STALWART

USER MANUAL

Model:

STF-90B,STF-270B

STF-450B

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1. Application Notes

Thank you for choosing STALWART products! For your safe and convenient use and reasonable maintenance of the equipment, please read the User Manual carefully before use and keep it properly for reference.

The equipment operator can copy some chapters of this operation manual, but only for internal use, for example, to instruct the user how to deal with emergencies. These chapters are clearly marked in the catalog of the manual.

STALWART has no obligation and responsibility for any instrument damage caused by the user's failure to use the equipment according to the instructions or the method specified by the manufacturer.

Due to the rapid improvement of STALWART products, the functions described in the instructions may be inconsistent with those of the products you purchased. Please refer to the physical functions.

➢ Please read carefully the Attention and Safety Precautions in 2. Safety Instructions.

➢ During transportation or use, no violent vibration or collision is allowed and the freezer shall be kept away from rain. Store in a clean room with humidity no more than 80%, no corrosive gas and good ventilation.

➢ Ultra low temperature freezer and biomedical freezer (hereinafter referred to as equipment) can only be operated by trained and authorized personnel.

➢ Maintenance the equipment can only be completed by STALWART or an agent authorized by STALWART.

➢ If the operator encounters any situation not mentioned in this manual, please contact STALWART or the agent authorized by STALWART for the correct handling method.

➢ If the equipment is not used according to the method specified in the specification, it may be damaged.

➢ Try to use the accessories provided by STALWART. If users would like to use other accessories, STALWART will not be responsible for the adverse consequences caused therefrom.

➢ Equipment must be inspected and maintained regularly to ensure good operation of the equipment.

Be sure to wear protective gloves

⚠ **Warning**:

After each access, be sure to dry the water stains around the sealing strip to prevent freezing. Wear protective gloves when storing items in the equipment, and beware of frostbite

Tips

◆ Always use protective equipment correctly (including clothes, gloves, goggles, etc.)

◆ Always keep good hygiene habits

◆ Every personnel is obliged to be responsible for his or her own safety

2. Safety Instructions

When using this product for the first time, please pay attention to the meaning of the following warning signs and carefully read the safety precautions, so that you can use this equipment safely and correctly.

⚠️	**Warning!** Failure to observe the precautions may result in serious personal injury or death.	❗	**Attention!** Failure to observe the precautions may result in personal injury or equipment failure and related property losses
⏚	Must be grounded	🔥⚠️	**Risk of Exploration:** This sign indicates the risk of explosion when using volatile and explosive chemicals.
🚫	Do not place it obliquely	☀️🚫	Avoid direct sunlight
⚡⚠️	Beware of electric shock.	❄️⚠️	Beware of low temperature
🔥⚠️	Operating instructions	🖐️📦	This equipment is a precision instrument

⚠️	Warning: Failure to observe the precautions may result in serious personal injury or death.
⚠️	Vents and drains are located at the bottom of the equipment. It is forbidden to place items at the bottom of the cabinet.
⚠️	Do not touch the equipment with wet hands to avoid electric shock; Equipment shall not be grounded through gas pipeline, water supply pipeline, telephone line or lightning rod, which may easily cause electric shock.
⚠️	This equipment can only be installed by professional technicians or after-sales maintenance personnel, it may cause electric shock or fire
⚠️	Be sure to install the equipment on a solid and flat ground and take due care to prevent tipping over. If the ground is not solid enough or the installation location is not appropriate, it may cause the equipment to fall over and cause equipment damage or personal injury
⚠️	Please handle the power cord carefully to avoid short circuits or open circuits. Please turn off the power before pulling out the power plug . Hold the power plug carefully and pull it out. Do not pull the wires of the power plug Otherwise, it may cause electric shock or fire due to the short circuit
⚠️	Please insert the power plug into the outlet tightly to ensure firmness and reliability, so as to avoid electric leakage; After installation, the power plug must be within reach, so that the power plug can be unplugged in time in case of emergency.
⚠️	Separate special outlets must be used and grounded reliably. The cross-sectional area of the copper conductor in the wall connected with the outlet must be more than 4mm'. Do not lengthen the power cord without authorization to avoid heating or fire.
⚠️	Do not use the power supply that is not specied in the equipment design, so as to avoid overheating , short circuit and other faults. For example, connecting 110V rated voltage products to 220V power supply may cause faults such as overheating and equipment burning. This equipment adopts a 220V/50HZ AC power supply. If the operating voltage is too low or too high, a suitable automatic voltage stabilizer must be installed for cooperative use.
🚫	Please place the equipment stably and avoid shaking
🔥⚠️	Do not place the equipment in a dangerous area, and do not operate the equipment near flammable items to prevent explosion or fire accidents

