Shenzhen Hawk Medical Instrument Co., Ltd.

Safety and Performance Information Relevant to The User or Other

Fluid Warmer

Model: Hawk-fw1

CE 0197

057-00688-00

Contents

Revision Notes:

On the premise of comply with relevant laws and regulations, we'll revise the manual timely according to the improvement of products or update of laws and regulations.

This Manual applies to Hawk-fw1 Fluid Warmer.

Version No.	Date of Preparation
V1.0.0	2025-11-01

Document version upgrade instructions:

V X.Y.Z

V means version No. of document.

X means device has big upgraded: When software, hardware and construction of device have big modified, the document should be upgraded accordingly.

Y means the device has small improvement: In order to better using the device, the software, hardware and construction of device have been tiny improved (it is not necessary for re-registration after evaluation), the document should be upgraded accordingly.

Z means correcting information of document while the device has no changed. It only correct the wrong word/ diagram/explanation and so on.

Operation Manual :

The Fluid Warmer has an expected service life of 8 years from the date of product installation when operated according to the instructions provided with this device.These 8 years include suggested or mandatory actions of preventative maintenance and repair activities, as well as required calibration(s) that are needed. Required reading includes the instructions for use and other materials provided with the device. This also includes any hardware and software updates that may be required.

Expected service life: 8 years. The date of manufacture is shown on the label.

Please report any serious incidents involving this equipment to Shenzhen Hawk Medical Instrument Co., Ltd and your local authority (or, if applicable, to the appropriate regulatory authority in the country where the incident occurred).

Please refer to section 9.2 of this Manual for a glossary of symbols used for fluid warmer of Shenzhen Hawk Medical Instrument Co., Ltd.

1. Product overview

1.1 Main Composition and Structure

The fluid warmer is mainly composed of the microcomputer system, warming device, temperature detector, alarm system and human-machine interface.

Microcomputer system: “brain” of the whole system used for intelligent control and management of the whole equipment and processing of detection signals.

Warming device: the heating wire in the silicone sheet is used for warming and the generated heat is transmitted to the liquid medicine in the infusion tube through the aluminum sheet.

Detector: mainly composed of sensors, such as the Hall sensor (for door opening detection) and temperature sensor (for detection of the aluminum sheet temperature). The signals detected by the sensors are processed and then transmitted into the microcomputer system, followed by related operations.

Alarm system: after the signals detected by the sensors are processed by the microcomputer into alarm control signals, the alarm system will respond to attract the attention and take correct measures. The alarm system mainly consists of the light alarm (light-emitting diode), sound alarm (loudspeaker), screen display alarm, etc.

Human-machine interface: the infusion parameters are set via the buttons, such as the warming temperature. The parameters and current operating status are shown on the color LCD

1.2 Intended use

Fluid warmer is an equipment heating liquids inside infusion tube based on thermal transfer principle, therefore, it is mainly used to heat liquid infused to human by infusion tube.Users of this device must be well trained professional persons.

1.3 Product Safety Performance

Power supply: 100V-240V ～50Hz/60Hz

Input power: ≤150VA

Temperature control accuracy: ≤±1℃

Temperature control range: 30℃～42℃ (The controlled temperature is 10℃ higher than surrounding temperature)

Degree of Protection Against the Ingress of Water: IP34

Mode of operation: Continuous

Applied part: None

Safety measures:

——1) When the temperature reaches 43℃, audible and visual alarms are issued and the heating circuit is cut off automatically.

——2) Automatically power cut if the heater's temperature reaches 50℃±5℃.

