Service Manual

FILE No: HMRSM-002-03

Deep Refrigerator-upright

DW-40L92•DW-40L188•DW-40L262

DW-40L92 DW-40L188 DW-40L262

Haier Medical & Laboratory Products Co., Ltd.

Effective models

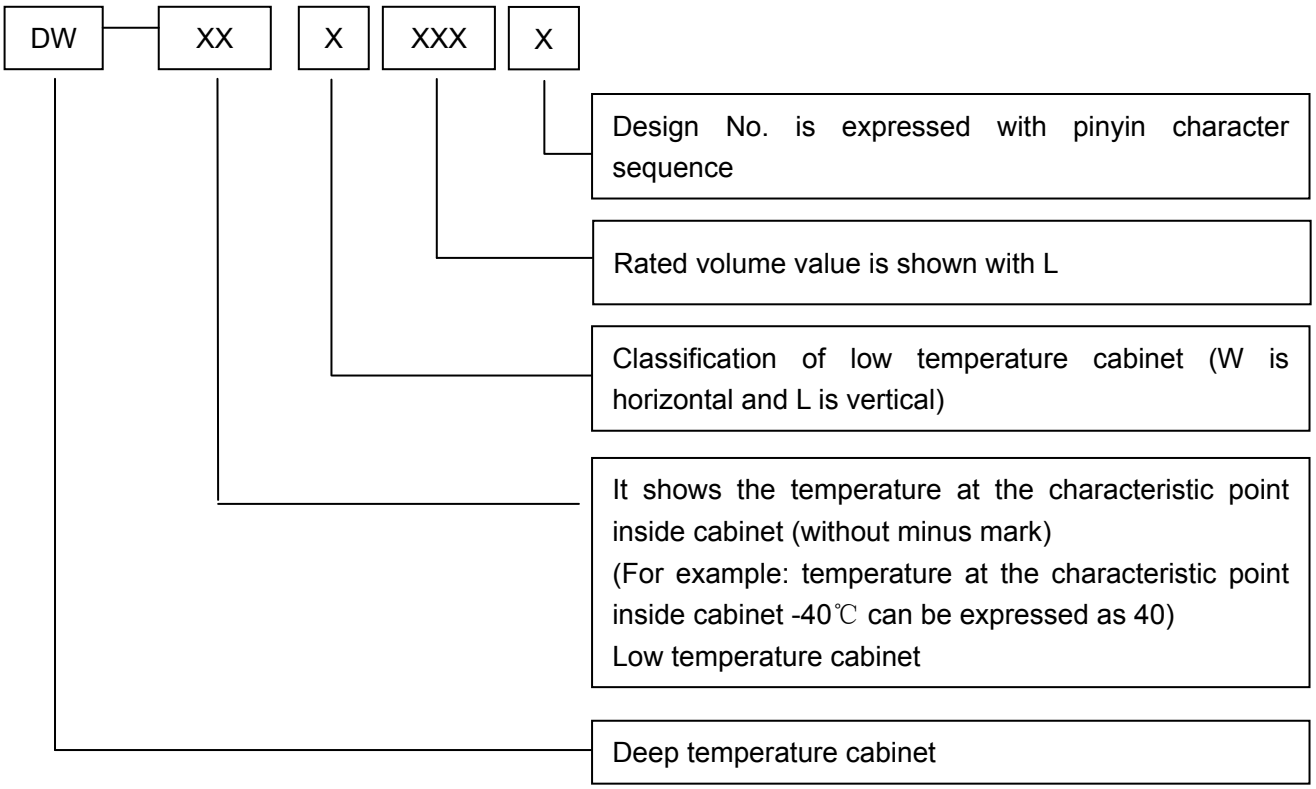
This service manual is effective for following models

Model name	Product code	Voltage(V)	Frequency(Hz)	Plug-type
DW-40L92		220	50	All
DW-40L188		220	50	All
DW-40L262		220	50	All

Content

【Designation】

Regulations for type naming:



Note: rated volume can be the gross volume or effective volume; the manufacturer can decide it by him according to the actual situation. The effective volume value must be marked on the nameplate whether effective volume or gross volume is marked in the product name.

Examples:

DW-40L262 means that the Deep temperature storage refrigerator with the temperature at characteristic temperature -40℃, horizontal and rated effective volume 262L.

【Safe Caution】

1. The machine is using an AC 220V/50/60HZ power. If the voltage used is lower than 198V or higher than 242V, an auto stabilizer above 1000W shall be equipped. Power line that required for lengthening shall be with a cross section no less than 1mm.

2. An independent private jack shall be used and reliably connected. The power line for refrigerator is equipped with three-wire, grounding-type plug which meets standard three-wire, grounding-type receptacle. In no circumstance should the third plug foot (grounding) of the power line be cut or removed. The plug shall be touchable after installation of refrigerator. Power line or plug with abrasion shall not be used. Abraded or damaged power line shall be sent to maintenance point designated by the manufacturer or be replaced by qualified personnel.

3. Hazardous articles of inflammable, explosive, materials such as acid and alkali with strong corrosion are prohibited in the refrigerator.