	Do not place the equipment in areas exposed to the sun or rain, so as to prevent danger such as short circuit or overheating.
	Do not tilt or lay the equipment sideways, and do not impact the equipment body; Refrigeration systems are installed in the equipment, which is easy to be damaged by tilt or impact.
	Please place the equipment in a dry and dust-free environment to avoid risks such as overheating, and short circuit.
	In case of unexpected sound, smell, smoke, etc. when the power is turned on, please unplug the power in time and contact the manufacturer or supplier.
	Please place the equipment in a dry and ventilated environment, and ensure that the equipment vents and instrument surfaces are not blocked or shielded by walls or other objects; Do not use it in a poorly ventilated environment to prevent damage caused by heat released by equipment.
	It is forbidden to disassemble and modify this equipment without authorization, so as to avoid potential safety hazards. In this case, STALWART will not bear any responsibility for quality accidents.
	It is forbidden to put inflammable and explosive dangerous goods, strong corrosive acids, alkalis and other items unsuitable for the equipment in the equipment.
	When storing toxic, harmful or radioactive materials, please use the equipment in safe areas. Improper use may cause harm to human health or environment.
	Metal objects such as nails or iron wires shall not be inserted into any aperture and gap or any outlet of the equipment, otherwise electric shock or injury may be caused due to accidental contact between the above objects and moving parts
	In order to ensure the normal operation and ventilation and heat dissipation of the equipment, the back, left and right sides of the freezer body should be at least 30cm away from the wall, and the air inlet and air outlet must not be blocked by obstacles!
	This equipment must be connected to a ground wire, and the equipment conductor terminal must be protected.
	Note: Failure to observe the precautions may result in personal injury or equipment failure and related property losses.
	It is forbidden to store living animals, flowers or other items with strict temperature requirements in the equipment.
	The temperature in the freezer is very low during operation. Do not touch the liner surface covering plate and frozen objects with your hands without wearing protective gear or frostbite may occur.
	Hold the handle and close the door to avoid pinching your fingers; When the equipment is not used for a long time, please unplug it and pack it for storage.
	When restarting the equipment after power failure or power off, please check the equipment settings first, otherwise the stored items may be damaged due to the change of settings.
	The equipment can be used for item preservation, not as production equipment!
	Keep the keys properly, so as to avoid accidents when children open the door accidentally.
	When handling the equipment, please be careful not to tip over the equipment, so as to prevent equipment damage or personal injury.
	When handling, it shall be lifted from the bottom, with the inclined plane not be greater than 45°, and it shall be handled with care. Please use the equipment in safe areas. Improper use may cause harm to human health or environment.

3. Precautions in Use

♦ Before putting the items into the equipment, please confirm that the temperature in the freezer has reached the set value first, and then put the articles in batches. Every time you put in items, they shall not exceed 1/3 of the inner volume of the freezer so as to prevent excessive temperature rise

♦ The equipment temperature display value is the temperature at the temperature sensor in the freezer. There is a certain gap between the displayed temperature and the actual temperature at the center of the equipment when the equipment just starts running, but as the equipment enters a stable state, the displayed temperature will gradually approach the actual temperature.

♦ The freezer body is provided with a test hole so as to lead out the test line from the cabinet during the test. After the test line is led out, it is necessary to plug the test hole with thermal insulation material again, otherwise the temperature inside the freezer may not reach the set value, and condensation will appear around the outside of the through hole.

♦ Please use a diluted neutral cleaner to clean the equipment, and do not use brushes, acid, gasoline, soap powder, polishing agent or hot water to clean the equipment, otherwise the painted surface and plastic rubber parts may be damaged. Be careful not to wipe plastic rubber parts with volatile solvents such as gasoline.

♦ After a period of operation, a layer of frost will form on the inner wall and inner door of the freezer body. Before defrosting, please take out the frozen items in the freezer and put them in an environment suitable for their storage, so as to prevent the item damage due to the temperature rise in the freezer during defrosting

♦ When the equipment is not used for a long time, the power supply shall be cut off.

4. Product Installation

4.1 Installation Environment

+ Ambient temperature: 16°(~ 32°(, the most ideal temperature is 18°(~ 25°(, and the air conditioning system shall be used when necessary.

+ Relative humidity:.80%RH

+ There is no strong vibration and corrosive gas around.

+ Avoid the existence of a large amount of dust.

+ Avoid rocking or shaking the equipment.

+ Elevation of the working position of the equipment: less than 2000m

+ Indoor use, pollution degree 2, and over voltage category II.

+ Input voltage AC single-phase 220-240.

+ There is no direct sunlight, other cold and heat sources and strong electromagnetic interference, which will affect the normal operation of the control system and directly damage the system in severe cases.

