WATER CHILLERS WITH SINGLE SCREW COMPRESSOR
ZUW-B FLOODED SERIES

2014 NEW PRODUCT
Daikin Central Air Conditioning Co., Ltd., one of the water chiller developing pioneers in Japan, has nearly 100 years history. Developing the high-performance semi-hermetic single-screw compressor to begin with in 1978, Daikin has become a leading single-screw compressor manufacturer in the world with the aim to satisfy every user’s need and try its best to create highly comfortable air conditioning environment.

Daikin takes the lead in terms of market share of single-screw compressors in Japan which are sold more than 60,000 units in the world. High-performance products together with the targeted and professional proposing-style sales method make Daikin central air conditioners widely used in various fields, including special ones involving hospitals and wine brewing, etc.

Through nearly 100 years of experiences and reliable refrigerant technology with efficient single screw compressor by highly intelligent control. Daikin achieves efficient, reliable performance and longer service life. Daikin provides enough satisfaction to customers.

The overall unit manufacturing base (Daikin Central Air Conditioning Co., Ltd in Huizhou), is supported by the Suzhou compressor plant and Changshu Fluorine chemistry plant (both Daikin correlate), has powerful production capacity and R&D capacities of chiller and the capacity for manufacturing key components. Thus making product quality get more guarantee.

The Central Air Conditioning After-Sales service Centre working closely with sales offices and factories can dispatch the service personnel to the work site within 24 hours, thus ensuring various problems can be solved timely. And the centre has a large number of after-sales service talents adhering to the quality principle of “Keep Improving”, who can provide more professional service.
「Giving careful thought to important parts such as compressor, heat exchanger and expansion valve, our chiller acquires superb performance and reliability」

Semi-hermetic single-screw compressor

- **High accuracy and long service life**
  The upper part pressure and lower part pressure of the screw do eliminating eccentric effect and balancing the load. The high-accuracy bearing used in the orthogonal screw structure, boasts a service life twice more than that of the bearing in a twin-screw compressor, effectively extending the maintenance interval of the chiller to 40,000 hours.

**Working mechanism of a single-screw compressor**

1. **Suction**
   Refrigerant is sucked into the screw rotor groove through the suction pipe, and when the screw rotor rotates, one tooth of the gate rotor engages with the groove, shutting the suction gas inlet.

2. **Compression**
   Compression strokes take place in the compression space formed by the screw rotor groove and gate rotor tooth. When the compression space decreases during the rotor rotation, the refrigerant inside is compressed and the pressure rises to the discharge level.

3. **Discharge**
   The pressure in the compression space reaches the discharge level. Compressed gas is discharged from upper discharge port.
- **Low noise and low vibration**
  The high-performance gate rotors mesh smoothly, minimizing shock and vibration, realizing stable running. Besides, two rotors are mounted symmetrically to make pressure balanced, thus significantly suppressing noise and vibration.

- **High-efficiency operation**
  Every rotation cycle consists of 12 compressions. Compared with traditional twin-screw compressors, almost no energy loss occurs to the semi-hermetic single-screw compressor, thanks to absence of gas mixing-up between the high pressure side and low pressure side. What's more, the gate rotor is made from high molecular material, reducing leakage loss by improving tightness, thus substantially enhancing the full-load and part-load efficiency.

---

**Electronic expansion valve**

- The electronic expansion valve adjusts delicately according to change of compressor load, thus achieving high-efficiency operation status.
- Adopting electronic valve to control refrigerant, thus the chiller runs more smoothly and stably.

---

**Flooded type evaporator**

By calculating and analyzing refrigerant flow in the evaporator, redesigned the suction distributing plate, make the refrigerant flow control in a more appropriate level. At the same time, adopting the special shape heat exchange pipe which can enhance the refrigerant boiling. With these achieving high performance and minimum size successfully.
Brand new product with good performance

Brand-new product perfectly match to customers’ demands

- The whole series adopts environmental refrigerant R134a featuring no harm to the ozone layer, which can actively respond to the environmental needs.
- Equipped with continuous capacity control compressor, the whole series can conduct continuative energy regulation within a range of 25% to 100%, thus achieving high-precision water temperature control.