Preheating time: less than 150 seconds (26±1℃ heating to 40℃)

Complete machine weight: ＜1kg

Dimension: 172*92*55mm

1.4 Medical Electronic Device Safety Classification

Class I,Type B applied part

1.5 Operational Environment

(1)Temperature: 5℃-30℃

(2)Relative humidity: 10%-93%RH

(3)Atmosphere pressure: 70.0kPa～106.0kPa

1.6 Effects to Environment and Energy Resource

The fluid warmer may have a certain amount of electromagnetic radiation, which may interfere other devices. If this situation occurs, please take appropriate measures to reduce the interference, such as adjust the device's location, or connect power supply from other sources. For further information, please refer to EMC Information(Chapter XI of this document).

1.7 Contraindication

1)Not for use in warming platelets, cryo-precipitates, or granulocyte suspensions；

2)Not for use in warming heat-sensitive drugs.

3)Not used for preventing the development of hypothermia .

1.8 Warning

(1) This device is used to heat drugs inside infusion tube. Don't use it for other purposes.

(2) Please follow doctor's instruction when using this device, ensure the drug can be heated, and check appropriate heating temperatures.

(3) Prevent impact or knocking on the device, please pick up and lay down gently.

(4) Please don’t heat broken infusion tube.

(5) Read this user manual before installation and operation.

(6) Don't wash this device.

(7) Do not allow service or maintenance the equipment while used in patient.

(8)Class I equipment, to avoid the risk of electric shock, the equipment must only be connected to a supply mains with protective earth.

(9) No modification of this equipment is allowed.

(10) If any operator requests more information such as circuit diagrams, parts list and product descriptions, for repairs carried out by qualified technical personnel, please contact the manufacturer.

(11) the use of disposable infusion devices should comply with the corresponding hygienic and quality standards of the competent authorities and forbid cross use. After the use of disposable infusion device, the operator will treat it as medical waste.

(12) Use only the power cord provided with the system.

(13) The device is susceptible to interference with magnetic field generated by the MRI devices.Use the device within a MRI environment is unavoidable. Keep a safe distance from the magnetice field outside the area that list.

(14) Unauthorized modifications to this equipment are not permitted,that may result in serious injury o patients.

(15) This equipment is not compatible with HF SURGICAL EQUIPMENT, and should not use in the presence of active HF SURGICAL EQUIPMENT.

(16) Do not to position device to make it difficult to operate the disconnection device.

(17) If the alarm volume is lower than the ambient volume, it may prevent the operator from recognizing the alarm.

2. Exterior Diagram

2.1 Complete Machine Diagram

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2.2 Accessory

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3. Introduction of Operation Interface

3.1 Switch on, Operating and Standby Interfaces

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3.2 Introduction of Operation Interface

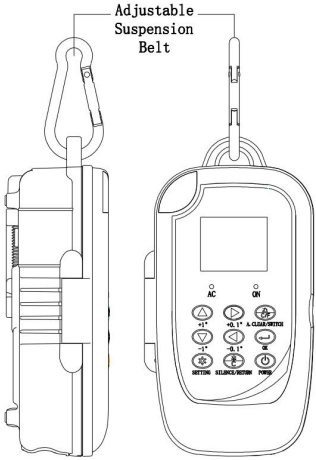
Please refer to section 4.2 of document.

4. Installation & Operation Instructions

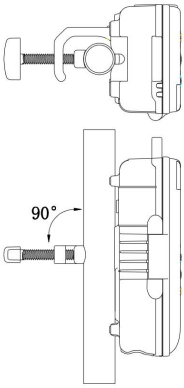
4.1 Installation

Two methods to install this device:

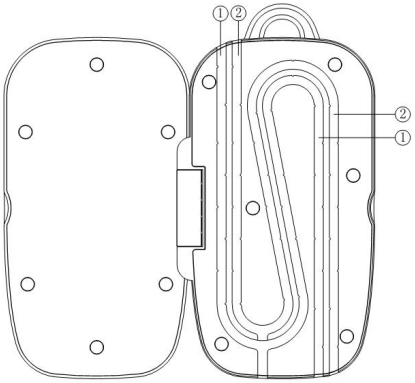
1.Use hanging ring to hang the device



2.Pole Clamp install illustration:(Open the hidden pole clamp and rotate 90 ° , same as below second photo)



Note: This device has two Tube Channel Installation Slots for warming the fluid or blood, can be installed two Tube Channels or one Tube Channel. Illustration as below:



①：1st Tube Channel Installation Slot

②：2nd Tube Channel Installation Slot

4.2 Instructions for use

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4.3 Power on / off

1.Keep pressing “Power” key until the LCD display is ON

2.Keep Pressing “Power” key 2 seconds, the display will be off.

