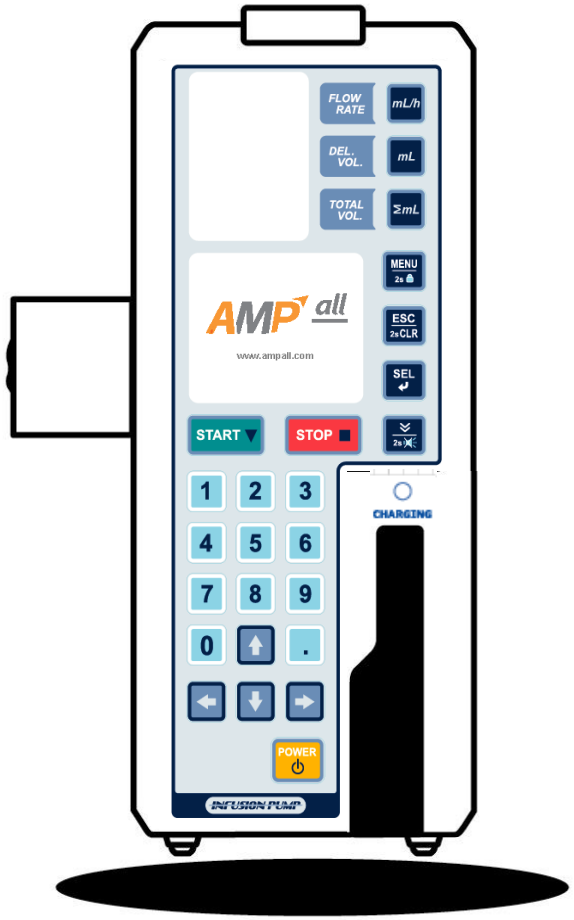
CE 1639

INFUSION PUMP OPERATING MANUAL



IP-7700

INTRODUCTION / FEATURES

Thank you for purchasing our IP-7700 Infusion Pump.

In order to use this pump correctly and safely, read this manual carefully before operating IP-7700 Infusion Pump. If you have any questions as you are reading through this manual, call the local authorized dealer in your country. Retain this manual together with the unit for future reference.

This IP-7700 Infusion Pump is intended for the infusion of chemicals such as anti-cancer drugs, oxytocic, nutrition, and drug for chemotherapy medication.

This device is designed for high flow-rate accuracy and ease of handle in the infusion of solutions with the equipped peristaltic finger system and the use of a drop senor control.

IFUs currently offered are only available in English, so if you require IFU in a country that uses a different language, IFU will be provided in that language.

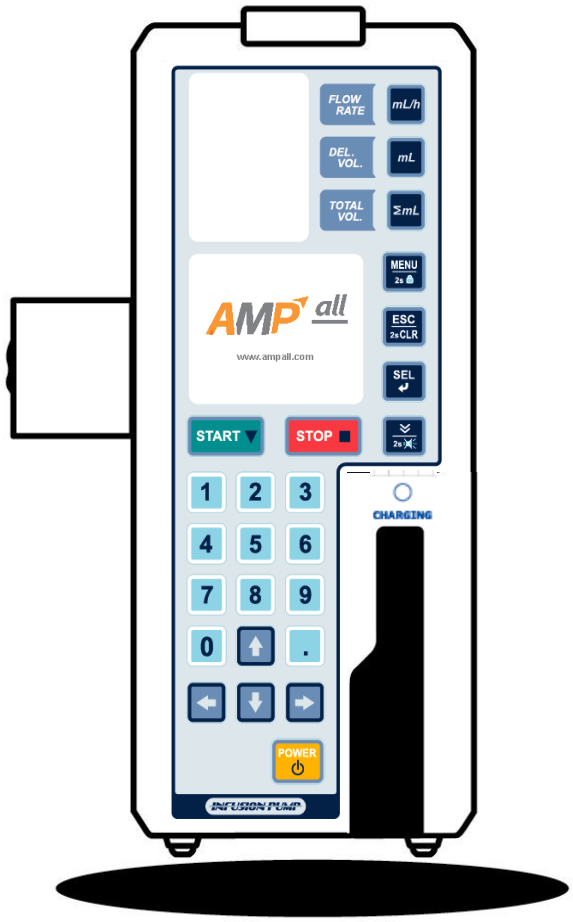
Features

- **Self testing – Every time the unit is turned on, self testing is proceeded.**
- **K.V.O.(Keep Vein Open) – When the delivery volume has been reached, flow rate turns into K.V.O. rate (adjustable from 1ml/h to 10ml/h) automatically.**
- **Keypad lock function – Keypad is locked with or without password depends on its using condition.**
- **Infusion setup – Flow rate/ Delivery volume/ Infusion time**
- **Retain memory – Last setting value is retained.**
- **Infusion remaining time display**
- **Alarm repeat function**
- **Open system – Calibration up to 10 IV set brands in a single unit.**
- **Buzzer level – 3steps**
- **Occlusion level – 9steps (4.5~14.5psi)**
- **Purge rate – Adjustable (1~1000ml/h)**
- **Bolus rate – ON/OFF, Adjustable (1~1000ml/h, 1~9999ml)**
- **History call back – Call back last 10 infusion data.**
- **Dosage mode(Body weight mode) – Automatically calculate and set a proper flow rate when dose rate, body weight, drug mass and solution volume are entered.**
- **Drop sensor – External (Optional item)**
- **Nurse call – Each unit can be connected with nurse call system (DC 24V, 0.5A) (Option)**
- **Profile function – Program infusion condition (flow rate, delivery volume, delivery time) differently for every hour, up to 24hours. (Option)**
- **Central system – Connect with main PC for monitoring (Option)**

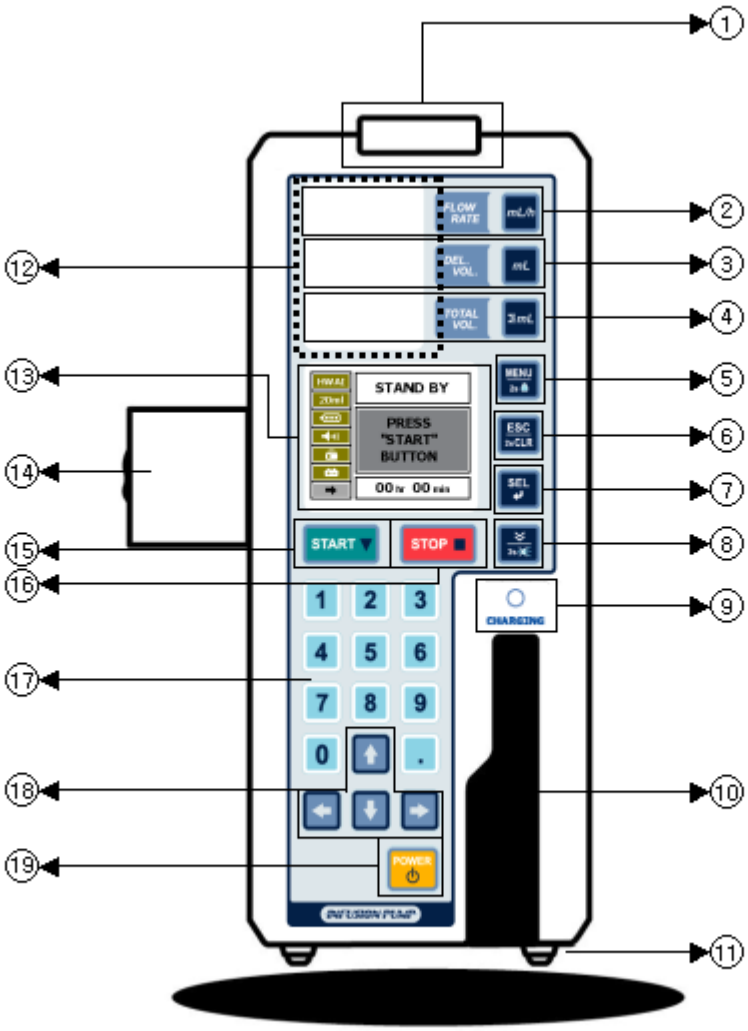
CONTENT

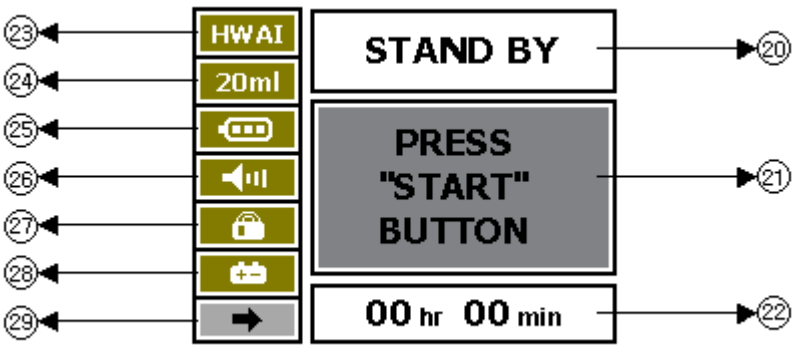
The battery may have discharged
due to the delivery period.
Please connect to a power socket
for fully charging before the first use.

1. DESCRIPTION OF PUMP



1-1. FRONT VIEW





1. DESCRIPTION OF PUMP

① STATUS LED(Red, Green) : Indicates the operation status of the pump in each color

- Flashing in red : warning / -Flashing in green : operating

② FLOW RATE: Set up and adjust Flow rate(㎖/h)

③ DEL. VOL : Set up and adjust Delivery volume(㎖)

④ TOTAL VOL: Display total infusion volume(㎖)

⑤ MENU/2s : Move to “MENU” mode/ Lock keypad by press the button for 2seconds.

⑥ ESC/2sCLR : Move to previous state/ Delete setup value by press the button for 2seconds.

⑦ SEL: Save setup value / Set up infusion time.

⑧ PURGE / 2s SILENCE :

- STANDBY mode : Remove air bubble in IV tube line.
- During infusion : **BOLUS** function, Bolus can be set in system menu mode.
- SILENCE button: Press the button for 2seconds to hold alarm sound for 2minutes when alarm goes off.

⑨ CHARGING : (Fully charged : Green / Charging : Orange)

⑩ Door Lock Lever

⑪ RUBBER FOOT

⑫ FND : Display FLOW RATE , DEL.VOL , TOTAL VOL

⑬ LCD : Display operating state.

⑭ POLE CLAMP : Fix the unit on an IV pole stand.

⑮ START

⑯ STOP

⑰ NUMERICAL BUTTONS

⑱ DIRECTION BUTTONS

⑲ POWER : Press for 2seconds to turn on or off the unit.

