

# Cold/Freezer Room Technical Handbook

Plug-in type



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TMP Scientific

## Part I Cooling system

The monoblock cooling units are composed of condenser unit, evaporator and a control panel, together in a single compact pack.

This configuration allows the highest simplicity on the hand of installation, turning monoblock cooling system the most versatile, handy solution for all kind of cold / freezer room projects. The monoblock refrigeration unit can meet the freeze demand in the hotel ,restaurant ,hospital, agriculture, biology and chemical industry, the temperature of which can be kept with in 2 – 8°C (cold room) , –15 – –25°C (freezer room) .

Monoblock cooling units are equipped with: high quality compressor, Reliable performance and long life–span with well known brand refrigeration parts. EBM fan motor, Castel Solenoid valve. Danfoss high/ low pressure controller, Danfoss filter direr, Eliwell thermostat.

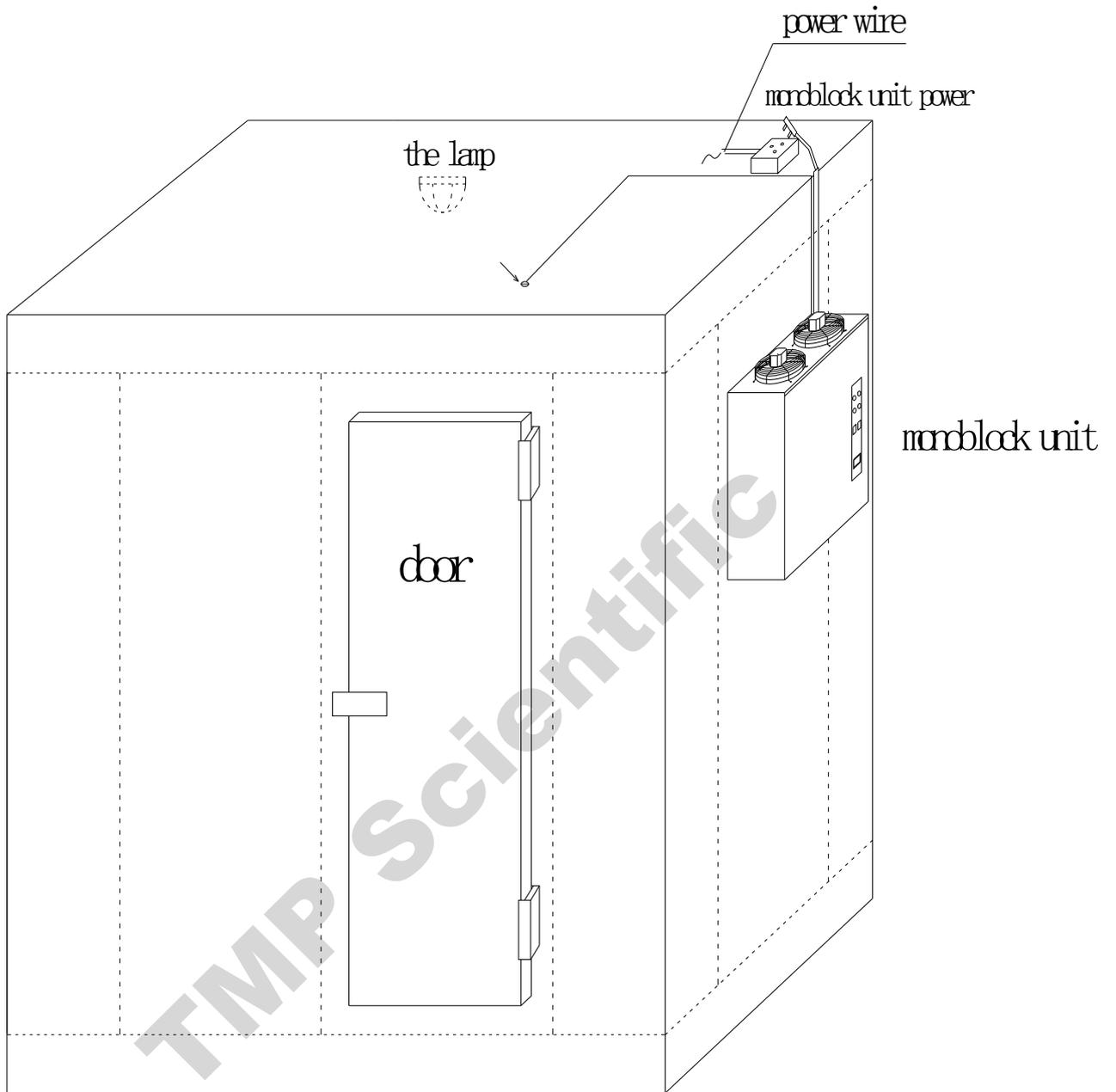
Self–supporting housing of galvanized plate