4.4 Operation Steps

1. Clean the surface of the Fluid Warmer.

2. Fix the device per the install illustration, connect to power supply;

3. Install the fluid tube to the corresponding heating plate slot, close the front cover, insert the drop sensor into the corresponding socket (if required), switch on the device (Press the "power" button, the startup indicator will light up, the system self-test, if there is an abnormal machine will issue a sound and light alarm);

4. According to the actual need to set the parameters, and press the "OK" key to save the settings, after back to the main interface, the Fluid Warmer will operate normally;

5. Switch off the device, and pull out the power plug from the AC socket after warming.

4.5 Alarms and solution

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4.6 Operation precautions

1. Before operating the device, please check with the pharmacist, make sure the medicine can be heated or not.

2. Before operating the device, please check the device is damaged or not, any liquid or wet there.

3. Please refer to the illustration of document to install the device correctly.

4. Please operate the device per above operation steps. If there is alarm, must solve it before using the device.

5.The device must be operated by well-trained professionals only.

6. Before being used formally, it is necessary to confirm the effectiveness of the alarm system.

Operating steps: turn on, then open the door. If the equipment triggers an "open door" alarm, the alarm system is normal. Otherwise, it's abnormal.

7.The pause time of the alarm tone is 2 minutes after pressing the "silence" button.

8.Device Fixing clamp are suitable for infusion racks with diameters from 15mm to 35mm.

4.7 Special instructions for the personal use

Do not recommend for personal use. If consumers have to use it individually, must check with pharmacist the medicine can be heated or not, and confirm the appropriate heating temperature too.

4.8 Safely disposal

Dispose of system components or accessories must follow the local laws, regulations or the hospital's waste disposal system.

5. Product accessories, consumables

5.1 Standard configuration inside package

Name	Units
Fluid Warmer	1
AC Power cord	1
User manual	1
Product qualification certificate	1
Product warranty card	1

5.2 Product accessories,consumables

AC Power cord

5.3 Detachable and replaceable parts

Not found.

5.4 Infusion sets

1)ISO 8536 series standard should be met for infusion sets.

2)Pipe diameter of Infusion sets should be within the scope of 3.2mm-4.5mm.

6. Product maintenance and maintenance methods

6.1 Routine maintenance

1.The device should inspect the function of temperature controlling regularly (once every 2 months) as below steps:

Switch on the device in room temperature (20±2)℃, set the device temperature to 36° C, when the device heating is stable (The heating symbol disappear), check the display temperature on interface, and use the temperature measure equipment to test the temperature of the heating grooved plate, both should in the range of 36 ± 1 ℃ .(Note: The accuracy of temperature measure equipment is ±0.5℃）

2.Keep surface of the device clean,and the heating surface should be disinfected thoroughly after use to avoid cross infection.

4. Keep the surface of the warmer away from sharp objects, otherwise the damages of the Fluid Warmer may lead to the tube channel broken, thus may cause patients' infection.

5. Keep the surface of the tube channel dry. Forbid any liquid immersing into the Fluid Warmer.

6. Inspect the pole clamp of Fluid Warmer before operation, prevent it falls during using and hurt people & damage device.

6.2 Clean and disinfection

6.2.1 Preparations

1) Before cleaning or disinfecting the equipment, it must be disconnected from the patient.

2) The device must be powered off, and the AC power cord must be disconnected from the device.

