SK-500I Syringe Pump

Instruction Manual

Product Registration No.: Yue FDA (approved) 2005-22100022

Please read the manual before using the product.

Please keep the manual for reference.

Limited Guarantee

SK-500I syringe pump is delicately made of top-quality components.
Shenzhen Shenke Medical Instrument Technical Development Co., Ltd. guarantees that the product won't have any defect in material and technology within 12 months from the purchasing date.
The company's liability and the agents authorized by Shenzhen Shenke Medical Instrument Technical Development Co., Ltd. under this limited guarantee should be restrictive under the operation privilege of Shenzhen Shenke Medical Instrument Technical development Co., Ltd.—undertaking the maintenance and the replacement of the syringe pump under the circumstance that it has defect in material and technology through inspection. The maintenance and the replacement of any products based on this limited guarantee, should not exceed the time limit of the above limited guarantee.

All the maintenance based on the limited guarantee should be undertaken by qualified and trained people. When syringe pump is found defect within the time limit of the limited guarantee, the purchaser should notify Shenzhen Shenke Medical Instrument Technical Development Co., Ltd or the authorized agents within 30 days to find the products defects.

The defective syringe pump should be sent directly to Shenzhen Shenke Medical Instrument Technical Development Co., Ltd. or the authorized agents for the purpose of inspecting, fixing and replacing the syringe pump. The postage should be borne by purchaser.

The products mailed to Shenzhen Shenke Medical Instrument Technical Development Co., Ltd. or its agents should be appropriate packed in transportation packing box with instruction manual of Shenzhen Shenke Medical Instrument Technical Development Co., Ltd. Inappropriate packing will cause severe damage to syringe pump which should be borne by purchaser.

The limited guarantee of Shenzhen Shenke Medical Instrument Technical Development Co., Ltd. does not apply to products damage or defects resulted from the following causes: mechanism damage and incorrect installation caused completely or partially by neglect of duty, liquor feeding, falling of syringe pump, false use and abuse; reconstruction of syringe pump by any unprofessional, disqualified or untrained people; damage due to incorrect packing when mailed to Shenzhen Shenke Medical Instrument Technical Development Co., Ltd. and its agents.

Shenzhen Shenke Medical Instrument Technical Development Co., Ltd. or its agents reserve the rights to issue the products inspection invoice to purchasers, provided they are not able to confirm the matter after inspection.

This limited guarantee is the only complete guarantee related to the products of Shenzhen Shenke Medical Instrument Technical Development Co. Ltd. It does not include the usage or process guarantee of whatever natural condition, wherever it is placed, and in legal, commercial or any other kind of activities. It guarantees but by no means confines its guarantee to the product's mechanical function and its adaptation to special purposes. Purchasers should clearly agree that the compensation will be paid only under this limited guarantee and that they should respect the announcement under this limited guarantee.

Preface

Thank you for using SK-500I syringe pump. Please read the manual carefully before using it so as to operate the pump correctly and safely.

Table of Content

1. Brief introduction

1.1 Brief Introduction

SK-500I syringe pump is a combination of microelectronic technology and modern nursing, an important outcome of microcomputer applied to clinical nursing. It can control the infusion rate and total volume precisely and continuously over long hours on large scale, which completely meets the various requirements of modern clinical treatment on different occasions and is now widely used in hospitals.

SK-500I syringe pump is an economical product of intellectualization, collectivization and high technology which can be used in all clinics or wards, thus promoting the previously single pump intravenous infusion control to mass control. The patients' infusion progress and alarm information (e.g. infusion completion, pipe occlusion) can all be seen at the Nurse's Station. This greatly improves the medical nursing quality, reduces the nurse's workload and ensures the patient's nursing safety.

1.2 Intended Use

It is used in hospitals where patients need intravenous infusion at steady speed or continuous and precise infusion.

1.3 Safety Precaution

1.3.1 Unqualified and untrained people are not allowed to operate the pump.

1.3.2 Attention for setting up the pump:

1) Place the pump in dry place.
2) Do not place the pump in places where atmosphere pressure, temperature, humidity, sunshine, dust, salt and ion air may bring damage to the pump.
3) Pay attention to the safety of the pump. Do not drop, vibrate or bump the pump(including during transportation).
4) Do not use the pump in the place which keeps chemical medicine or gives out poisonous gas.
5) Pay attention to the frequency of voltage and allowable current of voltage.
6) Make sure there is no high frequency cacophony maker, medical equipment or cell phone etc. near the pump.

1.3.3 Attention before using the pump

1) Confirm the power cord is safely and correctly connected.
2) Confirm the ON-OFF function and operation of the pump are ok.
3) Confirm there is no high frequency cacophony maker, medical equipment or cell phone etc. near the pump.
4) Confirm the patient's vein passage has been established.
5)Confirm the pump is mounted within 1.0m above or below the patient's heart.

1.3.4 Attention during using the pump

1) Do not exceed the time the doctor diagnoses for the treatment.
2)Keep supervising the working condition of the pump and the situation of the patient continuously.
3) When finding anything abnormal with the pump or patient, consider the patient's safety first, then stop the infusion and take proper action.

1.3.5 Attention after finishing using pump

1) Turn off the power and pull out the power cord as required.
2) Clean the pump before storing it for convenient use next time.

1.4 Functions and Features

1) Precise control of the infusion rate.
2) Precise control of the infusion volume. 3) Smooth flow, no pulsant.
4) Audible and visible alarm when there is infusion completion, near completion, occlusion, low battery, syringe abnormal, control abnormal and no AC power.
5) Intellectualized control of infusion.