Easily detachable front panels

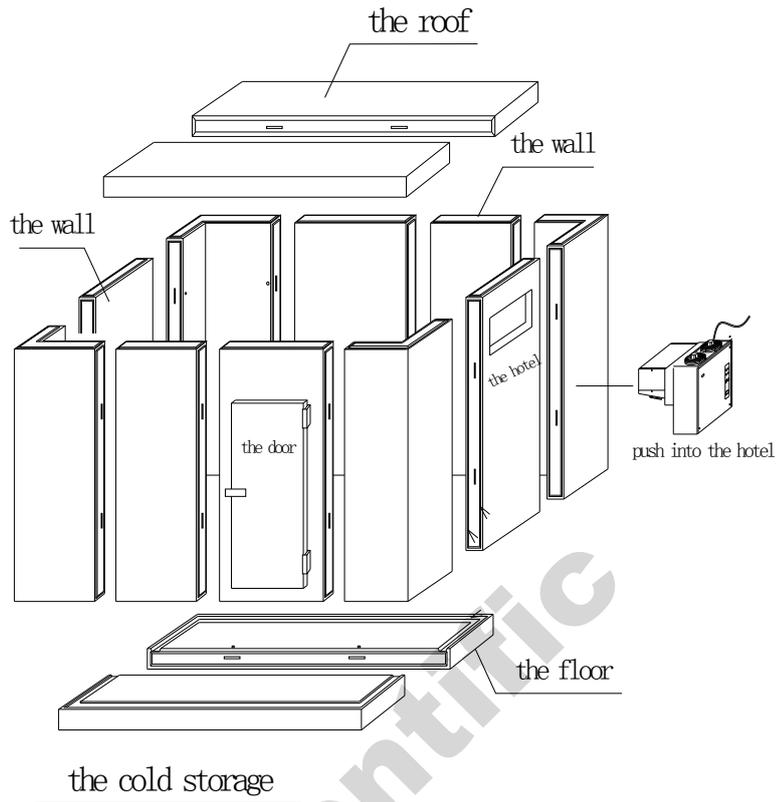
Hermetic compressors with engine thermal insulation