3) Wear rubber gloves, masks and other protective measures to prevent pollutants from splashing during cleaning and disinfection.

4). Prepare soft and lint-free gauze, and containers for cleaning agents and disinfectants.

6.2.2 Cleaning

This device should be cleaned regularly. In areas with serious environmental pollution or heavy sandstorms, the frequency of cleaning should be increased. Please check the hospital's regulations on cleaning in advance. The cleaning steps are as follows:

1)When cleaning the surface of the equipment, use a soft and lint-free gauze to soak in a neutral or weakly alkaline detergent. After the gauze is fully wet, wring it out until there is no liquid dripping, and then wipe the surface of the equipment with the gauze.

2)Wipe each surface of the equipment until the pollutants are detached from the surface of the equipment.

3)During the wiping process, ensure that the edges and corners of the equipment are cleaned.

4)After wiping, use a dry lint-free gauze to remove the residual detergent solution, and place it in a ventilated and cool environment to air dry.

Note：

- Do not immerse the device in liquid.
- Do not let liquid seep into the device casing.
- Do not use halogenated or petroleum-based solvents, glass cleaners, acetone, or other harsh cleaners.

Recommended detergents:

Cleaner	Cleaning Method
Clean water	Wipe

6.2.3 Disinfection

Disinfect the device according to the disinfection procedures of your hospital. The disinfection steps are as follows:

1)Before disinfection, please clean the equipment according to the method described in 6.2.2.

2)When disinfecting the surface of the equipment, use soft and lint-free gauze to immerse in medium and high-efficiency disinfectants.After the cloth is fully wet, wring it dry until no liquid drips, and wipe the surface of the device with gauze.

3)All surfaces of the equipment should be wiped , and the action time should refer to the instructions of the disinfectant.

4)During the wiping process, ensure that the edges and corners of the equipment are disinfected.

5)After disinfection, wipe the surface of the equipment with gauze wetted with water and remove residual disinfectant solution, and place it in a ventilated and cool place to air dry.

Note：

- Do not immerse the device in liquid.
- Do not let liquid seep into the device casing.
- When using disinfectant, please follow its instructions.
- This equipment cannot be sterilized by high pressure steam

The following table lists the disinfectants recommended for the device and the required contact time for the disinfection.

Recommended disinfectant solution:

Disinfectant solution	Contact time	Disinfection method
75% alcohol	3min	Wipe

6.3 Troubleshooting and solution

When the following situations appear, means the device is broken down, please solve it per the following methods.

No.	**Failure**	**Cause analysis**	**Solution**
1	AC lights is not on	1. No AC power supply 2. Control circuit failure	1. Check the AC power supply 2. Contact the manufacturer/distributor
2	Not heated	1. Control circuit failure 2. Heating device failure 3. The heater failure	1. Contact the manufacturer/distributor 2. Contact the manufacturer/distributor 3. Contact the manufacturer/distributor
3	Alarm Note Error E0	Internal communications failure	Contact the manufacturer/distributor

4	Alarm Note Error E1	Temperature sensor failure	The temperature detector is loose or damaged. Press the "ALARM RESET/SWITCH" button to clear the sound prompt. Contact the manufacturer/distributor to deal with.
5	Alarm Note Error E2	The temperature is too low.	Contact the manufacturer/distributor
6	Alarm Note Error E3	It means incorrect parameter and need restore factory settings.	Parameter storage error, need to restore the factory settings. Press the "ALARM RESET/SWITCH" button to clear the sound. Enter the settings interface, select "restore factory settings" to return to normal.
7	Alarm Note Error E4	The temperature is very high.>50℃	Contact the manufacturer/distributor
1. When appearing 4-5 alarm, the alarm can't be eliminated even when the problem was solved. 2. If internal parts of a device need to be replaced, only professional maintenance personnel can replace them.			Contact the manufacturer/ distributor

7. Transport and Storage

Storage conditions:

Temperature: -20℃～+55℃;

Relative humidity: 10～93%(no frosting);

Atmosphere pressure: 50.0kPa～106.0kPa;

Transport:

Place the product as per No. of layers indicated on packing carton.