Excellent control system

- New PLC controller (monitoring running parameter by digital color monitor)
- The special developed new type PLC controller is adopted to expand unit monitoring and control function.
- Equipped with various digital sensors which can collect all the unit operation parameter.

Abundant expansion and option functions.
- Unit reserve diversified control expansion functions, RS485 communication interface, Modbus, Bacnet, Lonworks protocol.
- Unit adopt standard Y-Δ starting method, it is able to select soft starter or frequency transformer to achieve soft starter functions to perfectly match to customers’ demands.

Diversified control system functions

- Various operation mode settings are available for meeting users’ various needs.
  - Operation system selection
  - Inlet/outlet water temperature control selection
  - Forced load operation setting
  - Remote / Local control selection
  - Cooling water pump interlock and forced operation selection
  - Chilled water pump interlock and forced operation selection
  - Energy-saving operation mode setting
  - Cold accumulation/duo-temperature setting selection
  - Achieving time switch to control unit, no need to watch over...
[ Diversified protection functions and Powerful control systems ]

- Various automatic protection devices ensure safety of unit operation. (When protection devices trip, malfunction causes and abnormal operation parameters will be displayed directly in the control panel.)
  - Protections of reverse phase, open phase and voltage imbalance for 3-phase power supply
  - Protections of current imbalance and overcurrent
  - Compressor motor overheat protection
  - High/Low pressure protection
  - Compressor positioner error protection
  - Protections of compressor suction/discharge superheat degree abnormity
  - Freeze-up protections of chilled water and freeze-up pressure protections of refrigerant system
  - Protections of pump interlock and water flow switch abnormity
  - Protections of temperature, pressure and current sensors abnormities

- LCD control panel displays operation parameters of unit.
  - Cooling water and chilled water inlet/outlet temperature
  - Suction/Discharge, condensing and evaporating temperatures of refrigerant system
  - Condensing and evaporating pressures of refrigerant system
  - Compressor load and electronic expansion valve opening
  - 3-phase operating current value
  - Current operation time and accumulated operating time of system, start frequency and start waiting time.

- Abnormality-shunning operation functions
  - Forced operation of water pump during unit stop for anti-freezing in winter.

