

Air Source Heat pump

Heat Pump for Heating and Cooling

- Applicable to model: DLN-050TA1

Packing List

| No. | Description | Quantity | Remark |
|-----|--------------------|----------|--------|
| 1 | Instruction manual | 1 | |
| 2 | Controller | 1 | |
| 3 | Controller Wire | 1 | |
| 4 | Heat pump | 1 | |
| | | | |
| | | | |

Notice

- ◆ In order to install the heat pump unit correctly, please read this manual carefully.
- ◆ The heat pump unit must be installed by professional and technical personnel.
- ◆ When installing our company's products, you must operate strictly in accordance with this manual.
- ◆ Due to the rapid development of our products, the contents of this manual are subject to change without notice.
- ◆ This product must use a copper core power cord that meets the required wire diameter for independent power supply, and the unit needs to have a reliable grounding wire; if the wiring does not meet the requirements, the unit cannot work normally, the company is not responsible for this.

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Accessories

1. Packing list

| No. | Description | Quantity | Remark |
|-----|--------------------|----------|--------|
| 1 | Instruction Manual | 1 | |
| 2 | Controller | 1 | |
| 3 | Controller wire | 1 | |
| 4 | Heat pump | 1 | |

2. Each unit requires the user to purchase at least the following optional items in order to be used normally

| No. | Name of Accessories | Quantity | Unit | Purpose | Remarks |
|-----|------------------------|----------|------|---|---------|
| 1 | Buffer tank | 1 | A | System energy storage to prevent frequent start and stop units, protect units | |
| 2 | Circulating water pump | 1 | A | Use it for heating | |
| 3 | Flow switch | 1 | A | Protective Heat Pump Unit | |
| 4 | Water filter | 1 | A | Filter water pipe impurities | |

Note: In addition to the above materials, pipeline equipment such as water pipes and gate valves are also required. The specifications and quantities of the specific equipment are determined by the actual situation of the project. The installation of auxiliary electric heating must be guided by a professional

Warning

1. Applicable power supply voltage: 380V/3N~/50Hz;

2. Applicable ambient temperature:

Heating: -30°C~25°C;

Refrigeration: 16°C~45°C.

Note: When the unit is used beyond the above range, protective shutdown or standby failure may occur.

The startup state is normal.

3. Applicable water inlet temperature: the lowest water inlet temperature is 9°C, and the highest water outlet temperature is 50°C;

4. Always communicate with the manufacturer when used outside the above range;

5. Unit antifreeze: when the unit is running at an ambient temperature below 2°C, the unit will automatically

Enter antifreeze protection:

1) In the standby state, the compressor or circulating water pump of the unit will automatically : Operation is normal;

2) If the unit is out of power for more than 15 minutes (the time is minus -5°C

The lower the temperature, the shorter the time), please set the unit at the lowest end of the unit

The water in the inlet and circulating water pump pipes is drained cleanly to prevent the unit from freezing.

Affect.

□ Please entrust a professional to install it. Installation by other personnel may cause imperfect installation, which may cause unit operation failure, water leakage, electric shock or fire.

□ Confirm whether the grounding is correct. If the grounding is not perfect, it may cause electric shock.

□ When installed in a small room, certain measures should be taken to maintain smooth ventilation to prevent the leakage of refrigerant from exceeding the limit concentration and causing suffocation.

□ Do not put fingers, sticks, etc. into the air outlet or air inlet. Because the internal wind wheel rotates at high speed, it may cause injury.

□ When an abnormality (burnt smell) occurs, the manual power switch should be cut off immediately, stop the operation, and get in touch with the manufacturer's after-sales service department. If the abnormal operation continues, it may cause electric shock or fire.

□ When the unit needs to be moved and reinstalled, please entrust the manufacturer's after-sales service department or professionals to implement it. If the installation is not perfect, it may cause unit operation failure, electric shock, fire, injury, water leakage and other accidents.

□ Never modify it by yourself, otherwise it may easily cause electric shock or fire.

□ When repairs are needed, please entrust the manufacturer's after-sales service department or professionals to implement it. If repaired improperly, it may cause electric shock, fire, injury, water leakage and other accidents.

□ It cannot be installed in a place where flammable gas is easy to leak. Once the flammable gas leaks, a fire may occur around the unit.

□ Confirm whether the long-term use and installation foundation is firm. If the foundation is not strong, a fall and injury accident may occur.

□ Determine whether a leakage protection switch is installed. If the leakage protection switch is not installed, it may cause electric shock or fire.

□ When cleaning the unit, shut down and cut off the power switch.

Working principle

1. Working principle of heat pump

- The low-pressure superheated refrigerant vapor from the evaporator is sucked and compressed into high-temperature and high-pressure superheated vapor by the compressor.
- The superheated steam is discharged into the condenser to exchange heat with water. The refrigerant is condensed (exothermic process) into a saturated or supercooled high temperature and high pressure refrigerant liquid. The hot water unit absorbs the heat released by the condensation of the refrigerant through water. And raise the water temperature.
- The refrigerant liquid is throttled and depressurized by the expansion valve and becomes a low-temperature and low-pressure refrigerant liquid.
- The refrigerant liquid flows into the evaporator, where it absorbs the heat of the surrounding air and vaporizes into a low-pressure superheated refrigerant vapor. According to the above-mentioned cycle of the refrigerant, the water flowing through the condenser is continuously heated, and the temperature of the water rises, thereby realizing the production of hot water.