Temperature: -20℃～+55℃;

Relative humidity: 10～93%(no frosting);

Atmosphere pressure: 50.0kPa～106.0kPa;

8. Product life

8.1 Production date: See product label

8.2 Product life:

The product life is 8 years.

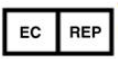
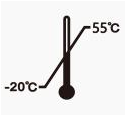
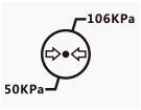
9. Product labels explanation

9.1 Product labels (on the back shell of Fluid warmer)

This label according to the relevant standards, displaying manufacturer, production date, batch No., equipment classification and other information.

9.2 Symbols and Significance

Symbols	Descriptions	Symbols	Descriptions
	Production batch No.		Protective Earthing
	Product serial No.	IP34	Degrees of protection against water : water splashed against the enclosure from any direction shall have no harmful effects
	Prohibition		AC power
	Type B		DC power
	Date of manufacture and Country of manufacture, CN: China		Please refer to manual
	Manufacturer		Dispose in environmental-friendly way

	Medical device		Model number
	EU Authorised representative		Unique device identifier
	EU importer		EU distributor
	This device is provided with a CE marking in accordance with the regulation 2017/745. 0197 is the Notified Body number.		Stacking limit (5)
	Temperature limit -20℃~55℃		Humidity limitation 10%~93%
	Atmospheric pressure limitation 50KPa~106KPa		

10. After sales service

The free warranty for the fluid warmer is one year.

Note: The following situation is not within the range of free maintenance and repair.

(1) Malfunctions resulting from improper operation, or modification / repair of the fluid warmer without supplier's knowledge and permission.

(2) Bruise or damage caused by improper handling during transport.

(3) Malfunction or damage caused by fire, salt, poisonous gas, earthquake, hurricane, flood, abnormal electric voltage or any other natural disaster.

For all the malfunctions and damage due to above reasons, the manufacturer can offer repair but charge for the cost.

Recycling

The normal working life of the Fluid warmer and power cable is five (8) years. The usage frequency and maintenance property level shall affect working life of machine. When exceeding the normal working life, the fluid warmer needs to be well scrapping. Please contact the manufacturer or distributor for more information.

11. Electromagnetic Compatibility (EMC) Information

Attention:

- Hawk-fw1 fluid warmer meet EN60601-1-2:2015+A1:2021 standard electromagnetic compatibility requirements.The Essential Performance of Hawk-fw1 Fluid Warmer are defined as:

  1)Temperature control accuracy: ≤±1℃

  2)Correct alarm signal of high priority.

- The user should install and use the electromagnetic compatibility information provided by the random document;
- Portable and mobile RF communication devices may affect the performance of Hawk-fw1 fluid warmer, use to avoid strong electromagnetic interference, such as near mobile phones, microwave ovens, etc.
- The guide and the manufacturer's statement are described in the annex.

Warning:

- Hawk-fw1 fluid warmer should not be close to or stacked with other equipment, if you have to close or stacked use, you should observe the verification in the use of its configuration can be normal operation;
- Class A equipment is intended for use in industrial environments, and it may be difficult to ensure that electromagnetic compatibility is potentially difficult in other environments due to Hawk-fw1 fluid warmer conduct harassment and radiation harassment;
- Besides internal components provided by manufacturer of the Hawk-fw1, using the other brand accessories and cables may result in Hawk-fw1 increasing emitting or decreasing immunity.