⑳ Display infusing state

㉑ Display operating state

㉒ Display delivery time

㉓ Display IV set(Infusion tube set) brand

㉔ Display number of drops for IV set : 15D , 19D , 20D , 60D

㉕ Display state of battery

㉖ Display state of BUZZER level

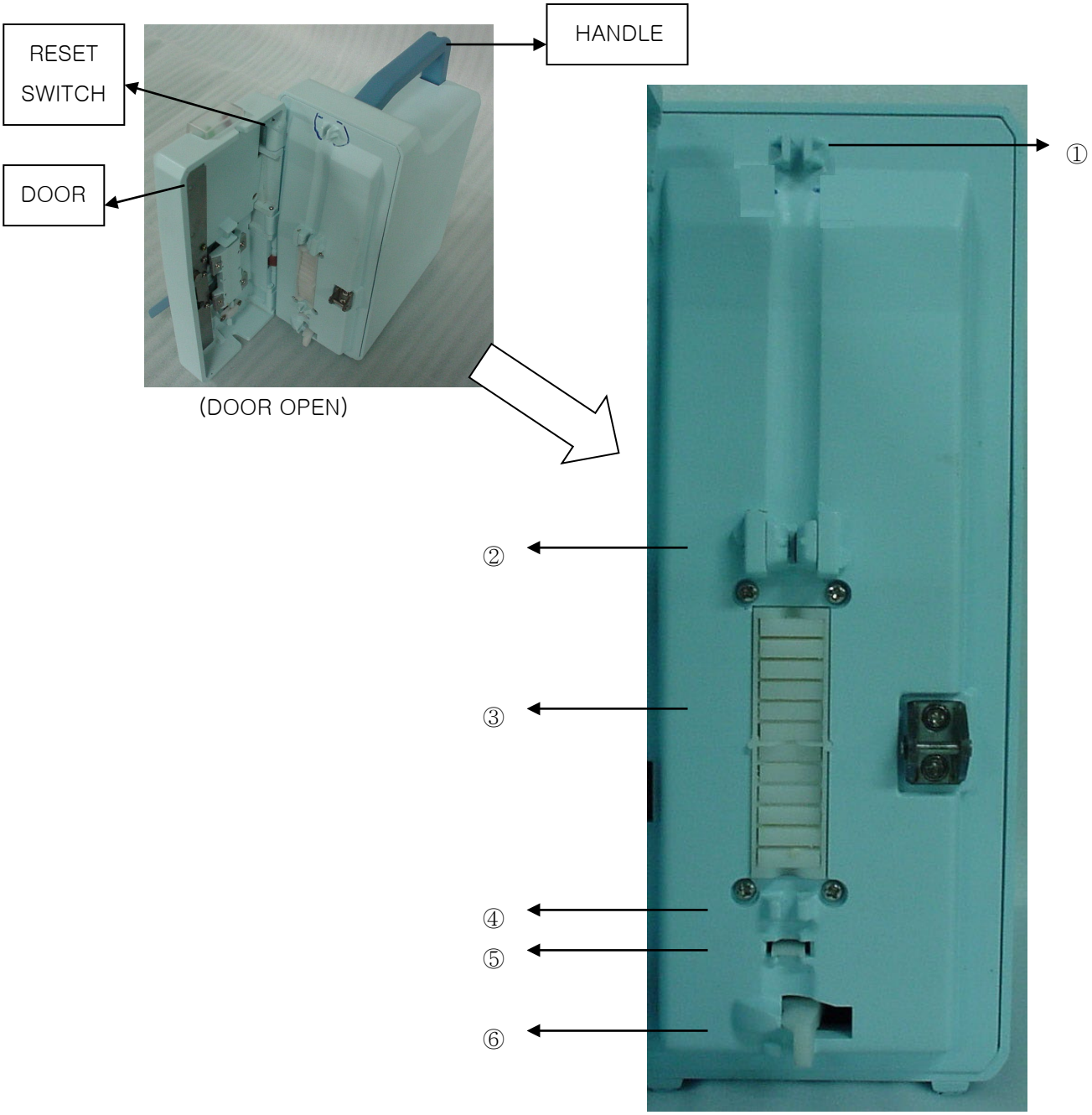
㉗ Display state of lock : Lock / Unlock

㉘ Power supply : AC / BATTERY

㉙ BATTERY REMAIN : Display remaining battery operating time.

※ Battery remaining time can be very different depends on battery condition.

1-2. INSIDE THE DOOR



①Tubing Guide : Fix an infusion tube.

②Air-in-line Detector : Detect air bubble in the infusion tube.

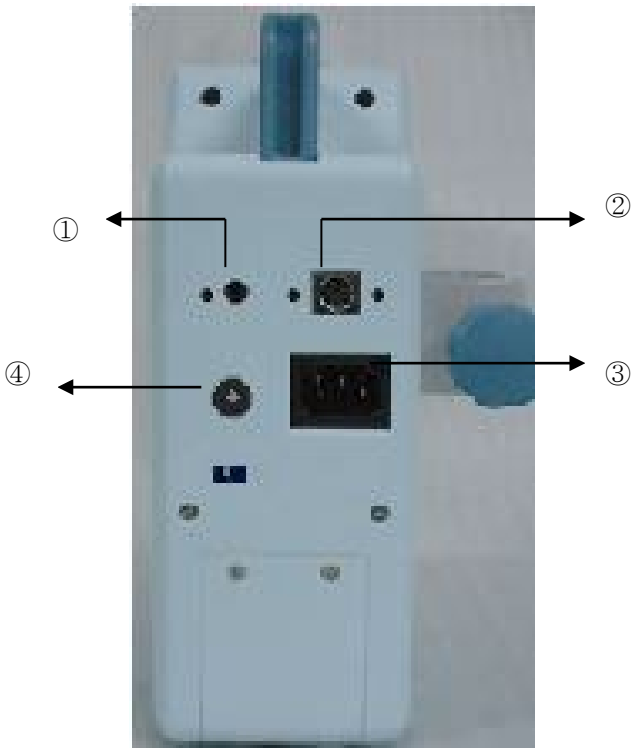
③Peristaltic Fingers : Press the infusion tube to drive down the solution.

④Tubing Guide : Fix the infusion tube.

⑤Occlusion Detector : Detect occlusion on the infusion tube.

⑥Tubing Clamp : Automatically block the infusion tube when door open

1-3. REAR VIEW



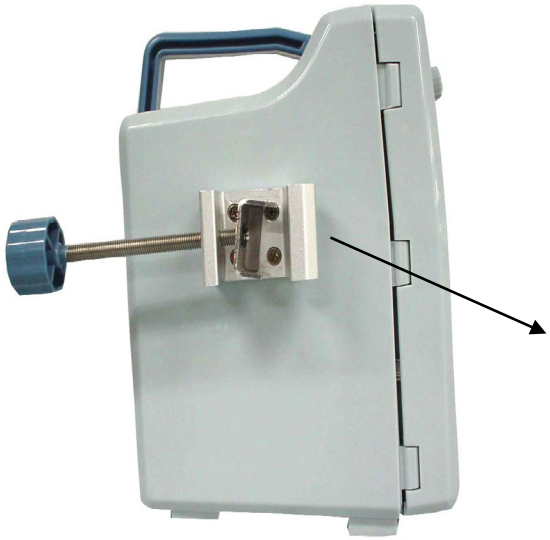
① Nurse Call Connector : Connect alarm terminal cord installed in the ward.

②Drop Sensor Connector

③AC Power Supply Connector

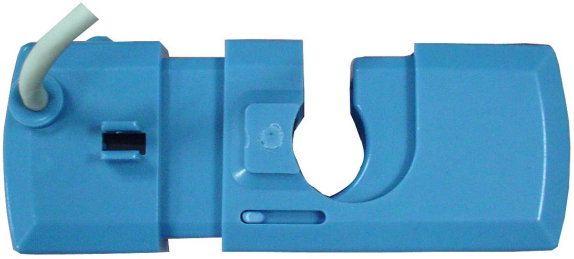
④Adaptor Connector

1-4. SIDE VIEW



① Pole Clamp : Fix the unit on IV pole stand.

1-5. COMPONENTS



Drop sensor (Optional item)

AC power cord

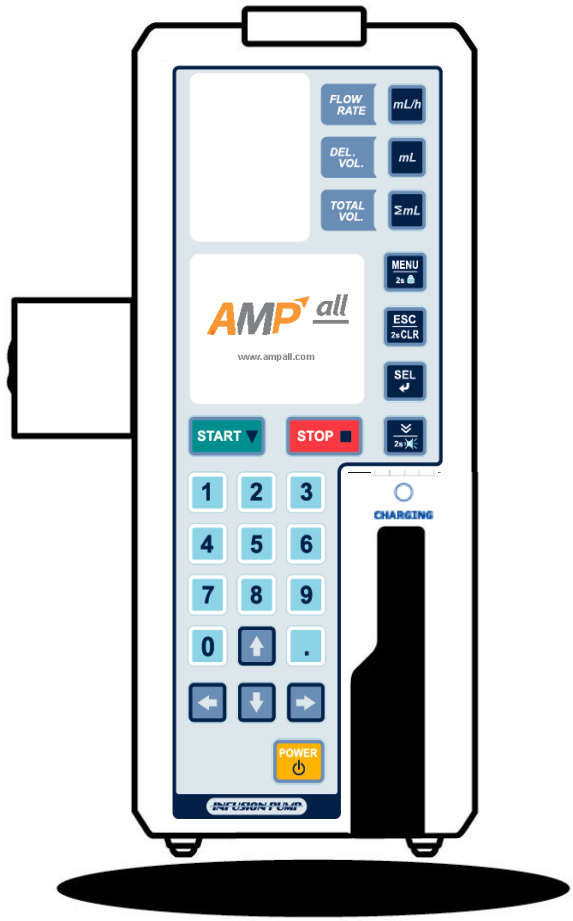
*Drop Sensor (Optional item)

① Drop sensor : Monitoring drops in IV set chamber

② Dimension : 35 x 93 x 18 mm

③ Weight : 0.1kg

2. PRIOR TO PUMP USE



2-1. EXPLANATION OF SYMBOLS

Warning is used to indicate the presence of a hazard which can cause severe personal injury, death or substantial property damage if the warning is i

Caution is used to indicate the presence of a hazard which will cause minor personal injury or property damage if the warning is ignored.

NOTE

Note is used to notify the user of installation, operation or maintenance information which is important but not hazard-related.

2-2. WARNINGS

• If this pump is used in the vicinity of the surgical operation equipment which generates a high frequency current such as mobile (cellular) phone, radio, or defibrillator, the pump may malfunction since electrical interference. Please carefully check for any sources of electrical interference in the vicinity before use.

• When using the pump concurrently with the electronic surgical unit, please note the following:
- Do not use the pump together with any electronic surgical unit that generates high frequency.
- Be sure that the pump is kept a sufficient distance from the electronic surgical unit.
- The pump and such device should not be connected to the same outlet.
- Check and confirm the normal operation of the pump regularly.

※ In case of malfunction, after turn on the Tubing Clamp, turn off the power immediately(switch off the power button on the rear side of the pump), and remove IV set from the pump and from the patient's skin. After this action, please contact your local authorized dealer at once.

• Avoid using the pump in presence of flammable gases and flammable anesthetic mixture with air, oxygen or Nitrous-oxide.

• The use of any mobile (cellular) phone near the pump is not allowed since the high frequency noise during the telephone conversation could cause malfunction of the pump.

• The use of the pump in MRI rooms such as high-pressure rooms or places where high electromagnetic radiation is generated is not allowed.

• In case of the use of any other IV sets than recommended in this manual, consult your local authorized dealer for compatibility of IV sets with this pump before use it. If an IV set with no compatibility is used, the accuracy of flow rate and alarm functions cannot be guaranteed.

• Be sure that the tubing is properly fit in the tubing slots of Air-In-Line detector and occlusion detector. If not, those alarms will not function normally.

• Be sure that the tubing runs straight over the peristaltic finger section. If not, an accurate infusion rate can not be guaranteed.

• During infusion, regularly check the drip rate to make sure that the solution is being infused at the selected rate.

• Do not connect the IV set administered from an infusion pump to another infusion line administered only by the manual roller clamp because this may cause inaccuracy of infusion rate and alarm functions.

• When the same site of the tubing has been set at peristaltic finger section for a long time (over 12 hours), use it after moving the tubing connected to this pump at a distance of more than 10 cm.
Deformation of tubing arising from long time (over 12 hours) use can affect the accuracy.

• The pump does not detect damage to the infusion line such as a leak in the line or a rupture in the filter due to pressure exertion. Therefore, regularly check for any damage to the infusion line during infusion.

• When the flow is obstructed due to kinking of the tubing or clogging of the needle or filter, it can cause the pressure in the infusion line to increase and cause the tubing to be inflated with the solution.
Complete removal of the obstruction will allow the solution to be delivered to the patient.
If the flow is obstructed, take appropriate actions after completely closing the manual roller clamp on IV set.

• The pump is connected to an AC power outlet to be operated. If there is no available AC power outlet, the pump can be operated with only its internal battery. **(Alternatively, the pump may be operated by DC power)**
The internal battery can be fired by high temperature or shock, be careful of the temperature and the humidity while using the pump.

• The spill of the solution on the AC power inlet may cause a short circuit.

• Check the pump and parts if it damaged. Please contact your local authorized dealer immediately when the pump or parts get shocks even though it looks normal.