2. Working diagram of heat pump

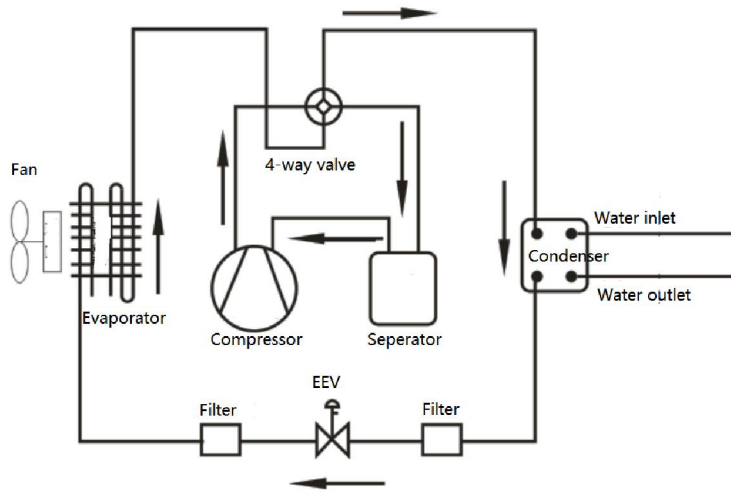
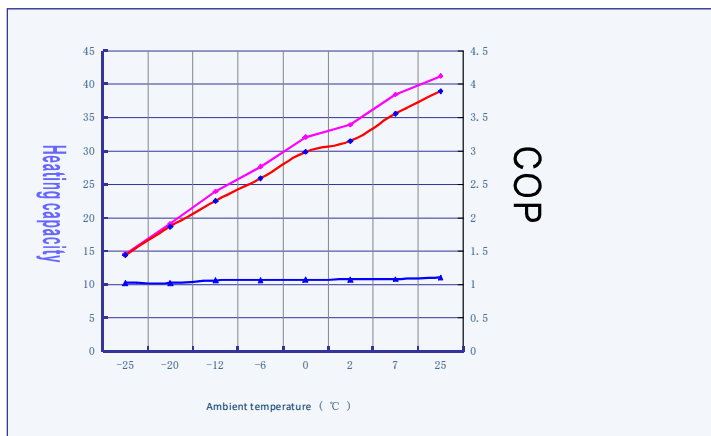


Figure 1. Schematic diagram of heat pump work

3. Heating capacity and COP curve



- When the ambient temperature is $-25^{\circ}\text{C}\sim 0^{\circ}\text{C}$, the energy efficiency will decrease. In addition, please pay attention to the antifreeze of the water pipe of the unit.

After-sales service

The after-sales service of the company's products is implemented in accordance with relevant national regulations. Within the warranty period, under reasonable use, if you find that the machine does not operate normally, please contact our company's business office near your place for free repairs.

The user must appoint a special person to manage and use the unit reasonably and correctly in accordance with the provisions of our company's "Instruction Manual". Accidents caused by improper use do not belong to the scope of our company's warranty, and the repair costs and repair costs beyond the warranty period must be borne by the user.

1. After-sales service

- ◆ Maintenance and repair should be done by the seller. Improper maintenance or repair may cause water leakage, electric shock and fire.
- ◆ When it must be moved and reinstalled, please ask the seller to do it. Improper installation may cause water leakage, electric shock and fire.
- ◆ When you need to provide after-sales service, please contact the seller and provide the following details:
 - ◆ Please refer to the warranty card for the factory number and installation date.
 - ◆ Detailed description of the fault.
 - ◆ Your name, address and contact number.
 - ◆ The company will charge a certain service fee if after-sales service is required for failures caused by the warranty period or improper use.

2. Maintenance

- ◆ After a period of use, due to the accumulation of dust in the machine, the performance of the hot water machine will be reduced, so maintenance is required.
- ◆ In addition to daily maintenance and maintenance by yourself, it is recommended that you sign a maintenance contract with us.
- ◆ For details of this professional service, please contact the seller.

3. Inquiry

- ◆ For after-sales service, please contact the seller or the company's after-sales service department.

Installation

1. Installation note

- ◆ Avoid installing in places with mineral oil
- ◆ Avoid installing in places where the air contains more corrosive gases such as salt and sulfur gas.
- ◆ Avoid installing in places where the power supply voltage fluctuates severely.
- ◆ Avoid installing in unstable and weak places such as cars and cabins.
- ◆ Avoid installing near flammable and explosive materials.
- ◆ Avoid installing in places with strong electromagnetic waves.
- ◆ Avoid installation in other special harsh environmental conditions.

2. Installation check

- ◆ Confirm the model, number, name, etc., to avoid incorrect installation.
- ◆ Whether the installation and maintenance space is sufficient.
- ◆ Whether the air inlet and outlet are barrier-free and dry and ventilated.
- ◆ Whether the weight on the supporting surface meets the requirements.
- ◆ Please select the power supply, power supply capacity, and wire diameter in accordance with the electrical installation requirements.
- ◆ Electrical installation must comply with the relevant technical standards for electrical equipment, and electrical insulation must be done.
- ◆ The unit must be energized for at least 8 hours for operation and debugging.

3. Installation space

- ◆ When installing, leave the maintenance space shown in the figure below before installing the unit.

There should be no obstacles 2000mm above the unit, and the side of the water pipe of the unit can be appropriately enlarged according to the actual situation.

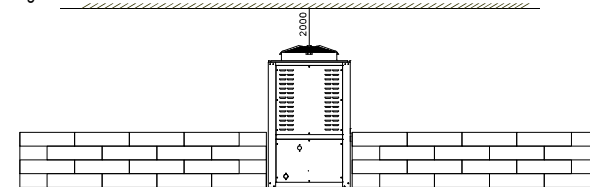


Figure 3. Obstacle distance in the vertical direction

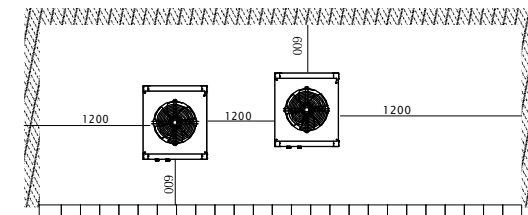


Figure 4. Distance of obstacles in the horizontal direction

Hoisting and preserving foundation

- (1) Please use more than 4 soft lifting belts to hoist the handling unit. (Refer to Figure 7)
 - (2) In order to avoid scratches and deformation on the surface of the unit, please add a protect the surface of the unit during hoisting and transportation.
 - (3) Before the final hoisting installation, the foundation needs to be checked again to prevent wrong with the actual object.
 - (4) The unit has a lot of condensed water. Please consider installing a shock absorber between channel and the foundation around the foundation.
- When installing, each unit reserves the foundation according to the following outline drawi Figure 6)