4.2 Installation Site

In order to operate the equipment normally and obtain the best performance level, the installation site of the equipment shall meet the following requirements:

✧ It cannot be installed in a narrow and closed space, and the door of the room shall not be smaller or lower than this equipment, which shall at least ensure the normal access of the equipment, so as to avoid the maintenance difficulties in case of equipment failure, which may result in damage to stored items due to the failure to repair the equipment in time;

✧ The installation floor must be solid, flat, non-combustible and able to bear the weight of the equipment during operation.

✧ It shall be with good ventilation, and direct sunlight shall be avoided;

✧ Each equipment needs to use a power outlet independently. Please ensure that the current borne by the power outlet shall be 10°, and the plug and outlet are firmly connected;

✧ Check the working voltage before use. In areas with unstable voltage, consider using a voltage stabilizer suitable for equipment load. The power of the voltage stabilizer is greater than 4KW to ensure that the input voltage requirements in the installation environment are met

Figure: N and E ends cannot be connected

Attention: Since the ambient temperature has great influence on the equipment, if the above environmental requirements cannot be met, the equipment may not run normally. Please improve the environment before using the equipment; The equipment is operated intermittently.

4.3 Preparation before Use:

Remove the outer packaging of all products (including the protective foam in the packaging box)

⚠ Warning: Don't put the plastic bags within the reach of children, so as to prevent suffocation accidents.

- Inventory of accessories: Please check the accessories and materials according to the packing list.
- Cleaning: Clean the product once before use.

4.4 First Power-on

When using the equipment for the first time, please follow these steps:

1. After the equipment is placed, leveled and cleaned, it shall stand for more than 24 hours, and then power it on to ensure the normal operation of the equipment.
2. Under no-load condition, connect the power cord to a special outlet with appropriate specifications.
3. After powering on, turn on the power switch of the equipment
4. Check whether the operating temperature of the equipment reaches the required value, observe the normal start and stop of the equipment for more than 24 hours, and put a small amount of items in the freezer after confirming the normal performance.
5. Please store items in batches, with the items not exceeding 1/3 of the freezer volume each time. Ensure that the equipment is running properly after shutdown for more than 12 hours before putting in the next batch of items.
6. Try not to open the door during cooling, otherwise the temperature will rise.

4.5 Operation after Power Failure

1. The equipment has a memory function for the set value. When the power is restored after power failure, the equipment will continue to operate before power failure.
2. Once the equipment is powered off, it requires 5 minutes before it can be switched on again, so as to avoid damaging the compressor.
3. We guarantee the normal operation of this equipment under certain conditions, but we are not responsible for any loss or damage of stored items after power failure.

❗ **Notes:**

- The transportation and movement of equipment is realized by casters.
- A special person shall be responsible for checking and recording the running status of the equipment every day (record and check once every 2- 4 hours). In case of failure or shutdown, the temperature in the storage chamber will rise. If it cannot be repaired in a short time, please take out the stored items and transfer them to a place that meets the temperature requirements for storage to avoid damage to the items.
- Before putting items into the equipment, it shall be confirmed in advance whether the temperature range of the equipment meets the temperature requirement of the items, so as to avoid damage to stored items due to the difference between the settable temperature of the equipment and the required temperature of the items. Please pay attention not to block the air outlet and air inlet when putting items into the equipment.
- Due to the refrigeration inertia, there is a certain difference between the actual display temperature and the set temperature of the equipment, which is a normal phenomenon.
- The equipment is item storage equipment, which cannot be used for routine production operations. It is strictly forbidden to put too many items which are relatively hot into the equipment at one time, otherwise the compressor will run for a long time, and be burned due to high temperature. Items must be put in batches, so as to ensure that the storage chamber is cooled step by step until the temperature required for storing items is reached.
- Electrical appliances without production license shall not be used inside the equipment.
- During use, when the power supply voltage fluctuates or a short-time alarm is triggered, if the voltage range is between 198V- 242V, it will not affect the normal use of the freezer.
- Do not change the set temperature frequently in a short time, otherwise the expected setting effect may not be achieved due to the large temperature inertia; Ensure that there is a certain air circulation space around the cabinet when putting in items, especially do not block the temperature sensor in the cabinet (for collecting the temperature of the cabinet), otherwise it will affect the stability and accurate control of the temperature in the freezer body.
- When putting in items, if the moisture content of the items is too much or too little, it will affect the humidity change in the cabinet, so it is best to keep the items sealed; The humidity of the working environment will affect the change of humidity in the cabinet, especially if the door is opened too frequently and the door is not closed properly.

⚠ **Warning:** Children are not allowed to play with this equipment as a game prop, otherwise the injury or loss caused therefrom will be at their own risk.

