CRYOGENIC STORAGE CABINET

USER'S GUIDE

DW-60W Series

- Please read the operation instruction before installing and using this product and keep it safe for reference.
- Please observe the operating instructions and precautions of the directions.
- If fault occurs, do not repair by yourself or send it to a maintenance department which is unauthorized by our company.
- Production standard for this product
  GB4706.13-2004
  GB/T 20154-2014

1. Main performance and characteristics of the product

➢ Thermal insulating door and secondary seal door are adopted for use convenience. The loss of refrigeration capacity is reduced and the energy consumption is saved.

➢ An air-cooled condenser is adopted which is provided with good heat dissipation and fast refrigerating speed.

➢ Stainless steel inner and tube-in-sheet evaporators are adopted. Things can be put in or taken out easily. The refrigeration effect is good and the freezer can be cleaned easily.

➢ An import microcomputer temperature controller is adopted for accurate temperature control. The temperature inside the freezer is displayed digitally. With elegant appearance, the freezer can be used conveniently. Users can regulate and check the inside temperature and the working state without opening the door.

➢ The microcomputer control is more accurate and safer

➢ The system is equipped with a safety protection device for ensuring the safe and reliable operation of the system.

➢ The refrigerating system all adopts imported parts which provide good reliability and long service life to the system.

2. Precautions

The sign of "⚠" means the place is dangerous to human bodies, or the use pattern is harmful to products, or alarm users should pay special attention to this.

✧ ⚠ It is strictly prohibited to unpack the outer packing case for transportation.

✧ The ultra low-temperature freezer should be used under the environmental temperature of 10℃~30℃. It is suggested to use it under the environment with air conditioning.

✧ ⚠ The slant angle of the body of the ultra low temperature freezer should not be larger than 45° in transportation to avoid faults of the compressor or the system.

✧ ⚠ After unpacked, the freezer should be placed on flat and firm ground near to the power socket.

✧ ⚠ Do not put it near the heat source and avoid the sunshine

✧ ⚠ The ultra-low temperature freezer should be stored in a dry and drafty room

without corrosive gas surrounding

⬦ ⚠ If the ultra low-temperature freezer has to be stopped for a long period, it should be cleaned inside and outside and then covered properly with plastic housing.

⬦ ⚠ The power supply is 198V～242V/50Hz. If the voltage is unstable, please equip a power regulator which is above 3000VA, and please use it alone.

⬦ ⚠ It is necessary to provide individual one-phase three-hole socket and the proper fuse for the ultra low-temperature freezer.

⬦ ⚠ The ultra low-temperature freezer must be provided with reliable independent ground wire. The ground wire cannot be connected with gas pipe, steam heating pipe, and water pipe and the zero line of single-phase source should not be taken over as well.

⬦ ⚠ If the power connect wire has to be lengthened, the sectional area of the conductor is larger than or equals to 1.5mm. The conductor can be single-stranded or multi-stranded. It is strictly prohibited to use a multipurpose socket for connection.

⬦ ⚠ The ultra low temperature freezer cannot lean against the wall. The space of at least 30cm should be left at the machine room for normal running of the system.

⬦ ⚠ No water is allowed to be splashed on the outside body of the ultra low-temperature freezer. When scouring the ground, it is strictly prohibited to splash water into the control panel and the compressor room. It is also prohibited to use the product in the rain or under the environment with the relative humidity of larger than 85%. Otherwise, faults such as electric leakage, etc. may be caused.

⬦ ⚠ With a continuous operation system, the ultra-low temperature freezer should be restarted after five minutes in case of a power failure or machine halt to prevent the compressor or the system from being damaged.

⬦ ⚠ It is strictly forbidden to store flammable, explosive and volatile dangerous goods and strong acid strong alkali.

⬦ ⚠ The ultra low-temperature freezer cannot be used under inflammable and explosive gas environments. Be sure not to spray combustibles such as paint, coating, etc. to avoid fires.