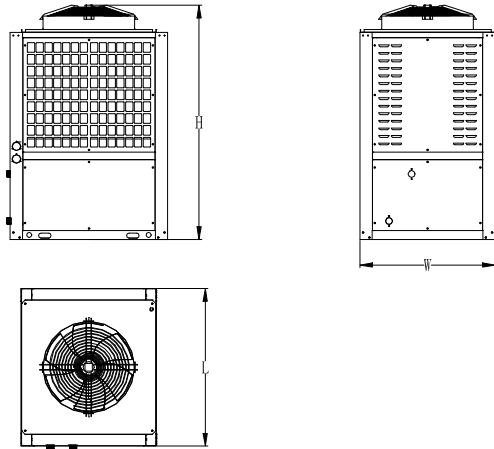


Figure 5. Overall dimensions of the unit

| Model | size (mm) | L(Length) | W(Width) | H(Height) |
|------------|-----------|-----------|----------|-----------|
| DLN-050TA1 | | 1250 | 1076 | 1870 |

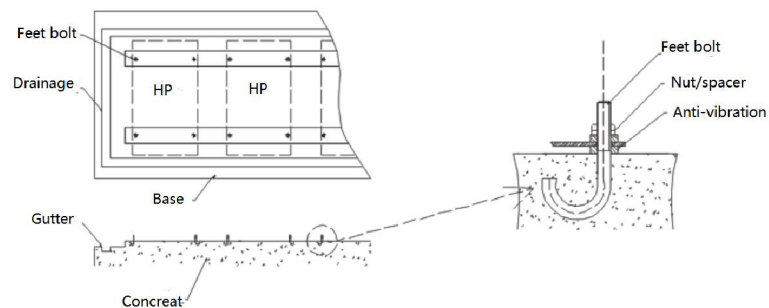


Figure 6. Schematic diagram of reserved foundation

| Specification | | |
|--|------------------------|-------|
| Model | DLN-050TA1 | |
| Heating (kW) | ℃7/6(DB/WB) | 39 |
| | -12/-14℃(DB/WB); | 24 |
| Heating consumption power (kW) | ℃7/6(DB/WB) | 10.95 |
| | -12/-14℃(DB/WB); | 10.67 |
| Nominal refrigerating capacity (kW) | 30 | |
| Rated Refrigeration Consumption Power (kW) | 11.95 | |
| Type of refrigerant and charge | R410A/6.3kg | |
| Heating method | Water cycle heating | |
| Power Supply Specifications | 380V/3N ~ Hz 50 | |
| Air outlet | Top outlet | |
| Type of condenser | Coaxial Heat Exchanger | |
| rated water flow (m ³ /h) | 8 | |
| effluent temperature (℃) | 41 | |
| Maximum effluent temperature (℃) | 50 | |
| Outdoor unit dimensions (mm) | x1076x1870 1250 | |
| Feed pipe diameter (DN) | 40 | |
| Diameter of outlet pipe (DN) | 40 | |
| Type of compressor | Scroll Type | |
| Noise (dB (A)) | ≤65 | |
| Applicable ambient temperature (℃) | -30~45 | |
| Unit weight (kg) | 450 | |
| Description: | | |
| Test conditions: the heating performance parameters of the unit are measured at the rated flow rate of the unit, the effluent temperature is 41℃, and the refrigeration performance parameters are measured at the rated flow rate and the effluent temperature is 7℃. | | |
| (2) If the product is upgraded and the specifications are changed without prior notice, the nameplate shall prevail. | | |
| (3) The above are the test parameters of a single unit, and the heating capacity, power, water flow and weight of the module combination are multiplied by the corresponding number of modules. | | |

Trouble Shooting

| Failure | Possible causes | Detection and exclusion methods |
|---|---|--|
| Excessive exhaust pressure | 1/ There is air or other non condensable gas in the water system; 2/ Water side heat exchanger scale serious or dirty plugging; 3/ Insufficient circulating water flow; 4/ Excess refrigerant charge; 5/ Fluorine/water system (expansion valve) dirty plugging | 1/ Remove gas from the water side heat exchanger; 2/ Clean water side heat exchanger; 3. Check water system piping and pumps; 4/ Release of some refrigerant; 5. Determine the location of the dirty plug, clean or replace the appropriate accessories |
| Low exhaust pressure | 1/ Inadequate refrigerant charge; 2/ Low suction pressure; 3/ Liquid refrigerant enters the compressor directly from the evaporator. | 1/ refrigerant charge; 2/ See "low suction pressure"; 3. Check and adjust the expansion valve, and the thermal expansion valve shall ensure that the temperature-sensing package and suction tube are in close contact and insulated from the outside world. |
| Excessive suction pressure | 1/ Excessive refrigerant charge; 2/ Four-way valve gas channeling; 3/ Poor compressor compression, The liquid refrigerant flows into the compressor from the evaporator. | 1/ Release part of refrigerant; 2/ Replacement of four-way valves; 3/ Replacement of compressors, Check and adjust the expansion valve, and the thermal expansion valve shall ensure that the temperature sensing package and suction tube are in close contact and insulated from the outside world. |
| Low suction pressure | 1/ Inadequate refrigerant charge; 2/ Expansion valve failure; 3/1 valve damage; 4/ System refrigerant leakage. | 1/ refrigerant charge; 2/ Replacement of expansion valves; 3/ Replacement of four-way valves; Check the leak and refill the refrigerant. |
| Compressor high pressure protection shutdown | 1/ The compressor exhaust pressure is too high; 2/ The set water temperature of the unit exceeds the allowable value; 3/ High pressure open damage. | 1/ See "Excessive exhaust pressure"; The set water temperature of the unit is adjusted to the allowable value; 3/ Replacement of high voltage switches; |
| Compressor protection against current overload | 1/ The compressor exhaust pressure is too high; 2/ Insufficient or excessive supply voltage; 3/ Current transformer damage; 4/ Compressor motor or terminal short circuit; 5/ Motor current setting protection value setting error. | 1/ See "Excessive exhaust pressure"; 2/ The voltage shall not exceed or be below the rated voltage for 15 operations, 3/ Replacement of current transformers; 4/ Replacement of compressors; Adjust the current to set the protection value. |
| Compressor shutdown due to built-in temp. controller action | 1/ The motor is too high or too low; 2/ Excessive exhaust pressure leads to motor overload; 3/ Insufficient refrigerant leads to excessive exhaust temperature. | 1/ The voltage shall not exceed or be less than 15 per cent of the rated voltage; 2/ See "High exhaust pressure"; 3/ See "low suction pressure"; |
| Compressor shutdown for low pressure protection | 1/ Filter clogging; 2/ Expansion valve blockage or failure; 3/ System suction pressure is too low; 4/ Low voltage switch malfunction. | 1/ Check, repair or replace filters; 2/ Adjust or replace expansion valves; 3/ See "low suction pressure"; Check system pressure and replace low voltage switch as appropriate |
| Compressor noise too big | 1/ Excess liquid refrigerant flows into the compressor from the evaporator and the compressor liquid hammer causes the compressor noise to increase; 2. Impurities flow into the compressor, 3/ Compressor lubrication is poor. | 1/ Check system superheat setting and bypass valve temperature setting, check and adjust or replace expansion valve; 2/ Replacement of compressors, Add lubricating oil or replace compressor. |
| Compressor can not start | 1/ overcurrent relay jumps off, insurance burns out; 2/ The control circuit is not switched on; 3/ contactor coil burnt out; 4/ Compressor damage. | 1/ Control circuit set in manual, after maintenance restart compressor; 2. Check the control system; 3/ Replacement of contactors; 4/ Replace compressor. |