• In case of malfunction, do not try to take the unit apart or attempt to repair by yourself. Please contact your local authorized dealer immediately. If the user does not comply with these warnings, AMPall cannot be held liable and the warranty does not apply.

• The pump should be used by a trained professional.

2-3. PRECAUTIONS

• The pump does not detect if the solution is infused out of the blood vessel. Please check the puncture site and monitor the patient's condition carefully.

• Do not try to use the pump for other purposes such as blood transfusion.

• The pump does not infuse high viscosity solutions, do not use any other IV sets than recommended in this manual.

• Opening the tubing clamp while the pump is connected with a patient makes Free Flow.

• Fix the pump securely to a pole stand and check its stability.

• The pump must be used in accordance with this instruction manual by trained medical personnel.

• Be sure to use components including power cord, provided or recommended in this manual.

• When alarm sounds, please take corrective actions. (Refer to trouble shooting)

If the user does not comply with these warnings, the company is not respo nsible for its result and the warranty is not applied.

2-4. CLEANING & SANITATION

• Before cleaning the pump, make sure to power off the pump and disconnect the AC power cord.
• Do not immerse the pump in water.
• Do not immerse the pump in any liquid nor allow any liquid to leak into the pump.
• Do not use alcohol, thinner, benzene, ammonia, acetone or any other organic solvents.
• Do not sterilize the pump.

< Casing >

• When the pump casing is stained, use a gauze cloth or similar, moistened with cold or tepid water and let it dry, especially the AC power inlet before use.
• Do not use drier to dry the unit.

< Air-In-Line detector / Occlusion detector >

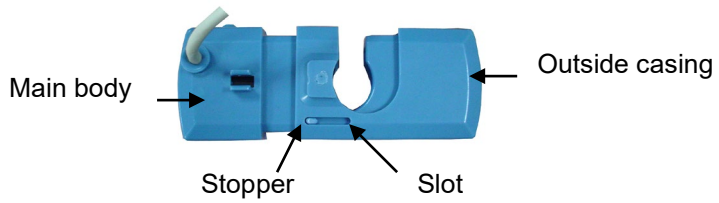
• When the Air-In-Line detector or Occlusion detector is stained, use a swab moistened with warm water and let it dry before use.
• Do not use something rigid or sharp like tweezers to clean the detectors.

< Drop Sensor >

• Before cleaning the drop sensor, make sure to disconnect the drop sensor completely from the pump.
• When the drop sensor is stained, use a gauze cloth or similar, moistened with cold or tepid water and let it dry.
• Do not allow any solution to splash on the drip sensor connector. If it is wetted, dry it before use.

Cleaning procedures are as follows.

1. By using a small minus screwdriver, pull the casing up and remove the outside casing as shown in the below picture.
2. Wipe the main body of the drip sensor with a gauze cloth or similar, moistened with cold or tepid water.
3. Wash the casing and spring.
4. Dry them.
5. To assemble the sensor, place the spring on the right of main body of the sensor and then slide the outside casing over the main body until the stopper on the main body gets in the slot on the outside casing.



2-5. STROAGE

• Avoid the following environment for storage and transport for the IP-7700 Infusion Pump.
- Where the unit is exposed to dirt or heavy dust.
- Where the unit is exposed to salty atmosphere.
- Where the unit is exposed to severe vibration or corrosive GAS.
- Where the unit is exposed to rough handling.
- Where the unit is exposed to direct sunlight or UV light.
- Where the unit is exposed to water.
- Where the unit is exposed to extreme temperature and humidity.

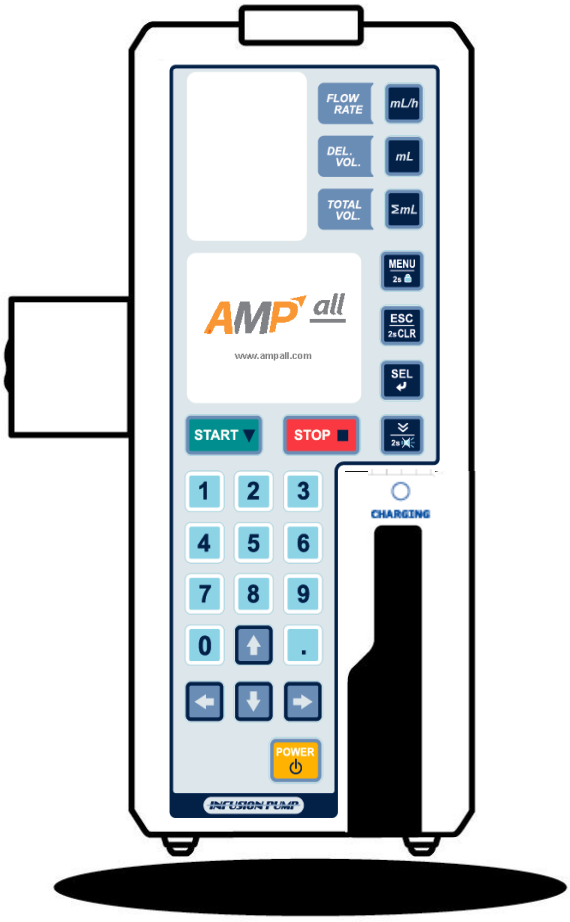
• The optimum storage conditions for the IP-7700 Infusion Pump
- Temperature is between -10℃ ~ 45℃.
- Humidity is between 10% ~ 95%

2-6. MAINTENANCE & REPAIR

• If any irregularity and failure are detected, stop operation of the pump immediately and contact your local authorized dealer to repair or replace by supplying the details of the situation. Never try to disassemble or repair by yourself because it could cause further serious failure.
• Make sure that there is not any damage with the pump and components. In case that the unit and components were shocked, do not use them even if visible damages are not observed. Please contact your local authorized dealer.
• Contact your local authorized dealer for periodical inspection of the pump for safety and longer product life.
• Operate the pump with the internal battery once a month to check its performance because the internal battery is subject to aging. If the operation time is getting short after it is normally recharged, contact your local authorized dealer to replace with a new battery. Please be sure that your local authorized dealer checks it annually.
• Please recharge the internal battery fully for more than 6 hours by connecting the pump to an AC power outlet before the pump is used for the first time or after a long interval.
• If the battery is low, the pump may stop running if there is no way to connect the pump to an AC power outlet.

the product and its electronic accessories (e.g. Power cord) should not be dispo sed of with other household waste at the end of their working life. To prevent p ossible harm to the environment or human health from uncontrolled waste dispo sal, please separate these items from other types of waste and recycle them re sponsibly to promote the sustainable reuse of material resources.

3. OPERATION



3-1. INITIAL SETUP

3-1-1 ATTACHING THE PUMP TO THE IV POLE STAND

• Fix the pump securely on the pole stand, using the pole clamp on the left of the pump.

3-1-2 CONNECT AC POWER

• Insert AC power cord to the AC power inlet on the back side of the pump and connect the power cord to AC power outlet. Charging lamp will be on in red or green depends on its battery charging state.
(Fully charged : Green / Charging : Orange)

• After turn on the unit,

- LCD displays  on the left side of LCD when it connected with AC power.
- LCD displays  connected with adaptor, and  connected with battery for power supply.

NOTE • Alternatively, the pump may be operated by DC power.

• When AC power is connected, the internal battery is automatically being recharged.

3-1-3 CONNECT DROP SENSOR (OPTIONAL ITEM)

• Connect the plug of the drop sensor into the drop sensor connector at the back of the pump.

• Do not connect the plug of the drop sensor when drop it is not used.

• Drop sensor with the same serial number as the pump should be used.
Otherwise, the function of the drop sensor could not be guaranteed.

NOTE • Please check the flicker of the lamp on the drop sensor whenever the solution drops.
If there is no flicker, please contact your local authorized dealer.

3-1-4 TURN ON THE UNIT

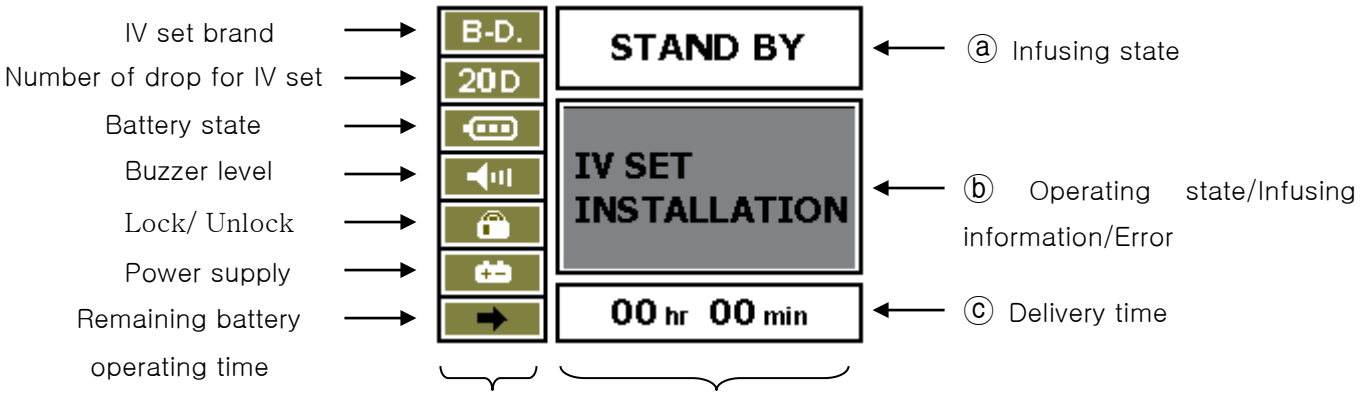
• Press [POWER] button for 2 seconds to turn on the unit.

- LCD, FND and LED state lamp turn on with confirming sound and SELF TESTING is proceeded for 3seconds.
- LCD divides left side and right side as below picture. Left side displays setup conditions, and right side displays operating state.

* Power supply -

 : AC power
 : Adaptor
 : Battery

- IV set(infusion tube set) brand is displayed on the left side of LCD. Please confirm the brand of IV set, if it is the one you are going to use with the unit.



• ⓐ INFUSING STATE

Display	Description
STAND BY	Initial display
INFUSING	Infusing state
BOLUS	BOLUS state
PROFILE	PROFILE state

• ⓑ OPERATING STATE / INFUSION INFORMATION / ERROR

Display	Description
IV SET INSTALLATION	Before IV set installation
PRESS " START" BUTTON	Complete IV set installation
WARNING AIR INLINE	Detecting air in line during infusion
WARNING OPEN DOOR	DOOR OPEN
WARNING OCCLUSION	OCCLUSION
WARNING BATTERY LOW	BATTERY LOW
WARNING FLOW ERROR	ERROR goes off during infusion
WARNING EMPTY ERROR	Detecting air in line during COMPLETE KEEP OPEN
COMPLETE KEEP VEIN	Infusion completion

• ⓒ Delivery time : Display delivery time based on FLOW RATE , DEL VOL

NOTE

• Please contact a local authorized dealer or agency when you have problem with the unit.

3-1-5 TURN OFF THE UNIT

• Press [POWER] button for 2 seconds on "STAND BY" mode to turn off the unit.

- The unit is turned off after 2seconds with confirming sound and logo in LCD.
- The unit is not turned off in "MENU" mode.

3-2. SETUP AND PREMING IV SET

1. Connect IV set to the solution container.
2. Fill the solution into the drop chamber up to one third.
3. By opening the manual roller clamp on IV set, make a drop of solution formed on the tip of needle.
   Or keep pressing [PURGE] button to remove air in tube.
4. When priming is completed, close the manual roller clamp.

※ Compatible infusion set

Manufacturer	Model
BD(Becton Dickinson)	AN122, A120F
KV(Korea Vaccine)	S203, S203T

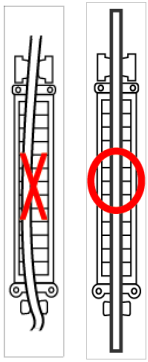
NOTE

- Infused volume by purge is included total infused volume.
- **Purge function is only in "STAND BY" mode. During infusion, purge button functions as Bolus button.**
- Refer to page 28 for setup purge rate.