⬦ ⚠ The key to the ultra low-temperature freezer should be kept out of the reach of children to avoid accidents

⬦ ⚠ The door should be closed tight. Otherwise, the normal operation and usage of the system may be affected.

✧ ⚠ **The service environment pollution grade of the ultra low temperature freezer is grade 2.**

3. Range of application

This product can be used in scientific research, cryogenic preservation of special ice cream products and low temperature experiments of special materials, etc. It is widely used in food freezing, scientific research institutes, industrial and mining enterprises, bioengineering research, electronic chemicals, offshore fishing and other industries.

4. Preparation for use

- After unpacking, remove all outer packaging materials.
- Checking standard accessories and data: check and compare the inside accessories and data with the packing list【please see related pages of the directions】
- Please place the cryostat in a suitable location [please refer to the relevant clauses in the precautions].
- It is best to clean before use [please refer to the relevant provisions in the maintenance and maintenance].

5. Product structure diagram

Vertical low temperature refrigerator structure diagram
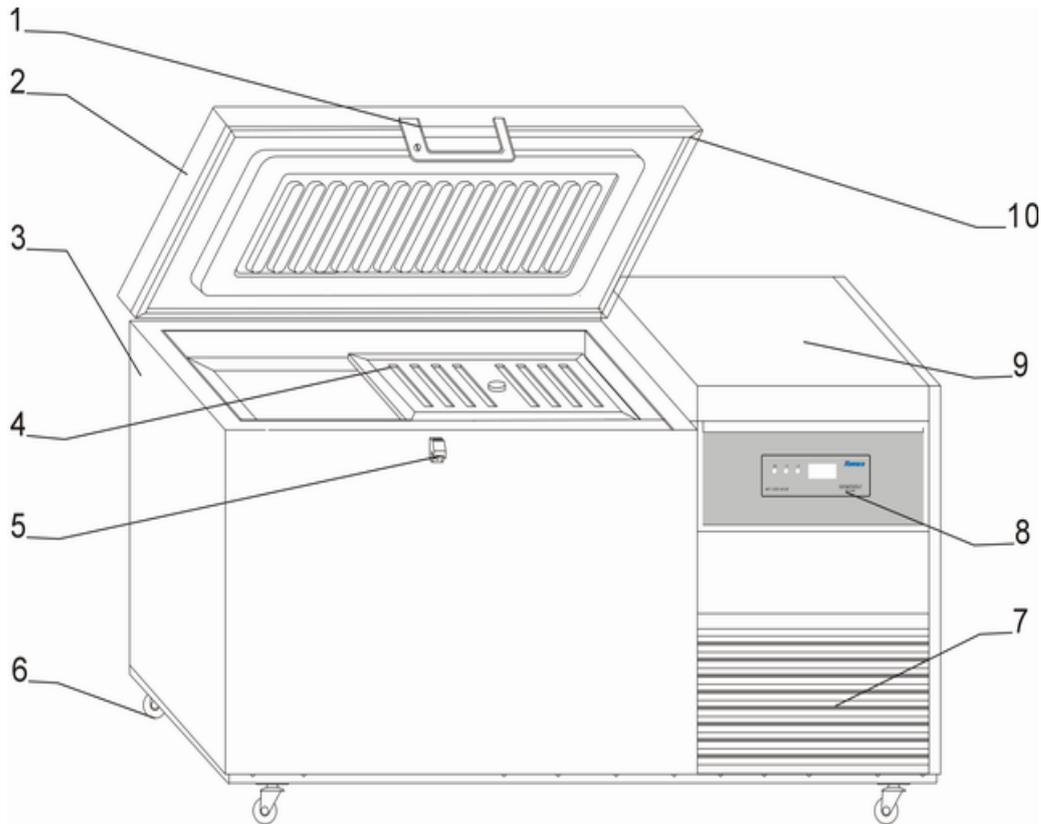
1. Door handle   2. Exterior doors   3. Body   4. Inner door (optional)   5. Lock
6. Casters   7. Ventilation window   8. control panel   9. Cabin   10. Door seal