4. Please don't use flammable spray closely to avid fire.

5. When there is inflammable gas such as coal gas leakage:

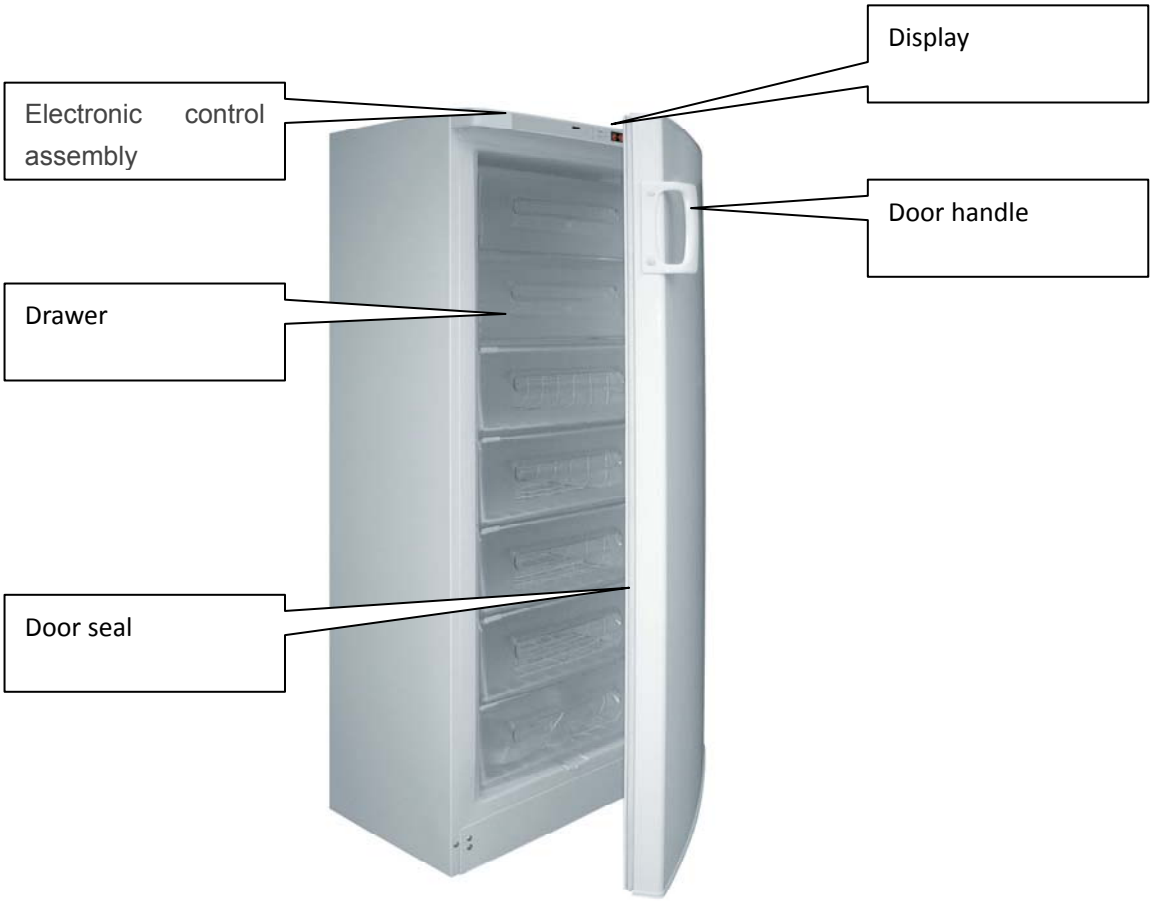
- Shut the valve for leakage;
- Open the door and window for ventilation;
- Don't pull out or insert power plug of the refrigerator.

6. Prevent children playing in the refrigerator to avoid accident.

7. Once the power of the refrigerator is cut, it shall be re-connected at least five minutes later to avoid damage on compressor or the system. The power shall be cut for maintenance. Do not roll or damage the power line.

8. Please wear protective equipments during accessing to the refrigerator to avoid freezing injury. When the refrigerator is scrapped, please remove the doorman. The scrapped refrigerator shall be away from fire and be sent to appointed site for disposition.