- ♦ To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.
- ♦ No modification of this equipment is allowed.
- ♦ Do not modify this equipment without authorization of the manufacturer.
- ♦ Protection impairment if used in a manner not specied by the manufacturer

5. Component Composition

Display control panel

Display control panel

ANTECH

ANTECH

Door body

Foam door

Door handle

Door handle

Door lock

Door Cabinet body

-25 C FREEZER

Door lock

Movable caster

STF-450B

STF-270B

* Due to the improvement of products and model differences, the actual products may be different from the diagram. Please refer to the actual products! The diagram is only used for functional parts description.

* Structure and composition The product consists of freezer body, door (glass door structure or foam door structure), refrigeration system and control system.

Intended use:

* Scope of application: It is suitable for storing items in hospitals, pharmacies, epidemic prevention stations, research institutions, biopharmaceuticals and other units.

* The storage temperature inside the box can be adjusted through the temperature button on the control panel, which is convenient to use and reliable in performance.

* The freezer has seven floors, each of which can hold 20Kg.

6. Operating Instructions

6.1 Function Introduction

Type A control panel

1. Function description of Type A control panel (Applicable to STF-90B, STF-270B

1. Control board introduction:

a. $\boxed{-25\,_{\text{°C}}}$ is display window for temperatureUnder normal operating conditions, the average temperature of the freezer compartment in the cabinet is displayed in units of °C; Different runningstatus can be displayed in the setup state (see below for details).

b. Door opening indicator: when the door is opened, the indicator light will be on. when the door is opened more than 1 minute, the indicator lighting with buzzer alarm, display "do".

c. Fault indicator: The indicator is off when the product is operating normally; the indicator is on when the product is operating abnormally.

d. "PRINT": The system can retain 7 days of data for printing. Press the Print key to print thetemperature for the set period of time.

e. ▼ In parameter setting mode, move to the previous parameter or decrease the value of the parameter. For example, when adjust the set temperature, press this button to reduce the set temperature. When adjust the parameter value, long press the key to quickly decrease theparameter.

f. ▼ In parameter setting mode, you can move to the next parameter or increase the value of the parameter. For example, when adjust the set temperature, press this button to increase the set temperature value. When adjust the parameter value, press and hold the up button for a long time and the parameter will increase rapidly. Under normal conditions, press and hold thekey for 3 seconds to import the U disk for 12 months.

g. ✅ is the button for set/mute, when there is no alarm state and the key is not unlocked, press

✅Displaying ambient temperature for 5 seconds and then restores normal display; In the unlocked state, press✅ fo r 3 seconds, can enter the user menu. When buzzer alarm (including high temperature, door open alarm, sensor fault alarm, etc.), in the locked state, first time press ✅Buzzer stops tweeting, 5 seconds after showing ambient temperature, resume normal display(The key mute is only to turn off the buzzer of this abnormal state alarm. If the fault is not eliminated, the buzzer will continue to alarm when the next exception occurs), press✅ again, buzzer alarms, After the ambient temperature is displayed for 5 seconds, the cabinet temperature and alarm status are restored. When the press is under unlocked state, ✅ can be used as a set button.

In the unlock state, in the parameter setting mode, press this key to display the value and theparameter name. If the pressed time is longer than 3 seconds, the setting will be saved and returned to normal interface.

h. USB data

Automatic export: when the U disk is connected to the USB interface, the recorder buzzer will chirp once and display "on". PDF files of data of the current month and the previous month will begenerated in the U disk. After data transmission, the buzzer will chirp once and display "End".

 Note: when the data is very little, the digital tube will not display "on" and "End".

Manually export: If the button is under locked state, after connecting U disk well and buzzeralarm for one time, press upper button for 3 seconds, digital tube display .d01/, Press the up button or down button to adjust .d00~d12/, press , The U disk internally generates a PDF file that generates this file (d00) or generates the data recorded in the previous month (1-12).

 Note: When the alarm of the digital tube flashes and displays "LoF," the recorder is not started;Long hold and key for 3s and "LoF" disappears, the recorder will be started successfully.

2. Function settings

a. Power on, open the power switch on the back of the cabient, the machine can enter the working state;

b. User parameter settings:
Unlock: In the normal running state, press the key andfor 3 seconds at the same time, the digital tube will display the parameter code "0000", and input the password "0005" (enter the user menu password, enter "0099" to restore the key lock password to the default "0005"), Unlock at this time. Press the key for 3 seconds after unlocking, thedigital tube displays the parameter code
"PS1" and enters the setting adjustment.

c. Use the up or down key to scroll through the parameters. The display order is b1-b2-Set-H-L-n-y-r-S-F-Pt-tH1-P1-PS1-MAX-MIN-CLR.