List below the cables information:

No.	Cable name	Length(m)	Shield or not
1	Power cord	2.5m	No

Guidelines and manufacturer's statements:

Guide and Manufacturer's Statement-Electromagnetic Emission		
The Hawk-fw1 Fluid Warmer is expected to be used in the following specified electromagnetic environments, and the customer or user shall ensure that it is used in such electromagnetic environments:		
Emission test	Conformance	Electromagnetic Environment-Guide
RF radiation CISPR 11	Group 1	The Hawk-fw1 uses RF energy only for its internal functions. Therefore, its RF emissions is very low and is not likely to cause any interference in nearby electronic equipment.
RF radiation CISPR 11	Class A	The EMISSIONS characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.
Harmonic radiation IEC 61000-3-2	N/A	
Voltage fluctuation /flickering emission IEC 61000-3-3	N/A	

Guide and Manufacturer's Statement-Electromagnetic Immunity			
The Hawk-fw1 is intended for use in the electromagnetic environment specified below. The customer or the user of the models Hawk-fw1 should assure that they are used in such an environment.			
Immunity test	EN60601 Test level	Coincidence level	Electromagnetic Environment-Guide
Electrostatic discharge(ESD) IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material,the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2kV for power supply lines ±1kV for SIP/SOP	±2kV for power supply lines ±1kV for SIP/SOP	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±0.5 kV, ±1 kV line to line ±0.5kV,±1kV, ±2kV Line to ground	±0.5 kV, ±1 kV line to line ±0.5kV,±1kV, ±2kV Line to ground	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interrupt and voltage variations in power input lines IEC 61000-4-11	<5 % UT (>95% dip in UT.) for 0.5 cycle <5 % UT (>95% dip in UT) for 1 cycle 70% UT (30% dip in UT) for 25/30 cycles <5% UT (>95 % dip in UT) for 5/6 sec	<5 % UT (>95% dip in UT.) for 0.5 cycle <5 % UT (>95% dip in UT) for 1 cycle 70% UT (30% dip in UT) for 25/30 cycles <5% UT (>95 % dip in UT) for 5/6 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Fluid Warmer require continued operation during power mains interruptions, it is recommended that the Hawk-fw1 be powered from an uninterruptible power supply or a battery.

Power frequency magnetic field (50/60 Hz) EN 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Note: U_T is the a.c. mains voltage prior to application of the test level.			

Guide and Manufacturer's Statement-Electromagnetic Immunity			
The Hawk-fw1 Fluid Warmer is expected to be used in the following specified electromagnetic environments, and the customer or user shall ensure that it is used in such electromagnetic environments:			
Immunity test	IEC 60601 Test level	Coincidence level	Electromagnetic Environment-Guide
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands	Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the Fluid Warmer, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz 385MHz-5785MHz Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communication equipment (Refer to table 9 of IEC 60601-1-2:2014+A1:2020)	3 V/m 80 MHz to 2.7 GHz 385MHz-5785MHz Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communication equipment (Refer to table 9 of IEC 60601-1-2:2014+A1:2020)	

Appendix 1

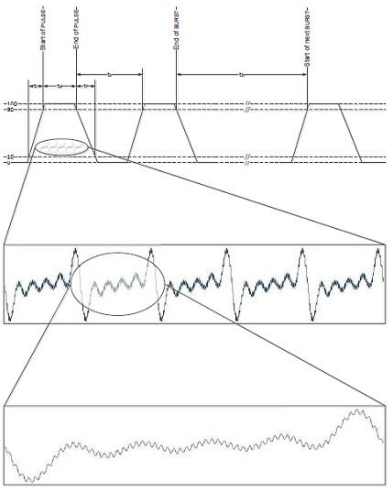
Table 1 Classification of alarms and color of alarm indicator light

Classification of alarms	Alarm priority	Color and frequency of alarm indicator light
Door open alarm	High as priority	Red light /2Hz
Temp Err alarm	High as priority	Red light /2Hz
High Temp alarm	High as priority	Red light /2Hz
Error alarm	High as priority	Red light /2Hz