【Product appearance】



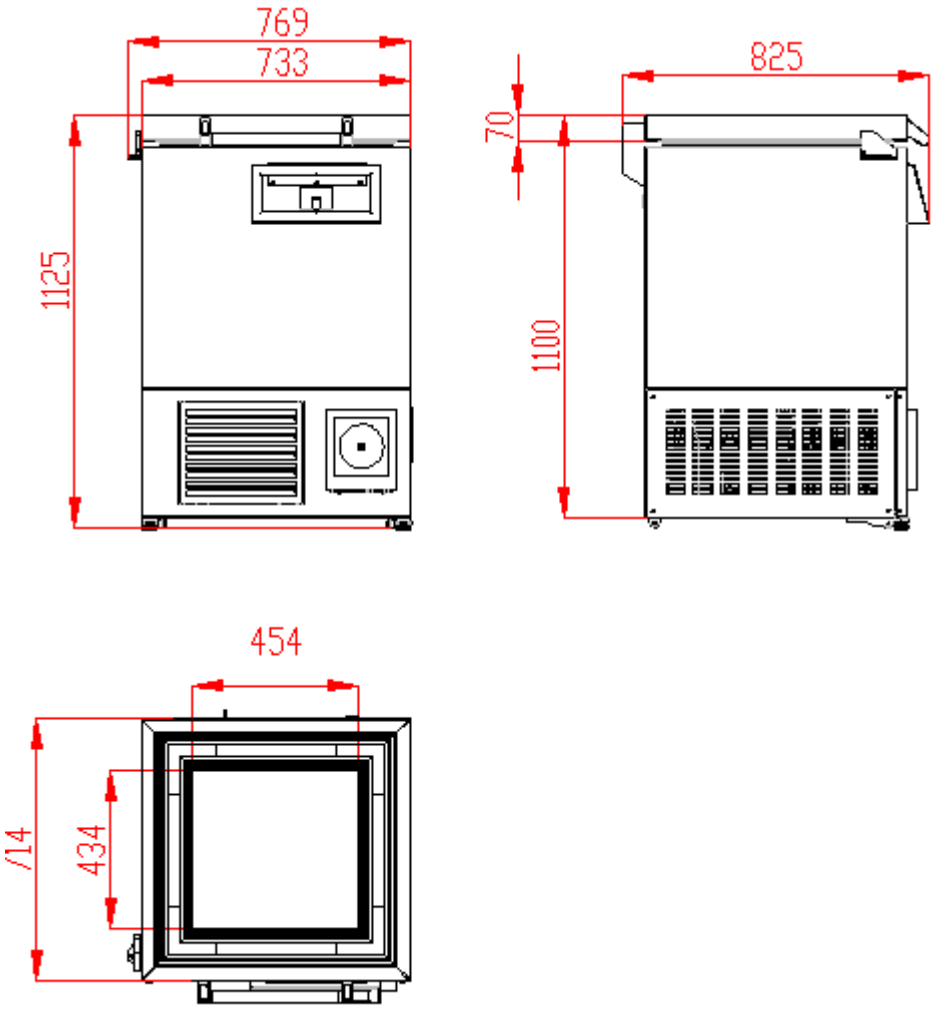
DW-40L262

Remark:

- The press is located in the cabin on rear bottom of the refrigerator with cabin cover
- The condenser is located at rear of the refrigerator.
- The evaporimeter is located inside the refrigerator as rack

【Dimensions】

DW-40L92



【Product Specifications】

Model	DW-40L92	DW-40L188	DW-40L262
Climate type	N	N	N
Protection type against electric shock	I	I	I
Effective volume (L)	92	188	262
Rated voltage	220V/50Hz/60HZ	220V/50Hz/60HZ	220V/50Hz/60HZ
Input power (W)	220	290	340
Net weight (kg)	46	63	84
Compressor	DANFOSS SC12CL	DANFOSS SC12CL	DANFOSS SC12CL
Freezing agent	R404A 160g	R404A 220g	R404A 220g
Outer dimension (WxDxH) (mm)	597*610*860	597*610*1475	657*685*1665
Inner size (WxDxH) (mm)	435*410*635	380*410*1225	480*462*1430

Note: when surrounding temperature is 25℃, the inner lowest temperature for empty refrigerator can be down to -40℃;

when surrounding temperature is higher than 32℃, the inner lowest temperature for empty refrigerator can be down to -35℃;

【Components and Function Modules】

1. Temperature control

It is controlled by microcomputer with digital display for temperature while the inner temperature can be adjusted from -10℃～ -40℃; there is parameter setting for super low temperature alarming and break down memory.

2. Safety system

2 error alarming (high/low temperature alarming, sensor error alarming

2 alarming methods (sound buzzing alarming, red light alarming)

Starting up delay protection function

3. Refrigerating system

Imported famous brand DANFOSS compressor is adopted

Environment protection free refrigerant

German famous brand EBM fan

High density insulation layer with heat preservation

The evaporimeter is used as rack directly for speed refrigeration.

4. Humanity design

Drawer design for convenient utilization

LED digital temperature display for convenient observation

Broad voltage belt suitable for voltage of 187 ~ 242

Doorknob design for easy on and off

Trundle design for convenient motion

Gate locks design for safe storage

【Disassemble Steps】

1. Replacement process for old handlebars

Since the original handlebar of DW-40L262/188/92 machine is easily loosen, the process is changed as following to be obeyed for handlebar replacement:

a. Unscrew the tapping screw on the door body with screwdriver and put aside;

b. Enlarge the screw hole on door body with drill toΦ9, and that on handlebar toΦ6.

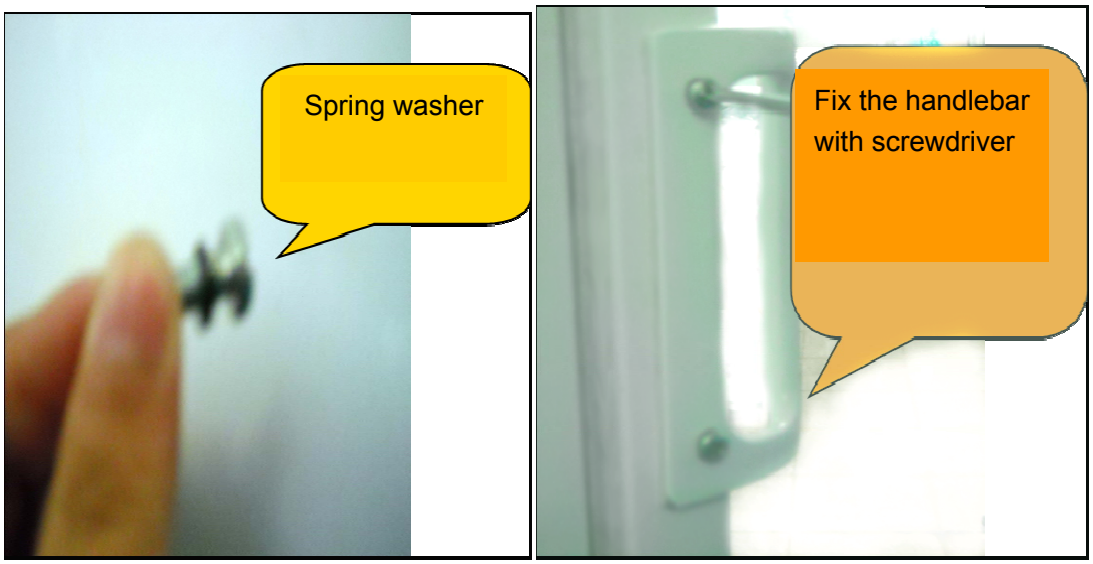
c. Strain the M6 rivet nut with hand riveter on door body.

d. Place two PS spacers on the door and align the hole on spacer with rivet nut.

e. Align the hole on handlebar with that of rivet nut;

f. Put a spring washer onto M6 bolt;

g. Fix the handlebar onto door body with screwdriver.