3-3. ATTACHING THE TUBE TO THE PUMP

1. Open the door and push the release lever to the right to release the tube clamp.
2. Place tube correctly, make sure that the tube places in the air bubble detector and lay down straightly on the peristaltic finger part and the occlusion detector. Make sure that the occlusion detector moves smoothly when it is pushed.

- If the tube does not keep straight over the Peristaltic finger section, the desired infusion rate may not be achieved.
- When the same site of the tubing has been set at peristaltic finger section for a long time (over 12 hours), use it after moving the tubing connected to this pump at a distance of more than 10 cm. Deformation of tubing arising from long time (over 12hours) use can affect the accuracy.
- The tube should be replaced with a new one every 24 hours.



NOTE

- Replace new IV set during the operation;
  ① Stop the operation.
  ② Close the manual roller clamp on IV set, then open the door and remove IV set.
  ③ Replace new IV set and remove air bubble on the IV set tube.
  ④ Place new IV set on the pump correctly.
  ⑤ Close the door and open the manual roller clamp
  ⑥ Restart infusion

3-4. CLOSING THE DOOR

• Close the door and lock the door lock lever.

- Make sure the tube does not place between the pump and door.

3-5. ATTACHING THE DROP SENSOR

• Attach the drop sensor vertically on the drop chamber on IV set, by squeezing the drop sensor with fingers.

• Do not attach the drop sensor when it is not used.

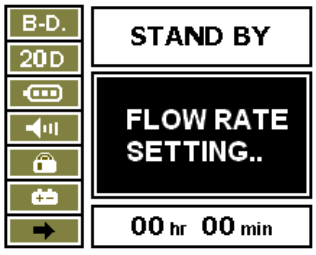
- The drop sensor should be located between the drop nozzle of drop chamber and the surface of the solution to avoid any incorrect detection.
- When the drop sensor is attached on the drop chamber, make sure that the drop sensor should be positioned vertically. If the drop sensor is attached obliquely, the desired infusion rate may not be achieved.

3-6. SETUP FLOW RATE (ml/h)

• Press FLOW RATE (ml/h) button, then setup desired value with numeral buttons.

• Delete previous digit in order with  button, delete complete value by press [ESC/2s CLR] button for 2seconds.

• Save the setup value with SEL button. After save the value, FND turns to initial display automatically.



SETUP FLOW RATE

NOTE

- If FLOW RATE is saved as 0 ml/h, alarm sound comes out and infusion is not started.
- FLOW RATE range : 1~1000ml/h (0.1 ml/h step, with 15drop IV set)

3-7. SETUP DELIVERY VOLUME(ml)

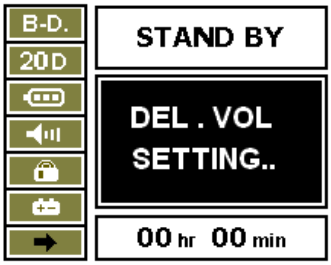
• Initial value for delivery volume is “0000”.

• Delivery volume range is 1~9999ml.

• Press DELIVERY VOLUME (ml) button, then setup desired value with numeral buttons.

• Delete previous digit in order with ⬅ button, delete complete value by press ESC/2s CLR button for 2seconds.

• Save the setup value with SEL button. After save the value, FND turns to initial display automatically.



SETUP DELIVERY VOLUME

• Delivery volume should be setup less than amount of solution container. So, when delivery volume is reached, flow rate turns into K.V.O. rate.

- Initial K.V.O. rate : 3ml/h with 15,19,20 drop IV set

1ml/h with 60 drop IV set

• K.V.O. rate is adjustable in “SYSTEM SEUP” mode.

NOTE

• If delivery volume is setup at 0ml, the unit operates infinite infusion. (Infusion keeps until solution container is empty.)

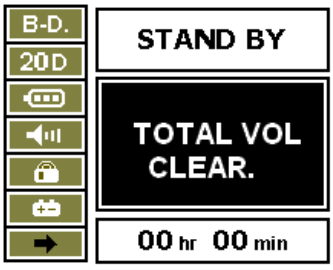
• DELIVERY VOLUME range: 1~9999ml(1ml step).

3-8. CONFIRM TOTAL INFUSED VOLUME(∑ml)

• Total volume(Σ㎖/CLEAR) shows the delivered volume so far.

• Press TOTAL VOL button.

• Delete total infused volume by press [ESC / 2sCLR] button for 2seconds.



TOTAL INFUSED VOLUME

3-9. SETUP DELIVERY TIME(hour)

• Press [SEL] button, DELIVERY TIME on the bottom of LCD is blinked. Set up delivery time with numerical buttons and save it with [SEL] button.

NOTE

- Third value is calculated and displayed automatically when two setup values are entered among FLOW RATE, DELIVERY VOLUME, DELIVERY TIME.
- Please make sure about total infused volume when you setup infusion by time, previous total infused volume is included if it is not deleted.
- DELIVERY TIME range: 1min~99hour 59min

3-10. OPENING THE MANUAL ROLLER CLAMP ON IV SET

• Open the manual roller clamp on IV set.

- Check solution comes into the drop chamber and check if the solution comes out of the needle. Solution must not come out of the needle.
- If the solution comes out of the needle, check the list below.
  - Check the IV set is a recommended type which has been calibrated.
  - Check the tube if it places correctly.
  - Check the IV set, if it is under good condition.

If the solution still comes out of the needle even it satisfies the above check list, please stop using the pump and contact local authorized dealer.

3-11. PUT NEEDLE INTO THE PATIENT

• Put needle into the patient.

- The pump does not detect incorrect inserting of needle if the solution is infused out of blood vessel. Please regularly check the puncture site and monitor the patient's condition carefully.

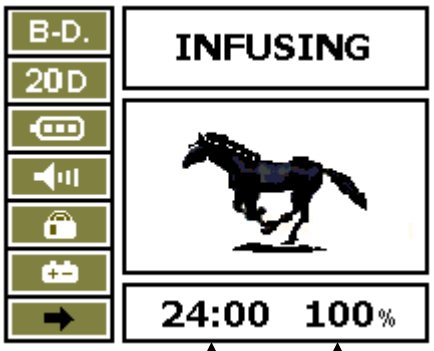
3-12. START INFUSION

NOTE

- Before start infusion, make sure about flow rate, delivery volume, amount of solution bag volume and brand of IV set.

• Press [START] button to start infusion.

• STATUS LED is blinked in green; LCD shows as below picture.



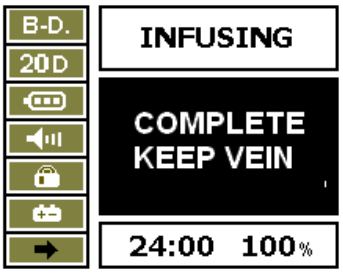
[INFUSING DISPLAY]

- Make sure about flow rate during infusion if it is correct.
- If there is detected any incorrect flow rate or infused volume, stop the unit immediately and contact local authorized agency.

3-13. INFUSION COMPLETION

• When delivery volume is reached, LCD shows “COMPLETE” and “COMPLETE KEEP VEIN” by turns as below picture with alarm sound.

• The unit turns into K.V.O. rate automatically.



Initial K.V.O. rate calibrated with 15,19,50 drop IV set	**3ml/h**
Initial K.V.O. rate calibrated with 60 drop IV set	**1ml/h**

NOTE

• K.V.O. rate is adjustable from 1ml/h to 10ml/h.

3-14. STOP INFUSION

• Press [STOP] button to stop infusion during the operation.

• Before restart infusion, FLOW RATE, DELIVERY VOLUME, the amount of solution volume should be confirmed. After confirming the condition, press [START] button to start infusion.

NOTE

• Allam goes off if do not restart in 2minutes after stop infusion temporally.

3-15. [POWER] BUTTON

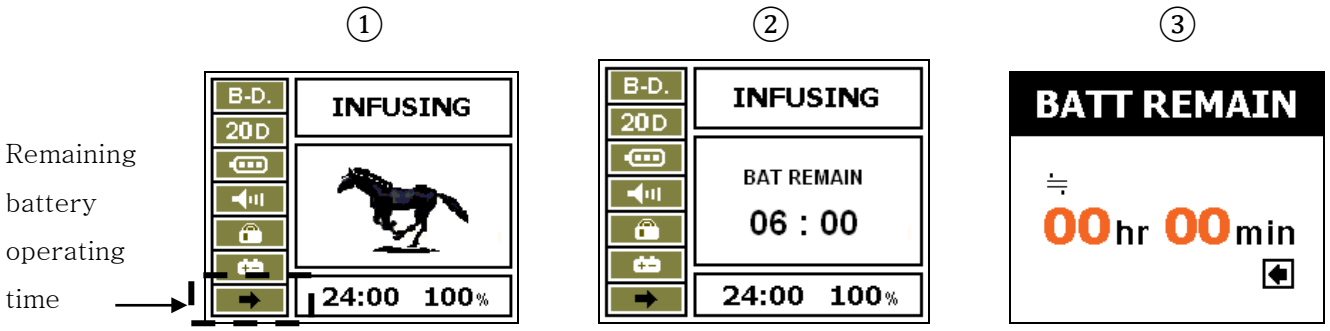
• Power is turned on and off by press [POWER] button.

• During infusion, [POWER] button does not function.

• Press [STOP] button first to stop infusion, then press [POWER] button to turn off the unit.

3-16. BATTERY REMAIN

• Press → button in initial mode, display turns into number ③ picture and display the remaining battery operating time.



• Remaining battery operating time is different as its infusion setup condition and battery condition.

• Check about battery condition and operating condition with you refer to “BATTERY REMAIN”.

• Charging LED on the front should be green when you refer to “BATTERY REMAIN”.

3-17. ERROR ALARM

• When alarm goes off with error, press [SILENCE] button to hold alarm sound for 2seconds then settle the problem. Otherwise, alarm sound goes off again.

3-18. BATTERY OPERATION

• This unit operates with AC power supply and built-in rechargeable battery. When AC power supply is disconnected, the unit turns into battery operating mode automatically.

• Battery is charged when AC power supply is connected when ever it is on or off.

• Battery operating time is 4hours at 125ml/h.

• New rechargeable battery should be charged more than 6hours.

• Battery state displays  on LCD as its remain state.

• With  battery state, if there is no AC power supply connected, the unit will be off with alarm sound and stop operation.

- Battery state should be checked every 6month to inspect battery life.
- Battery capacity may be different depends on its using condition such as fully charging and fully discharge cycle. For safety of longer battery operating time, battery should be fully charged one a month.
- If the unit has been kept without using it for more than 1months, or it is first time to use the unit, try to charge the built-in battery for more than 6hours.

3-19. NURSE CALL FUNCTION (OPTION)

- Connect nurse call connector on the back side of the unit and NURSE CALL SYSTEM built in a hospital with nurse call cord.

NOTE

- When alarm goes off, error message shows up in LCD, alarm signals are transferred to NURSE CALL SYSTEM every 5 second.
- Nurse call code number: 06LA548 ·

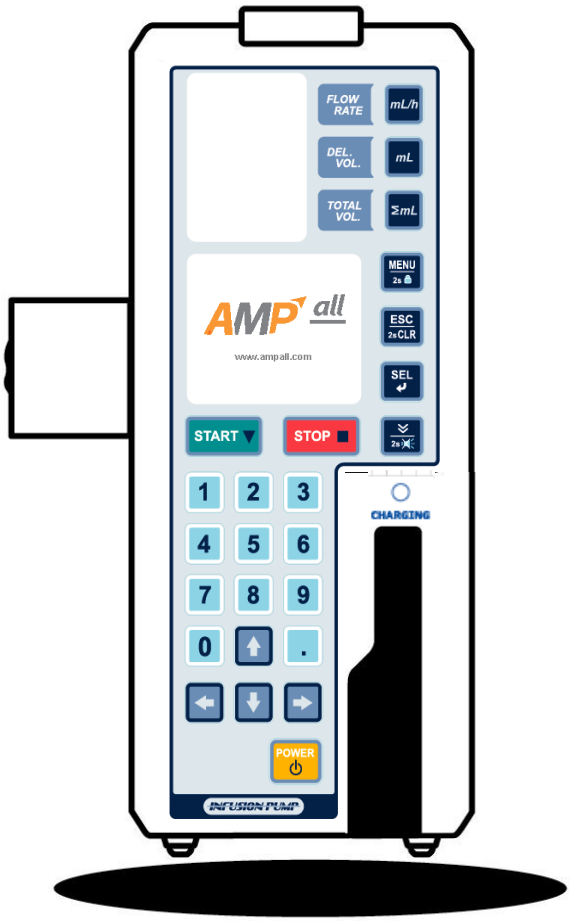
3-20. KEYPAD LOCK

- Lock keypad by pressing MENU/2s utton.
- Keypad lock can be done with password so user can control keypad lock.
- Under Keypad LOCK, all key do not function.