6. Start the test machine

- Plug in the socket and switch on the power switch (located at the right side of the temperature controller on the front part of the body). Then the power supply indicator light is on. In order to ensure the normal running of the cryogenic freezer, be sure to use the three-hole socket which is above 16A.
- The system will automatically start the compressor, and the refrigeration indicator light is on. The system goes into refrigerating cycle state.
- After the power has been supplied for a period of time, the temperature inside the freezer decreases obviously, which indicates the refrigerating system is working normally.
- Before storing articles, please keep the freezer running in empty state. When the freezer is running stably (it is best to keep it running in empty state for 3 hours above) and the inside is cooled completely, the cold store articles can be put in.

7. Model and main technical parameters parameters

Model⟍Parameters	DW-60W120	DW-60W220	DW-60W320	DW-60W420	DW-60W520	DW-60W620	DW-60W920
Capacity	120L	220L	320L	420L	520L	620L	620
Temperature	−25℃～−60℃						
Power voltage	～115V	～115V	～115V	～115V	～115V	～115V	～115V
Rated frequency	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz
Power consumption （kW・h/24h）	4.4	4.9	7.0	8.4	8.6	9.3	15.5
Power（W）	340	400	480	500	500	520	1050
Protective class	I						
Climate class	N	N	N	N	N	N	N
Alarm sytem	Sound and light			Sound and light			
Refrigerants	Mixed refrigerant			Mixed refrigerant			
Dimension (mm) W*D*H	900*750*920	1160*750*860	1530*750*860	1684*754*860	1850*890*1005	2115*895*1005	2000*1050*870
Storage room Dimension (mm) W*D*H	700*470*360	960*470*570	1330*470*570	1480*470*570	1220*600*690	1500*620*690	1800*850*670
N.W	80kg	95kg	110kg	120kg	165kg	190kg	184kg

【 Notes: technical parameters in this table are measured at the standard state. Please be subject to the nameplate of the goods freezer without prior notice in case of variation.】

8. Functions and basic operation of the controller

1. Control panel structure: computer control system is adopted by the ultra low temperature freezer

2. **Description**

The KLT11IB is designed for heating and cooling applications. The probe temperature is displayed on the bright 3-digit display .   The user is able to program different parameters including set point, hysteresis, alarms and probe adjustment using the silicone front keypad. The unit features error or alarm warning, internal buzzer

(optional), configurable digital input and password protection. The KLKey input allows an easy programming of the parameters. Select between temperature display in ºC or ºF , display color and 230V ac, 115V ac, 24V ac/dc or 12V ac/dc power supplies.

3. **Maintenance, cleaning and repair**

After the final installation of the unit, no routine main maintenance is required.

Clean the surface of the display controller with a soft and damp cloth. Never use abrasive detergents, petrol, alcohol, or solvents.

All repairs must be made by authorized personnel

4. **List of parameters**

	Description	Units	Range	Factory
SP	Set Point	Degrees	r1 to r2	-60
r0	Differential or hysteresis	Degrees	0.1 to 99.9	2.0
r1	Lower value for SP	Degrees	-200 to r2	60
r2	Higher value for SP	Degrees	r1 to 600	-25
r4	Set Point variation	Degrees	0.1 to 200	3.0
d0	Cooling or heating control	Degrees	Co/Ht	Co
c0	Minimum stopping time	Seconds	0 to 999	0
c2	Output status with probe error	Option	On/OFF	ON
P1	Ambient probe adjustment	Degrees	-99.9 to 99.9	0.0
P4	Decimal point	Option	no/yes	yes