2. Matters needs attention during replacement

- The rivet nut shall not be pulled tightly;
- Omitting or lacking PS spacers;
- Forget spring washer;

3. Self-checking items after replacement

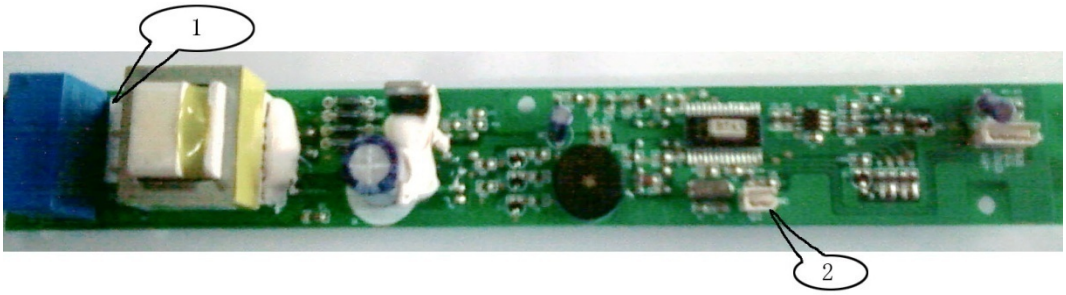
- Whether the rivet nut is tight;
- Whether two PS spacers are used;
- Whether spring washer is used;

4. Disassemble steps for control board

- Unscrew the following screws marked 1 and 2 in following figure, the control board can be fetched.

- Attention: there are wires connecting control panel and refrigerator as shown in following:

■ The following is details for connection of computer board and ports;



■ Mark “1” in the above figure is connecting port for power line to connect power line; mark “2” in the above figure is sensor port to connect sensor line.

5. Installation steps for control board

■ Installation shall be according to 4-4 disassembly steps oppositively.

【Screen Control System】

1 External view of computer board

2 Basic parameters for computer board

- Rated frequency 50/60Hz
- Rated voltage 220 -240 A.C
- Rated power 3W
- Control current for press under normal operation shall be no more than 10A
- The 5 minutes start delay for the first energization of press has change to 30S only in new machine. In normal operation, each time it is shut down, start timing, the compressor will not start if the start up time is less than 5 minutes; if the time is over 5 minutes, please take the actual time for operation.
- On-off temperature of press for each set grade (1)

Set temperature	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19
Start up temperature	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17
Shut down temperature	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19

Set temperature	-20	-21	-22	-23	-24	-25	-26	-27	-28	-29
Start up temperature	-18	-19	-20	-21	-22	-23	-24	-25	-26	-27
Shut down temperature	-20	-21	-22	-23	-24	-25	-26	-27	-28	-29

On-off temperature of press for each set grade (2)

Set temperature	-30	-31	-32	-33	-34	-35	-36	-37	-38	-39	-41	-42
Start up temperature	-29	-30	-31	-32	-33	-34	-35	-36	-37	-38	-39	-41
Shut down temperature	-31	-32	-33	-34	-35	-36	-37	-38	-39	-41	-42	-43

3 Temperature display function

■ The actual temperature displayed is integer. The measured value is rounded off to integer. in normal situation, the temperature shall not hop, with all temperature variable being ±1℃/min;

■ The display range is from +34℃ to -45℃, with temperature higher than +34℃, displaying “HH”; with temperature lower than -45℃, displaying “LL”.

4 Quick-freeze setup function

■ Press quick-freeze button to light indicating light SF, indicating that the refrigerator is in operation; press the button again to release the status, or it may be released automatically after three hours. Temperature can not be set under quick-freezing status;

5 Overheat alarming function

■ When the actual temperature sensed by the sensor is higher +5℃ higher or lower than set temperature, the overheat alarming light will flicker (with interval of 1S), accompanies by buzzing (with interval of 0.5S). Press the buzzing releasing button to release buzzing; but the red light will keep on flickering (press again can not recover buzzing. It is only when the temperature is within +5℃ upper or lower than set temperature or cut the power, the buzzing releasing button can reset to recover buzzing function).

■ Note: if the freezing sensor is in error, the red light may keep on flickering with interval of 1S and alarming fail.

6 Recovery processing and error display of freezing sensor

■ When the freezing sensor is in error (short circuit or open circuit), the temperature value displayed will be “F1”; the frozen food cabinet enters protecting mode and compressor is in fixed alternation of 20min on and 5min off with alarming in failure; if the refrigerator is in quick-freeze status, quit (the corresponding light will be off).

7 Break down memory function

■ When the frozen food cabinet is broken down and electrified again, the memory function can operate according to status set before breaking down.