Electronic control panel with 52 programmable parameters

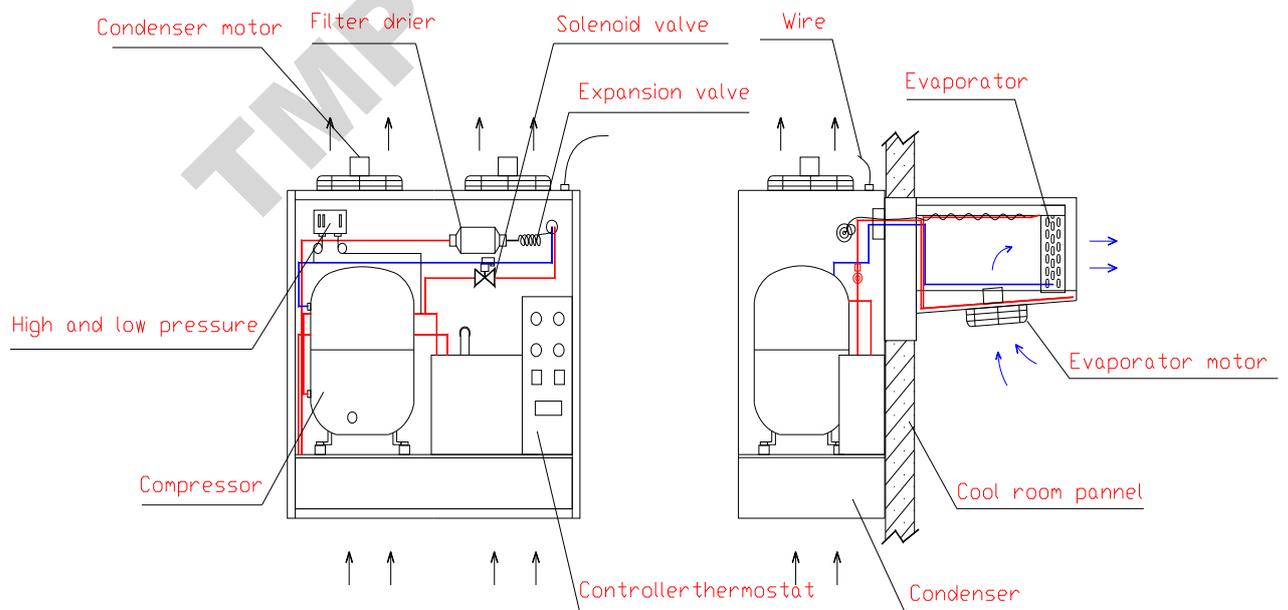
Condensation by air

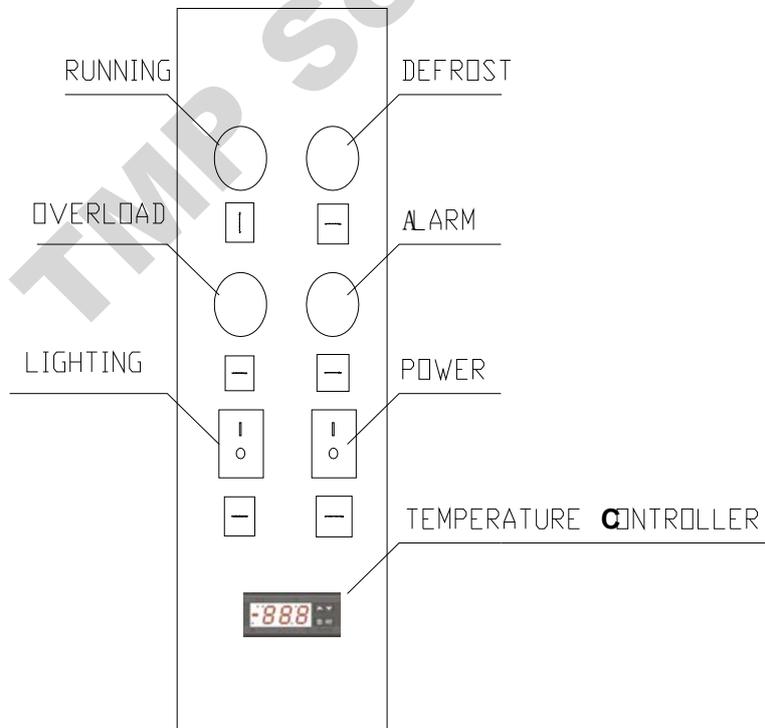
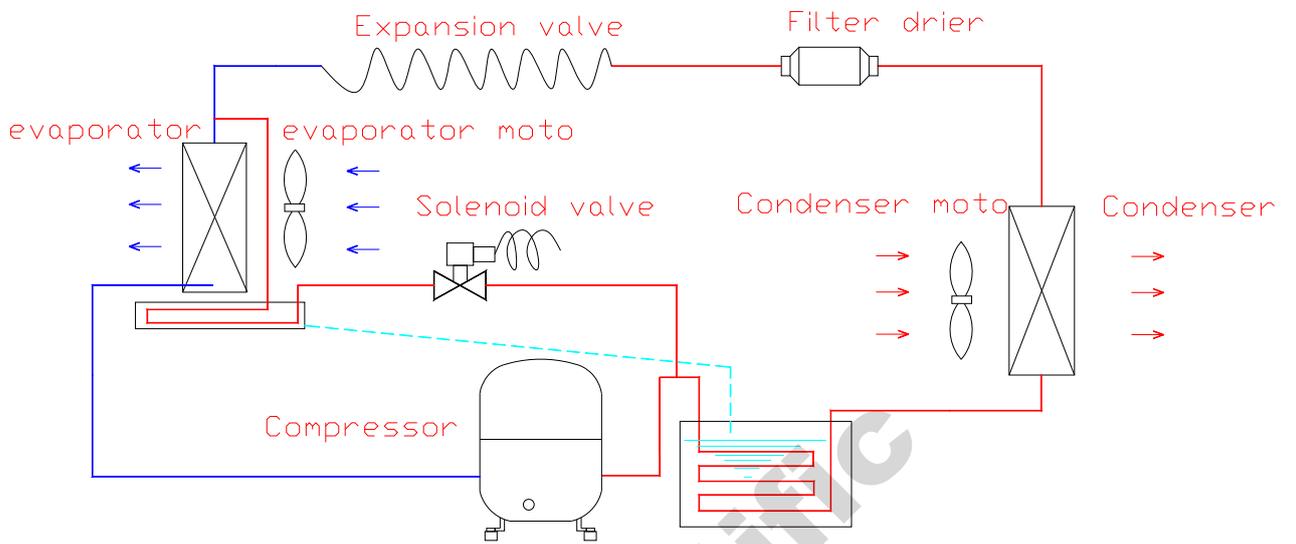


