



## CFC-free Refrigerant Water-cooled Water Chiller

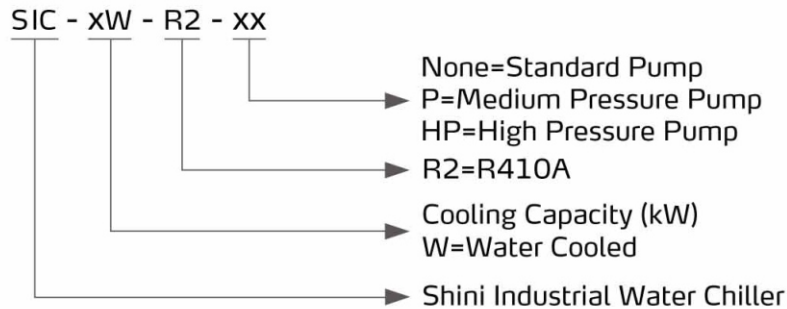
SIC-33W-R2



Refer carefully to this manual before operation.

# SIC-W-R2 Series

## ■ Coding Principle



## ■ Features

### Standard configuration

- Cooling range 7~25°C/44.6~77°F.
- Insulated water tank made of stainless steel.
- Equipped with anti-freeze thermostat.
- Adopt R410A refrigerant, used to improve coefficient of performance (COP) and R410A is ozone-friendly.
- Refrigeration loop controlled by high and low pressure switches to ensure stable operation.
- Compressor and pump overload protection.
- Adopts precise Italian temperature controller with an accuracy of  $\pm 1^{\circ}\text{C}/1.8^{\circ}\text{F}$ .
- All adopt quality compressors from major supplier.
- Middle Pressure Pump is optional.
- SIC-W-R2 adopts tube-in-shell condenser design. Without any need of cooling water for excellent heat transfer and rapid cooling.

### Accessory option

- Medium and high pressure pumps are optional to meet any pressure requirements.
- Water tank level sensor is available to detect whether the water level is normal.
- Hot-air bypass valve can be opted for with an accuracy of  $\pm 1^{\circ}\text{C}/1.8^{\circ}\text{F}$ .
- 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 ensure its quality and water ratio.
- Flow switches are optional to detect the chilled water.
- 1/2" water flow regulator SFR-400 is optional. (Only suitable for SIC-9W-R2 & SIC-14W-R2)