■ Display control>quick freeze>normal control F1 display >temperature display

8 Temperature adjustment principle and alignment

This machine adopts microcomputer controlled temperature control system to control on-off of the press. In electrified condition, the screen may display current temperature. If you want to change the set temperature, for example, change from -30℃ to -35℃, please operate as following:

Press both “∧” and “∨” for 3 seconds, the set temperature starts flickering. Press “∧” once, the temperature will decrease by 1℃ until it reaches -40℃, and then press back to -10℃; press “∨” once, the temperature will increase by 1℃ until it reaches -10℃, and then press back to -40℃; if there is no 5 second operation, quit the setting status back the normal temperature display.

Press “quick-freeze”, “△” and “▽” simultaneously for 5 seconds to align difference between displayed temperature and set temperature at certain point, with aligning temperature being ±5℃. If the displayed temperature is -40℃ and temperature of certain point is -35℃, enter +5℃ to make display temperature -35℃, vice versa.

Press alarm, cancel and temperature set for 10 seconds, the screen display HS. Press two temperature setting buttons simultaneously, the number on screen flickers; press “△” and “▽” to set highest temperature and then loosen. It will quit automatically in 3 seconds and the screen now displays LS. Press two temperature setting buttons simultaneously, the number on screen flickers; press “△” and “▽” to set lowest temperature and then loosen. It will quit automatically in 3 seconds.

Note: a. temperature range for HS and LS is 10~42℃。

b. When setting temperature for HS and LS, the HS value shall be higher or equal to LS, or it can not be set.

c. Once the HS and LS are set, press both temperature setting buttons simultaneously. The set temperature shall be set within HS and LS (including) only.

d. When both HS and LS are set -25, the set temperature shall be -25℃. Set temperature can not be adjusted and the quick freeze function fails.

【Control System Principle】

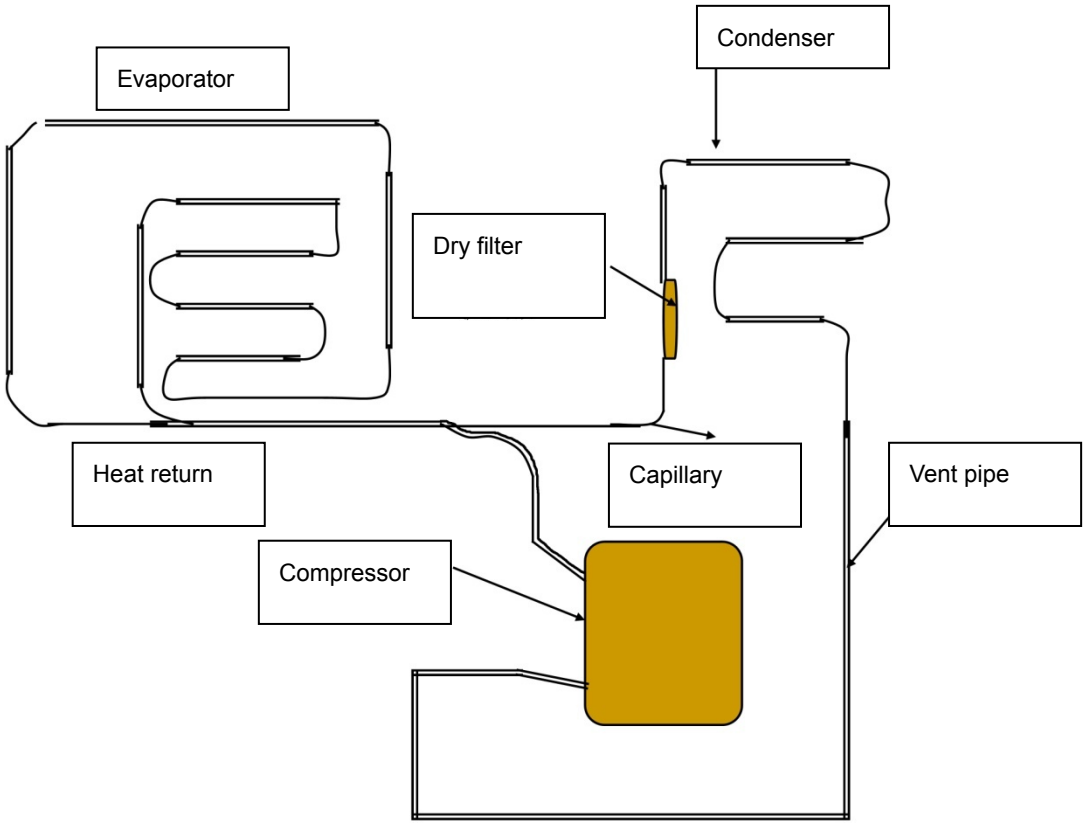
1 Working principle for press on and off

When inner temperature reaches set temperature, induct the temperature by sensor and change into electrical signal which is sent to control chip of computer board. By pre-set procedure, the chip then sends out stop order to compressor to shut it down. When the inner temperature is returned 1℃ higher than set temperature, the chip sends out stop order via the same procedure to shut the compressor down. (If temperature return in the refrigerator is too fast, less than 5 minutes, then take it as 5 minutes.)