installation schematic drawing

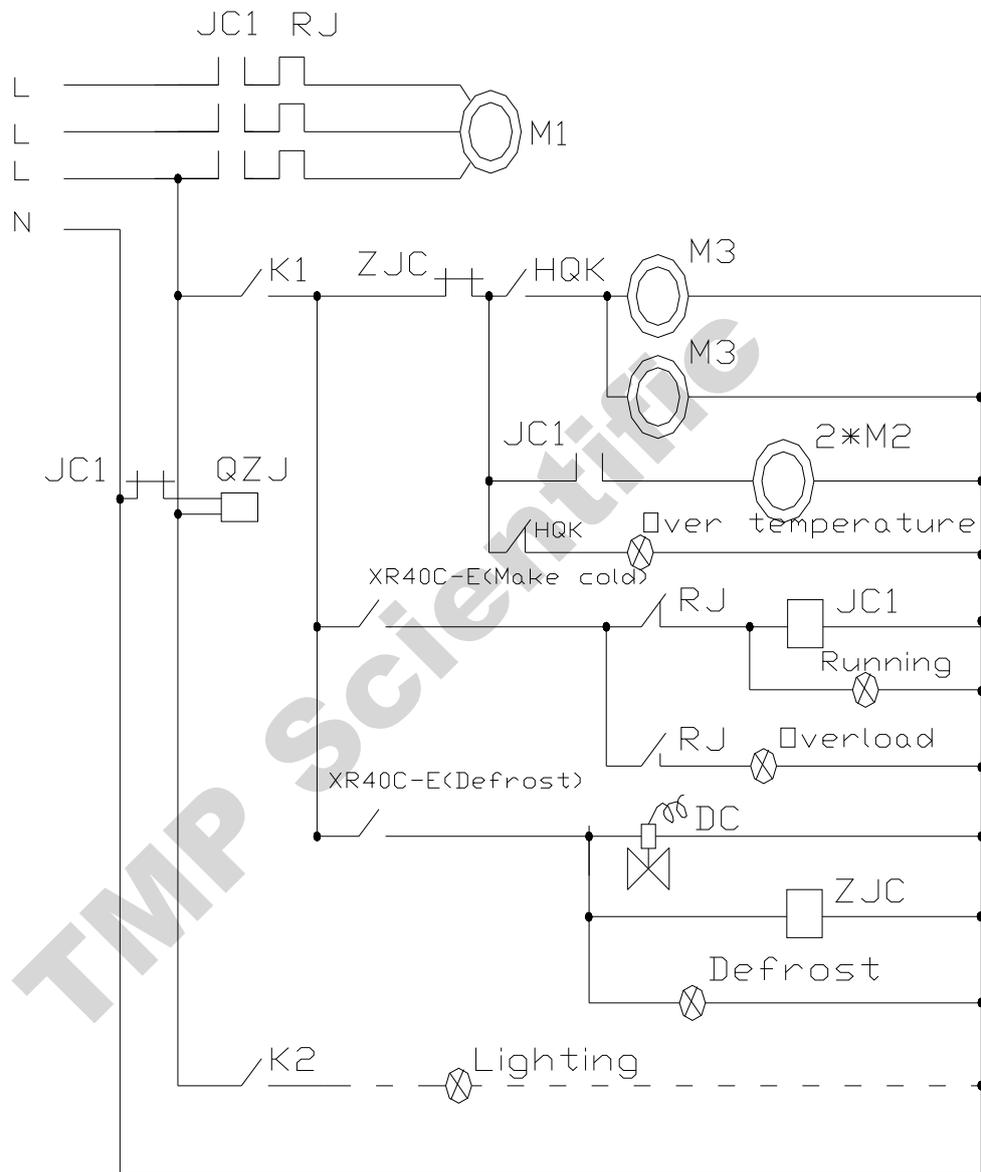


The monoblock structure :





# Electric circuit diagram



- |                        |                         |                       |
|------------------------|-------------------------|-----------------------|
| L — Voltage connection | K2 — Lighting           | RJ — Thermo relay     |
| N — Neutral connection | K1 — Control connection |                       |
| M1 — Compressor        | JC — Contactor          | DC — ELECTROMAGNETISM |
| M2 — Condenser motor   | QZJ — Crankcase heater  |                       |
| M3 — Evaporator moto   | ZJC — Relay             | XR40C—E— Tempreture   |
|                        | thermosta               |                       |

## Part II      INSTALLATION

-----The cold/freezer room – with plug in monoblock units

**NOTE:** Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment. **CAUTION:** Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.



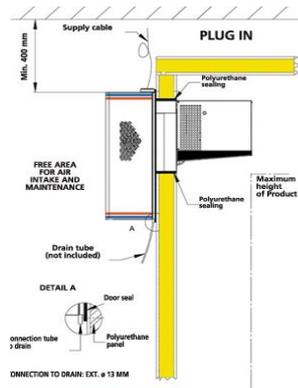
Monoblock Cooling/freezing Units, Panels, Doors, Service tools, Ice pack and Shelves are packed Separately



Installation normally starts with the back wall panels or corner panel.



Wall panels and floor Lock together with cam locks. Haier cold/freezer rooms are erected from inside, so installation in confined areas is simple.



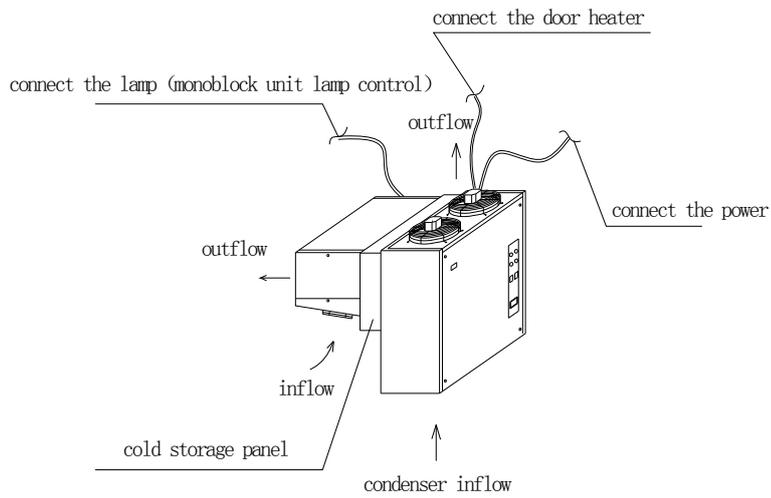
Monoblock Cooling/freezing Units are lifted into position and locked to wall panels by pop rivets or self-tapping screws. Note: Remove power cable from casing to ensure it is on the outside before sitting roof



.Roof Panels installed last



Affix Door handle and emergency release, 793 silicon joints between panels. Clean panels with cleaner and cloth provided.