P5	3 wires Pt100	Option	no/yes	yes
E0	Digital input configuration	Option	OFF/AI/ES/HC	OFF
H5	Access code to parameters	Numeric	0 to 255	0
A0	Alarm 1 hysteresis	Degrees	0.1 to 99.9	1.0
A1	Alarm 1 threshold	Degrees	0.0 to 999	0.0
A2	Alarm 1 exclusion time	Seconds	0 to 999	0
A3	Alarm 1 type	Option	OFF/HI/LO	OFF
A4	Alarm 2 hysteresis	Degrees	0.1 to 99.9	1.0
A5	Alarm 2 threshold	Degrees	0.0 to 999	0.0
A6	Alarm 2 exclusion time	Seconds	0 to 999	0
A7	Alarm 2 type	Option	OFF/HI/LO	OFF
A8	Alarm verification time	Seconds	0 to 999	0

5. Parameter descriptions

SP = Set point. Temperature we wish to regulate the machine

(variable from r1 to r2)

r0 = Differential or hysteresis

R1= Lower value for SP

r2= Higher value for SP

r4= Set point variation for energy saving. If digital input

configuration E0   ES this value modify the set point as follows:

> **If d0=Ht new SP= SP- r4**

> **If d0= Co new SP= SP+ r4**

do= Cooling or heating control

If d0 = Ht and TS is the temperature of ambient probe:

> **If TS >= SPthe load is disconnected**

> **If TS <= SP- r0 the load is connected**

If d0 = Co then:

> **If   TS <= SPthe load is disconnected**

> **If   TS >= SP+ r0 the load is connected**

c0 = Minimum stopping time of the load

c2 = Output status with probe error

P1 = Ambient probe adjustment

P4 = Decimal point

P5 = 3 wires Pt100. no = 2 wires, yes = 3 wires

E0= Digital input configuration

OFF = Digital input disabled

AI = External alarm (if input is short-circuited)

ES = Energy Saving. Set Point value is modified in r4.

HC = if input is short-circuited, it changes to Heat or Cold

depending of d0 value.

> **if d0 = Heat it changes to Cold mode.**

> **if d0 = Cold it changes to Heat mode.**

H5 = Access code to parameters (it is set to 00 from factory)

A0, A1, A2, A3= Alarm 1 parameters

If   A3=OFF alarm 1 disabled

If   A3=HI then a high-temperature alarm is set:

> **if   TS >= SP+A1 the alarm 1 is activated**
>
> **if   TS <= SP+A1-A0 the alarm 1 is de-activated**

If   A3=LO then a low-temperature alarm is set:

> **if   TS <= SP-A1 the alarm 1 is activated**
>
> **if   TS >= SP-A1+A0 the alarm 1 is de-activated**

The alarm 1 is not activated until the time since instrument is turn on is higher than A2

A4, A5, A6, A7= Alarm 2 parameters (similar to alarm 1)

A8= Alarm verification time. Time since the alarm situation occurs until its signalling. (It affects to Alarm 1, Alarm 2 and External alarm)

6.   Parameter programming

Set Point (SP) is the only parameter the user can access without code protection.

•Press SET .   SP   text will appear on the display .

•Press SET again.   The real value is shown on the display.

•The value can be modified with the UP and DOWN arrows.

•Press SET to enter any new values.

•Press SET and DOWN at the same time to quit programming or wait one minute and the display will automatically exit programming mode.

7.   Access to all code protected parameters

•Press SET for 8 seconds. The access code value 00 is shown on the display (unit comes with code set at 00 from factory).

• With the UP and DOWN arrows, code can be set to user needs.

•Press SET to enter the code. If the code is correct, the first parameter label is shown on the display (SP).

• Move to the desired parameter with the UP and DOWN Keys.

•Press SET to view the value on the display .

•   The value can be modified with the UP and DOWN arrows.

•Press SET to enter the value and exit.

• Repeat until all necessary parameters are modified.

•Press SET and DOWN at the same time to quit programming or wait one minute and the display will automatically exit programming mode.

*The keyboard code can be reset to ZERO by turning off the controller and turning it on again while keeping the SET key depressed.

8.   Led indication, buzzer and display messages

The led OUT indicates if the load is connected or not.

In normal operation, the probe temperature will be shown on the display .