Table 2 Alarm Conditions and Alarm Signal delay

No.	Name of alarm	Alarm Condition	Alarm priority	Alarm condition delay	Alarm signal generation delay
1	Door open	The front cover is open or not cover well	High priority	300ms	100ms
2	Temp Err	Temperature out of the set abnormal temperature range after the temperature is heated to the set temperature	High priority	1000ms	100ms
3	High Temp	The temperature is very high	High priority	1000ms	100ms
4	Error	System failure exists.	High priority	5s (Average time 3s)	100ms

Table 3 Characteristic Parameter of Alarm Sound



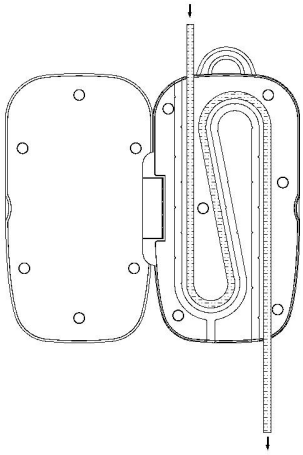
The alarm volume is between 45dB and 85dB

Figure 1

Characteristics	High piority
Number of Pluses in burst	10
Pulse spacing(ts)(See figure 1)	X
Between 1st and 2nd pulse	118
Between 2nd and 3rd pulse	118
Between 3rd and 4th pulse	359
Between 4th and 5th pulse	118
Between 5th and 6th pulse	0.73s
Between 6th and 7th pulse	118
Between 7th and 8th pulse	118
Between 8th and 9th pulse	359
Between 9th and 10th pulse	118
Interbutsr interval(tb)	3.62s
Difference in amplitude between anv two	

Table 4: Output temperature reference data

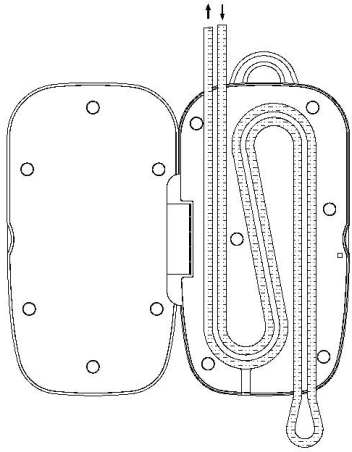
Single channel heating mode： It can be used in the case of high ambient temperature, high temperature of input liquid and low temperature of output liquid.



Ambient temperature：21℃,Set temperature:37℃				
Distance(cm) / Flow(ml/h)	30	50	80	100
1200	25.5	25.5	25.1	25.
500	28.3	28.1	26.7	26.3
300	29.9	29.2	27.5	27.2
200	30.5	29.2	26.1	25.2
100	28.9	26.7	22.6	21
50	25.6	23.2	21	21.0
ambient temperature：21℃,Set temperature:42℃				
Distance(cm) / Flow(ml/h)	30	50	80	100
1200	26.8	26.8	26.1	26
500	30.1	29.7	28.0	27.7
300	32.3	31.2	28.0	27.4
200	33.0	31.0	27.2	26.5
100	31.6	27.8	21.6	21.0
50	26.3	22.9	21.	21.0

Ambient temperature：26℃,Set temperature:37℃				
Distance(cm) / Flow(ml/h)	30	50	80	100
1200	28.4	28.4	28.4	28.4
500	30.7	30.6	29.8	29.8
300	32.2	31.6	30.5	30.2
200	32.7	32.0	30.3	29.7
100	32.1	30.5	28.4	27.8
50	29.6	27.9	26.6	26.4
ambient temperature：26℃,Set temperature:42℃				
Distance(cm) / Flow(ml/h)	30	50	80	100
1200	30.1	30.1	29.7	29.7
500	33.0	32.7	31.5	31.4
300	34.9	34.1	32.4	32.0
200	35.6	34.3	31.8	31.2
100	34.5	32.2	29.1	28.4
50	31.1	28.4	26.3	26.3

Double Channel heating mode： It can be used in the case of lower ambient temperature, lower input liquid temperature and higher output liquid temperature.



