting-up, compressor starts working. Refrigerant is compressed into high temperature high pressure gas in the process from B to C, and then be cooled when passing through condenser and changed into liquid. Heat is taken away by the cooling air. In the process 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-air 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  $\pm 1^{\circ}\text{C}/1.8^{\circ}\text{F}$ .



# SIC-A-R2 Series

## Outline Drawings



## 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		1½				2		2½		
P2 (inch) Cooling Water Outlet		1		1½				2		2½		
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 Big 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	Model SIC-Parameter	7.5A-R2	12A-R2	18A-R2	24A-R2	28A-R2	38A-R2	48A-R2	58A-R2	75A-R2	100A-R2	114A-R2	
		Refrigerant <sup>1)</sup> Capacity	kW	7.5	12	18	24	28	38	48	58	75	100
Refrigerant <sup>2)</sup> 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 <sup>4)</sup>	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/cm <sup>2</sup> ) <sup>3)</sup>	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) <sup>5)</sup>		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 (inch)	Chilled Water Outlet	1		1 <sup>1</sup> / <sub>2</sub>				2				2 <sup>1</sup> / <sub>2</sub>	
	Chilled Water Inlet	1		1 <sup>1</sup> / <sub>2</sub>				2				2 <sup>1</sup> / <sub>2</sub>	
	Water Tank Drainage Port	1/2								1			
	Water Tank Overflow Port	1/2						1					
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) <sup>6)</sup>		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 0.172m<sup>3</sup>/(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 0.172m<sup>3</sup>/(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 for domestic and Southeast Asia export, 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°C.



## ■ Specifications (60Hz)

Item	Model Parameter	SIC-									
		12A-R2	24A-R2	28A-R2	38A-R2	48A-R2	58A-R2	75A-R2	100A-R2	114A-R2	
Refrigerant <sup>1)</sup> Capacity	kW	15	30	35.5	45	60	70	90	122	136	
Refrigerant <sup>2)</sup> 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 evaporator									
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 <sup>4)</sup>	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/cm <sup>2</sup> ) <sup>3)</sup>	-/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) <sup>5)</sup>	-/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 (inch)	Chilled Water Outlet	1	1 1/2	2			2.5				
	Chilled Water Inlet	1	1 1/2	2			2.5				
	Water Tank Drainage Port	1/2				1					
	Water Tank Overflow Port	1/2						1			
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) <sup>6)</sup>	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 0.172m<sup>3</sup>/(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 0.172m<sup>3</sup>/(h.k W), the chilled water outlet temperature of 20°C/68°F and the environment temperature of 30°C/86°F.  
3) It is the working pressure of water pump when negative pressure of inlet water is 0.  
4) Low pressure pump is for domestic and Southeast Asia export, 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°C/109.5°F.

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