In case of alarm or error , the following messages can be shown (the alarm led is ON and buzzer sounds):

- Err   = Memory Error.
- ooo   = Open Probe Error.
- --- = Short-circuit Probe Error .
- A1H = High temperature alarm 1.
- A1L= Low temperature alarm 1.
- A2H= High temperature alarm 2.
- A2L= Low temperature alarm 2.
- ALE = External alarm.

9. Alarm validation

In case of alarm the internal buzzer and alarm led is activated. The display shown the corresponding message.   The buzzer and display message can be silenced pressing the SET and DOWN arrows at the same time. If alarm continues after   A8 it is signalling again.

9. Storage essentials

- Before storing articles, please keep the freezer running in empty state. When the freezer is running stably (it is best to keep it running in empty state for 9 hours above) and the inside is cooled completely, the cold store articles can be put in.
- Articles or other products put in the freezer in one time shouldn't be too much. Proper clearance should be left to help the circulation of the inside cold air.
- The refrigerating system of the ultra low temperature freezer is a device used for maintaining low temperature rather than a quick freezing device. If you want to store high capacity (high water-bearing material), precool them in other quick-freezing plant and then store them in the freezer to avoid long-time running without stop of the refrigerating system.
- When the initial storage capacity is large, a method of gradually lowering the temperature set should be adopted. The temperature is lowered by 10℃ in every step and then maintained for 1-2 hours until the storage temperature is reached.
- When storing plastic bag products, please note that do not get them close to metal edges to avoid scratch of plastic bag.

10. Product maintenance and maintenance

- Body cleaning: please use non-corrosive neutral cleaning agent to clean the inside and

outside surfaces of the ultra low temperature freezer and then use dry cloth to wipe it up.

- ⚠ Notes: it is strictly prohibited to use water to directly wash the inside and outside surfaces of the freezer so as not to affect the insulating property of electrical equipment. Boiling water, cleaner, acid, alkali, gasoline, alcohol, benzene, corrosive cleaning agent and scrub-bush are forbidden in cleaning.

- Clean dusts on the condenser frequently by banister brush or vacuum cleaner to maintain good condensing effect.
- Regularly wipe a little talcum powder on the door seal to extend the service life of the sealing strip.
- If the ultra low-temperature freezer has been running for a long time, frost may be easily accumulated on the door seal, the opening part of the freezer, and the sidewall inside the freezer. If the frost layer is too thick, the sealing property and the refrigerating property may be affected. Therefore, please defrost regularly and wipe it clean with a dry cloth.
- Please use a non-corrosive neutral cleaning agent to clean the inside and outside surfaces of the freezer and then use dry cloth to wipe it up.
- Machine halt: when stop using the freezer, unplug the power plug, clean it according to the above method, cover it with a plastic bag after natural drying, and put it on a ventilated and clean place.

11. Non-fault phenomenon

- Sound of running water can be heard in the ultra low temperature freezer: this is the sound of refrigerating fluid running in the pipeline.
- Compressor is hot: when the compressor is running, the surface temperature can reach to 70℃～90℃
- You may feel a little hot on the two sides of the body (close to the door body) when the freezer is running. That is because the leak proof tube equipped in the freezer.
- There is condensation on the door seal: in rainy and moist season or under the environment with higher relative humidity, there may be condensation on the outer surface of the freezer and the door seal. Then rub dry.

12. Failure analysis

phenomenon	Cause
The system is not running	Is the power contact good? Is the power supply voltage within the normal range?
The compressor is not running	Is the temperature setting correct?
After the temperature reaches the set value, it continues to drop.	Is the temperature setting correct?
The compressor is not running	Compressor failure, controller or control line damage
Temperature does not reach the set value	Is the door not closed? Are there too many items placed? Does the ambient temperature exceed the product requirements?
Too much noise	Whether the cabinet touches the wall panel or other objects to cause resonance

13. Controller circuit schematic

➤ **KELD controller wiring diagram （KLT 11IB）**

Product QC certification

Product name： _____

Product model： _____

Product code： _____

Quality inspector： _____