NOTE

- Refer to page 32 for setup KEYPAD LOCK.

4. SYSTEM SETUP

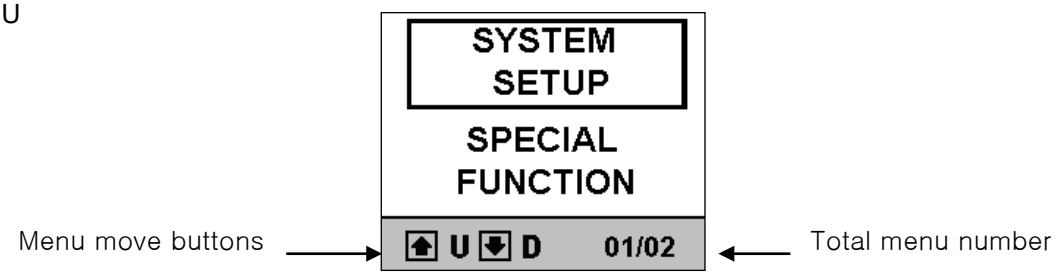


4. SYSTEM SETUP

• Press MENU button to get into Menu mode and select “SYSTEM SETUP” with [SEL] button.

• SYSTEM SETUP MENU

1. BUZZER
2. OCCLUSION
3. BRAND SET
4. INFUSION
5. DISPLAY
6. CONFIG



• It you do not press any button for 10seconds, LCD turns back to previous display with alarm sound.

• Press [ESC / 2sCLR] button to go back previous display. And press [SEL] button to save.

4-1. BUZZ. LEVEL SETUP

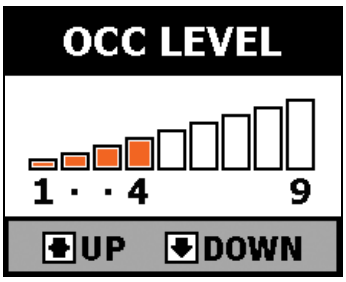
• Get into “BUZZ. LEVEL” mode, select Manu in order to MENU➔SYSTEM SETUP➔BUZZER.

•. Adjust buzzer level with UP , DOWN buttons. There are three levels, “HIGH” , “MIDDLE” and “LOW”. Select and save with [SEL] button. After save buzzer level display turns into previous mode.

Initial BUZZ. LEVEL	HIGH

4-2. OCC. LEVEL SETUP

• Get into ”OCC. LEVEL” mode, select menu in order to MENU➔SYSTEM SETUP➔OCCLUSION



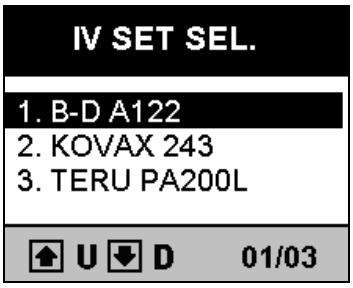
• OCCLUSION is adjusted with UP , DOWN buttons, it is from LEVEL 1 to LEVEL 9. Press [SEL] button to select and save. After select and save it, it turns into previous menu.

NOTE

- “H”: 800±200mmHg (106.7±26.7 kPa) or 1.09±0.27 kgf/㎠
- “M”: 500±100mmHg (66.7±13.3 kPa) or 0.68±0.14 kgf/㎠
- “L”: 300±100mmHg (40.0±13.3 kPa) or 0.41±0.14 kgf/㎠
- Initial set is LEVEL 5

4-3. IV SET SELECTION

• Get into “IV SET SEL.” menu in order to MENU➔SYSTEM SETUP➔BRAND SET.



• IV set should be calibrated by supplier, select the IV SET brand you will use with UP , DOWN button. Select and save the IV SET brand you will use with SEL button. After select and save it, it turns into previous menu.

• Here is the list of basic calibration IV SET brands.

NO	IV SET BRAND	MANUFACTURER
1	AN122	B.D.
2	A120F	B.D
3	S203	KOREA VACCINE
4	S203T	KOREA VACCINE

NOTE

• Preset is “B-D”.

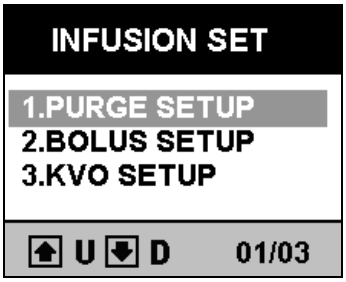
• If you want to use other IV set brand beside the list, please contact our local authorization dealer to get confirm about calibration.

• Un calibrated IV set may occur error or accuracy problem. Please make sure the IV set you are using is calibrated and approved by local authorized dealer or manufacturer.

• Manufacturer or local authorized dealer do not cover the result from using IV set which is not calibrated or approved by manufacturer or local authorized dealer.

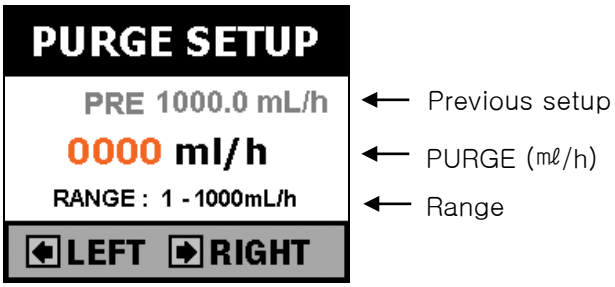
4-4. INFUSION SET

There are “PURGE SETUP” , “BOLUS SETUP” , “KVO SETUP” in “INFUSION SET” menu.



4-4-1. PURGE SET UP

• PURGE is setup from 1~1000ml/h.



• If PURGE rate is not setup, beep sound will come out and infusion will not start.

NOTE

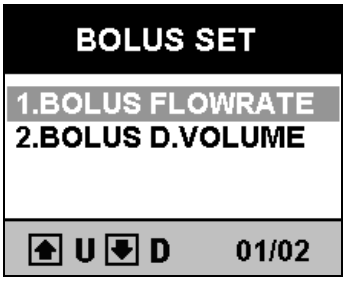
- Purge: To remove air in line(tube).
- Purge volume is included in total infused volume.
- Purge is working only STANDBY mode.

- When Purge rate is less then flow rate, Purge rate works as setup flow rate.

4-4-2. BOLUS SET

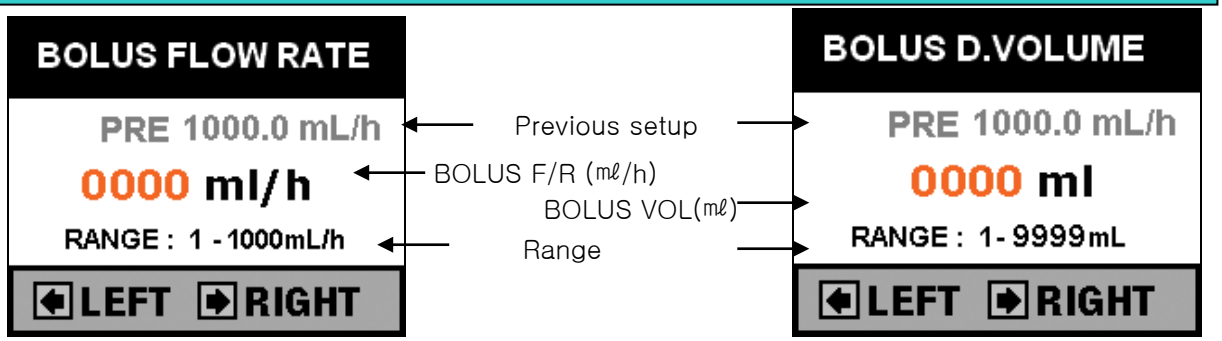
There are “BOLUS FLOWRATE” , “BOLUS D.VOLUME” for “BOLUS SET” menu.

※ BOLUS: Infuse sure amount of solution or drug by sure infusion speed.



- BOLUS FLOWRATE SET : Setup flow rate of BOLUS with numeral buttons. Save desired value with [SEL] button. Press [ESC / 2sCLR] buttons for 2seconds to delete the total value and press ▶ to delete previous digit in order.

※ Press [ESC / 2sCLR] button to move previous menu.



- BOLUS VOLUME : Setup total amount of BOLUS. Save desired value with [SEL] button. Press [ESC / 2sCLR] buttons for 2seconds to delete the total value and press ⬅ to delete previous digit in order.

NOTE

• BOLUS ON/OFF : Get into the menu in order to MENU➔SYSTEM SETUP➔6.CONFLG➔BOLUS ON/OFF. You can select BOLUS ON/OFF. (Refer to page 29 for setup). (Initial setup is BOLUS OFF mode.)

• BOLUS and PURGE button is same one. It functions differently as its mode as blow.

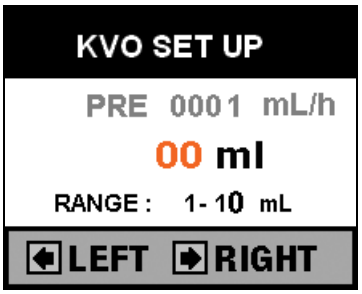
※ BOLUS function : Only during the infusion

• Please make about BOLUS ON/OFF. When you do not use BOLUS function, please setup BOLUS OFF so it does not function. And make sure when you use BOLUS function about its setup condition(flow rate, delivery volume) before use it.

4-4-3. K.V.O. SETUP

Setup K.V.O. (Keep Vein Open) rate from 0.1~10㎖/h.

※ K.V.O. (Keep Vein Open): When the delivery volume has been reached, flow rate turns into K.V.O. rate (adjustable from 1ml/h to 10ml/h) automatically to avoid clog by blood coagulation.



• Make sure K.V.O rate setup before use it to avoid excess infusion during K.V.O. function.

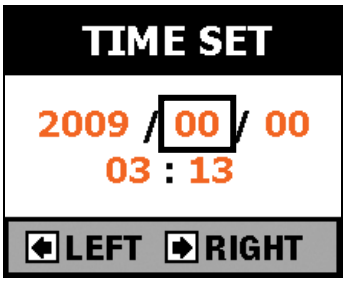
• Manufacturer does not cover the result from K.V.O. setup failure by user. So please make sure about K.V.O. setup condition before start infusion.

4-5. DISPLAY

There are “TIME SETUP” , “B.LIGHT TIME” , “B.LIGHT BRIGHT” for “DISPLAY” menu.

4-5-1. TIME SETUP

• Get into “TIME SET” menu in order to MENU➔SYSTEM SETUP➔DISPLAY➔TIME SETUP.



• Move with ⬆, ⬇, ➡, ⬅ buttons and input with numerical buttons for time setup. Press [SEL] button to select and save time set.

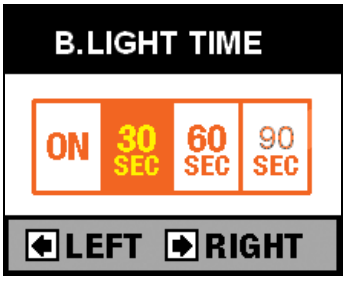
• There is no extra delete button because you can move with ⬆, ⬇, ➡, ⬅ buttons at any point.