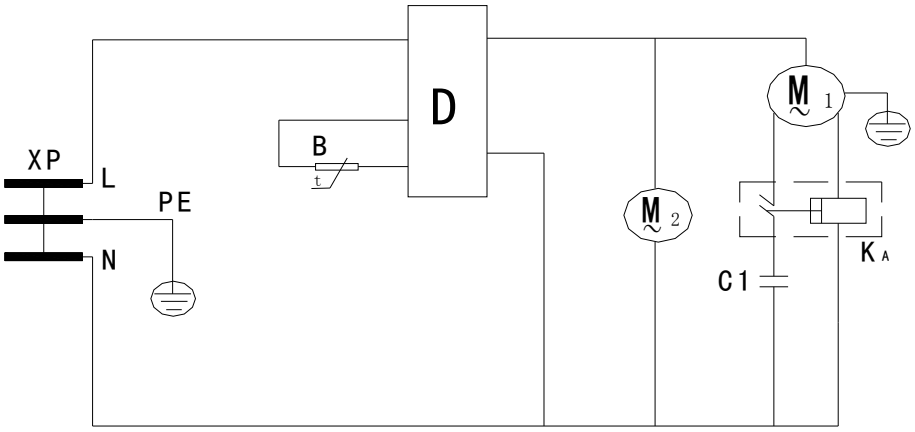
2 Working principle for fan on and off

The fan is in synchronous operation with the compressor. Please refer to 6-1 press working principle for fan working principle.

【System Schematic Diagram】



【System Circuit Diagram】



M1－压缩机　M2－冷却风机　D－电子温控器　KA－启动继电器
B －传感器　C1－启动电容　XP－电源插头

M1 – compressor　M2 – cooling fan　D – electronic temperature controller
Kh – starting relay　B – sensor　C1 – starting capacity　XP – power plug

【Inspection and Maintenance Process for Typical Error】

Problem points		Reason analysis	Maintenance measures
1. the press can not start		1. The fuse is burned out.	Change the fuse
		2. Connecting parts of cabinet is damaged.	Change socket connector.
		3. The connecting line for electric cabinet is not in right position.	Install correctly after inspection.
		4. The temperature controller is in error.	Adjust parameters. If the temperature controller is damaged, change it.
		5. The starter or thermal protector is damaged.	Change the starter or thermal protector.
		6. The press is in error.	Change press.
2. High temperature inside the refrigerator		1. The set temperature is high.	Reset
		2. The freezing agent is leaking.	Find leaking point and weld. Refill freezing agent.
		3. The temperature controller is damaged.	Change the temperature controller.
		4. The capillary or system is dirt and stopped.	Clean capillary or change filter.
3. The screen doesn't display temperature.	It displays F1.	1. The temperature-sensing probe is in short or open circuit.	Inspect the temperature sensing probe.
		2. Without temperature sensing probe.	Install temperature sensing probe.
4. Big noise		1. The refrigerator is not even.	Change position of the refrigerator.
		2. Sympathetic vibration between pipelines or refrigerators when press operating.	Clear up the pipelines to avoid sympathetic vibration.
		3. Fan and fan bracket is loosen.	Re-fix
		3. Connection bolts of the press is loosened.	Tight the inner connecting bolts.

【FAQ&A】

Question	Answers	Measures able to adopt
1. Inner temperature is too high or too low.	Can be resolved by adjusting and control of temperature.	See detailed operation in instruction manual.
2. Sides of the refrigerator is hot.	There is anticoagulant near refrigerator open on side surface. Heating is normal instead an error.	Can turn off the electric heating switch.
3. There is difference between displayed temperature and detected temperature.	The displayed temperature is temperature on sensing probe. It is normal to has difference with that of the refrigerator.	Normal situation needs no resolution.
4. The alarming rings in short time after start up.	Alarm when the inner temperature in within alarming region.	Normal situation needs no resolution.

Why there is serious frosting in DW-40L262/188?

Answer: it may caused by loosen door or frequent opening the door, or one of the small hole allowing condenser to enter the refrigerator is not plugged up. This needs to be disposed by service persons. Moreover, regular defrosting is required to keep better effect, normally once per 1-2 months.

Error of DW-40L series sensors and how does press operate?

Answer: During the operation of DW-40L low temperature reserving box, when the freezing sensor is in error (short circuit or open circuit), the temperature value displayed will be “F1”; the frozen food cabinet enters protecting mode and compressor is in fixed alternation of 20min on and 5min off with alarming in failure; if the refrigerator is in quick-freeze status, quit (the corresponding light will be off).