Ambient temperature：21℃,Set temperature:37℃				
Distance(cm) / Flow(ml/h	30	50	80	100
1200	26.8	26.6	26.1	26.1
500	31.7	31.4	29.8	28.2
300	32.1	30.7	29.1	27.6
200	32.8	31.2	28.4	26.2
100	32.1	29.7	24.3	21.0
50	32.2	27.5	23.9	21.0
ambient temperature：21℃,Set temperature:42℃				
Distance(cm) / Flow(ml/h)	30	50	80	100
1200	29.1	29.0	28.5	28.0
500	35.9	35.3	33.1	32.7
300	36.4	35.1	33.0	31.3
200	36.7	34.8	31.8	30.2
100	36.2	33.1	30.1	26.3
50	35.7	31.7	24.8	21.3

ambient temperature：26℃,Set temperature:37℃				
Distance(cm) / Flow(ml/h)	30	50	80	100
1200	30.3	30.1	29.7	29.3
500	32.8	32.4	31.6	31.8
300	34.4	33.3	31.9	30.5
200	34.1	32.4	30.6	28.9
100	32.8	30.5	27.8	26.3
50	29.1	27.7	26.7	26.1
ambient temperature：26℃,Set temperature:42℃				
Distance(cm) / Flow(ml/h)	30	50	80	100
1200	32.4	32.3	32.2	31.5
500	36.3	35.7	34.6	32.3
300	37.7	36.5	34.5	31.7
200	37.8	35.6	33.3	30.6
100	35.4	32.0	27.8	26.0
50	31.6	27.4	26.3	26.0

Testing conditions:

See figure 2.

Infusion set：BOON— A2, Diameter：3.5mm.

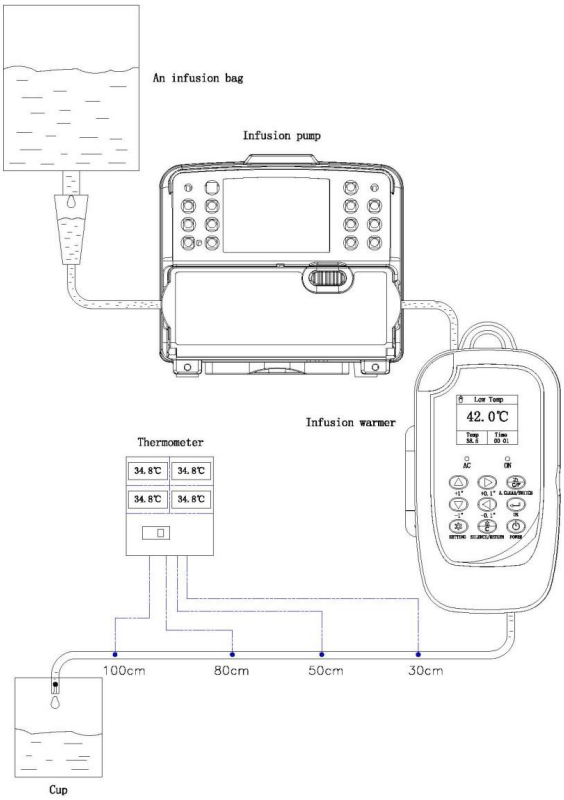
Attention:

1)The temperature of the patient's contact point is greatly influenced by the setting temperature, the ambient temperature and the infusion volume, so the setting temperature of the heater should be determined by combining the ambient temperature, the temperature of the input liquid and the layout of the pipeline;

2)It is recommended to use this product in the range of 100-500 ml/h infusion rate;

3)If the distance between the heater and the patient's end is too long, it will lead

Figure2: Schematic diagram of test



4)to greater heat loss. It is suggested that the user take additional insulation measures or shorten the length of the pipeline between the heater and the patient, or set higher temperature.

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