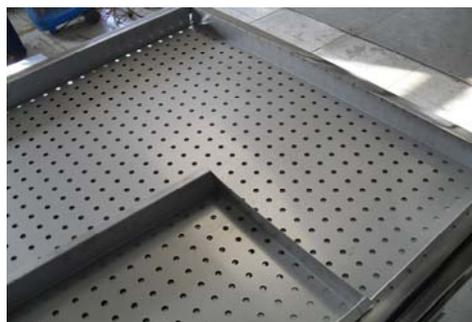


monoblock unit connecting wire

Connect monoblock unit wire. Plug into duty sharing mechanism power source and allow to pull down to temperature in line with normal good refrigeration practice.



Put up shelving to either two or three walls.



Place the Ice pack on the shelves with holes,

## Part III

## Servicing manual

### Service manual of Haier Cold /Freezer room

Troubles	Possible Cause	Corrective Action
Compressor fails to start(no hum)	<ol style="list-style-type: none"> <li>1. Power failure</li> <li>2. Disconnect switch open</li> <li>3. Burned-out compressor motor</li> <li>4. Control circuit open               <ol style="list-style-type: none"> <li>a. Overload protector tripped</li> <li>b. Thermostat setting too high</li> <li>c. Low-pressure control open</li> <li>d. High-pressure control open</li> <li>e. Loose wiring</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Contact power company</li> <li>2. Close switch and check circuits</li> <li>3. Replace</li> <li>4. Locate cause and repair               <ol style="list-style-type: none"> <li>a. Check overload</li> <li>b. Set to lower temperature</li> <li>c. Reset and check pressures</li> <li>d. Reset and check pressures</li> </ol> </li> <li>5. Repair wiring</li> </ol>
Compressor will not start (hums and trips overload protector)	<ol style="list-style-type: none"> <li>1. Improperly wired</li> <li>2. Low voltage to unit</li> <li>3. Burned-out compressor motor</li> <li>4. Mechanical problems in compressor</li> <li>5. Liquid refrigerant in compressor crankcase</li> </ol>	<ol style="list-style-type: none"> <li>1. Rewire unit</li> <li>2. Determine reason and correct</li> <li>3. Replace compressor motor</li> <li>4. Replace compressor</li> <li>5. Install crankcase heater</li> </ol>

<p>Compressor starts and runs, but short cycles</p>	<ol style="list-style-type: none"> <li>1. Defective overload protector</li> <li>2. Low voltage to unit</li> <li>3. Defective run capacitor</li> <li>4. High discharge pressure</li> <li>5. Suction pressure too low</li> <li>6. Suction pressure too high</li> <li>7. Compressor too hot</li> <li>8. Shorted motor winding</li> <li>9. Dirty or iced evaporator</li> <li>10. Low-pressure control differential set too close</li> <li>11. High pressure control differential set too close</li> <li>12. Erratic thermostat</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace overload protector</li> <li>2. Determine reason and correct</li> <li>3. Determine reason and replace</li> <li>4. Open compressor discharge service valve. Purge possible overcharge of refrigerant. Provide sufficient condenser cooling air to unit</li> <li>5. Properly charge system with refrigerant. Increase load on evaporator.</li> <li>6. Reduce air flow over evaporator. Purge overcharge of refrigerant. Replace compressor valves</li> <li>7. Properly charge system with refrigerant.</li> <li>8. Replace compressor</li> <li>9. Increase air flow over evaporator. Replace broken belt. Replace defective fan motor.</li> <li>10. Readjust differential.</li> <li>11. Readjust or replace control</li> <li>12. Relocate or replace thermostat</li> </ol>
<p>Unit operates excessively</p>	<ol style="list-style-type: none"> <li>1. Short of refrigerant</li> <li>2. Thermostat contacts stuck closed</li> <li>3. Excessive load</li> <li>4. Evaporator coil iced</li> <li>5. Restriction in refrigerant system</li> <li>6. Dirty condenser</li> <li>7. Restricted air over evaporator</li> <li>8. Inefficient compressor</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair leak and recharge unit</li> <li>2. Clean contacts or replace thermostat.</li> <li>3. Check heaters, load and replace unit accordingly; replace insulation</li> <li>4. Defrost unit and check operation</li> <li>5. Locate and remove</li> <li>6. Clean condenser</li> <li>7. Determine cause and correct</li> <li>8. Check compressor valves and repair</li> </ol>