- Large size color LCD touch screen, so easy to operate

  **Operation monitoring**
  The unit operation basic parameters, detailed parameters, input/output and temperature curve

  **Temperature setting**
  Setting the unit operation control model and water temperature

  **Login/Exit**
  By user’s password make login/exit to control panel.

  **System information**
  Use for seeing the supplier and related unit information

  **Record of alarm information**
  Use for checking the details and history record of unit abnormal condition

  **Operation setting**
  Setting the operation method, parameters and other related control setting

(Language is available in English, Chinese)
### Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>ZUW100/BSSY</th>
<th>ZUW120/BSSY</th>
<th>ZUW150/BSSY</th>
<th>ZUW175/BSSY</th>
<th>ZUW200/BSSY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling Capacity (30Hz/380V) kW</td>
<td>103.8</td>
<td>129.1</td>
<td>156.4</td>
<td>184.9</td>
<td>199.4</td>
</tr>
<tr>
<td>kcal/h</td>
<td>365</td>
<td>454</td>
<td>530</td>
<td>550</td>
<td>701</td>
</tr>
<tr>
<td>Power Consumption kW</td>
<td>66.2</td>
<td>82.6</td>
<td>95.2</td>
<td>111.5</td>
<td>120.7</td>
</tr>
<tr>
<td>COP</td>
<td>5.51</td>
<td>5.50</td>
<td>5.78</td>
<td>5.83</td>
<td>5.81</td>
</tr>
<tr>
<td>Chiller Water (50Hz) m³/h</td>
<td>62.8</td>
<td>78.1</td>
<td>94.6</td>
<td>111.8</td>
<td>120.6</td>
</tr>
<tr>
<td>l/min</td>
<td>1046</td>
<td>1301</td>
<td>1577</td>
<td>1883</td>
<td>2010</td>
</tr>
<tr>
<td>Condenser Water (50Hz) m³/h</td>
<td>78.5</td>
<td>97.6</td>
<td>118.3</td>
<td>139.8</td>
<td>150.7</td>
</tr>
<tr>
<td>l/min</td>
<td>1308</td>
<td>1637</td>
<td>1971</td>
<td>2329</td>
<td>2512</td>
</tr>
<tr>
<td>Dimensions (L x W x H) mm</td>
<td>3570 x 1170 x 1710</td>
<td>3500 x 1380 x 1820</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Semi-hermetically Sealed Single Screw Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condenser</td>
<td>Shell</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starting Method</td>
<td>Star-delta Starting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity Control %</td>
<td>120-100% Continuous Capacity Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressor</td>
<td>Carbon Steel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity x Model</td>
<td>CF4530-E100 x 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Flooded</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity x Model</td>
<td>WF5530-B100 x 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R134a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Circuit</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Electronic Expansion Valve</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Control System</td>
<td>MICRO TECH III Program Controller, LCD Display</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety Devices</td>
<td>Main Circuit Fuse, Phase Monitor, reverse-phase protection, High/Low Pressure Protector, Over-Current-Sensor (Comp.), Overheat Protector (Comp.), Freeze-up protector thermostat, Overheat Sensor for Discharge Gas, Chilled water interrupt latency, Safety Valve</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe OD</td>
<td>Chilled Water Inlet/Outlet</td>
<td>Φ140</td>
<td>Φ168</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation Material</td>
<td>NBR/PVC Polyethylene Foam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine Weight kg</td>
<td>3650</td>
<td>3160</td>
<td>3380</td>
<td>3630</td>
<td>4330</td>
</tr>
<tr>
<td>Operation Weight kg</td>
<td>3250</td>
<td>3380</td>
<td>3610</td>
<td>3910</td>
<td>4530</td>
</tr>
<tr>
<td>Evaporator Water Volume</td>
<td>1700</td>
<td>2200</td>
<td>2300</td>
<td>2800</td>
<td>3000</td>
</tr>
</tbody>
</table>

1. Cooling capacity is based on the following conditions:
   - Chilled water outlet temperature: 7°C; Chilled water flow rate 0.172m³/h (kW)
   - Condenser water inlet temperature: 30°C; Condenser water flow rate 0.215m³/h (kW)
2. Evaporator side fouling factor 0.018m²°C (kW); Condenser side fouling factor 0.041m²°C (kW)
4. In the scope of AHRI vapour compression cycle water-cooled chiller certification, the performance parameters of AHRI certificate can be obtained via manufacturer.
5. Low-Temperature Running: Chiller chilled water outlet temperature can reach the hightest 4°C, the lowest -8°C low temperature running. In this condition, chiller need to adopt ethylene glycol solution as refrigerating medium, please contact the manufacturer to select the low temperature condition parameters. Low temperature chiller named after the standard chiller name with “Z”.

Page 6/14
## Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>ZW240B1S</th>
<th>ZW280B1S</th>
<th>ZW300B1S</th>
<th>ZW360B1S</th>
<th>ZW400B1S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling Capacity (50Hz/380V)</td>
<td>kW</td>
<td>kW</td>
<td>kW</td>
<td>kW</td>
<td>kW</td>
</tr>
<tr>
<td>USPF</td>
<td>247.4</td>
<td>290.1</td>
<td>327.1</td>
<td>358.3</td>
<td>412.4</td>
</tr>
<tr>
<td>kcal/h</td>
<td>859.4</td>
<td>1030.8</td>
<td>1150.8</td>
<td>1260.8</td>
<td>1450.8</td>
</tr>
<tr>
<td>Power Consumption kW</td>
<td>158.2</td>
<td>174.4</td>
<td>196.6</td>
<td>212.8</td>
<td>248.7</td>
</tr>
<tr>
<td>CFP</td>
<td>8.50</td>
<td>8.85</td>
<td>8.85</td>
<td>8.92</td>
<td>8.83</td>
</tr>
<tr>
<td>Casing/Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chiller Water (50Hz) l/min</td>
<td>2949.4</td>
<td>3297.1</td>
<td>3642.1</td>
<td>4157.1</td>
<td></td>
</tr>
<tr>
<td>Condenser Water (50Hz) l/min</td>
<td>3118.7</td>
<td>3655.9</td>
<td>4121.9</td>
<td>4715.9</td>
<td></td>
</tr>
<tr>
<td>Dimensions (L×W×H) mm</td>
<td>3850×1400×1860</td>
<td>4110×1820×2230</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condenser Type</td>
<td>Semi-hermetically Sealed Single Screw Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>ZHA2W2G2Y+2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starting Method</td>
<td>Star-delta Starting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity Control</td>
<td>35-100% Continuous Capacity Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condenser Type</td>
<td>Shell</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R134a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Circuit</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Control System</td>
<td>MICRO TECH III Program Controller, LCD Display</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety Devices</td>
<td>Main Circuit Fuse, Phase Monitor, reverse-phase protection, High/Low Pressure Protector, Under/Over Current Sensor (Comp.), Overheat Protector, Freezing Protection Thermostat, Overheat Sensor for Discharge Gas, Chilled water interrupt latency, Safety Valve</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe</td>
<td>φ168</td>
<td>φ219</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe Of</td>
<td>φ168</td>
<td>φ219</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation Material</td>
<td>NBR/PVC Polyethylene Foam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine Weight</td>
<td>5280</td>
<td>6650</td>
<td>6410</td>
<td>6800</td>
<td>6920</td>
</tr>
<tr>
<td>Operation Weight</td>
<td>2680</td>
<td>2770</td>
<td>2850</td>
<td>3420</td>
<td>3610</td>
</tr>
<tr>
<td>Evaporator Water Volume L</td>
<td>30</td>
<td>42</td>
<td>44</td>
<td>62</td>
<td>69</td>
</tr>
</tbody>
</table>