1.5 Specification

Type	SK-500I
Maximum infusion rate	500ml/h (Different syringes have different maximum rate).
Range of infusion rate	10ml syringe: 0.1-100ml/h 20ml syringe : 0.1-200ml/h 50ml syringe : 0.1-500ml/h
Bolus rate	10ml syringe : 100ml/h 20ml syringe : 200ml/h 50ml syringe : 500ml/h
Accumulated infusion volume	0.1-999.9ml
Accuracy	±3%
Power supply	AC110-240V, 50/60Hz, 25W.
Battery	Rechargeable lithium battery, 7.4 V, 1650mAh, in compliance with the requirements of IEC 60601-1.
Maximum power consumption	25W, running more than 5 hours after being fully charged.
Battery charge	When syringe pump is connected to AC power, the power needs to be turned on (you may or may not operate the machine), the battery will automatically start charging (need 8~14 hours).
Fuses	F2.0AL, 250V.
Displayed information	Flow rate, accumulated infusion volume, syringe size, battery capacity, bed No., AC power connecting indication
Alarm information	infusion completion, near completion, occlusion, low battery, syringe abnormal, control abnormal, no AC alarm
Maximum size of the shell	288×130×122 mm（length×width×height）
Maximum weight	＜2.4kg
Classification	Type BF
Water proof	IP21
Electrical Shock Proof	Battery: Class II; AC Power: Type BF .
Shell material	ABS plastic
Operating conditions	Environment temperature +5℃~+40℃, atmosphere pressure 86~106kPa，relative humidity 20%~90%
Storage	Environment temperature -15℃~+50℃, atmosphere pressure 86~106kPa，relative humidity20%~90%
Applicable syringes	10ml, 20ml and 50ml syringe (The manufacture uses ‘Double Dove’ syringe to test).
Standard	Comply with the standards of EN ISO14971:2000 +A1:2003, IEC60601-1:1995+A1+A2, EN IEC 60601-1-2:2001,IEC60601-2-24,1998, EN 980:2003, EN 1041:1998, EN60601-1-4:1996+A1:1999, EN60601-1-6:2004.
Operating mode	Continuous operation

1.6 System Structure

SK-500I syringe pump contains the following components:

1) The microcomputer system: the ‘brain’ of the whole system, giving intellectualized control and management over the whole system and processing the detected signals. The two single-chip Micyoco(SCM) systems are used for mutual backup copy and supervision. When one SCM goes wrong, the other one will give an immediate warning signal and cut the power of the host computer, which makes the machine stop working, thus ensuring patient’s safety.

2) The pump device: the ‘heart’ of the whole system and the main driving force of the infusion. Driven by step motor, the lead screw moves the syringe piston forward.

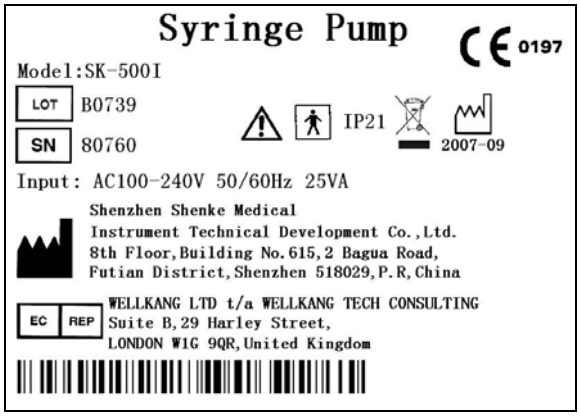
3) The inspection device: various kinds of sensors, such as displacement sensor (detecting liquid infusion rate and infusion volume), pressure sensor (detecting occlusion), etc. They can give corresponding signals which will, after being magnified, be sent to the microcomputer for signal processing. After which, a control instruction shall be sent for corresponding treatment.

4) The alarm device: After the signal given by the sensor is processed by the microcomputer, an alarm control signal will be received, which will be responded by the alarm device to arouse people’s attention for right treatment. There are mainly two kinds of alarms: photoelectric alarm (LBD) and sound alarm (buzzer).

5) The input and display device: The input part is in charge of setting various infusion parameters, such as infusion volume and infusion rate, etc. The display part is in charge of displaying various parameters and showing the current operation progress on the LCD.

1.7 Packing

1) Product label pattern (pasted on the back shell of the pump):



2) Definition and Symbols

Lot number

Serial No.

Attention (consult accompanying documents).

TYPE BF equipment.

Not for Municipal Waste.

Date of Manufacturer.

Manufacturer.

European Representative.

Device complies with the requirements if the EC Directive 93/42/EEC.
Registered with the CE mark.

IP21 Protected against Vertically falling drops of water.

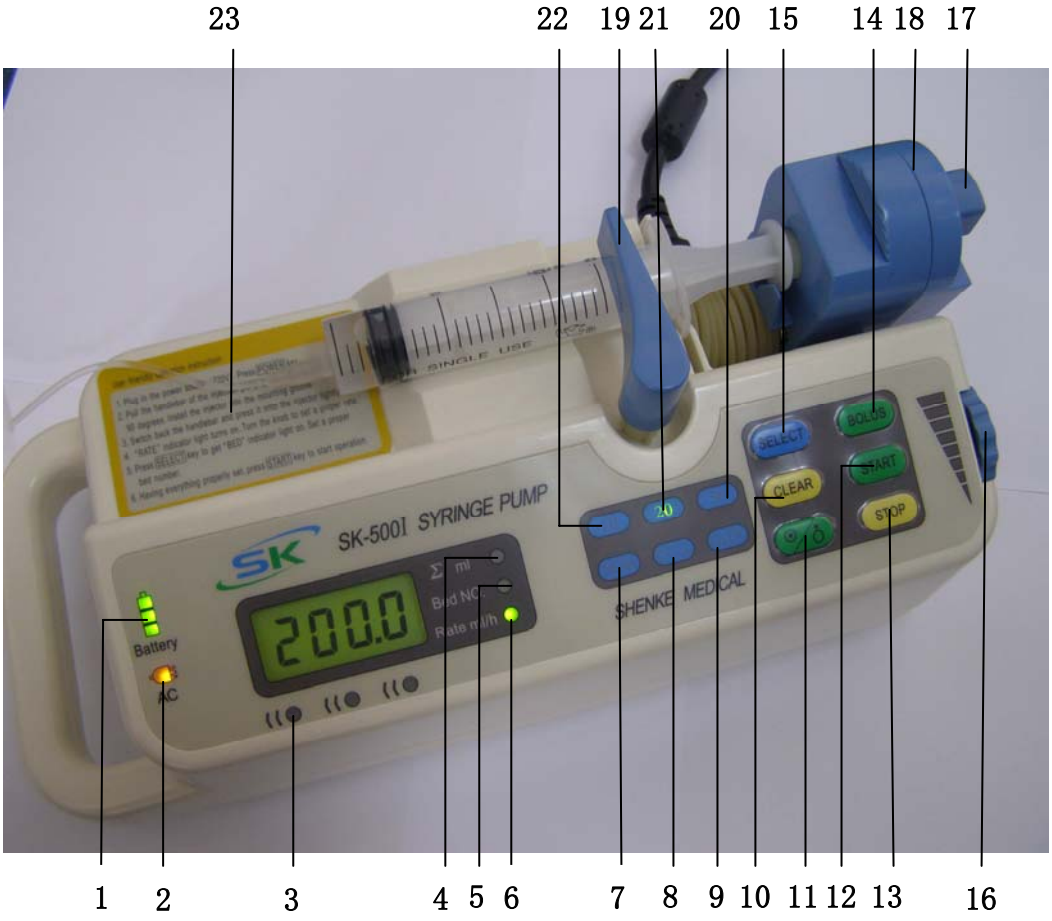
3) Inside content of a standard packing:
   - Syringe pump ×1
   - AC power cord ×1
   - Instruction manual ×1
   - Pole clamp ×1
   - Certificate of approval ×1
   - Maintenance card ×1