Control Panel

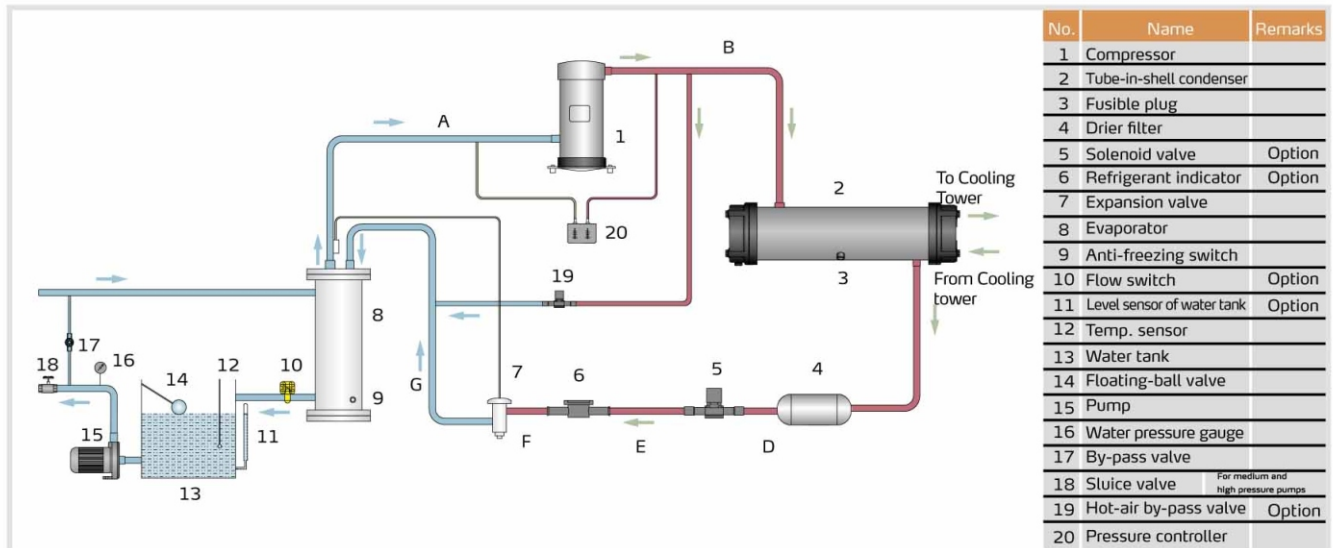
## Application

It is applied to plastics industry to precisely control moulds temperature so that molding cycle can be reduced and quality would be improved. Also SIC-W-R2 series can be applicable for electronic and machinery manufacturing to ensure normal operation temperature for devices.

## Working Principle

When the SIC-W water-cooled water chiller starting up, compressor starts working. Refrigerant is compressed into high temperature and high pressure gas in the process from B to C, and then be cooled when passing through the condenser and changed into liquid. Heat is taken away by the cooling water. In the process from C to D to E and F, the liquid refrigerant is dried and filtered by drier filter. After that, it will pass through solenoid valve, refrigerant indicator and then reach expansion valve. In the process from F to G, the high pressure liquid refrigerant will be throttled and depressurized by heat expansion valve and temperature will go down. In the process from G to A, chilled water absorbs the heat of process water in the evaporator and returns back to compressor. This heat exchange process repeats until process water is cooled down to required temperature.

Hot-air bypass function: the compressor continues working when 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 the compressor passes through the by-pass valve and then reaches evaporator, balancing out part of the machine refrigerating capacity and then goes back to compressor without passing through the condenser. With the help of hot-air bypass valve, the system can stay in an balanced condition and meanwhile can keep control accuracy within  $\pm 1^{\circ}\text{C}/1.8^{\circ}\text{F}$ .



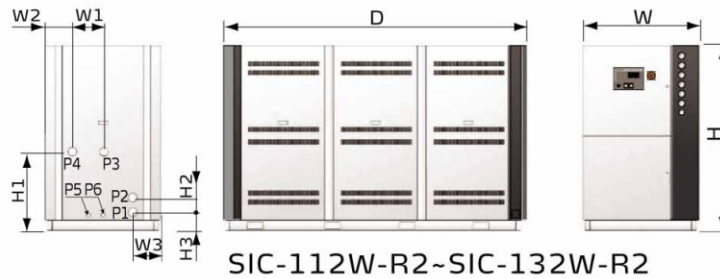
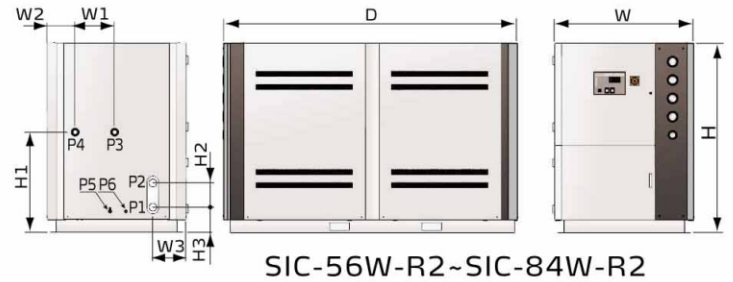
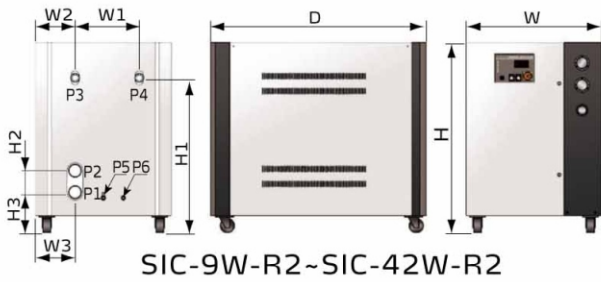
# SIC-W-R2 Series

## Structure of SIC-W



- ① Stainless steel water tank for storage of circulation water.
- ② Heavy-duty 3-phase pump ensures no blockages and high torque.
- ③ Scroll compressor(s) for super high efficiency and low noise.
- ④ Drier filter(behind compressor).
- ⑤ Main switch.
- ⑥ High/low pressure gauges.
- ⑦ Pump pressure gauge.
- ⑧ Powder coated frame.
- ⑨ Tube-in-shell evaporator ensures efficient cooling.
- ⑩ Tube-in-shell condenser design for quick heat transfer and excellent heat radiation.