1. Cooling capacity is based on the following conditions: Chilled water outlet temperature: 7°C; Chilled water flow rate 0.172m³/h kW
   Condenser water inlet temperature: 30°C; Condenser water flow rate 0.215m³/h kW
2. Evaporator side fouling factor 0.018m²·℃/KW; Condenser side fouling factor 0.048m²·℃/KW.
3. Power supply: Spharm380V, 50Hz; Standard Star-delta Starting.
4. In the scope of AHRI vapour compression cycle water-cooled chiller certification, the performance parameters of AHRI certificate can be obtained via manufacturer.
5. Low-Temperature Running: Chiller chilled water outlet temperature can reach the highest 4°C, the lowest -8°C low temperature running. In this condition, chiller need to adopt ethylene glycol solution as refrigerating medium, please contact the manufacturer to select the low temperature condition parameters. Low temperature chiller name after the standard chiller name with "Z".
Dimensions

**ZUW100, 120BS5Y(Z)**

- Dimensions:
  - ZUW100: 1200 x 1200 x 1200 mm
  - 120BS5Y(Z): 1100 x 1100 x 1200 mm

Please ensure above maintenance space.

**ZUW150, 175, 200BS5Y(Z)**

- Dimensions:
  - ZUW150: 1200 x 1200 x 1200 mm
  - 175BS5Y(Z): 1100 x 1100 x 1200 mm
  - 200BS5Y(Z): 1100 x 1100 x 1200 mm

Please ensure above maintenance space.

Bulkin will not provide the connect pipe flange which is used for the condenser water and chilled water to connect the pipe (Refrigerant medium).

Flange size is based on HG20592-97, PL-L08F.
### Dimensions

**ZUW240BT5Y(Z)**

- Dimensions
  - ZUW240BT5Y(Z)
  - ZUW280, 300, 350, 400BT5Y(Z)

Diagram showing dimensions for ZUW240BT5Y(Z) and ZUW280, 300, 350, 400BT5Y(Z).

Please ensure above maintenance space

Installed Base

---

**ZUW280, 300, 350, 400BT5Y(Z)**

Diagram showing dimensions for ZUW280, 300, 350, 400BT5Y(Z).

Please ensure above maintenance space

Installed Base
### Operation Limits

#### ZUW100, 120SB5Y, ZUW240BT5Y

- **Chilled Water Outlet Temperature (°C)**
  - Standard Type
  - Low Temperature Type

#### ZUW150, 175, 200BS5Y, ZUW280, 300, 350, 400BT5Y

- **Chilled Water Outlet Temperature (°C)**
  - Standard Type
  - Low Temperature Type

#### Minimum Water Volume

<table>
<thead>
<tr>
<th>Model</th>
<th>Min. volume (L)</th>
<th>Evap. volume (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZUW100B**</td>
<td>2616</td>
<td>106</td>
</tr>
<tr>
<td>ZUW120B**</td>
<td>3254</td>
<td>116</td>
</tr>
<tr>
<td>ZUW240B**</td>
<td>6235</td>
<td>163</td>
</tr>
</tbody>
</table>