Please contact your syringe pump sales agent if there is any component above mentioned missing.

1.8 Product Faceplate Appearance

No.	Description	Function
1	Battery capacity indicator light	The 3 indicator lights mean the level of battery capacity from low to high as marked from below to top. If all 3 lights on, it means the battery is full charged.
2	AC Power indicator light	When this light is on, it means the pump has already been connected to AC power and the battery starts charging automatically.
3	Operation indicator light	After the infusion begins, the three lights flash alternately from right to left. When stopping the infusion, all the three lights are off.
4	Accumulated volume indicator light	When this light is on, it means the value displayed on the LCD screen is the accumulated volume.
5	Bed number indicator light	When this light is on, it means the value displayed on the LCD screen is bed number.
6	Infusion rate indicator light	When this light is on, it means the value displayed on the LCD screen is infusion rate.
7	NEAR alarm indicator light	This is an alarm light indicating that infusion will soon complete.
8	OCCL indicator light	This is an alarm light indicating occlusion in infusion pipe and meanwhile the syringe pump stops automatically.
9	OVER indicator light	This is an alarm light indicating infusion completion.
10	CLEAR key	In STOP condition, press the key to clear the accumulated volume.
11	 key	Turn on: Press the key for about 3-5 seconds. Turn off: Press the key for about 3-5 seconds.
12	START key	Start infusion(after installing the syringe properly).
13	STOP key	Press the key to stop infusion.
14	BOLUS key	Keep pressing this key during infusion, the pump will infuse at the maximum rate. After releasing this key, the pump shall go back to its original rate.
15	SELECT key	Press the key to select infusion rate, accumulated volume, and bed number.
16	Adjusting knob & confirm	The knob is used to adjust infusion rate, bed number etc. Press the knob to confirm the value newly set.
17	Clutch button	Keep pressing the button to move the piston freely. When letting go of the fingers, the clutch will gear and can only be moved by the engine.

18	Piston	Use the piston to push the syringe.
19	syringe pressure lever	Check the type of the syringe.
20	50 ml syringe indictor light	This light shall be on when the 50ml syringe is placed properly.
21	20 ml syringe indictor light	This light shall be on when the 20ml syringe is placed properly.
22	10 ml syringe indictor light	This light shall be on when the 10ml syringe is placed properly.
23	User-friendly operation instruction	Operation guide for nurse's reference.



1.9 Battery Charge

1) As shown in Diagram 1, after the pump is connected to AC power supply and turned on, the AC indicator light is on and the battery begins to charge automatically. The battery capacity indicator light will be on. If all 3 lights are on, it means the battery is fully charged and it will stop charge automatically. When less than 3 lights are on, the pump will begin to charge the battery

automatically.

2) As shown in Diagram 2, the AC indictor light will be off when the power is turned off. This means the syringe pump is using the battery capacity. When all the 3 battery capacity indicator lights are off, the pump will give an alarm to remind the user to charge the battery.

Notice: It needs 14 hours to charge the battery fully after its power is used up.