Pipe installation

1. Installation note

- ◆ Try not to allow dust and other debris to enter the piping system.
- ◆ The unit must be secured before the water pipes can be installed.
- ◆ The inlet and outlet pipes must be sealed with thermal insulation materials.
- ◆ The pipeline ensures a certain flow rate of water, and try to avoid excessive throttling.
- ◆ Do not hook the inlet and outlet pipes during transportation, only the mounting holes of the base beam can be hooked. (Refer to Figure 7)
- ◆ When connecting the inlet and outlet pipes, two pipe wrenches must be used to clamp the two parts of the pipe to be connected to ensure that the unit, The inlet and outlet pipes do not rotate.

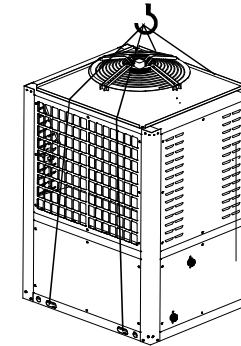


Figure 7. Schematic diagram of hoisting

(Refer to Figure 8)

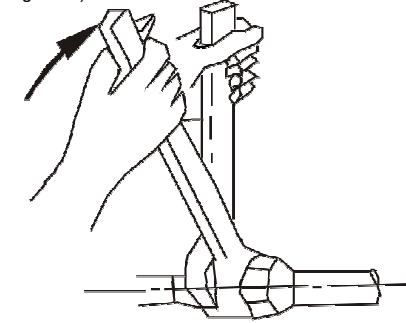
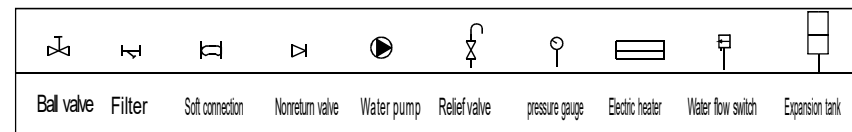