#### Water Volume Limits (Units: L/min)

<table>
<thead>
<tr>
<th>Model</th>
<th>Cond. Water</th>
<th>Chilled Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZUW100B**</td>
<td>710~1960</td>
<td>710~1990</td>
</tr>
<tr>
<td>ZUW120B**</td>
<td>710~1960</td>
<td>710~1990</td>
</tr>
<tr>
<td>ZUW240B**</td>
<td>1469~4130</td>
<td>1270~3200</td>
</tr>
</tbody>
</table>

**Note:**

- **Recommended continuous operation area**
- **Temperature drop phase**
### External Power Supply Wiring Diagram

**NOTE:**

1. Above cable parameters are only for reference. As concern about the cable setting method, cable selection and the other factors, when the user field wiring, user should according to project actual situation and related electrical standard to count.
2. When the volatility of the distribution voltage is large (＞±2), user should select the suitable cable specification.
■ Internal Control Wiring Diagram

- **Chiller Side**
  - TAB
  - Remote control connector
  - Operation cold storage
  - Load control operation
  - 2 Temperature operation
  - Chilled pump inter lock
  - Chilled water water relay
  - Condenser pump inter lock
  - Condenser water water relay
  - Operation signal output
  - Abnormal signal output
  - Chilled pump signal output
  - Condenser pump signal output

- **User Side**
## Foundation

1. Please use the foundation bolt for burying to base.
2. Please keep the smoothness and evenness of foundation surface.
3. The levelness is under 2mm based on 1000mm.
4. Please set drainage ditch around the foundation.
5. Fixing bolt base and bolt accessory are not included in the equipment (factory will not provide).
6. Please prepare an adequate measure to deal with possible tension caused by ground shake.
7. The reference values under the design condition of 0.05 horizontal and 0.05 vertical.
8. Fix bolt: J type. M24 should be buried deep 300 mm and it need 4. (User should prepare)

### Table: Chiller Model Specifications

<table>
<thead>
<tr>
<th>Chiller Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZWR100/105/6~</td>
<td>1020</td>
<td>1215</td>
<td>1870</td>
<td>530</td>
<td>2800</td>
<td>500</td>
<td>3800</td>
<td>350</td>
<td>500</td>
</tr>
<tr>
<td>ZWR150/175/6~</td>
<td>1420</td>
<td>1735</td>
<td>2230</td>
<td>590</td>
<td>2800</td>
<td>500</td>
<td>3800</td>
<td>350</td>
<td>500</td>
</tr>
<tr>
<td>ZWR200/205/6~</td>
<td>1920</td>
<td>2230</td>
<td>2730</td>
<td>590</td>
<td>2800</td>
<td>500</td>
<td>3800</td>
<td>350</td>
<td>500</td>
</tr>
<tr>
<td>ZWR260/300/400/405~</td>
<td>2520</td>
<td>2830</td>
<td>3330</td>
<td>690</td>
<td>3400</td>
<td>600</td>
<td>4600</td>
<td>450</td>
<td>600</td>
</tr>
</tbody>
</table>

### Notes:
- Fixing bolt and bolt accessory are not included in the equipment. (Factory will not provide.)
- Please prepare as an adequate measure to deal with possible tension caused by ground shake.
- The dimensions of fixing bolt base provides in the following chart are the reference values under the design condition of 0.05 horizontal and 0.05 vertical.
- Fix bolt: J type. M24 should be buried deep 300 mm and it needs 4. (User should prepare)
**Warning**

- Daikin Air-Conditioning(Shanghai)CO., LTD Huizhou Factory’s products are manufactured for export to numerous countries throughout the world. Daikin Huizhou Factory does not have control over which products are exported to and used in a particular country. Prior to purchase, please therefore confirm with your local authorized importer, distributor and/or retailer whether this product conforms to the applicable standards, and is suitable for use, in the region where the product will be used. This statement does not purport to exclude, restrict or modify the application of any local legislation.

- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.

- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorized parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.

- Read the User’s Manual carefully before using this product. The User’s Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings. If you have any enquiries, please contact your local importer, distributor or retailer.