Diagram 1

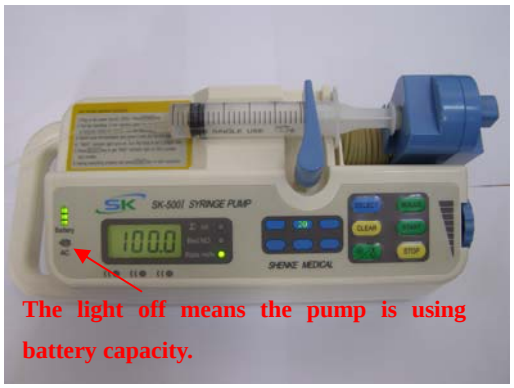
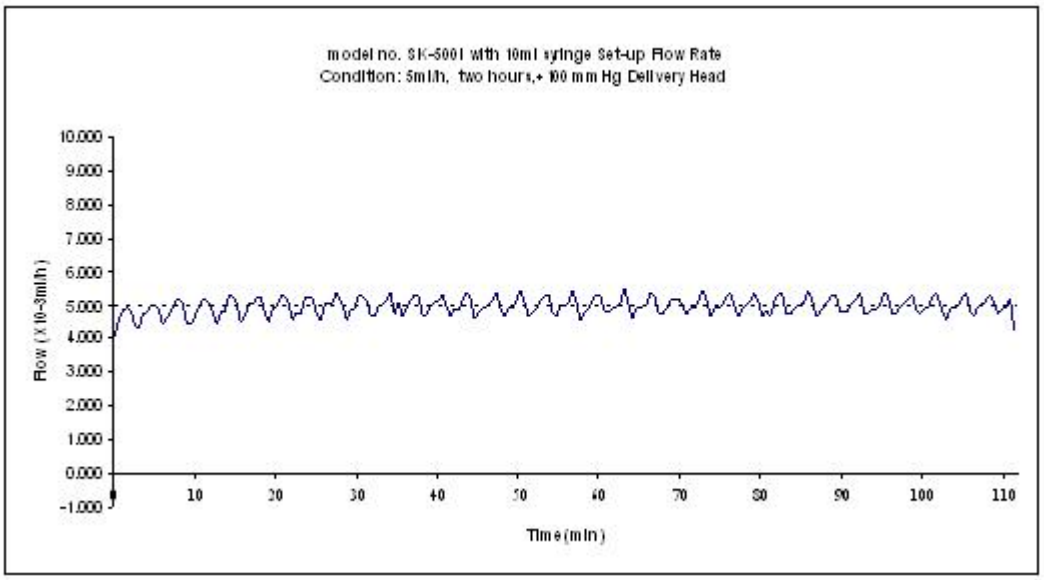
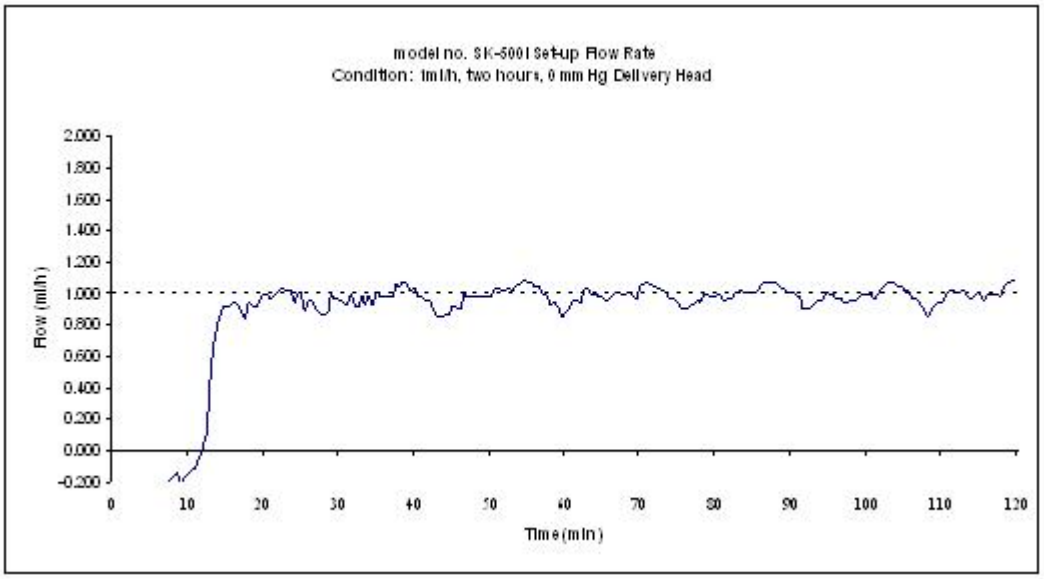


Diagram 2

2.0 Running Volume Curve





2. Syringe Pump Operation

2.1 Basic Operation Steps

Step 1 Power connection

Insert the power cord into the power supply as shown in Diagram 3.
Notice: The applicable voltage is AC100-240V, 50/60Hz.

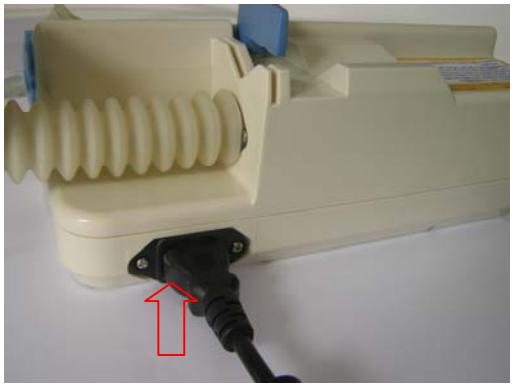


Diagram 3

Step 2 Turn the power on

Keep pressing the  key for 3~5 seconds, and then release it as shown in Diagram 4. The syringe pump begins self-diagnosis and all the indicator lights will flash by turns. After the self-diagnosis finishes, the LCD shall display as shown in Diagram 5.
Notice: When the orange light is on, it means the syringe pump is using AC power and that the battery is getting charged automatically.

Press  key (just on touch) for night vision in the dark.

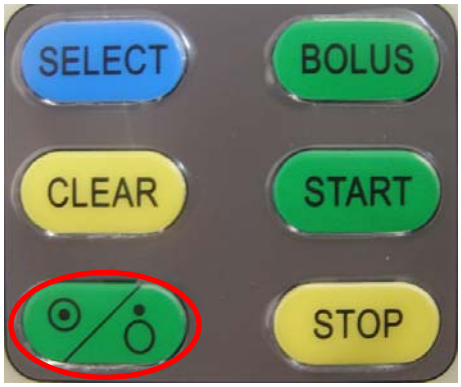


Diagram 4

Diagram 5

Step 3 Install the syringe

1. Pull the compression strut of the syringe up to its top and then turn it leftward around 90°, then let it go as shown in Diagram 6.
2. Press clutch button to pull its piston to the suitable place while putting the syringe filled with liquid into the mounting groove properly.
3. Turn the compression strut rightward, and compress it onto the syringe. The indicator light corresponding with the type of syringe will be on as shown in Diagram 7.