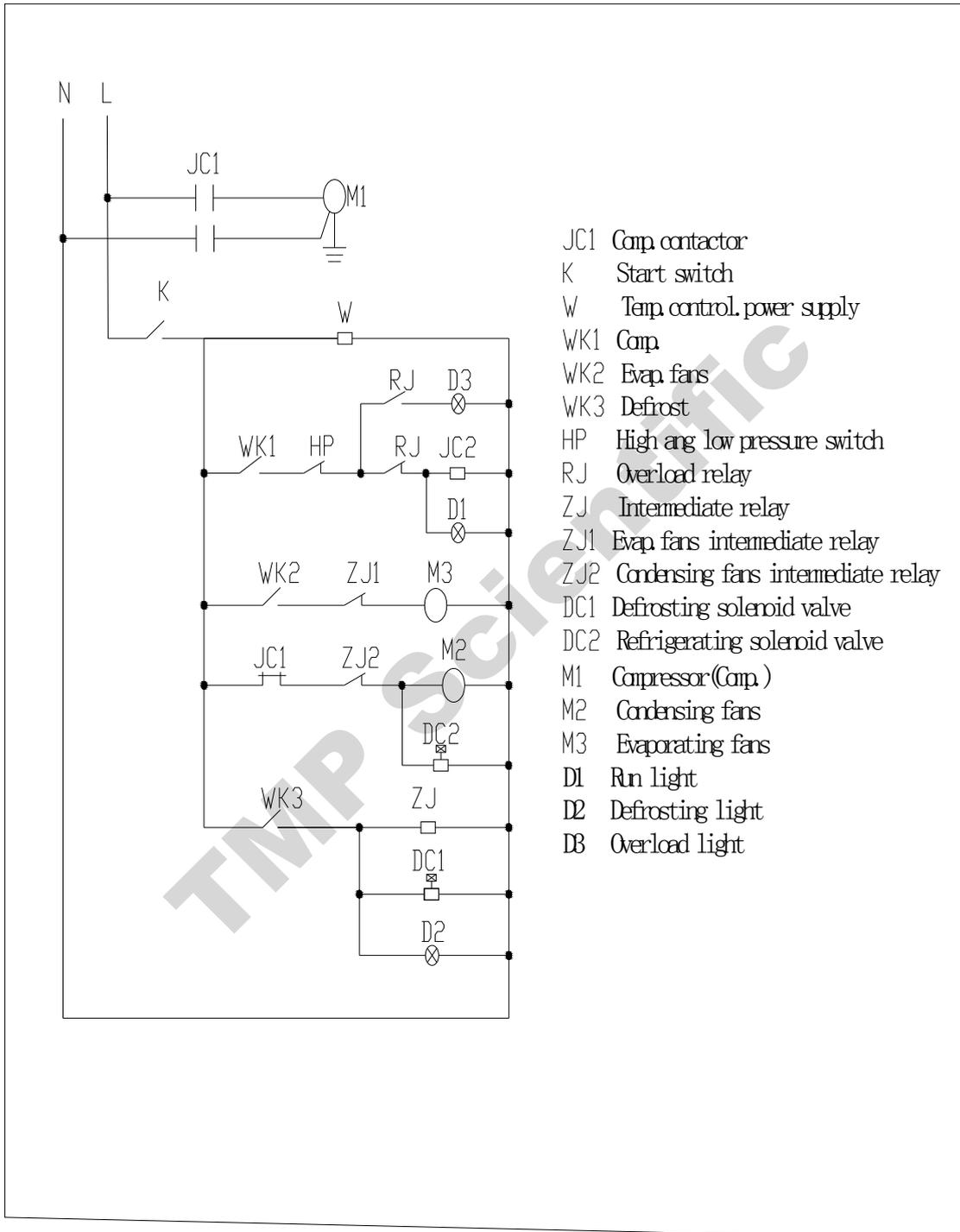
Compressor loses oil	<ol style="list-style-type: none"> <li>1. Traps in hot gas and/or suction lines</li> <li>2. Refrigerant velocity too low in risers</li> <li>3. Shortage of refrigerant</li> <li>4. Liquid refrigerant flooding back to compressor</li> <li>5. Gas-oil ratio low</li> <li>6. Plugged expansion valve or strainer</li> <li>7. Compressor short cycling</li> <li>8. Superheat too high at compressor suction</li> </ol>	<ol style="list-style-type: none"> <li>1. Reroute lines to provide proper pitch</li> <li>2. Resize risers or install oil return traps</li> <li>3. Repair leak and recharge</li> <li>4. Adjust expansion valve; alter refrigerant charge on capillary tube system</li> <li>5. Add 1 pt of oil for each 10 lb of refrigerant added to the factory charge</li> <li>6. Clean or replace</li> <li>7. See items under entry "Compressor starts and runs, but short cycles"</li> <li>8. Change location of TXV bulb or adjust superheat to return wet refrigerant to the compressor</li> </ol>
Compressor noisy	<ol style="list-style-type: none"> <li>1. Lack of compressor oil</li> <li>2. Tubing rattle</li> <li>3. Mounting loose</li> <li>4. Oil slugging</li> <li>5. Refrigerant flooding compressor</li> <li>6. Dry or scored shaft seal</li> <li>7. Internal parts of compressor broken or worn</li> <li>8. Compressor drive coupling loose</li> </ol>	<ol style="list-style-type: none"> <li>1. Add oil to correct level</li> <li>2. Reroute tubing</li> <li>3. Repair mounting</li> <li>4. Adjust oil level or refrigerant charge</li> <li>5. Check expansion valve for leak or oversized orifice</li> <li>6. Check oil level</li> <li>7. Overhaul compressor</li> <li>8. Tighten coupling and check alignment</li> </ol>
Unit low on capacity	<ol style="list-style-type: none"> <li>1. Ice or dirt on evaporator</li> <li>2. Expansion valve stuck or dirty</li> <li>3. Improper TXV superheat adjustment</li> <li>4. Wrong size expansion valve</li> <li>5. Excessive pressure drop in evaporator</li> <li>6. Clogged strainer</li> <li>7. Liquid flashing in liquid line</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean coil or defrost</li> <li>2. Clean or replace expansion valve</li> <li>3. Adjust expansion valve</li> <li>4. Replace valve</li> <li>5. Adjust expansion valve</li> <li>6. Clean or replace strainer.</li> <li>7. Subcool liquid or add refrigerant</li> </ol>