## Outline Drawings







## Dimensions

| Item                               | Model | SIC-9W-R2 | SIC-14W-R2 | SIC-21W-R2 | SIC-28W-R2 | SIC-33W-R2 | SIC-42W-R2 | SIC-56W-R2 | SIC-66W-R2 | SIC-84W-R2 | SIC-112W-R2 | SIC-126W-R2 | SIC-132W-R2 |
|------------------------------------|-------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|
| H                                  | mm    | 970       |            | 1050       |            | 1200       |            | 1450       |            |            | 1760        |             |             |
|                                    | inch  | 38.2      |            | 41.3       |            | 47.2       |            | 57         |            |            | 69.3        |             |             |
| H1                                 | mm    | 790       |            | 910        |            | 1078       |            | 765        |            |            | 750         | 490         | 520         |
|                                    | inch  | 31.1      |            | 35.8       |            | 42.4       |            | 30.1       |            |            | 29.5        | 19.3        | 20.5        |
| H2                                 | mm    | 91        |            | 140        |            | 140        |            | 200        |            |            | 140         |             |             |
|                                    | inch  | 3.6       |            | 5.5        |            | 5.5        |            | 7.9        |            |            | 5.5         |             |             |
| H3                                 | mm    | 207       |            | 225        |            | 308        |            | 190        |            | 200        | 190         |             |             |
|                                    | inch  | 8.1       |            | 8.9        |            | 12.1       |            | 7.5        |            | 7.9        | 7.5         |             |             |
| W                                  | mm    | 605       |            | 830        |            | 865        |            | 1055       |            |            | 1100        |             |             |
|                                    | inch  | 23.8      |            | 32.7       |            | 34         |            | 41.5       |            |            | 43.3        |             |             |
| W1                                 | mm    | 273       |            | 370        |            | 459        |            | 300        |            |            | 300         |             | 205         |
|                                    | inch  | 10.7      |            | 14.6       |            | 18         |            | 11.8       |            |            | 11.8        |             | 8.0         |
| W2                                 | mm    | 164       |            | 230        |            | 202        |            | 295        |            | 215        | 260         | 230         | 325         |
|                                    | inch  | 6.5       |            | 9.0        |            | 8.0        |            | 11.6       |            | 8.5        | 10.2        | 9.0         | 12.8        |
| W3                                 | mm    | 164       |            | 230        |            | 162        |            | 205        |            |            | 267         | 250         | 505         |
|                                    | inch  | 6.5       |            | 9.0        |            | 6.4        |            | 8.0        |            |            | 10.5        | 9.8         | 19.9        |
| D                                  | mm    | 1080      |            | 1200       |            | 1470       |            | 2235       |            |            | 2870        | 3085        | 3285        |
|                                    | inch  | 42.5      |            | 47.2       |            | 57.9       |            | 88.0       |            |            | 113         | 121.5       | 129.3       |
| P1 (inch) Cooling Water Inlet      |       |           |            | 1½         |            |            |            | 2          |            | 2½         |             |             | 2×2½        |
| P2 (inch) Cooling Water Outlet     |       |           |            | 1½         |            |            |            | 2          |            | 2½         |             |             | 2×2½        |
| P3 (inch) Chilled Water Inlet      |       | 1         |            | 1½         |            |            |            | 2          |            | 2½         |             |             |             |
| P4 (inch) Chilled Water Outlet     |       | 1         |            | 1½         |            |            |            | 2          |            | 2½         |             |             |             |
| P5 (inch) Water Tank Drainage Port |       |           |            |            |            | 1/2        |            |            |            |            |             |             | 1           |
| P6 (inch) Water Tank Overflow Port |       |           |            |            |            | 1/2        |            |            |            |            |             |             | 1           |
| Weight                             | kg    | 210       | 240        | 330        | 340        | 430        | 495        | 750        | 760        | 800        | 1200        | 1450        | 1750        |
|                                    | lb    | 463       | 529        | 727.5      | 729        | 948        | 1,091      | 1,653      | 1,675      | 1,764      | 2,646       | 3,197       | 3,858       |