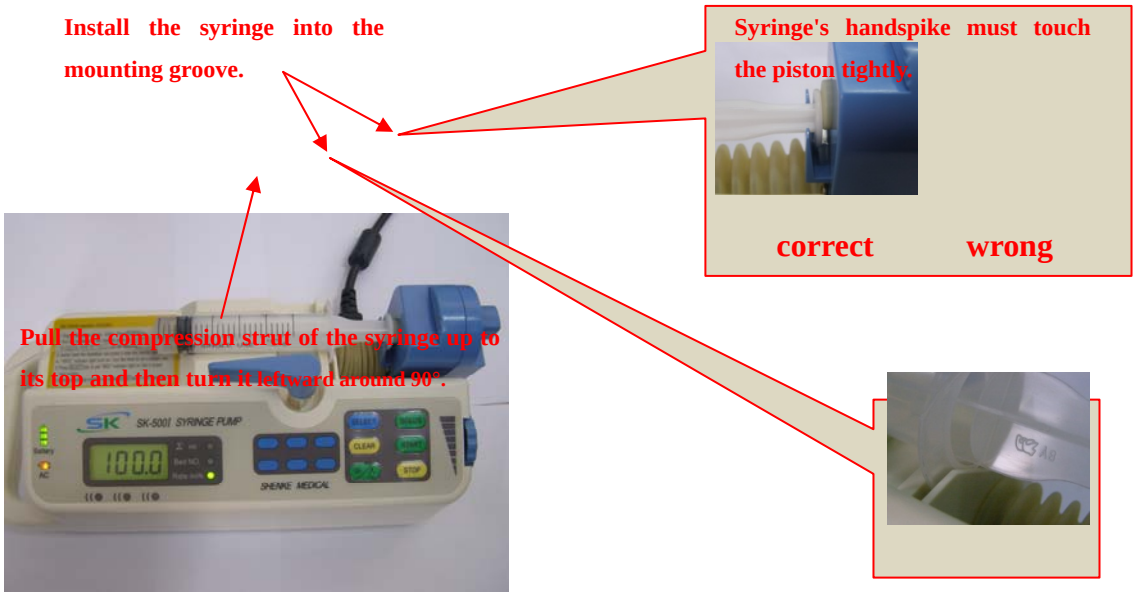


Diagram 6

Diagram 7

Step 4 Set the infusion rate

As shown in Diagram 8, when the syringe pump is in 'STOP' status, the LCD will turn to display rate while the rate indicator light is on. You can set the rate by turning the adjusting knob.
Notice: Turn the adjusting knob clockwise to increase the infusion rate or anti-clockwise to decrease the infusion rate.

Diagram 8

Step 5 Eliminate the accumulated volume

1. Press SELECT key as shown in Diagram 9. The screen will display the accumulated volume when the accumulated volume indicator light is on as shown in Diagram 8.
2. Press CLEAR key as shown in Diagram 10, the accumulated volume will become '0' and start to calculate a new.
Notice: The accumulated volume can only be viewed during the infusion process. If you need to eliminate it, you have to press STOP first.

Diagram 9

Diagram 10

Diagram 11

Step 6 Set bed number(necessary when used together with infusion supervision system)

Press SELECT key as shown in Diagram 12, the screen will display the bed number and the bed number indicator light shall be on as shown in Diagram 13. Then you can turn the knob to the bed number and press the knob to save it. In about 5 seconds, the screen will go back to the display of 'RATE' as shown in Diagram 10 and the bed number adjusting is finished.

Notice: Turn the adjusting knob clockwise to increase the number or anti-clockwise to decrease the number.

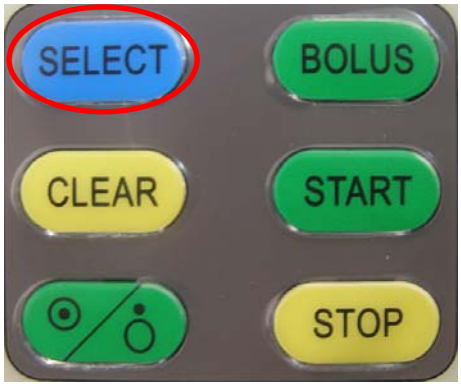


Diagram 12

Diagram 13

Step 7 Start infusion

After all values needed are well set and that the syringe is properly installed, press START key as shown in Diagram 14 to start the infusion, the operation indicator lights will flash alternately from right to left. The piston shall drive the syringe's handspike from right to left slowly as the infusion begins(Diagram 15).

Notice: The faster the operation indicator lights flashes, the higher the infusion rate is.

图 14

图 15

Step 8 Infusion completion

As shown in Diagram 16 when infusion comes to near completion, the NEAR indicator light shall be on accompanied with an alarm signal to alert the user.

Notice: The NEAR alarm can be silenced by pressing the adjusting knob and the 'NEAR' alarm will ring in 2 minutes.

As shown in Diagram 17, when infusion is completed, the OVER indicator light shall be on accompanied with an alarm signal to alert the user. Press STOP key as shown in Diagram 16, and the pump will stop the operation.

Notice: The OVER alarm can be silenced by pressing the adjusting knob and the OVER alarm will ring in 2 minutes.

Diagram 16

Diagram 17

Diagram 18

Step 9　Turn off the power

Press  key for 3~5 seconds as shown in Diagram 19 to turn off the power .

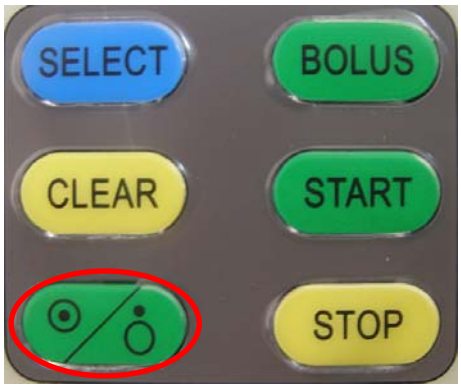


Diagram 19

2.2 'BOLUS' function

During the infusion process, if you need bolus infusion while the on going rate is lower than the maximum rate of the size of syringe in use, you can keep pressing the BOLUS key as shown in Diagram 20, the pump shall begin infusion at the fastest rate. It will go back to the original rate after releasing BOLUS key.

Notice: the maximum rate for 10ml syringe: 100ml/h, for 20ml syringe: 200ml/h and for 50ml: 500ml/h.