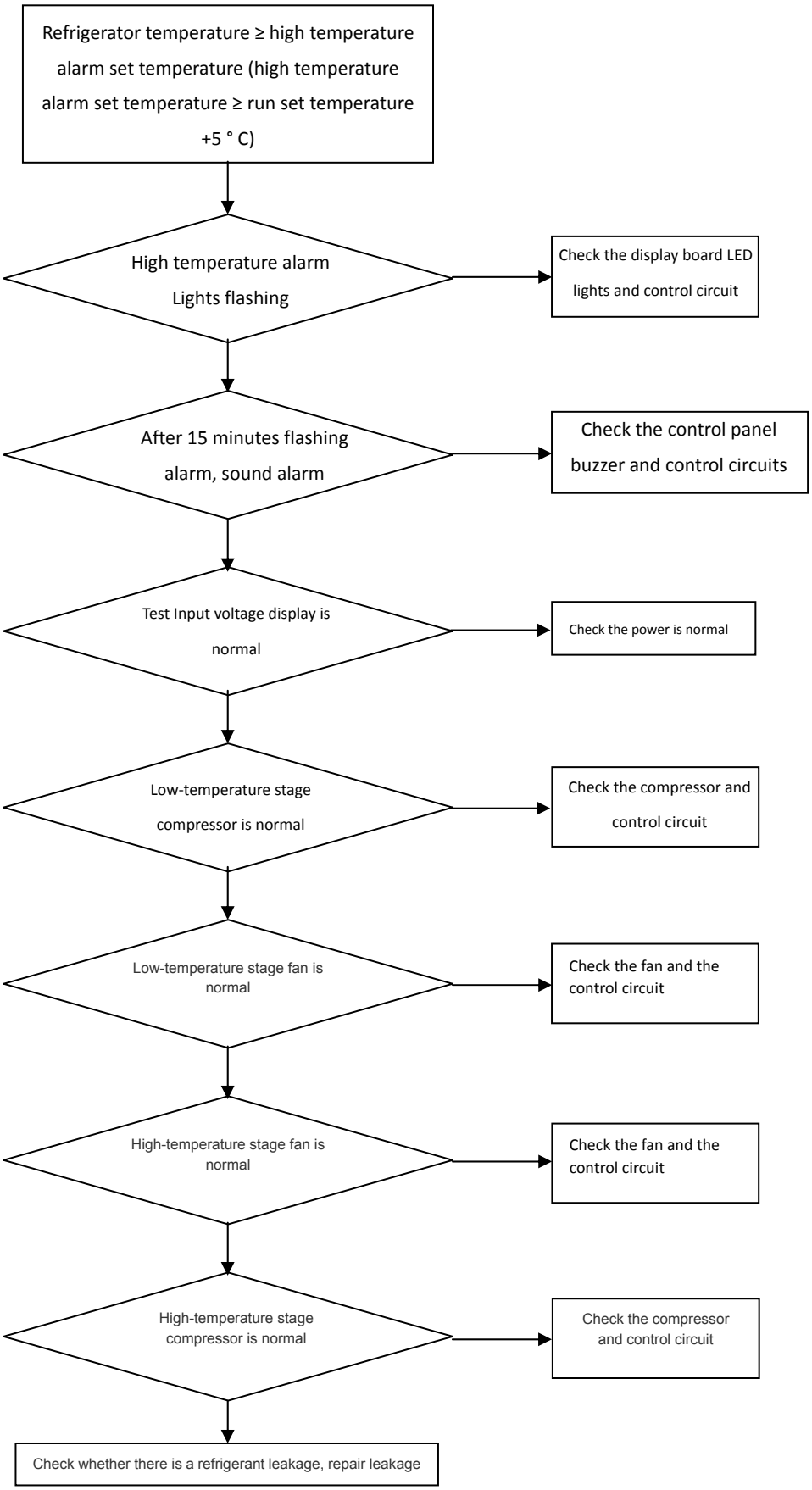
What is the temperature setting range for DW-40L series machine?

Answer: the set range is -10～-40℃/for old products: -20 ~ -40℃.

【Troubleshooting】

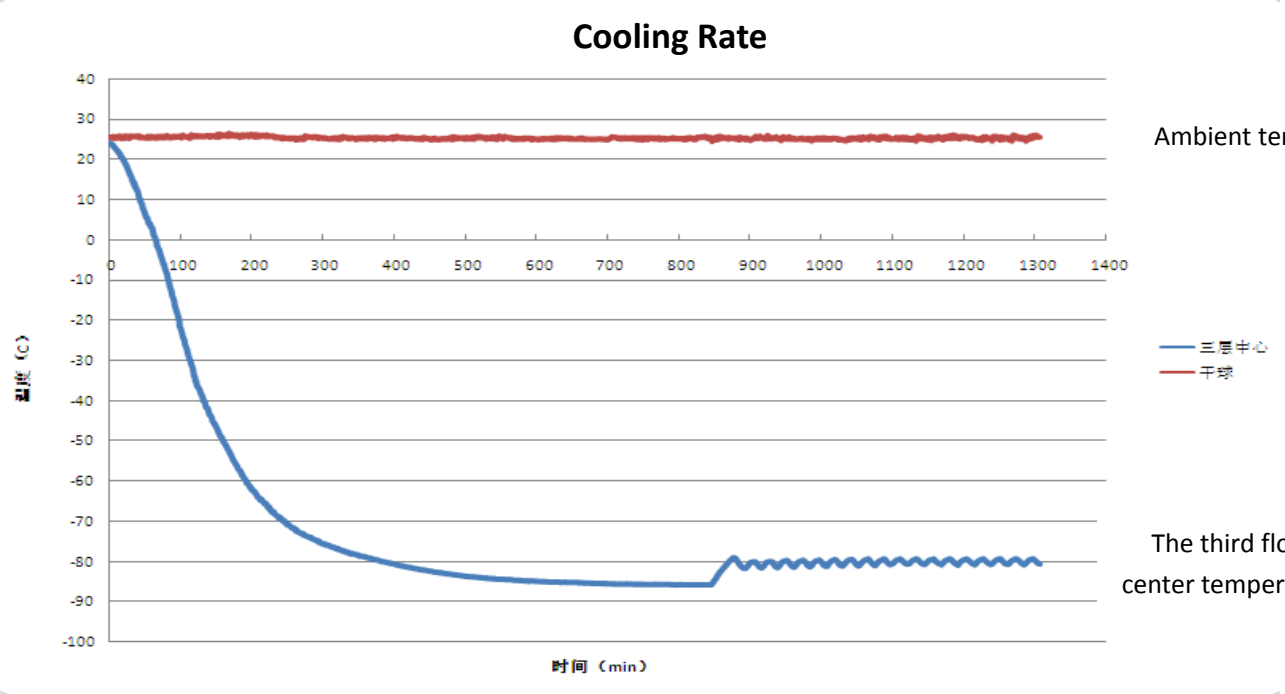
Fault	Analysis	Maintenance Measures
1.High temperature level compressor fails to start	1. User's fuse burns out	Change the fuse
	2. Machine storehouse wiring connector plugs s are damaged	Change the connector plugs
	3. Bas wire contact	Check contact and make in good condition.
	4. Display panel and control panel connection failure	Checking if it is due to bad connection, otherwise, change it.
	5. Relay, start capacitor or heat protector is damaged	Change the part.
	6. Compressor fault	Change the compressor
	7. User's voltage is too low	Add a manostat
2.Low temperature level compressor fails to start	1. Same reason as high temperature level compressor	Same measure as high temperature level compressor
	2. Pressure switch is damaged	Change the pressure switch
	3. High temperature level compressor has poor refrigeration	Repair high temperature level refrigerating system
3.Fan does not rotate	1. Fan wiring is loose	Checking the wiring
	2. Fan blades are blocked by foreign matters	Checking and clean them
	3. Fan is damaged	Change parts
4.High temperature in cabinet	1. The temperature setting of outage is too high.	Re-set computer board
	2. Refrigerant leaks.	Find leak location and make repair welding. Infuse refrigerant again.
	3.Temperature probe is damaged	Change parts
	4. Capillary tube or system is blocked by dirt\ greasy	Clean the capillary tube or change filter.
	5. High ambient temperature	Turn on air-conditioner，reduce ambient temperature.
	6. Condenser blockage	Clean condenser
5.Display board displays E0 E1 E2	1. Temperature probe short circuit or disconnect	Checking the temperature probe
	2.No temperature probe	Install a temperature probe