Press thekey to confirm the category. The first parameter name of this type of parameter will be displayed.

1. Press the or to scroll through the values

2. Press the to display the corresponding value

3. Press or to increase or decrease the value

4. Press the to temporarily store the modified value of the lock and return to the display parameter.

5. If you need to modify other parameters, repeat steps 1-4.

6. Press thefor more than 3 seconds to store the modified parameter and return to the display parameter category.

ci.Press the for more than 3 seconds, or if there is no button within 60 seconds, exit theparameter setting program.

cii.Parameter display

3. Press for more than 3s, or press no key in 60S to exit the parameter setting program

4.Parameter display

NO.	Menu item	Parameter Range	Suggested settings	Remarks
1	b1	V1.0-9.9	1.0	Hardware version
2	b2	V1.0-9.9	1.1	Software version
3	Set	-10~-25	-25	Temperature setting
4	H	0.0~10.0	5.0	Set value of high temperature alarm set+H; When H=0, the alarm is deactivated; When the temperature is higher than the high temp alarm set temperature alarm displays H1
5	L	0.0~10.0	5.0	Set value of low temperature alarm set-L; When L=0, the alarm is deactivated; When the temperature is lower than low temp set the low temperature alarm displays L1
6	Pt	0~240min	20	Print interval
7	tH1	20.0~50.0℃	40.0	Upper limit of ambient temperature alarm
8	PS1	0000~9999	0005	User menu password settings
9	MAX	_	_	The highest temperature since last clearance
10	NIN	_	_	The lowest temperature since last clearance
11	CLR	_	_	Clearance of the Max and Min temperature records

5.Alarm display

Alarm Code	Fault description
H1	High temperature alarm
L1	Low temperature alarm
H2	High ambient temperature alarm
door	Door open alarm
PF	Power failure alarm
bL	Low battery alarm
Er	Data Logging not connected
LoF	Data Logging not started
EE	Communication error

Type Control panel

1. Function description of Type A control panel (Applicable to STF-450B

a. -25.0 -40.0 is a temperature display window, which displays the average temperature of the upper chamber and the lower chamber of the freezer body in °C under normal operation. (The upper and lower chambers are set at -10 ~ -25 °C; The upper and lower chambers of STF-450B are set at -20 ~ -40°C;

b. Door opening indicator: When the door is opened, the indicator lights up. After more than 1 minute, the door opening alarm indicator light will be on and the buzzer triggered, displaying "door."

c. Fault indicator light: When the product runs normally, the indicator light is off; The indicator light is on for operation abnormality.

d. "LIGHT" (optional): After the equipment is powered on, the light is off by default, and the on-off of the light can be adjusted by the on-off key. When the light is out, it will be turned on by opening the door and then turned off by closing the door; When the light is on, it will keep on if you open or close the door; When the light is off, it does not change when the door is opened or closed. This equipment has two functions: automatic lighting and manual lighting. In the automatic lighting state, the lighting lamp will be on immediately when the door is opened, and the lighting lamp will be off after a 5 seconds delay; The user can also turn on the lighting lamp manually. In this case, the lighting lamp is always on (the indicator light above the key is on) without being controlled by the door opening and closing. Only when the manual lighting is turned off by pressing the light switch key again can the lighting lamp be automatically on (the indicator light above the key is off).

e. "PRINT " (optional printer): The system can keep 7 days of data for printing, and press the print key to print the temperature within the set time period.

f. ☑: In parameter setting mode, reduce the parameter value. For example, when setting the set temperature, reduce the set temperature. When setting the parameter value, long press the down button, and the parameter will decrease rapidly.

g. ☒: In parameter setting mode, increase the parameter value. For example, when adjust the set temperature, press this button to increase the set temperature value. When setting the parameter value, long press the up button, and the parameter will increase rapidly. Under normal conditions, long press the up key for 3 seconds to import the data of the USB flash drive in 12 months.

h. ☑: is the set/mute key; In case of no alarm state and key unlock state, press☑ display the ambient temperature for 5s and then return to normal display; In the unlock state, press ☑ for more than 3s, can enter the user menu.

When buzzer is triggered (including cabinet including high temperature alarm, door opening alarm, sensor fault alarm, etc.) and in the button unlock state, press ☑for the first time, and the buzzer stops ringing, and the ambient temperature is displayed for 5s, after which the normal display is resumed (pressing the mute button is only to turn off the buzzer for alarming this abnormal state, if the fault is not eliminated after 5 minutes of mute, the buzzer will alarm again.) Then press ☑ , and the buzzer alarms, and after displaying the ambient temperature for 5s, the cabinet temperature and alarm state are resumed. In the key unlock state, ☑ can be used as a setting key.