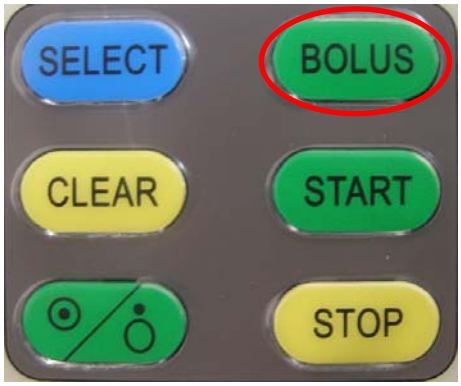


Diagram 20

2.3 Lock and unlock ‘NEAR’ alarm function

1) Under the condition of ‘Power Off”, with fingers pressing START + CLEAR keys together first, and then another finger pressing  , altogether for 5 seconds and then release all of them together as shown in Diagram 21.

2) The pump enters into the interface of locking and unlocking of NEAR alarm function as shown in Diagram 22. The NEAR alarm indicator light will turn on accordingly and the screen will display a value. You can adjust this value through the adjusting knob, 01 stands for locking the NEAR alarm function and 02 stands for unlocking NEAR alarm function. Press the adjusting knob to save the value newly set.

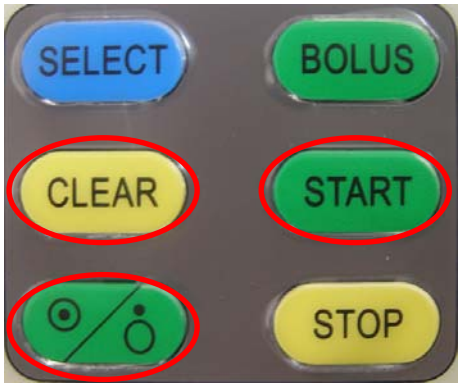


Diagram 21

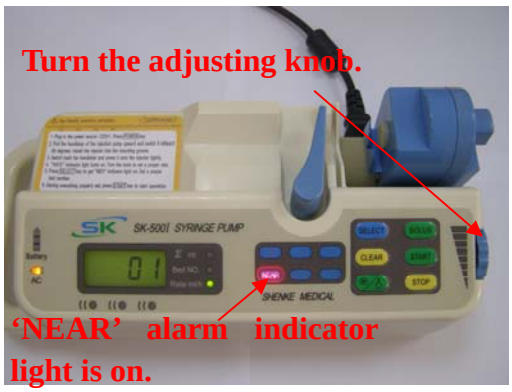


Diagram 22

2.4 Change New Brand of Syringe

Step 1 Measure the length of the syringe

Put the syringe to the measurer of the ‘Fast Operation Manual’ as shown in Diagram 23, measure the new brand of syringe by the scale, it reads 75mm as shown in Diagram 24.

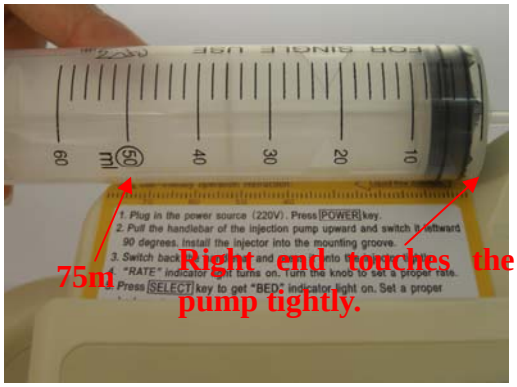


Diagram 23

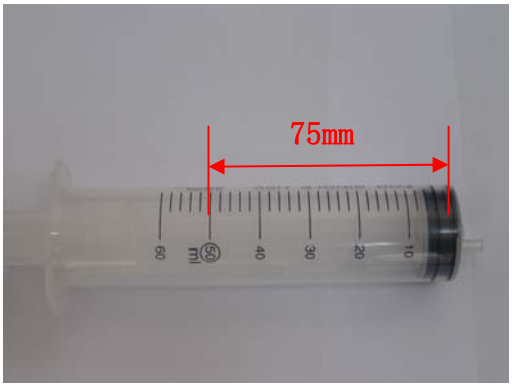


Diagram 24

Step 2 Install the syringe

Turn off the syringe pump as shown in Diagram 25. Install the syringe needed on the syringe pump. Make sure the syringe’s piston is pushed to the end of the syringe. Push the compression strut above until it touches the syringe properly.

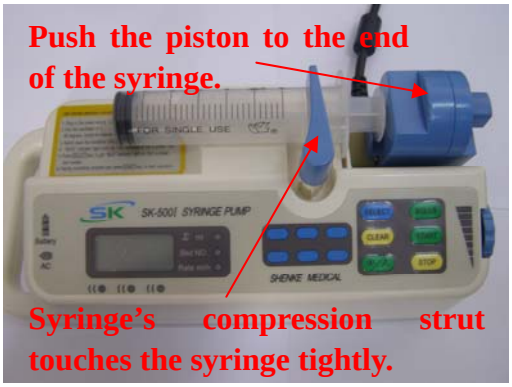
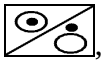


Diagram 25

Notice: We recommend 'Double Dove' syringe. If you want to change to other brand of syringe, please refer to '2.4 Change New Brand of Syringe' on page .

Otherwise it will cause inaccuracy, occlusion but not alarm or no occlusion but alarms.

Step 3 Set the syringe's parameters

1) 50ml syringe's parameter setting: Under the condition of 'Power Off', with finger pressing CLEAR key first, and then another finger pressing  , altogether for 5 seconds and then release both of them together as shown in Diagram 26. The pump will display as shown in Diagram 27 while the 50ml indicator light turns on accordingly. Turn the adjusting knob to adjust the value to the one you measured in Step 1, then press adjusting knob to save the value newly set.