NOTE

• Once time setup, the unit keeps time whenever it turns on or off.

4-5-2. LCD BACK LIGHT TIME

• Get into “B.LIGHT TIME” menu in order to MENU➔SYSTEM SETUP➔DISPLAY➔B.LIGHT TIME.



• There are 4modes for LCD black light mode.

-ON : Always LCD black light on.

-30SEC : Turns off after 30seconds.

- 60SEC : Turns off after 60seconds.

-90SEC : Turns off after 90seconds.

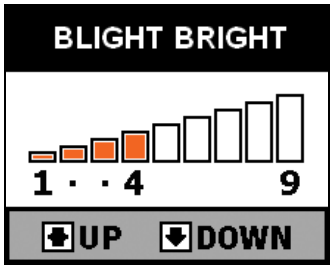
Move with ⬅, ➡ buttons and press [SEL] button to select and save the mode. After select and save it, it turns into previous menu.

NOTE

Initial set is ON.

4-5-3. LCD BLACK LIGHT BRIGHT

• Get into “BLIGHT BRIGHT” menu in order to MENU➔SYSTEM SETUP➔DISPLAY➔B.LIGHT BRIGHT.

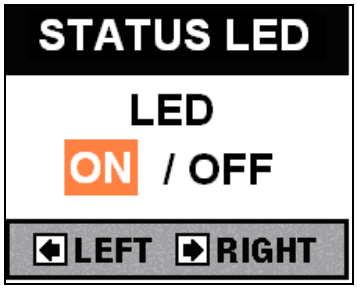


• There are brightness levels from LEVEL 1 to LEVEL 9. As level number is up, LCD goes brighter. Adjust it with , buttons and press [SEL] button to select and save it.

NOTE	Initial set is LEVEL 9.

4-5-4. SETUP STATUS LED

• Get into “STATUS LED” menu in order to MENU➔SYSTEM SETUP➔DISPLAY➔STATUS LED

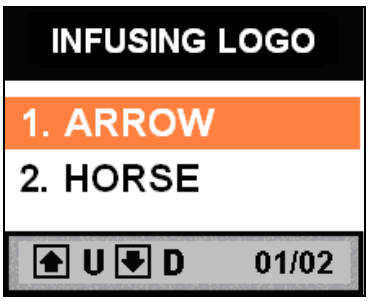


• Adjust “ON” or “OFF” with , buttons and save it with [SEL] button.

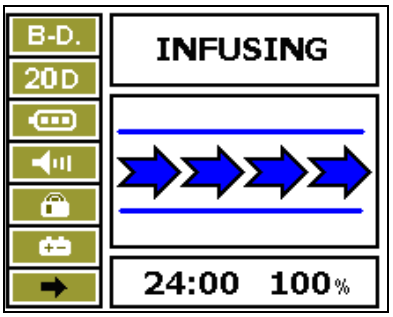
NOTE	Initial set is “ON”.

4-5-5. SETUP INFUSING LOGO

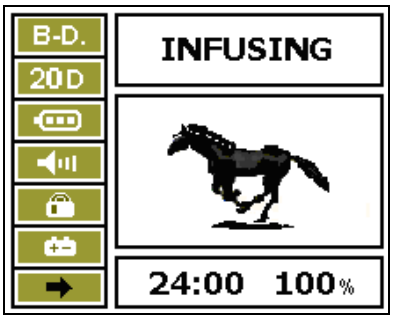
• Get into “INFUSION LOGO” menu in order to MENU➔SYSTEM SETUP➔DISPLAY➔INFUSING.



• Select Infusion Logo with , buttons and save it with [SEL] button.



1. ARROW



2. HORSE

NOTE Initial set is “HORSE”.

4-5-6. SETUP INITIAL LOGO

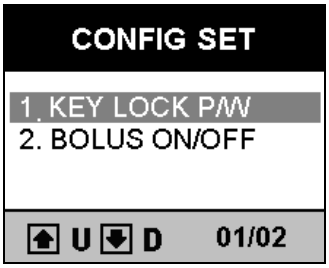
• Get into “INITIAL LOGO” menu in order to MENU➔SYSTEM SETUP➔DISPLAY➔INITIAL LOGO.

• This is Logo display for ON/OFF process.

• Select proper logo with ⬆ , ⬇ buttons and save it with [SEL] button.

4-6. CONFIG

There are KEY LOCK P/W , BOLUS ON/OFF for CONFIG menu.



Problems from incorrect setup by user, are charged on user. It does not cover by manufacturer.

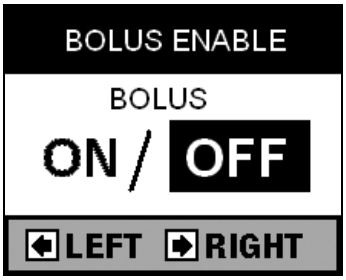
4-6-1. KEY LOCK P/W

• Get into KEYLOCK P/W menu in order to MENU➔SYSTEM SETUP➔CONFIG➔KEYLOCK P/W.

• Move with ◀, ▶ buttons, select and save with [SEL] button.

4-6-2. BOLUS ON/OFF

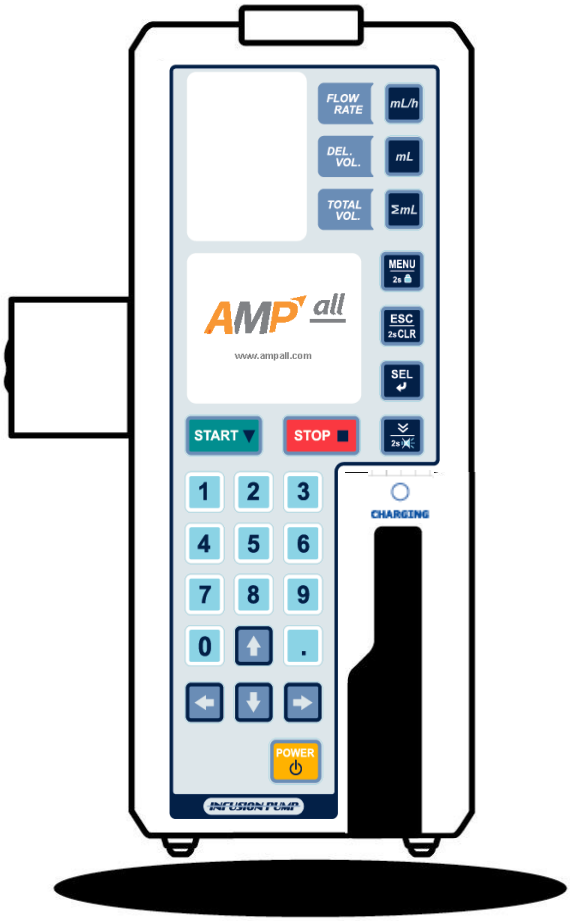
• Get into BOLUS INFUSE menu in order to MENU➔SYSTEM SETUP➔CONFIG➔BOLUS ON/OFF.



• Move with ◀, ▶ buttons, select and save with [SEL] button.

NOTE Preset is OFF. (KEY LOCK P/W , BOLUS INFUSE)

5. SPECIAL FUNCTIONS



5-1. Dosage

5-2. History

5-3. Profile(Option)

5-4. Pro. Mode

5. SEPCIAL FUNCTION

• Press MENU button to get into Menu mode and select SPEICAL FUNCTION with SEL button.

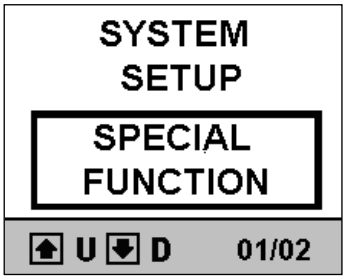
• SPEICAL FUNCTION MENU

1. DOSAGE (OPTION)

2. HISTORY

3. PROFILE (OPTION)

4. PRO.MODE



NOTE

• Contact local authorized dealer for OPTION SEPC.

5-1.DOSAGE

• DOSAGE SETUP

• Press buttons in order to MENU➔SPECIAL FUNCTION➔DOSAGE and there come up “DOSE RATE” on the LCD.

• DOSEGE : Automatically calculate and set the proper flow rate when the dose rate, body weight, drug mass and solution volume are entered.

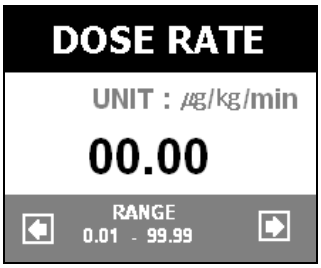
• After input each parameter, press [SEL] button. Each mode is confirmed and turns into next parameter automatically. Please refer to picture No. ① to ④.

• After setup complete parameter, it turns into picture No. ⑤ automatically and display complete information for each parameter value.

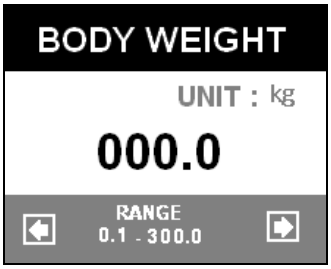
• Each parameter, you can delete or change the value with [ESC / 2sCLR] or , , , buttons.

• Press [ESC / 2sCLR] button to back previous mode.

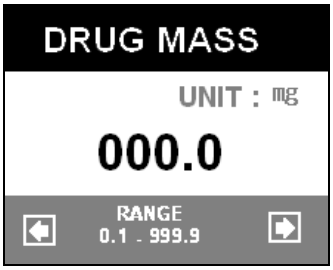
①



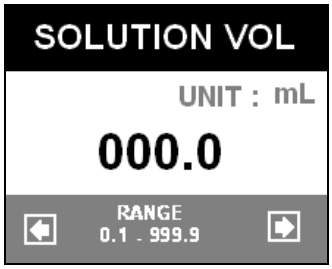
②



③

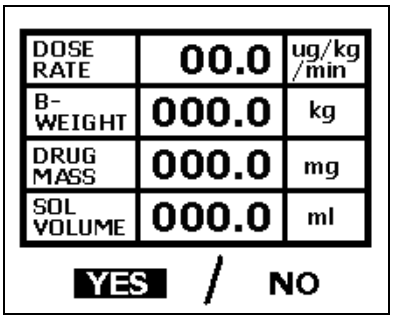


④



• As soon as finish input each parameter value, complete data is displayed as picture No. ⑤. Select YES to confirm the data for DOSAGE mode, it turns into STANDBY mode with confirm sound. Flow rate and Delivery volume are displayed on FND automatically. Press START button to start. If you select NO on the picture No. ⑤, it goes back DOSE RATE mode automatically to setup each parameter again.

⑤



*** Range for each parameter**

Dose rate	**0.01 ~ 99.99㎍/㎏/min. (0.01㎍/㎏/min. increment)**
Body weight	**0.1 ~ 300.0㎏ (0.1㎏ increment)**
Solution volume	**0.1 ~ 999.9㎖ (0.1㎖ increment)**
Drug volume	**0.1 ~ 999.9㎎ (0.1㎎ increment)**

NOTE

• Each parameter value should be more than “0”.

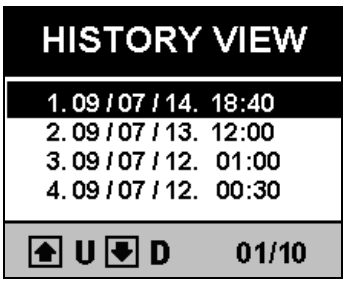
• DOSAGE Mode

Flow rate (ml/h) = [{Dose rate(㎍/kg/min.) * Body weight(kg) * Solution volume(ml)} / {Drug volume(mg) * 1000}]* 60

5-2. HISTORY

5-2-1. Check HISTORY

• Get into HISTORY VIEW menu in order to MENU➔SPECIAL FUNCTION➔HISTORY.



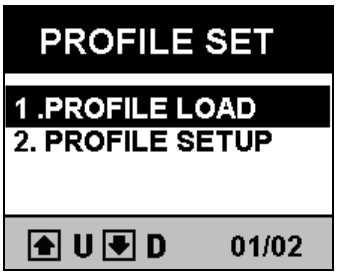
• HISTORY : Display last 10 infusion data, infusion starting time, infusion completing time, FLOW RATE , INFUSED VOLUME.