Figure 8. Schematic diagram of water pipe installation

2. Installation diagram

Illustration

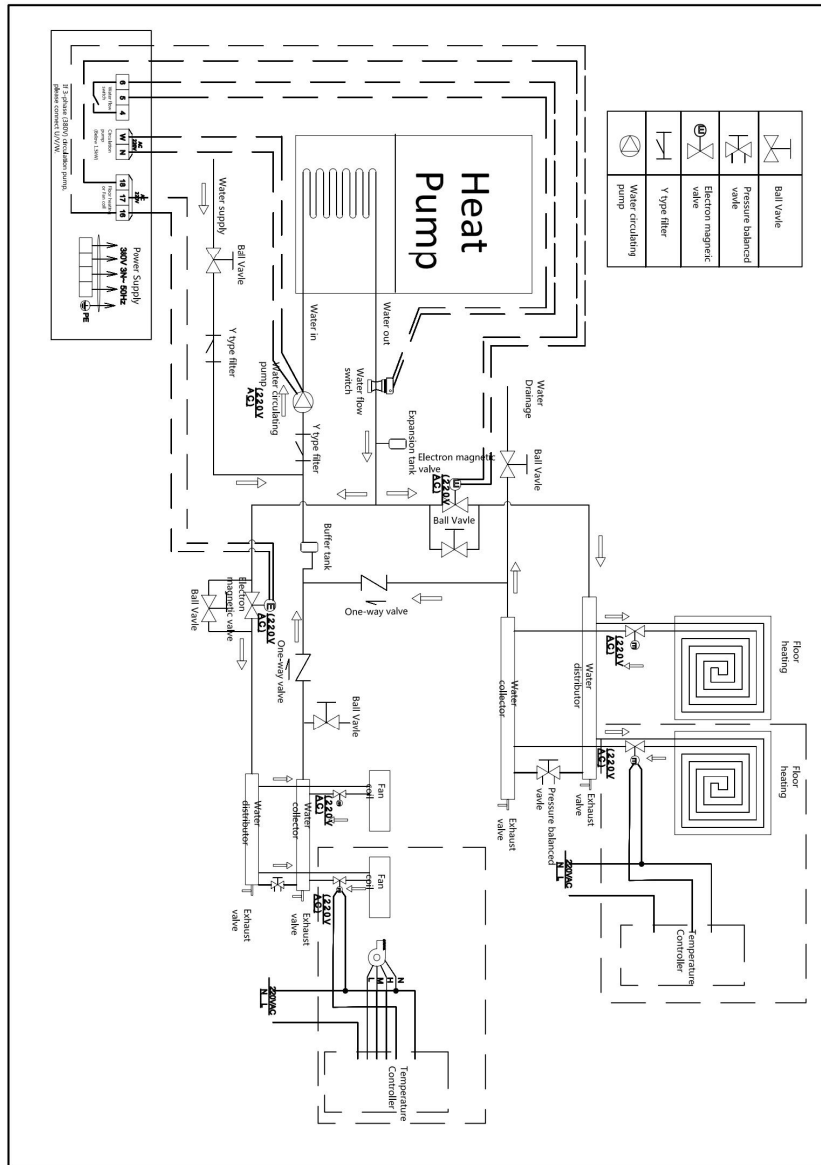


3. Selection of main pipe diameter of multiple units in parallel

Example (recommended value):

| | |
|--------------------------|--------------|
| Inlet/outlet: DLN-050TA1 | 1 PCS: DN50 |
| Inlet/outlet: DLN-050TA1 | 2 PCS: DN65 |
| Inlet/outlet: DLN-050TA1 | 3 PCS: DN80 |
| Inlet/outlet: DLN-050TA1 | 4 PCS: DN100 |
| Inlet/outlet: DLN-050TA1 | 5 PCS: DN100 |

■Engineering installation diagram



Error code list

| Fault code | Fault Description | Action description |
|------------|---|--|
| Er 01 | Fault phase fault | Stop the whole machine protection, need power off reset |
| Er 02 | Missing phase fault | Stop the whole machine protection, need power off reset |
| Er 03 | External flow fault | Stop the whole machine protection; cycle start pump 2 failures lock |
| Er 05 | High voltage fault 1 | Stop press 1; power off reset after 3 lockouts |
| Er 06 | Low voltage fault 1 | Stop press 1; power off reset after 3 lockouts |
| Er 09 | Communications fault | No shutdown, the unit continues to operate according to the final test parameters |
| Er 10 | Internal flow fault | Stop internal circulating pump protection; cycle start pump 2 failures lock |
| Er 11 | Time-limited protection | Stop the whole machine to protect; |
| Er 12 | Excessive exhaust protection 1 | Stop press 1; power off reset after 3 lockouts |
| Er 15 | Water temperature failure | Stop the machine protection; the corresponding antifreeze condition is cancelled, the fault is reset automatically |
| Er 16 | External coil temperature failure 1 | No shutdown, electronic expansion valve 1 fixed opening control |
| Er 18 | Exhaust temperature fault 1 | Stop press 1; power off reset after 3 lockouts |
| Er 20 | Indoor temperature failure | Switching of internal circulating pump to periodic control; automatic fault reset |
| Er 21 | Environmental temperature fault | No downtime, corresponding anti-freezing conditions cancelled, automatic fault reset |
| Er 23 | Underwater temperature protection | Stop press, fan; automatic fault reset |
| Er 25 | Water level switch fault | Automatic reset of fault |
| Er 27 | Outlet temperature fault | Stop the whole machine protection; the corresponding antifreeze condition is cancelled, the fault is reset automatically |
| Er 28 | Backwater temperature fault | The corresponding backwater function is cancelled and the fault is reset automatically |
| Er 29 | Gas return temperature fault 1 | No shutdown, electronic expansion valve 1 fixed opening control |
| Er 32 | Excessive protection of effluent temperature | Stop press, fan; automatic fault reset |
| Er 35 | Press Current Protection 1 | Stop press 1; power off reset after 3 lockouts |
| Er 44 | Protection against excessive temperature in heating environment | Automatic fault reset |
| Er 45 | Chassis Electric Heating Protection | Power-heating protection for stop-down disc; automatic fault reset |
| Er 46 | Auxiliary electric heating protection | Stop auxiliary electric heating protection; automatic fault reset |

1. Routine Maintenance

- For control and protection equipment, do not arbitrarily adjust the set point in the field.
- Pay close attention to whether the various operating parameters of the system are normal during operation.
- Regularly check whether the electrical wiring is loose or not, and fasten it in time if there is any.
- Regularly check the reliability of electrical components, and promptly replace failed and unreliable components.
- After long-term operation, calcium oxide or other minerals will be deposited on the surface of the heat exchange copper tube of the water heat exchanger. When these minerals deposit more on the heat transfer surface, they will affect the heat transfer performance and lead to increased power consumption, increased exhaust pressure and intake. As the pressure drops, the amount of hot water per unit system decreases. It can be cleaned with organic acids such as formic acid, citric acid and acetic acid.
- The dust on the surface of the evaporator fins should be blown regularly (usually once a month) with compressor air greater than 0.6MPa, brushed with fine copper wire or flushed with pressurized water. If there is too much dirt, use a paint brush with a strong detergent to clean it.
- After a long period of shutdown, when starting the unit, the following preparations should be made: thoroughly inspect and clean the unit, clean the water piping system, check the water pump, and tighten all line joints.
- Replacement parts must use our company's original parts, and can't just use other company's similar parts for replacement.

2. Refrigerant charge

- Check the charging of the refrigeration system by checking the suction and discharge pressure of the liquid pipeline. If there is a leak or replace the components in the refrigeration cycle system, air tightness inspection must be carried out.

3. Leak detection and air tightness test

- When conducting leak detection and air tightness tests, never fill the refrigeration system with oxygen, acetylene and other flammable and toxic gases. Only compressed air, nitrogen or refrigerants can be used in this type of test.

4. Follow the steps below to disassemble the compressor

- Turn off the power supply of the unit.
- Drain the refrigerant in the system from the low-pressure end, and pay attention to reducing the discharge rate to prevent the leakage of refrigerant oil.
- Remove the compressor suction and exhaust pipes.
- Remove the compressor power cable.
- Remove the compressor fixing bolts.
- Remove the compressor.