In unlock state and parameter setting mode, press this key to display parameter values and parameter names. If the pressing time is longer than 3 seconds, save the settings and return to the normal interface.

I. USB interface

Automatic export of USB data: When USB is connected to USB interface, buzzer beeps once after data transmission is completed, "USB" is displayed in the upper chamber, "on" is displayed in the lower chamber, PDF files of data of current month and last month are generated in USB, buzzer beeps once after data transmission is completed, "End" is displayed, and normal display resumes after 6 seconds.

❗ **Note:** When there is less data, "USB," "on" and "End" prompts are not displayed.

Manual export of USB data: In the key unlock state, when the USB flash drive is connected and the file is not being generated, press the up key for 3 seconds, and the digital tube in the lower chamber will display "d01." Press the key up or down key to adjust "d00~d12," and press ☑ key to cancel the file generation (d00) or generate the PDF file of the record data of the previous months (JAN-DEC).

❗ **Note:** When the alarm of the digital tube flashes and displays "LoF," the recorder is not started; Meanwhile press ☑ and ☒ key for 3s，and "LoF" disappears, the recorder is started.

6.2 Function Settings

1.After powering on, the machine will enter into the working state;2.User parameter settings:

Unlock: Under normal operation, press ▲ and ▼ key for 3 seconds at the same time, and the digital tube in the upper chamber will display "PS1" and the digital tube in the lower chamber will display the parameter code "0000." Press ▲ , enter the password "0005" (when entering the user menu password, enter "0099" torestore the key lock password to the default "0005.") , and unlock it. Unlock and press ✓ key for 3s, and the digital tube will display the parameter code "PS1," and enter the setting and adjustment parameters.

① Use ✓ to scroll the parameters, and the display order is as follows: b1→b 2→S et1→H01→L 01→S et2→H02→L 02→n →y →r →S →F →P t→t H1→P 1→P s1→MAX→NIN→CLR.

②Use ▲ or ▼ to increase or decrease the value;

③Use ✓ to temporarily store the modified values and return to the display parameters;

④If other parameters are modified, repeat steps ①~③.

⑤Press ✓ for more than 3s, save the modified parameters and return to the display parameter category.

3. Press ✓ for more than 3s, or press no key in 60S to exit the parameter setting program.

4. Parameter display

No.	Menu item	Parameter Range	Suggested settings	Remarks
1	b1	--	--	Hardware version
2	b2	--	--	Software version
3	Set1	-25U series: -10~-25 -40U series: -20~-40	-25U series: -25 -40U series: -40	Upper chamber temperature setting
4	H01	0.0~10.0	5.0	Set value of high temperature alarm set+H; When H =0, High temp alarm is disabled; When the alarm is over high temp alarm set, H1 will be displayed on the controller
5	L01	0.0~10.0	5.0	Set value of low temperature alarm set-L; When L =0, Low temp alarm is disabled; When the alarm is below low temp alarm set, L1 will be displayed on the controller
6	Set2 (450)	-25U series: -10~-25 -40U series: -20~-40	-25U series: -25 -40U series: -40	Lower chamber temperature setting
7	H02 (450)	0.0~10.0	5.0	Set value of high temperature alarm set+H; When H=0, cancel the alarm; When the temperature is too high, the high temperature alarm displays H02
8	L02 (450	0.0~10.0	5.0	Set value of low temperature alarm set-L; When L=0, cancel the alarm; When the temperature is too high, the high temperature alarm displays L02
9	Pt	0-240 min	20	Print interval
10	tH1	20.0~50.0℃	50	Upper limit of ambient temperature alarm
11	P1	Automatic heating mode 1 Automatic heating mode 23. Automatic heating mode 34. Always on5. Always off	1.(Set to 4 when the door is with condensation)	Mode 1: It shall be judged as once after the door is opened and closed once and heated for 5min (time setting). If the door is opened and closed again during the heating period, the heating time will be updated again; Mode 2: After the compressor is running. Heater on; When the compressor stops, the heater is delayed for 1 minute for turn-off; Mode 3: When the humidity in the cabinet is more than 80%, the door heating is on, and when the humidity in the cabinet is moderately less than 60%, the door heating is off; Mode 4: Door heating is always on; Mode 5: Door heating is always off.
12	Ps1	0000~9999	0005	User menu password settings
13	MAX	_	_	The highest temperature since last clearance
14	NIN	_	_	The lowest temperature since last clearance
15	CLR	_	_	Clearance of the Max and Min temperature records

5. Alarm display

Alarm Code	Default Description
H01	Upper chamber high temperature alarm
L01	Upper chamber low temperature alarm
H02	Lower chamber high temperature alarm
L02	Lower chamber low temperature alarm
H03	High ambient temperature alarm
door	Door opening alarm
PF	Power failure alarm
bL	Low battery alarm
EE	Communication failure
E2	Upper chamber temperature sensor alarm
E4	Lower chamber temperature sensor alarm
Er	Recorder not connected
Pr	USB Data logging failure
LoF	Recorder not started

6.2 Optional Accessories

1.Printer

Automatic printing:

When the printing interval Pt is not 0, the printer prints the current data every Pt minutes.