## Model Selection Reference

| Mould Clamping Force (T) | Moulding Capacity (kg/hr) | Model (kW) |
|--------------------------|---------------------------|------------|
| ≤250                     | ≤25                       | 6          |
| ≤450                     | ≤45                       | 11         |
| ≤650                     | ≤65                       | 14         |
| ≤850                     | ≤85                       | 18         |
| ≤1300                    | ≤130                      | 27         |
| ≤1800                    | ≤180                      | 38         |

| Mould Clamping Force (T) | Moulding Capacity (kg/hr) | Model (kW) |
|--------------------------|---------------------------|------------|
| ≤2500                    | ≤250                      | 52         |
| ≤3000                    | ≤300                      | 62         |
| ≤4000                    | ≤400                      | 84         |
| ≤5000                    | ≤500                      | 104        |
| ≤6000                    | ≤600                      | 126        |

# SIC-W Series

## Specifications

| Item                                    | Parameter                   | Model   | SIC-9W        | SIC-14W | SIC-21W     | SIC-28W              | SIC-33W     | SIC-42W | SIC-56W     | SIC-66W                       | SIC-84W     | SIC-112W | SIC-126W    | SIC-132W |
|---|-----------------------------|---|---------------|---------|-------------|----------------------|-------------|---------|-------------|-------------------------------|-------------|----------|-------------|----------|
|   |                             | -R2   | -R2           | -R2     | -R2         | -R2                  | -R2         | -R2     | -R2         | -R2                           | -R2         | -R2      | -R2         | -R2      |
| Refrigeration Capacity <sup>1)</sup>    | kW                          | 50Hz  | 9.0           | 14      | 21          | 28                   | 33          | 42      | 56          | 66                            | 84          | 112      | 126         | 132      |
|   |                             | 60Hz  | 10.8          | 16.8    | 25.2        | 33.6                 | 39.6        | 50.4    | 67.2        | 79.2                          | 100.8       | 134.4    | 151.2       | 158.4    |
|   | kcal/hr                     | 50Hz  | 7,740         | 12,040  | 18,060      | 24,080               | 28,380      | 36,120  | 48,160      | 56,760                        | 72,240      | 94,320   | 108,360     | 113,520  |
|   |                             | 60Hz  | 9,288         | 14,448  | 21,672      | 28,896               | 34,056      | 43,344  | 57,792      | 68,112                        | 86,688      | 115,584  | 130,032     | 136,224  |
| Compressor                              | Type                        | Scroll  |               |         |             |                      |             |         |             |                               |             |          |             |          |
|   | Power (kW)                  | 50Hz  | 2.5           | 3.55    | 5.5         | 7.35                 | 8.35        | 10.5    | 14.7        | 16.7                          | 21          | 28.35    | 31.5        | 33.4     |
|   |                             | 60Hz  | 3.2           | 4.5     | 6.4         | 8.5                  | 9.75        | 12.5    | 17          | 19.5                          | 25          | 33.5     | 37.5        | 39       |
| Refrigerant                             | Weight                      | kg  | 2.5           | 3.0     | 5.5         | 5.5                  | 9.8         | 8.7     | 10.8        | 16                            | 17.4        | 21.4     | 26.1        | 32       |
|   |                             | lb  | 5.5           | 6.6     | 12.1        | 12.1                 | 21.6        | 19.2    | 23.8        | 35.3                          | 38.4        | 47.2     | 57.5        | 70.5     |
|   | Control Mode                | Thermostatic expansion valve                        |               |         |             |                      |             |         |             |                               |             |          |             |          |
|   | Type                        | R410A   |               |         |             |                      |             |         |             |                               |             |          |             |          |
| Evaporator                              | Type                        | Tube-in-shell style                                 |               |         |             |                      |             |         |             |                               |             |          |             |          |
| Condenser                               | Type                        | Tube-in-shell style                                 |               |         |             |                      |             |         |             |                               |             |          |             |          |
|   | In/out Pipe (inch)          | 1½  |               |         |             | 2                    |             |         |             | 2½                            |             |          |             | 2×2½     |
|   |                             | Cooling Water Flow                                  | L/min         | 56      | 65          | 90                   | 100         | 130     | 160         | 220                           | 270         | 330      | 480         | 500      |