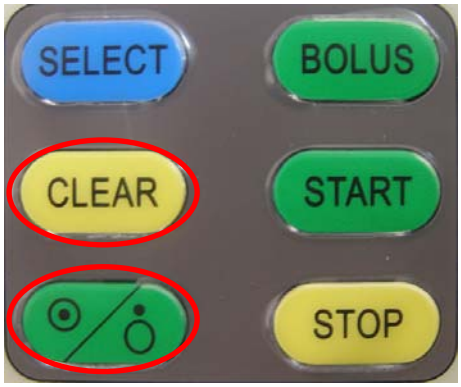
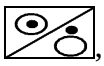


Diagram 26

Diagram 27

2) 20ml syringe's parameter setting: Under the condition of 'Power Off', with finger pressing BOLUS key first, and then another finger pressing  , altogether for 5 seconds and then release both of them together as shown in Diagram 28. The pump will display as shown in Diagram 29 while the 20ml syringe light turns on accordingly. Turn the adjusting knob to adjust the value to the one you measured in Step 1, then press adjusting knob to save the value newly set.

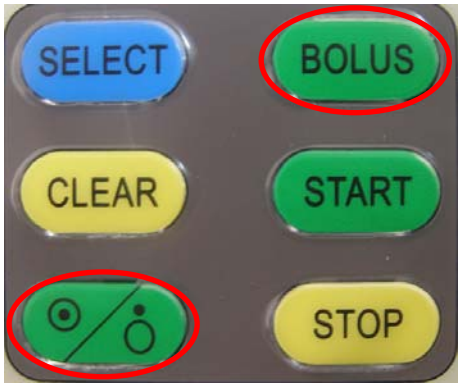


Diagram 28

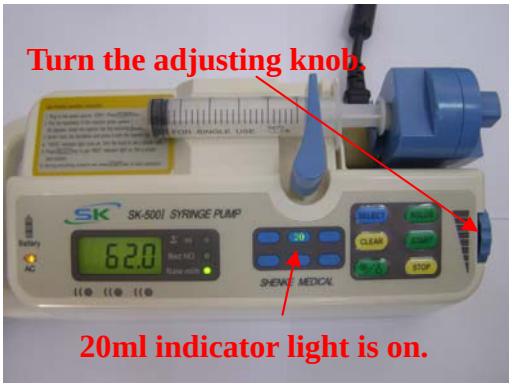
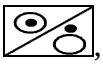


Diagram 29

3) 10ml syringe's parameter setting: Under the condition of 'Power Off', with finger pressing STOP key first, and then another finger pressing  , altogether for 5 seconds and then release both of them together as shown in Diagram 30. The pump will display as shown in Diagram 31 while the 10ml indicator light turns on accordingly. Turn the adjusting knob to adjust the value to the one you measured in Step 1, then press adjusting knob to save the value newly set.

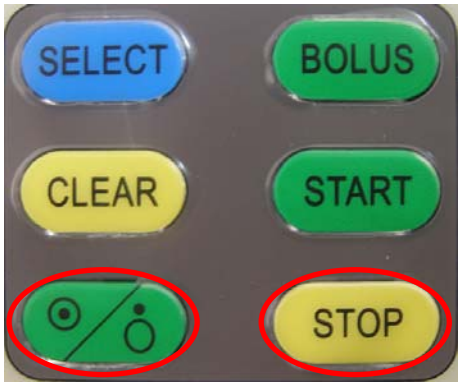


Diagram 30

Diagram 31

2.5 Adjust occlusion sensibility

1) Under the condition of 'Power Off", with finger pressing START key first, and then another finger pressing  , altogether for 5 seconds and then release both of them together as shown in Diagram 32

2) The pump enters into the interface of setting pressure alarm value as shown in Diagram 33. The occlusion alarm indicator light will turn on accordingly and the interface displays the pressure alarm value. Adjust the pressure alarm value by the adjusting knob. The smaller the value is, the more sensitive it shall be. Press the knob to save the value newly set.

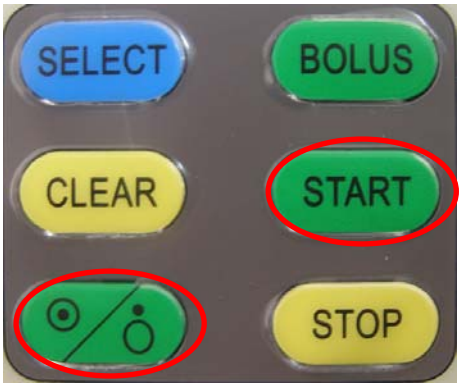


Diagram 32

Diagram 33

Notice: The recommended occlusion value is 12 ~20 when the machine operates at medium speed. It enters into KVO mode when occlusion alarm sounds. KVO mode shall end when the occlusion alarm is silenced.

3. Cleaning, Storage, Transport and Maintenance

3.1 Cleaning

1) Use a piece of cloth to wipe the syringe pump clean when any liquid drops on the pump.

2) Special attention must be paid when cleaning the syringe pump. Use a tampon moistened with 75% of alcohol to wipe the outer shell.

3.) Be sure to turn the syringe pump off and disconnect it from AC power supply before wiping the liquid off.

4) Do not use something like xylene, acetone or something analogous to clean the syringe pump. These chemicals will cause damage to the outer shell.

3.2 Storage and transport

The pump should be stored in the environment with temperature between -15 ~50℃, atmosphere pressure between 86~106kPa and relative humidity between 20%~90%.

3.3 Preventive inspection

Interval	Routine Maintenance Procedure
As per Hospital Policy	Thoroughly clean external surfaces of the pump before and after prolonged period of storage.
At least once per year (Refer to TSM for identification of parts)	1. Inspect AC power supply plug and cable for damage. 2. Perform functional tests as outlined in the

Technical Service Manual.

3. Operate the pump on battery power until the low battery alarm then charge the battery to confirm operation and charging.

3.4 Maintenance

The warranty is 1 year from the purchasing day. We can offer free repair service within the warranty time on condition that the product is operated properly. The following situation is not within the range of free maintenance and repair:

1) Malfunction caused by false use, repair or reconstruction by any unprofessional, unqualified or untrained people.
2) Malfunction or damage caused during transportation.
3) Malfunction or damage caused by fire, salt, poisonous gas, earthquake, hurricane, flood, abnormal voltage and other nature factors.

4. Electromagnetic Compatibility & Interference

This pump is protected against the effects of external interference, including high energy radio frequency emissions, magnetic fields and electrostatic discharge(for example, as generated by electrosurgical and cauterising equipment, large motors, portable radios, cellular telephones etc.) and is designed to remain safe when unreasonable levels of interference are encountered.