Note: When the printing interval Pt is less than the recording interval SCy, it is printed according to the recording interval; the remaining printing intervals are printed as an integral multiple of the recording interval Scy, that is: the printing interval Pt should be set as an integral multiple of the recording interval.

Manual printing:
When the key is unlocked and the working voltage is normal, press the print key to display "P01" by the digital tube, press the up key or down key to adjust "POO~P07." Press the set/mute multiplexing key or print key, and the printer will cancel the manual printing (POD) or print the data recorded in the previous days (1 ~ 7), with the data interval same as the automatic printing interval.

Printing paper installation:
The printing paper has been installed at the factory. When the paper is used up after a long time, you may purchase the same paper for installation. The installation steps are as follows:

① Click the cylindrical button on the printer to open the cover of the printer;
② Put the printing paper into the printer box and pull the paper head of the roll so that the paper slightly exposes from the upper port of the box cover after the box cover of the printer is closed;
③ Close the box cover.

2.Remote alarm terminal and RS485 interface

The remote alarm terminal is installed in the back of refrigerator and the alarm signal is output by the terminal.The terminal bearing capacity is SELV DC 30V, 2A.

7.Defrost, Discontinuation and Maintenance

⚠️Warning:

♦ In order to prevent people from getting electric shock or injury, please cut off the power supply of the equipment before any repairs and maintenance.
♦ Make sure you don't inhale drugs or suspended particles around it when maintaining the equipment, otherwise it will harm your health.

7.1. Equipment Maintenance

Defrosting: The equipment will automatically defrost during the working process for the convenience of use.
Cleaning and maintenance: The equipment should be cleaned and maintained regularly (for safety, please remove the power plug), and the inner and outer surfaces of the freezer should be wiped with a warm, damp soft cloth.

- **⊙ Notes:**
  - ♦ Do not use sharp metal appliances during defrosting to avoid damage to the Ultra-low temperature freezer.
  - ♦ Not to position the equipment so that it is difficult to operate the disconnecting device of separable plug.
  - ♦ Protection impairment if used in a manner not specified by the manufacturer.
  - ♦ The air switch on the back of the case can not only contact and open the power circuit, but also provide immediate protection in the event of short-cricuit faults, severe loads and under voltage in the power circuit, and it can also be used to start the compressor infrequently to protect the equipment.

7.2. Equipment Discontinuation

Deactivation: If the equipment is stored in an unsupervised area for a long time and not used, the power supply should be cut off and the inner and outer surfaces of the freezer should be cleaned with a warm, damp soft cloth, aired and sealed. The equipment must be locked to ensure that children cannot open the freezer door.

Scrapping: When the equipment reaches the end of its service life, it should be scrapped and must be handed over to a qualified professional recycling agency for disposal per local regulations. Non-professionals are not allowed to disassemble and break down the equipment without authorization. The scrapped equipment should be placed in a designated area inaccessible to children to avoid danger.

7.3 Maintenance, Replacement, and Recovery of Rechargeable Batteries Battery

installation position: top of the freezer body and bottom inside the electrical box.

1. Battery maintenance
   ①　In order to prolong the service life of the battery and avoid the product being left unused for a long time, the product must be operated for more than 24 hours every month to facilitate charging;.
   ②　When the equipment is not used for a long time, it should be connected to the working power regularly(generally once a month), and the power lock switch should be turned on so that the equipment can run for a period of time to complete charging, and each charging time should be no less than 24 hours;
   ③　When the working power supply is interrupted, the power lock switch of the equipment shall be turned off in time, otherwise it will cause power loss in battery and even permanent damage to the battery in severe cases;
   ④　The main power switch must be turned off during a long-term power outage or during transportation, otherwise long-term discharge causes power loss in battery and even permanent damage to the battery,and the display is abnormal after re-energizing;
   ⑤　The battery is a consumable, with a service life of about 2-3 years. If the battery is used improperly, such as power loss or reaching the end of battery life, it will cause a low battery alarm (refrigeration is not affected, but there is an alarm failure and influence to the use function of the printer, please contact our local distributor after-sales staff for replacement).