|   | gal/min                     |   | 14.8          | 17.2    | 23.8        | 26.4                 | 34.3        | 42.3    | 58.1        | 71.3                          | 87.1        | 126.8    | 132         | 158.5    |
| Water Tank                              | L                           | 40  |               | 70      |             | 80                   |             | 200     |             | 400                           |             |          |             |          |
|   | gal                         | 10.6  |               | 18.5    |             | 21.1                 |             | 52.8    |             | 105.7                         |             |          |             |          |
| Pump <sup>2)</sup>                      | Power (kW)                  | 50Hz  | 0.75/0.75/1.1 |         | 1.1/1.1/1.1 |                      | 1.1/1.5/2.2 |         | 2.2/1.8/2.4 |                               | 2.2/3.0/4.0 |          | 2.2/4.0/5.5 |          |
|   |                             | 60Hz  | 0.75/0.75/1.1 |         | 1.1/1.1/1.5 |                      | 2.2         |         | 3           |                               | 5           |          |             |          |
|   | Pump Flow                   | L/min   | 40            |         | 80          |                      | 120         |         | 190         |                               | 320         |          | 378         |          |
|   |                             | gal/min   | 10.6          |         | 21.1        |                      | 31.7        |         | 52          |                               | 84.5        |          | 99.9        |          |
| Working Pressure (kgf/cm <sup>2</sup> ) | 2.5/3.5/4.4                 |   | 2.5/3.3/4.1   |         | 2.2/3.5/4.4 |                      | 2.2/3.1/4.4 |         | 2.3/3.0/4.0 |                               | 2.2/3.2/4.3 |          |             |          |
| Total Power (kW)                        | 50Hz                        | 3.25  | 4.3           | 6.61    | 8.45        | 9.45                 | 11.6        | 16.9    | 18.9        | 23.2                          | 30.55       | 32.7     | 35.6        |          |
|   | 60Hz                        | 3.15  | 5.6           | 7.22    | 9.21        | 11.39                | 14.6        | 19.22   | 21.38       | 30.3                          | 38.41       | 42.7     | 42.26       |          |
| Pipe Coupling (inch)                    | Chilled Water Outlet        | 1×1   |               | 1½×1    |             | 2×1                  |             | 2½×1    |             | 2½×1                          |             |          |             |          |
|   | Chilled Water Inlet         | 1×1   |               | 1½×1    |             | 2×1                  |             | 2½×1    |             | 2½×1                          |             |          |             |          |
|   | Drainage Port Of Water Tank |   |               |         |             | 1/2                  |             |         |             | 1                             |             |          |             |          |
|   | Overflow Port Of Water Tank |   |               |         |             | 1/2                  |             |         |             | 1                             |             |          |             |          |
| Protective Device                       | Compressor                  | Overload relay                                      |               |         |             |                      |             |         |             |                               |             |          |             |          |
|   | Pump                        | Overload relay                                      |               |         |             |                      |             |         |             |                               |             |          |             |          |
|   | Refrigerant Circuit         | High and low pressure switches/Anti-freezing switch |               |         |             |                      |             |         |             |                               |             |          |             |          |
|   | Cooling water Circuit       | By-pass valve/Water level switch (Option)           |               |         |             |                      |             |         |             |                               |             |          |             |          |
| Operation Noise dB(A)                   |                             | 69  | 70.5          | 70.4    | 72.5        | 71.4                 | 74          | 75.5    | 73.3        | 78.5                          | 81.4        | 79.6     | 86.5        |          |
| Power                                   |                             | 3Φ, 230 / 400 / 460 / 575VAC, 50 / 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 is measured based on the flow 0.172 m<sup>3</sup> / (h·k W) and the outlet temperature (7°C/44.6°F) of chilled water under the environment temperature of 35°C/95°F.

2) This pump is used as standard either for domestic or Southeast Asia; medium (Model denotes "P", such as SIC-9W-R2-P) or high pressure pump (Model denotes "HP", such as SIC-9W-R2-P) are optional for installation on customer's demands.

3) Pump power is included in total power.

We reserve the right to change specifications without prior notice.

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