【How to deal with poor cooling】



【Testing Date】

Cooling Rate



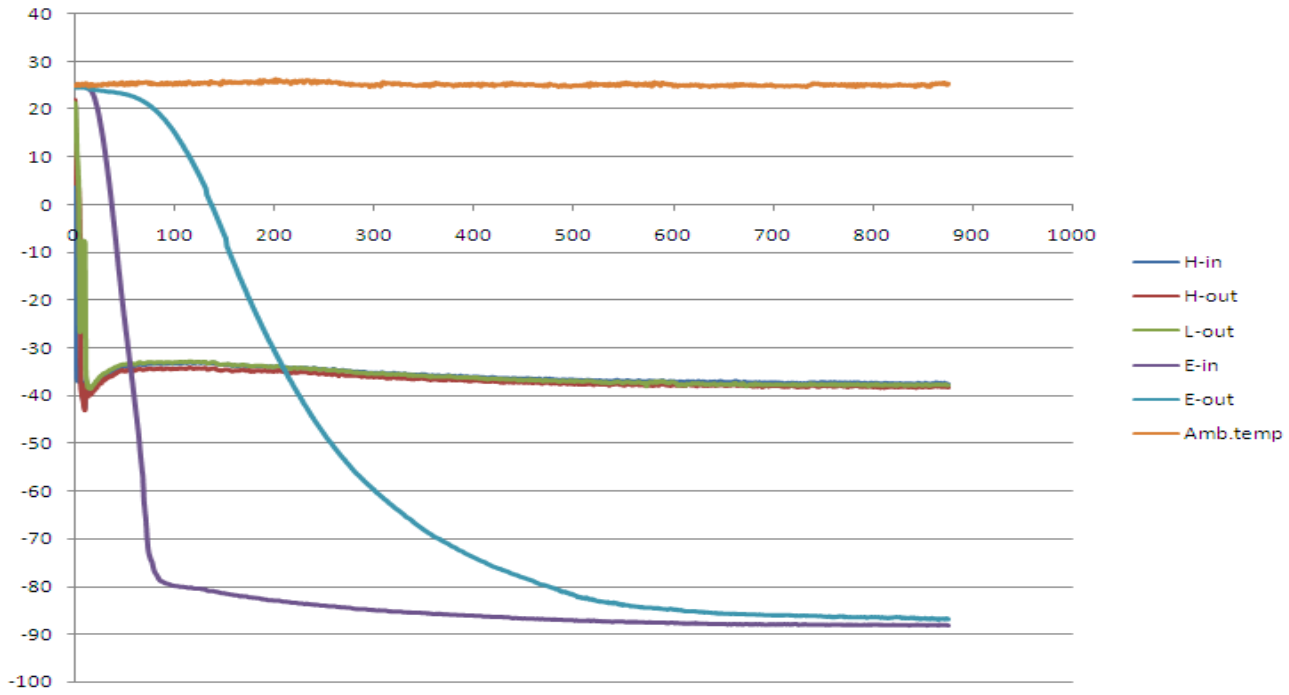
Ambient temp

The third floor center temperature

Cooling Rate

SN	Model	Power supply	Ambient temp	Cooling time(from ambient temp to -80℃)min
1		220-240V/50Hz	25℃±3	≤360
2		220-240V/50Hz		≤420
3		220-240V/50Hz 208-230V /60Hz 115V60Hz		≤420

Temperature of the cooling system parts



Temperature of the parts

sn	model	Power supply	Ambient temp	Cooling system temperature				
				H-IN	H-OUT	L-IN	E-IN	E-OUT
1		220-240V/50Hz	25℃±3	⩽-32℃	⩽ -32℃	⩽ -32℃	⩽ -86℃	⩽ -85℃
2		220-240V/50Hz						
3		220-240V/50Hz 208-230V /60Hz 115V60Hz						
4		220-240V/50Hz 208-230V /60Hz 115V60Hz						

Haier

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