2. Battery replacement and recovery
   ①　Turn off the power switch and pull out the power plug from the outlet;
   ②　Remove the screws on the electrical box with a screwdriver (Note: There are high-voltage electrical components in the electrical box, therefore before opening, turn off the power supply, unplug the power plug and turn off the power lock switch of the freezer, and the electrical box can only be opened by qualified engineers or maintenance personnel).;
   ③　Pull out the battery connecting cable; (Before unplugging the battery fixing cable, pay attention to the cathode/anode of the battery and the sequence of the connecting cables, so as to prevent burning down the control system due to installation of the new battery with cathode/anode reversed. Generally, the red wire is connected to the cathode, and the black wire is connected to the anode;.
   ④　Use a screwdriver to remove the fastening screws on the battery fixing plate and take out the battery;
   ⑤　The battery model is BT-12M4.0AC(12V4.0AH);
   ⑥　For a replaced battery that can be recycled, please contact the local battery recycling agency.

Tips: In order to effectively ensure that the battery replacement meets the requirements of the control system and avoid the influence of improper operation on the system, please contact our after-sales personnel for replacement or guidance.

8. After-sales service

Any product may fail. Please observe the operation of equipment in time during use. If there is any abnormality, please check and handle it according to the following table first. If the abnormality can't be changed, please inform our service center in time, and we will serve you wholeheartedly to avoid losses. Fan motor replacement time: about 6 years; Service life of the product: 10 years.

Problems	Causes and solutions
Equipment does not work	Please make sure that the outlet is energized. Please make sure power plug is plugged in, not loose. Please make sure the power fuse is not disconnected. Please make sure the supply voltage is appropriate, not too low or too high.
Compressor is not running	Please make sure that the temperature is set correctly. Please check whether the temperature inside the cabinet is too low.
The temperature does not reach the set value	Please make sure that the door is closed tightly and don't open it too many times during a short time. Please don't put too many items in at one time. Please make sure that the ambient temperature is not too high.
High noise	Please make sure that the freezer body is placed on a flat ground. Please make sure that the freezer body does not contact the wall.
Condensation on freezer body surface	In rainy and humid seasons, door condensation is normal, and it shall be wiped off with a dry cloth.
Undesirable odor	Equipment needs to be cleaned. Items with heavy smell are not packed.
The door is not closed properly, and the cool air leaks	After the equipment is used for a period of time, the door seal becomes hard and deformed. Maintenance method: Blow the deformed part of the hot seal with a blower to soften it, and then close and compress it after the door seal becomes soft.
The alarm lamp flashes and the buzzer is triggered	If the items were just put in,it will be automatically eliminated after running for a period of time when the temperature is stable . Please check if it is because the door is not locked. Please check if it is because of the low battery, which will be automatically eliminated after a period of running. Please make sure the temperature is not exceeding thestandard.
Lighting damage (refrigeration equipment)	Please call the after-sales telephone and contact after-service personnel of STALWART or replacement . Please do not replace the parts by your self.

The following conditions are not faults:

① When the compressor starts and stops, the equipment parts will make a slight impact sound ;

② When overheated items are put in after the door is opened, high temperature alarm and high

humidity alarm will be triggered in the control system (if this function is available, please refer to the alarm displaytable);

Solution: Put the items into the equipment after they are naturally cooled. Put the items in small quantitiesin batches, and do not put too much at a time. After the system runs stably, the high temperature alarm and high humidity alarm will be released automatically.

®Slight sound of running water caused by refrigerant flowing in the pipeline.

ⓘ Notes:

♦ The equipment can only be repaired, maintained or improved by the engineers certified Stalwart, so as to ensure the normal operation of the equipment and the compliance with corresponding safety standards.

♦ Please clean and disinfect the equipment before notifying the maintenance engineer; During the warranty period of the equipment, the Company will not undertake the warranty obligation if the fault or damage is caused by improper use of the user.

♦ Ambient temperature for storage: -40°C-+SS°C, relative humidity: 10% ~ 90%.

9. Specification

Menu	Ambient temperature	Climate	Refrigerant	Rated voltage(V)	Rated frequency(Hz)	Temp range 'C	Effective volume (L)	Exterior dimensions(mm)
STF-90B	16-32'C	N	R290	220-240	60	-20--40'C	90	669x700x854
STF-270B	16-32'C	N	R290	220-240	60	-20--40'C	270	640x700x1792
STF-450B	16-32'C	N	R290	220-240	60	Upper chamber : -20--40'C Lower chamber : -20--40'C	450	735X810X1960

* The foaming material of this product is cyclopentane.

10. Accessories

Name	User Manual	Key	Defrosting shovel
Number	1	2	1

* The specific packing list shall be subject to the physical objects received.

11. Electrical Schematic Diagram

STF-90B, STF-270B

STF-450B

If the product is improved, the technical data and circuit diagram shall be subject to the final product nameplate and cabinet circuit label.