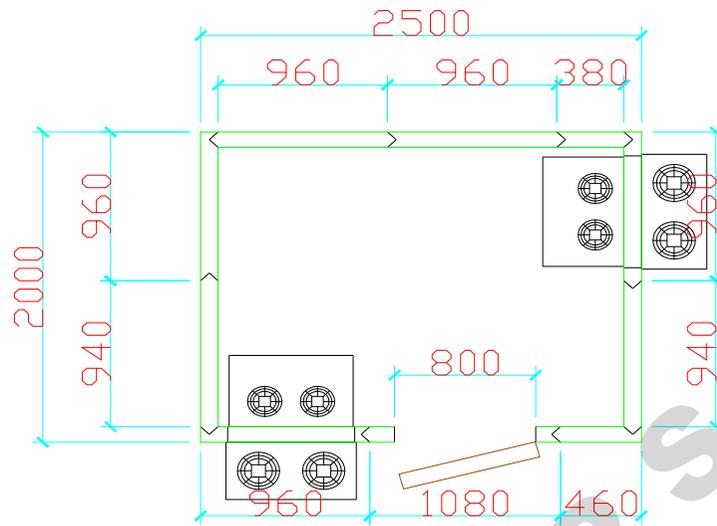
Space temperature To high	<ol style="list-style-type: none"> <li>1. Control setting too high</li> <li>2. Expansion valve too small</li> <li>3. Evaporator too small</li> <li>4. Insufficient air circulation</li> <li>5. Shortage of refrigerant</li> <li>6. Expansion valve plugged</li> <li>7. Inefficient compressor</li> <li>8. Restricted or undersized refrigerant Lines</li> <li>9. Evaporator iced or dirty</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust control</li> <li>2. Replace valve</li> <li>3. Replace coil</li> <li>4. Correct circulation</li> <li>5. Repair leak and recharge</li> <li>6. Clean or replace</li> <li>7. Check efficiency</li> <li>8. Clear restriction or resize lines</li> <li>9. Clean and defrost evaporator</li> </ol>
Suction line frosted or sweating	<ol style="list-style-type: none"> <li>1. Superheat setting too low</li> <li>2. Expansion valve stuck open</li> <li>3. Evaporator fan not running</li> <li>4. Overcharge of refrigerant</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust superheat setting</li> <li>2. Clean or replace valve</li> <li>3. Correct problem</li> <li>4. Correct charge</li> </ol>
Liquid line frosted or sweating	<ol style="list-style-type: none"> <li>1. Restricted drier or strainer</li> <li>2. Liquid line shut-off valve partially closed</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace drier or strainer</li> <li>2. Open valve</li> </ol>
Hot liquid line	<ol style="list-style-type: none"> <li>1. Expansion valve open too wide</li> <li>2. Refrigerant shortage</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust expansion valve</li> <li>2. Repair leak and recharge</li> </ol>
Top of condenser Coils cool when unit is operating	<ol style="list-style-type: none"> <li>1. Refrigerant shortage</li> <li>2. Refrigerant overcharge</li> <li>3. Inefficient compressor</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair leak and recharge</li> <li>2. Remove part of charge</li> <li>3. Check efficiency and correct</li> </ol>
Unit in vacuum-frost on expansion valve only	<ol style="list-style-type: none"> <li>1. Ice plugging expansion valve orifice</li> <li>2. Expansion valve strainer plugged</li> </ol>	<ol style="list-style-type: none"> <li>1. Apply hot wet cloth to expansion valve body; an increase in suction pressure indicates moisture; install a new drier</li> <li>2. Clean strainer or replace valve</li> </ol>
High head pressure	<ol style="list-style-type: none"> <li>1. Overcharge of refrigerant</li> <li>2. Air in system</li> <li>3. Dirty condenser</li> <li>4. Unit in too hot location</li> <li>5. Water-cooled condenser plugged</li> </ol>	<ol style="list-style-type: none"> <li>1. Purge overcharge</li> <li>2. Purge air</li> <li>3. Clean condenser</li> <li>4. Relocate unit</li> <li>5. Clean or replace condense</li> </ol>
Low head pressure	<ol style="list-style-type: none"> <li>1. Shortage of refrigerant</li> <li>2. Cold unit location</li> <li>3. Inefficient compressor valves</li> <li>4. Leaky oil return valve in oil separator</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair leak and recharge</li> <li>2. Provide warm condenser air</li> <li>3. Replace leaky valves</li> <li>4. Repair or replace</li> </ol>
High suction pressure	<ol style="list-style-type: none"> <li>1. Evaporator overloaded</li> <li>2. Expansion valve stuck open</li> <li>3. Expansion valve too large</li> <li>4. Leaking compressor suction valves</li> </ol>	<ol style="list-style-type: none"> <li>1. See previous entry "Unit operates excessively"</li> <li>2. Repair or replace valve</li> <li>3. Replace valve</li> <li>4. Replace suction valves or</li> </ol>