• Move with ▲, ▼, ▶, ◀ buttons and press SEL button to see detail information for each data.

• HISTORY DATA : Last 10 infusion data only.

5-3.PROFILE (OPTION)

• Get into PROFILE SET menu in order to MENU➔SPECIAL FUNCTION➔PROFILE.



5-3-1. PROFILE LOAD

• PROFILE LOAD : Call back the previous setup data. When you select this mode, there is YES or NO selection mode to start same profile.

• Select “YES” to start same profile with previous setup. The unit turns into STANDBY mode. Press START button to start PROFILE, the unit start PROFILE mode with displaying “PROFILE” on LCD.
• Select “NO” to setup new PROFILE.

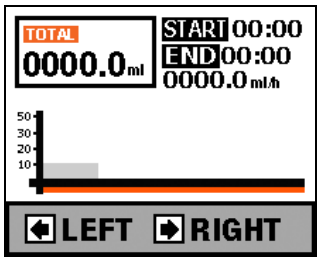
NOTE

• During PROFILE function, you can not setup Flow rate, Delivery volume. To stop PROFILE function, make sure PROFILE LOAD setup as “ NO”.

5-3-2. PROFILE SETUP

• PROFILE : Program infusion condition(flow rate, delivery volume, delivery time) differently for every hour, up to 24hours. (Option).
• Select “PROFILE SET UP” and press SEL button to get into below picture mode. Press SEL button to setup time for each profile, input each time with numerical buttons. Press SEL button to save each time and infusion setup(Flow rate, Delivery volume).
• Setup profile data up to 24hours in order to same process.

• Press START button to save.



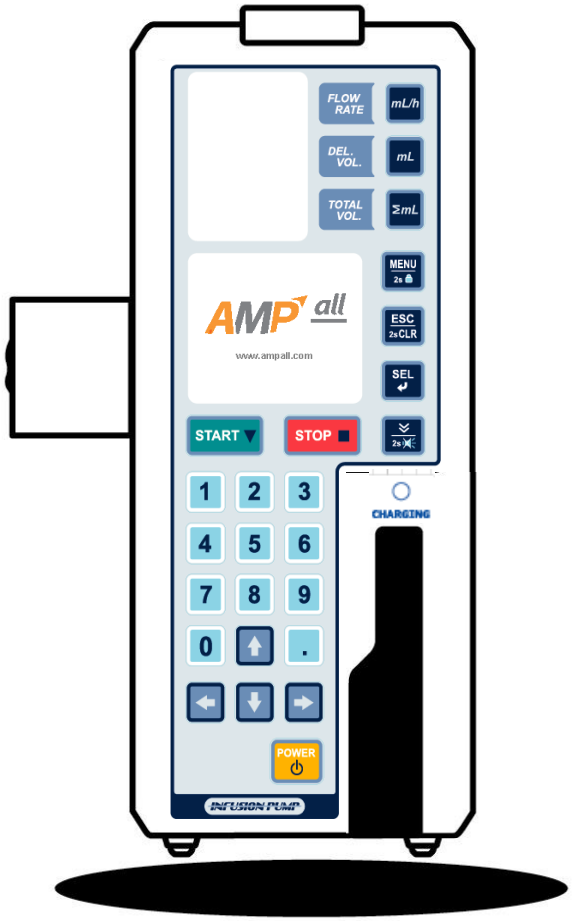
NOTE

- Time setup increment is hour only (not by minute).
- Maximum profile time is 24hour and 24 kinds of infusion setup available.
- Press up is “OFF”.
- Problem occurred by user setup is charged on user. Manufacturer does not cover the problem occurred by incorrect setup or use by user.

5-4.PRO.MODE

Contact local agency or local authorized dealer for this mode.

6. TROUBLE SHOOTING



Take the following actions if any trouble occurs. When the troubles could not be solved with the following actions, please contact your local authorized dealer immediately.

NOTE

- Whenever alarm goes off, the pump stops infusion and [STATUS] LED on the top of the pump is flashing in red. Alarm sound goes off only in error situation during infusion.

6. TROUBLE SHOOTING

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Symptom	Cause	Action
Pump is not switched on.	• AC or DC power cord is not connected properly	▶Check the AC or DC power cord connection. ⚠ • Never connect both AC and DC power to the pump at the same time
	• Internal battery has deteriorated	▶Stop the operation of the pump and replace with a new battery through your local authorized dealer.
	• The voltage of the internal battery is low.	▶Recharge the battery fully for more than 6 hours by connecting the pump to an AC power outlet.
The [AIR] LED flashes and alarm sound goes off with showing “AIR IN LINE” on the LCD.	• Air bubble is in the tubing • IV set is not properly placed • Air-In-Line detector is stained	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make “STAND-BY” mode by pressing [STOP] button. ▶3. Close the manual roller clamp on IV set. ▶4. Open the door and push the release lever to the right to release the tubing clamp. ▶5. Take the infusion line from the pump and tap the tube to make the air bubble gather into the drip chamber.(In case that Air-In-Line detector is stained, clean it with a gauze cloth or similar, moistened with cold or tepid water) ▶6. Set the infusion line back properly in place. ▶7. Close and lock the door securely. ▶8. Open the manual roller clamp on IV set. ▶9. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶10. Restart infusion by pressing [START] button.
	• IV set is not compatible with this pump.	▶Check the compatibility of IV set with your local dealer.
The [OCC] LED flashes and alarm sound goes off with showing “OCCLUSION” on the LCD.	• The manual roller clamp is closed.	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make “STAND-BY” mode by pressing [STOP] button. ▶3. Open the manual roller clamp on IV set. ▶4. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶5. Restart infusion by pressing [START] button

6. TROUBLE SHOOTING

Symptom	Cause	Action
The [OCC] LED flashes and alarm sounds continuously showing "OCCLUSION" on the LCD.	• The manual roller clamp is closed.	▶6. Close and lock the door securely. ▶7. Open the manual roller clamp on IV set. ▶8. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶9. Restart infusion by pressing [START] button.
	• IV set is not compatible.	▶Check the compatibility of IV set with your local dealer.
	• Tubing is kinked or twisted • IV set is not properly placed • Tubing is stretched or shrunk	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. Close the manual roller clamp on IV set. ▶4. Open the door and push the release lever to the right to release the tubing clamp. ▶5. Take the infusion line from the pump, check the infusion line and take a corrective action like untwisting or replacing with a new one to solve the problem of occlusion. ▶6. Set the infusion line back properly in place. ▶7. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶8. Restart infusion by pressing [START] button.
The [FLOW] LED flashes and alarm sounds continuously showing "FLOW ERR" on the LCD.	• The setting of drop volume is not correct. (e.g., In case of the use of IV set with 60drops/ml, the drop volume is set at 15drops/ml, 19drops/ml or 20drops/ml.)	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. By pressing [INFUSION SET] button, select the correct drops. ▶4. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶5. Restart infusion by pressing [START] button.
Also, [FLOW] LED flashes and alarm sounds continuously in case of Free Flow situation.	• The same site of the tubing has been set at peristaltic finger section for a long time(over 12 hours).	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. Close the manual roller clamp on IV set. ▶4. Open the door and push the release lever to the right to release the tubing clamp. ▶5. Either move the tubing connected to this pump at a distance of more than 10cm to reset or replace IV set with a new one. ▶6. Set the infusion line back properly in place. ▶7. Close and lock the door securely. ▶8. Open the manual roller clamp on IV set. ▶9. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶10. Restart infusion by pressing [START] button.

6. TROUBLE SHOOTING

Symptom	Cause	Action
The [FLOW] LED flashes and alarm sounds continuously showing "FLOW ERR" on the LCD. Also, [FLOW] LED flashes and alarm sounds continuously in case of Free Flow situation.	• IV set is not compatible with this pump.	▶Check the compatibility of IV set with your local dealer.
	• Tubing is not properly placed	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. Close the manual roller clamp on IV set. ▶4. Open the door and push the release lever to the right to release the tubing clamp. ▶5. Set the infusion line properly in place. ▶6. Close and lock the door securely. ▶7. Open the manual roller clamp on IV set. ▶8. Make sure to check that the delivery rate, delivery limit and drop volume that were set. ▶9. Restart infusion by pressing [START] button.
	• Drip sensor is not securely attached on the drip chamber on IV set.	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. Attach the drip sensor securely on the drip chamber. Make sure that the surface of drip chamber and drip sensor is dry. ▶4. Make sure to check that the delivery rate, delivery limit and drop volume that were set ▶5. Restart infusion by pressing [START] button.
The [EMPTY] LED flashes, and alarm sounds continuously showing "EMPTY" on the LCD.	• The solution container is empty	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. In case of completing the infusion, close the manual roller clamp on IV set and remove the needle from the skin. (In case of continuing the infusion, close the manual roller clamp, remove the needle from the skin and exchange the solution container with a new one and restart infusion by following the operating procedure)
	• Air or dew is in Drip chamber	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. Tap the drip chamber to remove air or dew ▶4. Make sure to check that the delivery rate, delivery limit and drop volume that were set. ▶5. Restart infusion by pressing [START] button.
	• Peristaltic fingers do not move	▶ Stop the operation of the pump and contact your local authorized dealer.

Symptom	Cause	Action
The [EMPTY] LED flashes and alarm sounds continuously showing "EMPTY" on the LCD despite the remaining solution in the container.	• Tubing is kinked or twisted. • Tubing is stretched or shrunk	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. Close the manual roller clamp on IV set. ▶4. Open the door and push the release lever to the right to release the tubing clamp. ▶5. Take the infusion line from the pump, check the infusion line and take a corrective action like untwisting or replacing with a new one to solve the problem of occlusion. ▶6. Set the infusion line back properly in place. ▶7. Close and lock the door securely. ▶8. Open the manual roller clamp on IV set. ▶9. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶10. Restart infusion by pressing [START] button.
	• The wire in the cable of the drop sensor is damaged.	▶ Stop the operation of the pump and contact your local authorized dealer.
	• The drop sensor is stained	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. Clean it with a gauze cloth or similar, moistened with cold or tepid water. ▶4. Attach the drop sensor securely on the drop chamber. ▶5. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶6. Restart infusion by pressing [START] button.
	• The manual roller clamp on IV set is closed.	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make "STAND-BY" mode by pressing [STOP] button. ▶3. Open the manual roller clamp on IV set. ▶4. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶5. Restart infusion by pressing [START] button.

6. TROUBLE SHOOTING

Symptom	Cause	Action
	• Drop sensor is not securely attached on the drip chamber on IV set.	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make “STAND-BY” mode by pressing [STOP] button. ▶3. Attach the drop sensor securely on the drop chamber. Make sure that the surface of drop chamber and drop sensor is dry. ▶4. Check the setting delivery rate, delivery limit and volume of medicine bag. ▶5. Restart infusion by pressing [START] button.
The [DOOR] LED flashes and alarm sounds continuously showing “DOOR OPEN” on the LCD.	• Door is open.	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make “STAND-BY” mode by pressing [STOP] button. ▶3. Close and lock the door securely. ▶4. Check the setting delivery rate, delivery limit and volume of medicine bat. ▶5. Restart infusion by pressing [START] button.
The [BATTERY] LED in Low level flashes and alarm sounds continuously showing “BATT LOW” on the LCD.	• The voltage of the internal battery is low	▶1. Turn the alarm off by pressing [SILENCE] button. ▶2. Make “STAND-BY” mode by pressing [STOP] button. ▶3. Recharge the battery fully for more than 6 hours by connecting the pump to an AC power outlet.
	• Internal battery has deteriorated	▶Stop the operation of the pump and replace with a new battery through your local authorized dealer.

- Before restarting infusion, make sure to check the delivery rate, delivery limit and drop volume that were set.
- After restarting infusion, check the drip rate to confirm the delivery of the solution at the selected rate.
- If any irregularity is observed, immediately stop the operation of the pump and contact your local authorized dealer.