5. Perform regular maintenance according to ensure that the unit is operating in good condition

- Fire prevention: If a fire occurs, turn off the main power switch immediately and extinguish it with a fire extinguisher.
- Prevent flammable gas: The working environment of the unit should be kept away from flammable materials such as gasoline and alcohol to prevent explosion accidents.
- Trouble: If the unit is shut down due to a failure, the cause of the failure should be found out and re-started after troubleshooting. Do not force the unit to start up without troubleshooting. If refrigerant leaks or chilled water leaks, turn off all switches. If the unit cannot be shut down by the control switch, turn off the main power switch.
- Don't short-circuit the circuit that needs protection device, otherwise it will not be able to protect normally and damage the unit when a fault occurs.

- Before selecting the diameter of the unit, the pressure and flow rate of the water pipe must be calculated, and the pressure drop of the pipe section can be selected from 0.3 to 0.5kgf/cm².
- (3 ~ 5m head), the main pipe flow velocity can be selected in the range of 1.2 ~ 2.5m/s. (Refer to the table below)
- After the selection of the main water pipe is completed, hydraulic calculation must be carried out. If the resistance of the water side pipe is greater than the selected pump head,
- You must re-select a larger water pump, or increase the main water pipe by a model.

| Water flow recommended value (m / s) | | | | |
|--|-----------|-----------|-----------|-----------|
| Pipe diameter (m m) | 15 | 20 | 25 | 32 |
| Pressurized system (m / s) | 0.4 ~ 0.5 | 0.5 ~ 0.6 | 0.6 ~ 0.7 | 0.7 ~ 0.9 |
| Unpressurized system (m / s) | 0.3 ~ 0.4 | 0.4 ~ 0.5 | 0.5 ~ 0.6 | 0.6 ~ 0.8 |
| Pipe diameter (m m) | 40 | 50 | 65 | 80 |
| Pressurized system (m / s) | 0.8 ~ 1.0 | 0.9 ~ 1.2 | 1.1 ~ 1.4 | 1.2 ~ 1.6 |
| Unpressurized system (m / s) | 0.7 ~ 0.9 | 0.8 ~ 1.0 | 0.9 ~ 1.2 | 1.1 ~ 1.4 |
| Pipe diameter (m m) | 100 | 125 | 150 | 200 |
| Pressurized system (m / s) | 1.3 ~ 1.8 | 1.5 ~ 2.0 | 1.6 ~ 2.2 | 1.8 ~ 2.5 |
| Unpressurized system (m / s) | 1.2 ~ 1.6 | 1.4 ~ 1.8 | 1.5 ~ 2.0 | 1.6 ~ 2.3 |
| Pipe diameter (m m) | 250 | 300 | 350 | 400 |
| Pressurized system (m / s) | 1.8 ~ 2.6 | 1.9 ~ 2.6 | 1.6 ~ 2.6 | 1.8 ~ 2.6 |
| Unpressurized system (m / s) | 1.7 ~ 2.4 | 1.7 ~ 2.4 | 1.6 ~ 2.1 | 1.8 ~ 2.3 |

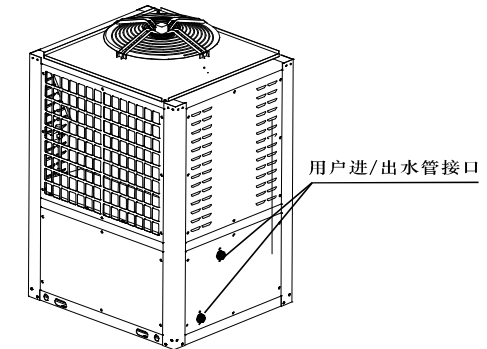


Figure 9. Schematic diagram of inlet/outlet pipe interface

◆ 4. Water Quality Control

- ◆ When the water quality is not good, more deposits such as scale and sand will be produced. Therefore, the water must be filtered and softened with water softening equipment before flowing into the water system.
- ◆ The water quality should be analyzed before the unit is used, such as PH value, conductivity, chloride ion concentration, sulfide ion concentration, etc. The following are the water quality standards applicable to this unit:

| | | | | | |
|---------|----------|-----------------------|------|---------|------|
| PH | Hardness | Electric conductivity | S | Cl | NH3 |
| 7-8.5 | < 50ppm | < 200μw/cm(25℃) | none | < 50ppm | none |
| SO4 | Si | Fe | Na | Ca | |
| < 50ppm | < 30ppm | < 0.3ppm | none | < 50ppm | |

Wiring and Controller

1. Wiring

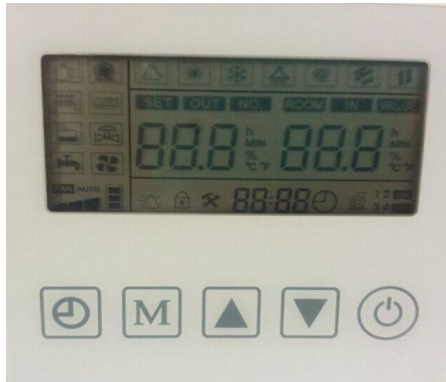
- ◆ The unit should use a dedicated power supply, and the power supply voltage must conform to the rated voltage.
- ◆ The power supply circuit of the unit must have a ground wire, and the power ground wire must be reliably connected to the external ground wire, and the external ground is effective.
- ◆ The user's incoming power supply must be equipped with a leakage protection switch.
- ◆ Wiring construction must be carried out by a professional installation technician in accordance with the circuit diagram.
- ◆ The arrangement of power cables and signal cables should be neat and reasonable, and they should not interfere with each other, and they should not be in contact with connecting pipes and valve bodies.
- ◆ If the user needs to provide the power cord by himself, please use the copper core power cord. The diameter of the copper core power cord should not be less than the following specifications; if the user's power distribution capacity is insufficient or the power cord (copper core wire) is not configured as required, the unit cannot start normally or The company is not responsible for the operation.

| Model | Power cable (3 phases with 5 cores wire) |
|------------|--|
| DLN-050TA1 | 3*10mm ² + 2*6mm ² |

2. Controller instruction

(1) Interface

○: "ON/OFF" button; ⊖: "Timer" button; M: Menu button; ▲: UP button; ▼: DOWN button



(2) Turn on and turn off

In the main interface, press the "On/Off" button for 5 seconds in the unlocked state, and it will turn on immediately when it is turned off, otherwise, it will turn off.