The RF emissions of this pump are very low and are not likely to cause any interference with the nearby electronic equipment. However, this pump emits a certain level of electromagnetic radiation which is within the levels specified by IEC/EN 60601-1-2 and IEC/EN 60601-2-24. If the pump interacts with other equipment, measures should be taken to minimize the effects, for instance by repositioning of relocation.

5. Battery Operation

The internal rechargeable battery allows continued operation when the AC power is unavailable, for example during patient transfer or AC power failure. A fully charged battery will provide over 5 hours at typical infusion rates.

To Achieve optimum operation, ensure that the battery is fully recharged after full discharge, before storage, and at regular 3 month intervals during storage.

Charge retention will eventually degrade. Where retention is critical the internal battery should be replaced every 2 years. It is recommended that only a qualified service engineer replaces the battery.

6. Disposal

6.1 Information on Disposal for Users of Waste Electrical & Electronic Equipment

This "  " symbol on the product and/or accompanying documents means that used electrical and electronic products should not be mixed with household waste.
If you wish to discard electrical and electronic equipment, please contact your Cardinal Health affiliate office or distributor for further information.
Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

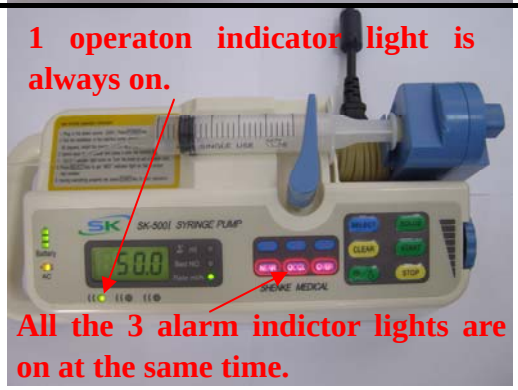
6.2 Information on Disposal in Countries outside the European Union

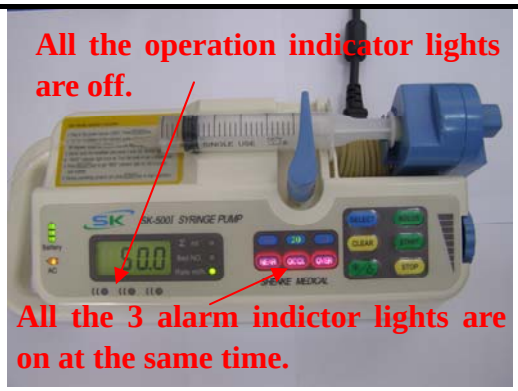
This symbol is only valid in the European Union. The product should be disposed of taking environmental factors into consideration. To ensure no risk or hazard, remove the internal rechargeable battery and the Nickel Metal Hydride battery from the control board and dispose of as outlined by the local country regulations. All other components can be safely disposed of as per local regulation.

7. Eliminate the alarm and solve problem

7.1. Common Alarm Signals and Alarm Elimination

Description	Display	Cause	Solution
Near completion		The infusion is near completion	The alarm can be silenced by pressing the adjusting knob(The alarm will ring again in 2 minutes). Press STOP key to silence the alarm and also stop the infusion at the same time.
Infusion completion		The infusion completes.	The alarm can be silenced by pressing the adjusting knob(The alarm will ring again in 2 minutes). Press STOP key to silence the alarm and also stop the infusion at the same time.

Infusion pipe occlusion		1. The infusion line is blocked. 2.The occlusion sensitivity is too high. 3. There is something wrong with the sensor.	For cause 1: Press STOP key to silence the alarm and also stop the infusion at the same time. Start the infusion again after solving the problem. For cause 2: Refer to '2.4 Change new brand of syringe' on page . For cause 3: Ask the manufacturer to check and repair.
Low battery capacity		1. The battery capacity is too low. 2. The battery ages or there is something wrong with syringe pump's charge circuit.	For cause 1: Connect to AC and charge the battery fully(you need to turn the power on). For cause 2: Ask the manufacturer to check and repair.
No AC power alarm		1. There is no AC supply. 2. There is a problem with power supply circuit.	For cause 1: Check if the power cord is well plugged or not. For cause 2: Ask the manufacturer to check and repair.
Syringe disengaged		1. The syringe is disengaged or not properly installed . 2. The syringe's parameter is wrongly set. 3. There is a problem with the syringe pump's potentiometer.	For cause 1: install the syringe properly again. For cause 2: Refer to '2.4 Change new brand of Syringe' on page and set the parameter again. For cause 3: Ask the manufacturer to check and repair.

Control abnormal		1. The syringe's parameter is wrongly set. 2. The syringe pump's motor cannot run properly.	For cause 1: Refer to '2.4 Change new brand of syringe' on page and set the parameter again. For cause 2: Ask the manufacturer to check and repair.

7.2 Common problems and solutions

Description	Result	Cause	Solution
Press 'START' key but the LED light is not on.	The syringe pump does not work.	The syringe is not properly installed.	Check if the indicator light is on or not after installing the syringe. Reinstall the syringe.
Turn the adjusting knob but the infusion rate does not change.	The infusion rate does not change.	The rate cannot be adjusted in 'operating status.	Press STOP key to stop the syringe pump. Press SELECT key until 'RATE' indicator light is on. Turn the adjusting knob to get the needed value. Press the adjusting knob and the value can be saved.
The syringe pump cannot turn on with the battery.	The syringe pump cannot turn on.	Battery used up.	Connect the syringe pump to AC power(be sure the power is turned on) to charge the battery.
The occlusion alarm signal sounds soon after the syringe pump starts operation.	The occlusion light is on and the syringe pump stops working.	The occlusion sensitivity is too high.	Refer to '2.4 Change new brand of Syringe' on page .
The indicator light cannot detect the syringe's size.	Indicator light corresponding to the syringe size is not on.	The syringe pump cannot identify the syringe's size.	Refer to '2.4 Change new brand of Syringe' on page and set the parameter again.

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