NOTE

- Repeat Alarm Function

: If no action is taken within 2 minutes after the alarm was switched off by press [SILENCE] button, the repeat alarm will sound.

Because of an industrial waste, used Ni-MH battery must be returned to ampall or distributor.

6. TROUBLE SHOOTING

In this pump, the delivery rate is not controlled by the drop sensor detecting the drop rate in the drop chamber. Therefore, to correct the fluctuations of volume of a drop caused by viscosity of solution, the delivery rate and limit should be compensated as follows.

< Example >

When 50% Glucose solution is to be delivered at the delivery rate of 100 ml/h,
the delivery rate and limit should be compensated by + 10%

Intended delivery rate: 100ml/h → Compensated value: 100ml/h x 1.10 = 110ml/h

Intended delivery limit: 1,000ml → Compensated value: 1,000ml x 1.10 = 1,100ml

• Without the above compensation, the actual delivery rate might be lower than intended but the pump could not detect it.

1. In case of using IV set of 15, 19 or 20drops/ml

Compensation Rate	Solution
0%	2. Isotonic Sodium Chloride Solution 3. 10% Glucose 4. 20% Fat Emerson
10%	- 50% Glucose
20%	5. 70% Glucose

2. In case of using IV set of 60drops/ml

Compensation Rate	Solution
0%	6. Isotonic Sodium Chloride Solution 7. 10% Glucose 8. 20% Fat Emerson
10%	- 50% Glucose
15%	9. 70% Glucose

7. Information on EMC

.1 Guidance and Manufacturer's Declaration – Electromagnetic Emissions

The EUT is intended for use in the electromagnetic environment specified below. The customer or the user of the EUT should assure that it is used in such an environment.

Emission test	Compliance	Electromagnetic environment - Guidance
RF Emissions CISPR 11	Group 1	The EUT uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment
RF Emissions CISPR 11	Class A	The EUT is suitable for use in ail establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations / Flicker emissions IEC 61000-3-3	Complies	

7.2 Guidance and Manufacturer's Declaration – Electromagnetic Immunity

The EUT is intended for use in the electromagnetic environment specified below. The customer or the user of the EUT should assure that it is used in such an environment.

Immunity test	IEC 60601 Test level	Compliance level	Electromagnetic environment -Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±(2,4,6)kV Contact ±(2,4,8)kV air	±(2,4,6)kV Contact ±(2,4,8)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%.
Surge IEC 61000-4-5	AC Mains (Line to Line): ± (0.5, 1) kV (Line to Earth): ± (0.5, 1,2) kV	AC Mains (Line to Line): ± (0.5, 1) kV (Line to Earth): ± (0.5, 1,2) kV	Mains power quality should be that of a typical commercial or hospital environment.
Power frequency magnetic field immunity IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Voltage dips, short interruptions IEC 61000-4-11	<5% UT (>95% dip in UT) for 0.5cycle 40% UT (60% dip in UT) for 5 cycle 70% UT (30% dip in UT) for 25 cycle <5% UT (<95% dip in UT) for 5 s	<5% UT (>95% dip in UT) for 0.5cycle 40% UT (60% dip in UT) for 5 cycle 70% UT (30% dip in UT) for 25 cycle <5% UT (<95% dip in UT) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the EUT image intensifier requires continued operation during power mains interruptions, it is recommended that the EUT image intensifier be powered from an uninterruptible power supply or a battery.
NOTE UT is the A.C. Mains voltage prior to application of the test level.			

7.3 Guidance and Manufacturer's Declaration – Electromagnetic Immunity

The EUT is intended for use in the electromagnetic environment specified below. The customer or the user of the EUT should assure that it is used in such an environment.

Immunity test	**IEC 60601 Test level**	**Compliance level**	**Electromagnetic environment - Guidance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80MHz	3 Vrms 150 kHz to 80MHz	Portable and mobile RF communications equipment should be used no closer to any part of the EUT, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = [\frac{3,5}{V_1}]\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5GHz	3 V/m 80MHz to 2.5GHz	$d = [\frac{3,5}{E_1}]\sqrt{P}$ 80 MHz to 800 MHz $d = [\frac{7}{E_1}]\sqrt{P}$ 800 MHz to 2,5 GHz where P is the maximum output power rating of the

			transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, a should be less than the compliance level in each frequency range. b Interference may occur in the vicinity of equipment marked with the following symbol : 
NOTE 1) At 80MHz and 800MHz, the higher frequency range applies. NOTE 2) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the EUT is used exceeds the applicable RF compliance level above, the EUT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the EUT. b Over the frequency range 150kHz to 80MHz, field strengths should be less than [V1] V/m.			

7.4 Recommended separation distances between portable and mobile RF communications equipment and the EUT

There is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the EUT can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the EUT as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter [W]	Separation distance according to frequency of transmitter [m]		
	150kHz to 80MHz $d = [\frac{3,5}{V_1}]\sqrt{P}$	80MHz to 800MHz $d = [\frac{3,5}{E_1}]\sqrt{P}$	800MHz to 2.5GHz $d = [\frac{7}{E_1}]\sqrt{P}$
	V1=3Vrms	**E1=3V/m**	**E1=3V/m**
0.01	0.116	0.1166	0.2333
0.1	0.368	0.3687	0.7378
1	1.166	1.1660	2.3333
10	3.687	3.6872	7.3785
100	11.660	11.6600	23.333

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where p is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1) At 80MHz and 800MHz, the separation distance for the higher frequency range applies.

NOTE 2) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

7.5 Immunity and Compliance Level

Immunity test	IEC 60601 Test Level	Actual Immunity Level	Compliance Level
Conducted RF IEC 61000-4-6	3Vrms 150kHz to 80MHz	3Vrms	3Vrms
Radiated RF IEC 61000-4-3	3Vrms 80MHz to 2.5GHz	3V/m	3V/m

7.6 Guidance and Manufacturer's Declaration – Electromagnetic Immunity

The EUT is intended for use in the electromagnetic environment specified below. The customer or the user of the EUT should assure that it is used in such an environment.

7. Information on EMC

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - Guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80MHz	3 Vrms 150 kHz to 80MHz	The EUT must be used only in a shielded location with a minimum RF shielding effectiveness and, for each cable that enters the shielded location with a minimum RF shielding effectiveness and, for each cable that enters the shielded location Field strengths outside the shielded location from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than 3V/m. (a)
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5GHz	3 V/m 80MHz to 2.5GHz	Interference may occur in the vicinity of equipment marked with the following symbol: 

NOTE 1) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

NOTE 2) It is essential that the actual shielding effectiveness and filter attenuation of the shielded location be verified to assure that they meet the minimum specification.

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength outside the shielded location in which the EUT is used exceeds 3V/m, the EUT should be observed to verify normal operation.
If abnormal performance is observed, additional measures may be necessary, such as relocating the EUT or using a shielded location with a higher RF shielding effectiveness and filter attenuation.

SPECIFICATION

INFUSION

FLOW RATE	1 ~ 1000ml/h (1ml steps) / 1.1 ~ 999.9ml/h (0.1ml steps)
ACCURACY WITH APPROVED I.V. SET	ml/h control mode: ±5%
DELIVERY VOLUME	0.1 ~ 9999ml
TOTAL INFUSED VOLUME	0.1 ~ 9999ml
K.V.O RATE	IV set: 15, 19, 20ml - 3ml/h / IV set: 60ml - 1ml/h (Adjustable from 1~10ml/h)

MECHANICAL

PUMPING MECHANISM	Linear Peristaltic Finger
DROP SENSOR	External (Optional)
DIMENSIONS (W×D×H)	100×190×250 (mm)
WEIGHT	Approximately 3.5kg

ALARM

AIR IN LINE, OCCLUSION, DOOR OPEN, EMPTY CONTAINER, K.V.O. RATE(INFUSION COMPLETION), LOW BATTERY, REPEAT ALARM, FLOW ERROR (I.V. SET FREE FLOW PROTECTION), DEIVCE MALFUNCTION

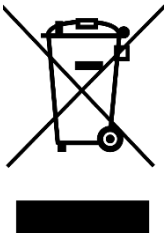
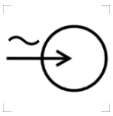
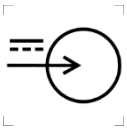
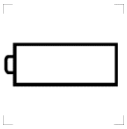
FEATURES

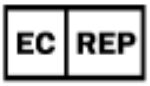
PURGE RATE	Adjustable from 1 to 1000ml/h
NURSE CALL	DC 24V, 0.5A
KEYPAD LOCK, RETAIN MEMORY, REMAINNING TIME, ALARM REPEAT, OPEN SYSTEM(Calibration is available for 10 brands of IV sets), K.V.O., PURGE, BOLUS, OCC LEVEL(9 steps : 4.5~14.5 psi), HISTORY CALL-BACK, DOSAGE MODE, NURSE CALL(OPTION), PROFILE(OPTION), CENTRAL SYSTEM(OPTION)	

OTHER PARAMETERS

POWER REQUIREMENTS	AC100 / 240V, 50 / 60Hz or DC24V 2A, 12V 4A / 45VA
POWER CONSUMPTION	40VA
CLASSIFICATIONS	Class IIb / Internal power supply / Type CF
BATTERY / OPERATION / CHARGING	Ni-MH9.6, 2000mAh / 4 hours (at 125ml/h) / more than 6 hours
BATTERY LIFE	1.5~2 years
OPERATION CONDITIONS	10~40℃, 30~85% RH (no condensation)
STORAGE CONDITIONS	-10~45℃, 10~95% RH (no condensation)
ATMOSPHERIC CONDITIONS	800 ~ 1100 hPa
WARRANTY PERIOD	1 year
Expected service Life	5 years

SYMBOL

No.	Description	Symbol
1	CE Marking of conformity	
2	Model Number.	
3	**Type CF applied part**	
4	Classification Class I	
5	Medical Device	
6	The product should be recycled separately from household waste. When this product reaches its end of life, follow the local laws and regulations of disposal. The improper disposal of waste electronic equipment from the consumer may be subject to fines.	
7	Rated power input, A.C.	
8	**Rated power input, D.C.**	
9	**Battery, general**	
10	Manufacture information	

11	Manufacturing Date and year	
12	Serial Number	
13	Manufacturer’ s EU representative information	
14	Refer to instructions for use	
15	Keep dry	
16	Fragile	
17	This way up	
18	Use no hooks	
19	To indicate that transport package shall not be exposed to sunlight.	
20	Indicates the temperature limits to which the medical device can be safely exposed.	
21	Indicates the range of humidity to which the medical device can be safely exposed.	
22	Indicates the range of atmospheric pressure to which the medical device can be safely exposed.	

AMPall warrants that the product shall be free from defects in workmanship and materials for the warranty period. The warranty is void if failure of the product has resulted from accident, alteration, abuse or misapplication to include unauthorized opening of the product.

Under the warranty, AMPall shall repair or replace at its option and expense any products found defective by the customer during the warranty period and returned to an authorized AMPall representative.
Return of the repaired or replaced product to the customer's original location shall be at the expense of AMPall unless AMPall determines that the products are not defective within the terms of the warranty.
In such case the customer shall pay AMPall all costs of handling, transportation and labor.

This warranty is in lieu of all other warranties whether expressed or implied.

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TEL: +31 (0)88 995 1333
E-mail: info@ar-experts.eu

Warranty Card

Thank you for your purchasing for AMPall product. The warranty period of IP-7700 is valid from the purchasing date. Please notice the purchasing date on the warranty card and keep this Warranty Card with the device all the time to get full customer service.

Product Name	Infusion Pump
Model Name	□ IP-7700
Manufacturing Date	
Warranty Period	1 years

Purchasing Date	/ / (year/ month/ date)
Customer	Name: Tel.:
	Add.:
Retailer	Name: Tel.:
	Add.:

Repairing Record

Date	Contents of Repair	Confirmation

☆ **Please show this Warranty Card when you request repairing service.**

3F. Annex Hankook Junja Hyeopdong B/D,

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