	5. Evaporator too large	5. Resize evaporator
Low suction pressure	<ol style="list-style-type: none"> <li>1. Shortage of refrigerant</li> <li>2. Evaporator underloaded</li> <li>3. Liquid line strainer clogged</li> <li>4. Plugged expansion valve</li> <li>5. Last charge on TXV power assembly</li> <li>6. Space temperature too low</li> <li>7. Expansion valve too small</li> <li>8. Excessive pressure drop through Evaporator</li> <li>9. Oversized compressor</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair leak and recharge</li> <li>2. Clean or defrost evaporator</li> <li>3. Clean or replace strainer</li> <li>4. Clean or replace valve</li> <li>5. Replace power assembly</li> <li>6. Adjust or replace thermostat</li> <li>7. Replace valve</li> <li>8. Check for plugged external equalizer</li> <li>9. Resize compressor</li> </ol>
Evaporator coil iced over	<ol style="list-style-type: none"> <li>1. Automatic defrost control erratic or inoperative</li> <li>2. Automatic defrost control improperly wired</li> <li>3. Defective defrost control thermal element</li> <li>4. Improperly installed control thermal element</li> <li>5. Defrost control termination point too low</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace control</li> <li>2. Rewire control</li> <li>3. Replace control</li> <li>4. Relocate element</li> <li>5. Replace or adjust control</li> </ol>
Cold room remains in defrost cycle	<ol style="list-style-type: none"> <li>1. Defrost control incorrectly wired</li> <li>2. Automatic defrost control inoperative</li> <li>3. Defrost control termination point too high</li> <li>4. Defrost solenoid valve stuck open</li> <li>5. Room temperature too low (below 55°F or 12.8°C)</li> </ol>	<ol style="list-style-type: none"> <li>1. Rewire defrost control</li> <li>2. Replace defrost control</li> <li>3. Replace or adjust control</li> <li>4. Clean or replace solenoid valve</li> <li>5. Relocate unit or provide heat</li> </ol>
Water collects in bottom of EMC cooler	<ol style="list-style-type: none"> <li>1. Drain tube plugged</li> <li>2. Drain tube frozen</li> <li>3. Split drain trough</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean tube</li> <li>2. Check drain heater element and repair or replace</li> </ol>
Water collects in bottom of EMC cooler (continued)	<ol style="list-style-type: none"> <li>4. Evaporator baffle not properly installed</li> <li>5. Humidiplate not adjusted properly</li> <li>6. Door gasket not sealing properly</li> </ol>	<ol style="list-style-type: none"> <li>3. Replace trough</li> <li>4. Install baffle properly</li> <li>5. Adjust humidiplate</li> <li>6. Adjust door or replace gasket</li> </ol>

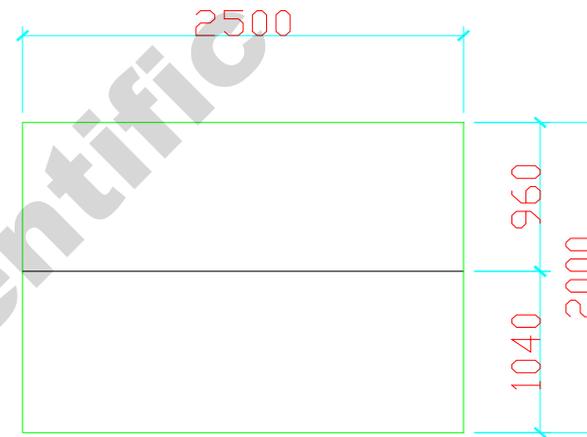
# Part IV Technical drawings

## Electrical principle chart





Wall installation drawings



Floor or roof installation drawings

**Technical Requirements:**

- 1、 Cold room dimensions: 2\*2.5\*2.6 ( m )
- 2、 Internal height: 2.4m
- 3、 Thickness of insulation board: 100mm

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