(3) Set temperature adjustment

a. When the mechanism is hot, the inlet water temperature can be adjusted, and the required heating temperature can be adjusted by pressing the ▲ and ▼ keys on the main interface.

b. In the case of turning on the refrigeration, the inlet water temperature can be adjusted, and the required refrigeration temperature can be adjusted by pressing the ▲ and ▼ keys on the main interface.

调试与初运行

1. Note

- <1> The circuit breaker must be switched on before 12 hours of operation to make the crankcase heater energized to preheat.
- <2> Open the valve of the water system to make the water system unblocked; open the water supply valve, fill the water system with water, and exhaust the air in the system at the same time.
- <3> The debugging can be carried out after the electrical safety inspection.
- <4> Start the test run of the unit after the power is turned on to prevent the normal operation of the unit from being affected or other influences.
- <5> Forced operation is absolutely not allowed. (The protection device does not operate, it is very dangerous)

2. Preparation before commissioning

- <1> Whether the heat pump unit is installed correctly.
- <2> The piping and wiring are correct.
- <3> The accessories are installed.
- <4> Smooth drainage.
- <5> Thermal insulation has been perfected.
- <6> The ground wire is connected correctly.
- <7> The power supply voltage is consistent with the rated voltage of the hot water unit.
- <8> The air inlet and outlet of the unit are barrier-free.
- <9> The leakage protector can operate effectively.

3. Debugging and running

- <1> Whether the switch of the wire controller is normal.
- <2> Whether the function keys of the wire controller are normal.
- <3> Whether the indicator light is on normally.
- <4> Whether the drainage is normal.
- <5> Whether it works normally in boot mode.
- <6> Whether the outlet water temperature is normal.
- <7> Whether there is vibration or abnormal sound during operation.
- <8> Whether the generated wind, noise and condensed water affect the surrounding environment.
- <9> Is there any leakage of refrigerant?
- <10> If there is a fault, first follow the fault and cause analysis described in the manual and eliminate it at the same time.

Operation and Maintenance

The operation and maintenance personnel of the unit must have certain professional knowledge or operate under the guidance of our professional technicians. In order to ensure the normal operation of the unit, necessary inspection and maintenance must be carried out after a period of use. During the maintenance process, please pay attention to the following points:

1. Selection of water pump

- The unit must be installed with a circulating pump before it can be used. The unit provides a circulating pump power port (three-phase power supply). Note: For single-phase power pump wiring, please refer to the description of the unit circuit diagram for wiring.
- The head of the circulating pump = the height difference between the highest water level point of the waterway and the main engine + the sum of the local resistance along the pipeline (specifically determined by the actual head hydraulic calculation)

2. Water pipe selection

Diameter of single inlet and outlet pipe

| Model | DLN-050TA1 | Remark |
|-------------------|------------|--------|
| Water inlet size | Male DN40 | |
| Water outlet size | Male DN40 | |

3. Selection of auxiliary electric heater

- The user can select the auxiliary electric heater according to the needs, and the unit only provides the control line port of the auxiliary electric heater control signal.
- The installation of auxiliary electric heater must be guided by factory service personnel or professionals.

4. Water flow switch selection

- The water flow switch is based on the configuration of the engineering water system, and the target water flow switch is recommended: the fluid temperature is 0 ~ 120°C, and the maximum working pressure is 13.5 bar.
- The water flow switch can be installed in a horizontal pipe or a vertical pipe with the liquid flow direction up, but it cannot be installed in a pipe with the liquid flow direction down.
- The water flow switch must be installed on a straight pipe with at least 5 times the pipe diameter on both sides of the linear stroke. At the same time, it must be noted that the direction of the liquid flow in the pipe must be consistent with the direction of the arrow on the controller. The wiring terminal should be in a position where wiring is easy. (Figure 10)
- It is absolutely forbidden for a wrench to hit the bottom plate of the water flow switch, which will cause the water flow switch to deform and fail. (Figure 11)
- Be sure to determine the target model according to the unit's rated flow, the diameter of the outlet pipe and the target adjustment range of the water flow switch, and the target must not be in contact with the inner wall of the pipe and other restrictors in the pipeline, otherwise it will easily cause the water flow switch to fail to reset normally.
- The water filter is configured according to the engineering water system, and the recommended filter mesh is about 40 meshes.

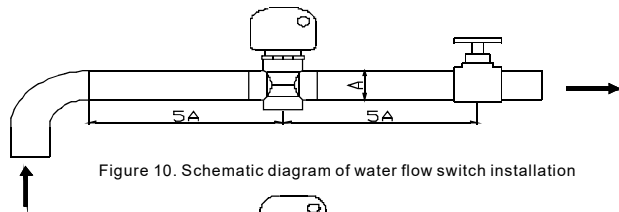


Figure 10. Schematic diagram of water flow switch installation

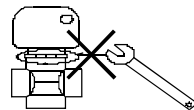


Figure 11. Installation prompt diagram

(4) Query of unit status

In the main interface, long press the ▼ key for 5 seconds to enter to view the unit status parameters. As shown in the table below

| Q u e r y c o d e | D e s c r i p t i o n | R e a d i n g |
|-------------------|---|--------------------------------------|
| 1 | W a t e r i n l e t t e m p e r a t u r e | -40 + P a r a m e t e r L 9 ~ 99 ° C |
| 2 | W a t e r o u t l e t t e m p e r a t u r e | -40 ~ 99 ° C |
| 3 | A m b i e n t t e m p e r a t u r e | -40 ~ 99 ° C |
| 4 | G a s e x h a u s t t e m p e r a t u r e | 0 ~ 125 ° C |
| 5 | G a s r e t u r n t e m p e r a t u r e | -40 ~ 99 ° C |
| 6 | E x t e r n a l c o i l t e m p e r a t u r e | -40 ~ 99 ° C |
| 7 | I n t e r n a l c o i l t e m p e r a t u r e | -40 ~ 99 ° C |
| 8 | C o m p r e s s o r c u r r e n t | 0-40 A |
| 9 | M a i n E E V o p e n i n g | 0 ~ 5 5 0 |
| 10 | R e s e r v e d | 0 ~ 5 5 0 |
| 11 | H i g h s p e e d v e n t i l a t i o n | 0 = c l o s e / 1 = o p e n |
| 12 | L o w s p e e d v e n t i l a t i o n | 0 = c l o s e / 1 = o p e n |
| 13 | C o m p r e s s o r | 0 = c l o s e / 1 = o p e n |
| 14 | 4 - w a y v a l v e | 0 = c l o s e / 1 = o p e n |
| 15 | 4 - w a y v a l v e | 0 = c l o s e / 1 = o p e n |
| 16 | C r a n k s h a f t h e a t e r | 0 = c l o s e / 1 = o p e n |
| 17 | C i r c u l a t i n g p u m p | 0 = c l o s e / 1 = o p e n |
| 18 | R e s e r v e d | 0 = c l o s e / 1 = o p e n |
| 19 | R e s e r v e d | 0 = c l o s e / 1 = o p e n |
| 20 | R e s e r v e d | 0 = c l o s e / 1 = o p e n |
| 21 | E m e r g e n c y s w i t c h | 0 = o p e n / 1 = c l o s e |
| 22 | H i g h p r e s s u r e s w i t c h | 0 = o p e n / 1 = c l o s e |
| 23 | L o w p r e s s u r e s w i t c h | 0 = o p e n / 1 = c l o s e |
| 24 | E x t e r n a l w a t e r f l o w s w i t c h | 0 = o p e n / 1 = c l o s e |
| 25 | R e s e r v e d | 0-40 A |
| 26 | R e s e r v e d | 0 ~ 5 5 0 |
| 27 | R e s e r v e d | 0 = c l o s e / 1 = o p e n |
| 28 | R e s e r v e d | 0 = O p e n / 1 = C l o s e |
| 29 | R e s e r v e d | 0 = O p e n / 1 = C l o s e |
| 30 | R e s e r v e d | 0 ~ 125 ° C |
| 31 | R e s e r v e d | -40 ~ 99 ° C |
| 32 | R e s e r v e d | -40 ~ 99 ° C |
| 33 | R e s e r v e d | -40 ~ 99 ° C |
| 41 | R e s e r v e d | 0 = O F F / 1 = O N |
| 42 | R e s e r v e d | 0 = O F F / 1 = O N |
| 43 | I n t e r n a l w a t e r f l o w s w i t c h | 0 = O F F / 1 = O N |
| 44 | B y p a s s v a l v e | 0 = O F F / 1 = O N |
| 45 | R e s e r v e d | 0 = O F F / 1 = O N |
| 46 | R e s e r v e d | 0 = O F F / 1 = O N |
| 47 | A u x i l i a r y e l e c t r i c h e a t e r | 0 = O F F / 1 = O N |
| 48 | I n t e r n a l c i r c u l a t i n g p u m p | 0 = O F F / 1 = O N |

| | | |
|----|----------------------|-------------|
| 49 | Reserved | -40 ~ 99 °C |
| 50 | Indoor temperature | -40 ~ 99 °C |
| 51 | Reserved | -40 ~ 99 °C |
| 52 | Reserved | -40 ~ 99 °C |
| 53 | Reserved | -40 ~ 99 °C |
| 54 | Reserved | -40 ~ 99 °C |
| 55 | Reserved | 0 ~ 550 |
| 56 | Reserved | -40 ~ 99 °C |
| 57 | Reserved | -40 ~ 99 °C |
| 58 | Reserved | 0 ~ 125 °C |
| 59 | Reserved | 0 ~ 125 °C |
| 60 | Reserved | 0-40 A |
| 61 | Reserved | 0-40 A |
| 62 | Reserved | 0=OFF/1=ON |
| 63 | Reserved | 0=OFF/1=ON |
| 64 | Reserved | 0=OFF/1=ON |
| 65 | Reserved | 0=OFF/1=ON |
| 66 | Space heating switch | 0=OFF/1=ON |
| 67 | Main EEV opening | 0 ~ 480 |
| 68 | Reserved | 0 ~ 480 |
| 69 | Reserved | 0 ~ 480 |
| 70 | Reserved | 0 ~ 480 |

(5) Clock setting

Press and hold the [Timing] and ▲ keys for 1 second to enter the clock flashing state. At this time, press the [Timing] button again to enter the clock setting state. First, the hour digit flashes, indicating that the current time can be adjusted by the ▲, ▼ keys. value. Each time you press the ▲ key, the hour increases by one, and each time you press the ▼ key, the hour decreases by one. If you hold down the ▲ key or the ▼ key for a long time, the hour will increase or decrease automatically. After setting the hour digit value, press the [Timer] button again; the minute digit flashes at this time, indicating that the current time minute value can be adjusted through the ▲, ▼ buttons. After setting the minute value, press the [Timing] key again to end.

(6) Timing setting

Long press the [Timing] key for 3 seconds to enter the time period selection, at this time it displays "Time Period 1", press the ▲, ▼ keys to select different time periods for setting; press the [Timing] key again to enter the time period 1 setting, press the ▲, ▼ keys Timing time can be modified; other time period settings can be deduced by analogy; long press [Timing] key for 5 seconds to delete all time period timings.

(7) Mode conversion

In the main interface of the power-on state, long press the ▲ key for 5 seconds to switch the operating mode.

(8) Key lock function

Automatically lock when there is no operation for 60 seconds;

In the key lock state, press and hold the "switch" key for 3 seconds, and the key lock will be released after the buzzer beeps once.

(9) Forced defrost function

Long press the M+▼ key for 5 seconds to enter the forced defrost function, and the defrost symbol will be displayed at the same time.

(10) Manually start the electric heating function

Long press the M+▲ key for 5 seconds to enter the manual start of auxiliary electric heating.

3. Wiring Schematic

